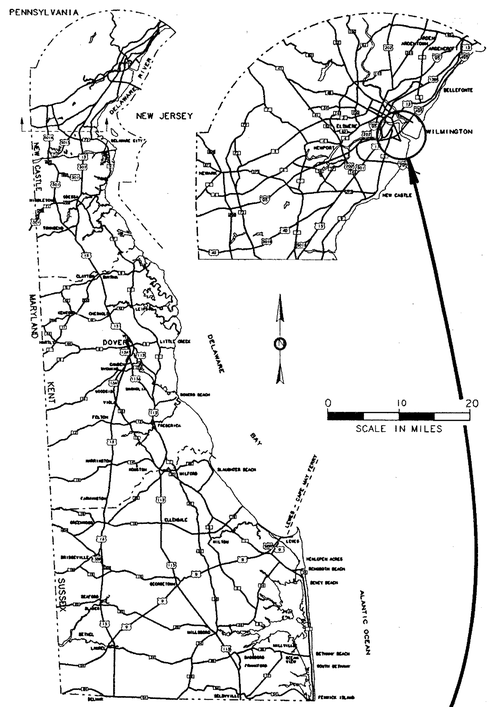
STATE OF DELAWARE



GENERAL LOCATION OF CONTRACT

THE STATE OF DELAWARE

DEPARTMENT OF TRANSPORTATION

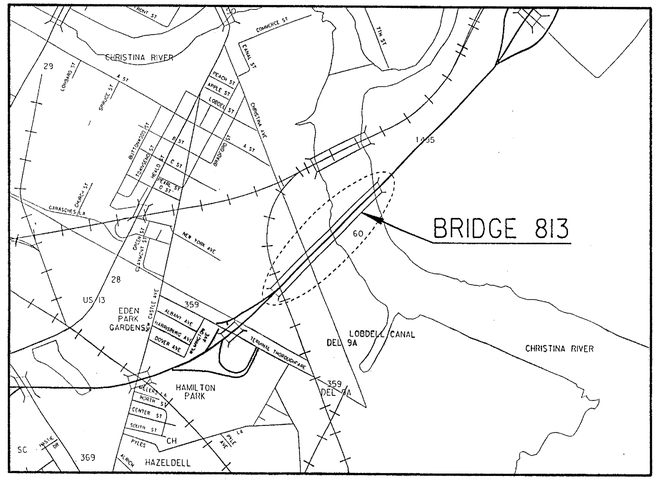
SPECIFICATION AND CONSTRUCTION PLANS FOR:

BRIDGE 813 ON I-495
over CHRISTINA RIVER

CONTRACT NUMBER 94-074-06

FEDERAL AID PROJECT NUMBER IM-N060[1]

ROADWAY LENGTH _____ **FEET=** _____ **MILES**
STRUCTURE LENGTH 4,395.11 **FEET=** 0.832 **MILES**
TOTAL LENGTH 4,395.11 **FEET=** 0.832 **MILES**



LOCATION MAP

CONTRACT	COUNTY	M.R. NO.	F.H.W.A. REG. NO.	FEDERAL AID PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
94-074-06	NEW CASTLE		3	IM-N060[1]	1	20

DESIGN DESIGNATION

FUNCTIONAL CLASS URBAN INTERSTATE
TYPE OF CONSTRUCTION _____
A.D.T. CURRENT 40266
A.D.T. PROJECTED 86847
D.H.V. PROJECTED 9553
DESIGN SPEED _____
% TRUCKS 17
DIRECTION OF DISTRIBUTION % 70
CLEAR ZONE (S) _____

SCALES

PLAN SHEET: 1" = ___ Feet
PROFILE SHEET:
Horizontal: 1" = ___ Feet
Vertical: 1" = ___ Feet
DETAIL SHEET: 1" = ___ Feet

INDEX OF SHEETS

MILEPOST

UTILITIES LEGEND

DELMARVA POWER & LIGHT CO. - ELECTRIC

CHARLES MICHAEL DOUGHERTY REGISTERED No. 9591 DELAWARE PROFESSIONAL ENGINEER

C. Michael Dougherty
PROJECT MANAGER
DATE 9/20/94

PREPARED BY
Greiner, Inc.
CONSULTING ENGINEERS
TIMONIUM, MARYLAND

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED _____ 19 ___

_____
DIVISION ADMINISTRATOR

DEPARTMENT OF TRANSPORTATION

RECOMMENDED
Dennis M. O'Shea
PROJECT ENGINEER
RECOMMENDED 9/21 19 94
DENNIS M. O'SHEA REGISTERED NO. 8419 DELAWARE PROFESSIONAL ENGINEER
SEAL

RECOMMENDED
Robert Brian McElroy
STORMWATER ENGINEER
RECOMMENDED 9/21 19 94
SEAL

RECOMMENDED
_____
ROAD DESIGN ENGINEER
RECOMMENDED _____ 19 ___
SEAL

RECOMMENDED
N K Chandhri
BRIDGE ENGINEER
RECOMMENDED 9.21. 19 94
SEAL

RECOMMENDED
Chas H. Hu
DESIGN ENGINEER
RECOMMENDED Sept. 21 19 94
CHAD H. HU REGISTERED NO. 4274 DELAWARE PROFESSIONAL ENGINEER
SEAL

APPROVED
Raymond M. Harbeson Jr.
CHIEF ENGINEER
APPROVED SEPT. 21, 19 94
RAYMOND M. HARBESON JR. REGISTERED NO. 4672 DELAWARE PROFESSIONAL ENGINEER
SEAL

BDNS01.00

SECT: 01

QUANTITY SUMMARY

ITEM	605502 C	605584 C	605600 C	72050 C	720521 C	720540 C	720552 C	720567 C	** 742500 C	743003 C	743500 C	743501 C	743504 C	743512 C	743514 C	746503 C	746540 C	748023 C	748501 C	759001 C	763000 C	763500 C
ITEM TITLE	TRI-CHORD TRUSS TYPE OVERHEAD SIGN SUPPORTS AND FOUNDATION	STEEL STRUCTURE REPAIR	BRIDGE MOUNTED SIGN SUPPORT	CRASH CUSHION (SAND BARRELS)	PLASTIC DRUMS	DELINEATORS	REFLECTOR PANELS	FURNISH AND MAINTAIN PORTABLE P.C.C. SAFETY BARRIER	FLAGGER, NEW CASTLE COUNTY	ARROWPANELS, TYPE C	WARNING LIGHTS, TYPE A	WARNING LIGHTS, TYPE B	WARNING SIGNS	FURNISH AND MAINTAIN TRUCK MOUNTED ATTENUATOR	FURNISH AND MAINTAIN MESSAGE BOARD	LUMINAIRES, OVERHEAD SIGN	OVERHEAD SIGN ELECTRIFICATION	INTERMEDIATE MARKINGS, PAINT, 4"	REMOVAL OF PAVEMENT STRIPING	FIELD OFFICE, TYPE I	INITIAL EXPENSE	MAINTENANCE OF TRAFFIC
UNIT	L.S.	LB	L.S.	EACH	EA-DY	EACH	EACH	L.F.	HOUR	EA-DY	EA-DY	EA-DY	EACH	EA-DY	EA-DY	EACH	L.S.	L.F.	L.F.	L.S.	L.S.	L.S.
SHEET NO. 0002 FROM STA. 364+00 TO STA. 371+00	L.S.	49212	L.S.	28	11990	8	2	400	200	170	224	900	47	80	30	4	L.S.	9320	9320	L.S.	L.S.	L.S.
TOTAL	L.S.	49212	L.S.	28	11990	8	2	400	200	170	224	900	47	80	30	4	L.S.	9320	9320	L.S.	L.S.	L.S.
PROPOSAL	L.S.	49212	L.S.	28	11990	8	2	400	200	170	224	900	47	80	30	4	L.S.	9320	9320	L.S.	L.S.	L.S.

ITEM	763505 C
ITEM TITLE	TRAFFIC OFFICERS
UNIT	HOUR
SHEET NO. 0002 FROM STA. 364+00 TO STA. 371+00	55
TOTAL	55
PROPOSAL	55

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
94-074-06	NEW CASTLE	IM-NO60(11)	2	020

BR813 ON I-495 OVER CHRISTINA RIVER-REPAIRS

ADDENDUMS

LEGEND

C FEDERAL AID FUNDED BRIDGE CONSTRUCTION

** FIXED PRICE

OCTOBER 3, 1994

DESIGN

CHKD.

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
94-074-06	NEW CASTLE	[illegible]	3	[illegible]

I-495 OVER CHRISTINA RIVER

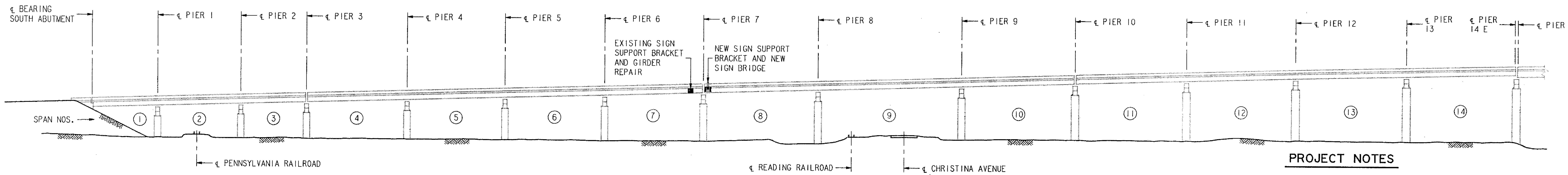
GENERAL PLAN AND ELEVATION - I

PLAN - SPANS 1 THRU 14

SCALE: 1" = 50'-0"

NOTES

(1) REMOVE EXISTING 1" LIQUID TIGHT FLEXIBLE CONDUIT BACK TO NEW SIGN SUPPORT BRACKET. REMOVE EXISTING CONDUCTORS BACK TO JUNCTION BOX. PROVIDE 3-#8 AWG WIRE FROM JUNCTION BOX TO NEW SIGN POLE. SEE SHEET NO. 16.



ELEVATION

SCALE: 1" = 50'-0"

PROJECT NOTES

1. THE WORK TO BE PERFORMED UNDER THIS CONTRACT OCCURS AT VARIOUS LOCATIONS ALONG THE NORTHBOUND AND SOUTHBOUND BRIDGES EXCEPT AS NOTED AND IS AS FOLLOWS:
   - REMOVAL OF EXISTING SIGN SUPPORT BRACKETS AND SUBSEQUENT GIRDER REPAIRS IN SPAN 7.
   - INSTALLATION OF NEW SIGN SUPPORT BRACKETS AND SUBSEQUENT INSTALLATION OF A NEW SIGN STRUCTURE IN SPAN 8.
   - WEB SPLICE RETROFITS IN SPANS 16 THRU 18.
   - BOLTED CONNECTION REPAIRS IN SPANS 16 AND 17.
   - SHOULDER BOLT REPAIR ON WEST EXTERIOR BEARING OF SOUTHBOUND BRIDGE AT PIER 32.
2. CONTRACTOR SHALL COMPLETE ALL WORK ASSOCIATED WITH THE GIRDER REPAIRS ON THE NORTHBOUND AND SOUTHBOUND APPROACH SPANS SHOWN ON SHEET NOS. 6, 7 AND 8 PRIOR TO THE WINTER SHUTDOWN PERIOD DESCRIBED IN THE SPECIFICATIONS, REGARDLESS OF ANY OTHER WORK COMPLETED.
3. THE CONTRACTOR SHALL SUBMIT THE PROPOSED METHODS OF REMOVAL FOR THE VARIOUS ITEMS OF WORK TO THE ENGINEER FOR APPROVAL. THE TECHNIQUE CHOSEN MUST NOT BE DETRIMENTAL TO THE REMAINING STRUCTURE. ANY DAMAGE TO THE EXISTING STRUCTURE TO REMAIN, CAUSED BY THE CONTRACTOR'S OPERATIONS, SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.

   IN ADDITION, THE METHOD FOR REMOVAL OF THE VINYL TOP COAT PAINT, VACUUM POWER TOOLS FOR EXAMPLE, FROM THE EXISTING STEEL SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO PERFORMING THE WORK.

5. ANY WORK PERFORMED FROM THE GROUND SHALL BE DONE ON MATS FURNISHED AND INSTALLED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. UPON COMPLETION OF WORK THE CONTRACTOR SHALL REMOVE ALL MATS AND RESTORE THE AREA TO THE SATISFACTION OF THE ENGINEER. THE MATS, INCLUDING INSTALLATION AND REMOVAL SHALL BE INCIDENTAL TO ITEM 605584, "STEEL STRUCTURE REPAIR."

GENERAL NOTES

DESIGN SPECIFICATIONS:	1992 AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES AND ALL APPLICABLE INTERIM SPECIFICATIONS. 1985 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS WITH 1991 INTERIM.
DESIGN:	SERVICE LOAD DESIGN METHOD.
LOADING:	LIVE LOAD - AASHTO HS 20-44. DEAD LOAD INCLUDES 25 psf PROVISION FOR FUTURE OVERLAY AND 15 POUNDS PER SQUARE FOOT FOR BRIDGE DECK FORMS.
MATERIAL AND FABRICATION:	DELAWARE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS DATED JULY 1985, WITH CURRENT MODIFICATIONS, ADDITIONS AND SPECIAL PROVISIONS.
CONCRETE:	PORTLAND CEMENT CONCRETE MASONRY, CLASS "D", f'c = 4500 psi. COVER OVER BAR REINFORCEMENT SHALL BE 2".
REINFORCEMENT STEEL:	ASTM A615 GRADE 60. SPLICES OF REINFORCEMENT SHALL MEET THE REQUIREMENTS OF AASHTO.
STRUCTURAL STEEL:	ASTM DESIGNATION A 709 GRADE 50, PAINTED WITH INORGANIC ZINC PRIMER VINYL TOP COAT SYSTEM, UNLESS NOTED OTHERWISE IN THE PLANS OR SPECIAL PROVISIONS.
HIGH STRENGTH BOLTS:	ASTM A 325, TYPE 1, MECHANICALLY GALVANIZED, PRIMED, AND PAINTED.
EXISTING STRUCTURE:	ALL DIMENSIONS AFFECTED BY THE GEOMETRICS, AND/OR LOCATION OF THE EXISTING STRUCTURE SHALL BE CHECKED IN THE FIELD BY THE CONTRACTOR, BEFORE ANY CONSTRUCTION IS DONE, AND BEFORE ANY STEEL IS ORDERED OR FABRICATED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SUPPLY THE ENGINEER WITH ALL FIELD DIMENSIONS REQUIRED TO CHECK DETAIL DRAWINGS. THE ± MARKS SHOWN WITH DIMENSIONS DO NOT INDICATE ANY DEGREE OF PRECISION. THESE MARKS (±) INDICATE EXISTING DIMENSIONS THAT MAY VARY AND DO REQUIRE FIELD VERIFICATION BY THE CONTRACTOR. FOR THE CONVENIENCE AND INFORMATION OF BIDDERS, PERTINENT PRINTS OF THE EXISTING STRUCTURE ARE AVAILABLE UPON REQUEST FROM THE DELAWARE DOT. NO RESPONSIBILITY FOR THEIR ACCURACY OR COMPLETENESS IS ASSUMED BY THE DELAWARE DOT. DIMENSIONS, DETAILS, ETC. AS SHOWN THEREON MAY NOT BE AS BUILT.
EPOXY BONDING COMPOUND:	ALL EXISTING CONCRETE THAT WILL BE IN CONTACT WITH NEW CONCRETE SHALL BE COATED WITH AN EPOXY BONDING COMPOUND.
NON-DESTRUCTIVE TESTING	LOCATIONS DESIGNATED ON THE PLANS FOR NON-DESTRUCTIVE TESTING (NDT) ARE BASED ON A VISUAL INSPECTION OF THE STRUCTURE AND DO REQUIRE FIELD VERIFICATION BY THE CONTRACTOR. DIFFERENCES FROM THE PLANS SHOULD BE REPORTED TO THE ENGINEER. ALL NDT SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER. ANY NDT PERFORMED WITHOUT THE ENGINEER BEING PRESENT WILL BE CONSIDERED VOID AND SHALL BE REPEATED WITH THE ENGINEER PRESENT AND AT NO ADDITIONAL COST TO THE DEPARTMENT. THE CONTRACTOR SHALL SUBMIT HIS PROPOSED METHODS OF NDT (ULTRASONIC TESTING FOR EXAMPLE) TO THE ENGINEER FOR APPROVAL 14 DAYS PRIOR TO BEGINNING THE WORK. ALL COSTS ASSOCIATED WITH NDT SHALL BE INCIDENTAL TO THE VARIOUS ITEMS AS NOTED ON THE PLANS. THERE SHALL BE NO EXTRA COMPENSATION TO THE CONTRACTOR SHOULD FIELD VERIFICATION OF THE DAMAGED AREAS SHOWN INDICATE A DISCREPANCY FROM THE PLANS.

WORK ITEM NOTES

- ALL ELECTRIFICATION WORK AND MATERIAL SHOWN SHALL BE INCLUDED IN ITEM 746540, "ELECTRIFICATION."

REVISIONS

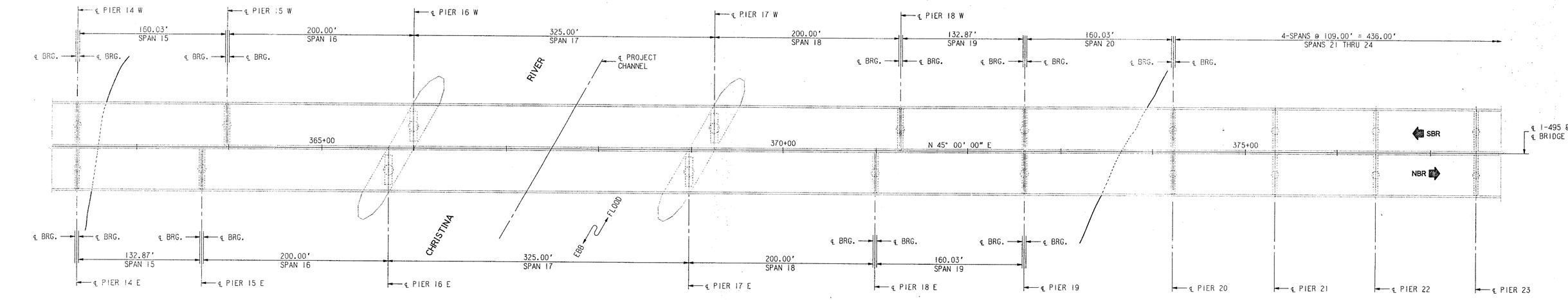
PREL. [illegible] A. B. MacEWEN DESIGN D. J. SJLERZYSKI CHKD. R. A. MILLER
Y. E. ZHOU

BGPE0100

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
94-074-06	NEW CASTLE	IM-N060(13)	4	20

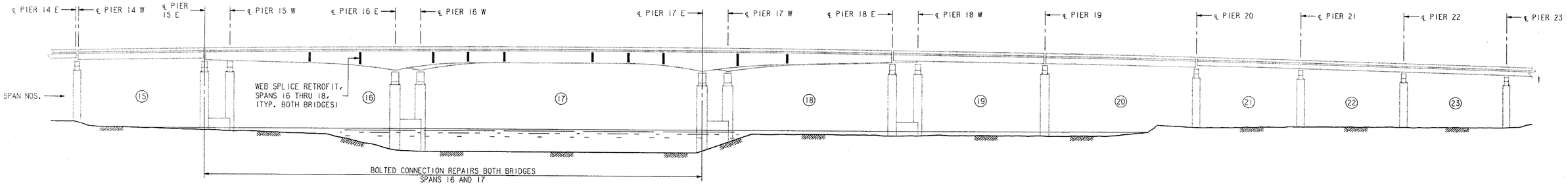
I-495 OVER CHRISTINA RIVER

GENERAL PLAN AND ELEVATION - II



PLAN - SPANS 15 THRU 23

SCALE: 1" = 50'-0"



ELEVATION

SCALE: 1" = 50'-0"

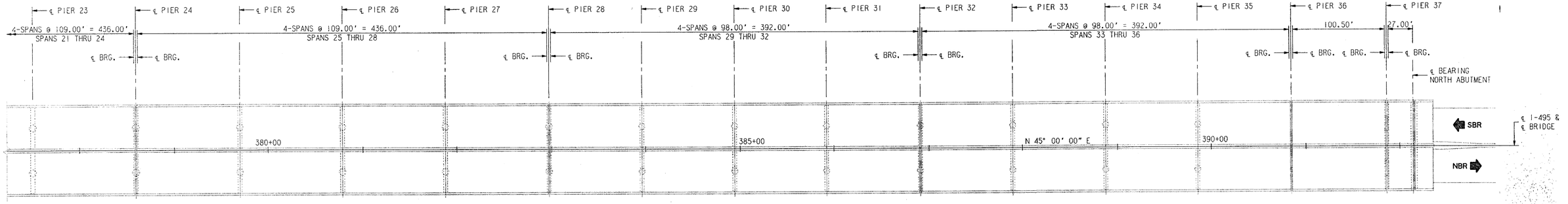
REVISIONS

BGPE0200

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
94-074-06	NEW CASTLE	IM-N060(1)	5	20

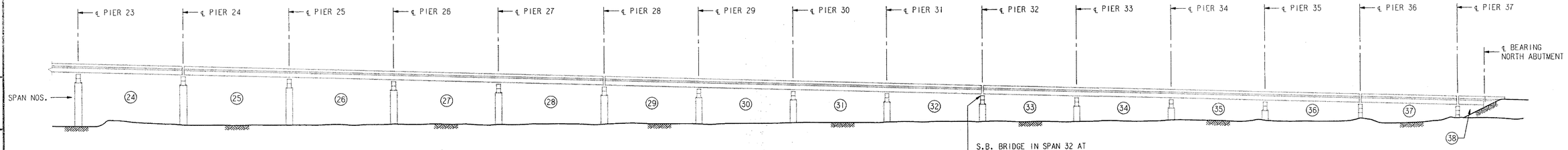
I-495 OVER CHRISTINA RIVER

GENERAL PLAN AND ELEVATION - III



PLAN - SPANS 24 THRU 38

SCALE: 1" = 50'-0"



ELEVATION

SCALE: 1" = 50'-0"

S.B. BRIDGE IN SPAN 32 AT PIER 32, SECURE SHOULDER BOLT ON WEST EXTERIOR BEARING. THIS WORK SHALL BE INCLUDED IN ITEM 605584, "STEEL STRUCTURE REPAIR." IN ADDITION, THIS WORK IS TO BE PERFORMED IN ITS ENTIRETY FROM UNDERNEATH THE BRIDGE.

REVISIONS

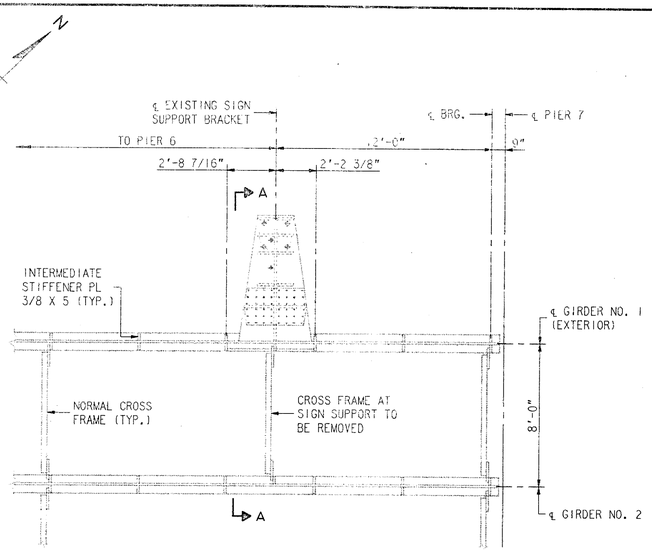
DESIGN D. J. SULERZYSKI CHKD. Y. E. ZHOU

BGPE0300

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
94-074-06	NEW CASTLE	IM-NOGO(11)	6	20

I-495 OVER CHRISTINA RIVER

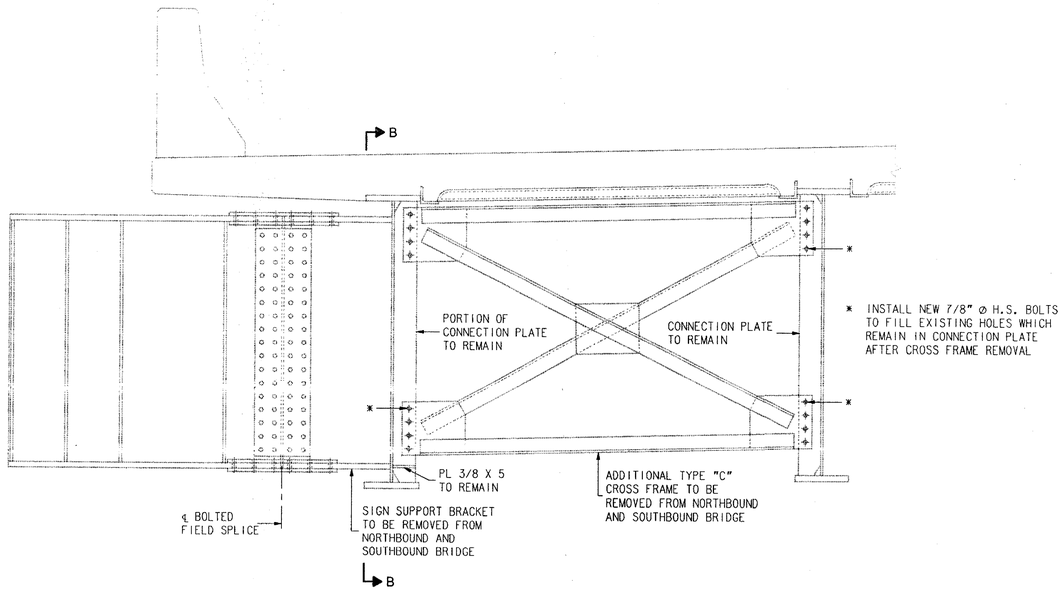
EXISTING STRUCTURAL STEEL REMOVAL



PART FRAMING PLAN

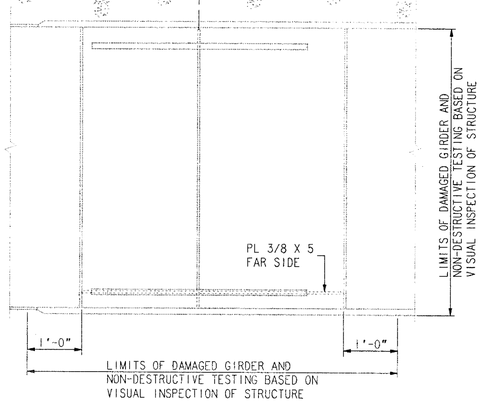
(SHOWN BELOW GIRDER TOP FLANGE)

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



SECTION A-A

SCALE: 3/4" = 1'-0"



SECTION B-B

SCALE: 3/4" = 1'-0"

NOTE:
DETAILS SHOWN ARE AT THE SOUTHBOUND BRIDGE, DETAILS FOR THE NORTH-BOUND BRIDGE ARE SIMILAR

LEGEND

- EXISTING STRUCTURE (SCREENED LINES)
- ○ EXISTING 7/8" ø BOLT
- ✣ EXISTING HOLE

SUGGESTED SEQUENCE OF OPERATIONS

THE CONTRACTOR SHALL PERFORM THE WORK IN THE VICINITY OF THE EXISTING SIGN SUPPORT BRACKETS ON THE NORTHBOUND AND SOUTHBOUND BRIDGES SIMULTANEOUSLY.

THE CONTRACTOR SHALL SUBMIT HIS PROPOSED METHODS OF REMOVAL TO THE ENGINEER. THE METHOD OF REMOVAL EMPLOYED MUST MEET THE APPROVAL OF THE ENGINEER PRIOR TO THE BEGINNING OF THIS WORK. ANY DAMAGE TO THE EXISTING STRUCTURE TO REMAIN, CAUSED BY THE CONTRACTOR'S OPERATIONS, SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER AT THE CONTRACTOR'S EXPENSE.

1. CLOSE PORTION OF ROADWAY TO TRAFFIC IN ACCORDANCE WITH TRAFFIC CONTROL PLANS.
2. NO CONSTRUCTION EQUIPMENT SHALL BE PERMITTED IN THE CLOSED PORTION OF THE ROADWAY IN THE SPAN CONTAINING THE EXISTING SIGN SUPPORT BRACKET.
3. THE CONTRACTOR SHALL ENSURE THAT ALL ELECTRICAL POWER TO THE WIRING IN THE VICINITY OF THE SUPPORT BRACKET IS TURNED OFF.
4. THE CONTRACTOR SHALL NOT REMOVE ANY OF THE EXISTING ADDITIONAL TYPE "C" CROSS FRAME UNTIL ALL OF THE EXISTING SUPPORT BRACKET IS REMOVED.
5. REMOVE EXISTING SIGN SUPPORT BRACKET AND GRIND SMOOTH THE CONNECTION WELD AREAS.
6. UPON REMOVAL OF THE SUPPORT BRACKET, THE CONTRACTOR SHALL REMOVE THE EXISTING ADDITIONAL TYPE "C" CROSS FRAME. THE CROSS FRAME'S CONNECTION PLATES SHALL NOT BE REMOVED.
7. AFTER REMOVAL OF THE BRACKET AND CROSS FRAME, THE CONTRACTOR SHALL FIELD MEASURE AND PERFORM NON-DESTRUCTIVE TESTING ON ALL STEEL MEMBERS IN THE VICINITY OF THE REMOVED BRACKET AND CROSS FRAME TO DETERMINE THE EXTENT OF DAMAGE TO THE EXISTING STEEL MEMBERS. THE CONTRACTOR SHALL VERIFY THE DAMAGED AREAS INDICATED IN THE SUBSEQUENT DRAWINGS AND ANY DISCREPANCIES REPORTED TO THE ENGINEER. THE CONTRACTOR SHALL SUBMIT THE NON-DESTRUCTIVE TESTING METHOD TO THE ENGINEER FOR APPROVAL.

NOTES

1. FOR GENERAL NOTES, SEE SHEET NO. 3.
2. ALL COSTS FOR NEW 7/8" ø H.S. BOLTS AND REMOVAL OF EXISTING STRUCTURAL STEEL, INCLUDING NON-DESTRUCTIVE TESTING, WILL BE INCIDENTAL TO ITEM NO. 605584, "STEEL STRUCTURE REPAIR."

REVISIONS

DESIGN D. J. SULERZYSKI CHKD. T. B. CUSTER

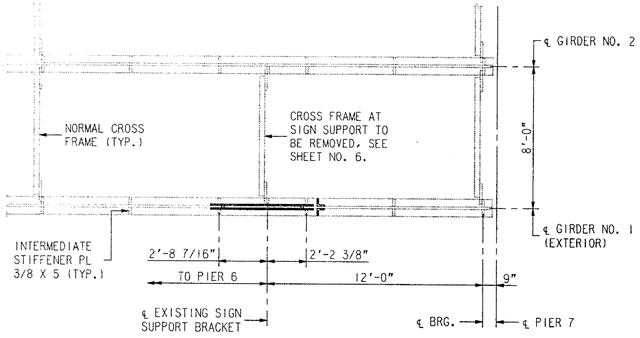
J. R. MASTEN

BGR00300

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
94-074-06	NEW CASTLE	IM-NO60(II)	7	20

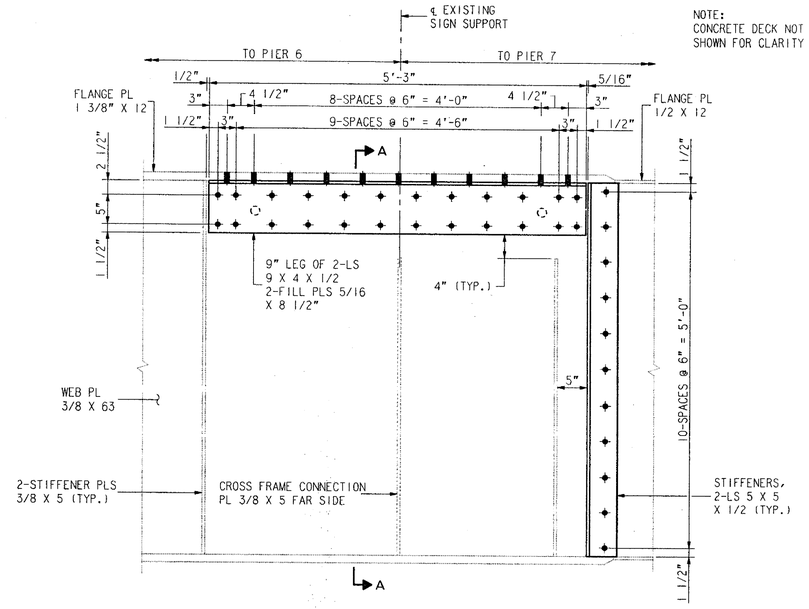
I-495 OVER CHRISTINA RIVER

GIRDER REPAIRS - NBR



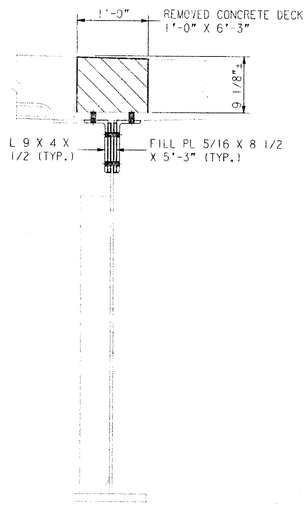
PART FRAMING PLAN

(SHOWN BELOW GIRDER TOP FLANGE)
SCALE: 1/4" = 1'-0"



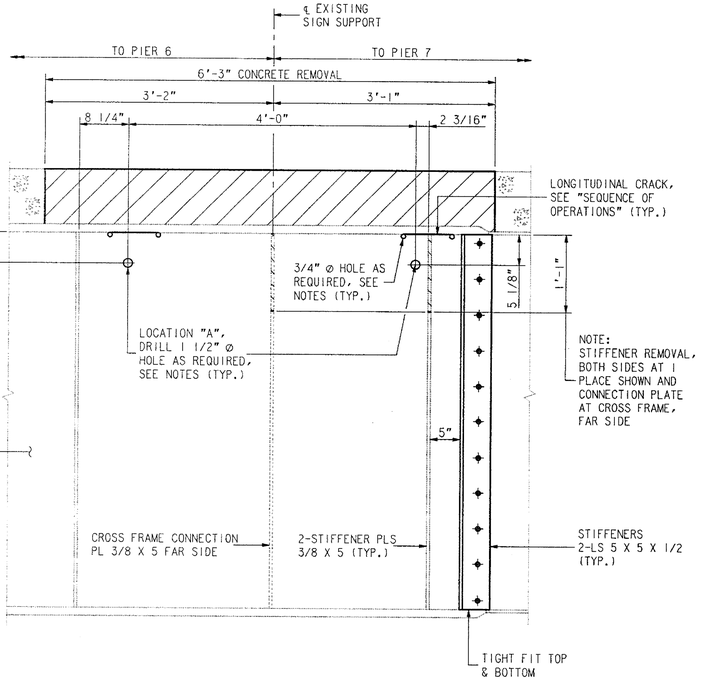
PART EAST ELEVATION OF REPAIRED EXTERIOR GIRDER

(SEE "SUGGESTED SEQUENCE OF OPERATIONS" NOS. 10 AND 11)
SCALE: 1" = 1'-0"



SECTION A-A

SCALE: 1" = 1'-0"



PART EAST ELEVATION OF EXTERIOR GIRDER

(SEE "SUGGESTED SEQUENCE OF OPERATIONS" NOS. 4 THROUGH 9)
SCALE: 1" = 1'-0"

LEGEND

- EXISTING STRUCTURE (SCREENED LINES)
- STRUCTURE TO BE REMOVED
- NEW 7/8" ⌀ BOLTS (PLAN VIEW)
- NEW 7/8" ⌀ BOLTS (ELEVATION VIEW)

NOTES

1. FOR GENERAL NOTES, SEE SHEET NO. 3.
2. ALL AREAS IN THE WEB AND FLANGE WHERE EXISTING MEMBERS HAVE BEEN REMOVED SHALL BE GROUND SMOOTH. NONDESTRUCTIVE TESTS SHALL BE APPLIED TO THESE AREAS TO EXAMINE ANY POSSIBLE CRACKS IN THE WEB PLATE.
3. THE METHOD OF CONCRETE DECK REMOVAL EMPLOYED MUST MEET THE APPROVAL OF THE ENGINEER. THE TECHNIQUE CHOSEN MUST NOT BE DETRIMENTAL TO THE REMAINING STRUCTURE.

   THE CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE THE GIRDER'S FLANGE AND PERMANENT METAL SLAB FORMS DURING CONCRETE REMOVAL OPERATIONS. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
4. FOR OTHER NOTES, SEE SHEET NO. 8.

WORK ITEM NOTES

- ALL WORK AND MATERIAL ASSOCIATED WITH THE CONCRETE REMOVAL SHOWN SHALL BE INCIDENTAL TO ITEM 605584, "STEEL STRUCTURE REPAIR." ANY REINFORCING STEEL SHALL ALSO BE INCIDENTAL TO THIS ITEM.
- ALL WORK AND MATERIAL ASSOCIATED WITH THE REPLACEMENT CONCRETE SHALL BE INCIDENTAL TO ITEM 605584, "STEEL STRUCTURE REPAIR."
- NEW STRUCTURAL STEEL SHOWN INCLUDING NEW HIGH STRENGTH BOLTS SHALL BE INCLUDED IN ITEM 605584, "STEEL STRUCTURE REPAIR."
- REMOVAL OF EXISTING STRUCTURAL STEEL SHALL BE INCIDENTAL TO ITEM 605584, "STEEL STRUCTURE REPAIR."
- DRILLED 1 1/2-INCH DIAMETER AND 3/4-INCH DIAMETER HOLES AT CRACK LOCATIONS AND FIELD-DRILLED HOLES FOR HIGH STRENGTH BOLTS SHALL BE INCIDENTAL TO ITEM 605584, "STEEL STRUCTURE REPAIR."
- NON-DESTRUCTIVE TESTING SHALL BE INCIDENTAL TO ITEM 605584, "STEEL STRUCTURE REPAIR."
- CLEANING AND PAINTING OF STRUCTURAL STEEL SHALL BE INCIDENTAL TO ITEM 605584, "STEEL STRUCTURE REPAIR."

SUGGESTED SEQUENCE OF OPERATIONS (NORTHBOUND BRIDGE)

THE CONTRACTOR SHALL PERFORM THE WORK SIMULTANEOUSLY WITH THE GIRDER REPAIR OF SBR.

1. NO GIRDER REPAIR WORK SHALL BE PERFORMED UNTIL ALL WORK IS COMPLETED FOR THE REMOVAL OF THE EXISTING SUPPORT BRACKET. SEE SHEET NO. 6.
2. MAINTAIN TRAFFIC PER TRAFFIC CONTROL PLANS.
3. NO CONSTRUCTION EQUIPMENT SHALL BE PERMITTED ON THE CLOSED PORTION OF THE ROADWAY IN THE SPAN CONTAINING THE EXISTING SIGN SUPPORT BRACKET.
4. INSTALL TWO NEW INTERMEDIATE TRANSVERSE STIFFENERS AT THE SPECIFIED LOCATION SHOWN.
5. REMOVE THE UPPER PORTION OF THE TWO EXISTING INTERMEDIATE TRANSVERSE STIFFENERS AND THE UPPER PORTION OF THE CONNECTION PLATE FOR THE ADDITIONAL TYPE "C" CROSSFRAME, AS SPECIFIED IN THE DRAWING.
6. WHERE EXISTING MEMBERS AND WELDS HAVE BEEN REMOVED, A NON-DESTRUCTIVE TESTING METHOD SHALL BE USED TO EXAMINE THE POSSIBLE EXISTENCE OF CRACKING IN THE WEB AND FLANGE PLATE. THE CONTRACTOR SHALL SUBMIT THE METHOD TO THE ENGINEER FOR APPROVAL.
7. NONDESTRUCTIVE TESTING (NDT) SHALL ALSO BE PERFORMED IN THE VICINITY OF THE WELD BETWEEN THE TOP FLANGE AND THE WEB OF THE GIRDER IN THE WEB PANEL TO DETERMINE THE EXTENT OF LONGITUDINAL CRACKS. A 3/4" ⌀ HOLE SHALL BE DRILLED 1 AT EVERY DETECTED CRACK TIP. THE HOLE SHALL BE DRILLED IN THE WEB PLATE ONLY, AND SHALL NOT ENCROACH INTO THE FLANGE. AFTER HOLES ARE DRILLED, PERFORM NDT TO ENSURE THAT CRACK TIPS HAVE BEEN REMOVED. IF THE TIP HAS NOT BEEN REMOVED, THEN IT SHALL BE GROUND OUT.
8. AT LOCATIONS LABELLED "A", 1 1/2" ⌀ HOLES SHALL BE DRILLED TO REMOVE THE CRACK SHOULD A CRACK BE DETECTED. NO HOLES NEED TO BE DRILLED IF NO CRACK IS DETECTED.
9. REMOVE A PORTION OF THE DECK SLAB AS SPECIFIED IN THE DRAWING. CARE SHALL BE TAKEN SO THAT EXISTING REINFORCING STEEL IS NOT DAMAGED.

   ALL BAR REINFORCEMENT, EXPOSED DURING THE REMOVAL OF THE CONCRETE AND INTENDED FOR RE-USE, SHALL BE THOROUGHLY CLEANED OF RUST AND OTHER FOREIGN MATERIAL BY SANDBLASTING, AND IN CASE OF A DAMAGED BAR, IT SHALL BE CUT AND MECHANICALLY SPLICED, OR REPLACED WITH A NEW BAR OF THE SAME SIZE AND LAPPED OR FIELD-WELDED TO THE ENDS OF THE EXISTING BAR TO THE SATISFACTION OF THE ENGINEER. AFTER REMOVAL OF ALL CONCRETE AS REQUIRED, THE REMAINING CONCRETE SURFACE SHALL BE THOROUGHLY CLEANED WITH OIL-FREE COMPRESSED AIR.
10. INSTALL TWO CONNECTION ANGLES BOLTED TO THE GIRDER'S TOP FLANGE AND WEB, AS SPECIFIED IN THE DRAWING.
11. CAST THE DECK SLAB.

REVISIONS

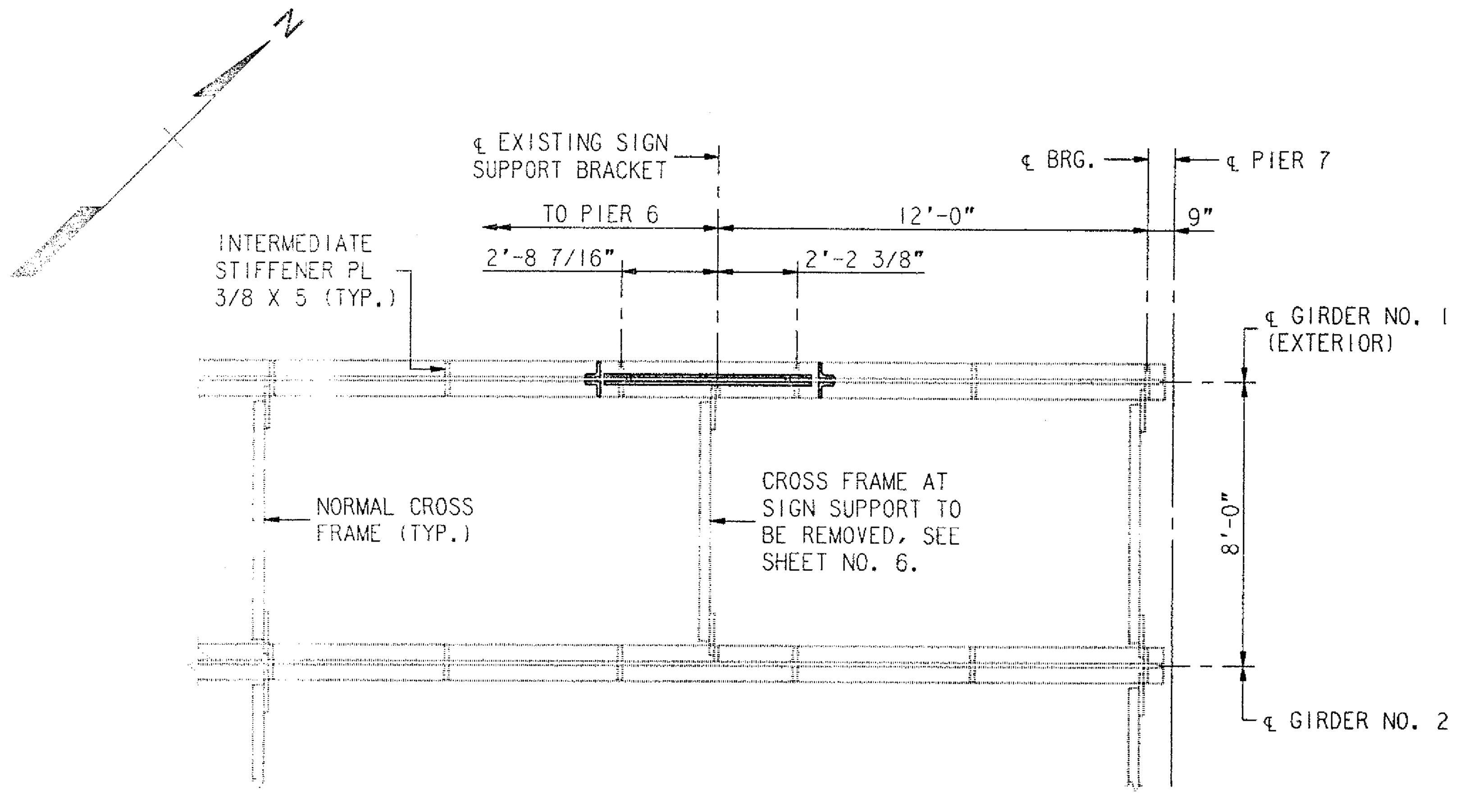
DES'GN Y. F. ZHOU DWN. T. B. CUSTER

CHK'D A. B. MacBETH

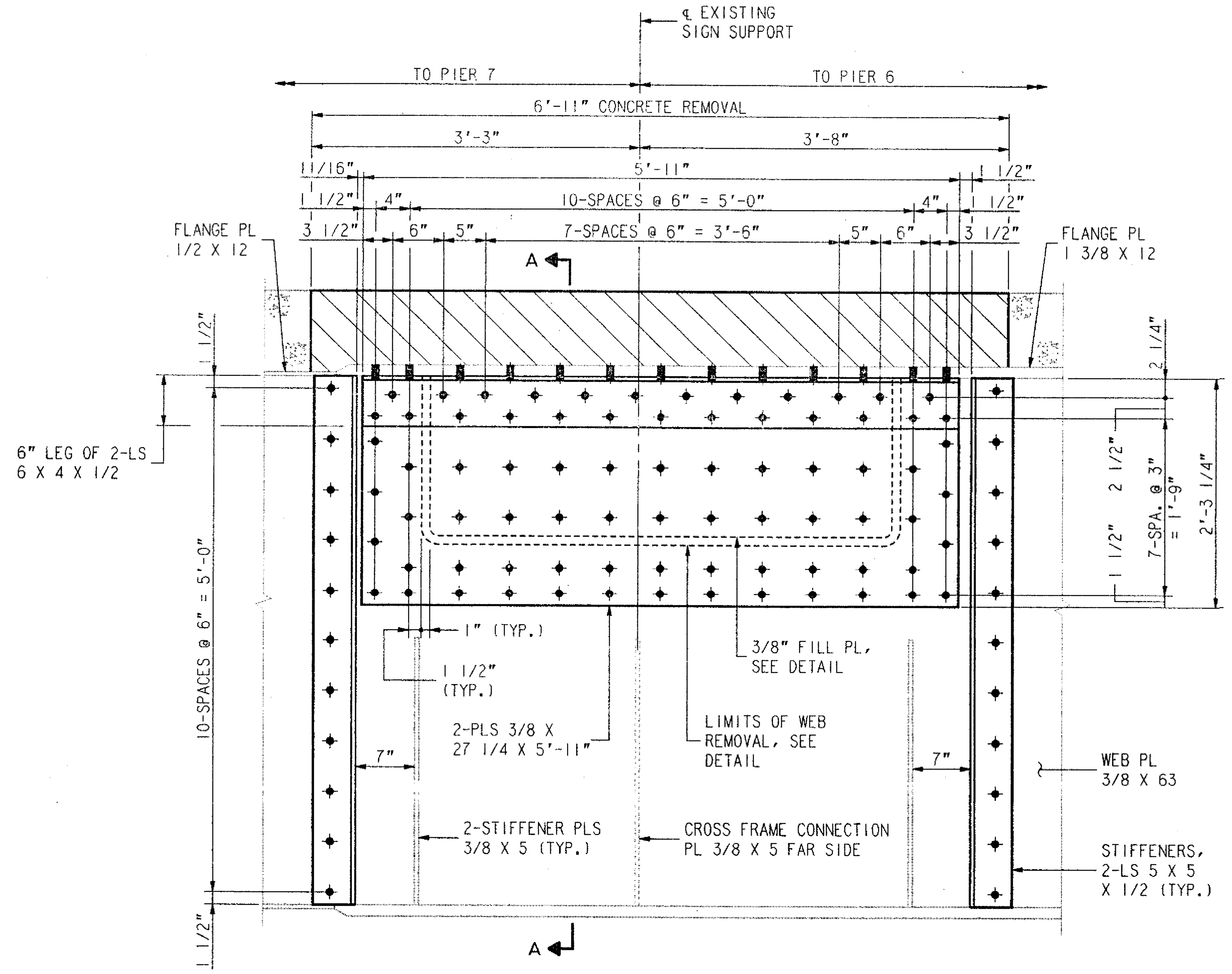
CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
94-074-06	NEW CASTLE	IM-N060(1)	8	20

I-495 OVER CHRISTINA RIVER

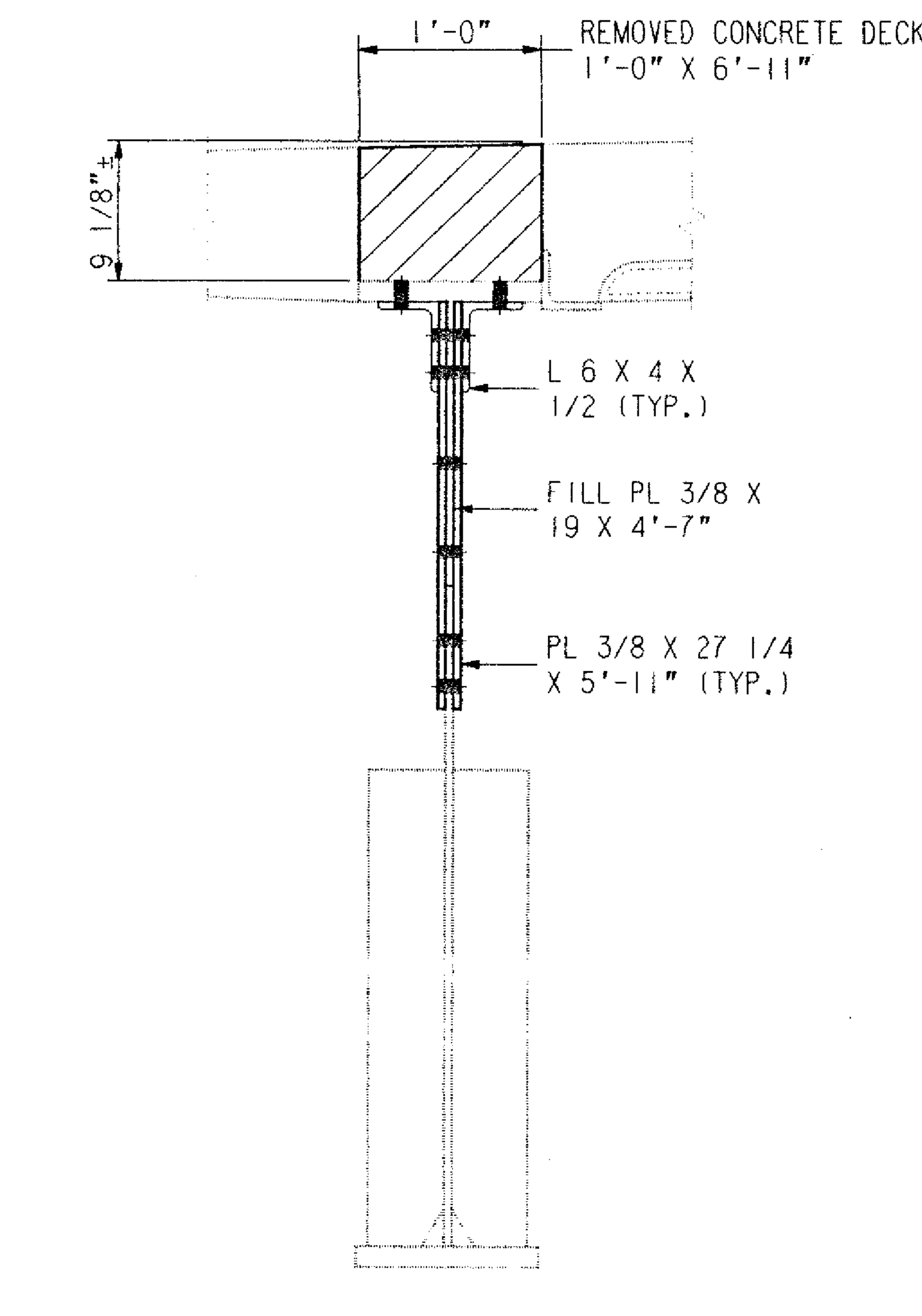
GIRDER REPAIRS - SBR



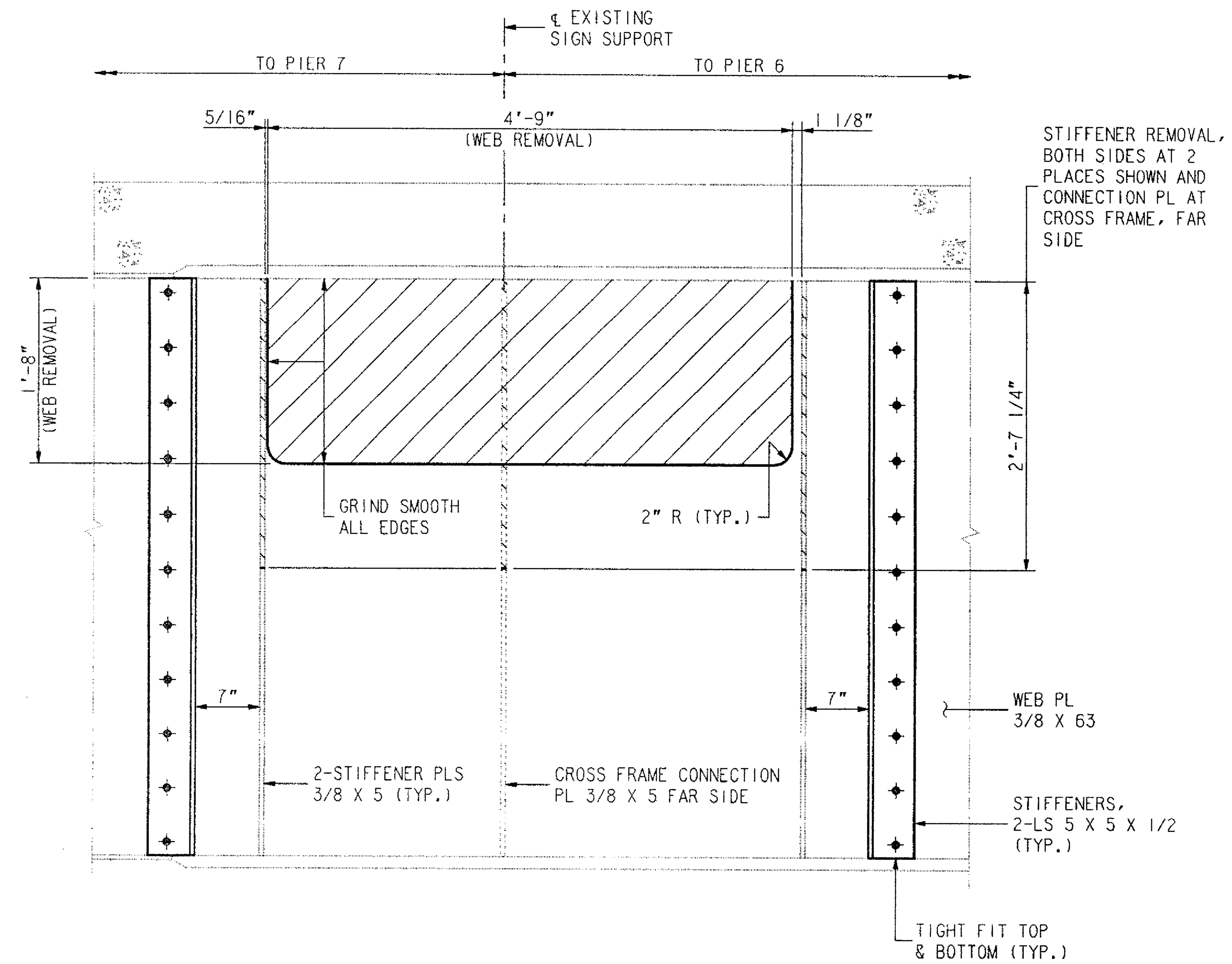
PART FRAMING PLAN
(SHOWN BELOW GIRDER TOP FLANGE)
SCALE: 1/4" = 1'-0"



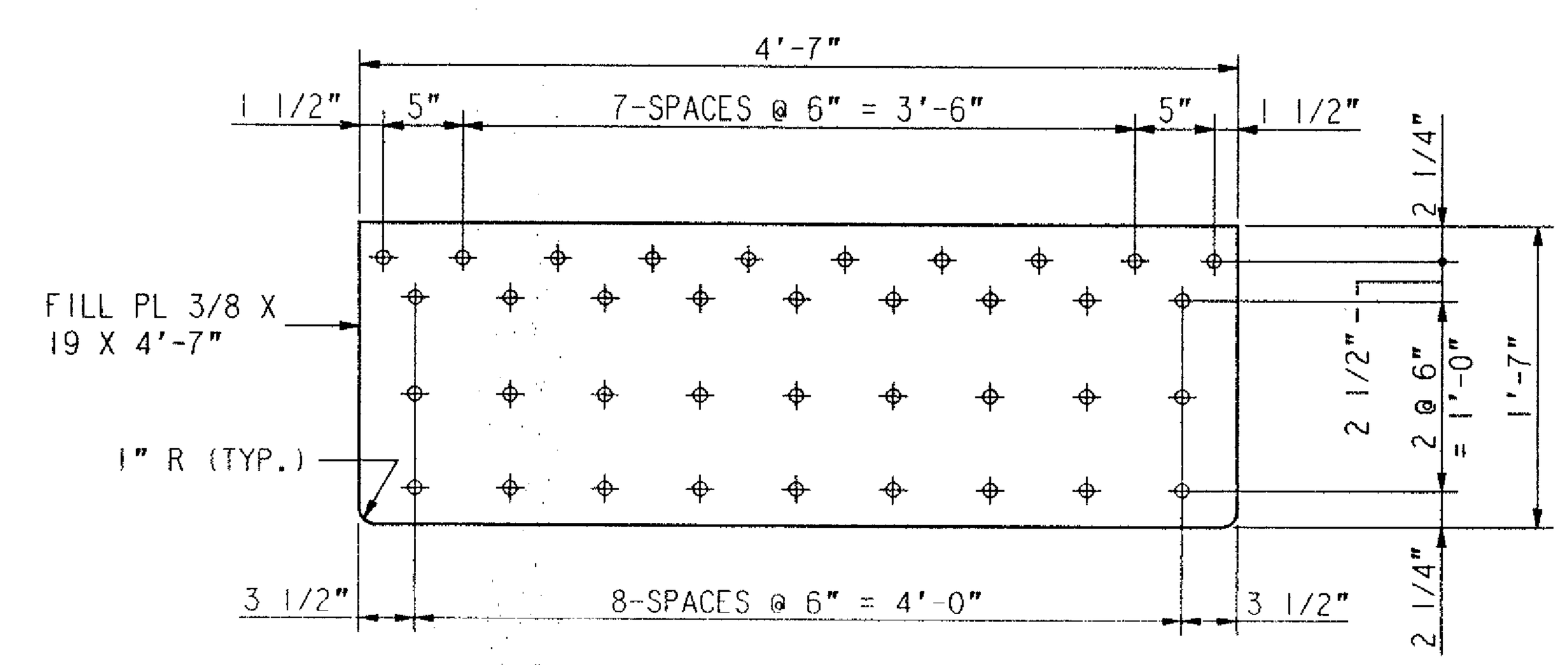
PART WEST ELEVATION OF REPAIRED EXTERIOR GIRDER
(SEE "SUGGESTED SEQUENCE OF OPERATIONS" NOS. 8 THROUGH 12)
SCALE: 1" = 1'-0"



SECTION A-A
SCALE: 1" = 1'-0"



PART WEST ELEVATION OF EXTERIOR GIRDER
(SEE "SUGGESTED SEQUENCE OF OPERATIONS" NOS. 4 THROUGH 7)
SCALE: 1" = 1'-0"



FILL PLATE
SCALE: 1" = 1'-0"

LEGEND

- EXISTING STRUCTURE (SCREENED LINES)
- STRUCTURE TO BE REMOVED
- NEW 7/8" ⌀ BOLTS (PLAN VIEW)
- NEW 7/8" ⌀ BOLTS (ELEVATION VIEW)

NOTES

1. FOR GENERAL NOTES, SEE SHEET NO. 3.
2. SUBMIT SHOP DRAWINGS FOR THE ENGINEER'S APPROVAL IN ACCORDANCE WITH SUBSECTION 105.02 OF THE DELAWARE STANDARD SPECIFICATIONS.
3. VINYL TOP COAT PAINT SHALL BE REMOVED FROM THE EXISTING STEEL WHERE NEW ANGLES AND PLATES ARE TO BE CONNECTED.
4. NEW ANGLES AND PLATES SHALL BE PRIMED WITH INORGANIC ZINC PRIOR TO INSTALLATION.
5. APPLY VINYL TOP COAT TO ANGLES AND PLATES AFTER INSTALLATION.
6. THE METHOD OF CONCRETE DECK REMOVAL EMPLOYED MUST MEET THE APPROVAL OF THE ENGINEER. THE TECHNIQUE CHOSEN MUST NOT BE DETRIMENTAL TO THE REMAINING STRUCTURE.

   THE CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE THE GIRDER'S FLANGE AND PERMANENT METAL SLAB FORMS DURING CONCRETE REMOVAL OPERATIONS. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
7. SEE WORK ITEM NOTES ON SHEET NO. 7.

SUGGESTED SEQUENCE OF OPERATIONS (SOUTHBOUND BRIDGE)

THE CONTRACTOR SHALL PERFORM THE WORK SIMULTANEOUSLY WITH THE GIRDER REPAIR OF NBR.

1. NO GIRDER REPAIR WORK SHALL BE PERFORMED UNTIL ALL WORK IS COMPLETED FOR THE REMOVAL OF THE EXISTING SUPPORT BRACKET. SEE SHEET NO. 6.
2. MAINTAIN TRAFFIC PER TRAFFIC CONTROL PLANS.
3. NO CONSTRUCTION EQUIPMENT SHALL BE PERMITTED ON THE CLOSED PORTION OF THE ROADWAY IN THE SPAN CONTAINING THE EXISTING SIGN SUPPORT BRACKET.
4. INSTALL NEW INTERMEDIATE TRANSVERSE STIFFENERS AT THE SPECIFIED LOCATIONS. THIS INCLUDES A TOTAL OF FOUR ANGLES TO BE BOLTED TO THE GIRDER WEB.
5. REMOVE THE DAMAGED PORTION OF GIRDER WEB AS SPECIFIED IN THE DRAWING. GRIND SMOOTH ALL CUT EDGES AND CORNERS, ON BOTH THE WEB AND THE TOP FLANGE.
6. REMOVE THE UPPER PORTION OF THE FOUR EXISTING INTERMEDIATE TRANSVERSE STIFFENERS AND THE UPPER PORTION OF THE CONNECTION PLATE FOR THE ADDITIONAL TYPE "C" CROSSFRAME. GRIND SMOOTH THE CONNECTION WELD AREAS AS SPECIFIED IN THE DRAWING.
7. IN THE GIRDER WEB AND FLANGE WHERE EXISTING MEMBERS HAVE BEEN REMOVED, A NON-DESTRUCTIVE TESTING METHOD SHALL BE USED TO EXAMINE THE POSSIBLE EXISTENCE OF CRACKS IN THE WEB AND FLANGE PLATE. THE CONTRACTOR SHALL SUBMIT THE METHOD TO THE ENGINEER FOR APPROVAL.
8. INSTALL TWO WEB SPLICE PLATES AND ONE FILL PLATE WITH HIGH STRENGTH BOLTS (SNUG TIGHT CONDITION ONLY). THE UPPER TWO ROWS OF BOLT HOLES ARE LEFT UNBOLTED IN THIS STEP.
9. REMOVE A PORTION OF THE DECK SLAB AS SPECIFIED IN THE DRAWING. CARE SHALL BE TAKEN SO THAT EXISTING REINFORCING STEEL IS NOT DAMAGED.

   ALL BAR REINFORCEMENT, EXPOSED DURING THE REMOVAL OF THE CONCRETE AND INTENDED FOR RE-USE, SHALL BE THOROUGHLY CLEANED OF RUST AND OTHER FOREIGN MATERIAL BY SANDBLASTING; AND IN CASE OF A DAMAGED BAR, IT SHALL BE CUT AND MECHANICALLY SPLICED, OR REPLACED WITH A NEW BAR OF THE SAME SIZE AND LAPPED OR FIELD-WELDED TO THE ENDS OF THE EXISTING BAR TO THE SATISFACTION OF THE ENGINEER. AFTER REMOVAL OF ALL CONCRETE AS REQUIRED, THE REMAINING CONCRETE SURFACE SHALL BE THOROUGHLY CLEANED WITH OIL-FREE COMPRESSED AIR.
10. INSTALL TWO CONNECTION ANGLES BOLTED TO THE TOP FLANGE AND THE SPLICED WEB, AS SPECIFIED IN THE DRAWING.
11. PROPERLY TIGHTEN ALL HIGH STRENGTH BOLTS.
12. CAST THE DECK SLAB.

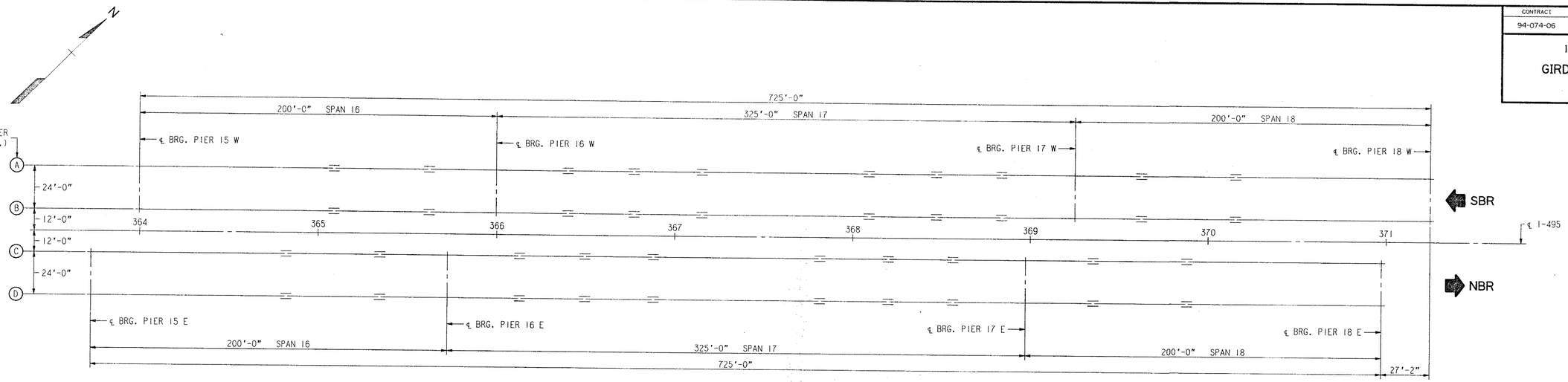
REVISIONS

DESIGN CHKD. T. B. CUSTER

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
94-074-06	NEW CASTLE	IM-N060(1)	9	20

I-495 OVER CHRISTINA RIVER

GIRDER PLAN AND ELEVATION SPANS 16-18



PLAN

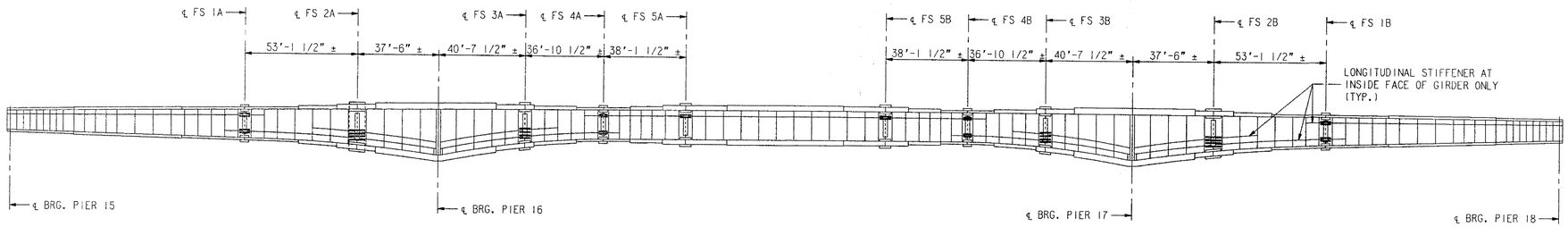
SCALE: 1" = 30'-0"

LEGEND

GIRDER FIELD SPLICE.

GIRDER RETROFIT AT FIELD SPLICE.

FS FIELD SPLICE



GIRDER ELEVATION

SCALE: 1" = 30'-0"

NOTE

1. FOR GENERAL NOTES, SEE SHEET NO. 3.
2. SEE WORK ITEM NOTES ON SHEET NO. 7.

REVISIONS

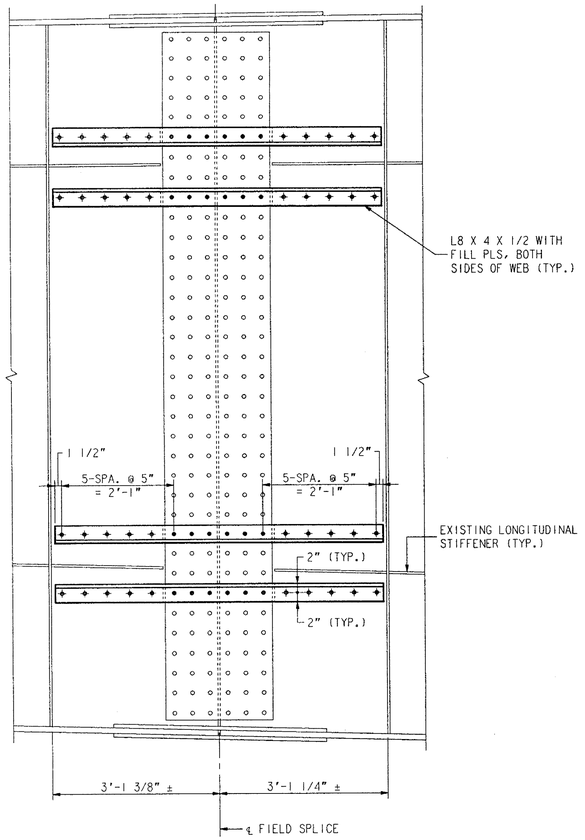
DESIGN A. G. WHITNEY CHKD. B. C. MEHTA

DETAILED A. B. MACEWEN CHKD.

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
94-074-06	NEW CASTLE	IM-NOGO(1)	10	20

I-495 OVER CHRISTINA RIVER

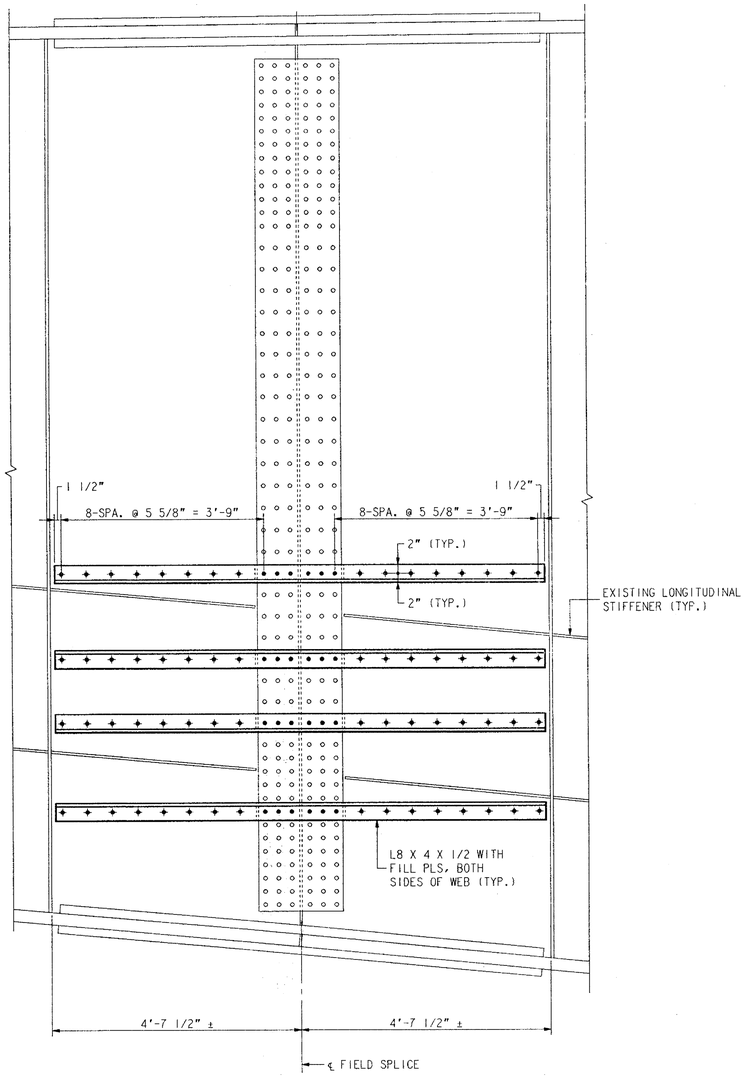
SPLICE RETROFIT DETAILS - I



RETROFIT AT SPLICES 1A AND 1B

(8-LOCATIONS)
SCALE: 3/4" = 1'-0"

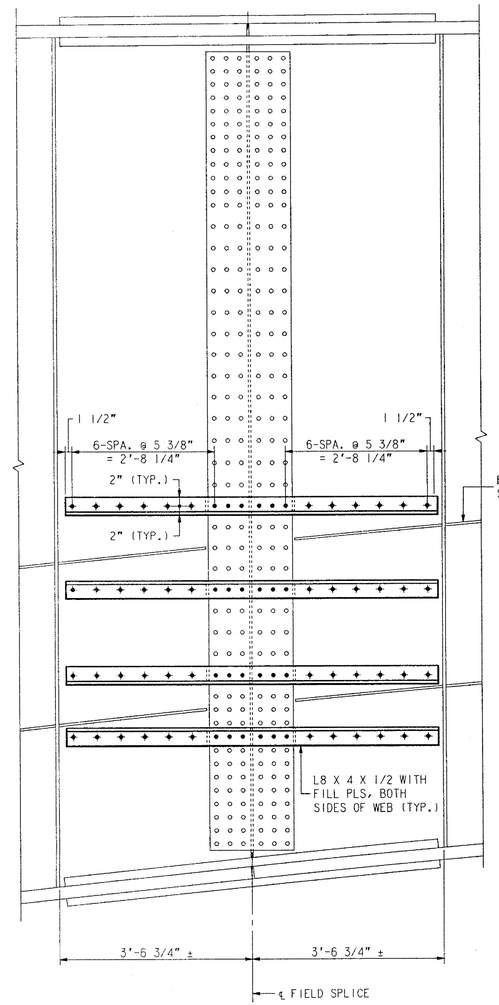
NOTE:
SPLICE 1A SHOWN,
SPLICE 1B OPPOSITE HAND



RETROFIT AT SPLICES 2A AND 2B

(8-LOCATIONS)
SCALE: 3/4" = 1'-0"

NOTE:
SPLICE 2A SHOWN,
SPLICE 2B OPPOSITE HAND



RETROFIT AT SPLICES 3A AND 3B

(8-LOCATIONS)
SCALE: 3/4" = 1'-0"

NOTE:
SPLICE 3A SHOWN,
SPLICE 3B OPPOSITE HAND

LEGEND

- ○ EXISTING 7/8" ⌀ BOLT.
- • EXISTING 7/8" ⌀ BOLT TO BE REMOVED AND REPLACED WITH NEW 7/8" ⌀ HIGH STRENGTH BOLT.
- ✦ NEW 7/8" ⌀ (ASTM A 325) HIGH STRENGTH BOLT IN 15/16" ⌀ FIELD DRILLED HOLE.

NOTES

1. FOR GENERAL NOTES, SEE SHEET NO. 3.
2. FOR GIRDER REPAIR NOTES AND DETAIL, SEE SHEET NO. 11.
3. SEE WORK ITEM NOTES ON SHEET NO. 7.

REVISIONS

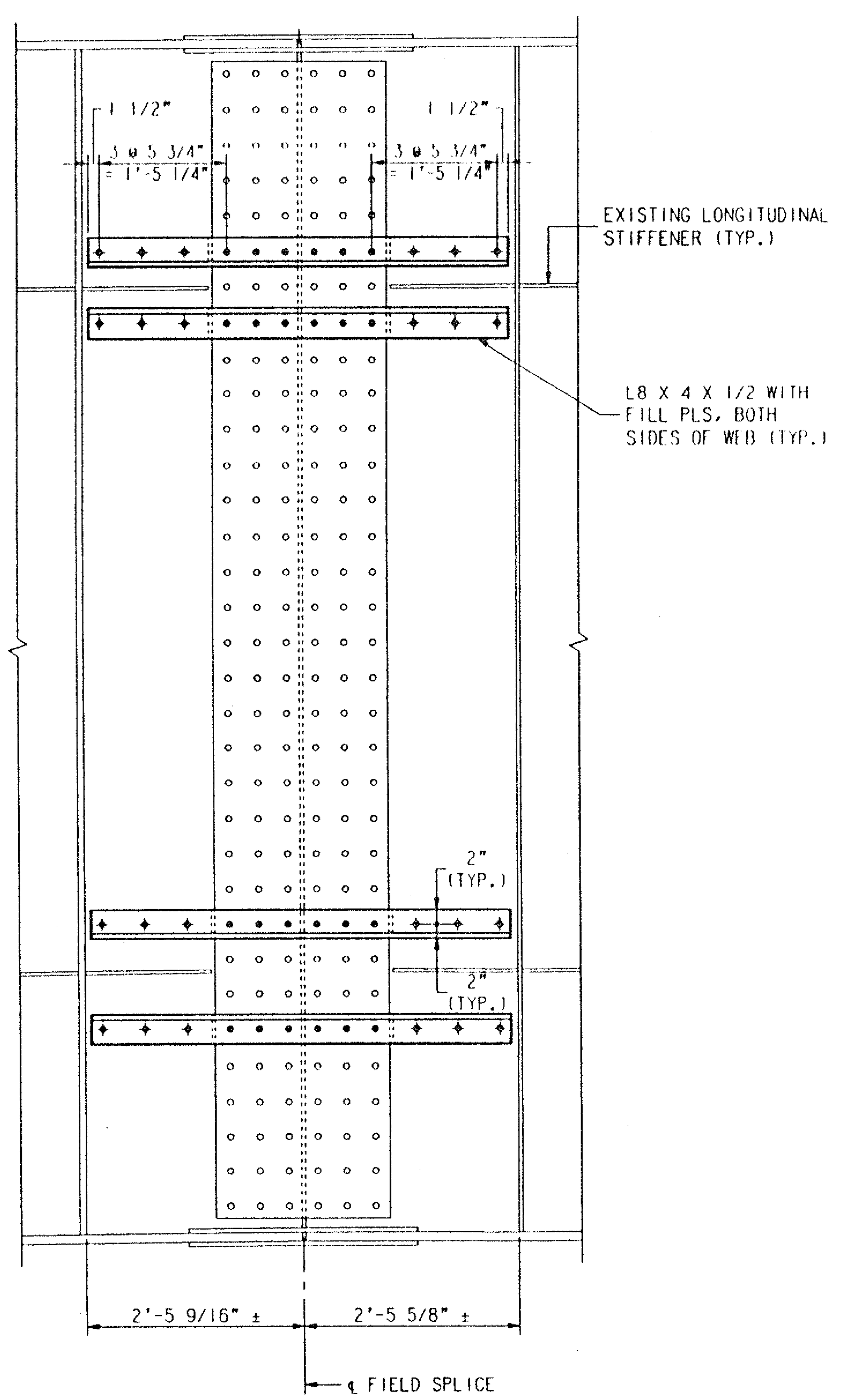
DESIGN A. G. WHITNEY CHKD. B. C. MEHTA
DRAWN A. B. McGINLEY CHKD. A. G. WHITNEY

BGRD0900

CONTRACT	COUNTY
94-074-06	NEW CASTLE

I-495 OVER CHRISTINA RIVER

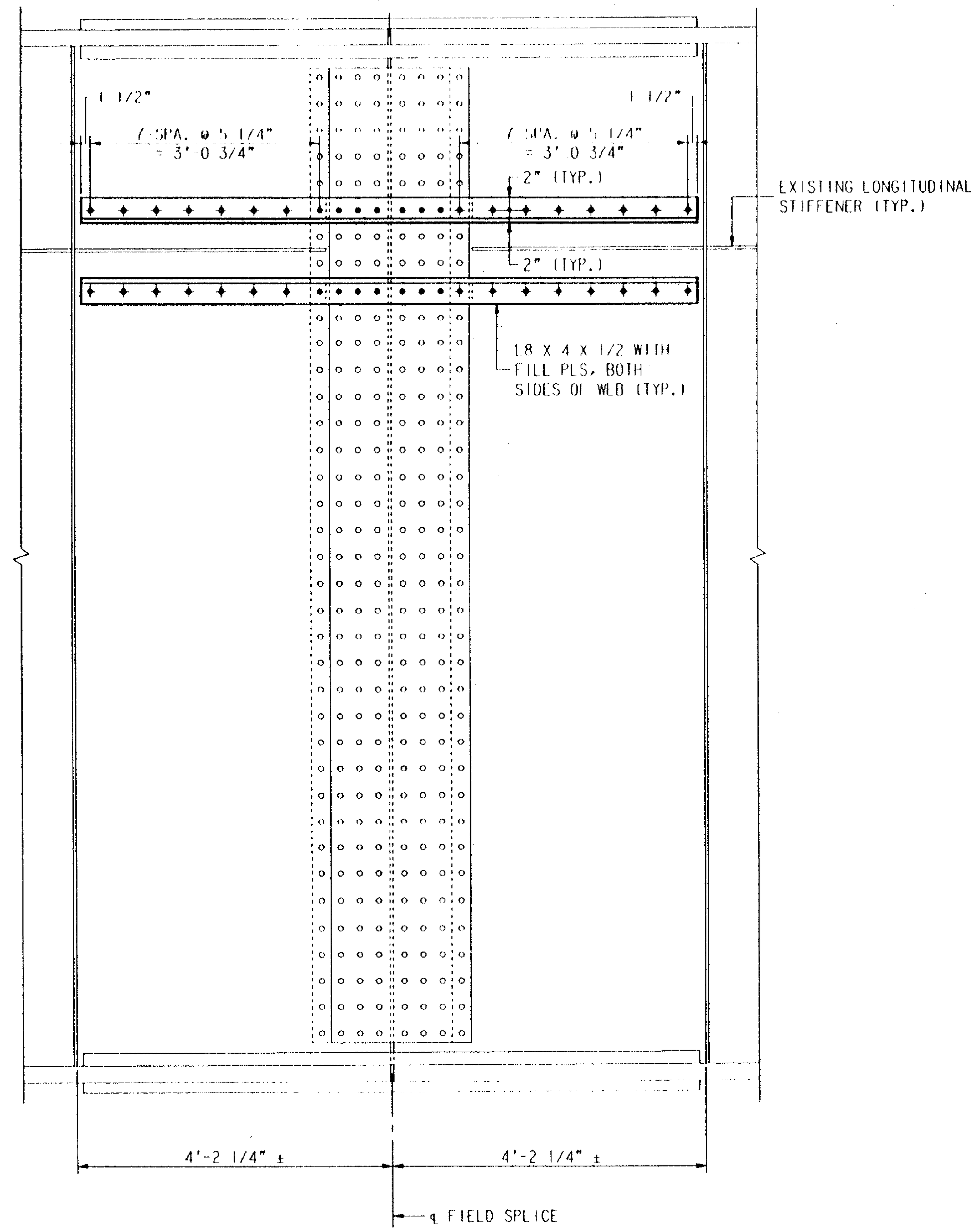
SPLICE RETROFIT DETAILS - II



RETROFIT AT SPLICES 4A AND 4B

(8-LOCATIONS)
SCALE: 3/4" = 1'-0"

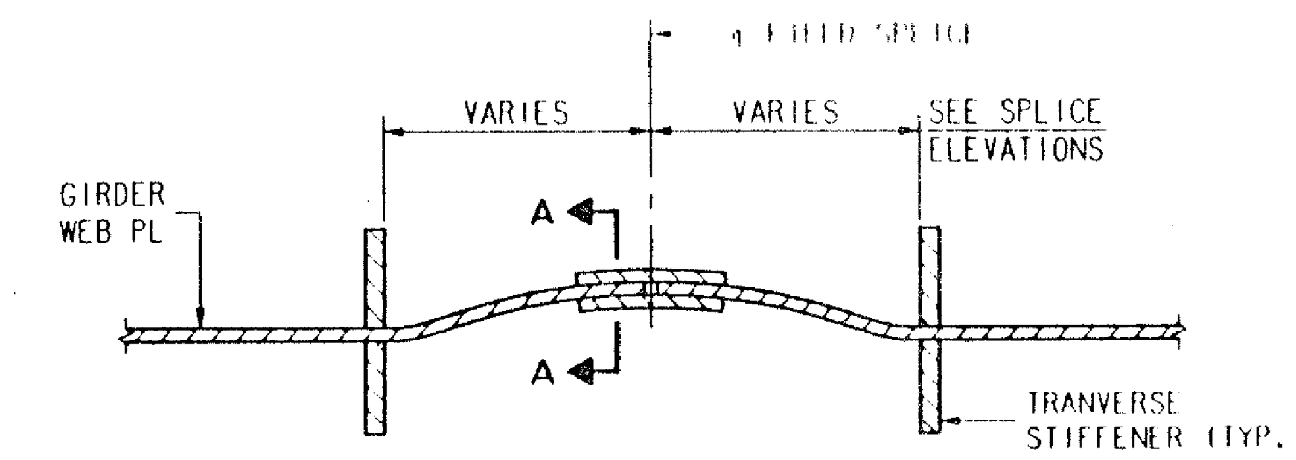
NOTE:
SPLICE 4A SHOWN,
SPLICE 4B OPPOSITE HAND



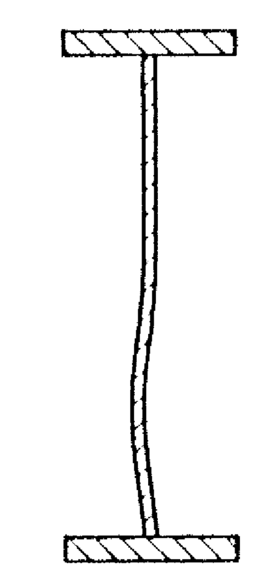
RETROFIT AT SPLICES 5A AND 5B

(8-LOCATIONS)
SCALE: 3/4" = 1'-0"

NOTE:
SPLICE 5A SHOWN,
SPLICE 5B OPPOSITE HAND



PLAN



NOTE:
DISTORTION AT EACH FIELD SPLICE LOCATION VARIES.
SEE GIRDER REPAIR NOTES 1 AND 2.

SECTION A-A

(SPLICE PLS ARE NOT SHOWN)

DISTORTION OF WEB PLATE AT FIELD SPLICE

NOT TO SCALE

LEGEND

- ○ EXISTING 7/8" ⌀ BOLT.
- • EXISTING 7/8" ⌀ BOLT TO BE REMOVED AND REPLACED WITH NEW 7/8" ⌀ HIGH STRENGTH BOLT.
- ✦ NEW 7/8" ⌀ (ASTM A 325) HIGH STRENGTH BOLT IN 15/16" ⌀ FIELD DRILLED HOLE.

NOTE

1. FOR GENERAL NOTES, SEE SHEET NO. 3.
2. SEE WORK ITEM NOTES ON SHEET NO. 7.

GIRDER REPAIR NOTES

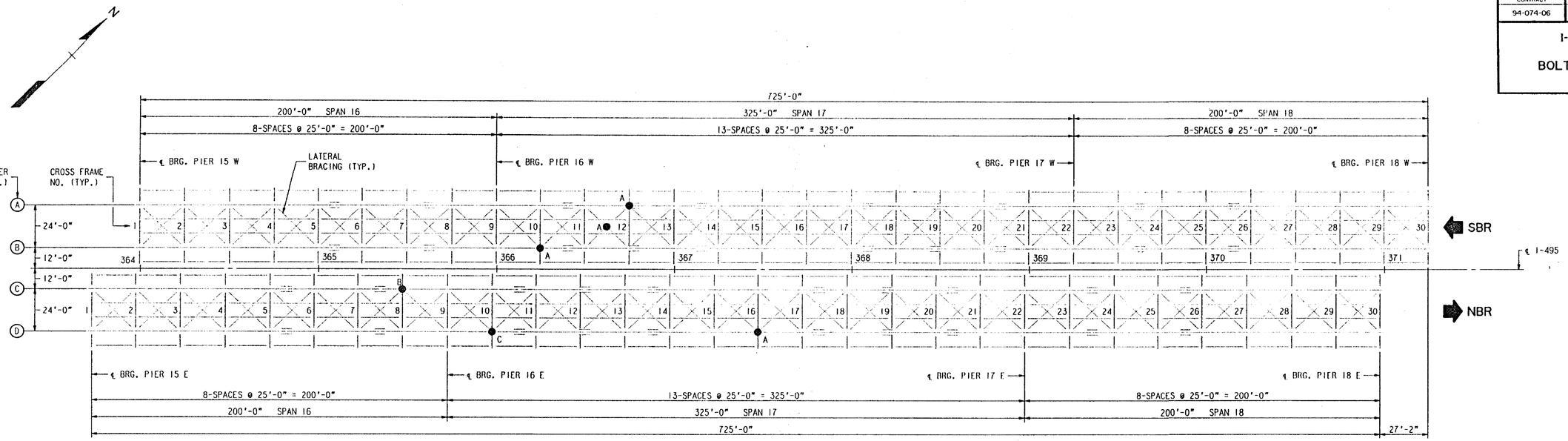
1. REQUIRED FIELD MEASUREMENTS SHALL BE TAKEN BY THE CONTRACTOR BETWEEN TRANSVERSE STIFFENERS AT ALL EXISTING FIELD SPLICE LOCATIONS.
(ALSO REFER TO EXISTING STRUCTURE NOTES ON SHEET NO. 3).
2. WEB DISTORTION IN THE VERTICAL AND THE HORIZONTAL PLANE SHALL BE MEASURED BY THE CONTRACTOR IN THE VICINITY OF ALL THE FIELD SPLICE LOCATIONS.
3. VINYL TOP COAT PAINT SHALL BE REMOVED FROM THE EXISTING WEB PLATES AND EXISTING WEB SPLICE PLATES WHERE NEW ANGLES AND SHIM PLATES ARE TO BE CONNECTED. PAINT REMOVAL SHALL BE INCIDENTAL TO ITEM 605584, "STEEL STRUCTURE REPAIR."
4. SUBMIT SHOP DRAWINGS FOR THE ENGINEER'S APPROVAL IN ACCORDANCE WITH SUBSECTION 105.02 OF THE DELAWARE STANDARD SPECIFICATIONS.
5. PREPARE NEW ANGLES AND SHIM PLATES AS PER FIELD MEASUREMENTS AND DETAILS SHOWN ON THE PLANS.
6. NEW ANGLES AND SHIM PLATES SHALL BE PRIMED WITH INORGANIC ZINC PRIOR TO INSTALLATION.
7. USE EXISTING HOLES AT THE SPLICE AND DRILL NEW HOLES IN THE WEB PLATE AS SHOWN ON THE PLANS.
8. SOME TEMPORARY LONG BOLTS WITH THREADS WILL BE REQUIRED TO DRAW NEW ANGLES, SHIM PLATES AND EXISTING WEB PLATE TOGETHER. AFTER FULL CONTACT IS ACHIEVED BETWEEN ALL CONNECTED MEMBERS, USE REGULAR HIGH STRENGTH BOLTS. FOR THE REMAINING HOLES, REMOVE LONG BOLTS AND REPLACE WITH REGULAR HIGH STRENGTH BOLTS.
9. APPLY VINYL TOP COAT TO ANGLES AFTER INSTALLATION.

REVISIONS

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
94-074-06	NEW CASTLE	IM-NO60(1)	12	20

I-495 OVER CHRISTINA RIVER

BOLTED CONNECTION REPAIRS SPANS 16 AND 17



FRAMING PLAN

SCALE: 1" = 30'-0"

LEGEND

● BOLTED CONNECTION REPAIR

A- LOOSE BOLT

B- 4 MISSING AND 3 LOOSE BOLTS

C- 2 LOOSE BOLTS

NOTES

1. FOR GENERAL NOTES, SEE SHEET NO. 3.
2. THE AREAS IDENTIFIED REPRESENT THE GENERAL VICINITY IN WHICH REPAIRS ARE TO BE MADE. A DETAILED DESCRIPTION OF THE LOCATION FOR THESE REPAIRS CAN BE OBTAINED FROM DELAWARE DEPARTMENT OF TRANSPORTATION'S BRIDGE MANAGEMENT SECTION.
3. ALL WORK SHOWN SHALL BE PERFORMED IN CONJUNCTION WITH THE WEB SPLICE RETROFIT REPAIRS.
4. THE CONTRACTOR SHALL REPLACE ALL LOOSE AND MISSING BOLTS SHOWN ON THE FRAMING PLAN WITH 7/8" ø H.S. BOLTS.
5. THE WORK SHOWN SHALL BE INCIDENTAL TO ITEM 605584, "STEEL STRUCTURE REPAIR."

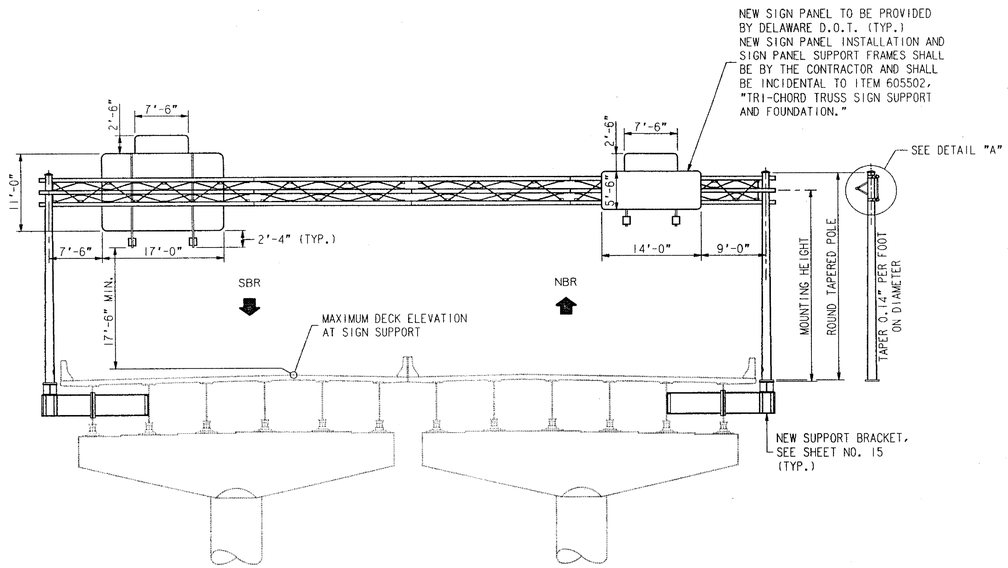
REVISIONS

PREL. TRACING A. B. MacEWEN DESIGN D. J. SULERZYSKI CHKD. Y. E. ZHOU

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
94-074-06	NEW CASTLE	IM-N060(11)	13	37

I-495 OVER CHRISTINA RIVER

TRI-CHORD TRUSS
SIGN SUPPORTS - I

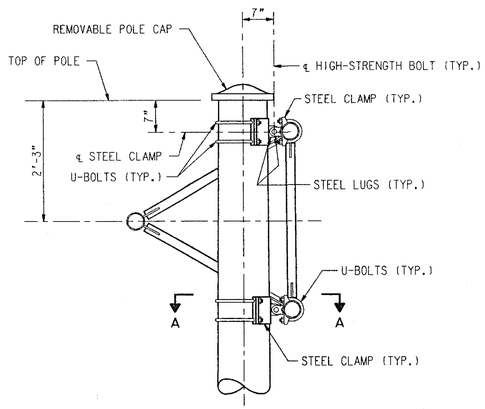


ELEVATION

SCALE: 1" = 10'-0"

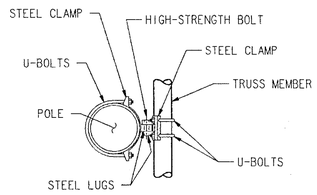
NOTE:

THE CONTRACTOR SHALL CONTACT DELAWARE TURNPIKE AUTHORITY AND ARRANGE FOR THE PICKUP OF THE NEW SIGN PANELS.



DETAIL "A"

SCALE: 3/4" = 1'-0"



SECTION A-A

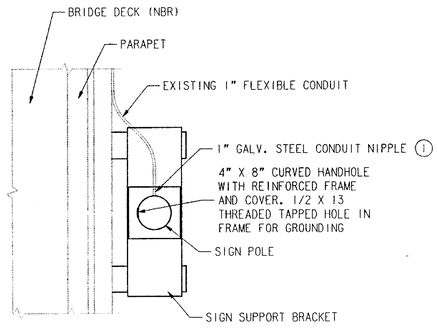
SCALE: 3/4" = 1'-0"

WORK ITEM NOTES:

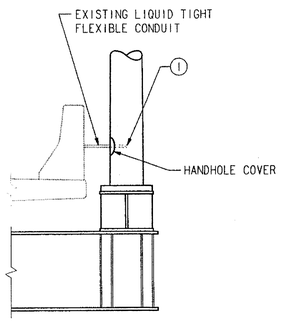
- ALL WORK SHOWN ON THIS SHEET, EXCEPT FOR THE SUPPORT BRACKETS DETAILED ON SHEET NO. 15, THE LUMINAIRES AND THE ELECTRIFICATION WORK, SHALL BE INCLUDED IN ITEM 605502, "TRI-CHORD TRUSS SIGN SUPPORT AND FOUNDATION."
- ALL ELECTRIFICATION WORK SHOWN SHALL BE INCLUDED IN ITEM 746540, "ELECTRIFICATION."
- ALL WORK ASSOCIATED WITH THE LUMINAIRES SHALL BE INCLUDED IN ITEM 746503, "LUMINAIRES, OVERHEAD SIGN."

NOTES:

1. FOR GENERAL NOTES, SEE SHEET NO. 3.
2. THE DIMENSIONS AND MEMBER SIZES SHOWN FOR THE TRI-CHORD TRUSS AND POLE SUPPORTS HAVE BEEN DESIGNED SPECIFICALLY FOR THE TWO SIGN PANELS SHOWN AS LOCATED ON THIS SHEET. NO ADDITIONAL SIGN PANELS SHALL BE MOUNTED ON THIS SIGN STRUCTURE.
3. THE CONTRACTOR SHALL DESIGN ALL CONNECTIONS FOR THE FABRICATION AND ERECTION OF THE TRI-CHORD TRUSS AND POLE SUPPORTS. IN ADDITION, THE CONTRACTOR SHALL DESIGN AND DETAIL THE HANDHOLE AND STEEL CONDUIT NIPPLE SHOWN ON THIS SHEET. THE DESIGN AND DETAILS SHALL NOT REDUCE THE STRUCTURAL CAPACITY OF THE TAPERED POLE. THE DESIGN CALCULATIONS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS, SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF DELAWARE AND SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO FABRICATION.
4. ALL STRUCTURAL MEMBERS, CONNECTIONS AND HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS.
5. MINIMUM YIELD STRESS OF STEEL TUBULAR TRUSS MEMBERS AND POLES SHALL BE 55,000 psi. ALL OTHER STRUCTURAL STEEL SHALL BE ASTM A 709 GRADE 50.
6. FLAT AND LOCK WASHERS MUST BE PROVIDED ON ALL U-BOLTS. THE TRUSS MUST BE CAMBERED IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS OF HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS.
7. FOR ATTACHMENT OF SIGN PANELS TO TRI-CHORD TRUSS AND SIGN PANEL SUPPORT FRAMES, SEE DETAIL THIS SHEET AND SHEET NO. 16.
8. IF ALTERNATE DESIGNS FOR THE TRI-CHORD TRUSS ARE PREPARED AND SUBMITTED IN ACCORDANCE WITH THE SPECIFICATION, THE CONTRACTOR SHALL ALSO PREPARE AND SUBMIT FOR APPROVAL CALCULATIONS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF DELAWARE DEMONSTRATING THE ADEQUACY OF THE SUPPORT BRACKET SHOWN IN THE PLANS FOR THE ALTERNATE DESIGN. AS AN OPTION, THE CONTRACTOR MAY SUBMIT FOR APPROVAL CALCULATIONS AND DRAWINGS SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF DELAWARE FOR BRACKETS WHICH ARE APPROPRIATE FOR HIS TRI-CHORD TRUSS DESIGN.
9. FOR DETAILS OF THE TRI-CHORD TRUSS AND POLE SUPPORTS, SEE SHEET NO. 14.
10. FIELD WELDING SHALL NOT BE PERMITTED.



PLAN

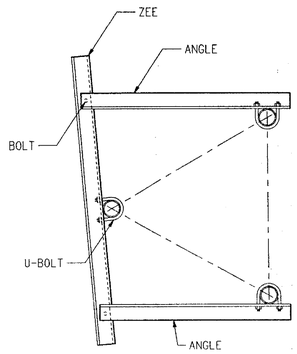


SECTION

(1) PROVIDE 1" RIGID GALV. STEEL CONDUIT NIPPLE, 3" LONG. WELD NIPPLE IN PLACE. SEE ELECTRICAL DETAILS SHEET FOR SIGN LIGHTING WIRING.

SIGN LIGHTING FEEDER DETAILS

SCALE: 3/8" = 1'-0"



NOTE:
FOR DETAILS NOT SHOWN, SEE DELAWARE DEPARTMENT OF TRANSPORTATION'S STANDARD SHEET "TRI-CHORD TRUSS WITH CENTER-SUPPORTS"

REAR MOUNTED SIGN BRACKET

SCALE: 3/4" = 1'-0"

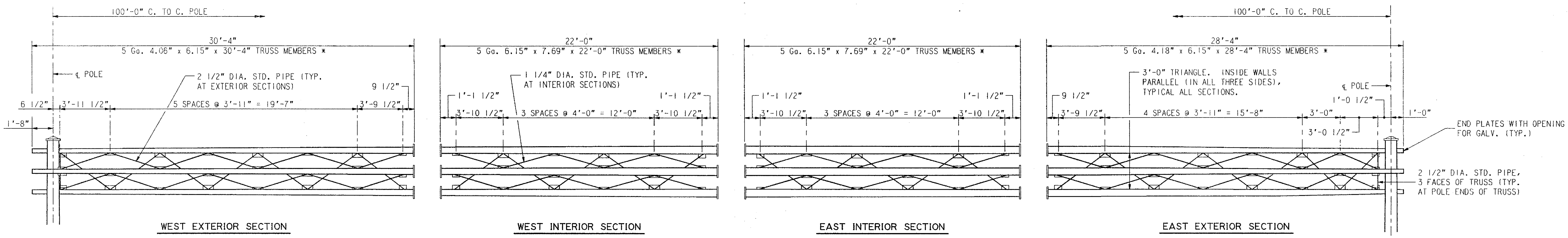
REVISIONS

PREL. TRACING L. M. HARP DESIGN D. J. SULERZYSKI CHKD. R. A. MILLER W. A. O'CONNOR

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS.
94-074-06	NEW CASTLE	IM-N060(1)	14	20

I-495 OVER CHRISTINA RIVER

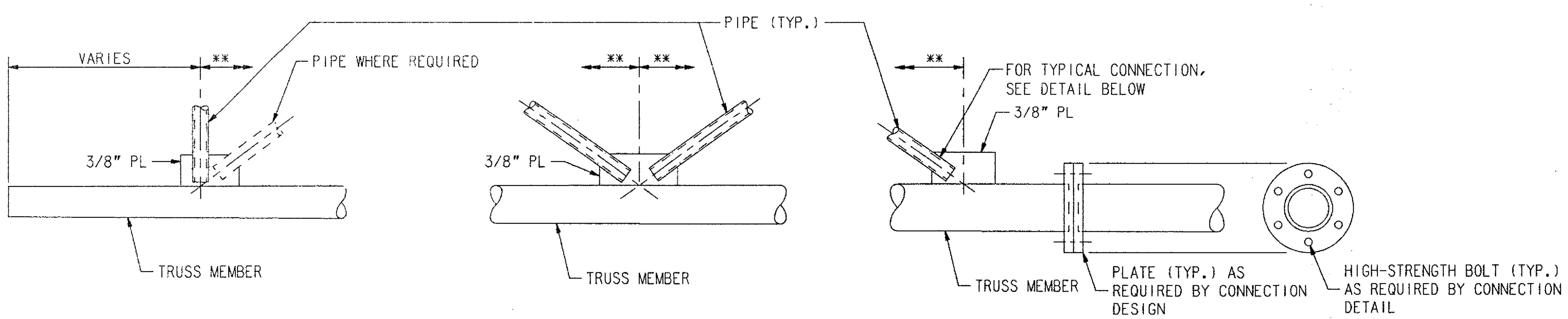
TRI-CHORD TRUSS SIGN SUPPORTS - II



* - TUBE TAPER 0.07" PER FOOT ON DIAMETER

TRUSS GEOMETRY

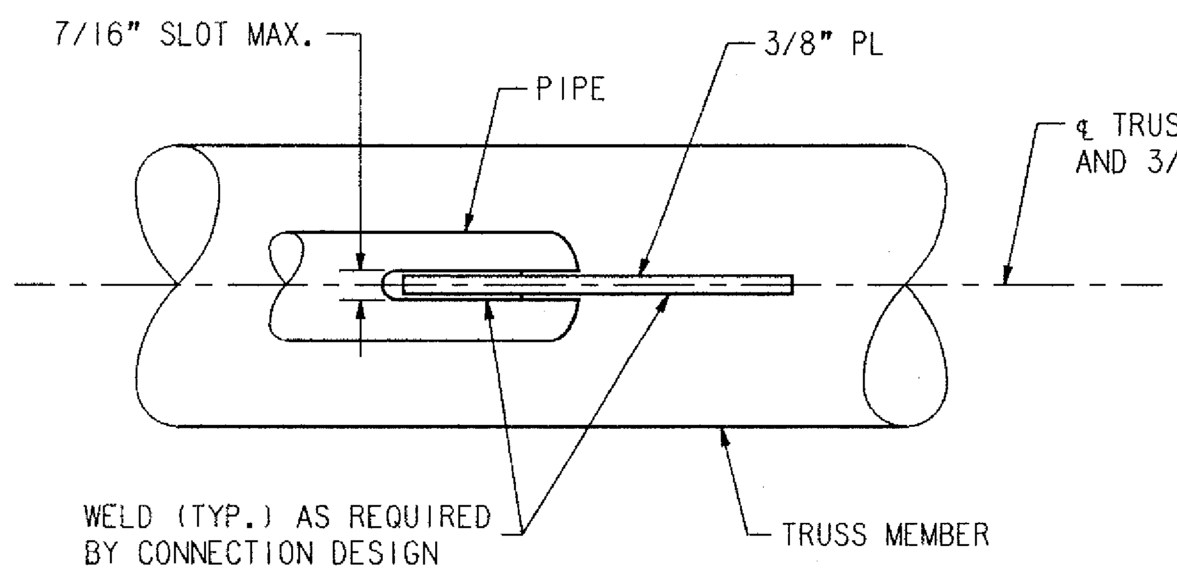
SCALE: 1/4" = 1'-0"



JOINT DETAILS

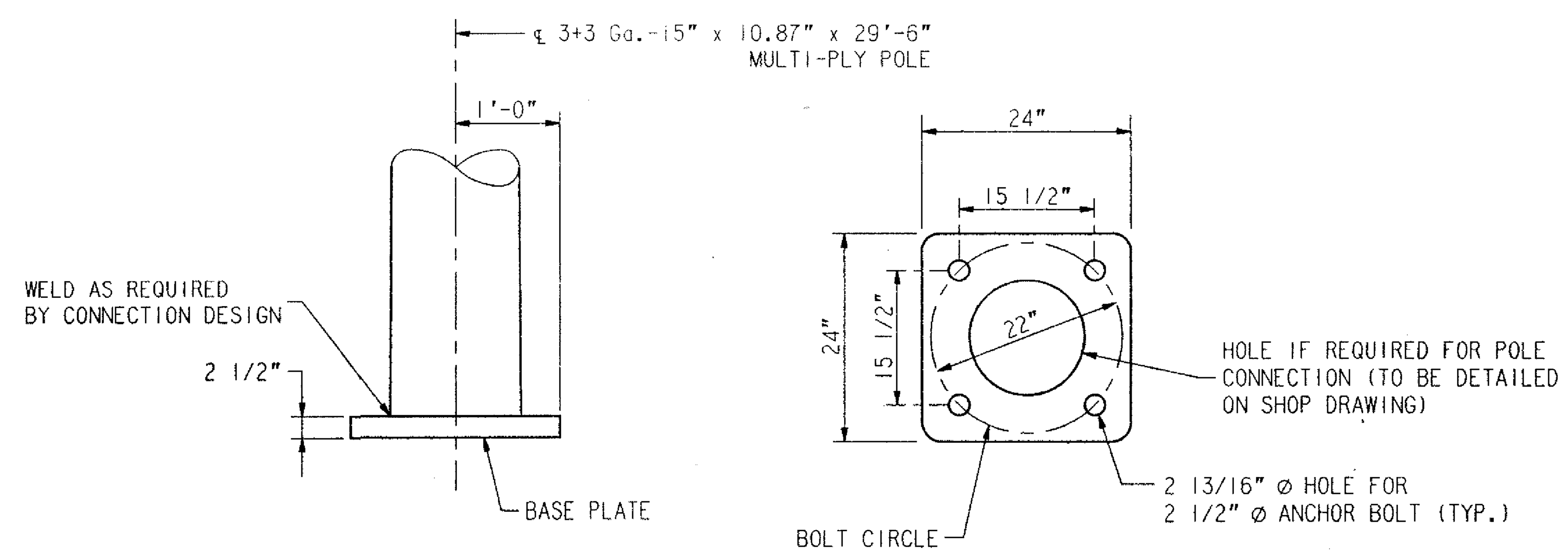
SCALE: 1" = 1'-0"

** - SEE TRUSS GEOMETRY THIS SHEET.



DETAIL

SCALE: 3" = 1'-0"



POLE AND BASE PLATE DETAILS

SCALE: 3/4" = 1'-0"

WORK ITEM NOTES:

- ALL WORK SHOWN ON THIS SHEET SHALL BE INCLUDED IN ITEM 605502, "TRI-CHORD TRUSS SIGN SUPPORT AND FOUNDATION."

NOTES

1. FOR GENERAL NOTES, SEE SHEET NO. 3.
2. FOR OTHER NOTES, SEE SHEET NO. 13.

REVISIONS

DESIGN D. J. SULERZYSKI CHKD. W. A. O'CONNOR

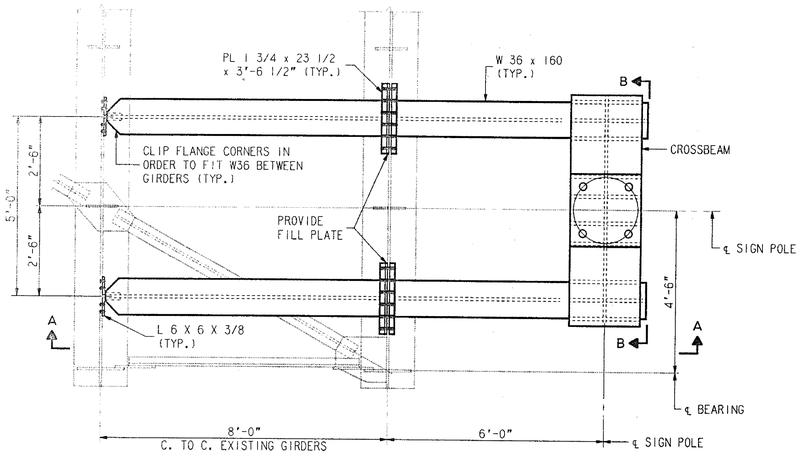
L. W. HARP

BGRD0700

CONTRACT	COUNTY	F.A.P. NO.	SHEET NO.	TOTAL SHTS
94-074-06	NEW CASTLE	IM-NO60(1)	15	20

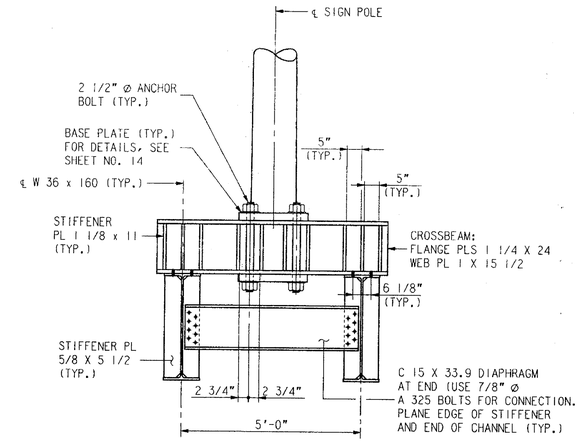
I-495 OVER CHRISTINA RIVER

SUPPORT BRACKET



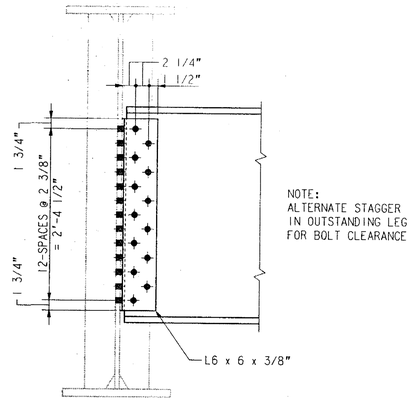
PLAN

(BELOW TOP FLANGE OF GIRDER)
SCALE: 1/2" = 1'-0"



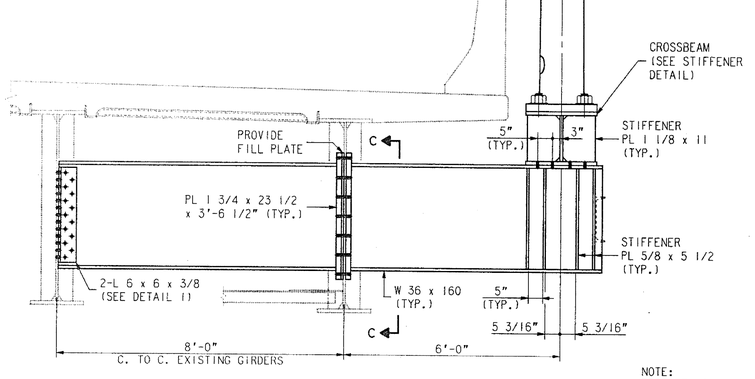
VIEW B-B

SCALE: 1/2" = 1'-0"



DETAIL 1

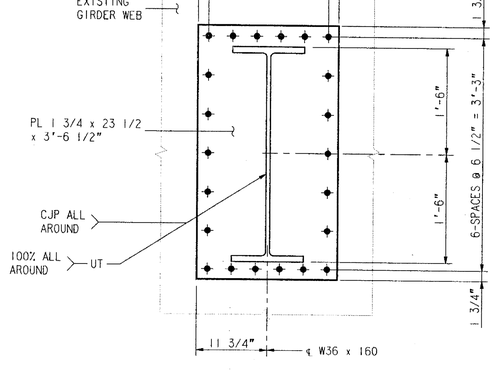
SCALE: 1" = 1'-0"



SECTION A-A

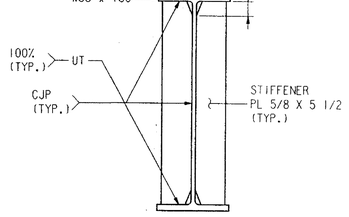
SCALE: 1/2" = 1'-0"

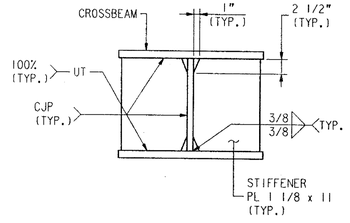
NOTE:
BRACKET IS CENTERED
ON MID-DEPTH OF
EXISTING EXTERIOR
GIRDER WEB



SECTION C-C

SCALE: 1" = 1'-0"





STIFFENER DETAILS

SCALE: 1" = 1'-0"

WORK ITEM NOTES:

- NEW STRUCTURAL STEEL SHOWN, EXCEPT AS NOTED BELOW, AND NEW HIGH STRENGTH BOLTS SHALL BE INCLUDED IN ITEM 605600, "BRIDGE MOUNTED SIGN SUPPORT."
- FIELD-DRILLED HOLES, SHOWN FOR HIGH STRENGTH BOLTS SHALL BE INCIDENTAL TO ITEM 605600, "BRIDGE MOUNTED SIGN SUPPORT."
- CLEANING AND PAINTING OF NEW AND EXISTING STRUCTURAL STEEL, AS WELL AS VINYL TOP COAT PAINT REMOVAL FROM EXISTING STRUCTURAL STEEL SHALL BE INCIDENTAL TO ITEM 605600, "BRIDGE MOUNTED SIGN SUPPORT."
- STEEL BASE PLATE ATTACHED TO SIGN POLE AND 2 1/2-INCH DIAMETER ANCHOR BOLTS SHALL BE INCLUDED WITH ITEM 605502, "TRI-CHORD TRUSS SIGN SUPPORT AND FOUNDATION."

NOTES

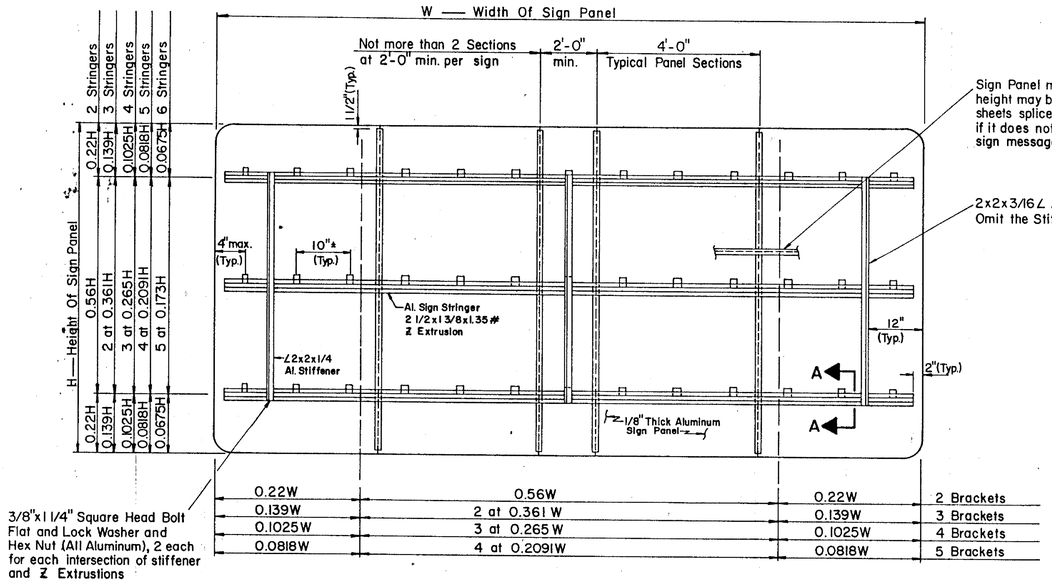
1. FOR GENERAL NOTES, SEE SHEET NO. 3.
2. ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM DESIGNATION A 709, GRADE 50, PAINTED WITH INORGANIC ZINC PRIMER VINYL TOP COAT SYSTEM.
3. ALL BOLTS SHALL BE 1" DIAMETER A325 HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED. BOLT HOLES FOR 1" DIAMETER BOLTS SHALL BE 1 1/16" DIAMETER. BOLT HOLES FOR 7/8" DIAMETER BOLTS SHALL BE 15/16" DIAMETER.
4. ANCHOR BOLTS SHALL CONFORM TO ASTM DESIGNATION A 687. ANCHOR BOLT HOLES SHALL BE 2 13/16" DIAMETER.
5. VINYL TOP COAT PAINT SHALL BE REMOVED FROM THE EXISTING STEEL WHERE NEW ANGLES AND PLATES ARE TO BE CONNECTED.
6. NEW ANGLES AND PLATES SHALL BE PRIMED WITH INORGANIC ZINC PRIOR TO INSTALLATION.
7. APPLY VINYL TOP COAT TO ANGLES AND PLATES AFTER INSTALLATION.
8. THE SUPPORT BRACKET SHOWN HAS BEEN DESIGNED SPECIFICALLY FOR THE TWO SIGN PANELS SHOWN AS LOCATED ON SHEET NO. 13.

REVISIONS

PREP. BY: A. B. MacEWEN DESIGN D. J. SULEWSKI CHKD. W. A. O'CONNOR

COUNTY	CONTRACT	P. R. A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	94-074-06	2	DEL.	IM-N060[1]	16	20

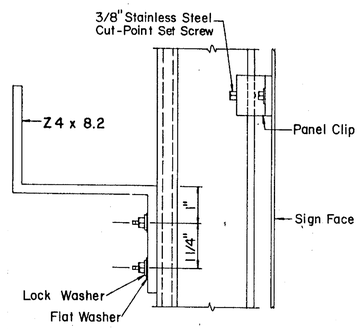
NO.	REVISIONS	BY	DATE



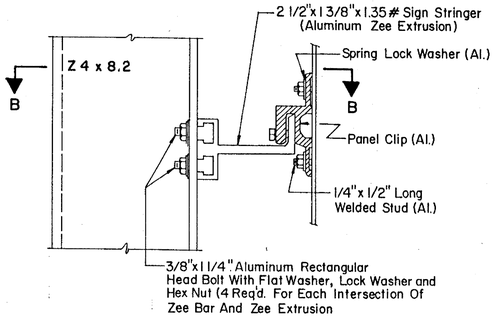
DETAILS OF SIGN PANEL

NOTE:
Stringers shall be fabricated of new material in one piece. Where large signs necessitate splicing the stringers, such splices shall be located at points of contraflexure and shall be held to a minimum, but the splice must develop the full section of the member.

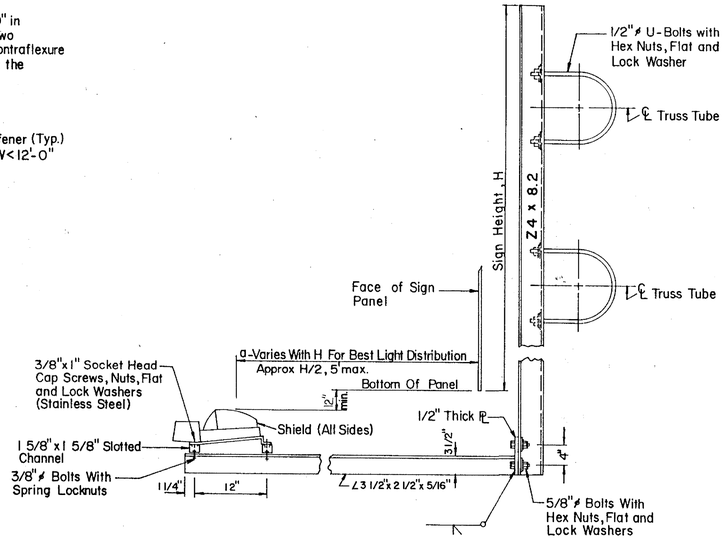
HEIGHT	2 Brackets		3 Brackets		4 Brackets		5 Brackets	
H	No.	Max. W	No.	Max. W	No.	Max. W	No.	Max. W
3'-0"or Less	2	15'-0"	2	22'-0"	2	30'-0"	2	38'-0"
4'-0"	2	15'-0"	2	22'-0"	2	30'-0"	2	38'-0"
5'-0"	2	15'-0"	2	22'-0"	2	30'-0"	2	37'-0"
6'-0"	3	15'-0"	3	22'-0"	3	29'-0"	3	36'-0"
7'-0"	3	15'-0"	3	22'-0"	3	28'-0"	3	35'-0"
8'-0"	3	15'-0"	3	22'-0"	3	27'-0"	3	34'-0"
9'-0"	4	14'-0"	4	21'-0"	4	26'-0"	4	33'-0"
10'-0"	4	14'-0"	4	20'-6"	4	25'-0"	4	32'-0"
11'-0"	4	14'-0"	4	20'-0"	4	24'-0"	4	31'-0"
12'-0"	5	13'-0"	5	19'-0"	5	23'-0"	5	29'-6"
13'-0"	5	12'-0"	5	18'-0"	5	22'-0"	5	28'-0"
14'-0"	5	11'-0"	5	17'-0"	5	21'-0"	5	26'-6"
15'-0"	6	10'-0"	6	15'-6"	6	19'-6"	6	25'-0"
16'-0"	6	—	6	14'-0"	6	18'-0"	6	23'-0"
17'-0"	6	—	6	12'-6"	6	16'-6"	6	21'-0"



SECTION B-B



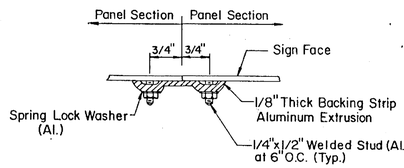
SECTION A-A



SIGN BRACKET ASSEMBLY

LUMINAIRES

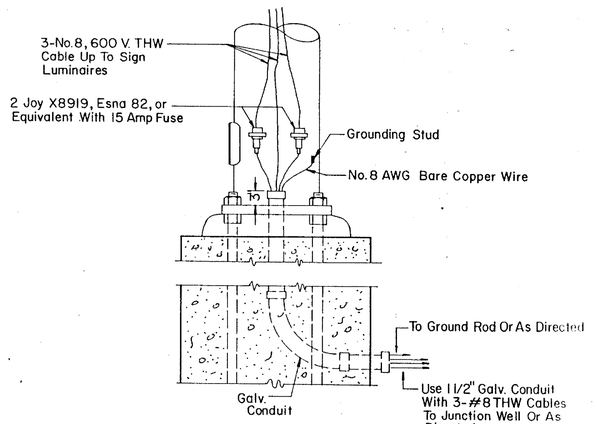
Panel	a	Nos. Req'd	Spacing	Panel	a	Nos. Req'd	Spacing
N.B. SIGN	4'-0"	2	7'-0"				
S.B. SIGN	4'-0"	2	8'-6"				



DETAILS OF PANEL SPLICE

GROUND RODS

Sign Support	Nos. Req'd	Size & Length	Sign Support	Nos. Req'd	Size & Length



TYPICAL ELECTRICAL DETAIL POLE BASE

NOTES:

1. All Steel, Connections and Hardwares shall be galvanized to meet the requirements of AASHO M111.
2. Number and Spacing of Luminaires shall be specified by the Engineer.
3. Length and Number of Ground Rods shall be specified by the Engineer.
4. Use 3/4"ϕ flexible Conduit to top of sign panel for remote mounted photocell. (1 required for each sign support.)

MATERIALS SPECIFICATIONS:

Structural Shapes and Plate (Steel): AASHO M183 (ASTM A36)
U-Bolts: AASHO M183 (ASTM A36)
Other Steel Bolts: ASTM A307
Aluminum Plates, Stiffeners, Extrusions, Panel Clips, Backing Strips: Alloy 6061-T6

All Sign Panels and Supports shall conform to the pertinent requirements set forth in the 1985 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS" with subsequent revisions.

DELAWARE
DEPARTMENT OF HIGHWAYS & TRANSPORTATION
DIVISION OF HIGHWAYS

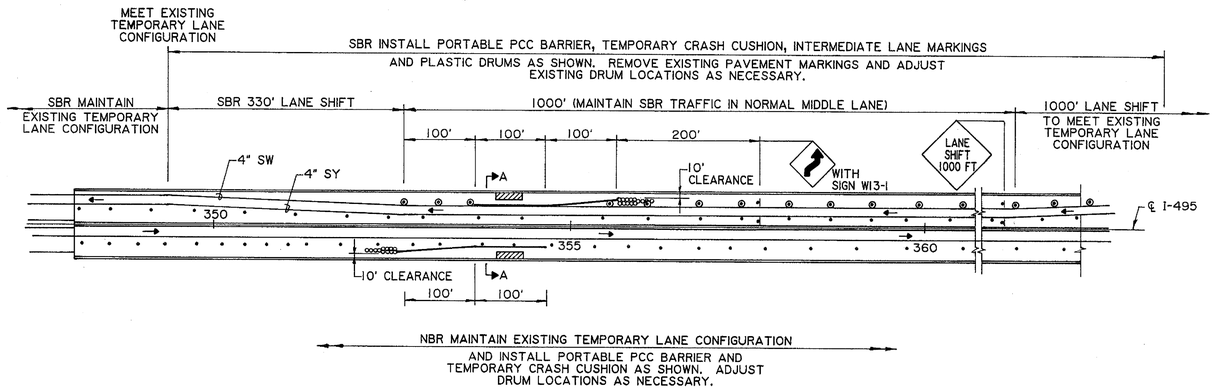
SIGN PANEL AND ELECTRICAL DETAILS
(STANDARD SHEET)

D. T. G. R. D. C.	SCALE NO SCALE	APPROVED BY: BRIDGE ENGINEER

CONTRACT	COUNTY	FEDERAL AID PROJECT Nº	SHEET Nº	TOTAL SHEETS
94-074-06	NEW CASTLE	IM-N060(1)	17	20

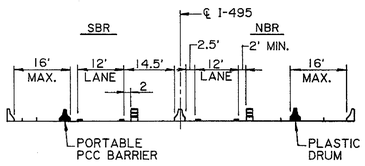
I-495 OVER CHRISTINA RIVER

TRAFFIC CONTROL PLAN - I



PHASE I WORK BEFORE WINTER SHUTDOWN

(REMOVAL OF EXISTING SIGN SUPPORT BRACKETS AND SUBSEQUENT GIRDER AND DECK REPAIRS IN SPAN 7.)



SECTION A-A

LEGEND

- WORK AREA (GIRDER & DECK REPAIR, BRACKET REMOVAL)
- PCC BARRIER (PORTABLE)
- PLASTIC DRUMS ALREADY IN USE
- PLASTIC DRUMS (50' C/C) TO BE PLACED FOR PHASE I WORK
- TEMPORARY CRASH CUSHION (14 BARRELS)
- TEMPORARY SIGN
- SW SOLID WHITE INTERMEDIATE MARKINGS, PAINT
- SY SOLID YELLOW INTERMEDIATE MARKINGS, PAINT

TRAFFIC CONTROL NOTES:

1. THE CONTRACTOR AND ALL OTHERS SHALL PERFORM ALL WORK IN A MANNER THAT WILL ENSURE THE LEAST PRACTICABLE OBSTRUCTION TO TRAFFIC CONSISTENT WITH SAFETY AND SHALL COMPLY WITH THE MANUAL ENTITLED "DELAWARE TRAFFIC CONTROLS FOR STREETS AND HIGHWAY CONSTRUCTION, MAINTENANCE, UTILITY AND EMERGENCY OPERATIONS" LATEST EDITION (HEREIN AFTER REFERRED TO AS "THE TRAFFIC CONTROL MANUAL"). ALL CONSTRUCTION SAFETY EQUIPMENT SUCH AS SIGNS, DRUMS, AND PORTABLE CONCRETE BARRIER SHALL MEET SPECIFICATIONS. THE USE OF CONES IN LIEU OF DRUMS WILL NOT ALLOWED FOR THIS PROJECT.

2. PHASE I TRAFFIC CONTROL:

   THE CONTRACTOR SHALL COMPLETE ALL WORK ASSOCIATED WITH THE GIRDER REPAIRS IN THE VICINITY OF PIER 7 ON THE N.B. AND S.B. APPROACH SPANS PRIOR TO THE WINTER SHUTDOWN PERIOD DESCRIBED IN THE SPECIFICATIONS, REGARDLESS OF ANY OTHER WORK COMPLETED. IMPLEMENTATION OF THE MAINTENANCE OF TRAFFIC SETUP TO PERFORM THIS WORK SHALL BE COORDINATED WITH ANY CONSTRUCTION ACTIVITIES AND MAINTENANCE OF TRAFFIC ALREADY IN PROGRESS ON I-495. INTERMEDIATE PAVEMENT MARKINGS SHALL BE USED FOR EDGE LINES TO REINFORCE THE DRUMS FOR DELINEATION OF TRAVEL LANES DURING MAINTENANCE OF TRAFFIC. EXISTING PAVEMENT MARKINGS WHICH CONFLICT WITH THE INTERMEDIATE PAVEMENT MARKINGS SHALL BE REMOVED AND RESTORED UPON COMPLETION OF WORK AND ACCEPTANCE OF THE CONCRETE STRENGTH BY THE ENGINEER.

3. PHASE II TRAFFIC CONTROL:

   ALL WORK PERFORMED DURING THE 1995 CONSTRUCTION SEASON SHALL BE IMPLEMENTED USING THE MAINTENANCE OF TRAFFIC AS SHOWN ON SHEET NUMBERS 18, 19 AND 20 AND CASE 26 OF THE MANUAL. IMPLEMENTATION OF THE MAINTENANCE OF TRAFFIC MAY BEGIN ONLY UPON WRITTEN APPROVAL OF THE ENGINEER. A MINIMUM OF TWO LANES IN EACH DIRECTION SHALL BE MAINTAINED AT ALL TIMES EXCEPT AS REQUIRED FOR THE ERECTION OF THE OVERHEAD SIGN STRUCTURE. NO LANE CLOSURES WILL BE PERMITTED BETWEEN THE HOURS OF 5 AM TO 9 AM AND 4 PM TO 7 PM, DAILY.

   COMPLETE ROADWAY CLOSURE AND DETOUR FOR THE ERECTION OF THE OVERHEAD SIGN STRUCTURE SHALL BE ALLOWED ONLY FOR ONE NIGHT AND BETWEEN THE HOURS OF 7 PM AND 5 AM. PAYMENT FOR MESSAGE BOARDS SHALL BE UNDER ITEM NO. 743514 - FURNISH AND MAINTAIN MESSAGE BOARD. ALL OTHER ITEMS ASSOCIATED WITH THE COMPLETE

   ROADWAY CLOSURE AND DETOUR, INCLUDING ANY TEMPORARY LIGHTING, SHALL BE PAID FOR UNDER ITEM NO. 763500 - MAINTENANCE OF TRAFFIC.

I-495/CHRISTINA RIVER MAINTENANCE OF TRAFFIC QUANTITY LIST

ITEM #	UNIT	DESCRIPTION	QUANTITY		
			PHASE I	PHASE II	TOTAL
720501	EA.	CRASH CUSHIONS (SAND BARRELS)	28	0	28
720527	EA-DY	PLASTIC DRUMS	840	11150	11990
720540	EACH	DELINEATORS	8	0	8
720552	EA.	REFLECTIVE PANELS	2	0	2
720567	L.F.	FURNISH AND MAINTAIN PORTABLE PCC SAFETY BARRIER	400	0	400
742500	HOUR	FLAGGER, NEW CASTLE COUNTY	50	150	200
743003	EA-DY	ARROW PANELS, TYPE C	0	170	170
743500	EA-DY	WARNING LIGHTS, TYPE A	0	224	224
743501	EA-DY	WARNING LIGHTS, TYPE B	4	896	900
743504	EA.	WARNING SIGNS	4	43	47
743512	EA-DY	FURNISH AND MAINTAIN TRUCK MOUNTED ATTENUATOR	0	80	80
743514	EA-DY	FURNISH AND MAINTAIN MESSAGE BOARD	0	30	30
748023	L.F.	INTERMEDIATE MARKINGS, PAINT 4"	9320	0	9320
748501	L.F.	REMOVAL OF PAVEMENT STRIPING	9320	0	9320
763500	L.S.	MAINTENANCE OF TRAFFIC	LS	LS	LS

REVISIONS

CHKD.

DESIGN

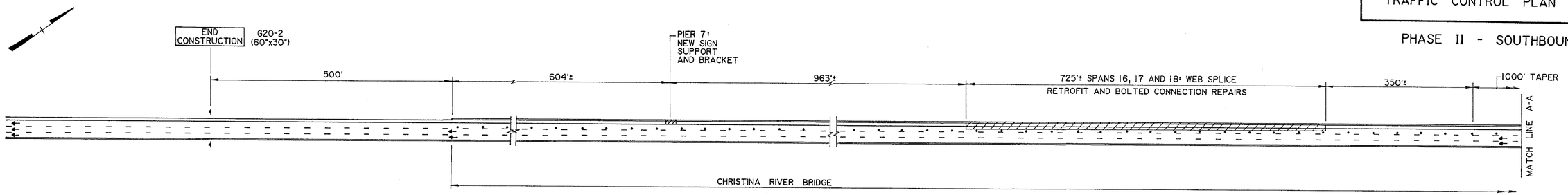
PREL. TRACING

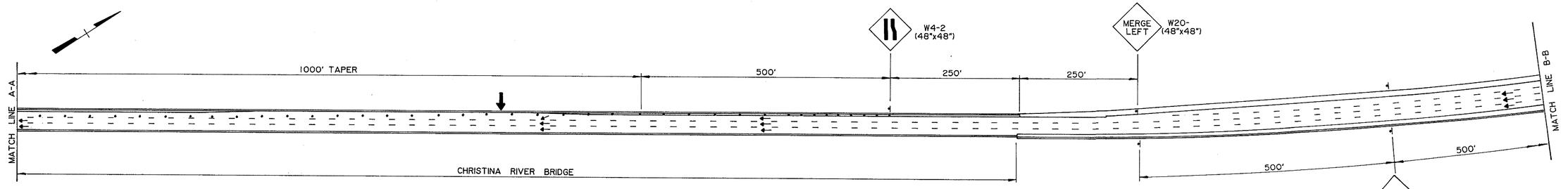
CONTRACT	COUNTY	FEDERAL AID PROJECT Nº	SHEET Nº	TOTAL SHEETS
94-074-06	NEW CASTLE	IM-NO60(I)	18	20

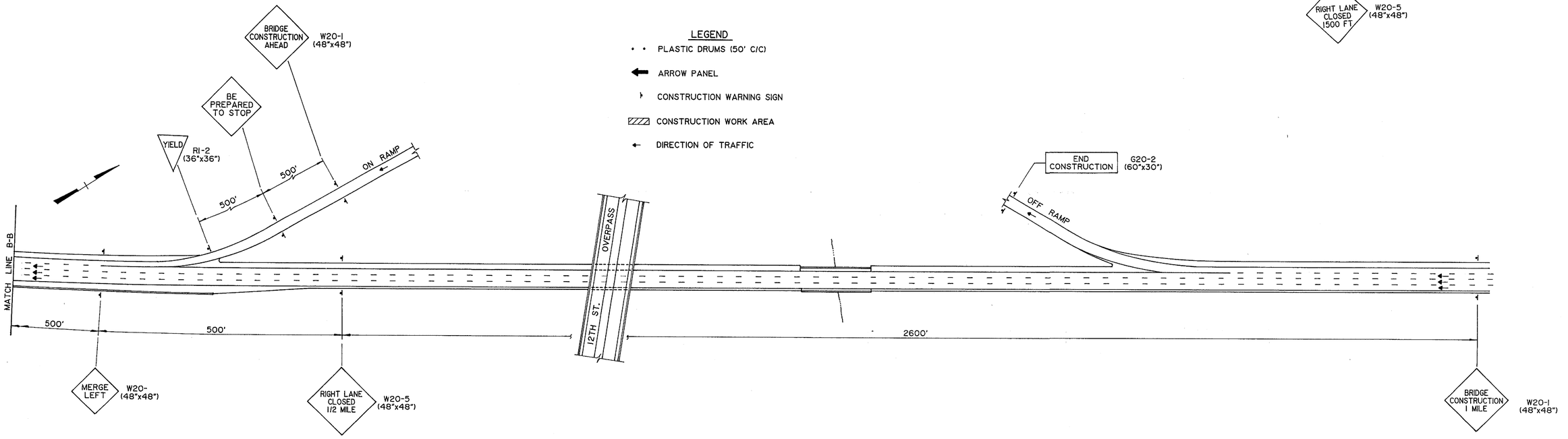
I-495 OVER CHRISTINA RIVER

TRAFFIC CONTROL PLAN - II

PHASE II - SOUTHBOUND







REVISIONS

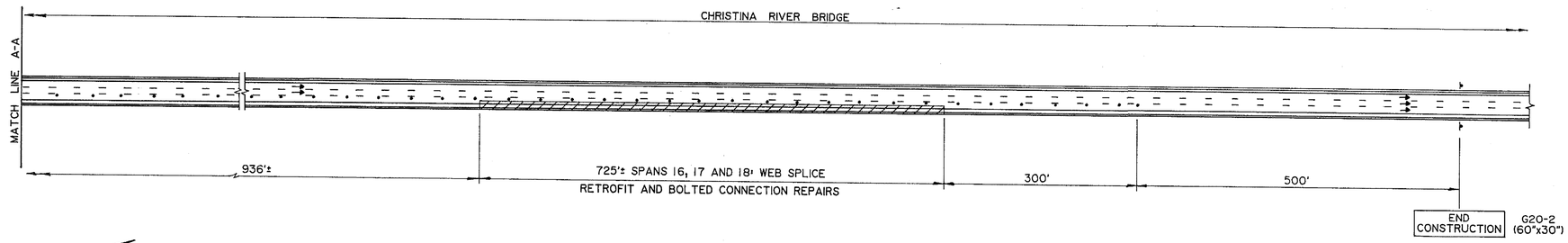
PREL. TRACING ____ DESIGN ____ CHKD. ____

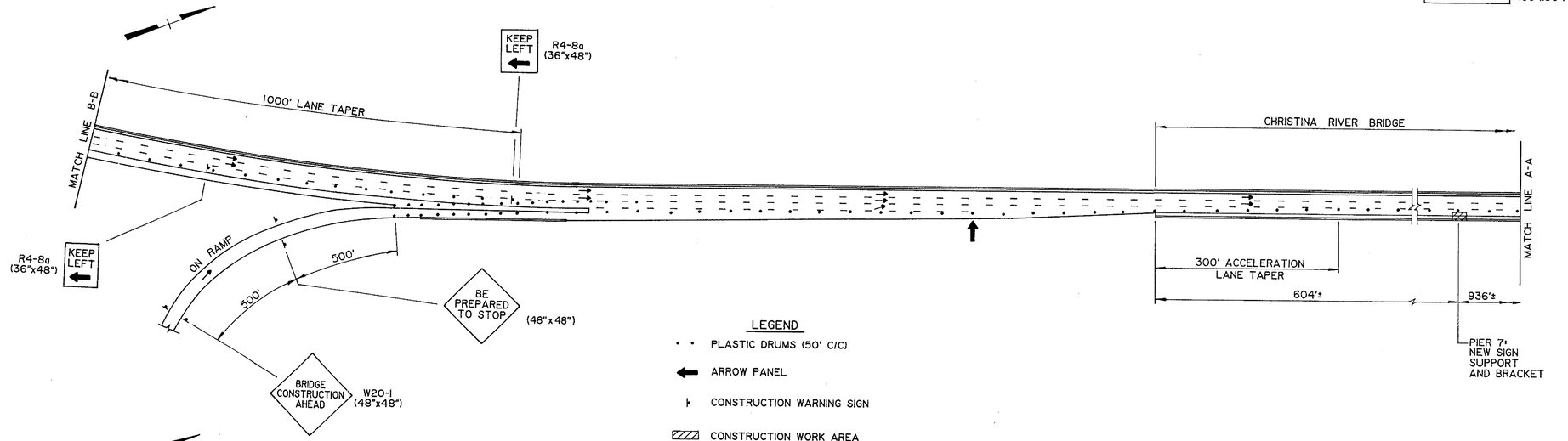
CONTRACT	COUNTY	FEDERAL AID PROJECT Nº	SHEET Nº	TOTAL SHEETS
94-074-06	NEW CASTLE	IM-N060(11)	19	20

I-495 OVER CHRISTINA RIVER

TRAFFIC CONTROL PLAN - III

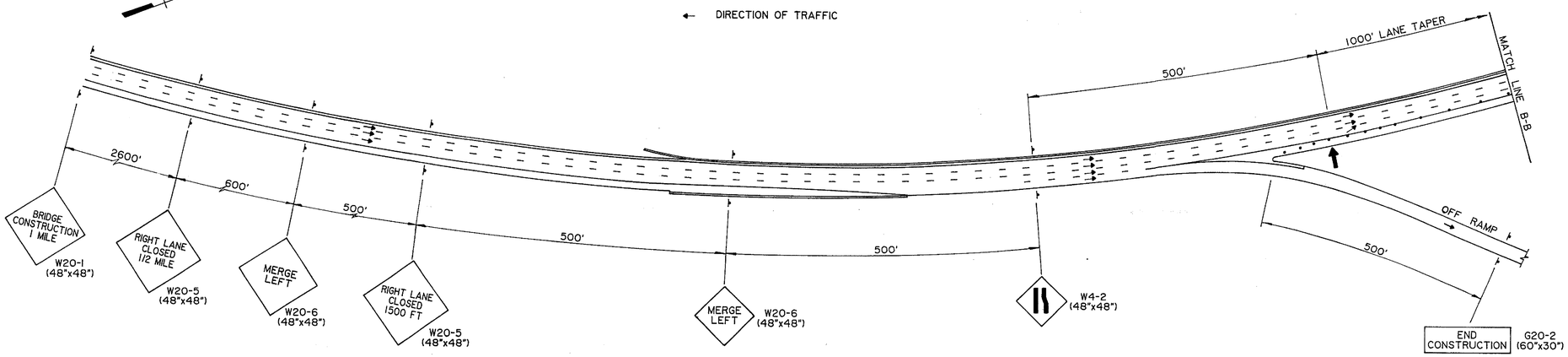
PHASE II - NORTHBOUND





LEGEND

- • • PLASTIC DRUMS (50' C/C)
- ARROW PANEL
- CONSTRUCTION WARNING SIGN
- CONSTRUCTION WORK AREA
- ← DIRECTION OF TRAFFIC



NOTE: WARNING LIGHTS AND TRUCK MOUNTED ATTENUATORS SHALL BE USED AS SPECIFIED BY CASE 26 OF THE TRAFFIC CONTROL MANUAL.

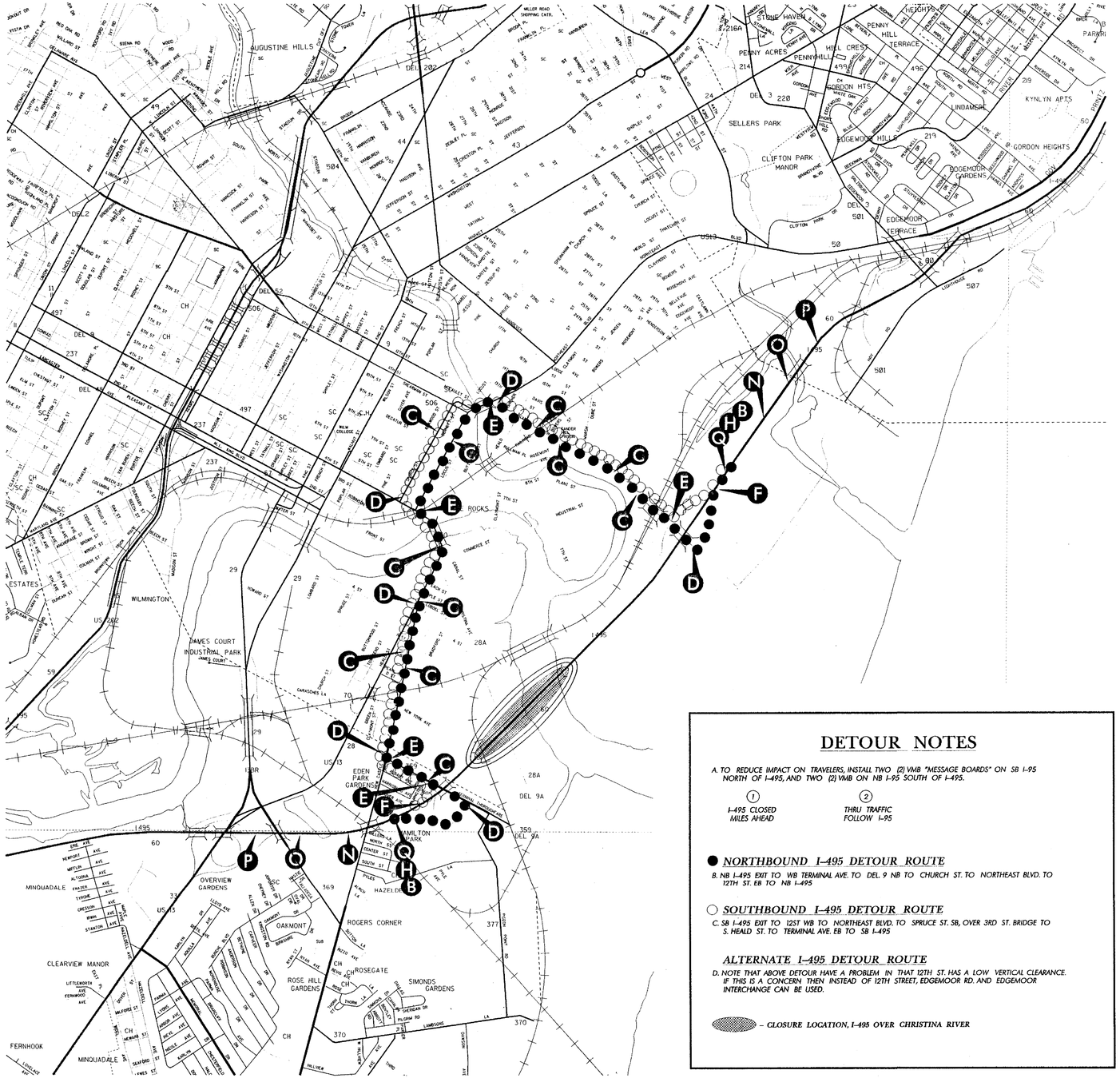
REVISIONS

PREL. TRACING ____ DESIGN ____ CHKD. ____

DETOUR PLAN
(NOT TO SCALE)

CONTRACT	COUNTY	F.A.P. NO.	SHEET	
94-074-06	N.C.		20	20

Br. 1-813, I-495 Bridge Repair



DETOUR NOTES

A. TO REDUCE IMPACT ON TRAVELERS, INSTALL TWO (2) VMB "MESSAGE BOARDS" ON SB I-95 NORTH OF I-495, AND TWO (2) VMB ON NB I-95 SOUTH OF I-495.

① I-495 CLOSED MILES AHEAD

② THRU TRAFFIC FOLLOW I-95

● **NORTHBOUND I-495 DETOUR ROUTE**

B. NB I-495 EXIT TO WB TERMINAL AVE. TO DEL 9 NB TO CHURCH ST. TO NORTHEAST BLVD. TO 12TH ST. EB TO NB I-495

○ **SOUTHBOUND I-495 DETOUR ROUTE**

C. SB I-495 EXIT TO 12ST WB TO NORTHEAST BLVD. TO SPRUCE ST. SB, OVER 3RD ST. BRIDGE TO S. HEALD ST. TO TERMINAL AVE. EB TO SB I-495

ALTERNATE I-495 DETOUR ROUTE

D. NOTE THAT ABOVE DETOUR HAVE A PROBLEM IN THAT 12TH ST. HAS A LOW VERTICAL CLEARANCE. IF THIS IS A CONCERN THEN INSTEAD OF 12TH STREET, EDGEMOOR RD. AND EDGEMOOR INTERCHANGE CAN BE USED.

▬ – CLOSURE LOCATION, I-495 OVER CHRISTINA RIVER

NOTES

1. SIGNS C,D,E, & F SHALL BE INSTALLED AND MAINTAINED BY TRAFFIC FOR THIS.
2. THE CONTRACTOR SHALL COMPLY WITH GUIDELINES IN "TRAFFIC CONTROL FOR STREETS AND HIGHWAY CONSTRUCTION, MAINTENANCE, UTILITY AND EMERGENCY OPERATIONS" MANUAL, FOR LIGHTS, BARRICADES AND SIGNS. (AS PER LATEST REVISION)
3. THE CONTRACTOR MAY DETAIL CHANGES AT SOME TIME DURING THE LIFE OF THE CONTRACT, IN THE EVENT OF OMMISSIONS OR CORRECTIONS TO SIGNS PROPOSED BY THE DELAWARE TRAFFIC CONTROL MANUAL WE PREPARE.
4. SIGNS B THROUGH M, THE WORD (ROAD) SHOULD BE CHANGE TO RAMP ON BRIDGE WHERE APPLICABLE.

RECOMMENDED Sept. 22 19 94 *Bret A. Martine*

RECOMMENDED Sept. 22 19 94 *Steve G. Trout*

RECOMMENDED 19

APPROVED CHIEF SAFETY INSPECTOR DATE

APPROVED TRAFFIC ENGINEER DATE

DESIGN

PREL TRACING *Bret A. Martine*

DETOUR	A
DETOUR	B
DETOUR	C
DETOUR	D
DETOUR	E
END DETOUR	F
	G
ROAD CLOSED	H
ROAD CLOSED MILES AHEAD LOCAL TRAFFIC ONLY	I
ROAD CLOSED TO THRU TRAFFIC	J

P DETOUR AHEAD

N DETOUR 500 FT

L ROAD CLOSED AHEAD

O DETOUR 1000 FT

M ROAD CLOSED 500 FT

K ROAD CLOSED 1000 FT

R RAMP CLOSED

Q