

29-13764 FIELD EXAM NOTES									
9/22/2008 MHOLLIDAY / DKIDMAN									
DITCH DIMENSIONS FOR MANNINGS EQUATION TAKEN IN 3 PLACES									
DIST	WIDTH	DEPTH	AREA	SLOPE MEASUREMENTS IN FEET					
0.0		LEW							
0.5	0.75	0.22	0.165	DIST	HT				
1.0	0.5	0.32	0.16	0	4.38	RISE =	0.19	FT	
1.5	0.5	0.43	0.215	20	4.49	RUN =	120	FT	
2.0	0.5	0.51	0.255	40	4.38				
2.5	0.5	0.46	0.23	60	4.52				
3.0	0.5	0.38	0.19	80	4.55				
3.5	0.5	0.28	0.14	100	4.53				
4.0	0.75	0.13	0.0975	120	4.57				
4.5		REW							
	4.5		1.4525						
CHANNEL DIMENSIONS APPEARED VERY UNIFORM									
DIST	WIDTH	DEPTH	AREA	AVERAGE AREA OF 3 CROSS SECTIONS IS				1.48	SQ FT
0.0		LEW							
0.5	0.75	0.17	0.1275	AVERAGE MAX DEPTH WAS				0.52	FT
1.0	0.5	0.31	0.155						
1.5	0.5	0.45	0.225	CALCULATED WETTED PERIMETER WAS				4.66	FT
2.0	0.5	0.49	0.245						
2.5	0.5	0.53	0.265						
3.0	0.5	0.39	0.195						
3.5	0.5	0.32	0.16						
4.0	0.75	0.17	0.1275						
4.5		REW							
	4.5		1.5						
DIST	WIDTH	DEPTH	AREA						
0.0		LEW							
0.5	0.75	0.16	0.12						
1.0	0.5	0.31	0.155						
1.5	0.5	0.44	0.22						
2.0	0.5	0.51	0.255						
2.5	0.5	0.49	0.245						
3.0	0.5	0.41	0.205						
3.5	0.5	0.3	0.15						
4.0	0.75	0.19	0.1425						
4.5		REW							
	4.5		1.4925						

Manning's Equation Calculator for Flow Rate in Any Open Channel

S = 0.0016 ft/ft

n = 0.018 manning's coefficient

A = 1.48 area (ft²)

P = 4.66 wetted perimeter (ft)

R = 0.32 hydraulic radius (ft)

Q = 2.26057 flowrate (CFS)

Channel Slope

Slope Options

☐ Manual Entry

☒ Slope Calculator

Slope Calculator

Rise = 0.19 feet

Run = 120 feet

Slope, S = 0.0016 ft/ft

Pipe Material

smooth earth

READ ME

Manning's Equation (1), is a velocity (v) in a open channel equation (2) when combine computation of the flow rate flow.

In equations (1) and (3), n is Roughness and can be four channel types. R is the hydraulic radius is equal to the area of the channel divided by the wetted perimeter, $R = A/P$. S is the slope and is often assumed to be equal to the channel bed slope.

Because Manning's Equation is arbitrary. To obtain a velocity must be reported in ft², hydraulic radius S must be reported in ft/ft. n is a unitless constant.

$$(1) \quad v = 1.49$$

$$(2) \quad Q = vA$$

$$(3) \quad Q = 1.49$$

is an empirical formula that solves for velocity under uniform flow. The continuity equation with equation (1) allows for the determination of the discharge (Q) in an open channel under uniform flow.

n refers to Manning's Coefficient of Roughness and is found in tabulated form for many open channels. It is the hydraulic radius of the open channel and the slope of the energy grade line which is equal to the slope of the channel.

Since the equation is empirical the units are not consistent. Velocity in ft/s and a flow rate in ft³/s, area in ft², and hydraulic radius must be reported in ft, and n . Manning's Coefficient of Roughness is

$$Q = \left(\frac{1}{n} \right) \left(R^{\frac{2}{3}} \right) \sqrt{S} A$$

A

$$Q = \left(\frac{1}{n} \right) (A) \left(R^{\frac{2}{3}} \right) \sqrt{S}$$

26	Counter	Material	n
	1	plastic (pvc, abs)	0.0090
	2	clean uncoated CI	0.0140
	3	clean coated CI	0.0130
	4	dirty CI	0.0250
	5	riveted steel	0.0160
	6	welded steel pipe	0.0125
	7	galvanized iron	0.0160
	8	brass and glass	0.0110
	9	wood stave, small diam.	0.0115
	10	wood stave, large diam.	0.0125
	11	concrete, average	0.0130
	12	conc., ball & spigot flowing full	0.0100
	13	conc., ball & spigot partially full	0.0085
	14	conc., with rough joints	0.0165
	15	conc., dry mix, rough forms	0.0160
	16	conc., wet mix, steel forms	0.0130
	17	conc., very smooth finish	0.0115
	18	vitrified sewer pipe	0.0140
	19	common-clay drain tile	0.0130
	21	planed timber	0.0110
	22	canvas	0.0120
	24	brick	0.0160
	26	smooth earth	0.0180
	28	corrugated metal pipe (CMP)	0.0240
	30	natural channel, w/ stones and weeds	0.0350
	31	natural channel, very poor condition	0.0600
	32	not in use	
	33	not in use	
	34	not in use	
	35	not in use	

Avg. n values from App. 19.A Lindenburg 1999

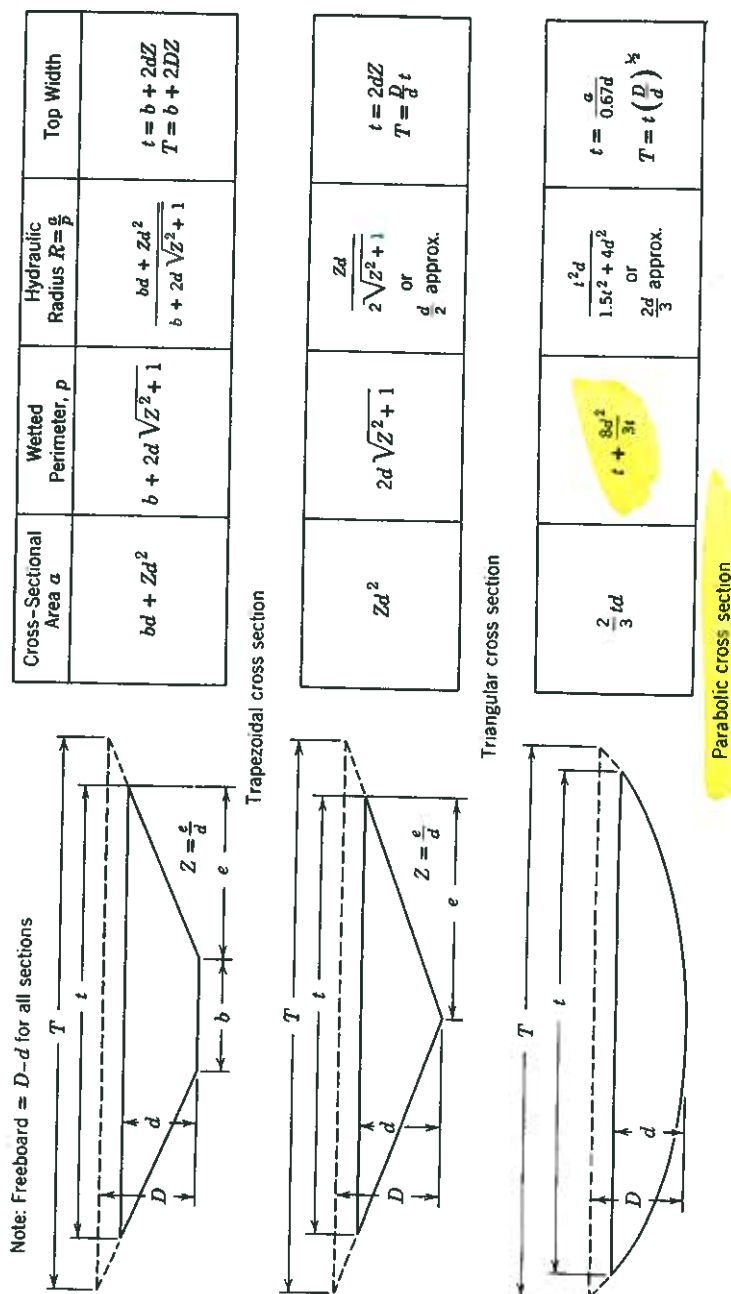


Fig. 7.1 Channel cross section, wetted perimeter, hydraulic radius, and top width formulas.

Table 7.1 Vegetation
Geographical Area of
Northeastern

Southeastern

Upper Mississippi

Western Gulf

Southwestern

Northern Great Plains

*Recommended vegetation

Table 7.1. Other factors affecting runoff, ease of erosion, protective cover, stabilization as a seed or herbicides are used, availability of seed, and ant vegetation.

7.5 Design Velocity

The ability of vegetation to stabilize a channel is dependent on the erosive characteristics of the material. The permissible velocity for those for sod-forming vegetation is highly localized erosion.

Permissible velocities for velocity are given in an average velocity or with the channel velocity and illustrated is about 0.8 m/s, 0.3 m/s. Design of velocity.

7.6 Roughness

Slope and hydraulic roughness; however, the tests by Ree (1949) data to determine



09/22/2008

CPS N ~~42° 54.479'~~ W ~~111° 31.819'~~

P/D



09/22/2008

DITCH



Pou

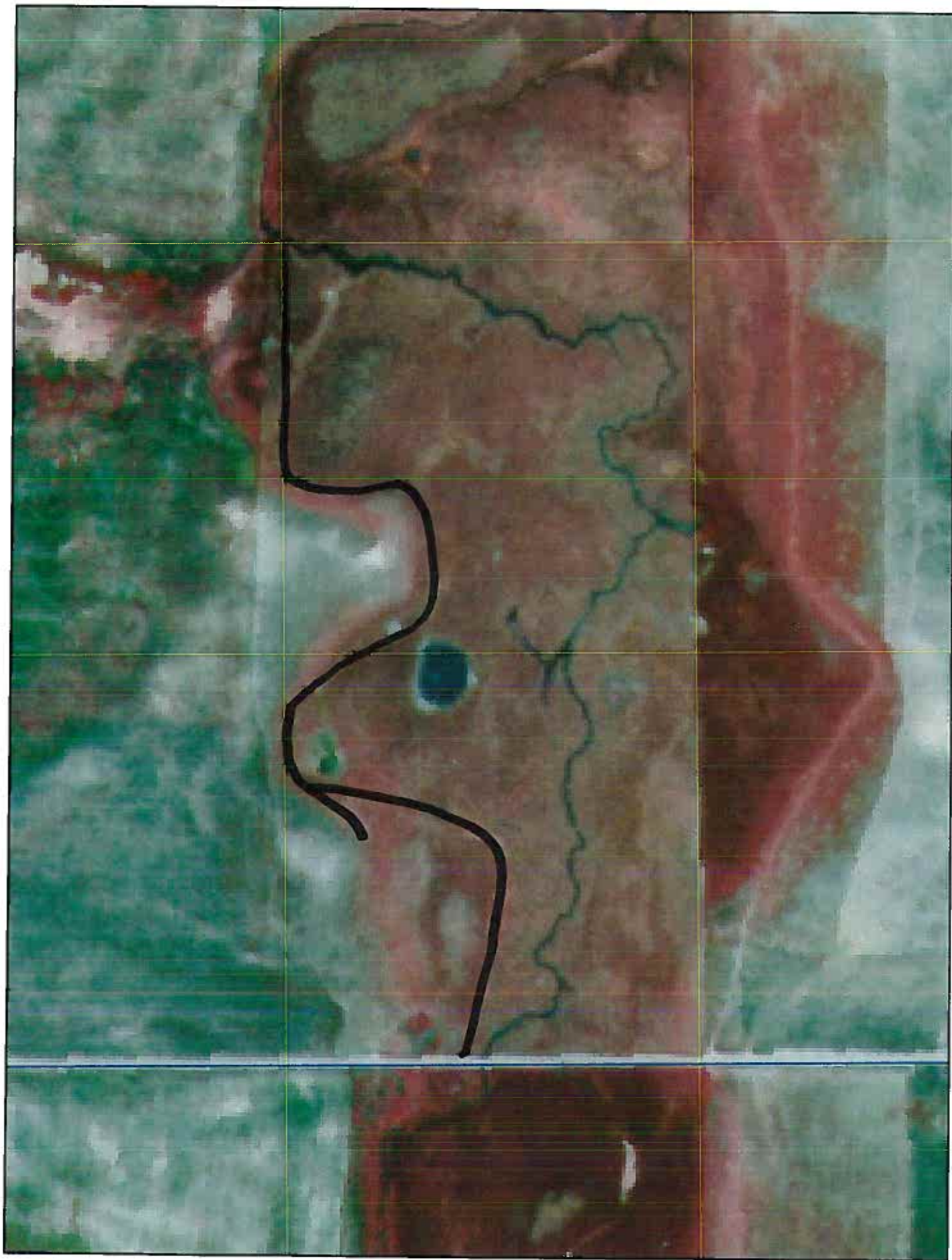


BANIVOCK CREEK









LINE DRAWN BY CLAIMANT TO SHOW WESTERN EXTENT OF POA,
EASTERN EDGE OF POA IS BANNOCK CREEK.