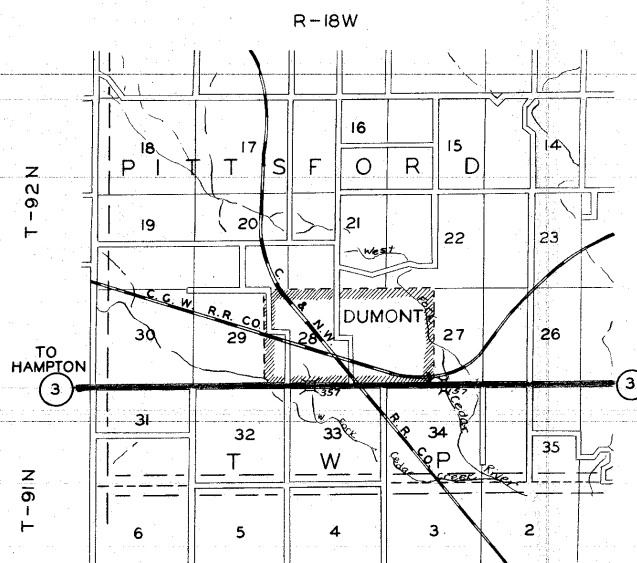


STATE OF IOWA
STATE HIGHWAY COMMISSION
DESIGN FOR
BRIDGE WIDENINGS
PRIMARY ROAD SYSTEM F.N. PROJECT NO. 502
BUTLER COUNTY
FEBRUARY 1957

CONSTRUCTION PLANS
SHOWING
PROJECT AS BUILT

PREPARED BY Robert J. Hinder
DATE 2-21-59 RESIDENT ENGINEER

J. Shute



LAYOUT
SCALE 1 INCH = 1 MILE

DESIGN: 257 SECTION: 28-33	STA. 119+46.4 TWP. PITTSFORD
DESIGN FOR REPLACING UNDER TRAFFIC 32'x 20' I-BEAM BRIDGE WITH 33'x 30' CONCRETE SLAB BRIDGE	
ESTIMATE OF QUANTITIES	
ITEM	TOTAL
Concrete	362 C.Y. ✓
Reinforcing Steel	14,384 lbs. ✓
Structural Steel	470 lbs. ✓
Treated Timber Trestle pile (14' oversize)	780 Lin. Ft. ✓
Treated Timber Trestle pile (12' @ 30' 4' @ 9')	336 Lin. Ft. ✓
Treated Lumber	4310 F.B.M. ✓
Hardware (Galvanized)	200 lbs. ✓
Excavation Class 20	66 C.Y. ✓
Excavation Class 21	45 C.Y. ✓
Run-around	137400 Lump Sum ✓
Flood Lighting	Lump Sum ✓
Removal of Old Concrete	Lump Sum ✓
Pavement Widening Approach Slab	114 Sq. Yd. ✓
Removal of Present Substructure	Lump Sum ✓

*Includes the 4' @ 9' to be used as deadman

Specifications:
All material and construction
to be in accordance with Iowa
State Highway Commission
Standard specifications, Series
1956, plus current special
provisions

DESIGN: 157 SECTION: 27 & 34	STA. 208+64.5 TWP. PITTSFORD CIVIL
DESIGN FOR WIDENING UNDER TRAFFIC 90'x 20' PONY TRUSS SPAN WITH 6-40'x 20' I-BEAM APPROACH SPANS TO 2-45'x 28' PRESTRESSED BEAM SPANS WITH 6-40'x 28' ROADWAY APPROACH SPANS	
ESTIMATE OF QUANTITIES	
ITEM	TOTAL
Concrete	335.48 Cu. Yds. ✓
Reinforcing Steel	45,958 lbs. ✓
Structural Steel	25,000 lbs. ✓
Precast Concrete Piles P10B 8 @ 35'	280 Lin. Ft. ✓
Treated Timber Foundation Piles 4 @ 25'	100 Lin. Ft. ✓
Untreated Timber Piles 13 @ 30'	390 Lin. Ft. ✓
Prestressed Concrete Beams 41'-10'	8 Pcs. ✓
Prestressed Concrete Beams 42'-2'	4 Pcs. ✓
Prestressed Concrete Beams 45'-5'	14 Pcs. ✓
Excavation Class 10 Channel	425 Cu. Yds. ✓
Excavation Class 20	75 Cu. Yds. ✓
Excavation Class 21	62 Cu. Yds. ✓
Pavement Widening	45 Sq. Yds. ✓
Removal of Trusses & Handrail from Appr. Spans	Lump Sum ✓
Cleaning and Painting Old Steel	Lump Sum ✓
Flood Lighting	Lump Sum ✓
Removal of Old Concrete	Lump Sum ✓
Precast Concrete Piles P10A 4 @ 25'	100 Lin. Ft. ✓

*Includes cost of transportation

COPY APPROVED AND FORWARDED TO AMES.

DATE 2-28-59

ASST. DIST. ENG.

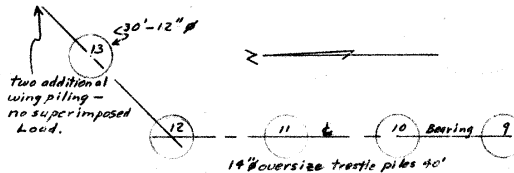
APPROVED:
CHIEF E. SINEE
IOWA HIGHWAY COMMISSION

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
APPROVED:
DISTRICT ENGINEER

LOG OF PILING DRIVEN

Kind of Piling Cres. Trestle (Southern Pine)
Untreated, Treated, (Give Species) Steel, (Give Type), ConcreteCounty Butler Proj. No. FN-502Type of Hammer Gravity
Single or Double Acting Steam, GravityContractor Torvik & SonsI. H. Comm. No. of Hammer 288Design No. 257 Sta. of C. L. 119446.4Gross Weight of Hammer 3220 Effective Wt. 3220Foundation Number North Half, East Abut.Weight of Driving Cap 920Length, Width and Type of Structure 33' x 30'Weight of Pile Abut. 1850Remarks Concrete Slab BridgeFormula Used $P = \frac{3W}{4} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$ Remarks Testing was used on all piles.Required Penetration FullRequired Bearing 15 TonsWas Bearing Determined Immediately Upon Completion of Driving? Yes

Sketch below foundation and location of each pile by circles with numbers therein. Note battered piles on sketch, and give amount of batter. Mail 3 copies on F. A. projects and 2 copies on state projects to Dist. Engr., upon completion of each foundation



Pile No.	Date Driven	Length in Leads Nearest Foot	Length in Structure Nearest Foot	Avg. Penetration in Last 10 Feet (inches)	Drop in Feet	Bearing in Tons	Pile No.	Date Driven	Length in Leads Nearest Foot	Length in Structure Nearest Foot	Avg. Penetration in Last 10 Feet (inches)	Drop in Feet	Bearing in Tons
1							26						
2							27						
3							28						
4							29						
5							30						
6							31						
7							32						
8							33						
9	5/22/57	40'	1.5	38.5	.75	10	34						
10	5/22/57	40'	1.5	38.5	.70	10	35						
11	5/22/57	40'	1.6	38.6	.65	10	36						
12	5/22/57	40'	1.4	38.4	.50	10	37						
13	5/23/57	30'	1.8	38.2	1.10	10	38						
14	5/24/57	25'	2.8	22.2			39						
15	5/24/57	20'	2.5	22.5			40						
16							41						
17							42						
18							43						
19							44						
20							45						
21							46						
22							47						
23							48						
24							49						
25							50						

*On Pile Trestle Bridges give length in ground and also total length in structure.

Robert C. Huebel
Resident Engineer

Pile driving formulae

IHC Hammer #288 Wt. 3270 lbs.

IHC Cap #612 " 920 lbs.

 $P = \frac{3WH}{4} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$ $P = \frac{3 \times 3270 \times 920}{4} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$ $P = 570.35 \times .536$ $P = 25.7$ $P = \frac{357}{1.15} = 22.4 \text{ tons}$

For 30' wing piling

 $P = \frac{29.8}{570.35}$

WTM = 5170

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