OS-299 (7-08)

pennsylvania
DEPARTMENT OF TRANSPORTATION

TRANSMITTAL LETTER

PUBLICATION:

Publication 72M
April 2004 Edition
Change No. 3

DATE:

August 29, 2008

SUBJECT:

Revisions to
Standards for Roadway Construction
April 2004 Edition

INFORMATION AND SPECIAL INSTRUCTIONS:

Incorporate the attached revisions into the April 2004 Edition of the Standards for Roadway Construction. These revisions should be adopted as soon as practical on all new and existing designs without affecting any letting schedules.

Revisions to RC-28M and RC-30M incorporate changes previously issued in SOL 432-08-04 and revisions to RC-64M and RC-67M incorporate changes previously issued in SOL 433-08-07.

Coordinate full implementation of the new RC-70 series of standards with Publication 13M, Design Manual, Part 2, Change No. 3 and Publication 584, PennDOT Drainage Manual, Initial Edition.

The major revisions for each Standard Drawing are presented below. It is strongly advised that all recipients thoroughly examine the changes and revisions incorporated in this Change.

The new Standard Drawings that have been added are presented below.

STANDARD	SHEET	DESCRIPTION OF CHANGES
RC-28M	Sheet 1 of 1	Added detail for Superpave Base Replacement (No changes from SOL 432-08-04)
RC-30M	Sheet 3 of 5	Added detail for Restoration of Pavement over Pipe (No changes from SOL 432-08-04)
RC-64M	Sheet 1 of 1	Revised details for Depressed Curb for Drives (No changes from 433-08-07)
RC-67M	All Sheets	Revised for conformance to Americans with Disabilities Act (ADA) (No changes from 433-08-07)
RC-70M	All Sheets	New Standard. Perimeter Control Devices.
RC-71M	All Sheets	New Standard. Sediment Basin and Sediment Trap.
RC-72M	All Sheets	New Standard. Inlet and Outlet Protection.
RC-73M	All Sheets	New Standard. Channel and Slope Protection.
RC-74M	All Sheets	New Standard. Temporary Diversions.
RC-75M	All Sheets	New Standard. Dewatering Devices.
RC-76M	All Sheets	New Standard. Straw Bale Barrier.
RC-77M	All Sheets	New Standard. Rock Construction Entrance.

Any comments or questions regarding the above revisions should be directed to the Standards and Criteria Section, Highway Quality Assurance Division, Bureau of Design.

CANCEL AND DESTROY THE FOLLOWING:

RC-28M	March 30, 2006
RC-30M	March 30, 2006
RC-64M	April 15, 2005
RC-67M	April 15, 2004
RC-70M	April 15, 2004
SOL 432-08-04	April 14, 2008
SOL 433-08-07	April 21, 2008

ADDITIONAL COPIES ARE AVAILABLE FROM:

☒ PennDOT SALES STORE
(717) 787-6746 phone
(717) 787-8779 fax
ra-penndotsalesstore.state.pa.us

☒ PennDOT website - www.dot.state.pa.us
Click on Forms, Publications & Maps

☒ DGS warehouse (PennDOT employees ONLY)

APPROVED FOR ISSUANCE BY:

ALLEN D. BIEHLER BY:

Brian G. Thompson, P.E.
Director of Bureau of Design, Highway Administration

INDEX OF STANDARDS FOR ROADWAY CONSTRUCTION

STANDARD DRAWING NUMBER	DRAWING DATE	DESCRIPTION
EARTHWORK		
RC-10M	APR. 15, 2004	CLASSIFICATION OF EARTHWORK
RC-11M (2 Sheets)	APR. 15, 2004	CLASSIFICATION OF EARTHWORK FOR STRUCTURES
RC-12M (2 Sheets)	MAR. 30, 2006	BACKFILL AT STRUCTURES
RC-13M	APR. 15, 2004	PAY LIMIT OF SUBBASE
PAVEMENTS		
RC-20M (3 Sheets)	MAR. 30, 2006	CONCRETE PAVEMENT JOINTS
RC-21M	MAR. 30, 2006	REINFORCED CONCRETE PAVEMENT
RC-23M (3 Sheets)	JUL. 20, 2007	BRIDGE APPROACH SLAB
RC-24M (3 Sheets)	JUL. 20, 2007	PAVEMENT RELIEF JOINT
RC-25M (7 Sheets)	MAR. 30, 2006	SHOULDERS
RC-26M (9 Sheets)	MAR. 30, 2006	CONCRETE PAVEMENT REHABILITATION
RC-27M (2 Sheets)	MAR. 30, 2006	PLAIN CONCRETE PAVEMENT
* RC-28M	AUG. 29, 2008	OVERLAY TRANSITIONS AND PAVING NOTCHES
RC-29M (3 Sheets)	MAR. 30, 2006	BRIDGE ANTI-ICING SYSTEM APPROACH INSTALLATION
DRAINAGE		
* RC-30M (5 Sheets)	AUG. 29, 2008	SUBSURFACE DRAINS
RC-31M (2 Sheets)	MAR. 30, 2006	ENDWALLS
RC-32M	APR. 15, 2004	SLOPE PIPE FITTINGS, PIPE CONNECTORS AND CONCRETE COLLAR FOR PIPE EXTENSION
RC-33M (2 Sheets)	MAR. 30, 2006	END SECTIONS FOR PIPE CULVERTS
RC-34M (10 Sheets)	MAR. 30, 2006	INLETS
RC-35M	APR. 15, 2004	DRAINAGE DIKE
RC-36M	APR. 15, 2004	SPRING BOXES
RC-39M (6 Sheets)	APR. 15, 2004	STANDARD MANHOLES
RC-40M	MAR. 30, 2006	SLOPE PROTECTION
RC-43M	APR. 15, 2004	GABIONS
GUIDE RAIL AND MEDIAN BARRIER		
RC-50M (16 Sheets)	MAR. 30, 2006	GUIDE RAIL TRANSITION AT END OF STRUCTURE
RC-52M (8 Sheets)	MAR. 30, 2006	TYPE 2 STRONG POST GUIDE RAIL
RC-53M (2 Sheets)	MAR. 30, 2006	TYPE 2 WEAK POST GUIDE RAIL
RC-54M (7 Sheets)	MAR. 30, 2006	BARRIER PLACEMENT AT OBSTRUCTIONS
RC-55M	APR. 15, 2004	TYPE 2 WEAK POST MEDIAN BARRIER
RC-57M (8 Sheets)	MAR. 30, 2006	CONCRETE MEDIAN BARRIER
RC-58M (5 Sheets)	MAR. 30, 2006	SINGLE FACE CONCRETE BARRIER
RC-59M (2 Sheets)	MAR. 30, 2006	CONCRETE GLARE SCREEN

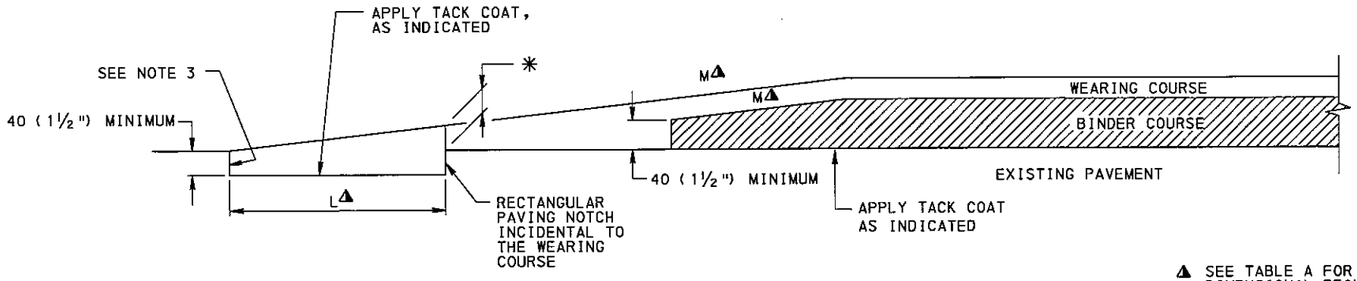
STANDARD DRAWING NUMBER	DRAWING DATE	DESCRIPTION
FENCES AND CURBS		
RC-60M (3 Sheets)	APR. 15, 2004	RIGHT-OF-WAY FENCE
RC-61M	APR. 15, 2004	RIGHT-OF-WAY GATES AND REMOVABLE FENCE SECTIONS
RC-63M (2 Sheets)	MAR. 30, 2006	PERMANENT BARRICADES
* RC-64M	AUG. 29, 2008	CURBS AND GUTTERS
RC-65M	APR. 15, 2004	CONCRETE MOUNTABLE CURBS
* RC-67M (13 Sheets)	AUG. 29, 2008	CURB RAMPS
EROSION AND SEDIMENTATION CONTROL		
* RC-70M (3 Sheets)	AUG. 29, 2008	PERIMETER CONTROL DEVICES
* RC-71M (4 Sheets)	AUG. 29, 2008	SEDIMENT BASIN AND SEDIMENT TRAP
* RC-72M (7 Sheets)	AUG. 29, 2008	INLET AND OUTLET PROTECTION
* RC-73M (4 Sheets)	AUG. 29, 2008	CHANNEL AND SLOPE PROTECTION
* RC-74M	AUG. 29, 2008	TEMPORARY DIVERSIONS
* RC-75M	AUG. 29, 2008	DEWATERING DEVICES
* RC-76M	AUG. 29, 2008	STRAW BALE BARRIER
* RC-77M	AUG. 29, 2008	ROCK CONSTRUCTION ENTRANCE
HIGHWAY LIGHTING		
RC-80M (2 Sheets)	APR. 15, 2004	HIGHWAY LIGHTING-FOUNDATIONS
RC-81M	APR. 15, 2004	HIGHWAY LIGHTING-JUNCTION BOXES-LIGHT DUTY
RC-82M (2 Sheets)	APR. 15, 2004	HIGHWAY LIGHTING-JUNCTION BOXES-HEAVY DUTY
RC-83M (2 Sheets)	APR. 15, 2004	HIGHWAY LIGHTING-LIGHTING POLE DETAILS
RC-84M	APR. 15, 2004	HIGHWAY LIGHTING-LIGHTING AND ELECTRICAL DETAILS
ROADSIDE DEVELOPMENT AND PLANTING		
RC-91M (2 Sheets)	APR. 15, 2004	BRACING AND PLANTING DETAILS

APRIL, 2004 EDITION

SEE CHANGE #1 FOR MAR. 30, 2006 STANDARD REVISIONS

SEE CHANGE #2 FOR JUL. 20, 2007 STANDARD REVISIONS

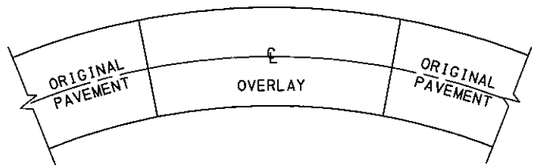
* SEE CHANGE #3 FOR AUG. 29, 2008 STANDARD REVISIONS



OVERLAY TRANSITION WITH PAVING NOTCH ON CONCRETE AND BITUMINOUS PAVEMENTS

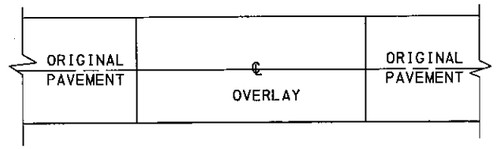
▲ SEE TABLE A FOR DIMENSIONAL REQUIREMENTS

✱ SHOULD EQUAL THE THICKNESS OF THE WEARING COURSE.



PLAN VIEW

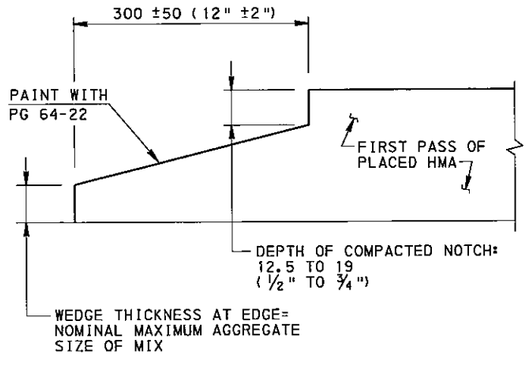
SUPERELEVATION SECTION



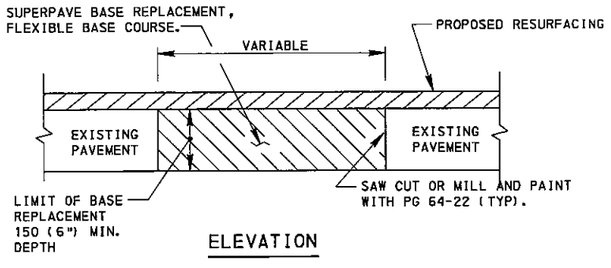
PLAN VIEW

TANGENT SECTION
TWO-LANE , TWO-WAY TRAFFIC AND
TWO-LANE DIRECTIONAL

OVERLAY TRANSITIONS



LONGITUDINAL NOTCHED WEDGE JOINT



ELEVATION

SUPERPAVE BASE REPLACEMENT

SEE NOTES 5, 6, 7 AND 8 THIS SHEET.

TABLE A

FUNCTIONAL CLASSIFICATION	SLOPE M (MAXIMUM)	PAVING NOTCH L (MINIMUM)
INTERSTATE AND OTHER LIMITED ACCESS FREEWAYS	0.17% (1" IN 50')	15 m (50')
ARTERIALS > 70 km/h (45 MPH) SEE NOTE 2.	0.28% (1" IN 30')	9 m (30')
ARTERIALS < 70 km/h (45 MPH) SEE NOTE 2	0.83% (1" IN 10')	3 m (10')
COLLECTORS AND LOCAL ROADS	0.83% (1" IN 10')	3 m (10')
CROSS STREETS SEE NOTE 1	8.33% (1" IN 12")	0.3 m (1')
DRIVEWAYS	8.33% (1" IN 12")	NO NOTCH

TABLE B

NOMINAL MAXIMUM AGGREGATE SIZE		
MIX	METRIC	ENGLISH
SP9.5 (ID-2W, ID-2W H.D.)	9.5	⅜"
SP12.5	12.5	½"
SP19 (ID-3B, ID-2B, ID-2B H.D.)	19	¾"

NOTES:

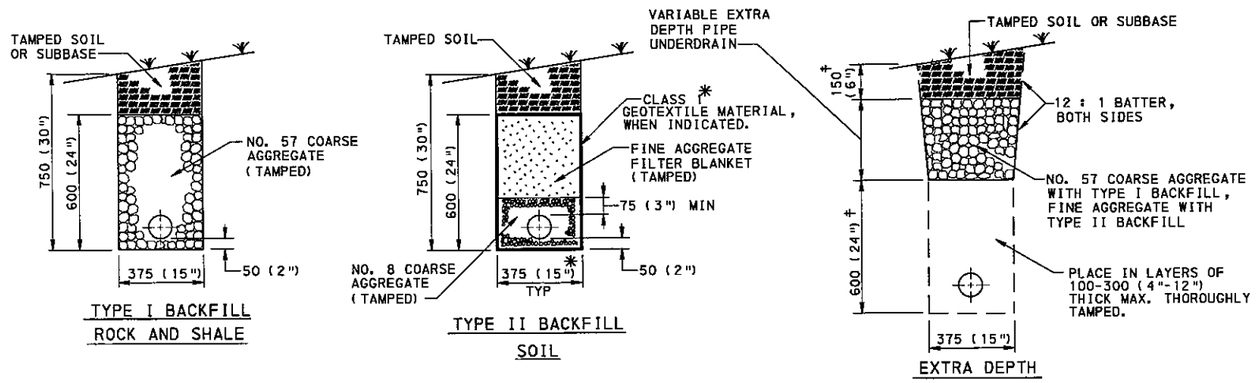
1. USE HIGHER APPROPRIATE CRITERIA IF A CROSS STREET HAS A FUNCTIONAL CLASSIFICATION OF COLLECTORS AND LOCAL ROADS OR HIGHER.
2. USE 85TH PERCENTILE SPEED, IF AVAILABLE. OTHERWISE, USE THE POSTED SPEED.
3. PLACE EDGE FLUSH WITH EXISTING PAVEMENT AND SEAL AS SPECIFIED IN PUBLICATION 408, SECTION 401.3(k)3.
4. CONSTRUCT FLEXIBLE BASE REPLACEMENT IN ACCORDANCE WITH THE REQUIREMENTS OF PUBLICATION 408, SECTION 316.
5. PREPARE EXPOSED VERTICAL AND HORIZONTAL SURFACES AS PER PUBLICATION 408, SECTION 409.3(k).
6. FOR NON-OVERLAY APPLICATIONS, THE TOP 40 (1½") OF BASE REPLACEMENT WILL BE SUPERPAVE WEARING COURSE.
7. FOR RESTORATION OF RIGID PAVEMENT, REFER TO PUBLICATION 408, SECTION 516 AND RC-26M.
8. FOR SUPERPAVE BASE REPLACEMENT, SAW CUTTING, EXCAVATION, HAULING AND DISPOSAL, BITUMINOUS TACK COAT, BITUMINOUS MATERIAL, AND SEALING OF THE JOINTS ARE CONSIDERED AS INCIDENTAL.
9. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS IN () PARENTHESIS.

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

OVERLAY TRANSITIONS AND PAVING NOTCHES

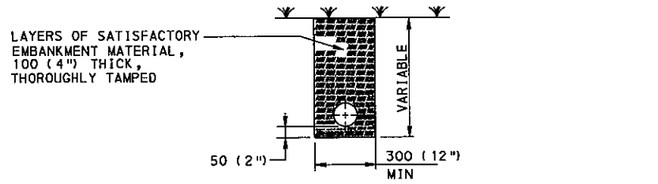
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 1 OF 1
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-28M



PIPE UNDERDRAIN

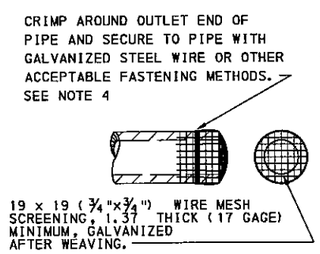
NOTES

1. PROVIDE MATERIALS AND CONSTRUCT AS SPECIFIED IN PUBLICATION 408, SECTION 610 FOR PIPE UNDERDRAIN AND PAVEMENT BASE DRAIN.
2. PROVIDE BITUMINOUS PAPER WHEN GEOTEXTILE MATERIAL IS NOT INDICATED.
3. FOR THE SUBSURFACE DRAIN OUTLET PROVIDE MATERIALS MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 615. A MINIMUM OF 600 (24") OF COVER OVER THE PIPE IS REQUIRED FOR OUTLETS CONSTRUCTED WITH THE SAME MATERIAL AS THE UNDERDRAIN OR PAVEMENT BASE DRAIN.
4. USE THE WIRE MESH SHIELD IN AREAS NOT SUBJECT TO MOWING OR DAMAGE BY EQUIPMENT OR VEHICLES. REFER TO RC-31M FOR CONSTRUCTION OF ENDWALLS FOR OUTLET PROTECTION.
5. LONGITUDINAL BASE DRAINS MAY RUN CONTINUOUSLY THROUGH TWO (2) OUTLETS. USE A 45° ELBOW ON THE THIRD OUTLET OF A SERIES. BEGIN THE DRAIN FOLLOWING THE THIRD OUTLET WITH AN END CAP.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS IN () PARENTHESIS.

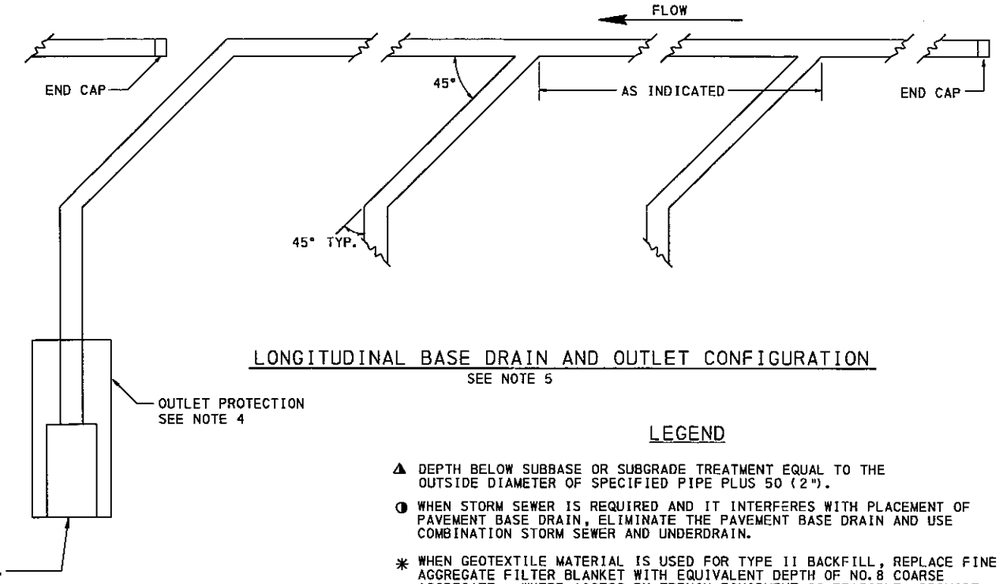


EXCAVATION OVER 900 (36") IN DEPTH AND FOR A MAXIMUM WIDTH OF 600 (24") IS PAYABLE AS CLASS 4 EXCAVATION. USE SUBSURFACE DRAIN OUTLETS FOR ALL PIPE UNDERDRAIN AND PAVEMENT BASE DRAINS.

SUBSURFACE DRAIN OUTLETS
(SEE DETAIL A.)



DETAIL A
WIRE MESH SHIELD



LONGITUDINAL BASE DRAIN AND OUTLET CONFIGURATION
SEE NOTE 5

LEGEND

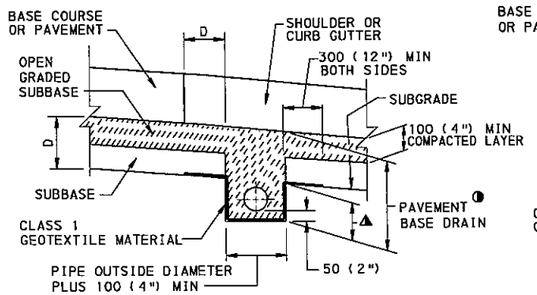
▲ DEPTH BELOW SUBBASE OR SUBGRADE TREATMENT EQUAL TO THE OUTSIDE DIAMETER OF SPECIFIED PIPE PLUS 50 (2").

◑ WHEN STORM SEWER IS REQUIRED AND IT INTERFERES WITH PLACEMENT OF PAVEMENT BASE DRAIN, ELIMINATE THE PAVEMENT BASE DRAIN AND USE COMBINATION STORM SEWER AND UNDERDRAIN.

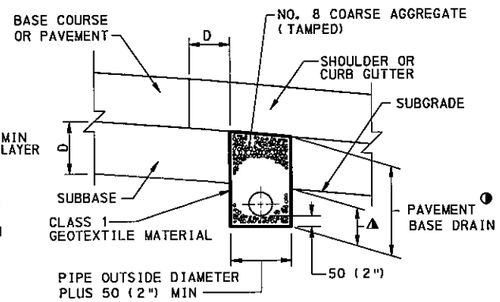
* WHEN GEOTEXTILE MATERIAL IS USED FOR TYPE II BACKFILL, REPLACE FINE AGGREGATE FILTER BLANKET WITH EQUIVALENT DEPTH OF NO.8 COARSE AGGREGATE. WHERE ACCESS BY TRENCH EQUIPMENT IS FEASIBLE, PROVIDE TRENCH WIDTH EQUAL TO PIPE OUTSIDE DIAMETER PLUS 50 (2"), BUT NOT LESS THAN 150 (6"), WHEN GEOTEXTILE MATERIAL IS INDICATED.

‡ TYPE I OR TYPE II BACKFILL

D= SUBBASE DEPTH

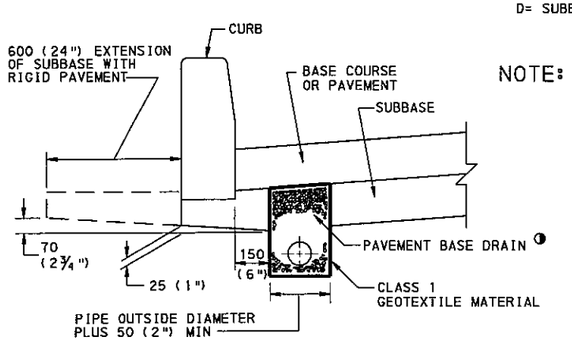


TYPICAL PLACEMENT
(OPEN GRADED SUBBASE)



TYPICAL PLACEMENT
(STANDARD SUBBASE)

PAVEMENT BASE DRAIN



PLACEMENT AT CURB SECTION

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

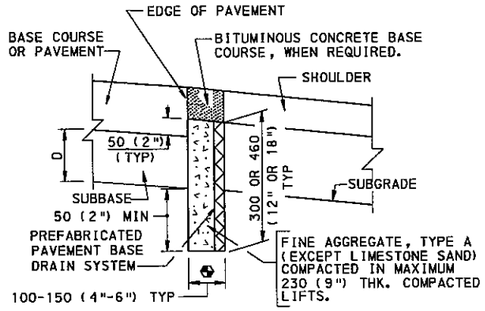
SUBSURFACE DRAINS

RECOMMENDED AUG. 29, 2008
ACTING CHIEF, HWY. QA DIVISION

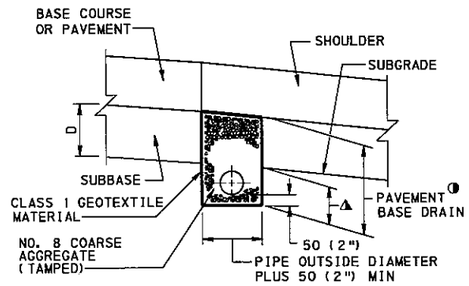
RECOMMENDED AUG. 29, 2008
DIRECTOR, BUREAU OF DESIGN

SHT 1 OF 5

RC-30M



PREFABRICATED
PAVEMENT BASE DRAIN
(REHABILITATION)
SEE NOTE 3.



PAVEMENT BASE DRAIN
(REHABILITATION)

NOTES

1. PROVIDE MATERIALS AND CONSTRUCTION MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 610 FOR PAVEMENT BASE DRAIN, SECTION 612 FOR SUBGRADE DRAINS AND SECTION 604 FOR COMBINATION STORM SEWER AND UNDERDRAIN.
2. PROVIDE BITUMINOUS PAPER WHEN GEOTEXTILE MATERIAL IS NOT INDICATED.
3. PREFABRICATED PAVEMENT BASE DRAIN IS NOT RECOMMENDED UNDER CURBED SECTIONS AND ADJACENT TO WIDENED PAVEMENT.
4. PLACE 2A AGGREGATE MATERIAL, IN A LIFT TS (3") THICK, COMPACT TO 95% SPD.

LEGEND

▲ DEPTH BELOW SUBBASE EQUAL TO THE OUTSIDE DIAMETER OF SPECIFIED PIPE PLUS 50 (2").

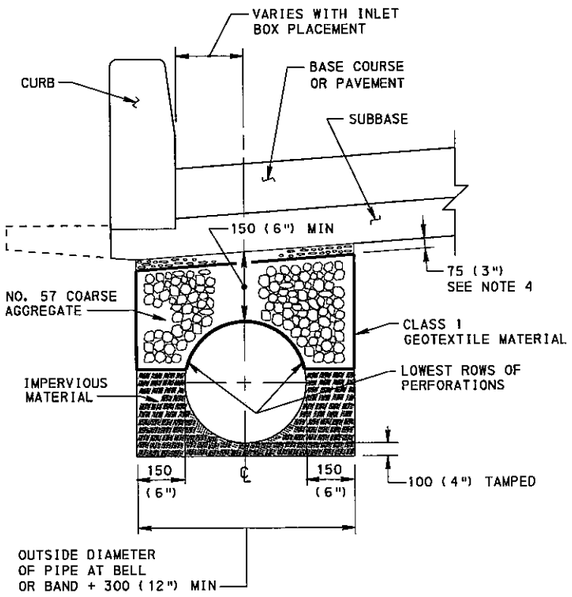
◑ WHEN STORM SEWER IS REQUIRED AND IT INTERFERES WITH PLACEMENT OF PAVEMENT BASE DRAIN, ELIMINATE THE PAVEMENT BASE DRAIN AND USE COMBINATION STORM SEWER AND UNDERDRAIN.

D= SUBBASE DEPTH.

IF SLOUGHING OF THE SUBBASE MATERIAL FROM UNDER THE PAVEMENT IS OBSERVED DURING TRENCH EXCAVATION, COMPACT BACKFILL HYDRAULICALLY, AS DIRECTED BY THE ENGINEER.

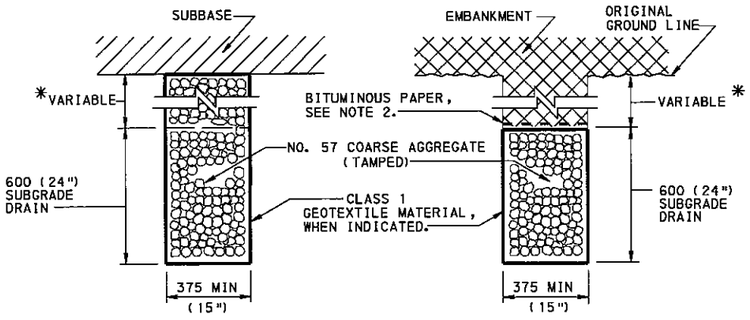
⊖ WIDTH IS EQUAL TO 75-125 (3"-5") OF BACKFILL AGGREGATE PLUS 25 (1") FOR THE PREFABRICATED BASE DRAIN.

✳ VARY TO MAINTAIN THE NECESSARY SUBGRADE SLOPE. CONSIDER ADDITIONAL AGGREGATE INCIDENTAL TO THE SUBGRADE DRAIN PAY ITEM.



COMBINATION
STORM SEWER AND UNDERDRAIN

NOTE: PLACE NO. 57 COARSE AGGREGATE, TAMPED IN LAYERS 150 (6") THICK, STARTING AT THE LOWEST ROWS OF PERFORATIONS OR THE START OF THE OPEN JOINT. PLACE GROUPS OF PERFORATIONS OR THE OPEN JOINT (1/3 PIPE CIRCUMFERENCE) SYMMETRICALLY ABOUT THE VERTICAL CENTER LINE.



TREATMENT UNDER SUBBASE TREATMENT UNDER EMBANKMENT

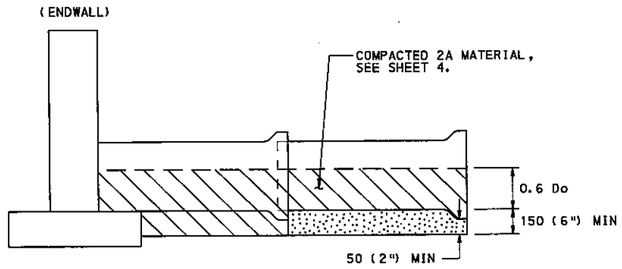
SUBGRADE DRAIN

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

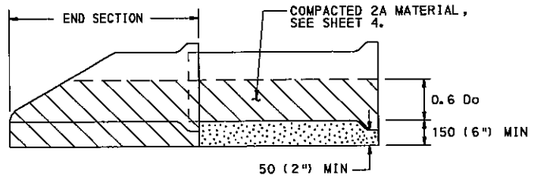
SUBSURFACE DRAINS

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 2 OF 5
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-30M



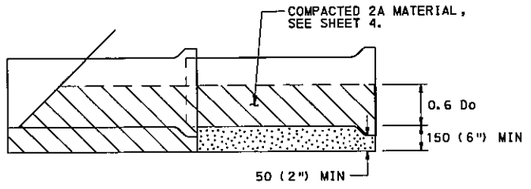
BACKFILL DETAIL AT ENDWALL

(FOR CONCRETE PIPE)



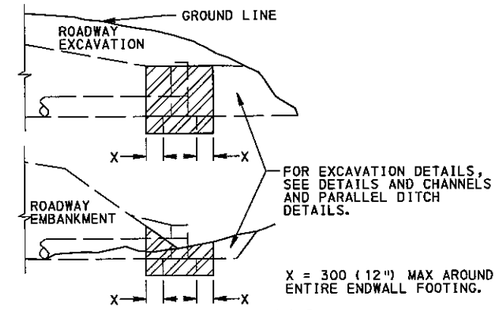
BACKFILL DETAIL AT END SECTION

(FOR CONCRETE PIPE)

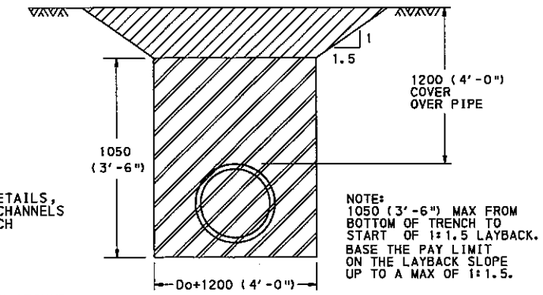


BACKFILL DETAIL AT LAST SECTION OF PIPE

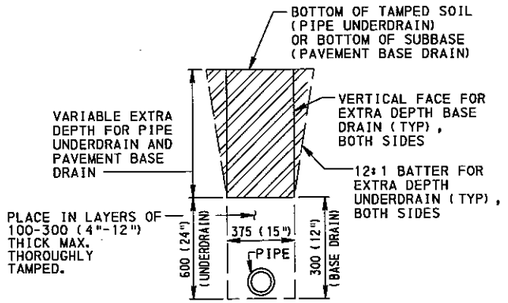
(FOR CONCRETE PIPE)



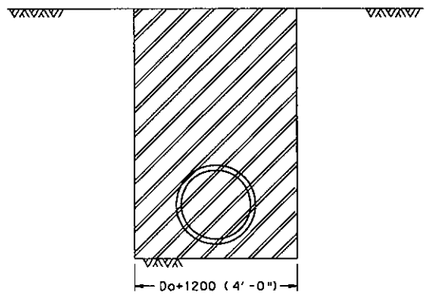
EXCAVATION FOR ENDWALLS



ABOVE DRAWING SHOWS EXCAVATION FOR PIPE IN CUT OR FILL WHERE SUBGRADE IS 1050 (3'-6") OR MORE ABOVE THE BOTTOM OF THE TRENCH.



EXTRA DEPTH FOR PIPE UNDERDRAIN AND PAVEMENT BASE DRAIN



ABOVE DRAWING SHOWS EXCAVATION FOR PIPE IN CUT OR FILL WHERE SHORING OR A TRENCH BOX IS USED.

PAY LIMITS FOR PIPE EXCAVATION

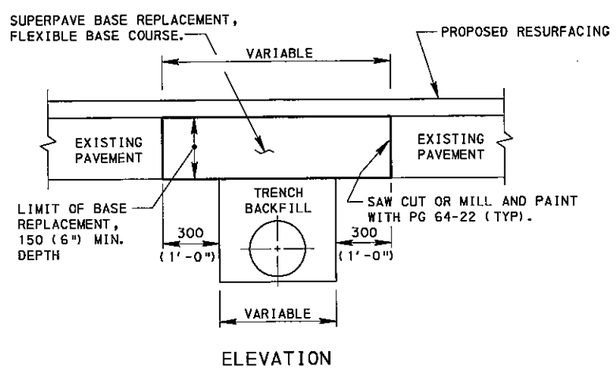
NOTES

1. PROVIDE MATERIALS AND CONSTRUCT AS SPECIFIED IN PUBLICATION 408, SECTION 601 FOR PIPE CULVERTS, SECTION 602 FOR CORRUGATED METAL PIPE-ARCH CULVERTS AND SECTION 603 FOR METAL PLATE CULVERTS.
2. SHORING OR TRENCH BOX INSTALLATION FOR FLEXIBLE PIPE IS NOT NORMALLY USED. IF SHORING OR TRENCH BOX INSTALLATION IS PERMITTED IN SPECIAL CIRCUMSTANCES, REFER TO PUBLICATION 408, SECTION 601.3(f).
3. IN ALL EXCAVATION AREAS FOLLOW OSHA SAFETY REQUIREMENTS.
4. DO NOT COMPACT NO. 8 MATERIAL USED FOR BEDDING UNDER CONCRETE PIPES.
5. ALLOW NO PAYMENT FOR EXCAVATION IN EXCESS OF SPECIFIED LIMITS AND FOR ADDITIONAL BACKFILL MATERIAL REQUIRED.
6. PAYMENT FOR THE BACKFILL ENVELOPE, INCLUDING BEDDING, COARSE AGGREGATE AND SUITABLE MATERIAL UP TO 300 (12") ABOVE THE PIPE IS INCIDENTAL TO THE PIPE.
7. FOR BOTTOM TRENCH WIDTHS ≥ 2.5 m (8'-0"), ALL EXCAVATION IS CLASS 1.
8. FOR INLET OR OUTLET PROTECTION SEE DETAIL A.
9. CONSTRUCT FLEXIBLE BASE REPLACEMENT IN ACCORDANCE WITH THE REQUIREMENTS OF PUBLICATION 408, SECTION 316.
10. PREPARE EXPOSED VERTICAL AND HORIZONTAL SURFACES AS PER PUBLICATION 408, SECTION 409.3(k).
11. FOR NON-OVERLAY APPLICATIONS, THE TOP 40 (1½") OF BASE REPLACEMENT WILL BE SUPERPAVE WEARING COURSE.
12. FOR RESTORATION OF RIGID PAVEMENT, REFER TO PUBLICATION 408, SECTION 516 AND RC-26M.
13. FOR SUPERPAVE BASE REPLACEMENT, SAW CUTTING, EXCAVATION, HAULING AND DISPOSAL, BITUMINOUS TACK COAT, BITUMINOUS MATERIAL, AND SEALING OF THE JOINTS ARE CONSIDERED AS INCIDENTAL.

LEGEND

- CLASS 4 EXCAVATION
- CLASS 1 EXCAVATION
- AGGREGATE FOR BEDDING (AASHTO NO. 8)
- COARSE AGGREGATE (2A)

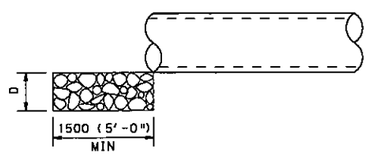
Do = OUTSIDE DIAMETER OF PIPE.



ELEVATION

RESTORATION OF PAVEMENT OVER PIPE

SEE NOTES 9, 10, 11 AND 13 THIS SHEET.



DETAIL A - PIPE INLET OR OUTLET PROTECTION

D = 450 (18"), R-4 ROCK, FOR PIPES LESS THAN 900 (36") INSIDE DIAMETER OR SPAN.
D = 600 (24"), R-5 ROCK, FOR PIPES 900 (36") AND GREATER INSIDE DIAMETER OR SPAN.

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

SUBSURFACE DRAINS
PIPE PLACEMENT
EXCAVATION - BEDDING - BACKFILL

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 3 OF 5
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-30M

PIPE INSTALLATION PROCEDURES

CONSTRUCTION DETAILS BELOW COVER THE FOLLOWING CONDITIONS:

(A) PIPE LYING ON TOP OF THE NATURAL GROUND, ROCK OR COMPACTED (97% SPD) FILL.

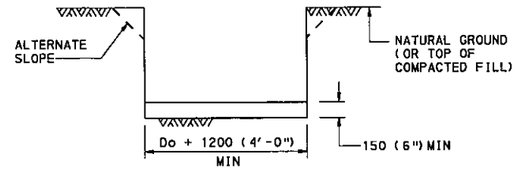
(B) THE EXISTING GROUND IS BETWEEN THE TOP AND THE BOTTOM OF THE PROPOSED PIPE AND THE PIPE IS TO BE COVERED WITH EARTH FILL.

(C) THE TOP OF PIPE IS BELOW THE LEVEL OF THE NATURAL GROUND OR COMPACTED FILL (TO MINIMUM 97% SPD) AND TO BE COVERED WITH EARTH FILL TO HEIGHTS ABOVE THE NATURAL GROUND.

STEP 1 : REMOVE TOPSOIL (COMPRESSIBLE LAYER OF ORGANIC MATERIAL) TO A WIDTH EQUAL TO 5 OUTSIDE DIAMETERS OF THE PIPE IN ALL FILL CONDITIONS ABOVE (A), (B) & (C). ALSO IF SPECIFIED ON THE CONTRACT DRAWING, UNDERCUT FOR THE DEPTH BELOW THE BEDDING AS SHOWN BY DESIGN (MAKE MIN WIDTH 5 DIAMETERS OF PIPE). PAY AS CLASS 1 EXCAVATION.

STEP 2 : CONSTRUCT THE EMBANKMENT TO 1200 (4'-0") ABOVE THE TOP OF PIPE OR TO THE SUBGRADE ELEVATION, WHICHEVER IS LESS. FOR PIPES 1800 (72") OR GREATER SEE NOTE 1.

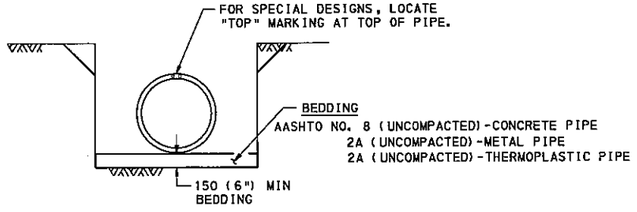
STEP 3 : EXCAVATE THE TRENCH TO THE WIDTH OF THE OUTSIDE DIAMETER OF THE PIPE BARREL PLUS 1200 (4'-0") AND CREATE AN APPROPRIATE BEDDING 150 (6") DEEP.



STEP 4 : FOR CONCRETE PIPE, IF THIS EXCAVATION IS THROUGH ROCK, OR HARD SHALE, OR IN AREAS OF UNDERCUT, PROVIDE 150+40 mm/m (6"+½" INCH/FT) OF, Do+1200 (4'-0"), BELOW THE INTENDED BOTTOM ELEVATION OF THE PIPE, 400 (16") MAX.

NOTE: IF UNSUITABLE MATERIAL IS FOUND, UNDERCUT AS DIRECTED AND BACKFILL WITH SUITABLE MATERIAL TO BOTTOM OF BEDDING ELEVATION. (UNLESS OTHERWISE SPECIFIED.)

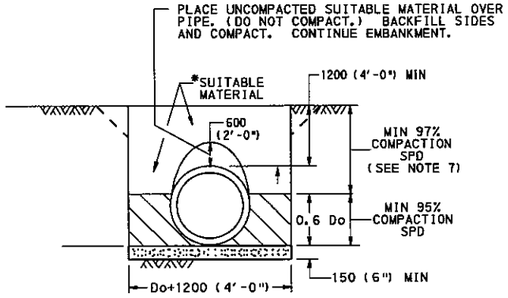
STEP 5 : LAY PIPE ON APPROPRIATE BEDDING. SEE STEP 6D FOR METAL PIPE ARCH AND METAL PLATE PIPE ARCH.



STEP 6 : FOR CONCRETE PIPE, SEE STEP 6A.
: FOR METAL PIPE AND METAL PLATE PIPE, SEE STEP 6B.
: FOR THERMOPLASTIC PIPE, SEE STEP 6C.
: FOR METAL PIPE ARCH AND METAL PLATE PIPE ARCH, SEE STEP 6D.

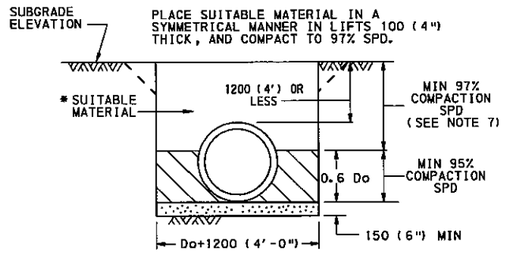
STEP 6A : CONCRETE PIPE

PLACE 2A COARSE AGGREGATE MATERIAL, IN LIFTS 100 (4") THICK, ADJACENT TO THE LOWER HAUNCHES TO A HEIGHT OF 0.6 Do. COMPACT TO 95% SPD. TEST THE SIDE BACKFILL MATERIAL AND CONTINUE EMBANKMENT IN ACCORDANCE WITH PUBLICATION 408, SECTION 601.



FILLS 1.5 m TO 14.6 m (5' TO 48')

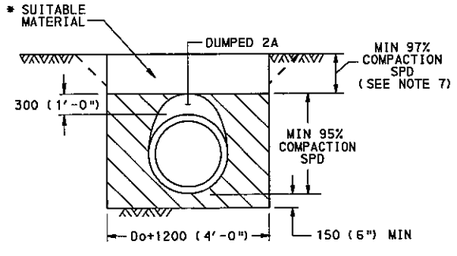
FOR FILLS OVER 14.6 m (48'), SEE NOTE 8.



SHALLOW FILLS 1200 (4'-0") AND LESS

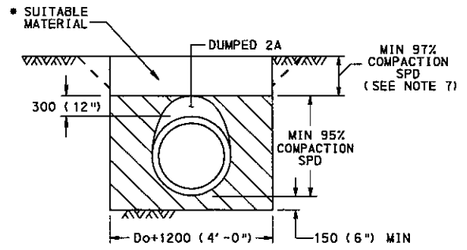
STEP 6B : METAL PIPE AND METAL PLATE PIPE

PLACE 2A COARSE AGGREGATE MATERIAL, IN LIFTS 100 (4") THICK, ADJACENT TO THE LOWER HAUNCHES TO A HEIGHT OF 300 (12") ABOVE TOP OF PIPE. COMPACT TO 95% SPD. TEST THE BACKFILL MATERIAL AND CONTINUE EMBANKMENT IN ACCORDANCE WITH PUBLICATION 408, SECTION 601.



STEP 6C: THERMOPLASTIC PIPE

PLACE 2A COARSE AGGREGATE MATERIAL, IN LIFTS 100 (4") THICK, ADJACENT TO THE LOWER HAUNCHES TO A HEIGHT OF 300 (12") ABOVE TOP OF PIPE. COMPACT TO 95% SPD. TEST THE BACKFILL MATERIAL AND CONTINUE EMBANKMENT IN ACCORDANCE WITH PUBLICATION 408, SECTION 601.

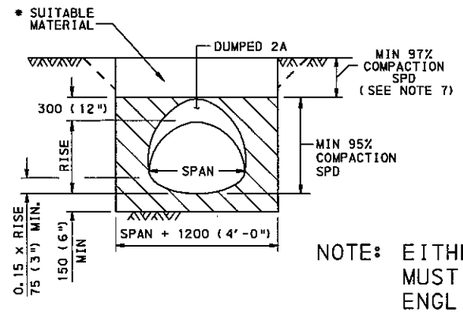


STEP 6D : METAL PIPE ARCH AND METAL PLATE PIPE ARCH

(1) PLACE 2A COARSE AGGREGATE MATERIAL (0.15 x RISE) ON TOP OF THE BEDDING AND FORM THE CRADLE.

(2) LAY THE PIPE ON THE PREPARED CRADLE.

(3) PLACE 2A COARSE AGGREGATE MATERIAL, IN LIFTS 100 (4") THICK, ADJACENT TO THE LOWER HAUNCHES TO A HEIGHT OF 300 (12") ABOVE TOP OF PIPE. COMPACT TO 95% SPD. TEST THE BACKFILL MATERIAL AND CONTINUE EMBANKMENT IN ACCORDANCE WITH PUBLICATION 408, SECTION 601.



NOTES

1. THE INSTALLATION OF PIPES 1800 (72") OR GREATER INSIDE DIAMETER OR SPAN IS PERMITTED WITHOUT PLACING EMBANKMENT FIRST. MAKE THE BACKFILL ENVELOPE AS SHOWN ON THIS DRAWING EXCEPT PROVIDE 2A MATERIAL ON EACH SIDE OF THE PIPE EQUAL TO ONE OUTSIDE DIAMETER OR SPAN OF THE PIPE. FOR CONCRETE PIPE, THE WIDTH OF UNCOMPACTED AGGREGATE FOR BEDDING (AASHTO NO. 8) REMAINS AT Do + 1200 (4'-0"). PAYMENT FOR THE 2A MATERIAL IS AS PER NOTE 3.
2. A HIGHER STRENGTH PIPE THAN SPECIFIED MAY BE SUPPLIED AT NO ADDITIONAL COST TO THE DEPARTMENT.
3. PAYMENT FOR THE BACKFILL ENVELOPE INCLUDING BEDDING, COARSE AGGREGATE AND SUITABLE MATERIAL UP TO 300 (12") ABOVE THE PIPE IS INCIDENTAL TO THE PIPE.
4. TO PRECLUDE POINT LOADING ON RELATIVELY RIGID CONCRETE PIPE, DO NOT COMPACT AASHTO NO. 8 BEDDING MATERIAL.
5. FOR TRENCH BOX/SHORING INSTALLATION REQUIREMENTS REFER TO PUBLICATION 408, SECTION 601.
6. PERMIT PLACEMENT OF BACKFILL MATERIAL IN LAYERS, LIFTS, 200 (8") THICK WHEN USING VIBRATORY COMPACTION EQUIPMENT.
7. COMPACT TOP 1000 (3'-0") OF SUBGRADE TO 100% IN ACCORDANCE WITH PUBLICATION 408, SECTION 206.3.
8. FOR REINFORCED CONCRETE PIPES INSTALLED WITH 14.9 m (49') OF COVER OR MORE, PROVIDE 300 (12") BEDDING MINIMUM AND 400 (16") WHEN ROCK IS PRESENT.

LEGEND

AGGREGATE FOR BEDDING (AASHTO NO. 8), UNCOMPACTED

COARSE AGGREGATE (2A)

Do = OUTSIDE DIAMETER OF PIPE, MILLIMETERS

SPD = STANDARD PROCTOR DENSITY

ID = INSIDE DIAMETER

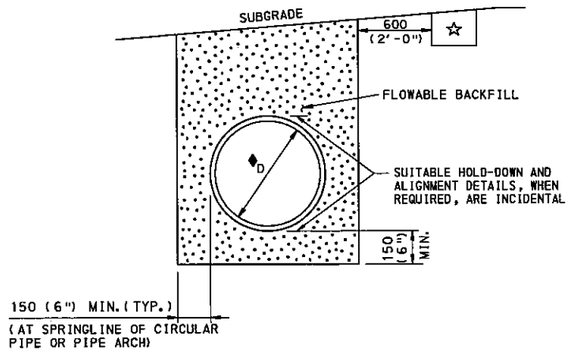
* SUITABLE MATERIAL = MATERIAL CONTAINING NO DEBRIS, ORGANIC MATTER, FROZEN MATERIAL OR LARGE STONES WITH A DIAMETER GREATER THAN ONE-HALF THE THICKNESS OF THE COMPACTED LAYERS BEING PLACED.

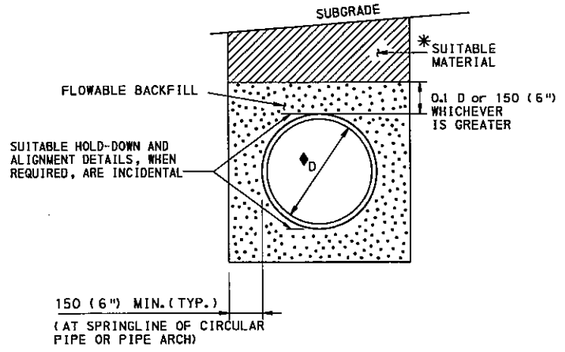
NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

SUBSURFACE DRAINS
PIPE PLACEMENT
EXCAVATION - BEDDING - BACKFILL

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 4 OF 5
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-30M





◆D = NOMINAL DIAMETER OR RISE IN DESCRIPTION OF PIPE ITEM. 900 mm (3'-0") MAXIMUM DIAMETER OR RISE.

FLOWABLE BACKFILL DETAIL

(SEE NOTE 4)

NOTES:

1. PROVIDE MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH THE REQUIREMENTS OF PUBLICATION 408, SECTIONS 601 AND 220.
2. FLOWABLE BACKFILL WILL ENVELOP THE LAST SECTION OF PIPE OR END SECTION. CONSTRUCT DIKE OF FLOWABLE BACKFILL MATERIAL AS SPECIFIED IN SPECIAL PROVISION OR PROVIDE FORMWORK TO CONTAIN FLOWABLE BACKFILL.
3. PAYMENT FOR THE BACKFILL ENVELOP (AGGREGATE, BEDDING AND BACKFILL OR FLOWABLE BACKFILL MATERIAL) AND SUITABLE MATERIAL UP TO 300 (12") ABOVE THE PIPE IS INCIDENTAL TO THE PIPE.
4. THE FLOWABLE BACKFILL DETAIL REPLACES STEPS 6A, 6B, 6C AND 6D ON SHEET 4 WHEN FLOWABLE BACK FILL IS SPECIFIED.

☆ IF DRAINAGE IS REQUIRED TO MAINTAIN POSITIVE FLOW OF WATER AWAY FROM THE TRENCH, IT MUST BE PROVIDED BY USE OF PROPERLY DESIGNED GRANULAR OR SYNTHETIC DRAINS.

✱ SUITABLE MATERIAL = MATERIAL CONTAINING NO DEBRIS, ORGANIC MATTER, FROZEN MATERIAL OR LARGE STONES WITH A DIAMETER GREATER THAN ONE-HALF THE THICKNESS OF THE COMPACTED LAYERS BEING PLACED.

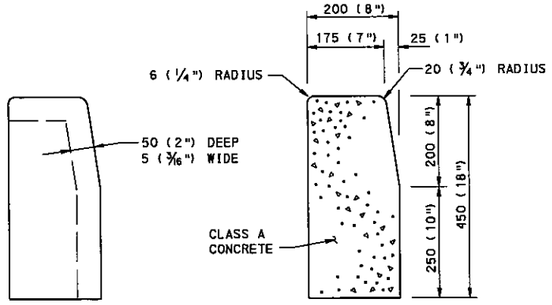
NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

SUBSURFACE DRAINS

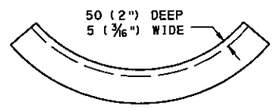
FLOWABLE BACKFILL

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 5 OF 5
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-30M

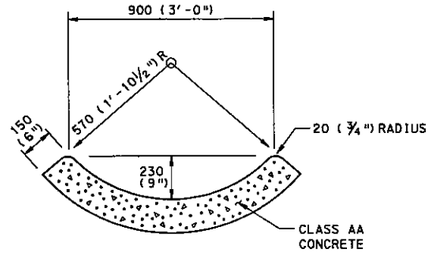


DETAIL A
CONTRACTION JOINT

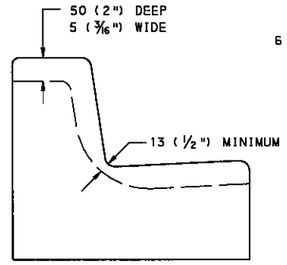
TYPICAL
CROSS SECTION



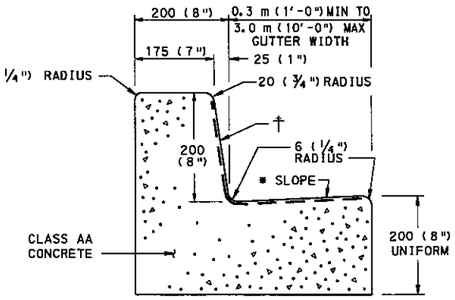
DETAIL B
CONTRACTION JOINT



TYPICAL
CROSS SECTION



DETAIL C
CONTRACTION JOINT

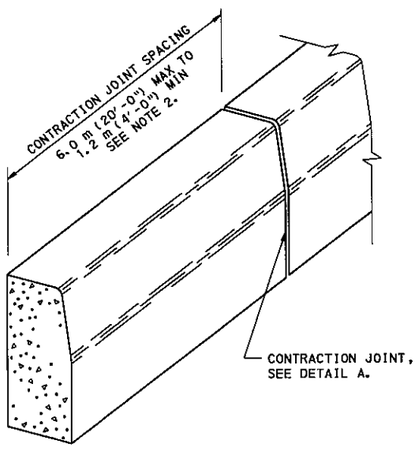


TYPICAL
CROSS SECTION

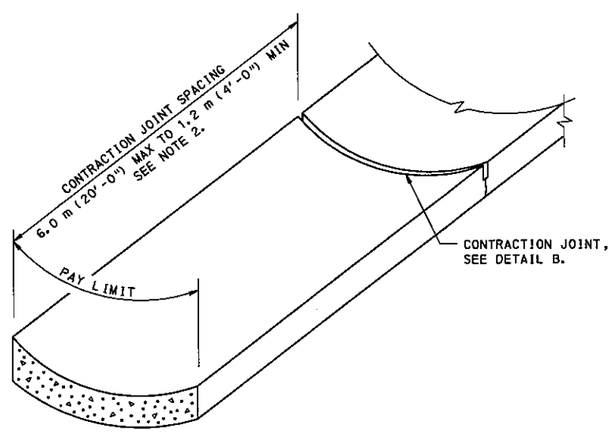
* UNDER 1.5 m (5'-0") GUTTER WIDTH = 8.0% (1"/FT) MIN.
1.5 m (5'-0") AND GREATER GUTTER WIDTH = 4.0% (1/2"/FT) MIN.

NOTE: REFER TO RC-67M FOR MAXIMUM SLOPE OF GUTTER WHEN PLACED AT A CURB RAMP

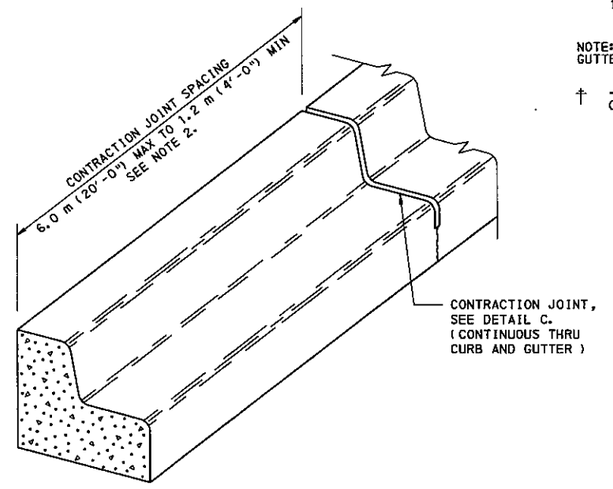
† – – – REPRESENTS WIDTH OF GUTTER FOR COMPUTING PAY AREA.



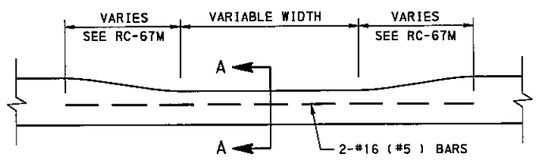
PLAIN CEMENT CONCRETE CURB



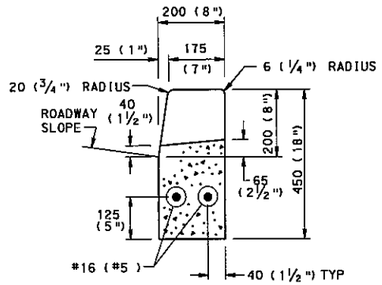
PLAIN CEMENT CONCRETE GUTTER



PLAIN CEMENT CONCRETE CURB GUTTER



ELEVATION VIEW



SECTION A-A

DEPRESSED CURB FOR DRIVEWAYS

NOTES

1. PROVIDE MATERIALS AND CONSTRUCTION MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 630 FOR PLAIN CEMENT CONCRETE CURB AND DEPRESSED CURB, SECTION 640 FOR PLAIN CEMENT CONCRETE GUTTER AND SECTION 641 FOR PLAIN CEMENT CONCRETE CURB GUTTER.
2. SPACE CONTRACTION JOINTS IN UNIFORM LENGTHS OR SECTIONS.
3. PLACE 20 (3/4") THICK PREMOLDED EXPANSION JOINT FILLER MATERIAL AT STRUCTURES AND AT THE END OF THE WORK DAY. CUT MATERIAL TO CONFORM TO AREA ADJACENT TO CURB OR TO CONFORM TO CROSS SECTIONAL AREA OF CURB.
4. SEE RC-50M FOR PLAIN CEMENT CONCRETE CURB SLOPED TOP TREATMENT AT END OF STRUCTURES.
5. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.
6. WHERE CURBS ARE INSTALLED ADJACENT TO PARKING LANES A 150 (6") HIGH CURB CAN BE UTILIZED WITH APPROVAL FROM THE LOCAL MUNICIPALITY.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

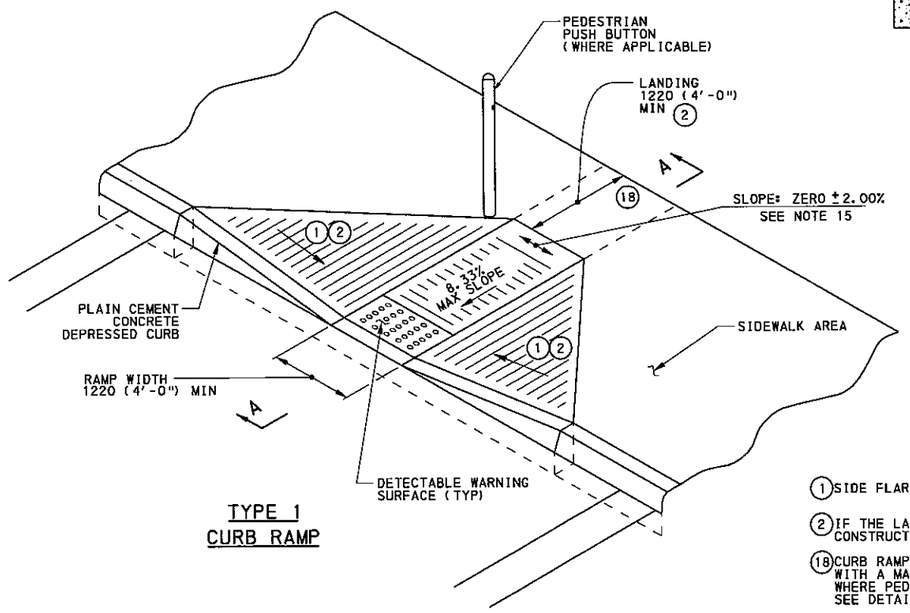
CURBS AND GUTTERS

RECOMMENDED AUG. 29, 2008
ACTING CHIEF, HWY. QA DIVISION

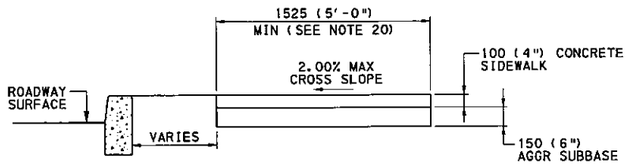
RECOMMENDED AUG. 29, 2008
DIRECTOR, BUREAU OF DESIGN

SHT 1 OF 1

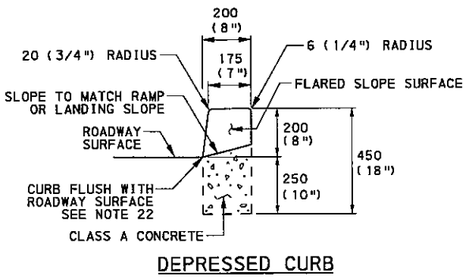
RC-64M



TYPE 1
CURB RAMP



SIDEWALK
TYPICAL SECTION

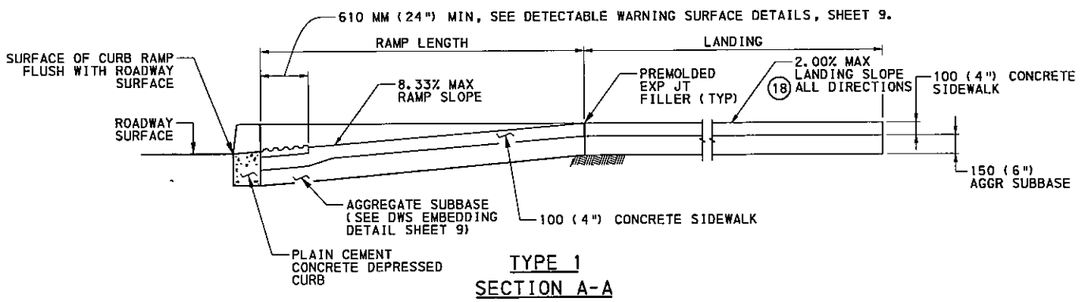


DEPRESSED CURB

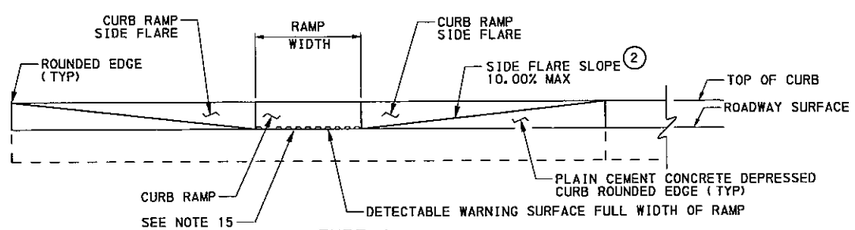
(1) SIDE FLARES 10.00% MAX SLOPE

(2) IF THE LANDING IS INDICATED TO BE LESS THAN 1220 (4'-0"), CONSTRUCT SIDE FLARES 8.33% MAX. SLOPE.

(18) CURB RAMPS REQUIRE A 1220 (4'-0") MINIMUM LANDING WITH A MAXIMUM SLOPE OF 2.00% IN ALL DIRECTIONS WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SEE DETAILS FOR LOCATIONS.



TYPE 1
SECTION A-A



TYPE 1
ELEVATION

PERCENT SLOPE	EQUIVALENT SLOPE
10.00%	10:1 (1:10)
8.33%	12:1 (1:12)
7.14%	14:1 (1:14)
2.00%	50:1 (1:50)
1.00%	100:1 (1:100)

EQUIVALENT SLOPES

NOTES

1. PROVIDE MATERIALS AND CONSTRUCTION MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTIONS 350, 409, 630, 676 AND 694.
2. PROVIDE EXPANSION JOINT MATERIAL 13 (1/2") THICK WHERE CURB RAMP ADJOINS ANY RIGID PAVEMENT, SIDEWALK OR STRUCTURE WITH THE TOP OF JOINT FILLER FLUSH WITH ADJACENT CONCRETE SURFACE.
3. CONSTRUCT DIAGONAL CURB RAMPS WITH A 1220 (4'-0") CLEARSPACE OUTSIDE OF TRAVEL LANES AT THE BOTTOM OF THE RAMP. IF DIAGONAL CURB RAMPS ARE PROVIDED AT MARKED CROSSINGS, THE 1220 (4'-0") CLEAR SPACE IS LOCATED WITHIN THE MARKINGS AND OUTSIDE OF THE TRAVEL LANES. SEE SHEET 7 FOR CROSSWALK DETAILS.
4. SEAL JOINTS WITH AN APPROVED SEALING MATERIAL.
5. PROVIDE SLIP RESISTANT TEXTURE ON CURB RAMP BY COARSE BROOMING TRANSVERSE TO THE SLOPE OF THE RAMP. EXTEND TEXTURE THE FULL WIDTH AND LENGTH OF THE CURB RAMP INCLUDING FLARED SIDE RAMPS.
6. MODIFY CONSTRUCTION DETAILS TO ADAPT DIMENSIONS TO EXISTING CURB HEIGHTS WHERE THE CURB IS LESS THAN THE STANDARD 200 (8") HEIGHT.
7. CURB RAMP AND SIDE FLARE LENGTHS ARE VARIABLE AND BASED ON CURB HEIGHT AND THE SIDEWALK SLOPE.
8. IT MAY BE NECESSARY TO LIMIT THE RUN OF A PARALLEL OR PERPENDICULAR CURB RAMP IN ORDER TO AVOID CHASING GRADE INDEFINITELY WHEN TRAVERSING THE HEIGHT OF CURB. RAMP LENGTH NOT TO EXCEED 4500 (15'-0"), ADJUST RAMP SLOPE AS NEEDED TO PROVIDE ACCESS TO THE MAXIMUM EXTENT POSSIBLE.
9. MEASURE AND PAY FOR DEPRESSED CURB IN ACCORDANCE WITH SECTION 630.4.
10. THE DETAILS DEPICT PEDESTRIAN PUSH BUTTON POLES TO ILLUSTRATE THE PREFERRED PLACEMENT OF PEDESTRIAN PUSH BUTTONS. PEDESTRIAN PUSH BUTTONS ARE TO BE INSTALLED WHERE APPLICABLE.
11. CONSTRUCT BUILT-UP CURB RAMP OF BITUMINOUS MATERIAL AS INDICATED, INCLUDING SURFACE PREPARATION AND TACK COAT, AS REQUIRED.
12. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. US CUSTOMARY UNITS IN () PARENTHESIS.
13. ALIGN DETECTABLE WARNING DOMES ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF THE RAMP AND PERPENDICULAR TO CURB.
14. PROVIDE DETECTABLE WARNING SURFACES (DWS) 610 (24") MINIMUM (IN THE DIRECTION OF PEDESTRIAN TRAVEL) ACROSS FULL WIDTH OF RAMP AT THE GRADE BREAK NEAR STREET EDGE. PROVIDE DWS THAT CONTRAST VISUALLY WITH ADJACENT WALKWAY SURFACES, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT FOR THE FULL WIDTH OF RAMP.
15. FOR NEW CONSTRUCTION, DO NOT EXCEED 2.00% CROSS SLOPE ON THE CURB RAMP OR ACCESSIBLE ROUTE.
16. FOR NEW CONSTRUCTION AND ALTERATIONS, CONSTRUCT CURB RAMP AND FLARE SLOPES WITH THE FLATTEST SLOPE POSSIBLE. THE SLOPES INDICATED IN THE DETAILS SHOW THE MAX SLOPE ALLOWABLE. SLOPES THAT EXCEED THOSE INDICATED IN THE DETAILS, OR CONTRACT DOCUMENTS AS APPLICIABLE, WILL NOT BE ACCEPTED AND WILL BE RECONSTRUCTED.
17. THE IMMEDIATE ADJOINING SURFACE AT THE BOTTOM AND TOP OF CURB RAMPS IS NOT TO EXCEED ROADWAY PROFILE SLOPE WHEN LOCATED ADJACENT TO THE ROADWAY. IN AREAS WHERE THE ADJOINING SURFACE IS NOT ADJACENT TO THE ROADWAY, THE LONGITUDINAL SLOPE IS NOT TO EXCEED 5.00%. FOR ALL LOCATIONS DO NOT EXCEED 2.00% CROSSLOPE. FOR LOCATIONS THAT REQUIRE A TURNING MANEUVER, THE MAXIMUM SLOPE IS 2.00% IN ALL DIRECTIONS. THE CHANGE IN GRADE AT THE BOTTOM OF THE CURB RAMP AND ADJOINING ROAD SURFACE IS NOT TO EXCEED AN ALGEBRAIC DIFFERENCE OF 11.00%. SEE SHEET 8 FOR DETAILS.
18. THE CONSTRUCTION STANDARDS DEPICTED ARE MOST APPROPRIATE FOR NEW CONSTRUCTION. ALL CONSTRUCTION MUST MEET THE STANDARDS CONTAINED HEREIN UNLESS OTHERWISE NOTED OR DIRECTED.
19. ALL SLOPES ARE MEASURED WITH RESPECT TO A LEVEL PLANE. THEREFORE, THE LENGTH OF RAMP IS NOT SOLELY DEPENDANT ON THE HEIGHT OF CURB. (FOR EXAMPLE, A 150 (6") CURB DOES NOT NECESSARILY MEAN A RAMP LENGTH OF 1800 (6-0") FOR A 12:1 (1:12) SLOPE.
20. SIDEWALK WIDTH MAY BE REDUCED TO 1220 (4'-0"), WHEN PASSING AREAS 1525 X 1525 (5'-0" X 5'-0") ARE PROVIDED EVERY 61 METERS (200').
21. THE TRAVEL LANE IS DEFINED BY THE OUTSIDE EDGE OF THE WHITE PAVEMENT MARKING LINE. IF A WHITE PAVEMENT MARKING LINE DOES NOT EXIST, THE TRAVEL LANE IS DEFINED BY THE CONTRACT DOCUMENTS.
22. DEPRESSED CURB FOR CURB RAMPS MUST BE FLUSH TO ADJACENT ROADWAY. EDGE OF ROAD ELEVATIONS AT THE FLOW LINE SHALL BE GRADED TO ENSURE POSITIVE DRAINAGE AND PREVENT PONDING.

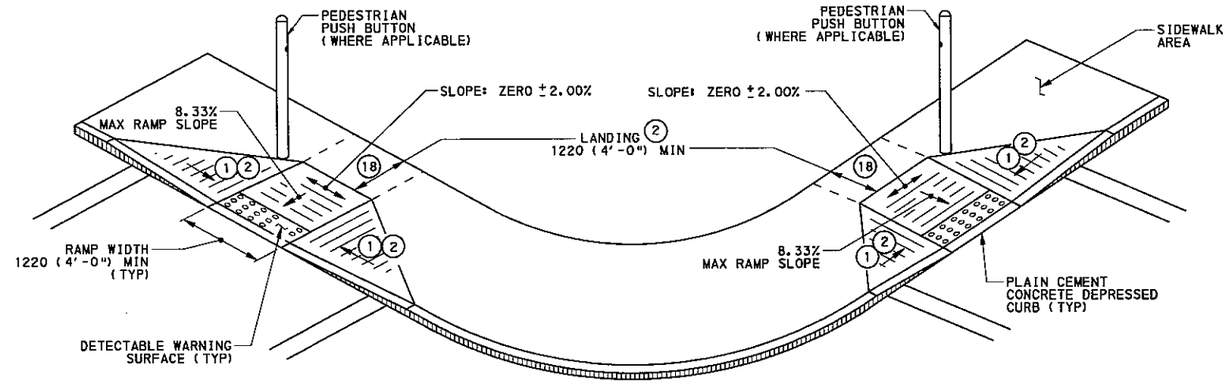
NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

CURB RAMPS AND SIDEWALKS

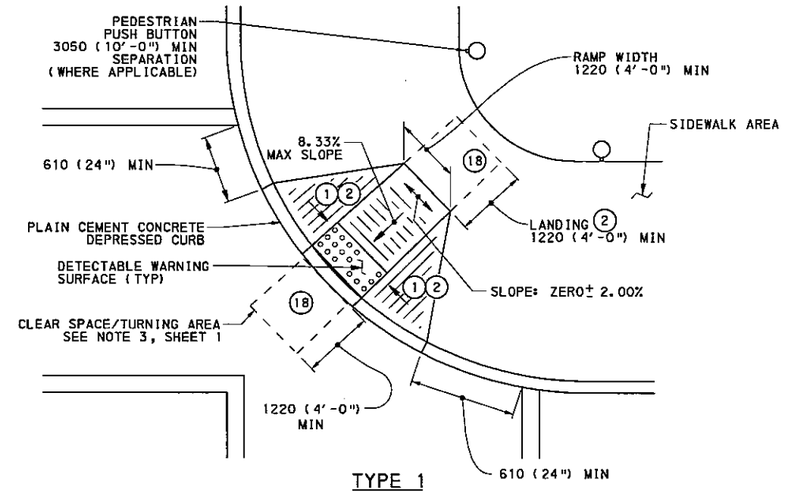
NEW CONSTRUCTION OR ALTERATION DETAILS

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 1 OF 13
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-67M

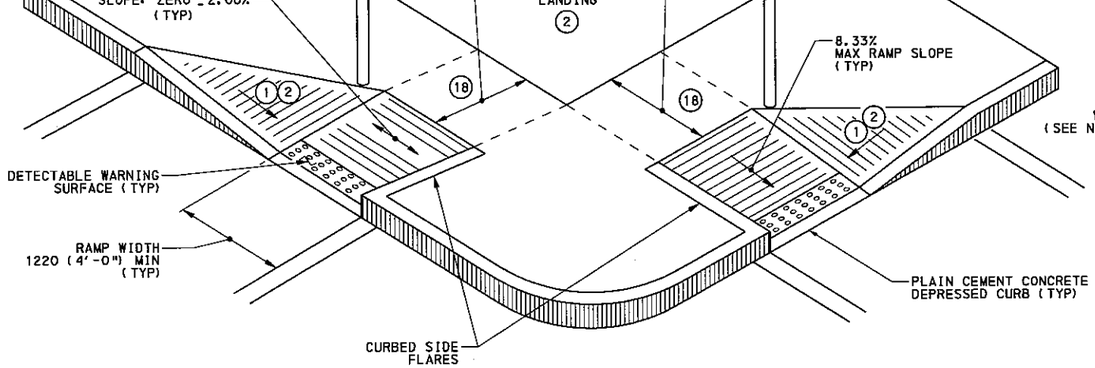


NOTE: IF SPACE IS LIMITED, IT MAY BE NECESSARY TO CURB THE SIDE FLARES OF THE TYPE 1 CURB RAMPS (SEE ALTERNATE INSTALLATION DETAIL BELOW). PEDESTRIAN TRAFFIC SHOULD NOT BE DIRECTED TO CROSS THE VERTICAL DROP.

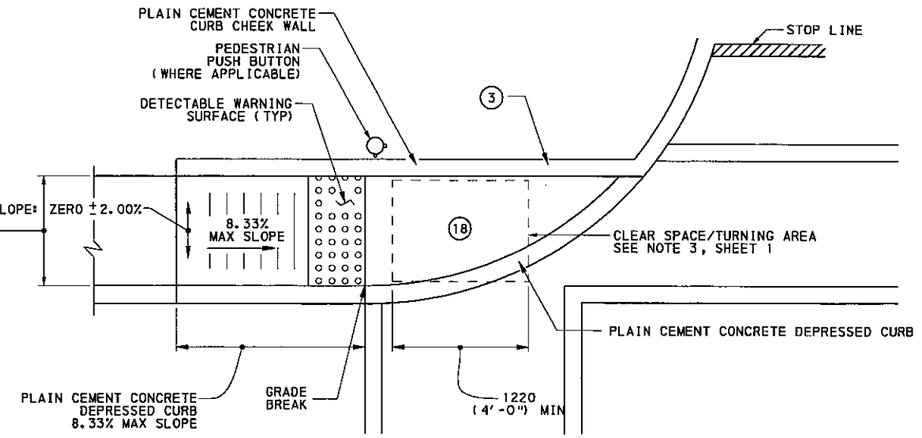
TYPE 1
DOUBLE CURB RAMPS
(PREFERRED INSTALLATION)



TYPE 1
CURB RAMP
(DIAGONAL-REQUIRES ASSISTANT DISTRICT EXECUTIVE APPROVAL)



TYPE 1
DOUBLE CURB RAMPS
(ALTERNATE INSTALLATION)



TYPE 1A
CURB RAMP
(DIAGONAL-REQUIRES ASSISTANT DISTRICT EXECUTIVE APPROVAL)

(1) SIDE FLARES 10.00% MAX SLOPE

(2) IF THE LANDING IS INDICATED TO BE LESS THAN 1220 (4'-0"), CONSTRUCT SIDE FLARES 8.33% MAX. SLOPE.

(3) OPTIONAL ROLLED CONCRETE SURFACE OR REGRADE SLOPE CAN BE USED TO MEET THE ADJACENT SURFACES IN LIEU OF A RETURN CURB CHEEK WALL.

(18) CURB RAMPS REQUIRE A 1220 (4'-0") MINIMUM LANDING WITH A MAXIMUM SLOPE OF 2.00% IN ALL DIRECTIONS WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SEE DETAILS FOR LOCATIONS.

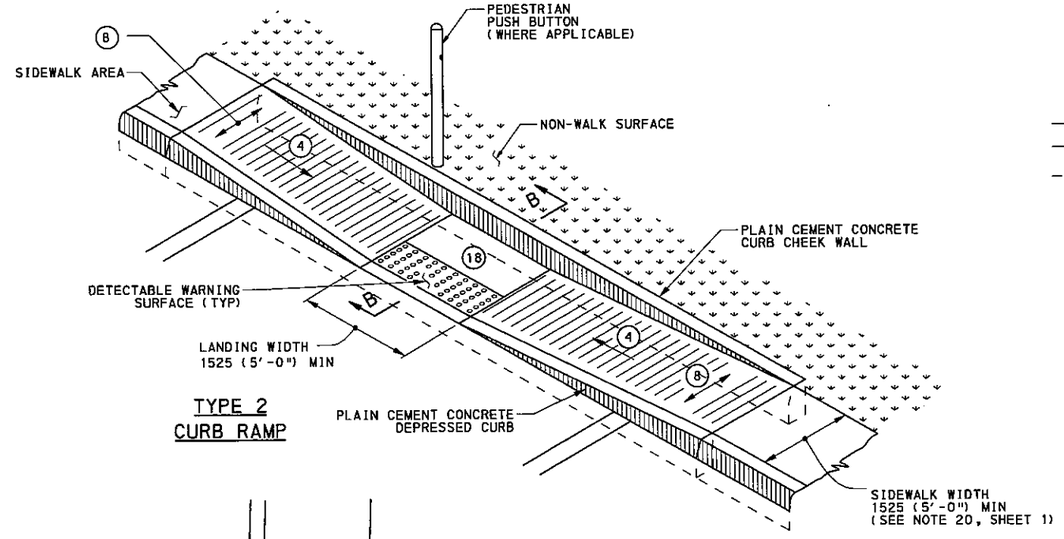
NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

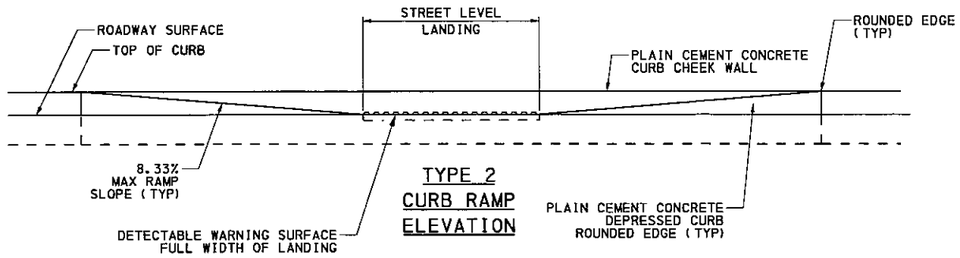
CURB RAMPS AND SIDEWALKS

NEW CONSTRUCTION OR ALTERATION DETAILS TYPE 1 CURB RAMPS

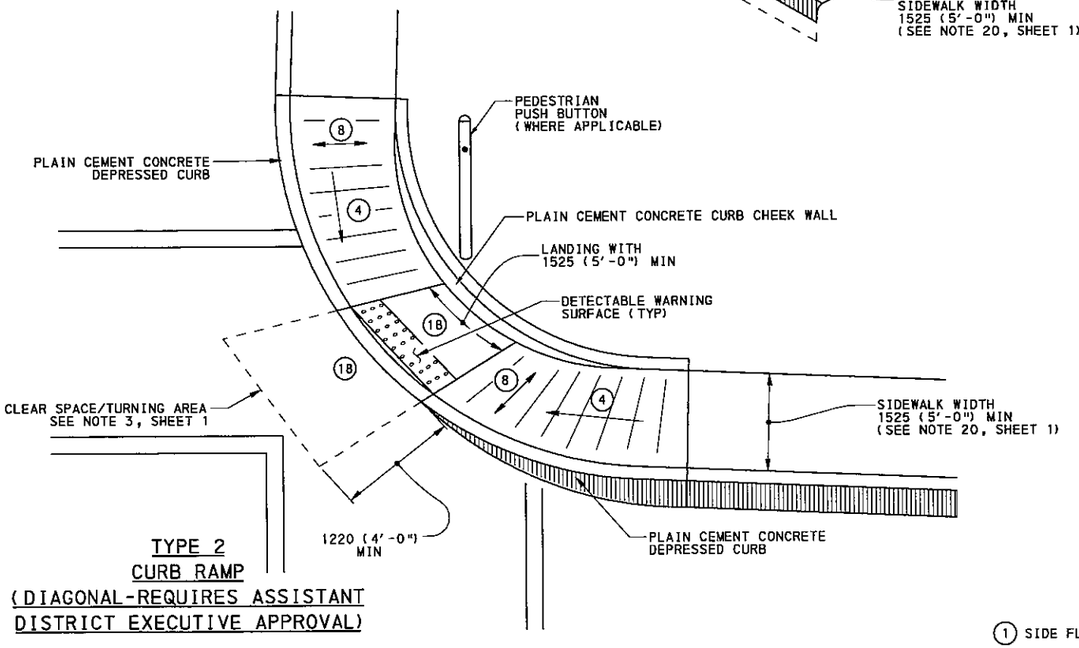
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 2 OF 13
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-67M



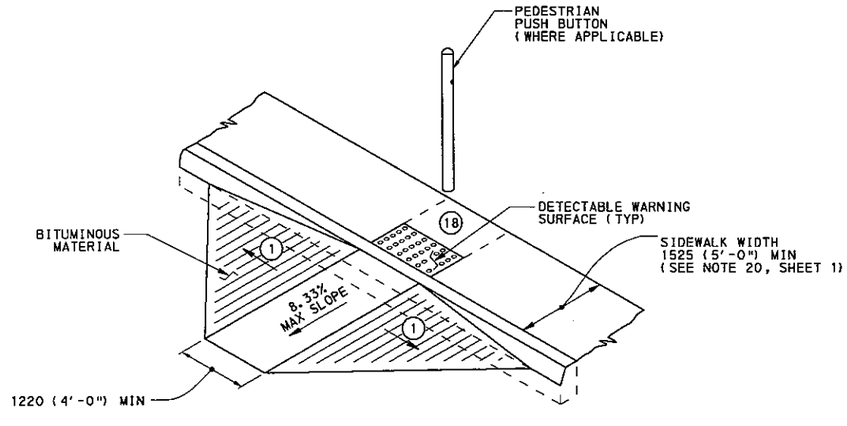
TYPE 2
CURB RAMP



TYPE 2
CURB RAMP
ELEVATION

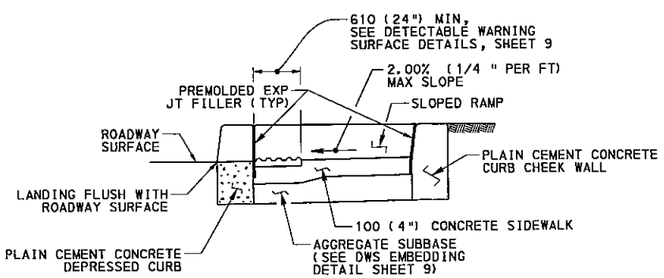


TYPE 2
CURB RAMP
(DIAGONAL-REQUIRES ASSISTANT DISTRICT EXECUTIVE APPROVAL)



NOTES: DO NOT USE TYPE 3 CURB RAMPS IN VEHICULAR TRAFFIC LANES, PARKING SPACES, OR ACCESS AISLES.

TYPE 3
CURB RAMP
(BUILT-UP, FOR ALTERATIONS ONLY)
SEE NOTE 11, SHEET 1



TYPE 2
CURB RAMP
SECTION B-B

(1) SIDE FLARES 10.00% MAX SLOPE
(4) 8.33% MAX RAMP SLOPE
(8) SLOPE: ZERO ±2.00%
(18) CURB RAMPS REQUIRE A 1220 (4'-0") MINIMUM LANDING WITH A MAXIMUM SLOPE OF 2.00% IN ALL DIRECTIONS WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SEE DETAILS FOR LOCATIONS.

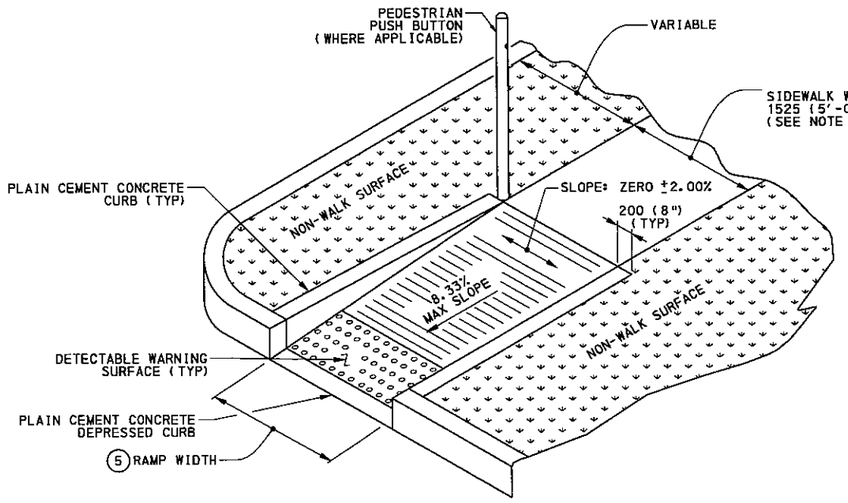
NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

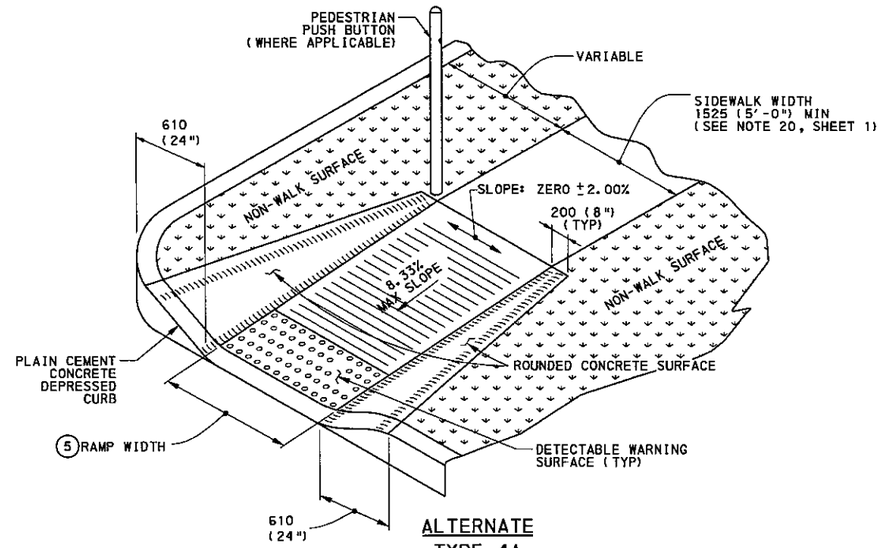
CURB RAMPS AND SIDEWALKS

NEW CONSTRUCTION OR ALTERATION DETAILS TYPE 2 AND TYPE 3 CURB RAMPS

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 3 OF 13
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-67M



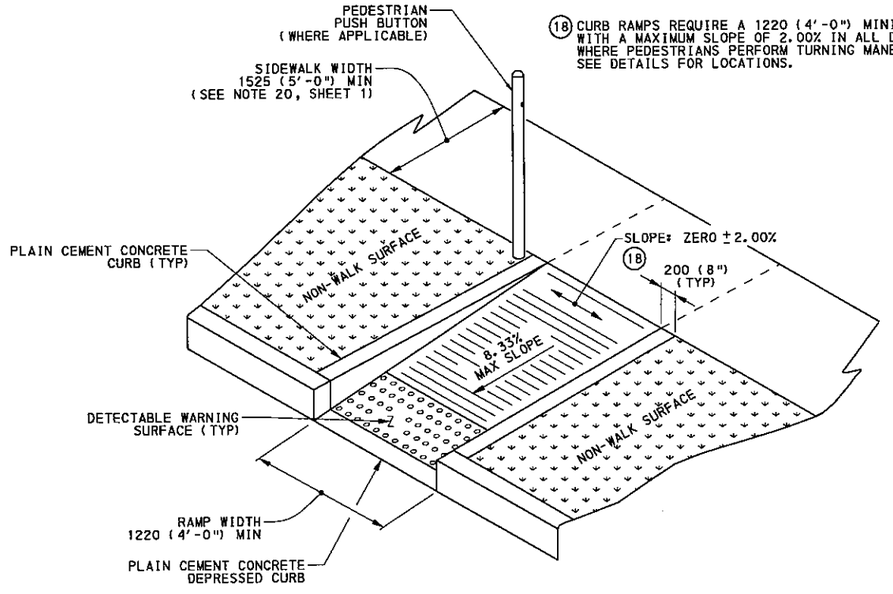
TYPE 4
CURB RAMP
(PARALLEL)



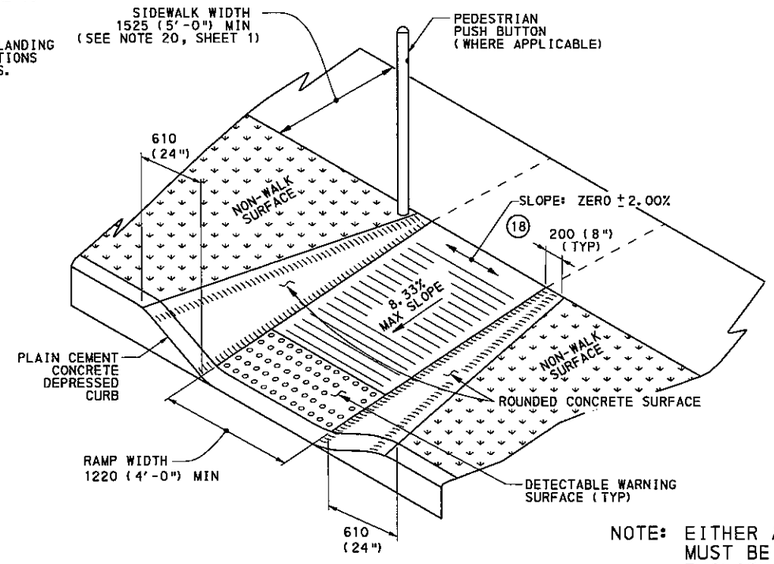
ALTERNATE
TYPE 4A
CURB RAMP
(PARALLEL)

(5) CURB RAMP WIDTH IS EQUAL TO SIDEWALK WIDTH WHEN THE SIDEWALK WIDTH IS GREATER THAN OR EQUAL TO 1220 (4'-0").

(18) CURB RAMPS REQUIRE A 1220 (4'-0") MINIMUM LANDING WITH A MAXIMUM SLOPE OF 2.00% IN ALL DIRECTIONS WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SEE DETAILS FOR LOCATIONS.



TYPE 4
CURB RAMP
(PERPENDICULAR)



ALTERNATE
TYPE 4A
CURB RAMP
(PERPENDICULAR)

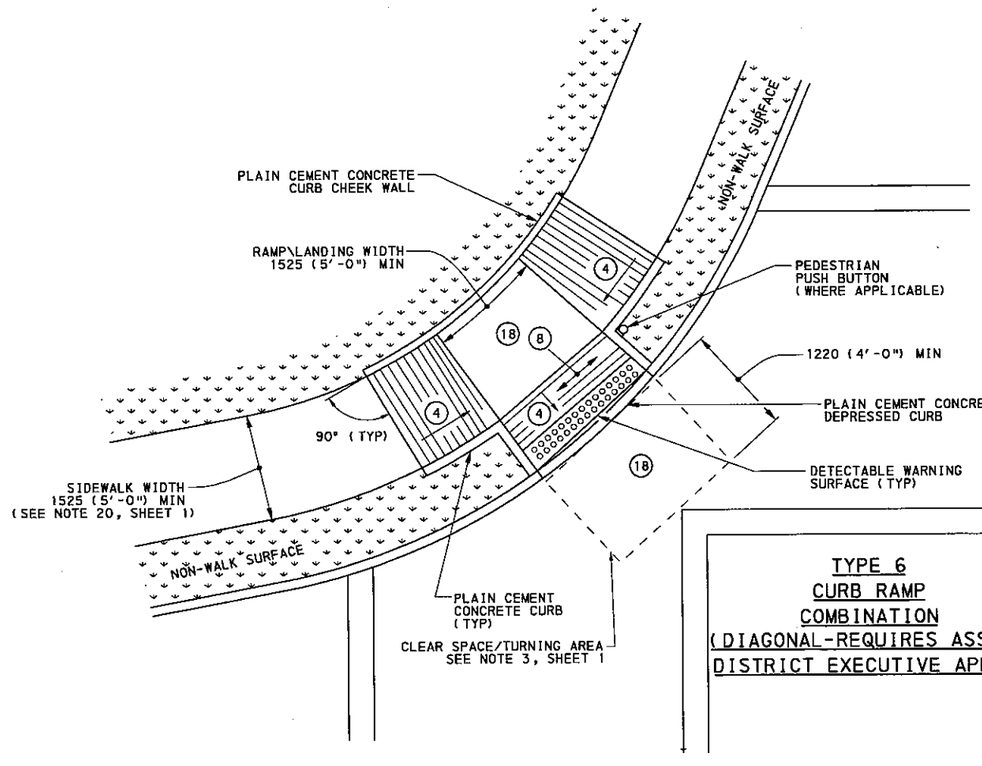
NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

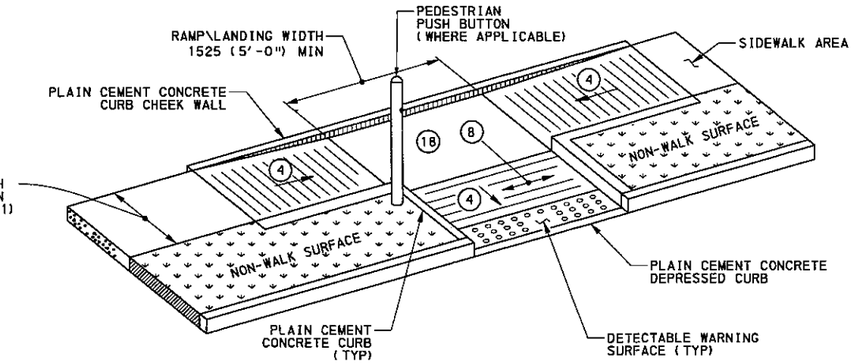
CURB RAMPS AND SIDEWALKS

NEW CONSTRUCTION OR ALTERATION DETAILS TYPE 4 CURB RAMPS

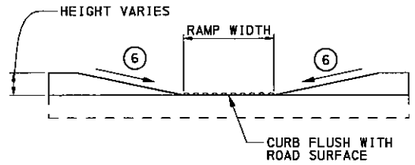
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 4 OF 13
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-67M



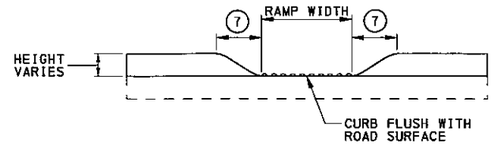
TYPE 6
CURB RAMP
COMBINATION
(DIAGONAL-REQUIRES ASSISTANT DISTRICT EXECUTIVE APPROVAL)



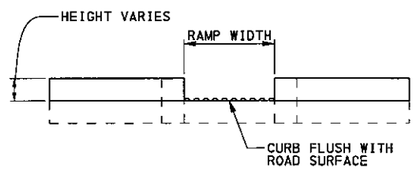
TYPE 6
CURB RAMP
COMBINATION



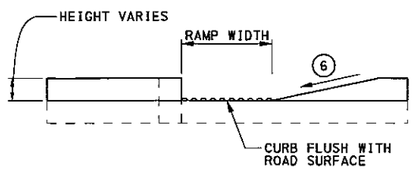
FLARED
TRANSITION



ROLLED
TRANSITION

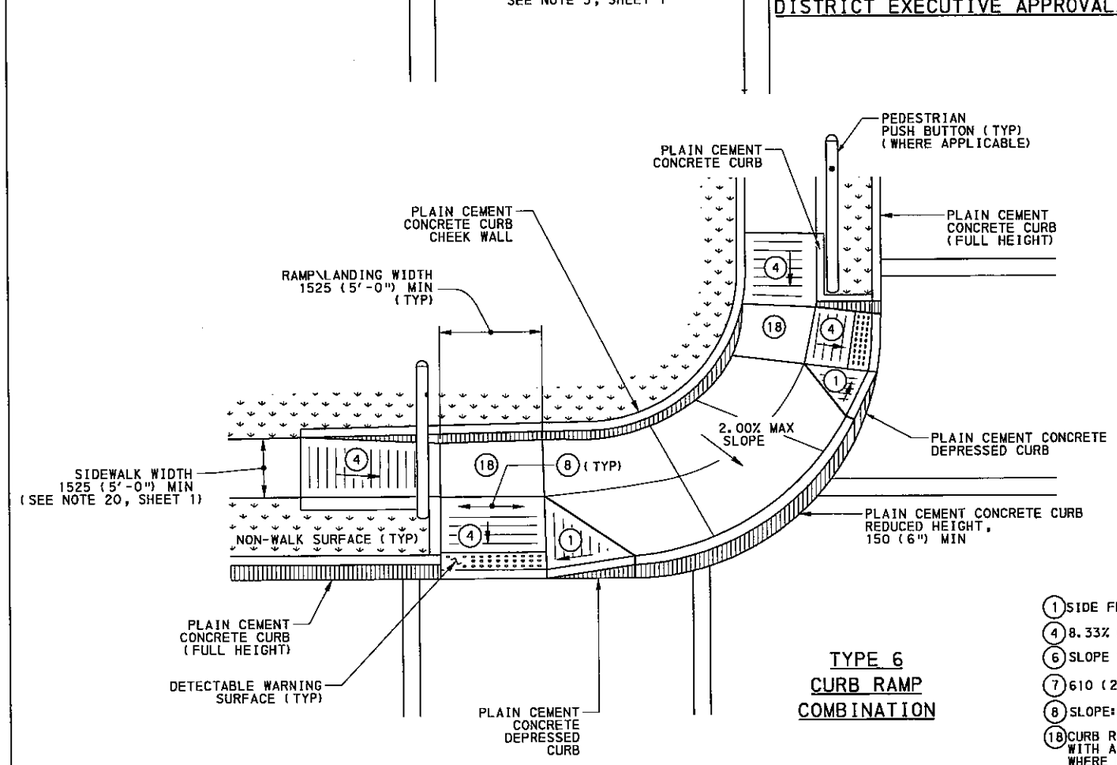


VERTICAL
TRANSITION



COMBINATION
TRANSITION

TYPICAL ELEVATIONS
FOR DEPRESSED CURBS



TYPE 6
CURB RAMP
COMBINATION

(1) SIDE FLARES 10.00% MAX SLOPE
(4) 8.33% MAX RAMP SLOPE
(6) SLOPE VARIES SEE RAMP DETAILS
(7) 610 (2'-0") ROLLED TRANSITION
(8) SLOPE: ZERO ± 2.00%
(18) CURB RAMPS REQUIRE A 1220 (4'-0") MINIMUM LANDING WITH A MAXIMUM SLOPE OF 2.00% IN ALL DIRECTIONS WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SEE DETAILS FOR LOCATIONS.

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

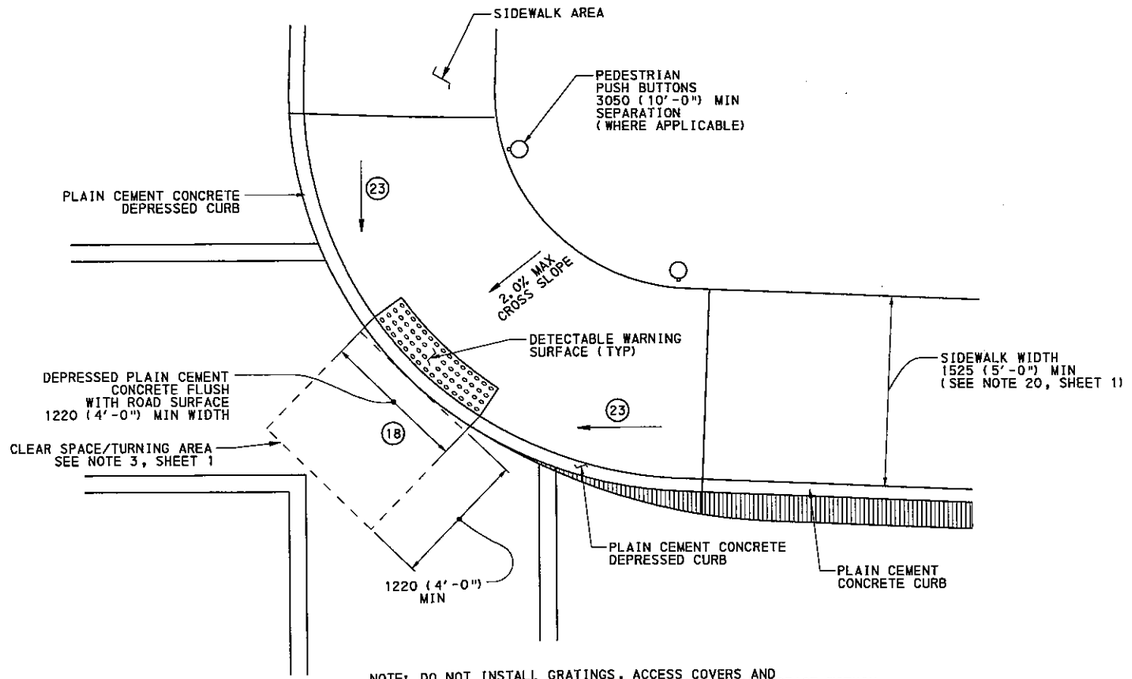
CURB RAMPS AND SIDEWALKS NEW CONSTRUCTION OR ALTERATION DETAILS TYPE 6 CURB RAMPS AND TYPICAL ELEVATIONS

RECOMMENDED AUG. 29, 2008
ACTING CHIEF, HWY. QA DIVISION

RECOMMENDED AUG. 29, 2008
DIRECTOR, BUREAU OF DESIGN

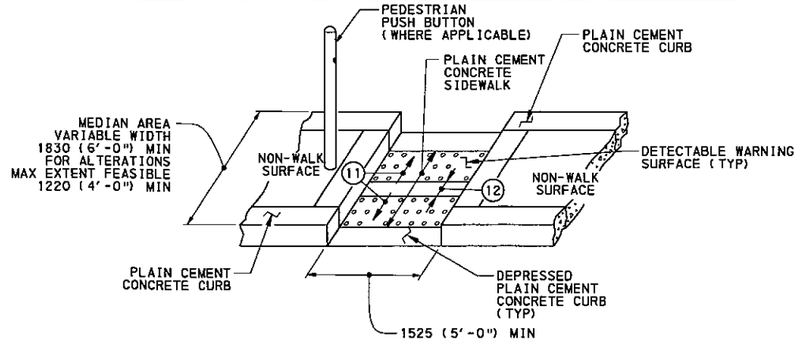
SHT 5 OF 13

RC-67M



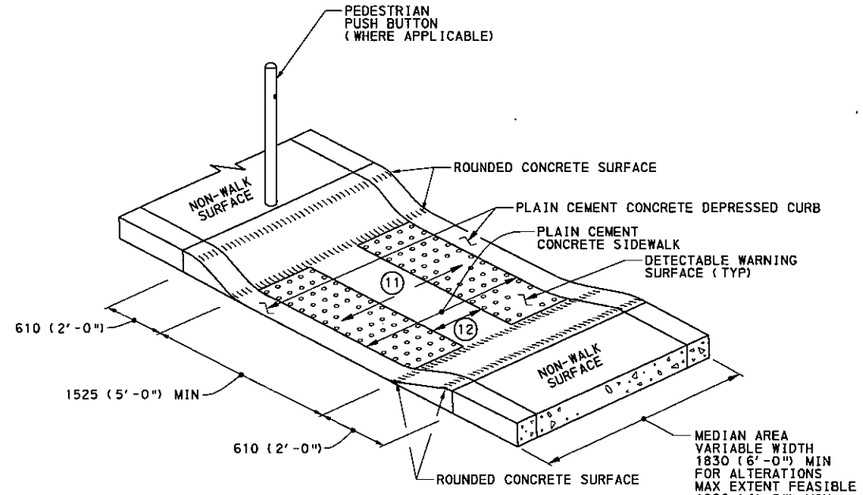
NOTE: DO NOT INSTALL GRATINGS, ACCESS COVERS AND OTHER APPURTENANCES ON THE BLENDED TRANSITION SURFACE WITHIN THE PEDESTRIAN ACCESS ROUTE. EXISTING UTILITY COVERS IN THE PATH OF TRAVEL ARE ACCEPTABLE IF THE TOP SURFACE IS FLUSH (LESS THAN 1/4" IN ELEVATION DIFFERENCE), FIRM, STABLE AND SLIP RESISTANT. INLET GRATES MUST HAVE OPENINGS NO GREATER THAN 13 (1/2") IN DIRECTION OF TRAVEL.

BLENDED TRANSITION (DIAGONAL-REQUIRES ASSISTANT DISTRICT EXECUTIVE APPROVAL)



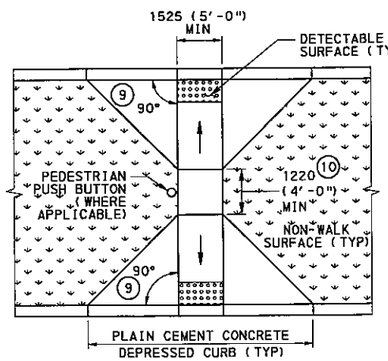
TYPE A TYPICAL MEDIAN OR ISLAND ACCESS OPENING WITH CURB SIDES

(NARROW MEDIANS)

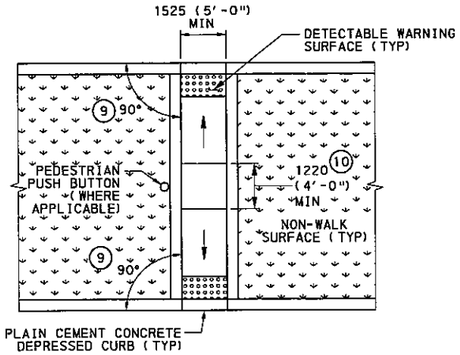


TYPE B TYPICAL MEDIAN OR ISLAND ACCESS OPENING WITH FLARED SIDES

(NARROW MEDIANS)



RAMPED MEDIAN OR ISLAND ACCESS OPENING (TYPE 1 DOUBLE CURB RAMPS)



RAMPED MEDIAN OR ISLAND ACCESS OPENING (TYPE A DOUBLE CURB RAMPS)

(9) 90° DESIRABLE

(10) LANDINGS ARE NOT REQUIRED FOR RAMP LONGITUDINAL SLOPES 5.00% OR LESS

(11) PROVIDE ADEQUATE SLOPE FOR DRAINAGE (2.00% MAX)

(12) NO SEPARATION BETWEEN DETECTABLE WARNING SURFACES FOR MEDIAN AREAS LESS THAN 1625 (5'-4").

(18) CURB RAMPS REQUIRE A 1220 (4'-0") MINIMUM LANDING WITH A MAXIMUM SLOPE OF 2.00% IN ALL DIRECTIONS WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SEE DETAILS FOR LOCATIONS.

(23) 5.00% MAX RUNNING SLOPE

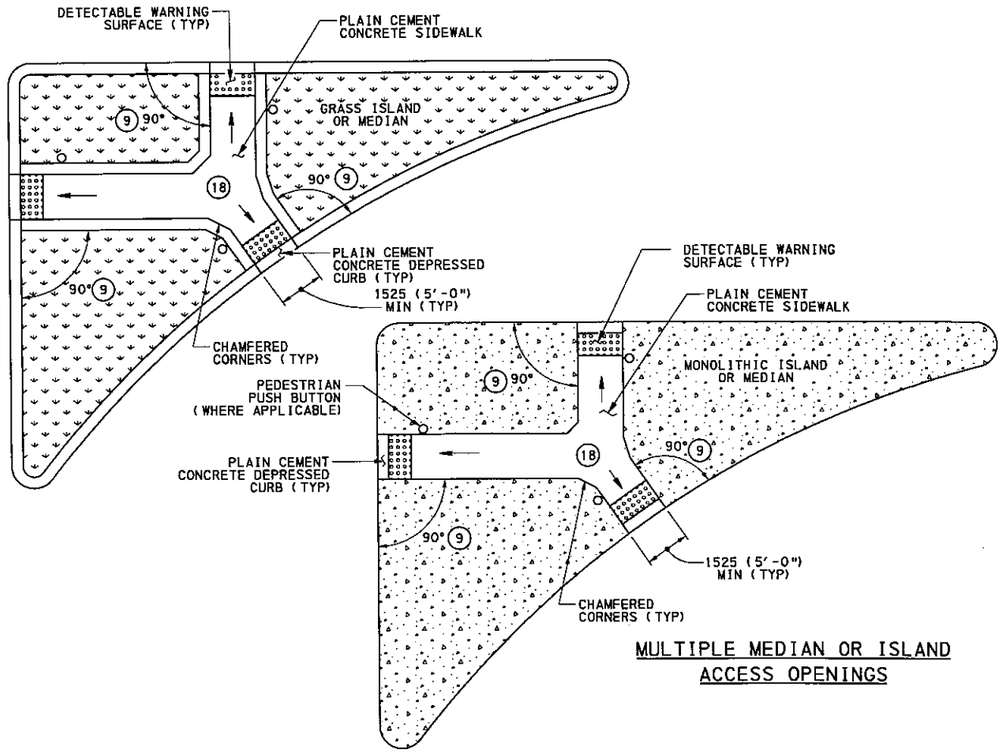
NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

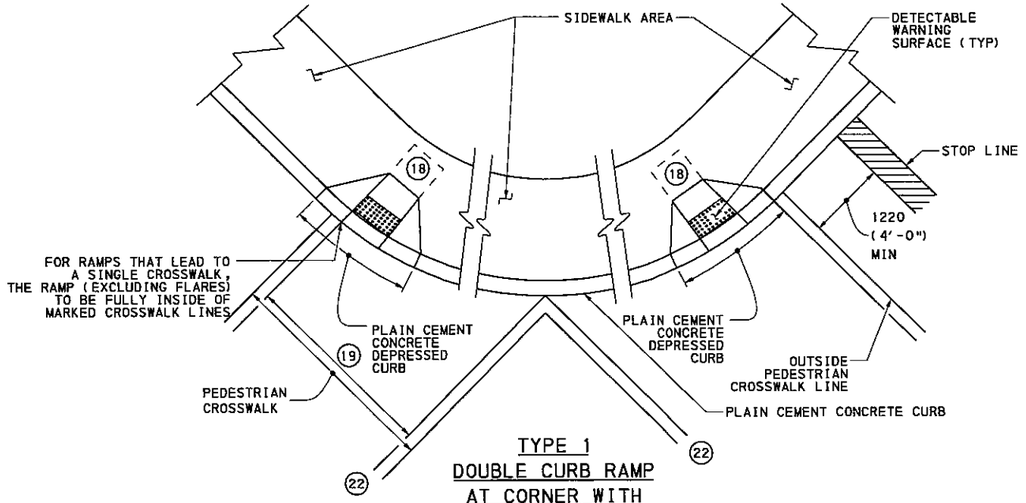
CURB RAMPS AND SIDEWALKS

NEW CONSTRUCTION OR ALTERATION DETAILS

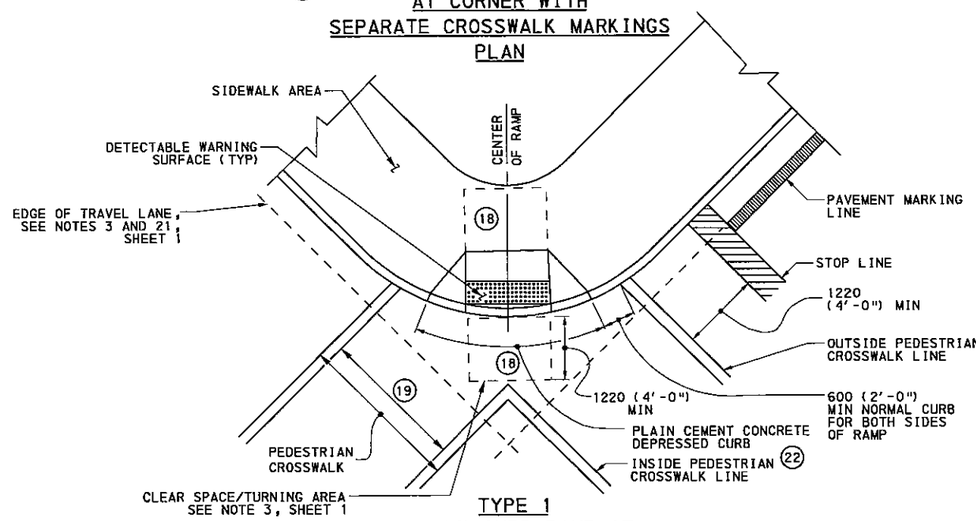
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 6 OF 13
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-67M



MULTIPLE MEDIAN OR ISLAND ACCESS OPENINGS



TYPE 1
DOUBLE CURB RAMP
AT CORNER WITH
SEPARATE CROSSWALK MARKINGS
PLAN



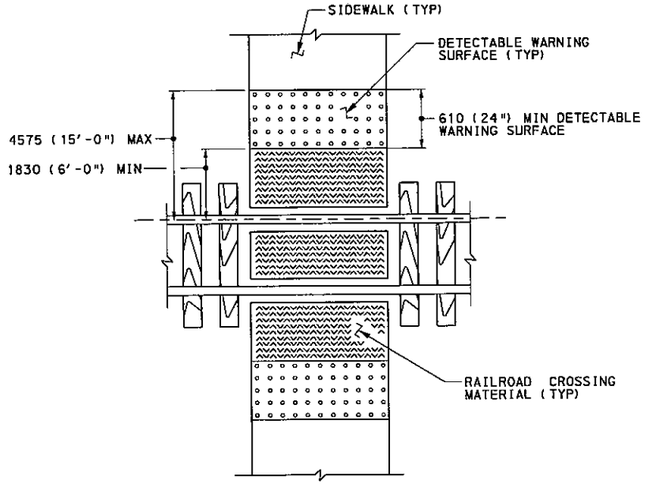
TYPE 1
SINGLE CURB RAMP AT
CORNER WITH CROSSWALK MARKINGS
PLAN
(DIAGONAL-REQUIRES ASSISTANT
DISTRICT EXECUTIVE APPROVAL)

(9) 90° DESIRABLE

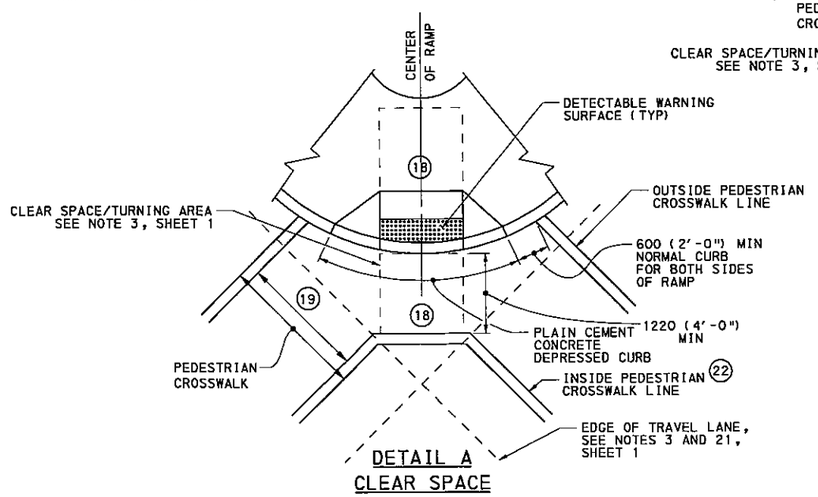
(18) CURB RAMPS REQUIRE A 1220 (4'-0") MINIMUM LANDING WITH A MAXIMUM SLOPE OF 2.00% IN ALL DIRECTIONS WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SEE DETAILS FOR LOCATIONS.

(19) 1830 (6'-0") MIN MEASURED FROM INSIDE OF PAINTED EDGE TO INSIDE OF PAINTED EDGE

(22) THE INSIDE PEDESTRIAN CROSSWALK LINES MUST BE OUTSIDE OF THE PROJECTED CURB LINES.



TYPICAL DETECTABLE WARNING
SURFACE AT RAILROAD CROSSING



DETAIL A
CLEAR SPACE
AT CROSSWALK MARKINGS
PLAN
(DIAGONAL-REQUIRES ASSISTANT
DISTRICT EXECUTIVE APPROVAL)

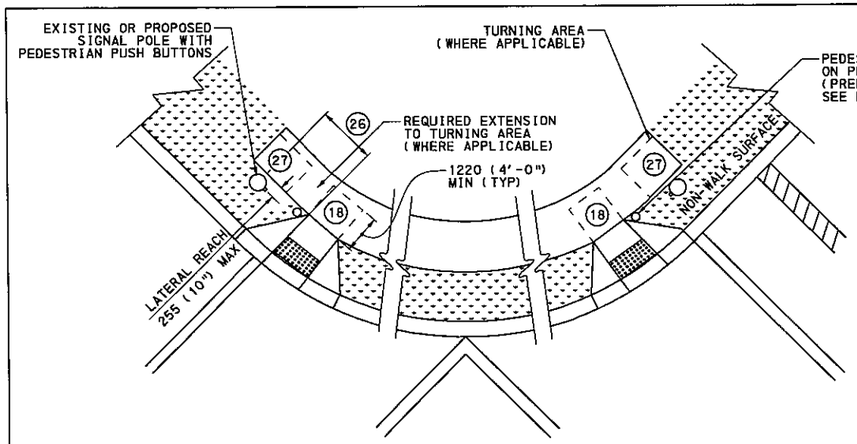
NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

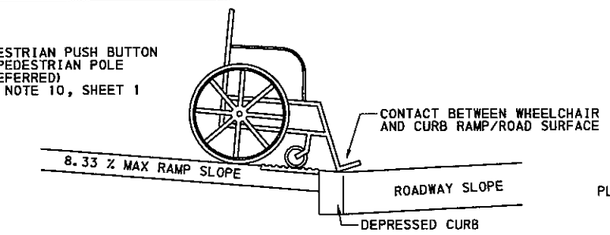
CURB RAMPS AND SIDEWALKS

NEW CONSTRUCTION OR ALTERATION DETAILS

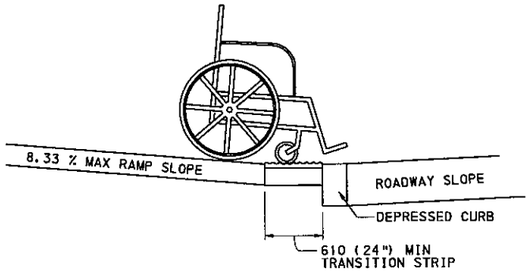
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 7 OF 13
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-67M



PROVIDING ACCESS TO EXISTING
PEDESTRIAN PUSH BUTTONS
USING SEPARATE CURB RAMPS
PLAN



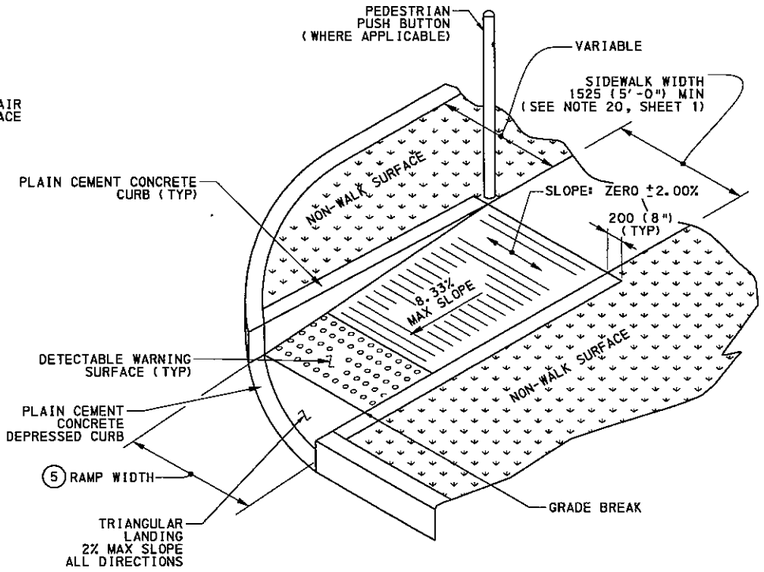
ALGEBRAIC DIFFERENCES BETWEEN ROADWAY SLOPE AND CURB RAMP SLOPE GREATER THAN 11% NOT PERMITTED.



PROVIDE A 610 (24") MIN TRANSITION STRIP IF ALGEBRAIC DIFFERENCES BETWEEN ROADWAY SLOPE AND CURB RAMP SLOPE ARE GREATER THAN 11.00%.

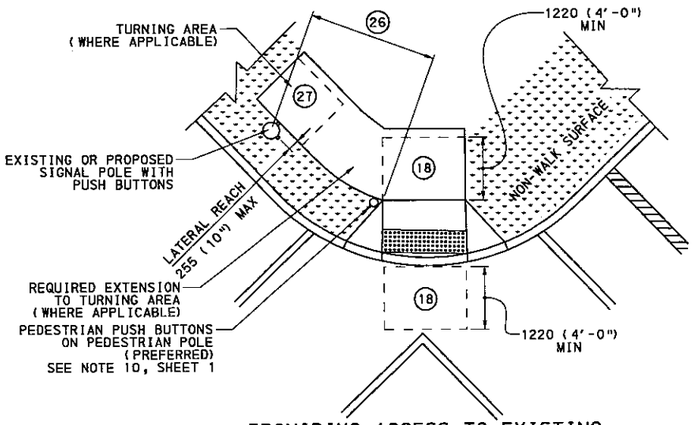
TRANSITION STRIP SLOPE NOT TO EXCEED 2.00%

CHANGE OF GRADE
LIMITATIONS

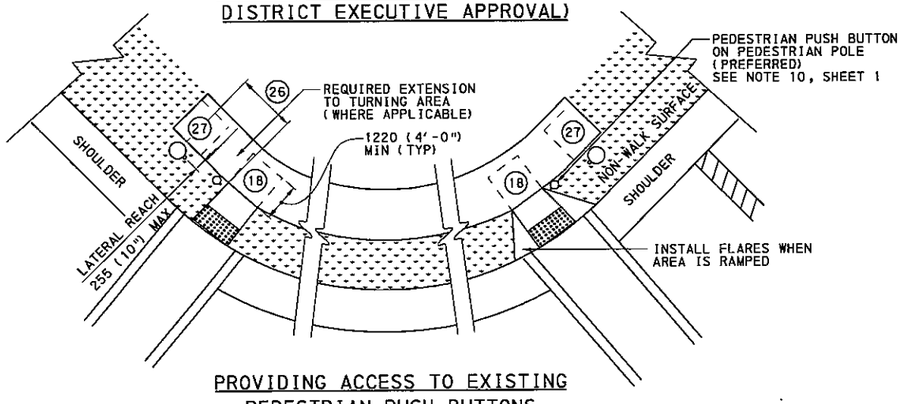


TRIANGULAR LANDING
FOR DIRECTIONAL RAMPS
ON CURB RETURNS

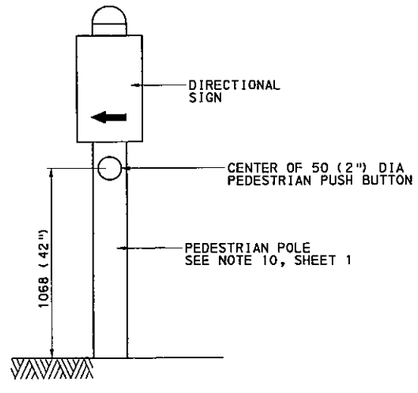
DIRECTIONAL RAMPS ARE PREFERRED FOR THE VISUALLY IMPAIRED. WHEN DIRECTIONAL RAMPS ARE INSTALLED ON A CURB RETURN, A TRIANGULAR LEVEL LANDING MUST BE PROVIDED TO TRANSITION THE GRADE BREAK.



PROVIDING ACCESS TO EXISTING
PEDESTRIAN PUSH BUTTONS
USING A DIAGONAL CURB RAMP
PLAN
(DIAGONAL-REQUIRES ASSISTANT
DISTRICT EXECUTIVE APPROVAL)



PROVIDING ACCESS TO EXISTING
PEDESTRIAN PUSH BUTTONS
NON-CURBED ROADWAY
PLAN



PEDESTRIAN PUSH BUTTON
DETAIL

(5) CURB RAMP WIDTH IS EQUAL TO SIDEWALK WIDTH WHEN THE SIDEWALK WIDTH IS GREATER THAN OR EQUAL TO 1220 (4'-0").

(18) CURB RAMPS REQUIRE A 1220 (4'-0") MINIMUM LANDING WITH A MAXIMUM SLOPE OF 2.00% IN ALL DIRECTIONS WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SEE DETAILS FOR LOCATIONS.

(26) 3050 (10'-0") MAX. MEASURED FROM WHERE PEDESTRIAN WOULD WAIT FOR SIGNAL CHANGE TO THE LOCATION OF THE PUSH BUTTON. IF THE DISTANCE IS GREATER THAN 3050 (10'-0"), THE SIGNAL POLE MUST BE RELOCATED OR A PEDESTRIAN POLE MUST BE INSTALLED.

(27) 1220 X 1220 (4'-0" X 4'-0") MINIMUM LANDING WITH 2.00% MAX SLOPE IN ALL DIRECTIONS WHERE PEDESTRIANS PERFORM 180 DEGREE TURNING MANEUVERS.

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

CURB RAMPS AND SIDEWALKS

NEW CONSTRUCTION OR
ALTERATION DETAILS

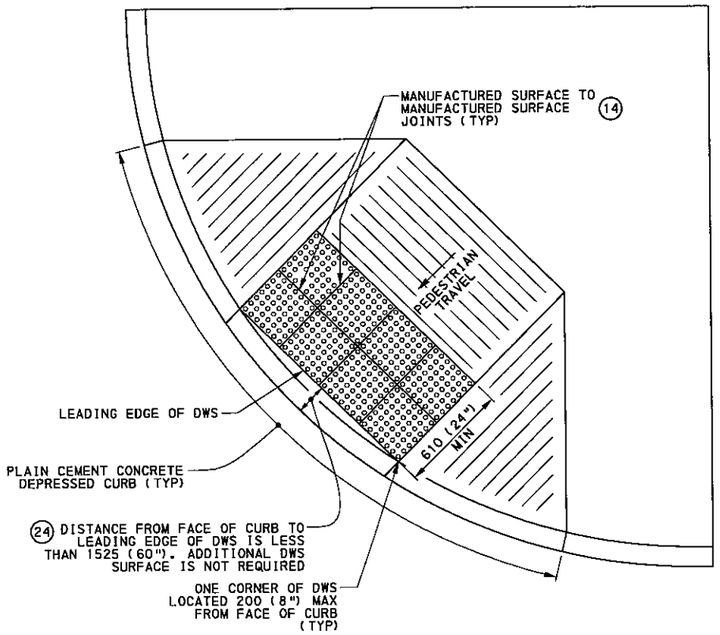
RECOMMENDED AUG. 29, 2008
ACTING CHIEF, HWY. QA DIVISION

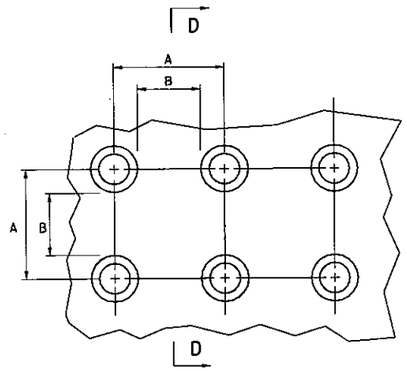
RECOMMENDED AUG. 29, 2008
DIRECTOR, BUREAU OF DESIGN

SHT 8 OF 13

RC-67M

SEE NOTE 3 ON SHEET 1 CONCERNING DIAGONAL RAMPS





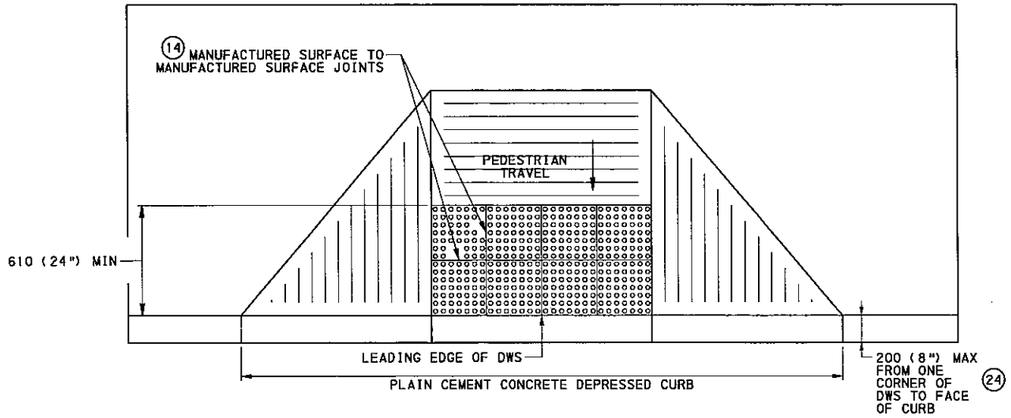
TRUNCATED DOME DIMENSIONS		
DIM	MIN mm (Inch)	MAX mm (Inch)
A	41 (1.6")	61 (2.4")
B	17 (0.65")	38 (1.5")
C	(13)	(13)
D	23 (0.9")	36 (1.4")

DETECTABLE WARNING SURFACE (DWS)
TRUNCATED DOME DETAILS

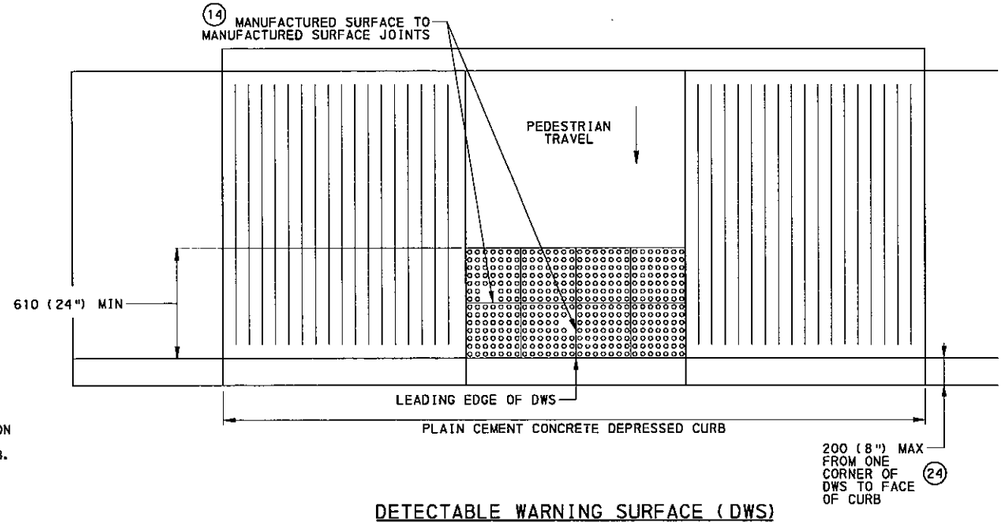
(13) THE C DIMENSION IS 50% TO 65% OF THE D DIMENSION.

(14) CONSTRUCTION JOINTS ARE SHOWN TO DEPICT A 90 DEGREE GRID. ACTUAL SIZE AND SHAPE MAY VARY.

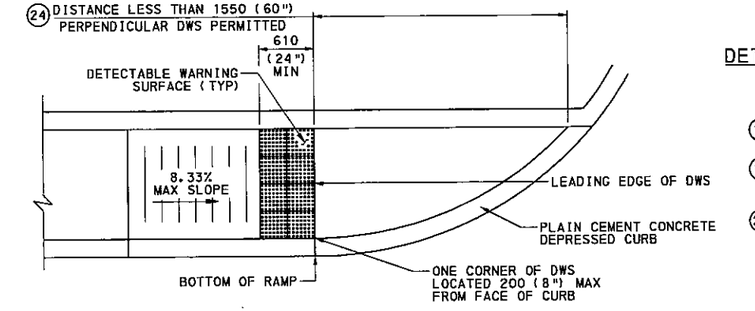
(24) ONE CORNER OF THE DWS MUST BE WITHIN 200 (8") OF THE FACE OF CURB. NO OTHER POINT ON THE LEADING EDGE OF THE DWS MAY BE MORE THAN 1550 (60") AWAY FROM THE FACE OF CURB.

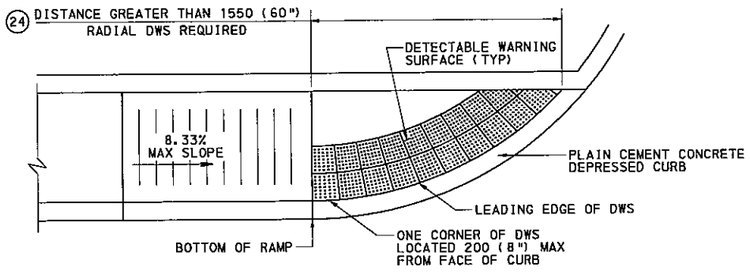


DETECTABLE WARNING SURFACE (DWS)
ON TYPE 1 CURB RAMP

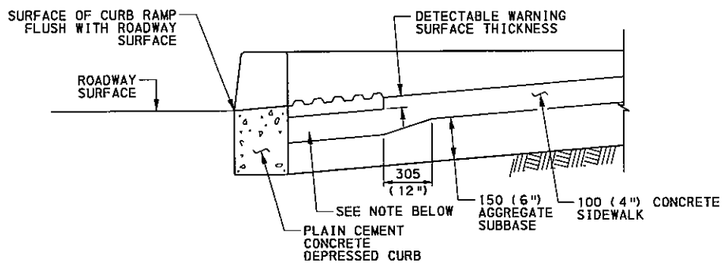


DETECTABLE WARNING SURFACE (DWS)
ON TYPE 2 CURB RAMP





DETECTABLE WARNING SURFACE (DWS)
ON CURVED SURFACES



NOTE: CONSTRUCT NOTCH AS SHOWN TO PROVIDE FULL THICKNESS SIDEWALK UNDER DETECTABLE WARNING SURFACE.

DETECTABLE WARNING SURFACE
EMBEDDING DETAIL

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

CURB RAMPS AND SIDEWALKS

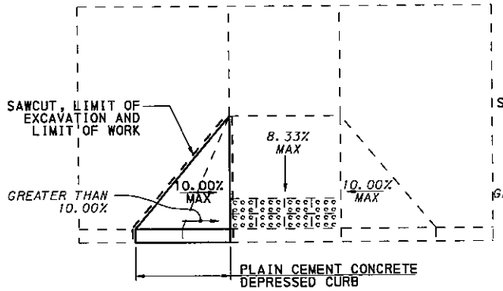
NEW CONSTRUCTION OR ALTERATION DETAILS

RECOMMENDED AUG. 29, 2008
ACTING CHIEF, HWY. QA DIVISION

RECOMMENDED AUG. 29, 2008
DIRECTOR, BUREAU OF DESIGN

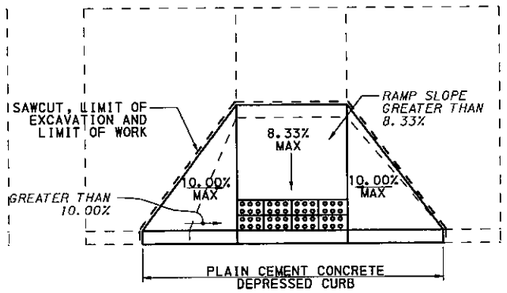
SHT 9 OF 13

RC-67M



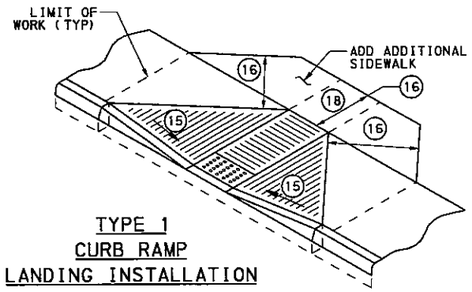
DETAIL ILLUSTRATES FLARE REMOVAL AND REPLACEMENT.

SIDE FLARE
RECONSTRUCTION

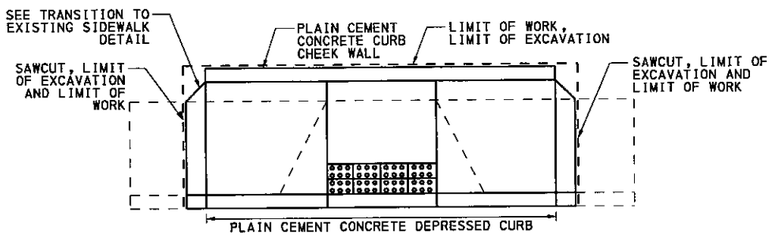


DETAIL ILLUSTRATES CURB RAMP (INCLUDING FLARES) REPLACEMENT.

TOTAL RAMP
RECONSTRUCTION

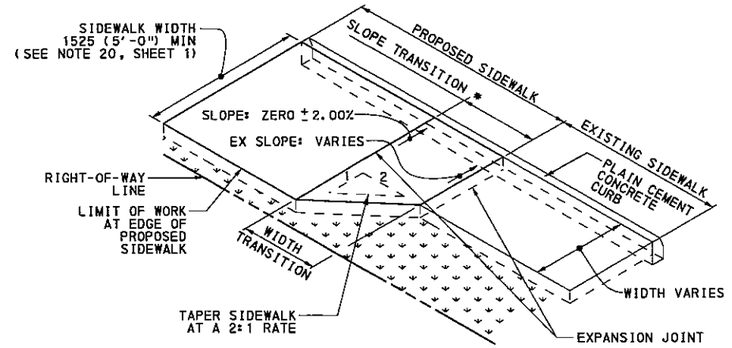


TYPE 1
CURB RAMP
LANDING INSTALLATION



DETAIL ILLUSTRATES A TYPE 1 EXISTING RAMP REPLACED WITH A TYPE 2 RAMP.
USE THIS DETAIL AS AN EXAMPLE TO REPLACE ANY RAMP WITH
A DIFFERENT CURB RAMP TYPE.

TOTAL RAMP
RECONSTRUCTION
(RAMP TYPE CHANGE)



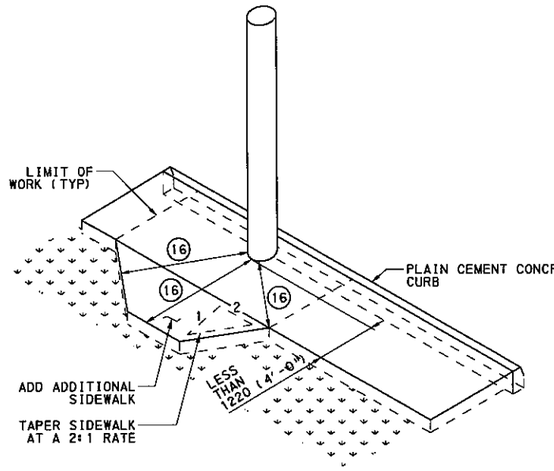
TRANSITION TO EXISTING
SIDEWALK DETAIL

* MINIMUM SLOPE TRANSITION LENGTH BASED ON THE DIFFERENCE OF PROPOSED SIDEWALK CROSS SLOPE AND EXISTING SIDEWALK CROSS SLOPE AT THE LOCATION OF TIE IN. THIS MINIMUM LENGTH TO BE DETERMINED BY THE FOLLOWING FORMULA:
DELTA % SLOPE X 150 (0.5').

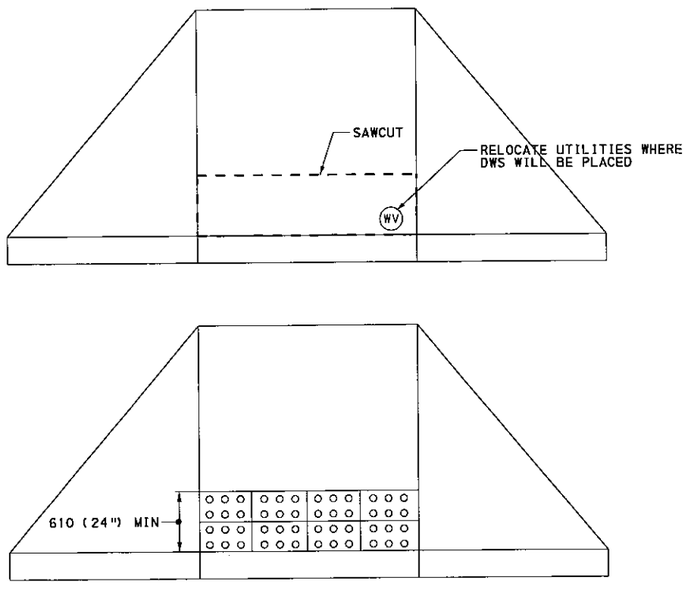
THE MINIMUM WIDTH TRANSITION SHALL BE CALCULATED USING THE FOLLOWING FORMULA:
CHANGE IN WIDTH X (2).

DEPENDING ON WHICH IS LONGEST, EITHER THE SLOPE TRANSITION OR WIDTH TRANSITION WILL CONTROL THE LENGTH OF SIDEWALK TRANSITION.

TRANSITION AREAS ARE TO SERVE AS TEMPORARY CONNECTIONS OF THE PEDESTRIAN ACCESS ROUTE. FUTURE IMPROVEMENTS TO THE REMAINING PORTION OF EXISTING SIDEWALK SHALL INCLUDE REMOVING THE TRANSITION AREA AND CONSTRUCTING A FULLY COMPLIANT SIDEWALK.



SIDEWALK ADDITION DUE TO
OBSTRUCTIONS



DETECTABLE WARNING SURFACE (DWS)
INSTALLATION DETAIL

DETECTABLE WARNING SURFACE (DWS)
INSTALLATION INSTRUCTIONS

1. SAW CUT EXISTING CURB RAMP SURFACE WHERE THE DWS WILL BE PLACED.
2. REMOVE EXISTING CONCRETE FROM THIS AREA.
3. REPLACE AND COMPACT ANY DISTURBED AGGREGATE SUBBASE.
4. PLACE NEW CEMENT CONCRETE AND LEVEL TO A 100 (4 INCH) DEPTH SO THAT THE TOP OF THE CONCRETE IS LOWER THAN THE ADJOINING SIDEWALK, EQUIVALENT TO THE EMBEDDING DEPTH OF THE DWS MATERIAL.
5. LAY-OUT AND PROPERLY FIT EACH UNIT PRIOR TO SETTING IN WET CONCRETE.
6. CUT UNITS AS NECESSARY. TOTALLY REMOVE ALL PARTIAL DOMES.
7. PLACE UNITS ACROSS THE ENTIRE WIDTH OF THE CURB RAMP SURFACE AND/OR WHERE THE CURB IS FLUSH.
8. ALLOW FOR SMALL EXPANSION GAP BETWEEN EACH UNIT NOT TO EXCEED 3 (1/8").
9. PRESS UNITS INTO FULL CONTACT WITH THE FRESH CONCRETE.
10. ADJUST HEIGHT OF EACH UNIT EDGE TO BE LEVEL WITH ADJACENT RAMP SURFACES.
11. ONLY TRUNCATED DOMES SHOULD BE ABOVE THE ADJACENT FINISHED CONCRETE.
12. FILL ANY SAW CUT GAPS WITH APPROVED JOINT SEALANT MATERIAL.
13. DO NOT ALLOW FOOT TRAFFIC ON DWS FOR 72 HOURS OR UNTIL CONCRETE HAS CURED.

(15) SIDE FLARES 10.00% MAX FOR RAMPS WITH LANDINGS 1220 (4'-0") OR GREATER.
SIDE FLARES 8.33% MAX FOR RAMPS WITH LANDINGS LESS THAN 1220 (4'-0").

(16) 1220 (4'-0") MIN ACCESSIBLE PATH WIDTH

(18) CURB RAMPS REQUIRE A 1220 (4'-0") MINIMUM LANDING WITH A MAXIMUM SLOPE OF 2.00% IN ALL DIRECTIONS WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SEE DETAILS FOR LOCATIONS.

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

CURB RAMPS AND SIDEWALKS

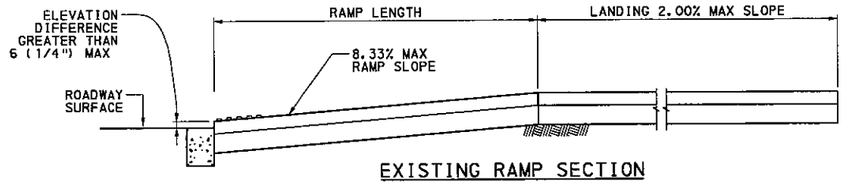
ALTERATION DETAILS

RECOMMENDED AUG. 29, 2008
ACTING CHIEF, HWY. QA DIVISION

RECOMMENDED AUG. 29, 2008
DIRECTOR, BUREAU OF DESIGN

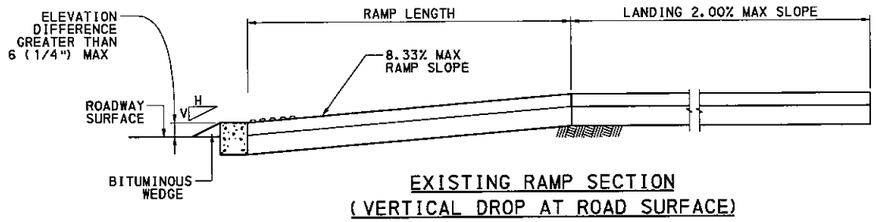
SHT 10 OF 13

RC-67M



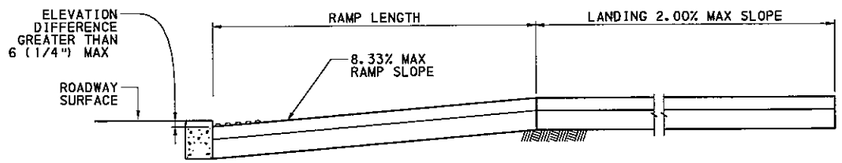
EXISTING RAMP SECTION
(VERTICAL DROP AT RAMP)

RECOMMENDED CORRECTION:
RECONSTRUCT THE ENTIRE RAMP, WITH LANDINGS AND FLARES WHERE APPLICABLE.
(SEE RAMP RECONSTRUCTION DETAIL ON SHEET 10)



EXISTING RAMP SECTION
(VERTICAL DROP AT ROAD SURFACE)

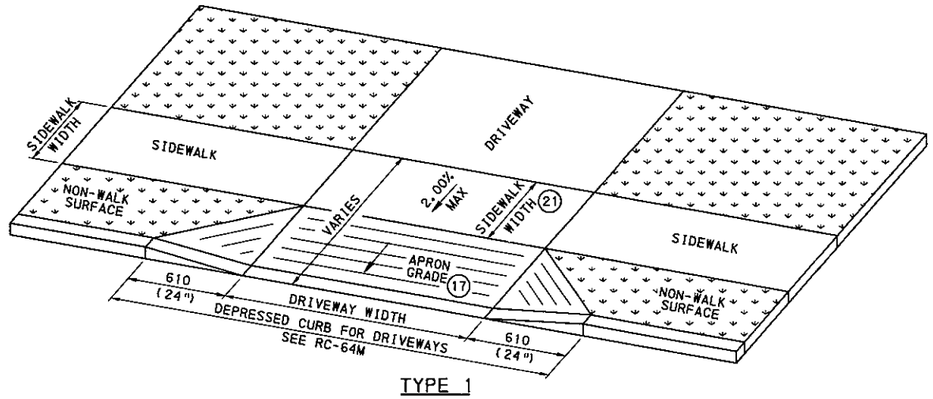
RECOMMENDED CORRECTION:
ELEVATION DIFFERENCE GREATER THAN 6 (1/4") AND LESS THAN OR EQUAL TO 12 (1/2"):
PLACE BITUMINOUS MATERIAL AT FACE OF CURB TO BEVEL TRANSITION
AT A 2:1 (HORZ:VERT) RATE AS SHOWN.
ELEVATION DIFFERENCE GREATER THAN 12 (1/2"), USE 8.33% MAX:
PLACE BITUMINOUS MATERIAL AT FACE OF CURB TO BEVEL TRANSITION
AT A SLOPE EQUAL TO THE RAMP SLOPE OR LANDING SLOPE.



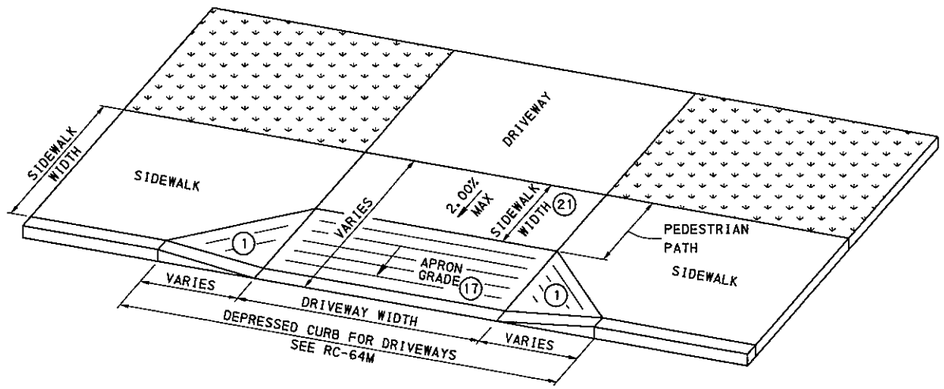
EXISTING RAMP SECTION
(RAMP SETTLEMENT)

RECOMMENDED CORRECTION:
RECONSTRUCT THE ENTIRE RAMP, WITH LANDINGS AND FLARES WHERE APPLICABLE.
(SEE RAMP RECONSTRUCTION DETAIL ON SHEET 10)

ALTERATION DETAILS



TYPE 1
DRIVEWAY APRON



TYPE 1A
DRIVEWAY APRON

(1) SIDE FLARES 10.00% MAX SLOPE

(17) 8% MAX CHANGE IN GRADE BETWEEN ROAD SURFACE AND DRIVEWAY

(21) MINIMUM SIDEWALK WIDTH 1525 (5'-0") (SEE NOTE 20, SHEET 1)

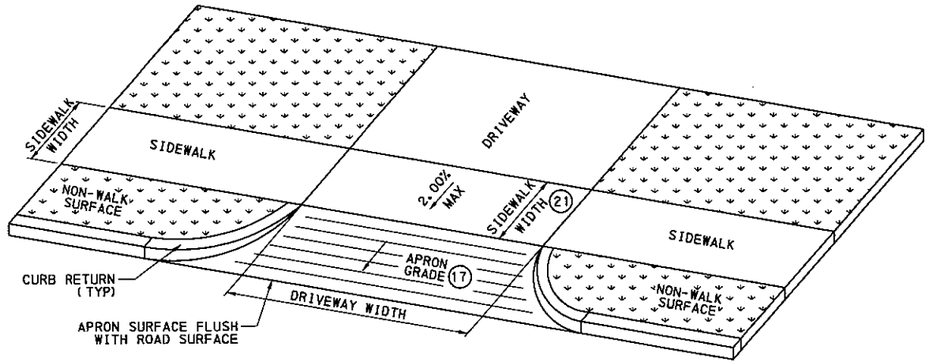
NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

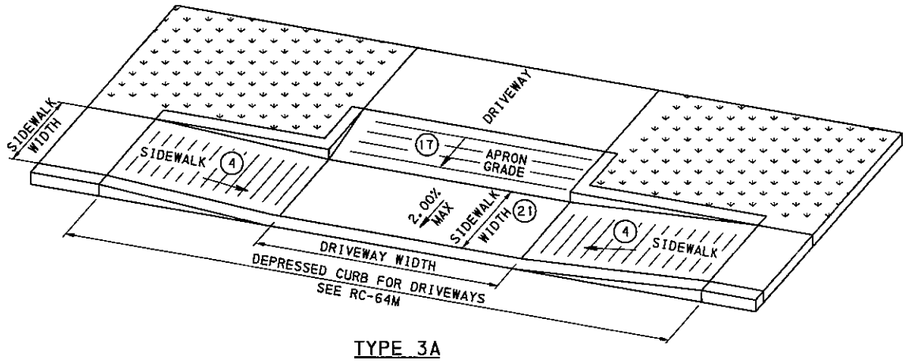
CURB RAMPS AND SIDEWALKS

ALTERATION DETAILS
AND DRIVEWAY APRONS

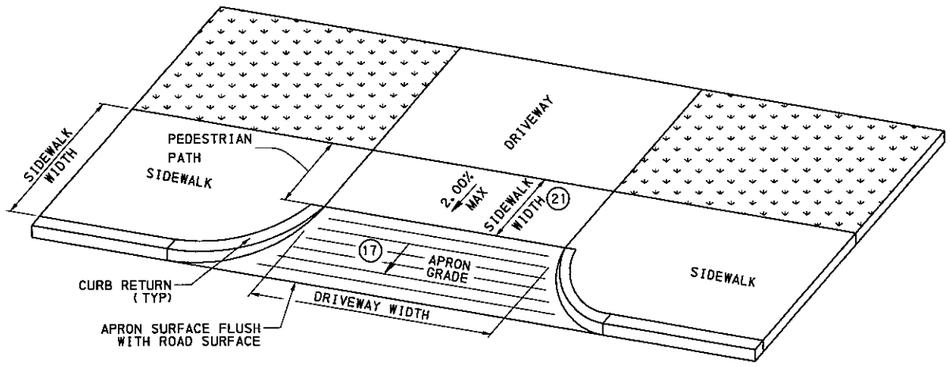
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 11 OF 13
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-67M



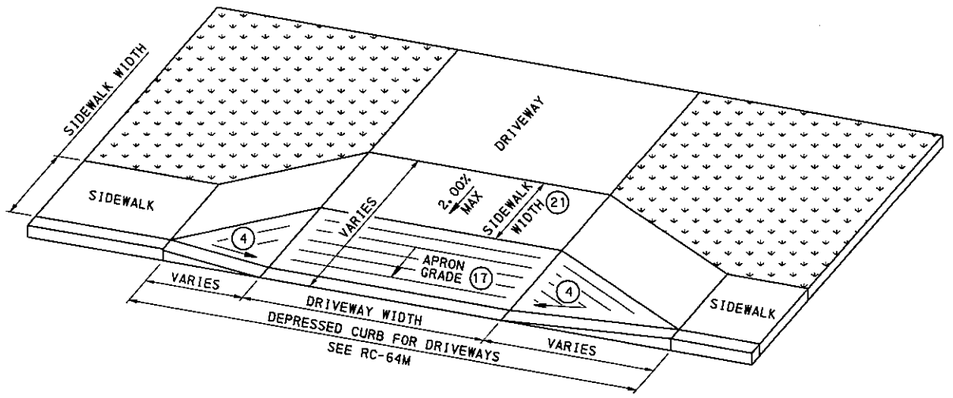
TYPE 2
DRIVEWAY APRON



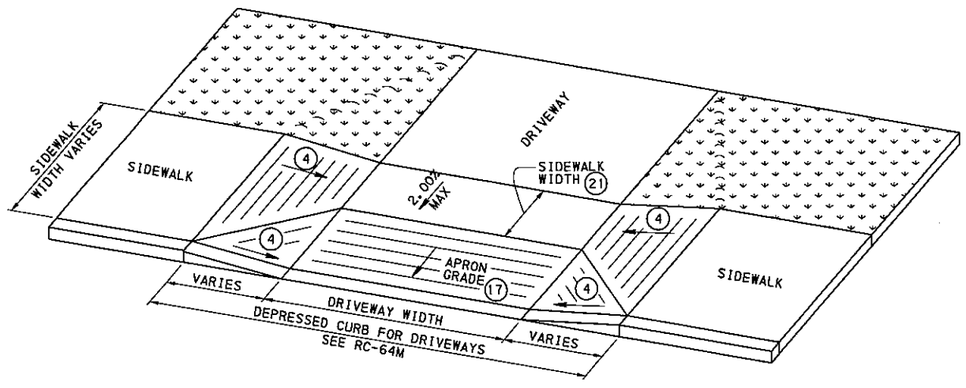
TYPE 3A
DRIVEWAY APRON



TYPE 2A
DRIVEWAY APRON



TYPE 4
DRIVEWAY APRON



TYPE 3
DRIVEWAY APRON

(4) 8.33% MAX SLOPE

(17) 8% MAX CHANGE IN GRADE BETWEEN ROAD SURFACE AND DRIVEWAY

(21) MINIMUM SIDEWALK WIDTH 1525 (5'-0") (SEE NOTE 20, SHEET 1)

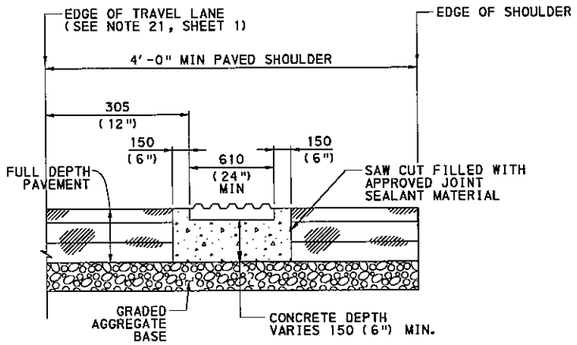
NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

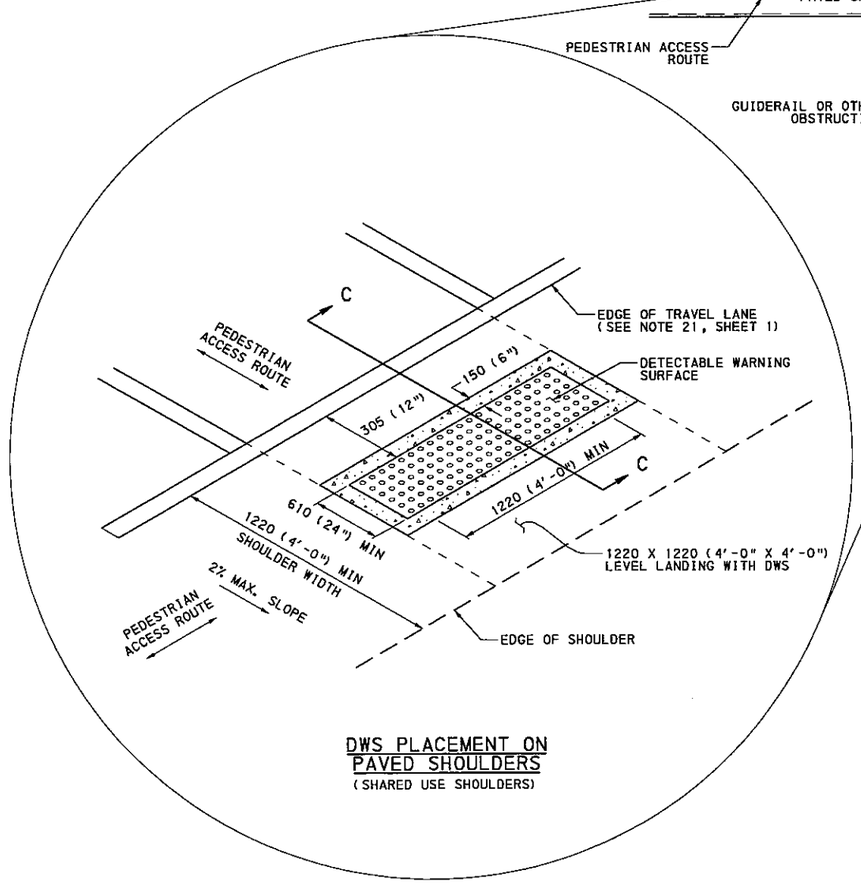
CURB RAMPS AND SIDEWALKS

DRIVEWAY APRONS

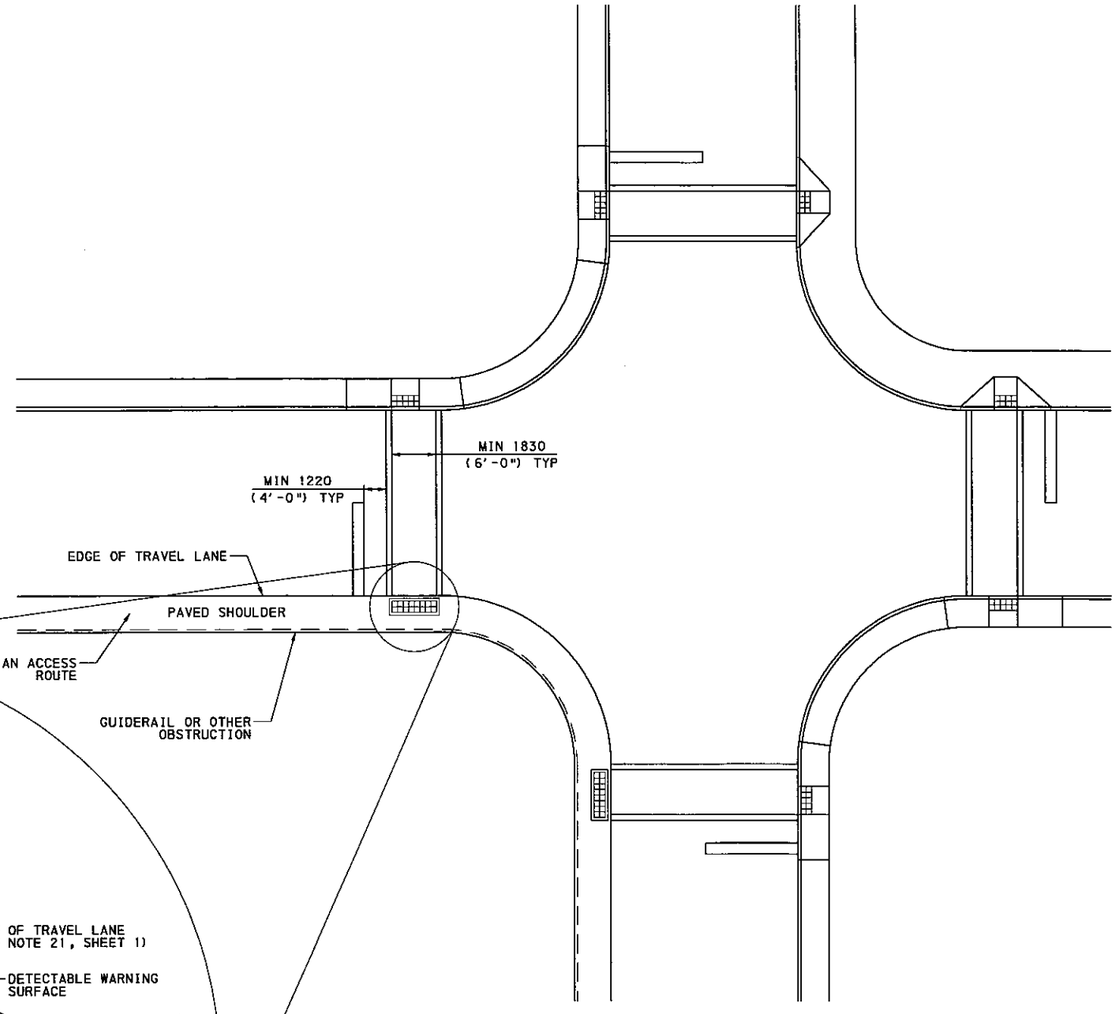
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 12 OF 13
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-67M



SECTION C-C



DWS PLACEMENT ON
PAVED SHOULDERS
(SHARED USE SHOULDERS)



TYPICAL INTERSECTION PLAN
WITH DWS ON PAVED SHOULDERS
(SHARED USE SHOULDERS)

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

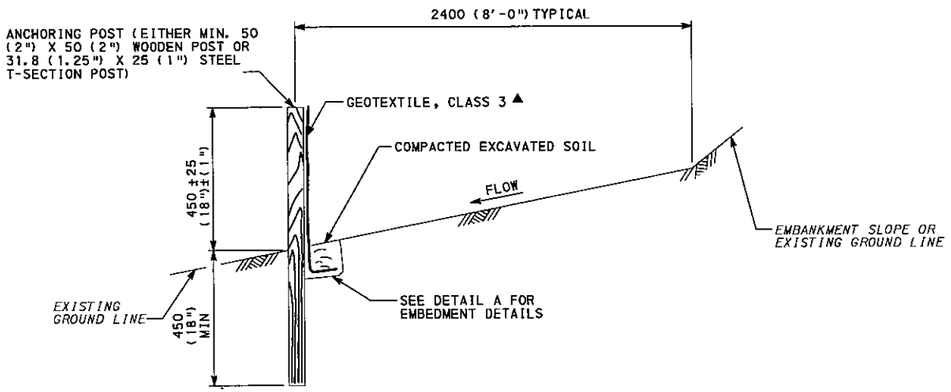
CURB RAMPS AND SIDEWALKS

DWS PLACEMENT ON
PAVED SHOULDERS

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 13 OF 13
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-67M

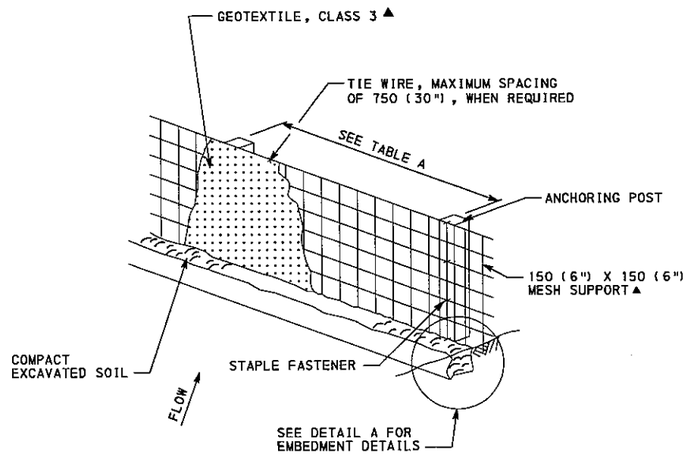
NOTES

1. REMOVE DEPOSITS WHEN SEDIMENT ACCUMULATION IS ONE HALF THE ABOVE GROUND HEIGHT OF THE SILT FENCE.
2. ADHERE TO THE MANUFACTURER'S RECOMMENDATIONS RELATIVE TO REQUIRED GEOTEXTILE REPLACEMENT DUE TO WEATHERING.
3. PLACE SILT FENCE ON LEVEL GRADE. EXTEND BOTH ENDS OF THE FENCE AT LEAST 2400 (8'-0") UP SLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
4. REPLACE UNDERCUT AND OVERTOPPED SECTIONS OF THE FENCE WITH A ROCK FILTER OUTLET (SEE SHEET 2). ROCK FILTER OUTLETS SHOULD BE INSTALLED ALONG THE SILT BARRIER FENCE AT POINTS OF FREQUENT FAILURES AND WHERE REQUIRED BY THE EROSION AND SEDIMENT POLLUTION CONTROL PLAN.
5. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN ( ) PARENTHESIS.



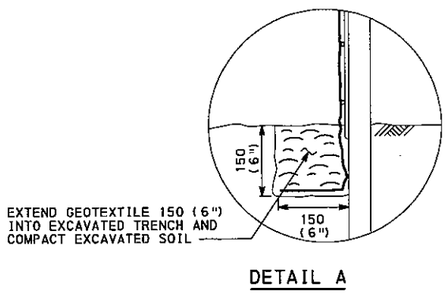
SILT BARRIER FENCE, 450 (18") HEIGHT

▲ SEE TABLE A

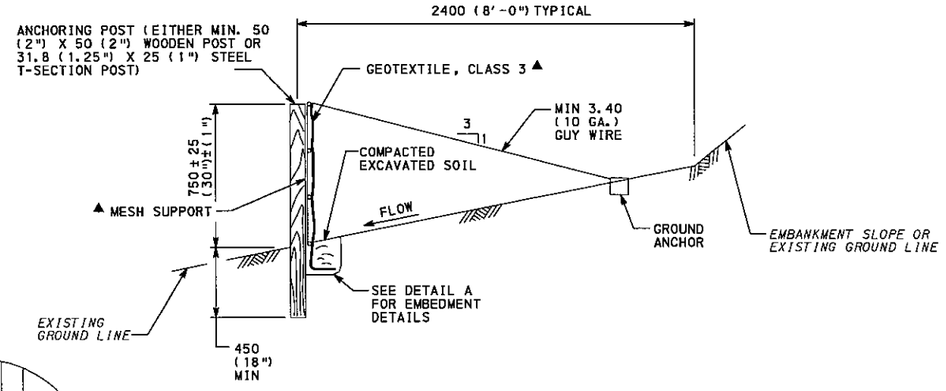


SILT BARRIER FENCE

▲ SEE TABLE A

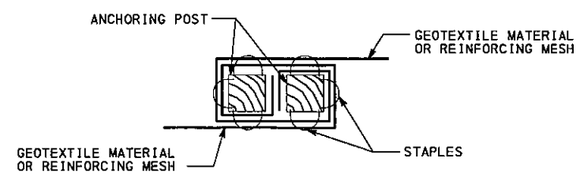


DETAIL A



SILT BARRIER FENCE, 750 (30") HEIGHT

▲ SEE TABLE A



SILT BARRIER FENCE JOINING DETAIL

TABLE A
SILT BARRIER FENCE
GEOTEXTILE SELECTION

TYPE OF CLASS 3 GEOTEXTILE MATERIAL	NOMINAL GEOTEXTILE HEIGHT	POST SPACING WITHOUT MESH SUPPORT	MAX POST SPACING WITH MESH SUPPORT
3A	750 (30")	2.4 m (8'-0")	NA
3A	1050 (42")	NA	2.4 m (8'-0")
3B	750 (30")	1.2 m (4'-0")	NA
3B	1050 (42")	NA	1.2 m (4'-0")

NA = NOT APPLICABLE

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

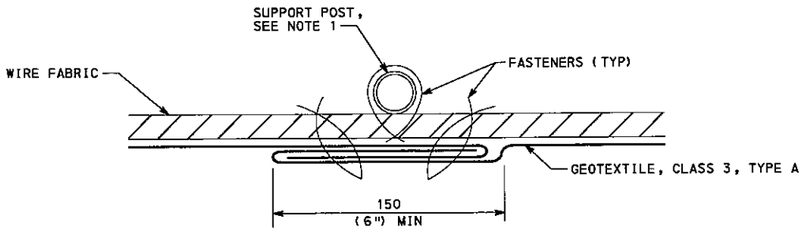
PERIMETER CONTROL DEVICES

RECOMMENDED AUG. 29, 2008
ACTING CHIEF, HWY. QA DIVISION

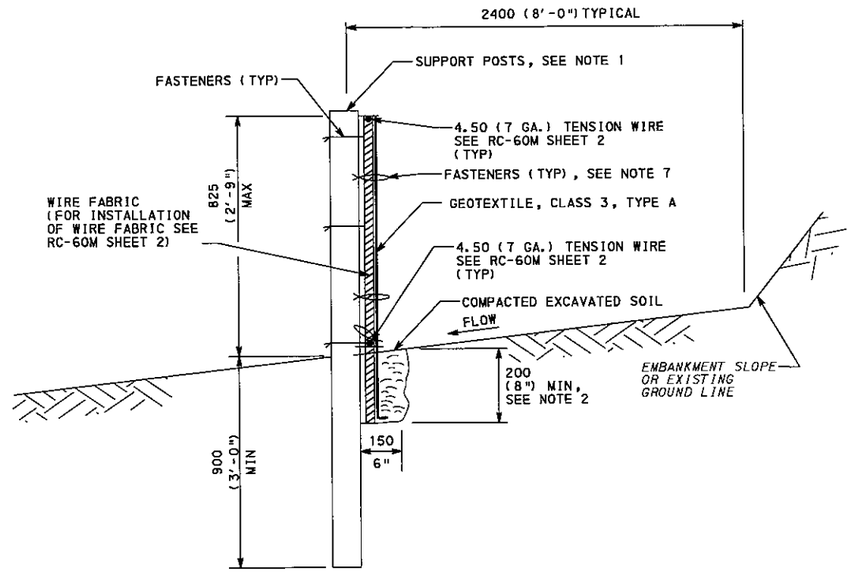
RECOMMENDED AUG. 29, 2008
DIRECTOR, BUREAU OF DESIGN

SHT 1 OF 3

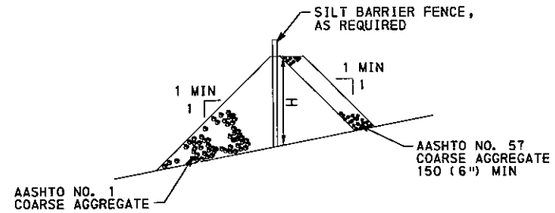
RC-70M



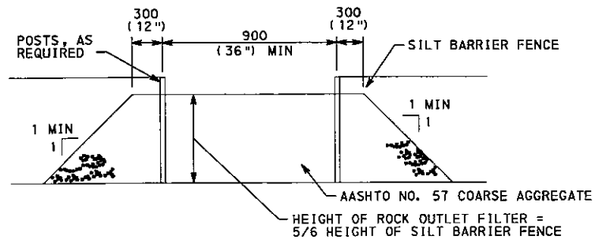
GEOTEXTILE OVERLAP DETAIL



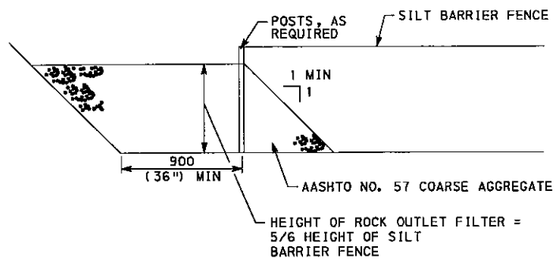
HEAVY DUTY SILT BARRIER FENCE



CROSS SECTION



FILTER AT INTERSECTION OF SILT BARRIER FENCE UP-SLOPE FACE



FILTER AT TOE OF SLOPE

ROCK FILTER OUTLET

NOTES

1. SPACE POSTS AT 3000 (10'-0") MAXIMUM. USE 64 (2.5") DIAMETER GALVANIZED STEEL OR ALUMINUM POSTS.
2. EXTEND GEOTEXTILE AND WIRE FABRIC 200 (8") MIN INTO EXCAVATED TRENCH.
3. PLACE HEAVY DUTY SILT BARRIER FENCE ON LEVEL GRADE. EXTEND BOTH ENDS OF THE FENCE AT LEAST 2400 (8'-0") UP SLOPE AT 45 DEGREES TO THE MAIN FENCE ALIGNMENT.
4. REMOVE DEPOSITS WHEN SEDIMENT ACCUMULATION IS ONE HALF THE ABOVE GROUND HEIGHT OF THE SILT FENCE.
5. ADHERE TO THE MANUFACTURER'S RECOMMENDATIONS RELATIVE TO REQUIRED GEOTEXTILE REPLACEMENT DUE TO WEATHERING.
6. REPLACE UNDERCUT AND OVERTOPPED SECTIONS OF THE FENCE WITH A ROCK FILTER OUTLET. ROCK FILTER OUTLETS SHOULD BE INSTALLED ALONG THE SILT BARRIER FENCE AT POINTS OF FREQUENT FAILURES AND WHERE REQUIRED BY THE EROSION AND SEDIMENT POLLUTION CONTROL PLAN.
7. SPACE GEOTEXTILE TO WIRE FABRIC FASTENERS AT 600 (24") MAX CENTER TO CENTER.
8. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN ( ) PARENTHESIS.

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

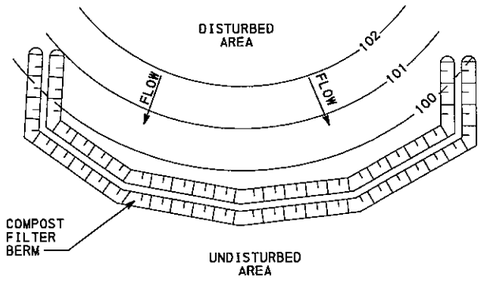
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

PERIMETER CONTROL DEVICES

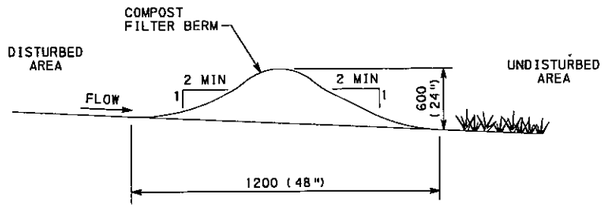
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 2 OF 3
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-70M

NOTES

1. REMOVE DEPOSITS WHEN SEDIMENT ACCUMULATION IS ONE THIRD THE HEIGHT OF THE EXPOSED COMPOST FILTER BERM OR ONE HALF OF THE EXPOSED COMPOST FILTER SOCK.
2. PLACE COMPOST FILTER SOCK/BERM ON LEVEL GRADE. EXTEND BOTH ENDS OF THE COMPOST FILTER SOCK/BERM AT LEAST 2400 (8'-0") UPSLOPE AT 45 DEGREES TO THE MAIN ALIGNMENT.
3. REPLACE BIODEGRADABLE FILTER SOCK AFTER 6 MONTHS; PHOTODEGRADABLE AFTER 12 MONTHS.
4. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN ( ) PARENTHESIS.

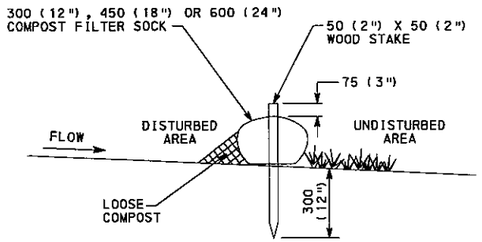


PLAN VIEW

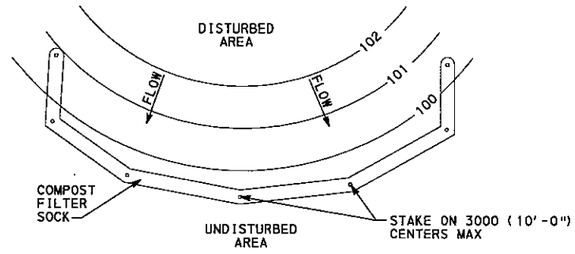


SECTION VIEW

COMPOST FILTER BERM



SECTION VIEW



PLAN VIEW

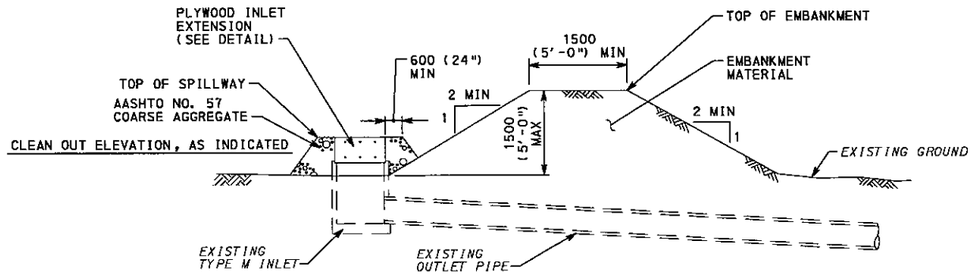
COMPOST FILTER SOCK

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

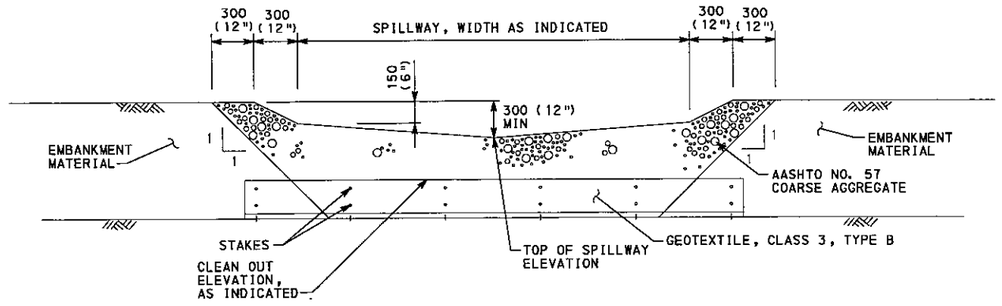
PERIMETER CONTROL DEVICES

RECOMMENDED AUG. 29, 2008 ACTING CHIEF, HWY. QA DIVISION	RECOMMENDED AUG. 29, 2008 DIRECTOR, BUREAU OF DESIGN	SHT 3 OF 3 RC-70M

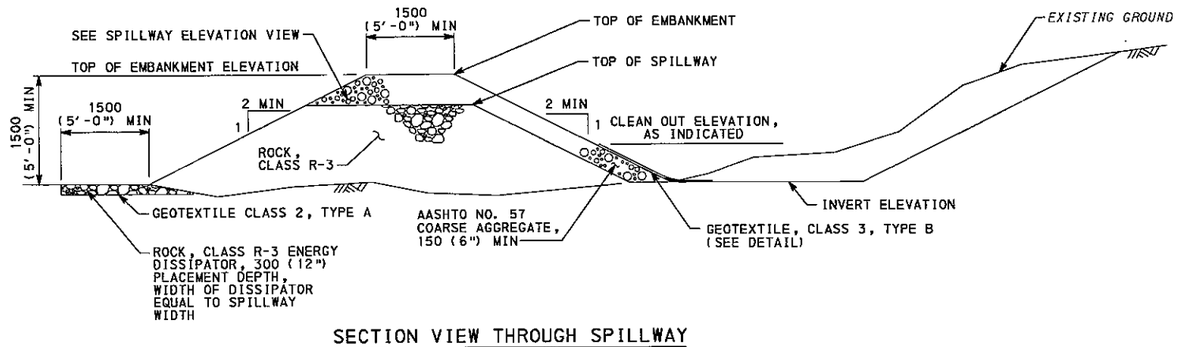


SECTION VIEW THROUGH SPILLWAY

EMBANKMENT SEDIMENT TRAP (TYPE M INLET)



ELEVATION VIEW (INTERIOR OF SPILLWAY)

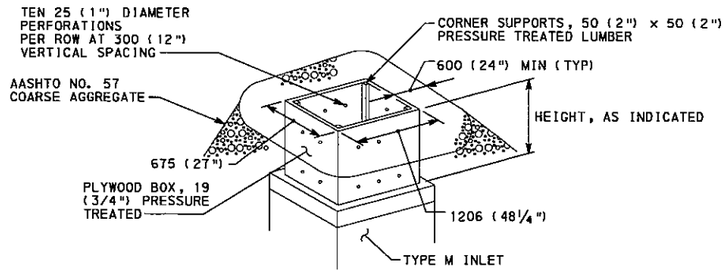


SECTION VIEW THROUGH SPILLWAY

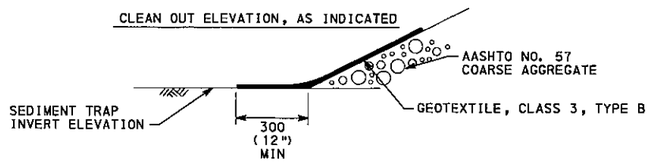
SEDIMENT TRAP (EMBANKMENT)

NOTES

1. PLACE CLEAN OUT STAKES NEAR THE CENTER OF SEDIMENT TRAP. REMOVE SEDIMENT WHEN THE CLEAN OUT ELEVATIONS ON THE STAKES HAVE BEEN MET. DURING REMOVAL, IF REQUIRED, REMARK CLEAN OUT ELEVATIONS ON THE STAKES. SATISFACTORILY DISPOSE OF SEDIMENT.
2. STABILIZE INTERIOR AND EXTERIOR SLOPES WITH SEEDING AND SOIL SUPPLEMENTS AND MULCH AS INDICATED.
3. INSPECT SEDIMENT TRAP ONCE A WEEK AND AFTER EACH STORM EVENT THAT PRODUCES RUNOFF.
4. REPAIR DAMAGED OR CLOGGED SPILLWAYS IMMEDIATELY.
5. REMOVE ALL TRASH AND OTHER DEBRIS FROM SEDIMENT TRAP AND SPILLWAY WHEN DIRECTED.
6. WHEN DIRECTED, REMOVE TEMPORARY SEDIMENT TRAP.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN () PARENTHESIS.



PLYWOOD INLET EXTENSION DETAIL



GEOTEXTILE PLACEMENT DETAIL

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

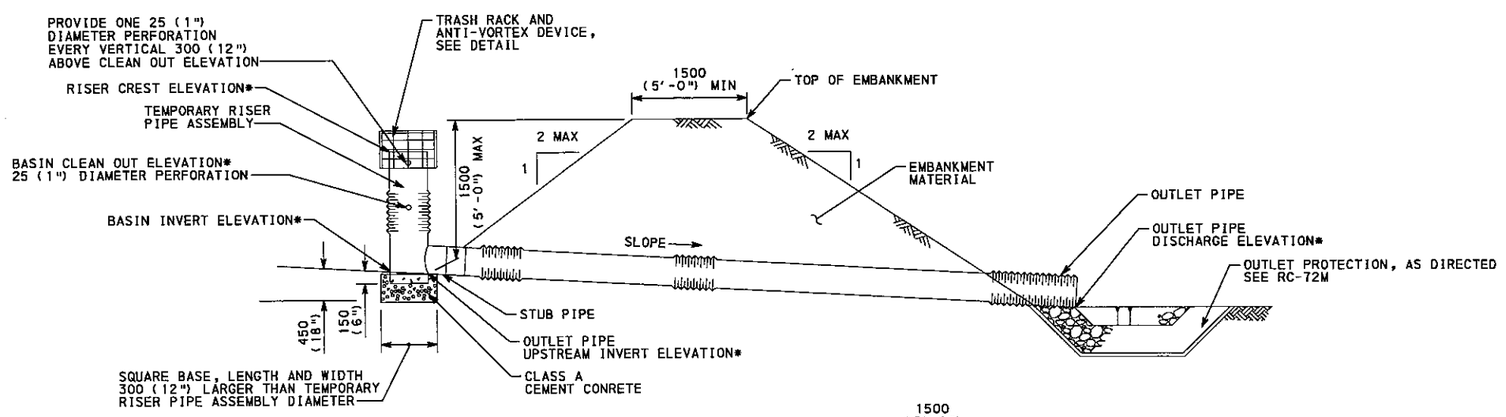
SEDIMENT BASIN AND SEDIMENT TRAP

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 1 OF 4
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-71M

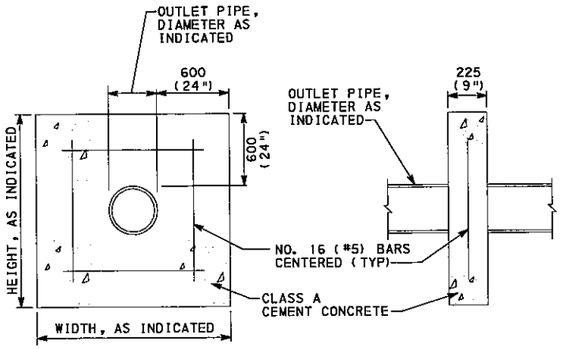
NOTES

1. PROVIDE SUITABLE MATERIAL TO ENSURE THAT EMBANKMENTS, RISERS, PIPES AND CONNECTIONS DO NOT LEAK.
2. PLACE CLEAN OUT STAKES NEAR THE CENTER OF SEDIMENT TRAP. REMOVE SEDIMENT WHEN THE CLEAN OUT ELEVATIONS ON THE STAKES HAVE BEEN MET. DURING REMOVAL, IF REQUIRED, REMARK CLEAN OUT ELEVATIONS ON THE STAKES. SATISFACTORILY DISPOSE OF SEDIMENT.
3. STABILIZE INTERIOR AND EXTERIOR SLOPES WITH SEEDING AND SOIL SUPPLEMENTS AND MULCH AS INDICATED.
4. INSPECT SEDIMENT TRAP/BASIN ONCE A WEEK, AFTER EACH RUNOFF STORM EVENT, OR AS DIRECTED.
5. REPAIR DAMAGED OR CLOGGED SPILLWAYS IMMEDIATELY.
6. REMOVE ALL TRASH AND OTHER DEBRIS FROM SEDIMENT TRAP/BASIN AND SPILLWAY AS DIRECTED.
7. WHEN DIRECTED REMOVE TEMPORARY SEDIMENT TRAP/BASIN OR CONVERT TEMPORARY SEDIMENT TRAP/BASIN TO PERMANENT STORMWATER MANAGEMENT FACILITY AS INDICATED.
8. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN () PARENTHESIS.

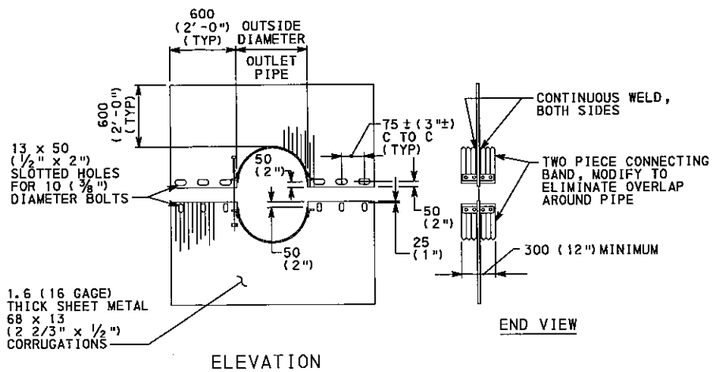
* ELEVATION AS INDICATED



SEDIMENT TRAP (RISER)

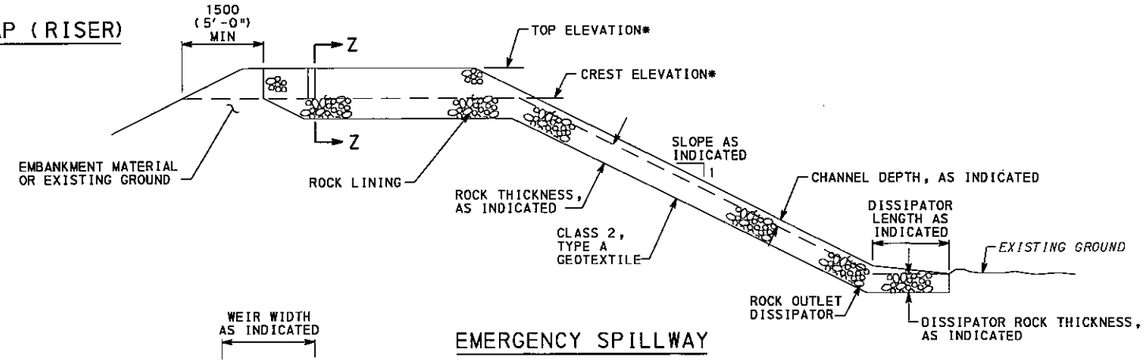


CONCRETE ANTI-SEEP COLLAR

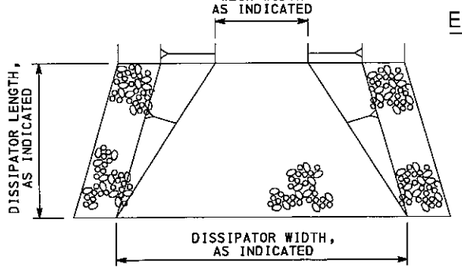


CMP ANTI-SEEP COLLAR

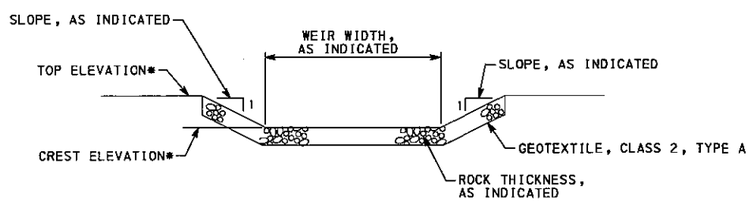
CAULK THE LAP BETWEEN THE TWO HALF-SECTIONS WITH BITUMINOUS MASTIC AT THE TIME OF INSTALLATION. MARK UNASSEMBLED COLLARS BY PAINTING OR TAGGING TO IDENTIFY MATCHING PAIRS.



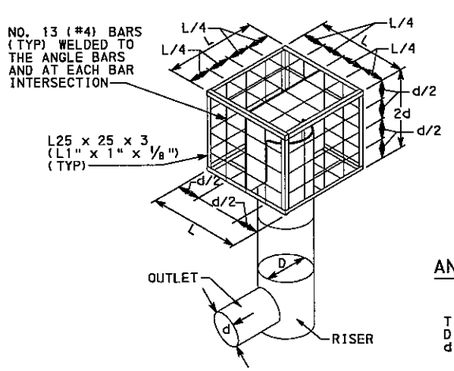
EMERGENCY SPILLWAY



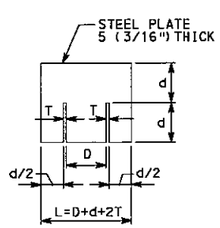
PLAN VIEW: ROCK OUTLET DISSIPATOR



WEIR SECTION Z-Z



TRASH RACK AND ANTI-VORTEX DEVICE



ANTI-VORTEX DEVICE

T = THICKNESS OF RISER PIPE
D = DIAMETER OF RISER PIPE
d = DIAMETER OF OUTLET PIPE

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

SEDIMENT BASIN AND SEDIMENT TRAP

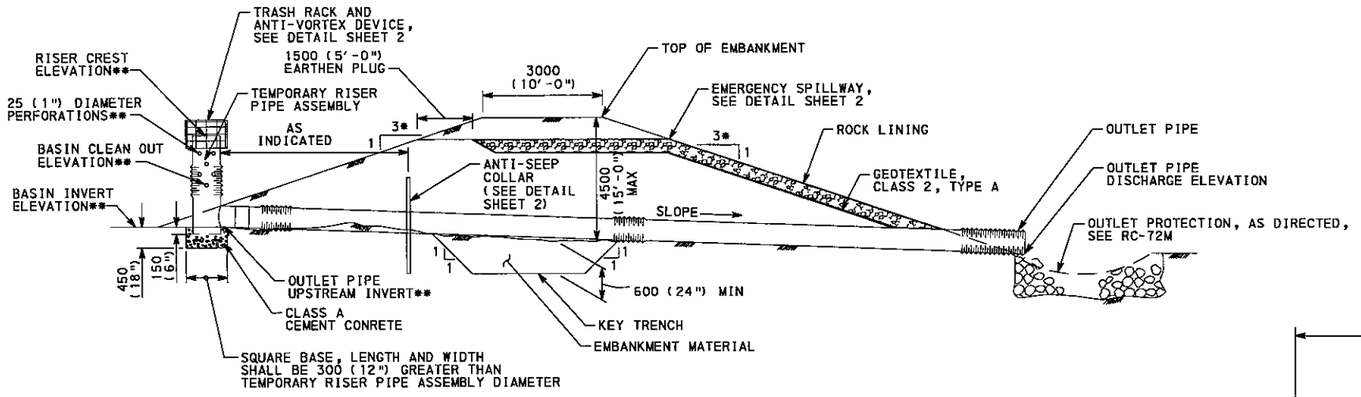
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 2 OF 4
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-71M

NOTES

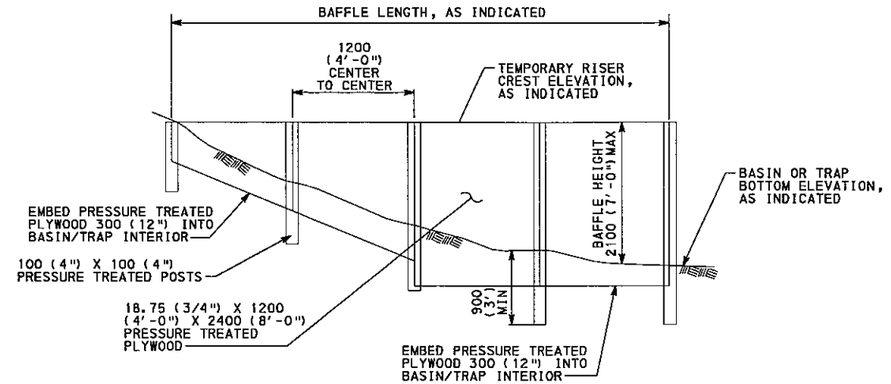
1. REFER TO SHEET 2 FOR SEDIMENT BASIN CONSTRUCTION NOTES.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN ( ) PARENTHESIS.

* HORIZONTAL COMPONENT OF SIDE SLOPES SHALL NOT EXCEED 3:1 IN AREAS ADJACENT TO TRAFFIC WHERE SLOPES NEED TO BE TRAVERSABLE.

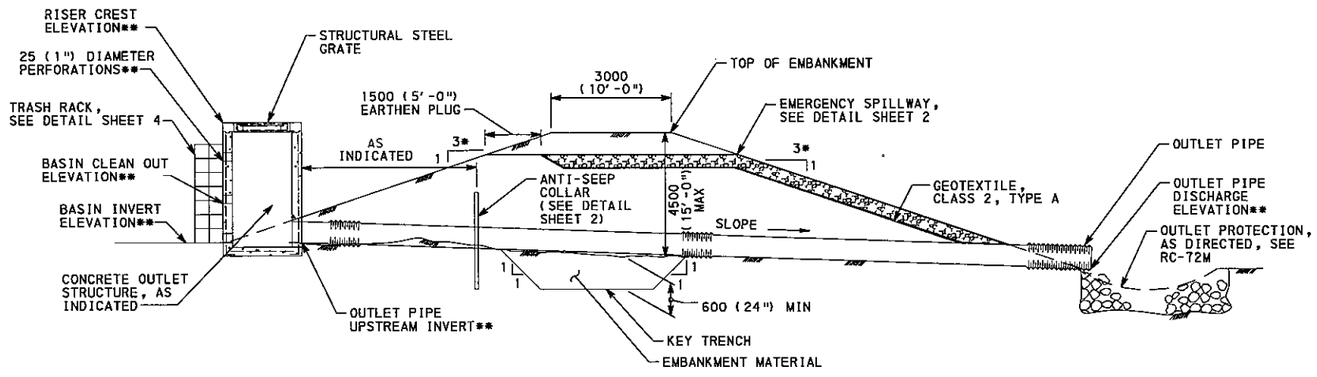
** ELEVATION AS INDICATED



SEDIMENT BASIN - TEMPORARY CONFIGURATION



TEMPORARY BAFFLE WALL



SEDIMENT BASIN - PERMANENT CONFIGURATION

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

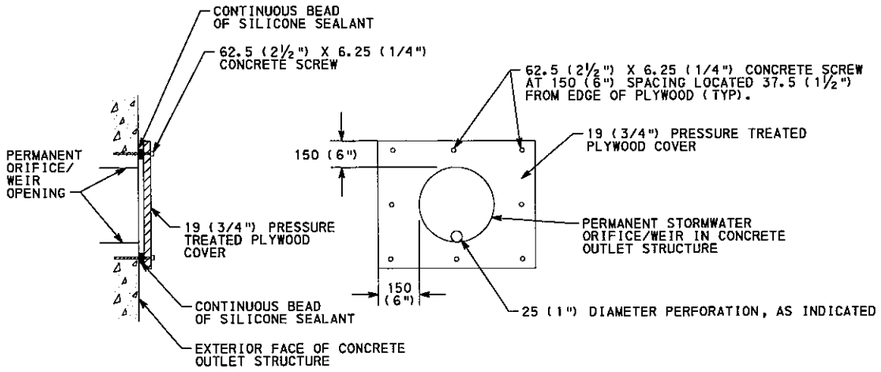
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

SEDIMENT BASIN AND SEDIMENT TRAP

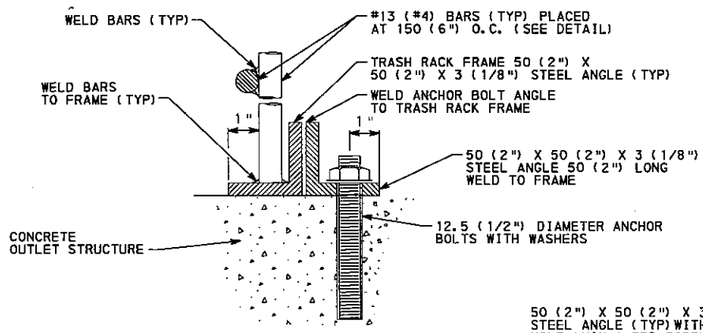
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 3 OF 4
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-71M

NOTES

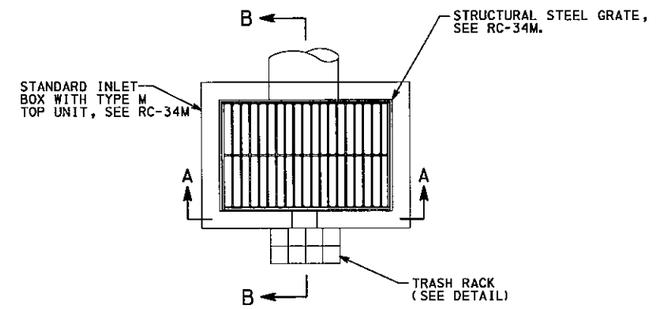
1. FORM BOTTOM OF OUTLET STRUCTURE TO CHANNEL THE FLOW TOWARD THE OUTLET PIPE.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN () PARENTHESIS.



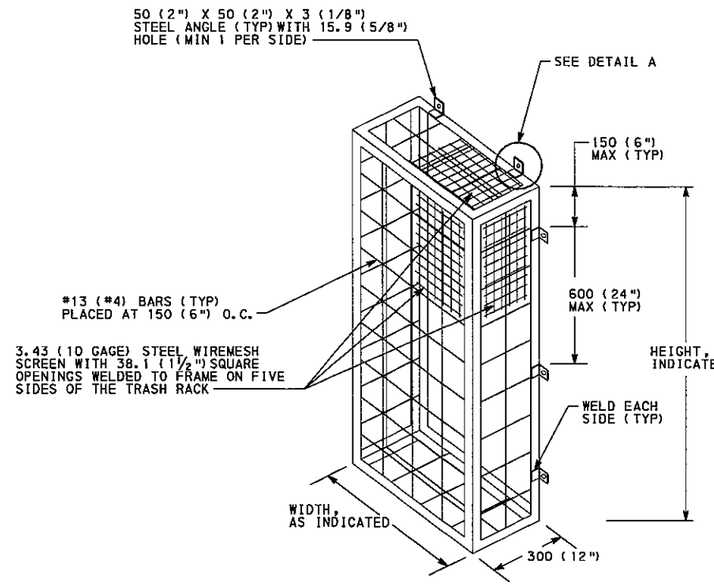
TEMPORARY ORIFICE COVER PLATE



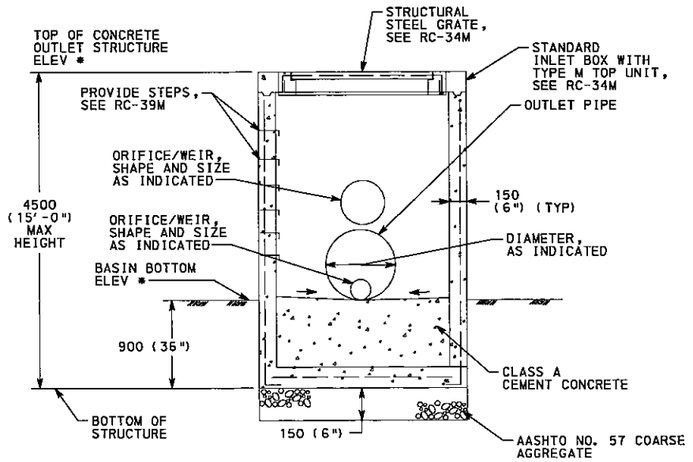
DETAIL A



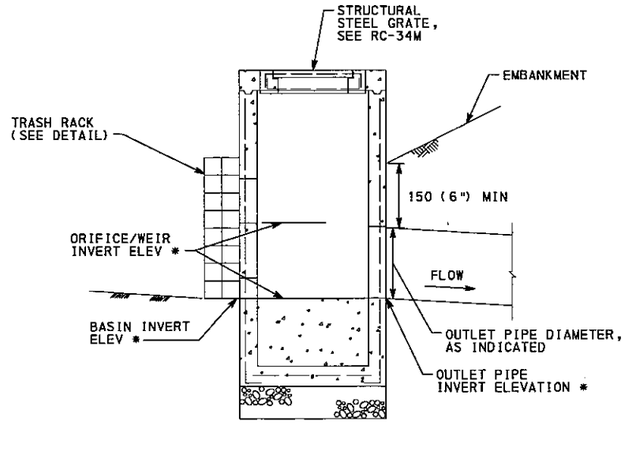
PLAN



TRASH RACK



SECTION A-A



* ELEVATION AS INDICATED

SECTION B-B

CONCRETE OUTLET STRUCTURE

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

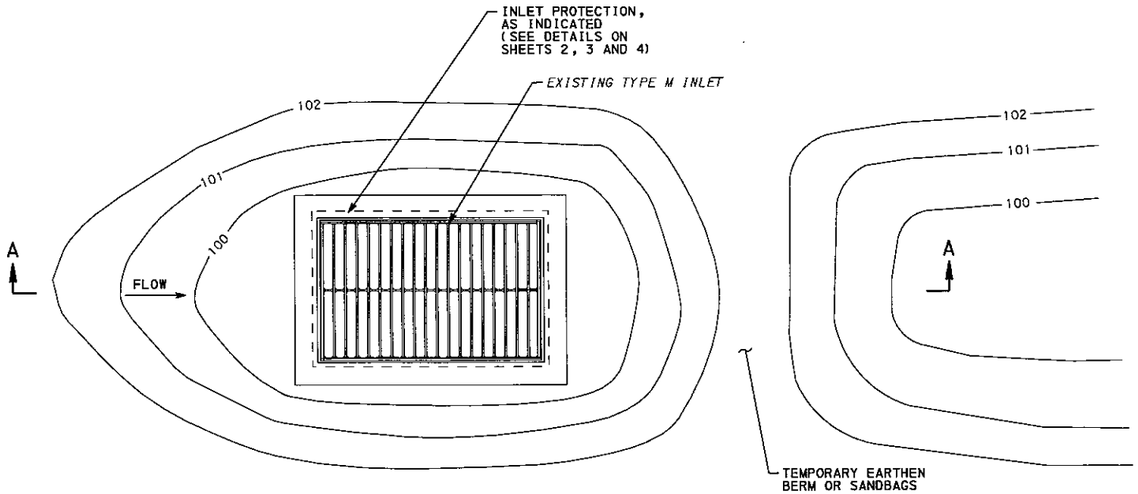
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

SEDIMENT BASIN AND SEDIMENT TRAP

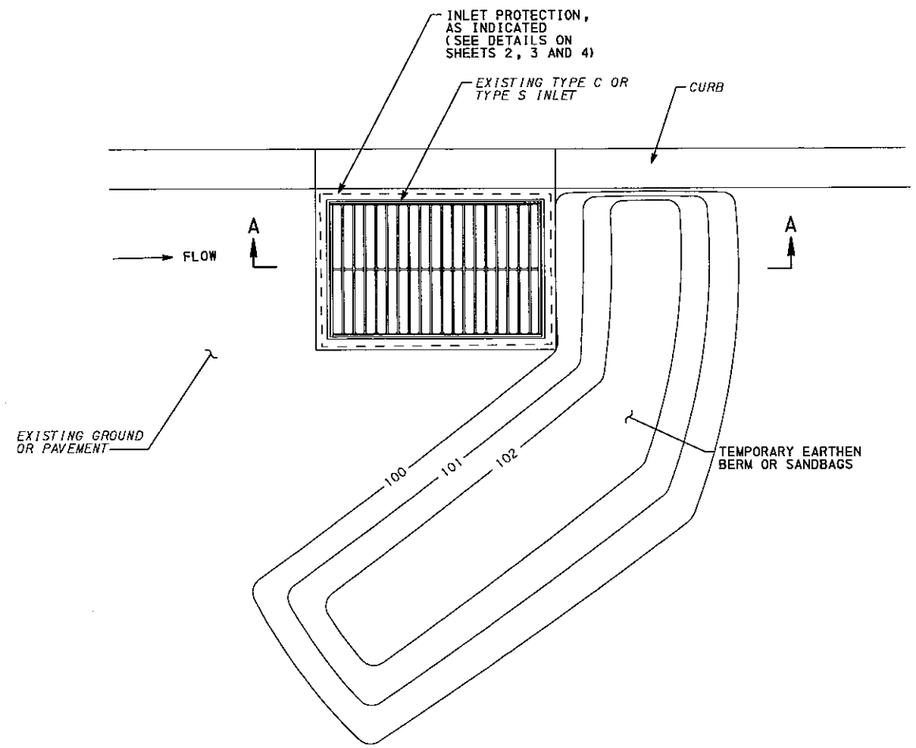
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 4 OF 4
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-71M

NOTES

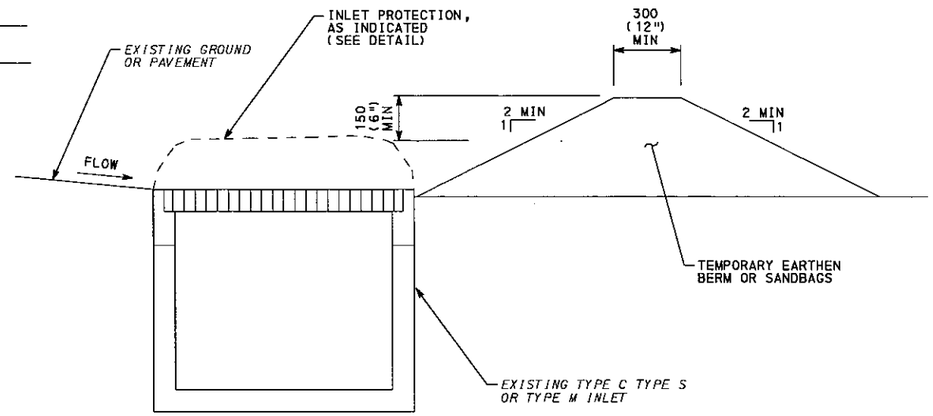
1. TEMPORARY EARTHEN BERMS OR SANDBAGS CAN BE USED FOR ALL INLET PROTECTION.
2. USE BERMS AS REQUIRED.
3. DO NOT USE INLET PROTECTION ON ROADWAYS WHERE PONDING WATER OR INLET PROTECTION MAY BE HAZARDOUS TO VEHICULAR TRAFFIC.
4. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN () PARENTHESIS.



TYPE M INLET PROTECTION



TYPE C OR TYPE S INLET PROTECTION



SECTION A-A

TYPE C, TYPE S OR TYPE M INLET PROTECTION SIDE VIEW

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

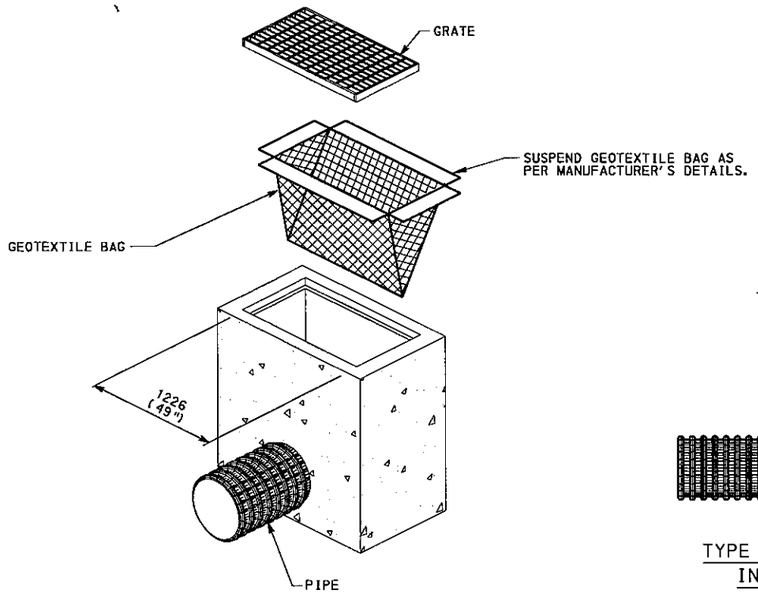
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

INLET AND OUTLET PROTECTION

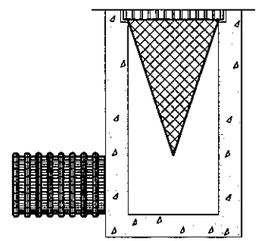
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 1 OF 7
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-72M

NOTES

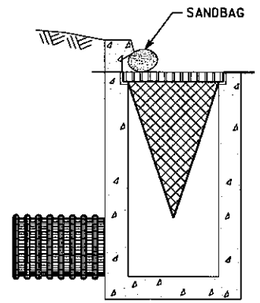
1. INSPECT INLET FILTER BAG AFTER EACH RUNOFF EVENT. MAINTAIN AS REQUIRED TO ENSURE PROPER FUNCTIONING OF THE BAG.
2. REMOVE ACCUMULATED SEDIMENT/DEBRIS WHEN THE INLET FILTER REACHES ONE HALF MAXIMUM CAPACITY.
3. REPLACE FILTER BAG IF RIPPED OR TORN.
4. PROVIDE DOWN GRADIENT BERM AS INDICATED ON SHEET 1. DO NOT USE IN SAG/SUMP CONDITIONS.
5. USE SANDBAGS AT TYPE C INLET CURB OPENINGS TO TO PREVENT BYPASS FLOW.
6. REMOVE AND PROPERLY DISPOSE OF INLET FILTER BAG WHEN NO LONGER NEEDED.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN () PARENTHESIS.



ISOMETRIC VIEW



TYPE M OR TYPE S INLET INSTALLATION (TYP)



TYPE C INLET INSTALLATION (TYP)

SIDE VIEW

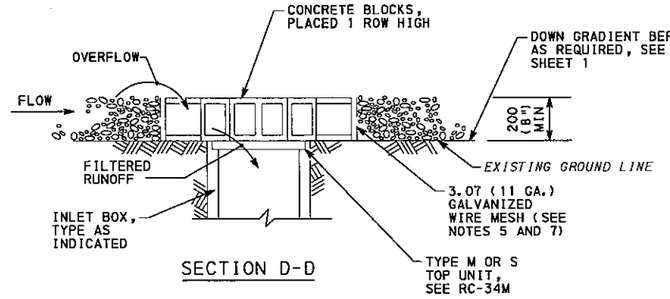
INLET FILTER BAG

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

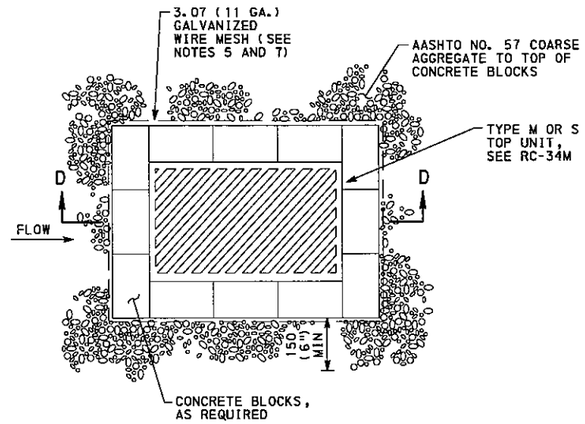
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

INLET AND OUTLET PROTECTION

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 2 OF 7
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-72M

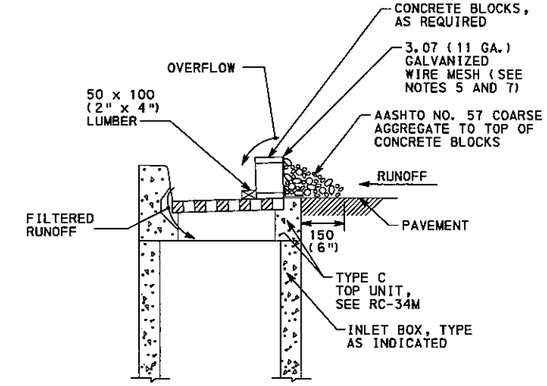


SECTION D-D

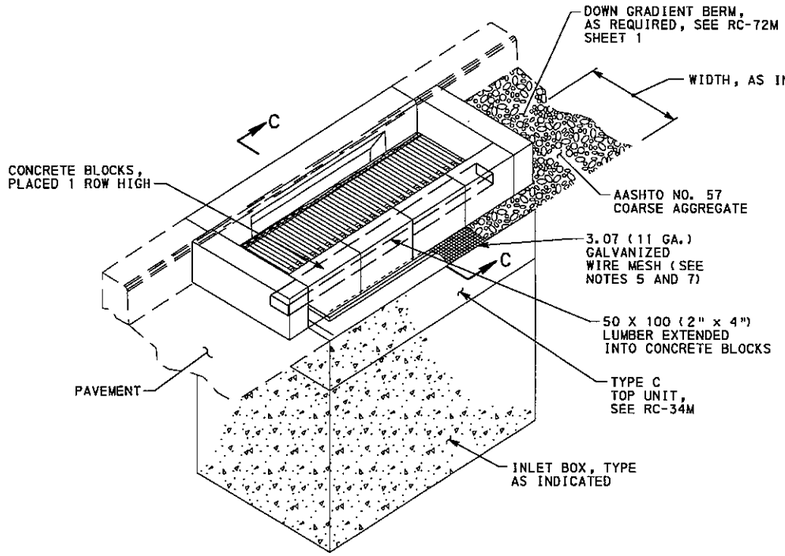


PLAN

CONCRETE BLOCK/GRAVEL INLET PROTECTION
(TYPE M OR TYPE S INLETS)



SECTION C-C



PLAN

CONCRETE BLOCK/GRAVEL INLET PROTECTION
(TYPE C INLET)

NOTES

1. INSPECT AND REPAIR CONCRETE BLOCK/GRAVEL INLET FILTER AFTER EACH RUNOFF EVENT. REMOVE ACCUMULATED SEDIMENT AS NECESSARY. REMOVE AND DISPOSE OF SEDIMENT IN ACCORDANCE WITH PUBLICATION 408.
2. REMOVE SEDIMENT AS REQUIRED OR WHEN DIRECTED FROM TRAVELED ROADWAYS.
3. REPLACE AND SATISFACTORILY DISPOSE OF CLOGGED FILTER STONE (AASHTO NO. 57 COARSE AGGREGATE). RAKE PERIODICALLY TO INCREASE INFILTRATION.
4. PLACE 3.07 (11 GA.) GALVANIZED WIRE MESH AROUND PERIMITER OF CONCRETE BLOCKS TO PREVENT MOVEMENT OF GRAVEL.
5. UPON APPROVAL, 6.25 (1/4") MAX PLASTIC MESH MAY BE SUBSTITUTED FOR GALVANIZED WIRE MESH.
6. PLACE CONCRETE BLOCKS MEETING THE REQUIREMENTS OF PUBLICATION 408 AROUND INLET PERIMETER.
7. PLACE 3.07 (11 GA.) GALVANIZED WIRE MESH OVER EXPOSED GRATE AREA OF TYPE C INLETS ONLY. PLACE WIRE MESH ALONG PERIMETER OF CONCRETE BLOCKS PRIOR TO PLACING AASHTO NO. 57 COARSE AGGREGATE, ALL INLET TYPES.
8. PROVIDE DOWN GRADIENT BERM AS INDICATED ON RC-72M, SHEET 1. DO NOT USE IN SAG/SUMP CONDITIONS.
9. DO NOT USE INLET PROTECTION ON ROADWAYS WHERE PONDING WATER OR INLET PROTECTION MAY BE HAZARDOUS TO VEHICULAR TRAFFIC.
10. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN () PARENTHESIS.

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

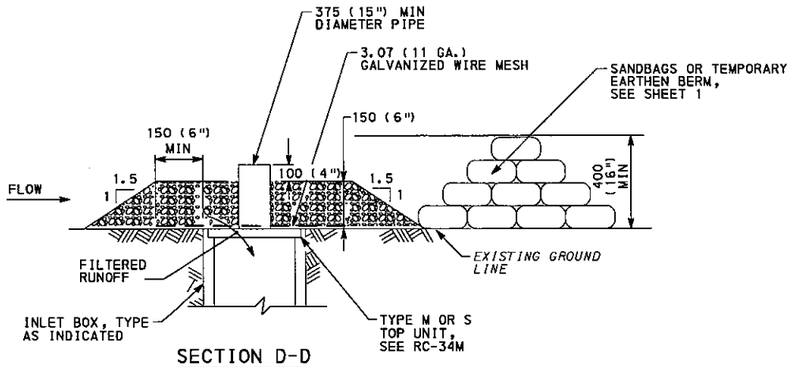
INLET AND OUTLET PROTECTION

RECOMMENDED AUG. 29, 2008
ACTING CHIEF, HWY. QA DIVISION

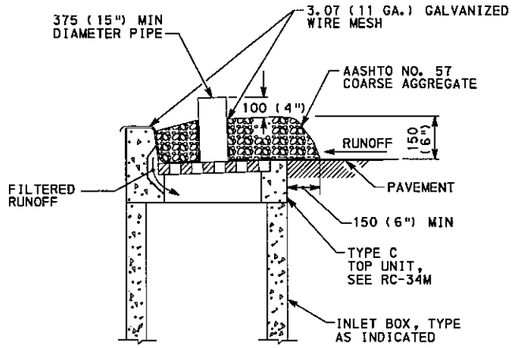
RECOMMENDED AUG. 29, 2008
DIRECTOR, BUREAU OF DESIGN

SHT 3 OF 7

RC-72M



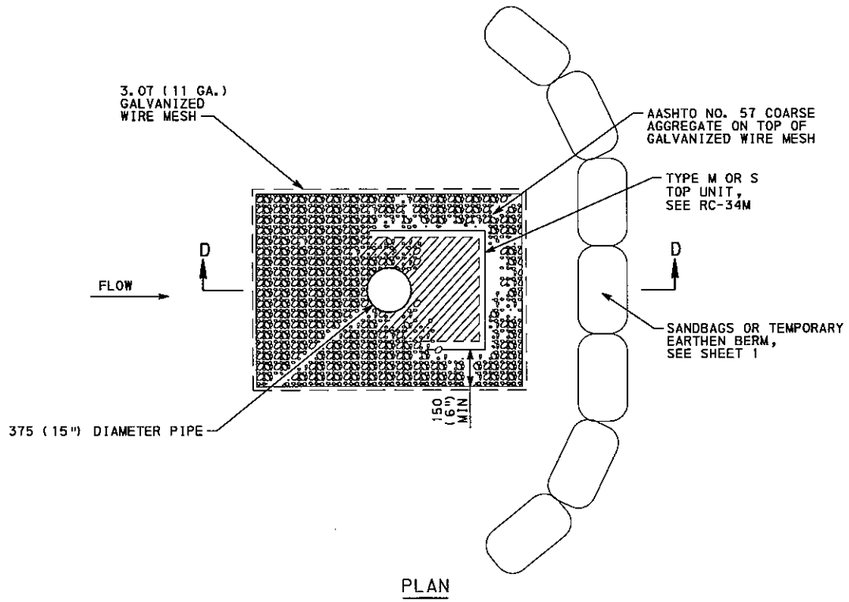
SECTION D-D



SECTION C-C

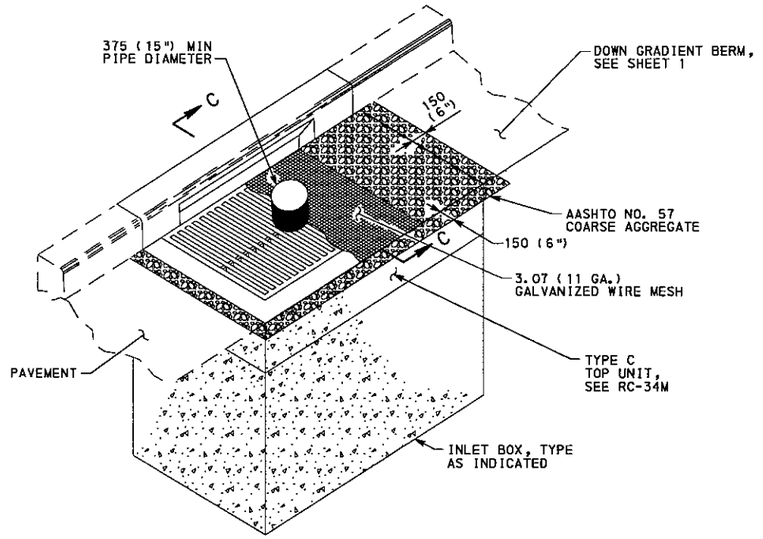
NOTES

1. INSPECT AND REPAIR CONCRETE BLOCK/GRAVEL INLET FILTER AFTER EACH RUNOFF EVENT. REMOVE ACCUMULATED SEDIMENT AS NECESSARY. REMOVE AND DISPOSE OF SEDIMENT IN ACCORDANCE WITH PUBLICATION 408.
2. REMOVE SEDIMENT AS REQUIRED OR WHEN DIRECTED FROM TRAVELED ROADWAYS.
3. REPLACE AND SATISFACTORILY DISPOSE OF CLOGGED FILTER STONE (AASHTO NO. 57 COARSE AGGREGATE). RAKE PERIODICALLY TO INCREASE INFILTRATION.
4. PLACE 3.07 (11 GA.) GALVANIZED WIRE MESH ON TOP OF INLET.
5. PLACE 375 (15") DIAMETER PIPE ON WIRE MESH AS INDICATED AND IN ACCORDANCE WITH PUBLICATION 408, SECTION 860.
6. DO NOT USE INLET PROTECTION ON ROADWAYS WHERE PONDING WATER OR INLET PROTECTION MAY BE HAZARDOUS TO VEHICULAR TRAFFIC.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN () PARENTHESIS.



PLAN

PIPE/GRAVEL INLET PROTECTION
(TYPE M OR TYPE S INLET)



PLAN

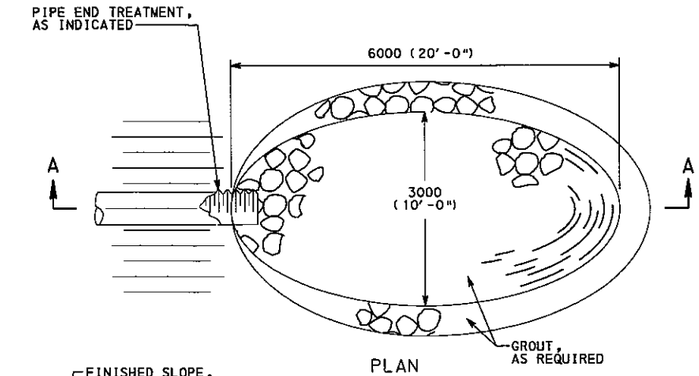
PIPE/GRAVEL INLET PROTECTION
(TYPE C INLET)

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

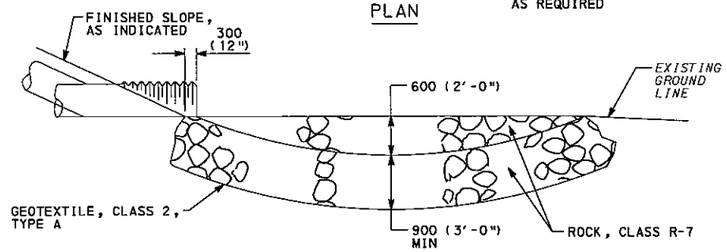
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

INLET AND OUTLET PROTECTION

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 4 OF 7
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-72M

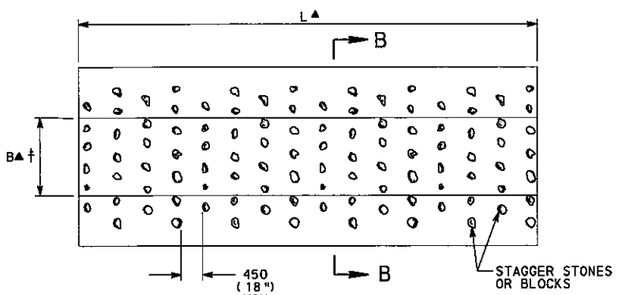


PLAN

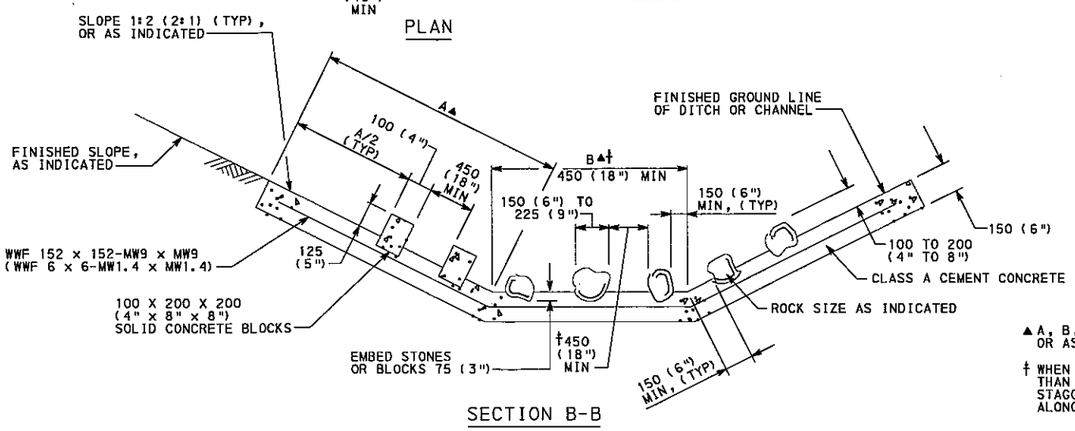


SECTION A-A

ROCK BASIN



PLAN

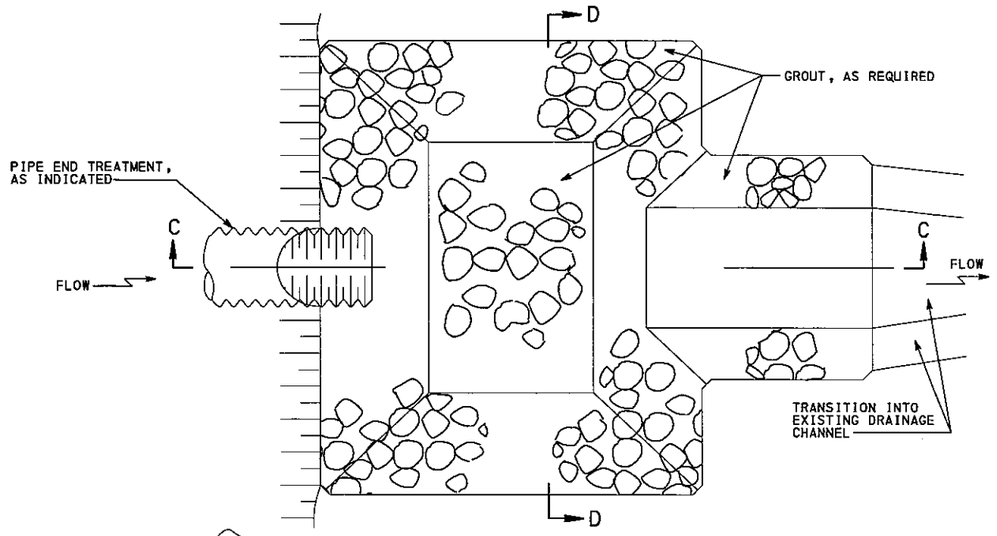


SECTION B-B

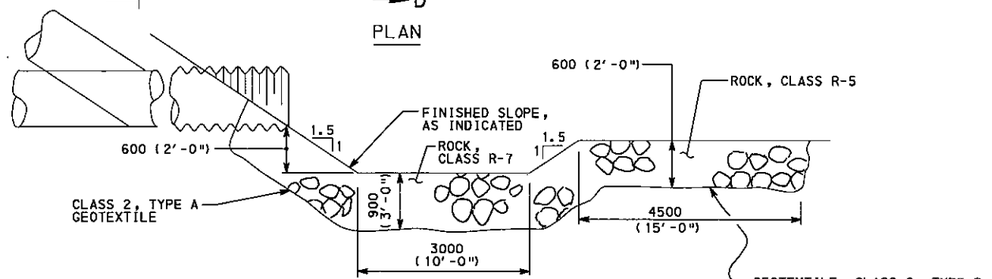
PAVED ENERGY DISSIPATOR

▲A, B, AND L AS INDICATED OR AS DIRECTED

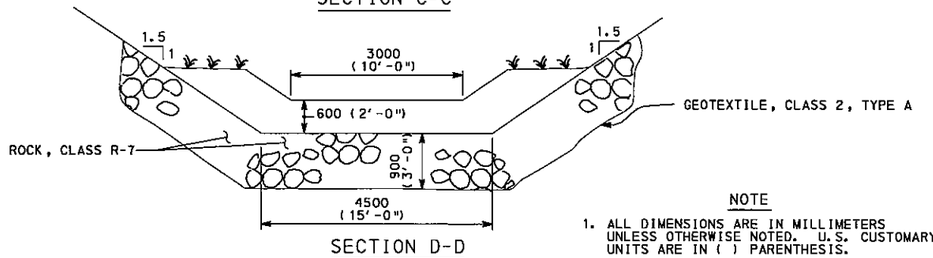
† WHEN CHANNEL BOTTOM WIDTH IS LESS THAN 900 (3'-0"), USE A SINGLE, STAGGERED ROW OF STONES OR BLOCKS ALONG CHANNEL BOTTOM



PLAN



SECTION C-C



SECTION D-D

ROCK ENERGY DISSIPATOR

NOTE

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN ( ) PARENTHESIS.

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

INLET AND OUTLET PROTECTION

RECOMMENDED AUG. 29, 2008
ACTING CHIEF, HWY. QA DIVISION

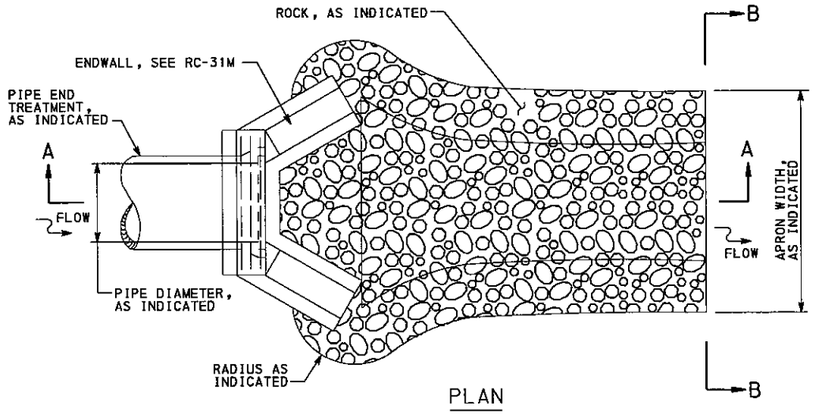
RECOMMENDED AUG. 29, 2008
DIRECTOR, BUREAU OF DESIGN

SHT 5 OF 7

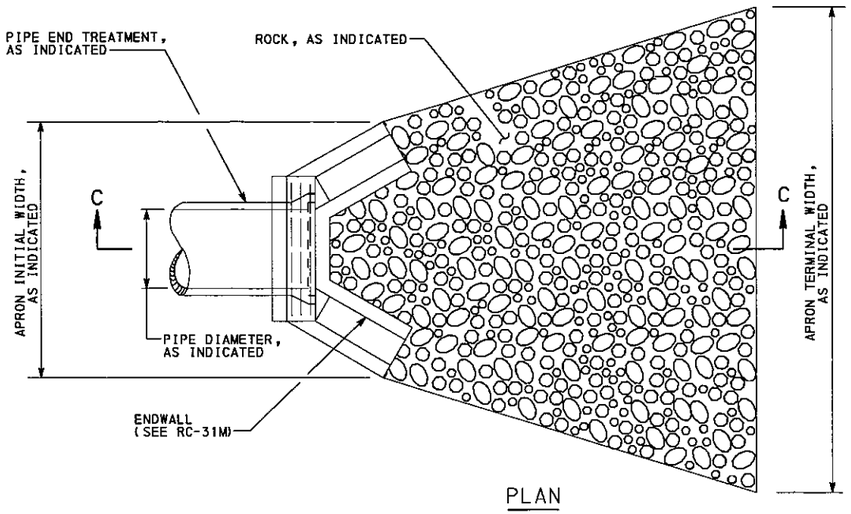
RC-72M

NOTES

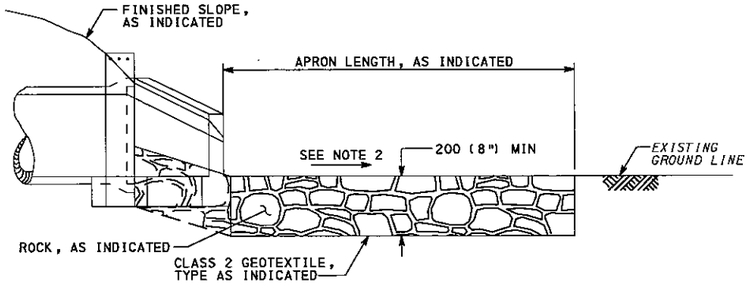
1. PROVIDE GEOTEXTILE MATERIAL ALONG ALL INTERFACE AREAS WITH GROUND CONTACT.
2. SLOPE SHOULD BE LEVEL OR AS CLOSE TO LEVEL AS REASONABLY POSSIBLE BASED ON SITE CONDITIONS.
3. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN ( ) PARENTHESIS.



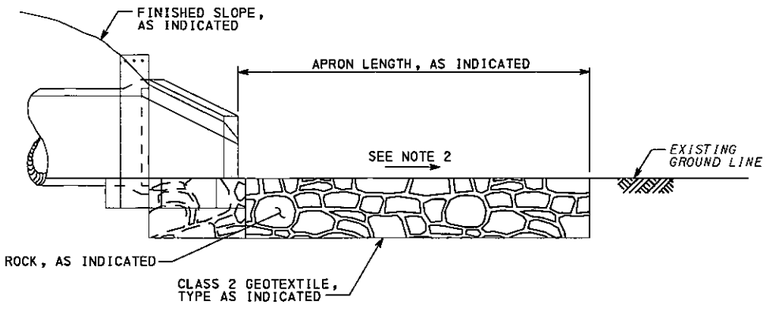
PLAN



PLAN

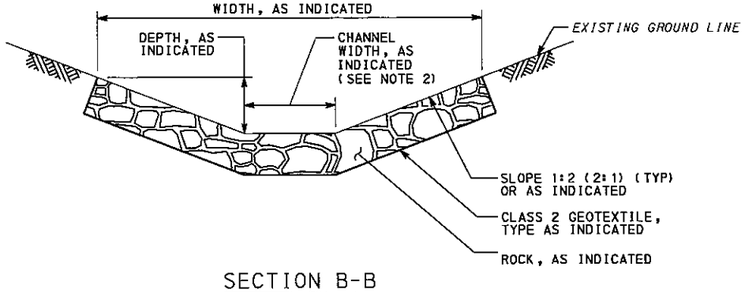


SECTION A-A



SECTION C-C

ROCK APRON (FLAT AREA)



SECTION B-B

ROCK APRON (DEFINED CHANNEL)

NOT TO SCALE

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

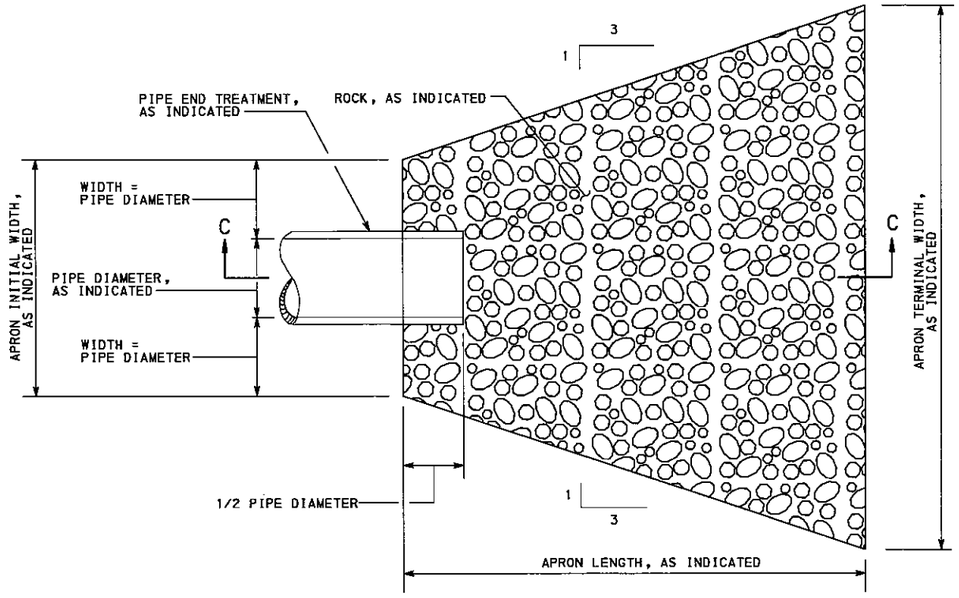
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

INLET AND OUTLET PROTECTION

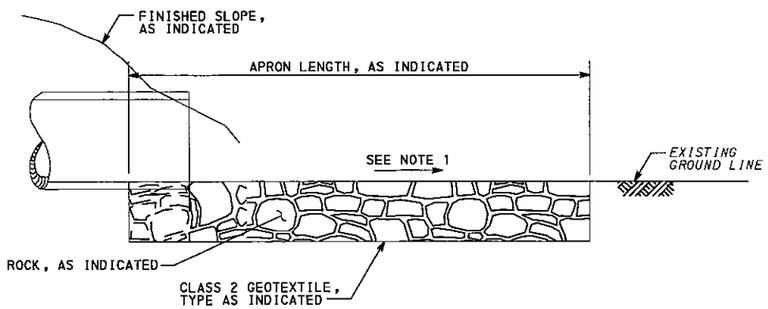
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 6 OF 7
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-72M

NOTES

1. SLOPE SHOULD BE LEVEL OR AS CLOSE TO LEVEL AS REASONABLY POSSIBLE BASED ON SITE CONDITIONS.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN ( ) PARENTHESIS.



PLAN



SECTION C-C

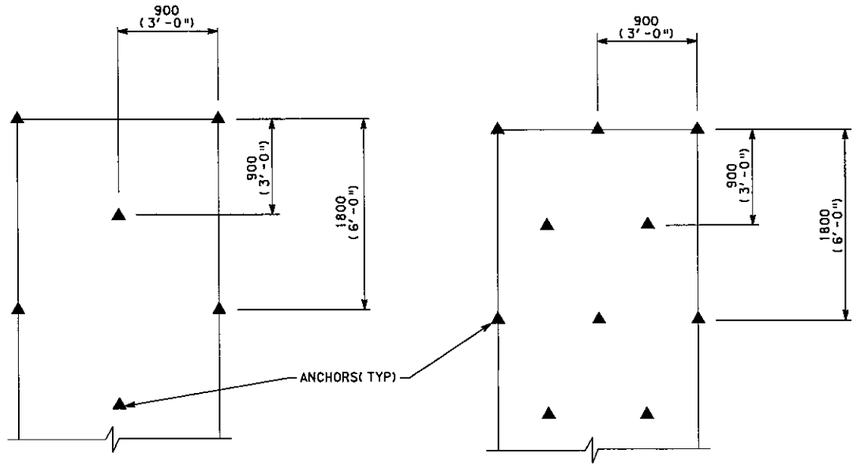
ROCK APRON (FLAT AREA)

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

INLET AND OUTLET PROTECTION

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 7 OF 7
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-72M



ANCHOR PATTERN FOR
SLOPES FLATTER THAN 3:1

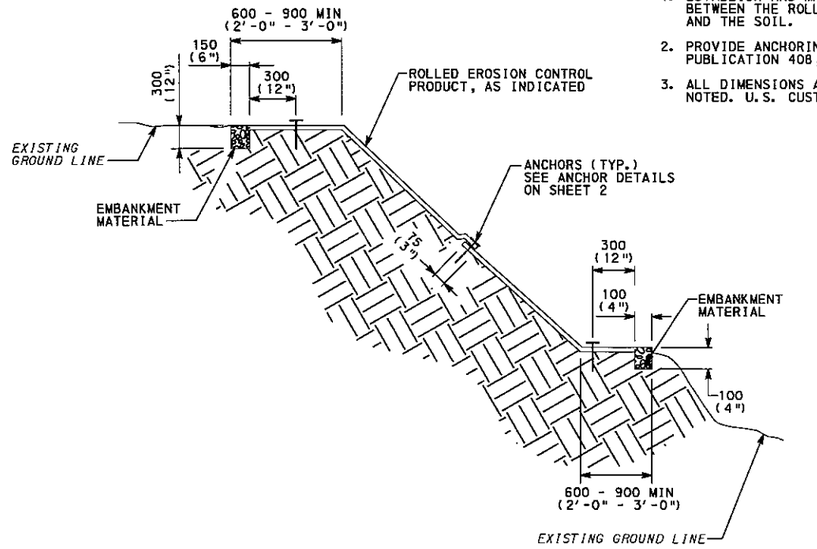
PLACE 1.2 ANCHORS/M² (1 ANCHOR/SY)

ANCHOR PATTERN FOR SLOPES
BETWEEN 3:1 AND 2:1
(INCLUDING 3:1)

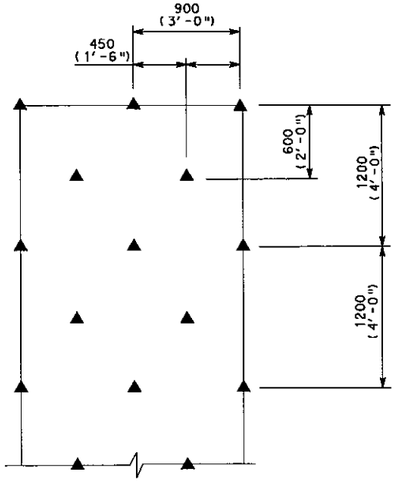
PLACE 1.8 ANCHORS/M² (1½ ANCHORS/SY)

NOTES

1. ESTABLISH AND MAINTAIN CONTINUOUS CONTACT BETWEEN THE ROLLED EROSION CONTROL PRODUCTS AND THE SOIL.
2. PROVIDE ANCHORING DEVICES IN ACCORDANCE WITH PUBLICATION 408, SECTION 806.2(d).
3. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN () PARENTHESIS.

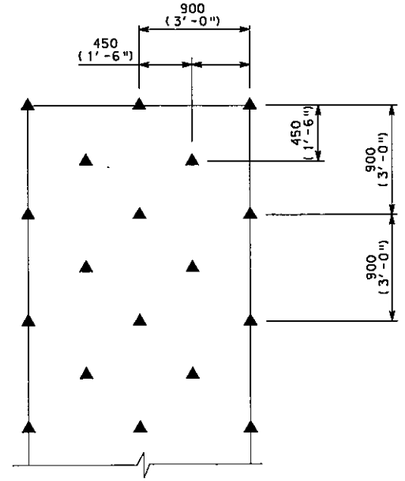


TYPICAL SLOPE CROSS-SECTION



ANCHOR PATTERN FOR SLOPES
BETWEEN 2:1 AND 1:1
(INCLUDING 2:1)

PLACE 2.5 ANCHORS/M² (2 ANCHORS/SY)



ANCHOR PATTERN FOR
1:1 OR STEEPER

PLACE 3 ANCHORS/M² (2½ ANCHORS/SY)

ANCHOR PATTERNS FOR SLOPES

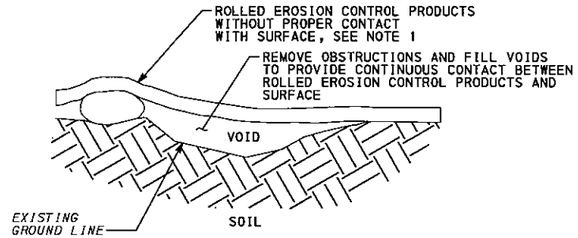


FIGURE 1

LACK OF CONTINUOUS CONTACT

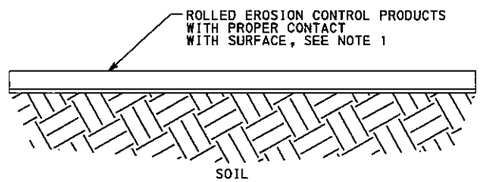


FIGURE 2

CONTINUOUS CONTACT

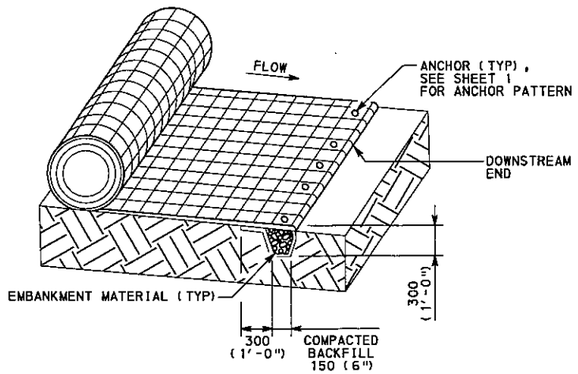
NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

ROLLED EROSION CONTROL PRODUCTS (RECP)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

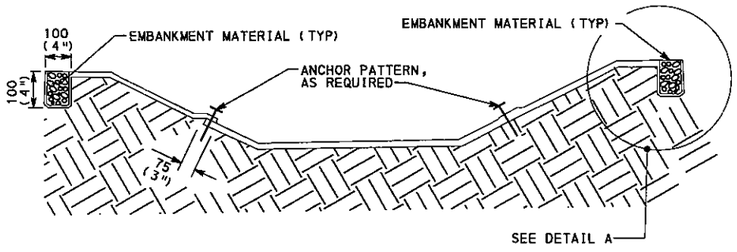
CHANNEL AND SLOPE PROTECTION

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 1 OF 4
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-73M



INITIAL ANCHOR TRENCH

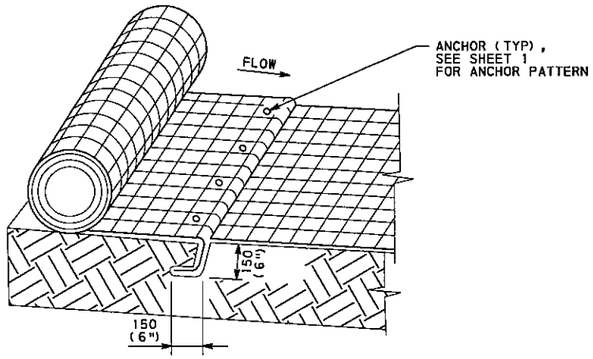
SEE NOTE 1



TYPICAL TRAPEZOIDAL CHANNEL CROSS-SECTION

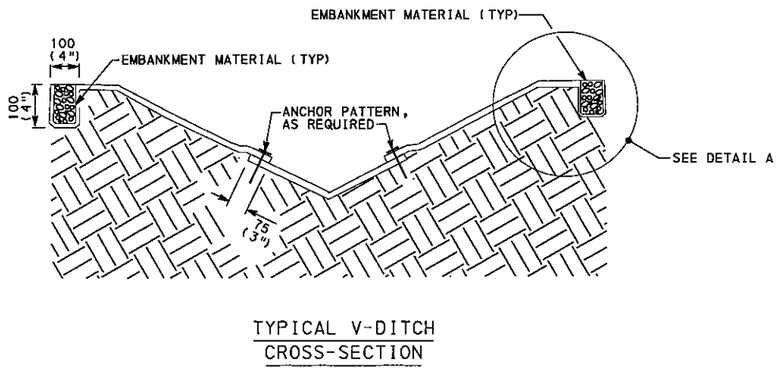
NOTES

1. EXCAVATE INITIAL ANCHOR TRENCH 300 (1'-0") DEEP AND 150 (6") WIDE ACROSS THE WIDTH OF THE CHANNEL TO PREVENT UNDERMINING OF THE ROLLED EROSION CONTROL PRODUCTS.
2. EXCAVATE INTERMITTENT CHECK SLOT 150 (6") DEEP AND 150 (6") WIDE ACROSS THE WIDTH OF THE CHANNEL AT 7000 TO 9000 (25'-0" TO 30'-0") ALONG THE LENGTH OF THE ROLLED EROSION CONTROL PRODUCTS TO PREVENT LOOSE SOIL FROM BEING TRANSPORTED DOWNSTREAM BENEATH THE ROLLED EROSION CONTROL PRODUCTS.
3. EXCAVATE TERMINAL ANCHOR TRENCH 300 (1'-0") DEEP AND 150 (6") WIDE ACROSS THE WIDTH OF THE CHANNEL TO ENSURE WATER FLOW TRANSITIONS SMOOTHLY ONTO THE ROLLED EROSION CONTROL PRODUCTS WITHOUT SEPARATION FROM THE SOIL.
4. EXTEND ROLLED EROSION CONTROL PRODUCTS 600-900 (2'-0" - 3'-0") ABOVE THE CREST OF CHANNEL SIDE WHENEVER POSSIBLE.
5. PLACE 3 ANCHORS/M2 (2½ ANCHORS/SY).
6. PROVIDE ANCHORING DEVICES IN ACCORDANCE WITH SECTION 806.2(d) OF PUBLICATION 408.
7. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN () PARENTHESIS.

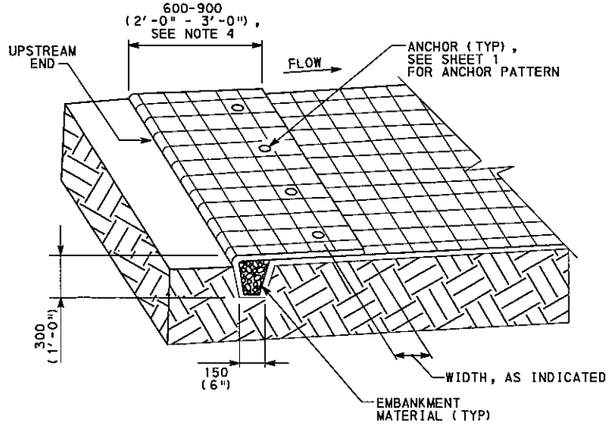


INTERMITTENT CHECK SLOT

SEE NOTE 2

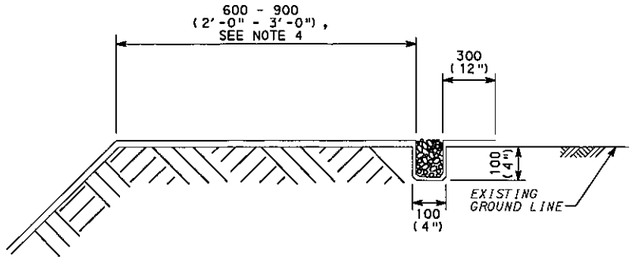


TYPICAL V-DITCH CROSS-SECTION



TERMINAL ANCHOR TRENCH

SEE NOTE 3



DETAIL A

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

CHANNEL AND SLOPE PROTECTION

ROLLED EROSION CONTROL PRODUCTS (RECP)

RECOMMENDED AUG. 29, 2008
ACTING CHIEF, HWY. QA DIVISION

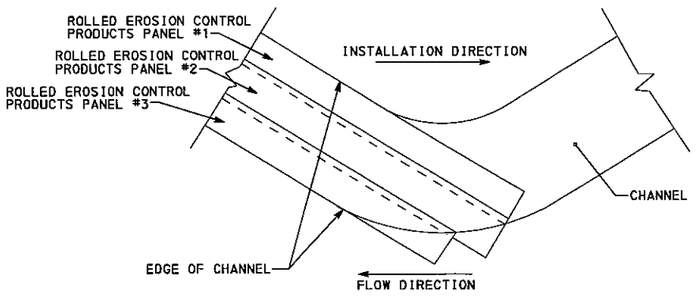
RECOMMENDED AUG. 29, 2008
DIRECTOR, BUREAU OF DESIGN

SHT 2 OF 4

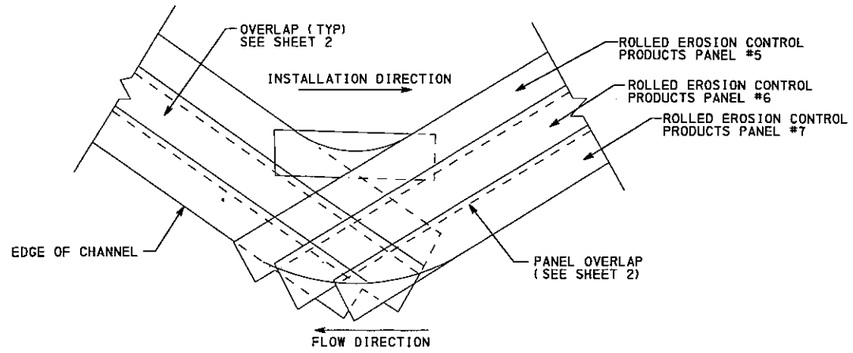
RC-73M

NOTES

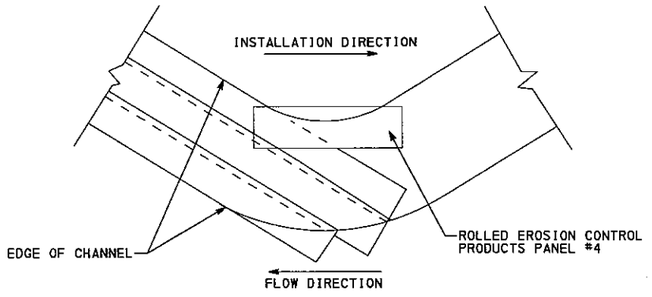
1. INSTALL ROLLED EROSION CONTROL PRODUCTS IN STRAIGHT SECTIONS AROUND CHANNEL BEND TO AVOID CURLING OF MAT EDGES. INSTALL ROLLED EROSION CONTROL PRODUCTS STARTING WITH PANEL #1.
2. ESTABLISH AND MAINTAIN CONTINUOUS CONTACT BETWEEN THE ROLLED EROSION CONTROL PRODUCTS AND SOIL SURFACE.
3. INSTALL ROLLED EROSION CONTROL PRODUCTS AS INDICATED AND AS SHOWN ON SHEET 2.
4. TERMINATE PANELS AT CHANNEL EDGE OR AS DIRECTED BY THE REPRESENTATIVE.
5. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN ( ) PARENTHESIS.



ROLLED EROSION CONTROL PRODUCTS PANELS 1, 2 & 3



ROLLED EROSION CONTROL PRODUCTS PANELS 5, 6 & 7



ROLLED EROSION CONTROL PRODUCTS PANEL 4

INSTALLATION FOR CHANNEL BENDS
ROLLED EROSION CONTROL PRODUCTS (RECP)

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

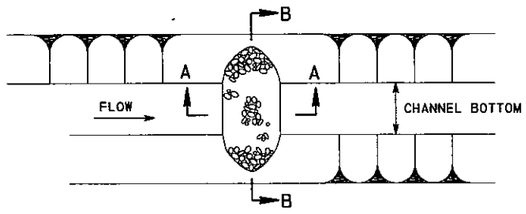
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

CHANNEL AND SLOPE PROTECTION

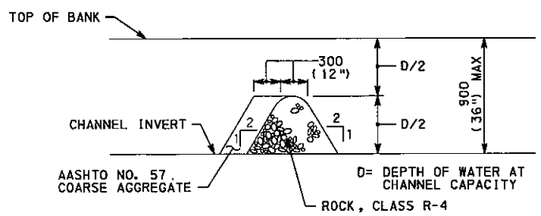
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 3 OF 4
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-73M

NOTES

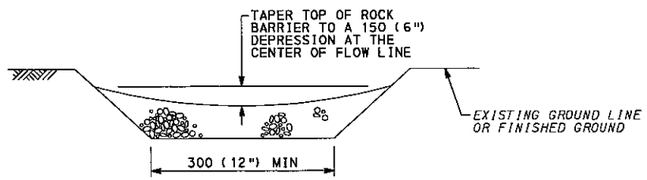
1. REMOVE ACCUMULATED SEDIMENT WHEN IT REACHES ONE HALF THE HEIGHT OF THE ROCK BARRIER. REPLACE CLOGGED FILTER STONE. REMOVE AND DISPOSE OF SEDIMENT IN AN APPROVED MANNER.
2. PROVIDE GEOTEXTILE MATERIAL ALONG ALL INTERFACE AREAS WITH GROUND CONTACT.
3. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN ( ) PARENTHESIS.



PLAN VIEW

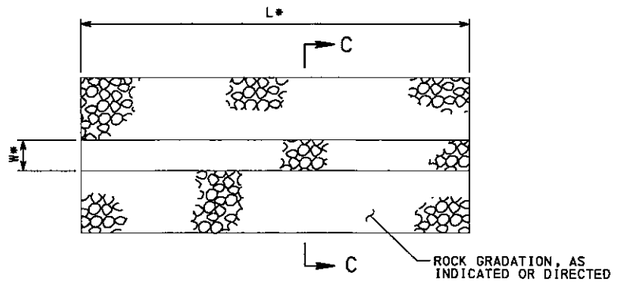


SECTION A-A

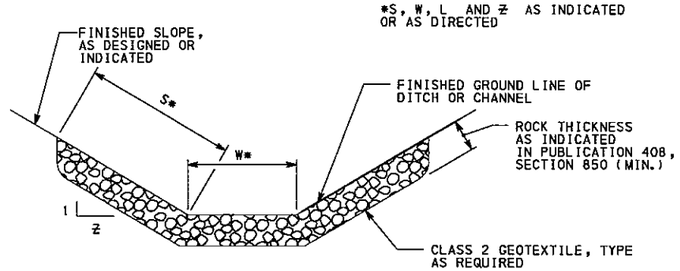


SECTION B-B

ROCK BARRIER



PLAN



SECTION C-C

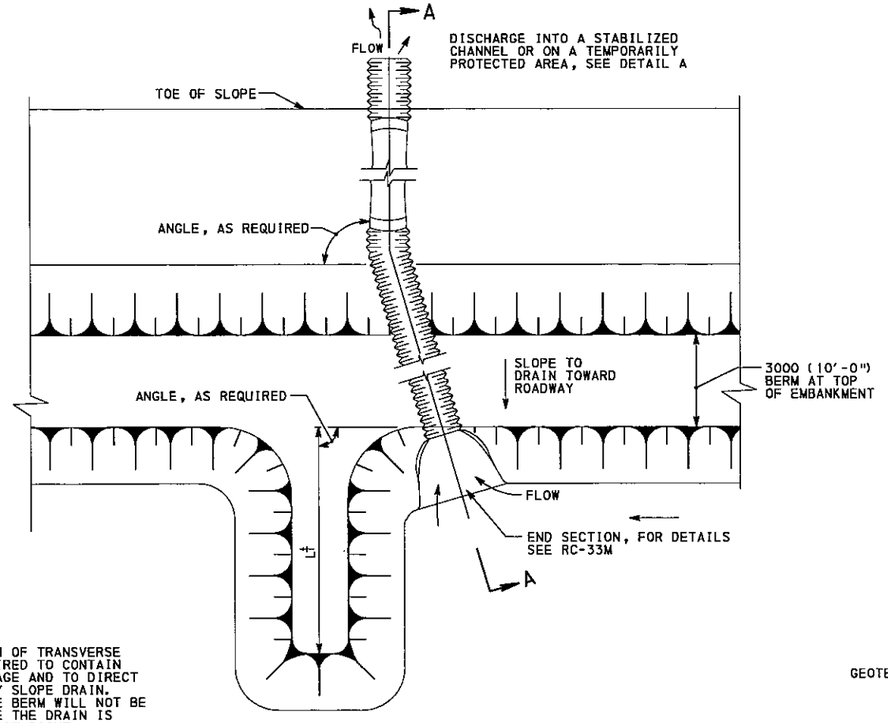
ROCK LINING FOR CHANNELS

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

CHANNEL AND SLOPE PROTECTION

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 4 OF 4
Daniel B. Stewart	Barry E. Thomas	RC-73M
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	



† PROVIDE LENGTH OF TRANSVERSE BERM (L) REQUIRED TO CONTAIN SURFACE DRAINAGE AND TO DIRECT INTO TEMPORARY SLOPE DRAIN. THE TRANSVERSE BERM WILL NOT BE REQUIRED WHERE THE DRAIN IS LOCATED AT A LOW POINT.

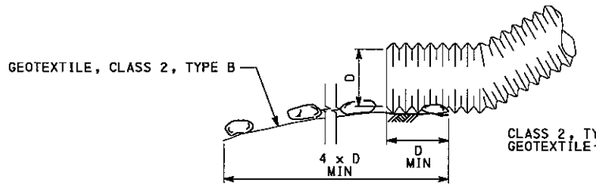
PLAN

TABLE A
SUGGESTED MINIMUM SIZES

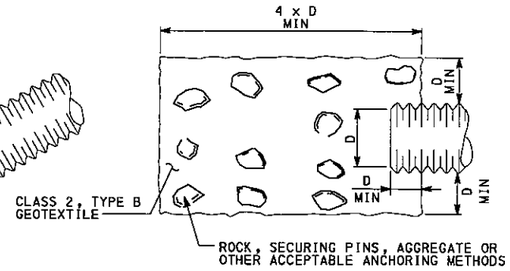
DRAINAGE AREA HECTARES (ACRES)	CORRUGATED PIPE SIZE DIAMETER MM (INCHES)	MINIMUM BERM HEIGHT MM (INCHES)
0 TO 0.8 (0 TO 2)	300 (12)	600 (24)
0.8 TO 1.6 (2 TO 4)	375 (15)	675 (27)
1.6 TO 2.0 (4 TO 5)	450 (18)	750 (30)

NOTES

1. MAINTAIN SLOPE PIPES AT ALL TIMES AS INDICATED IN PUBLICATION 408, SECTION 854. CLEAN OR REPAIR ALL CLOGGED OR LEAKING PIPES AS NECESSARY. REPLACE ALL INLETS AND OUTLETS AS NECESSARY. REMOVE ACCUMULATED SEDIMENT FROM THE ENTRANCE OR EXIT OF EACH SLOPE PIPE AND DISPOSE OF IN AN APPROVED MANNER.
2. INSPECT TEMPORARY SLOPE PIPES ONCE A WEEK AND AFTER EACH STORM EVENT THAT PRODUCES RUNNOFF.
3. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN () PARENTHESIS.

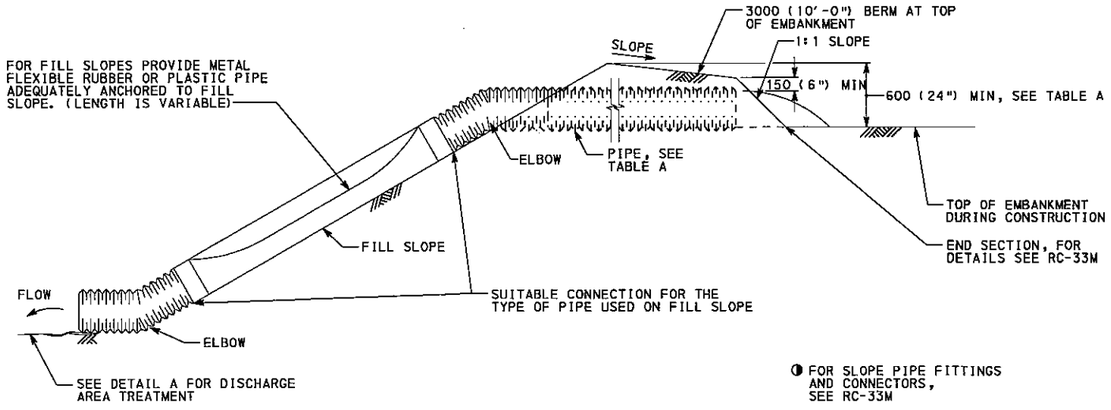


SECTION



PLAN

DETAIL A



◑ FOR SLOPE PIPE FITTINGS AND CONNECTORS, SEE RC-33M

SECTION A-A

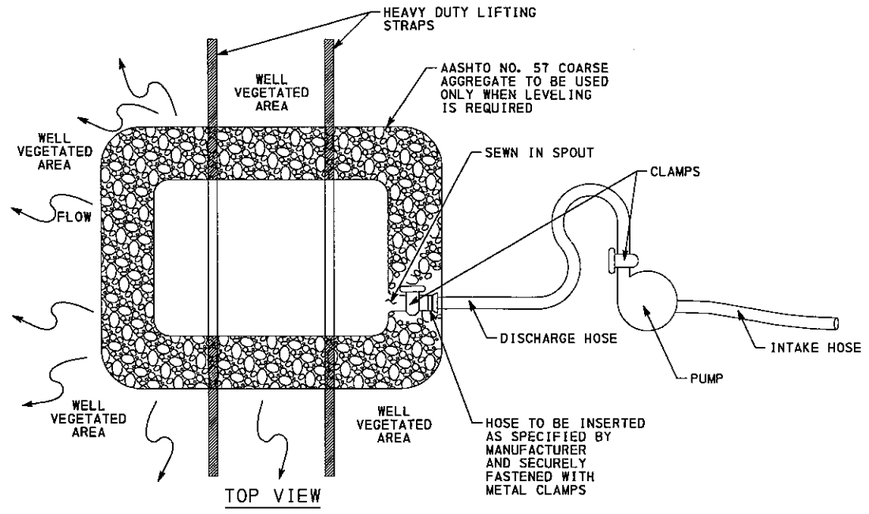
TEMPORARY SLOPE PIPE◑

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

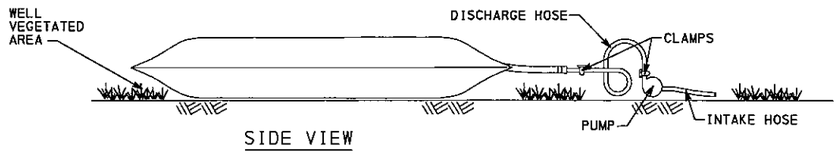
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

TEMPORARY DIVERSIONS

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 1 OF 1
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-74M



TOP VIEW



SIDE VIEW

PUMPED WATER FILTER BAG

NOTES

1. LOCATE BAG IN LEVEL AREAS (LESS THAN 5% GRADE). WHEN LEVEL AREAS ARE NOT AVAILABLE, PLACE AASHTO NO. 57 COARSE AGGREGATE TO LEVEL THE BAG.
2. LOCATE BAG IN A WELL VEGETATED AREA. DISCHARGE ONTO A STABLE, EROSION RESISTANT AREA. WHEN VEGETATED AREA IS NOT AVAILABLE, PROVIDE A GEOTEXTILE (CLASS 4, TYPE A) LINED FLOW PATH TO A STABLE EROSION RESISTANT RECEIVING WATER COURSE OR A WELL VEGETATED AREA.
3. LOCATE BAG IN AN AREA ACCESSIBLE BY EQUIPMENT FOR MAINTENANCE AND REMOVAL PURPOSES.
4. DO NOT INSERT MORE THAN ONE HOSE INTO A BAG.
5. REPLACE THE BAG WHEN 50% OF THE SEDIMENT CAPACITY HAS BEEN FILLED AND/OR WHEN THERE IS A FAILURE. THE ADDITIONAL BAGS WILL BE PAID AS EACH.
6. REMOVE AND PROPERLY DISPOSE OF THE PUMPED WATER FILTER BAGS. RESTORE THE AREA IN ACCORDANCE WITH THE SPECIFICATIONS IN PUBLICATION 408. DO NOT CUT FILTER BAG OR DISTRIBUTE AND SEED SEDIMENT.
7. DO NOT PERMIT DISCHARGE FROM THE BAG TO DRAIN BACK INTO WORK OR ACCESS AREAS OF THE PROJECT.
8. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN ( ) PARENTHESIS.

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

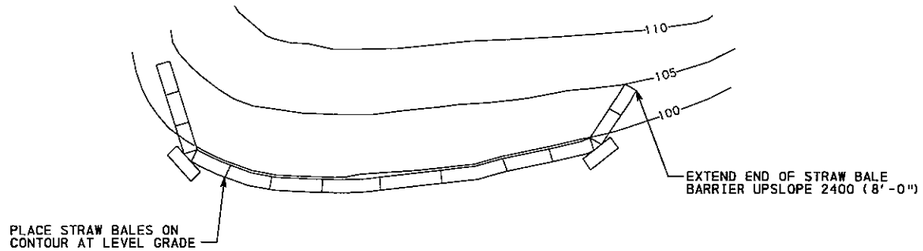
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

DEWATERING DEVICES

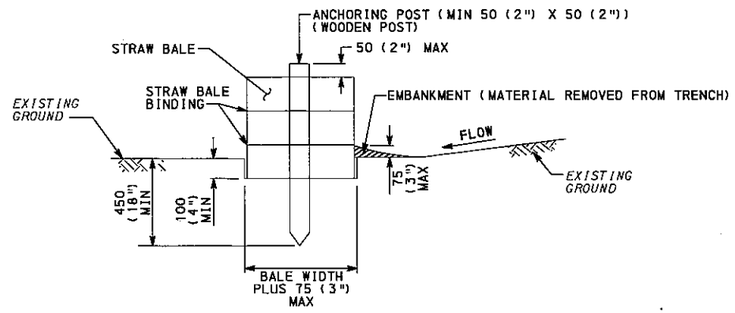
RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 1 OF 1
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-75M

NOTES

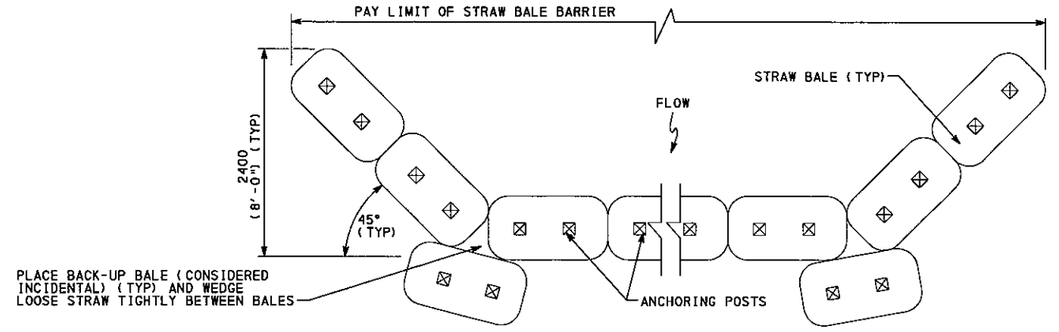
1. PLACE AND COMPACT EMBANKMENT MATERIAL FROM THE TRENCH EXCAVATION ON THE UPSLOPE SIDE OF THE STRAW BALE BARRIER.
2. PLACE STRAW BALE BARRIER ON UNIFORM GRADE. EXTEND BOTH ENDS UPSLOPE 2400 (8'-0") MIN AT 45 DEGREES FROM MAIN STRAW BALE BARRIER ALIGNMENT.
3. REMOVE SEDIMENT ACCUMULATION WHEN DEPTH OF SEDIMENT EQUALS 75 (3") ABOVE THE COMPACTED EMBANKMENT MATERIAL.
4. PLACE BALES SO BINDINGS ARE IN THE HORIZONTAL POSITION.
5. ANCHOR EACH BALE WITH TWO WOOD STAKES MINIMUM. DRIVE FIRST STAKE AT AN ANGLE AND INTO THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER.
6. REMOVE/REPLACE STRAW BALE BARRIER EVERY THREE MONTHS WHEN DIRECTED OR WHEN NO LONGER NEEDED. PROPERLY DISPOSE OF STRAW, POSTS AND SEDIMENT.
7. REPLACE UNDERCUT AND OVERTOPPED SECTIONS OF THE BARRIER WITH A ROCK FILTER OUTLET.
8. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN ( ) PARENTHESIS.



CONTOUR PLAN

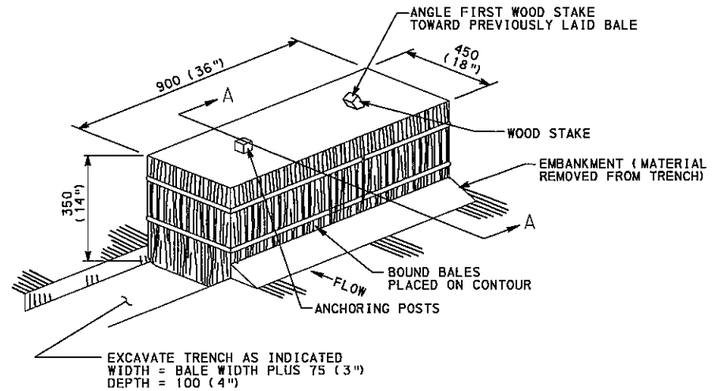


SECTION A-A



PLAN

STRAW BALE BARRIER



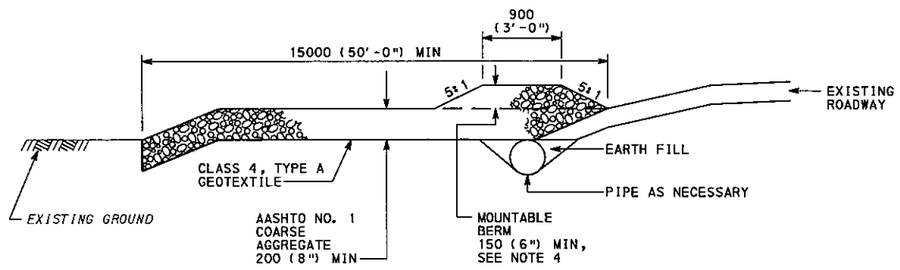
STRAW BALE BARRIER DETAIL

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

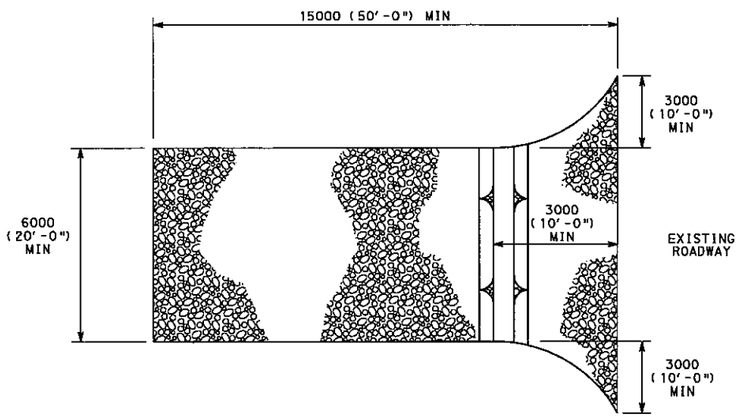
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

STRAW BALE BARRIER

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 1 OF 1
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-76M



PROFILE



PLAN

ROCK CONSTRUCTION ENTRANCE

NOTES

1. INSPECT THE ENTRANCE DAILY. REMOVE ALL SEDIMENT DEPOSITED ON THE PUBLIC ROADWAYS AND RETURN TO THE CONSTRUCTION SITE. WASHING OF THE ROADWAY WILL NOT BE PERMITTED.
2. MAINTAIN THE SPECIFIED ROCK CONSTRUCTION ENTRANCE THICKNESS. PLACE ADDITIONAL ROCK WHENEVER ROCK BECOMES CLOGGED WITH SEDIMENT.
3. MAINTAIN STOCKPILE OF AASHTO NO. 1 COARSE AGGREGATE.
4. CONSTRUCT A MOUNTABLE BERM ONLY WHEN 150 (6") MIN COVER CANNOT BE PROVIDED OVER THE PIPE.
5. SATISFACTORILY REMOVE MATERIALS AS PER SPECIFICATION IN SECTION 849 WHEN ROCK CONSTRUCTION ENTRANCE IS NO LONGER NEEDED.
6. PROVIDE GEOTEXTILE MATERIAL MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 735. FURNISH AND INSTALL IN ACCORDANCE WITH SECTION 212. PROVIDE GEOTEXTILE ALONG ALL INTERFACE AREAS WITH GROUND CONTACT.
7. CONSTRUCT ROCK CONSTRUCTION ENTRANCE WITHIN THE RIGHT-OF-WAY OR EASEMENT AREAS. ENTRANCE MAY BE CONSTRUCTED ON A SKEW IF ADEQUATE PULL OUT SIGHT DISTANCE IS AVAILABLE.
8. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE NOTED. U.S. CUSTOMARY UNITS ARE IN () PARENTHESIS.

NOTE: EITHER ALL METRIC OR ALL ENGLISH VALUES MUST BE USED ON PLANS. METRIC AND ENGLISH VALUES SHOWN MAY NOT BE MIXED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF DESIGN

ROCK CONSTRUCTION ENTRANCE

RECOMMENDED AUG. 29, 2008	RECOMMENDED AUG. 29, 2008	SHT 1 OF 1
ACTING CHIEF, HWY. QA DIVISION	DIRECTOR, BUREAU OF DESIGN	RC-77M