

ENGINEERS REPORT ON INVESTIGATION OF AND PROPOSED PLAN FOR RELIEF

WEBSTER COUNTY DRAIN - DISTRICT NO. 47

To the Honorable Board of Supervisors of Webster County, Iowa.

In response to your request for technical assistance to the Webster County District Commissioners dated March 13, 1945, we wish to submit the following report.

GENERAL:

We have completed a thorough investigation of the original tile lines that were constructed as outlet lines within this drainage district. While our survey was in progress, we carefully checked all low areas and pond elevations within the district boundary. This will assure adequate depths in the plan for relief.

We have completed a net work of interior divides (as shown on the map) to guarantee uniformity of outlet capacity in all proposed relief lines when combined with the present existing tile lines.

Our check on the existing lines indicates the original job as constructed in a fairly creditable manner. The exceptions are clearly evident on laterals 1 and 3 as shown on the profiles.

Since there is some interest for an outlet extension to D.D. 447 as expressed by owners in Boone County, we are submitting alternate outlet extension plans C.D.E. as set forth on profile sheet 7 of 8 for consideration of such information as has been obtained via limited surveys.

FINDINGS:

We find that practically all existing tile lines are woefully short of the usual capacity, the exception being the upper end of lateral 3. That whereas, most of the tile drains in this territory were designed to carry $\frac{1}{2}$ " runoff per 24 hour period, a large percentage of the lines in this district have less than $\frac{1}{8}$ " capacity for the areas they now are serving. We also find that at numerous points the old lines were constructed too shallow for satisfactory farm drainage. Particularly the upper end of original lateral 1.

We find that the main tile outlet has been in a submerged condition for many years past. This is caused partly by silting of the channel across the N.W. $\frac{1}{4}$ of the N.W. $\frac{1}{4}$ of Sec. 5 - 33 - 85 but chiefly due to the construction of a farm drive structure on the above tract of land. This structure, serving as a farm bridge, is but 185' below the 28" outlet to D.D. 447. It has 5 lines of 22" tile laying parallel to the direction of flow with each line securely bedded in concrete. The flow lines of the two lower 22" tile are about 7" higher than the grade of the 28" tile outlet.

Note: This revised draft completed, as is, 4-13-48 following discovery of numerous errors in original draft

The deficiencies sighted above have, in the past few years, created a terrific loss to many owners in the production of crops. The ponded areas, of which there are many, have all suffered heavily. While the best of drainage systems would prove hopeless against the local flood conditions during May and June of 1947, it is equally evident that D.D.#47 is entitled to a drainage improvement that will grant full crop production in normal seasons.

RECOMMENDATIONS: PLAN A on open ditch relief.

encl { SEC. 1 provides for a dragline cleanout of the original 1600' of channel below the County line and for the removal of the farm bridge structure previously referred to

SEC. 2 provides for partial open ditch replacement.

We strongly recommend that the relief improvement consist of an open ditch on the outlet 5880' of the original tile drain or to a point about 70' short of entering the N & S road along the west line of Sec. 32. This would require the careful removal of the original tile line over this route but would greatly reduce what, otherwise, proves to be the most costly section in the proposed improvement. The tile thus salvaged could be used in the relief line to lateral 1 (and lateral 3 if salvage exceeds expectancy) which would further reduce the overall cost. See plan A - sheet 4 of 8. *Sec 2 - Plan B*

Conscious of the objections raised by the affected owners, to open ditch replacement, we are submitting plan B for consideration and comparison of costs. An open ditch to sta. 58 & 80 with proper headwall protection and ample weir notch capacity will grant greater relief to the adjacent affected area than is possible via tile relief (plan A). In addition to this advantage there would be a material saving in the overall cost after taking probable damage allowance into consideration.

The same line of reasoning could be used to encourage open ditch replacement to sta. 78 & 88 or to the junction of lateral 3. This is deemed inadvisable for the following reasons. The present tile line, consisting of 24" and 30" tile, is located in the east side ditch to lateral 3 thence across the road grade and up the west side ditch to lateral 3. Thus the salvaging of the original tile between stas. 58 & 80 and 78 & 88 could not be accomplished as a part of an open ditch operation since its location is well removed from any desirable line for an open ditch continuation.

The costs incurred to remove these sections by other methods would too nearly equal the probable salvage values. Actually greater carrying capacity could be obtained at lesser cost by a continuation of an open ditch however there would be on a highway and one farm bridge necessitated due to this extension.

Plan B provides for ~~a ditch blasting cleanout of the original 1600' drain of channel and removal of the aforementioned farm bridge below the County line road and tile relief throughout the original drainage area.~~ We hesitate to recommend this plan owing, in part, to the present quotations on the size and lengths of tile required to grant reasonable relief, and to the uncertainty of manufacture of the required sizes at this time.

Recent labor bids for tile installation and recent bids for open ditch excavation appear far more reasonable, and lend greater encouragement to drainage improvements, than do late quotations from tile manufacturers. See estimates of cost. It is therefore well to weigh the economics of the present situation before paying too high a premium for any commodity.

Fifteen of the land owners in D. D. #47 now have farm plan agreements approved by the District Commissioners. Some of these cooperators will experience difficulty in adopting better land use until improvements in drainage outlets are completed, since adequate farm drainage is essential to efficient conservation.

Plans A & B each provide adequate and uniform tile relief to all areas, in need of relief, so far as is known. Sec. 3 (upper main relief), Sec. 6 (lateral 2 relief) and Sec. 7 (lateral 3 relief) are all planned in close proximity to the original tile lines that they relieve.

SEC. 4 (lateral A) is a much needed new tile line into a large ponded area lying along the east central part of Section 31.

SEC. 5 (lateral 1 relief) is well removed, for part of its length, from the original lateral 1 location. This routing together with laterals 1-A and 1-B provides for outlets needed, and crosses a low wet ponded area, both N & S of the $\frac{1}{4}$ corner common to Secs. 29 & 32. Lateral 1-C, a new tile line, will provide the outlet for a small contributing area in Section 28 and for improved road drainage at that point.

The plan as set forth in sheets 1, 2, 3, 4, 5 & 6 of 8 sheets will provide $\frac{3}{8}$ " capacity to all areas within the original district boundary. ~~Sheet 7 of 8 indicates the possibilities via plans C, D & E and is submitted herewith as a guide to proper actions should a "joint" outlet extension into Boone County be considered.~~

Plan C, or outlet extension of one mile only, is not to be recommended since silting is sure to take place at a very critical point near sta.-26. Either Plan D or E will provide a desirable outlet improvement at a reasonable cost. Either C or D would be a great improvement over the present natural channel immediately below the County Line.

Serious overflow has been and will continue to be a problem for several miles downstream. It is, therefore, recommended that considerable further study of this condition be made should the apparent interest for improved outlet be definitely considered.

The accompanying plans, the attached est. of costs, equalizer data sheet, clearing specifications, drain specifications and bank leveling with surface inlet pipe detail constitute a complete report.

and detail for intake construction

PLAN A - PARTIAL OPEN DITCH REPLACEMENT - WEBSTER CO., D. D. NO. 47.

LOWER MAIN:

~~SEC. 1: 1600' cleanout (sta. 0 to sta. -16)~~
 SEC. 2: 5880' new ditch (sta. 0 to sta. 58 + 80) COMBINED

44,213 Cu. Yds. Exc. (includes removal of 3900'-28", 1200'-26",
 780'-24" tile (see below) and leveling of all spoil banks) at 22¢ \$9,726.86
 Removal of concrete and tile farm drive structure 50.00
 Trees and brush clearing along Sec. 1 100.00
 2 units of 40'-30" S.I.P. installed at \$120.00 each 240.00
 5 units at 40'-15" S.I.P. installed at \$ 64.00 each 320.00
 35 Cu. Yd. Concrete Headwall in place at \$60.00 per yd. 2,100.00
 16 acres farm land usurped at \$250.00 per acre (120' x 5824' long) 4,000.00 16,536.86
 Estimated - Tile Salvage Value: (61% salvage at current quotations)
 2388'-28" at 2,919.00 per M — \$6,970.57)
 734'-26" at 2,530.00 per M — 1,857.02) CREDIT TO MAIN
 478'-24" at 2,089.00 per M — 998.54)
9,826.13
 \$ 6,710.73

SEC. 3: UPPER MAIN RELIEF

Length : in ft.	Size : Inch	Tile Cost : per M.	Line	Ave. : Cut	Lay Cost : per ft.	Line	Cost : Installed
2000'	32"	3,780.00	7,560.00	9.4'	1.75	3,500.00	11,060.00
4900'	20"	1,522.50	7,460.25	8.2'	1.28	6,272.00	13,732.25
1800'	16"	850.50	1,530.90	6.1'	.87	1,566.00	3,096.90
280'	12"	441.00	123.48	4.8'	.35	98.00	221.48
60'	10"	336.00	20.16	6.5'	.70	42.00	62.16
68'	8"	200.00	13.60	6.7'	.74	50.32	63.92
34'	8"	200.00	6.80	4.0'	.20	6.80	13.60
			16,715.19			11,535.12	28,250.31
1 Type B-5 equalizer		at \$150.00					150.00
11 - 12" intakes		installed at \$25.00					275.00
							28,675.31

SEC. 4: LAT. A (NEW LINE)

1300'	14"	588.00	764.40	7.6'	1.00	1,339.00	2,103.40
662'	12"	441.00	291.94	5.3'	.68	450.16	742.10
			1,056.34			1,789.16	2,845.50
3 - 12" Intakes		installed at \$25.00					75.00
							2,920.50

Assuming a possible 61% salvage of tile on lower 5880' of original main there would be 3600' available for relief line on Lat. 1. Note first three items below.

SEC. 5: LAT. 1 RELIEF USING SALVAGE TILE FROM MAIN

Length in ft.	Size Inch	Tile per M.	Cost Line	Ave. Cut	Lay Cost per ft.	Line	Cost Installed	
2388	38"	haul at 20¢/ft.	477.60	8.7'	1.55	3,701.40	4,179.00	
734	26"	haul at 18¢/ft.	132.12	9.4'	1.65	1,211.10	1,343.22	
478	24"	" " 16¢/ft.	76.48	8.4'	1.40	669.20	745.68	
1400	18"	1,018.50	1,425.90	6.3'	.95	1,330.00	2,755.90	
40	8"	200.00	8.00	5.1'	.27	10.80	18.80	
102	8"	200.00	20.40	4.4'	.16	16.32	36.72	
			2,140.50			6,938.82	9,079.32	9,079.32
Plus est'd salvage value of			9,826.13	-- DEBIT TO LAT. 1				9,826.13
4 - 12" Intakes in place at \$25.00								100.00
								19,005.45

LAT. 1-A (NEW LINE)

60'	8"	200.00	12.00	5.4'	.30	18.00	30.00	30.00
-----	----	--------	-------	------	-----	-------	-------	-------

LAT. 1-B (NEW LINE)

60'	6"	140.00	8.40	4.6'	.17	10.20	18.60	18.60
-----	----	--------	------	------	-----	-------	-------	-------

LAT. 1-C (NEW LINE)

500'	10"	336.00	168.00	4.6'	.33	165.00	333.00	
1234'	8"	200.00	226.80	5.1'	.27	306.18	532.98	865.98
			394.80			471.18		
3 - 12" Intakes in place at \$25.00								75.00
								19,995.03

SEC. 6: LAT. 2 RELIEF

174'	16"	850.50	147.99	7.7'	1.10	191.40	339.39	
4400'	14"	588.00	2,587.20	7.0'	.95	4,180.00	6,767.20	
996'	12"	441.00	439.24	5.4'	.42	418.32	857.56	
200'	10"	336.00	67.20	5.9'	.46	92.00	159.20	
44'	8"	200.00	8.80	4.6'	.23	10.12	18.92	8,142.27
			3,250.43			4,891.84		

1 Type B-4 Equalizer at \$130.00

4 - 12" Intakes in place at \$25.00

130.00
100.00
8,372.27

SEC. 7: LAT. 3 RELIEF

1200'	22"	1,774.50	2,129.40	7.3'	1.20	1,440.00	3,569.40	
1000'	18"	1,018.50	1,018.50	6.7'	1.00	1,000.00	2,018.50	
2500'	16"	850.50	2,126.25	7.8'	1.10	2,750.00	4,876.25	
1100'	10"	336.00	369.60	5.8'	.44	484.00	853.60	
456'	8"	200.00	91.20	4.8'	.25	114.00	205.20	
20'	8"	200.00	4.00	4.4'	.22	4.40	8.40	
72'	8"	200.00	14.40	4.4'	.22	15.84	30.24	11,561.59
			5,753.35			5,808.24		

1 Type B-3 Equalizer at \$115.00

2 - 12" Intakes in place at \$25.00

115.00
50.00
11,726.59
\$ 97,405.88

WEBSTER COUNTY D. D. NO. 47

PLAN B - TILE RELIEF

MAIN RELIEF

SEC. 1. 1600' O. D. Blasting Cleanout	\$600.00	
Removal of concrete and tile farm structure (0-185')	50.00	
Trees and brush clearing along route	<u>100.00</u>	750.00

SEC. 2.

Length : Size :	Tile Cost	Ave. :	Lay Cost	Cost
in ft. : Inch :	per ft. : Line	Cut : per ft. :	Line	Installed:
5852' : 36"	4,725.00	27,650.70	8.8' : 1.70	9,948.40 : 37,599.10:
2 - Type B - 5 Equalizers @ \$150.00				300.00
2 - 24" Intakes installed @ \$50.00				<u>100.00</u>
				37,999.10

SEC. 3

pipe line
equalizers

2000' : 32"	3,780.00	7,560.00	9.4' : 1.75	3,500.00	11,060.00:
4900' : 20"	1,522.50	7,460.25	8.2' : 1.28	6,272.00	13,732.25:
1800' : 16"	850.00	1,530.90	6.1' : .87	1,566.00	3,096.90:
280' : 12"	441.00	123.48	4.8' : .35	98.00	221.48:
(60' : 10"	336.00	20.16	6.5' : .70	42.00	62.16:
(68' : 8"	200.00	13.60	6.7' : .74	50.32	63.92:
(34' : 8"	140.00	4.76	4.0' : .20	6.80	11.56:
	16,713.15			11,535.12	28,248.27
1 - Type B - 5 Equalizer @ \$150.00					150.00
11 - 12" Intakes Installed @ \$25.00					<u>275.00</u>
					28,673.27

LAT. A NEW LINE

SEC. 4

1300' : 16"	850.50	1,105.65	7.0' : 1.00	1,300.00	2,405.65:
662' : 14"	588.00	389.26	5.2' : .70	463.40	852.66:
	1,494.91			1,763.40	3,258.31
3 - 12" Intakes in place at \$25.00					<u>75.00</u>
					3,333.31

LAT. 1 RELIEF

SEC. 5.

2300' : 24"	2,089.00	4,804.70	9.3' : 1.55	3,565.00	8,369.70:
1300' : 22"	1,774.50	2,306.85	8.7' : 1.40	1,820.00	4,126.85:
1400' : 18"	1,018.50	1,425.90	6.3' : .95	1,330.00	2,755.90:
40' : 8"	200.00	8.00	5.1' : .27	10.80	18.80:
102' : 8"	200.00	20.40	4.4' : .16	16.32	36.72:
	8,565.85			6,742.12	15,307.97
4 - 12" Intakes installed @ \$25.00					<u>100.00</u>
					15,407.97

LAT. 1 - A NEW LINE

60' : 8"	200.00	12.00	5.4' : .30	18.00	30.00:
					30.00

LAT. 1 - B NEW LINE

60' : 6"	140.00	8.40	4.6' : .17	10.20	18.60:
					18.60

IAT. 1 - C NEW LINE

WEBSTER COUNTY D.D. NO. 47 - Cont.

Length :	Size :	Tile Cost		Ave. :	Lay Cost		Cost
in ft. :	Inch :	per ft. :	Line	Cut :	per ft. :	Line	Installed :
500'	10"	336.00	168.00	4.6'	.33	165.00	333.00
1834'	8"	200.00	226.80	5.1'	.27	306.18	532.98
			394.80			471.18	865.98
3 - 12" Intakes installed at \$25.00							75.00
							940.98

PLAN B. TILE RELIEF

16,397.55

SEC 6:

IAT. - 2

6. 174'	16"	850.50	147.99	7.7'	1.10	191.40	339.39
4400'	14"	598.00	2,587.20	7.0'	.95	4,180.00	6,767.20
996'	12"	441.00	439.24	5.4'	.42	418.32	857.56
(200'	10"	336.00	67.20	5.9'	.46	92.00	159.20
(44'	8"	200.00	8.80	4.6'	.23	10.12	18.92
							3,250.43
							4,891.84
							8,142.27
4 - 12" Intakes installed @ \$25.00							100.00
1 - Type B - 4 Equalizer @ \$130.00							130.00
							8,372.27

SEC 7:

IAT. - 3

7. 1200'	22"	1,774.50	2,129.40	7.3'	1.20	1,440.00	3,569.40
1000'	18"	1,018.50	1,018.50	6.7'	1.00	1,000.00	2,018.50
2500'	16"	850.50	2,126.25	7.8'	1.10	2,750.00	4,876.25
1100'	10"	336.00	369.60	5.8'	.44	484.00	853.60
456'	8"	200.00	91.20	4.8'	.25	114.00	205.20
(20'	8"	200.00	4.00	4.4'	.22	4.40	8.40
(72'	8"	200.00	14.40	4.4'	.22	15.84	30.24
							5,753.35
							5,808.24
							11,561.59
Type B - 3 Equalizer @ 115.00 (surface height)							115.00
2 - 12" Intakes installed @ \$25.00							50.00
							11,726.59

New Tile only 63,843.59 Labor only 41,188.50 107,252.09

All sizes above 12" are assumed to be dragline installed. Remainder "Buckeye or Handwork". Cost per foot for all such lines are estimated via formula: $(D + 1) Ad \div 10 - (D + 1) \div 1008$

Where D -- inside diameter of tile in feet.

Ad -- being average depth

10.0-

.008 being current cost factor

-2.67

Ex: 20" = $1.67' + 1 = 2.67 \times 8.2$ (ave. cut) =

$21.894 \times 7.33 = 160.5 \times .008 = \1.28 per'

GO THE LINE

FILED IN THE

QUALITY MEASURES

LETTER TO THE WORLD, THE

See sheet 6 of 8-upper right-hand corner.

WEBSTER COUNTY D.D. NO. 47 - Alternate Outlet - PLAN C
To Abet PLAN A - Includes Spoilbank Leveling.

PLAN C: Sec. 1 is Now O.D. down W. 1/4 1/4 line to bridge one mile south of 0

SEC.	STA.	to	STA.	LENGTH	CU. YDS.	
1	0 + 00	-55 + 70	5370'	19,394 @ 16¢ per yd. -	\$3,103.04	
13.2 acres farm land usurped at \$250 per acre (108' wide x 5320' long)					3,300.00	
2 units 36" S.I.P. installed at \$200 each - - - - -					400.00	
2 " 30" " " " " 120 " - - - - -					240.00	
4 " 15" " " " " 64 " - - - - -					256.00	
Trees and brush clearing along Sec. 1					150.00	\$7,149.04
2	0 + 00	58 + 80	5880'	15356 @ 22¢ -	9,978.32	
2 units of 40' - 30" S.I.P. installed at \$120 each - -					240.00	
5 " 40' - 15" " " " " 64 " - - - - -					320.00	
35 cu. yd. Concrete Headwall at 60 per yd. - - - - -					2,100.00	
16 acres farm land usurped at 250 per acre					4,000.00	16,638.32
3	As itemized on Plan A	- - - - -	- - - - -	- - - - -	- - - - -	5.31 28,671.47
4	" " " " A	- - - - -	- - - - -	- - - - -	- - - - -	2,920.50 3,333.33
5	" " " " A	- - - - -	- - - - -	- - - - -	- - - - -	19,995.03 10,168.90
6	" " " " A	- - - - -	- - - - -	- - - - -	- - - - -	8,372.27 9,142.27
7	" " " " A	- - - - -	- - - - -	- - - - -	- - - - -	726. 11,668.59
Total estimated of Labor & Materials - - - - -					- - - - -	95,777.06 87,141.70
Engineering and Miscellaneous - - - - -					- - - - -	6,000.00
(Occasional overflow below sta. - 34 + 50) Estimated Total Cost - - - - -					- - - - -	101,777.06 93,141.70
(south 80 rod line Sec. 5 at Sta. 40 + 33)					- - - - -	
(will require one new road bridge on co.line)					- - - - -	

Not recommended.

WEBSTER COUNTY D.D. NO. 47 - Alternate Outlet - PLAN C

To Abet PLAN B

Includes Spoilbank Leveling

PLAN C Sec. 1 is O.D. down W 1/4 1/4 line to bridge one mile south of O

SEC.	STA. to	STA.	LENGTH	CU. YDS.	
1	0 + 00	-53 + 70	5370'	19,394 at 18¢ per yd. =	3,490.92
				15 acres farmland usurped at \$250 per acre - - - - -	3,750.00
				2 units of 10' - 36" S.I.P. installed at \$200 each	400.00
				2 " " 10' - 30" " " " " 120 " - - -	240.00
				4 " " 10' - 15" " " " " 64 " - - -	256.00
				Trees and brush clearing along Sec. 1 - - - - -	150.00
					<u>\$8,296.92</u>
2	As itemized on Plan B	- - - - -	- - - - -	- - - - -	37,999.10
3	" " " " "	- - - - -	- - - - -	- - - - -	^{5.31} 28,671.81
4	" " " " "	- - - - -	- - - - -	- - - - -	3,333.31
5	" " " " "	- - - - -	- - - - -	- - - - -	^{19,995.03} 16,652.75
6	" " " " "	- - - - -	- - - - -	- - - - -	^{8,372.27} 9,162.27
7	" " " " "	- - - - -	- - - - -	- - - - -	^{726.} 11,436.52
				Estimated total of Labor & Materials - - - - -	^{118,388.53} \$116,821.01
				Engineering & Miscellaneous - - - - -	6,000.00
				Estimated Total Cost - - - - -	<u>124,388.53</u> \$122,821.01

Occasional overflow below Sta. -34 + 50
 South 80 rod line Sec. 5 at Sta. 40 + 33
 Probably will require one new bridge at Co. line road.

Not recommended

WEBSTER COUNTY D.D. No. 147 - Alternate Outlets - PLAN D

To Abet Plan A - Includes Spoilbank Leveling

Sec. 1 is O.D. on or near W 1/4 1/4 line Secs. 5 & 8 to R2

SEC.	STA.	to STA.	LENGTH	CU. YDS.		
1	0 + 00	-69 + 00	6900'	28,132 at 17¢	04,782.14	
			16.6 acres farmland taken at \$250 per acre (108' wide x 6720' long)		4,150.00	
			2 units of 10' - 36" S.I.P. installed at 200 each - -		400.00	
			4 " " 10' - 30" " " " " " 120 " - -		480.00	
			12 " " 10' - 15" " " " " " 64 " - - -		768.00	
			Clearing trees and brush - - - - -		150.00	010,730.14
2	0 + 00	58 + 80	5880'	15,356 at 22¢	9,978.32	
			2 units of 10' - 30" S.I.P. installed at \$120 each - - -		240.00	
			5 " " 10' - 15" " " " " " 64 " - -		320.00	
			35 cu. yd. concrete headwall at \$60 per yd. - - - - -		2,100.00	
			16 acres farm land taken at \$250 per acre		4,000.00	16,638.32
3	As itemized on Plan A	- - - - -	- - - - -	- - - - -	- - - - -	5.31 28,671.41
4	" " " " "	- - - - -	- - - - -	- - - - -	- - - - -	2920.50 3,333.31
5	" " " " "	- - - - -	- - - - -	- - - - -	- - - - -	19,995.03 10,168.00
6	" " " " "	- - - - -	- - - - -	- - - - -	- - - - -	8372.27 9,142.27
7	" " " " "	- - - - -	- - - - -	- - - - -	- - - - -	726. 11,488.50
Estimated total cost of labor & materials						99,058.46
Engineering and miscellaneous						6,500.00
Estimated Total Cost - - - - -						105,558.46

Occasional overflow below Sta. 61,
H.R.R.P. at Sta. 67 + 73
Probably will require two new road bridges

WEBSTER COUNTY D.D. NO. 47 - Alternate Outlets - PLAN D

To Abet Plan B - Includes Spoilbank leveling

Sec. 1 is O.D. on or near W 1/4 1/4 line Secs. 5 & 8 to RY

SEC.	STA.	to	STA.	LENGTH	CU. YDS.	
1	0 + 00		-69 + 00	6900'	28,132 at 19¢	\$5,315.08
				16.6 acres farm land taken at \$250. per acre (108' wide x 6720' long)		4,150.00
				2 units of 10' - 36" S.I.P. installed at \$200 each - - -		400.00
	4	"	10' - 30" " " "	" " 120 "		1,000.00
	12	"	10' - 15" " " "	" " 64 "		768.00
				Clearing trees and brush - - - - -		150.00
						<u>\$11,293.08</u>
2	As itemized on Plan B					37,999.10
3	"	"	"	"		28,671.47 ^{5.31}
4	"	"	"	"		3,333.31
5	"	"	"	"		19,995.03
6	"	"	"	"		8,372.27
7	"	"	"	"		11,226.59
					Estimated cost of labor and materials - - - -	121,394.69
					Engineering and Miscellaneous - - - - -	6,500.00
					Estimated Total Cost - - - - -	<u>127,894.69</u>

Occasional overflow below Sta. 64
N.R.R.P. at Sta. 67 + 73
Probably will require two new road bridges

WEBSTER COUNTY D.D. No. 147 - Alternate Outlet - PLAN E

To Abet Plan A - Includes Spoil bank leveling

PLAN E: Sec. 1 is new O.D. on or near W 1/4 1/4 line Secs. 5 & 8 to 1-3/4 miles S. of Co. line

PLAN E: Sec. 1 is new O.D. on or near W 1/4 1/4 line Secs. 5 & 8 to 1-3/4 mi. S. of Co. line

SEC.	STA.	to	STA.	LENGTH	CU. YDS.		
1	0 + 00		97 + 00	9780	14,567 at 16¢	\$7,130.72	
				25.8 acres farm land taken at \$250 per acre (108' wide x 9600' long)		5,950.00	
				1/4 units of 10' - 36" S.I.P. installed at \$200 each		800.00	
				1/4 " " 10' - 30" " " " " " 120 "		120.00	
				20 " " 10' - 15" " " " " " 64 "		1,200.00	
				Clearing trees and brush along Sec. 1		200.00	\$15,810.72
				Clearing trees & brush along Sec. 1		200.00	\$16,210.72
2	0 + 00		58 + 00	5800'	15,356 @ 22¢	9,978.32	
				2 units of 10' - 30" S.I.P. installed @ \$120 each		240.00	\$7,999.30
				5 " " 10' - 15" " " " " " 64 "		320.00	\$8,319.30
				35 cu. yds. concrete headwall @ \$60 per cu. yd.		2,100.00	\$10,419.30
				16 acres of farm land taken @ \$250 per acre		4,000.00	\$14,419.30
3				As itemized on Plan A			\$19,995.03
4				" " " " "			\$20,671.47
5				" " " " "			\$2,920.50
6				" " " " "			\$3,373.91
7				" " " " "			\$19,995.03
				Estimated Cost of Labor & Materials			\$120,338.00
				Engineering & Miscellaneous			\$8372.27
							\$726
				Estimated cost of labor and materials			\$11,506.59
				Engineering & Miscellaneous			\$6,500.00
				Total Estimated Cost			\$110,668.74
							\$102,703.70

Occasional overflow below Sta. 91
 Straightened small channel begins at Sta. 97 + 00
 This plan will require two new road bridges.

WEBSTER COUNTY D.D. No. 47 - Alternate Outlet - PLAN E

To Abet Plan B

Includes spoil bank leveling

PLAN E: Sec. 1 is now O.D. on or near N. 1/4 1/4 line Secs. 5 & 8 to 1-3/4 mi. S. of Co. line

SEC.	STA. to	STA.	LENGTH	CU. YDS.	
1	0 + 00	-97 + 80	9780'	14,567 @ 17¢ -	\$7,576.39
				23.8 acres farm land taken @ \$250. per acre - - - - -	5,950.00
				(108' wide x 9600' long)	
				1/4 units of 10' - 36" S.I.P. installed @ \$200 each - - -	800.00
				4 " " 10' - 30" " " " " " 120 " "	1,200.00
				20 " " 10' - 15" " " " " " 64 " "	1,280.00
				Clearing Trees & Brush along Sec. 1 - - - - -	200.00
					<u>\$16,286.39</u>
2	As itemized on Plan B				37,999.10
3	" " " " " "				28,673.27
4	" " " " " "				3,333.31
5	" " " " " "				19,995.03
6	" " " " " "				8,372.27
7	" " " " " "				11,536.52
				Estimated cost of labor and materials	126,338.00
				Engineering & Miscellaneous	6,500.00
				Total Estimated Cost	<u>\$132,838.00</u>

below Sta. 51
Channel begins at Sta. 97 + 80
are two new road bridges.

CLEARING SPECIFICATIONS

For the execution of such operations on ditches in, and the concern of
County, Iowa.

1. Contractors shall organize their work units so that all operations will be carried on in an orderly and workmanlike manner. Normally clearing work will begin at the outlet of open ditches, or at beginning of cleanout points, and progress upstream. Sequence of work shall be so conducted as to expedite contiguous district contract work. "Good Housekeeping" methods will be insisted upon at all times.
2. It is urged that amicable relations be maintained with property owners, tenants and renters of lands affected or over whose lands access is needed in approaching or carrying on this contract.
3. It shall be the responsibility of the contractor to arrange with owners, tenants and renters for such storage space as may be required for the proper execution of the work. However, contractors are warned not to enter into agreements with owners, tenants, renters or other parties relative to final disposition of tree trunks, pole or limb wood that will in any manner affect contiguous District operational action or seriously interfere with farming activities in adjoining cropland.
4. Approved blasting methods must be used. Surface cutting of trees will not be permitted. Stumps must be blown clean and all roots removed that will materially interfere with track making, excavation or bank leveling operations. Stumps, roots and objectionable litter must be retrieved and burned or otherwise satisfactorily disposed of. Contractors will be held strictly accountable for failure in such cases. Overall widths of clearing operations necessary for the completion of drainage district improvements will be left to the judgment of the engineer in charge of such operations.
5. Blasting materials must be stored in magazines of approved construction and all precautions taken to prevent explosive materials getting into the hands of unauthorized persons, particularly school children. Further, it is recommended that storage of explosives be limited, at all times, to quantities consistent with current needs.
6. It will be the responsibility of the contractor to furnish all necessary equipment, materials and labor for the execution of the work contemplated. The removal and re-routing of fencing interfering with orderly operation of this work will be done at the expense of the Drainage District. However, the contractor may be ordered, in writing, to assume such fencing work. In such cases payment will be made on a cost plus 10% basis. Itemized statements of posts will be required of the contractor for such fencing work. The same procedure will govern in cases of unforeseen contingencies that logically come under the heading of extra work.
7. Surety bond, forfeitures, and legal requirements, as set forth in the Proposal Form, shall govern.
8. Monthly or periodic estimates will be issued as units of work are completed. Estimates will consist of 80% of finished contract work. 20% will be withheld pending final acceptance of a completed contract complying with the terms as set forth above.

COUNTY, IOWA, TILE DRAIN SPECIFICATIONS

Officially adopted by the Board of Supervisors

Month Day Year

By _____ Chairman

Attest _____ County Auditor

Prepared by IA-3CD

Earl A. Iliff - Engineer

Louis E. Kuester - District Conservationist

____ County, Iowa

TILE DRAIN SPECIFICATIONS

- - - -

DEFINITIONS OF TERMS

- 1.- Board - Shall mean the Board of Supervisors or the duly appointed Commission, chosen by them to act.
- 2.- Contractor - Shall mean the individual or firm, awarded the contract to supply materials for and/or to construct or install the improvement, his agent, superintendent, foreman, or like representative of any and all sub-contractors.
- 3.- Engineer - Shall mean the duly appointed engineer in charge of installation and construction.
- 4.- Aides - Shall mean any and all assistants to the Engineer delegated to act in his stead.
- 5.- Auditor - Shall mean the County Auditor who is clerk to the Board of Supervisors.

TILE DRAIN SPECIFICATIONS

- 1.- a. Stakes to govern alignment, grade, extent and scope of all work contemplated will be set by the Engineer in charge, or by his aides, and data sheets that clearly depict all requirements in each case will be supplied the Contractor by the Engineer prior to any and all construction.
b. The Contractor will be responsible for the preservation of the stakes and the information supplied him so long as such needs exist.
- 2.- The Contractor will be responsible for the delivery of all materials to the point of installation. All materials will be subject to inspection by the Engineer, or his aides, prior to the installation. All pipe materials must comply with A. S. T. M. and evidence of compliance shall be the responsibility of the Contractor. All concrete materials shall be of such quality as will guarantee durable concrete, i.e., lump free cement of standard quality, - rust free re-inforcing bars of prescribed length, size and form, - sharp well graded aggregate that are reasonably free from shale, silt or other deleterious substances.
- 3.- Protection, preservation and maintenance of acceptable materials shall be the responsibility of the Contractor pending use of such materials. Rejected materials shall be immediately and permanently removed from the project, by the Contractor, or otherwise disposed of to the satisfaction of the Engineer upon due written notice by the Engineer to the Contractor of such rejection.
- 4.- The Contractor will be required to use only approved methods of construction such as- positive methods in target setting that will guarantee adhering to established grades, - definite precautionary measures must be in effect to prevent excavating below the grade indicated for pipe laying, - careful moulding for bed of pipe to avoid knife edge bearings (See Paragraph 6 below) and such preventative measures must be adopted as will carefully preserve and protect installations until same are finally accepted.
- 5.- Work on all lines will begin at the outlet and progress upstream as one continuous operation until each line is complete. "Jumping In" operations will be permitted only upon written request to, and written approval by the Engineer in charge, and then, all requirements under Par. 1 shall govern.
- 6.- The tile bed shall be so molded that each section of tile shall have full length bearing for, at least, 90 degrees of the outer circumference or in lieu of such moulding, careful hand tamping will be required, using stable soils only, that will provide the specified bearing.

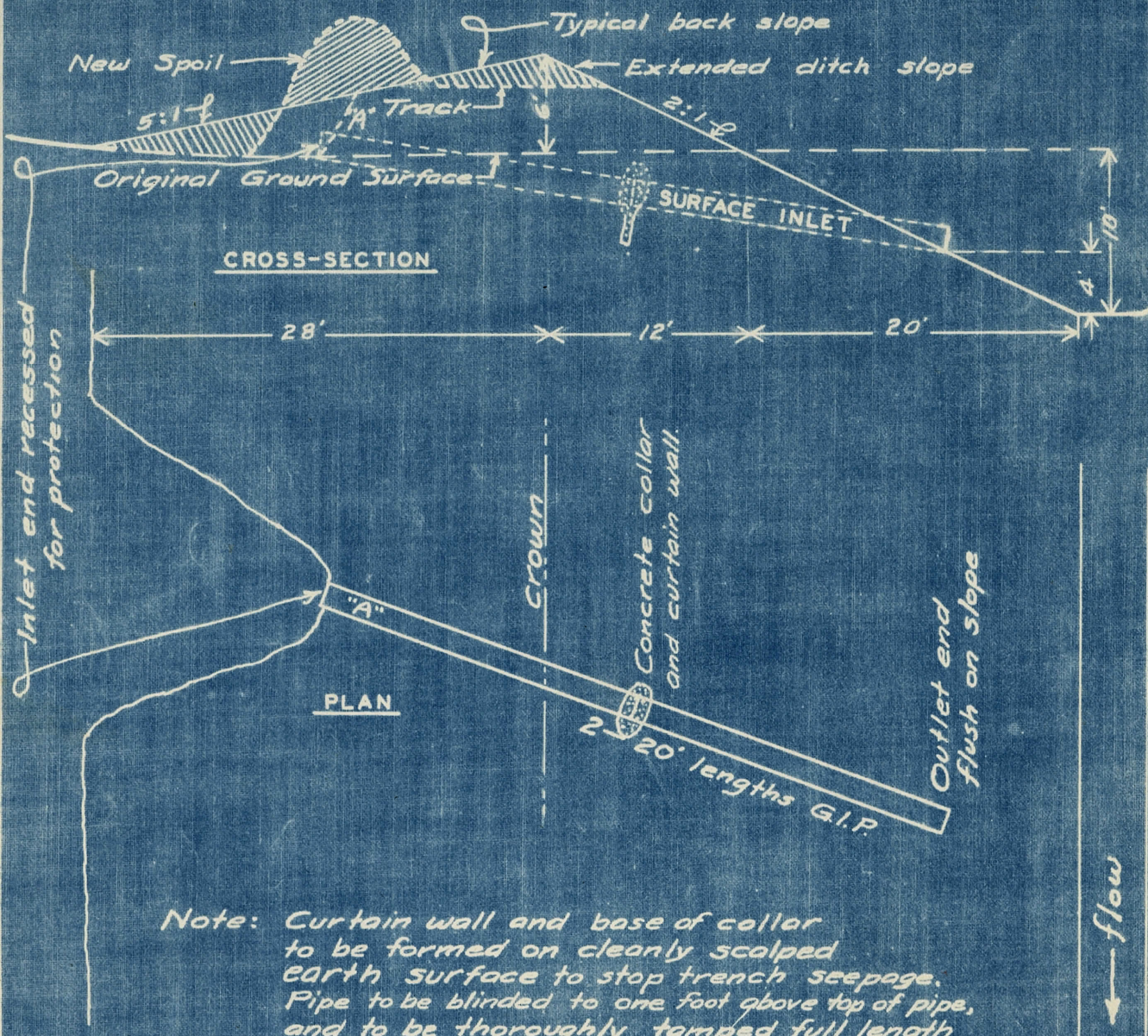
COUNTY, TILE DRAIN SPECIFICATIONS, CONTINUED

- 7.-- Turning the tile sections will be required, where necessary, to avoid excessive joint cracks. All cracks of greater than $3/8$ " opening must be carefully batted or otherwise safely stopped. "Blinding" will be required but, on demand by the Engineer, the Contractor shall furnish labor for re-opening at points not visible where close inspection is deemed necessary.
- 8.-- All old tile are to be properly connected where crossed. If the old line is badly silted and above new line, the old line shall be re-connected as formerly using any stabilizing method that will prevent such connection settling with the new trench. If the old line is clean, re-connecting to the new or old line is optional. If old line clashes with the new line then same shall be carefully connected to the new line. In every case of the old line being connected to the new line, the dead end of the old line shall be securely stopped.
- 9.-- Should sand pockets of the fine "running" type be encountered, the Contractor will be required to excavate below grade to a sufficient depth to encase the tile line entirely across such sand pocket with, at least, four inches of a stable soil, either loam, clay or a mixture of same. In the event that such measures are deemed inadequate by the parties concerned, then more adequate provision for guaranteeing barrel alignment will come under the heading of extra work. (See Paragraph 10 below)
- 10.-- Extra work will include unforeseen contingencies or items deemed needed over and above the schedule of work. Materials and/or labor for such items will be provided by the Contractor at cost plus 15% basis on itemized billing or at stated flat price if agreeable with and approved by the Engineer. All work of this nature shall be negotiated in writing with complete information disclosed.
- 11.a.-- It shall be the duty of both Engineer and Contractor to carry out the full intent of the approved plan. Should conditions be encountered during construction that confute the plan or that enforce alterations or corrections, then every effort shall be made to maintain intended tile capacity to the various tracts of land.
 - b.-- Should conflict be found between plan and specifications, then the specifications shall govern.
- 12.-- Sub-contracting of any or all work awarded will be subject to approval by official action of the Board.
- 13.-- Surety bond, forfeitures and all items under legal requirements, as set forth in the Proposal Form, shall govern.

COUNTY, IOWA.--- TILE DRAIN SPECIFICATIONS--- CONTINUED

- 14.- Monthly or periodic payments on completed work will be made available to the Contractor via drainage district warrants upon estimates signed by the Engineer and submitted to the Auditor. Such payments will be based on 80% of the unit price bid with 20% retained as final payment. It shall be the duty of the Engineer to make, or have made, the necessary check of completed work prior to issuance of estimates either partial or final.
- 15.- In backfilling, all earth removed from trenches must be returned to, and heaped above the trench in such manner as to insure against objectionable depressions once settlement has taken place.
- 16.- When, in the opinion of the Engineer, the contract has been satisfactorily completed, he shall so indicate to the Board via a written report to be accompanied by the final estimate. The final estimate to become payable _____ days following favorable action on the final report by the Board.

TYPICAL BANK LEVELING SECTION & SURFACE INLET PIPE INSTALLATION DETAIL



Note: Curtain wall and base of collar to be formed on cleanly scalped earth surface to stop trench seepage. Pipe to be blinded to one foot above top of pipe, and to be thoroughly tamped full length of pipe. In case of delayed back-fill, a dam, level with new surface, is to be built at "A"

SCALE: 1" = 10'
IOWA - S.C.D - 37
AUGUST 1946

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
H. H. BENNETT, CHIEF

REFERENCE:

DRAFTING APPROVAL:

TECHNICAL APPROVAL:

COMPILED:

TRACED:

CHECKED:

DATE

DRAWING NO.

E.A.I.

E.A.I.

E.A.I.

6-1-46

L.

WEBSTER COUNTY DRAINAGE DISTRICT NO. 47
OPEN~~ED~~ DRAIN

Revised
3-18-52

Sec. 2 - LOWER MAIN

46,150 cu.yds. @ .25 includes bank leveling

per ft.

Ave
Cut per ft.

Cost
11,537.50

8,307.00

80' 30" G.I.P. @ 4.42 353.60
200' 15" G.I.P. @ 1.87 374.00
2 - 30" Band @ 4.30 8.60
5 - 15" Bands @ 1.90 9.50
745.70

1.00 1.00
.80 .80

80.00
160.00

35 cu.yd. Concrete Headwall @ 60.00
16 ac. Farm Land Usurped @ 400.00
1 Farm Bridge @ 600.00

2,100.00
6,400.00
600.00
20,877.50

18,392.70
21,623.20

Sec. 3 - UPPER MAIN RELIEF

As itemized on Plan B 18,892.24

13,587.44

32,479.68

Sec. 4 - LATERAL "A" - NEW LINE

1300' 14" @ .62 806.00
662' 12" @ .46 304.52
3 - 12" Intakes @ 30.00
1,110.52

7.6 @ 1.10
5.3 @ .75

1,430.00
496.50
90.00
2,016.50

3,127.02

Sec. 5 - LATERAL 1 - RELIEF

20' 30" G.I.P. @ 4.42 88.40
2280' 24" D.T. @ 2.20 5,016.00
1300' 22" @ 1.86 2,418.00
1400' 18" @ 1.07 1,498.00
40' 8" @ .22 8.80
102' 8" @ .22 22.44
4 - 12" Intakes @ 30.00

9.3 @ 2.00
9.3 @ 1.73
8.7 @ 1.55
6.3 @ 1.03
5.1 @ .30
4.4 @ .22

40.00
3,944.40
2,015.00
1,442.00
12.00
22.44
120.00

LATERAL 1-A

60' 8" @ .22 13.20

5.4 @ .33

19.80

LATERAL 1-B

60' 6" @ .14 8.40

4.6 @ .20

12.00

LATERAL 1-C

500' 10" @ .35 175.00
1834' 8" @ .22 403.48
3 - 12" Intakes @ 30.00
9,651.72

4.6 @ .47
5.1 @ .30

185.00
550.20
90.00
8,452.84

74,874.06
78,104.56

LATERAL 2 - RELIEF

Sec. 6 as itemized on Plan B 3,420.70

5,659.70

9,080.40

LATERAL 3 - RELIEF

Sec. 7 Same as Plan B

6,032.56

6,583.68

12,616.24

Sec. 2

Material

Labor

Estimated G.I.P. needs for incoming tile:

		<u>per ft.</u>	<u>Cost</u>	<u>per ft.</u>	<u>Cost</u>	<u>Total</u>
180'	8"	G.I.P. @ 1.05	189.00	@ .50	90.00	
60'	10"	G.I.P. @ 1.30	78.00	@ .50	30.00	
120'	12"	G.I.P. @ 1.52	182.40	@ .50	60.00	
20'	15"	G.I.P. @ 1.87	37.40	@ .60	12.00	
20'	18"	G.I.P. @ 2.21	44.20	@ .65	13.00	
			<u>531.00</u>		<u>205.00</u>	
						736.00
TOTAL MATERIAL			40,384.44	TOTAL LABOR		57,382.66

Sub Total

Engineer

GRAND TOTAL

94,545.66
97,777.10
9,454.56
9,700.00
\$107,467.10
\$104,300.26

WEBSTER COUNTY DRAINAGE DISTRICT NO. 47
Plan B - Tile Relief

Revised
3-18-52

LOWER MAIN

Sec. 2	Material Per ft.	Cost	Ave. Cut	Labor Per ft.	Cost	Total
52'	42" G.I.P. @ 8.50	442.00	8.8	@ 2.00	104.00	
1'	42" BAND " 12.65	12.65				
5800'	36" D.T. " 5.00	29,000.00	8.8	@ 1.87	10,846.00	
		<u>29,454.65</u>				
2	Type B - 5 Equalizers @ \$165.00				330.00	
2	24" Intakes installed @ 75.00				150.00	
					<u>11,430.00</u>	
						40,884.65

UPPER MAIN RELIEF

Sec. 3

2000'	32" D T @ 4.00	8,000.00	9.4	@ 1.93	3,860.00	
4900'	20" D.T. @ 1.60	7,840.00	8.2	@ 1.47	7,203.00	
1800'	16" D.T. @ .89	2,880.00	6.1	@ .96	1,728.00	
280'	12" D.T. @ .46	128.80	4.8	@ .68	190.40	
60'	10" D.T. @ .35	21.00	6.5	@ .74	44.40	
68'	8" D.T. @ .22	14.96	6.7	@ .78	53.04	
34'	8" D.T. @ .22	7.48	4.0	@ .40	13.60	
		<u>18,892.24</u>				
1	Type B - 5 Equalizers @ \$165.00				165.00	165.00
11	12" Intakes @ 30.00				330.00	330.00
					<u>13,587.44</u>	
						32,479.68

LATERAL "A" - New Line

Sec. 4

1300'	16" @ .89	1,157.00	7.0	@ 1.10	1,430.00	
662'	14" @ .62	410.44	5.2	@ .77	509.74	
		<u>1,567.44</u>				
3 -	12" Intakes @ 30.00				90.00	
					<u>2,029.74</u>	
						3,597.18

LATERAL I - RELIEF

Sec. 5	per ft.	Cost	Ave. Cut	per ft.	Cost	Total
2300'	24" @ 2.20	5,060.00	9.3	@ 1.72	3,956.00	
1300'	22" @ 1.86	2,418.00	8.7	@ 1.55	2,015.00	
1400'	18" @ 1.07	1,498.00	6.3	@ 1.03	1,442.00	
40'	8" @ .22	8.80	5.1	@ .30	12.00	
102'	8" @ .22	22.44	4.4	@ .22	22.44	
4 - 12" Intakes @ 30.00					120.00	

LATERAL I-A

60'	8" @ .22	13.20	5.4	@ .33	19.80	
-----	----------	-------	-----	-------	-------	--

LATERAL I-B

60'	6" @ .14	8.40	4.6	@ .20	12.00	
-----	----------	------	-----	-------	-------	--

LATERAL I-C

500'	10" @ .35	175.00	4.6	@ .37	185.00	
1834'	8" @ .22	403.48	5.1	@ .30	550.20	
		<u>9,607.32</u>			<u>90.00</u>	
3 - 12" Intakes @ 30.00					<u>8,424.44</u>	

18,031.76

LATERAL 2Sec. 6

174'	16" @ .89	154.86	7.7	@ 1.21	210.54	
1400'	14" @ .62	2,728.00	7.0	@ 1.05	4,620.00	
996'	12" @ .46	458.16	5.4	@ .46	458.16	
200'	10" @ .35	70.00	5.9	@ .50	100.00	
44'	8" @ .22	9.68	4.6	@ .25	11.00	
		<u>3,420.70</u>			<u>120.00</u>	
4 - 12" Intakes @ 30.00					<u>140.00</u>	
1 Type B - 4 Equalizer @ 140.00					<u>5,659.70</u>	

9,080.40

LATERAL 3Sec. 7

1200'	22" @ 1.86	2,232.00	7.3	@ 1.32	1,584.00	
1000'	18" @ 1.07	1,070.00	6.7	@ 1.10	1,100.00	
2500'	16" @ .89	2,225.00	7.8	@ 1.21	3,025.00	
1100'	10" @ .35	385.00	5.8	@ .49	539.00	
456'	8" @ .22	100.32	4.8	@ .28	127.68	
20'	8" @ .22	4.40	4.4	@ .25	5.00	
72'	8" @ .22	15.84	4.4	@ .25	18.00	
		<u>6,032.56</u>			<u>125.00</u>	
1 - Type B - 3 Equalizers @ \$125.00					<u>60.00</u>	
2 - 12" Intakes @ \$30.00					<u>6,583.68</u>	

Total Materials 68,974.91
 Engineer 11,500.00
 GRAND TOTAL \$ 128,189.91

Total Labor 47,715.00

12,616.24

Dewey T. Bondurant, Head, Engineering
Design Unit

Fort Dodge, Iowa
DEC. 16, 1964

Dilman L. Moothart, Area Engineer

Engineering - WP - Beaver Watershed

I have checked the plans (six sheets) you left with me on Beaver Watershed and made notations and corrections in green pencil. I have also completed the following:

1. Rough draft of the five large Junction Box Equalizers ready for your final drafting.
2. "Tile Design Data" tabulation sheet showing present tile capacities, required design acres and relief tile capacities for entire project along with design coefficients used for various sections.
3. Engineers Report "Character, Location and Design Basis of Contemplated Improvements".

There was one change in design, involving a change in tile size, discovered when working out the Tile Design Data tabulation sheet which I want to call your attention to. This change is on the upper section of Lateral 3 Relief from Station 47+00 to 58+00. The 884 ft. of 10" tile was changed to 14"; the 40 ft. of 12" R/C Culvert Pipe to 15" Culvert Pipe and the 176 ft. of 10" to 14". This was due to an error in the drainage area originally recorded above Station 47+00. It was recorded as 69 acres and should have been 169 acres. This change is shown in green pencil on the profile of Lateral 3 Relief.

The Tile Line Equalizers (nine of them) showed the elevations of the grade line of the main tile lines. These were changed to show the elevations of the grade line of the equalizers.

Some of the stations on the plan map did not agree with those on the profiles. These changes have been made in green pencil also.

Plans (prints - 6 sheets) along with rough draft of Equalizers are being mailed to you ~~in~~ separately in a mailing tube.

Attachments-

WEST POTTAWATTAMIE SOIL CONSERVATION DISTRICT

Post Office Box 647
234 Post Office Building
Council Bluffs, Iowa 51504
August 5, 1964

NOTICE TO PROSPECTIVE BIDDERS - CONSTRUCTION

SEALED BIDS, IN SINGLE COPY, WILL BE RECEIVED AT THE WEST POTTAWATTAMIE SOIL CONSERVATION DISTRICT OFFICE, P. O. BOX 647, 234 POST OFFICE BUILDING, COUNCIL BLUFFS, IOWA, UNTIL 11:00 A.M., CENTRAL STANDARD TIME, THURSDAY, SEPTEMBER 3, 1964, AND THEN BE PUBLICLY OPENED AND READ FOR THE CONSTRUCTION OF FOUR (4) WATERSHED PROTECTION AND FLOOD PREVENTION STRUCTURES AND ASSOCIATED WATERWAYS AND TILING LOCATED WITHIN THE RYAN-HENSCHAL WATERSHED, PART 4, LOCATED APPROXIMATELY THREE (3) MILES NORTH OF WESTON, POTTAWATTAMIE COUNTY, IOWA.

THE ESTIMATED QUANTITIES OF THE MAJOR ITEMS OF WORK ARE:

2,297 CU.YDS. COMMON EXCAVATION; 74,117 CU.YDS. COMPACTED EARTH FILL; 187.6 CU.YDS. AIR-ENTRAINED CONCRETE; 22,312 LBS. STEEL BAR REINFORCEMENT; 344 LIN.FT. 18" DIAM. CORRUGATED IRON OR STEEL PIPE; 22 LIN.FT. 12" DIAM. CORRUGATED IRON OR STEEL PIPE; ONE VERTICAL INLET ASSEMBLY (30" TO 18" CORRUGATED IRON OR STEEL PIPE); 1,938 LIN.FT. 6" DIAM. CORRUGATED IRON OR STEEL PIPE; 47 LIN.FT. 4" DIAM. PERFORATED FIBER PIPE; 637 CU.YDS. FILTER MATERIAL; 13,600 LIN.FT. 5" DIAM. DRAIN TILE; 2 TRASH RACKS; 2 TIMBER SUPPORT-PROPPED OUTLETS; 2 SURFACE INLETS TO DRAIN TILE; CLEARING AND GRUBBING; AND OTHER INCIDENTAL WORK.

ALL BIDS MUST BE ACCOMPANIED BY BID BOND, CERTIFIED CHECK, CASHIER'S CHECK, MONEY ORDER, OR CASH IN AN AMOUNT NOT LESS THAN TWENTY PERCENT (20%) OF THE AMOUNT BID.

THE SUCCESSFUL BIDDER WILL BE REQUIRED TO EXECUTE A FORMAL CONTRACT AND FURNISH PERFORMANCE AND PAYMENT BONDS IN AMOUNTS OF 100% AND 50% RESPECTIVELY OF THE TOTAL AMOUNT OF THE CONTRACT.

A CONTRACT WILL NOT BE AWARDED TO A FIRM IN WHICH ANY OFFICIAL OF THE SPONSORING LOCAL ORGANIZATIONS, THE CONTRACTING LOCAL ORGANIZATION, OR ANY MEMBER OF HIS IMMEDIATE FAMILY HAS DIRECT OR INDIRECT INTEREST IN THE PECUNIARY PROFITS OR CONTRACTS OF SUCH FIRM.

ALL WORK SHALL BE COMPLETED WITHIN 142 CALENDAR DAYS AFTER THE DATE OF RECEIPT OF NOTICE TO PROCEED.

ARRANGEMENTS TO INSPECT THE SITES MAY BE MADE BY CONTACTING LOUIE FAHRENKROG, CONTRACTING OFFICER FOR THE WEST POTTAWATTAMIE SOIL CONSERVATION DISTRICT, P. O. BOX 647, 234 POST OFFICE BUILDING, COUNCIL BLUFFS, IOWA (PHONE: COUNCIL BLUFFS 328-1543, EXT. 24).

COMPLETE ASSEMBLY OF THE INVITATION FOR BIDS MAY BE OBTAINED FROM THE CONTRACTING OFFICER.

A PRE-BIDDERS' MEETING WILL BE HELD AT 10:00 A.M., C.S.T., MONDAY, AUGUST 31, 1964, AT THE WEST POTTAWATTAMIE SOIL CONSERVATION DISTRICT OFFICE, 234 POST OFFICE BUILDING, COUNCIL BLUFFS, IOWA, AT WHICH TIME PROSPECTIVE BIDDERS' QUESTIONS REGARDING THE CONTENTS OF THE INVITATION FOR BIDS WILL BE ANSWERED.

AN INSPECTION OF THE SITES WILL BE HELD BEGINNING AT 1:00 P.M., C.S.T., MONDAY, AUGUST 31, 1964. ENGINEERING PERSONNEL WILL BE AVAILABLE TO ANSWER QUESTIONS DURING THIS SITE INSPECTION TOUR.

1.

BEAVER WATERSHED

(WEBSTER COUNTY, IOWA, D.D. #47)

BILL OF MATERIAL AND COST ESTIMATE

SECTION 1

LOWER MAIN RELIEF

		MATERIAL			LABOR		
ITEM	LENGTH	SIZE AND TYPE	COST PER FT.	TOTAL	AV. CUT	COST PER FT.	TOTAL
1	52'	42" CMP-12GA	12.73	661.96	7.5	2.00	104.00
2	3948'	36" DT-E.B.	4.30	16,976.40	8.8	1.35	5329.80
3	1552'	34" DT- E.B.	3.92	6083.84	9.4	1.41	2188.32
4	300'	34"DT-1500D	5.70	1710.00	10.3	1.55	465.00
5	JUNCTION BOX EQUALIZER-10			404.73			200.00
6	JUNCTION BOX EQUALIZER-#11			177.21			150.00
7	SURFACE INLET-#1			118.18			18.00
8	SURFACE INLET-#2			118.18			18.00
9	SMALL ANIMAL GUARD			189.60			3.00
TOTALS				26,440.10			8,476.12

TOTAL FOR SECTION 1 - \$34,916.22

{ VERA LANE 3 spans
before starting Section 2 }

SECTION 2

UPPER MAIN RELIEF

ITEM	LENGTH	MATERIAL			LABOR		
		SIZE AND TYPE	COST PER FT.	TOTAL	AV CUT	COST PER FT.	TOTAL
1	1100'	32" DT-E.G.	3.40	3740.00	8.4	1.25	1375.00
2	800'	32" DT-1500D	5.00	4000.00	10.6	1.57	1256.00
3	2860'	22" DT-E.G.	1.45	4147.00	6.4	0.84	2402.40
4	1948'	22" DT-1500D	2.25	4383.00	10.7	1.40	2727.20
5	1900'	18" DT-E.G.	0.90	1710.00	6.1	0.73	1387.00
6	180'	12" DT-E.G.	0.44	79.20	4.8	0.50	90.00
7	100'	36" R/C-C.P.	8.84	884.00	10.3	2.00	200.00
8	92'	24" R/C-C.P.	4.24	390.08	10.0	1.60	147.20
9	TILE LINE EQUALIZER No. 1						
	60'	12" R/C-C.P.	1.58	94.80	6.5	1.40	84.00
	TILE LINE EQUALIZER No. 2						
10	68'	12" R/C-C.P.	1.58	107.44	6.7	1.40	95.20
	TILE LINE EQUALIZER No. 3						
11	34'	8" DT-E.G.	0.22	7.48	4.0	0.40	13.60
12	JUNCTION BOX EQUALIZER #12			317.75			175.00
	SURFACE INLET No. 3						
13				68.22			18.00
	SURFACE INLET No. 4						
14				17.10			18.00
	SURFACE INLET No. 5						
15				12.40			18.00
	SURFACE INLET No. 6						
16				17.10			18.00
	SURFACE INLET No. 7						
17				17.10			18.00
	SURFACE INLET No. 8						
18				45.88			18.00
	SURFACE INLET No. 9						
19				50.58			18.00
	SURFACE INLET No. 10						
20				50.58			18.00

		MATERIAL			LABOR		
ITEM	LENGTH	SIZE AND TYPE	COST PER FT.	TOTAL	AV. CUT	COST PER FT.	TOTAL
21	SURFACE INLET NO. 11			45.88			18.00
22	SURFACE INLET NO. 12			33.88			18.00
23	SURFACE INLET NO. 13			26.08			18.00
TOTALS				16879.55			10,150.60

TOTAL FOR SECTION 2 - 27,030.15

{ 2nd hand 3 spans
before starting Section 3 }

SECTION 3

LATERAL 1 RELIEF

1	752'	26" DT - E.Q.	2.00	1504.00	7.3	1.02	767.04
2	1500'	26" DT - 1500 D	3.00	4500.00	10.4	1.44	2160.00
3	700'	24" DT - E.Q.	1.70	1190.00	7.3	0.99	693.00
4	600'	24" DT - 1500 D	2.65	1590.00	10.5	1.42	852.00
5	1400'	18" DT - E.Q.	0.90	1260.00	6.3	0.76	1064.00
6	48'	30" R/C - C.P.	6.14	294.72	9.0	1.80	86.40
7	40'	TILE LINE EQUALIZER NO. 4 8" DT - E.Q.	0.22	8.80	5.1	0.50	20.00
8	102'	TILE LINE EQUALIZER NO. 5 8" DT - E.Q.	0.22	22.44	4.4	0.44	44.88
9	SURFACE INLET NO. 14			12.40			18.00
10	SURFACE INLET NO. 15			12.40			18.00
11	SURFACE INLET NO. 16			47.58			18.00
12	SURFACE INLET NO. 17			33.88			18.00

ITEM	LENGTH	MATERIAL			LABOR		
		SIZE AND TYPE	COST PER FT.	TOTAL	AV. CUT	COST PER FT.	TOTAL

LATERAL 1-A

13	60'	6" DT-E.Q.	0.15	9.00	5.4	0.54	32.40
----	-----	------------	------	------	-----	------	-------

LATERAL 1-B

14	60'	8" DT-E.Q.	0.22	13.20	4.6	0.46	27.60
----	-----	------------	------	-------	-----	------	-------

LATERAL 1-C

15	400'	12" DT-E.Q.	0.44	176.00	4.6	0.48	192.00
16	400'	10" DT-E.Q.	0.30	120.00	4.2	0.42	168.00
17	1486'	8" DT-E.Q.	0.22	326.92	5.0	0.50	743.00
18	48'	12" R/C-C.P.	1.58	75.84	7.5	1.40	67.20
19	SURFACE INLET NO. 18			23.32			18.00
20	SURFACE INLET NO. 19			12.40			18.00
21	SURFACE INLET NO. 20			12.40			18.00

TOTALS 11,245.30 7,043.52

TOTAL FOR SECTION 3 - 18,288.82

{ Vera lane 3 spaces
before starting Section 4 }

ITEM	LENGTH	MATERIAL			LABOR		
		SIZE AND TYPE	COST PER FT.	TOTAL	AV. CUT	COST PER FT.	TOTAL

SECTION 4

LATERAL A

1	1248'	16" DT-E.Q.	0.72	898.56	6.9	0.79	985.92
2	662'	14" DT-E.Q.	0.52	344.24	5.0	0.55	364.10
3	52'	18" R/C-C.P.	2.69	139.88	6.5	1.50	78.00
4	SURFACE INLET NO. 21			36.04			18.00
5	SURFACE INLET NO. 22			36.04			18.00
6	SURFACE INLET NO. 23			31.84			18.00

TOTALS

1,486.60

1,482.02

TOTAL FOR SECTION 4 - 2,968.62

{ Vera lane 3 spaces
before starting section 5 }

SECTION 5

LATERAL 2 RELIEF

1	122'	18" DT-E.Q.	0.90	109.80	8.0	0.96	117.12
2	4400'	16" DT-E.Q.	0.72	3168.00	7.0	0.80	3,520.00
3	948'	12" DT-E.Q.	0.44	417.12	5.1	0.53	502.44
4	52'	18" R/C-C.P.	2.69	139.88	9.4	1.50	78.00
5	48'	12" R/C-C.P.	1.58	75.84	7.8	1.40	67.20
6	TILE LINE EQUALIZER NO. 6 200' 10" DT-E.Q.			60.00	5.9	0.59	118.00
7	TILE LINE EQUALIZER NO. 7 44' 18" DT-E.Q.			9.68	4.6	0.46	20.24
8	JUNCTION BOX EQUALIZER #13			177.21			150.00

		MATERIAL			LABOR			
ITEM	LENGTH	SIZE AND TYPE	COST PER FT.	TOTAL	AV CUT	COST PER FT.	TOTAL	
9	SURFACE INLET NO. 24			36.04			18.00	
10	SURFACE INLET NO. 25			40.74			18.00	
11	SURFACE INLET NO. 26			12.40			18.00	
12	SURFACE INLET NO. 27			12.40			18.00	
TOTALS				4,259.11			4,645.00	

TOTAL FOR SECTION 5 — 8,904.11

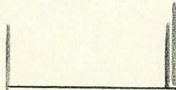
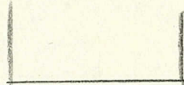
{ Vena Lane 3 spaces
before starting Section 6 }

SECTION 6

LATERAL 3 RELIEF

1	1200'	24" DT-E.Q.	1.70	2040.00	7.3	0.99	1,188.00
2	2550'	20" DT-E.Q.	1.10	2805.00	7.4	0.93	2,371.50
3	550'	18" DT-E.Q.	0.90	495.00	7.5	0.90	495.00
4	400'	18" DT-1500D	1.45	580.00	8.4	1.01	404.00
5	1060'	14" DT-E.Q.	0.52	551.20	5.5	0.60	634.00
6	456'	8" DT-E.Q.	0.22	100.32	4.8	0.48	218.88
7	40'	15" R/C-C.P.	2.14	85.60	8.5	1.50	60.00
8	TILE LINE EQUALIZER NO. 8						
	20'	8" DT-E.Q.	0.22	4.40	4.4	0.44	8.80
9	TILE LINE EQUALIZER NO. 9						
	72'	8" DT-E.Q.	0.22	15.84	4.4	0.44	31.68
10	JUNCTION BOX EQUALIZER NO. 14			137.92			100.00
11	SURFACE INLET NO. 28			12.40			18.00
12	SURFACE INLET NO. 29			12.40			18.00

TOTALS


6,840.08
5,549.86

TOTAL FOR SECTION 6 - 12,389.94

TOTALS FOR PROJECT 67,150.74

37,347.12

GRAND TOTAL (MATERIAL AND LABOR) 104,497.86