Iowa Department of Transportation

Metric

Standard Road Plans

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Highway Division

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Standard Road Plans

Prepared by the Methods Section
Office of Design

Iowa Department of Transportation

Highway Division

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Standard Road Plans

http://www.iowadot.gov/design/stdrdpln.htm

Prepared by the Methods Section
Office of Design

Questions concerning specific information contained in the Standard Road Plans should be sent to the Methods Section at:
design.standards@dot.iowa.gov

Questions concerning subscriptions to printed versions of the manual and its revisions should be directed to:
Office of Document Services
Telephone 515-239-1940

Preface

The Standard Road Plans contained within this manual have been developed to show standardized design features, construction methods and approved materials to be used in design plans for Interstate, Primary, and Secondary road construction in the State of Iowa.

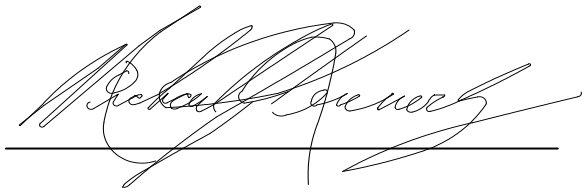
Standard Road Plans address “typical” design situations and are not intended to provide solutions to unique design problems. Where these problems require more individualized solutions, Standard Road Plans may be altered to cover, in part or in whole, these problems. When Standard Road Plans are altered, it is important that they be identified as “Details of ----.“ The DOT title block and all references to “Standard Road Plan” should be removed.

This manual is updated approximately twice per year. It is the responsibility of the holder of this manual to maintain the manual in current condition. The best way to do this is to check the Standard Road Plans website periodically for updates and revisions. The most current version of the manual and its revisions may be downloaded in PDF or DGN (MicroStation) format from:

http://www.iowadot.gov/design/stdrdpln.htm

Specific questions or suggestions with regard to the contents of this manual should be sent to the Methods Section at design.standards@dot.iowa.gov.

Approved



Michael J. Kennerly, P.E.
Design Engineer

Index

Refer to each section's index for a listing of the current Standard Road Plans within that section.

Pavement Widening And Resurfacing

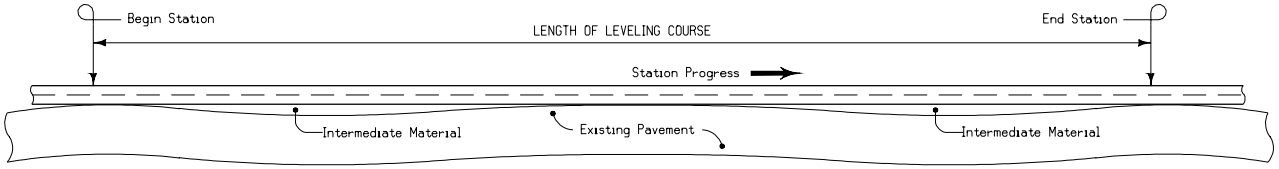
RG

SECTION

Pavement Widening and Resurfacing

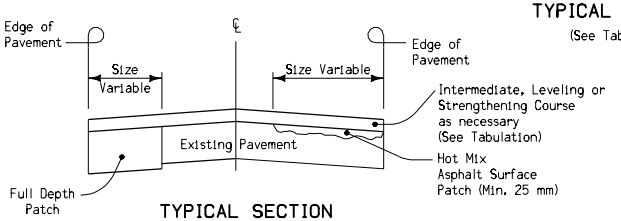
RG

NO.	DATE	TITLE
RG-1 (English)	04-19-11	P.C. Concrete Pavement Widening
RG-2	10-19-04	Details for Hot Mix Asphalt Resurfacing (Double Course)
RG-6	10-02-01	Details for Hot Mix Asphalt Resurfacing (Single Course)
RG-8	10-17-06	Hot Mix Asphalt Base Widening

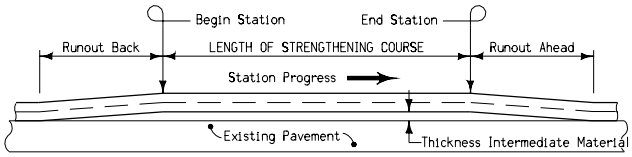


TYPICAL LEVELING COURSE

(See Tabulation for Location)



TYPICAL SECTION
FULL DEPTH AND SURFACE PATCHES



TYPICAL STRENGTHENING COURSE

(See Tabulation for Location)

GENERAL NOTES:

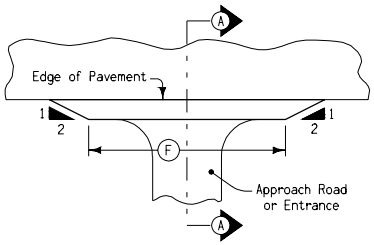
Unless otherwise specifically noted, full runout for Hot Mix Asphalt resurfacing shall be at the rate of 6 meters of length for each 10 millimeters of resurfacing thickness. Place subgrade paper, burlap, or similar material over adjacent surfaces in areas of run–out wedges to facilitate removal of wedges where subsequent future resurfacing is anticipated. Temporary runout shall be at the rate of 1.2 meters length for each 10 millimeters of resurfacing thickness.

Design Density = 2325 kilograms per cubic meter

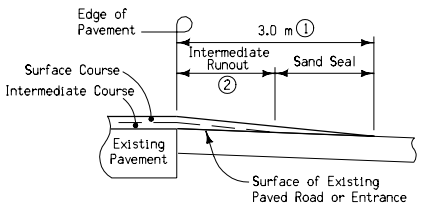
Tack Coat = 0.2 liters per square meter
For quantitative purposes, it is estimated that 2 applications are necessary.

Wedge shaped fillets of HMA shall be constructed at all paved entrances and paved intersecting roads. Full thickness fillets shall be constructed at all non–paved residential and com–mercial entrances and non–paved public roads.

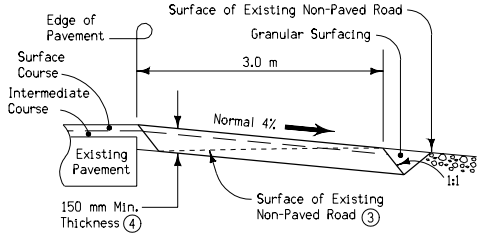
Fillet sizes as listed in the table are recommended and shall be used for design and estimating purposes. The Engineer shall establish the length and width of each individual fillet to accom–modate conditions at the site.



TYPICAL PLAN FOR FILLET
AT ENTRANCE OR
INTERSECTING ROAD



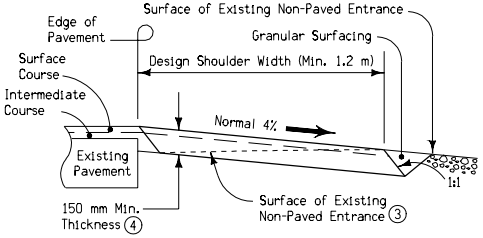
SECTION A-A
(WEDGE SHAPED FILLET)



SECTION A-A
(FULL THICKNESS FILLET - NON-PAVED ROAD)

NORMAL FILLET SIZES	
TYPE OF ACCESS	(F) Min. - m
Residential Entrance	12
Farm Entrance	18
Commercial Entrance	24
Non-Paved Road	30
Paved Road	Variable*

* See layout drawing for details of construction of special areas.



SECTION A-A
(FULL THICKNESS FILLET - NON-PAVED ENTRANCE)

(1) 3.0 meter width based on 80 millimeter thickness of resurfacing. Adjust for additional thickness on proportional basis.

(2) The ratio of the Intermediate Course runout length to the total runout length shall be the same as the ratio of the Intermediate Course resurfacing thickness to the total resurfacing thickness.

(3) Special shaping of existing surface prior to placement of fillet may be required by the Engineer and shall be considered incidental to other work on the project.

(4) For existing fillets at non–paved roads and entrances, a wedge shaped fillet match–ing the thickness of the resurfacing should be constructed.

All dimensions given in millimeters unless noted.

M

METRIC VERSION

Iowa Department of Transportation
Highway Division

STANDARD ROAD PLAN **RG-2**

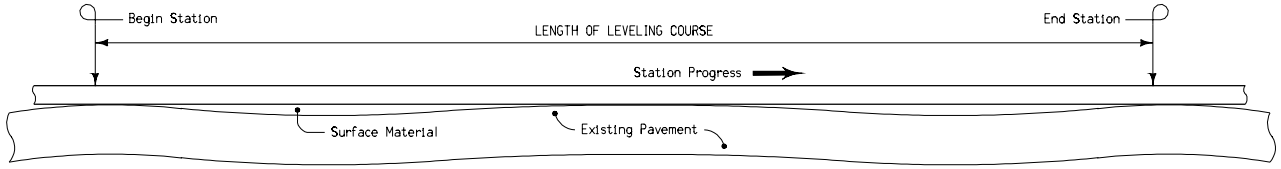
REVISION: Changed Asphaltic Concrete to HMA.

REVISION NO. 13

REVISION DATE 10-19-04

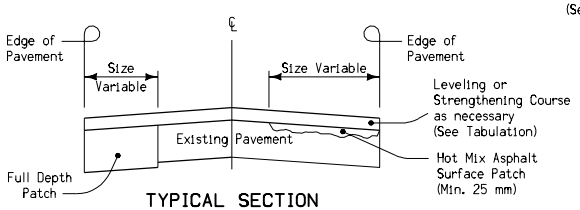
William J. Stein
APPROVED BY DESIGN METHODS ENGINEER

DETAILS FOR HOT
MIX ASPHALT RESURFACING
(DOUBLE COURSE)

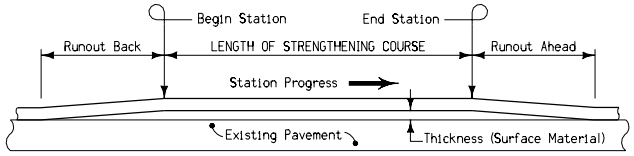


TYPICAL LEVELING COURSE

(See Tabulation for Location)

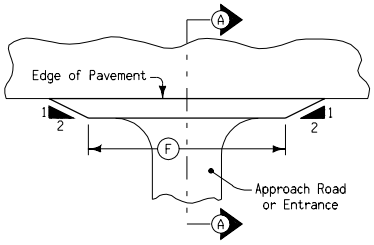


TYPICAL SECTION
FULL DEPTH AND SURFACE PATCHES

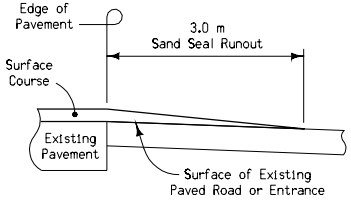


TYPICAL STRENGTHENING COURSE

(See Tabulation for Location)

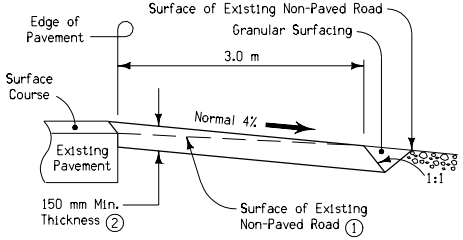


TYPICAL PLAN FOR FILLET AT
ENTRANCE OR INTERSECTING ROAD



SECTION A-A

(WEDGE SHAPED FILLET)

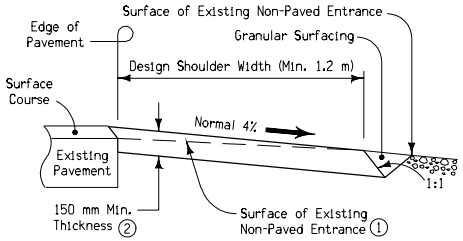


SECTION A-A

(FULL THICKNESS FILLET - NON-PAVED ROAD)

NORMAL FILLET SIZES	
TYPE OF ACCESS	(F) Min. - m
Residential Entrance	12
Farm Entrance	18
Commercial Entrance	24
Non-Paved Road	30
Paved Road	Variable*

* See layout drawing for details of construction of special areas.



SECTION A-A

(FULL THICKNESS FILLET - NON-PAVED ENTRANCE)

GENERAL NOTES:

Refer to typical cross sections of the project for detail data as to exact course dimensions and other construction requirements.

Refer to tabular listing for location and other details of runouts.

Unless otherwise specifically noted, full runout for HMA resurfacing shall be at the rate of 6 meters of length for each 10 millimeters of resurfacing thickness. Place subgrade paper, burlap, or similar material over adjacent surfaces in areas of run–out wedges to facilitate removal of wedges where subsequent future resurfacing is anticipated. Temporary runout shall be at the rate of 1.2 meters length for each 10 millimeters of resurfacing thickness.

Design Density = 2325 kilograms per cubic meter

Tack Coat = 0.2 liters per square meter
For quantitative purposes, it is estimated that 2 applications are necessary.

Sand seal shall be constructed in accordance with current Stan–dard Specification for Hot Mix Asphalt Mixtures.

Wedge shaped fillets of HMA shall be constructed at all paved entrances and paved intersecting roads. Full thickness fillets shall be constructed at all non–paved residential and com–mercial entrances and non–paved public roads.

Fillet sizes as listed in the table are recommended and shall be used for design and estimating purposes. The Engineer shall establish the length and width of each individual fillet to accom–modate conditions at the site.

(1) Special shaping of existing surface prior to placement of fillet may be required by the Engineer and shall be considered incidental to other work on the project.

(2) For existing fillets at non–paved roads and entrances, a wedge shaped fillet match–ing the thickness of the resurfacing should be constructed.

All dimensions given in millimeters unless noted.

M

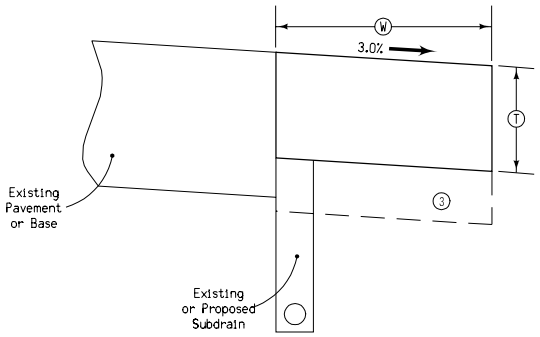
METRIC VERSION

Iowa Department of Transportation
Highway Division

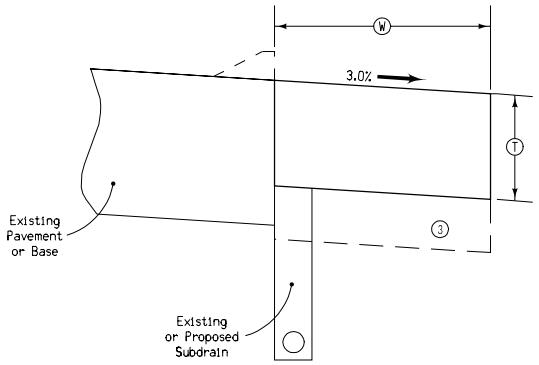
STANDARD ROAD PLAN **RG-6**

REVISION: Changed ACC to HMA	REVISION NO.
	11
	REVISION DATE
William J. Stein	10-02-01
APPROVED BY DESIGN METHODS ENGINEER	

DETAILS FOR HOT
MIX ASPHALT RESURFACING
(SINGLE COURSE)



Hot Mix Asphalt
Widening on Existing
Pavement Without Curb



Hot Mix Asphalt
Widening on Existing
Pavement With Curb

GENERAL NOTES:

'W' and 'T' shall be as specified as part of the individual project plans. Dimensions may vary for superelevated curves or at locations specifically designated by the Engineer.

Any asphalt materials excavated shall be handled as detailed elsewhere in the project plans.

Special shaping of widening units through bridge approach sections shall be done at the direction of the Engineer.

Excavation in excess of that indicated shall be considered incidental to other work on the project.

Special Backfill, as indicated, shall be placed only at locations where specifically required by the Engineer. Any such Special Backfill placed shall be paid for as "Extra Work" as per Article 1109.03 of the Standard Specifications.

(1) Estimated for two (2) applications of tack coat. Priming of subgrade or finished base not required.

(2) Quantities indicated are for design purposes and may be adjusted at time of construction when so directed by the Engineer.

(3) 150 mm Special backfill required when widening unit is part of the proposed traffic lane or when noted in project plans.

Design Quantities per side per station ②																							
Quantities Per Side	Thickness (Millimeters)																					Special Backfill	Width
	75	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280		Mg	M
HMA Base (Mg)	5.2	7.0	7.7	8.4	9.1	9.8	10.5	11.2	11.9	12.6	13.3	14.0	14.6	15.3	16.0	16.7	17.4	18.1	18.8	19.5			
Tack Coat (L) ①	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0		10.1	0.3
Class 13 Excavation, Widening (M^3)	2.3	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6.0	6.3	6.6	6.9	7.2	7.5	7.8	8.1	8.4			
HMA Base (Mg)	10.5	14.0	15.3	16.7	18.1	19.5	20.9	22.3	23.7	25.1	26.5	27.9	29.3	30.7	32.1	33.5	34.9	36.3	37.7	39.1			
Tack Coat (L) ①	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0		20.3	0.6
Class 13 Excavation, Widening (M^3.)	4.5	6.0	6.6	7.2	7.8	8.4	9.0	9.6	10.2	10.8	11.4	12.0	12.6	13.2	13.8	14.4	15.0	15.6	16.2	16.8			
HMA Base (Mg)	15.7	20.9	23.0	25.1	27.2	29.3	31.4	33.5	35.6	37.7	39.8	41.9	43.9	46.0	48.1	50.2	52.3	54.4	56.5	58.6			
Tack Coat (L) ①	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0		30.4	0.9
Class 13 Excavation, Widening (M^3)	6.8	9.0	9.9	10.8	11.7	12.6	13.5	14.4	15.3	16.2	17.1	18.0	18.9	19.8	20.7	21.6	22.5	23.4	24.3	25.2			
HMA Base (MG)	20.9	27.9	30.7	33.5	36.3	39.1	41.9	44.6	47.4	50.2	53.0	55.8	58.6	61.4	64.2	67.0	69.8	72.5	75.3	78.1			
Tack Coat (L) ①	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0		40.5	1.2
Class 13 Excavation, Widening (M^3)	9.0	12.0	13.2	14.4	15.6	16.8	18.0	19.2	20.4	21.6	22.8	24.0	25.2	26.4	27.6	28.8	30.0	31.2	32.4	33.6			

Design Rates	
Item	Rate
Base Course	2325 kg/m^3
Special Backfill	2250 kg/m^3
Tack Coat	0.2 L/m^2

All dimensions given in millimeters unless noted.

M

METRIC VERSION

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION 13 10-17-06

RG-8

SHEET 1 of 1

REVISIONS: Deleted details of shoulders and added additional quantities.

Deanna Maifield
APPROVED BY DESIGN METHODS ENGINEER

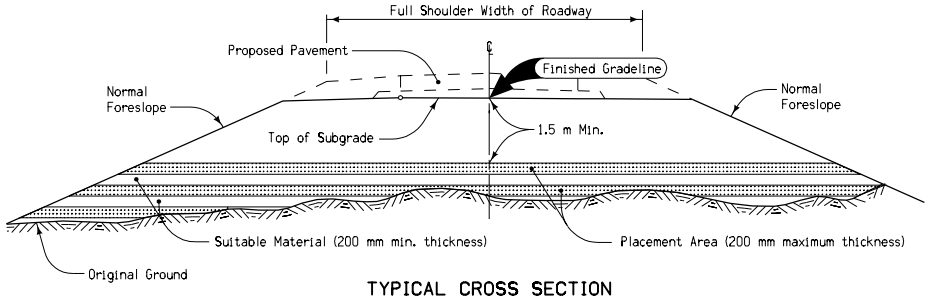
HOT MIX ASPHALT
BASE WIDENING

Earthwork

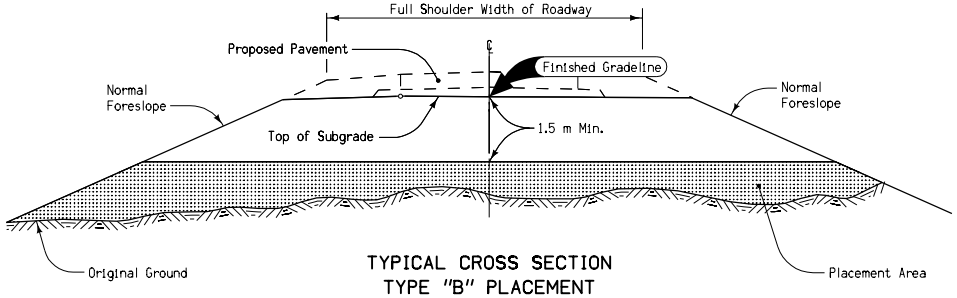
RL

Earthwork

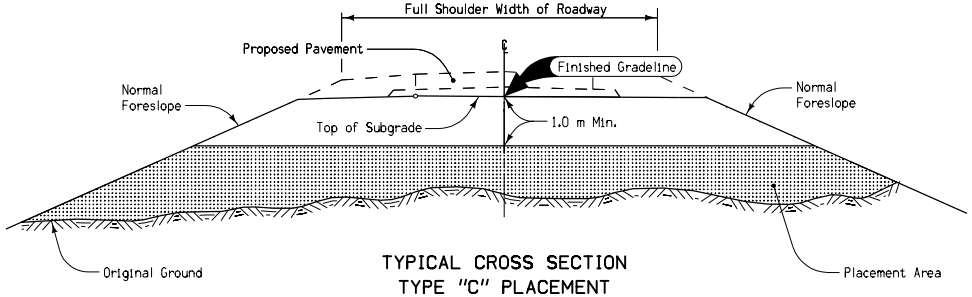
NO.	DATE	TITLE
RL-1A (English)	Void	Replaced by EW-101
RL-1B	10-17-06	Details of Embankment (Allowable Placement of Unsuitable Material)
RL-2A	10-18-05	Details of Embankment Subgrade Treatment, Moisture Density Control & Special Compaction
RL-3	10-31-95	Details for Standard Wing Dikes
RL-4	09-21-99	Ditch Blocks and Dikes
RL-6	10-17-06	Settlement Plate
RL-7	10-16-07	Safety Ramp
RL-8	04-21-09	Rural Entrance
RL-9	04-17-07	Temporary Erosion Control Measures
RL-12	04-20-10	Special Shaping for High Tension Cable Guardrail at Median Obstacles
RL-13	04-15-03	Details for Special Grading at Side Piers
RL-14A (English)	Void	Replaced by EW-301
RL-15	Void	Replaced by EW-203 and EW-204
RL-16 (English)	04-19-11	Temporary Stream Crossing, Causeway, or Equipment Pad
RL-17	Void	Replaced by EW-201 and EW-202



TYPICAL CROSS SECTION
TYPE "A" PLACEMENT



TYPICAL CROSS SECTION
TYPE "B" PLACEMENT



TYPICAL CROSS SECTION
TYPE "C" PLACEMENT

GENERAL NOTES:

This plan illustrates the normal construction procedure for the placement of unsuitable materials.

Materials and methods of construction shall be in accordance with current Standard and Supplemental Specifications.

Materials listed as "unsuitable" in the project plans shall normally be placed as detailed for the particular type of soil described in "Roadway and Borrow Excavation" of the Specifications. Project plan details or specific directions of the Engineer may require placement of topsoil or other unsuitable soil by methods other than those shown. Refer also to plan cross sections and soil survey sheets for additional information.

All dimensions given in millimeters unless noted.

M

METRIC VERSION

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION
9 | 10-17-06

RL-1B

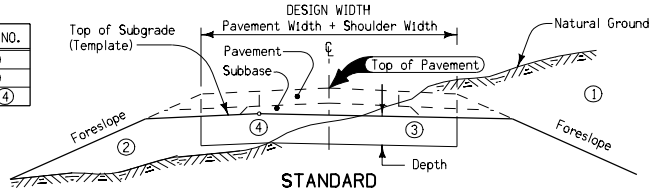
SHEET 1 of 1

REVISIONS: Do not allow placement of type "C" under shoulders due to shoulder stability problems.

Deanna Maifield
APPROVED BY DESIGN METHODS ENGINEER

DETAILS OF EMBANKMENT
(ALLOWABLE PLACEMENT
OF UNSUITABLE MATERIAL)

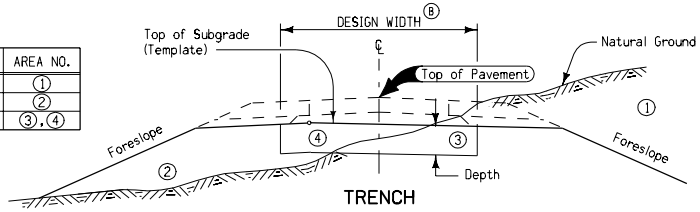
TYPE OF WORK	AREA NO.
Excavation	①
Embankment	②
Subgrade Treatment	③,④



AREA NO.	TYPE OF ADJUSTMENTS TO TEMPLATE QUANTITY
①	None
②	None
③	+ Cut
④	- Fill

STANDARD
SUBGRADE TREATMENT

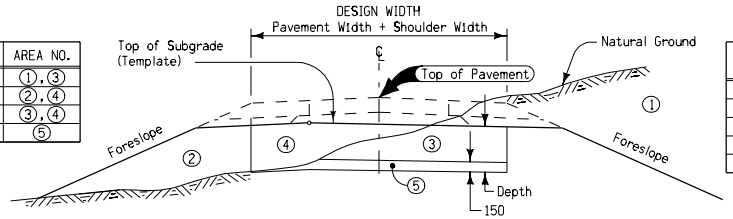
TYPE OF WORK	AREA NO.
Excavation	①
Embankment	②
Subgrade Treatment	③,④



AREA NO.	TYPE OF ADJUSTMENTS TO TEMPLATE QUANTITY
①	None
②	None
③	+ Cut
④	- Fill

TRENCH
SUBGRADE TREATMENT

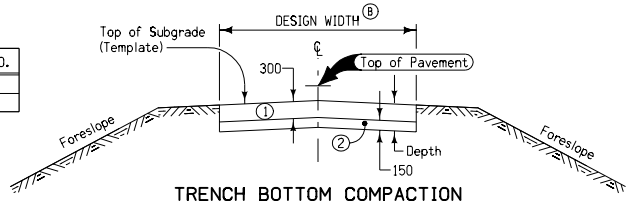
TYPE OF WORK	AREA NO.
Excavation	①,③
Embankment	②,④
M & D Embankment	③,④
Scarify with M & D Embank.	⑤



AREA NO.	TYPE OF ADJUSTMENTS TO TEMPLATE QUANTITY
①	None
②	None
③	+ Cut + Fill
④	None
⑤	None

MOISTURE CONTROL OR
MOISTURE AND DENSITY CONTROL

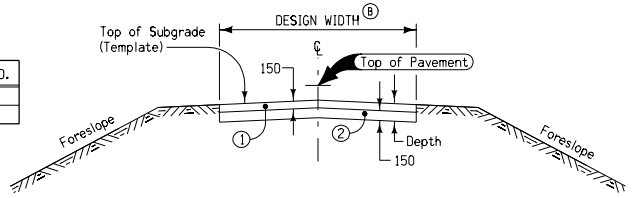
TYPE OF WORK	AREA NO.
Excavation	①
Scarify	②



AREA NO.	TYPE OF ADJUSTMENTS TO TEMPLATE QUANTITY
①	+ Cut + Fill
②	None

TRENCH BOTTOM COMPACTION
(Existing Roadways)

TYPE OF WORK	AREA NO.
Excavation	①
Scarify	②



AREA NO.	TYPE OF ADJUSTMENTS TO TEMPLATE QUANTITY
①	None
②	None

Ⓑ Design width equals pavement width plus 1.0 meter on each side.

SPECIAL COMPACTION

The pay quantity for Subgrade Treatment shall be in either megagrams or cubic meters. The volume shall be based on specified depth, the treatment type, and shall include the quantity allowed for shrinkage.

The pay quantity for "Compaction with Moisture and Density Control" or "Compaction with Moisture Control" shall be the absolute volume for the specified depth and subgrade width.

Contract Items:

Compaction with Moisture and Density Control
Compaction with Moisture Control
Compacting Trench Bottom
Special Compaction of Subgrade

Tabulations:

103-1
103-3
103-6

All dimensions given in millimeters unless noted.

M METRIC VERSION

Iowa Department of Transportation
Highway Division

STANDARD ROAD PLAN | **RL-2A**

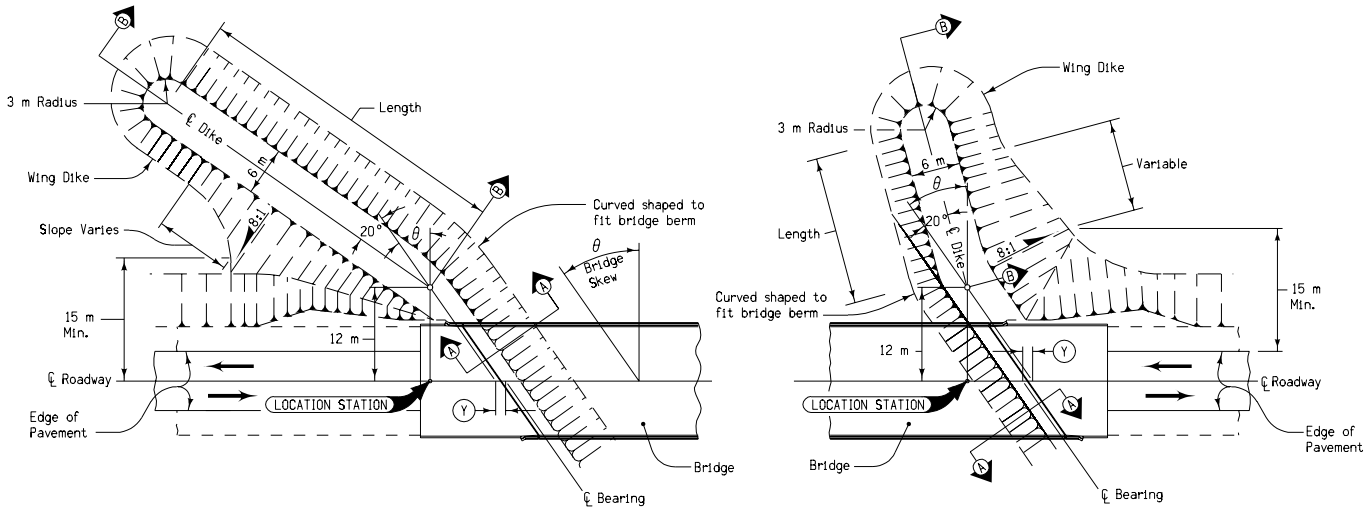
REVISION: Add note B to drawings 2 and 4.

REVISION NO. 9

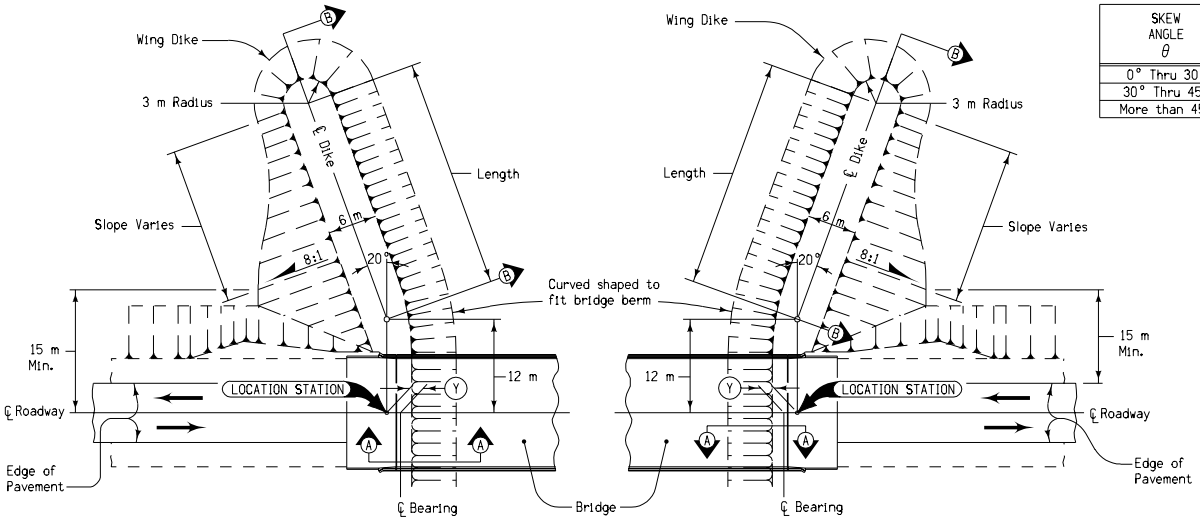
REVISION DATE 10-18-05

William J. Stein
APPROVED BY DESIGN METHODS ENGINEER

DETAILS OF EMBANKMENT
SUBGRADE TREATMENT, MOISTURE
DENSITY CONTROL & SPECIAL COMPACTION

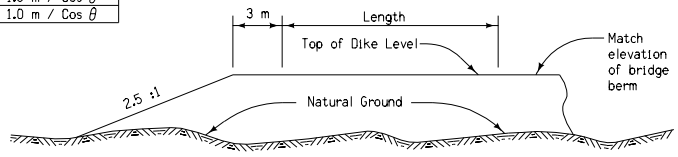


TYPICAL PLAN VIEW OF DIKE CONSTRUCTION AT SKEWED BRIDGE

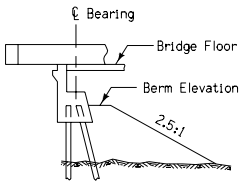


TYPICAL PLAN VIEW OF DIKE CONSTRUCTION AT NON-SKEWED BRIDGE

SKEW ANGLE θ	DIMENSION (Y)
0° Thru 30°	2.0 m / Cos θ
30° Thru 45°	1.5 m / Cos θ
More than 45°	1.0 m / Cos θ



SECTION B-B



SECTION A-A

General Notes:

This plan illustrates the normal construction procedure for wing dikes at bridges. The details for construction shall be as indicated hereon except when otherwise shown on the Project Plan.

Materials and methods of construction shall be in accordance with current Standard and Supplemental Specifications.

At locations where a portion of the wing dike would be within 15 meters of the edge of the traffic lane for the approach traffic, that portion of the dike shall be constructed with a slope of 8:1 parallel to traffic. The stream side slope of the wing dike shall be 2.5:1 as shown.

The wing dikes will be built with an additional skew angle of 20 degrees to the skew angle of the bridge. For details see the typical drawings on this sheet. The method of location will be similar when the direction of flow or skew is opposite that indicated.

Top of dike elevation will be the same as the bridge berm elevation unless otherwise noted.

Necessary materials for construction of the dikes are included on the tabulation of "Estimate of Quantities" for excavation.

Price bid for "Excavation of the class specified" shall be full compensation for construction of dikes as indicated hereon.

For guidelines to determine wing dike lengths or when to use wing dikes, see the Office of Bridges and Structures' document "Guidelines for Preliminary Design of Bridges and Culverts" or Iowa D.O.T.'s "Instructional Memorandums to County Engineers," I.M. 3.131.

All dimensions given in millimeters unless noted.

METRIC VERSION

Iowa Department of Transportation
Project Development Division

STANDARD ROAD PLAN **RL-3**

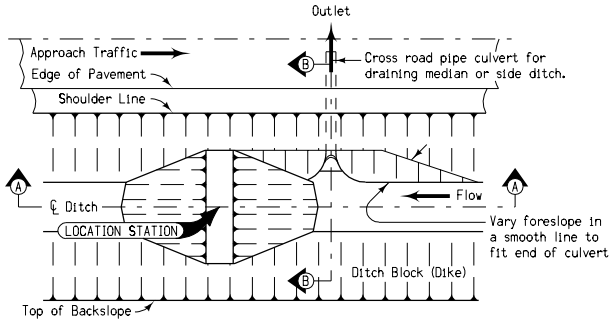
REVISION: Revise general notes.

REVISION NO. 7

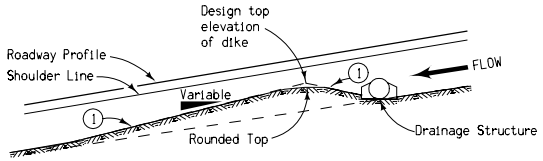
REVISION DATE 10-31-95

David P. Reitz 07-31-95
APPROVED BY DESIGN METHODS ENGINEER

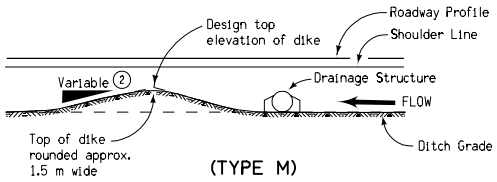
DETAILS FOR
STANDARD WING DIKES



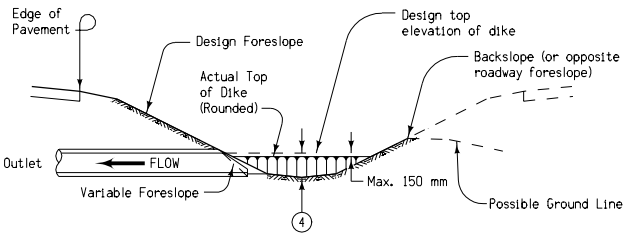
(TYPE M AND G)
TYPICAL PLAN FOR DITCH BLOCK (DIKE)



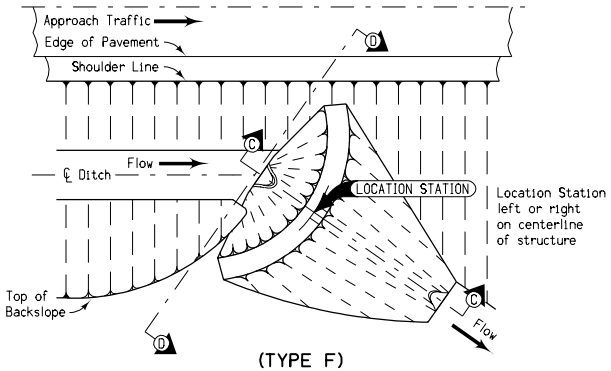
(TYPE G)
TYPICAL SECTION A-A



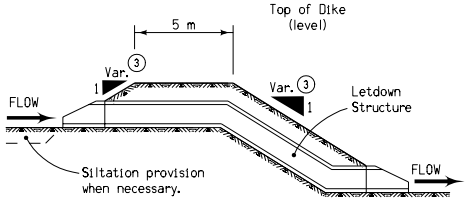
(TYPE M)
TYPICAL SECTION A-A



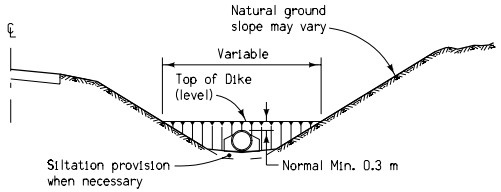
(TYPE M AND G)
TYPICAL SECTION B-B



(TYPE F)
TYPICAL PLAN FOR DIKE AT LETDOWN STRUCTURES



(TYPE F)
TYPICAL SECTION C-C



(TYPE F)
TYPICAL SECTION D-D

GENERAL NOTES:

Dikes of the types indicated hereon shall be constructed essentially as shown. Some variation will be allowed to adapt to local conditions when necessary.

Type F dike for letdown structures may vary in length and plan in different locations. Ends of dikes shall ordinarily tie into natural ground at the elevation of top of dike.

Refer to detail road plans and tabulation of drainage structures for exact information on location, top elevation, shape, or any variation from this plan for dikes.

Construction of dikes shall be coordinated with project provisions for erosion control as directed by the Engineer.

Necessary material for construction of dikes is included in "Estimate of Quantities" for excavation.

Price bid for "Excavation of the class specified" shall be full compensation for construction of dikes as indicated hereon in accordance with current Standard Supplemental Specifications.

DESCRIPTION OF DIKES

Type M – Normal ditch block for medians or roadway side ditches.

Type G – Ditch block using established ditch grades. For median or side ditches.

Type F – Dike for letdowns or other structures away from roadway area. Refer to project plans for details.

(1) Design Ditch Grade to accomplish purpose of Ditch Block. Maximum slope approximately 10:1 relative to roadway grade.

(2) Dike slope shall not be greater than 10:1.

(3) Any portion of dike constructed within 15 meters of edge of roadway with approaching traffic shall be 8:1 slope relative to approach roadway. Any portion of dike beyond 15 meters from edge of roadway may vary from 8:1 to a of 2.5:1 at 30 meters from roadway.

(4) Shall be 450 mm unless specified otherwise

All dimensions given in millimeters unless noted.

M

METRIC VERSION

Iowa Department of Transportation
Project Development Division

STANDARD ROAD PLAN **RL-4**

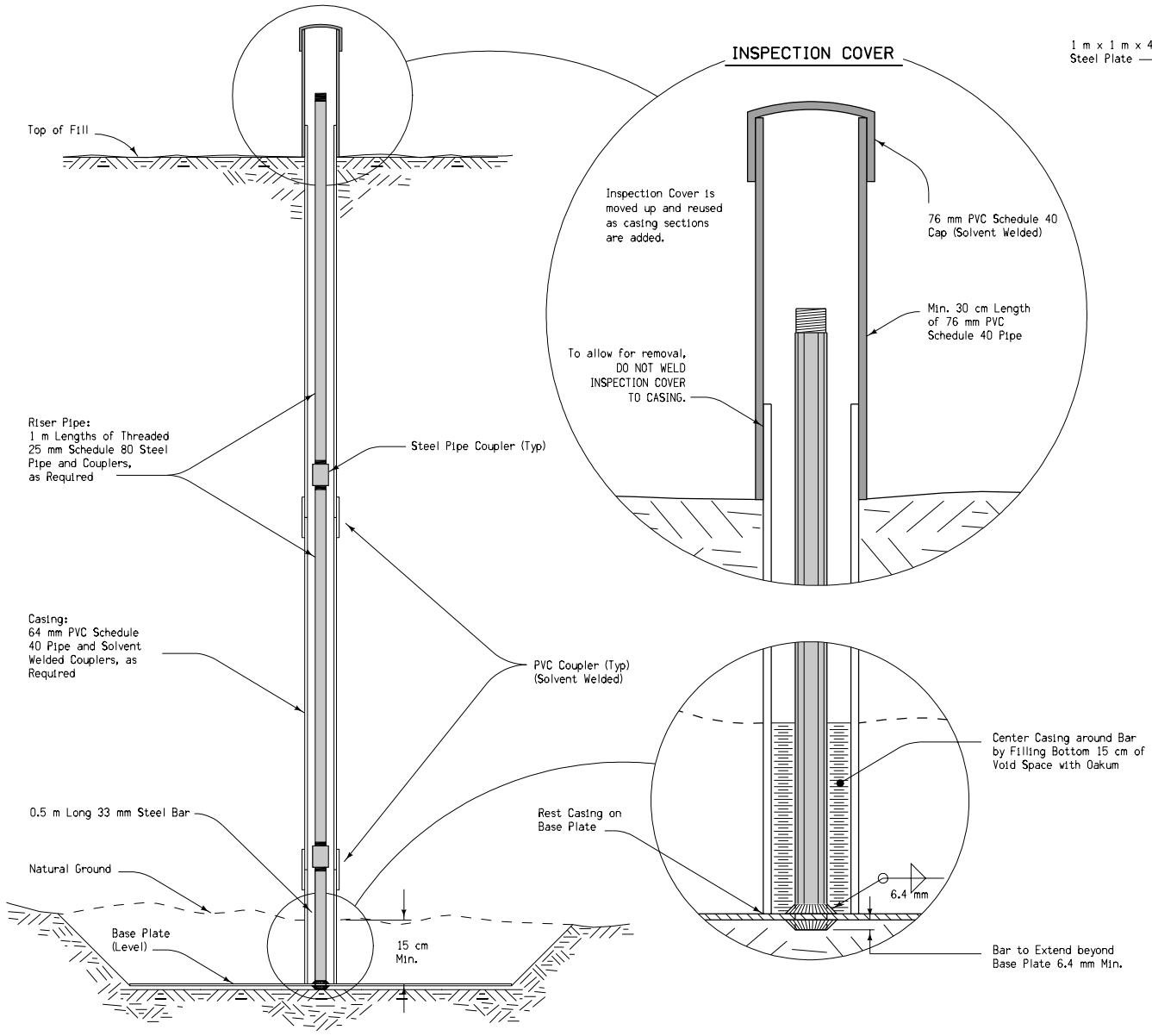
REVISION: Change section B-B, change note D to note 4 and add the word to-supplemental to General Notes.

REVISION NO. 5

REVISION DATE 09-21-99

05-24-99
APPROVED BY DESIGN METHODS ENGINEER

DITCH BLOCKS AND DIKES



Tabulation:
103–5

All dimensions given in millimeters unless noted.

M

METRIC VERSION

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION	
5	10-17-06

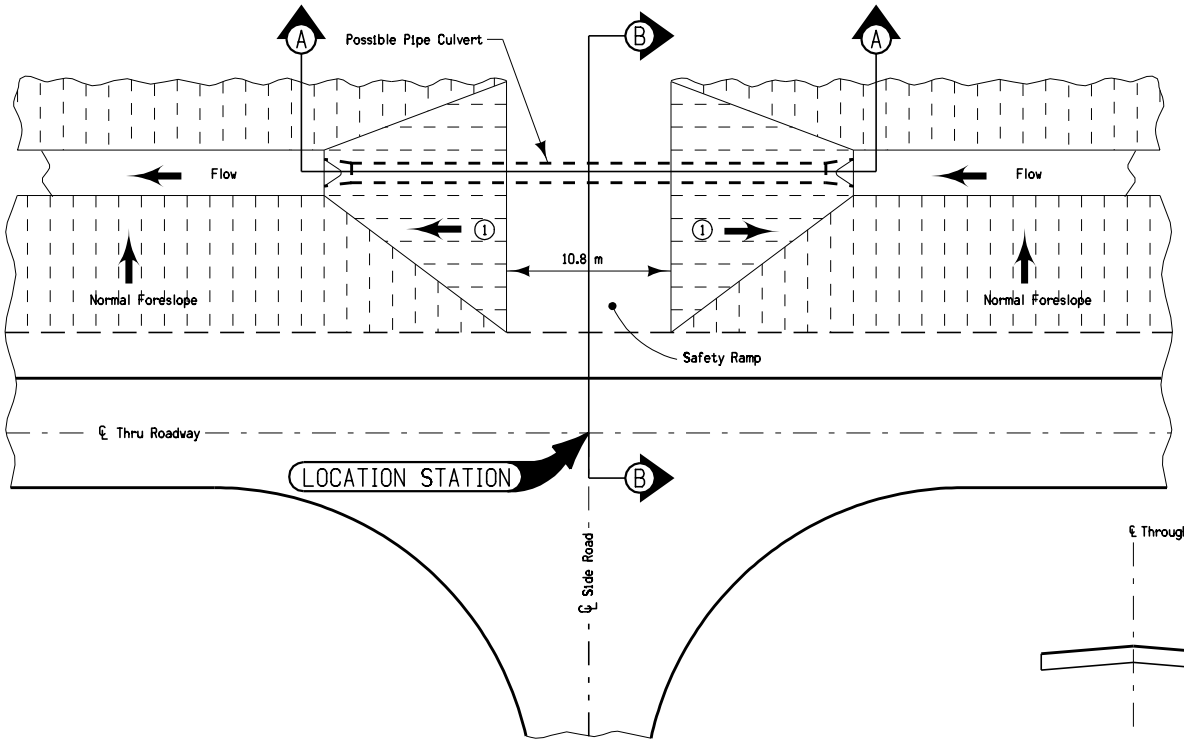
RL-6

SHEET 1 of 1

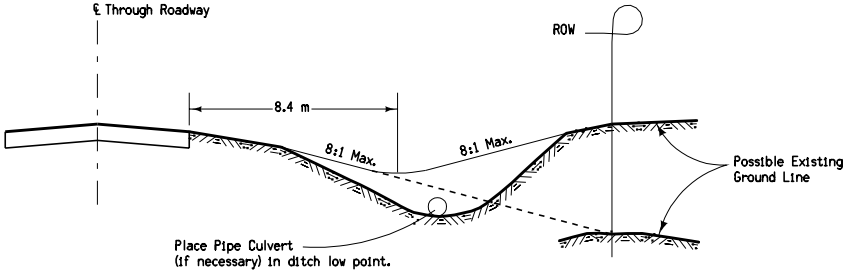
REVISIONS: Updated design. Remove all information concerning Embankment Control Stakes.

Deanna Maifield
APPROVED BY DESIGN METHODS ENGINEER

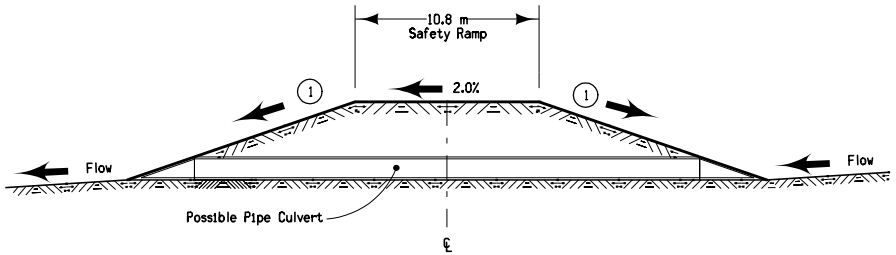
SETTLEMENT PLATE



PLAN



SECTION B-B



SECTION A-A

① Slope 10:1 or flatter without pipe, 8:1 or flatter with pipe. Construct slopes relative to the roadway grade.

Contract Items:

Culvert, Unclassified Entrance Pipe
Excavation, Class 10

All dimensions given in millimeters unless noted.

M

METRIC VERSION

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION 10 10-16-07

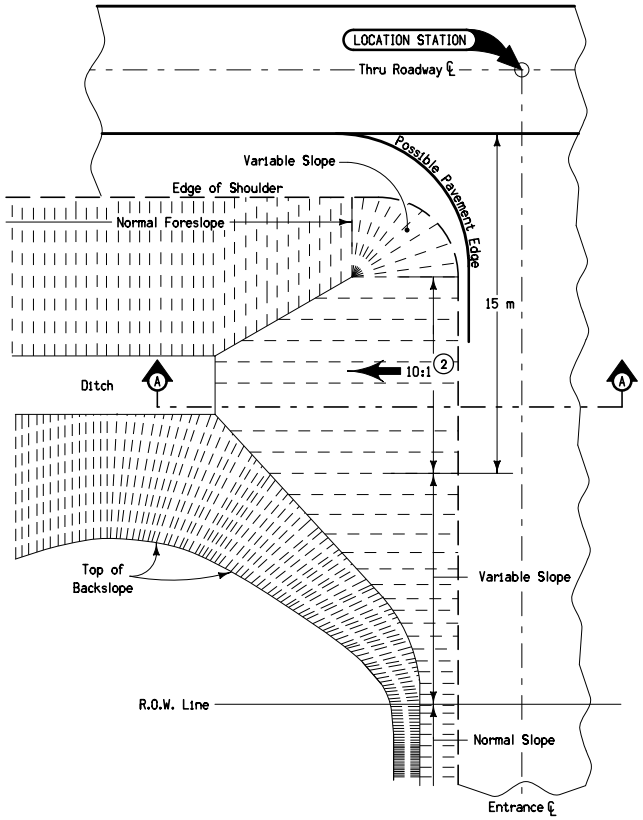
RL-7

SHEET 1 of 1

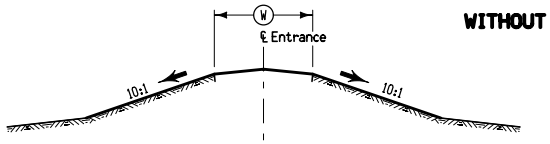
REVISIONS: Modified standard to show only safety ramp. Revised safety ramp width and added a dimension to section B-B.

Deanna Maifield
APPROVED BY DESIGN METHODS ENGINEER

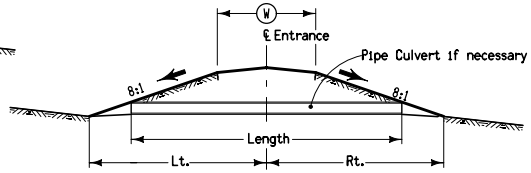
SAFETY RAMP



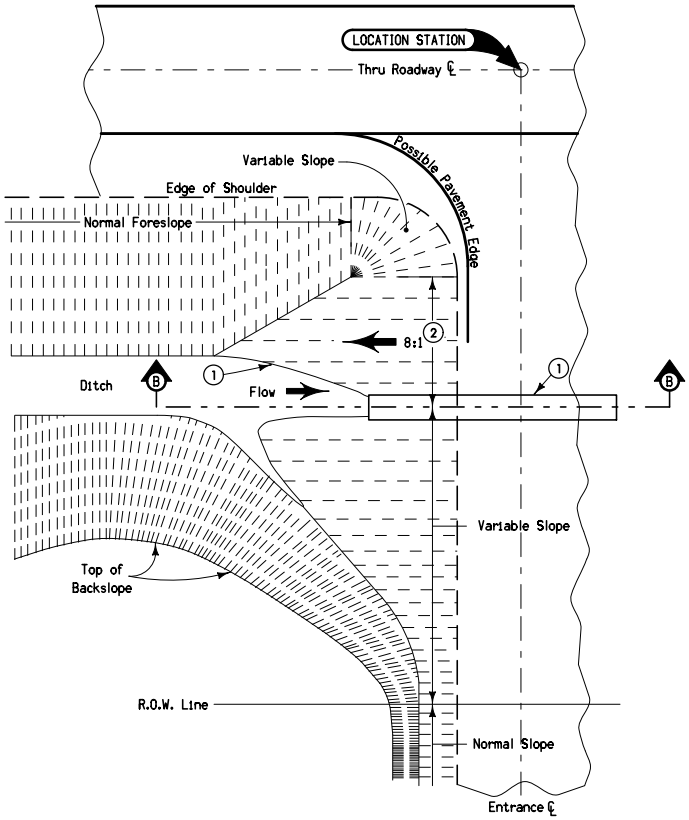
TYPE B OR C ENTRANCE
WITHOUT PIPE



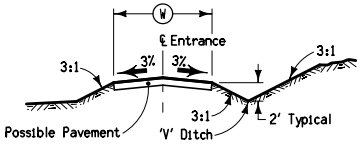
SECTION A-A



SECTION B-B



TYPE B OR C ENTRANCE
WITH PIPE



ENTRANCE TYPICAL SECTION

Surface and slopes of entrances shall be smoothly shaped and rounded where practical to provide minimal hazard to an out of control vehicle from through roadway.

Earthwork and material used for construction of entrances are included in estimate of quantities.

(1) Normal locations for entrance pipe culverts shall coincide with the line of the toe of backslopes as shown. Some special shaping of ditch may be required to fit culvert. Refer to tabulation of entrance pipe culverts and cross sections for details of installation.

(2) Construct slope relative to thru roadway grade.

ENTRANCE RADIUS CHART

TYPE OF ENTRANCE	Shoulder Radius (SR)	Pavement Radius (PR)
TYPE 'B' Light Commercial	10.5 m	13.5 m
TYPE 'C' Field, Farm or Residential	4.5 m	6 m

Contract Items:

Culvert, Unclassified Entrance Pipe
Excavation, Class 10

Tabulation:

102-3

METRIC VERSION

Iowa Department of Transportation

REVISION
4 04-21-09

STANDARD ROAD PLAN

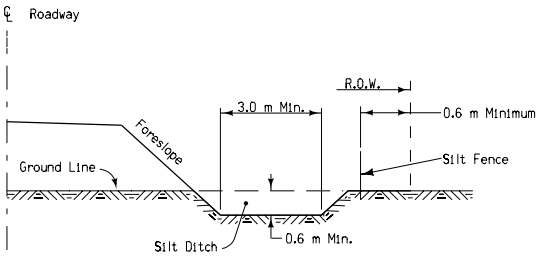
RL-8

SHEET 1 of 1

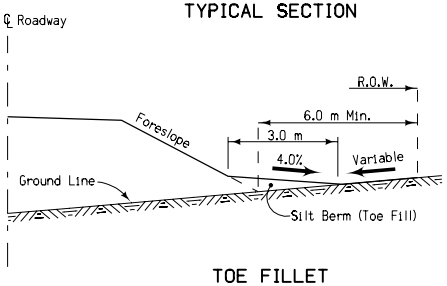
REVISIONS: Added dimensions to show Length and Rt. and Lt. on Section B-B.

Deanna Maifield
APPROVED BY DESIGN METHODS ENGINEER

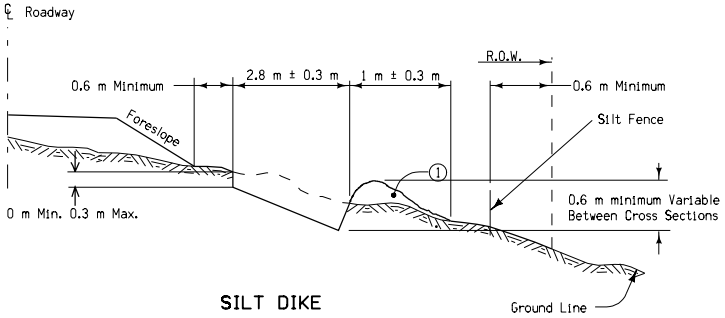
RURAL ENTRANCE



SILT DITCH
TYPICAL SECTION

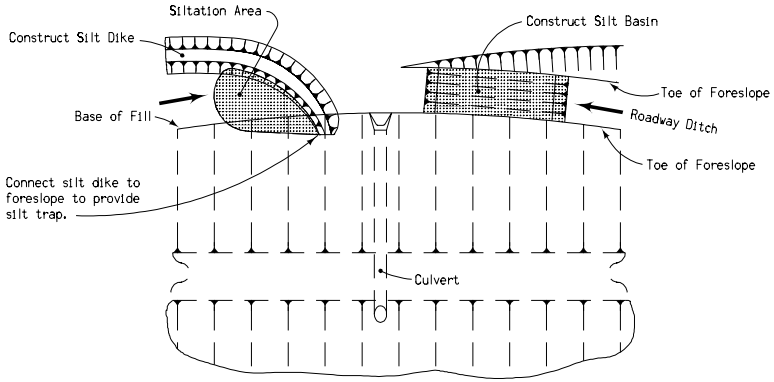


TOE FILLET
TYPICAL SECTION

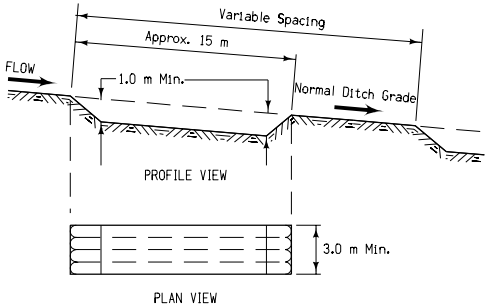


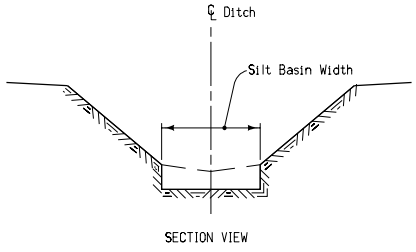
SILT DIKE
TYPICAL SECTION

① Windrow of excavated and compacted silt material or deposited and compacted earth.



TYPICAL PLAN
CULVERT INSTALLATION





SILT BASIN

For areas where roadway ditch, silt ditch, or silt dikes are not provided, the Contractor shall construct an earth fillet at the toe of the roadway foreslope. This toe fillet will not be paid for separately but shall be considered incidental to "Roadway and Borrow Excavation".

All installation locations are to be approved by the engineer.

Cleaning out of silt ditches, silt dikes, and silt basins shall be incidental to "Roadway and Borrow Excavation".

Contract Items:
- Silt Ditch
- Silt Dike
- Silt Basin

Tabulation:
- 100-19

All dimensions given in millimeters unless noted.

M
METRIC VERSION

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION 6 04-17-07

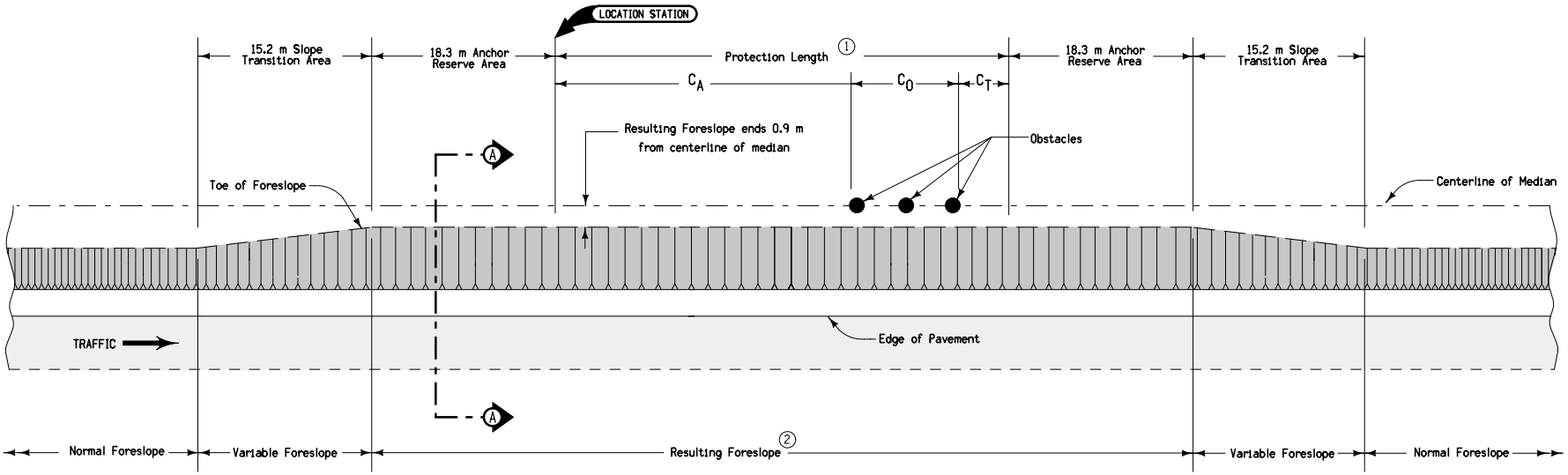
RL-9

SHEET 1 of 1

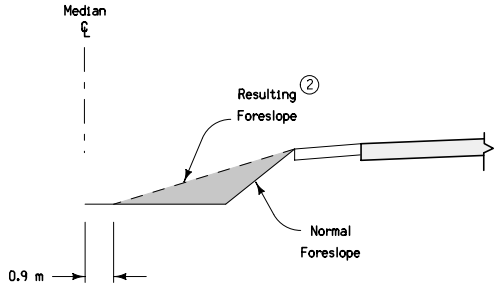
REVISIONS: Change Silt Dike to allow windrow and edited notes and bid items. Deleted dike with culvert section, it is covered by RL-4

Deanna Maifield
APPROVED BY DESIGN METHODS ENGINEER

TEMPORARY EROSION CONTROL MEASURES



PLAN



SECTION A-A

Possible Contract Items:

Topsoil
Embankment in place
Excavation, Class 10

Possible Tabulation:

107-24
108-9A

All dimensions given in millimeters unless noted.

Positive drainage shall be provided through the median obstacle area.

① Refer to Tabulation 108-9A and BA-351.

② Resulting Foreslope shall be no steeper that 6:1.

M
METRIC VERSION

Iowa Department of Transportation

REVISION	
8	04-20-10

STANDARD ROAD PLAN

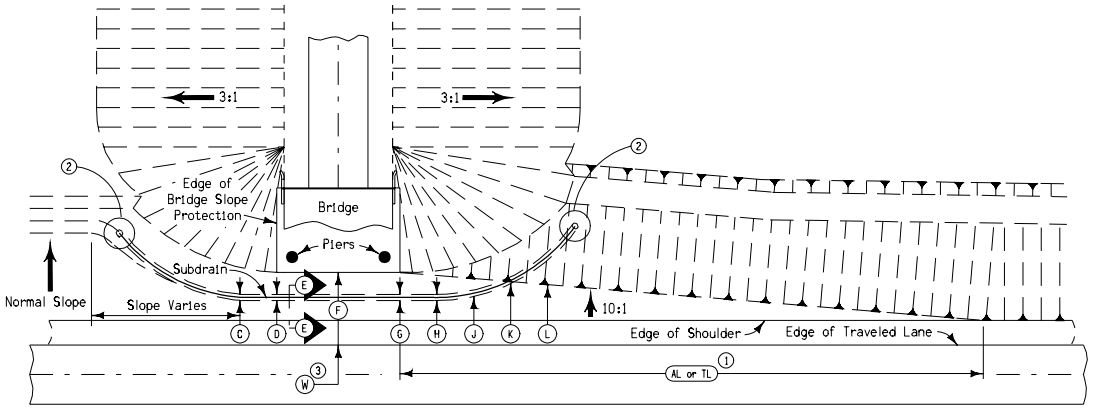
RL-12

SHEET 1 of 1

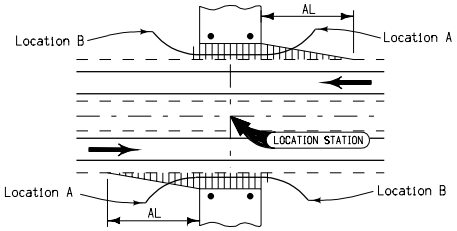
REVISIONS: Updated references to renamed standards.

Deanna Maifield
APPROVED BY DESIGN METHODS ENGINEER

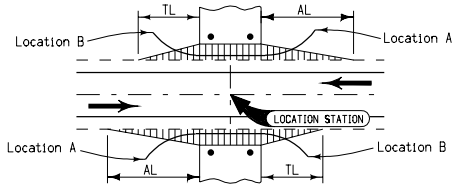
SPECIAL SHAPING FOR HIGH TENSION CABLE GUARDRAIL AT MEDIAN OBSTACLES



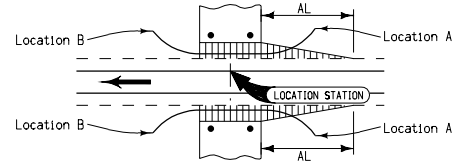
SITUATION PLAN



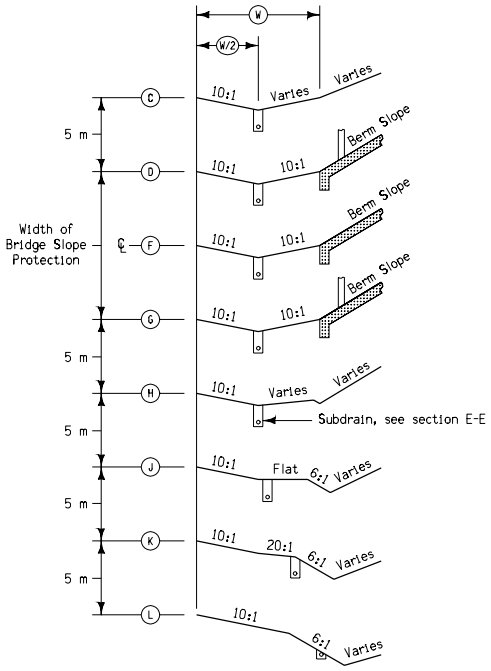
TYPE 6
(Interstate, Freeway and Expressway)



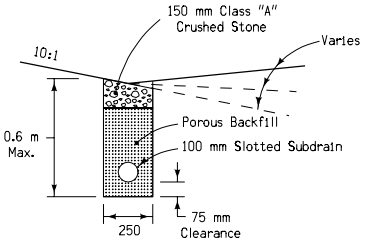
TYPE 7
(Two-Way)



TYPE 8
(Ramp)



TYPICAL SECTIONS



SECTION E-E

GENERAL NOTES:

These details illustrate the grading and subdrain requirements for side piers at locations indicated on the "Tabulation of Grading and Subdrain(s) at Side Piers." All grading shall be as specified for "Embankments" in the current Standard and Supplemental Specifications.

Materials and methods of construction shall be in accordance with current Standard and Supplemental Specifications.

Earthwork for construction of the grading at side piers has been included in the tabulation of earthwork quantities. Drainage structure requirements in conjunction wth the grading at side piers has also been tabulated elsewhere in the plans.

When Longitudinal Subdrains are proposed or present at this site, the 150 millimeter subdrain at the base of Bridge Berm is not required.

Subdrain installation shall be in conformance with "Placing Longitudinal Subdrains" of the current Standard and Supplemental Specifications.

When a subdrain installation does not have a subdrain outlet on the end, that end shall be capped with methods approved by the Engineer. Outlet Location A and B are indicated on Tabulation 104-12 in the project plans.

Price bid for contract items shall be considered full compensation for furnishing all necessary materials and installing subdrain as indicated hereon.

Contract items are:
Longitudinal Subdrain (Shoulder), 100 millimeter
Subdrain Outlet (RF-19E)

(1) (AL) or (TL) is the length measured from the edge of the bridge slope protection to a point on the shoulder edge.

(2) See typical section on Standard Road Plan RF-19E.

(3) W=Clear Zone at (F)

All dimensions given in millimeters unless noted.

METRIC VERSION

Iowa Department of Transportation
Highway Division

STANDARD ROAD PLAN **RL-13**

REVISION: Change contract item.	REVISION NO.
	6
APPROVED BY DESIGN METHODS ENGINEER	REVISION DATE
William J. Stein	04-15-03

DETAILS FOR SPECIAL GRADING
AT SIDE PIERS

Signals and Lighting

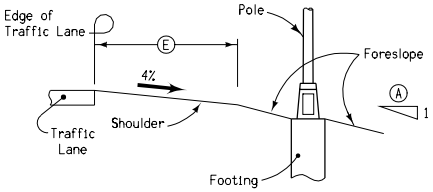
RM

SECTION

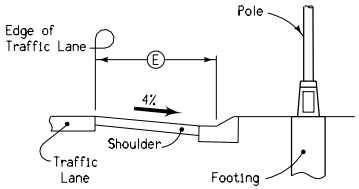
Signals and Lighting

RM

NO.	DATE	TITLE
RM-31	09-21-99	Location Details for Poles on Transformer Bases (Roadway Lighting)
RM-32	04-27-99	Location Details for Poles on Slip Bases (Roadway Lighting)
RM-33	10-03-00	Electrical Installation Details (Roadway Ducts)
RM-34A	10-19-04	Electrical Installation Details via Handhole (Slip-Base)
RM-34B	09-21-99	Electrical Installation Details (Transformer Base)
RM-35 (English)	04-19-11	Control Station Details (Pole-Mounted)
RM-36 (English)	04-19-11	Control Station Details (Pad-Mounted)
RM-37 (English)	10-21-08	Junction Box (Cast Iron)
RM-38	04-27-99	Junction Box (Fiber Reinforced Concrete)
RM-39	---	Void
RM-40	09-21-99	Cable Splices and Connectors
RM-41	04-25-00	Underdeck Lighting (High Pressure Sodium Luminaire)
RM-42 (English)	10-18-11	Precast Handhole
RM-43	10-18-05	Transformer Base (Cast Aluminum)
RM-44 (English)	10-20-09	Lighting Tower
RM-46	10-16-07	Slip Base for Light Poles
RM-47(English)	10-18-11	Footing for Slip-Base Light Poles
RM-48	10-17-06	Temporary Floodlighting



TYPE 1



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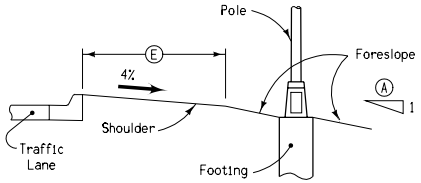

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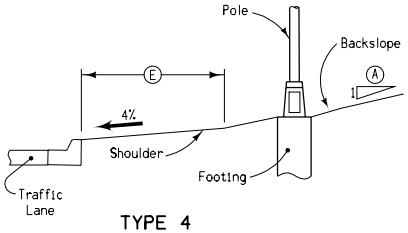

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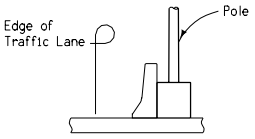

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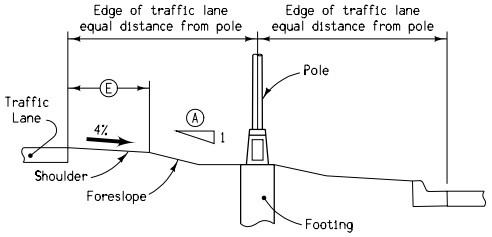

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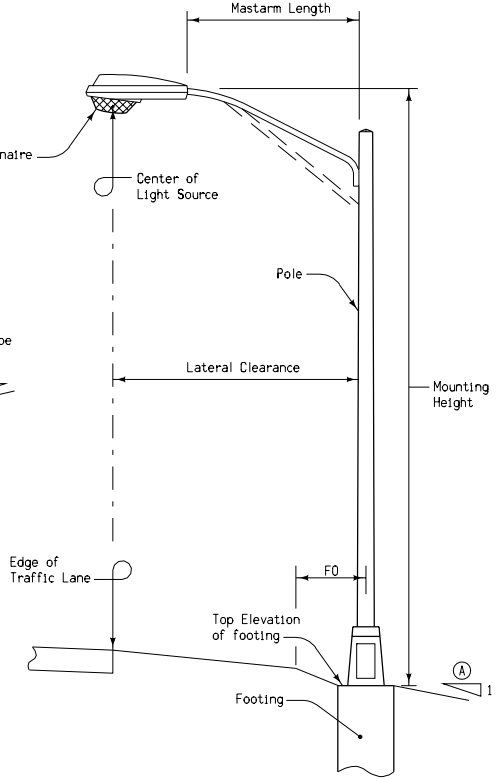
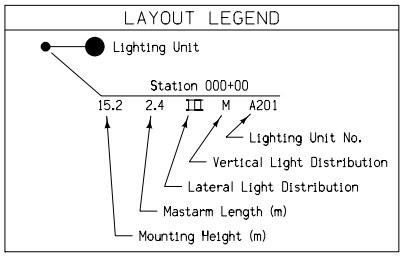
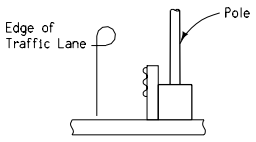


TYPICAL POLE INSTALLATION





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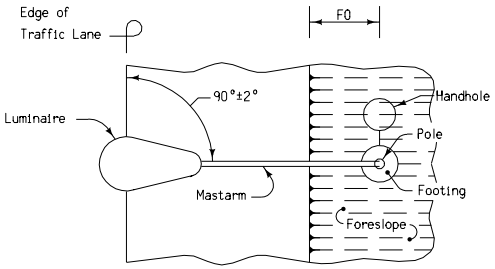


ORIENTATION OF MASTARM

GENERAL NOTES:

The details indicated hereon are for the installation of light poles on transformer bases for roadway illumination.

Materials and methods of construction shall be in accordance with current Standard and Supplemental Specifications.

Refer to appropriate Standard Road Plans and project plans for additional details.

DEFINITIONS:

Mounting Height (MH) is the dimension measured vertically from the center of end of mastarm to the top of footing as shown. Allowable tolerance in MH for final installation is from +75 millimeters to −75 millimeters.

Overhang (OH) is the horizontal dimension from the edge of the traffic lane to the Luminaire center. Unless specifically designated otherwise, design OH shall be zero, with an allowable tolerance of ±150 millimeters.

Lateral clearance will be controlled by luminaire dimensions, and by specified overhang and mastarm dimensions. Unless otherwise directed by the Engineer, clearance of adjacent poles having identical mastarm lengths shall not vary by more than ±75 millimeters.

Orientation: If not otherwise specified, angular orientation of mastarms shall be 90° ±2° to the respective centerlines or baselines, or to the respective edges of the pavement along acceleration and deceleration tapers.

Twin–Mastarm Angles: Included angle shall provide required orientation within the nearest 5 degree increment. Anticipated angle will be shown on the detail plans.

Footing offset (FO) is the vertical offset from the edge of the shoulder to the centerline of footing. If the foreslope is steeper than 6:1, FO should be between 0.6 and 0.9 meter. If the foreslope is 6:1 or flatter, the FO will vary based on specified mast arm length.

All dimensions given in millimeters unless noted.

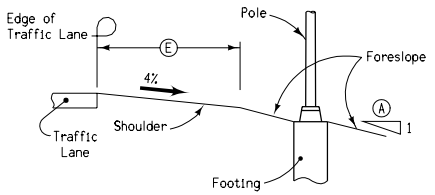
METRIC VERSION

Iowa Department of Transportation
Project Development Division

STANDARD ROAD PLAN RM-31

REVISION: Revise notes.	REVISION NO.
	1
APPROVED BY DESIGN METHODS ENGINEER 05-24-99	REVISION DATE 09-21-99

LOCATION DETAILS FOR POLES ON TRANSFORMER BASES (ROADWAY LIGHTING)



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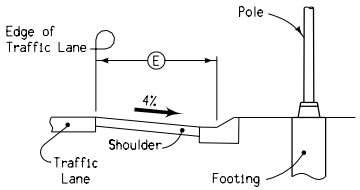

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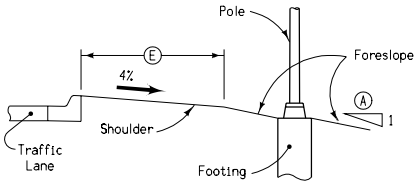

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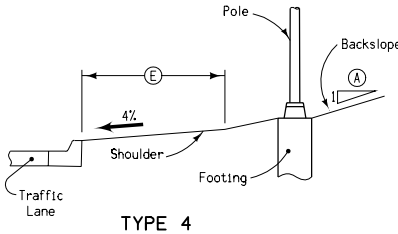

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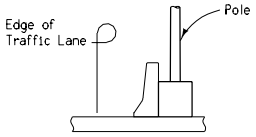

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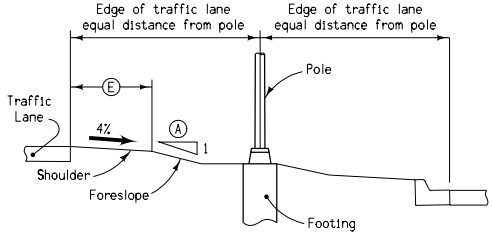

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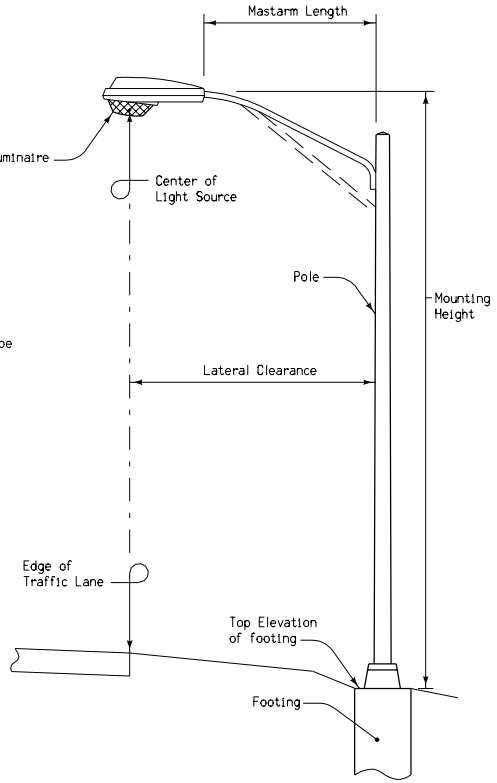
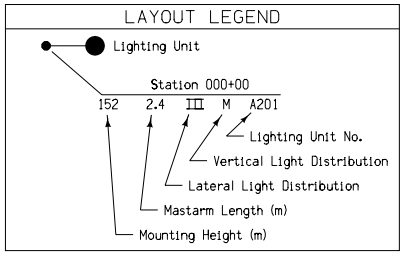
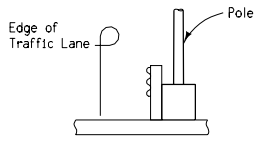


TYPICAL POLE INSTALLATION





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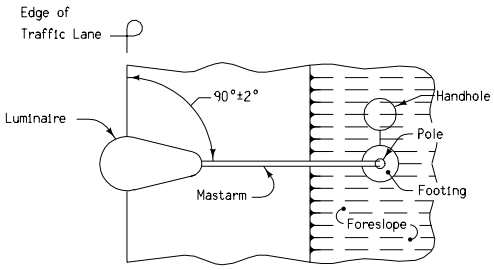


ORIENTATION OF MASTARM

GENERAL NOTES:

The details indicated hereon are for the installation of light poles on slip bases for roadway illumination.

Materials and methods of construction shall be in accordance with current Standard and Supplemental Specifications.

Refer to appropriate Standard Road Plans and project plans for additional details.

DEFINITIONS:

Mounting Height (MH) is the dimension measured vertically from the center of end of mast arm to the top of footing as shown. Allowable tolerance in MH for final installation is from +75 millimeters to −75 millimeters.

Overhang (OH) is the horizontal dimension from the edge of the traffic lane to the Luminaire center. Unless specifically designated otherwise, design OH shall be zero, with an allowable tolerance of ±150 millimeters.

Lateral clearance will be controlled by luminaire dimensions, and by specified overhang and mastarm dimensions. Unless otherwise directed by the Engineer, clearance of adjacent poles having identical mastarm lengths shall not vary by more than ±75 millimeters.

Orientation: If not otherwise specified, angular orientation of mast-arms shall be 90 ±2 °to the respective centerlines or baselines, or to the respective edges of the pavement along acceleration and deceleration tapers.

Twin-Mastarm Angles: Included angle shall provide required orientation within the nearest 5 degree increment. Anticipated angle will be shown on the detail plans.

All dimensions given in millimeters unless noted.

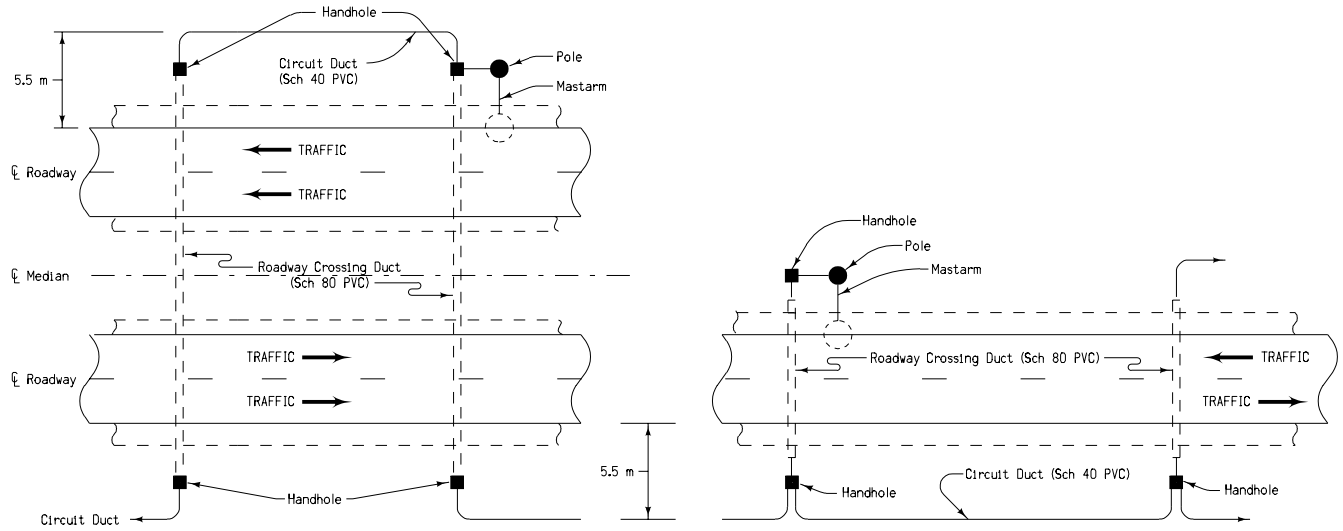
METRIC VERSION

Iowa Department of Transportation
Project Development Division

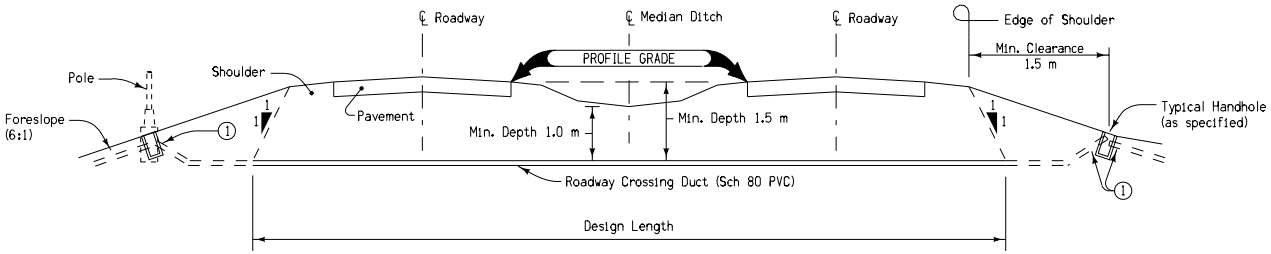
STANDARD ROAD PLAN **RM-32**

REVISION: New	REVISION NO.
	New
APPROVED BY DESIGN METHODS ENGINEER 12-28-98	REVISION DATE 04-27-99

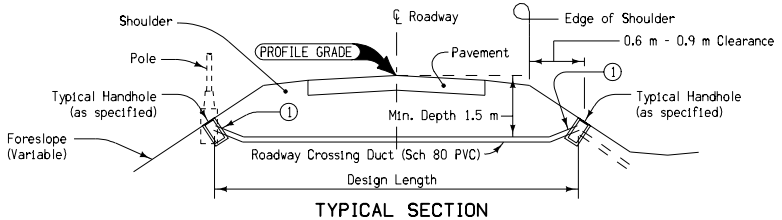
LOCATION DETAILS FOR POLES
ON SLIP BASES
(ROADWAY LIGHTING)



TYPICAL PLANS
CIRCUIT AND ROADWAY CROSSING DUCTS



TYPICAL SECTION
WHERE FORESLOPES ARE 6:1 OR FLATTER



TYPICAL SECTION
WHERE FORESLOPES ARE STEEPER THAN 6:1

GENERAL NOTES:

The details indicated hereon are for installation of electrical roadway ducts. Alternate designs may be submitted to the Engineer for approval.

Materials and methods of construction shall be in accordance with current Standard and Supplemental Specifications.

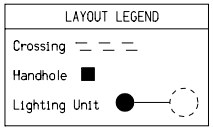
Refer to appropriate Standard Road Plans and project plans for additional details.

The type, size and location of electrical roadway ducts will be shown on the project plans. Roadway crossings shall be installed as shown hereon unless otherwise specified or directed by the Engineer.

Ducts for roadway crossings shall be Sch 80 PVC. Crossings which are to be placed without disturbing the existing roadway surface shall be installed by jacking or boring methods approved by the Engineer. No access to duct or jacking of duct from median will be allowed without the specific approval of the Engineer.

After cable is installed, all duct terminal ends in handholes, transformer bases, light pole shafts, or similar locations as directed by the Engineer shall be sealed against entry of moisture. Sealants shall be either approved sealing bushings or a non-hardening sealing compound.

① Connect to pole footing, handhole, or circuit duct as shown on project plans.



All dimensions given in millimeters unless noted.

M
METRIC VERSION

Iowa Department of Transportation
Project Development Division

STANDARD ROAD PLAN **RM-33**

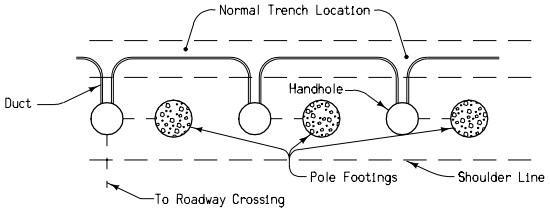
REVISION: Show Profile Grade at inside edge of pavement for 4 lanes.

REVISION NO. 2

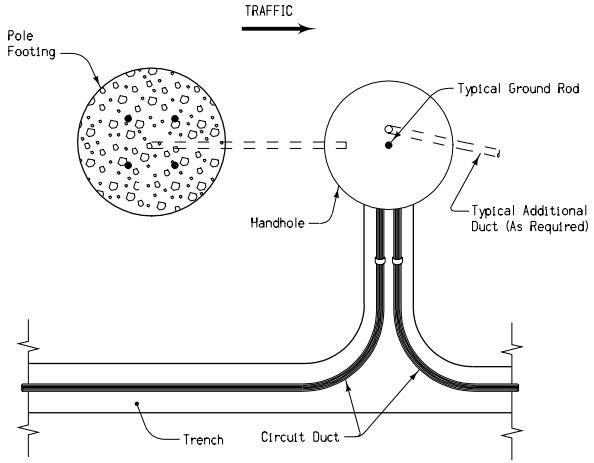
REVISION DATE 10-03-00

06-07-00
APPROVED BY DESIGN METHODS ENGINEER

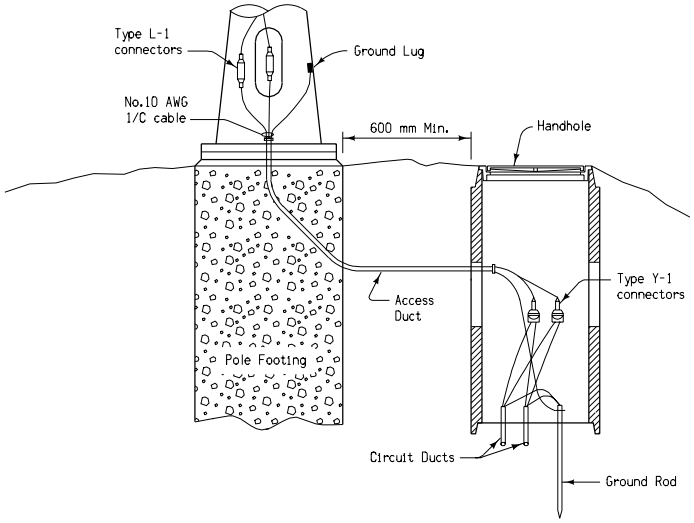
ELECTRICAL INSTALLATION DETAILS
(ROADWAY DUCTS)



TYPICAL LAYOUTS ①
CONNECTIONS TO POLE FOOTINGS



PLAN VIEW



DETAILS OF UNDERGROUND DISTRIBUTION

GENERAL NOTES:

Lighting circuits shall consist of single conductor phase lines with bare ground wires installed in continuous underground ducts.

Standard trench location for lighting distribution circuits shall be 1.0 meter outside the line of the pole footings, except for roadway crossings, access to connection points, or other cases detailed on the project plans or approved by the Engineer.

The Engineer may allow variation from minimum depths for roadway crossings, access to connection points, soil conditions, or other special cases. Where rock is encountered, a minimum trench depth of 0.6 meters will be required.

Ducts installed under pavement slabs, drives, and other similar locations detailed in the project plans shall be designated as "crossings" and distinguished from other underground circuit ductwork. Refer to Standard Road Plan RM-33 for additional details.

All load taps in phase lines shall be with Y-1 connectors and all circuit branch taps shall be made with Y-3 connectors unless otherwise specified or detailed. When the method of in-line splicing is not specified on the project plans, the Engineer may approve the use of connector assemblies or field molded splices.

Provide 600 volt fuses as specified, 5 amperes for each Type L-1 connector, and 20 amperes for each Type Y-1 connector.

① Each connection to pole footing shall require a separate access duct.

All dimensions given in millimeters unless noted.

M
METRIC VERSION

Iowa Department of Transportation
Highway Division

STANDARD ROAD PLAN RM-34A

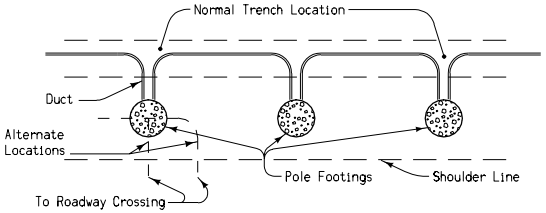
REVISION: Remove General Notes already in the Specifications Book. Correct Title.

REVISION NO. 2

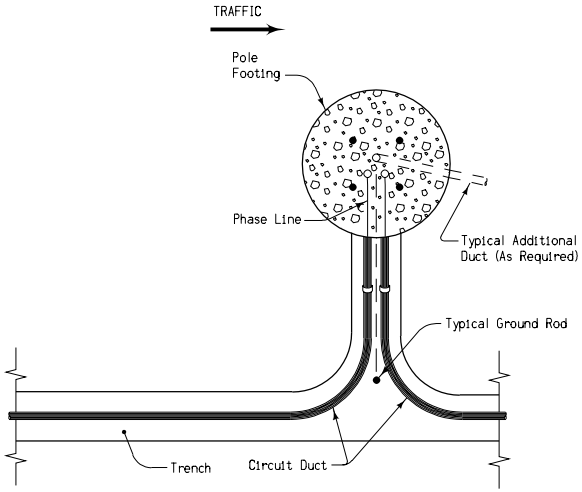
REVISION DATE 10-19-04

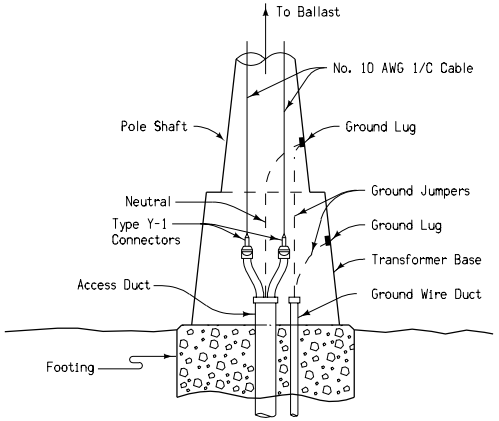
William J. Stein
APPROVED BY DESIGN METHODS ENGINEER

ELECTRICAL INSTALLATION DETAILS
VIA HANDHOLE
(SLIP-BASE)



TYPICAL LAYOUTS ①
CONNECTIONS TO POLE FOOTINGS





WIRING DIAGRAM
(BALLAST TAP CONNECTION)

GENERAL NOTES:

The details indicated hereon are for installation of cable in underground ducts. Alternate designs may be submitted to the Engineer for approval.

Materials and methods of construction shall be in accordance with current Standard and Supplemental Specifications.

Refer to appropriate Standard Road Plans and project plans for additional details.

Lighting circuits shall consist of single conductor phase lines with bare ground wires installed in continuous underground ducts.

Standard trench location for lighting distribution circuits shall be 1.0 meter outside the line of the pole footings, except for roadway crossings, access to connection points, or other cases detailed on the project plans or approved by the Engineer.

The Engineer may allow variation from minimum depths for roadway crossings, access to connection points, soil conditions, or other special cases. Where rock is encountered, a minimum trench depth of 0.6 meters will be required.

Ducts installed under pavement slabs, drives, and other similar locations detailed in the project plans shall be designated as "crossings" and distinguished from other underground circuit ductwork. Refer to Standard Road Plan RM–33 for additional details.

All load taps in phase lines shall be with Y–1 connectors and all circuit branch taps shall be made with Y–3 connectors unless otherwise specified or detailed. When the method of in–line splicing is not specified on the project plans, the Engineer may approve the use of connector assemblies or field molded splices.

Provide 600 volt fuses as specified, 5 apmeres for each Type Y–1 connector.

All unused connector openings shall be sealed against entry of moisture as directed by the Engineer.

① Each connection to pole footing shall require a separate access duct.

All dimensions given in millimeters unless noted.

M

METRIC VERSION

Iowa Department of Transportation
Project Development Division

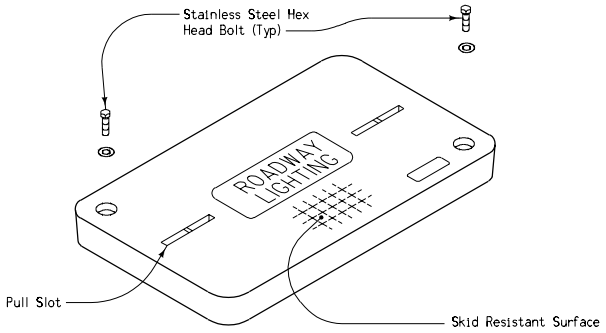
STANDARD ROAD PLAN | **RM–34B**

REVISION: Add note; change note; change title block.

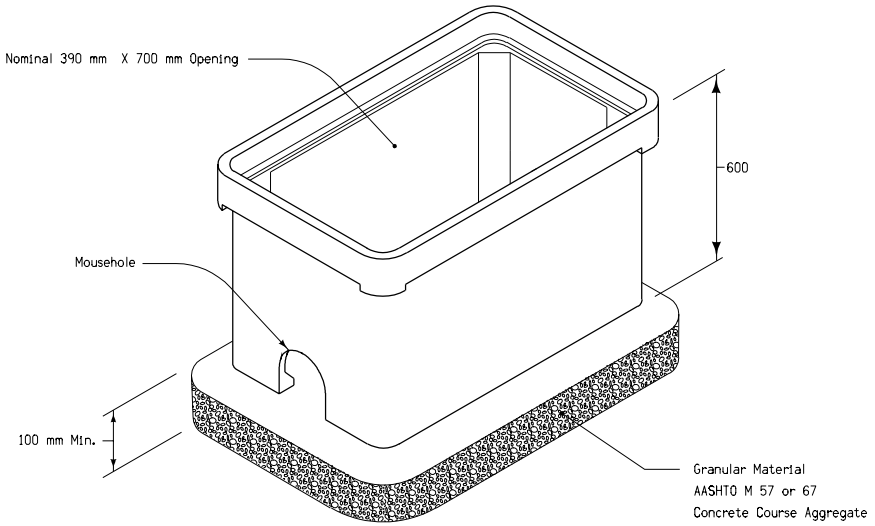
REVISION NO.
1
REVISION DATE
09-21-99

05-24-99
APPROVED BY DESIGN METHODS ENGINEER

ELECTRICAL INSTALLATION DETAILS
(TRANSFORMER BASE)



COVER



BOX

JUNCTION BOX DETAILS

GENERAL NOTES:

The details indicated hereon are for typical junction boxes used in electrical circuitry for highway lighting. Alternate designs may be submitted to the Engineer for approval.

Materials and methods of construction shall be in accordance with current Standard and Supplemental Specifications.

Refer to appropriate Standard Road Plans and project plans for additional details.

Junction box shall be installed per manufacturer's recommendations.

Covers of junction boxes installed in locations subject to pedestrian traffic shall have an approved anti-skid pattern.

M

METRIC VERSION

Iowa Department of Transportation
Project Development Division

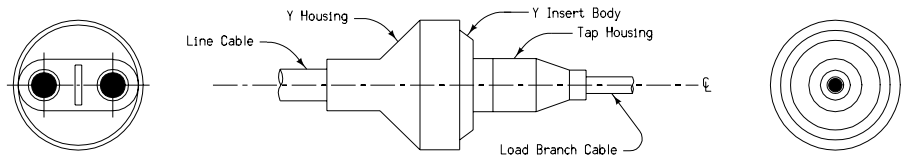
STANDARD ROAD PLAN | **RM-38**

REVISION: New

APPROVED BY DESIGN METHODS ENGINEER 12-28-98

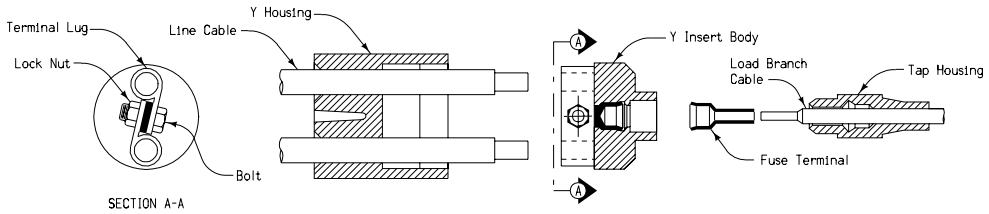
REVISION NO.
New
REVISION DATE
04-27-99

JUNCTION BOX
(FIBER REINFORCED CONCRETE)



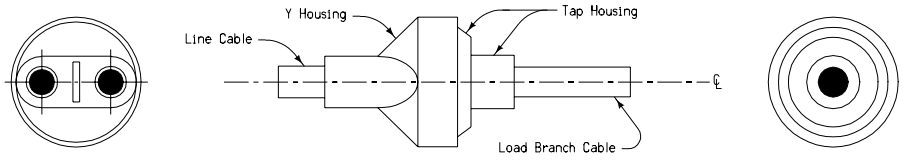
TYPE Y-1 OR Y-2 CONNECTOR ①

ASSEMBLED CONNECTOR



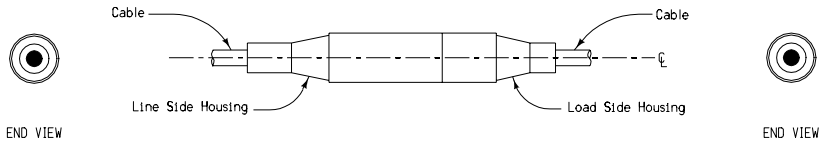
DETAILS OF TYPE Y-1 CONNECTOR

DISASSEMBLED CONNECTOR



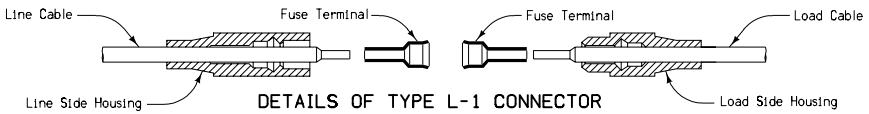
TYPE Y-3 CONNECTOR ①

ASSEMBLED CONNECTOR



TYPE L-1 OR L-2 CONNECTOR ②

ASSEMBLED CONNECTOR



DETAILS OF TYPE L-1 CONNECTOR

DISASSEMBLED CONNECTOR

GENERAL NOTES:

The details indicated hereon are typical for cable splices and connectors. Alternate designs may be submitted to the Engineer for approval.

Materials and methods of construction shall be in accordance with Standard and Supplemental Specifications.

Refer to appropriate Standard Road Plans and project plans for additional details.

All connector assemblies shall be of waterproof construction, designed for both direct burial in the earth and exposure to sunlight, and shall be capable of repeated disconnections without damage to the watertight seals and terminals or reducing the conductivity below specifications. It shall be the responsibility of the Contractor to furnish connectors recommended for the required cable sizes.

Types L–1 and L–2 connectors shall be of the friction type, and shall disconnect without stressing the cable or its attachment beyond recommended limits when axial tension is applied to the cable or housing.

The top housings of Y–1 and Y–2 connectors shall be friction connected to Y insert bodies, and shall meet the disconnecting requirements of L–1 and L–2 connectors.

Lineside terminals of type Y–1 and Y–2 connectors, and all terminals for type Y–3 connectors shall be of the semi–permanent type, and shall be designed not to disconnect under tension.

Where the cable size exceeds the capacity of the L–2 and Y–3 connectors the contrractor shall use set screw type splice and tap units with waterproof heat–shrink covering.

Method of Measurement and basis of Payment shall be in accordance with Section 2523 of the Standard and Supplemental Specifications.

① Y–1 connectors are fused. Y–2 and Y–3 connectors are unfused.

② L–1 connectors are fused. L–2 connectors are unfused.

All dimensions given in millimeters unless noted.

M

METRIC VERSION

Iowa Department of Transportation
Project Development Division

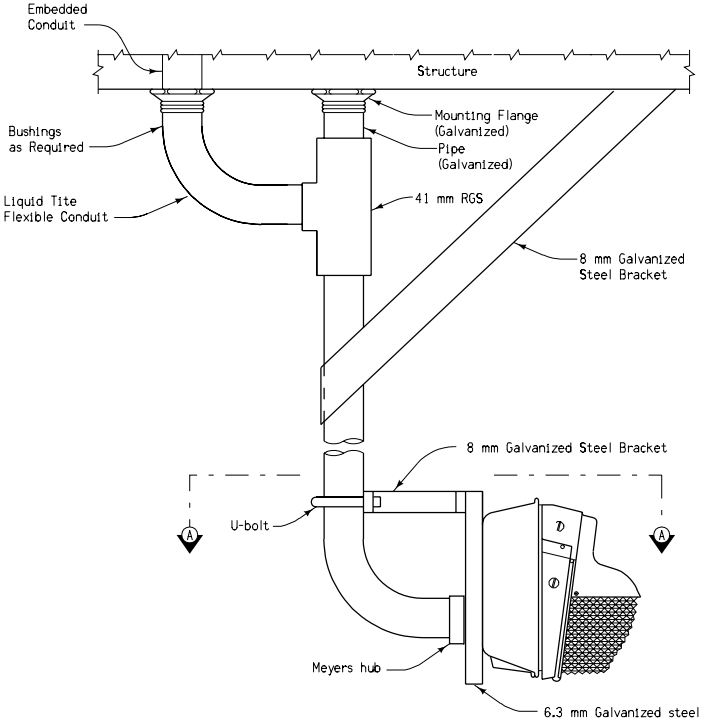
STANDARD ROAD PLAN | **RM–40**

REVISION NO.
1
REVISION DATE
09-21-99

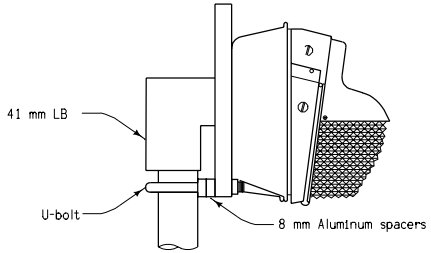
REVISION: Add note.

05-24-99
APPROVED BY DESIGN METHODS ENGINEER

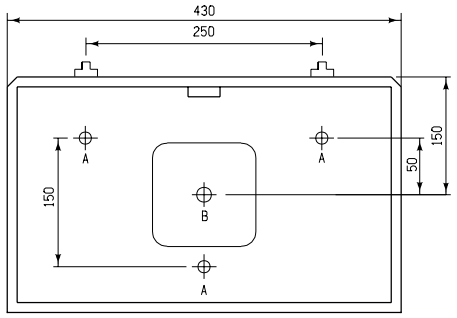
CABLE SPLICES
AND CONNECTORS



CASE A
TOP MOUNTED

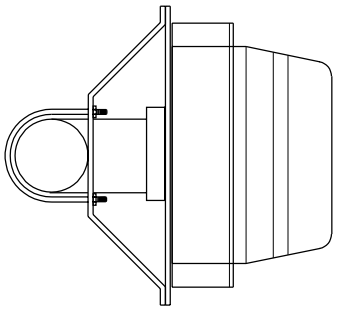


CASE B
STANCHION MOUNTED

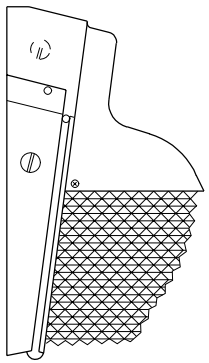


HOLE	DESCRIPTION
A	11 mm (Min.) Mounting Hole
B	Entry for 41 mm conduit

SIMPLIFIED BACK VIEW



SECTION A-A



CASE C
WALL MOUNTED

GENERAL NOTES:

Materials and methods of construction shall be in accordance with current Standard and Supplemental Specifications.

Details shown hereon are typical. Alternate designs may be submitted to the Engineer for approval. Minimum requirements and equivalent materials must be used. Refer to appropriate Standard Road Plans and project plans for any additional requirements for particular installations shown on plans.

Each luminaire shall provide a ballast housing to be attached to, or integral with, the luminaire housing.

Method of Measurement and basis of Payment shall be in accordance with Section 2523 of the Standard and Supplemental Specifications.

LAYOUT LEGEND	
High pressure sodium (Low Mounting Height)	■

All dimensions given in millimeters unless noted.

M
METRIC VERSION

Iowa Department of Transportation
Project Development Division

STANDARD ROAD PLAN | **RM-41**

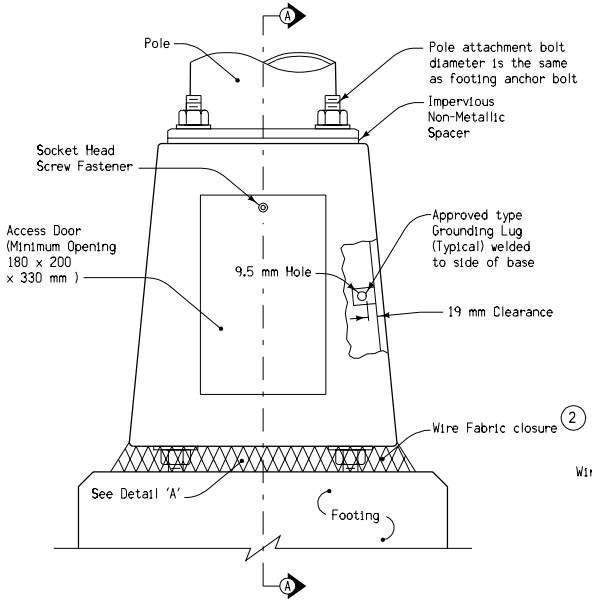
REVISION: Change Title to conform to the specifications.

REVISION NO. 2

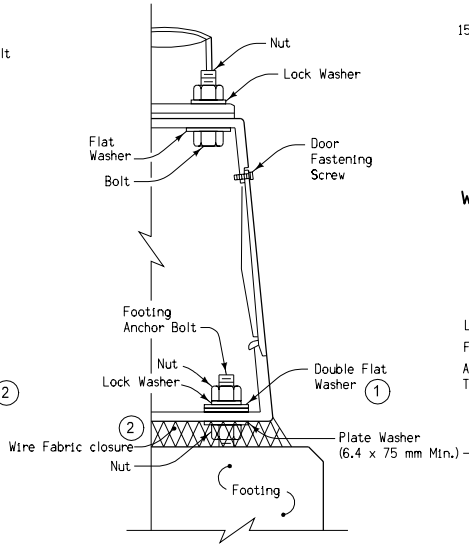
REVISION DATE 04-25-00

APPROVED BY DESIGN METHODS ENGINEER 01-10-00

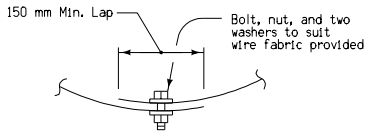
UNDERDECK LIGHTING
(HIGH PRESSURE SODIUM LUMINAIRE)



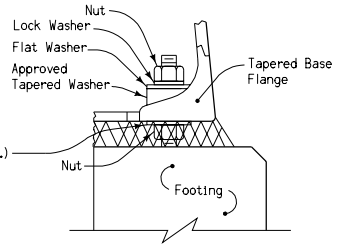
ELEVATION



SECTION A-A



WIRE FABRIC CLOSURE DETAIL (2)



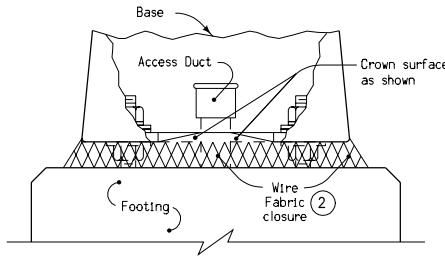
ALTERNATE SECTION A-A

All hardware shall be stainless steel.

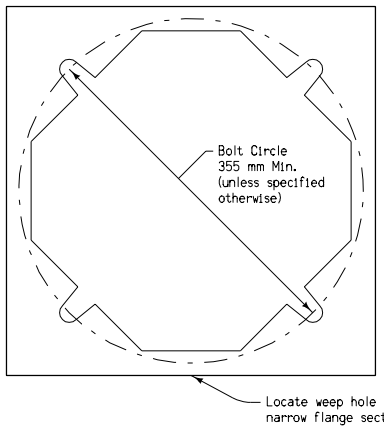
When the design of the base flanges requires the use of tapered, mating washers, such washers shall be of the design and material recommended by the manufacturer of the base.

(1) Use double thickness flat washers only when tapered washer is not required.

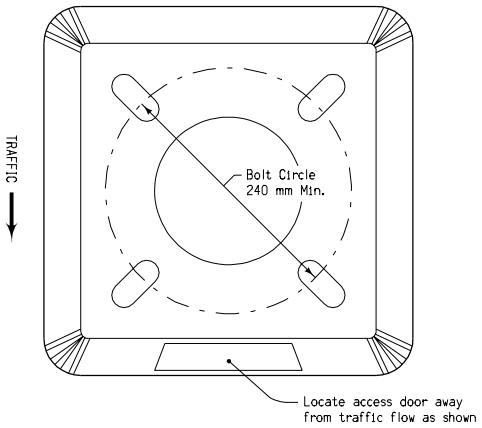
(2) Wire fabric material to comply with Materials I.M. 443.01: Rodent Guard, Expanded Metal. Wire fabric shall be placed around anchor bolt circle between concrete footing and base.



DETAIL 'A'



BOTTOM VIEW



TOP VIEW

All dimensions given in millimeters unless noted.

METRIC VERSION

Iowa Department of Transportation
Highway Division

STANDARD ROAD PLAN RM-43

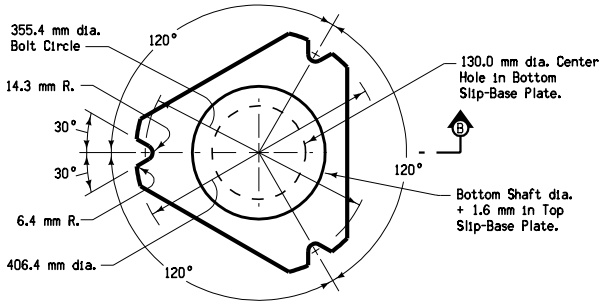
REVISION: Replace grout with wire fabric closure.

REVISION NO. 2

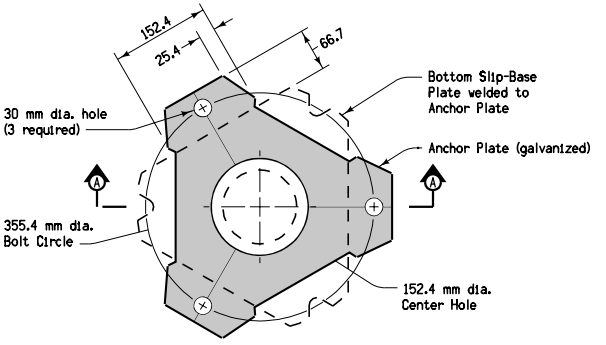
REVISION DATE 10-18-05

William J. Stein
APPROVED BY DESIGN METHODS ENGINEER

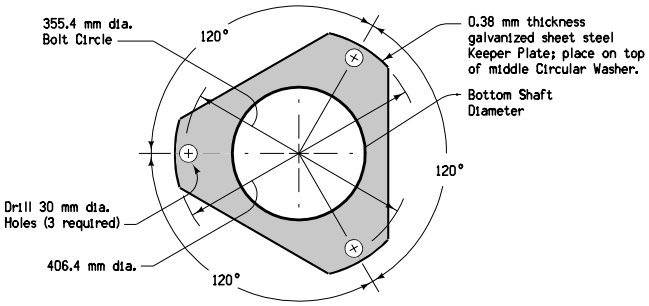
TRANSFORMER BASE (CAST ALUMINUM)



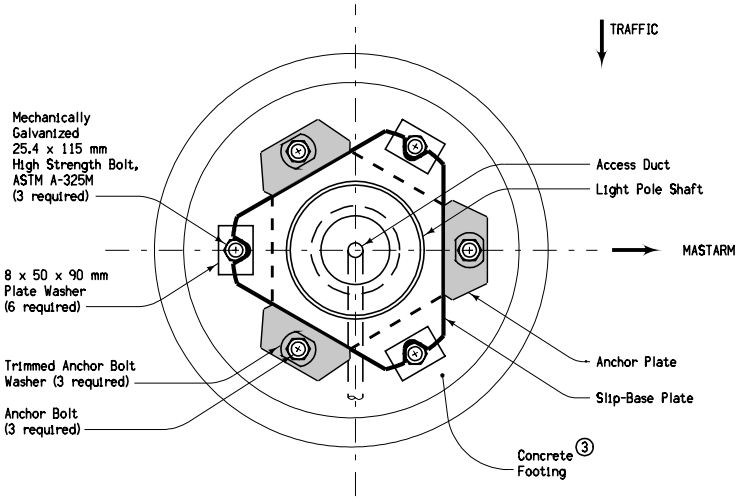
SLIP-BASE PLATE



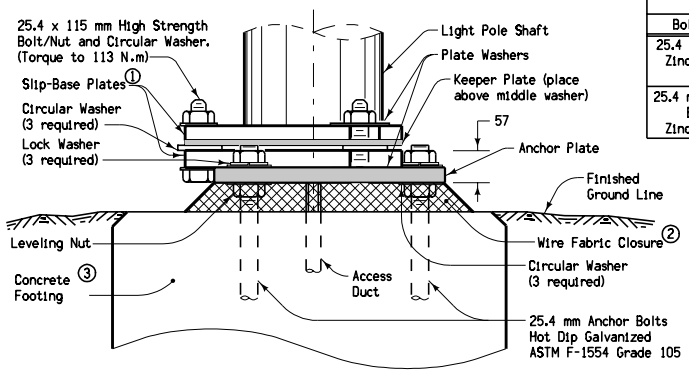
ANCHOR PLATE



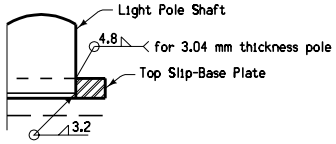
KEEPER PLATE



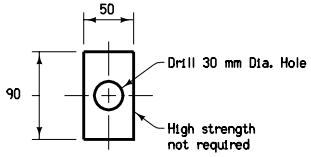
PLAN



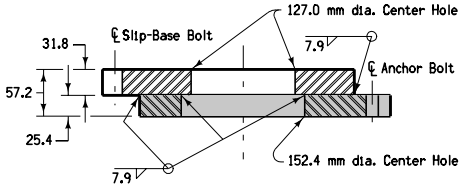
TYPICAL INSTALLATION



TYPICAL HALF SECTION 'B'



8 mm THICK PLATE WASHER



SECTION A-A
ANCHOR PLATE

① The top Slip-Base Plate shall be positioned to clear all Anchor Bolts.

② Wire fabric material shall comply with Materials I.M. 443.01. Wire fabric shall be placed around anchor bolt circle between concrete footing and base plate. The fabric shall fit tight to the bottom surface of the base plate and the top surface of the footing to prevent rodent entry.

③ Refer to RM-47 for footing details.

HARDWARE CLASSIFICATION

Bolt Size	Bolt Grade	Nuts	Washers	Galvanizing
25.4 x 115 mm Zinc Coated	ASTM A-325M Type 1 Zinc Coated	ASTM A-563M Class 10S Zinc Coated	ASTM F-436M Zinc Coated	ASTM B-695 Class C Type 1
25.4 mm Anchor Bolts Zinc Coated	ASTM F-1554 Grade 105 Zinc Coated	ASTM A-563M Class 10S Zinc Coated	ASTM F-436M Zinc Coated	ASTM A-153M Class C

All dimensions given in millimeters unless noted.

METRIC VERSION

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION 6 10-16-07

RM-46

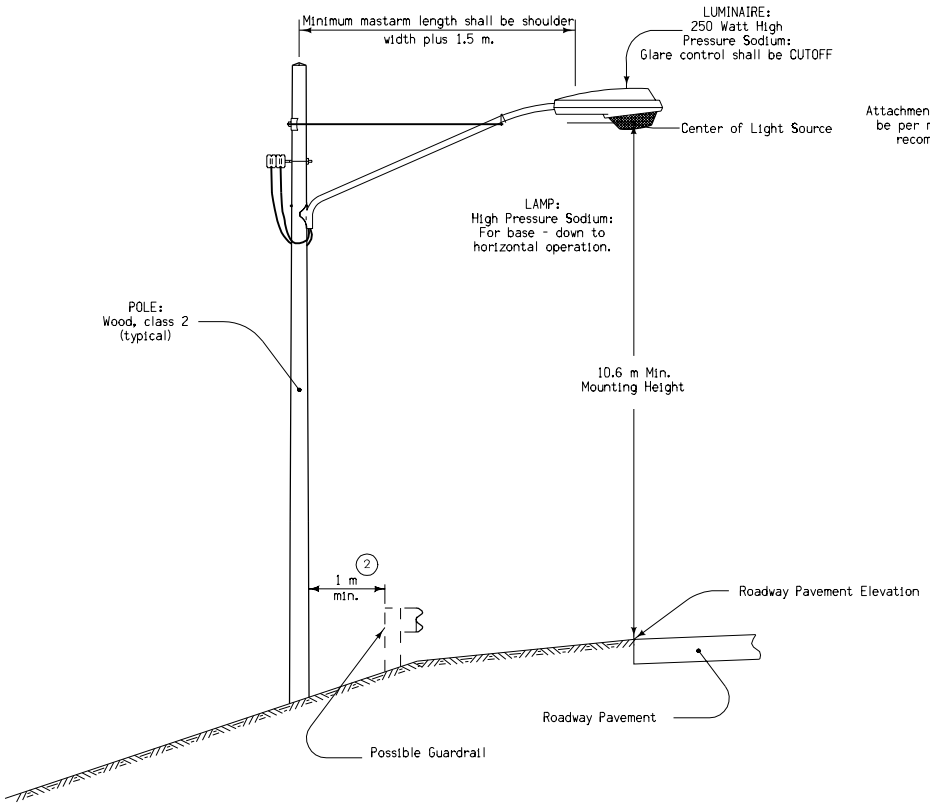
SHEET 1 of 1

REVISIONS: Added note 2 and 3.

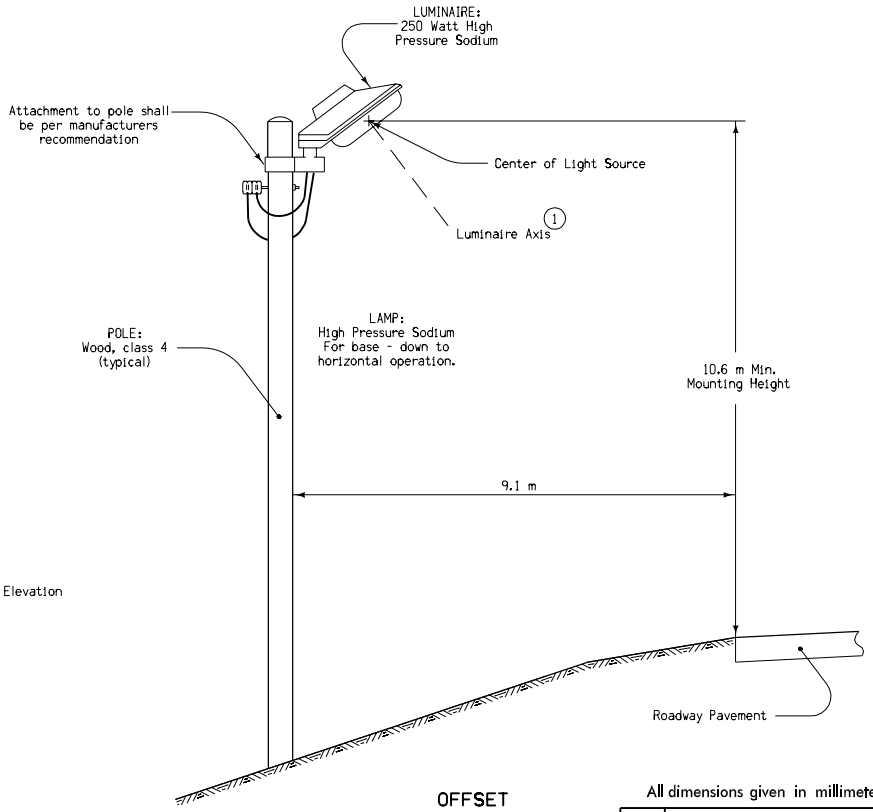
Deanna Maifield
APPROVED BY DESIGN METHODS ENGINEER

SLIP BASE FOR LIGHT POLES

CONVENTIONAL



OFFSET



1 Luminaire axis shall be directed to within the limits of the near traffic lane unless specified otherwise.

2 When protecting pole with guardrail.

OFFSET LIGHTING UNIT

Contract item:
Temporary Floodlighting Luminaire

Tabulation:
108-27

All dimensions given in millimeters unless noted.

M

METRIC VERSION

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION	
2	10-17-06

RM-48

SHEET 1 of 1

REVISIONS: Show guardrail as optional.

Deanna Maifield
APPROVED BY DESIGN METHODS ENGINEER

TEMPORARY FLOODLIGHTING

Ramp and Median Crossover Geometrics

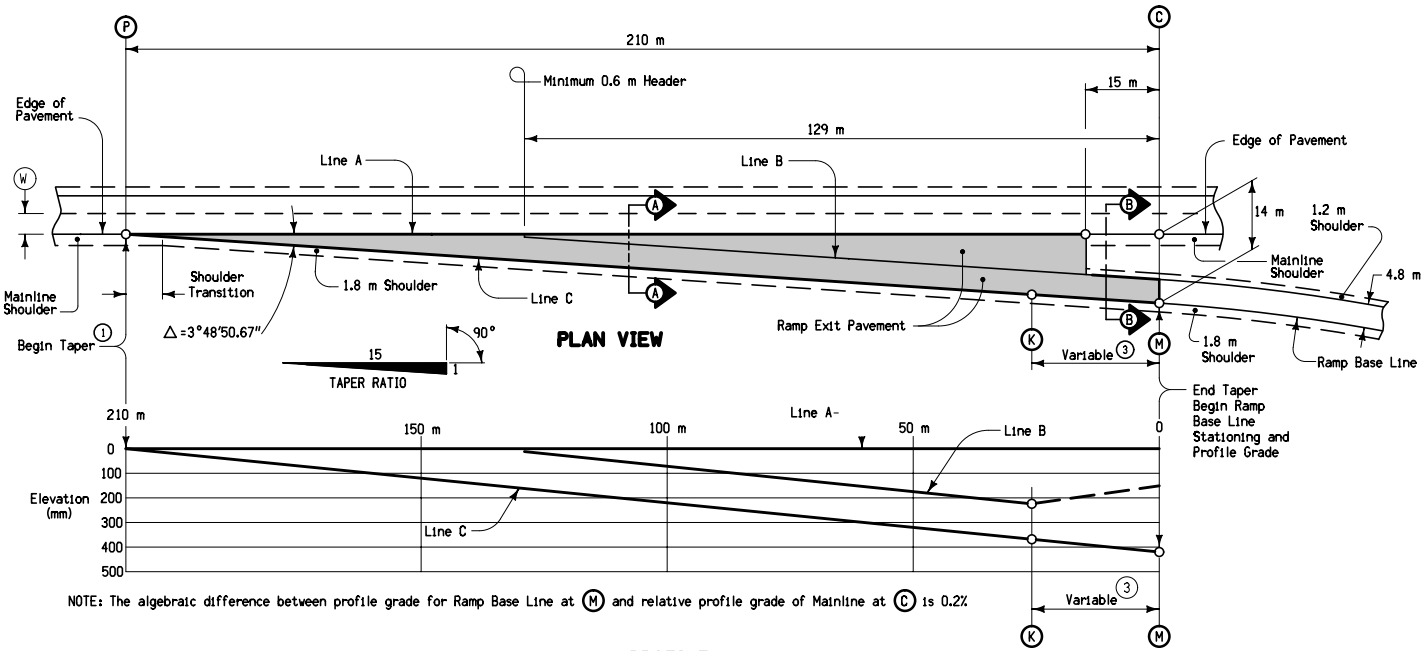
RV

SECTION

Ramp and Median Crossover Geometrics

RV

NO.	DATE	TITLE
RV-4	04-21-09	Deceleration Taper for 4.8 m Exit Ramp
RV-5	04-21-09	Acceleration Taper for 4.8 m Entrance Ramp
RV-8	04-21-09	Deceleration Taper for 5.5 m Exit Loop
RV-9	04-21-09	Acceleration Taper for 5.5 m Entrance Loop
RV-10	04-19-11	Jointing Details for 4.8 m Exit and Entrance Ramp
RV-11	Void	Jointing Details for 4.8 m Exit and Entrance Ramp



NOTE: The algebraic difference between profile grade for Ramp Base Line at (M) and relative profile grade of Mainline at (C) is 0.2%

PROFILE

Ramp exit pavement shall be the same thickness as mainline pavement.

Ramp exit pavement shown by shaded area is 1345 square meters.

Special shaping of area between lines A and B may be required to assure proper drainage.

For jointing layout, see Standard Road Plan RV-10.

This design is based on 100 km/h design speed at e max = 6%.

(1) For header construction details at the beginning of taper, refer to Typical 7101 or Typical 7102.

(2) Subbase for ramp exit pavement shall be the same thickness as mainline subbase.

(3) The ramp pavement cross slope between (K) and (M) is determined by superelevation rotated about line C. Refer to Standard Road Plan RP-3 and plans for superelevation transition requirements.

TABLE OF SHOULDER TRANSITION LENGTHS

W_o	Shoulder Width beyond Edge of Mainline Pavement		
	2.4m	3m	3.6m
3.6m	NA	18m	27m
4.2m	9m	18m	NA

NOTE: W_o is the width of the outside lane to the Edge of Pavement.

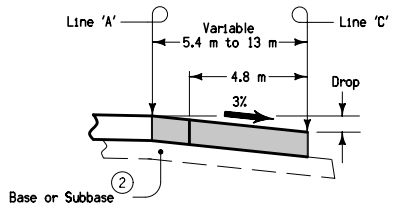
(C)

TABLE OF OFFSETS AND DROPS FOR 4.8 m RAMP TAPER

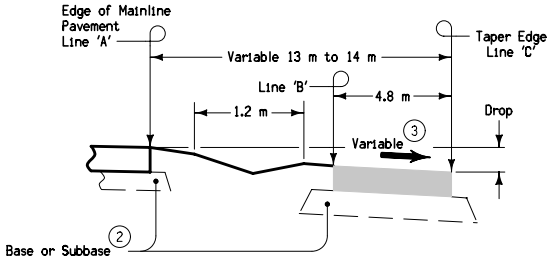
Distance (m) From Point C Along Line A	210	200	190	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10	0
Offset (m) From Line A To Line C	0	0.667	1.333	2.000	2.667	3.333	4.000	4.667	5.333	6.000	6.667	7.333	8.000	8.667	9.333	10.000	10.667	11.333	12.000	12.667	13.333	14.000
Drop (mm) From Line A To Line C	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420

(M)

NOTE: The elevations at edge of taper from BEGIN TAPER to POINT (M) are established by a constant 3% slope across the appropriate taper widths based on the Taper Ratio of 15:1, Drop = (0.03) x (Offset).



SECTION A-A



SECTION B-B

All dimensions given in millimeters unless noted.

METRIC VERSION

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION 5 04-21-09

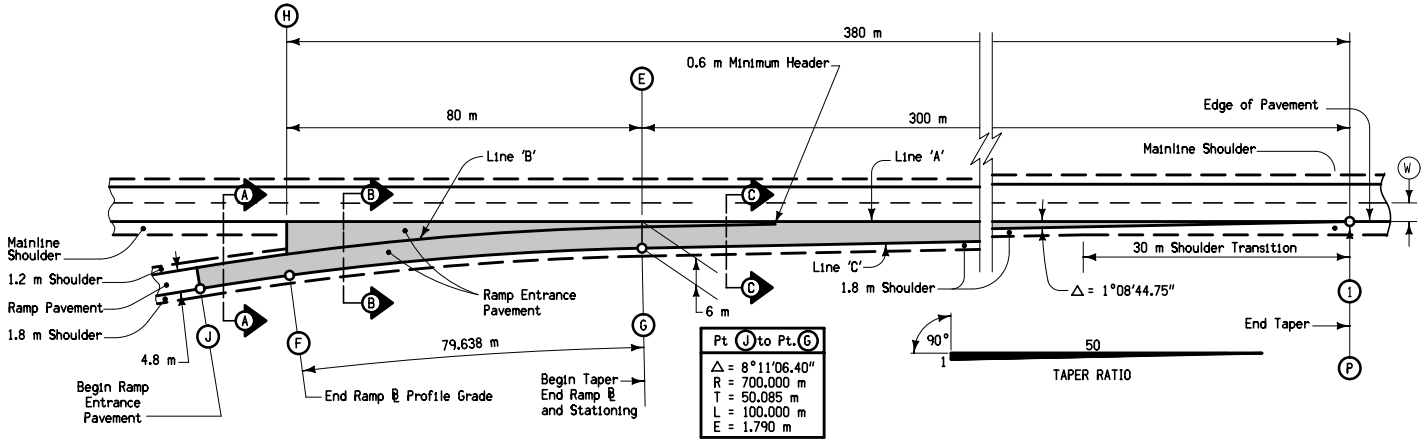
RV-4

SHEET 1 of 1

REVISIONS: Corrected circle note 2. Removed mainline pavement and shoulder widths. Added table for shoulder transaction distance. (Metrics Re-instated.)

Deanna Maifeld
APPROVED BY DESIGN METHODS ENGINEER

DECELERATION TAPER FOR 4.8 m EXIT RAMP

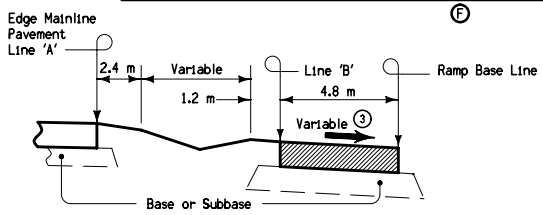


NOTE: The algebraic difference between profile grade for Ramp Base Line at (F) and relative profile grade of Mainline at (H) is 0.54%.

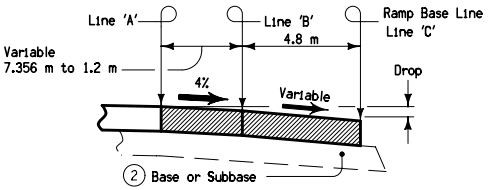
PROFILE

TABLE OF OFFSETS AND DROPS FOR 4.8 m RAMP TAPER

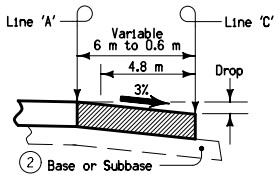
		(H)								(E)								
Distance From Point (E) Along Line A (m)		80	70	60	50	40	30	20	10	0	10	20	50	100	150	200	250	300
From Line 'A' To Line 'B'	Offset (m)	7.356	6.083	4.955	3.971	3.131	2.435	1.880	1.469	1.200								
	Slope (%)	← Constant 4.00% Slope →								3.64								
	Drop (mm)	294	243	198	159	125	97	75	59	44								
From Line 'B' To Line 'C'	Offset (m)	← Constant 4.8 m Offset →																
	Slope (%)	5.20	5.20	5.20	5.20	5.20	5.20	5.10	4.44	3.64								
	Drop (mm)	250	250	250	250	250	250	245	213	175								
From Line 'A' To Line 'C'	Offset (m)									6.000	5.800	5.600	5.000	4.000	3.000	2.000	1.000	0.000
	Slope (%)									3.64	3.07	3.00	← Constant 3.00%					→
	Drop (mm)	544	493	448	409	375	347	320	272	219	178	168	150	120	90	60	30	0
Distance From Point (G) Along Line C (m)		79.638	69.626	59.631	49.651	39.684	29.728	19.780	9.840	0.000								
		(F)								(G)								(P)



SECTION A-A



SECTION B-B



SECTION C-C

Ramp entrance pavement shall be the same thickness as mainline pavement.

Ramp entrance pavement shown by shaded area is 1345 square meters.

Special shaping of area between lines A and B may be required to assure proper drainage.

For jointing layout, see Standard Road Plan RV-10.

This design is based on 100 km/h design speed at e max = 6%.

(1) For header construction details at the beginning of taper, refer to Typical 7101 or Typical 7102.

(2) Subbase for ramp entrance pavement shall be the same thickness as mainline subbase.

(3) The ramp pavement cross slope between (J) and (F) is determined by superelevation rotated about line C. Refer to Standard Road Plan RP-3 and plans for superelevation transition requirements.

TABLE OF SHOULDER TRANSITION LENGTHS

(W0)	Shoulder Width beyond Edge of Mainline Pavement		
	2.4m	3m	3.6m
3.6m	NA	60m	90m
4.2m	30m	60m	NA

NOTE: W_0 is the width of the outside lane to the Edge of Pavement.

All dimensions given in millimeters unless noted.

METRIC VERSION

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION 5 04-21-09

RV-5

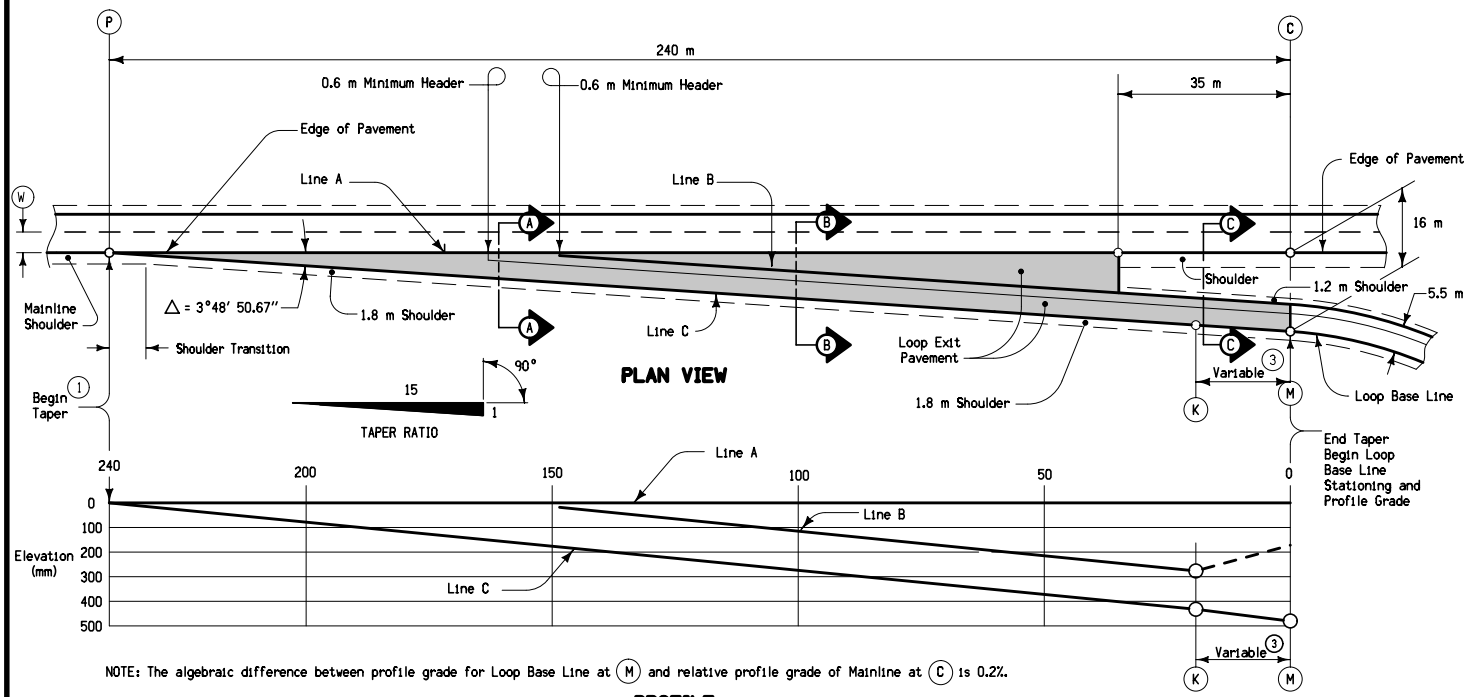
SHEET 1 of 1

REVISIONS: Corrected circle note 2. Removed mainline pavement and shoulder widths. Added table for shoulder transaction distance. (Metrics Re-instated.)

Deanna Maifurt

APPROVED BY DESIGN METHODS ENGINEER

ACCELERATION TAPER FOR 4.8 m ENTRANCE RAMP



NOTE: The algebraic difference between profile grade for Loop Base Line at (M) and relative profile grade of Mainline at (C) is 0.2%.

Loop exit pavement shall be the same thickness as mainline pavement.

Loop exit pavement shown by shaded area is 1345 square meters.

Special shaping of area between lines A and B may be required to assure proper drainage.

For jointing layout, see Standard Road Plan RV-10.

This design is based on 100 km/h design speed at e max = 6%.

(1) For header construction details at the beginning of taper, refer to Typical 7101 or Typical 7102.

(2) Subbase for loop exit pavement shall be the same thickness as mainline subbase.

(3) The loop pavement cross slope between (K) and (M) is determined by superelevation rotated about line C. Refer to Standard Road Plan RP-3 and plans for superelevation transition requirements.

TABLE OF SHOULDER TRANSITION LENGTHS			
W_o	Shoulder Width beyond Edge of Mainline Pavement		
	2.4m	3m	3.6m
3.6m	NA	18m	27m
4.2m	9m	18m	NA

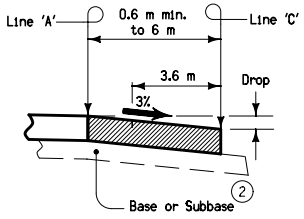
NOTE: W_o is the width of the outside lane to the Edge of Pavement.

(C)

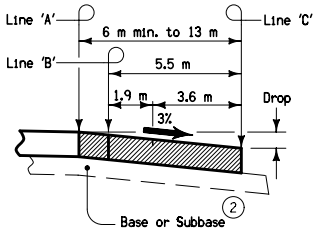
TABLE OF OFFSETS AND DROPS FOR 5.5 m LOOP TAPER																								
Distance (m) From Point C Along Line A	240	230	220	210	200	190	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10	0
Offset (m) From Line A To Line C	0	0.667	1.333	2.000	2.667	3.333	4.000	4.667	5.333	6.000	6.667	7.333	8.000	8.667	9.333	10.000	10.667	11.333	12.000	12.667	13.333	14.000	14.667	15.333	16.000
Drop (mm) From Line A To Line C	0	20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480

(M)

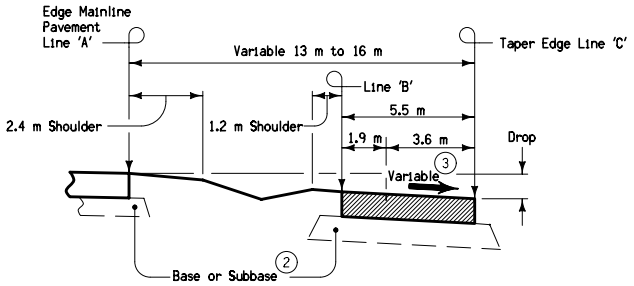
NOTE: The elevations at edge of taper from BEGIN TAPER to POINT (M) are established by a constant 3% slope across the appropriate taper widths based on the Taper Ratio of 15:1, Drop = (0.03) x (Offset).



SECTION A-A



SECTION B-B



SECTION C-C

All dimensions given in millimeters unless noted.

METRIC VERSION

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION 5 04-21-09

RV-8

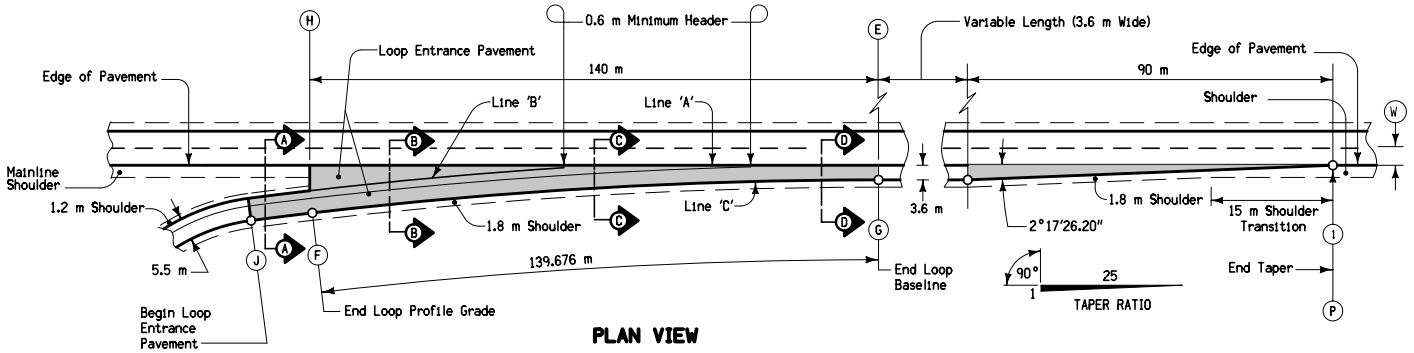
SHEET 1 of 1

REVISIONS: Corrected circle note 2. Removed mainline pavement and shoulder widths. Added table for shoulder transaction distance. (Metrics Re-instated.)

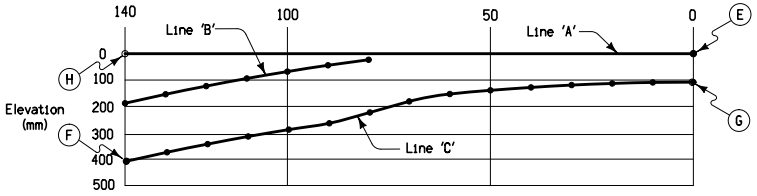
Deanna Maifeld

APPROVED BY DESIGN METHODS ENGINEER

DECELERATION TAPER FOR 5.5 m EXIT LOOP



PLAN VIEW



Pt. (J) to Pt. (G)
△ = 7°24'02.54"
R = 1200.000 m
T = 77.608 m
L = 155.000 m
E = 2.507 m

NOTE: The algebraic difference between profile grade for Loop ② at (F) and relative profile of Mainline at (H) is 0.38%

PROFILE

TABLE OF OFFSETS AND DROPS FOR 5.5 m LOOP ENTRANCE

Distance From Point (E) Along Line 'A' (m)		140	130	120	110	100	90	80	70	60	50	40	30	20	10	0
From Line 'A' To Line 'B'	Offset (m)	6.257	5.130	4.088	3.129	2.255	1.464	0.757								
	Slope (%)	3.00	3.00	3.00	3.00	3.00	3.00	3.00								
	Drop (mm)	188	154	123	94	68	44	23								
From Line 'B' To Line 'C'	Offset (m)	5.5	5.5	5.5	5.5	5.5	5.5	5.5								
	Slope (%)	4.00	4.00	4.00	4.00	4.00	4.00	3.64								
	Drop (mm)	220	220	220	220	220	220	200								
From Line 'A' To Line 'C'	Offset (m)								5.643	5.101	4.642	4.267	3.975	3.767	3.642	3.600
	Slope (%)								3.21	3.00	3.00	3.00	3.00	3.00	3.00	3.00
	Drop (mm)	408	374	343	314	288	264	223	181	153	139	128	119	113	109	108
Distance From Point (G) Along Line 'C' (m)		139.676	129.659	119.651	109.651	99.658	89.673	79.694	70.040	60.025	50.014	40.007	30.003	20.001	10.000	0

(H) (E) (F) (G)

NOTE: From (G) to (P) cross slope between Line A and Line C is a constant 3%.

TABLE OF SHOULDER TRANSITION LENGTHS			
(W_o)	Shoulder Width beyond Edge of Mainline Pavement		
	2.4m	3m	3.6m
3.6m	NA	60m	90m
4.2m	30m	60m	NA

NOTE: W_o is the width of the outside lane to the Edge of Pavement.

Loop exit pavement shall be the same thickness as mainline pavement.

Loop exit pavement shown by shaded area is 1130 square meters.

Special shaping of area between lines A and B may be required to assure proper drainage.

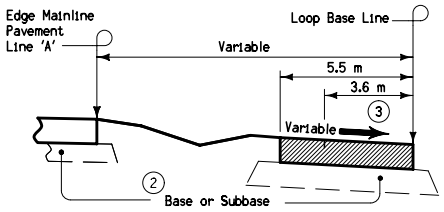
For jointing layout, see Standard Road Plan RV-10.

This design is based on 100 km/h design speed at e max = 6%.

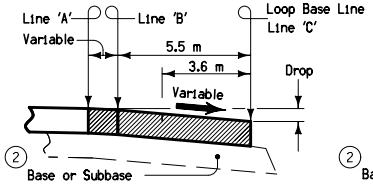
① For header construction details at the beginning of taper, refer to Typical 7101 or Typical 7102.

② Subbase for loop exit pavement shall be the same thickness as mainline subbase.

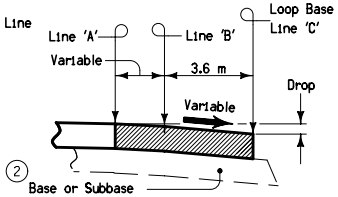
③ The loop pavement cross slope between (J) and (F) is determined by superelevation rotated about line C. Refer to Standard Road Plan RP-3 and plans for superelevation transition requirements.



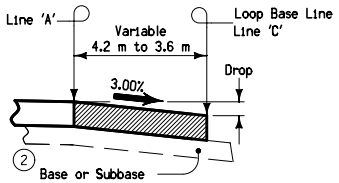
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

All dimensions given in millimeters unless noted.

METRIC VERSION

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION 5 04-21-09

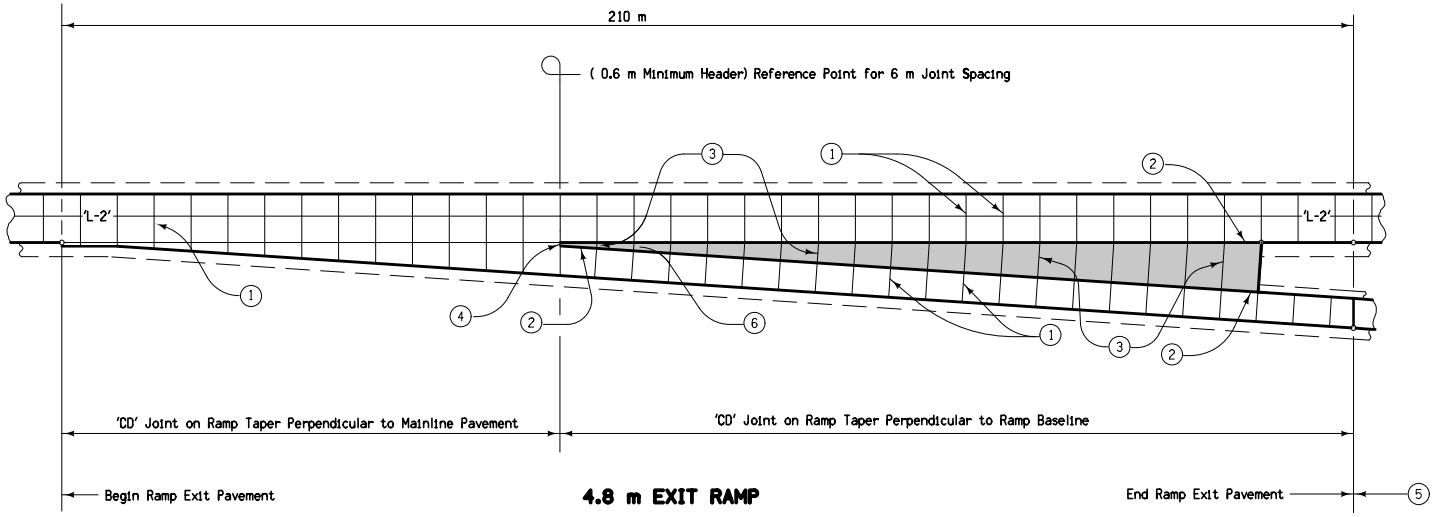
RV-9

SHEET 1 of 1

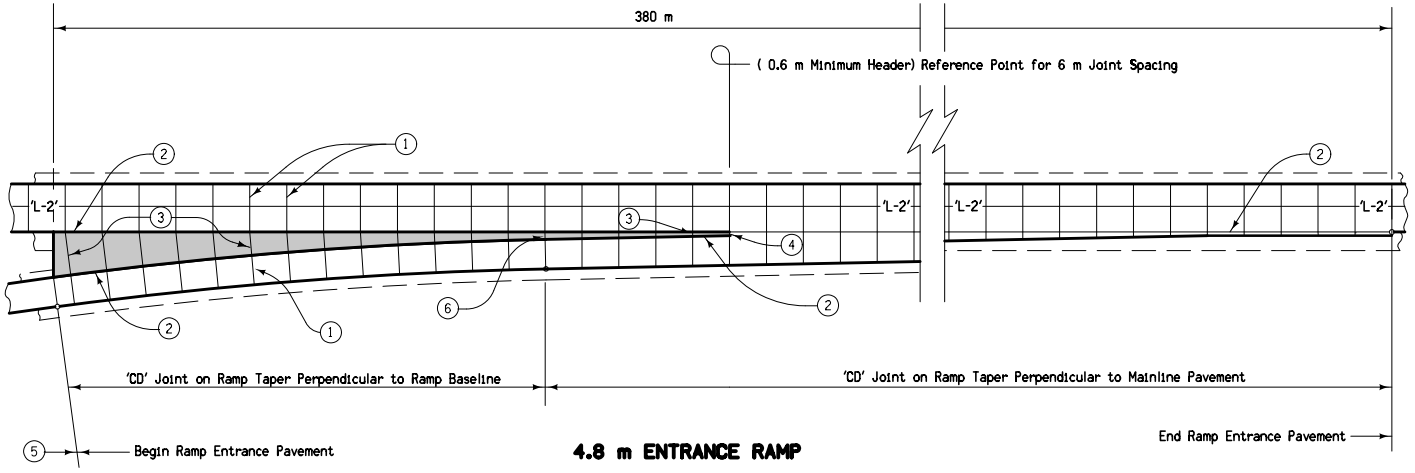
REVISIONS: Corrected circle note 2. Removed mainline pavement and shoulder widths. Added table for shoulder transaction distance. (Metrics Re-instated.)

Deanna Maifurth
APPROVED BY DESIGN METHODS ENGINEER

ACCELERATION TAPER FOR 5.5 m ENTRANCE LOOP



4.8 m EXIT RAMP



4.8 m ENTRANCE RAMP

1. 'CD' Joints at 6 m spacing.
2. 'BT-2' or 'KT-2' Joint.
3. 'C' Joint.
4. 'B' Joint.
5. Refer to plans for ramp jointing.
6. The transverse joints on the ramp shall be perpendicular to the ramp baseline where the gore area is 1.2 m or greater.

For joint details, see Standard Road Plan PV-101.

All dimensions given in millimeters unless noted.

M

METRIC VERSION

Iowa Department of Transportation

STANDARD ROAD PLAN

REVISION 1 04-19-11

RV-10

SHEET 1 of 1

REVISIONS: Updated references to new standards.

Deanna Maifield

APPROVED BY DESIGN METHODS ENGINEER

JOINTING DETAILS FOR 4.8 m EXIT AND ENTRANCE RAMP