July 12, 1989

TO WHOM IT MAY CONCERN:

The Office of County Engineer is preparing standard details. The current list of details is printed below.

LIST OF STANDARD DETAILS

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(Alternating row dates for clarity)
Discharge to Unconfined Section (Flared Outlet) (Minimum Tailwater Condition)

PLAN VIEW

PROFILE VIEW

Rip rap to be embedded in proposed transition section

Graded Aggregate Filter  See Rip rap standard & specifications

CROSS SECTION A-A
Discharge to confined channel section

Plan View

Top of rip rap

Top of channel

Profile View

Section View

Minimum depth of rip rap = maximum depth of flow (downstream normal depth or discharge depth, which ever is greater)

Slope to vary from 2:1 at pipe outlet to existing channel slope at end of apron.

Width of bottom to vary from 1/2 pipe diameter pipe outlet to existing channel bottom at end of apron

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: April 12, 1980

riprap outlet

scs-II

COUNTY ENGINEER

REVISIONS: OF

DETAIL No. -02
Discharge to Semi Confined Section (Maximum Tailwater Condition)

Min. depth = discharge or tailwater depth, whichever is greater.

Depth dictated by channel section at end of apron

Filter cloth or graded aggregate

\[ w = d + 0.4 L_e \]

6" min. Channel section to vary from A-A to B-B

Filter cloth or graded aggregate filter

See rip rap standard & specification

SECTION B-B

\[ w = d + 0.4 L_e \]

4"

d/2 16" min.

Filter cloth or graded aggregate filter

SECTION A-A

riprap outlet

SCS - III
PROFILE - RIP-RAP OUTFALL WITH PLUNGE POOL

MAX. 60" Ø PIPE
EX.GRADE

TOP SOIL TO BE PLACED OVER RIP-RAP TO FACILITATE PLANT GROWTH

MINIMUM RIP-RAP ø20-12"

STABILIZE W/ KY-31 TALL FESCUE @ 100 LB/AC.
TO BE SPREAD OVER SURFACE OF RIP-RAP OUTFALL

FILTER CLOTH POLYFILTER "X" OR EQUIV.

FOR USE WHERE REGULAR RIP-RAP OUTLETS ARE NOT FEASIBLE.

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: April 12, 1989
COUNTY ENGINEER

plunge pool

REVISIONS: OF
DETAIL NO. -04
Section Rip-Rap

For slopes 1:1.5 or flatter

Section Grouted Rip-Rap

For steep slopes up to 6:1 and 5' or higher

Section Gabions

Continuous turned down wall

bank protection of streams
CUTOFF WALL AND CONC. PAVING

GENERAL NOTES
1. REFER TO MARYLAND STATE HIGHWAY ADMINISTRATION FOR MATERIALS AND METHODS OF CONSTRUCTION.
2. CHANNEL CROSS SECTION TO TRANSITION TO EXISTING DITCH AT END OF PAVING.
3. THIS STANDARD TO BE USED ONLY ON APPROVAL BY THE DEPT. OF TRANSPORTATION.
4. INSTALL FILTER CLOTH UNDER RIP-RAP.
5. f_c = 3500 p.s.i. at 28 DAYS.
6. WHEN CONCRETE PAVING IS USED, WIRE MESH SHALL BE EXTENDED DOWN INTO CUTOFF WALL AT LOWER END OF PAVING.

CUTOFF WALL AND RIP-RAP PAVING

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: April 17, 1980

COUNTY ENGINEER

REVISIONS:  OF -06
This is a minimum design.
STREET SIGN DETAIL

This is the minimum required by the Subdivision Ordinance. For more extensive standards refer to the Manual on Uniform Traffic Control Devices and the Standards of the West Virginia Department of Transportation.
MAJOR TREES:

Acceptable major trees shall be 8' to 10' tall and have minimum caliper of 1\(\frac{1}{4}\)" measured 6" above ground level. They shall be branch at a point approximately 60% of the total height of the tree above ground. Larger size trees are acceptable but must conform to American Standards for nursery stock.

- **Acer saccharum** (Sugar Maple)
- **Carpinus betulus** (European Hornbeam)
- **Cladrastis lutea** (Yellowwood)
- **Fagus grandifolia** (American Beech)
- **Fagus sylvatica** (European Beech)
- **Ginkgo biloba** (Male Grafted Ginkgo)
- **Fraxinus Pennsylvanica Marshall** (Marshall Seedless Ash)
- **Gleditsia triacanthos inermis** (Thornless Honeylocust)
- **Quercus alba** (White Oak)
- **Quercus borealis** (Red Oak)
- **Quercus palustris** (Pin Oak)
- **Quercus phellos** (Willow Oak)
- **Tilia cordata** (Little Leaf Linden)
- **Tilia tomentosa** (Silver Linden)
- **Zelkova serrata** (Village Green Zelkova)

MINOR TREES:

Acceptable minor trees shall be a minimum of 6' tall and have a minimum caliper of 3/4" measured at 6" above the ground. They shall be branch at a point approximately 60% of the total height of the tree above ground. Larger size trees are acceptable but must conform to American Standards for nursery stock.

- **Acer campestre** (Hedge Maple)
- **Acer ginnala** (Amur Maple)
- **Carpinus caroliniana** (American Hornbeam)
- **Cercis canadensis** (Redbud)
- **Cornus florida** (White Flowering Dogwood)
- **Cornus florida rubra** (Red Flowering Dogwood)
- **Cornus kousa** (Kousa Dogwood)
- **Crataegus phaenopyrum** (Washington Hawthorn)
- **Crataegus mouis** (Downey Hawthorn)
- **Koelreuteria paniculata** (Golden Rain-tree)
- **Ostrya virginiana** (Ironwood)
- **Prunus serrulata 'Kwanzan'** (Kwanzan Double Pink Flowering Cherry)
- **Prunus yodensis** (Yoshino Cherry - White)
- **Pyrus calleryana** (Callery Pear - Bradford Pear)
- **Sophora japonica** (Chinese Scholar-tree)

OTHER SPECIES:

Considered by request.

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JEFFERSON COUNTY, WEST VIRGINIA

Approved: April 13, 1989

COUNTY ENGINEER

street tree variety list

REVISIONS: M

DETAIL No. 41
TWO PIECES REINFORCED RUBBER HOSE.
DOUBLE STRAND NO. 14 GAGE WIRE TWISTED.
TWO STAKES AS SPECIFIED 2" x 2" LOCATED PARALLEL TO PAVING EDGE.

3" MULCH AS SPECIFIED.
FINAL GRADE AND SAUCER.
SOIL SHOULDER AS SPECIFIED.
SOIL MIX BACKFILL
IF HARDPAN LOOSEN BEFORE PLANTING

TREE BALL

NO LESS THAN 3"

9" ROOT BALL
NOTES:
1. THE DIMENSIONS SHOWN HERE ARE TYPICAL AND MAY BE MODIFIED IN SPECIFIC SITUATIONS WITH APPROVAL OF THE COUNTY ENGINEER.
2. TREES ARE TO BE LOCATED WITH THE FOLLOWING MINIMUM CLEARANCES:
   a. 5' FROM WATER METER
   b. 5' FROM GAS BOX
   c. 5' FROM INLET OR MH
   d. 10' FROM FIRE HYDRANT
   e. 15' FROM STREET LIGHT
3. MINOR TREE SPACING 30' (=5') O.C. MIN.
4. MAJOR TREE SPACING 50' (=5') O.C. MIN.
5. SHADE TREES TO BE 1 1/2" MINIMUM CALIPER 10' MINIMUM HEIGHT.
6. FLOWERING TREES TO BE 3/4" MINIMUM CALIPER 6' MINIMUM HEIGHT.
7. SPECIES TO BE AS APPROVED BY JEFFERSON COUNTY ENGINEER.
8. SEE DETAIL NO. M-42 FOR PLANTING DETAILS.
LANDSCAPE SPECIFICATIONS

1. ALL SIZES AND SPECIES MENTIONED ARE TO BE IN ACCORDANCE WITH THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z60.1-1980, OR LATEST REVISION).

2. LANDSCAPE CONTRACTOR IS TO FOLLOW GUIDELINES SET FORTH IN THE LANDSCAPE SPECIFICATION GUIDELINES FOR BALTIMORE-WASHINGTON METROPOLITAN AREA (SECOND EDITION-1986). THESE GUIDELINES PRESENT METHODS FOR SOIL PREPARATION, ESTABLISHING TURF, AND INSTALLATION OF PLANT MATERIALS.

3. PLANTS AND MATERIALS SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR UNDER GUIDELINES SET FORTH IN THE LANDSCAPE SPECIFICATION GUIDELINE FOR BALTIMORE AND WASHINGTON METROPOLITAN AREAS, SECTION 1.15.

4. OWNER RESERVES THE RIGHT TO COORDINATE IMPLEMENTATION, AND TO OVERSEE STANDARDS, PRACTICES AND INSTALLATION OF PROPOSED LANDSCAPE PLAN.

5. NO PLANTINGS SHALL BE LOCATED WITHIN FOUR FEET OF A FIRE HYDRANT OR SIAMESE CONNECTION.

6. ALL PLANTS SIX FEET IN HEIGHT AND TALLER ARE TO BE STAKED PER STANDARDS DETAIL M-42.

7. THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL LANDSCAPING AND SCREENING, INCLUDING REPLACEMENT OF DEAD OR DYING MATERIALS, AND THE UPKEEP OF ANY BERM, WALLS, OR FENCES.

8. SEE STANDARD DETAILS M-41 AND M-43, RESPECTIVELY, FOR LISTS OF AND LOCATION DETAILS FOR STREET TREES.

9. SEE STANDARD DETAILS WM-56, WP-33 AND WP-42, RESPECTIVELY, FOR BASIN LANDSCAPING, BANK VEGETATION AND STREAM VEGETATION.
OPTION A

Planting Description - one row of evergreen shrubs with a height of six (6) feet or more when planted, likely to reach a height of six (6) feet or more at maturity, planted every five (5) linear feet; one row of medium evergreen trees with a height of six (6) feet or more when planted, likely to reach a height of twenty (20) feet or more at maturity, planted every ten (10) linear feet; one row of deciduous trees with a height of six (6) feet or more when planted, likely to reach a height of thirty (30) feet or more at maturity, planted every twenty (20) linear feet; one row of large evergreen trees with a height of six (6) feet or more when planted, likely to reach a height of thirty (30) feet or more at maturity, planted every twenty (20) linear feet.

OPTION B

Planting Description - one row of medium evergreen trees with a height of six (6) feet or more when planted, likely to reach a height of twenty (20) feet or more at maturity, planted every ten (10) linear feet; an earth berm six (6) feet in height with a 1 to 1 slope planted with grass or other ground cover that will prevent erosion; one row of large evergreen trees with a height of six (6) feet or more when planted, likely to reach a height of thirty (30) feet or more at maturity, planted every twenty (20) linear feet.

OPTION C

Planting Description - one row of medium evergreen trees with a height of six (6) feet or more when planted, likely to reach a height of twenty (20) feet or more at maturity, planted every ten (10) linear feet; a solid board fence, masonry or brick wall with a height of six (6) feet; one row of large evergreen trees with a height of six (6) feet or more when planted, likely to reach a height of thirty (30) feet or more at maturity, planted every twenty (20) linear feet.

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: August 8, 1990

screen planting wide buffer

REVISIONS: M
DETAIL No. 52
OPTION D

Planting Description - one row of evergreen shrubs, with a height of two (2) feet or more when planted, likely to reach a height of six (6) feet or more at maturity, planted every five (5) linear feet; one row of medium evergreen trees, with a height of six (6) feet or more when planted, likely to reach a height of twenty (20) feet or more at maturity, planted every ten (10) linear feet; one row of large evergreen trees, with a height of six (6) feet or more when planted, likely to reach a height of thirty (30) feet or more at maturity, planted every twenty (20) linear feet.

OPTION E

Planting Description - one row of medium evergreen trees, with a height of six (6) feet or more when planted, likely to reach a height of twenty (20) feet or more at maturity, planted every ten (10) linear feet; a solid board fence, masonry or brick wall with a height of six (6) feet; one row of large evergreen trees, with a height of six (6) feet or more when planted, likely to reach a height of thirty (30) feet or more at maturity, planted every twenty (20) linear feet.
Option F

Planting Description - one row of evergreen shrubs with a height of two (2) feet or more when planted, likely to reach a height of six (6) feet or more at maturity, planted every five (5) linear feet; one row of medium evergreen trees with a height of six (6) feet or more when planted, likely to reach a height of twenty (20) feet or more at maturity, planted every ten (10) linear feet.

Option G

Planting Description - one row of medium evergreen trees with a height of six (6) feet or more when planted, likely to reach a height of twenty (20) feet or more at maturity, planted every ten (10) linear feet; and a solid board fence, masonry or brick wall with a height of six (6) feet.
**Conventional**

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>84.87'</td>
<td>21.027'</td>
<td>50.0'</td>
<td>20.0'</td>
<td>40.0'</td>
<td>50.0'</td>
<td>55.90'</td>
<td>50.0'</td>
<td>75.0'</td>
<td>25.0'</td>
<td>25.0'</td>
</tr>
<tr>
<td>Extra-wide</td>
<td>292.545'</td>
<td>216.77'</td>
<td>60.0'</td>
<td>22.0'</td>
<td>50.0'</td>
<td>60.0'</td>
<td>64.81'</td>
<td>55.0'</td>
<td>55.0'</td>
<td>25.0'</td>
<td>25.6'</td>
</tr>
</tbody>
</table>

**Tangent Offset**

The tangent offset cul-de-sac shown is typical but any angle of I can be used.

<table>
<thead>
<tr>
<th></th>
<th>AK</th>
<th>AL</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>30.77'</td>
<td>28.63'</td>
<td>50.0'</td>
<td>20.0'</td>
<td>40.0'</td>
<td>50.0'</td>
<td>70.71'</td>
<td>75.0'</td>
<td>25.0'</td>
<td>25.0'</td>
<td>45'</td>
<td>10.29'</td>
<td>14'</td>
</tr>
<tr>
<td>Extra-wide</td>
<td>31.607'</td>
<td>34.53'</td>
<td>40.0'</td>
<td>22.0'</td>
<td>50.0'</td>
<td>50.0'</td>
<td>81.24'</td>
<td>85.0'</td>
<td>25.0'</td>
<td>25.0'</td>
<td>45'</td>
<td>17.06'</td>
<td>17'</td>
</tr>
</tbody>
</table>

**Eyebrow**

The Eyebrow cul-de-sac's use is to increase the amount of road frontages and can be used only on local roads.

<table>
<thead>
<tr>
<th></th>
<th>AL</th>
<th>L</th>
<th>AK</th>
<th>K</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>123.96'</td>
<td>41.03'</td>
<td>70.77'</td>
<td>50.0'</td>
<td>20.0'</td>
<td>40.0'</td>
<td>50.0'</td>
<td>25.0'</td>
<td>25.0'</td>
<td></td>
</tr>
</tbody>
</table>
A "T" or "Y" Turnaround shall be used in lieu of a cul-de-sac only if the street is to be extended in the future.
RESIDENTIAL

SECTION B.2.a.17
TYPE RG
LIMITED LIGHT

SECTION B.2.a.18
TYPE RL
LIGHT

2"
6"

TYPE RM
MEDIUM

1/2"
2/2"
5"

SECTION II.2.j.1
TYPE CM
MEDIUM

1/2"
1/2"
8"

TYPE CH
HEAVY

2"
4"

TYPE RH
HEAVY

2"
4"

TYPE RX
EXTRA HEAVY

COMMERCIAL

SECTION II.2.j.1
TYPE CL
LIGHT

1/2"
2/2"
5"

SECTION II.2.j.1
TYPE CM
MEDIUM

1/2"
1/2"
8"

TYPE CH
HEAVY

2"
4"

TYPE CX
EXTRA HEAVY

LEGEND

ASPHALT SURFACE COURSE
ASPHALT BASE COURSE
4000 PSI P.C. CONCRETE
GRADE CRUSHED STONE
AGGREGATE 100% OF AASHTO T59C
COMPACTED SUBGRADE
95% OF AASHTO T93C

JEFFERSON COUNTY, WEST VIRGINIA
APPROVED: JULY 27, 1980
COUNTY ENGINEER

ROAD SURFACE SECTIONS

REVISIONS:
DETAIL NO.: R - 05
SELECT ROAD PAVEMENT SECTIONS FROM DETAIL R-05B AS FOLLOWS:

1. Check Soils Survey to determine soils series of soil to be used in the subgrade.

2. Determine the Subgrade Support Class of the soils series from the table below.

<table>
<thead>
<tr>
<th>SUBGRADE SUPPORT CLASS</th>
<th>SOILS SERIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (good - excellent)</td>
<td>Berks and rock land and Weikert when Weikert when shale content is high (40% or greater retained on the No.4 screen).</td>
</tr>
<tr>
<td>B (medium)</td>
<td>Ashton, Berks, Blairton, Braddock, Dekalb, Edgemont, Huntington, Laidig, Landes, Linde, Melvin, Monogahela, and Weikert, and Frakstown when shale content is medium to high.</td>
</tr>
<tr>
<td>C (poor)</td>
<td>Benevola, Chilhowie, Clifton, Duffield, Frankstown, Fedwick, Hagerstown, Opequon</td>
</tr>
</tbody>
</table>

3. Select the appropriate road section based on the proposed use of the pavement and the Subgrade Support Class.

<table>
<thead>
<tr>
<th>USE</th>
<th>ROAD SECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential driveways and small parking lots with 50 stalls or less and no trucks</td>
<td>A-1, B-1, C-1</td>
</tr>
<tr>
<td>Subdivision roads and large parking lots</td>
<td>A-2, B-2, C-2</td>
</tr>
<tr>
<td>State road widening, industrial parking lots and truck driveways</td>
<td>A-3, B-3, C-3</td>
</tr>
</tbody>
</table>
NOTE: These sections are based on a guide compiled by the Flexible Pavement Council.

See WVDOT Standard Specifications, Tables 703.4 and 704.6.2 for sizes and classes of stone.

JEFFERSON COUNTY, WEST VIRGINIA
COUNTY ENGINEER

APPROVED: Jan 25 1995

ROAD SURFACE SECTIONS

REVISIONS: R
DETAIL NO.: -05B
The Flexible Pavements Council (FPC) has compiled a guide for selecting road pavement sections based on "subgrade support or soil condition" and intended traffic. Applying these guidelines to Jefferson County the following set of pavements sections would be recommended:

<table>
<thead>
<tr>
<th>Use</th>
<th>Subgrade Support Class</th>
<th>Thickness and Size Range of Aggregate</th>
<th>Thickness Asphalt Base</th>
<th>Asphalt Surface</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Driveways</td>
<td>A</td>
<td>5&quot; of 1-1/2&quot; minus base</td>
<td>-</td>
<td>2&quot;</td>
<td>7&quot;</td>
</tr>
<tr>
<td>Small Parking Lots</td>
<td>B</td>
<td>6&quot; of 1-1/2&quot; minus base</td>
<td>-</td>
<td>2-1/2&quot;</td>
<td>8-1/2&quot;</td>
</tr>
<tr>
<td>(50 stalls or less, no trucks)</td>
<td>C</td>
<td>7&quot; of 1-1/2&quot; minus base</td>
<td>2&quot;</td>
<td>1&quot;</td>
<td>10&quot;</td>
</tr>
<tr>
<td>Subdivision Roads and Large Parking Lots up to 500 stalls</td>
<td>A</td>
<td>5&quot; of 1-1/2&quot; minus base</td>
<td>2&quot;</td>
<td>1&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>4&quot; of 1-1/2&quot; minus base</td>
<td>2/ over 3&quot; coarse aggregate</td>
<td>2&quot;</td>
<td>10&quot;</td>
</tr>
<tr>
<td>State Road Widening,</td>
<td>A</td>
<td>5&quot; of 1-1/2&quot; minus base</td>
<td>2/ over 3&quot; coarse aggregate</td>
<td>2-1/2&quot;</td>
<td>11-12&quot;</td>
</tr>
<tr>
<td>Industrial Parking Lots</td>
<td>B</td>
<td>6&quot; of 1-1/2&quot; minus base</td>
<td>2/ over 4&quot; coarse aggregate</td>
<td>2-1/2&quot;</td>
<td>14&quot;</td>
</tr>
<tr>
<td>and Truck Driveways</td>
<td>C</td>
<td>7&quot; of 1-1/2&quot; minus base</td>
<td>2/ over 5&quot; coarse aggregate</td>
<td>3-1/2&quot;</td>
<td>17&quot;</td>
</tr>
</tbody>
</table>

1/ Table 704.6,2, WVDOH Standard Specifications, Classes 1,2,4,6 or 8 or Table 703.4 WVDOH Standard Specifications, Sizes 4 to 57

2/ Table 703.4, WVDOH Standard Specifications, Sizes 1 to 357

Subgrade Support Class (SSC) comprise the following soils series:

SSC "A" (Good-to-Excellent)--Berks and rock land and Weikert when Weikert's shale content is high (40% or greater ratteded on No. 4 screen).

SSC "B" (Medium)--Ashton, Berks, Blairton, Braddock, Dekalt, Edgemont, Huntington, Laidig, Landes, Lindsie, Melvin, Monongahela, and Weikert, and Frankstown when shale content is medium to high.

SSC "C" (Poor)--Benevola, Chilhowie, Clifton, Duffield, Frankstown, Fedwick, Hagerstown, Opequon
MIN. LIMITS OF VERTICAL CUT

12" MIN.
Distressed Area Limits 12" MIN.
Top Courses
Base Course
Subgrade

MIN. LIMITS OF VERTICAL CUT

12" MIN.
Distressed Area Limits 12" MIN.
Top Courses
Base Course

REMOVE MATERIAL DOWN TO A LEVEL AT LEAST 6" INTO FIRM SUBGRADE

4" MIN.

DISTRESSED AREA LIMITS

6" MIN.
Top Courses
Base Course

COMPACT ALL REPAIR MATERIALS TO 95% OF MAXIMUM DENSITY

JEFFERSON COUNTY, WEST VIRGINIA

SURFACE REPAIR METHODS

COUNTY ENGINEER

APPROVED: JULY 25, 1980

REVISIONS:
DETAIL NO. R - 06
TYPICAL SECTION
Scaled 1"=10'

NOTES:

1. See Section 8.2.a.1 for roadway widths where subdivision is served by a single entrance.
2. See detail no. R-5 for other paving section options.
3. Shoulders may be stabilized with grass, gravel or asphalt. However, base gravel must extend to daylight to allow drainage.
4. This is minimum paving section. Refer to Detail R-5 for other sections.

Prime Coat (WVDH Sec.409)
Tack Coat (WVDH Sec.408)
1' Wearing Course (#2 WVDH Sec.401,Para.401.4.6)
2' Base Course (#2 WVDH Sec.401,Para. 401.4.6)

(See note 4.)
1 1/2" Wearing Course
2 1/2" Base Course
6" Gravel on compacted subgrade

Use Class #2 aggregate: WVDOH Sec. 704, para. 704.6
Minimum compaction to be 95% of maximum dry density per AASHTO T99 C

Note: In the event the WVDOH requirements are more stringent the WVDOH requirements will control.
* or thickness of pavement, when abutting concrete pavement.
* * Does not apply, when abutting concrete pavement. Instead a longitudinal joint with tie bars or tie bolt assemblies shall be constructed at this location.

**Slope @ 1/2":1"**

**3,000 psi Concrete (Typ)**

**COMBINATION CONCRETE CURB AND GUTTER**

**TYPE I - BARRIER TYPE**

**COMBINATION CONCRETE CURB AND GUTTER**

**TYPE III - MOUNTABLE TYPE**

**COMBINATION CONCRETE CURB AND GUTTER**

**TYPE IV - DROP CURB**
1. APPLY TACK COAT WHEN PLACED ON EXISTING PAVEMENT.
2. USE IN TEMPORARY SITUATIONS ONLY.
GENERAL NOTES

1. SIDEWALK RAMPS SHOULD BE LOCATED AS INDICATED, HOWEVER, EXISTING SURFACE UTILITIES MAY AFFECT PLACEMENT.

PLAN

SECTION "A-A"

COARSE BROOM TO PROVIDE NON-SKID SURFACE

RE-EDGE BORDERS ON 3 BLOCKS AFTER TEXTURE BROOMING 2" MIN. BORDER

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: March 29, 1980

WHEELCHAIR SIDEWALK RAMP

REVISIONS: DETAIL No. R - 24
Notes:
1. See WVDOH Standard Sheet G.R.1 for other details.
2. Anchored ends may be required per WVDOH standards.
These options may be used on low volume, low speed roads.

Source: National Cooperative Highway Research Program
Transportation Research Board
ELEVATION VIEW

1 foot minimum cover
13"x17"CHPA or 15" CMP (minimum)

PLAN VIEW

DRIVEWAY SWALE

OPEN SECTION
RESIDENTIAL
DRIVEWAY

JEFFERSON COUNTY, WEST VIRGINIA

REVISIONS: December 6, 1990
Jan. 25, 1995

DETAIL No. R - 31
SIMPLE MONUMENTAL ENTRANCE

(SHOPPING CENTER OR OTHER LARGE GENERATORS)

SIMPLE 15' R (MIN)

MINIMUM DESIGN STANDARDS

ACTUAL LENGTH TO BE BASED ON DESIGN SPEED AND IN ACCORDANCE TO AASHTO STANDARDS FOR ACCELERATION AND DECELERATION LANES.

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: March 30, 1989

COMMERCIAL ENTRANCE

REVISIONS: R
DETAIL No. 32
Curb stop in lieu of curbing. Place so as to allow wheelchair passage to sidewalk area.

SINGLE SPACE

Curb stop in lieu of curbing.

MULTIPLE SPACE

Handicap Sign
Pavement Marking
Marked Pedestrian Walk
PLANNED VIEW

20'-0"  24'-0" (TWO WAY TRAFFIC)

PARKING AREA

20'-0" (ONE WAY TRAFFIC)

TERTIARY | ROADWAY

5% MAXIMUM - 2% MINIMUM

SEE PAVING SECTION

COMB. CURB & GUTTER
OC CURB. SEE
DETAILS R-21 & R-22

JEFFERSON COUNTY, WEST VIRGINIA
COUNTY ENGINEER

APPROVED: March 30, 1965

TOWNHOUSE PARKING

REVISIONS: DETAIL No.
R - 42
HANDICAPPED PARKING SPACE SYMBOL

1'-6" / 1'-0" OBA STANDARD ALUM.
HANDICAPPED PARKING SIGN TO READ: "RESERVED PARKING" WITH
IDENTIFICATION SYMBOL, BOLT TO STL. TUBE WITH 3/8" CADMIUM
PLATED NUT, BOLT, & WASHERS.

SIGNS MAY BE ORDERED FROM:
CBO SAFETY
46TH AVE. N.
NASHVILLE, TN.
PH: 615-255-2717

2" Std. STL TUBE EXTEND INTO
CONC. FILLED PIPE 2'-0" PROVIDE
WELDED WATERTIGHT CAP. PAINT
P & L # 8118 "BLACK COFFEE."

PAINT PIPE BASE YELLOW

PAVEMENT

8" Ø STD. STL PIPE FILLED W/ CONC.

6'-14" LONG BARS EA WAY THRU PIPE
1'-6" CONC. BASE
Landscaped end islands used for roadway delineation.

End island dimensions for 18-foot parking stalls: suggested compound curb radii design (top), and simple curb radius design (bottom).

Dimensions of an extra wide end island with traditional radii.

A schematic representation of the sight distance problem on a ring road with a horizontal curve.


Jefferson County, West Virginia

end islands in parking lots

REVISIONS: R
DETAIL No.: 44A
Vehicle trajectory when curb radius is less than the minimum turn radius of the vehicle.

Dimensions for typical end islands for 60-degree parking (top) and 90-degree parking (bottom).

Dimensions for modified end islands to increase curb radius for 60-degree parking (top) and 90-degree parking (bottom).

Jefferson County, West Virginia

Engineer

End Islands in Parking Lots

Revisions: R
Detail No.: -44B
LIST OF STANDARD SYMBOLS

Earth Dike

Straw Bale Dike

Silt Fence

Temporary Swale

Stabilized Construction Entrance

Grade Stabilization Structure

Pipe Slope Drain

Perimeter Dike/Swale

Inlet Protection

Diversion

Grassed Waterway

Lined Waterway

Rock Outlet Protection

Subsurface Drain

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: March 10, 1989

COUNTY ENGINEER

LIST OF STANDARD SYMBOLS

REVISIONS: SC - 01

DETAIL No.
CONSTRUCTION SPECIFICATIONS

1. Stone Size - Use 2" stone, or reclaimed or recycled concrete equivalent.
2. Length - As required, but not less than 50 feet (except on a single residence lot where a 30 foot minimum length would apply).
3. Thickness - Not less than six (6) inches.
4. Width - Ten (10) foot minimum, but not less than the full width at points where ingress or egress occurs.
5. Filter Cloth - Will be placed over the entire area prior to placing of stone. Filter will not be required on a single family residence lot.
6. Surface Water - All surface water flowing or diverted toward construction entrances shall be piped across the entrance. If piping is impractical, a mountable berm with 5:1 slopes will be permitted.
7. Maintenance - The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
8. Washing - Wheels shall be cleaned to remove sediment prior to entrance onto public rights-of-way. When washing is required, it shall be done on an area stabilized with stone and which drains into an approved sediment trapping device.
9. Periodic inspection and needed maintenance shall be provided after each rain.
CONSTRUCTION NOTES FOR FABRICATED SILT FENCE

1. Woven wire fence to be fastened securely to fence posts with wire ties or staples.

2. Filter cloth to be fastened securely to woven wire fence with ties spaced every 24" at top and mid section.

3. When two sections of filter cloth adjoin each other they shall be overlapped by six inches and folded.

4. Maintenance shall be performed as needed and material removed when "bulges" develop in the silt fence.

POSTS: STEEL EITHER T OR U TYPE OR 2" HARDWOOD.
FENCE: WOVEN WIRE, 14 GA, 6" MAX. MESH OPENING.
FILTER CLOTH: FILTER X, MIRAFI 100X, STABI-LINKA T140N OR APPROVED EQUAL.
PREFABRICATED UNIT: GEOFAB, ENVIROFENCE, OR APPROVED EQUAL.
1. Bales shall be placed at the toe of a slope or on the contour and in a row with ends tightly abutting the adjacent bales.

2. Each bale shall be embedded in the soil a minimum of (4) inches, and placed so the bindings are horizontal.

3. Bales shall be securely anchored in place by either two stakes or re-bars driven through the bale. The first stake in each bale shall be driven toward the previously laid bale at an angle to force the bales together. Stakes shall be driven flush with the bale.

4. Inspection shall be frequent and repair replacement shall be made promptly as needed.

5. Bales shall be removed when they have served their usefulness so as not to block or impede storm flow or drainage.

Jefferson County, West Virginia

County Engineer

March 10, 1980

Straw Bale Dike

Revisions: SC
Detail No.: -12
SWALE INLET PROTECTION DETAIL

2" x 4" Frame

18"

Nail Strip

12"

Posts driven into ground

Wire Mesh
Approved Filter cloth

Excavate and re-compact earth

Edge of roadway or top of earth dike?

6" min.

FLOW

FLOW

FLOW

Curb Inlet Protection Detail

6" maximum spacing of 2" x 4" spacers

2" stone

2' x 4' anchors

2' x 4' weir

2' x 4' spacer

2" stone

Filter cloth

2" x 4' spacer

2' x 4' weir

sand bag or alternate weight

INLET

To pipe

Inlet Protection Detail

Jefferson Country, West Virginia

COUNTY ENGINEER

APPROVED: March 10, 1980

REVISIONS: DETAIL No.

SC-13
CONSTRUCTION NOTES

1. Woven wire fence to be fastened securely to fence posts with wire ties or staples.

2. Filter cloth to be fastened securely to woven wire fence with ties spaced every 24" at top and mid section.

3. When two sections of filter cloth adjoin each other they shall be overlapped by six inches and folded.

4. Maintenance shall be performed as needed and material removed when bulges develop.

WOVEN WIRE FENCE (MIN. 14 1/2 GAUGE, MAX. 6" MESH SPACING)

PLAN VIEW

SECTION A-A

POSTS: 2" x 4"

FENCE: WOVEN WIRE, 14 Ga, 6" Max. MESH OPENING.

FILTER CLOTH: FILTER X, MIRAFI 100X, STABI-LINKA TI40N OR APPROVED EQUAL.

PREFabricated UNIT: GEOfab, ENVIROfence, OR APPROVED EQUAL.

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: MARCH 31, 1980

COUNTY ENGINEER

CULVERT INLET PROTECTION DEVICE

REVISIONS: SC

DETAIL NO. -14
Schematic representation of a brushlayer fill installation.

Live fascine with jute or coir. Rooted/leafed condition of the living plant material is not representative at time of installation.

Source: Public Works, Dec. 1989

JEFFERSON COUNTY, WEST VIRGINIA

brushlayer slope stabilization

REVISIONS:
DETAIL No. SC -15
CONSTRUCTION SPECIFICATIONS

1. All dikes shall be compacted by earth-moving equipment.
2. All dikes shall have positive drainage to an outlet.
3. Top width may be wider and side slopes may be flatter if desired to facilitate crossing by construction traffic.
4. Field location should be adjusted as needed to utilize a stabilized safe outlet.
5. Earth dikes shall have an outlet that functions with a minimum of erosion. Runoff shall be conveyed to a sediment trapping device such as a sediment trap or sediment basin where either the dike channel or the drainage area above the dike are not adequately stabilized.
6. Stabilization shall be: (A) in accordance with standard specifications for seed and straw mulch or straw mulch if not in seeding season, (B) flow channel as per the chart below.

FLOW CHANNEL STABILIZATION

<table>
<thead>
<tr>
<th>TYPE OF TREATMENT</th>
<th>CHANNEL GRADE</th>
<th>DIKE A</th>
<th>DIKE B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5-3.0%</td>
<td>Seed and Straw Mulch</td>
<td>Seed and Straw Mulch</td>
</tr>
<tr>
<td>2</td>
<td>3.1-5.0%</td>
<td>Seed and Straw Mulch</td>
<td>Seed using Jute, or Excelsior; Sod; 2” Stone</td>
</tr>
<tr>
<td>3</td>
<td>5.1-8.0%</td>
<td>Seed with Jute, or Sod; 2” Stone</td>
<td>Lined Rip-Rap 4-8”</td>
</tr>
<tr>
<td>4</td>
<td>8.1-20%</td>
<td>Lined Rip-Rap 4-8”</td>
<td>Engineering Design</td>
</tr>
</tbody>
</table>

A. Stone to be 2 inch stone, or recycled concrete equivalent, in a layer at least 3 inches in thickness and be pressed into the soil with construction equipment.
B. Rip-Rap to be 4-8 inches in a layer at least 8 inches thickness and pressed into the soil.
C. Approved equivalents can be substituted for any of the above materials.

7. Periodic inspection and required maintenance must be provided after each rain event.
1. All temporary swales shall have uninterrupted positive grade to an outlet.

2. Diverted runoff from a disturbed area shall be conveyed to a sediment trapping device.

3. Diverted runoff from an undisturbed area shall outlet directly into an undisturbed stabilizer area at non-erosive velocity.

4. All trees, brush, stumps, obstructions, and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of the swale.

5. The swale shall be excavated or shaped to line, grade, and cross section as required to meet the criteria specified herein and be free of bank projections or other irregularities which will impede normal flow.

6. Fills shall be compacted by earth moving equipment.

7. All earth removed and not needed on construction shall be placed so that it will not interfere with the functioning of the swale.

8. Stabilization shall be as per the chart below:

   **FLOW CHANNEL STABILIZATION**

<table>
<thead>
<tr>
<th>TYPE OF TREATMENT</th>
<th>CHANNEL GRADE</th>
<th>A (5 AC OR LESS)</th>
<th>B (5 AC - 10 AC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.5-3.0%</td>
<td>SEED AND STRAW MULCH</td>
<td>SEED AND STRAW MULCH</td>
</tr>
<tr>
<td>2</td>
<td>3.1-5.0%</td>
<td>SEED AND STRAW MULCH</td>
<td>SEED USING JUTE OR EXCELSIOR</td>
</tr>
<tr>
<td>3</td>
<td>5.1-8.0%</td>
<td>SEED WITH JUTE OR EXCELSIOR; SOD</td>
<td>LINED RIP-RAP 4-8&quot;</td>
</tr>
<tr>
<td>4</td>
<td>8.1-20%</td>
<td>LINED 4-8&quot; RIP-RAP</td>
<td>ENGINEERED DESIGN</td>
</tr>
</tbody>
</table>

9. Periodic inspection and required maintenance must be provided after each rain event.
CONSTRUCTION SPECIFICATIONS

1. All perimeter dike/swale shall have uninterrupted positive grade to an outlet.

2. Diverted runoff from a disturbed area shall be conveyed to a sediment trapping device.

3. Diverted runoff from an undisturbed area shall outlet into an undisturbed stabilized area at non-erosion velocity.

4. The swale shall be excavated or shaped to line, grade, and cross section as required to meet the criteria specified in the standard.

5. Stabilization of the area disturbed by the dike and swale shall be done in accordance with the standard and specification for seed and straw mulch, and shall be done within 10 days.

6. Periodic inspection and required maintenance must be provided after each rain event.

Max. Drainage Area Limit: 2 Acres
LANDGRADING

Ditch or Diversion to divert surface flow (if required).

Bench

Grade: 2% - 3%

Bench to drain to stable outlet

X  | Y(max)
---|------
2  | 20'
3  | 30'
4  | 40'

SLOPE DETAIL (WITH BENCH)

Construction Specifications

1. All graded or disturbed areas including slopes shall be protected during clearing and construction in accordance with the approved sediment control plan until they are permanently stabilized.
2. All sediment control practices and measures shall be constructed, applied and maintained in accordance with the approved sediment control plan and the "Standards and Specifications for Soil Erosion and Sediment Control in Developing Areas".
3. Topsoil required for the establishment of vegetation shall be stockpiled in amount necessary to complete finished grading of all exposed areas.
4. Areas to be filled shall be cleared, grubbed and stripped of topsoil to remove trees, vegetation, roots or other objectionable material.
5. Areas which are to be topsoiled shall be scarified to a minimum depth of three inches prior to placement of topsoil.
6. All fills shall be compacted as required to reduce erosion, slippage, settlement, subsidence or other related problems. Fill intended to support buildings, structures and conduits, etc., shall be compacted in accordance with local requirements or codes.
7. All fill to be placed and compacted in layers not to exceed 8 inches in thickness.
8. Except for approved landfills, fill material shall be free of brush, rubbish, rocks, logs, stumps, building debris and other objectionable materials that would interfere with or prevent construction of satisfactory fills.
9. Frozen materials or soft, mucky or highly compressible materials shall not be incorporated into fills.
10. Fill shall not be placed on a frozen foundation.
11. All benches shall be kept free of sediment during all phases of development.
12. Seeps or springs encountered during construction shall be handled in accordance with the Standard and Specifications for Subsurface Drain or other approved method.
13. All graded areas shall be permanently stabilized immediately following finished grading.
14. Stockpiles, borrow areas and spoil areas shall be shown on the plans and shall be subject to the provisions of this Standard and Specifications.
PIPE OUTLET SEDIMENT TRAP ST-1

Earth Embankment
Outlet Protection

Excavate if Necessary For Storage

Flow

* Riser Embedded 9" into Concrete
OR
1/4" Metal Plate Welded All Around

All Slopes 2:1 or Flatter

4' min.

1'-6" min.

5' max.

Perforated Riser
1/4" to 1/2" Hardware Wire Cloth With Filter Cloth Securely Fastened

W = Dia. of Riser + 2 1/2"

Weld All Around

12"

EMBANKMENT SECTION THRU RISER

SIZES OF PIPE NEEDED

Barrel Diameter

Riser Diameter

Max. Drainage Area: 5 Acres

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: March 10, 1980

COUNTY ENGINEER

PIECE OUTLET SEDIMENT TRAP

REVISIONS: SC

DETAIL No. -31
SECTION A-A

EXCAVATED GRASS OUTLET SEDIMENT TRAP

CONSTRUCTION SPECIFICATION FOR ST-II

1. Volume of sediment storage shall be 1300 cubic feet per acre of contributory drainage area.

2. Minimum crest width shall be 4 x Drainage Area.

3. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.

4. The structure shall be inspected after each rain and repairs made as needed.

5. Construction operations shall be carried out in such a manner that erosion and water pollution shall be minimized.

6. The sediment trap shall be removed and area stabilized when the remaining drainage area has been properly stabilized.

7. All cut slopes shall be 1:1 or flatter.

Maximum Drainage Area: 5 Acres
STORM INLET SEDIMENT TRAP ST-III

FLOW

FLOW

YARD DRAIN

As Required

1\:1 or Flatter

I\:min

1\:1 or Flatter

CROSS SECTION

CONSTRUCTION SPECIFICATION FOR ST-III

1. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to \( \frac{1}{4} \) the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.

2. The volume of sediment storage shall be 1800 cubic feet per acre of contributory drainage.

3. The structure shall be inspected after each rain and repairs made as needed.

4. Construction operations shall be carried out in such a manner that erosion and water pollution shall be minimized.

5. The sediment trap shall be removed and the area stabilized when the constructed drainage area has been properly stabilized.

6. All cut slopes shall be 1:1 or flatter.

Maximum Drainage Area: 3 Acres

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: March 10, 1989

COUNTY ENGINEER

STORM INLET SEDIMENT TRAP

REVISIONS: SC
DETAIL NO: -33
CONSTRUCTION SPECIFICATION FOR ST-IV

1. The swale sediment trap shall be constructed in accordance with the dimensions provided on the design drawings or sized to provide the minimum storage necessary 1800 cubic feet of storage for each acre of drainage area.

2. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.

3. The structure shall be inspected after each rain and repairs made as needed.

4. Construction operations shall be carried out in such a manner that erosion and water pollution shall be minimized.

5. The sediment trap shall be removed and area stabilized when the contributory drainage area has been properly stabilized.

6. The swale sediment trap will be properly backfilled and the swale or ditch reconstructed.

Maximum Drainage Area: 2 Acres
STONE OUTLET SEDIMENT TRAP

PROFILE

CROSS SECTION A-A

OPTION: A one foot layer of 2" stone may be placed on the upstream side of the riprap in place of the embedded filter cloth.

CONSTRUCTION SPECIFICATIONS FOR ST-V

1. Area under embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.

2. The fill material for the embankment shall be free of roots and other woody vegetation as well as oversized stones, rocks, organic material or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed.

3. All cut and fill slopes shall be 2:1 or flatter.

4. The stone used in the outlet shall be small riprap 4"-8" along with a 1' thickness of 2" aggregate placed on the up-grade side on the small riprap on the embankment.

5. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to \( \frac{1}{2} \) the design depth of the trap.

6. The structure shall be inspected after each rain and repairs made as needed.

7. Construction operations shall be carried out in such a manner that erosion and water pollution is minimized.

8. The structure shall be removed and the area stabilized when the drainage area has been properly stabilized.

Maximum Drainage Area: 5 Acres

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: March 10, 1983

STONE OUTLET SEDIMENT TRAP

REVISIONS: SC
DETAIL No.: 35
RIPRAP OUTLET SEDIMENT TRAP ST-VI

PROFILE

EXISTING GROUND

WEIR CREST TO BE 0.5 × 0 DRAIN LINE BELOW EXISTING GROUND AT E OF EMBANKMENT

FILTER CLOTH

STONE THICKNESS = 1 / 2 STONE SIZE TO BE 4" TO 8"

LENGTH OF WEIR (b)

MAX. 2:1 SLOPE (TYP.)

TOP OF COMPACTED EMBANKMENT

MIN. 1% ABOVE EXIST. GROUND AT E

MAX. 5% ABOVE EXIST. GROUND AT E

FREEBOARD EQUALS 1/2 × b

WEIR CREST

CROSS SECTION

EXCAVATE FOR STORAGE

FILTER CLOTH (EMBEDDED MIN. 4" AT UPSTREAM END)

MIN. 1% FALL

STORAGE LIMIT

APRON LENGTH (5'MIN.)

UNDISTURBED GROUND

COMPACTED EMBANKMENT

CHANNEL SIDE FORMED BY COMPACTED EMBANKMENT OR EXCAVATION INTO EXISTING GROUND

STONE LINED OUTLET CHANNEL AS PER TABLE ST-VI (CHANNEL MAY BE CURVED TO FIT EXISTING TOPOGRAPHY)

FLARE APRON TO EQUAL 1.5 × WEIR LENGTH (b) AT END

PERSPECTIVE VIEW

JEFFERSON COUNTY, WEST VIRGINIA

COUNTY ENGINEER

APPROVED: March 13, 1989

RIPRAP OUTLET SEDIMENT TRAP

REVISIONS: SC

DETAIL NO.: 36
OPTIONAL SEDIMENT BASIN DEWATERING DEVICE I
WITH 6" PERFORATED RISER

TOP OF FILL

ANTI-VORTEX DEVICE

CAP END UNLESS EQUAL TO OR GREATER THAN EL OF PRIMARY RISER CREST

RISER

1" PERFORATIONS

MINIMUM 6" DIA. CMP

FILTER CLOTH OVER WIRE MESH

6" DIA. CMP

2" STONE CORE

CONTINUOUS BAND

L BASE PLATE (1/4")
SIZE: D+24"

PERFORATIONS - 6" SPACING HORIZ. & VERT. LOCATED IN CONCAVE

PERFORATIONS OR SLITS, MUST NOT BE MADE ANY LOWER THAN 6" ABOVE TOP OF THE HORIZONTAL OUTFALL BARREL.

OPTIONAL SEDIMENT BASIN DEWATERING DEVICE II

RISER

POND EMBANKMENT

6" OR 1/2" DIAMETER ROD BOLTED OR WELDED TO RISER

8" MIN. DIAMETER PERFORATED PIPE WRAPPED WITH FILTER CLOTH

CAP END OF PIPE

POND INVERT

12" MIN.

2" STONE

WELDED OR CEMENTED JOINT (WITH ADAPTER IF NECESSARY)
LIST OF STANDARD S.D. SYMBOLS

Endwall or Cutoff Wall
Flared End Section
Storm Drain Pipe
Riprap
Concrete Channel
Drop Inlets
Curb Inlets
Shallow Manhole (Rectangular)
Regular Manhole
Structure Call-Outs
  Endwall
  Manhole
  Inlet

  Numbered from low end of storm drain line

Ditch Invert

  Arrow indicates direction of flow
TYPICAL PIPE BEDDING

(Trench shown is for 18" thru 54" pipe)

For pipe without corrugations a one-inch layer of fine aggregate for leveling will normally be adequate to achieve a uniform bearing surface. For corrugated pipe, layers shall be minimum for 1/2 depth corrugations, 2" minimum for 1" depth corrugations, and 3" minimum for 2" or 2 1/2" depth corrugations.

TYPICAL PIPE BEDDING

(Trench shown is for 60" thru 108" rigid pipe in soil cut sections)

CLASS A
Concrete Cradle Load Factor=3.0

Note: $B_c = 2B_e$ or $B_c + 3$ ft
Whichever is narrower
HEAVY DUTY DUCTILE IRON TRENCH DRAIN
HEEHAH R-499D-CX TYPE "A" AND HEAVY DUTY TRENCH FRAME HEEHAH TYPE "X"

ENTRANCE WIDTH VARIES
TOP OF DRAIN ELEVATION VARIES
PAINT P3 (BLACK)

FINISHED GRADE OR PAVEMENT
8" @ MIN.

#4 @ 12' O/C Each Way (Typ.)

Standard Frame Section
Material - Cast Iron ASTM A-48
Class 30

* Check Manufacturers Specifications

JEFFERSON
COUNTY,
WEST VIRGINIA
COUNTY ENGINEER

APPROVED: April 4, 1980

TRENCH DRAIN
REVISIONS:
DETAIL NO.
SD
- 15
NOTES

1. THIS TECHNIQUE MUST BE APPROVED BY THE COUNTY ENGINEER ON A PROJECT-BY-PROJECT BASIS.

2. THIS TECHNIQUE IS TO BE USED ONLY WHEN IT IS NOT POSSIBLE TO EXTEND PIPE ENDS TO DAYLIGHT.

3. AREA OF PERFORATIONS AT EACH END TO BE AS FOLLOWS:
   a. Inlet end = 1.5 times x-section area of pipe
   b. Outlet end = 1.0 times x-section area of pipe

4. PERFORATIONS MAY BE AS FOLLOWS:
   a. 1" diameter holes at 4" apart both ways
   b. 1" x 4" slots staggered at 6" apart both ways

5. DIMENSIONS L1 AND L0 TO BE DETERMINED BASED ON PERFORATION REQUIREMENTS AND SPECIFIED CLEARANCES.
See WVDOH Standard Detail M.S. 3-B.

**PLAN VIEWS**

**JEFFERSON COUNTY, WEST VIRGINIA**

**TYPE A MANHOLE (Precast)**

**APPROVED:** April 3, 1988

**COUNTY ENGINEER**

**REVISIONS:**

**DETAIL No.:** SD - 21

- Invert channel or split pipe same size as outlet on inside of sidewalls.
- Precoat Riser Units (Reinforcing Not Shown)
NOTE: MANHOLE FRAME AND COVER TO BE LOCATED OVER STEPS. SEE PLANS FOR TOP ELEVATION.

GENERAL NOTES A & B
1. USE SOLID MASONRY (BRICK OR CONCRETE BLOCK) OR Poured CONCRETE FOR WALLS.
2. PAQUE OUTSIDE WALLS.
3. MORTAR SHALL CONFORM TO ASTM SPECIFICATION C270 TYPES M OR S.
4. REFER TO WEST VIRGINIA DEPARTMENT OF HIGHWAYS FOR MATERIALS AND METHODS OF CONSTRUCTION.
5. FOR PIPES LARGER THAN 30" PROVIDE STEPS IN CHANNELS OF STRUCTURES.
6. $f_{c} = 3,500$ RE.S.L. AT 28 DAYS.
Top of step to be non-skid surface (rough diamond design) raised 1/8" above metal elevations shown.

CAST IRON STEP
FOR MANHOLES

PLAN

SECTION C-C

Inlet Box

Reinforced Plastic and Reinforced Corrosion-Resistant Rubber Manhole Steps. (Details and dimensions may slightly vary among manufacturers' designs.)

FOR MANHOLES

GENERAL NOTES FOR INLET STEPS

1. STEPS ARE TO BE MADE OF: (1) CAST IRON, 1 INCH SQUARE (2) 3/8" STEEL ROD EMBEDDED IN POLYPROPYLENE PLASTIC, OR (3) ALUMINUM ALLOY, 7/8" BY 13/16", WITH A MINIMUM EMBEDMENT OF 3", A MINIMUM PROJECTION OF 5½", AND A MINIMUM WIDTH OF 10".

2. STEPS SHALL BE PLACED IN VERTICAL ALIGNMENT, 12" APART, AND SHALL ALIGN WITH THE COVER OPENING.

3. STEPS NOT REQUIRED IN STRUCTURES LESS THAN 4'0" DEEP.

* Applies to Inlet Boxes, O/G Separators and SWM Control Structures

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: April 4, 1989

COUNTY ENGINEER

INLET BOX & MANHOLE STEPS

REVISIONS: SD

DETAIL No. -23
The tapered top section shall be manufactured and meet the same requirements as the manhole's sidewalls, but shall conform to the dimensions detailed herein.

Lifting holes in the tapered top section and the circumferential notches in the manhole cover are for handling purposes only.

Castings are to be of the design shown and are to be of Gray-Iron meeting the requirements of 709.10 of the Specifications (WVDOH).
All concrete shall be Class "B" Concrete.
All exposed edges shall have a 3/4" x 45° chamfer. Chamfer on vertical edges shall be continued a minimum of one foot below finished ground line.

When headwalls are placed on the inlet end of corrugated metal pipe or skewed concrete pipe, a bevel shall be used at the inlet opening. The end of the pipe shall be flush with the face of the wall, as shown on the "Bevel Detail," and the bevel constructed from the end of the pipe to the face of the wall.

When headwalls are placed on the inlet end of concrete pipe, the "bell" or "groove" of the pipe shall be placed in the wall in lieu of the bevel, except when the pipe is to be cut for placing in skewed headwalls. The inside of the "bell" or "groove" shall be filled with concrete up to the flow line.

Bevels are not required at outlet headwalls.

Reinforcing fabric shall conform to the requirements of 709.3 and 709.4 of the Specifications. Reinforcing fabric, as detailed herein, shall be used in all walls of all headwall structures. The covering for the fabric shall be two inches, measured from the surface of the concrete to the face of the wire, unless otherwise specified. The fabric shall be cut as necessary to accommodate the pipe opening in the wall and may be otherwise cut or field bent to fit the structure.

Keyed or dowelled type construction joints, acceptable to the Engineer, may be used during construction.
CONSTRUCTION DETAIL - SKEWED PIPE

ELEVATION

BACKWALL DETAIL
(For Concrete Pipe)

PLAN VIEW

BEVEL DETAIL

SECTION A-A

All concrete shall be Class B Concrete.
Reinforcing steel shall be new billet steel and shall conform to the requirements of 709.1 of the Specifications.

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: April 10, 1985

COUNTY ENGINEER

PIECE CULVERT WINGWALLS

REVISIONS: DETAIL NO.

SD
-32
### Dimensions (In.)

<table>
<thead>
<tr>
<th>Pipe Dia. (in.)</th>
<th>GA.</th>
<th>A (±1&quot;)</th>
<th>B (Max)</th>
<th>H (±1&quot;)</th>
<th>L (±1/2&quot;)</th>
<th>W (±2&quot;)</th>
<th>Approx Slope</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>16</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>21</td>
<td>24</td>
<td>2-1/2</td>
</tr>
<tr>
<td>15</td>
<td>16</td>
<td>7</td>
<td>8</td>
<td>6</td>
<td>26</td>
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<td>2-1/2</td>
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<tr>
<td>18</td>
<td>16</td>
<td>8</td>
<td>10</td>
<td>6</td>
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<td>2-1/2</td>
</tr>
<tr>
<td>21</td>
<td>16</td>
<td>9</td>
<td>12</td>
<td>6</td>
<td>36</td>
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<tr>
<td>24</td>
<td>16</td>
<td>10</td>
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<td>2-1/2</td>
</tr>
<tr>
<td>30</td>
<td>14</td>
<td>12</td>
<td>16</td>
<td>8</td>
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<td>14</td>
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<td>2-1/2</td>
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<td>16</td>
<td>16</td>
<td>22</td>
<td>11</td>
<td>69</td>
<td>84</td>
<td>2-1/2</td>
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<tr>
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<td>16</td>
<td>18</td>
<td>27</td>
<td>12</td>
<td>78</td>
<td>90</td>
<td>2-5/4</td>
</tr>
</tbody>
</table>

*Circle Appropriate Size*

### Alternate Connections

- **For 12" To 24" Only**
  - Pipe
  - Threaded Rod
  - Connector Lug

- **For 30" And 36" Only**
  - Pipe
  - Threaded Rod
  - Side Lug

### Notes:
1. Toe plate to be punched to match holes in skirt lip. 3/8" Galvanized bolts to be furnished. Length of toe plate to be W + 10" for 12" to 30" dia. pipe and W + 22" for 36" to 48" dia. pipe.
2. Skirt section for 12" to 30" dia. pipe to be made in one piece; skirt section for 36" to 48" dia. pipe may be made from two sheets joined by riveting or bolting on center line with 3/8" dia fasteners.
3. Connector section, toe plate and skirt to be of same gage metal; each to be Galv. and coated with a tar base paint.
4. For description, materials and construction methods, see specifications.
NOTES

1. V-ditch (W=0) is permitted.
2. Depth to be determined using ten (10) year storm, Manning's equation and 0.5 foot free board.
3. Thickness (T) to be equal 2.25 times d50.
4. d50 to be determined from Soil Conservation Service charts or WVDOT Drainage Manual, Chart 5-4 (below).
5. Stone is to be embedded in filter fabric, Polyfilter X or equal.

CHANNEL SLOPE, S₀ (ft./ft.)

FLOW DEPTH, (ft.)

JEFFERSON COUNTY, WEST VIRGINIA
APPROVED: April 12, 1986
COUNTY ENGINEER
Concrete gutter types, depths and widths shall be specified on the plans and shall conform with the table below. Only one concrete gutter type and depth shall be used in each individual run of gutter.

#### STANDARD CONCRETE GUTTER TYPES

<table>
<thead>
<tr>
<th>Gutter Type</th>
<th>Gutter Side Slopes</th>
<th>Gutter Depths and Widths</th>
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<tr>
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<td>S1:</td>
<td>S2:</td>
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<td>1</td>
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<td>2:1</td>
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<tr>
<td>2</td>
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<td>2:1</td>
</tr>
<tr>
<td>3</td>
<td>4:1</td>
<td>1(\frac{1}{2}):1</td>
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<tr>
<td>4</td>
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<td>2:1</td>
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<td>5</td>
<td>6:1</td>
<td>1(\frac{1}{2}):1</td>
</tr>
<tr>
<td>6</td>
<td>5:1</td>
<td>5:1</td>
</tr>
</tbody>
</table>

*Shall be inside gutter slope for road side ditches, unless otherwise specified.*

---

Cut-off walls

Max. 50' Spacing

1/2" Expansion Joint

Flow Line of Gutter

WATERSTOP

#4(1/2") Bars 4'-2", spaced 6" ctc. each, bent as shown. Bars shall have a minimum concrete cover of 2".

Cut-off walls

Welded Wire Fabric (6" x 12" - 6/6 page)
NOTES:
1. Concrete slump not to exceed 2-3'.
2. Use of this solution should be limited to small sinkholes (approximately 3' wide)
Seed soil cap in permanent grasses

Cover filter cloth with soil cap minimum four(4') feet deep

Maximum slope of 3:1

Existing ground

Existing sinkhole

Second layer of filter cloth

First layer of filter cloth
(Typer 3301 or equal)

Fill with 3' - 6' graded stone

NOTES:

1. For use in capping sinkholes up to four(4') in width.
   (Not for structural purposes)

2. Not for use in very impervious soils. If excessive ponding occurs it may be necessary to install a standpipe or other infiltration device.
Top stone to be 3'-4' in size

Removable solid end plate

Filter cloth (Type 303 or equal)

2' filter stone

Existing ground

Inlet pipe

Concrete plug to stabilize inlet pipe

Filter stone or other clean filter material to wedge pipe pipe into place.

NOTES:

1. Concrete to be 3000 psi strength.
2. Inlet pipe to be minimum 8' diameter.
3. Inlet pipe to be coated CMP, schedule 40 PVC or equal.
4. Debris to be removed from mouth of the sinkhole prior to installation.
5. All stone to be graded to size and free of fines.
NOTES:

1. Inlet filter pipe may be used where sinkhole is a hazard yet there is a need to allow runoff to enter hole.

2. Options #1 and #3 may be used to prevent flooding behind the dike or as a water quality device.

3. Dimensions and sizes should be based on hydrologic analysis and engineered design.
TYPES OF COUPLERS FOR CORRUGATED STEEL PIPE

(All connector bands require neoprene gaskets)

**ANNULAR COUPLING BAND**

- **End View**
- **Top View**

**SIDE VIEW**

One piece lap-type coupling for annular or helical pipe—12" and 24" widths

**END VIEW**

**Two piece lap-type coupling for annular or helical pipe—12" and 24" widths**

**STANDARD LAP-TYPE COUPLING BANDS FOR ANNULAR C.S.P. OR HELICAL C.S.P.**

**HUGGER TYPE COUPLING BAND**

- **End View**
- **Top View**

"Rubber Band" Gasket these Corrugations

**SIDE VIEW**

**END VIEW**

**ELEVATION**

Pipe Diameter 12" to 24" I.D.

**ELEVATION**

Pipe Diameter 36" to 72" I.D.

**ROD AND LUG TYPE**

UNDER NO CIRCUMSTANCE, WILL THE DIPPLE (UNIVERSAL) CONNECTOR BAND BE ACCEPTABLE FOR USE IN ANY SEDIMENT CONTROL OR STORM WATER MANAGEMENT STRUCTURE.
5" x 2 1/8" x 1/2" Steel Angle Attached with 1/2" #8 anchor bolts @ 30" C/C.

PROFILE @ C

FOR USE WHERE:
1. h < 5 feet
2. Slopes in backwater area not > 4:1
Bottom steel to be within 1/2" clear of slab bottom

4- #4 Bars

Secondary Weir (Optional)

100 YR HW 16" 2 YR HW Weir Crest

#4 Deformed Bars @ 6" c/c
Both ways w/1/2" cover (Typ)
(All walls)

6' - 4" Max.
5' - 4" Max.

4" MIN.

High Flow Weir

SOLID CONCRETE BLOCK OR BRICK

Standard Manhole Steps

Orifice Trash Rack WM-14

Low Flow Orifice

Low Flow Channel

Weir Crest

Outfall Pit

6'-4" Max.

unless slab is redesigned and center post is provided.

#5 Deformed Bars @ 6" c/c
Both ways

4" - 6" STONE EMBEDDED IN MIRA 700X OR EQUAL

* Optional

Notes:
1. Locate weir(s) away from the side facing the downstream embankment.
2. f'c for concrete to equal 3,500 psi or greater @ 28 days.
3. All reinforcing steel to be ASTM A615, Grade 60.
4. With aluminum or aluminized pipe, the embedded section must be painted with zinc chromate or equivalent.

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: March 16, 1990

COUNTY ENGINEER

INLET BOX CONTROL STRUCTURE

REVISIONS: 1/26/95

DETAIL No. WM-12
BARS MUST BE HOT DIPPED IF REBAR OR SMOOTH BAR IS USED. Paint with two (2) coats of zinc cold galvanizing compound.

**BAR TYPE**

1" DIA. HOLES 4" OC BOTH WAYS THROUGHOUT ENTIRE TRASH RACK

GALVANIZED EXPANSION BOLTS

MIN. HALF 2" ACCOMP W 1" DIA. HOLES 8 4" OC BOTH WAYS, BOLTED TO WALL HORIZONTALLY W/ GALV. EXPANSION BOLTS (CENTERED OVER 8' ORIFICES)

**PERFORATED PLATE TYPE**

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: March 16, 1989

COUNTY ENGINEER

ORIFICE TRASH RACKS

REVISIONS: WM

DETAIL NO. -14
3/8" x 2 1/2" STEEL PLATE (TYP) Attach to weir structure Top & Bottom using 1/2" Anchor Bolts spaced @ 12" max.

#6 GALVANIZED REBAR @ 8" c/c both ways (Bars must be welded to plate)

3/8" x 4" Steel Plate (TYP) Bolted to weir structure using 1/2" bolts spaced @ 12" maximum

#6 Galvanized rebar @ 8" c/c both ways, Welded to plate

NOTES:

1. Bar spacings not to exceed 8" c/c. All other dimensions and sizes are minimums and need to checked by the designer for each application.
2. For weir structure details, see Standard Detail WM-12.
3. Rack must be hot dipped, if rebar or smooth bar, and painted with two(2) coats ZRC cold galvanizing compound.
Top stiffener (if required) is \( x \times x \) angle welded to top and oriented perpendicular to corrugations.

Pressure Relief Holes
1 1/2" diam.

Tackweld all around

12" spacer
Bar (typical)
SAME MATERIAL
AS SUPPORT BAR

Dia. RISER

8" min.

Support Bar Size
(#6 Rebar minimum)

SECTION A-A

ISOMETRIC

Top is ___ gage corrugated metal or 1/8" steel plate. Pressure relief holes may be omitted, if ends of corrugations are left fully open when corrugated top is welded to cylinder.

Cylinder is ___ gage corrugated metal pipe or fabricated from 1/8" steel plate.

Notes:
1) The cylinder must be firmly fastened to the top of the riser.
2) Support bars are welded to the top of the riser or attached by straps bolted to top of riser.
TYPICAL ANTI-SEEPE COLLARS

NOT TO SCALE

INSTALL WITH CORRUGATIONS VERTICAL

COLLAR WELDED IN PLACE ON BARREL SECTION

2' min.  

AT LEAST THE LAST TWO CORRUGATIONS ON EACH END MUST BE ANGULAR OR FLANGE

CONTINUOUS WELD (FULL CIRCUMFERENCE, BOTH SIDES)

I. PLATES TO BE PRE-CUT, CLAMPED TOGETHER & PRE-DRILLED & LABELED TO FACILITATE WATER-TIGHT FIELD ASSEMBLY.

CONTINUOUS WELD (FULL CIRCUMFERENCE BOTH SIDES)

WELDED FLANGE

STAINLESS STEEL NUT & BOLT, CONNECTION WITH "MASTIK" BETWEEN PLATES

MULTI-PIECE COLLAR FOR LARGE PIPES

USE MASTIK OR EQUIV. BETWEEN PLATE & FLANGE

COLLAR FOR FLANGE JOINT PIPE

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: March 14, 1989

C. C. COUNTY ENGINEER

ANTI-SEEPE COLLAR (METAL)

REVISIONS: WM

DETAIL NO. - 17
CONSTRUCT ANTI-SEEP COLLAR WITH RCP PIPE STUBS BEFORE CONSTRUCTING PIPE OR PIPE CRADLE.
CONCRETE TO HAVE $f_c = 4000$ psi.

PIPE CRADLE
SD-04

#4 BARS @ 8"  
#4 BARS @ 12"

RCP

$\sigma$

CONCRETE ANTI-SEEP COLLAR
N.T.S.

COMPUTATIONS FOR SIZING COLLAR

$L_s = y (z + 4) \left( 1 + \frac{\text{pipe slope}}{0.25 \cdot \text{pipe slope}} \right)$

$L_c = 0.15 (L_s)$

Collar size, in feet, = $\frac{L_c}{\# \text{ of collars}} + \frac{\text{Pipe diameter}''}{12''/1'}$

where:

$y =$ distance from bottom of basin to crest of riser

$z =$ slope ratio of upstream slope of embankment ($z:1$)

Pipe slope is expressed as feet per foot
RISER BASE DETAIL

NOTES:
1. The concrete base shall be poured in such a manner to insure that the concrete fills the bottom of the riser to the invert of the outlet pipe to prevent the riser from breaking away from the base.
2. With aluminum or aluminized pipe, the embedded section must be painted with zinc chromate or equivalent.
3. Riser base may be sized as computed using flotation with a factor of safety of 1.2.

FLOTATION COMPUTATION METHOD

\[ V_{IR} = \text{Volume inside riser} \quad U_F = \text{Uplift Force} = V_{IR} \times 62.4 \]

Required Weight to oppose flotation = 1.2 \( U_F \)

\[ W_B = \text{Weight of Base} = V_b \times (150 - 62.4) \]

where \( V_b \) is trial volume of base.

Units are pounds and feet.
FILL CELLS WITH CONCRETE
CELLULAR CONFINEMENT SYSTEM OR EQUIVALENT REINFORCED SYSTEM

PLACE GEOWEB OVER FILL COMPACTED TO 98% OF MAX. DENSITY PER AASHTO T99C AND COVERED WITH DUPONT TYPE R 3401 GEOTEXILE (4 oz./yd² non-woven cloth) OR EQUAL.

RIPRAP (SEE DETAILS ON PLAN FOR RIPRAP CLASS)

NOTE: TO BE USED ONLY WHEN:
1) Site does not allow practical installation of an emergency spillway in cut
2) Approval by the County Engineer

SPECIFICATIONS

1. Panel Thickness (Nominal) 0.045 ± 0.002 in.
2. Cell Area 41 in²
4. Welds/Seam 7 or 3, for 8 in. or 4 in.
5. Seams Tensile Peel Strength 450 lbs. or 225 lbs.
6. Installation Temperature Range -16°F to +110°F
7. Polymer Material High Density Polyethylene
8. Carbon Black Content 2%
9. Chemical Resistance Superior

JEFFERSON COUNTY, WEST VIRGINIA

APPROVED: 12-28-89

COUNTY ENGINEER

reinforced emergency spillway

REVISIONS: WM
DETAIL No. 20
1. REBARS ARE TO BE TACK-WELDED AT ALL INTERSECTIONS.
2. TRASH RACK MUST BE HOT-DIPPED IF REBAR OR SMOOTH BAR AND PAINTED WITH TWO (2) COATS ZRC COLD GALVANIZING COMPOUND.
CHECK DAM DEDETAIL
N.T.S.

TYPE A

Top of Ditch
Sodded
Ditch Invert
Check Dams to be constructed every 100 feet.

TYPE B

ELEVATION

SILT CLEANOUT LEVEL

2'-0"
1'-6"
VARIES
1'-2"
2'-0"

SPILLWAY

TOP ELEVATION OF OUTLET STRUCTURE TO BE SET IN FIELD AS DIRECTED BY THE ENGINEER.

POLY FILTER "X"

2'-0"
2'-0"
SLOPE

SECTION A-A

4" TO 12"
PLACED RIP RAP FOR SEDIMENT CONTROL OR AS DIRECTED BY THE ENGINEER.

PLAN VIEW SYMBOL

TSOS

JEFFERSON COUNTY, WEST VIRGINIA

CHECK DAM DETAILS

APPROVED: March 14, 1980

COUNTY ENGINEER

REVISIONS:

DETAIL No.

WM-31

4/18/83 R