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PACIFICORP
ELECTRIC OPERATIONS

ONE UTAH CENTER

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AUG 26 1991

DIVISION OF
OIL GAS & MINING

August 23, 1991

Ms. Pamela Grubaugh-Littig
Permit Supervisor
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: ABATEMENT FOR NOV 91-20-2-1, PART 1, DES BEE DOVE MINE, ACT/015/017

Dear Pamela:

I am enclosing the following text, calculations, designs and drawings for abatement of Part 1 of NOV 91-20-2-1. This part required a plan to help reduce erosion on the DBD Junction Road fillslope area west of the sediment pond.

If there are any questions, please contact Guy Davis at 653-2312 or myself at 220-4584.

Sincerely,

Guy Davis (for)

J. Blake Webster
Permitting Administrator

GD/dw
Enclosure

DES BEE DOVE LOWER BELTED ROAD DRAINAGE

To help reduce the recent erosion on the Junction Road fillslope between STA 156+00 and 161+00 the following plan has been designed.

To divert the road runoff from the fillslope area, used mine belting will be installed along the existing guard rail. The installation would be as depicted on Figure 2.

To handle the diverted runoff and direct the flow into a natural channel, a designed rip-rap channel and culvert would be constructed and installed. These designs and cross-sections are shown on Figures 3 and 4. The culvert will have a metal collar at the inlet according to permit packet 5-1 drawing 19 of 38. Outlet velocity control will be accomplished by construction of a 4' x 10' rock impact basin of 1.5' angular rock. Monitoring after precipitation events for 1 year will be conducted to assure the basin is effective.

Flow calculations, designs and drawings are as follows:

DES BEE DOVE LOWER BELTED ROAD DRAINAGE DESIGN

1. Area = 1.35 Acres (Figure 1)
2. Time of Concentration
 - a. Hydraulic Length - 1000 ft.
 - b. Average Slope - 7%
 - c. Velocity - 5.3 fps (Exhibit A)
 - d. Time of Concentration - .05 hr.
3. Curve Number
 - 80% at 98
 - 20% at 87

Weighted Average - 96 (Exhibit B)

4. Design Flow

4.07 cfs (Table 1)

10 yr./6 hr. Storm Event

5. Guard Rail Belting Installation

Figure 2

Length - Approx. 600 ft.

To Divert Road Runoff Away From Fillslope.

6. Channel Design

Figure 3

Rip-rap Sizing Calculation

Length - Approx. 270 ft.

7. Culvert Design

Figure 4

Length - Approx. 80 ft.

Rock Impact Basin

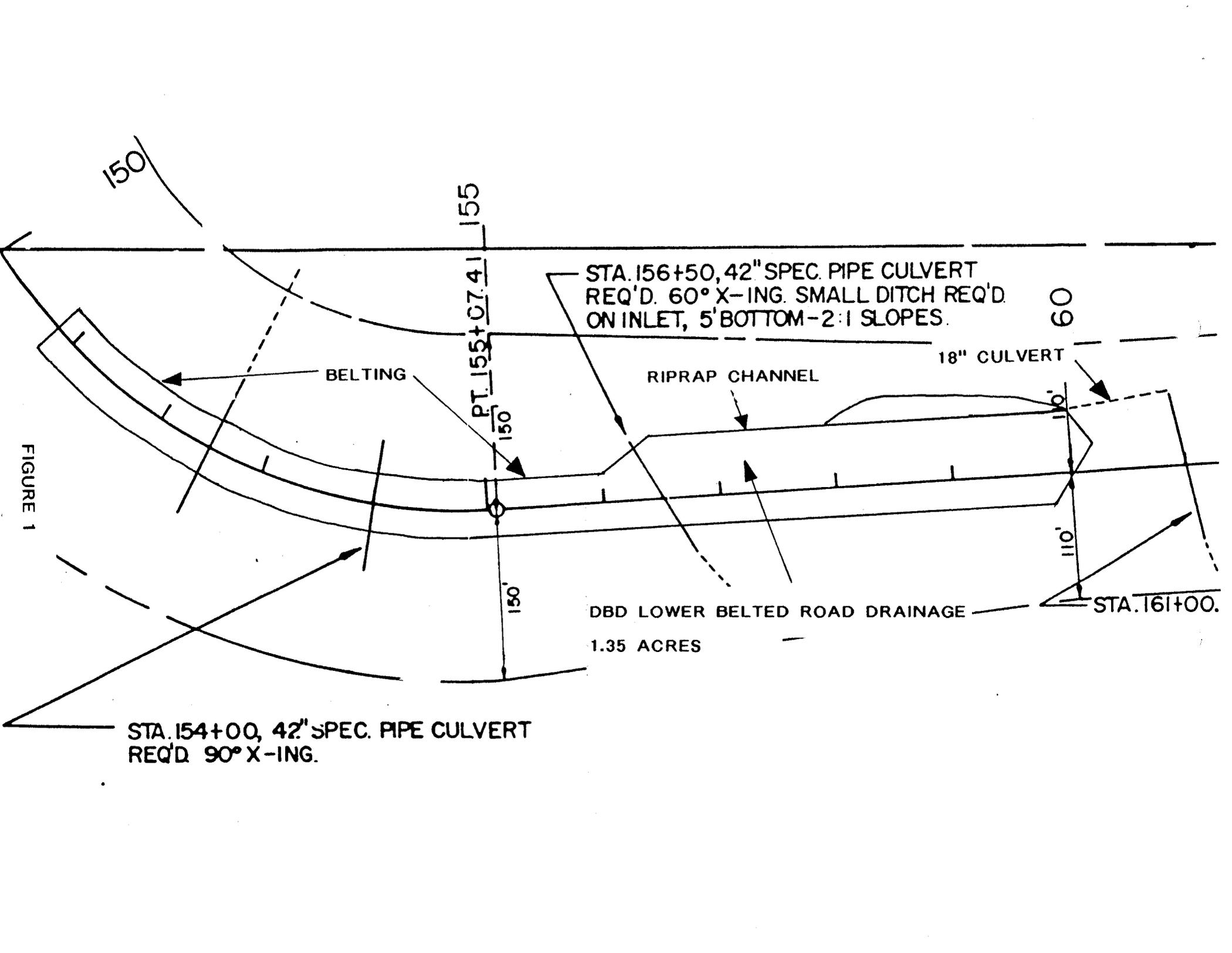
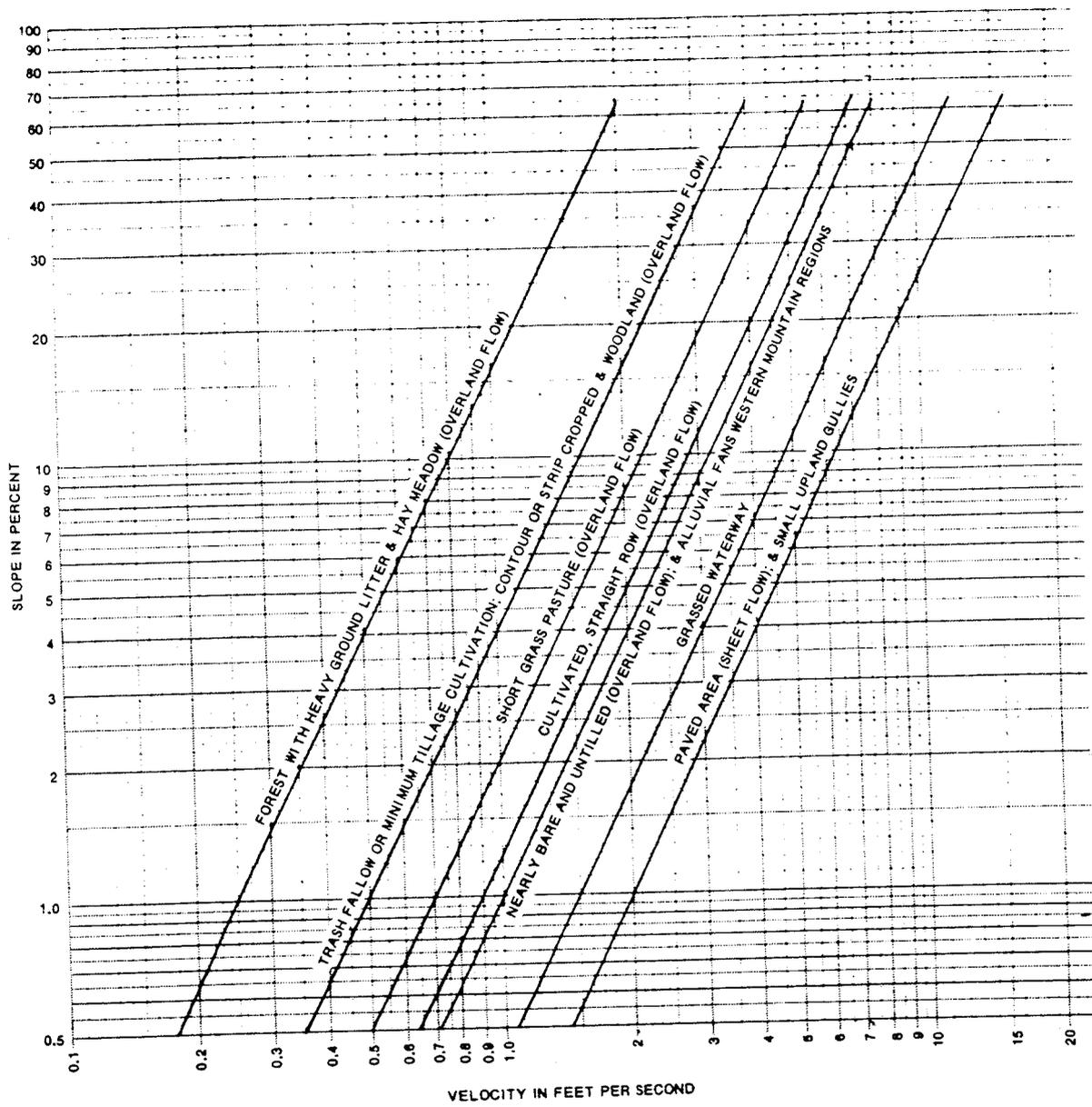


FIGURE 1



FROM "NEH" SECTION 4

Figure 15.2.--Velocities for upland method of estimating T_c

9.2

Table 9.1.--Runoff curve numbers for hydrologic soil-cover complexes

(Antecedent moisture condition II, and $I_a = 0.2 S$)

Land use	Cover		Hydrologic soil group			
	Treatment or practice	Hydrologic condition	A	B	C	D
Fallow	Straight row	----	77	86	91	94
Row crops	"	Poor	72	81	88	91
	"	Good	67	78	85	89
	Contoured	Poor	70	79	84	88
	"	Good	65	75	82	86
	"and terraced	Poor	66	74	80	82
	" " "	Good	62	71	78	81
Small grain	Straight row	Poor	65	76	84	88
		Good	63	75	83	87
	Contoured	Poor	63	74	82	85
		Good	61	73	81	84
	"and terraced	Poor	61	72	79	82
		Good	59	70	78	81
Close-seeded legumes <u>1/</u> or rotation meadow	Straight row	Poor	66	77	85	89
	" "	Good	58	72	81	85
	Contoured	Poor	64	75	83	85
	"	Good	55	69	78	83
	"and terraced	Poor	63	73	80	83
	"and terraced	Good	51	67	76	80
Pasture or range		Poor	68	79	86	89
		Fair	49	69	79	84
		Good	39	61	74	80
	Contoured	Poor	47	67	81	88
	"	Fair	25	59	75	83
	"	Good	6	35	70	79
Meadow		Good	30	58	71	78
Woods		Poor	45	66	77	83
		Fair	36	60	73	79
		Good	25	55	70	77
Farmsteads		----	59	74	82	86
Roads (dirt) <u>2/</u> (hard surface) <u>2/</u>		----	72	82	87	89
		---	74	84	90	92

1/ Close-drilled or broadcast.2/ Including right-of-way.

FROM "NEH" SECTION 4

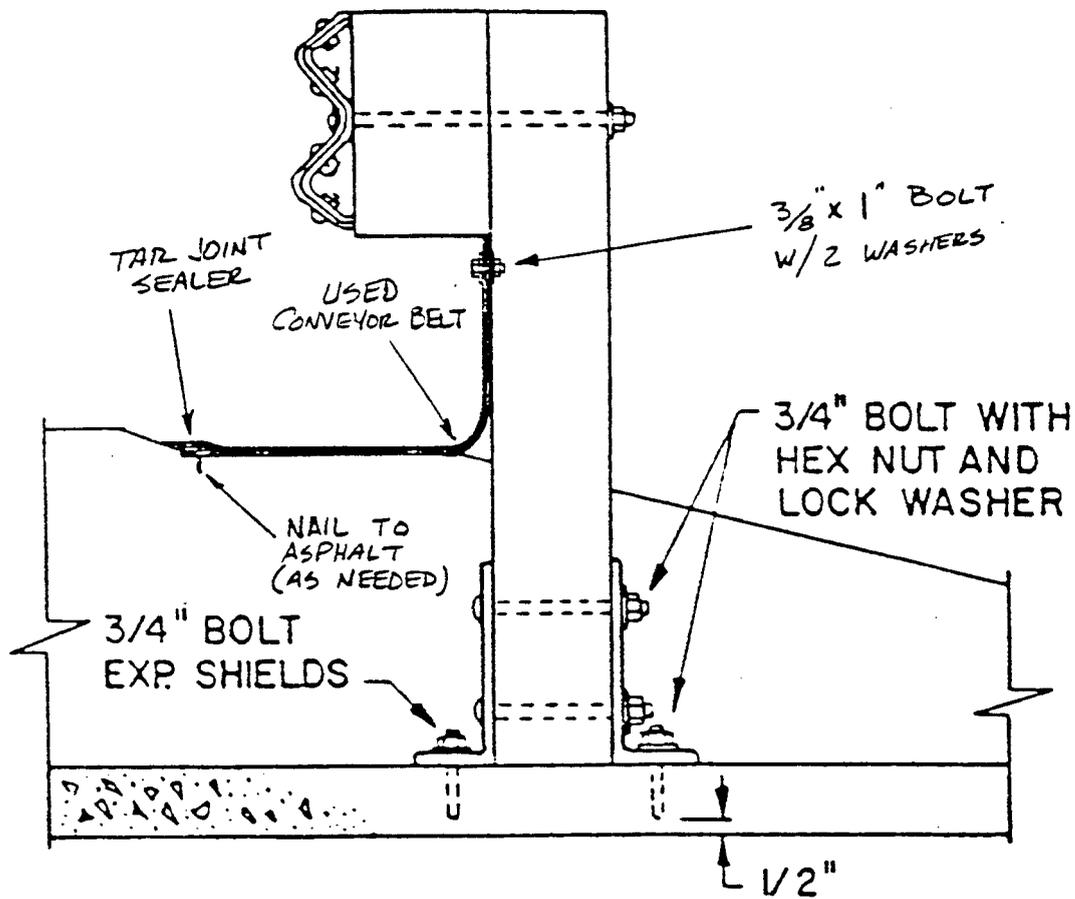
INPUT SUMMARY

FOR W.S.: DBD LOWER BELTED ROAD DRAINAGE

STORM:	WATERSHED:
DISTRIBUTION =SCS TYPE 2	LAND SLOPE = 0.0000 PCT
PRECIP.DEPTH = 1.20 IN	CURVE NUMBER = 96.00
DURATION = 6.00 HR	CHANNEL LENGTH = 0.00 FT
NUMBER OF LINES = 915	TIME OF CONC. = 0.0500 HR
	AREA = 1.35 AC
	D = 0.0067 HR

OUTPUT SUMMARY

RUNOFF DEPTH = 0.8121 IN
INITIAL ABSTRACTION = 0.0833 IN
PEAK FLOW = 4.07 CFS (2.9903 IFH)
AT T = 3.13 HRS

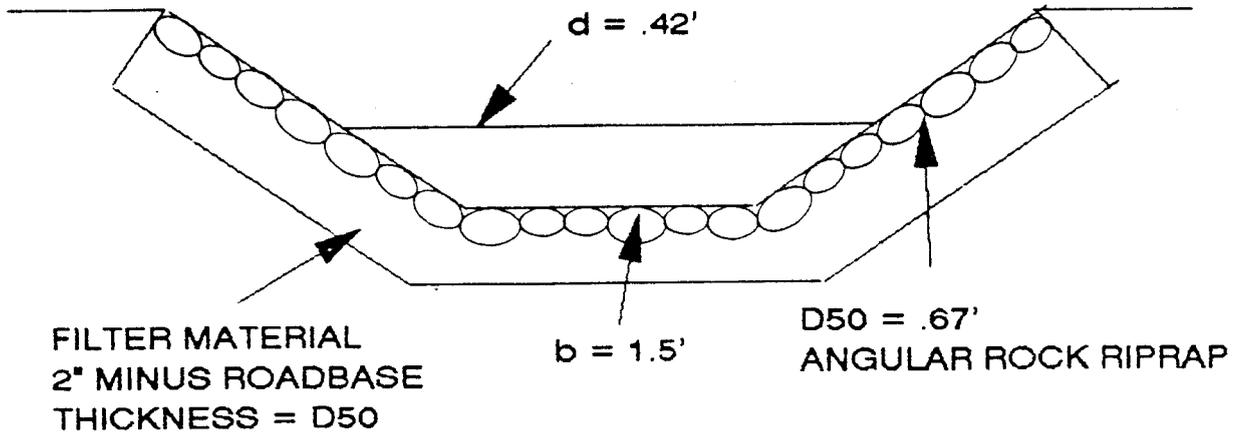


TYPICAL GUARD RAIL

BELTING INSTALLATION

FIGURE 2

DES-BEE-DOVE MINE
CHANNEL AT
STA 156 TO 161



Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: DBD CHANNEL AT 156

Comment: CHANNEL AT STA 156 TO 161

Solve For Depth

Given Input Data:

Bottom Width.....	1.50 ft
Left Side Slope..	1.50:1 (H:V)
Right Side Slope.	1.50:1 (H:V)
Manning's n.....	0.035
Channel Slope....	0.0600 ft/ft
Discharge.....	4.07 cfs

Computed Results:

Depth.....	0.42 ft
Velocity.....	4.60 fps
Flow Area.....	0.88 sf
Flow Top Width...	2.75 ft
Wetted Perimeter.	3.00 ft
Critical Depth...	0.51 ft
Critical Slope...	0.0280 ft/ft
Froude Number....	1.43 (flow is Supercritical)

Open Channel Flow Module, Version 3.21 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

FIGURE 3

RIPRAP SIZING

RIPRAP SIZING FOR TRAPAZOIDAL DITCHES

ENTER LISTED PARAMETERS

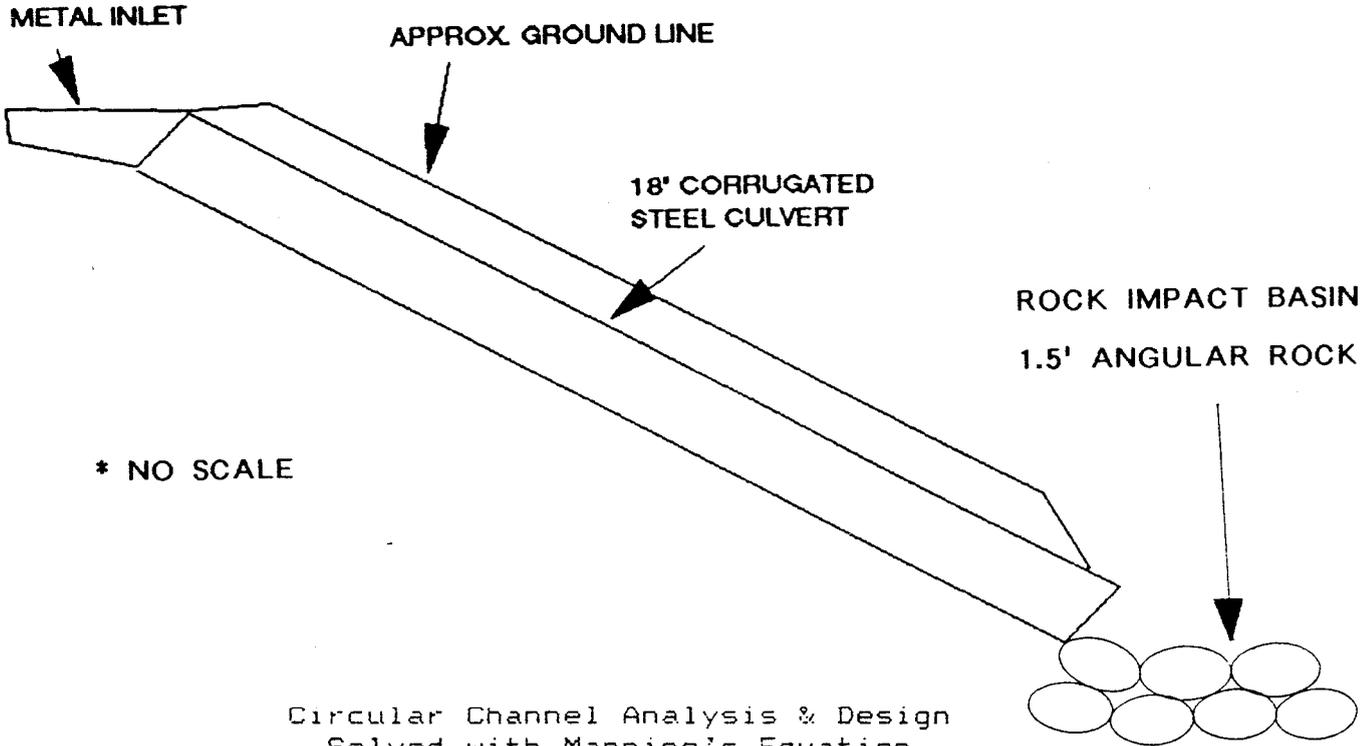
1. FLOW RATE (CFS) 4.07
2. CHANNEL SLOPE .06
3. BOTTOM WIDTH (FT) 1.5
4. SIDE SLOPE .66
5. PHI ANGLE 42
6. SPECIFIC GRAVITY OF RIPRAP 2.65

DESIRED SAFETY FACTOR FOR CHANNEL BOTTOM 1

DESIRED SAFETY FACTOR FOR CHANNEL BANKS 1

VELOCITY	DEPTH	D50	S.F. BTM	S.F. BANK
4.433	.427	.6716	1.806	1

DBD CULVERT ROAD DRAINAGE AT STA 161



Circular Channel Analysis & Design
Solved with Manning's Equation

Open Channel -- Uniform flow

Worksheet Name: DBD CULVERT AT 161

Comment: ROAD DRAINAGE CULVERT AT STA 161 OUTLET

Solve For Actual Depth

Given Input Data:

Diameter.....	1.50 ft
Slope.....	0.4000 ft/ft
Manning's n.....	0.014
Discharge.....	4.07 cfs

Computed Results:

Depth.....	0.26 ft
Velocity.....	19.75 fps
Flow Area.....	0.21 sf
Critical Depth....	0.77 ft
Critical Slope....	0.0063 ft/ft
Percent Full.....	17.40 %
Full Capacity.....	61.69 cfs
QMAX @.94D.....	66.36 cfs
Froude Number.....	8.18 (flow is Supercritical)

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FIGURE 4