PROJECT NO. SN-3301 (6)--51-24
FHWA NO. 127810

IOWA
DEPARTMENT OF TRANSPORTATION
Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

FARM TO MARKET SYSTEM

CRAWFORD COUNTY

BRIDGE

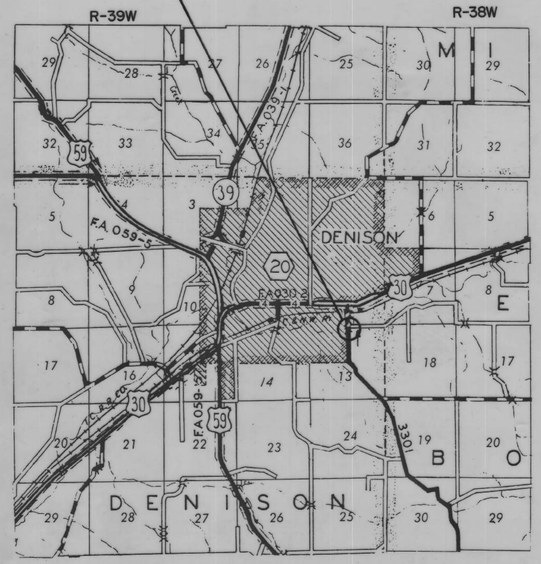
THE STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, SERIES OF 1984, PLUS CURRENT SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS, SHALL APPLY TO WORK ON THIS PROJECT.

MILEAGE SUMMARY
STA. 49+91.42 TO STA. 52+38.58 ; 247.17 LIN. FT. = 0.0468 MILES

INDEX OF SHEETS

STANDARD ROAD PLANS					
THE FOLLOWING STANDARD ROAD PLANS SHALL BE CONSIDERED APPLICABLE TO CONSTRUCTION WORK ON THIS PROJECT.					
IDENT.	DATE	IDENT.	DATE	IDENT.	DATE
RE-2A	2-17-87	RL-11	5-13-86		
RE-7	5-31-86	RE-19E	2-17-87		
RE-12A	5-12-86				
RE-47	8-20-85				
RE-48A	3-31-87				
RE-49	9-23-86				
RE-52	9-23-86				
RE-59	9-23-86				

DESIGN NO. 5387
STATION 51+15.00
PROPOSED 205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
0°SKEW



PROJECT LOCATION
SCALE 1" = 1 MILE

PROJECT TRAFFIC CONTROL PLAN
THIS ROAD WILL BE CLOSED TO THROUGH TRAFFIC DURING CONSTRUCTION. LOCAL TRAFFIC TO ADJACENT PROPERTIES WILL BE MAINTAINED AS PROVIDED FOR IN ARTICLE 1107.08, 1984 SPECIFICATIONS PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS. TRAFFIC CONTROL DEVICES, PROCEDURES AND LAYOUTS SHALL BE AS PROVIDED FOR BY SUPPLEMENTAL SPECIFICATIONS FOR TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS, SPECIFICATION 1037 AND THE IOWA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

-150-

TRAFFIC COUNT: 1990 V.P.D., 1984

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED:
DIVISION ADMINISTRATOR DATE

APPROVED
H. Dale Wright 10-15-87
COUNTY ENGINEER DATE

CRAWFORD COUNTY BOARD OF SUPERVISORS
APPROVED BY:
Marilyn E. Lofthus
Lon Jensen
LeRoy G. Hansen
Virgil L. Anderson
BOARD OF SUPERVISORS 10-15-87 DATE

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.
Jacobus L. Burns
IOWA REGISTRATION NUMBER 3803 DATE 10-15-87

DEPARTMENT OF TRANSPORTATION IOWA — Highway Division
AUTHORIZED FOR LETTING
R. Ed. Anderson 11-13-87
DEPUTY CHIEF ENGINEER DATE

IOWA DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION
AUTHORIZED FOR LETTING
DISTRICT LOCAL SYSTEMS ENGR. DATE

SHEET 1 OF 20

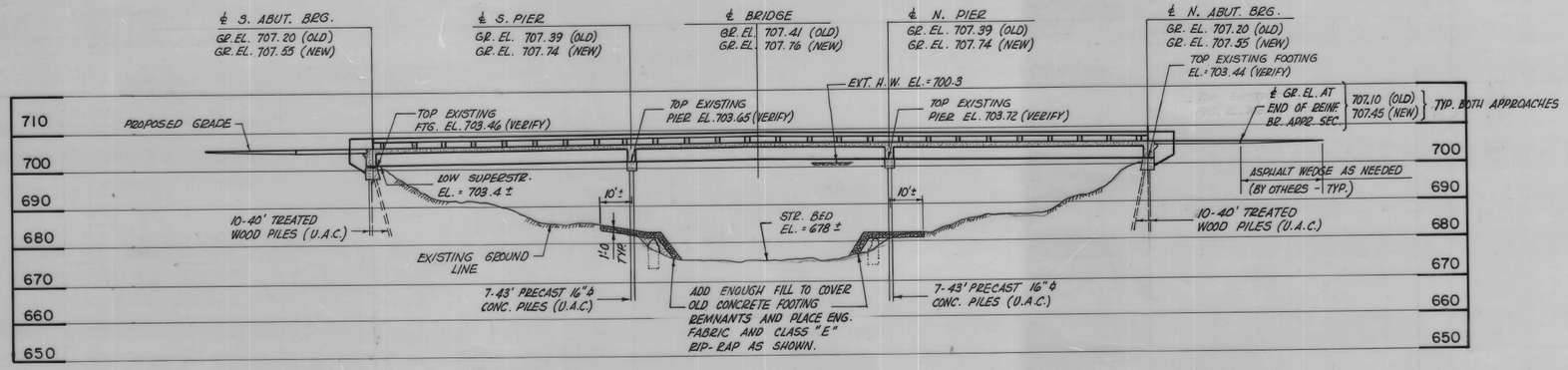
880 044
001 716
033
SJK

CRAWFORD COUNTY PROJECT NO. SN-3301 (6)--51-24 BRIDGE 003450

CALHOUN-BURNS & ASSOCIATES, INC. CONSULTING ENGINEERS
WEST DES MOINES, IOWA 50311 (515) 224-4344

DESIGN NO. 5387 DJC 10-15-87 LWK 10/15/87 CRAWFORD COUNTY PROJECT NO. SN-3301 (6)--51-24 FILE NO. 53610

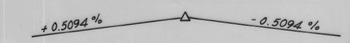
BENCHMARK: S.W. CORNER OF CONCRETE BASE OF R.E.C. HIGH VOLTAGE BOX, 59' RT. STA. 50+00; EL. = 702.30



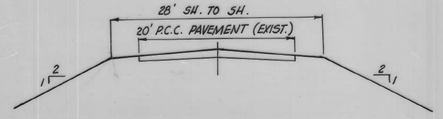
LONGITUDINAL SECTION ALONG ℄ ROADWAY

DEFINITIONS: "OLD" - WHEN ONLY BEAMS KNOWN TO BE DAMAGED ARE REPLACED WITH NEW BEAMS.
"NEW" - WHEN, AFTER DECK REMOVAL, IT IS DETERMINED THAT ALL BEAMS ARE TO BE REPLACED WITH NEW SUPERSTRUCTURE.

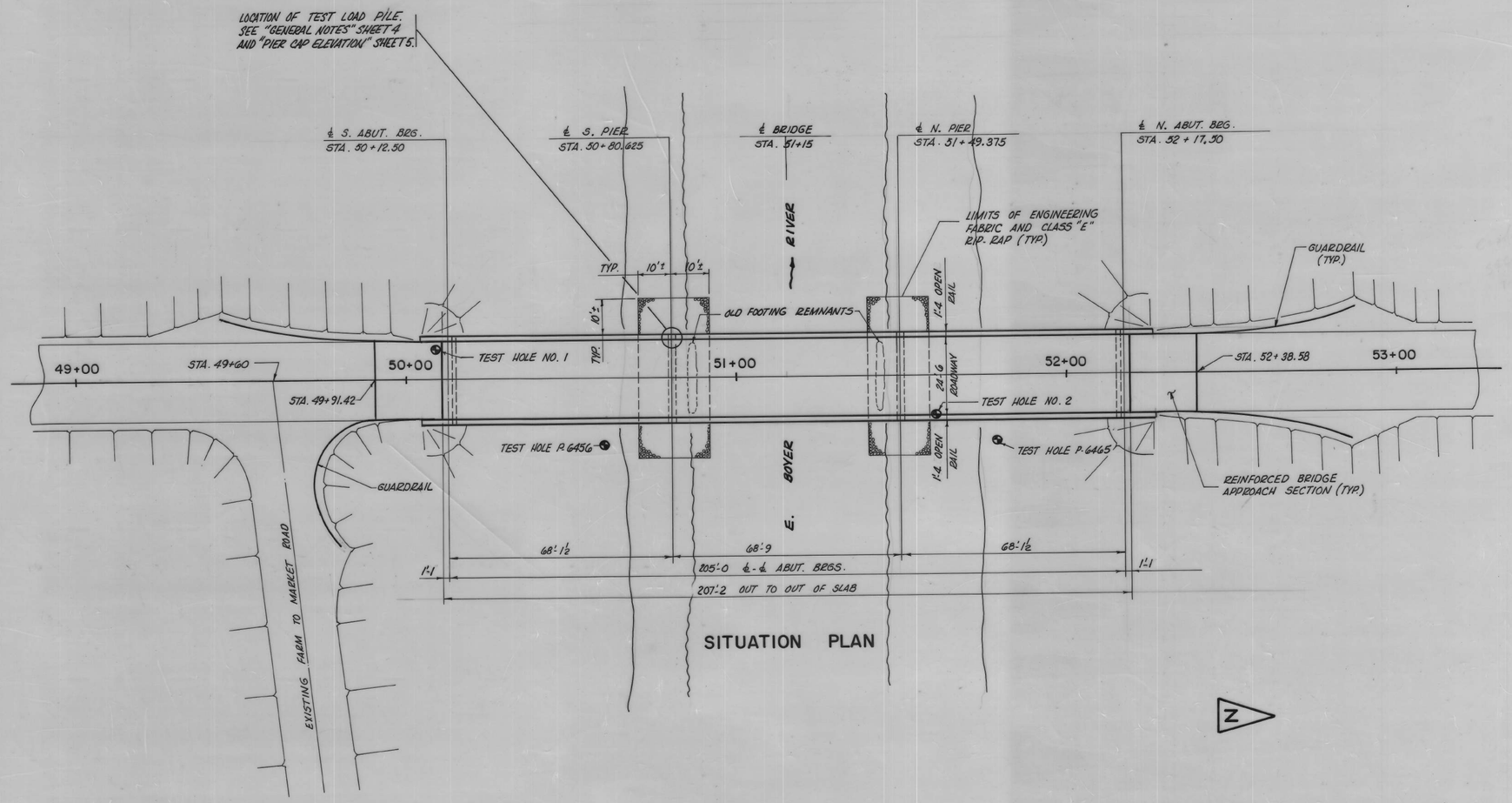
V.P.I. STA. 51 + 15.00
V.C. = 250'
EL. V.P.I. = 707.73 (OLD)
EL. V.P.I. = 708.08 (NEW)
M.O. = 0.3184



PROPOSED GRADE



TYPICAL APPROACH SECTION



SITUATION PLAN

LOCATION

CRAWFORD COUNTY
T-83N, R-39W
SECTION 13
DENISON TOWNSHIP
OVER E. BOYER RIVER

HYDRAULIC DATA

DRAINAGE AREA = 127 SQ. MI.
DISCHARGE Q50 = 12,000 C.F.S. STAGE = 700.3
Q100 = 14,400 C.F.S.
EXT. H.W. EL. = 700.3
EXISTING AREA = 2,728 S.F.
VELOCITY = 4.4 FT./SEC.

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-9 INTERIOR SPAN — 68'-1½ END SPANS

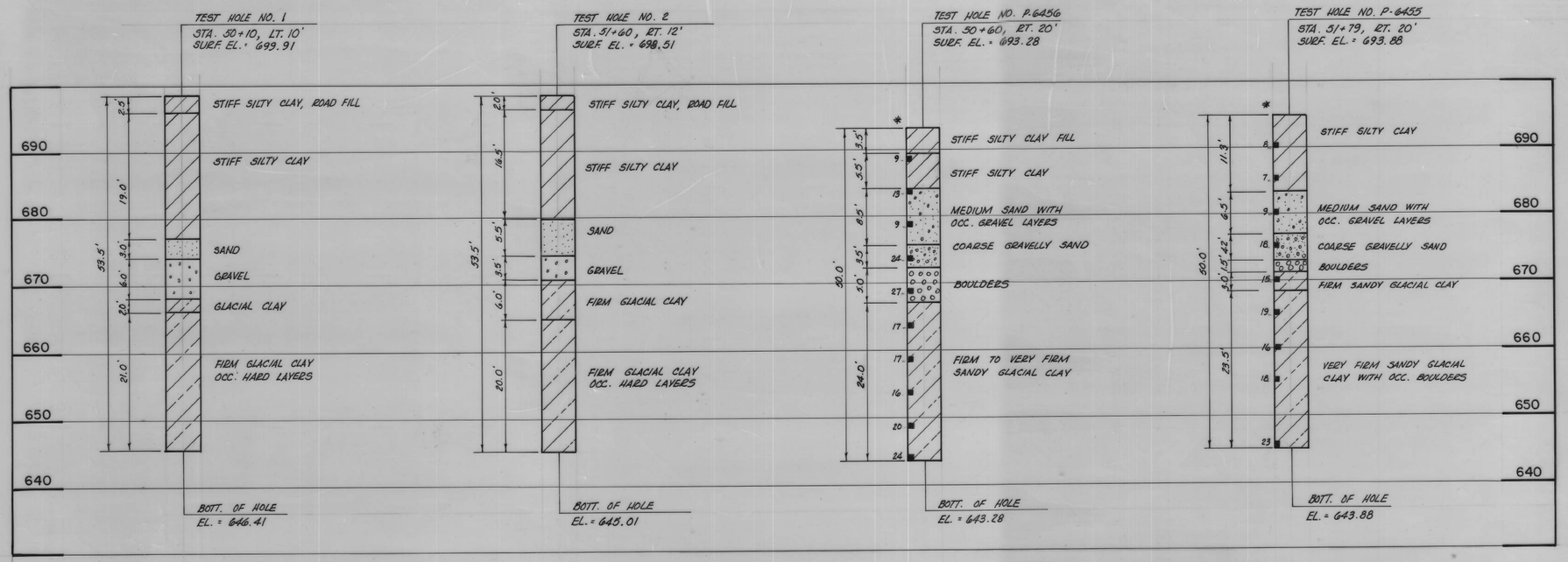
SITUATION PLAN

STATION 51 + 15 — 0° SKEW

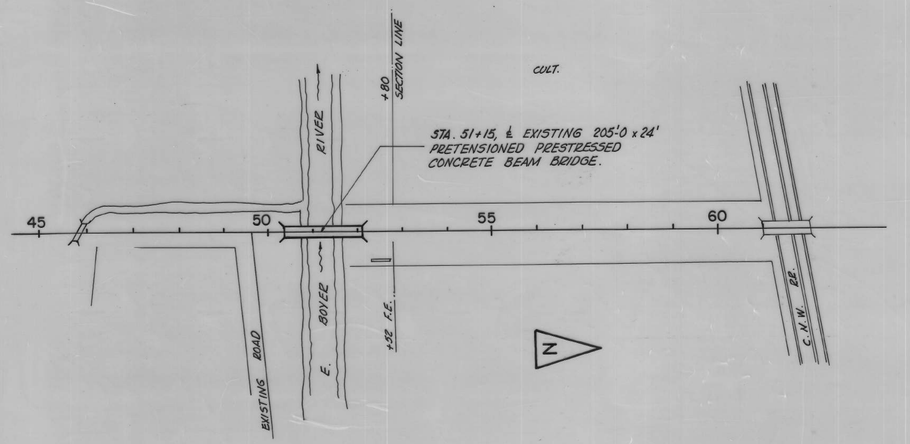
CRAWFORD COUNTY — IOWA

SHEET 2 OF 20

BENCHMARK: S.W. CORNER OF CONCRETE BASE OF R.E.C. HIGH VOLTAGE BOX, 59' RT. STA. 50+00; EL. = 702.30



SOUNDING DATA



GENERAL PLAN

SCALE 1" = 100'

CONCRETE REMOVAL

SUBSTRUCTURE, DECK AND DIAPHRAGM CONCRETE REMOVAL SHALL BE TO NEAT LINES AS SHOWN IN DETAIL. ALL SUCH REMOVALS SHALL BE TO NEAT SAW CUTS TO PROVIDE CLEAN STRAIGHT SURFACES AT INTERFACES BETWEEN NEW CONCRETE AND REMAINING CONCRETE. THE REMOVAL SHALL BE DONE IN A MANNER WHICH WILL PREVENT ANY DAMAGE TO THE EXISTING STRUCTURE TO REMAIN. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY DAMAGE CAUSED, AND SHALL REPAIR ANY DAMAGED AREA TO ITS ORIGINAL CONDITION, AS DIRECTED BY THE ENGINEER, AT THE CONTRACTOR'S EXPENSE. ANY EXISTING REINFORCING STEEL WHICH IS EXPOSED DURING REMOVAL OPERATIONS IS TO BE CAREFULLY PROTECTED, CLEANED AND INCORPORATED INTO NEW CONSTRUCTION. ALL COSTS OF CONCRETE REMOVAL AND CLEANING REBARS SHALL BE INCLUDED IN THE PRICE BID FOR "REMOVALS, AS PER PLAN".

DRILLED-IN DOWELS

EPOXY ADHESIVE FOR BONDING DOWELS IN DRILLED HOLES SHALL BE SIKA BRAND SIKADUR HI-MOD GEL, AND SHALL BE USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE CONTRACTOR SHALL ARRANGE A MEETING WITH THE SIKA TECHNICAL REPRESENTATIVE AND THE ENGINEER TO REVIEW THE MANUFACTURER'S RECOMMENDATIONS PRIOR TO CONSTRUCTION.

DRILLED HOLES FOR DOWELS SHALL BE 1/4 INCH LARGER IN DIAMETER THAN THE DIAMETER OF THE BAR. WHERE NOT SHOWN ON THE PLANS, THE MINIMUM EMBEDMENT DEPTH IS 10 TIMES THE BAR DIAMETER.

INSTALLATION PROCEDURE:

1. BLOW HOLE CLEAN USING OIL-FREE COMPRESSED AIR.
2. PLACE EPOXY TO PREDETERMINED DEPTH IN HOLE, AND INSERT CLEAN BAR, WORKING BACK AND FORTH, UP AND DOWN, TO ENSURE COMPLETE EMBEDMENT AND COATING.
3. POSITION BAR IN CENTER OF HOLE WITH TEMPLATE UNTIL EPOXY SETS.

COST OF ALL LABOR AND MATERIALS TO DRILL HOLES AND EMBED BARS WILL BE INCLUDED IN THE PRICE BID FOR "REINFORCING STEEL" AND NO SEPARATE PAYMENT WILL BE MADE.

EPOXY BONDING CONCRETE

NEW CONCRETE SHALL BE BONDED TO EXISTING CONCRETE WITH SIKA-DUR "HI-MOD" #370 EPOXY BONDING AGENT.

EPOXY BONDING AGENT SHALL BE APPLIED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. EPOXY SHALL NOT BE APPLIED BY SPRAY METHODS, AND NO SOLVENT SHALL BE ADDED TO THE EPOXY ADHESIVE.

THE SUPPLIER OF THE ADHESIVE SHALL SUBMIT TO THE ENGINEER A CERTIFIED TEST REPORT COVERING EACH LOT OF THE ADHESIVE SHIPPED TO THE PROJECT. THE TEST REPORT SHALL CERTIFY THAT THE COMPOSITION AND PROPERTIES OF THE ADHESIVE ARE IN ACCORDANCE WITH THESE PLANS AND IT SHALL GIVE THE ACTUAL VALUES OF THE MECHANICAL PROPERTIES OF THE MATERIAL IN THE PARTICULAR LOT.

THE SURFACE OF THE OLD CONCRETE TO WHICH NEW CONCRETE IS TO BE BONDED SHALL BE CLEANED BY SANDBLASTING, AFTER REMOVAL OF CONCRETE AS SHOWN ON THE PLANS, SO THAT ALL FOREIGN MATERIAL, LOOSE AND UNSOUND CONCRETE IS REMOVED AND ONLY SOUND CONCRETE REMAINS. WASHING WITH FRESH WATER WILL BE REQUIRED AS NECESSARY TO REMOVE DUST AND SMALL PARTICLES NOT REMOVED BY OTHER CLEANING METHODS.

WHEN ALL FREE WATER HAS DRIED FROM THE AREA TO BE BONDED, EPOXY ADHESIVE SHALL BE APPLIED BY BRUSH TO A 20 MIL THICKNESS MINIMUM. THE EPOXY SURFACE SHALL APPEAR SHINY AND SHALL BE TACKY JUST BEFORE NEW CONCRETE IS PLACED AGAINST IT. IF THE CONCRETE HAS ABSORBED THE ADHESIVE, AS EVIDENCED BY A DULL APPEARANCE, APPLY ANOTHER COAT. THE NEW CONCRETE SHALL THEN BE PLACED WHILE THE EPOXY REMAINS TACKY.

THE EPOXY BONDING AGENT IS TO BE APPLIED TO CONCRETE THAT IS FREE OF ALL DUST, OIL, DEBRIS OR OTHER FOREIGN MATERIAL. ANY MATERIAL THAT INHIBITS THE ABILITY TO BOND SHALL BE REMOVED BY OIL FREE AIR COMPRESSORS OR LIGHT SANDBLASTING PRIOR TO PLACEMENT OF EPOXY BONDING AGENT. STANDING WATER PUDDLES ARE TO BE REMOVED. A DAMP CONDITION OF SURFACE IS ACCEPTABLE PRIOR TO APPLICATION.

SIKA-DUR #370 EPOXY BONDING AGENT SHALL BE APPLIED BY HEAVY DUTY BRUSHES.

SIKA-DUR #370 EPOXY BONDING AGENT SHALL BE APPLIED AT A RATE OF 9 SQUARE YARDS PER GALLON (APPROXIMATELY 80 SQUARE FEET/GALLON). THE MINIMUM BUILDUP IS TO BE 20 MIL.

PRIOR TO PLACING THE EPOXY, THE INSPECTOR, CONTRACTOR AND SIKA REPRESENTATIVE SHALL MEET TO DETERMINE THE FINAL RATE OF APPLICATION. A WET FILM THICKNESS GAUGE SHALL BE EMPLOYED AT RANDOM INTERVALS TO ENSURE A MINIMUM BUILDUP OF 20 MILS.

SIKA-DUR "HI-MOD" #370 WILL LOSE TACK AFTER APPROXIMATELY 3 HOURS AT 70 DEGREES F.

COST OF LABOR AND MATERIALS TO APPLY EPOXY BONDING AGENT WILL BE INCLUDED IN PRICE BID FOR "STRUCTURAL CONCRETE" AND NO SEPARATE PAYMENT WILL BE MADE.

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-9 INTERIOR SPAN — 68'-1½ END SPANS

SOUNDING DATA, GENERAL PLAN & NOTES

STATION 51+15 — 0° SKEW

CRAWFORD COUNTY — IOWA

CALHOUN-BURNS & ASSOCIATES, INC. CONSULTING ENGINEERS
WEST DES MOINES, IOWA 50311 (515) 224-4344

DESIGN NO. 5387 CRAWFORD COUNTY FILE NO. 53610

TOTAL ESTIMATED QUANTITIES (OLD)

ITEM NO.	ITEM	UNIT	QUANTITY
1	STRUCTURAL CONCRETE	C.Y.	148.0
2	REINFORCING STEEL	LBS.	1,708
3	REINFORCING STEEL, EPOXY COATED	LBS.	40,182
4	STRUCTURAL STEEL	LBS.	348
5	PRETENSIONED PRESTR. CONCRETE BEAMS (A67 SPECIAL)	NO.	8
6	CONCRETE OPEN RAIL	L.F.	443.0
7	CLASS 20 EXCAVATION	C.Y.	19
8	CLASS 24 EXCAVATION	C.Y.	325
9	REVETMENT, CLASS "E" RIP-RAP	TONS	107
10	FORMED STEEL BEAM GUARDRAIL	L.F.	250
11	BEAM GUARDRAIL POSTS	NO.	52
12	RE-52 BEAM GUARDRAIL END ANCHORAGES	NO.	4
13	TYPE 3 OBJECT MARKER	NO.	4
14	TRIPLE YELLOW OBJECT MARKER, AS PER PLAN	NO.	8
15	SINGLE WHITE DELINEATORS	NO.	14
16	PAVEMENT MARKINGS	STA.	8.03
17	BARRICADES	NO.	2
18	BRIDGE APPROACH SECTION, REINFORCED, AS PER PLAN	SQ.YDS.	107
19	REMOVAL OF PAVEMENT	SQ.YDS.	89
20	CONCRETE SEALER, AS PER PLAN	S.F.	1,580
21	REMOVALS, AS PER PLAN	L.S.	LUMP SUM
22	TRAFFIC CONTROL	L.S.	LUMP SUM
23	MOBILIZATION	L.S.	LUMP SUM
24	ENGINEERING FABRIC	SQ.YDS.	221

ITEM NO. ESTIMATE REFERENCE INFORMATION

ITEM NO.	
1.	ALL STRUCTURAL CONCRETE IS TO BE CLASS "D".
3.	INCLUDES 4,050 L.F. OF #3 BAR, 28,456 L.F. OF #5 BAR, 2,862 L.F. OF #6 BAR AND 919 L.F. OF #7 BAR.
4.	INCLUDES MASONRY PLATES. LEAD SHEETS ARE INCIDENTAL TO THIS ITEM.
5.	INCLUDES COST OF PIER BEARING MATERIAL AND ABUTMENT SOLE PLATES.
8.	INCLUDES 30% FOR SHRINKAGE.
10 THRU 15 & 17	SEE TABULATIONS ON SHEET 19.
16.	BROKEN YELLOW CENTERLINE, PERMANENT YELLOW NO-PASSING ZONE LINE AND WHITE EDGE LINES FROM STA. 49 + 91.42 TO STA. 52 + 38.58. SEE SHEET 19.
19.	EXISTING PAVEMENT IS 6" THICK PORTLAND CEMENT CONCRETE.
22.	SEE NOTE ON SHEET 1 AND DETAILS ON SHEET 20.

SEEDING, FERTILIZING, AND MULCHING OF ALL DISTURBED AREAS FOLLOWING THE COMPLETION OF WORK ON THIS PROJECT SHALL BE DONE AS DIRECTED BY THE ENGINEER.

SEED MIXTURE: SEEDING RATE - 3 LBS. PER 1,000 SQ. FT.

FESCUE, KY. 31	75%
REED CANARYGRASS	25%

FERTILIZER: RATE - 15 LBS. OF 15-15-15 OR EQUIVALENT COMBINED COMMERCIAL FERTILIZER PER 1000 SQ. FT. THE PREPARATION OF THE SEEDBED, FURNISHING AND APPLICATION OF SEED AND FERTILIZER TO ALL DISTURBED AREAS ON THIS PROJECT SHALL BE CONSIDERED INCIDENTAL TO WORK ON THIS PROJECT, AND NO EXTRA COMPENSATION WILL BE ALLOWED.

TOTAL ESTIMATED QUANTITIES (NEW)

ITEM NO.	ITEM	UNIT	QUANTITY
1	STRUCTURAL CONCRETE	C.Y.	168.6
2	REINFORCING STEEL	LBS.	1,809
3	REINFORCING STEEL, EPOXY COATED	LBS.	49,034
4	STRUCTURAL STEEL	LBS.	2829
5	PRETENSIONED PRESTR. CONCRETE BEAMS (B67E)	NO.	12
6	CONCRETE OPEN RAIL	L.F.	443.0
7	CLASS 20 EXCAVATION	C.Y.	19
8	CLASS 24 EXCAVATION	C.Y.	325
9	REVETMENT, CLASS "E" RIP-RAP	TONS	107
10	FORMED STEEL BEAM GUARDRAIL	L.F.	250
11	BEAM GUARDRAIL POSTS	NO.	52
12	RE-52 BEAM GUARDRAIL END ANCHORAGES	NO.	4
13	TYPE 3 OBJECT MARKER	NO.	4
14	TRIPLE YELLOW OBJECT MARKER, AS PER PLAN	NO.	8
15	SINGLE WHITE DELINEATORS	NO.	14
16	PAVEMENT MARKINGS	STA.	8.03
17	BARRICADES	NO.	2
18	BRIDGE APPROACH SECTION, REINFORCED, AS PER PLAN	SQ.YDS.	107
19	REMOVAL OF PAVEMENT	SQ.YDS.	89
20	CONCRETE SEALER, AS PER PLAN	S.F.	1,589
21	REMOVALS AS PER PLAN	L.S.	LUMP SUM
22	TRAFFIC CONTROL	L.S.	LUMP SUM
23	MOBILIZATION	L.S.	LUMP SUM
24	ENGINEERING FABRIC	SQ.YDS.	221

ITEM NO. ESTIMATE REFERENCE INFORMATION

ITEM NO.	
1.	ALL STRUCTURAL CONCRETE IS TO BE CLASS "D".
3.	INCLUDES 4,050 L.F. OF #3 BAR, 15,512 L.F. OF #5 BAR, 17,647 L.F. OF #6 BAR AND 2,362 L.F. OF #7 BAR.
4.	INCLUDES STEEL DIAPHRAGMS AND MASONRY PLATES. LEAD SHEETS ARE INCIDENTAL TO THIS ITEM.
5.	INCLUDES COST OF PIER BEARING MATERIAL AND ABUTMENT SOLE PLATES.
8.	INCLUDES 30% FOR SHRINKAGE.
10 THRU 15 & 17	SEE TABULATIONS ON SHEET 19.
16.	BROKEN YELLOW CENTERLINE, PERMANENT YELLOW NO-PASSING ZONE LINE AND WHITE EDGE LINES FROM STA. 49 + 91.42 TO STA. 52 + 38.58. SEE SHEET 19.
19.	EXISTING PAVEMENT IS 6" THICK PORTLAND CEMENT CONCRETE.
22.	SEE NOTE ON SHEET 1 AND DETAILS ON SHEET 20.

SEEDING, FERTILIZING, AND MULCHING OF ALL DISTURBED AREAS FOLLOWING THE COMPLETION OF WORK ON THIS PROJECT SHALL BE DONE AS DIRECTED BY THE ENGINEER.

SEED MIXTURE: SEEDING RATE - 3 LBS. PER 1,000 SQ. FT.

FESCUE, KY. 31	75%
REED CANARYGRASS	25%

FERTILIZER: RATE - 15 LBS. OF 15-15-15 OR EQUIVALENT COMBINED COMMERCIAL FERTILIZER PER 1000 SQ. FT. THE PREPARATION OF THE SEEDBED, FURNISHING AND APPLICATION OF SEED AND FERTILIZER TO ALL DISTURBED AREAS ON THIS PROJECT SHALL BE CONSIDERED INCIDENTAL TO WORK ON THIS PROJECT, AND NO EXTRA COMPENSATION WILL BE ALLOWED.

DESIGN STRESSES

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES, SERIES 1983.

SPECIFICATIONS			
CONCRETE	SECTION 8 f'c	=	3,500 PSI
REINFORCING STEEL ASTM A615	SECTION 8 GRADE 60, f's	=	24,000 PSI
PRESTRESSING STEEL	SEE SECTION 9 f's	=	270,000 PSI
PRESTRESSED CONCRETE	SEE SECTION 9 f'c	=	5,000 PSI

SPECIFICATIONS

DESIGN: AASHTO SERIES OF 1983.

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, HIGHWAY DIVISION, SERIES OF 1984, PLUS CURRENT SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.

GENERAL NOTES

THE EXISTING BRIDGE IS I.D.O.T. DESIGN NO. 3158, FILE NO. 20017, BUILT IN 1958. IT WAS DESIGNED FOR H15-44 LIVE LOADING AS PER A.A.S.H.O. SERIES OF 1953 AND CONSTRUCTED IN ACCORDANCE WITH THE IOWA HIGHWAY COMMISSION SPECIFICATIONS, SERIES OF 1956 WITH THEN CURRENT SPECIAL PROVISIONS.

IT IS THE INTENT OF THIS DESIGN TO REMOVE THE EXISTING BRIDGE DECK, CURBS AND RAIL IN THEIR ENTIRETY, MODIFY THE SUBSTRUCTURES, REPLACE EIGHT (8) BEAMS ("OLD" ALTERNATE) OR INSTALL TWELVE (12) BEAMS ("NEW" ALTERNATE), CONSTRUCT A NEW DECK, CONCRETE OPEN RAILS AND APPROACH ELEMENTS IN ACCORDANCE WITH CURRENT A.A.S.H.T.O. DESIGN AND I.D.O.T. CONSTRUCTION SPECIFICATIONS. THE DECK FOR BOTH ALTERNATES AND THE BEAMS FOR THE "NEW" ALTERNATE ARE DESIGNED FOR HS20-44 LIVE LOADING PLUS 20 LBS. PER SQ. FT. OF ROADWAY FOR FUTURE WEARING SURFACE. THE REPLACEMENT BEAMS FOR THE "OLD" ALTERNATE ARE DESIGNED FOR H20-44 LIVE LOADING PLUS 20 LBS. PER SQ. FT. OF ROADWAY FOR FUTURE WEARING SURFACE.

SLAB THICKNESS INCLUDES 1/2" INTEGRAL WEARING SURFACE.

ALL EXPOSED CORNERS OF 90 DEG. OR SHARPER ARE TO BE FORMED WITH A 3/4" DRESSED AND BEVELED STRIP. CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2" UNLESS OTHERWISE NOTED OR SHOWN. ALL REINFORCING BARS ARE TO BE SECURELY WIRED IN PLACE AND ADEQUATELY SUPPORTED ON BAR CHAIRS BEFORE CONCRETE IS PLACED.

FORMS FOR THE SLAB AND RAILS AR TO BE SUPPORTED BY THE PRESTRESSED BEAMS.

COST OF PREFORMED EXPANSION JOINT FILLER MATERIALS SHALL BE INCLUDED IN PRICE BID FOR STRUCTURAL CONCRETE.

THE COST OF COIL RODS, COIL TIES AND NEOPRENE BEARING PADS SHALL BE INCLUDED IN THE PRICE BID FOR "PRETENSIONED PRESTRESSED CONCRETE BEAMS".

THE COST OF FURNISHING AND PLACING ALL MASONRY PLATES AND STEEL DIAPHRAGMS SHALL BE BID AS "STRUCTURAL STEEL".

DAMAGE TO ANY STEEL OR CONCRETE NOT TO BE REMOVED SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPAIRED BY HIM AT NO EXTRA COST TO THE COUNTY.

THE BRIDGE CONTRACTOR SHALL USE EXTREME CARE IN REMOVING THE OLD SLAB CONCRETE FROM THE TOP OF THE EXISTING BEAMS. IF THE EXISTING BEAMS ARE DAMAGED THE COUNTY ENGINEER SHALL BE NOTIFIED TO DECIDE THE POSSIBLE REUSE OF THE BEAMS. IF ANY BEAMS ARE DAMAGED BEYOND REUSE THEY SHALL BE REPLACED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE COUNTY. SEE ALLOWABLE DAMAGE DETAIL ON SHEET 6.

ALL EXISTING REINFORCING EXPOSED AND PROTRUDING FROM BEAMS AND DIAPHRAGMS WHEN REMOVING OLD CONCRETE IS TO BE CLEANED AND STRAIGHTENED WHERE NECESSARY AND BONDED INTO THE NEW CONSTRUCTION UNLESS NOTED OTHERWISE.

THE CONTRACTOR'S WORK AND MATERIAL STORAGE AREA SHALL BE AS DESIGNATED BY THE ENGINEER. THE CONTRACTOR SHALL SHAPE, FERTILIZE AND SEED THE CONTRACTOR'S AREA IN ORDER TO RETURN IT TO ITS PRESENT CONDITION, AND PAYMENT FOR THIS WORK SHALL BE INCIDENTAL TO CONSTRUCTION. DAMAGED AREAS OUTSIDE THE CONTRACTOR'S AREA SHALL BE REPAIRED TO THEIR PRESENT CONDITION, AS DETERMINED BY THE ENGINEER, AND NO ADDITIONAL PAYMENT WILL BE AUTHORIZED FOR THIS WORK.

CONCRETE SEALER SHALL BE APPLIED TO THE EXPOSED ABUTMENT BRIDGE SEAT SURFACES AND TO ALL SURFACES OF THE CONCRETE OPEN RAILS AND POSTS. THE "BRIDGE SEAT SURFACE" SHALL INCLUDE ALL SURFACES OF THE BRIDGE SEAT STEPS AND THE EDGE FILLETS. THE SEALER SHALL EXTEND UP THE BACK FACE OF THE ABUTMENT DIAPHRAGMS. THE CONCRETE PROTECTIVE COATING SHALL BE AN APPROVED SEALER LISTED IN MATERIALS I.M. 491.12, AND SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

WATER REDUCING ADMIXTURES SHALL NOT BE USED FOR CONCRETE PLACED ON THIS PROJECT.

REINFORCEMENT SHALL BE GRADE 60 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE ROADWAY WILL BE CLOSED DURING CONSTRUCTION.

THE CONTRACTOR SHALL LEVEL AND SHAPE THE FORESLOPES AROUND THE PROPOSED ABUTMENT WINGS TO MATCH EXISTING FORESLOPES. DRESSING OF SLOPES OUTSIDE THE BRIDGE AREA NOT DISTURBED BY THE BRIDGE CONTRACTOR SHALL BE PAID FOR AS EXTRA WORK.

BONDING NEW CONCRETE TO OLD CONCRETE SHALL BE DONE IN ACCORDANCE WITH SECTION 2403.15 OF THE STANDARD SPECIFICATIONS, EXCEPT AS PROVIDED ELSEWHERE FOR EPOXY BONDING.

THE BID ITEM "REMOVALS, AS PER PLAN" SHALL ENCOMPASS ALL REMOVALS OF PORTIONS OF THE EXISTING BRIDGE AS SHOWN ON THE DESIGN PLANS. THE LUMP SUM BID FOR "REMOVALS, AS PER PLAN" SHALL INCLUDE THE REMOVAL AND DISPOSAL OF PORTIONS OF THE EXISTING STRUCTURES IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS.

THE PLACEMENT OF ASPHALTIC CONCRETE DEMOLITION MATERIAL WITHIN THE STREAM CHANNEL IS PROHIBITED. ANY MATERIAL OF THIS TYPE PLACED ON THE FLOOD PLAIN MUST BE OF SUFFICIENT SIZE TO PREVENT MOVEMENT INTO THE STREAM CHANNEL DURING A FLOOD.

ALL UNSALVAGEABLE MATERIAL AND RUBBLE REMOVED FROM THE BRIDGE SHALL BE DISPOSED OF OFF THE HIGHWAY RIGHT-OF-WAY ON A WASTE AREA PROVIDED BY THE BRIDGE CONTRACTOR. THE WASTE MATERIAL MUST NOT CREATE AN UNSIGHTLY CONDITION WHEN VIEWED FROM PUBLIC HIGHWAYS. THE COST OF WASTING THIS MATERIAL IS TO BE INCLUDED IN THE LUMP SUM BID FOR "REMOVALS. AS PER PLAN". NO PAYMENT WILL BE MADE FOR OVERHAUL. DISPOSE OF BROKEN CONCRETE APPROX. 1000' EAST AS DIRECTED BY ENGINEER.

COMPLETION OF APPROACHES BEYOND THAT SHOWN ON THE PLANS, PERMANENT EROSION CONTROL AND ANY NECESSARY RELOCATION OF FIELD ENTRANCE SHALL BE BY OTHERS AND IS NOT A PART OF THIS CONTRACT.

THE CONTRACTOR MAY PLACE UP TO 200 CUBIC YARDS OF FILL MATERIAL BELOW ELEVATION 678.5 IN ORDER TO CONSTRUCT A TEMPORARY STREAM CROSSING AND/OR ACCOMPLISH OTHER WORK NECESSARY TO COMPLETE CONSTRUCTION. ADDITIONAL FILL MATERIAL MAY BE PLACED ABOVE ELEVATION 678.5 AS NECESSARY TO COMPLETE THE WORK. CULVERTS SHALL BE INSTALLED, AS REQUIRED, IN ANY TEMPORARY CROSSING TO CARRY LOW STREAM FLOWS. THE CONTRACTOR SHALL REMOVE ANY TEMPORARY CROSSINGS PRIOR TO COMPLETION OF THE PROJECT. THE COST OF INSTALLATION, MAINTENANCE, AND REMOVAL OF TEMPORARY CROSSINGS SHALL BE INCIDENTAL TO THE PROJECT.

UTILITY COMPANIES WHOSE FACILITIES ARE KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

THE CONTRACTOR SHALL VISIT THE CONSTRUCTION SITE TO ENSURE THAT HE IS FAMILIAR WITH THE EXISTING SITE CONDITIONS. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. SHOULD ANY UNDERGROUND UTILITIES BE FOUND, THEY SHALL BE PROTECTED IN PLACE AND THE ENGINEER SHALL BE IMMEDIATELY NOTIFIED. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

GENERAL NOTES (CONT'D.)

IF ARCHAEOLOGICAL MATERIALS ARE ENCOUNTERED DURING THE CONSTRUCTION PHASE OF THIS PROJECT, THE OFFICE OF PROJECT PLANNING AND/OR THE OFFICE OF LOCAL SYSTEMS (IOWA D.O.T.) MUST BE CONTACTED IMMEDIATELY SO THE PROPER AUTHORITIES CAN BE NOTIFIED ACCORDING TO THE EXISTING FEDERAL REGULATIONS AND STATE PROCEDURES. ADDITIONALLY, IT SHOULD BE NOTED THAT FINDINGS AND RECOMMENDATIONS FOR CLEARANCE FOR FURTHER TESTING CANNOT BE CONSIDERED FINAL UNTIL CONCURRENCE IS RECEIVED FROM THE STATE HISTORIC PRESERVATION OFFICER. PHONE: OFFICE OF PROJECT PLANNING-515/239-1225; OFFICE OF LOCAL SYSTEM - 515/239-1528.

IT IS THE INTENT OF THESE PLANS AND SPECIFICATIONS TO EFFECT REHABILITATION OF THIS BRIDGE AT THE MOST ECONOMICAL COST TO THE OWNER. WHILE SOME OF THE PRESTRESSED CONCRETE BEAMS HAVE DETERIORATED BEYOND USE, OTHERS MAY BE CANDIDATES FOR INCORPORATION INTO A REHABILITATED STRUCTURE. ACTUAL CONDITION OF THESE BEAMS CANNOT BE DETERMINED UNTIL THE EXISTING BRIDGE DECK IS REMOVED AND THE TOP OF ALL BEAMS CAN BE INSPECTED. IT IS UNDERSTOOD THERE WILL BE A DELAY IN SUPERSTRUCTURE REHABILITATION WORK BY THE CONTRACTOR TO PERMIT INSPECTION OF ALL BEAMS; EVALUATION AND DECISION BY THE OWNER AND ENGINEER REGARDING CONSTRUCTION OF THE "OLD" BEAM ALTERNATE OR THE "NEW" BEAM ALTERNATE; ORDERING OF THE SELECTED BEAMS BY THE CONTRACTOR; AND MANUFACTURE, CURING AND DELIVERY OF THE SELECTED BEAMS TO THE JOB SITE. THE TWO POSSIBLE ALTERNATES FOR REHABILITATION OF THE BRIDGE SUPERSTRUCTURE ARE SHOWN IN THESE PLANS.

[redacted] NO ADDITIONAL COMPENSATION WILL BE AUTHORIZED TO THE CONTRACTOR FOR TIME DELAYS DUE TO EVALUATION AND DECISION OF THE SELECTED ALTERNATE BY THE ENGINEER AND OWNER. BEAMS FOR CONSTRUCTION OF THE SELECTED ALTERNATE SHALL BE ORDERED BY THE CONTRACTOR IMMEDIATELY UPON NOTIFICATION OF THE ALTERNATE SELECTED BY THE ENGINEER.

THIS BRIDGE SITE HAS BEEN SELECTED TO USE IOWA D.O.T. PILE ANALYZER EQUIPMENT TO TEST THE BEARING CAPACITY OF AN EXISTING PRECAST CONCRETE PIER PILE LOCATED AS SHOWN ON THE "SITUATION PLAN" ON SHEET 2. ONE WEEK PRIOR TO THE TESTING OF THE CONCRETE PILE THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH PILE DRIVING EQUIPMENT INFORMATION (PILE HAMMER SIZE AND TYPE, CUSHION THICKNESS AND TYPE, ETC.). THE ENGINEER SHALL NOTIFY THE MATERIALS ENGINEER IN AMES WHEN THE PILE IS GOING TO BE TESTED AND SHALL FORWARD THE PILE DRIVING EQUIPMENT INFORMATION TO THE SOILS SECTION IN AMES SO THAT THE CONTRACTOR IS NOT CAUSED UNDUE DELAYS. THE CONTRACTOR SHALL FULLY COOPERATE TO FACILITATE THE PILE TESTING PROCEDURE.

THE PRECAST CONCRETE PILE IS TO BE TESTED DYNAMICALLY WITH A PILE ANALYZER FURNISHED AND OPERATED BY THE IOWA D.O.T. DYNAMIC MEASUREMENTS WILL BE TAKEN DURING TEST DRIVING OF THE PILE. THE CONTRACTOR SHALL PROVIDE SAFE ACCESSIBILITY FOR THE INSTALLATION OF STRAIN GAUGES AND ACCELEROMETERS. THE CONTRACTOR WILL BE REQUIRED TO DRILL THREE SHALLOW HOLES APPROXIMATELY 3/8" IN DIAMETER IN THE PILE AS DIRECTED BY THE ENGINEER IN ORDER TO INSTALL CONCRETE ANCHORS WHICH WILL BE PROVIDED BY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH A REASONABLE MEANS OF ACCESS TO THE PILE TO CONNECT WIRING TO THE GAUGES; REQUIRING APPROXIMATELY TWO HOURS. A PLATFORM WITH A MINIMUM SIZE OF 4 FEET SQUARE (16 SQ. FT.) SHALL BE PROVIDED BY THE CONTRACTOR AND SHALL BE EQUIPPED SO THAT IT MAY BE RAISED TO THE TOP OF THE PILE. ALL COSTS INCURRED BY THE CONTRACTOR FOR ASSISTING THE DYNAMIC PILE TESTING SHALL BE CONSIDERED INCIDENTAL TO THE OTHER WORK. SEE SHEET 5 FOR DETAILS AND NOTES REGARDING PARTIAL PIER CAP REMOVAL AND RECONSTRUCTION ASSOCIATED WITH THIS TESTING.

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-9 INTERIOR SPAN — 68'-1½ END SPANS

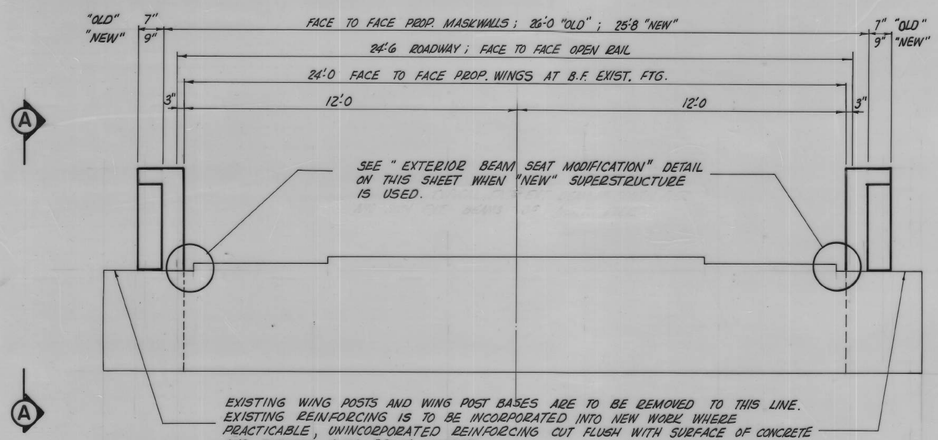
ESTIMATED QUANT.'S & REMOVAL NOTES

STATION 51 + 15 — 0° SKEW

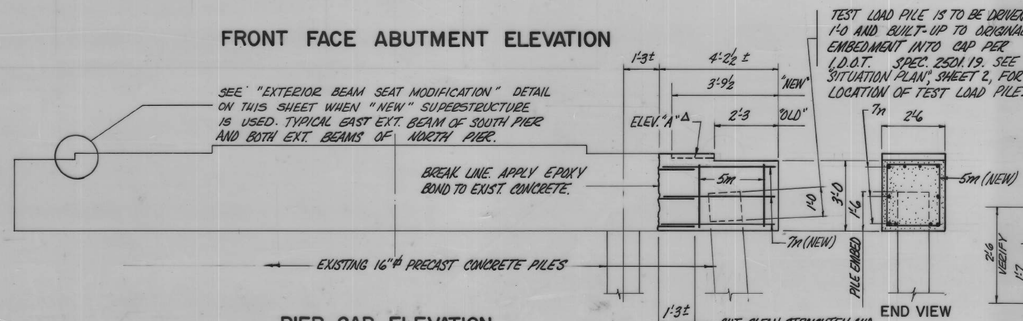
CRAWFORD COUNTY — IOWA

SHEET 4 OF 20

BENCHMARK: S.W. CORNER OF CONCRETE BASE OF R.E.C. HIGH VOLTAGE BOX, 59' RT. STA. 50+00; EL. = 702.30

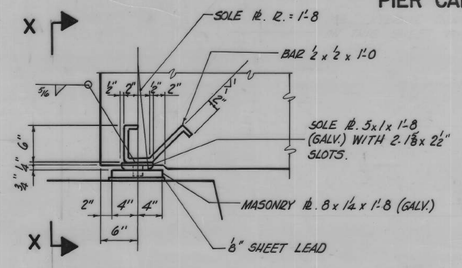


FRONT FACE ABUTMENT ELEVATION

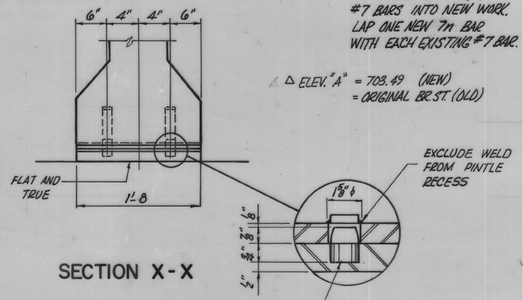


PIER CAP ELEVATION

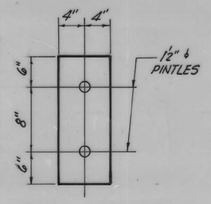
END VIEW



PART ELEVATION



SECTION X-X

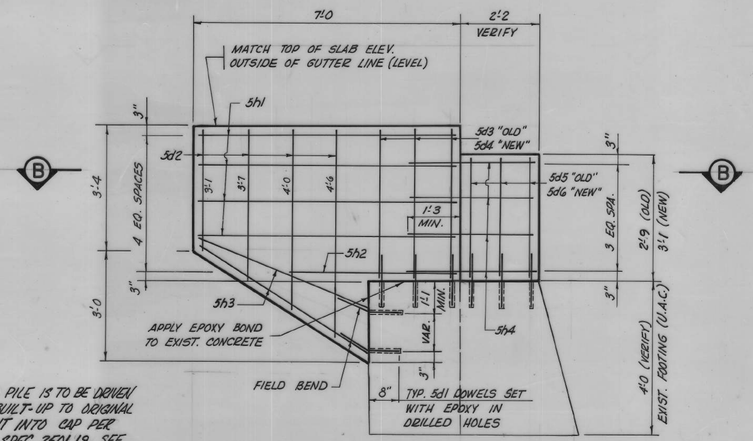


MASONRY PLATE PLAN

BEARING NOTES

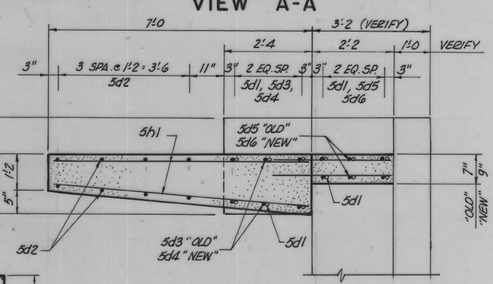
MASONRY PLATES AND SOLE PLATES ARE TO BE GALVANIZED.
CONTACT SURFACES OF MASONRY AND SOLE PLATES SHALL BE FINISHED ANSI 250.
MASONRY PLATES ARE TO BE SET IN 1/8" SHEET LEAD (COST INCIDENTAL TO "STRUCTURAL STEEL".)
PINTLES AND MASONRY PLATES ARE A PART OF THE SUPERSTRUCTURE STRUCTURAL STEEL QUANTITY.
COST OF ANCHORED CURVED SOLE PLATES SHALL BE INCLUDED IN PRICE BID FOR PRETENSIONED PRESTRESSED CONCRETE BEAMS.
WT. OF BEARING (EXCLUDING SOLE PLATE) = 58 LBS. EACH
6 BEARINGS REQUIRED ("OLD").
8 BEARINGS REQUIRED ("NEW").

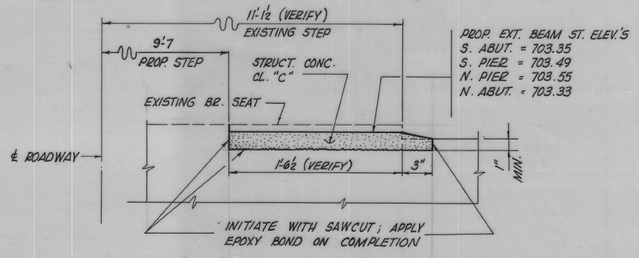
BEARING DETAILS



SECTION B-B

VIEW A-A





EXTERIOR BEAM SEAT MODIFICATION

USE WITH "NEW" SUPERSTRUCTURE ONLY.

REINFORCING BAR LIST - ONE ABUTMENT AND PIER CAP RECONSTRUCTION

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5d1	WING AND MASKWALL, DOWELS	——	24	2'-0	30
5d2	WING, VERTICAL, BOTH FACES	——	16	SHOWN	63
5d3	WING, VERT., BOTH FACES, "OLD"	——	12	3'-5	43
5d4	WING, VERT., BOTH FACES, "NEW"	——	12	3'-9	47
5d5	MASKWALL, VERT., BOTH FACES, "OLD"	——	12	2'-7	32
5d6	MASKWALL, VERT., BOTH FACES, "NEW"	——	12	2'-11	37
5h1	WING, HORIZ., BOTH FACES	——	16	6'-8	111
5h2	WING, HORIZ., BOTH FACES	——	4	4'-3	18
5h3	WING, HORIZ., BOTH FACES	——	8	5'-4	44
5h4	MASKWALL, HORIZ., BOTH FACES	——	16	3'-3	54
5m	PIER CAP AT TEST PILE-HOOPS	□	2	10'-5	22
7n	PIER CAP AT TEST PILE LONGIT.	——	10	4'-0	82
	TOTAL LBS. "OLD"				519
	TOTAL LBS. "NEW"				528

ESTIMATED QUANTITIES - TWO ABUTMENTS AND PIER CAP RECONSTRUCTION

ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE, CLASS "D" (OLD)	C.Y.	7.8
STRUCTURAL CONCRETE, CLASS "D" (NEW)	C.Y.	8.4 *
REINFORCING STEEL (OLD)	LBS.	1038
REINFORCING STEEL (NEW)	LBS.	1056

* INCLUDES 0.2 C.Y. FOR PIER AND ABUTMENT EXTERIOR BEAM SEAT MODIFICATIONS.
NOTE: BOTH CONCRETE QUANTITIES INCLUDE 0.9 C.Y. FOR PIER CAP RECONSTRUCTION.

SUBSTRUCTURE NOTES

ALL EXPOSED CORNERS 90 DEGREES OR SHARPER ARE TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP. MINIMUM DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS NOTED OTHERWISE. ALL REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED.

DIMENSIONS SHOWN FOR EXISTING SUBSTRUCTURES ARE FROM EXISTING PLANS. FIELD VERIFY ALL CRITICAL DIMENSIONS/ELEVATIONS.

INITIATE ALL REMOVAL LINES WITH SAW CUTS. FOR NOTES ON CONCRETE REMOVAL, DOWEL INSTALLATION, AND EPOXY BONDING, SEE SHEET 3.

THE EXISTING CREOSOTES WOOD ABUTMENT PILES WILL CARRY THE "OLD" AND "NEW" ALTERNATE SUPERSTRUCTURES WITH HS20-44 LIVE LOAD (NO IMPACT) AND 20 LBS. PER SQ. FT. OF ROADWAY FOR FUTURE WEARING SURFACE.

DESIGN CAPACITY FOR PIER PILES IS 47 TONS PER PILE. SEE "GENERAL NOTES" ON SHEET 4, FOR NOTES REGARDING PIER PILE LOAD TEST REQUIREMENTS.

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

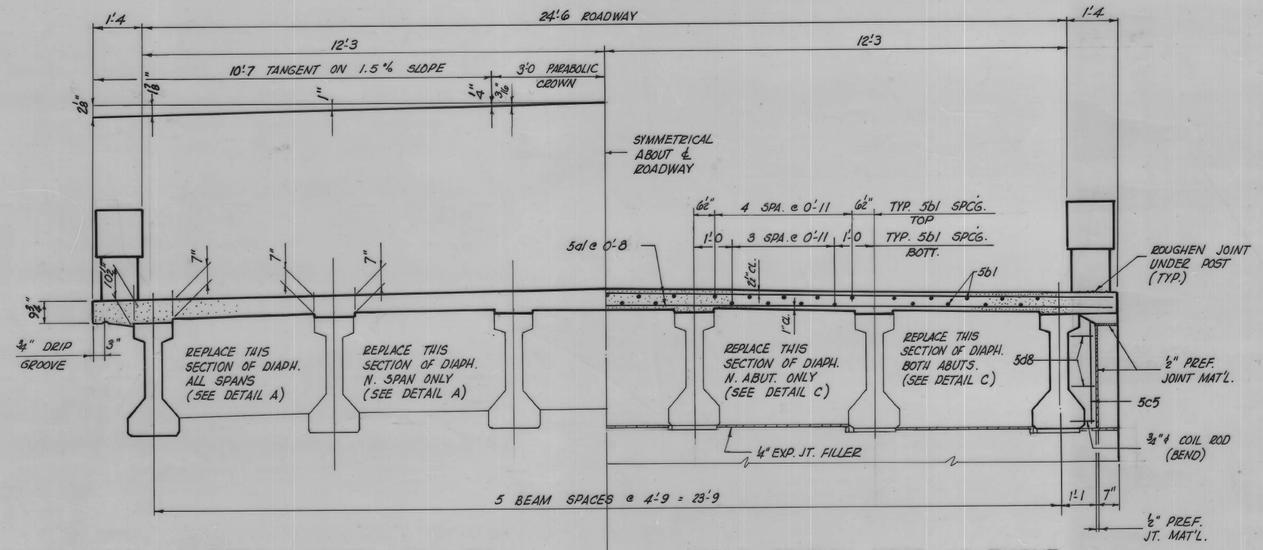
68'-9 INTERIOR SPAN 68'-1½ END SPANS

SUBSTRUCTURE MODIFICATION DETAILS

STATION 51+15 0° SKEW

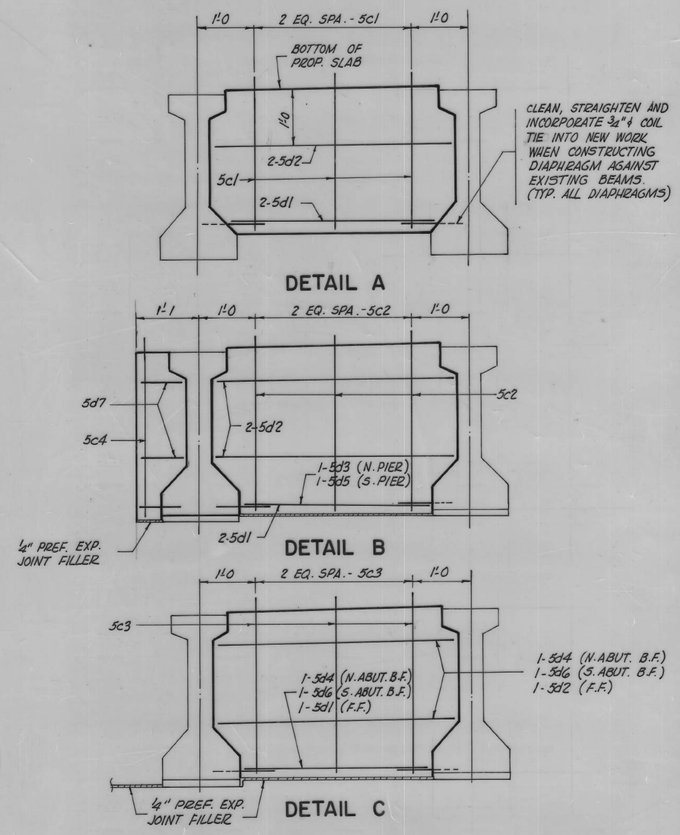
CRAWFORD COUNTY IOWA

SHEET 5 OF 20



HALF SECTION NEAR MID-SPAN

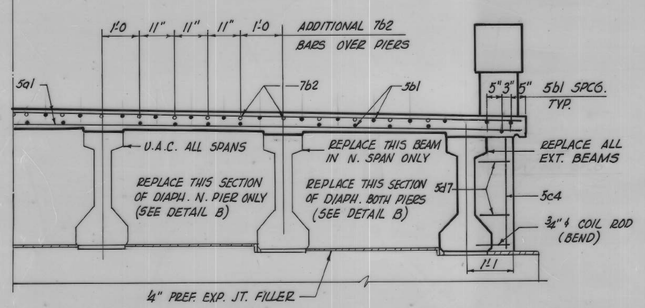
HALF SECTION NEAR ABUTMENT



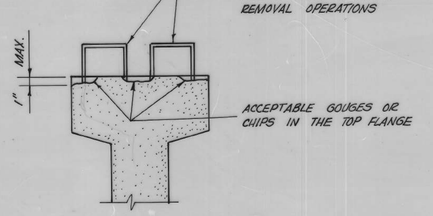
DETAIL A

DETAIL B

DETAIL C



HALF SECTION NEAR PIER



ALLOWABLE BEAM DAMAGE DETAILS TO TOP OF EXISTING BEAMS

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-9 INTERIOR SPAN — 68'-1½ END SPANS

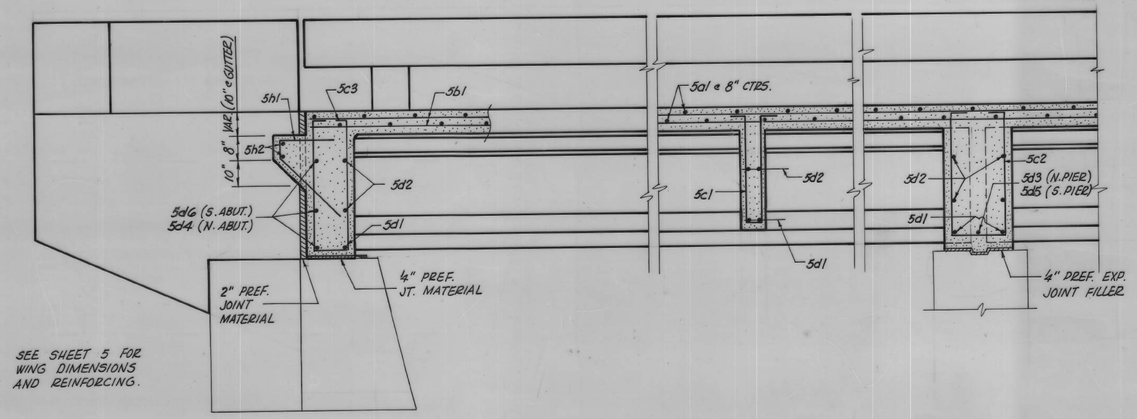
SUPERSTRUCTURE DETAILS (OLD)

STATION 51 + 15 — 0°SKEW

CRAWFORD COUNTY — IOWA

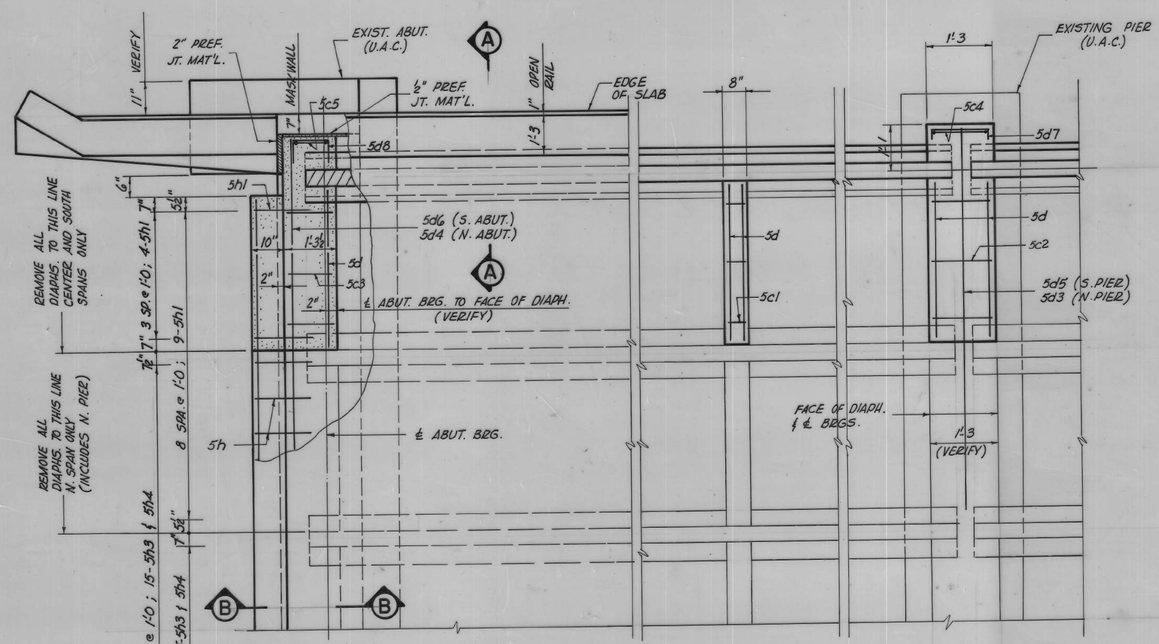
CALHOUN-BURNS & ASSOCIATES, INC. CONSULTING ENGINEERS
WEST DES MOINES, IOWA 50311 (515) 224-4344

SEE OPEN RAIL DETAILS - SHEET 17
FOR RAIL DETAILS.

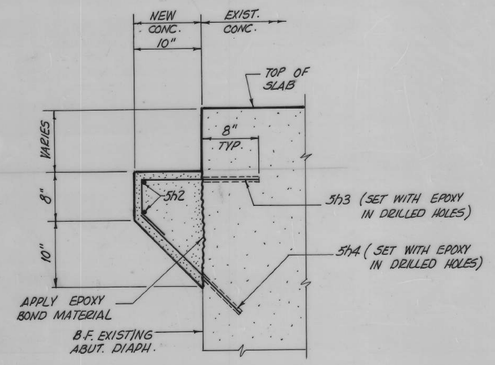


SEE SHEET 5 FOR WING DIMENSIONS AND REINFORCING.

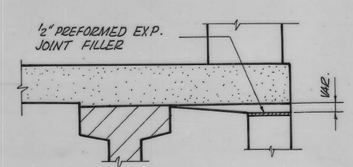
LONGITUDINAL SECTION NEAR EXTERIOR BEAM



PART PLAN



SECTION B-B
(FOR CONSTRUCTING PAVING NOTCH ON EXISTING DIAPHRAGM)



SECTION A-A

SUPERSTRUCTURE NOTES (OLD)

THE EXISTING PRETENSIONED PRESTRESSED CONCRETE BEAMS ARE FROM I.D.O.T. STANDARD H11-3(OBSOLETE) AND ARE DESIGNED FOR H15-44 LIVE LOADING WITH NO ALLOWANCE FOR FUTURE WEARING SURFACE.

THE PROPOSED A67-SPECIAL REPLACEMENT BEAMS, SHOWN ON SHEET 10, ARE DESIGNED FOR H20-44 LIVE LOADING PLUS 20 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

THE CONCRETE FOR THE SECTIONS OF DIAPHRAGMS TO BE REPLACED, AS SHOWN ON SHEET 9, SHALL BE PLACED MONOLITHICALLY WITH THE DECK SLAB.

THE COST OF ALL NEOPRENE BEARING PADS USED AS BEARINGS AT THE PIERS SHALL BE INCLUDED IN THE PRICE BID FOR "PRETENSIONED, PRESTRESSED CONCRETE BEAMS".

THE COST OF ALL PREFORMED EXPANSION JOINT FILLER MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE".

ALL BEAMS SHALL BE SET VERTICAL.

FORMS FOR THE DECK SLAB AND OPEN RAIL SHALL BE SUPPORTED BY THE PRESTRESSED CONCRETE BEAMS.

ALL EXPOSED CORNERS OF 90 DEGREES OR SHARPER SHALL BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.

THE CLEAR DISTANCE FROM FACE OF CONCRETE TO THE NEAR REINFORCING BAR SHALL BE 2" UNLESS OTHERWISE NOTED OR SHOWN. ALL REINFORCING BARS ARE TO BE SECURELY WIRED IN PLACE AND ADEQUATELY SUPPORTED ON BAR CHAIRS BEFORE CONCRETE IS PLACED.

COIL RODS AND COIL TIES SHALL BE INCIDENTAL TO THE COST OF "PRETENSIONED, PRESTRESSED CONCRETE BEAMS".

THE DECK SLAB AS SHOWN INCLUDES 1/2" FOR AN INTEGRAL WEARING SURFACE.

TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2 1/2" CLEAR BELOW TOP OF SLAB. BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE THE BOTTOM OF SLAB. TOP AND BOTTOM REINFORCING STEEL IS TO BE SUPPORTED BY METAL BAR CHAIRS SPACED AT NO MORE THAN 3'-0 CENTERS LONGITUDINALLY OR TRANSVERSELY, OR BY CONTINUOUS ROWS OF METAL HIGH CHAIRS OR SLAB BOLSTERS SPACED AT 4'-0 APART.

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-9 INTERIOR SPAN — 68'-½ END SPANS

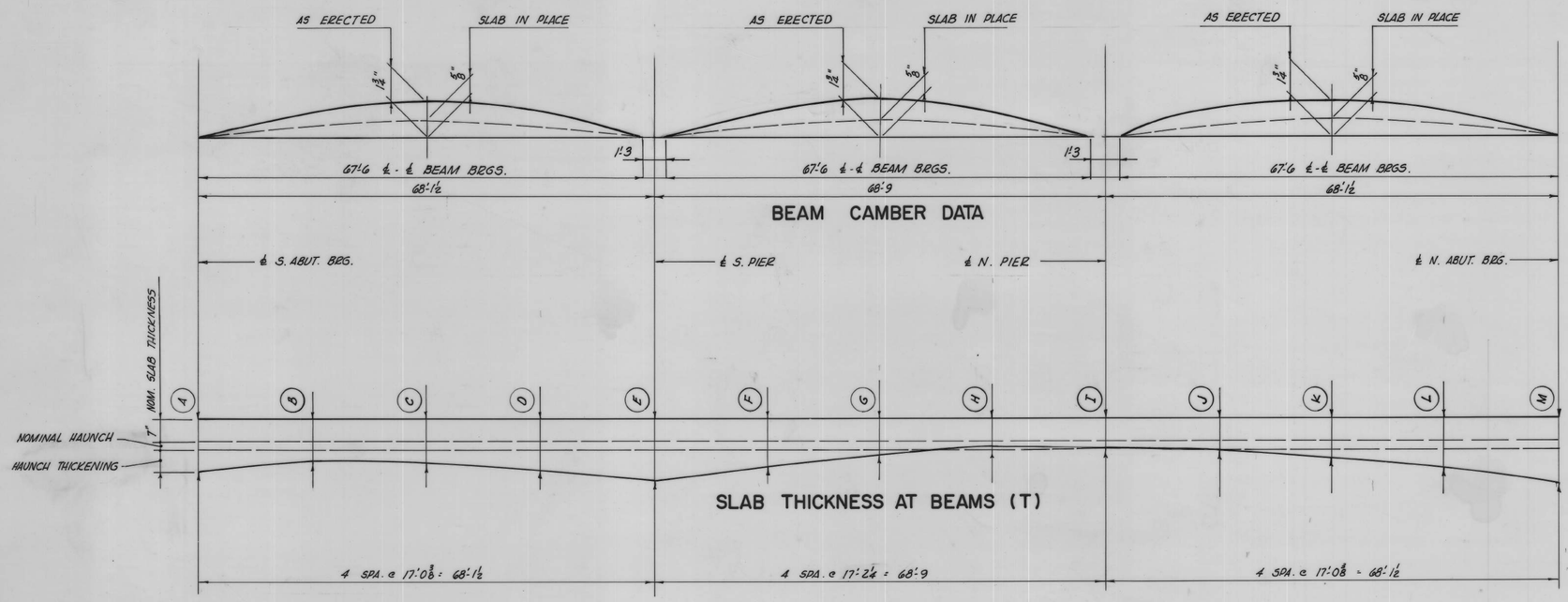
SUPERSTRUCTURE DETAILS (OLD)

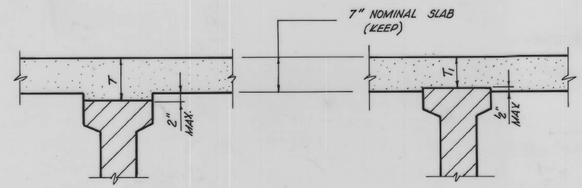
STATION 51 + 15 — 0° SKEW

CRAWFORD COUNTY — IOWA

SHEET 7 OF 20

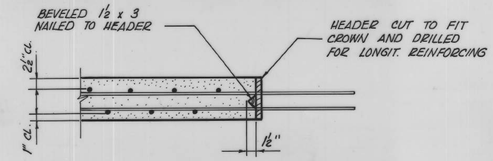
BENCHMARK: S.W. CORNER OF CONCRETE BASE OF R.E.C. HIGH VOLTAGE BOX, 59' RT. STA. 50+00; EL. = 702.30





SLAB THICKNESS DETAILS

NOTE: THE SLAB THICKNESS (T) AT BEAMS IS BASED ON THE ANTICIPATED BEAM CAMBER REMAINING AFTER PLACING THE SLAB, BUT IS NOT GUARANTEED FOR CONSTRUCTION. IF BEAM IS UNDER CAMBERED, INCREASE SLAB THICKNESS (T) AT BEAMS TO COMPENSATE. IF BEAM IS OVER CAMBERED, THE SLAB THICKNESS (T) MAY BE DECREASED TO A MAXIMUM OF 1/2" EMBEDMENT AT THE BEAM (T). IF MORE THAN 1/2" EMBEDMENT IS REQUIRED, OR IF THE HAUNCH EXCEEDS 2", THE GRADE LINE IS TO BE REVISED.

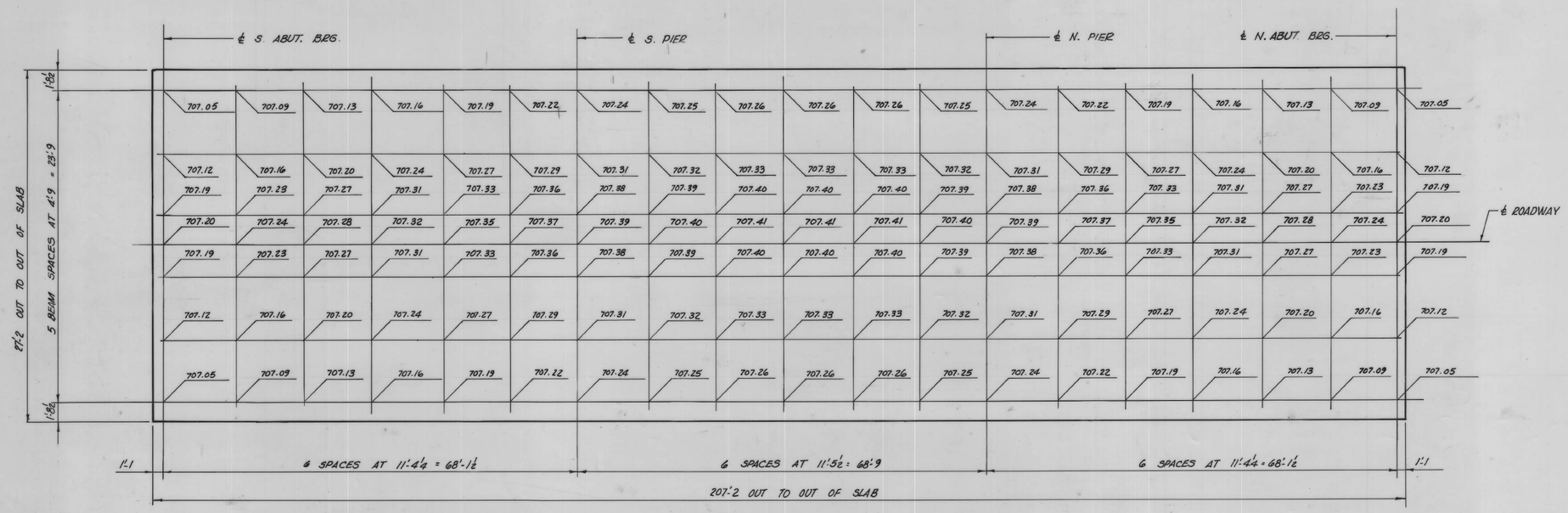


TRANSVERSE FLOOR
CONSTRUCTION JOINT

SLAB THICKNESS DIMENSION TABLE

DIMENSION	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)	(M)
INTERIOR BEAM	8 3/16	8 0	8 1/4	8 5/16	8 3/8	8 0	7 15/16	7 7/8	7 13/16	7 11/16	7 5/8	8 5/16	8 1/16
INTERMEDIATE BEAM	8 1/4	7 15/16	8 1/16	8 1/8	8 1/16	7 15/16	7 7/8	7 13/16	7 1/2	7 1/2	7 11/16	8	8 1/2
EXTERIOR BEAM	8 3/4	8 7/16	8 5/16	8 3/8	8 5/16	8 7/16	8 0	7 15/16	8	8	8 1/16	8 1/2	9

NOTE: SLAB THICKNESSES SHOWN ARE FOR ESTIMATING PURPOSES ONLY AND ARE NOT GUARANTEED FOR CONSTRUCTION.



TOP OF SLAB ELEVATIONS

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

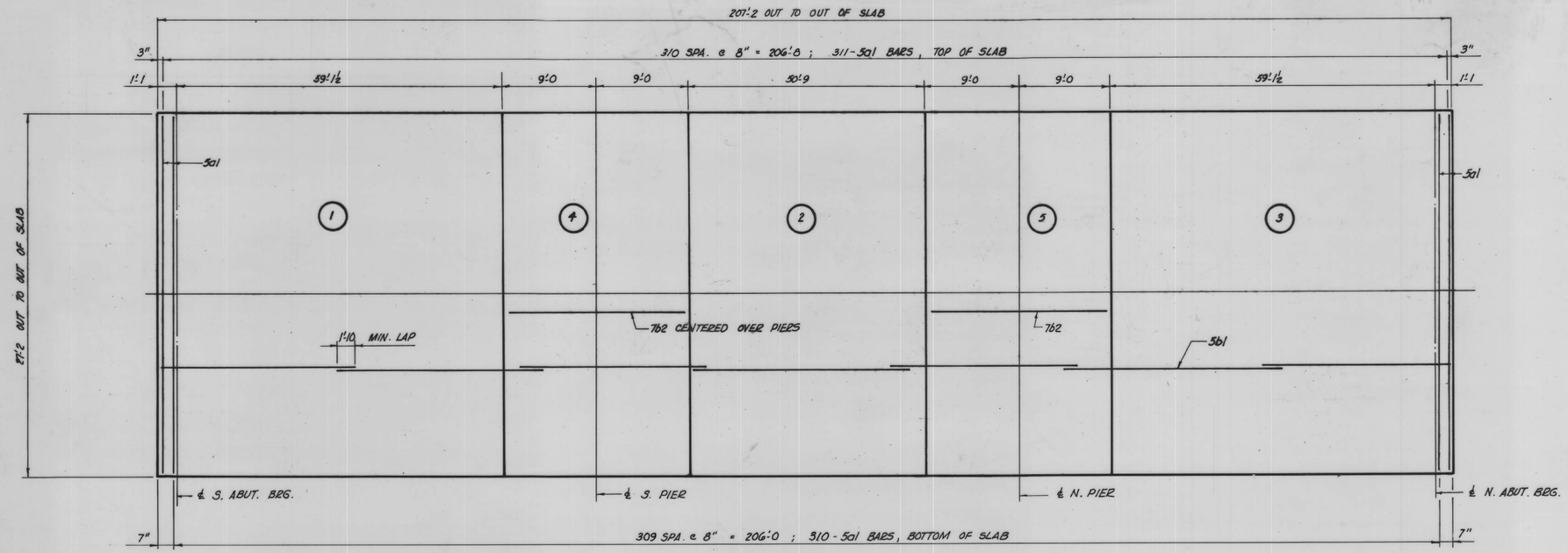
68'-9 INTERIOR SPAN 68'-1 1/2 END SPANS

SUPERSTRUCTURE DETAILS (OLD)

STATION 51 + 15 0° SKEW

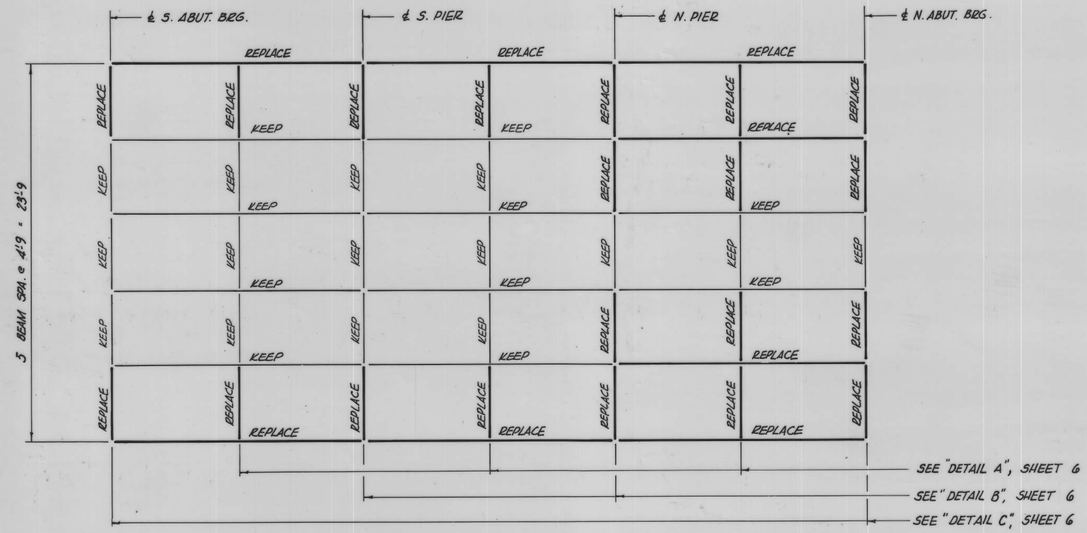
CRAWFORD COUNTY IOWA

SHEET 8 OF 20



CONCRETE PLACEMENT DIAGRAM AND TRANSVERSE REINFORCING STEEL LAYOUT

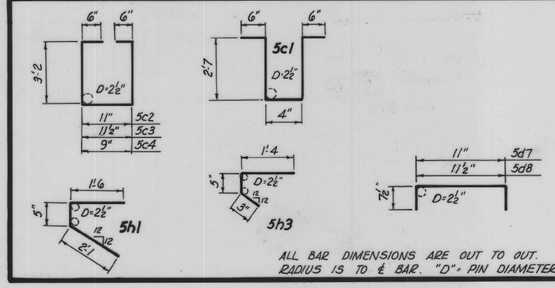
ROADWAY SLAB SHALL BE PLACED IN SECTIONS AND IN SEQUENCE INDICATED BY ENCIRCLED NUMBERS ON PLACEMENT DIAGRAM. ALL SLAB REINFORCING STEEL IN EACH INDIVIDUAL UNIT IS TO BE IN PLACE BEFORE ANY SECTION IS POURED. ALTERNATE PROCEDURES FOR PLACING CONCRETE MAY BE SUBMITTED FOR APPROVAL, TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD, AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULT.



SCHEMATIC LAYOUT OF BEAM AND DIAPHRAGM REPLACEMENTS

(BASED ON PRELIMINARY REVIEW OF CONDITION OF EACH BEAM & DIAPHRAGM. SEE "GENERAL NOTES", SHEET 4.

BENT BAR DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT. RADIUS IS TO ℄ BAR. "D" = PIN DIAMETER

REINFORCING BAR LIST - SUPERSTRUCTURE

	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
△	5a1	SLAB, TRANSVERSE	—	621	26'-10	17,380
△	5b1	SLAB, LONGITUDINAL	—	357	31'-0	11,543
△	7b2	SLAB, LONGITUDINAL, AT PIERS	—	52	17'-8	1,878
	5c1	INTERM. DIAPHRAGM, HOOPS	⊔	24	6'-6	163
	5c2	PIER DIAPHRAGM, HOOPS	□	18	8'-3	155
△	5c3	ABUT. DIAPHRAGM, HOOPS	□	18	8'-1	152
	5c4	PIER DIAPHRAGM, END, HOOPS	□	4	8'-1	34
	5c5	ABUT. DIAPHRAGM, END, VERT.	—	8	2'-9	23
	5d1	ALL DIAPHRAGMS, BOTTOM	—	36	3'-3	122
	5d2	ALL DIAPHRAGMS, LONGIT.	—	52	4'-2	226
	5d3	N. PIER DIAPH., BOTTOM	—	1	10'-1	11
△	5d4	N. ABUT. DIAPHRAGM, B.F.	—	3	10'-2	32
	5d5	S. PIER DIAPHRAGM, BOTTOM	—	1	5'-1	5
△	5d6	S. ABUT. DIAPHRAGM, B.F.	—	3	5'-4	17
	5d7	PIER DIAPHRAGM, END, TIES	⊓	8	2'-2	18
	5d8	ABUT. DIAPHRAGM, END, TIES	⊓	8	2'-0	17
△	5h1	PAVING NOTCH, TRANSVERSE	⊏	26	4'-0	108
△	5h2	PAVING NOTCH, LONGITUDINAL	—	4	22'-8	95
△	5h3	PAVING NOTCH, TRANSV., DOWEL	⊏	20	2'-0	42
△	5h4	PAVING NOTCH, TRANSV., DOWEL	—	20	1'-10	38
△		TWO (2) CONCRETE OPEN RAILS				8,897
		TOTAL (LBS.) UNCOATED				774
△ EPOXY COATED		TOTAL (LBS.) EPOXY COATED				40,182

CONCRETE PLACEMENT QUANT. - SUPERSTR.

LOCATION	QUANTITIES
SECTION (1)	40.2
SECTION (2)	31.6
SECTION (3)	42.4
SECTION (4)	12.6
SECTION (5)	13.4
TOTAL (CU. YDS.)	140.2

ESTIMATED QUANTITIES - SUPERSTR.

ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE, CLASS "D"	C.Y.	140.2
REINFORCING STEEL - UNCOATED	LBS.	774
REINFORCING STEEL - EPOXY COATED	LBS.	40,182
STRUCTURAL STEEL	LBS.	348
PRET. PRESTR. CONC. BEAMS (A67-SPECIAL)	NO.	8

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

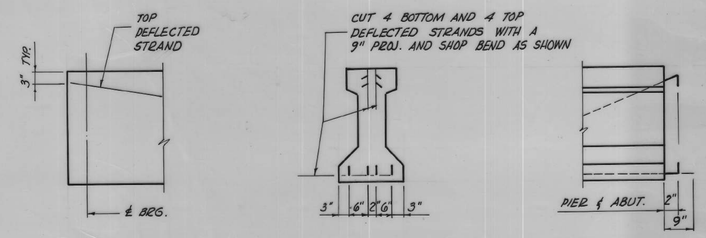
68'-9 INTERIOR SPAN — 68'-1½ END SPANS

SUPERSTRUCTURE DETAILS (OLD)

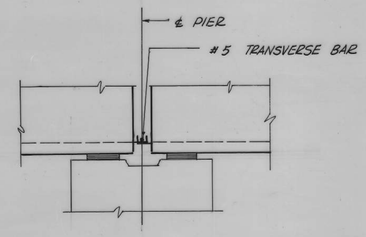
STATION 51+15 — 0° SKEW

CRAWFORD COUNTY — IOWA

SHEET 9 OF 20



BEAM END DETAILS

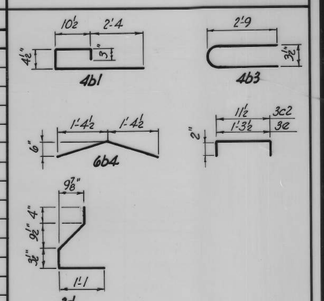


BEAM DETAIL AT EXISTING PIER

(PIER DIAPHRAGM NOT SHOWN)

BAR LIST			
BEAM		A67 (SPECIAL)	
SPAN		67'-6	
BAR	SHAPE	NO.	LENGTH
6a1	—	4	35'-1
4a2	—	2	3'-3
4b1	⊓	104	4'-9
4b3	⊔	8	5'-8
6b4	⋀	12	2'-11
3c2	⌐ ⌐	52	1'-4
* 3d	↳	120	2'-10
3e	⌐ ⌐	16	1'-8

BENT BAR DETAILS

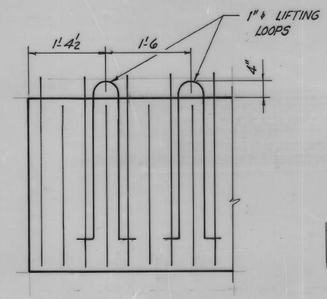


ALL BAR DIMENSIONS ARE OUT TO OUT.

BEAM DATA

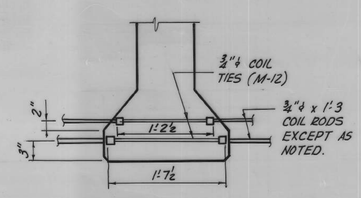
BEAM	A67 (SPECIAL)
SPAN	67'-6
INITIAL PRESTRESS (KIPS)	635
SIZE STRANDS	½"
STRAIGHT STRANDS	16
DEFLECTED STRANDS	6
HOLD DOWN FORCE (KIPS)	12
CAMBER ②	1.29 / 1.75
DEAD LOAD DEFLECTION ① ③	1.06 / 0.26
REINFORCING STEEL (LBS.)	792
CONCRETE (CU.YDS.)	8.03

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 THE 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.

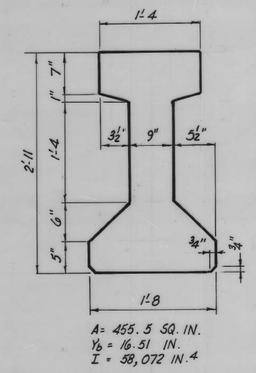


LIFTING LOOP DETAILS

LIFTING LOOPS ARE TO BE STRUCTURAL GRADE STEEL. ALTERNATE TYPES MAY BE SUBSTITUTED WITH APPROVAL OF THE ENGINEER.

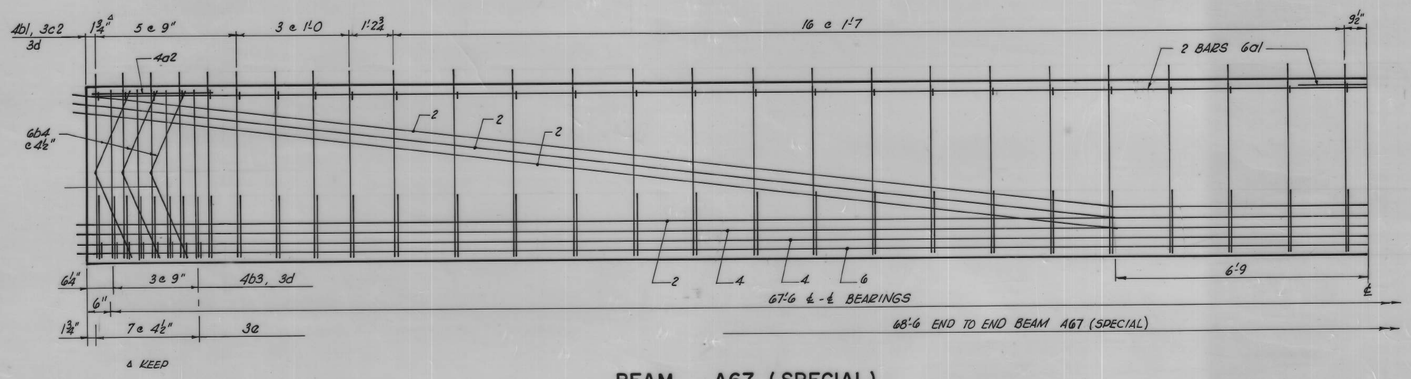


COIL TIE DETAILS

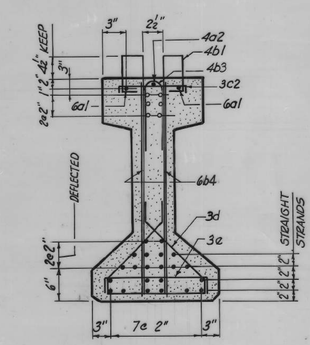


A= 455.5 SQ. IN.
Y_b = 16.51 IN.
I = 58,072 IN.⁴

BEAM A67 (SPECIAL)



BEAM A67 (SPECIAL)



BEAM A67 (SPECIAL)

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

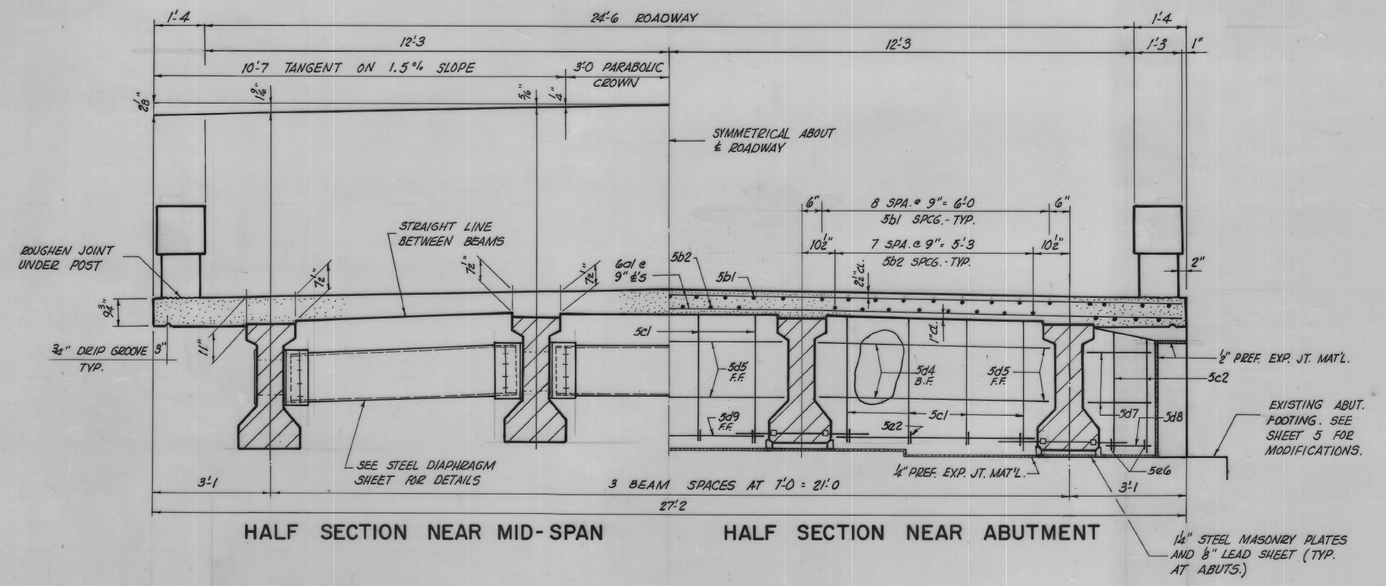
68'-9 INTERIOR SPAN — 68'-1½ END SPANS

BEAM DETAILS (OLD)

STATION 51+15 — 0° SKEW

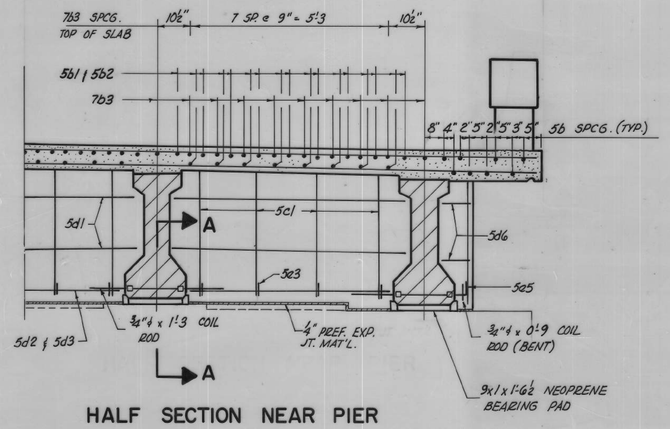
CRAWFORD COUNTY — IOWA

CALHOUN-BURNS & ASSOCIATES, INC. CONSULTING ENGINEERS
WEST DES MOINES, IOWA 50311 (515) 224-4344

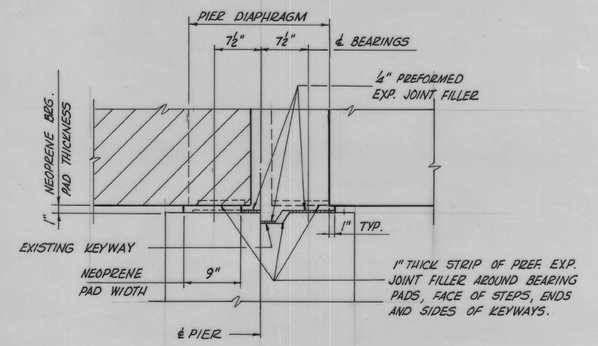


HALF SECTION NEAR MID-SPAN

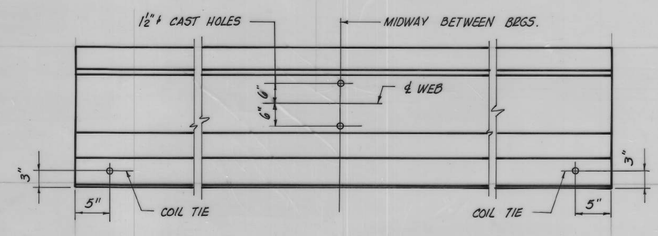
HALF SECTION NEAR ABUTMENT



HALF SECTION NEAR PIER



SECTION A-A



LOCATION OF BEAM COIL TIES AND STEEL DIAPHRAGM BOLT HOLES

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

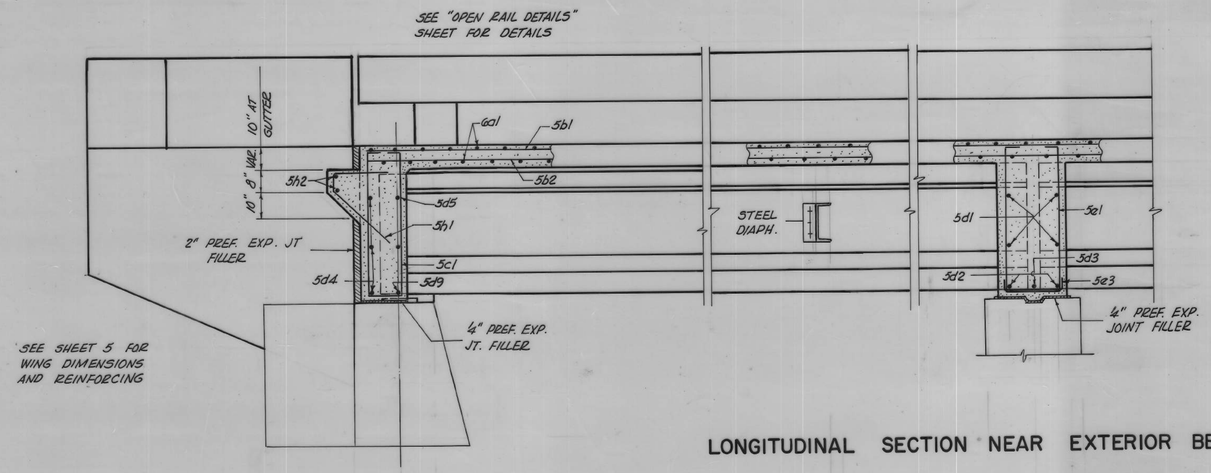
68'-9 INTERIOR SPANS 68'-1½ END SPANS

SUPERSTRUCTURE DETAILS (NEW)

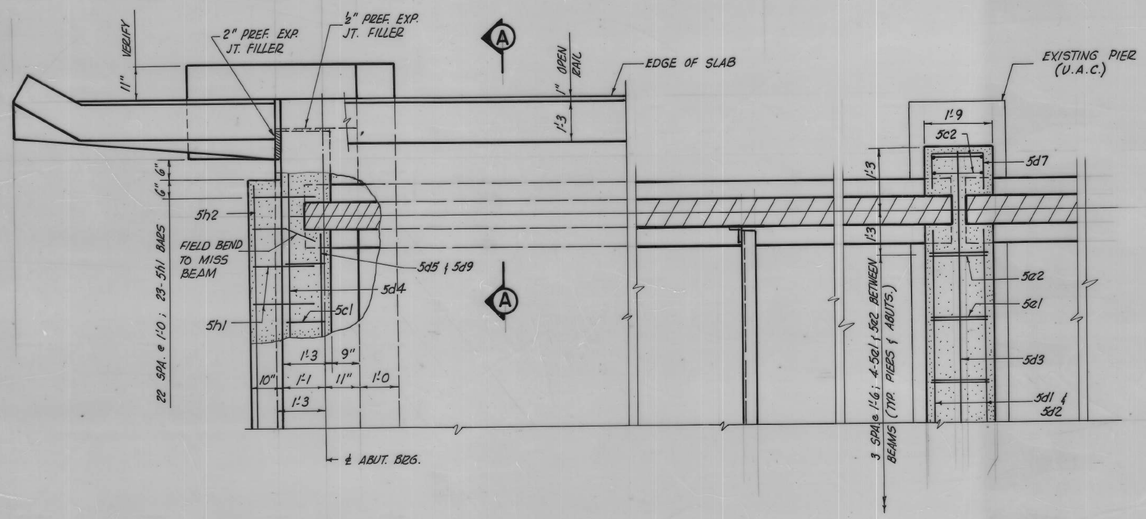
STATION 51+15 0° SKEW

CRAWFORD COUNTY IOWA

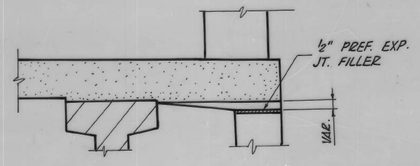
SHEET 11 OF 20



LONGITUDINAL SECTION NEAR EXTERIOR BEAM



PART PLAN



SECTION A-A

SUPERSTRUCTURE NOTES (NEW)

THE "NEW" BEAMS AND DECK SLAB ARE DESIGNED FOR HS20-44 LOADING PLUS 20 LBS. PER SQ. FT. OF ROADWAY FOR FUTURE WEARING SURFACE.

SLAB THICKNESS INCLUDES 1/2" INTEGRAL WEARING SURFACE.

ALL EXPOSED CORNERS OF 90 DEGREES OR SHARPER ARE TO BE FORMED WITH A 3/4" DRESSED AND BEVELED STRIP. CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR SHALL BE 2" UNLESS OTHERWISE NOTED OR SHOWN. ALL REINFORCING BARS ARE TO BE SECURELY WIRED IN PLACE AND ADEQUATELY SUPPORTED ON BAR CHAIRS BEFORE CONCRETE IS PLACED.

ALL BEAMS ARE TO BE SET VERTICAL.

FORMS FOR THE SLAB AND OPEN RAIL ARE TO BE SUPPORTED BY THE PRESTRESSED BEAMS.

TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2 1/2" CLEAR BELOW TOP OF SLAB. BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF SLAB. TOP AND BOTTOM REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL METAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0 CENTERS LONGITUDINALLY OR TRANSVERSELY, SPACED AT 4'-0 APART.

COIL RODS AND COIL TIES ARE INCIDENTAL TO THE COST OF "PRETENSIONED PRESTRESSED CONCRETE BEAMS."

THE PIER AND ABUTMENT DIAPHRAGM CONCRETE IS TO BE PLACED MONOLITHIC WITH THE DECK SLAB AS SHOWN.

COST OF ALL PREFORMED EXPANSION JOINT FILLER MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE".

COST OF BEARING MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR PRESTRESSED BEAMS (NEOPRENE BEARINGS AND ABUTMENT SOLE PLATES ONLY.)

ALL REINFORCING IS TO BE GRADE 60.

THE EPOXY COATING OF CERTAIN REINFORCING BARS, AS DESIGNATED ON THE PLANS, SHALL BE IN ACCORDANCE WITH ARTICLE 4151.038 OF THE STANDARD SPECIFICATIONS OF THE IOWA DOT - HIGHWAY DIVISION.

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-9 INTERIOR SPANS 68'-1½ END SPANS

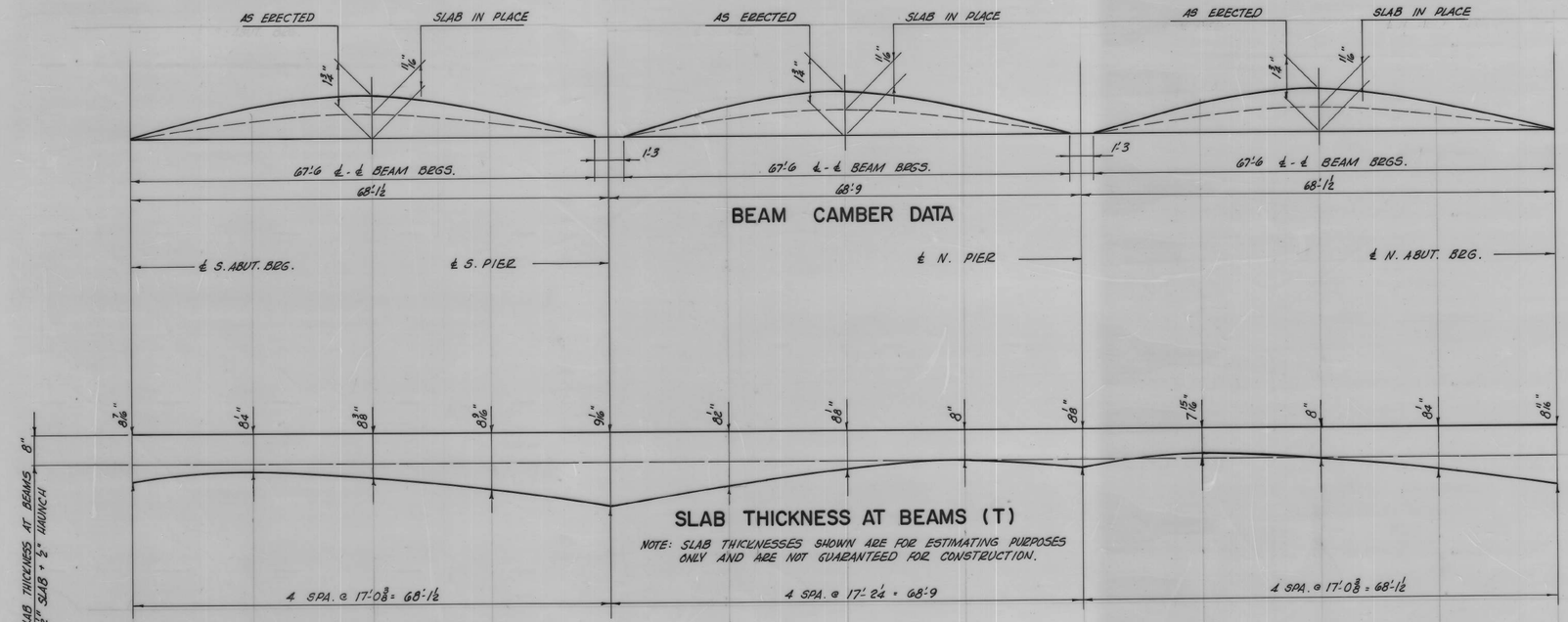
SUPERSTRUCTURE DETAILS (NEW)

STATION 51 + 15 0° SKEW

CRAWFORD COUNTY IOWA

SHEET 12 OF 20

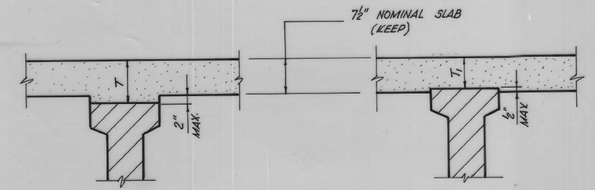
BENCHMARK: S.W. CORNER OF CONCRETE BASE OF R.E.C. HIGH VOLTAGE BOX, 59' RT. STA. 50+00; EL. = 702.30



BEAM CAMBER DATA

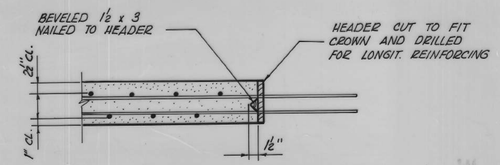
SLAB THICKNESS AT BEAMS (T)

NOTE: SLAB THICKNESSES SHOWN ARE FOR ESTIMATING PURPOSES ONLY AND ARE NOT GUARANTEED FOR CONSTRUCTION.

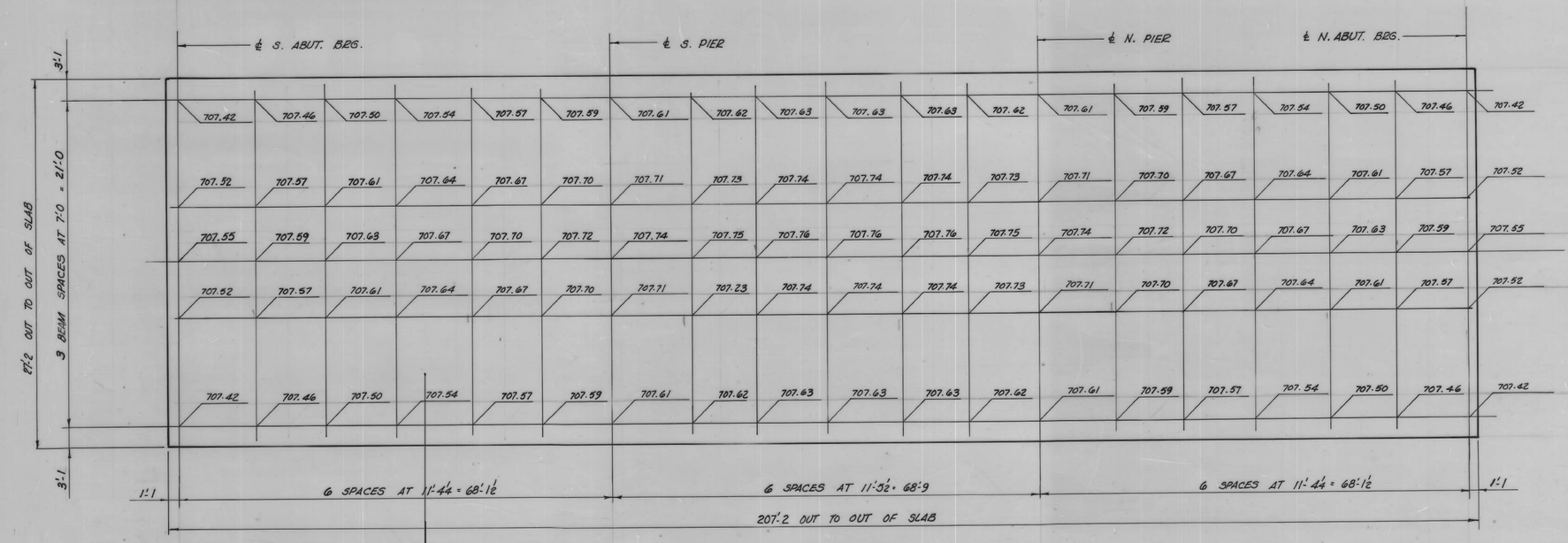


SLAB THICKNESS DETAILS

NOTE: THE SLAB THICKNESS (T) AT BEAMS IS BASED ON THE ANTICIPATED BEAM CAMBER REMAINING AFTER PLACING THE SLAB, BUT IS NOT GUARANTEED FOR CONSTRUCTION. IF BEAM IS UNDER CAMBERED, INCREASE SLAB THICKNESS (T) AT BEAMS TO COMPENSATE. IF BEAM IS OVER CAMBERED, THE SLAB THICKNESS (T) MAY BE DECREASED TO A MAXIMUM OF ½" EMBEDMENT AT THE BEAM (T_1). IF MORE THAN ½" EMBEDMENT IS REQUIRED, OR IF THE HAUNCH EXCEEDS 2", THE GRADE LINE IS TO BE REVISED.



TRANSVERSE FLOOR CONSTRUCTION JOINT



TOP OF SLAB ELEVATIONS

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

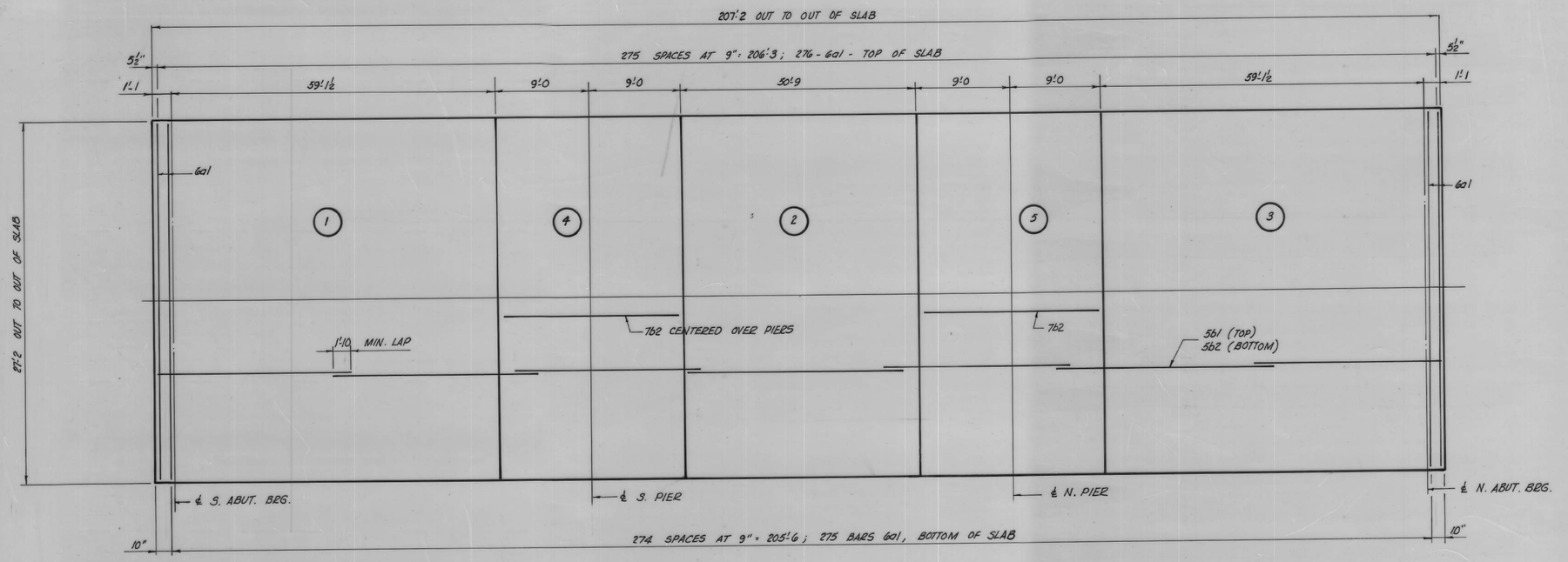
68'-9 INTERIOR SPAN 68'-1½ END SPANS

SUPERSTRUCTURE DETAILS (NEW)

STATION 51 + 15 0° SKEW

CRAWFORD COUNTY IOWA

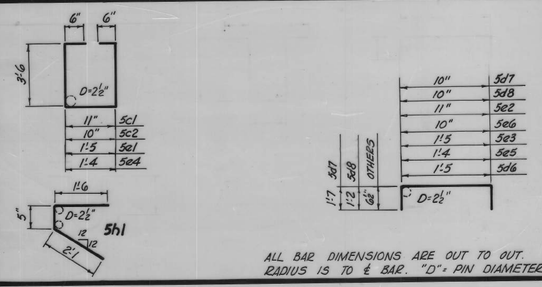
SHEET 13 OF 20



CONCRETE PLACEMENT DIAGRAM AND TRANSVERSE REINFORCING STEEL LAYOUT

ROADWAY SLAB SHALL BE PLACED IN SECTIONS AND IN SEQUENCE INDICATED BY ENCIRCLED NUMBERS ON PLACEMENT DIAGRAM. ALL SLAB REINFORCING STEEL IN EACH INDIVIDUAL UNIT IS TO BE IN PLACE BEFORE ANY SECTION IS POURED. ALTERNATE PROCEDURES FOR PLACING CONCRETE MAY BE SUBMITTED FOR APPROVAL, TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD, AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULT.

BENT BAR DETAILS



ALL BAR DIMENSIONS ARE OUT TO OUT. RADIUS IS TO ℄ BAR. "D" = PIN DIAMETER

REINFORCING BAR LIST - SUPERSTRUCTURE

	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
△	6a1	SLAB, TRANSVERSE	—	551	26'-10	22,207
△	5b1	SLAB, LONGITUDINAL, TOP	—	245	31'-0	7,922
△	5b2	SLAB, LONGITUDINAL, BOTTOM	—	224	31'-0	7,243
△	7b3	SLAB, LONGITUDINAL, AT PIERS	—	56	17'-8	2,023
△	5c1	ABUT. DIAPHRAGM, HOOPS	□	24	8'-11	223
△	5c2	ABUT. DIAPHRAGM, HOOPS, ENDS	□	8	8'-10	74
	5d1	PIER DIAPHRAGM, LONGITUDINAL	—	24	6'-2	154
	5d2	PIER DIAPHRAGM, LONGITUDINAL, BOTT.	—	12	5'-2	65
	5d3	PIER DIAPHRAGM, LONGITUDINAL, BOTT.	—	2	23'-2	48
△	5d4	ABUT. DIAPHRAGM, LONGITUDINAL, B.F.	—	6	25'-3	158
	5d5	ABUT. DIAPHRAGM, LONGITUDINAL, F.F.	—	12	6'-2	77
	5d6	PIER DIAPHRAGM, ENDS	⊐⊏⊐	8	2'-6	21
	5d7	ABUT. DIAPHRAGM, ENDS	⊐⊏⊐	8	4'-0	33
	5d8	ABUT. DIAPHRAGM, ENDS, BOTT.	⊐⊏⊐	4	3'-2	13
	5d9	ABUT. DIAPHRAGM, LONGIT. BOTT.	—	6	5'-2	32
	5e1	PIER DIAPHRAGM, HOOPS	□	24	9'-5	236
	5e2	ABUT. DIAPHRAGM, HAIRPINS	⊐⊏⊐	24	2'-0	50
	5e3	PIER DIAPHRAGM, HAIRPINS	⊐⊏⊐	24	2'-6	63
	5e4	PIER DIAPHRAGM, HOOPS - ENDS	⊐⊏⊐	4	9'-4	39
	5e5	PIER DIAPHRAGM, HAIRPINS, ENDS	⊐⊏⊐	4	2'-5	10
	5e6	ABUT. DIAPHRAGM, HAIRPINS, ENDS	⊐⊏⊐	8	1'-11	16
△	5h1	PAVING NOTCH, TRANSVERSE	⊐	46	4'-0	192
△	5h2	PAVING NOTCH, LONGITUDINAL	—	4	22'-8	95
△		TWO (2) CONCRETE OPEN RAILS				8,897
	△ EPOXY COATED	TOTAL (LBS.) UNCOATED				857
		TOTAL (LBS.) EPOXY COATED				49,034

CONCRETE PLACEMENT QUANT. - SUPERSTR.

LOCATION	QUANTITIES
SECTION (1)	45.8
SECTION (2)	34.7
SECTION (3)	45.7
SECTION (4)	17.5
SECTION (5)	17.1
TOTAL (CU. YDS.)	160.8

ESTIMATED QUANTITIES - SUPERSTR.

ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE, CLASS "D"	C.Y.	160.8
REINFORCING STEEL - UNCOATED	LBS.	857
REINFORCING STEEL - EPOXY COATED	LBS.	49,034
STRUCTURAL STEEL	LBS.	2829
PRET. PRESTR. CONC. BEAMS (B67R)	NO.	12

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-9 INTERIOR SPAN — 68'-1½ END SPANS

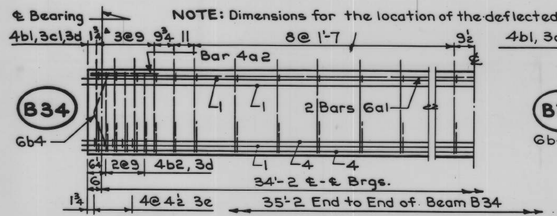
SUPERSTRUCTURE DETAILS (NEW)

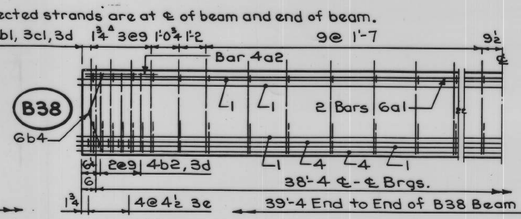
STATION 51 + 15 — 0° SKEW

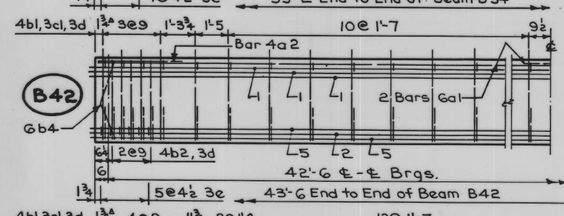
CRAWFORD COUNTY — IOWA

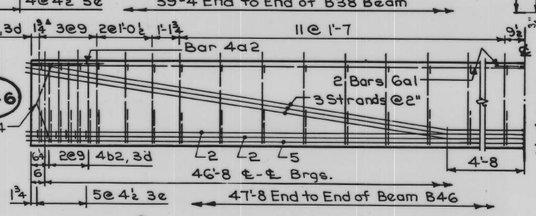
SHEET 14 OF 20

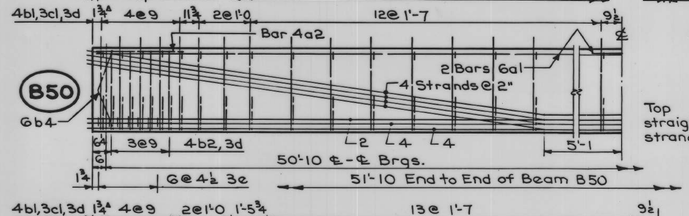
NOTE: Dimensions for the location of the deflected strands are at ℄ of beam and end of beam.

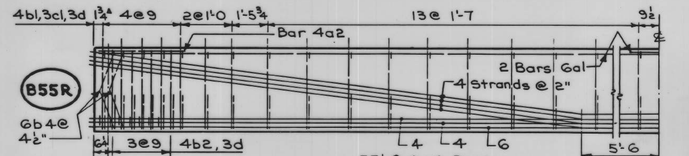


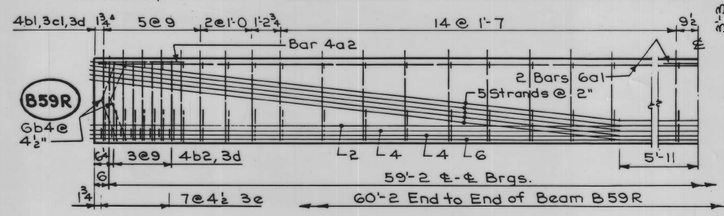


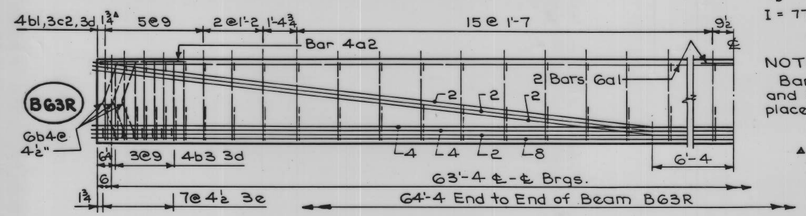


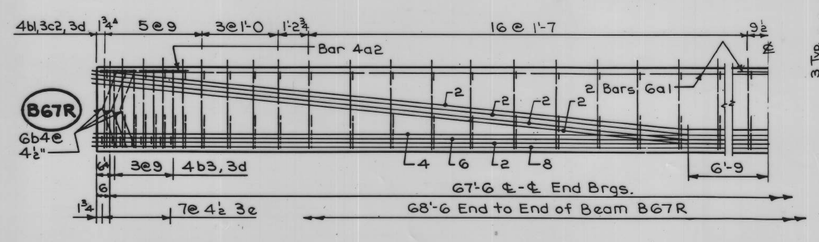


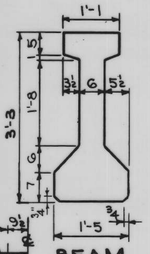




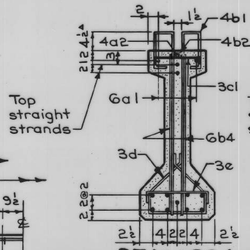


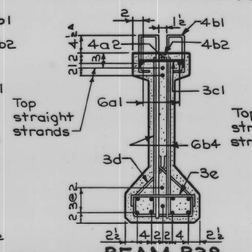


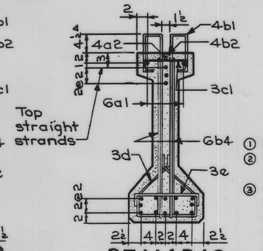


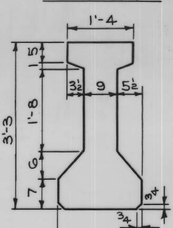


*Where deflecting strands interfere with placement, some in-place bending may be necessary.



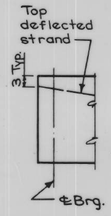


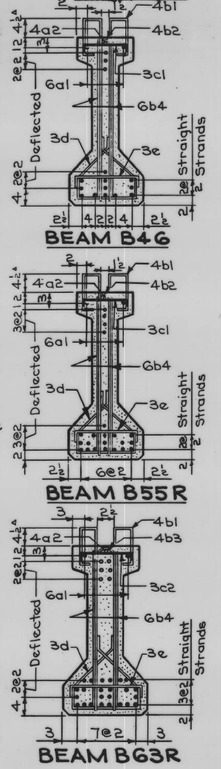


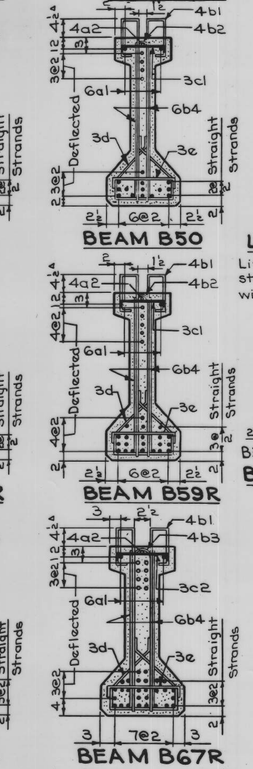


NOTE:
Bars 4b1, Gb4 and 3d are to be placed in pairs.

▲Keep

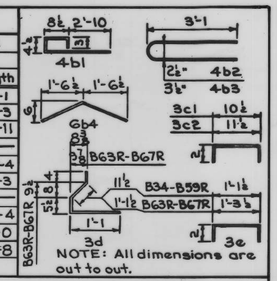






REINFORCING BAR LIST

Beam		B34		B38		B42		B46		B50		B55R		B59R		B63R		B67R	
Span		34'-2		38'-4		42'-6		46'-8		50'-10		55'-0		59'-2		63'-4		67'-6	
Bar	Shape	№	Length	№	Length	№	Length	№	Length	№	Length	№	Length	№	Length	№	Length	№	Length
Ga1	—	2	34'-11	2	39'-1	4	22'-7	4	24'-8	4	26'-9	4	28'-10	4	30'-11	4	33'-0	4	35'-1
4a2	—	2	2'-6	2	2'-6	2	2'-6	2	2'-6	2	3'-3	2	3'-3	2	3'-3	2	3'-3	2	3'-3
4b1	⊔	56	4'-11	60	4'-11	64	4'-11	72	4'-11	80	4'-11	84	4'-11	92	4'-11	96	4'-11	104	4'-11
4b2	⊔	6	6'-3	6	6'-3	6	6'-3	6	6'-3	8	6'-3	8	6'-3	8	6'-3	—	—	—	—
4b3	⊔	—	—	—	—	—	—	—	—	—	—	—	—	—	—	8	6'-4	8	6'-4
Gb4	⋀	4	3'-3	4	3'-3	4	3'-3	4	3'-3	4	3'-3	8	3'-3	8	3'-3	12	3'-3	12	3'-3
3c1	⊓	28	1'-3	30	1'-3	32	1'-3	36	1'-3	40	1'-3	42	1'-3	46	1'-3	—	—	—	—
3c2	⊓	—	—	—	—	—	—	—	—	—	—	—	—	—	—	48	1'-4	52	1'-4
*3d	∠	68	2'-10	72	2'-10	76	2'-10	84	2'-10	96	2'-10	100	2'-10	108	2'-10	112	3'-0	120	3'-0
3e	⊓	10	1'-6	10	1'-6	12	1'-6	12	1'-6	14	1'-6	14	1'-6	16	1'-6	16	1'-8	16	1'-8

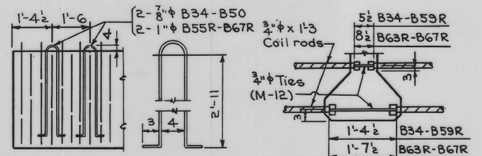


NOTE: All dimensions are out to out.

BEAM DATA

Beam		B34	B38	B42	B46	B50	B55R	B59R	B63R	B67R
Span		34'-2	38'-4	42'-6	46'-8	50'-10	55'-0	59'-2	63'-4	67'-6
Initial Prestress	Kips	318	347	434	347	405	520	607	694	809
Size Strands		½	½	½	½	½	½	½	½	½
Straight Strands		11	12	15	9	10	14	16	18	20
Deflected Strands		—	—	—	3	4	4	5	6	8
Hold Down Force	Kips	—	—	—	11.2	13.8	12.7	13.7	16.8	19.5
Camber ②		.14 .19	.19 .25	.26 .35	.42 .58	.56 .77	.89 1.24	1.11 1.53	1.07 1.44	1.35 1.77
① D.L. Deflection ③ in. (7'-6 Spcg.)		.05 .02	.14 .04	.21 .05	.31 .08	.43 .11	.59 .14	.78 .19	.82 .21	1.05 .26
① D.L. Deflection ③ in. (8'-0 Spcg.)		.10 .02	.15 .04	.23 .06	.33 .08	.46 .11	.63 .15	.83 .21	.87 .22	1.12 .28
① D.L. Deflection ③ in. (8'-6 Spcg.)		.11 .03	.16 .04	.24 .06	.35 .09	.49 .12	.66 .16	.88 .22	.93 .23	1.19 .30
Reinforcing Steel	lb.	428	459	497	545	610	660	710	770	821
Concrete	c.y.	3.47	3.87	4.28	4.69	5.10	5.51	5.92	8.27	8.80

① Due to weight of 8" 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 8" 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 the beam is upper figure + 75% of lower figure for end spans and upper figure + 50% of lower figure for interior spans.

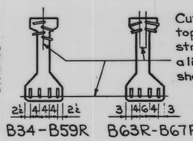


LIFTING LOOP DETAILS

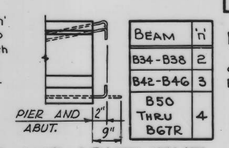
Lifting loops are to be structural grade steel. Alternate types may be substituted with the approval of the Engineer.

COIL TIE DETAILS

Number and location of coil ties to be as detailed on specific designs.

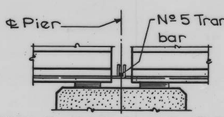


Cut 4 bottom and 'n' top deflected or top straight strands with a 12" projection and shop bend as shown.



Beam	'n'
B34-B38	2
B42-B46	3
B50 Thru B67R	4

BEAM END DETAIL AT PIER AND ABUTMENT



DETAILS AT PIER BEFORE PLACING PIER DIAPHRAGM

NOTES:

Unless otherwise noted lengths of all beams shall be increased .0005L 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 IDOT Materials Department recommendations.

Bearing details will be as detailed on the Bridge Design sheets.

All strands are to be ½" 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.

The portions of the prestress beams that are to be embedded in the abutment and pier diaphragms shall be roughened for a distance of 10" from the beam end by sandblasting or other approved methods to provide suitable bond between the beam and the diaphragm in accordance with Article 2403.15 of the specifications.

MAXIMUM SPACING OF BEAMS FOR SPANS SHOWN

Loading		Future W.S.	Slab Thickness	Maximum Spacing
HS 20	(Primary)	20 psf	8"	7'-6
H20	(Primary)	20 psf	8"	8'-0
H15	(Secondary)	—	8"	8'-6

DESIGN STRESSES:

Design stresses for the following materials are to be in accordance with A.A.S.H.T.O. Standard Specifications for Highway Bridges, Series of 1977:

Reinforcing steel in accordance with Section 1.5.6(B) f_s = 20,000 psi

Concrete in accordance with Section 1.6.6(B), f'_c = 5000 psi.

Prestressing steel in accordance with Section 1.6.6(A), f'_s = 270,000 psi.

SPECIFICATIONS:

DESIGN: A.A.S.H.T.O. Series of 1977.

CONSTRUCTION: Standard Specifications of the Iowa Department Of Transportation, current Series, plus current special provisions and supplemental specifications.

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

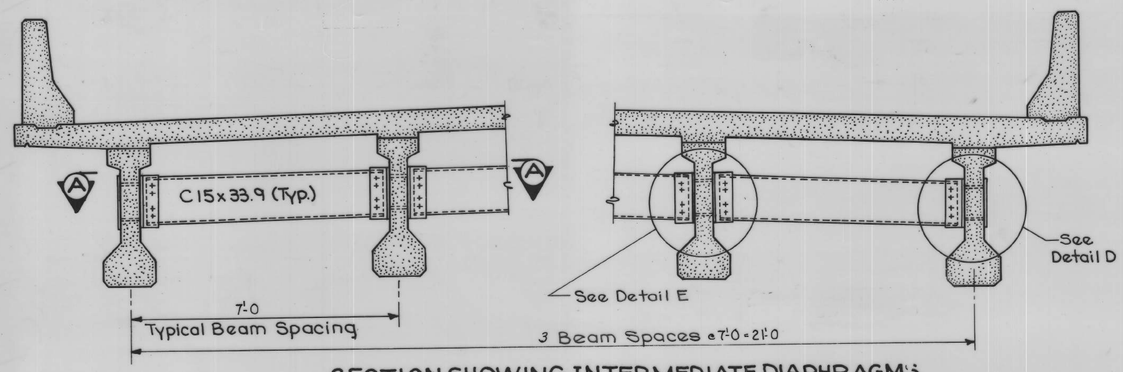
68'-9 INTERIOR SPAN — 68'-1½ END SPANS

BEAM DETAILS (NEW)

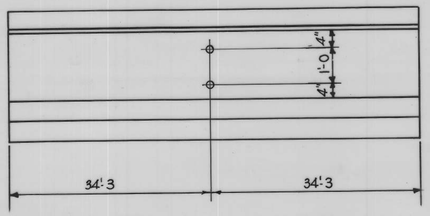
STATION 51+15 — 0° SKEW

CRAWFORD COUNTY — IOWA

SHEET 15 OF 20



SECTION SHOWING INTERMEDIATE DIAPHRAGMS



INTERMEDIATE DIAPHRAGM BOLT LOCATION

NOTES:

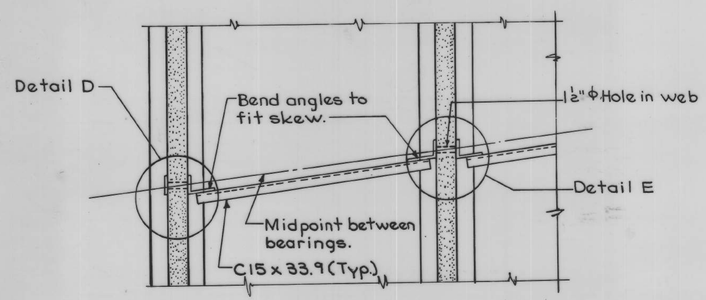
All diaphragm materials, including bolts, nuts and washers shall be galvanized.

These steel diaphragms are an approved alternate for the concrete intermediate diaphragms shown on other sheets of these plans. If the contractor chooses to use these steel diaphragms, the cost of the steel and bolts is assumed to be equal value to the concrete, reinforcing and coil rods that would be deleted and no pay adjustment will be made.

If the steel diaphragm alternate is used shop drawings showing layout and details of the diaphragms shall be submitted for approval.

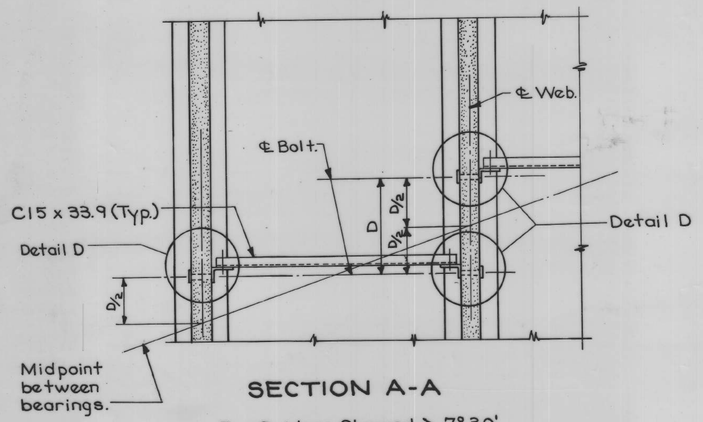
The 1½" ϕ holes shall be cast into the web. Drilling is not allowed.

The 2½" ϕ O.D. plain washers shall meet the dimensional requirements of A.N.S.I. B18.22.1, Type A Plain Washers.



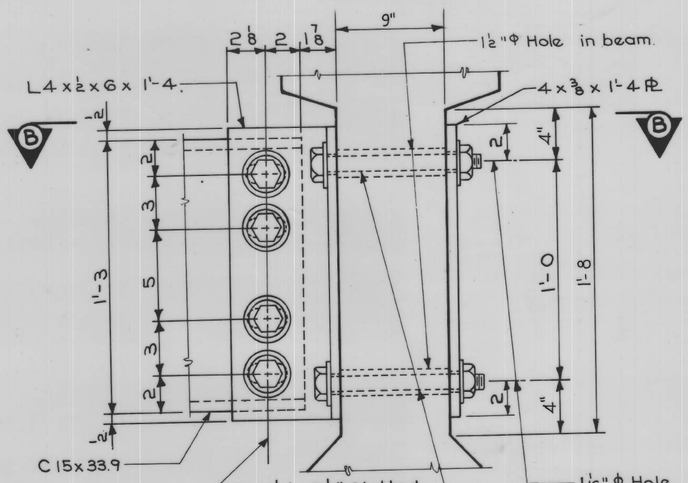
SECTION A-A

For Bridges Skewed < 7° 30'

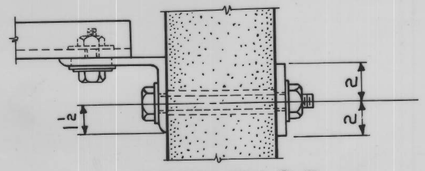


SECTION A-A

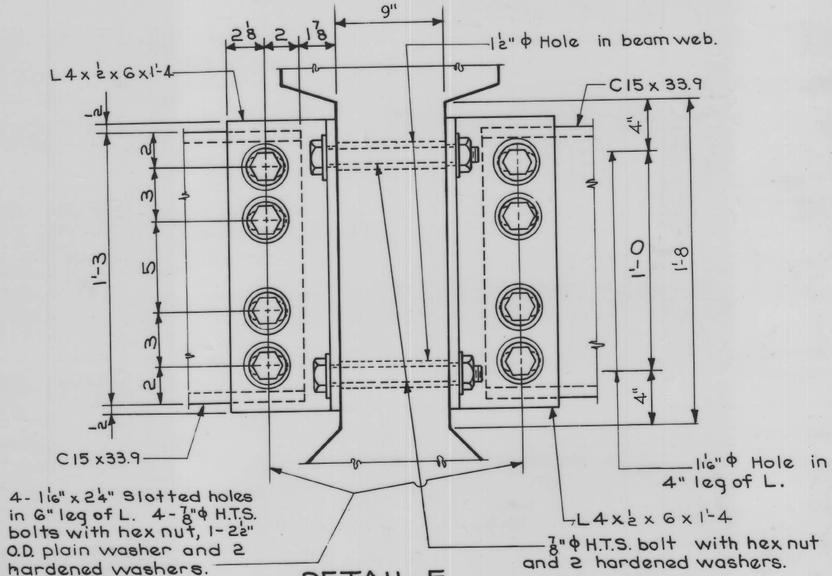
For Bridges Skewed > 7° 30'



DETAIL D



SECTION B-B



DETAIL E

LENGTH OF ⅞" ϕ H.T.S. BOLTS THRU WEB

Web Thickness (inches)	Bolt Length (inches)
6	9
7	10
8	11
9	12

NOTE:
Thread Length : Min. 3"
Max. 4"

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

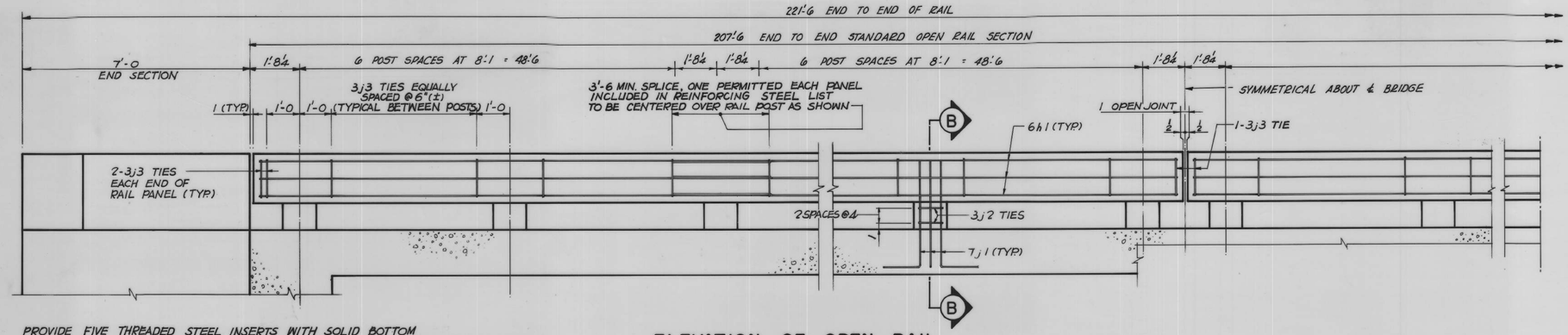
68'-9 INTERIOR SPAN — 68'-1½ END SPANS

STEEL DIAPHRAGM DETAILS

STATION 51 + 15 — 0° SKEW

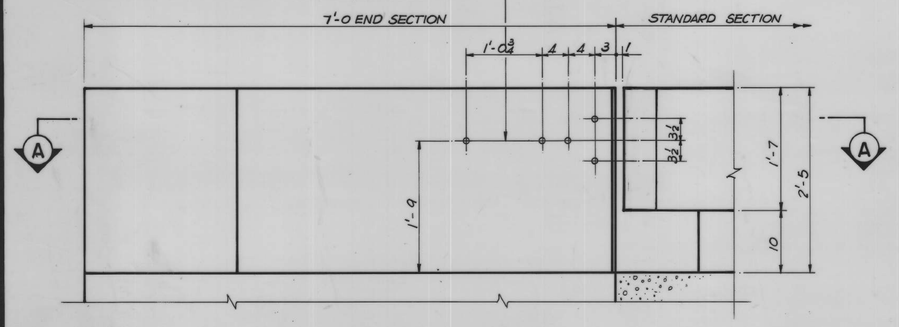
CRAWFORD COUNTY — IOWA

SHEET 16 OF 20

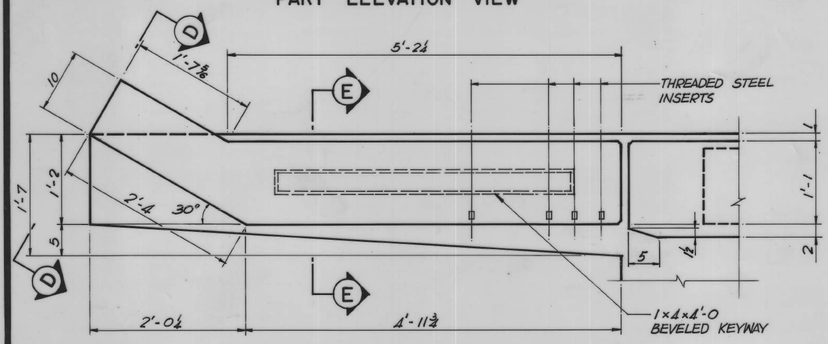


ELEVATION OF OPEN RAIL

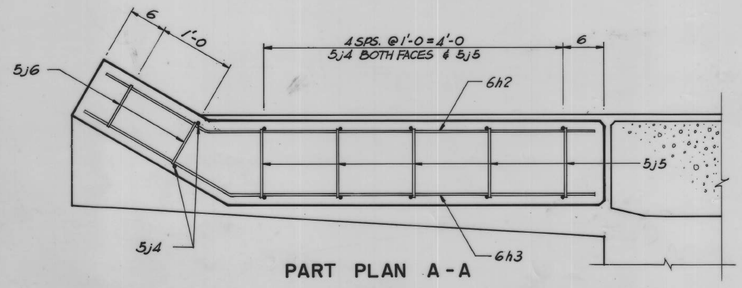
PROVIDE FIVE THREADED STEEL INSERTS WITH SOLID BOTTOM TAPPED TO A MINIMUM THREAD DEPTH OF 2½" FOR USE WITH ⅞"Ø GALVANIZD HIGH STRENGTH BOLTS WITH GALVANIZED ROUND WASHERS. COST OF INSERTS TO BE INCLUDED IN PRICE BID FOR "STRUCTURAL CONCRETE." BOLTS AND WASHERS TO BE FURNISHED BY CONTRACTOR INSTALLING GUARD RAIL



PART ELEVATION VIEW

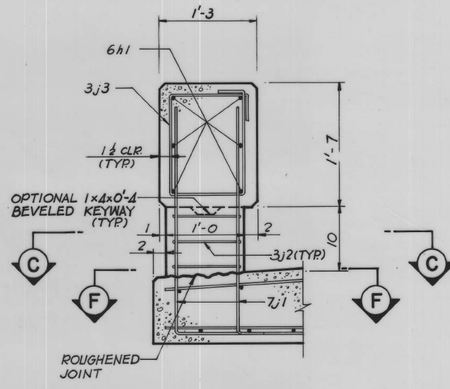


PART PLAN VIEW

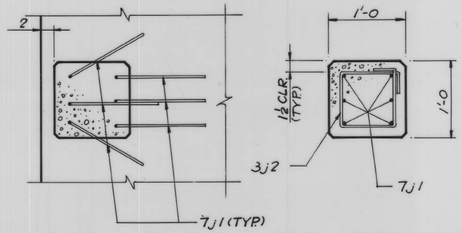


PART PLAN A-A

END SECTION DETAILS

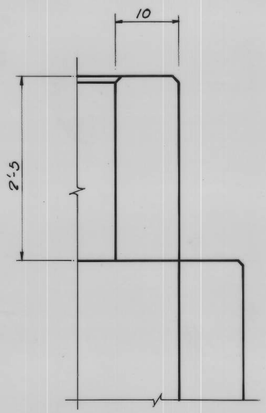


PART SECTION B-B

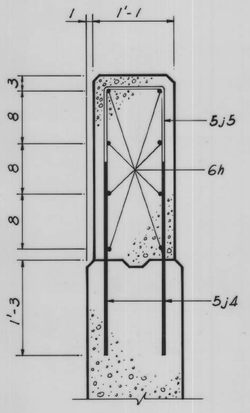


PART PLAN F-F

PART SECTION C-C



END VIEW D-D

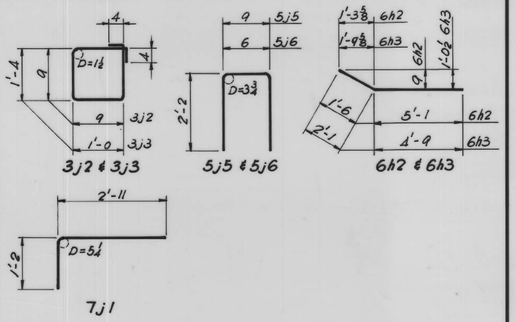


PART SECTION E-E

REINFORCING BAR LIST - TWO RAILS

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTION	7j1	RAIL POST VERTICAL		336	4'-1	2804
	3j2	RAIL POST TIES		168	3'-8	232
	3j3	RAIL TIES		644	5'-4	1291
	6h1	RAIL LONGITUDINAL		96	27'-7	3977
4 END SECTIONS	5j4	ANCHOR TO SLAB		48	2'-6	125
	5j5	VERTICAL		20	5'-1	106
	5j6	VERTICAL		8	4'-10	40
	6h2	LONGITUDINAL		16	6'-7	158
	6h3	LONGITUDINAL		16	6'-10	164
					TOTAL (LBS.)	8,897

BENT BAR DETAILS



NOTE: ALL DIMENSIONS ARE OUT TO OUT. "D" = PIN DIAMETER

CONCRETE PLACEMENT SUMMARY

SECTION		TOTAL
STANDARD SECTION	8 @ 4.02	32.2
END SECTION	4 @ .64	2.6
TOTAL (CU. YDS.)		34.8

CONCRETE OPEN RAIL QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE OPEN RAIL	L.F.	443.0

OPEN RAIL NOTES

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

ALL OPEN RAIL CONCRETE IS TO BE CLASS D.

THE CONCRETE OPEN RAIL IS TO BE BID ON A LINEAL FOOT BASIS MEASURED FROM END TO END OF RAIL. THE NUMBER OF LINEAL FEET OF OPEN RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT. PRICE BID FOR CONCRETE OPEN RAIL SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL, AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.

ALL OPEN RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.

ALL EXPOSED CORNERS OF 90° OR SHARPER ARE TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.

ALL REINFORCING STEEL IS TO BE GRADE 60 AND EPOXY COATED.

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

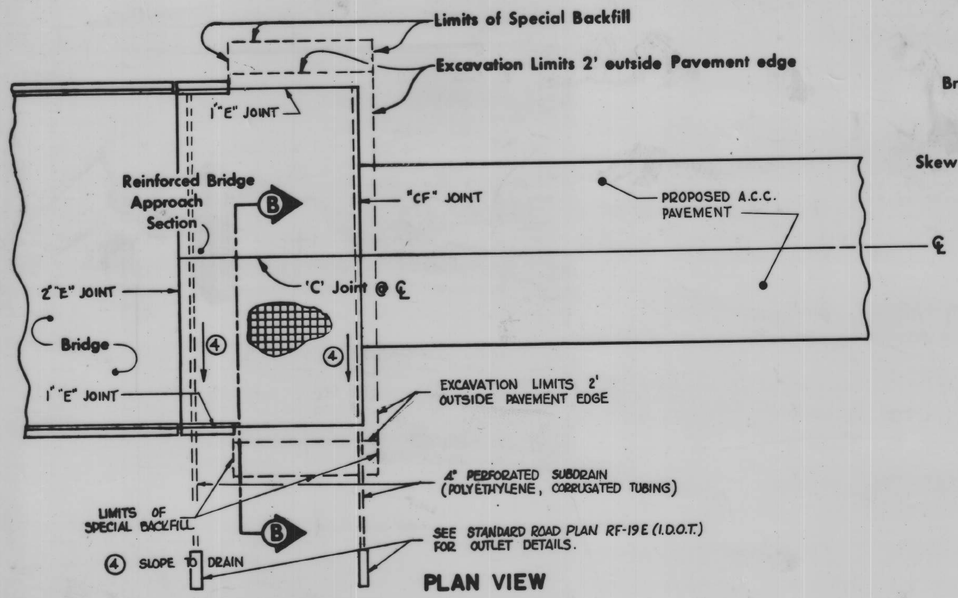
68'-9 INTERIOR SPAN — 68'-1½ END SPANS

OPEN RAIL DETAILS

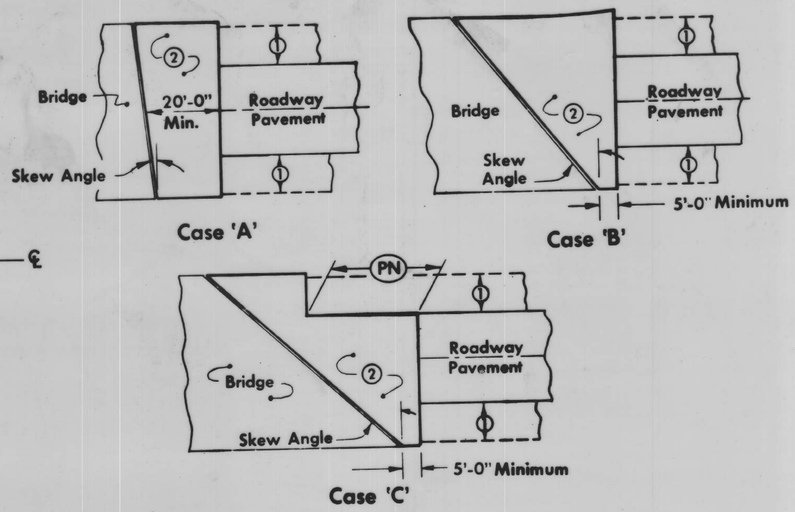
STATION 51 + 15 — 0° SKEW

CRAWFORD COUNTY — IOWA

SHEET 17 OF 20



PLAN VIEW



APPROACH PAVEMENT LAYOUTS AT VARIOUS SKEWS

① Design shoulder width. ② Reinforced Bridge Approach Section.

GENERAL NOTES:

THE INTENT OF THIS SHEET IS TO DETAIL THE CONSTRUCTION OF PORTLAND CEMENT CONCRETE BRIDGE APPROACH PAVEMENT.

THE SUBGRADE SHALL BE EXCAVATED TO THE LIMITS SHOWN. A TRANSVERSE SUB-DRAIN (AS DETAILED ON THIS SHEET) SHALL BE INSTALLED DIRECTLY BENEATH THE LOCATION OF THE PROPOSED "CF" JOINT. THE EXCAVATION SHALL BE BACKFILLED WITH SPECIAL BACKFILL MATERIAL AND AN APPROVED ENGINEERING FABRIC AS SPECIFIED IN SECTION 4191.09C INSTALLED AS SHOWN. THE ENGINEERING FABRIC SHALL BE SECURED TO THE TOP OF THE BRIDGE PAVING NOTCH AND EXTENDED AS SHOWN.

A BRIDGE APPROACH PAVEMENT SECTION SHALL BE CONSTRUCTED OF REINFORCED P.C. CONCRETE; CONCRETE USED FOR CONSTRUCTION SHALL BE CLASS D.

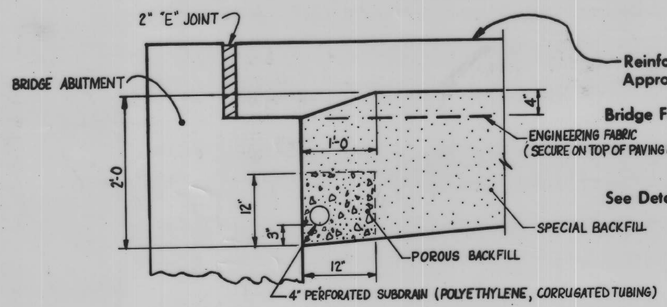
THE SKEW ANGLE OF THE BRIDGE SHALL DETERMINE THE SHAPE OF THE REINFORCED BRIDGE APPROACH SECTION AS DETAILED HEREON. THE SHORT EDGE OF THE SECTION SHALL BE A MINIMUM OF 5'-0" AND THE LENGTH AT C OF THE ROADWAY SHALL BE A MINIMUM OF 20'-0".

THE 4" PERFORATED SUBDRAIN, SUBDRAIN OUTLET & INCH DIAMETER CORRUGATED METAL PIPE, POROUS BACKFILL, SPECIAL BACKFILL, ENGINEERING FABRIC, AND P.C.C. PAVEMENT SHALL BE PLACED AS INDICATED HEREON AND ELSEWHERE IN THE PLANS.

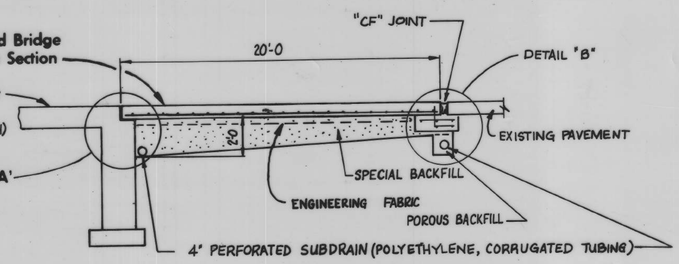
"REINFORCED BRIDGE APPROACH SECTION" SHALL BE MEASURED AND PAID FOR AS SPECIFIED IN SECTIONS 2301.39F AND 2301.40F. THE FOLLOWING ITEMS SHALL BE CONSIDERED INCIDENTAL TO THE INCLUDED IN THE PRICE BID FOR "REINFORCED BRIDGE APPROACH SECTION".

FURNISHING AND INSTALLING TWO SUBDRAINS.
FURNISHING AND PLACING POROUS BACKFILL.
FURNISHING AND INSTALLING SUBDRAIN OUTLETS.
FURNISHING AND INSTALLING ENGINEERING FABRIC.
FURNISHING AND BACKFILLING WITH SPECIAL BACKFILL.
FURNISHING AND INSTALLING REINFORCING STEEL TIE BARS AND DOWEL ASSEMBLIES.
PLACING, FINISHING, CURING, ALL JOINT CONSTRUCTION AND ALL OTHER MATERIAL AND LABOR TO CONSTRUCT THE "REINFORCED BRIDGE APPROACH SECTION" AS DETAILED ON THIS SHEET.

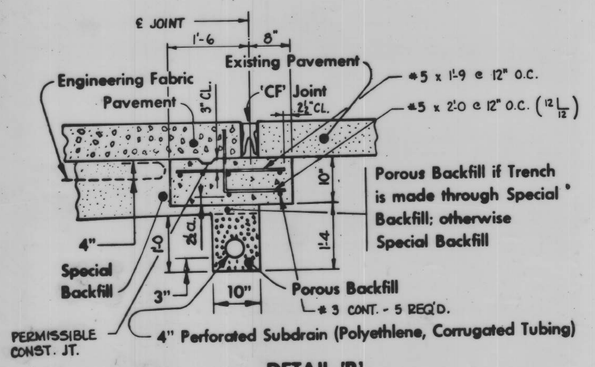
ALL BACKFILL BEHIND THE ABUTMENT BETWEEN THE WINGS SHALL BE GRANULAR BACKFILL EXCEPT AS DETAILED ON THIS SHEET. MATERIAL REFERRED TO ON THE PLANS AS "GRANULAR BACKFILL" SHALL BE FURNISHED AND DELIVERED TO THE SITE BY CRAWFORD COUNTY.



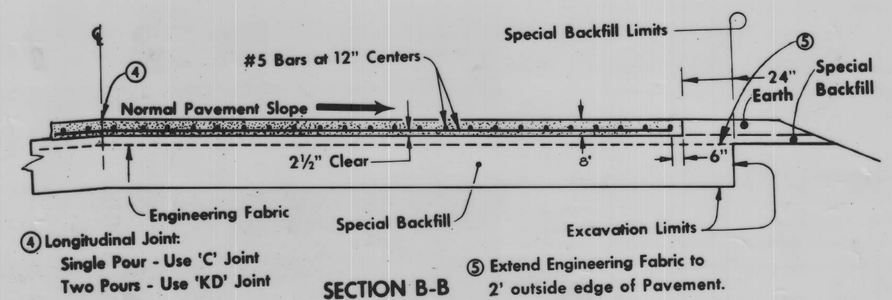
FIXED ABUTMENT BRIDGE
DETAIL 'A'



SECTION THRU CENTER LINE



DETAIL 'B'



④ Longitudinal Joint:
Single Pour - Use 'C' Joint
Two Pours - Use 'KD' Joint

SECTION B-B

⑤ Extend Engineering Fabric to 2' outside edge of Pavement.

205'-0 x 24' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

68'-9 INTERIOR SPAN — 68'-1½ END SPANS

REINFORCED BRIDGE APPROACH PAVING

STATION 51 + 15 — 0° SKEW

CRAWFORD COUNTY — IOWA

SHEET 18 OF 20

CALHOUN-BURNS & ASSOCIATES, INC. CONSULTING ENGINEERS
WEST DES MOINES, IOWA 50311 (515) 224-4344

DESIGN NO. 5387

CRAWFORD COUNTY

FILE NO. 53610

TABULATION OF DELINEATORS AND OBJECT MARKERS

Refer to Standard Road Plan RE-48A-B and RE-29C ** Not a Bid Item

LOCATION		DELINEATOR	OBJECT MARKER				REMARKS
STATION	TYPE	SINGLE WHITE D-IW	TRIPLE YELLOW OM2-3YV	TYPE 3		OFFSET BRACKETS **	
				OM-3L	OM-3R		
		NO.	NO.	NO.	NO.	NO.	
51+15	1	1	2	1	1	-	W. END
51+15	1	1	2	1	1	-	E. END
51+15	1	1	2	1	1	-	W. END
51+15	1	1	2	1	1	-	E. END

TRAFFIC CONTROL PLAN

THE PROJECT ROUTE WILL BE CLOSED TO TRAFFIC. TRAFFIC CONTROL ON THIS PROJECT SHALL BE IN ACCORDANCE WITH DETAIL SHEET 520-26. FOR ADDITIONAL COMPLIMENTARY INFORMATION, REFER TO SUPPLEMENTAL SPECIFICATION 1012 AND THE IOWA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

ALL TRAFFIC CONTROL DEVICES SHALL BE FURNISHED, ERECTED, MAINTAINED AND REMOVED BY THE CONTRACTOR.

SLAT FENCE BARRICADES OR PLASTIC SAFETY FENCE SHALL BE PLACED ON BOTH SIDES OF THE BRIDGE SITE. IN ADDITION, A TYPE III BARRICADE SHALL BE PLACED IN ADVANCE OF THE SLAT FENCE OR PLASTIC SAFETY FENCE, A "ROAD CLOSED" SIGN (R-11-2, 48" x 30") SHALL BE PLACED ON EACH TYPE III BARRICADE ALONG WITH TWO TYPE "A" LOW INTENSITY FLASHING WARNING LIGHTS.

CRAWFORD COUNTY MAINTENANCE SHALL SALVAGE ALL ROAD MARKERS AFTER ROAD IS CLOSED.

THE BID ITEM "TRAFFIC CONTROL" SHALL INCLUDE THE COST FOR ALL TRAFFIC CONTROL MEASURES REQUIRED OF THE CONTRACTOR EXCEPT FOR THOSE WHICH ARE SEPARATE BID ITEMS OR ARE INCIDENTAL TO OTHER BID ITEMS.

THE GUARDRAIL INSTALLATION MUST BE COMPLETED BEFORE THE ROAD IS OPENED TO TRAFFIC.

REMOVAL OF OLD PAVEMENT

110-1

STATION TO STATION		AREA Sq. Yds.	REMARKS
49+91.42	50+11.42	44.5	INCLUDES 20' SAW CUT
52+18.58	52+38.58	44.5	INCLUDES 20' SAW CUT
			PAVEMENT IS 6"± THICK P.C.C.

TABULATION OF GRADING FOR GUARDRAIL INSTALLATIONS

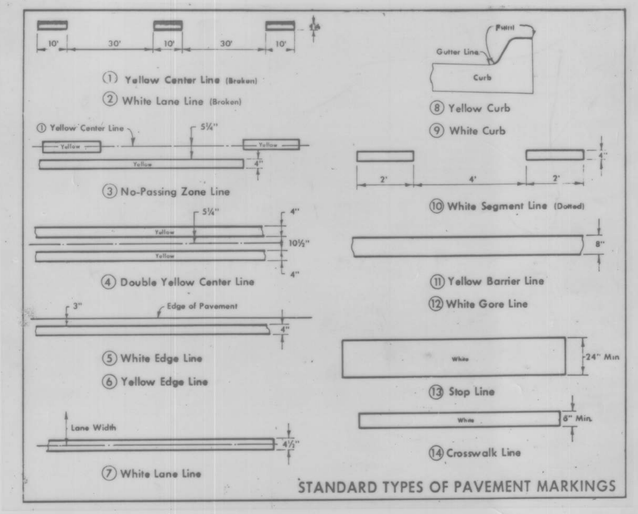
Refer to RL-11 or Typicals 4303 and 4306

HAZARD LOCATION (Station)	LOCATION POINT (Station)	INSTALLATION (Type)	DIMENSIONS (A) (Lin. Ft.)	(Y) (Lin. Ft)	(Z) (Lin. Ft.)	CLASS 24 EXCAVATION (Cu. Yds.)	PIPE Size (Inches)	Type	Length (Lin. Ft.)	REMARKS
51+15	49+46	1	62.5	7'	30'	30				LT. W. END
51+15	49+70	SPCL.	62.5	7'	30'	30				RT. E. END
51+15	52+83	1	62.5	7'	30'	30				LT. W. END
51+15	52+83	1	62.5	7'	30'	30				RT. E. END

TABULATION OF BARRICADES (Refer to Section 2518 of the St'd. Spec's.)

108-13A
6-25-76

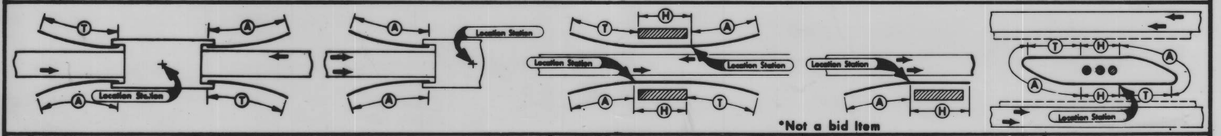
NO.	STATION
1	49+50
1	53+00



STANDARD TYPES OF PAVEMENT MARKINGS

TABULATION OF "W" BEAM GUARDRAIL INSTALLATIONS

(Refer to appropriate Standard Road Plans)



*Not a bid Item

LOCATION NO.	LOCATION STATION	STANDARD ROAD PLAN	FORMED STEEL "W" BEAM GUARDRAIL Case	(L2) (Feet)	(A) Lin. Ft.	(H) Lin. Ft.	(T) Lin. Ft.	TOTAL Lin. Ft.	BEAM GUARDRAIL POSTS 10"×10" SINGLE SPACER	8"× 8" SINGLE SPACER	8"× 8" NO SPACER	6"× 8" NO SPACER	BEAM GUARDRAIL END ANCHORAGE BRIDGE RE-26 RE-28 Type	No.	END RE-33 RE-52, RE-53 Type	No.	RE-27° RE-41° RE-49° RE-55° Special* Type	No.	REMARKS
1	51+15	RE-59			62.5			62.5	3	8		2			RE-52	1			
2	51+15	SPCL.			62.5			62.5	3	8		2			RE-52	1			
3	51+15	RE-59			62.5			62.5	3	8		2			RE-52	1			
4	51+15	RE-59			62.5			62.5	3	8		2			RE-52	1			

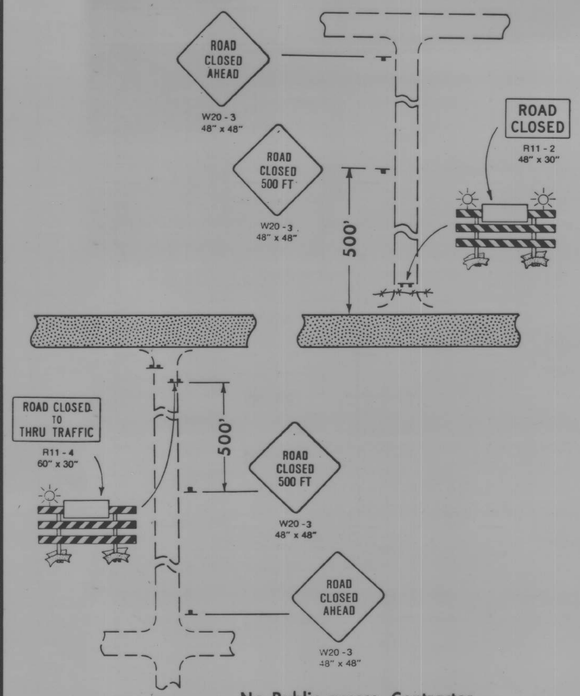
QUANTITIES AND TABULATIONS

CALHOUN-BURNS & ASSOCIATES, INC. CONSULTING ENGINEERS
WEST DES MOINES, IOWA 50311 (515) 224-4344

DESIGN NO. 5387 CRAWFORD COUNTY FILE NO. 53610

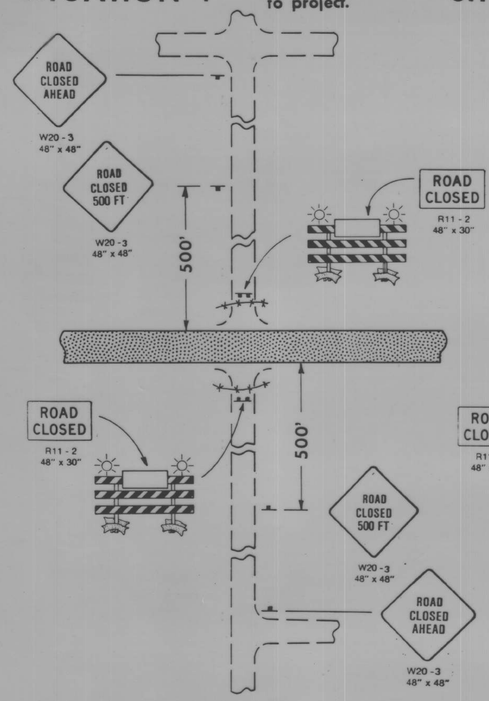
SITUATION 2

No Access to project.



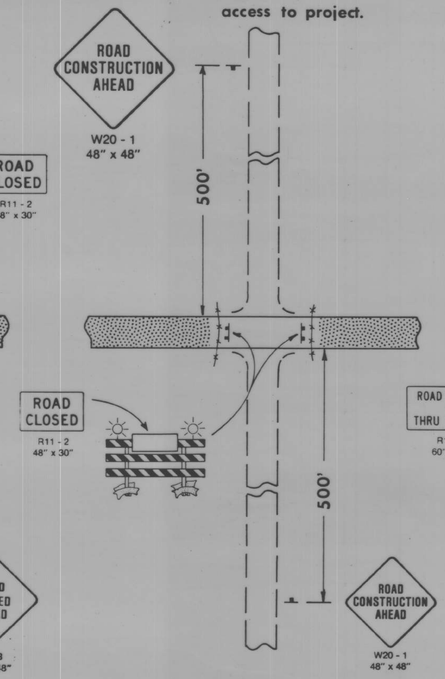
SITUATION 4

No Access to project.



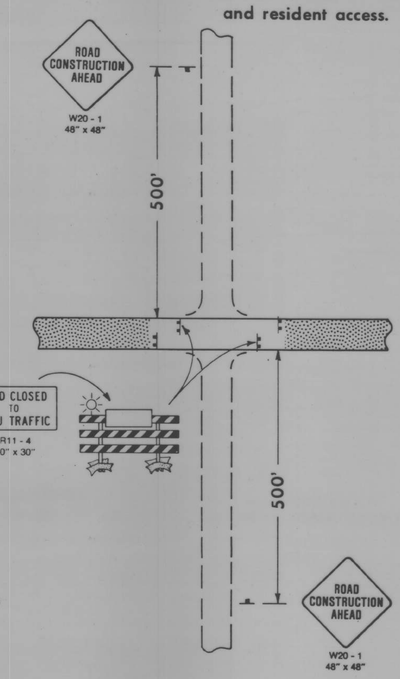
SITUATION 5

Public cross-traffic maintained. No access to project.



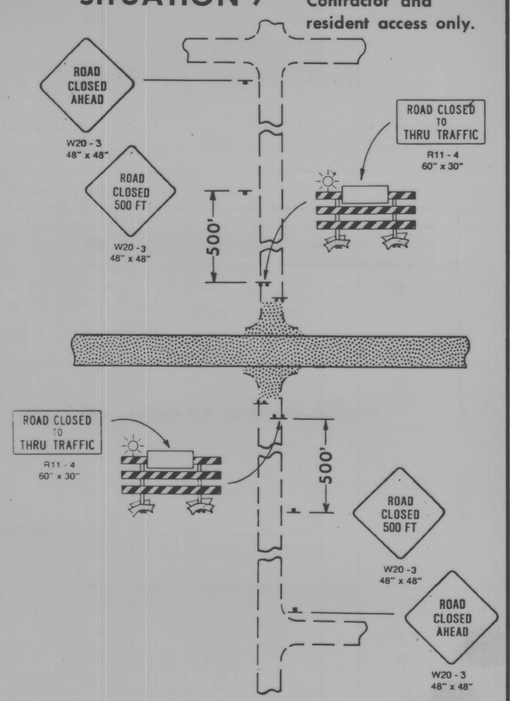
SITUATION 6

Public cross-traffic maintained. Contractor and resident access.



SITUATION 7

No Public access. Contractor and resident access only.

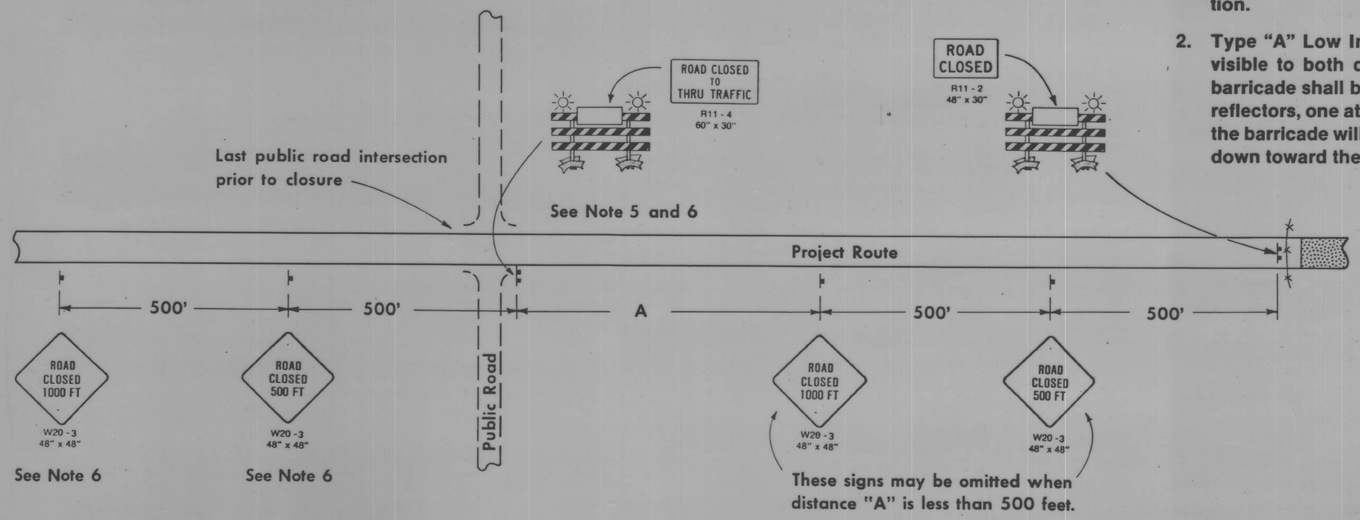


SITUATION 3

No Public access. Contractor and resident access only.

SITUATION 1

Project Route closure.



GENERAL NOTES

1. **SITUATION 1 illustrates traffic control necessary to close the project route. SITUATIONS 2 through 7 are for signing of sideroads based on existing agreements and field conditions and will be selected by the engineer in charge of construction.**
2. **Type "A" Low Intensity Flashing Warning Lights shall be visible to both directions of traffic. The back side of the barricade shall be reflectorized by a minimum of six yellow reflectors, one at each end of each rail, or at least one rail on the barricade will show reflectorized stripes properly sloped down toward the traffic side.**
3. **All "Stop" and other regulatory signs on the sideroads are not to be disturbed. If a "Stop" or other regulatory sign must be removed, it will be relocated by the Contracting Authority.**
4. **This layout does not include all barricades as may be required by Section 2518 of the Standard Specifications.**
5. **In Situation 1, when distance "A" is less than 500 feet the barricade should be placed in the middle of the traffic lane approaching the work area. In this case, Note 2 shall apply. The barricade may be omitted if the distance to the work area is less than 400 feet.**
6. **In Situation 1, if the intersection is the point of detour these two signs and barricade will become the responsibility of the contracting authority and may be modified by the contracting authority to fit detour signing.**

LEGEND

- Traffic Sign
- Type III Barricade (Type "A" Low Intensity Flashing Warning Light Required for Nighttime Use)
- Type "A" Low Intensity Flashing Warning Light
- Work Area
- Slat Fence Barricade or Orange Plastic Safety Fence

DETAIL SHEET 520-26

Revision Date 1 - 23 - 85

SIGNING FOR TEMPORARY ROAD CLOSURES IN RURAL AREAS

(PROJECT ROUTE CLOSED TO TRAFFIC)

STATE OF IOWA	FHWA REGION 7	FISCAL YEAR		Crawford COUNTY	PROJECT NUMBER SN-330(66)--51-24	SHEET NUMBER 20	TOTAL SHEETS 20