



LOCATION & OWNERSHIP MAP  
SALEM TOWNSHIP  
Sec 2-3-10-11

**LEGEND**

PROPOSED IMPROVEMENT

HIGHWAYS

PROPERTY LINE

SECTION CENTER

WATERSHED

SECTION CORNER

ACRES OWNED

ACRES BENEFITED

TRANSMISSION LINE TOWERS

SURFACE DITCH

**SUPPORTING DATA**

DRAINAGE AREA 163 ACRES

LAND USE GENERAL FARMING

SOIL TYPE FULTON, TOLEDO

LAND SLOPE 0-2%

DESIGN COEFFICIENT  $Q_b$

TYPE DRAINAGE SURFACE TILE

**BENCH MARK DESCRIPTION**

BM #1 - TOP OF FOOTER ON S.E. CORNER OF BLDG. NEXT TO CORNER BOARD 30'S. 0+00 ON DITCH. M.S.L. ELEV. 579.12

BM #2 - TOP OF SPIKE IN S. SIDE OF WALNUT 14+62 TREE ON S. SIDE OF DITCH. M.S.L. ELEV. 579.24

BM #3 - TOP OF W. END OF 30" C.M.P. UNDER 26+21 GORDON RD. M.S.L. ELEV. 576.49

BM #4 - TOP OF SPIKE IN N. SIDE OF POWER POLE E. SIDE OF GORDON ROAD. 15'S. OF DITCH. M.S.L. ELEV. 577.62

BM #5 - TOP OF CROSS ARM ON E. LEG OF POWER TOWER 150' S. OF DITCH ON R. FLORO FARM. M.S.L. ELEV. 591.44

BM #6 - TOP OF SPIKE IN S. SIDE OF 30" OAK TREE 50' N. OF DITCH. M.S.L. ELEV. 577.01

BM #7 - TOP OF SPIKE IN N. SIDE OF POWER POLE S. SIDE OF DITCH W. SIDE OF DRIVE. M.S.L. ELEV. 575.68

BM #8 - TOP OF SPIKE IN W. TAP ROOT OF 28" OAK TREE 20' LEFT OF DITCH. M.S.L. ELEV. 575.86

**CONSTRUCTION DATA**

STATION	GRADE	BOTTOM WIDTH	SIDE SLOPES	CUBIC YARDS	AVERAGE DEPTH
59+00	0.03	10'	1 1/2:1	775	3.4'
46+60	0.05	4'	1 1/2:1	1385	4.5'
26+21	0.07	3'	1 1/2:1	764	4.5'

**SPECIFICATIONS**

<b>I. EXCAVATION.</b>	A. BOTTOM WIDTH SHALL BE THREE (3) FEET BETWEEN STA. 12+44 AND STA. 26+21 (4) TO STA. 46+60 (10') TO STA. 59+00
	B. THE DITCH BANK SLOPES ARE TO BE CONSTRUCTED TO AT LEAST 1 1/2 FOOT HORIZONTAL TO 1 FOOT VERTICAL.
	C. THE DITCH ALIGNMENT SHALL BE APPROXIMATELY THE CENTERLINE OF THE EXISTING DITCH UNLESS OTHERWISE INDICATED ON PLAN.
	D. THE TOTAL EXCAVATION CONSISTS OF 3,518 CUBIC YARDS OF EARTH OVER 5900 LINEAL FEET OF DITCH.
	E. 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. CONTRACTOR SHOULD VIEW PROPOSED WORK.
<b>II. CLEARING.</b>	ALL TREES OR BRUSH WHICH WOULD INTERFERE THE EXCAVATION OPERATION MUST BE CLEARED FROM THE DITCH RIGHT-OF-WAY AHEAD OF CONSTRUCTION OPERATION. STUMPS BE REMOVED OR CUT AS LOW AS POSSIBLE. CLEARED DEBRIS SHOULD BE DISPOSED OF BY BURNING OR REMOVAL FROM RIGHT-OF-WAY.
<b>III. BERM WIDTH.</b>	UNLESS OTHERWISE NOTED THE BERMS WILL HAVE THE FOLLOWING MINIMUM WIDTHS: FOUR (4) FEET WIDE FOR DITCHES UP TO FOUR (4) FOOT DEPTH; SIX (6) FEET WIDE FOR FOUR TO SIX FOOT DEPTH; TEN (10) FOOT WIDE FOR DITCHES OVER SIX FEET IN DEPTH.
<b>IV. SPOIL BANKS</b>	EXCAVATED MATERIALS SHOULD BE DEPOSITED AND SPREAD ALONG ONE OR BOTH SIDES OF DITCH, EXCEPT WHERE USED FOR LEVEES. SLOPES OF SPOIL AFTER SPREADING SHOULD BE AT LEAST 3:1 ON CHANNEL SIDE AND 4:1 ON FIELD SIDE, THE HEIGHT OF THE SPOIL SHOULD NOT EXCEED ONE (1) ABOVE GROUND LEVEL.
<b>V. TILE OUTLETS</b>	LAND OWNERS SHALL PROTECT THEIR TILE OUTLETS WITH A SECTION OF CONTINUOUS RIGID PIPE AND FLAP-GATE OR GUARD TO EXCLUDE RODENTS. FOR DETAILS CONTACT SOIL CONSERVATION SERVICE.
<b>VI. SURFACE WATER OUTLETS</b>	WHEREVER A LATERAL OR A SURFACE DITCH ENTERS THE MAIN DITCH AT A HIGHER ELEVATION PROTECTION FROM EROSION SHOULD BE PROVIDED FOR BY A STRUCTURE. FOR DETAILS CONTACT SOIL CONSERVATION SERVICE.
<b>VII. DITCH BANK SEEDING</b>	THE DITCH BANKS WILL BE SEEDING IMMEDIATELY AFTER EACH DAY'S WORK TO TALL FESCUE (KENTUCKY 31 OR ALTA) AT A RATE OF 25 LBS. PER ACRE. AND 500 LBS. 10-10-10 FERTILIZER OR EQUIVALENT WILL BE APPLIED. 2 ACRES OF DITCH BANK SEEDING WILL BE REQUIRED.
<b>VIII. CULVERTS</b>	EXISTING CULVERTS AND BRIDGES WILL BE CLEANED AND FLOW LINE LOWERED TO CORRESPOND TO THE PROPOSED DITCH GRADE AS INDICATED ON PLAN.
	STA. 22+45 TO 22+61 18' 27" R/C OR 33" CMP
	STA. 26+21 TO 26+49 28' 30" R/C OR 36" CMP
	STA. 39+61 TO 39+85 24' 36" R/C OR EQUIVALENT IN DRAINAGE CAPACITY.
	STA. 46+60 TO 46+79 24' 42" R/C OR EQUIVALENT IN DRAINAGE CAPACITY.
	INSTALL GRADE STABILIZATION STRUCTURE AT STA. 12+44 PRIOR TO CONSTRUCTION OF DITCH OR SIMULTANEOUSLY.

**HYDRAULIC CALCULATION**

CHANNEL FLOW $V = \frac{1.486}{n} R^{2/3} S^{1/2}$	
MAXIMUM VELOCITY 5 FPS	
REACH	STA. 12+41 26+21 46+60
TO STA.	26+21 46+60 59+00
DRAINAGE AREA AC	100 137 163
$Q_b$ FLOW CFS.	17 23 28
"N"	.04 .04 .04
SLOPE FT/FT	.0007 .0005 .0003
S 1/2	.0266 .0224 .0173
Q/S 1/2 = KD	639 1027 1618
KD VALUE USED	663 1096 1631
SIDE SLOPE	1 1/2:1 1 1/2:1 1 1/2:1
BOTTOM WIDTH FT	3' 4' 10'
DEPTH FT	2.3' 2.7' 2.3'
AREA SQ.FT.	14.85 21.75 30.95
VELOCITY-C/A FPS	1.2 1.1 .90
HEAD LOSS IN CULVERTS $H = \frac{V^2}{2g} (K_1 + K_2 + K_3)$	
STATION	22+45 26+21 39+61 46+60
DRAINAGE AREA	77 100 123 137
$Q_b$ FLOW-CFS.	15 17 21 23
DIAMETER-IN.	27" 30" 36" 42"
TYPE	R/C R/C R/C R/C
N	.013 .013 .013 .013
LENGTH - FT.	16' 28' 24' 24'
X SEC. AREA-SQ.FT.	3.98 4.91 7.07 9.62
KP	.0106 .0092 .0072 .0059
KPL	.170 .258 .1728 .1415
KE	.5 .5 .5 .5
VELOCITY-FPS.	3.3 3.5 2.97 2.4
HEADLOSS-FT	.28 .33 .22 .15

THIS DITCH PLAN HAS BEEN APPROVED BY  
*John A. Papoun* 9/29/67  
OTTAWA COUNTY ENGINEER DATE

LOCATION - N 1/2 OF N.E. 1/4 OF SEC. 10  
N. 1/2 OF N.W. 1/4 OF SEC. 11 T6N  
R-15E SALEM TWP. OTTAWA  
COUNTY, OHIO.

SURVEYED - 4/12/67 D. SOMMER  
E. CAMPBELL  
D. OFFER

REFERENCE - FIELD NOTES ON  
FILE IN OTTAWA SOIL & WATER  
CONSERVATION OFFICE.

JOB CLASS II GROUP # 27

DITCH IMPROVEMENT  
ELMER GOODMAN DITCH  
OTTAWA COUNTY, OHIO.

U.S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

Designed	Date	Approved by
Donald Oppen	7/67	<i>Richard J. Craft</i>
Drawn		Title
<i>Donald Oppen</i>		<i>Agil Engineer</i>
Traced		Title
Checked		Sheet
<i>R. Craft</i>	9/67	No. 1
		of 5
		Drawing No.
		74-1-83-67-14