

SUPPORTING DATA
 DRAINAGE AREA - - - - - 202 ACRES
 LAND USE - - - - - GENERAL FARMING
 SOIL TYPE - - - - - HOYTVILLE-NAPPAHIE
 LAND SLOPE - - - - - 0 - 2%
 TYPE DRAINAGE - - - - - SURFACE & TILE
 DESIGN COEFFICIENT C_b CURVE

LEGEND
 PROPOSED IMPROVEMENT
 HIGHWAYS
 PROPERTY LINE
 WATERSHED
 SECTION ENTER
 SECTION CORNER
 ACRES IN WATERSHED
 ACRES OWNED
 18" SEWER TILE

CONSTRUCTION DATA

STATION	GRADE %	BOTTOM WIDTH	SIDE SLOPES	CUBIC YARDS	AVERAGE DEPTH
3+45	.05	3'	1 1/2:1	235	3.5'
13+00	.15	3'	1 1/2:1	825	4'
35+83	.08	3'	1 1/2:1	1818	5'

BENCH MARK DESCRIPTION
 BM#1 TOP OF RAILROAD SPIKE IN CENTER OF CROSS ROADS OF ST. RT. 105 & 590 M.S.L. ELEV. 697.59
 BM#2 TOP W. SIDE OF OLD WINDMILL ANGLE IRON AT N.E. CORNER OF PUMPKIN NEAR N.E. CORNER OF BLDG. AREA OF CORNELL OVERMYER. M.S.L. ELEV. 599.54
 BM#3 TOP OF SPIKE IN N. SIDE OF POWER POLE E. SIDE ST. RT. 590 APPROX. 350' N. OF MELVIN BECK BLDG. AREA. M.S.L. ELEV. 600.69
 BM#4 TOP OF SPIKE IN W. SIDE OF POLE E. SIDE OF ST. RT. 590 APPROX. 300' N. OF HOVA BLDG. AREA. M.S.L. ELEV. 601.70

THIS DITCH PLAN HAS BEEN APPROVED BY
John G. Papuan
 OTTAWA COUNTY ENGINEER
 7/11/67 DATE

SPECIFICATIONS

I. EXCAVATION:
 A. BOTTOM WIDTH: THE BOTTOM WIDTH SHALL BE THREE (3) FEET BETWEEN STA. MINUS 2+10 TO STA. 35+83.
 B. BANK SLOPES: THE DITCH BANKS ARE TO BE CONSTRUCTED TO AT LEAST 1 1/2 FOOT HORIZONTAL TO 1 FOOT VERTICAL ON FARM SIDE AND DO NOT DISTURB SLOPE ON ROAD SIDE.
 C. ALIGNMENT: THE IMPROVEMENT WILL FOLLOW EXISTING SLOPE ON ROAD SIDE AND REMAINDER TAKEN FROM FARM SIDE (SEE CROSS SECTIONS).
 D. TOTAL EXCAVATION: THE TOTAL EXCAVATION CONSISTS OF 2878 CUBIC YARDS OF EARTH OVER 3793 LINEAL FEET OF DITCH.
 E. EXCESS YARDAGE: NO EXTRA COMPENSATION WILL BE PAID FOR SUCH EXCAVATION IN EXCESS OF YARDAGE HEREIN ESTIMATED FROM CROSS SECTIONS OF PROPOSED DITCH. CONTRACTOR SHOULD VIEW THE PROPOSED WORK TO HIS OWN SATISFACTION.

II. CLEARING:
 ALL TREES OR BRUSH WHICH WOULD INTERFERE WITH THE EXCAVATION OPERATION MUST BE CLEARED FROM THE DITCH RIGHT-OF-WAY AHEAD OF THE CONSTRUCTION OPERATION. CLEARED DEBRIS TO BE BURNED OR REMOVED FROM RIGHT-OF-WAY.

III. BERM WIDTHS:
 UNLESS OTHERWISE NOTED THE BERMS WILL HAVE THE FOLLOWING WIDTHS: FOUR (4) FEET WIDE FOR DITCHES UP TO FOUR (4) FOOT DEPTH; SIX (6) FEET WIDE FOR FOUR TO SIX FOOT DEPTH.

IV. SPOIL BANKS:
 EXCAVATED MATERIAL SHOULD BE DEPOSITED AND SPREAD ALONG ONE OR BOTH SIDES OF THE DITCH AS DETERMINED. SLOPE OF THE SPOIL AFTER SPREADING SHOULD BE AT LEAST 3:1 ON CHANNEL SIDE AND AT LEAST 4:1 ON THE FIELD SIDE. THE HEIGHT OF THE SPOIL SHOULD NOT EXCEED ONE FOOT ABOVE AVERAGE GROUND. 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 / RODENT GUARD.

VI. SURFACE WATER OUTLETS:
 WHEREVER A LATERAL OR SURFACE DITCH ENTERS THE MAIN DITCH AT A HIGHER ELEVATION, PROTECTION FROM EROSION SHOULD BE PROVIDED BY DROP STRUCTURES, PIPE DROPS OR OTHER SUITABLE STRUCTURES FOR ASSISTANCE ON OUTLETS SEE YOUR SOIL CONSERVATION SERVICE TECHNICIAN.

VIII. DITCH BANK SEEDINGS:
 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. 1 ACRES OF DITCH BANK SEEDING WILL BE REQUIRED.

HYDRAULIC CALCULATION

CHANNEL FLOW - $V = \frac{1.486}{N} R^{2/3} S^{1/2}$

REACH	STA. TO STA.	-3+10	3+45	13+00	35+83
DRAINAGE AREA		2.4	4.2 A	202.4	
C_b FLOW (C.F.S.)		.4	7.1	34.0	
"N"		.04	.04	.04	
SLOPE - S (FEET)		.0005	.0015	.0008	
S 1/2		.0224	.0387	.0283	
Q/S 1/2 = KD		18	183	1201	
KD VALUE USED		25	183	1241	
SIDE SLOPE		1 1/2:1	1 1/2:1	1 1/2:1	
BOTTOM WIDTH (FT)		3'	3'	3'	
DEPTH (FT)		0.4	1.2	3.1	
AREA (SQ. FT)		1.44	5.76	23.73	
VELOCITY = Q/A (FPS)		.38	4.23	1.43	
HEAD LOSS IN CULVERTS $H = \frac{V^2}{2g} (1 + KE + KPL)$					
STATION		3+45	20+11	30+49	35+83
DRAINAGE AREA (AC)		2	12.2	16.2	20.2
C_b FLOW (CFS)		.4	30.5	27.2	34
DIAMETER (IN.)		18"	30"	36"	18"
TYPE		V.S.P	R/C	R/C	V.S.P
N		.014	.013	.013	.014
LENGTH (FT)		25'	30'	30'	685'
X-SECTIONAL AREA		1.77	4.91	7.07	1.77
KP		.031	.0092	.0072	.031
KPL		.525	1.840	1.440	
KE		.50	.50	.50	
VELOCITY (CFS)		.23	4.17	3.84	
HEAD LOSS (FT)		.002	.46	.38	

LOCATION - E. 1/2 OF SEC. 10 T6N R14E OF SEC. 3 T6N R14E HARRIS TWP OTTAWA CO. OHIO.
 SURVEYED - E. BEARDSLEY & SOMMER 3. OFFER - 10/9/52 - 2/17/67
 REFERENCE - FIELD NOTES ON FILE IN OTTAWA SOIL & WATER CONSERVATION OFFICE.

JOB CLASS "II" GROUP #25

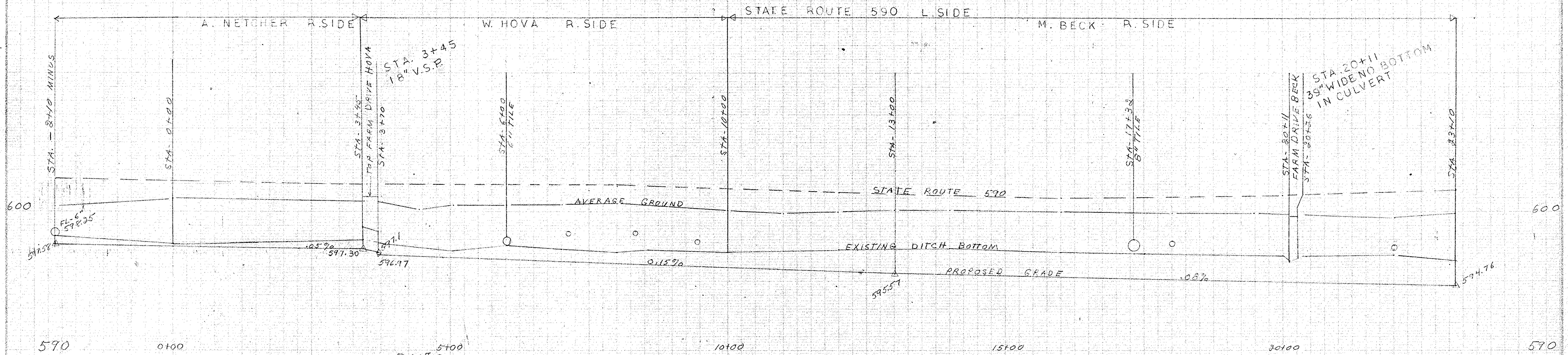
DITCH IMPROVEMENT
 STATE ROUTE-590-ROAD DITCH
 OTTAWA COUNTY, OHIO.

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	Date	Approved by
DONALD OPPER	3/13/67	
Drawn		Title
DONALD OPPER	3/13/67	
Traced		Title
Checked	Sheet No. of 3	Drawing No. 34-01-83-67-7

BM# 4 STA. 0+60
TOP SPIKE W. SIDE
POLE E. SIDE 590
M.S.L. 601.70

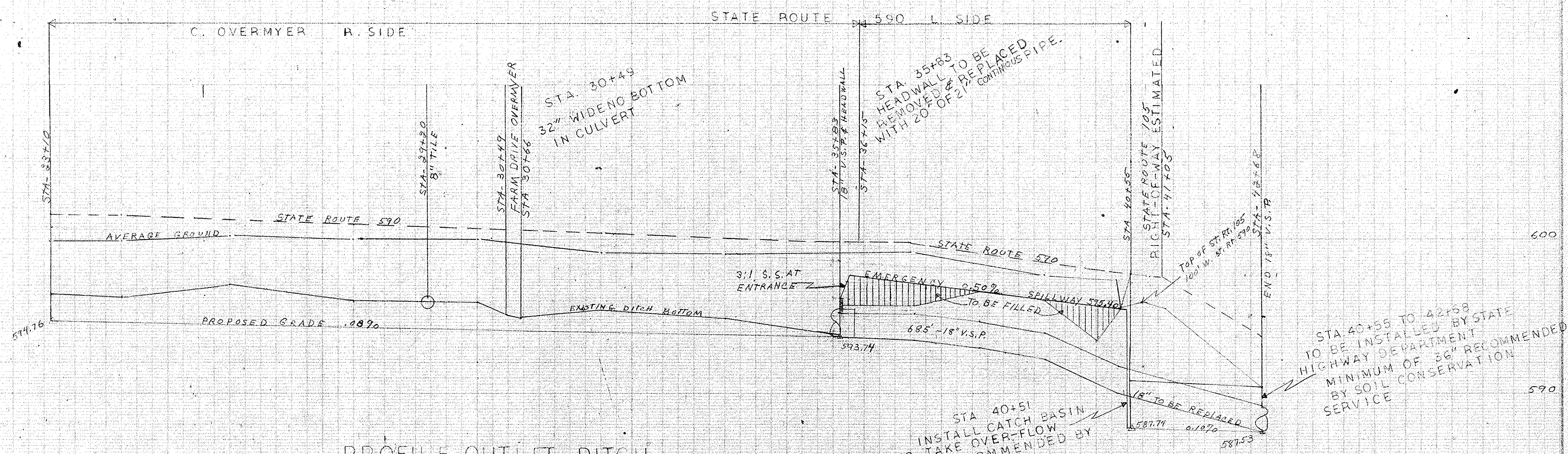
BM# 3 - STA. 15+40
TOP OF SPIKE N. SIDE
POLE E. SIDE 590
M.S.L. 600.69



BM# 2 - STA. 29+20
TOP OF ANGLE IRON
AT PUMP IN BLDG AREA
M.S.L. 599.54

BM# 1 STA. 40+90
CENTER LINE ST. RTS
590 & 105
M.S.L. 597.59

ELEVATION IN FEET
(MEAN SEA LEVEL DATUM)

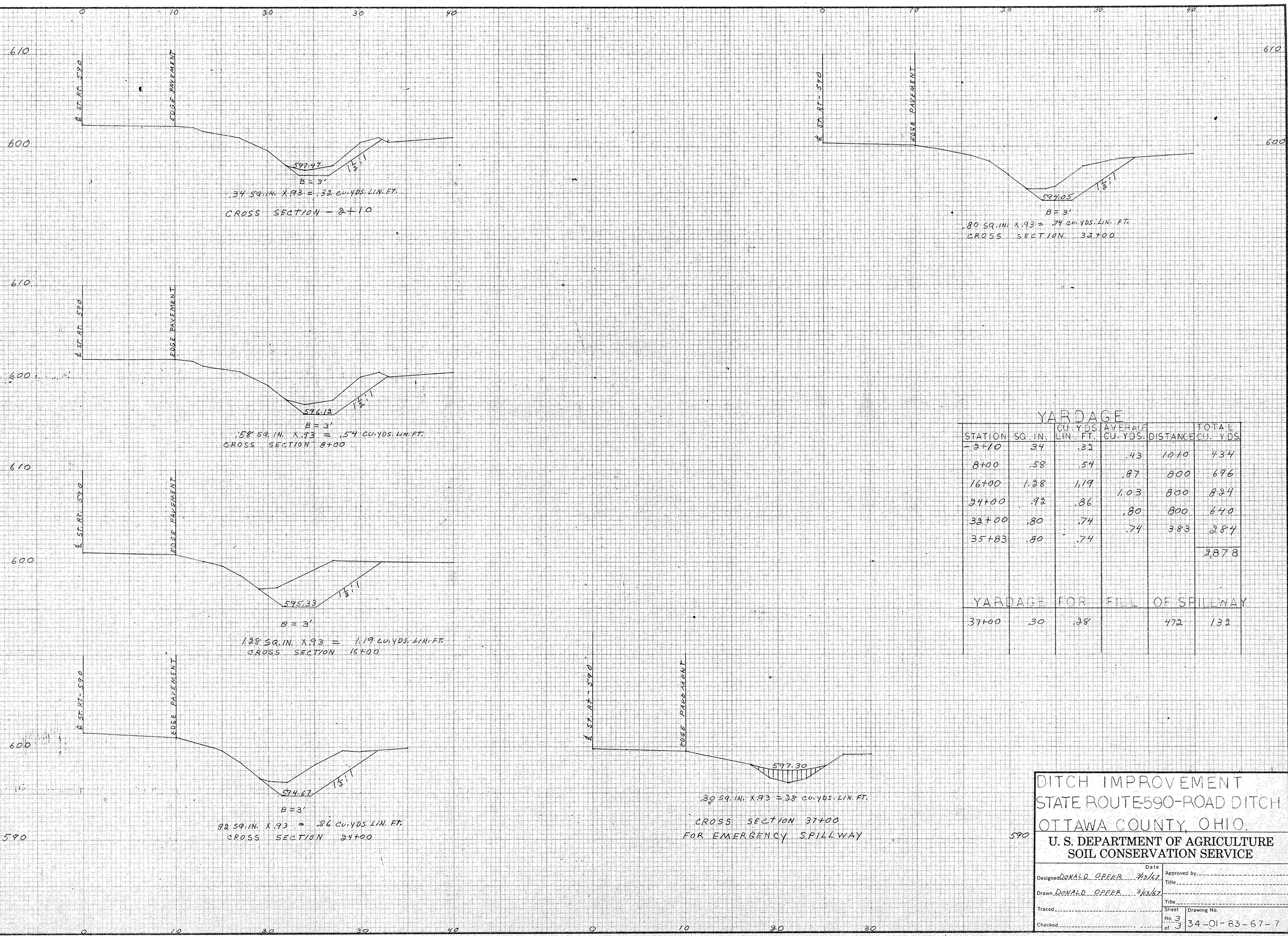


PROFILE OUTLET DITCH

STA 40+55 TO 42+58
TO BE INSTALLED BY STATE
HIGHWAY DEPARTMENT
MINIMUM OF 36\"/>

DITCH IMPROVEMENT
STATE ROUTE-590-ROAD DITCH
OTTAWA COUNTY, OHIO.
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed DONALD OFFER 3/12/67	Date 3/12/67	Approved by _____
Drawn DONALD OFFER 4/12/67	Title _____	Checked _____
Traced _____	Sheet No. 2	Drawing No. 34-01-83-67-7
Checked _____	of 3	



YARDAGE

STATION	SQ. IN.	CU. YDS. LIN. FT.	AVERAGE CU. YDS.	DISTANCE	TOTAL CU. YDS.
8+10	34	.32	.43	1010	434
8+00	.58	.54	.87	800	696
16+00	1.28	1.19	1.03	800	824
24+00	.92	.86	.80	800	640
32+00	.80	.74	.74	383	284
35+83	.80	.74			
					2878
YARDAGE FOR FILL OF SPILLWAY					
37+00	30	.28		472	132

DITCH IMPROVEMENT
STATE ROUTE 590-ROAD DITCH
OTTAWA COUNTY, OHIO.
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed <u>DONALD OPEER</u>	Date <u>7/12/67</u>	Approved by _____
Drawn <u>DONALD OPEER</u>	<u>3/13/67</u>	Title _____
Traced _____	Sheet No. <u>3</u>	Drawing No. _____
Checked _____	of <u>3</u>	<u>34-01-63-67-7</u>