



LOCATION AND OWNERSHIP MAP
BENTON TOWNSHIP

LEGEND

PROPOSED IMPROVEMENT	=====
HIGHWAYS	=====
PROPERTY LINE	-----
WATERSHED	-----
SECTION CENTER	X
SECTION CORNER	X
ACRES IN WATERSHED	XX
STREAM (LARGE)	~~~~~
DITCH (4" OVER)	-----
RAILROAD	-----
ACRES OWNED	XX A.

SUPPORTING DATA

DRAINAGE AREA	393 AC.
DESIGN COEFFICIENT	0.05
LAND USE	GENERAL FARMING
SOIL TYPE	TOLEDO, FULTON
LAND SLOPE	0-2%
TYPE DRAINAGE	SURFACE & TILE

CONSTRUCTION DATA

STATION	GRADE	WIDTH	SLOPE	CUBIC YARDS	AVERAGE DEPTH
6436	0.10	3'	1/2:1	132	4'
5944	0.15	3'	1/2:1	142	5.5'
39135	0.10	3'	1/2:1	150	4.5'
21454	0.05	3'	1/2:1	130	3.5'

INDEX TO SMALL PARCELS

SECTION	PARCEL	PROPERTY OWNERS	ACRES
8	A	AT-T & CABLE	1.5
8	B	NORFOLK WESTERN R.R.	4.0
8	C	CITIZENS COUNTY	5.0
8	D	BENTON TWP TRUSTEES	5.0

- ### BENCHMARK DESCRIPTION
- BM-1 TOP OF SPIKE IN NW TAP ROOT OF 3" STA. 3+10 OAK TREE 10' SOUTH OF DITCH. M.S.L. ELEV. 592.70
 - BM-2 TOP OF SPIKE IN NORTH WEST SIDE OF STA. 21+54 AT T CABLE LINE POLE 35' SOUTH EAST OF DITCH. M.S.L. ELEV. 590.90
 - BM-3 TOP OF SPIKE IN SOUTH SIDE OF POWER STA. 27+50 POLE ON NORTH SIDE OF TROWBRIDGE ROAD. M.S.L. ELEV. 589.54
 - BM-4 TOP OF CHISELED X ON NORTH WEST CORNER OF CONCRETE CATCH BASIN COVER LOCATED IN SOUTH WEST CORNER OF INTERSECTION OF GRAYTOWN AND TROWBRIDGE ROAD. M.S.L. ELEV. 588.75
 - BM-5 TOP OF CHISELED X ON CENTER OF STA. 47+43 WEST HEAD WALL OF CONCRETE CATCH BASIN ON EAST SIDE OF GRAYTOWN ROAD. M.S.L. ELEV. 586.31
 - BM-6 TOP OF CHISELED X ON SOUTH END OF STA. 56+37 HEAD WALL ON DROP BOX STRUCTURE ON LILLIAN SOMMER. M.S.L. ELEV. 585.25
 - BM-7 TOP OF CHISELED X ON CENTER OF STA. 65+25 EAST HEAD WALL OF CATCH BASIN ON EAST SIDE OF GRAYTOWN ROAD. M.S.L. ELEV. 582.44
 - BM-8 TOP OF CHISELED X ON NORTH END OF STA. 66+68 OF CONCRETE HEAD WALL IN NORTH WEST CORNER OF INTERSECTION OF GRAYTOWN AND HAUSENCOMB ROAD. M.S.L. ELEV. 585.01
 - BM-9 TOP OF U.S.G.S. MARKER PLATE IN EAST STA. 77+50 STEP OF SOUTH ABUTMENT OF BRIDGE ON GRAYTOWN ROAD OVER TURTLE CREEK. M.S.L. ELEV. 585.47

THIS DITCH PLAN HAS BEEN APPROVED BY
John A. Papen
OTTAWA COUNTY ENGINEER DATE 11/2/68

SURVEYED - D. SCHMER 6/3/4/1968
E. CAMPBELL
D. OFFER

LOCATION - E 1/2 OF SE 1/4 OF SEC. 8 N 1/2 OF N.E. 1/4 AND E 1/2 OF N.W. 1/4 OF SEC. 17 T 7 N. - R 14 E. BENTON TWP OTTAWA COUNTY, OHIO.

REFERENCE - FIELD NOTES ON FILE IN OTTAWA COUNTY SOIL & WATER CONSERVATION OFFICE 149 CHURCH ST. OAK HARBOR, OHIO.

ENGINEERING JOB CLASS IV
DITCH IMPROVEMENT PLAN
LICK DITCH GROUP
BENTON TOWNSHIP
OTTAWA COUNTY, OHIO.
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

HYDRAULIC CALCULATION

CHANNEL FLOW $V = \frac{1.486}{N} R^{2/3} S^{1/2}$ MAXIMUM VELOCITY 5 FPS

REACH	STA TO STA	C+00	21+54	21+92	39135	5944	6436
DRAINAGE AREA AC.		121	184	355.5	393		
Qc FLOW CFS.		14	20	31	33		
N		.04	.04	.04	.04		
SLOPE - S FT./FT.		.0005	.0010	.0015	.0010		
S 1/2		.0224	.0310	.0387	.0310		
Q/S 1/2 = KD		625	634	801	1044		
KD VALUE USED		663	663	654	1079		
SIDE SLOPE		1/2:1	1/2:1	1/2:1	1/2:1		
BOTTOM WIDTH FT.		3'	3'	3'	3'		
DEPTH FT.		2.3	2.3	2.6	2.9		
AREA SQ.FT.		14.9	14.9	17.94	21.33		
VELOCITY Q/A=F.P.S.		.94	1.34	1.72	1.55		

HEAD LOSS IN CULVERTS

$H = \frac{V^2}{2g} (1 + KE + KPL)$

STATION	16115	21454	39135	39145	43135	51433	5944	6436	6436
DRAINAGE AREA AC.	100	130	184	238	265	300	355.5	393	412
Qc FLOW - CFS	12	15	20	24	26	29	31	33	34
DIAMETER IN.	24"	30"	30"	42"	35"	36"	3' X 3'	48"	36"
TYPE	VSP	VSP	R/C	R/C	R/C	R/C	CONCRETE	C.T.	C.T.
"N"	0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.15	0.13
LENGTH FT.	24'	44'	8'	40'	24'	24'	20'	24'	16.65'
X SECTIONAL AREA SQ.FT.	3.14	491	491	962	7.07	7.07	8.50	12.57	7.07
KP	.14	.107	.0092	.0059	.0072	.0072	.0053	.0066	.0012
KPL	3.36	47	0.74	24	17	17	14	0.68	7.60
KE	.50	.50	.50	.50	.50	.50	.50	.50	.50
VELOCITY FPS.	3.8	3.1	4.1	2.5	3.7	4.1	3.65	2.63	4.81
HEAD LOSS FT.	.40	.30	.41	.17	.35	.43	.34	.18	3.34'

The 36" culvert will provide "C" curve (3") topward until the tailwater in Turtle Creek exceeds elevation 579.48

Designed	Donald G. Papp	Date	11/2/68
Drawn	Donald G. Papp	Approved by	Russell K. Rowan
Traced		Title	Soil Engg.
Checked	R. H. Rowan	Sheet	No. 1
		Drawing No.	34-01-83-68-00