

BRIDGES AND CULVERTS

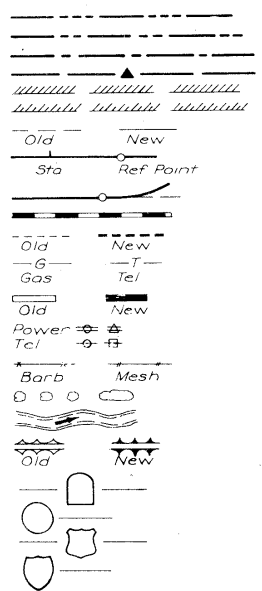
LETTING DATE MAY 25, 1971

CERRO GORDO COUNTY

PROJECT NO. 1-35-7(10)186--08-17

CONVENTIONAL SIGNS

- State Line
- Co. Line
- Twp. Line
- Sec. Line
- Corp. Line
- Urban Bdry.
- R.O.W. Lines
- Survey Line
- Profile Grade
- Railroad
- Field Tile
- Underground Lines
- Culverts
- Utility Poles
- Fences
- Trees Or Brush
- Stream
- Dike
- County Road No.
- Primary Road No.
- U. S. Road No.
- Interstate Road No.



STATE OF IOWA
STATE HIGHWAY COMMISSION

PLANS OF PROPOSED IMPROVEMENT
ON THE

INTERSTATE ROAD SYSTEM
CERRO GORDO COUNTY
BRIDGES AND CULVERTS

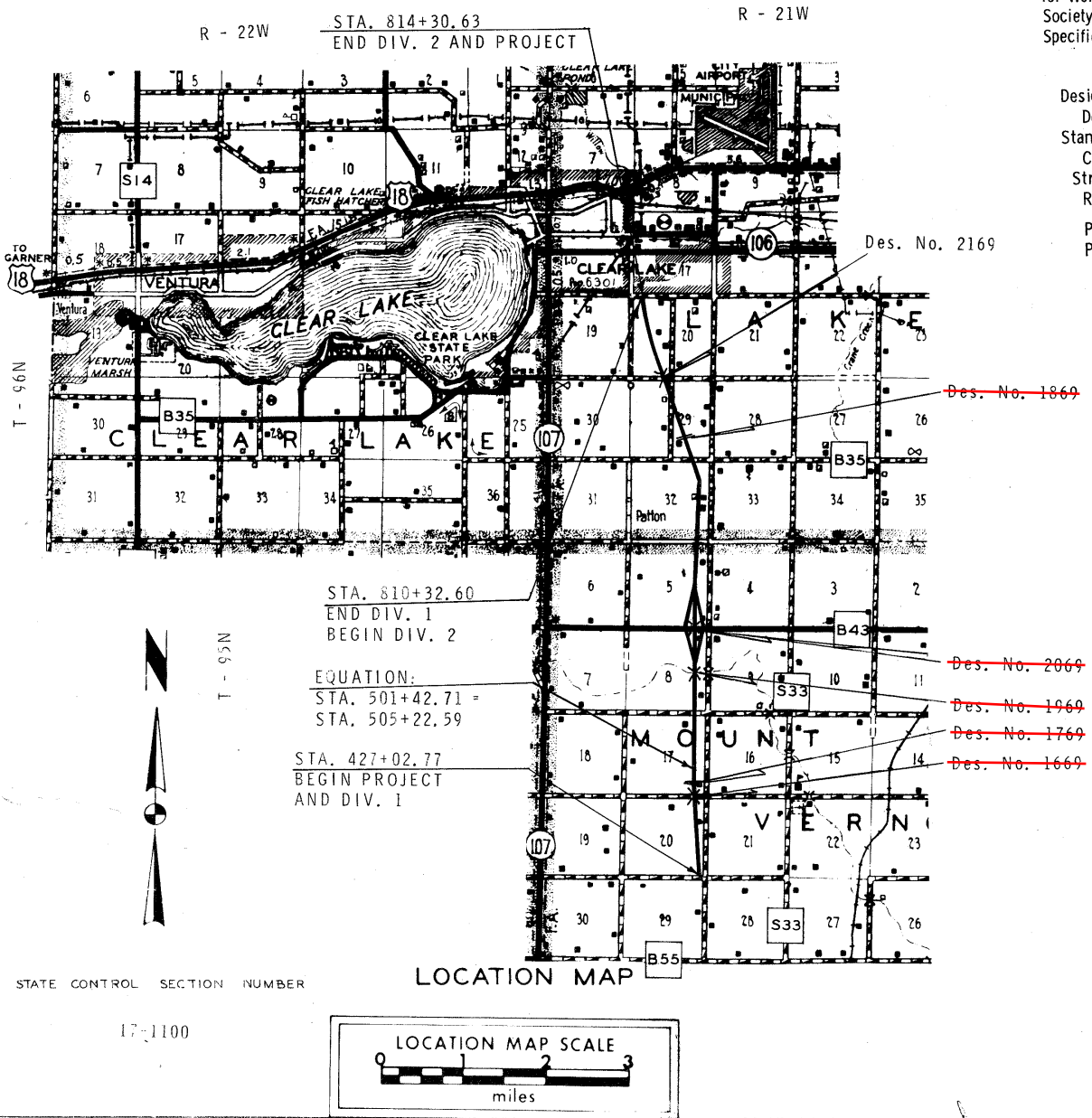
0.5 MILES SOUTH OF IA. 106, SOUTH 7.7 MILES

THE IOWA STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS
FOR CONSTRUCTION WORK, SERIES OF 1964 SHALL
APPLY TO WORK ON THIS PROJECT

(PLUS CURRENT SUPPLEMENT SPECIFICATIONS AND SPECIAL PROVISIONS)

All Welding shall meet the requirements of the Eighth Edition of the Specifications for Welded Highway and Railway Bridges (AWS D2.0-69) of the American Welding Society, except as modified by the Standard Specifications and the current Supplemental Specifications.

Design Stresses
Design Stresses for the following materials are in accordance with A. A. S. H. O.
Standard Specifications for Highway Bridges, Series of 1969 plus 1970 Interim Specifications.
Concrete in accordance with Section with 1.5.1 f'c = 3500 p. s. i.
Structural Steel in accordance with 1.7.1 ASTM A36 fs = 20,000 p. s. i.
Reinforcing Steel in accordance with 1.5.1 D, fs = 20,000 p. s. i.
Prestressing Steel in accordance with Section 1.6.7 f's = 270,000 psi.
Prestress Concrete in accordance with Section 1.6.7 f'c = 5000 p. s. i.



MILEAGE SUMMARY				105-1	STATE CONTROL SECTION NO.
DIV.	LOCATION	LIN. FT.	MILES		
	BRIDGE AT STA. 479+96, 74 O. R.	146.010	.028		
	BRIDGE AT STA. 561+75.0	146.0	.028		
	BRIDGE AT STA. 755+24.20	154.469	.029		
			.085		

INDEX OF SHEETS		105-3
NO.	DESCRIPTION	
1	TITLE SHEET	
2	ESTIMATE SHEET	
3	CULVERT DESIGN NO. 1769	
4-7	CULVERT DESIGN NO. 1869	
8-16	BRIDGE DESIGN NO. 1669	
17-25	BRIDGE DESIGN NO. 1669	
26-41	BRIDGE DESIGN NO. 2069	
42-52	BRIDGE DESIGN NO. 2169	

CONSTRUCTION PLANS SHOWING PROJECT AS BUILT
Prepared by Agnes Hachula, P.E. Date 3-16-73
Res. Const. Engineer
Approved and Forwarded to Ames
District Const. Engineer
After Microfilming Return This Copy to:
Darrel D. Campbell District Engineer
Prime Contractor: Christensen Bros. Inc.
Contract Amount: \$158,444.97
Bridge Design No. 2169

THIS PROJECT LET AS
EACI-35-7(10)186 --08-17

Prime Contractor:	Christensen Bros. Inc.
Contract Amount:	\$145,726.66
Bridge Design No.:	1669
Prime Contractor:	A. M. Cohen & Son, Inc.
Contract Amount:	\$138,035.41
Bridge Design No.:	2069
Prime Contractor:	Christensen Bros. Inc.
Contract Amount:	\$155,058.33
Bridge Design No.:	1969
Prime Contractor:	Christensen Bros. Inc.
Contract Amount:	\$52,908.91
Culverts:	1869-1769

IOWA STATE HIGHWAY COMMISSION STANDARDS REQUIRED			
STANDARD	ISSUED	REVISED	
CHP2.5-65	1965	1967	
C3P	1932	1967	
C3J	1959	1964	
CBH-00	1960		
CBH-15			
P10A			

DESIGN DESIGNATION
INTERSTATE
HIGHWAY
1971 AADT 6040 V.P.D.
1991 AADT 9270 V.P.D.
1991 DHV 1140 V.P.H.
DIRECTIONAL 67.2 %
TRUCKS 8 %
DESIGN V 70 M.P.H.
FULL CONTROL OF ACCESS
SHALL BE EXERCISED ON
THIS PROJECT.

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED
UNDER MY SUPERVISION AND THAT ENGINEERING
DECISIONS WITH REGARD TO THE DESIGN WERE MADE
BY ME OR BY OTHER DULY REGISTERED PROFESSIONAL
ENGINEERS UNDER THE LAWS OF THE STATE OF IOWA
DATE 3-16-73 19 73 IOWA REG. NO. 105-3

APPROVED
R. H. Grier 4/9/71
DEPUTY CHIEF ENGINEER
IOWA HIGHWAY COMMISSION
DATE
U.S. DEPT. TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ENGINEER
DATE

CERRO GORDO COUNTY

PROJECT NO. 1-35-7(10)186--08-17

FILE NO. 2300

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	5		1	52

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

April 8, 1971 William A. Lundquist REG. NO. 4449
DATE WM. A. LUNDQUIST

DESIGN NO. 2069 LOCAL ROAD OVER I-35 STA. 6589+63.2 LOCAL RD.
CERRO GORDO COUNTY STA. 589+63.2 I-35
SECTIONS 5 & 8 T-95N R-21W MOUNT VERNON TOWNSHIP

DESIGN FOR 2°17' SKEW
274'-6x32' PRETENSIONED PRESTRESSED CONCRETE
BEAM BRIDGE

ESTIMATE OF QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL
1	Structural Concrete	Cu. Yds.	570.2
2	Reinforcing Steel	Lbs.	112 427
3	Structural Steel	Lbs.	6 160
4	Class 20 Excavation	Cu. Yds.	360
5	4" Tile Subdrain	L.F.	** 198 251
6	Pretensioned Prestressed Concrete Beam	No.	10
7	Aluminum Handrail	L.F.	576.33
8	Steel Handrail	L.F.	576.33
9	Cresotated Wood Piling	L.F.	3420 0.00
10	Granular Backfill	Cu. Yds.	120
11	3 1/2" Preformed Elastic Neoprene Joint	L.F.	80 79.2
12	Concrete Slope Protection	Sq. Yd.	386 380
13	2" Rigid Steel Conduit	L.F.	611
14	Cresotated Test Piling	L.S.	Lump Sum 700.00
8001	Piling, Cresotated	L.F.	1900
8002	Piling, Cresotated	L.F.	2844.45
8003	Retarder, Structural Concrete	Cu. Yds.	260.40
8004	Heating Concrete Materials	Cu. Yds.	138.00

ESTIMATE REFERENCE INFORMATION

100.4

Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	DESCRIPTION
1.	319.4 cu. yds. class "D" concrete for superstructure and 250.8 cu. yds. class "C" concrete for substructure.
13.	Includes 607.0 L.F. of 2" conduit and 4.0 L.F. of 1" conduit.
8005	Protection of Concrete

* See E.W.O. No. 1 - Blanket
** See E.W.O. No. 4 - Blanket

I hereby certify that this plan was prepared by me or under my direct personal supervision and that I am a duly registered professional engineer under the laws of the State of Iowa.

Date Dale E. Derby Reg. No. 3049

IN LETTING OF MAY 25, 1971

DESIGN	LOCATION			DESCRIPTION	ESTIMATE OF QUANTITIES					REMOVALS
	SECTION	TOWNSHIP	STATION		SIZE AND TYPE	STRUC. CONC. CL. "C" CU. YD.	REINF. STEEL LBS.	EXCAVATION- C. Y.		
							CL. 20	CL. 24		
1769	17	MOUNT VERNON	485+69 O. R.	3' x 3' x 335' RCB Culvert Skew 30°	130.8	9 905	89			
1869	29	LAKE	731+05	10' x 12' x 233' RCB Culvert Skew 15°	554.7	76 302	1785			

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

April 8, 1971 James R. Sassaman REG. NO. 2663
DATE JAMES R. SASSAMAN

DESIGN NO. 1969 I-35 OVER BEAVERDAM CREEK STA. 561+75.0
CERRO GORDO COUNTY T-95N R-21W MOUNT VERNON TWP.
SECTION 8

DESIGN FOR
DUAL 143'-0x40' PRETENSIONED PRESTRESSED
CONCRETE BEAM BRIDGES

ESTIMATE OF QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL
1	Structural Concrete	Cu. Yds.	584.6
2	Reinforcing Steel	Lbs.	117 036
3	Pretensioned Prestressed Concrete Beams	No.	28
4	Granular Backfill	Cu. Yds.	14
5	10BP42 Steel Bearing Piling	L.F.	1752 1664.30
6	4" Tile Subdrain	L.F.	232
7	12BP53 Steel Bearing Piling	L.F.	2628 2508.8
8	Aluminum Handrail	L.F.	576
9	Class 20 Excavation	Cu. Yds.	188
8001	Heat Materials	Cu. Yds.	188.49
8002	Protection of Concrete	Cu. Yds.	188.49
8003	Piling Cutoffs	L.F.	119.20
8004	Piling Cutoff	L.F.	87.70

ESTIMATE REFERENCE INFORMATION

100.4

Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	DESCRIPTION
1.	The pier, abutment footing, and temporary paving block concrete, 134.4 cu. yds., are to be class "C" concrete. The remainder, 450.2 cu. yds., is to be class "D" concrete.
* See E.W.O. No. 2 - Blanket	
** See E.W.O. No. 3 - Blanket	

THESE BRIDGES WILL REQUIRE BRIDGE SIGN ASSEMBLIES, FURNISHED AND PLACED BY OTHERS, AS SPECIFIED IN SECTION 2 C-5 OF THE I. S. H. C. MANUAL ON "UNIFORM TRAFFIC CONTROL DEVICES", DATED JANUARY - 1963.

8005	Splice Piling 10BP42 Steel Brg.	each	1 only
8006	Retarder, Structural Concrete	Cu. Yds.	382.12
8007	Stainless Steel Nuts and Washers	number	72.00
8008	Price Adjustment For Reasonably Acceptable Work	Amount	\$ 49.20

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

April 8, 1971 James R. Sassaman REG. NO. 2663
DATE JAMES R. SASSAMAN

DESIGN NO. 2169 I-35 OVER LOCAL ROAD STA. 755+24.20 Q. I-35
CERRO GORDO COUNTY STA. 8755+24.20 Q. SIDE RD. SURVEY
SECTIONS 29 & 20 T-96N R-21W LAKE TOWNSHIP

DESIGN FOR 17°08' SKEW
DUAL 151'-4x40' PRETENSIONED PRESTRESSED CONCRETE
BEAM BRIDGES

ESTIMATE OF QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL
1	Structural Concrete	Cu. Yds.	776.6
2	Reinforcing Steel	Lbs.	150 702
3	Pretensioned Prestressed Concrete Beam	No.	28
4	Cresotated Piling	Lin. Ft.	4585 0.00
5	Class 20 Excavation	Cu. Yds.	588
6	4" Tile Subdrain	Lin. Ft.	252
7	Granular Backfill	Cu. Yds.	192
8	Aluminum Handrail or Steel Handrail	Lin. Ft.	621.2
9	Cresotated Test Piling	L.S.	Lump Sum
50	Traverse Reimbursement	Lump sum	\$ 100.00

ESTIMATE REFERENCE INFORMATION

100.4

Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	DESCRIPTION
1.	The Piers, Abutment Footings, and temporary Paving Blocks, 298.2 cu. y., is to be class "C" concrete. The remainder, 478.4 cu. y. is to be class "D"

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

April 8, 1971 James R. Sassaman REG. NO. 2663
DATE JAMES R. SASSAMAN

DESIGN NO. 1669 I-35 OVER LOCAL ROAD STA. 479+96.740 (O. R.)
CERRO GORDO COUNTY STA. 5434+10.31 (SIDE RD. SURVEY)
SECTIONS 20 & 17 T-95N R-21W MOUNT VERNON TOWNSHIP

DESIGN FOR 4°16'15.72" SKEW (L.A.)
DUAL 143'-0x40' PRETENSIONED PRESTRESSED
CONCRETE BEAM BRIDGES

ESTIMATE OF QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL
1	Structural Concrete	Cu. Yds.	707.0
2	Reinforcing Steel	Lbs.	138 682
3	Pretensioned Prestressed Concrete Beams	No.	28
4	Granular Backfill	Cu. Yds.	14
5	Cresotated Piling	L.F.	4585 5451.75
6	4" Tile Subdrain	L.F.	295
7	Class 20 Excavation	Cu. Yds.	446
8	Aluminum Handrail or Steel Handrail	L.F.	537.4
8001	Heat Concrete Materials	Cu. Yds.	177.80
8002	Protection of Concrete	Cu. Yds.	84.60

ESTIMATE REFERENCE INFORMATION

100.4

Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	DESCRIPTION
1.	The pier abutment footings, and temporary paving block concrete, 256.0 cu. yds. are to be class "C" concrete. The remainder, 451.0 cu. yds. is to be class "D" concrete.

8003	Piling, Cresotated Unused	L.F.	140.00
8004	Stainless steel nuts & washers	number	72.00
8005	Retarder, Structural Concrete	Cu. Yds.	396.20

ESTIMATE SHEET

Item	Design No. 2169		
8001	Heat Concrete Materials	cu.yds.	126.20
8002	Protections of concrete	cu.yds.	18.20
8003	Piling, Creosoted	L.F.	741.90
8004	Piling, Creosoted	L.F.	1446.40
8005	Piling, Creosoted	L.F.	3246.05
8006	Piling, unused	L.F.	600.00
8007	Stainless Steel Nuts & Washers	Number	76.00
8008	Retarder Added	cu.yds	407.60

Design No. 1969 E.W.O. NO.1-Blanket

- A-Description - The contractor is to heat the material incorporated into structural concrete and protect structural concrete as order by the Engineer.
- B-Reason - Structural concrete is to be placed at air temperatures requiring heating and protection in accordance with Article 2403.12 of the Standard specifications. Quantity to be protected and paid for includes approx. 540 cu.yds to be used for encasement of steel bearing piling.

- C-Settlement - Contractor's Invoices
- 8001 Heating, Concrete Materials - Estimated total Invoice Price - \$185.00
- NOTE: "Supplemental Specifications for Construction Projects" Spec. 686, states the contractor is to paid invoice price for heating concrete materials, but no increase in payment will exceed \$100 per cu.yd.

Agreed Unit Price

8002 Protection of Concrete - 185.0 cu yds. @ \$8.80 = \$1628.00

Total of E.W.O. = \$1813.00

Justification of Agreed Unit Price: Unit price is to be 10% of contract unit price for structural concrete (\$88.00) as stated in "Supplemental specifications for Construction Projects," Spec. 686. (10% x \$88.00 = \$8.80)

Design No. 1969 E.W.O. NO.2-Blanket

- A-Description - The estimated quantities of piling steel bearing 12BPS3 are to be corrected to show the final quantities for which payment is to be made.
- B-Reason - To provide payment for final quantities of piling and cutoffs in accordance with the standard specifications.

- C-Settlement - Contract Unit Price
- 7001 Contract Item No. 21- Piling, Furnish Steel Bearing, 12BPS3 - Decrease 1192 L.F. @ \$6.20 = \$739.04 (Minus)
- 7002 Contract Item No. 22- Piling, Drive Steel Bearing, 12BPS3 - Decrease 1192 L.F. @ 1.00 = \$1192.00 (minus)
- Agreed Unit Price
- 8003- Piling, Cut off add 11920 L.F. @ (75% \$6.20) \$4.65 \$554.28 (Add)
- Total this E.W.O. \$303.96 (minus)

Justification of Agreed Unit Price: Article 2501.22 of the standard specifications, series of 1964 as revised by Supplemental specification No 686, dated 12-1-70, provides payment of 75% of the furnish price.

Design No. 1969 E.W.O. NO.3-Blanket

- A-Description - The estimated quantities of piling steel bearing 10BP42 are to be corrected to show the final quantities for which payment is to be made.
- B-Reason - To provide payment for final quantities of piling and cutoffs in accordance with the standard specifications.

- C-Settlement - Contract Unit Price
- 7003 Contract Item No. 18- Piling, Furnish steel bearing 10BP42 decrease 87.7 L.F. @ \$5.00 = \$438.50 (minus)
- 7004 Contract Item No. 19 Piling, Drive steel bearing 10BP42 decrease 87.7 L.F. @ \$1.00 = 87.70 (minus)
- 8004 Piling, Cutoff Agreed Unit Price 328.88 (Add)
- add 87.7 @ (75% \$5.00) \$3.75 = Total this E.W.O. = \$197.32 (minus)

Justification of Agreed Unit Price = Article 2501.22 of the standard specifications, series of 1964, as revised by Supplemental specifications No. 686, dated December 1, 1970 provides payment of 75% of the furnished price.

Design No. 1969 E.W.O. NO. 4-Blanket

- A-Description - The contractor is to splice extension on the following abutment pile with cutoff from pile that has already been driven. South abutment NBL-1 only on east exterior pile.

- B-Reason - This piling was driven below cutoff elevation to obtain required bearing. Extension is necessary to obtain design cutoff elevation.

- C-Settlement - Agreed Unit Price
- 8005- Splice Piling Steel Bearing 10BP42 - add - 1 only @ \$30.00 = \$30.00
- Justification of Agreed Unit Price = Article 2501.22c of the "Supplemental Specifications" No. 686, dated December 1, 1970 provides payment for splicing steel bearing piling at six times the contract furnished price per foot (6 x \$5.00 = \$30.00)

Design No. 1969 E.W.O. NO.5-Blanket

- A-Description - The contractor is to add an admixture to concrete for the purpose of retarding hardening as ordered by the Engineer.
- B-Reason - Temperature and humidity conditions make it necessary to retard hardening of concrete incorporated into this bridge deck.

- C-Settlement - Agreed Unit Price
- 8006 - Retarder, Structural concrete - add 382 1/2 cu.yds @ \$150 = \$573.18
- Justification of Agreed Unit Price: Article 2403.25 of the standard specifications provides payment of \$150 per cu.yds. when an admixture is not specified but is ordered by the engineer to be add to the concrete for the purpose of retarding hardening.

Design No. 1969 E.W.O. NO.6-Blanket

- A-Description - The contractor is to furnish and place stainless steel nuts & washers for holding handrails in place in lieu of aluminum as originally called for in contracts.
- B-Reason - Construction Memorandum dated April 6, 1972 specifies the use of aluminum nuts has been discontinued. Any bridges with aluminum handrail nuts on which the handrail has not been erected, stainless steel nuts should be ordered installed in lieu of aluminum nuts.

- C-Settlement - Agreed Unit Price
- 8007 - Stainless Steel Nuts & Washers - add 72 sets @ \$2.67 = \$192.24
- Justification of Agreed Unit Price: Agreed unit price taken from Contractor's invoice now on file in R.C.E.'s office.

Design No. 1969 E.W.O. NO.7-Blanket

- A-Description - The total contract payment is adjusted (reduced) for work not in reasonable close conformity with the specifications and material requirements.

- B-Reason - The coarse aggregate used in 191.1 cu.yds. of D-57 concrete in the NBL deck was not in compliance with article 4115.06 of the STD. Spec. series of 1964. (62-67 percent passed the 1/2 in sieve.) The work has been found to be reasonably acceptable and will be allowed to remain in place.

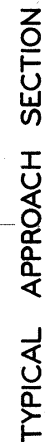
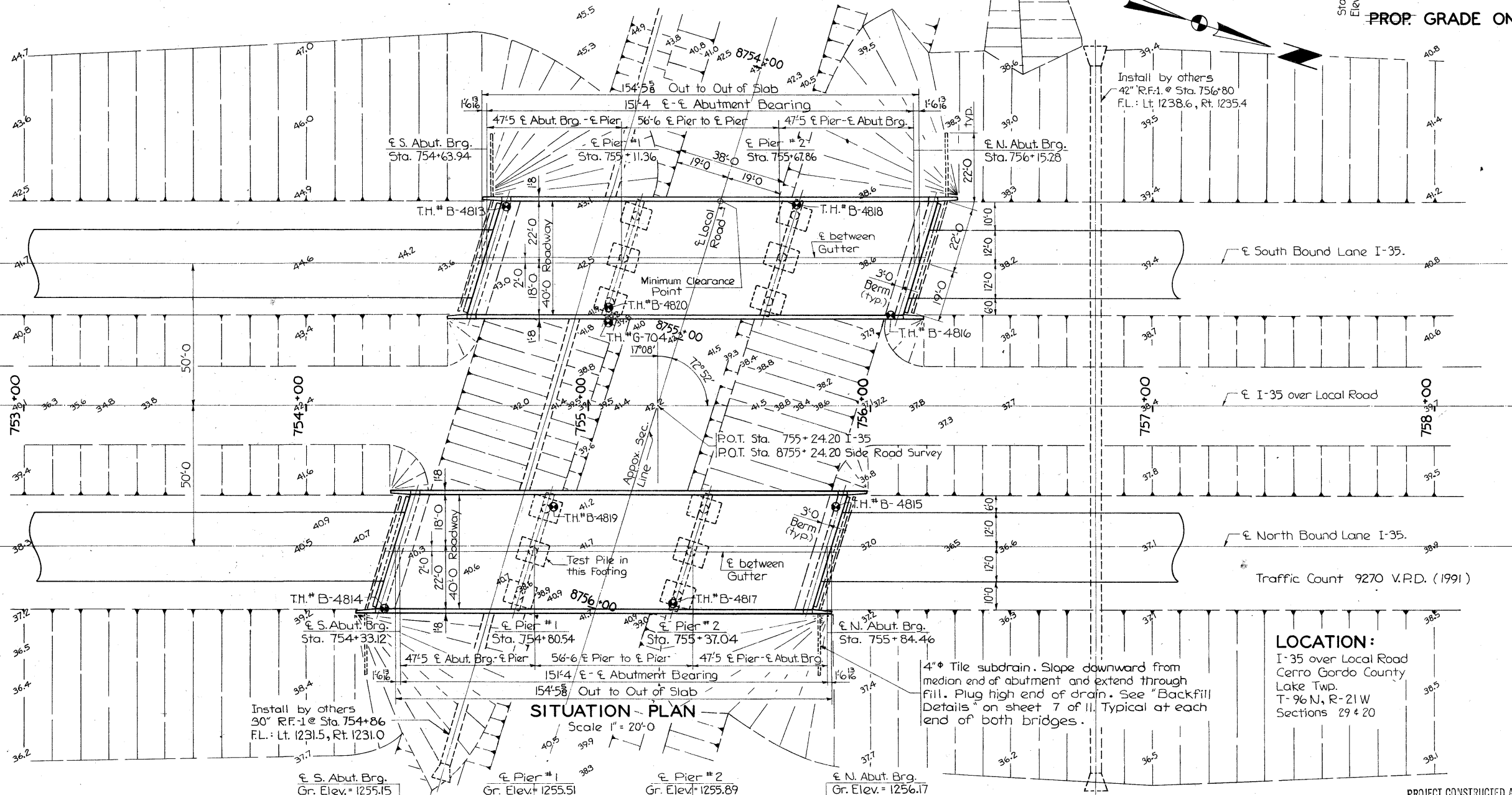
- C-Settlement - Agreed Unit Price
- 8008 - Price adjustment for reasonably acceptable work: \$49.20 (minus)
- Agreed Total Price determined by the engineer as the equivalent to 10% of the estimated cost of the non-complying material.
- (142.6 Tons) (\$3.45 per ton) (0.10) = \$49.20

Design No. 2069 E.W.O. NO.1-Blanket

- A-Description - The contractor is to furnish and drive the following lengths of creosoted piling in the locations detailed on the plans. West Abut - 19 @ 50 L.F. = 950 L.F. Pier No. 1 - 30 @ 30 L.F. = 900 L.F. Pier No. 2 - 35 @ 30 L.F. = 1050 L.F. Pier No. 3 - 30 @ 30 L.F. = 900 L.F. Abut. - 19 @ 50 L.F. = 950 L.F. = Total 4750 L.F.

- B-Reason - The pile lengths shown on the plans for estimating bidding purpose only. A test pile (Contract Item No 33) driven in Pier No 2 indicates that the increased lengths described above will be necessary to obtain the minimum required bearing

- C-Settlement - Contract Unit Price
- 7001 - Contract Item No. 31- Piling, Creosoted - 4750 L.F. @ \$2.60 = \$12350.00 (minus)
- Agreed Unit Price
- 8001 - Piling, Creosoted - add 1700 L.F. @ \$2.94 = \$5000.00
- 8002 - Piling, Creosoted - add 2850 L.F. @ \$2.837 = \$8085.45
- Total this E.W.O. = \$1779.45



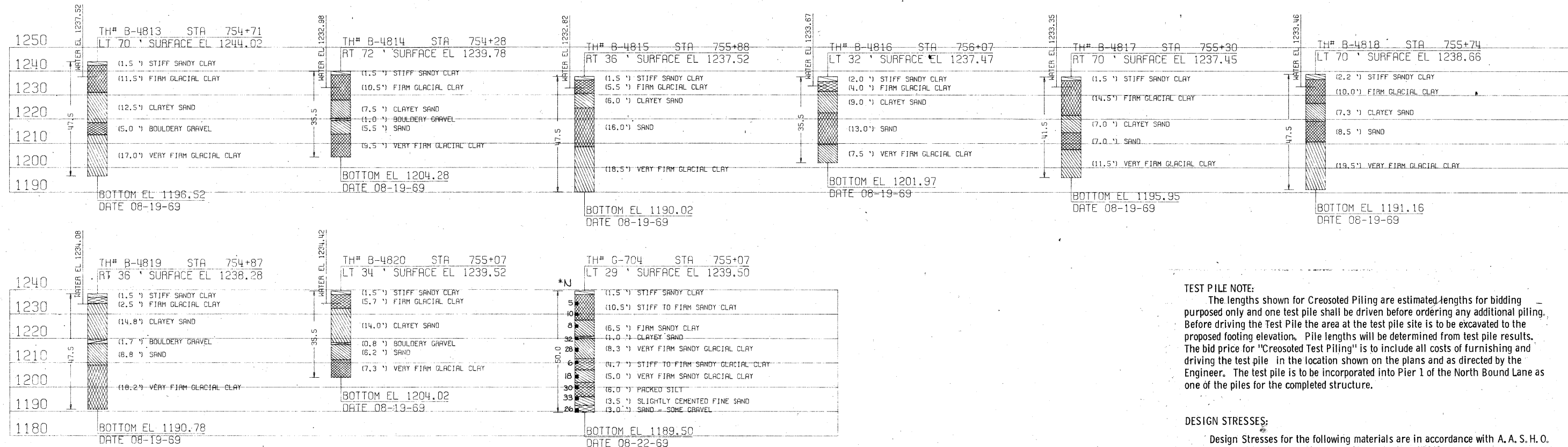
I-35 over Local Road
Cerro Gordo County
Lake Twp.
T-96 N, R-21 W
Sections 29 & 20

PROJECT CONSTRUCTED ACCORDING TO STANDARDS

IOWA STATE HIGHWAY COMMISSION
DESIGN SHEET NO 1 OF 11 FILE NO 23008, DESIGN NO 2169.

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	5		12	52

Bench Mark: No 80, Sta 753+83, 307' Rt., Set R.R. Spk. E. Side H-Line Pole, Elev = 1234.47
Bench Mark: No 80B, Sta 754+58, 18.5' Rt. of Q. of S.B.L., Set I.H.C.B.M. in S.E. Corner of S.B.L. ----- Elev 1256.15



SOUNDING DATA

Scale: 1" = 20'-0"

* N = Number of blows per foot of penetration.

TEST PILE NOTE:

The lengths shown for Creosoted Piling are estimated lengths for bidding purposes only and one test pile shall be driven before ordering any additional piling. Before driving the Test Pile the area at the test pile site is to be excavated to the proposed footing elevation. Pile lengths will be determined from test pile results. The bid price for "Creosoted Test Piling" is to include all costs of furnishing and driving the test pile in the location shown on the plans and as directed by the Engineer. The test pile is to be incorporated into Pier 1 of the North Bound Lane as one of the piles for the completed structure.

DESIGN STRESSES:

Design Stresses for the following materials are in accordance with A. A. S. H. O. Standard Specifications for Highway Bridges, Series of 1969, and 1970 Interim Specs.
Concrete in accordance with Section 1.5.1 f'c = 3500 psi.
Reinforcing Steel in accordance with Section 1.5.1 fs = 20,000 psi.

See sheet 2 of 11 for Design Stresses for the prestressed beams.

SPECIFICATIONS:

Design: A. A. S. H. O., Series of 1969, and 1970 Interim Specifications.
Construction: Standard Specifications of the Iowa State Highway Commission, Series of 1964, plus current Special Provisions and Supplementary Specifications.

GENERAL NOTES:

This bridge is designed for HS 20-44 loading, plus 20 lbs. per square foot of roadway for future wearing surface, and an alternate loading designated in BPR-PPM 20-4, Section 4c.

The approach fills as shown are not a part of this contract, but are to be in place before the abutment piles are driven. The Bridge Contractor is to level off and shape the berms to the elevations and dimensions shown. Dressing of slopes outside the bridge area not disturbed by the Bridge Contractor shall be paid for as extra work.

Abutment piles are to be driven in oversized holes drilled through the fill to Elevation 1239.7± for the South abutment N. B. L., to Elevation 1240.7± for the North abutment N. B. L., to Elevation 1240.0± for the South abutment S. B. L., and to Elevation 1240.9± for the North abutment S. B. L. The minimum diameter for the drilled holes is to be 4" larger than the pile diameter 3' from the butt. No separate payment will be made for drilling holes since it is considered incidental to driving piles. Do not backfill holes.

The Bridge Contractor is to install tile subdrain behind each abutment as noted or shown on sheets 1 & 7 of 11. The bid price for "4" Tile Subdrain" is to include all the labor and the excavation necessary for the installation.

The pier excavation quantities assume the grade will be completed prior to the start of pier construction.

The portion of the prestressed beams that are to be embedded in the abutment and pier diaphragms are to be roughened by sand blasting or other approved methods to provide suitable bond between the beam and the diaphragm in accordance with Article 2403.15 of the specifications.

The test piling is to help determine the proper pile length, see Test Pile Note. The Bridge Contractor is to shape the ditches under the bridges to drain.

PROJECT CONSTRUCTED ACCORDING TO STANDARDS

DESIGN FOR 17° 08' SKEW	
DUAL 15'-4" x 40' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES	
47'-5" END SPANS	56'-6" INTERIOR SPAN
SOUNDING DATA	
STATION: 755+24.20 & I-35	
STATION: 8755+24.20 & SIDE RD. SURVEY	
CERRO GORDO COUNTY	
IOWA	STATE HIGHWAY COMMISSION
DESIGN SHEET No 2 OF 11. FILE No 23008. DESIGN No 2169.	

TOTAL ESTIMATED QUANTITIES					
Item No	Item	Unit	4 Abuts. & 2 Superstr.	4 Piers	Total
1	Structural Concrete	cu. yds.	555.2	221.4	776.6
2	Reinforcing Steel	lbs.	116,566	34,136	150,702
3	Preten. Prestr. Concrete Beam	A 46 number	28		28
		A 55 number	14		14
4	Creosoted Piling	lin. ft.	52 @ 35'	111 @ 25'	4595 5452.35
5	Class 20 Excavation	cu. yds.	192	396	588
6	4" Tile Subdrain	lin. ft.			252
7	Granular Backfill	cu. yds.	192		192
8	Aluminum Handrail or Steel Handrail	lin. ft.	621.2		621.2
			621.2		621.2
9	Creosoted Test Piling	L.S.		1 @ 35'	Lump Sum 300.00

Estimate Reference Information:

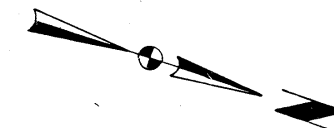
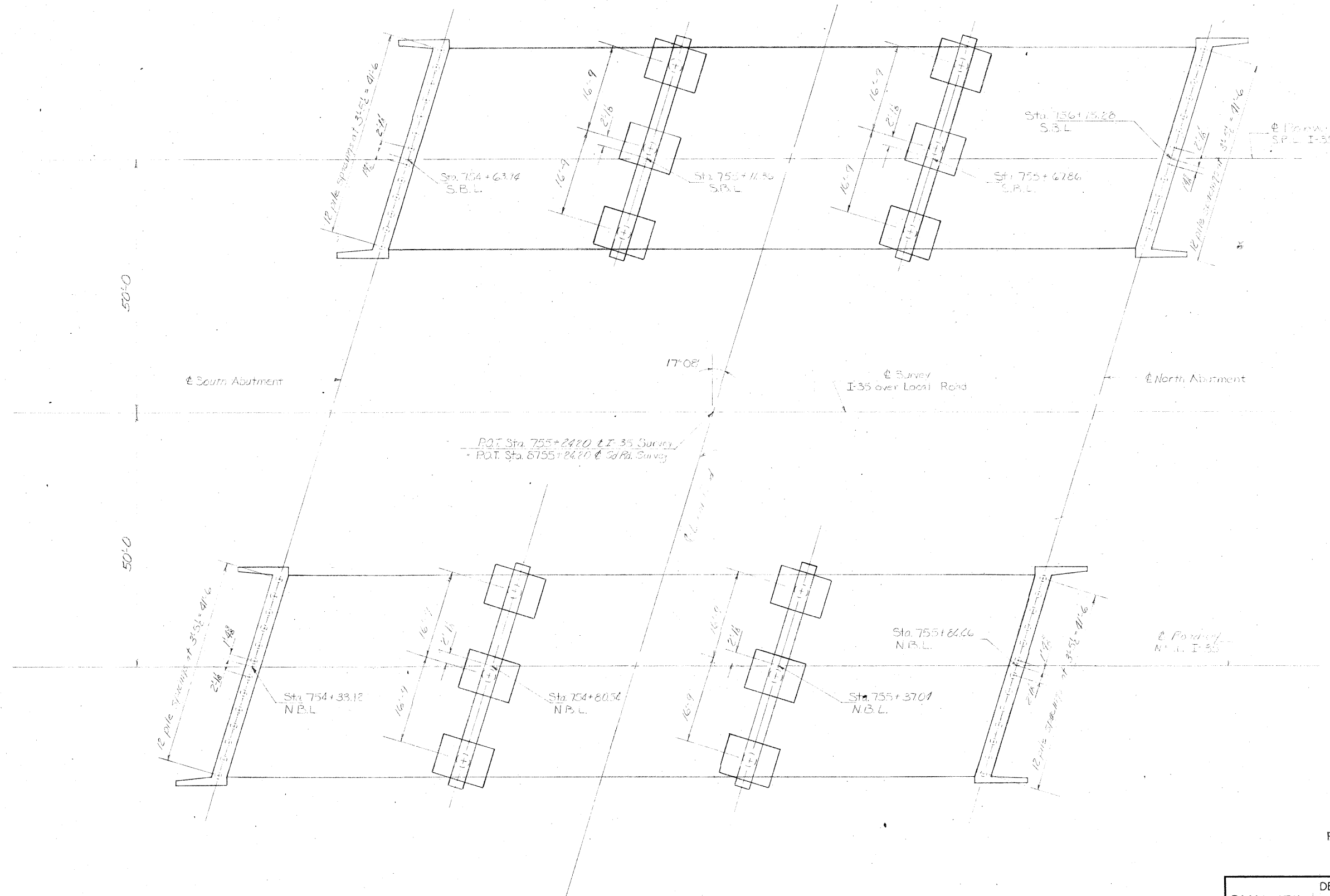
Item No 1. The piers, abutment footings, and temporary paving blocks, 298.2 c.y., is to be class "C" concrete. The remainder, 478.4 c.y., is to be class "D" concrete.

DESIGNED BY: Dean E. Smith TRACED BY: H. S. Idages
CHECKED BY: S. R. M.

CERRO GORDO COUNTY

PROJECT NUMBER
I-35-7(10)186--08-17

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	6		43	52



PROJECT CONSTRUCTED ACCORDING TO STANDARDS

DESIGN FOR 17° 08' SKEW
DUAL 151'-4" x 40' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES
 47'-5" END SPANS 56'-6" INTERIOR SPAN
SUBSTRUCTURE LAYOUT
 STATION: 755+24.20 & I-35 OCTOBER, 1970
 STATION: 8755+24.20 & SIDE RD SURVEY
CERRO GORDO COUNTY
 IOWA STATE HIGHWAY COMMISSION
 DESIGN SHEET No. 3 OF 11, FILE No. 23008, DESIGN No. 2169

DESIGNED BY: *James E. Smith*
 CHECKED BY: *John E. Smith*

TRACED BY: *John E. Smith*
 CHECKED BY: *John E. Smith*

CERRO GORDO

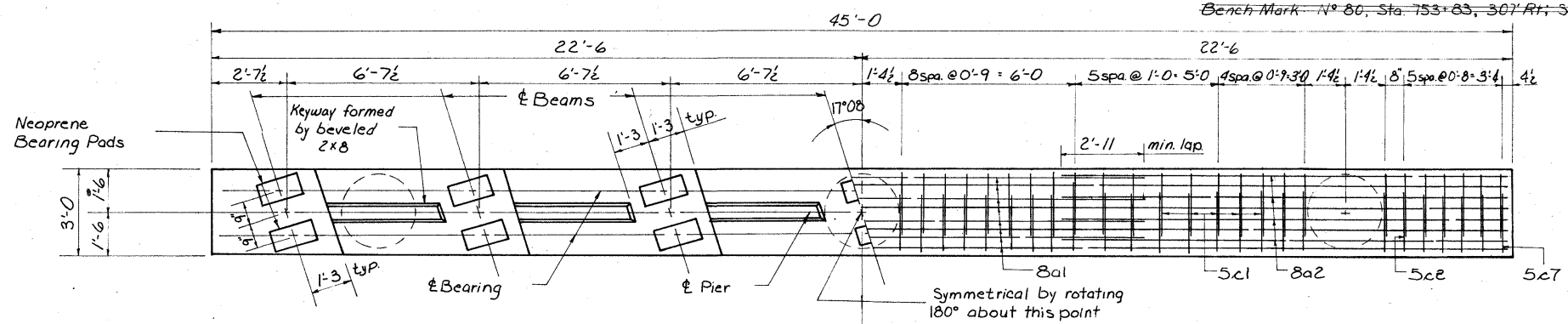
COUNTY

PROJECT NUMBER

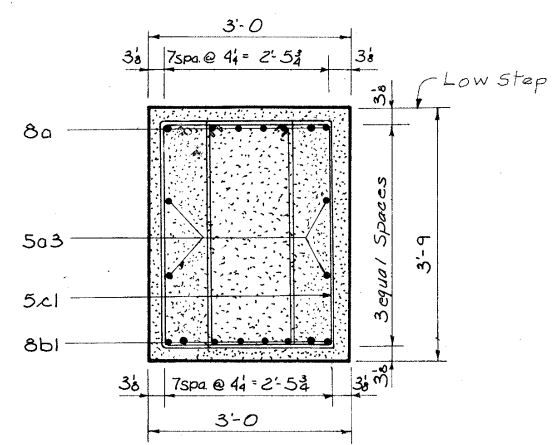
I-35-7(01)18-08.1

STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	5		44	52

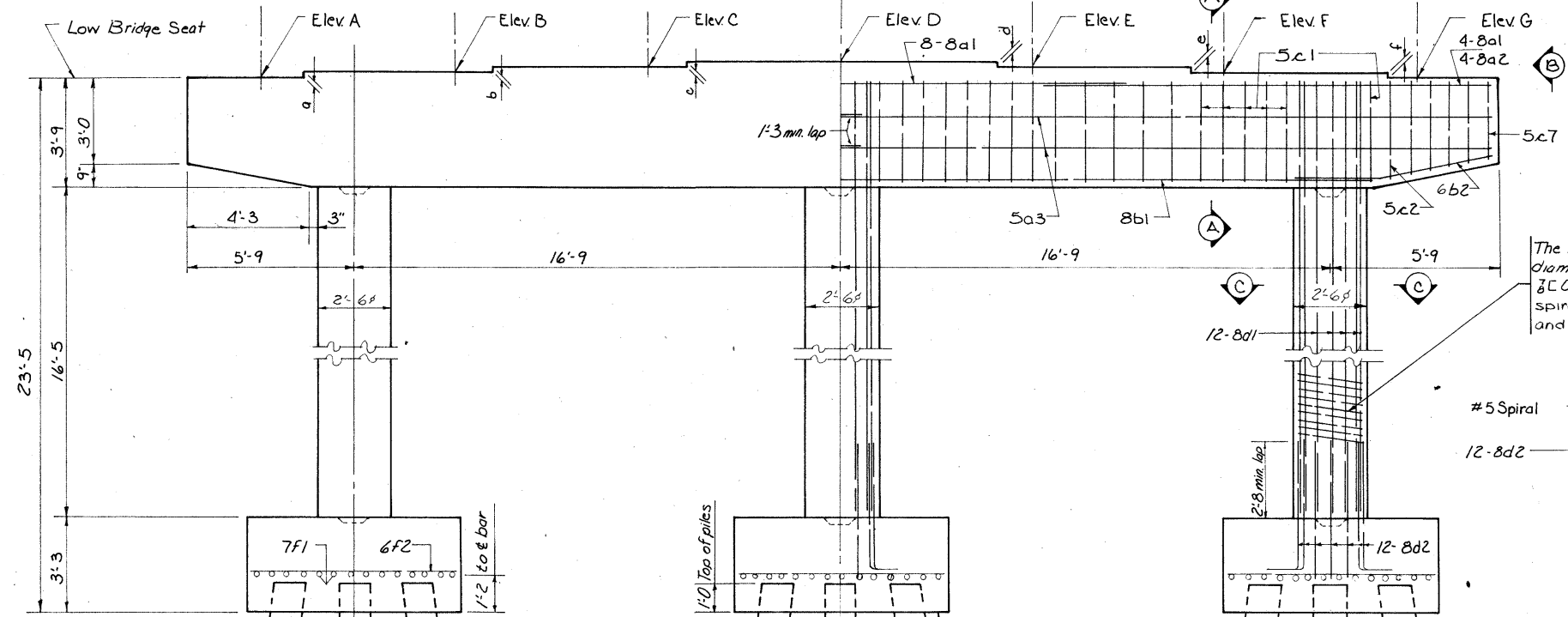
Bench Mark: No 80B, Sta 754+58, 18.5' BT of E of S.B.L. Set I.H.C. B.M. in S.E. Curb of S.B.L. --- Elev. 1266.15
 Bench Mark: No 80, Sta. 753+83, 30' RT; Set R.R. Spk. E. Side H-Line Pole. --- Elev. 1234.47



PLAN OF CAP



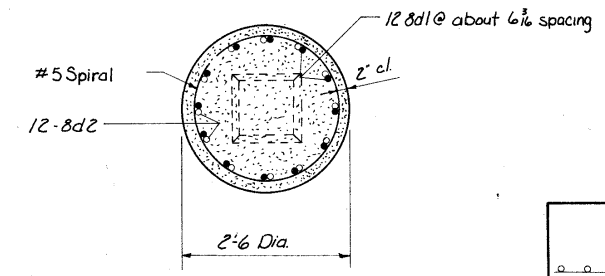
SECTION A-A



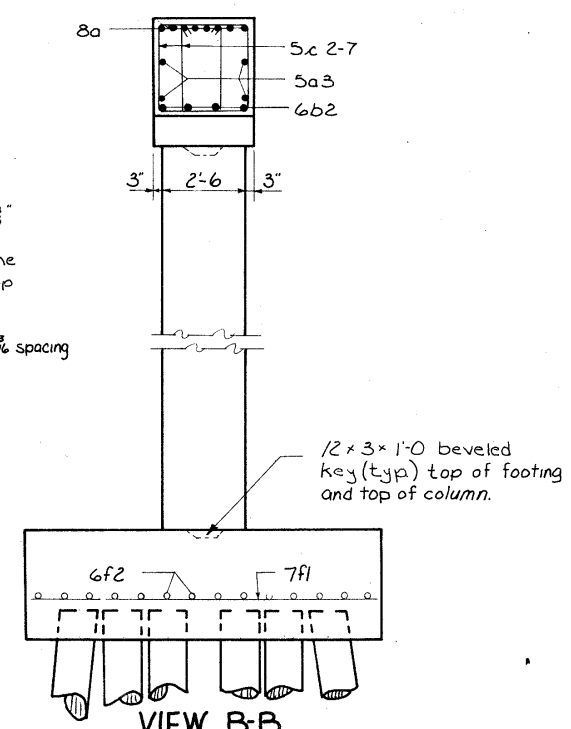
(Looking South)
ELEVATION VIEW

Bottom Footing Elevation
 Pier N°1 N.B.L. = 1228.28
 Pier N°2 N.B.L. = 1228.66
 Pier N°1 S.B.L. = 1228.57
 Pier N°2 S.B.L. = 1228.92

The spiral reinforcing is to be #5 bar with 25 3/8" diameter, 3" pitch and with 4 equally spaced 3/8" O.D. 69 spacers punched to hold spirals. The spirals to have at least 1 1/2 extra turns at top and bottom of column.

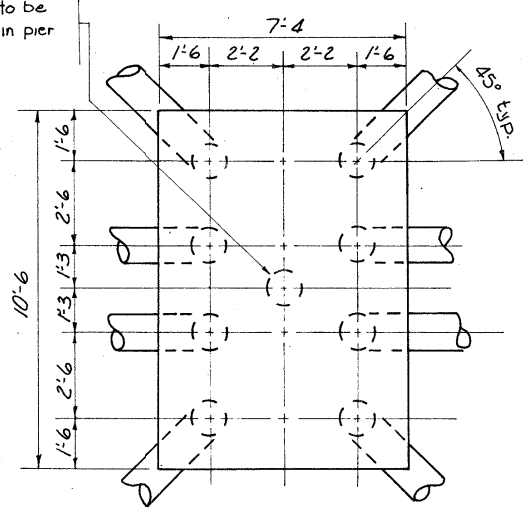


SECTION C-C

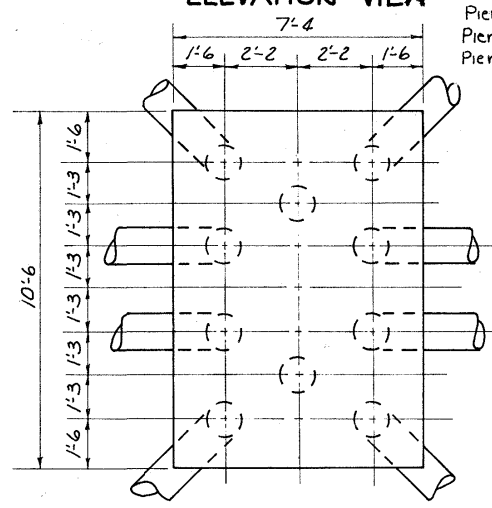


VIEW B-B

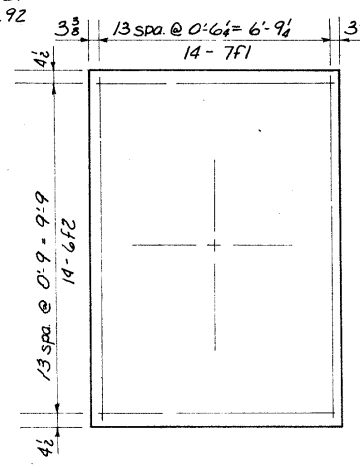
Note: Test pile is to be the vertical pile in pier N°1, N.B.L.



PILE PLAN
(Exterior Footings)



FOOTING PLAN



REINFORCING PLAN

PIER	ELEVATION							DIMENSION					
	A	B	C	D	E	F	G	a	b	c	d	e	f
1 NBL	1251.70	1251.81	1251.92	1252.02	1252.00	1251.93	1251.85	1 1/8	1 1/8	1 1/8	1	1 1/8	1 1/8
2 NBL	1252.08	1252.19	1252.30	1252.40	1252.38	1252.30	1252.22	1 1/8	1 1/8	1 1/8	1	1 1/8	1 1/8
1 SBL	1251.99	1252.09	1252.20	1252.24	1252.17	1252.08	1252.00	1 1/8	1 1/8	1	1 1/8	1 1/8	1 1/8
2 SBL	1252.34	1252.45	1252.55	1252.59	1252.51	1252.43	1252.34	1 1/8	1 1/8	1	1 1/8	1 1/8	1 1/8

PROJECT CONSTRUCTED ACCORDING TO STANDARDS

DESIGN FOR 17° 08' SKEW
DUAL 15'-4" x 40' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES
 47'-5" END SPANS 56'-6" INTERIOR SPAN
PIER DETAILS
 STATION: 755+24.20 & I-35 November, 1970
 STATION: 8755+24.20 & SIDE RD. SURVEY
 CERRO GORDO COUNTY
 IOWA STATE HIGHWAY COMMISSION
 DESIGN SHEET NO. 4 OF 11 FILE NO. 23008 DESIGN NO. 2169

ABUTMENT NOTES:

All exposed corners of 90° or sharper are to be filleted with a 3/4" dressed and beveled strip.
 Minimum clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown.
 Reinforcing steel is to be securely wired in place before concrete is placed.
 All backfill behind the abutment, between the wings is to be granular backfill.
 The remainder of the abutment excavation is to be backfilled with soil.
 Piles are to be driven to full penetration if practicable, but to not less than 20 nor more than 40 tons bearing value per pile

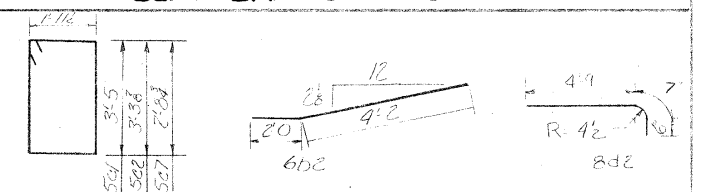
PIER NOTES:

All exposed corners 90° or sharper are to be filleted with a 3/4" dressed and beveled strip.
 Reinforcing steel is to be securely wired in place before concrete is poured.
 The spiral reinforcing may be made of plain structural grade reinforcing steel and spliced by lapping 1 1/2 turns. The length of the spiral shown does not include the lapped length of the splices. The cost of the laps at splices is to be included in the price bid for other reinforcement. The #5 spirals shall be of a material permitted for #4 spirals.
 Minimum clear distance from face of concrete to near reinforcing bar is to be 2" unless otherwise noted or shown.
 Piles are to be driven to full penetration if practicable, but to not less than 20 tons nor more than 40 tons value per pile.
 A test pile is to be used at pier 1 of Abut. to help determine proper pile lengths.

REINFORCING BAR LIST ~ 1 PIER

Bar	LOCATION	Size	N ^o	Length	Weight
8-1	Top of Pier Cap, Longitudinal	8	8	32'-2"	687
8-2	Top of Pier Cap, Longitudinal	8	8	15'-5"	329
5-3	Pier Cap Longitudinal Sides	8	8	23'-0"	192
8-1	Bottom of Pier Cap, Longitudinal	8	8	36'-0"	761
6-2	Bottom of Pier Cap, Longitudinal Sides	8	8	6'-2"	74
5-1	Pier Cap Hoops	7-6	7-6	11'-6"	712
5-2-7	Pier Cap Hoops	2-4	2-4	1'-0"	267
8-1	Column Vertical	3-6	3-6	17'-8"	1810
8-2	Column Diagonal	3-4	3-4	5'-10"	561
7-1	Footings Longitudinal	4-2	4-2	10'-2"	873
6-2	Footings Transverse	4-2	4-2	7'-0"	442
5-1	Column Spiral	3	3	447'-11"	1432
3-1-6-7	Spiral Spacers	1-2	1-2	16'-5"	136

BENT BAR DETAILS



Note: All dimensions are cut to out. Round to nearest inch.

CONCRETE PLACEMENT QUANTITY ~ 1 PIER

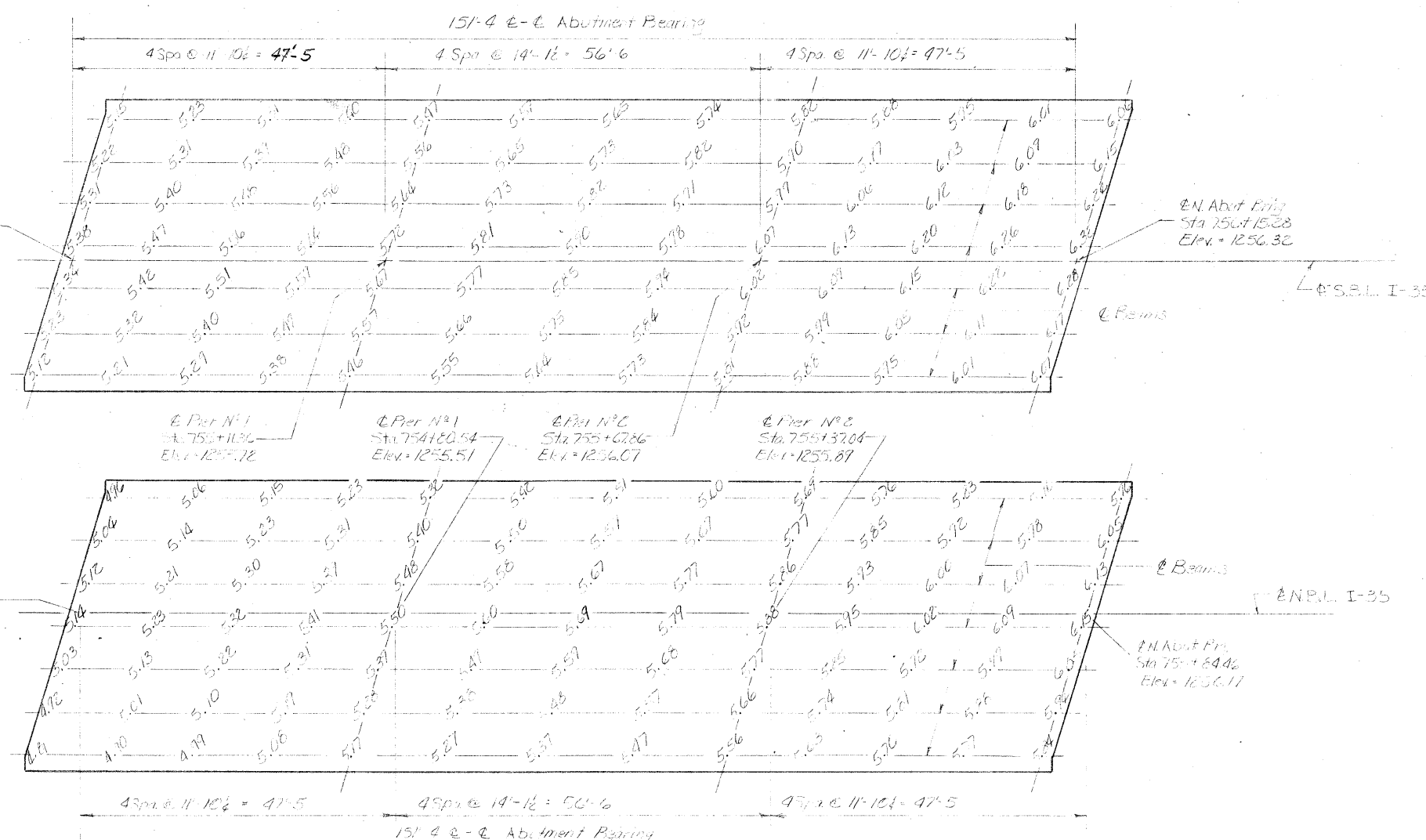
LOCATION	S.B.L.	N.E.L.
Footings	370.0	370.0
Column	9.0	10.0
Cap	17.1	17.6
	55.1	55.6

ESTIMATED QUANTITIES ~ FOUR PIERS

ITEM	UNIT	TOTAL
Structural Concrete	Cu Yds.	321.4
Reinforcing Steel	Lbs.	34,136
Excavation (11' x 20')	Cu Yds.	376
Concrete Piling (11' x 20')	Unit	3246.05
Concrete Ties (11' x 20')	L.S.	117

PROJECT CONSTRUCTED ACCORDING TO STANDARDS

DESIGN FOR 17° 08' SKEW
DUAL 15'-4" x 40' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES
 47'-5" END SPANS 56'-6" INTERIOR SPAN
PIER DETAILS & SLAB ELEVATIONS
 STATION: 755+24.20 & I-35 OCTOBER, 1970
 STATION: 8755+24.20 & SIDE RD. SURVEY
CERRO GORDO COUNTY
 IOWA STATE HIGHWAY COMMISSION
 DESIGN SHEET No 5 OF 11, FILE No 23008, DESIGN No 2169.



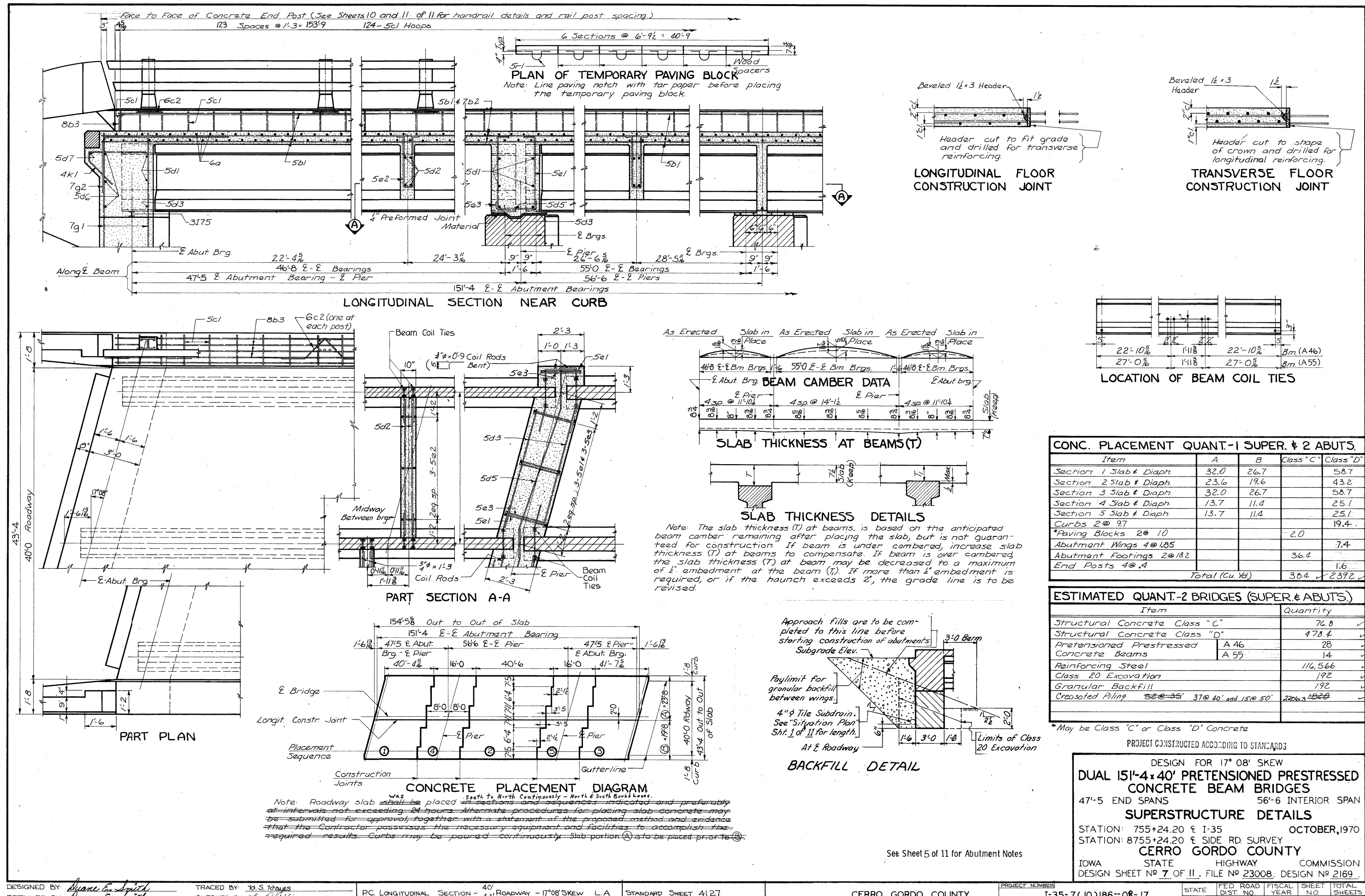
TOP OF SLAB ELEVATIONS

DESIGNED BY: *[Signature]*
 TRACED BY: *[Signature]*
 CHECKED BY: *[Signature]*

CERRO GORDO COUNTY

PROJECT NUMBER	STATE	FED. ROAD DIST. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
186-08-17	IOWA	5	46	52	

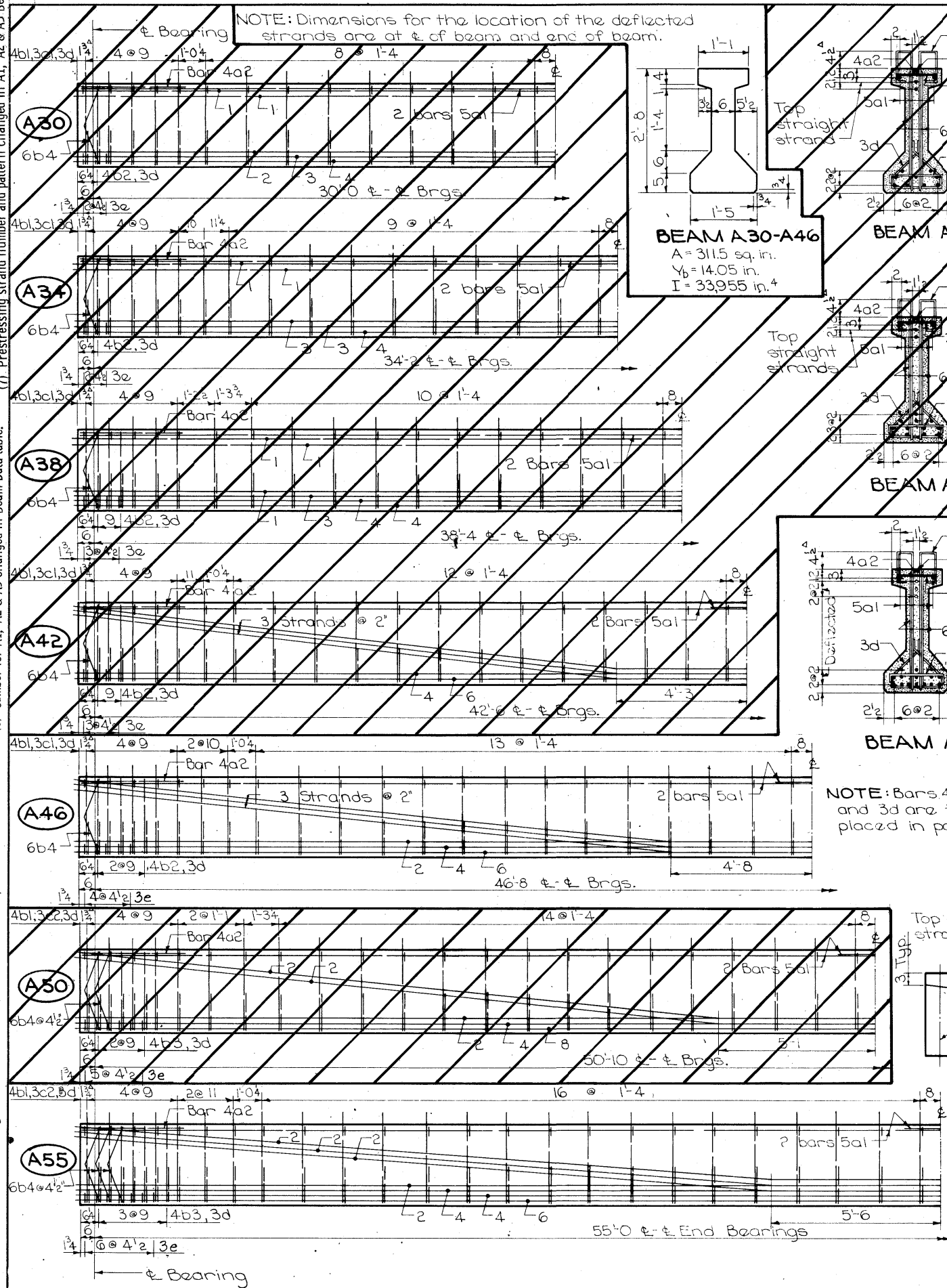
This sheet to be used with PC66 Prestress Beams and wood piles. Use a minimum detailing haunch of 12".



See Sheet 5 of 11 for Abutment Notes

Revised (7-8-66) Lower figures of D.L. deflection due to creep and shrinkage in Beam Data table changed.
Revised (1-25-67) Bars 3e added & No. of 3d bars increased, deflection note re-written.
Revised (5-2-67) Note concerning roughening of beams at diaphragms added.
Revised (9-4-68) Projection of Bar 4b1 above top flange changed from 4" to 4 1/2". Also Future W.S. Loading changed.
Revised (3-6-69) Beam designation numbers changed.
Revised (1-14-70) Design Stresses & Specifications updated.

Revised (9-12-67)
(1) End of beam changed from sloped to square.
(2) Projection of Bar 4b1 above top flange changed from 4 1/2" to 4".
(3) Stirrup spacings near beam end changed.
(4) Bend detail of projected bottom strands at beam end changed.
(5) Length of bar 5a1 & 4b1 changed.
(6) Detail showing location of top deflected strands at beam end and end of beam.
(7) Prestressing strand number and pattern changed in A1, A2 & A3 Beams.
(8) Camber for A1, A2 & A3 changed in Beam Data table.



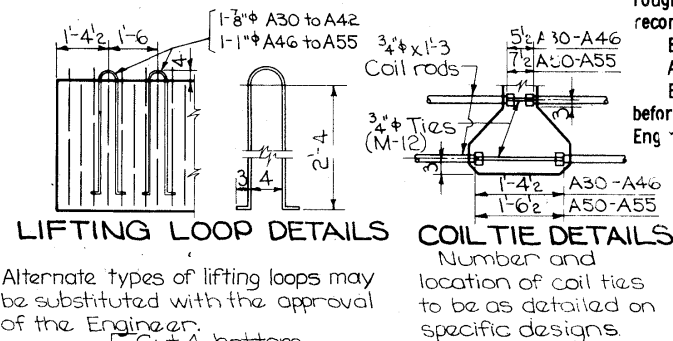
REINFORCING BAR LIST											
Beam	A30	A34	A38	A42	A46	A50	A55				
Span	30'-0"	34'-2"	38'-4"	42'-6"	46'-8"	50'-10"	55'-0"				
Bar Shape	No. length	No. length	No. length	No. length	No. length	No. length	No. length				
5a1	2 30'-9"	2 34'-11"	2 39'-1"	2 42'-7"	2 46'-8"	2 50'-9"	2 55'-0"				
4a2	2 3'-3"	2 3'-3"	2 3'-3"	2 3'-3"	2 3'-3"	2 3'-3"	2 3'-3"				
4b1	56 4'-0"	64 4'-0"	68 4'-0"	76 4'-0"	84 4'-0"	88 4'-0"	96 4'-0"				
4b2	2 5'-0"	2 5'-0"	4 5'-0"	4 5'-0"	6 5'-0"	6 5'-0"	6 5'-0"				
4b3	—	—	—	—	—	6 5'-2"	8 5'-2"				
6b4	4 2'-8"	4 2'-8"	4 2'-8"	4 2'-8"	4 2'-8"	4 2'-8"	4 2'-8"				
3c1	28 1'-1"	32 1'-1"	32 1'-1"	38 1'-1"	42 1'-1"	48 1'-1"	48 1'-1"				
3c2	—	—	—	—	—	4 1'-2"	48 1'-2"				
3d*	60 2'-10"	68 2'-10"	76 2'-10"	84 2'-10"	96 2'-10"	100 2'-10"	112 2'-10"				
3e	6 1'-5"	6 1'-5"	8 1'-5"	8 1'-5"	10 1'-5"	12 1'-7"	14 1'-7"				

* Where deflecting strands interfere with placement some in-place bending may be necessary.

BEAM DATA											
Beam	A30	A34	A38	A42	A46	A50	A55				
Span	30'-0"	34'-2"	38'-4"	42'-6"	46'-8"	50'-10"	55'-0"				
Initial Prestress Kips	315	34	405	376	434	520	636				
Size Strands	1/2	1/2	1/2	1/2	1/2	1/2	1/2				
Straight Strands	1	1	1	1	1	1	1				
Deflected Strands	—	—	—	—	3	3	6				
Hold Down Stress Kips	—	—	—	102	9.3	11.4	13.1				
Camber @	in. 17	25	22	32	34	49	61				
DL Deflection @ in. (6'-4" Spcg.)	.09	.02	.14	.04	.22	.06	.34				
DL Deflection @ in. (8'-0" Spcg.)	.19	.05	.15	.04	.22	.09	.53				
DL Deflection @ in. (9'-6" Spcg.)	.3	.08	.16	.04	.22	.16	.57				
Reinforcing Steel lb.	311	350	385	428	479	529	598				
Concrete C.Y.	2.48	2.82	3.15	3.48	3.82	5.00	5.40				

- NOTES
- ① Due to weight of slab and diaphragms.
② Upper figure is the beam camber at release. Lower figure is the beam camber just before slab is placed.
③ Upper figure is the elastic deflection of beam due to weight of slab. Lower figure is the deflection due to the combined effect of creep due to weight of slab and shrinkage of slab. Total deflection of beam is upper figure + 75% of lower figure for end spans and upper figure + 50% of lower figure for interior spans.

Unless otherwise noted lengths of all beams shall be increased .0005 L to compensate for creep shrinkage and elastic shortening.
All deflected strands are to be held down at 4 points except that the hold down point may be moved toward the end of the beam a distance not to exceed .05 span at the producer's option.
Tops of beams are to be struck off level and artificially roughened in accordance with the I. H. C. Materials Department recommendations.
Bearing details will be as detailed on the Bridge design sheets.
All strands are to be 1/2" ϕ 270 kip grade.
Beams for continuous bridges shall be at least 4 weeks old before the slab is placed except as otherwise approved by the Engineer.



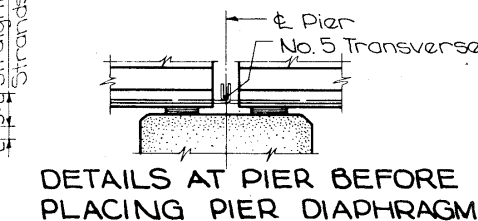
Alternate types of lifting loops may be substituted with the approval of the Engineer.

Cut 4 bottom and all deflected and top straight strands with a 12" projection & shop bend as shown.

Remaining strands are to be cut with a 2" projection.

BEAM END DETAIL AT PIER AND ABUT.

MAXIMUM SPACING OF BEAMS FOR SPANS SHOWN		
Loading	Future W. S.	Maximum Spacing
H20-S16 (Primary)	20 #/ft ²	7'-3"
H20 (Primary)	20 #/ft ²	8'-0"
H15 (Secondary)	—	9'-6"



DESIGN FOR 17° 08' SKEW
DUAL 15'-4" x 40' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES
47'-5" END SPANS 56'-6" INTERIOR SPAN
BEAM DETAILS
STATION: 755+24.20 & I-35 OCTOBER, 1970
STATION: 8755+24.20 & SIDE RD SURVEY
CERRO GORDO COUNTY
IOWA STATE HIGHWAY COMMISSION
DESIGN SHEET No. 9 OF 11, FILE No. 23008, DESIGN No. 2169.

DESIGNED BY: TRACED BY: J. H. Hoyer
CHECKED BY: J. H. Hoyer

