FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IOWA	SN.666			

STATE OF IOWA
STATE HIGHWAY COMMISSION
DESIGN FOR
TWIN 12' X 12' BOX CULVERTS WITH FLUME

SECONDARY ROAD SYSTEM SN PROJECT NO. 666

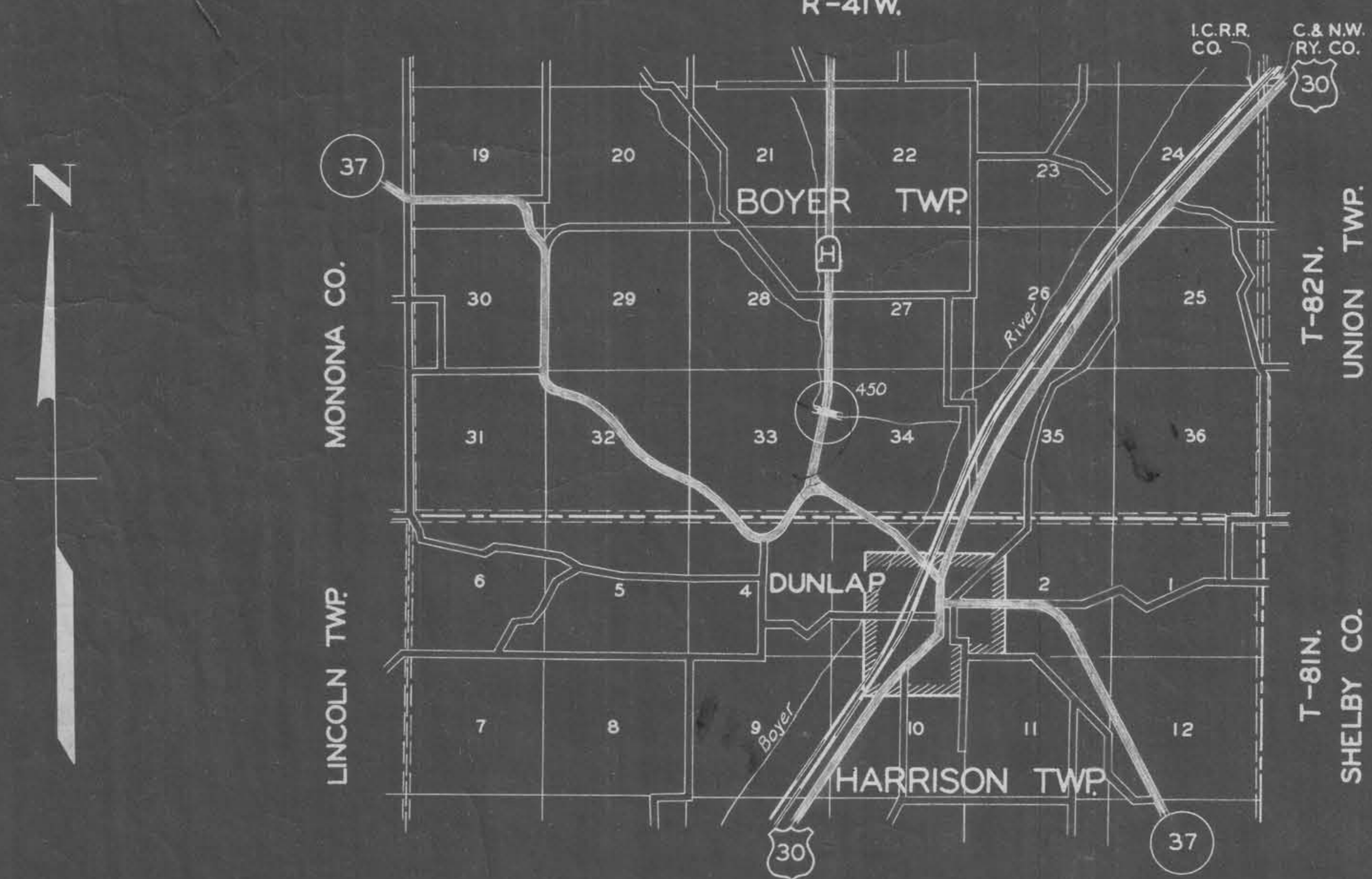
CRAWFORD COUNTY

JULY 1950

DESIGN 450	BOYER TWP.	CRAWFORD CO.
SECTIONS 33-34	STA. 4+44	OVER CREEK

TWIN 12' x 12' R.C.B. WITH FLUME

PART	TOTAL
Concrete	339.5 C.Y.
Reinforcing	40,417 lbs.
Excavation Cl. 10	3676 C.Y.
Excavation Cl. 23	1753 C.Y.



SCALE: 1 INCH = 1 MILE

Materials and construction to be in accordance with Iowa State Highway Commission Standard Specifications, Series 1948.

APPROVED

BOARD OF SUPERVISORS

APPROVED

CHIEF ENGINEER DATE
IOWA HIGHWAY COMMISSION

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

RECOMMENDED FOR APPROVAL:

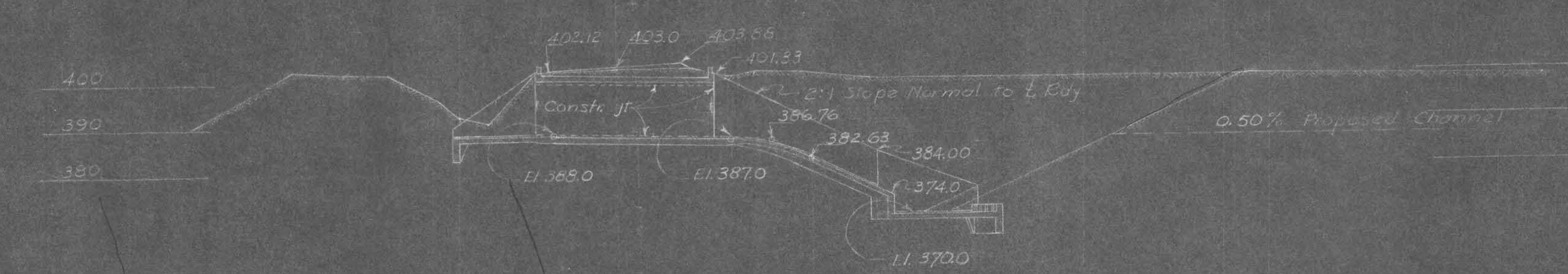
DISTRICT ENGINEER DATE

APPROVED:

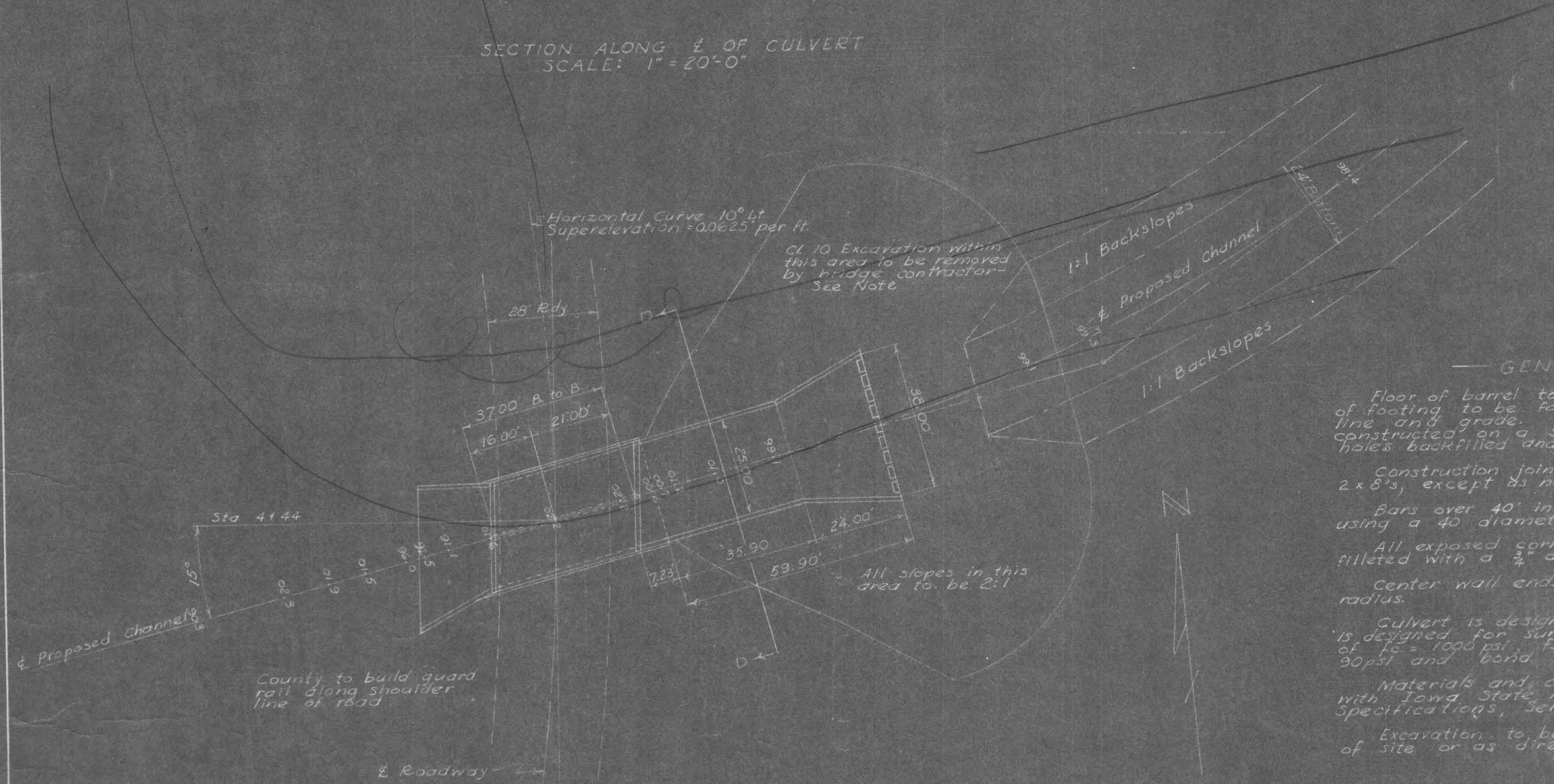
DIVISION ENGINEER DATE

Jack - 7-12-50

BENCH MARK: No. 1, Power pole Rt. Sta. 2+00 - El. 400.00



SECTION ALONG ℄ OF CULVERT
SCALE: 1" = 20'-0"



SITUATION PLAN
SCALE: 1" = 20'-0"

GENERAL NOTES

Floor of barrel to be finished smooth. Sides of footing to be formed to insure correct line and grade. Culvert and flume to be constructed on a stable foundation with holes backfilled and compacted.

Construction joints to be formed by beveled 2 x 8's, except as noted, and placed as shown.

Bars over 40' in length to be spliced by using a 40 diameter lap.

All exposed corners 90° or sharper to be filleted with a ¾" dressed beveled strip.

Center wall ends to be rounded with a 6" radius.

Culvert is designed for H-20 loading, flume is designed for surcharge with unit stresses of fc = 1000 psi, fs = 20,000 psi, n = 10, shear 90 psi and bond 187 psi.

Materials and construction to be in accordance with Iowa State Highway Commission Standard Specifications, Series 1948.

Excavation to be disposed of within 500 feet of site or as directed by engineer.

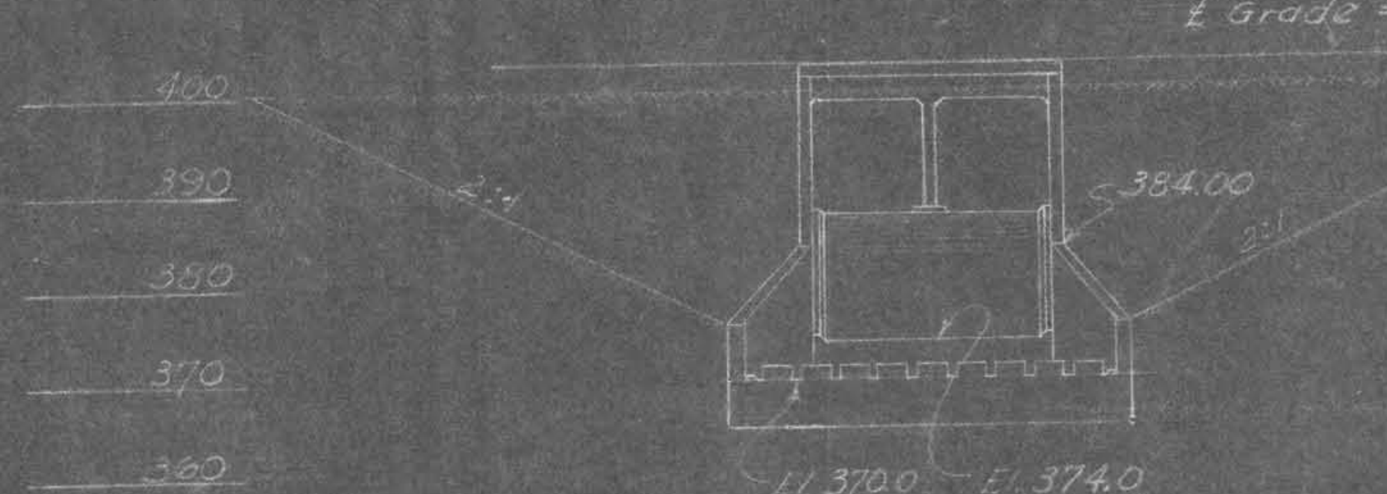
REINFORCING ESTIMATE

Mark	Location	Shape	Size	No.	Length	Linear Feet ½ϕ	⅝ϕ	¾ϕ	1ϕ	Weight lbs.
a	Wall: Vert.		¾ϕ	94	14'-5"			1355.20		2035
a₁	" " middle		⅝ϕ	38	14'-5"		547.83			571
b	" Hor. front f.		"	48	40'-0" to 24'-0"		1586.33			1655
b₁	Wing: Back Face		½ϕ	22	25'-2" to 8'-6"	368.83				246
b₂	Wall: Hor., middle		⅝ϕ	13	38'-0"		494.00			515
b₃	" " back face		½ϕ	24	22'-3" to 8'-4"	419.25				280
b_f	Flume Wall: Hor. front		⅝ϕ	34	16 @ 32'-10" 18 @ 24'-10"		525.33 446.99			1014
c	Wing: Vert. back		"	27	18'-6" to 10'-3"		391.16			408
c₁	" " short		"	19	10'-6"		199.50			208
c₂	" " back f.		"	12	7'-1" to 3'-7"		61.92			65
c₃	" " front		½ϕ	39	15'-1" to 3'-5"	359.25				240
c₄	" " short		"	17	6'-0"	102.00				68
c_f	Chute Wall: Vert. back		¾ϕ	96	42 Var. 54 @ 17'-1"			787.17 922.48		2568
c_f1	Flume " " short		"	41	27 @ 8'-0" 14 @ 7'-0"			216.00 98.00		472
c_f2	Chute " " front		⅝ϕ	72	32 Var. 40 @ 11'-5"		419.75 456.68			914
c_f3	Flume " " short		"	33	21 @ 6'-2" 12 @ 5'-0"		129.50 60.00			198
c_f4	" " " back		¾ϕ	8	8'-4" to 7'-8"			63.83		96
d	Floor: Bot. wing		½ϕ	2	21'-1" 18'-6"	39.58				26
d₁	" " end		"	5	13'-6"	67.50				45
d_f	Flume Wall: Hor. back		⅝ϕ	34	16 @ 32'-10" 18 @ 24'-10"		525.33 446.99			1014
e	Slab: Long. bot.		¾ϕ	16	38'-9"			620.00		931
e₁	" " top		½ϕ	8	38'-9" to 21'-5"	248.00				166
f	Floor: Long top		¾ϕ	40	34'-9" to 31'-5"			1324.17		1989
f₁	" " bot.		½ϕ	2	38'-7"	77.17				52
f_f	Flume Floor: Long. top		⅝ϕ	50	25 @ 38'-5" 25 @ 25'-0"		960.43 625.00			1654
f_f1	" " " bot.		½ϕ	33	11 @ 25'-0" 22 @ 23'-8"	275.00 520.67				532
h_f	Flume drop: Vert.		⅝ϕ	27	13'-1"		353.25			368
i	Parapet: Vert.		½ϕ	56	6'-10"	382.67				256
j	" Hor.		"	4	27'-8"	110.67				74
j₁	Curb Rail		⅝ϕ	4	27'-5"		109.67			114
k	Slab: Trans. bot.		1ϕ	55	20 Var. 35 @ 28'-8"				582.50 1003.35	4229
k₁	" corners		¾ϕ	56	8'-0"			448.00		673
k₂	" Trans. top		1ϕ	53	9'-0"				477.00	1272
k₃	" " bot. short		"	8	15'-8"				125.33	334
m	Floor: Trans. top		"	58	27'-8"				1604.67	4280
m₁	" " end		¾ϕ	22	33'-10" to 13'-1"			617.50		927
m₂	" " bot. end		⅝ϕ	11	29'-7" to 24'-3"		296.42			309
m₃	" " bot.		1ϕ	55	9'-0"				495.00	1320
m_f	Flume Floor: Trans. top		¾ϕ	61	37 @ 28'-2" 24 Var.			1042.18 842.92		2832
m_f1	" " " bot.		"	33	21 @ 19'-0" 12 Var.			399.00 315.50		1073
m_f2	Flume Drop: Trans.		"	4	26'-8"			106.67		160
p	Curtain: Long.		1ϕ	4	37'-0"				148.00	395
p_f	Flume Curtain: Long.		"	2	39'-2"				78.33	209
s	Wing: Slope top		¾ϕ	4	2 @ 26'-5" 2 @ 24'-5"			102.17		153
s₁	" " bot.		"	2	26'-5" 24'-2"			50.58		76
s_f	Flume Wall: Slope		"	8	4 @ 27'-6" 4 @ 23'-10"			205.33		308
s_f1	Still Basin Wall: Slope		"	4	25'-11"			103.67		156
t	Curtain: Trans.		⅝ϕ	50	5'-0"		250.00			261
u	" Brackets		"	8	6'-11"		55.33			58
v_f	Still Basin Floor: Sill		½ϕ	18	8'-4"	150.00				100
c_f5	" " Wall: Vert. back		¾ϕ	58	20'-10" to 14'-1"			1014.00		1523
c_f6	Chute Wall Ext.: Back		"	9	21'-6"			193.50		291
c_f7	Still Basin Wall: Vert. f.		⅝ϕ	50	15'-2" to 7'-5"		563.83			588
c_f8	Chute Wall Ext.: Front		"	7	15'-11"		111.42			116
					TOTAL	3120.59	9616.66	10,827.84	4514.18	40,417

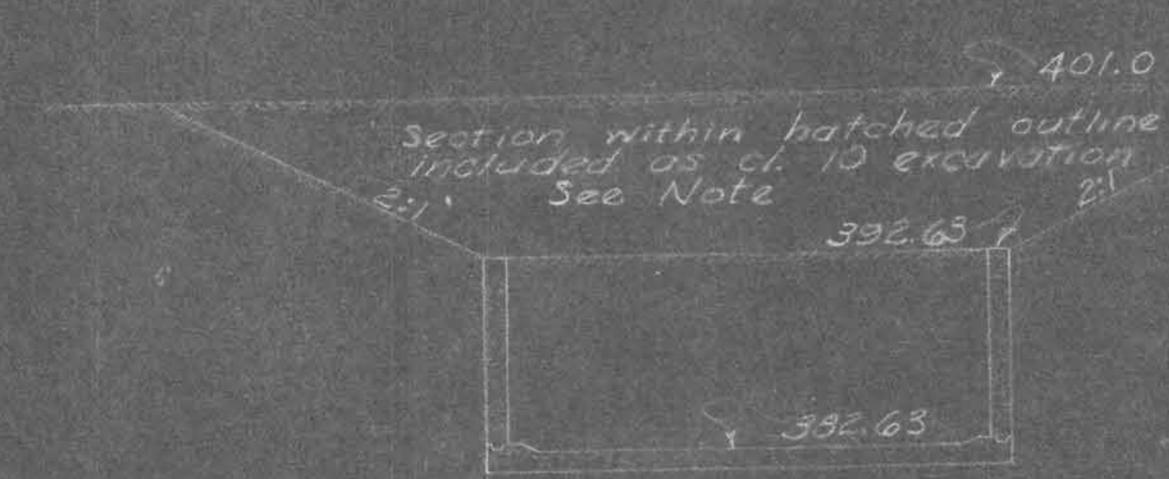
CONCRETE {Above Constr. jt. in floor 163.2 C.Y. / Below " " " 176.3 C.Y.} 339.5 C.Y.

EXCAVATION Class 10 3676 C.Y.

EXCAVATION Class 23 1753 C.Y.



END ELEVATION OF OUTLET
SCALE: 1" = 20'-0"



SECTION D-D (TYPICAL)
SCALE: 1" = 10'-0"

Location:
Section 33-34
Boyer Township
Crawford County

DESIGN FOR
15° SKEW
TWIN 12' x 12' CONCRETE CULVERT AND FLUME
REINFORCED

STATION 4+44 PROJECT No. SN-666

CRAWFORD COUNTY

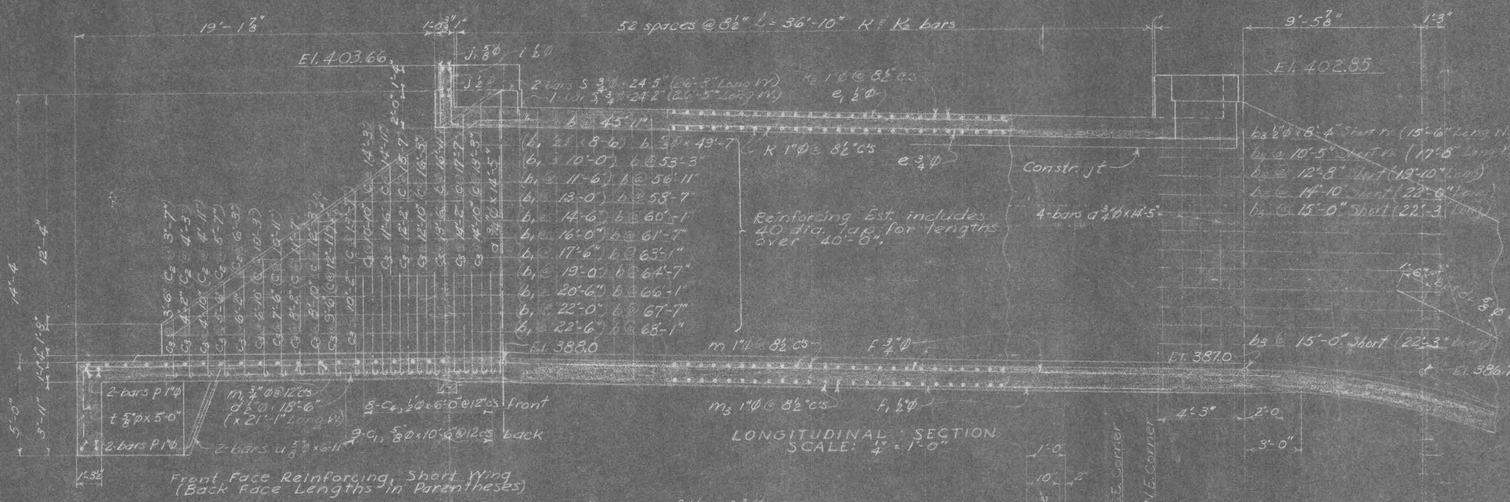
IOWA STATE HIGHWAY COMMISSION

JULY 1950 SCALES AS NOTED

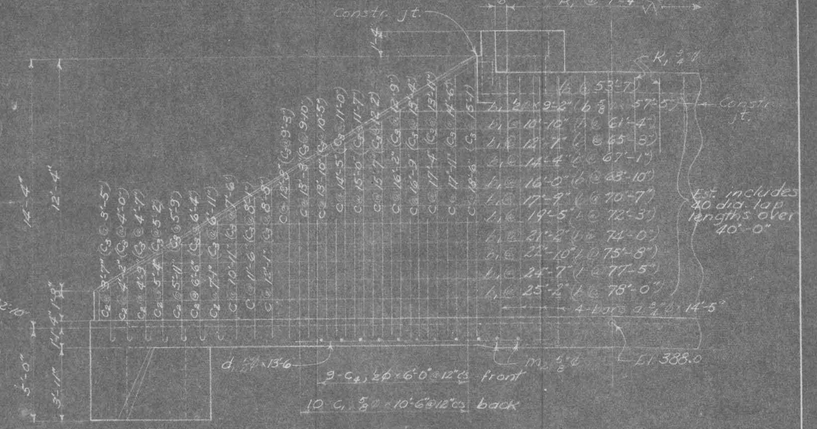
SHEET 1 OF 3

Design 459 Crawford County File No. 14278

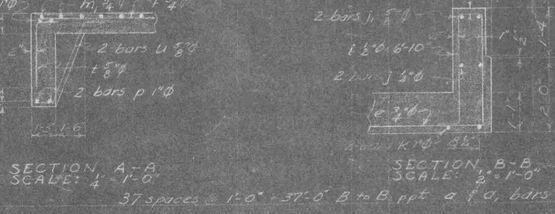
BENCH MARK: No. 1, Power pole Ct. Sta 2+00 – El. 400.00

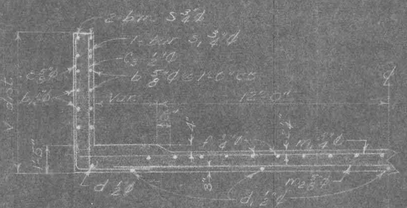


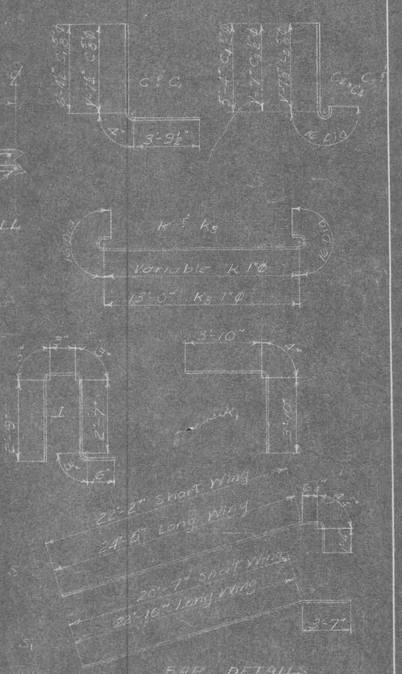
Front Face Reinforcing, Short Wing
(Back Face Lengths in Parentheses)

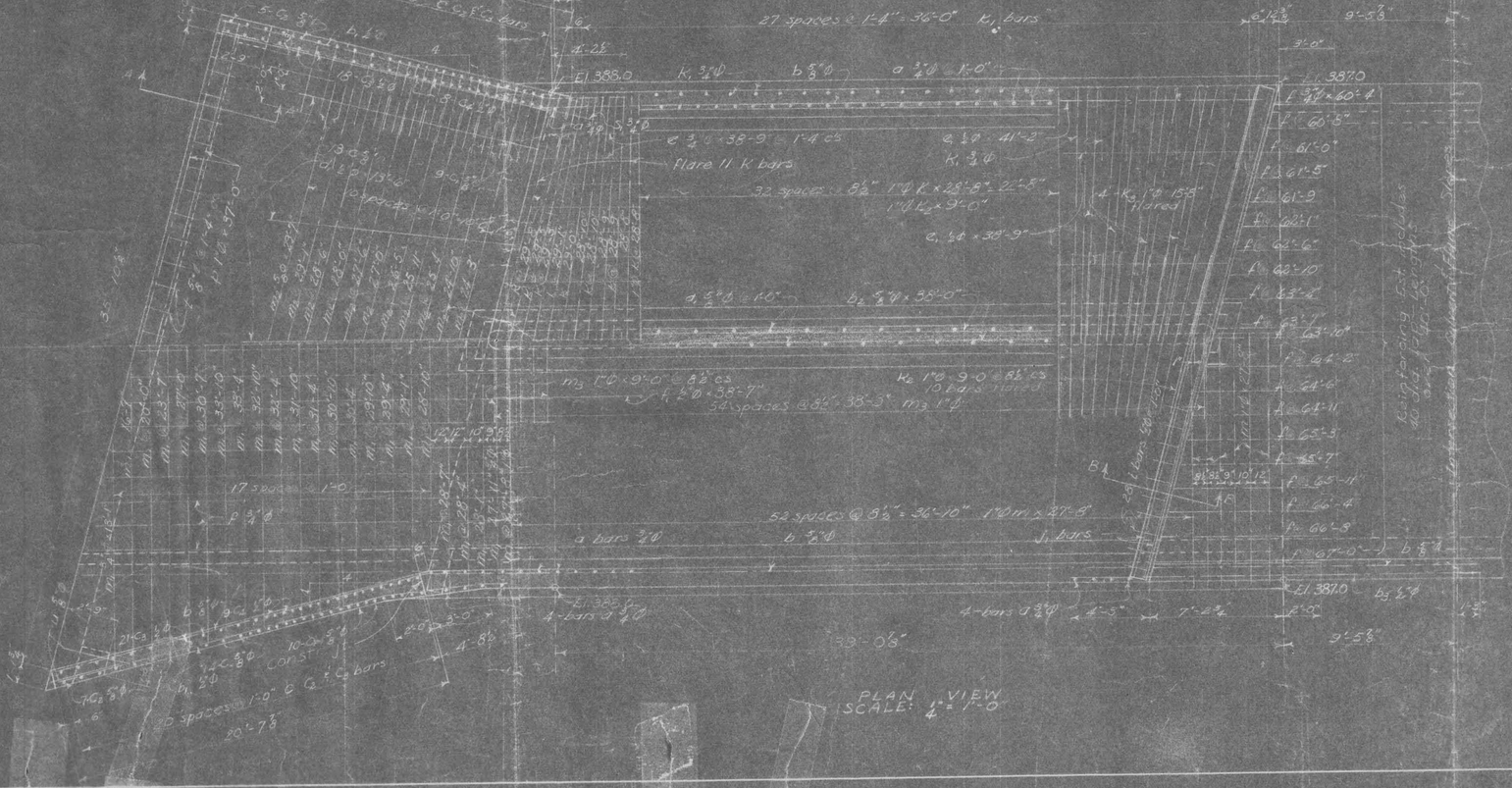


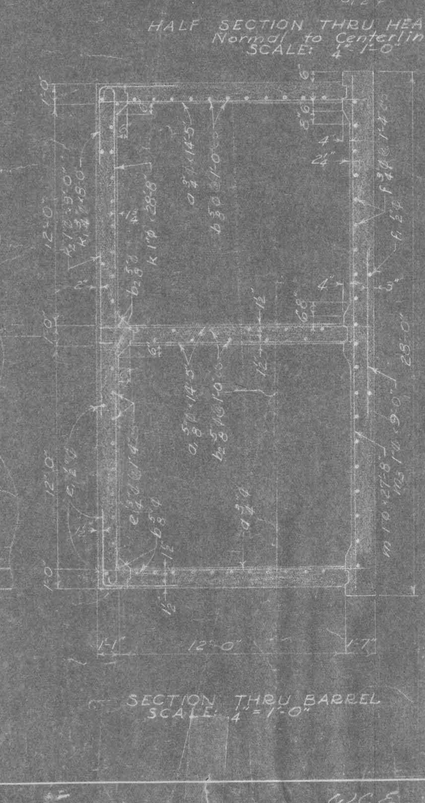
Back Face Reinforcing, Long Wing
(Front Face Lengths in Parentheses)











DESIGN FOR
15° SKEW
TWIN 12' x 12' CONCRETE CULVERT AND FLUME
REINFORCED
STATION 4+44 PROJECT No. SN-660
CRAWFORD COUNTY
IOWA STATE HIGHWAY COMMISSION
JULY 1950 SCALES AS NOTED
SHEET 2 OF 5

Design 450 Crawford County File 142

BENCH MARK: No. 1, Power pole Rt. Sta. 2400 — El. 400.00

LONGITUDINAL SECTION
SCALE: 1/4" = 1'-0"

HALF SECTION THRU STILLING BASIN
Normal To Wall
SCALE: 1/4" = 1'-0"

SECTION C-C
SCALE: 1/4" = 1'-0"

PLAN VIEW
SCALE: 1/4" = 1'-0"

HALF END VIEW OF STILLING BASIN
SCALE: 1/4" = 1'-0"

SILL BLOCK DETAIL
SCALE: 1" = 1'-0"

BAR DETAILS

DESIGN FOR
15° SKEW
TWIN 12' x 12' CONCRETE CULVERT
AND FLUME
REINFORCED
STATION 4+44 PROJECT No. SN-666
CRAWFORD COUNTY
IOWA STATE HIGHWAY COMMISSION
JULY 1940 SCALES AS NOTED