

PROJECT REFERENCE NO. <i>U-4751</i>	SHEET NO. <i>2D-2</i>
RW SHEET NO.	
HYDRAULICS ENGINEER <i>Edward J. Valicek</i> Professional Seal 029388 10/17/2017	HYDRAULICS ENGINEER <i>Joshua G. Dalton</i> Professional Seal 26971 10/17/2017

**DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED**

DETAIL 36
 MULTI-BARREL CULVERT, LOW FLOW CHANNEL, HIGH FLOW SILLS, AND FLOOD PLAIN BENCH

NOTES:
 1) NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED OR FLOODPLAIN AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. ONLY MATERIAL THAT IS EXCAVATED FROM THE STREAM BED MAY BE USED TO LINE THE LOW FLOW CULVERT BARREL. RIP RAP MAY BE USED TO SUPPLEMENT THE NATIVE MATERIAL IN THE HIGH FLOW CULVERT BARREL. IF RIP RAP IS USED TO LINE THE HIGH FLOW CULVERT BARREL, NATIVE MATERIAL SHOULD BE PLACED ON TOP TO FILL VOIDS AND PROVIDE A FLAT SURFACE FOR ANIMAL PASSAGE. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.
 2) SILLS ARE TO BE 1.0 FT WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.
 3) THE CHANNEL EDGE SHALL BE LINED WITH CLASS I RIP RAP (AS SHOWN ON THE PLAN VIEW).
 4) COIR FIBER MATTING SHALL BE SECURED ON THE FLOOD PLAIN BENCHES AND PLACED BEHIND RIP RAP EDGE TO PREVENT WASHOUT OF SEDIMENT THROUGH GAPS.

QUANTITIES: COIR FIBER MAT. = 60 SQ YD GEOTEXTILE = 460 SQ YD CL 'I' RIP RAP = 187 TONS CL 'II' RIP RAP = 204 TONS

SECTION A-A **SECTION B-B**

CL STA. = 117 + 49 -L-

DETAIL 39
 SINGLE BARREL RCBC TYPICAL INLET AND OUTLET CHANNELS

TYPICAL INLET CHANNEL (LOOKING DS; NTS)

TYPICAL OUTLET CHANNEL (LOOKING DS; NTS)

NOTES:
 *CULVERT TO BE BACKFILLED WITH NATIVE MATERIAL TO A DEPTH OF 1.0'. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

CL STA. = 42 + 78 -Y8RPDB-

DETAIL 60
 FALSE SUMP (Not to Scale)

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

STA. 187 + 35 -L-
 STA. 195 + 16 -L-
 STA. 198 + 16 -L-
 STA. 200 + 35 -L-
 STA. 203 + 85 -L-
 STA. 209 + 66 -L-
 STA. 212 + 16 -L-
 STA. 214 + 85 -L-
 STA. 217 + 85 -L-
 STA. 220 + 44 -L-
 STA. 222 + 82 -L-

TYPICAL INLET CHANNEL (NTS)

TYPICAL OUTLET CHANNEL (NTS)

DETAIL 37
 SINGLE BARREL RCBC TYPICAL INLET AND OUTLET CHANNELS

NOTES:
 *CULVERT TO BE BACKFILLED WITH NATIVE MATERIAL TO A DEPTH OF 1.0'. NATIVE MATERIAL CONSISTS OF MATERIAL THAT IS EXCAVATED FROM THE STREAM BED AT THE PROJECT SITE DURING CULVERT CONSTRUCTION. NATIVE MATERIAL IS SUBJECT TO APPROVAL BY THE ENGINEER AND MAY BE SUBJECT TO PERMIT CONDITIONS.

CL STA. = 138 + 59 -L-

DETAIL 40
 42" PIPE OUTLET CHANNEL (Not to Scale)

Length = 14 Ft.
 d = 3.5 Ft. (If Channel Depth < 3.5' Place Rip Rap to Top of Bank)
 Est. = 21 Tons of Class 'I' Rip-Rap, 35 SY of Geotextile

STA. 110 + 45 -L- RT
 STA. 211 + 05 -L- RT
 STA. 33 + 85 -Y8RPDB- LT

DETAIL 41
 SPECIAL LATERAL 'V' DITCH (Not to Scale)

Min. D = 1.0 Ft.

FROM STA. 18 + 25 TO STA. 23 + 50 -Y1RPB- LT

DETAIL 42
 60" PIPE OUTLET CHANNEL (Not to Scale)

Length = 20 Ft.
 d = 5.0 Ft. (If Channel Depth < 5' Place Rip Rap to Top of Bank)
 Est. = 42 Tons of Class 'I' Rip-Rap, 71 SY of Geotextile

STA. 26 + 50 -Y8RPC- RT

DETAIL 43
 LATERAL 'V' DITCH (Not to Scale)

Min. D = 1.0 Ft.
 b = 5.0 Ft.

FROM STA. 24 + 00 TO STA. 28 + 50 -Y1RPB- RT

DETAIL 44
 LATERAL BASE DITCH (Not to Scale)

Min. D = 1.0 Ft.
 B = 4.0 Ft.
 b = 5.0 Ft.

FROM STA. 19 + 92 TO STA. 24 + 00 -Y1RPB- RT

DETAIL 45
 SPECIAL CUT DITCH (Not to Scale)

Min. D = 1.0 Ft.

FROM STA. 21 + 50 TO STA. 22 + 00 -Y1RPD- RT

DETAIL 48
 LATERAL 'V' DITCH (Not to Scale)

Min. D = 1.0 Ft.
 b = 5.0 Ft.

FROM STA. 31 + 88 TO STA. 35 + 50 -L- LT

DETAIL 49
 STANDARD 'V' DITCH (Not to Scale)

Min. D = 1 Ft.
 Max. d = 1 Ft.

Type of Liner = Class 'B' Rip Rap

FROM STA. 45 + 75 -L- RT TO STA. 15 + 92 -Y1RPA- RT

DETAIL 38
 MULTI-BARREL CULVERT, LOW FLOW CHANNEL, HIGH FLOW SILLS, AND FLOOD PLAIN BENCH

NOTES:
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 2) SILLS ARE TO BE 1.0' WIDE, CAST SEPARATELY AND ATTACHED BY DOWELS.
 3) THE CHANNEL EDGE SHALL BE LINED WITH CLASS I RIP RAP (AS SHOWN ON THE PLAN VIEW).
 4) COIR FIBER MATTING SHALL BE SECURED ON THE FLOOD PLAIN BENCHES AND PLACED BEHIND RIP RAP EDGE TO PREVENT WASHOUT OF SEDIMENT THROUGH GAPS.

QUANTITIES: EST. CL 'I' RIP RAP: 10 TONS EST. COIR FIBER MATTING: 50 SY

PLAN VIEW

SECTION A-A **SECTION B-B**

CL STA. = 151 + 41 -L-

DETAIL 50
 SPECIAL LATERAL 'V' DITCH (Not to Scale)

Min. D = 2.5 Ft.

FROM STA. 11 + 43 TO STA. 14 + 25 -L- LT
 FROM STA. 15 + 39 TO STA. 16 + 00 -L- LT

DETAIL 51
 LATERAL BASE DITCH (Not to Scale)

Min. D = 3.0 Ft.
 Max. d = 3.0 Ft.
 B = 5.0 Ft.
 b = 5.0 Ft.

*When B is < 6.0'
 Type of Liner = Class 'B' Rip Rap

FROM STA. 175 + 29 TO STA. 176 + 25 -L- LT

DETAIL 52
 LATERAL BASE DITCH (Not to Scale)

Min. D = 3.0 Ft.
 Max. d = 3.0 Ft.
 B = 5.0 Ft.
 b = 5.0 Ft.

*When B is < 6.0'
 Type of Liner = Class 'I' Rip Rap

FROM STA. 178 + 45 TO STA. 178 + 67 -L- LT

DETAIL 53
 SPECIAL LATERAL BASE DITCH (Not to Scale)

Min. D = 1.0 Ft.
 B = 2.0 Ft.

Type of Liner = Class 'B' Rip Rap

FROM STA. 103 + 00 TO STA. 106 + 80 -L- LT

DETAIL 54
 LATERAL BASE DITCH (Not to Scale)

Min. D = 1.5 Ft.
 B = 2.0 Ft.
 b = 5.0 Ft.

*When B is < 6.0'
 Type of Liner = Class 'B' Rip Rap

FROM STA. 104 + 25 TO STA. 110 + 35 -L- RT

DETAIL 55
 DITCH BLOCK (Not to Scale)

EL. 41.0

Min. D = 1.0 Ft.

STA. 56 + 60 -Y8RPDB- RT
 STA. 60 + 18 -Y8RPDB- RT
 STA. 63 + 64 -Y8RPDB- RT

DETAIL 56
 CUT DITCH (Not to Scale)

Min. D = 1.0 Ft.

FROM STA. 32 + 50 TO STA. 34 + 50 -SR4- LT