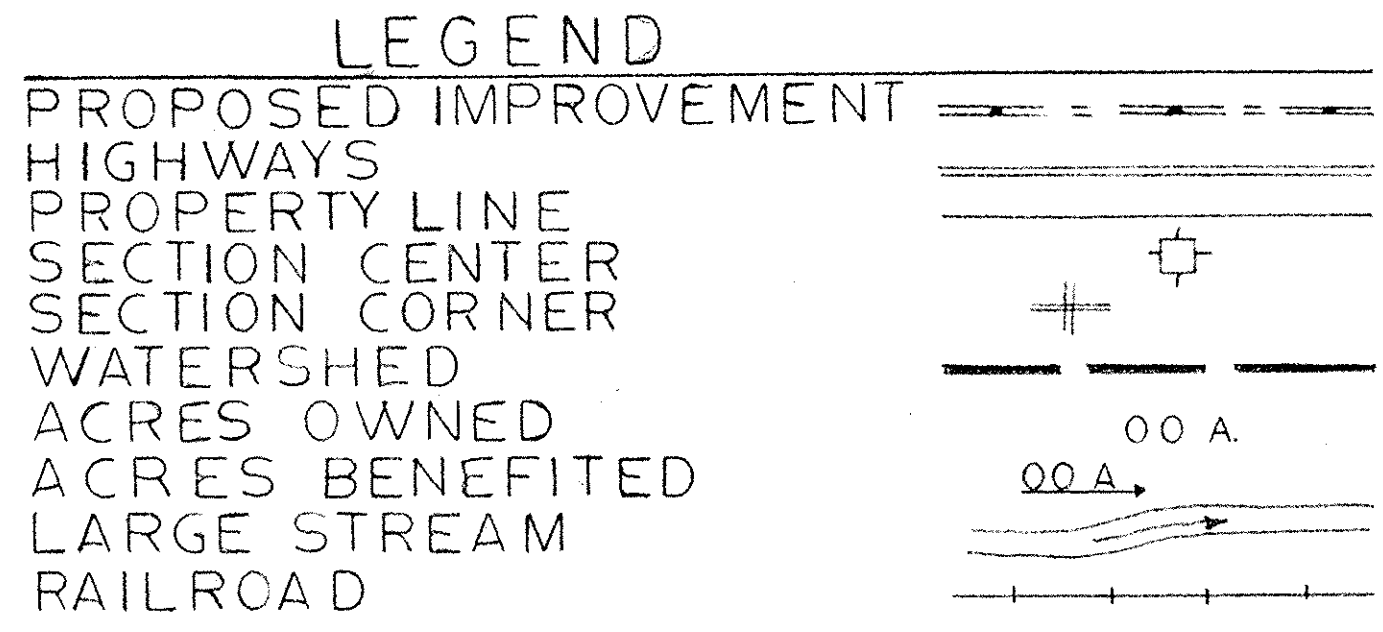


LOCATION & OWNERSHIP MAP

SPECIFICATIONS

- I. **EXCAVATION**
 A. Bottom Width: The bottom width shall be THREE (3') feet between sta. 0+00 and sta. 66+00.
 B. Bank Slopes: The ditch bank slopes are to be constructed to at least 1 1/2 foot horizontal to 1 foot vertical.
 C. Alignment: The centerline of the improvement shall be approximately the centerline of the existing ditch unless otherwise indicated on plan.
 D. Total excavation: The total excavation consists of 4,923 cubic yards of earth over 5800 lineal feet of ditch. (the plan).
 E. Excess Yardage: No extra compensation will be paid for such excavation in excess of yardage herein estimated. This estimate was made from cross-sections of the proposed ditch. The contractor should view the proposed work to his own satisfaction.
- II. **CLEARING**
 All trees and/or brush which would interfere with the excavation operation must be cleared from the ditch right-of-way ahead of the construction operations. Stumps on the berm should be removed or cut as low as cutting tools permit. Cleared debris should be disposed of by burning or removed from the right-of-way.
- III. **BERM WIDTHS**
 Unless otherwise noted the berms will have the following minimum widths: four (4) feet wide for ditches up to four (4) feet depth; six (6) feet wide for four to six foot depth; and ten (10) foot wide for ditches over six feet in depth.
- IV. **SPOIL BANKS**
 Excavated material should be deposited and spread along the field side of the ditch, as determined, except where used for levees, and in overflow areas with timber or brush cover. Slope of the spoil after spreading should be at least 3:1 on the channel side and at least 4:1 on the field side. The height of the spoil should not exceed one foot above average ground level. Openings shall be provided for surface water to enter the ditch.
- V. **TILE OUTLETS**
 Landowners shall protect their tile outlets with a section of continuous rigid pipe and flap-gates or grid to exclude rodents. For details of construction see your Soil Conservation Technician. All tile outlets shall have adequate outlets before performance is certified.
- VI. **SURFACE WATER OUTLETS**
 Wherever a lateral or a surface ditch enters the main ditch at a higher elevation protection from erosion should be provided by: drop structures, pipe drops, other suitable structure or grassed waterway. For assistance on outlets see your Soil Conservation Technician.
- VII. **DITCH BANK SEEDING**
 The ditch banks will be seeded, immediately after each day's work, to tall fescue (Kentucky 31 or Alta) at the rate of 25 lbs. per acre. A minimum of 500 lbs. of 10-10-10 fertilizer or equivalent will be applied. 2.5 acres of ditch bank seeding will be required.
- VIII. **CULVERTS**
 Existing culverts will be cleaned and the inverts (flow line) lowered to correspond to the proposed ditch grade as indicated on the plan.
 Station 11+50 TO BE CLEANED
 Station 29+00 REMOVE 18" R/C IF REPLACE USE 30" R/C OR EQUIVALENT
 Station 49+21 TO BE CLEANED
 Station 66+00 NO DIRT IN SEWER.



SUPPORTING DATA

DRAINAGE AREA	320 ACRES
DESIGN COEFFICIENT	Qc CURVE
LAND USE	GENERAL CROPS
SOIL TYPE	TOLEDO FULTON
LAND SLOPE	0 - 2 %
TYPE DRAINAGE	SURFACE & TILE

INDEX TO SMALL PARCELS

SECTION	PARCEL	PROPERTY OWNERS	ACRES
18	A	GAILLARD KEMP	.5
18-7		BENTON TWP TRUSTEE	
18		OTTAWA COUNTY	

HYDRAULIC CALCULATIONS

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

STATION	11+50	29+00	49+21	66+00
DRAINAGE AREA AC	70A	152	220	320
Qc FLOW C.F.S.	8.5	16.5	23	30
DIAMETER IN.	30"	30"	60" ARCH	42"
TYPE "N"	C.M.P.	R/C	STONE	R/C
LENGTH FT.	.025	.013	.025	.013
X SEC. AREA FT.	.85	.22	.374	12.69
KP	.50	.50	.50	.50
KPL	.034	.0092	.017	.0059
KE	.25	.24	.22	2150
VELOCITY F.P.S.	1.8	3.4	1.7	3.1
HEADLOSS FT.	.11	.31	.09	2.14

CHANNEL FLOW

MAXIMUM VELOCITY 5 F.P.S. $V = \frac{1.486}{N} R^{2/3} S^{1/2}$

REACH	STA. TO STA.	0+00 TO 11+50	11+50 TO 49+21	49+21 TO 66+00
DRAINAGE AREA AC		70	220	320
Qc FLOW C.F.S.		8.5	23	30
"N"		.04	.04	.04
SLOPE FT/FT		.0010	.0008	.0015
S-1/2		.0316	.0283	.0387
Qc / S-1/2 = KD		269	813	775
KD VALUE USED		281	854	788
SIDE SLOPE		1 1/2 : 1	1 1/2 : 1	1 1/2 : 1
BOTTOM WIDTH FT.		3'	3'	3'
DEPTH OF FLOW FT.		1.5	2.6	2.5
AREA SQ.FT.		7.89	17.94	16.89
VELOCITY F.P.S.		1.1	1.3	1.8

BENCH MARK DESCRIPTION

- BM #1 - TOP OF IRON PIPE TO SUPPORT R.R. TIE HEADWALL. STA. 0+00 M.S.L. ELEV. 594.50
- BM #2 - TOP OF SPIKE IN N. SURFACE ROOT OF 12" WHITE ASH TREE 50' E. OF DITCH ON PROPERTY LINE. STA. 9+12 M.S.L. ELEV. 593.91
- BM #3 - TOP OF SPIKE IN W. SIDE OF 16" HICKORY TREE W. SIDE OF DITCH. STA. 30+67 M.S.L. ELEV. 592.60
- BM #4 - TOP OF CHISELED X ON E. END OF N. HEADWALL OF CULVERT ON TROWBRIDGE ROAD. STA. 49+43 M.S.L. ELEV. 591.22
- BM #5 - TOP OF CHISELED X IN CENTER OF HEADWALL OF STRUCTURE ON W. SIDE OF DITCH. STA. 55+35 M.S.L. ELEV. 588.53
- BM #6 - TOP OF CHISELED X ON S.W. CORNER OF 6' SQ. CATCH BASIN W. SIDE OF ELLISTON TROWBRIDGE RD. STA. 66+00 M.S.L. ELEV. 587.58

THIS DITCH PLAN HAS BEEN APPROVED BY

BENTON TOWNSHIP TRUSTEES DATE 6/15/69

John G. Pappas 6/15/69
Donald Opper
James G. ...

CONSTRUCTION DATA

STATION	% GRADE	BOTTOM WIDTH	SIDE SLOPES	CUBIC YARDS	AVERAGE DEPTH
11+50	.10	3'	1 1/2 : 1	681	4.8'
49+21	.08	3'	1 1/2 : 1	3273	5.2
66+00	.15	3'	1 1/2 : 1	969	5.0
					4,923

THIS DITCH PLAN HAS BEEN APPROVED BY

John G. Pappas 6/20/69
 OTTAWA COUNTY ENGINEER DATE

LOCATION - N 1/2 OF SECTION 18 S.E. 1/4 OF SECTION 7 T-7N R-14E BENTON TOWNSHIP OTTAWA COUNTY, OHIO.

SURVEYED - D. SOMMER D. OPFER 2/20/69
 E. LICK E. ANDERSON
 J. DEHN R. BARSHEL

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

JOB CLASS II GROUP #44
DITCH IMPROVEMENT
 KRUMNOW DITCH
 BENTON TOWNSHIP
 OTTAWA COUNTY, OHIO.

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE

Date 4/1/69
 Designed *Donald Opper*
 Drawn *Donald Opper*
 Checked *R.K. Rowe*

Approved by *Russell K. Rowe*
 Title *Cons. Eng.*

Traced
 Sheet No. 1 of 3
 Drawing No. 34-01-83-69-09