DGN $REF001 $REF002 $REF003 $REF004 $REF005 $REF006
$DGNLEV $LEV001 $LEV002 $LEV003 $LEV004 $LEV005 $LEV006

SURVEYED BY .....
SUPERVISED BY.....
DESIGNED BY.....Dewberry (703) 849-0607

IN PROGRESS 09/26/08
NOT FOR CONSTRUCTION

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

REVISED	FHWA REGION	STATE	FEDERAL AID PROJECT	STATE ROUTE	STATE PROJECT	SHEET NO.
	3	VA.		7		21(3)

DRAINAGE DESCRIPTIONS

Sheet 7(2)

7(2)-1
1 - Special Design JB-1 Req'd.(Contractor to provide shop drawings)
H = 22.1'; W = 4.0'; D = 8.5'; Inv.= 235.6'
Type C Tower Req'd.
1 - St'd.T-DI-3B,L = 14' Req'd.
1-St'd. SL-1 Safety Slab Req'd.
St'd. IS-1 Inlet Shaping Req'd.
(Connect 1-St'd. UD-4 To Structure)

7(2)-1 — 7(2)-12
125' - 60" Conc.Pipe Req'd.(17.8' Cover)
Inv.(in) = 235.6'; Inv.(out) = 235.1'

7(2)-2
1 - St'd.JB-1 Req'd.
H = 14.1'; W = 4.0'; D = 8.5'; Inv.= 236.3'
Type A Tower Req'd.
1-St'd. T-DI-3B,L = 14' Req'd.
1-St'd. SL-1 Safety Slab Req'd.
(Connect 1-St'd. UD-4 To Structure)

7(2)-2 — 7(2)-1
53' - 60" Conc.Radial Pipe Req'd.(21.9' Cover)
(92' - 448' Radius - using 8' pipe joint lengths at full bevel)
Inv.(in) = 236.3'; Inv. (out) = 235.6'

7(2)-3
1 - St'd.DI-3BB Req'd.
L = 8'; H = 13.8'; Inv.= 236.8'
1-St'd. SL-1 Safety Slab Req'd.

7(2)-3 — 7(2)-2
33' - 15" Conc.Pipe Req'd.(12.4' Cover)
Inv.(in) = 236.8'; Inv. (out) = 236.6'

7(2)-4
1 - St'd.DI-3C Req'd.
L = 6'; H = 4.2'; Inv.= 236.7'

7(2)-4 — 7(2)-5
133' - 18" Conc.Pipe Req'd.(3.0' Cover)
Inv.(in) = 236.7'; Inv. (out) = 236.0'

7(2)-5
1 - St'd.DI-3B Req'd.
L = 6'; H = 4.7'; Inv.= 236.0'
St'd. IS-1 Inlet Shaping Req'd.

7(2)-5 — 7(2)-15
22' - 18" Conc.Pipe Req'd.(6.4' Cover)
Inv.(in) = 236.0'; Inv. (out) = 235.9'

7(2)-6
1 - St'd.DI-3B Req'd.
L = 8'; H = 3.9'; Inv.= 236.1'

7(2)-6 — 7(2)-7
91' - 15" Conc.Pipe Req'd.(2.5' Cover)
Inv.(in) = 236.1'; Inv. (out) = 235.4'

7(2)-7
1 - St'd.DI-3B Req'd.
L = 6'; H = 3.9'; Inv.= 235.4'

7(2)-7 — 7(2)-9
84' - 15" Conc.Pipe Req'd.(2.5' Cover)
Inv.(in) = 235.4'; Inv.(out) = 235.0'

7(2)-8
1 - St'd.DI-3B Req'd.
L = 10'; H = 3.9'; Inv.= 237.9'
(Connect 1-St'd. UD-4 To Structure)

7(2)-8 — 7(2)-3
176' - 15" Conc.Pipe Req'd.(12.0' Cover)
Inv.(in) = 237.9'; Inv.(out) = 237.1'

7(2)-9
1 - St'd.DI-3B Req'd.
L = 6'; H = 3.9'; Inv.= 235.0'

7(2)-9 — 7(2)-10
88' - 15" Conc.Pipe Req'd.(2.6' Cover)
Inv.(in) = 235.0'; Inv.(out) = 234.5'

7(2)-10
1 - St'd.DI-3B Req'd.
L = 6'; H = 4.1'; Inv.= 234.5'

7(2)-10 — EX.7(2)-11
85' - 15" Conc.Pipe Req'd.(3.5' Cover)
Inv.(in) = 234.5'; Inv.(out) = 234.0'

EX.7(2)-11
Remove Existing Top
Modify To Accept 15" & 18" Conc.Pipes
1-St'd. T-DI-3C Req'd.,L = 12'

EX.7(2)-11 — 8-11
132' - 18" Conc.Pipe Req'd.(3.8' Cover)
Inv.(in) = 233.7'; Inv.(out) = 233.0'

7(2)-12
1-St'd. 30" ES-1 or 2 Req'd.
41.67 Sq.Yds.Standard EC-3 Type B Culvert Outlet Protection Required

7(2)-13
1- Mod. SWM-1 Req'd.
Top of Riser = 235.65' ; Bottom of Riser = 233.00'
H = 2.67' Inv.24" Pipe out = 232.76'
3.0 in. Water Quality Orifice Inv.= 234.40
See Detail Sheet 2H

7(2)-13 — 7(2)-14
30' - 24" Conc.Pipe Req'd.(3.0' Cover)
Inv.(in) = 233.0'; Inv.(out) = 232.8'
St'd. Concrete Cradle Req'd.

7(2)-14
1 - St'd. 24" EW-1 Req'd.

7(2)-15
1 - St'd.JB-1 Req'd.
H = 8.1'; W = 2.0'; D = 6.0'; Inv.= 235.9'
Type C Tower Req'd.
1 - St'd.MH-1 Frame & Cover Req'd.

7(2)-15 — 7(2)-1
45' - 60" Conc.Pipe Req'd.(16.7' Cover)
Inv.(in) = 235.9'; Inv.(out) = 235.7'

Sheet 8

8-1
1 - St'd.DI-3B Req'd.
L = 6'; H = 3.9'; Inv.= 234.1'

8-1 — 8-2
57' - 15" Conc.Pipe Req'd.(2.7' Cover)
Inv.(in) = 234.1'; Inv.(out) = 233.5'

8-2
1 - St'd.DI-3C Req'd.
L = 6'; H = 4.5'; Inv.= 233.3'
(Connect 2-St'd. UD-4 and 1-St'd. CD-2 To Structure)

8-2 — 8-3
48' - 15" Conc.Pipe Req'd.(3.7' Cover)
Inv.(in) = 233.3'; Inv.(out) = 232.7'

8-3
1 - St'd.DI-3B Req'd.
L = 6'; H = 5.3'; Inv.= 232.7'

8-3 — 8-14
13' - 24" Conc.Pipe Req'd.(3.0' Cover)
Inv.(in) = 232.7'; Inv.(out) = 232.6'

8-4
28' - 6' x 4' Conc.Box Culvert (3.9' Cover)
St'd.BCS-DT,BCS-05,BCW-21 & BCE-01
2-St'd.Type 1 Wingwalls Req'd.
Remove Existing Endwall
Inv.(in) = 232.4'; Inv.(Out) = 232.2'
Undercut 24" and fill with
4" Bedding Material Aggregate No.25 or 26 Req'd. Above
20" Bedding Material Aggregate No.57 Wrapped in Geotextile Drainage Fabric
40 Sq.Yds.Standard EC-1 Class A1 Required
Type B Installation

8-5
32' - 6' x 4' Conc.Box Culvert (1.9' Cover)
St'd.BCS-DT,BCS-02,BCW-21 & BCE-01
2-St'd.Type 1 Wingwalls Req'd.
Remove Existing Endwall
Inv.(in) = 234.8'; Inv.(Out) = 234.4'
Undercut 30" and fill with
4" Bedding Material Aggregate No.25 or 26 Req'd. Above
26" Bedding Material Aggregate No.57 Wrapped in Geotextile Drainage Fabric

8-6
Remove Existing Endwall
Connect Proposed 48" Concrete Pipe To Existing 48" Pipe

8-6 — 8-7
26' - 48" Conc.Pipe Req'd.(2.8' Cover)
Inv.(in) = 232.0'; Inv.(out) = 231.9'
Undercut 24" and fill with
4" Bedding Material Aggregate No.25 or 26 Req'd. Above
20" Bedding Material Aggregate No.57 Wrapped in Geotextile Drainage Fabric

8-7
1 - St'd.48" EW-2 Req'd.
26.7 Sq.Yds.Standard EC-1 Class 1 Required
Type B Installation

8-8
1 - St'd.DI-3B Req'd.
L = 10'; H = 4.2'; Inv.= 236.3'
(Connect 1-St'd. UD-4 To Structure)

8-8 — 8-20
73' - 18" Conc.Pipe Req'd.(2.5' Cover)
Inv.(in) = 236.3'; Inv.(out) = 235.2'

8-9
1 - St'd.DI-3B Req'd.
L = 10'; H = 4.2'; Inv.= 240.2'
(Connect 1-St'd. UD-4 To Structure)

8-9 — 8-8
244' - 15" Conc.Pipe Req'd.(2.8' Cover)
Inv.(in) = 240.2'; Inv.(out) = 236.6'

EX.8-10
Modify Existing Drop Inlet
Remove Existing 15" Pipes
Connect to Proposed 15" Conc.Pipe
Inv.= 232.9'

EX.8-10 — 8-11
10' - 15" Conc.Pipe Req'd.(4.6' Cover)
Inv.(in) = 232.9'; Inv.(out) = 232.8'

8-11
5.0 LF St'd.MH-1 or 2 Req'd.
1-St'd.MH-1 Frame & Cover Req'd.
Inv.= 232.8'
Use collars to raise to finished ground elevation.

8-11 — 8-3
36' - 18" Conc.Pipe Req'd.(4.0' Cover)
Inv.(in) = 232.8'; Inv.(out) = 232.7'

8-12
1 - St'd.DI-3B Req'd.
L = 6'; H = 5.5'; Inv.= 236.0'

8-12 — 8-13
92' - 18" Conc.Pipe Req'd.(6.3' Cover)
Inv.(in) = 236.0'; Inv.(out) = 235.6'

8-13
1 - St'd.DI-3B Req'd.
L = 6'; H = 6.5'; Inv.= 235.6'
St'd.IS-1 Inlet Shaping Req'd.
(Connect 1-St'd. UD-4 To Structure)

8-13 — 8-24
47' - 18" Conc.Pipe Req'd.(7.7' Cover)
Inv.(in) = 235.6'; Inv.(out) = 235.3'

8-14
1 - St'd.24" ES-1 or 2 Req'd.
6.66 Sq.Yds.Standard EC-3 Type B Culvert Outlet Protection Required

8-15
1 - St'd.18" ES-1 or 2 Req'd.
1 Sq.Yds.Standard EC-1 Class 1 Required
Type A Installation

8-16
1 - St'd.DI-3B Req'd.
L = 6'; H = 6.0'; Inv.= 238.1'

8-16 — 8-17
133' - 24" Conc.Pipe Req'd.(3.9' Cover)
Inv.(in) = 238.1'; Inv.(out) = 237.4'

8-17
1 - St'd.DI-3B Req'd.
L = 6'; H = 6.2'; Inv.= 237.4'
(Connect 1-St'd. UD-4 To Structure)

8-17 — 8-18
148' - 24" Conc.Pipe Req'd.(3.9' Cover)
Inv.(in) = 237.4'; Inv.(out) = 236.7'

8-18
1 - St'd.DI-3B Req'd.
L = 6'; H = 6.3'; Inv.= 236.4'

8-18 — 8-19
40' - 24" Conc.Pipe Req'd.(4.0' Cover)
Inv.(in) = 236.4'; Inv.(out) = 236.0'

8-19
1 - St'd.24" ES-1 or 2 Req'd.
4 Sq.Yds.Standard EC-1 Class A1 Required
Type A Installation

8-20
1 - St'd.DI-3B Req'd.
L = 6'; H = 4.5'; Inv.= 234.9'

8-20 — 8-15
22' - 18" Conc.Pipe Req'd.(4.5' Cover)
Inv.(in) = 234.9'; Inv.(out) = 234.7'

8-21
1- St'd.48" EW-2 Req'd.

8-21 — 8-22
30' - 48" Conc.Pipe Req'd.(3.4' Cover)
Inv.(in) = 235.0'; Inv.(out) = 234.5'
Undercut 30" and fill with
4" Bedding Material Aggregate No.25 or 26 Req'd. Above
26" Bedding Material Aggregate No.57 Wrapped in Geotextile Drainage Fabric

8-22
Remove Existing Endwall
Connect Proposed 48" Concrete Pipe To Existing 48" Pipe

Sheet 9

9-1
1 - St'd.DI-3B Req'd.
L = 8'; H = 6.6'; Inv.= 246.2'

9-1 — 9-2
247' - 15" Conc.Pipe Req'd.(5.1' Cover)
Inv.(in) = 246.2'; Inv.(out) = 245.0'

9-2
1 - St'd.DI-3B Req'd.
L = 8'; H = 5.3'; Inv.= 244.7'
(Connect 1-St'd. UD-4 To Structure)

9-2 — 9-9
198' - 15" Conc.Pipe Req'd.(3.9' Cover)
Inv.(in) = 244.7'; Inv.(out) = 243.5'

EX.9-3
Modify Existing Drop Inlet to Accept Proposed 24" Conc.Pipe
Inv.= 242.5'

EX.9-3 — 9-5
151' - 24" Conc.Pipe Req'd.(2.7' Cover)
Inv.(in) = 242.5'; Inv.(out) = 241.7'

9-5
1 - St'd.DI-3B Req'd.
L = 4'; H = 5.2'; Inv.= 241.5'

9-5 — 9-6
173' - 24" Conc.Pipe Req'd.(3.2' Cover)
Inv.(in) = 241.5'; Inv.(out) = 240.6'

9-6
1 - St'd.DI-3B Req'd.
L = 6'; H = 5.4'; Inv.= 240.6'
(Connect 1-St'd. UD-4 To Structure)

9-6 — 9-7
133' - 24" Conc.Pipe Req'd.(3.2' Cover)
Inv.(in) = 240.6'; Inv.(out) = 239.9'

9-7
1 - St'd.DI-3B Req'd.
L = 6'; H = 5.3'; Inv.= 239.9'

9-7 — 9-8
173' - 24" Conc.Pipe Req'd.(3.4' Cover)
Inv.(in) = 239.9'; Inv.(out) = 239.1'

9-8
1 - St'd.DI-3B Req'd.
L = 6'; H = 5.6'; Inv.= 239.1'
(Connect 1-St'd. UD-4 To Structure)

9-8 — 8-16
134' - 24" Conc.Pipe Req'd.(3.4' Cover)
Inv.(in) = 239.1'; Inv.(out) = 238.4'

9-9
1 - St'd.DI-3B Req'd.
L = 8'; H = 3.9'; Inv.= 243.2'
(Connect 1-St'd. UD-4 To Structure)

9-9 — 8-9
233' - 15" Conc.Pipe Req'd.(2.8' Cover)
Inv.(in) = 243.2'; Inv.(out) = 240.5'

Sheet 10

10-1
Remove Existing Endwall
Connect Proposed 48" Conc.Pipe to Existing 48" Pipe

10-1 — 10-7
94' - 68" x 43" Conc.Ellip.Pipe Req'd.(2' Cover)
Inv.(in) = 248.3'; Inv.(out) = 247.8'
4" Bedding Material Aggregate No.25 or 26 Req'd. Above
8" Bedding Material Aggregate No.57 Wrapped in Geotextile Drainage Fabric

10-2
1 - St'd.DI-3B Req'd.
L = 8'; H = 3.9'; Inv.= 254.4'

10-2 — 10-3
58' - 15" Conc.Pipe Req'd.(2.5' Cover)
Inv.(in) = 254.4'; Inv.(out) = 253.7'

10-3
1 - St'd.DI-3B Req'd.
L = 10'; H = 4.2'; Inv.= 253.4'

10-3 — 10-7
153' - 15" Conc.Pipe Req'd.(2.8' Cover)
Inv.(in) = 253.4'; Inv.(out) = 251.2'

10-4
1-Std.JB-1 Req'd
H = 8.5';W = 2.0'; D = 7.4'; Inv.244.4'
Type C Tower Req'd
1 - St'd.T-DI-4B Req'd.,L = 6'
St'd.IS-1 Inlet Shaping Req'd.

10-4 — 10-5
97' - 72" Conc.Pipe Req'd.(2.0' Cover)
Inv.(in) = 244.4'; Inv.(out) = 243.9'
4" Bedding Material Aggregate No.25 or 26 Req'd. Above
8" Bedding Material Aggregate No.57 Wrapped in Geotextile Drainage Fabric

10-5
1-Std.JB-1 Req'd
H = 7.9';W = 2.0'; D = 8.5'; Inv.243.9'
Type C Tower Req'd
1 - St'd.T-DI-4B Req'd.,L = 4'
St'd.IS-1 Inlet Shaping Req'd.

10-5 — EX.10-11
34' - 72" Conc.Pipe Req'd.(1.4' Cover)
Inv.(in) = 243.9'; Inv.(out) = 243.7'
4" Bedding Material Aggregate No.25 or 26 Req'd. Above
8" Bedding Material Aggregate No.57 Wrapped in Geotextile Drainage Fabric

10-6
1 - St'd.DI-3B Req'd.
L = 14'; H = 3.9'; Inv.= 250.4'

10-6 — 11-2
89' - 15" Conc.Pipe Req'd.(2.6' Cover)
Inv.(in) = 250.4'; Inv.(out) = 250.0'

10-7
1 - St'd.DI-4E Req'd.
L = 8'; H = 7.8'; Inv.= 247.5'
St'd.IS-1 Inlet Shaping Req'd.

10-7 — 10-8
47' - 54" Conc.Pipe Req'd.(2.8' Cover)
Inv.(in) = 247.5'; Inv.(out) = 247.1'
4" Bedding Material Aggregate No.25 or 26 Req'd. Above
8" Bedding Material Aggregate No.57 Wrapped in Geotextile Drainage Fabric

10-8
1 - St'd.JB-1 Req'd.
H = 9.2';W = 2.0'; D = 7.4'; Inv.245.2'
1- St'd.T-DI-4B Req'd.,L = 6'
Type A Tower Req'd.
St'd.IS-1 Inlet Shaping Req'd.

COMMONWEALTH OF VIRGINIA
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PROFESSIONAL ENGINEER

A			SHEET NO. 21(3)

$TIME$ST.AMP$