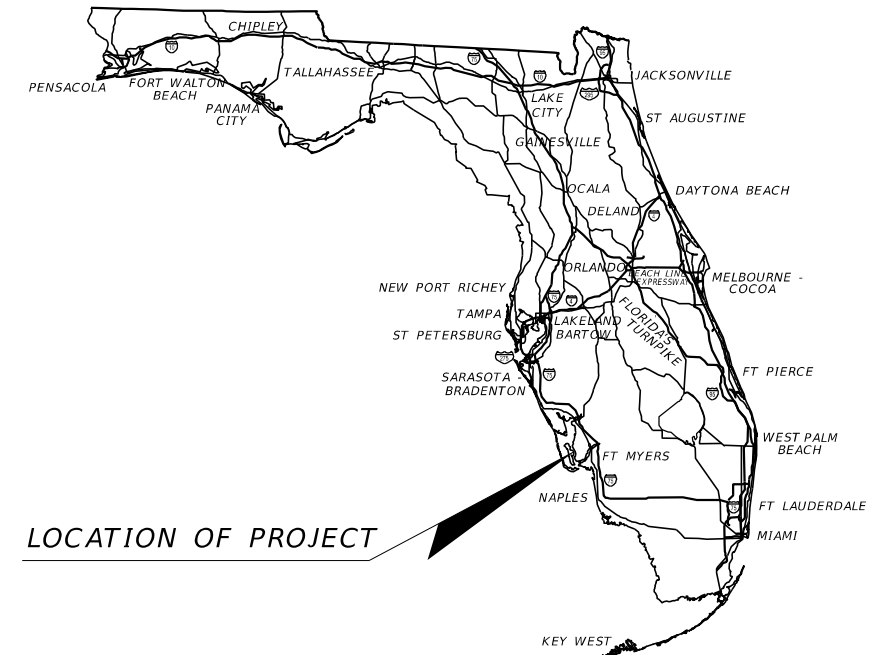


**LEE COUNTY PUBLIC WORKS
DEPARTMENT OF TRANSPORTATION**



LOCATION OF PROJECT

**PINE ISLAND RD (CR-78) OVER
LITTLE PINE ISLAND PASS
(BRIDGE NO. 120111) REPAIRS**

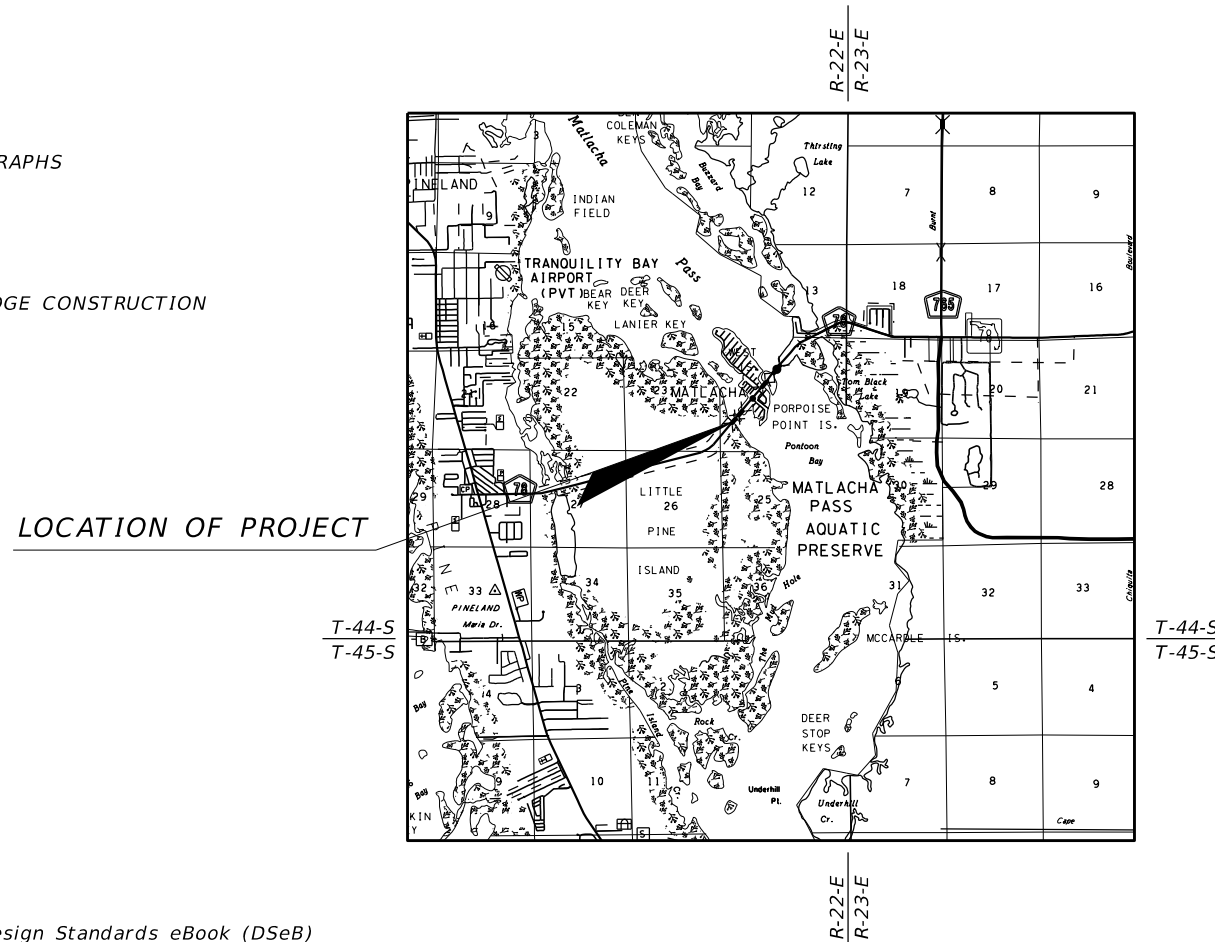
STRUCTURE PLANS

INDEX OF STRUCTURE PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2	SUMMARY OF PAY ITEMS
3	GENERAL NOTES
4	PLAN AND ELEVATION WITH OVERVIEW OF REPAIRS
5	TYPICAL SECTION
6	SUPERSTRUCTURE REPAIR OVERVIEW
7	REPAIR TYPE 1 DETAILS
8	REPAIR TYPE 2 DETAILS
9	SUBSTRUCTURE REPAIR OVERVIEW
10	REPAIR TYPE 3 DETAILS (1 OF 3)
11	REPAIR TYPE 3 DETAILS (2 OF 3)
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14	REPAIR TYPE 5 DETAILS
15	REPAIR TYPE 6 DETAILS
16	MISCELLANEOUS REPAIR OVERVIEW
17	REPAIR TYPE 7 DETAILS
18	REPAIR TYPE 8 AND 9 DETAILS
19	INSPECTION FINDINGS SITE PHOTOGRAPHS

BX-1 - BX-13 EXISTING BRIDGE PLANS

2010 INTERIM DESIGN STANDARD FOR ROAD AND BRIDGE CONSTRUCTION
400 GUARDRAIL



LOCATION OF PROJECT

GOVERNING DESIGN STANDARDS:

Florida Department of Transportation, FY 2020-2021 Design Standards eBook (DSeB) and applicable Design Standards Revisions (DSRs) at the following website:
<http://www.dot.state.fl.us/rddesign/DesignStandards/Standards.shtm>

GOVERNING STANDARD SPECIFICATIONS:

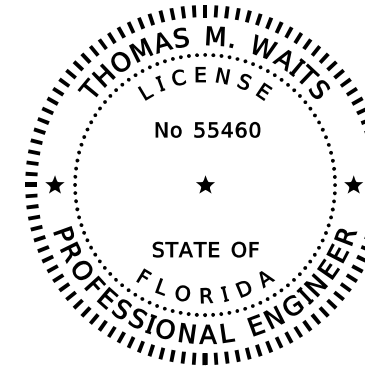
Florida Department of Transportation, July 2021 Standard Specifications for Road and Bridge Construction at the following website:
<http://www.dot.state.fl.us/programmanagement/Implemented/SpecBooks>

REVISIONS:

1 Sheets 1, 2, 3, 6, 9, 10 & 12 (Revised 8/09/2021)

KEY SHEET REVISIONS	
DATE	DESCRIPTION
8/09/21	Revised Submittal Phase and Date

1
**FINAL
100% SUBMITTAL
AUGUST
JULY 2021**



THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY

ON THE DATE ADJACENT TO THE SEAL
PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

**STRUCTURE PLANS
ENGINEER OF RECORD:**

THOMAS M. WAITS, P.E.
P.E. LICENSE NUMBER 55460
HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BLVD.
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

LEE COUNTY PROJECT MANAGER:

AVELINO CANCEL, P.E.

CONSTRUCTION CONTRACT NO.	FISCAL YEAR	SHEET NO.
	21	1

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

SUMMARY OF PAY ITEMS			
PAY ITEM NO.	DESCRIPTION	UNIT	QUANTITY
101-1	MOBILIZATION (25%)	LS	1
102-1	MAINTENANCE OF TRAFFIC (10%)	LS	1
1. & 2. REPAIRS TO PRECAST CONCRETE SLABS			
110-4-10	REMOVAL OF EXISTING CONCRETE	SY	9 12 ¹
400-143	CLEANING & COATING CONCRETE SURFACE	SF	130
411-1	EPOXY MATERIAL FOR CRACK INJECTION-STRUCTURES REHAB (TYPE E)	GA	1
411-2	CRACKS INJECT & SEAL-STRUCTURES REHAB	LF	55
401-70-1	RESTORE SPALLED AREAS, EPOXY	CF	5.7 7.6 ¹
450-82	CFRP SLAB REPAIR	LF	52
3. REPAIRS TO BENT CAPS			
110-4-10	REMOVAL OF EXISTING CONCRETE	SY	10 13 ¹
400-143	CLEANING & COATING CONCRETE SURFACE	SF	59
411-1	EPOXY MATERIAL FOR CRACK INJECTION-STRUCTURES REHAB (TYPE E)	GA	1
411-2	CRACKS INJECT & SEAL-STRUCTURES REHAB	LF	19
400-4-5	CONCRETE CLASS IV, BRIDGE SUBSTRUCTURE	CY	0.8 1.1 ¹
450-82	CFRP BENT CAP REPAIR	LF	12
4. REPAIRS TO PILES			
411-1	EPOXY MATERIAL FOR CRACK INJECTION-STRUCTURES REHAB (TYPE E)	GA	1
411-2	CRACKS INJECT & SEAL-STRUCTURES REHAB	LF	6
457-1-12	STANDARD INTEGRAL PILE JACKET, NON-STRUCTURAL, 16.1 to 30.0"	LF	8
5. REPAIRS TO SEAWALLS			
401-70-1	RESTORE SPALLED AREAS, EPOXY (TYPE K)	CF	0.3 0.6 ¹
6. REPAIR UNDERMINING TO SEAWALL			
530-3-4	RIPRAP, RUBBLE, F&I, DITCH LINING	TN	1.6
7. REPLACEMENT OF EXISTING UTILITY PIPE BRACKETS (WORK DONE BY OTHERS)			
460-98-2	PIPE HANGER	EA	37
460-112	ANCHOR BOLT REPLACEMENT	EA	74
413-149	PENETRANT SEALER	GA	1
413-154	CLEANING & SEALING CONCRETE SURFACES - PENETRANT SEALER	SF	9
8. INSTALLATION OF BARRIER REFLECTORS			
705-11	BARRIER DELINEATOR ON EXISTING BARRIER	EA	28
9. REPAIRS TO ASPHALT SURFACE			
999-1	ASPHALT CRACK REPAIR	GA	4

PAY ITEM NOTES

¹ 1. QUANTITIES FOR PAY ITEMS 110-4-10, 400-4-5 AND ~~400-70-1~~ 401-70-1 HAVE BEEN INCREASED BY ~~50%~~ 100% BEYOND THE FIELD MEASURED AREA TO ACCOUNT FOR UNFORESEEN OCCURRENCES DURING THE REMOVAL AND REPAIR OF SPALLED CONCRETE. PAYMENT WILL BE BASED ON THE ACTUAL WORK PERFORMED, AND NOT THE PLAN QUANTITY.

2. PAY ITEM 450-82 IS SUBJECT TO A WARRANTY PERIOD IN ACCORDANCE WITH THE MANUFACTURERS LIMITED WARRANTY.

3. PAY ITEM 400-143 COVERS SURFACE PREPARATION FOR CFRP APPLICATION (PAY ITEM 450-82). SEE CFRP STRENGTHENING NOTES ON REPAIR TYPES 1 AND 3 FOR SURFACE PREPARATION DETAILS.

BRIDGE NO. 120111

REVISIONS						THOMAS M. WAITS, P.E. P.E. LICENSE NUMBER 55460 HIGHSPANS ENGINEERING, INC. 2121 MCGREGOR BOULEVARD SUITE 200 FORT MYERS, FL 33901 REGISTRY NO. 27559	DRAWN BY: SDS 11/20 CHECKED BY: TMW 11/20 DESIGNED BY: RMW 11/20 CHECKED BY: TMW 11/20	LEE COUNTY DEPARTMENT OF TRANSPORTATION			SHEET TITLE: SUMMARY OF PAY ITEMS	REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	PROJECT ID		
8/9/21	SDS	¹ REVISED QUANTITIES & NOTE				CR 78	LEE		CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	2		

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GENERAL NOTES

A. DESIGN SPECIFICATIONS

1. FDOT STRUCTURES MANUAL DATED JANUARY 2021 AND SUBSEQUENT STRUCTURES DESIGN BULLETINS.
2. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) LOAD AND RESISTANCE FACTOR (LRFD) BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION AND ALL SUBSEQUENT INTERIMS.
3. FDOT DESIGN MANUAL DATED JANUARY, 2021 AND SUBSEQUENT ROADWAY DESIGN BULLETINS.

B. GOVERNING STANDARDS AND CONSTRUCTION SPECIFICATIONS

1. FLORIDA DEPARTMENT OF TRANSPORTATION, 2020-21 STANDARD PLANS AND REVISED INDEX DRAWINGS AS APPENDED HEREIN, AND JULY 2021 STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AS AMENDED BY CONTRACT DOCUMENTS.
2. FLORIDA DEPARTMENT OF TRANSPORTATION DEVELOPMENTAL DESIGN SPECIFICATION DDS305 BITUMINOUS CRACK AND JOINT SEALING.

C. VERTICAL DATUM

VERTICAL DATUM USED IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29), UNLESS OTHERWISE NOTED.

D. ENVIRONMENT

BRIDGE NUMBER	SUPERSTRUCTURE	SUBSTRUCTURE
120111	EXTREMELY	EXTREMELY

E. DESIGN METHODOLOGY

LOAD AND RESISTANCE FACTOR DESIGN (LRFD) METHOD USING STRENGTH, SERVICE, AND FATIGUE LIMIT STATES.

F. DESIGN LOADINGS

1. LIVE LOADS: HL-93 WITH DYNAMIC LOAD ALLOWANCE
2. DEAD LOADS:
REINFORCED CONCRETE: 150 PCF
3. CONSTRUCTION LOADS: REPAIRS AT BENT CAPS WILL REQUIRE THE INSTALLATION OF TEMPORARY FORMWORK TO SUPPORT THE CONCRETE POUR. CONTRACTOR TO SUBMIT SHOP DRAWINGS OF THIS FORMWORK AND ANY SUPPORTING STRUCTURE TO THE ENGINEER FOR APPROVAL.

G. STRUCTURE MATERIALS

1. REINFORCING STEEL: ASTM A1035 GRADE 100, CHROMX 9100
2. CONCRETE STRENGTH:

CONCRETE CLASS	MIN. 28-DAY COMPRESSIVE STRENGTH (PSI)	LOCATION OF CONCRETE IN STRUCTURE
IV *	5,500	REPAIR 3

* MIXTURE TO CONTAIN SMALL AGGREGATE AND ADMIXTURES FOR FLOWABILITY AND CORROSION RESISTANCE IN ACCORDANCE WITH SECTION 934

H. REPAIR MATERIALS

1. CARBON FIBER REINFORCEMENT:

PROPERTY	DESIGN VALUE
TENSILE STRENGTH	128,000 PSI
TENSILE MODULUS	14,200 KSI
ELONGATION AT BREAK	0.9%
THICKNESS PER LAYER	0.04 IN.
STIFFNESS/WIDTH	568 K/IN.

2. EPOXY COMPOUND:

EPOXY TYPE	FDOT STANDARD SPECIFICATIONS SECTION	LOCATION OF EPOXY REPAIR IN STRUCTURE
E	SECTION 411, 926	CRACK INJECTION
K	SECTION 926	UNDERWATER PILES & SEAWALLS

3. PORTLAND CEMENT GROUT: FDOT STANDARD SPECIFICATIONS SECTION 934
4. UTILITY PIPE BRACKET: SEE TECHNICAL SPECIFICATIONS
5. ASPHALT PAVEMENT: FDOT STANDARD SPECIFICATIONS SECTION 330, AND 337
6. BARRIER DELINEATOR: FDOT STANDARD SPECIFICATIONS SECTION 521, 705, AND 993

I. CONCRETE COVER:

ALL NEW REINFORCEMENT IS TO BE PLACED TO PROVIDE AS SHOWN IN ORIGINAL PLANS.

J. CONCRETE FINISH COATING

CONCRETE ON DECK EDGES TO BE TEXTURED AND PAINTED TO MATCH EXISTING CONDITIONS. CONCRETE ON UNDERSIDE OF DECK AND PILE CAPS TO BE FINISHED FLUSH WITH EXISTING CONCRETE, AND ANY EDGES OR CORNERS SHALL RECEIVE A 3/4" CHAMFER.

K. PLAN DIMENSIONS

ALL DIMENSIONS IN THESE PLANS ARE MEASURED IN FEET EITHER HORIZONTALLY OR VERTICALLY UNLESS OTHERWISE NOTED.

L. UTILITIES

LOCATIONS OF UTILITIES SHOWN IN THE PLANS ARE APPROXIMATE.

M. TRAFFIC CONTROL PLANS



~~LANE CLOSURES SHALL CONFORM WITH INDEX 102-603 FROM FY 2021/22 FDOT STANDARD PLANS. ALL LANE CLOSURE REQUESTS SHALL BE SUBMITTED TO LEE COUNTY AT LEAST 10 DAYS IN ADVANCE AND SHALL ONLY OCCUR BETWEEN THE HOURS OF 9 PM TO 5 AM. PCMS BOARDS AS SHOWN BELOW SHALL BE INSTALLED AT LEAST 7 DAYS IN ADVANCE OF LANE CLOSURE.~~

THE INSTALLATION OF CFRP IN REPAIR ITEM 1 REQUIRES THE CLOSURE OF THE SOUTHBOUND LANE FOR 8 HOURS. THIS LANE CLOSURE SHALL ONLY OCCUR BETWEEN THE HOURS OF 9 PM TO 5 AM. IN ADDITION, THE SPEED LIMIT SHALL BE REDUCED TO 15 MPH FOR BOTH LANES FOR A DURATION OF 72 HOURS FOLLOWING THE INSTALLATION OF CFRP IN REPAIR ITEM 1. LANE CLOSURES AND SPEED REDUCTIONS SHALL CONFORM WITH INDEX 102-600 AND 102-603 FROM FY 2021/22 FDOT STANDARD PLANS. PCMS BOARDS AS SHOWN BELOW AND SHALL BE INSTALLED AT LEAST 7 DAYS IN ADVANCE OF LANE CLOSURE. ALL LANE CLOSURE REQUESTS SHALL BE SUBMITTED TO LEE COUNTY AT LEAST 10 DAYS IN ADVANCE.

N. PHASING OF WORK

REPAIR ITEM 1 (CFRP STRENGTHENING OF SUPERSTRUCTURE) WILL REQUIRE THE TRAFFIC ON THE BRIDGE TO BE TEMPORARILY REDUCED TO 1 LANE IN ORDER TO ALLOW REPAIR MATERIALS TO ADEQUATELY CURE AND GAIN STRENGTH. THE FOLLOWING ARE THE STEPS WHICH MUST BE FOLLOWED RELATING TO REPAIR ITEM 1:

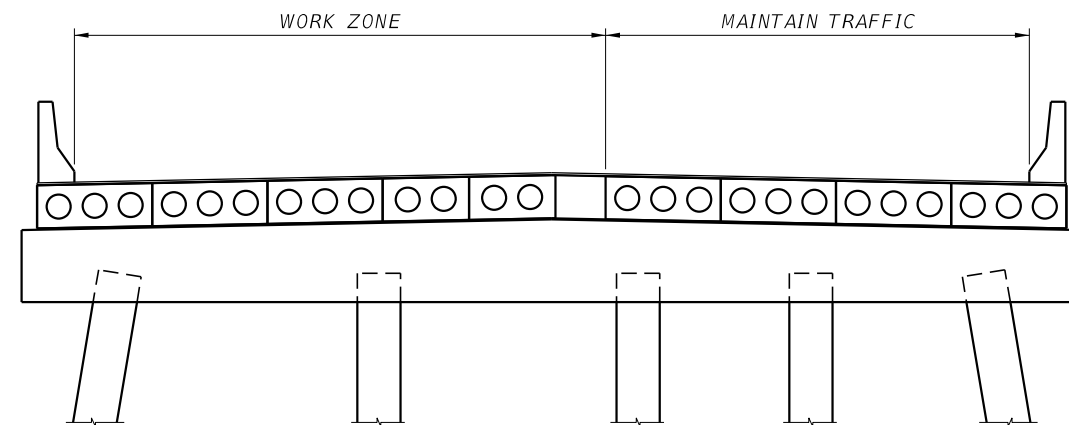
1. COMPLETE ALL SURFACE PREPARATION WORK FOR CFRP APPLICATION PRIOR TO SOUTHBOUND LANE CLOSURE TO MAXIMIZE TIME FOR CURING CFRP REPAIR.
2. ALL VEHICULAR TRAFFIC, INCLUDING CONTRACTORS VEHICLES AND EQUIPMENT, SHALL BE PREVENTED FROM DRIVING THROUGH THE WORK ZONE IDENTIFIED BELOW.
3. TWO NIGHTS OF SOUTHBOUND LANE CLOSURES SHOULD BE USED TO REPAIR EACH SLAB, ONE PER NIGHT.
4. MAINTAIN LANE CLOSURE UNTIL 5AM REGARDLESS OF COMPLETION OF REPAIR ITEM 1 PROCEDURES.

O. HAZARDOUS MATERIALS

EXISTING PLANS INDICATE THAT THE BRIDGE BEARINGS CONTAIN ASBESTOS. THE CONTRACTOR IS TO EXERCISE CAUTION WHEN WORKING IN THE PROXIMITY OF THESE BEARINGS SO AS NOT TO DAMAGE OR DISTURB THEM. POTENTIAL HAZARDOUS MATERIAL ENCOUNTERED IN THE PROXIMITY OF THE BEARINGS DURING REPAIR WORK IS TO BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL GUIDELINES.

PCMS

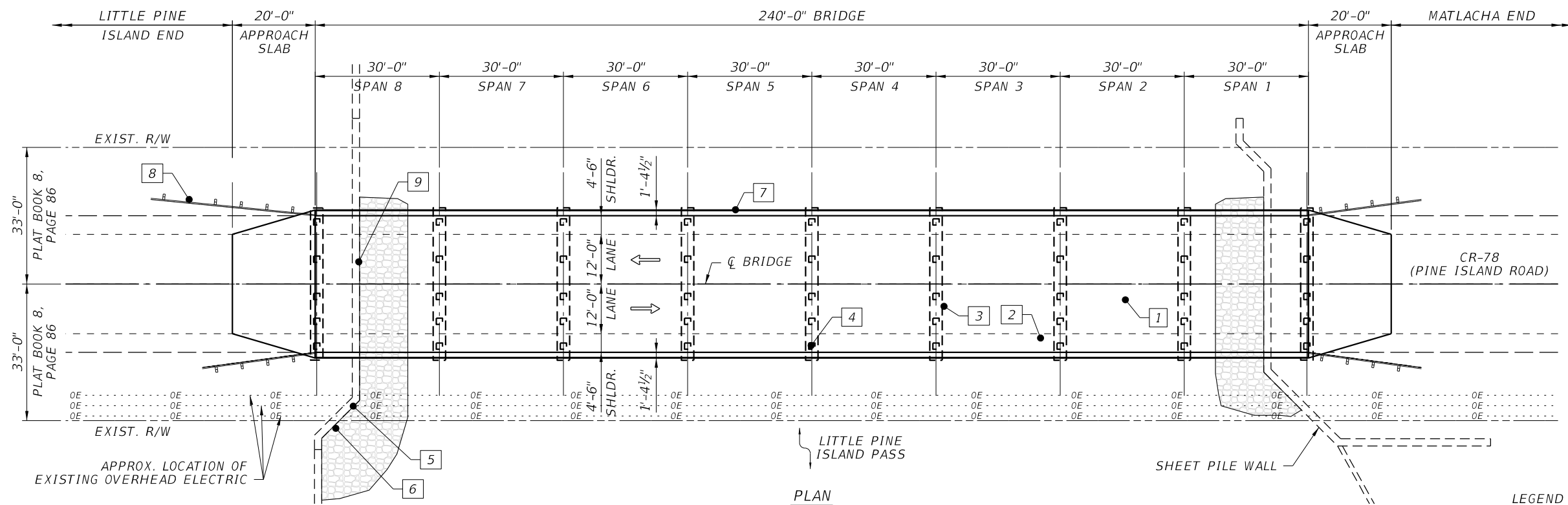
7 DAYS PRIOR TO LANE CLOSURE		DURING LANE CLOSURE	
DISPLAY 1	DISPLAY 2	DISPLAY 1	DISPLAY 2
BRIDGE LANE CLOSURES	(BEGIN DATE) TO (END DATE)	LANE CLOSED AHEAD	MERGE LEFT/RIGHT



PHASING OF WORK
LOOKING NORTHEAST

BRIDGE NO. 120111

REVISIONS						THOMAS M. WAITS, P.E. P.E. LICENSE NUMBER 55460 HIGHSPANS ENGINEERING, INC. 2121 MCGREGOR BOULEVARD SUITE 200 FORT MYERS, FL 33901 REGISTRY NO. 27559	DRAWN BY: SDS 11/20 CHECKED BY: TMW 11/20 DESIGNED BY: RMW 11/20 CHECKED BY: TMW 11/20	LEE COUNTY DEPARTMENT OF TRANSPORTATION			GENERAL NOTES		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	PROJECT ID	PROJECT NAME:	SHEET NO.	
8/9/21	SDS	1 REVISIED NOTE						CR 78	LEE		CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	3	

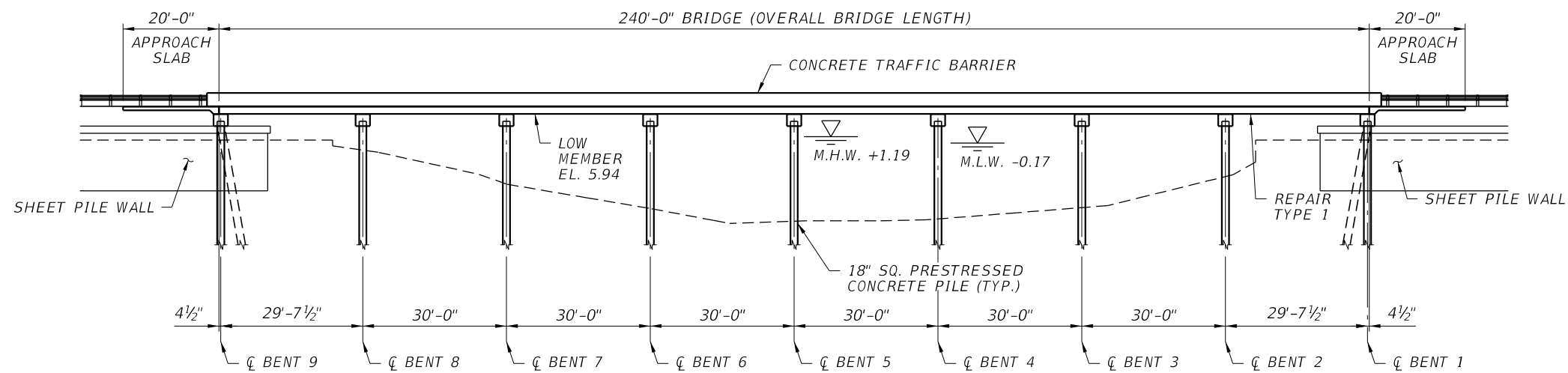


PLAN

LEGEND

X REPAIR TYPE

SEE SHEET 19 FOR EXAMPLES OF DAMAGED AREAS FROM BRIDGE INSPECTION PHOTOGRAPHS



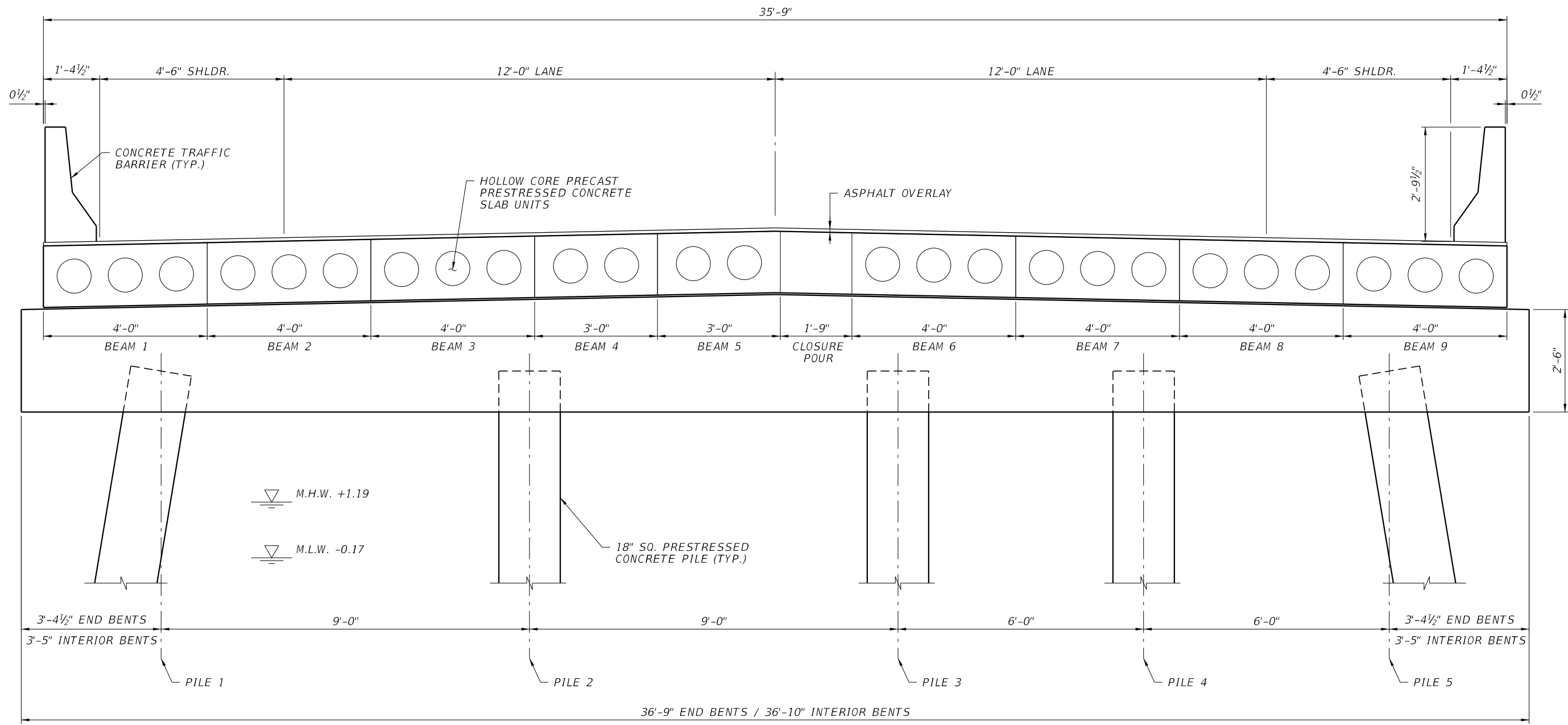
ELEVATION

REPAIR TYPE	EXISTING REPAIR CONDITION	REPAIR PROCEDURE
1	CRACKING AT UNDERSIDE OF PRECAST CONC. SLABS	EPOXY INJECT CRACKS AND APPLY CFRP MATERIAL AS SPECIFIED
2	SPALLING CONCRETE AREAS AT UNDERSIDE OF PRECAST CONC. SLABS	REMOVE LOOSE AND DAMAGED CONCRETE AND PATCH WITH SPECIFIED MATERIAL
3	CRACKING/SPALLING OF BENT CAPS	EPOXY INJECT CRACKS AND/OR PATCH SPALLED AREAS WITH SPECIFIED MATERIAL. APPLY CFRP WRAP AT SPECIFIED LOCATIONS.
4	CRACKING/SPALLING OF PILES	INSTALL PILE JACKET/STRENGTHENING AS SPECIFIED
5	CRACKING/SPALLING AT SEAWALLS	USE WET APPLICATION EPOXY PASTE APPLIED BY HAND TO CRACK AND SPALL AREAS
6	UNDERMINING AT SEAWALL FOUNDATION	PLACE PEA GRAVEL AND RUBBLE RIP AS INDICATED
7	CORRODED UTILITY (PIPE) BRACKETS (NORTH EDGE OF BRIDGE)	NEW STAINLESS STEEL BRACKETS BY OTHERS
8	METAL GUARDRAIL POST REFLECTORS	INSTALL REFLECTOR TO TOP OF POST AT METAL GUARD RAIL IN ACCORDANCE WITH STANDARD INDEX 400
9	CRACKING OF ASPHALT OVERLAY AT BRIDGE ENDS	APPLY ASPHALT CRACK SEALANT AS INDICATED

BRIDGE NO. 120111

REVISIONS						THOMAS M. WAITS, P.E. P.E. LICENSE NUMBER 55460 HIGHSPANS ENGINEERING, INC. 2121 MCGREGOR BOULEVARD SUITE 200 FORT MYERS, FL 33901 REGISTRY NO. 27559	DRAWN BY: SDS 11/20 CHECKED BY: TMW 11/20 DESIGNED BY: RMW 11/20 CHECKED BY: TMW 11/20	LEE COUNTY DEPARTMENT OF TRANSPORTATION			SHEET TITLE:	REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	PROJECT ID	PLAN & ELEVATION WITH OVERVIEW OF REPAIRS	
								CR 78	LEE		CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	SHEET NO.
										4		

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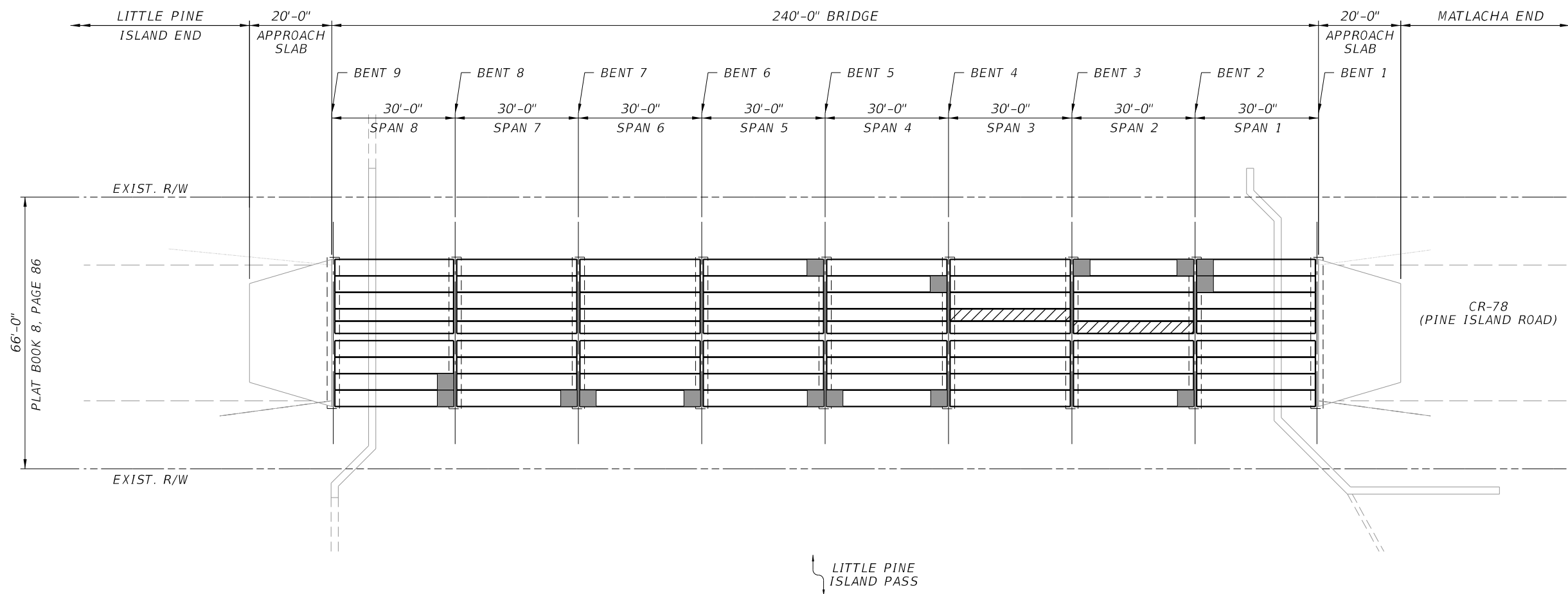


TYPICAL SECTION
LOOKING NORTHEAST

BRIDGE NO. 120111

REVISIONS						THOMAS M. WAITS, P.E. P.E. LICENSE NUMBER 55460 HIGHSPANS ENGINEERING, INC. 2121 MCGREGOR BOULEVARD SUITE 200 FORT MYERS, FL 33901 REGISTRY NO. 27559	DRAWN BY: SDS 11/20 CHECKED BY: TMW 11/20 DESIGNED BY: RMW 11/20 CHECKED BY: TMW 11/20			LEE COUNTY DEPARTMENT OF TRANSPORTATION			SHEET TITLE: TYPICAL SECTION		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION		ROAD NO.	COUNTY	PROJECT ID	PROJECT NAME:		SHEET NO.			
							CR 78	LEE		CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR		5			

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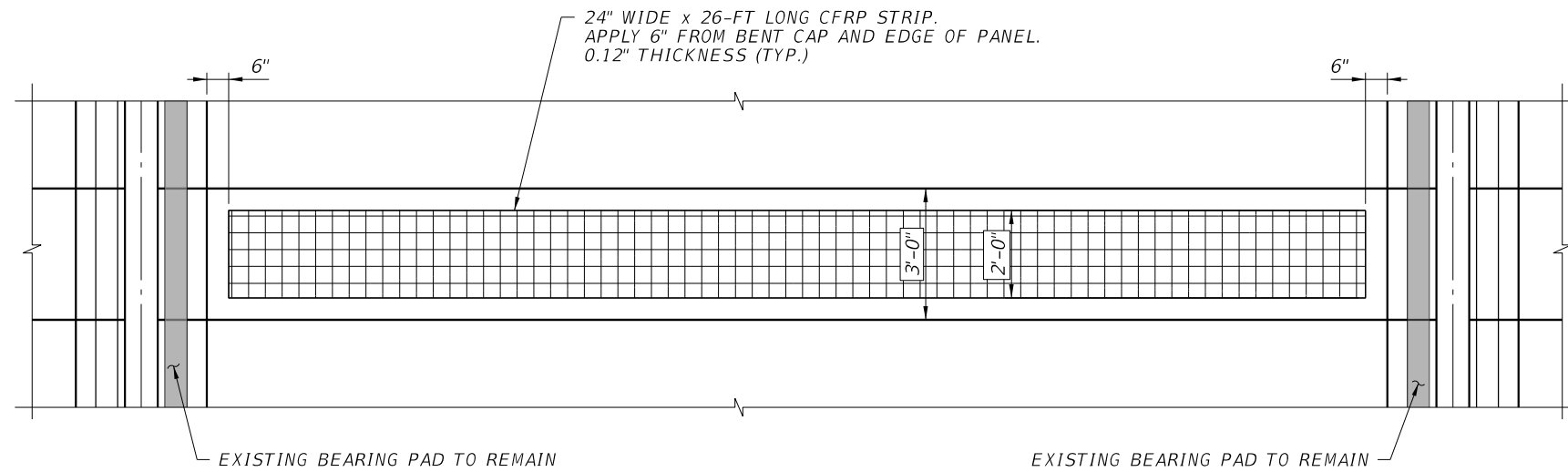
REPAIR LOCATION	REPAIR TYPE	UNIT	QUANTITY
SPAN 3, BEAM 4	CRACK INJECTION	LF	32
SPAN 2, BEAM 5	CRACK INJECTION	LF	23
SPAN 3, BEAM 4	CFRP STRENGTHENING	LF	26
SPAN 2, BEAM 5	CFRP STRENGTHENING	LF	26
SPAN 8, BEAM 8	SPALL REPAIR	SF	3 4
SPAN 8, BEAM 9	SPALL REPAIR	SF	3 4
SPAN 7, BEAM 9	SPALL REPAIR	SF	2 2
SPAN 6, BEAM 9	SPALL REPAIR	SF	5 6
SPAN 6, BEAM 9	SPALL REPAIR	SF	5 6
SPAN 6, BEAM 9	SPALL REPAIR	SF	3 4
SPAN 5, BEAM 1	SPALL REPAIR	SF	3 4
SPAN 5, BEAM 9	SPALL REPAIR	SF	2 2
SPAN 4, BEAM 2	SPALL REPAIR	SF	14 18
SPAN 4, BEAM 9	SPALL REPAIR	SF	3 4
SPAN 4, BEAM 9	SPALL REPAIR	SF	2 2
SPAN 2, BEAM 1	SPALL REPAIR	SF	2 2
SPAN 2, BEAM 1	SPALL REPAIR	SF	2 2
SPAN 2, BEAM 9	SPALL REPAIR	SF	6 8
SPAN 1, BEAM 1	SPALL REPAIR	SF	6 8
SPAN 1, BEAM 2	SPALL REPAIR	SF	3 4



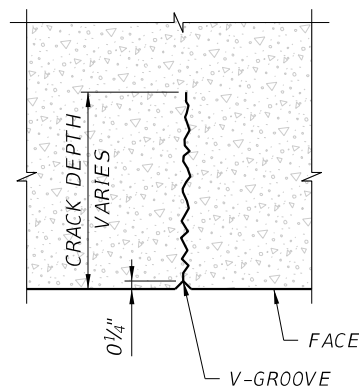
BRIDGE NO. 120111

REVISIONS				THOMAS M. WAITS, P.E. P.E. LICENSE NUMBER 55460 HIGHSPANS ENGINEERING, INC. 2121 MCGREGOR BOULEVARD SUITE 200 FORT MYERS, FL 33901 REGISTRY NO. 27559	DRAWN BY: SDS 11/20 CHECKED BY: TMW 11/20 DESIGNED BY: RMW 11/20 CHECKED BY: TMW 11/20	LEE COUNTY DEPARTMENT OF TRANSPORTATION			SHEET TITLE:	REF. DWG. NO.
DATE	BY	DESCRIPTION	ROAD NO.			COUNTY	PROJECT ID	SUPERSTRUCTURE REPAIR OVERVIEW		
8/9/21	SDS	1 REVISIED QUANTITIES	CR 78			LEE				PROJECT NAME: CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR

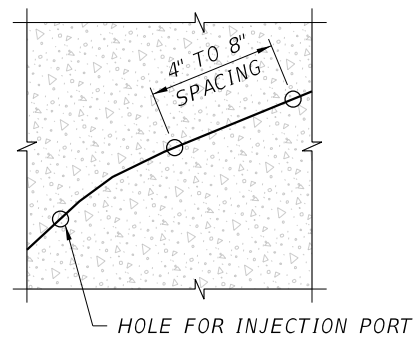
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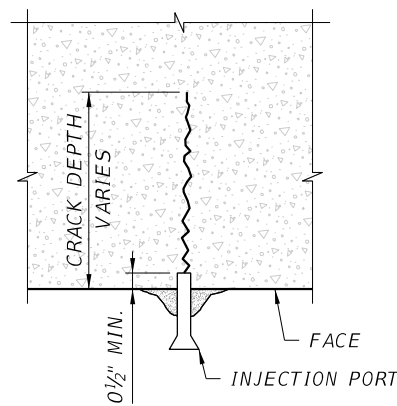
APPLICATION OF CFRP TO DECK PANELS (PLAN VIEW, TYPICAL)



DETAIL 1 - SECTION THROUGH CRACK



DETAIL 2 - PLAN VIEW



DETAIL 3 - SECTION THROUGH REPAIR

CRACK REPAIR DETAILS

LEGEND



EXISTING CONCRETE SECTION (REINF. OMITTED FOR CLARITY)



TYPE F-1 EPOXY

NOTES FOR BEAM CFRP STRENGTHENING

1. PRIOR TO APPLICATION OF CFRP, FOLLOW SPALL/CRACK REPAIR PROCEDURES AND ALLOW TO CURE FOR A MINIMUM OF 14 DAYS.
2. REPAIR EXISTING SUBSTRATE PER ICRI GUIDELINE NO. 310.1R.
3. CONCRETE SHALL BE ABRASIVELY PREPARED TO ACHIEVE AN OPEN PORE STRUCTURE AND CSP-3 IN ACCORDANCE WITH ICRI GUIDELINE NO. 310.2R BY MEANS OF GRINDING, SAND BLASTING, SHOT BLASTING, OR PRESSURE WASHING.
4. APPLICATION SURFACES SHALL BE CLEAN, SOUND, AND FREE OF STANDING WATER AT TIME OF APPLICATION. ALL DUST, LAITANCE, GREASE, CURING COMPOUNDS, AND OTHER FOREIGN MATERIALS THAT MAY HINDER THE BOND MUST BE REMOVED BEFORE INSTALLATION.
5. USE SIMPSON STRONG-TIE CSS-CUCF22 CFRP OR APPROVED EQUAL. FOLLOW MANUFACTURERS SPECIFICATIONS FOR APPLICATION.
6. USE 3 LAYERS OF CFRP STRIPS TO PROVIDE A MINIMUM THICKNESS OF 0.12" FOR ALL CFRP APPLICATIONS, UNLESS OTHERWISE NOTED.
7. USE EPOXY BONDING AGENT PER MANUFACTURERS SPECIFICATIONS.
8. COAT ALL CFRP WITH SIMPSON STRONG-TIE FX-70-9 PROTECTIVE EPOXY COATING PER MANUFACTURER PROCEDURES.

NOTES FOR CRACK INJECTION

1. "V" GROOVE THE CONCRETE SURFACE ALONG THE FULL LENGTH OF THE CRACK AS SHOWN IN DETAIL 1.
2. CLEAN CONCRETE SURFACE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS PRIOR TO PLACING EPOXY COMPOUND.
3. DRILL HOLES FOR INJECTION PORTS TO A DEPTH SHOWN IN DETAIL 3.
4. SEAL SURFACE OF CRACK WITH TYPE F EPOXY COMPOUND PER FDOT STANDARD SPECIFICATIONS, SECTION 411. APPLY TO PROVIDE A MINIMUM THICKNESS OF 1/16" AND EXTEND A MINIMUM OF 1" TO EITHER SIDE OF CRACK. ALLOW A MINIMUM OF SIX HOURS CURING BEFORE INITIATING INJECTION PROCESS.
5. INSTALL INJECTION PORTS AND INJECT THE EPOXY COMPOUND PER FDOT STANDARD SPECIFICATIONS, SECTION 411. ALLOW MINIMUM OF SIX HOURS CURING TIME.
6. CUT THE PORTS AFTER CURING.
7. FILL VOIDS WITH EPOXY PASTE SMOOTH ALL SURFACES TO PREVENT SHARP EDGES THAT COULD DAMAGE CFRP.
8. FOR SECTIONS WHERE CFRP IS TO BE APPLIED, FILL ALL VOIDS WITH EPOXY PASTE AND SMOOTH ALL SURFACES TO PREVENT SHARP EDGES THAT COULD PUNCTURE CFRP WRAP.
9. DO NOT DRILL ANY CORES UNLESS REQUESTED BY THE ENGINEER.
10. PANELS THAT ALSO REQUIRE APPLICATION OF CFRP.

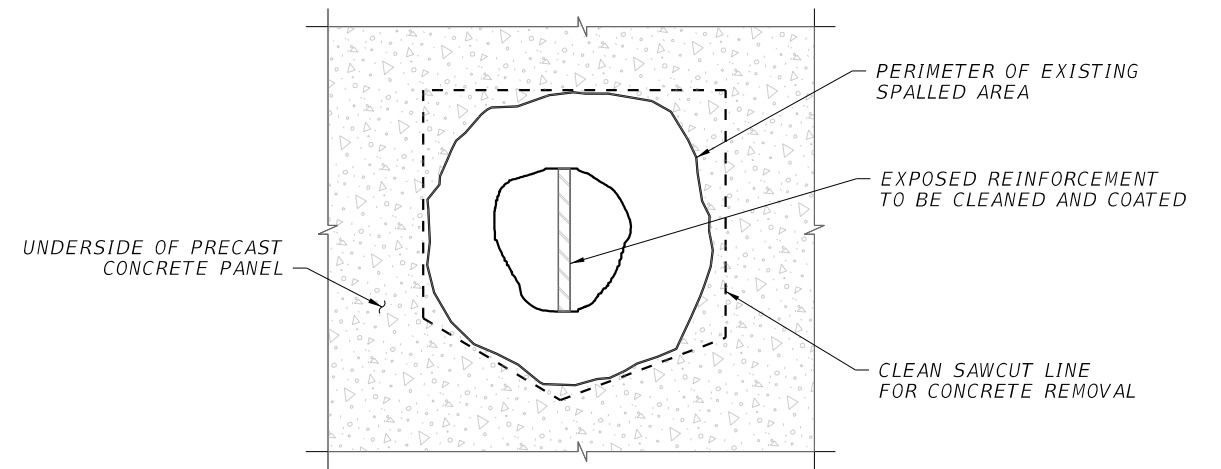
BRIDGE NO. 120111

REVISIONS						THOMAS M. WAITS, P.E. P.E. LICENSE NUMBER 55460 HIGHSPANS ENGINEERING, INC. 2121 MCGREGOR BOULEVARD SUITE 200 FORT MYERS, FL 33901 REGISTRY NO. 27559	DRAWN BY: SDS 11/20 CHECKED BY: TMW 11/20 DESIGNED BY: RMW 11/20 CHECKED BY: TMW 11/20	LEE COUNTY DEPARTMENT OF TRANSPORTATION			REPAIR TYPE 1 DETAILS		REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	PROJECT ID	PROJECT NAME:	SHEET NO.	
									CR 78	LEE		CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	7

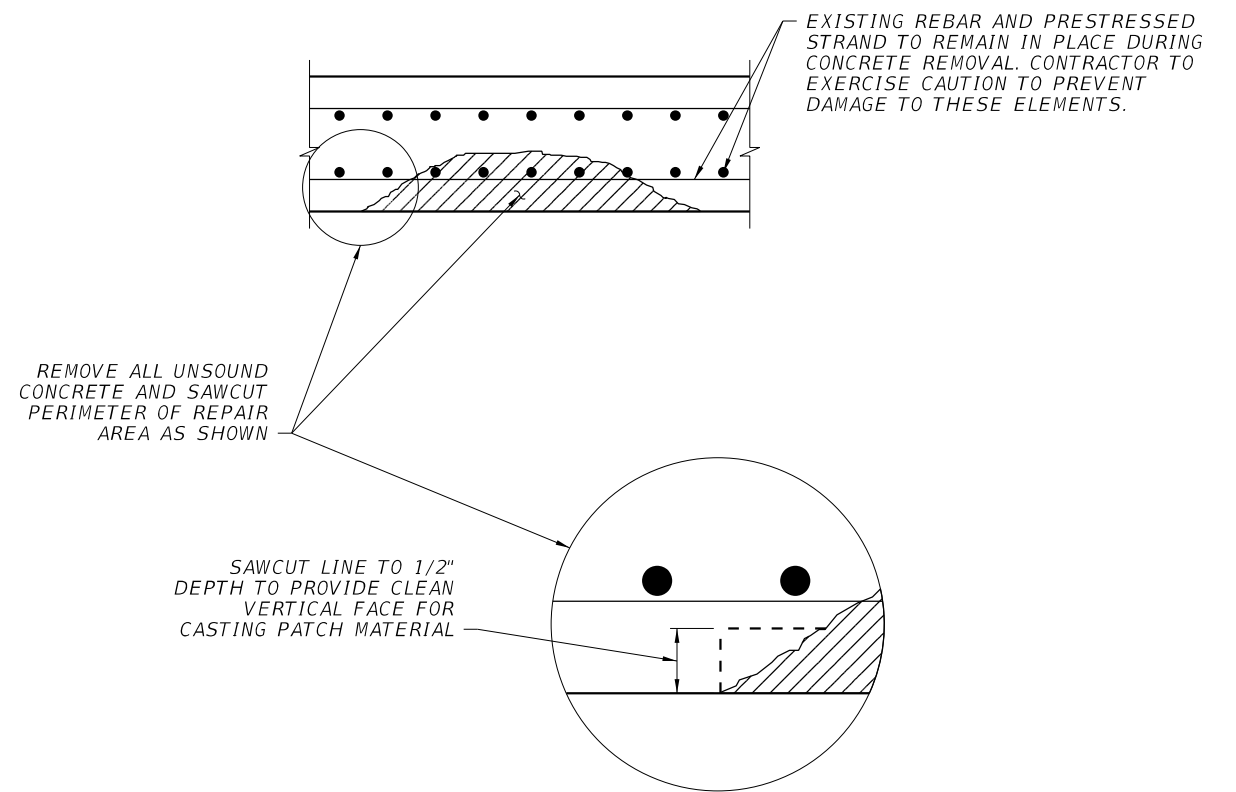
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PHOTO SHOWING TYPICAL AREA FOR SPALL REPAIR



SPALL REPAIR - DETAIL 1



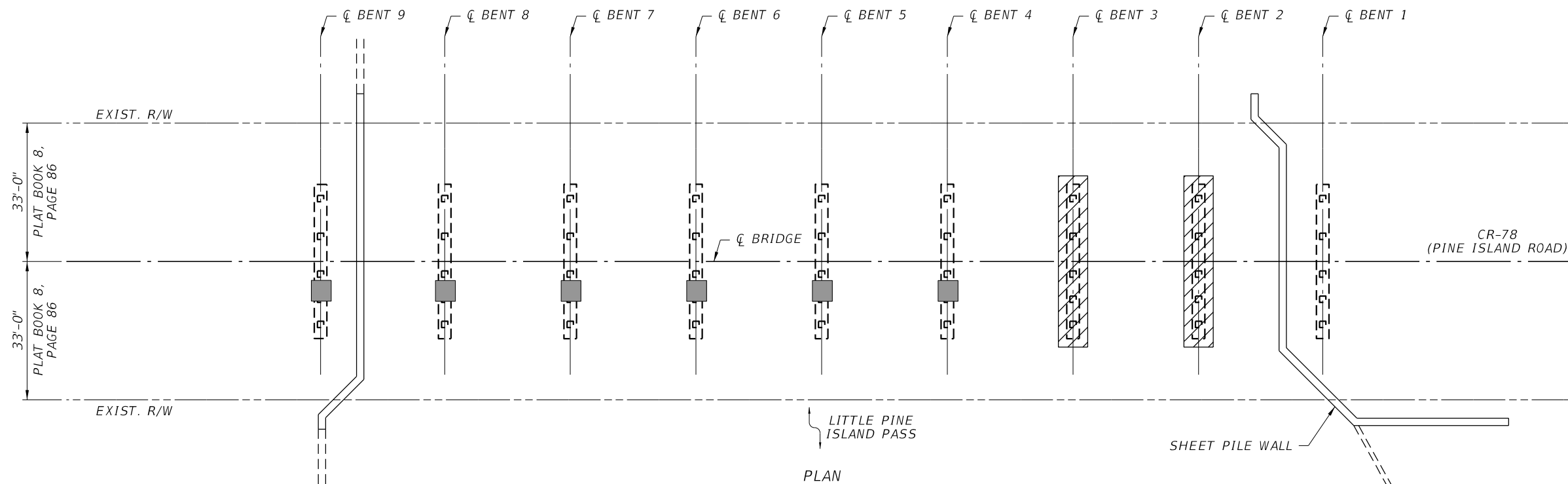
SPALL REPAIR - DETAIL 2

SLAB SPALL REPAIR NOTES

1. REMOVE ANY LOOSE CONCRETE OR DELAMINATING PATCHES FROM SLAB UNDERSIDES.
2. CLEAN ALL CORROSION FROM ANY EXPOSED REINFORCEMENT USING POWER TOOLS.
3. APPLY A CORROSION-INHIBITING AGENT LISTED ON THE FDOT'S APL TO ANY EXPOSED REINFORCEMENT PRIOR TO RE-CASTING. CORROSION-INHIBITING AGENT SHALL BE COMPATIBLE WITH THE SELECTED REPAIR MATERIAL. SUBMIT PRODUCT TO ENGINEER FOR APPROVAL.
4. USE A TYPE F-1 EPOXY MORTAR LISTED ON THE APL, AND FOLLOW MANUFACTURER'S INSTRUCTIONS ON MIXING WITH FINE AGGREGATE. SUBMIT PRODUCT TO ENGINEER FOR APPROVAL.
5. USE A TROWEL OR OTHER SLENDER TOOL TO APPLY GEL PATCH, MASTER EMACO N 425, OR APPROVED EQUAL TO HARD-TO-REACH AREAS ABOVE THE BENT CAPS AND FINISH FLUSH WITH THE SURROUNDING SURFACES.
6. CONTRACTOR SHALL ENSURE THAT A COLLECTION SYSTEM IS IN PLACE TO PREVENT ANY CONSTRUCTION DEBRIS FROM ENTERING THE WATER DURING THE DEMOLITION AND RE-CASTING PHASES OF WORK.

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DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	PROJECT ID	PROJECT NAME:	SHEET NO.	
								CR 78	LEE		CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	8	



REPAIR LOCATION	REPAIR TYPE	UNIT	QUANTITY
BENT 3, PILE 3	CRACK INJECTION	LF	3
BENT 3, PILE 3	CRACK INJECTION	LF	3
BENT 3, PILE 3	INSTALL CONCRETE JACKET	SF	64
BENT 2	CFRP STRENGTHENING	LF	7.5
BENT 3	CFRP STRENGTHENING	LF	4.5
BENT 2	SPALL REPAIR	SF	14
BENT 2	SPALL REPAIR	SF	14
BENT 2	SPALL REPAIR	SF	14
BENT 2	SPALL REPAIR	SF	15
BENT 3	SPALL REPAIR	SF	6
BENT 3	SPALL REPAIR	SF	24
BENT 4	SPALL REPAIR	SF	27
BENT 4	SPALL REPAIR	SF	14
BENT 4	SPALL REPAIR	SF	24
BENT 5	SPALL REPAIR	SF	36
BENT 5	SPALL REPAIR	SF	24
BENT 5	SPALL REPAIR	SF	24
BENT 5	SPALL REPAIR	SF	24
BENT 5	SPALL REPAIR	SF	24
BENT 6	CRACK INJECTION	LF	5
BENT 7	SPALL REPAIR	SF	15
BENT 8	SPALL REPAIR	SF	12
BENT 9	CRACK INJECTION	LF	8

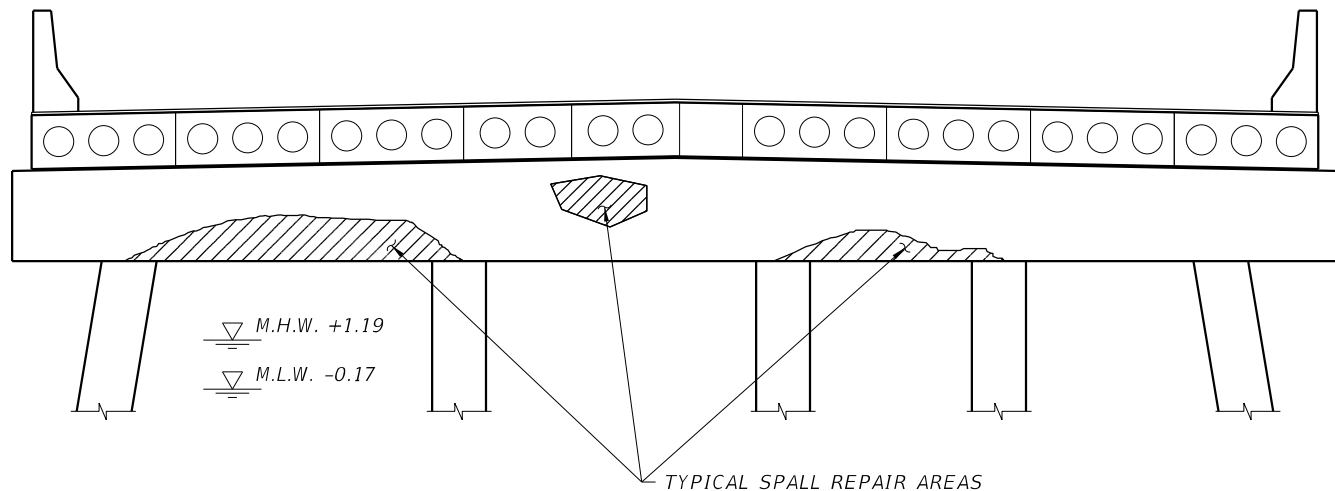
18
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DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	PROJECT ID	PROJECT NAME:	SHEET NO.
8/9/21	SDS	1 REVISD QUANTITIES				CR 78	LEE		CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	9		

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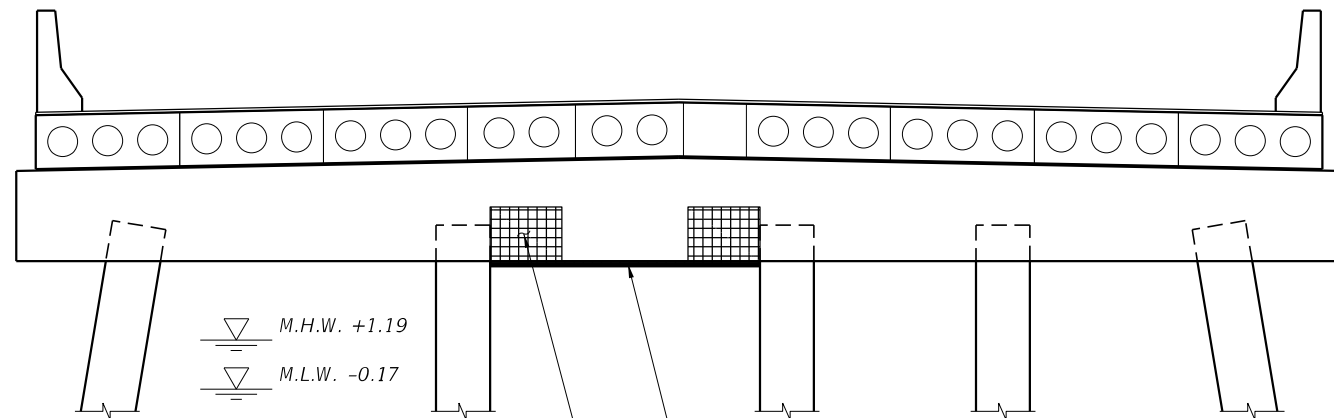
SPALL AND CRACK REPAIR AT ALL INTERMEDIATE BENTS

BENT CAP SPALL REPAIR NOTES

1. REMOVE ALL LOOSE AND SPALLED CONCRETE IN THE AREA OF THE REPAIR TAKING CARE NOT TO DAMAGE EXISTING REINFORCEMENT.
2. THE DEPTH OF CONCRETE REMOVAL SHALL BE LIMITED TO 9". IF LOOSE CONCRETE IS ENCOUNTERED BEYOND THIS LIMIT, THE DEMOLITION SHALL BE STOPPED AND THE ENGINEER OF RECORD NOTIFIED BEFORE PROCEEDING FURTHER.
3. IF CONCRETE REMOVAL EXPOSES A LAP SPlice IN THE REINFORCEMENT, THE DEMOLITION SHALL BE STOPPED AND THE ENGINEER OF RECORD NOTIFIED BEFORE PROCEEDING FURTHER.
4. CLEAN EXISTING REINFORCEMENT AND REMOVE ALL SURFACE RUST BY POWER TOOL CLEANING.
5. EVALUATE EXISTING EXPOSED REINFORCEMENT AND NOTIFY ENGINEER IF STEEL SECTION LOSS DUE TO CORROSION IN ANY ONE BAR EXCEEDS 50% OF THE ORIGINAL BAR DIAMETER.
6. FOR BARS WITH DIAMETER LOSS DUE TO CORROSION GREATER THAN 50%, FULLY EXPOSE THE BAR AND CHASE UNTIL CLEAN METAL IS FOUND AND INSTALL REPLACEMENT BAR OF SAME DIAMETER USING AN ANCHORING EPOXY LISTED ON THE APL. DOWEL THE REPLACEMENT BAR INTO THE CONCRETE SECTION A MINIMUM OF 12", PER DETAIL 3.
7. RECAST BENT CAP WHERE SPALL HAS BEEN REMOVED TO THE ORIGINAL BENT CAP DIMENSIONS. UTILIZE AN APL APPROVED EPOXY BONDING AGENT PRIOR TO CASTING AND RECAST WITH SPECIFIED CONCRETE MIX DESIGN TO ENSURE FULL CONCRETE CONSOLIDATION.
8. FOR CRACKS WITH NO LOOSE OR SPALLED CONCRETE, FOLLOW CRACK INJECTION REPAIR PROCEDURES.

BENT CAP CFRP STRENGTHENING NOTES

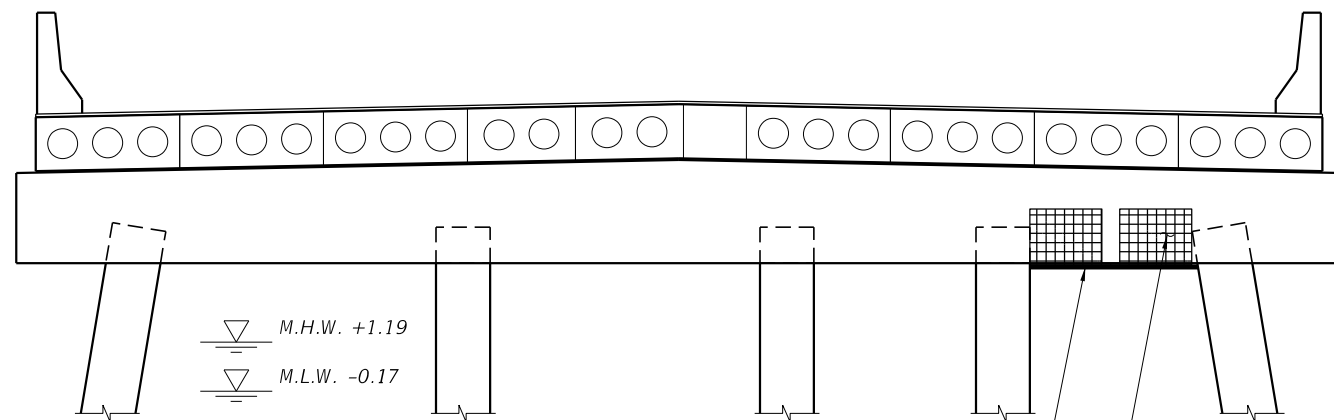
1. PRIOR TO APPLICATION OF CFRP, FOLLOW SPALL REPAIR PROCEDURES AND ALLOW TO CURE FOR A MINIMUM OF 14 DAYS.
2. REPAIR EXISTING SUBSTRATE PER ICRI GUIDELINE NO. 310.1R.
3. CONCRETE SHALL BE ABRASIVELY PREPARED TO ACHIEVE AN OPEN PORE STRUCTURE AND CSP-3 IN ACCORDANCE WITH ICRI GUIDELINE NO. 310.2R BY MEANS OF GRINDING, SAND BLASTING, SHOT BLASTING, OR PRESSURE WASHING.
4. APPLICATION SURFACES SHALL BE CLEAN, SOUND, AND FREE OF STANDING WATER AT TIME OF APPLICATION. ALL DUST, LAITANCE, GREASE, CURING COMPOUNDS, AND OTHER FOREIGN MATERIALS THAT MAY HINDER THE BOND MUST BE REMOVED BEFORE INSTALLATION.
5. USE SIMPSON STRONG-TIE CSS-CUCF22 CFRP OR APPROVED EQUAL. FOLLOW MANUFACTURES SPECIFICATIONS FOR APPLICATION.
6. USE 3 LAYERS OF CFRP STRIPS TO PROVIDE A MINIMUM THICKNESS OF 0.12" FOR ALL CFRP APPLICATIONS, UNLESS OTHERWISE NOTED.
7. USE AN APL APPROVED EPOXY BONDING AGENT PER MANUFACTURES SPECIFICATIONS.
8. INSTALL UNDERSIDE OF BENT CAP CFRP STRIPS PRIOR TO U-WRAP CFRP ANCHORAGE. APPLY ALL CFRP STRIPS AS INDICATED IN CFRP STRENGTHENING DETAILS AT BENTS 2 AND 3.
9. COAT ALL CFRP WITH SIMPSON STRONG-TIE FX-70-9 PROTECTIVE EPOXY COATING PER MANUFACTURER PROCEDURES.



CFRP STRENGTHENING AT BENT 2

24" WIDE X 90" LONG CFRP.
0.12" THICKNESS (TYP.)
APPLY ALONG FULL LENGTH OF
CAP BETWEEN PILES 2 AND 3

24" WIDE X 72" LONG CFRP U-WRAP
ANCHORAGE. 0.12" THICKNESS (TYP.)
APPLY AT EACH END AND PROVIDE 18"
LENGTH ON EACH VERTICAL FACE (TYP.)



CFRP STRENGTHENING AT BENT 3

24" WIDE X 54" LONG CFRP.
0.12" THICKNESS (TYP.)
APPLY ALONG FULL LENGTH OF
CAP BETWEEN PILES 4 AND 5

24" WIDE X 72" LONG CFRP U-WRAP
ANCHORAGE. 0.12" THICKNESS (TYP.)
APPLY AT EACH END AND PROVIDE 18"
LENGTH ON EACH VERTICAL FACE (TYP.)

BRIDGE NO. 120111

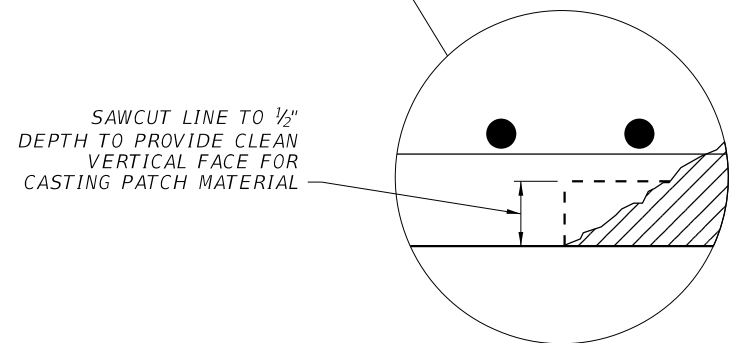
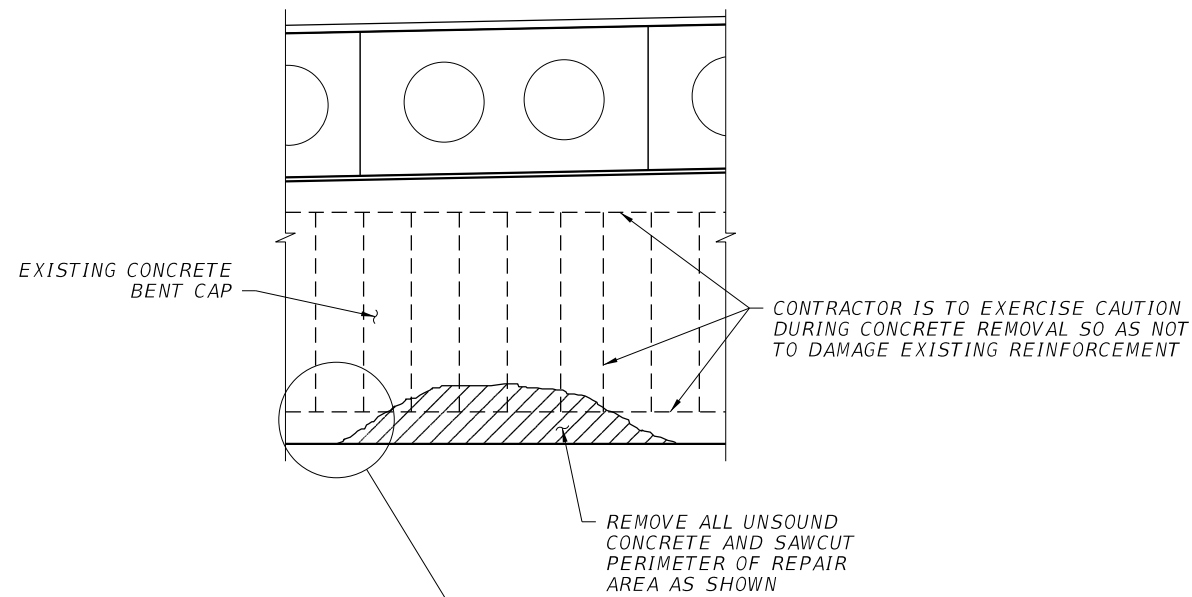
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
8/9/21	SDS	1 ADDED NOTE			

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2121 MCGREGOR BOULEVARD
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REGISTRY NO. 27559

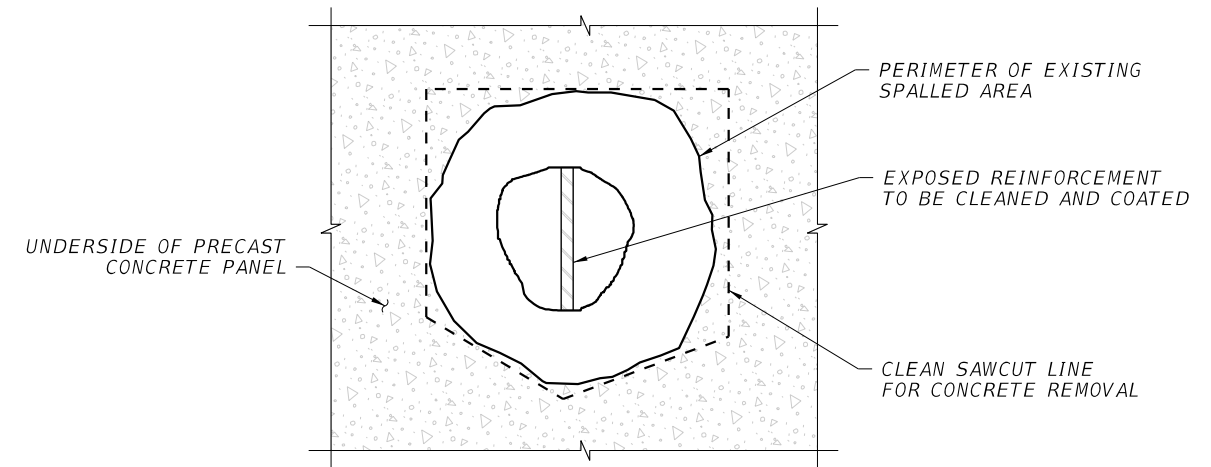
DRAWN BY: SDS 11/20	LEE COUNTY DEPARTMENT OF TRANSPORTATION		
CHECKED BY: TMW 11/20	ROAD NO.	COUNTY	PROJECT ID
DESIGNED BY: RMW 11/20	CR 78	LEE	
CHECKED BY: TMW 11/20			

SHEET TITLE: REPAIR TYPE 3 DETAILS (1 OF 3)	REF. DWG. NO.
PROJECT NAME: CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	SHEET NO. 10

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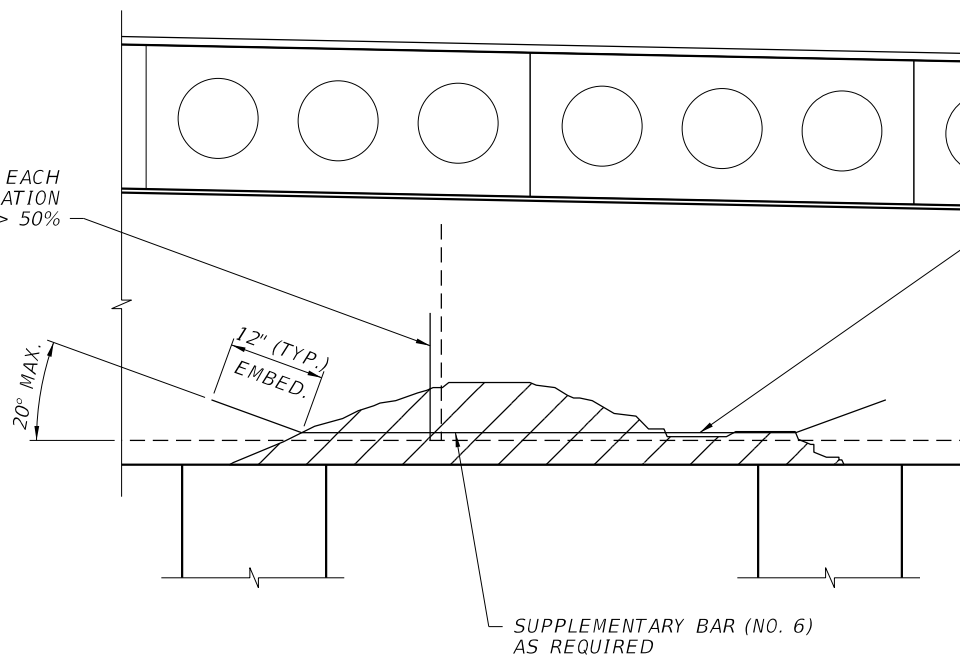
SPALL REPAIR - SECTION VIEW



SPALL REPAIR - PLAN VIEW

INSTALL 1 NO. 6 U-BAR AT EACH EXISTING VERTICAL BAR LOCATION WHERE SECTION LOSS > 50%

INSTALL 1 NO. 6 DOWEL BAR AT EACH EXISTING HORIZONTAL BAR LOCATION WHERE SECTION LOSS > 50%



DETAIL 1 - SUPPLEMENTAL REINFORCEMENT

NOTES

1. AFTER ALL LOOSE AND DAMAGED CONCRETE HAS BEEN REMOVED, CONTRACTOR IS TO INSPECT THE EXISTING EXPOSED REINFORCEMENT AND IDENTIFY EACH BAR WHERE SECTION LOSS DUE TO CORROSION EXCEEDS 50% OF THE DIAMETER. PERFORM CLEANING AND SURFACE PREPARATION IN ACCORDANCE WITH THE SPECIFICATIONS AND INSTALL SUPPLEMENTAL BARS AT EACH OF THESE LOCATIONS IN ACCORDANCE WITH DETAIL 1.

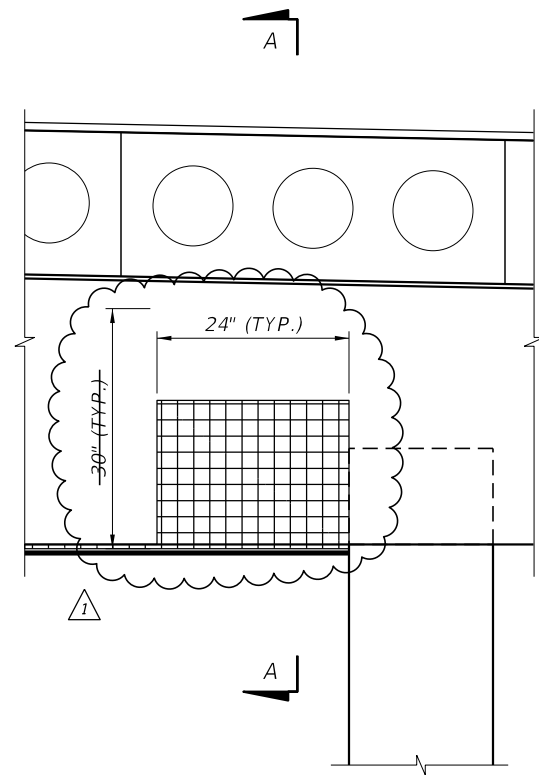
BRIDGE NO. 120111

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

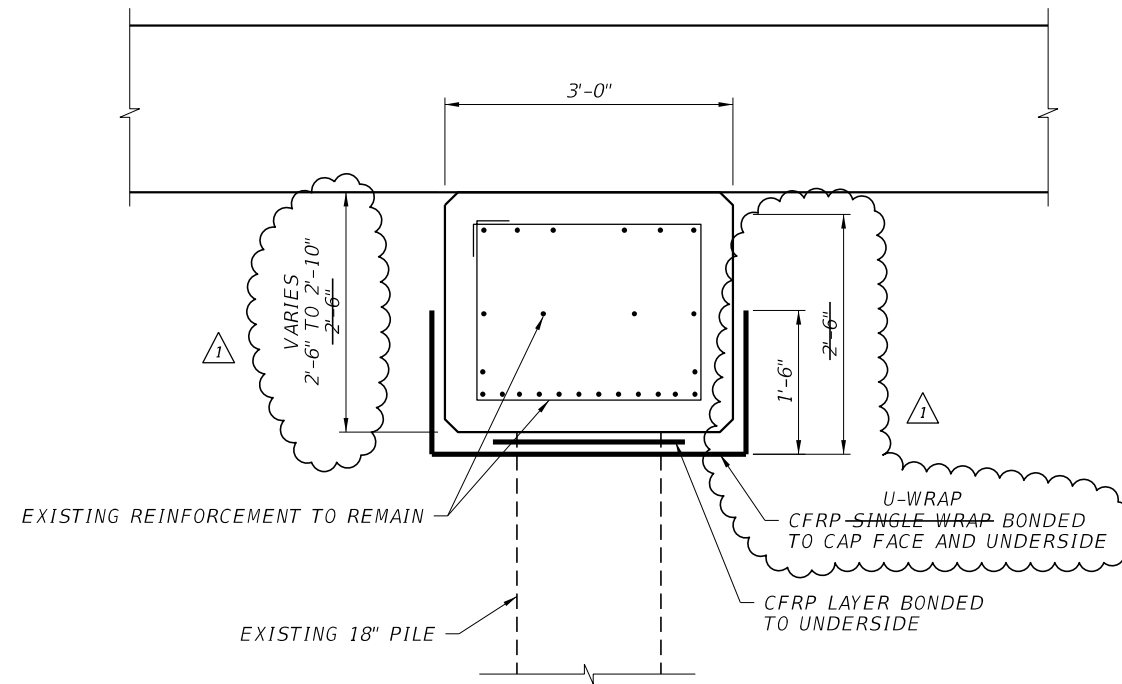
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P.E. LICENSE NUMBER 55460
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2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

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CHECKED BY: TMW 11/20	ROAD NO.	COUNTY	PROJECT ID
DESIGNED BY: RMW 11/20	CR 78	LEE	
CHECKED BY: TMW 11/20			

SHEET TITLE: REPAIR TYPE 3 DETAILS (2 OF 3)	REF. DWG. NO.
PROJECT NAME: CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	SHEET NO. 11



CFRP BENT CAP STRENGTHENING VIEW 1



CFRP BENT CAP STRENGTHENING SECTION A-A

BRIDGE NO. 120111

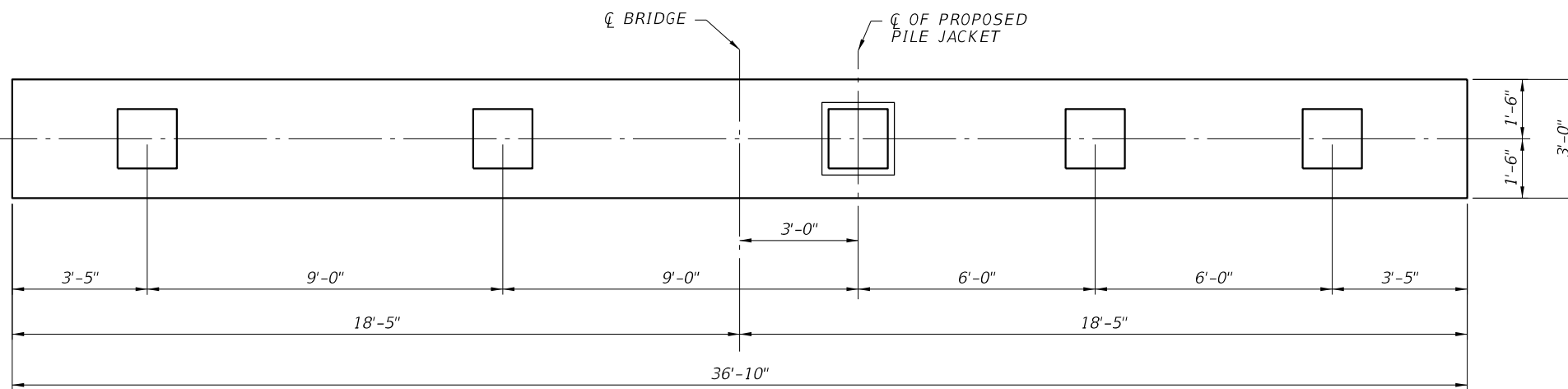
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
8/9/21	SDS	1 REVISIED CFRP			

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FORT MYERS, FL 33901
REGISTRY NO. 27559

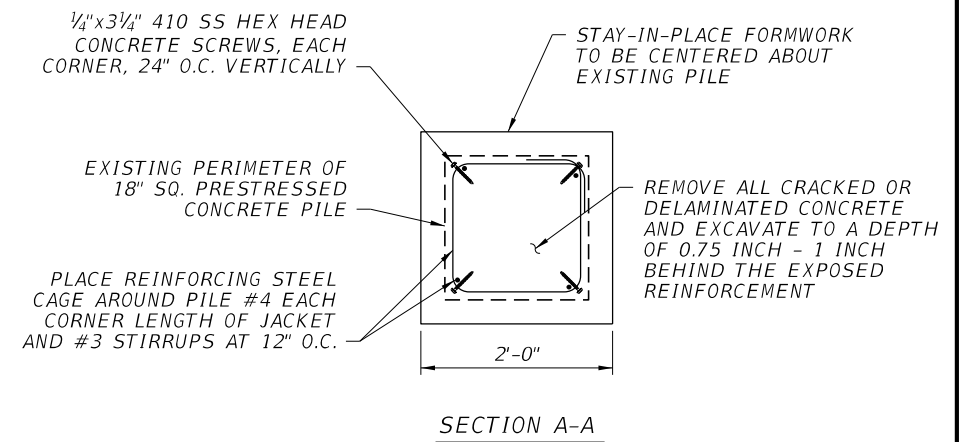
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CHECKED BY: TMW 11/20	ROAD NO.	COUNTY	PROJECT ID
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CHECKED BY: TMW 11/20			

SHEET TITLE: REPAIR TYPE 3 DETAILS (3 OF 3)	REF. DWG. NO.
PROJECT NAME: CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	SHEET NO. 12

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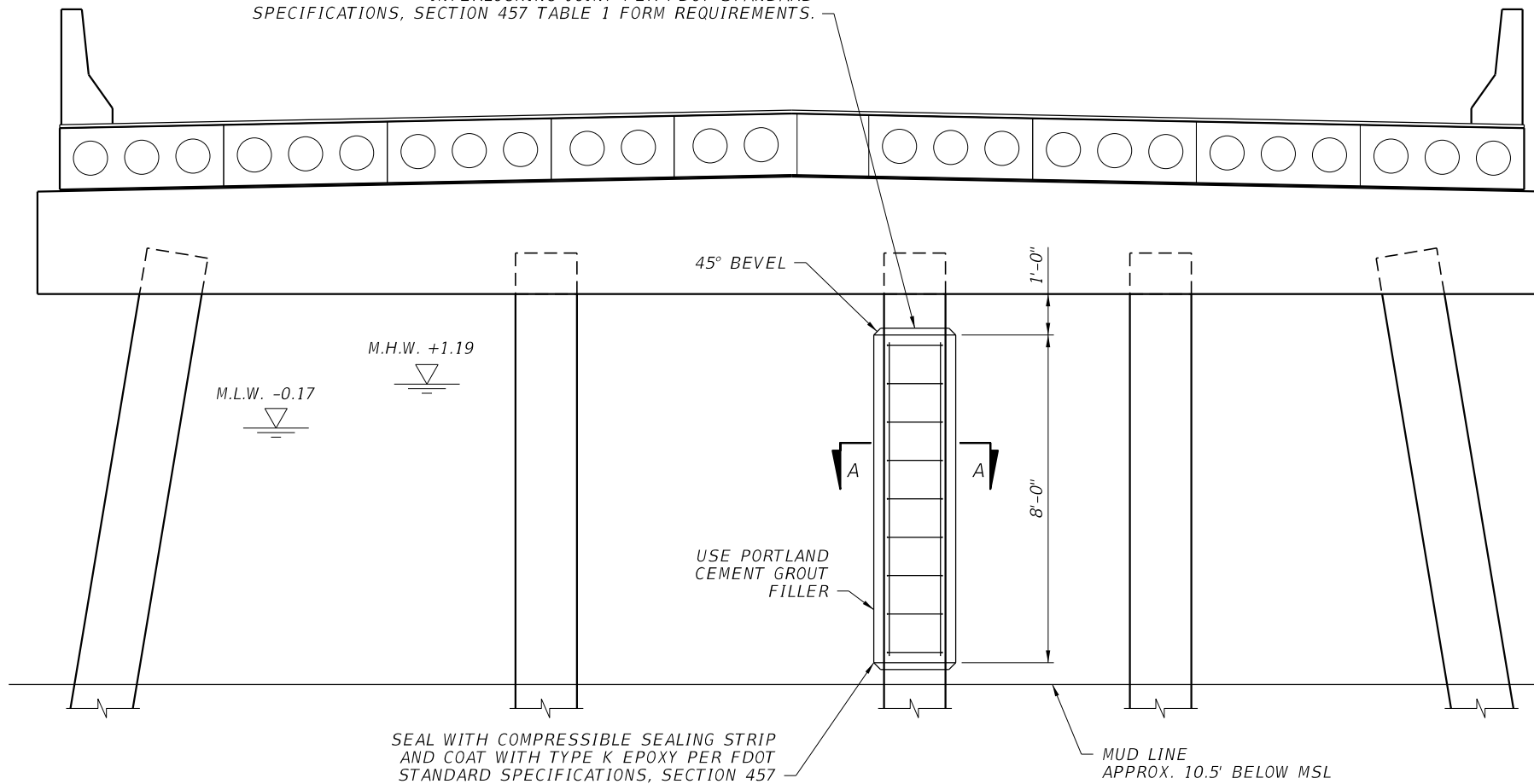
PLAN



SECTION A-A

STAY-IN-PLACE FORMWORK TO BE COMPOSED OF DURABLE, INERT, CORROSION RESISTANT MATERIAL WITH A SEALED INTERLOCKING JOINT PER FDOT STANDARD SPECIFICATIONS, SECTION 457 TABLE 1 FORM REQUIREMENTS.

REPAIR TYPE 3		
LOCATION	UNIT OF REPAIR	TOTAL LENGTH OF REPAIR
PILE 7-3	LF	8



INTERMEDIATE BENT 3

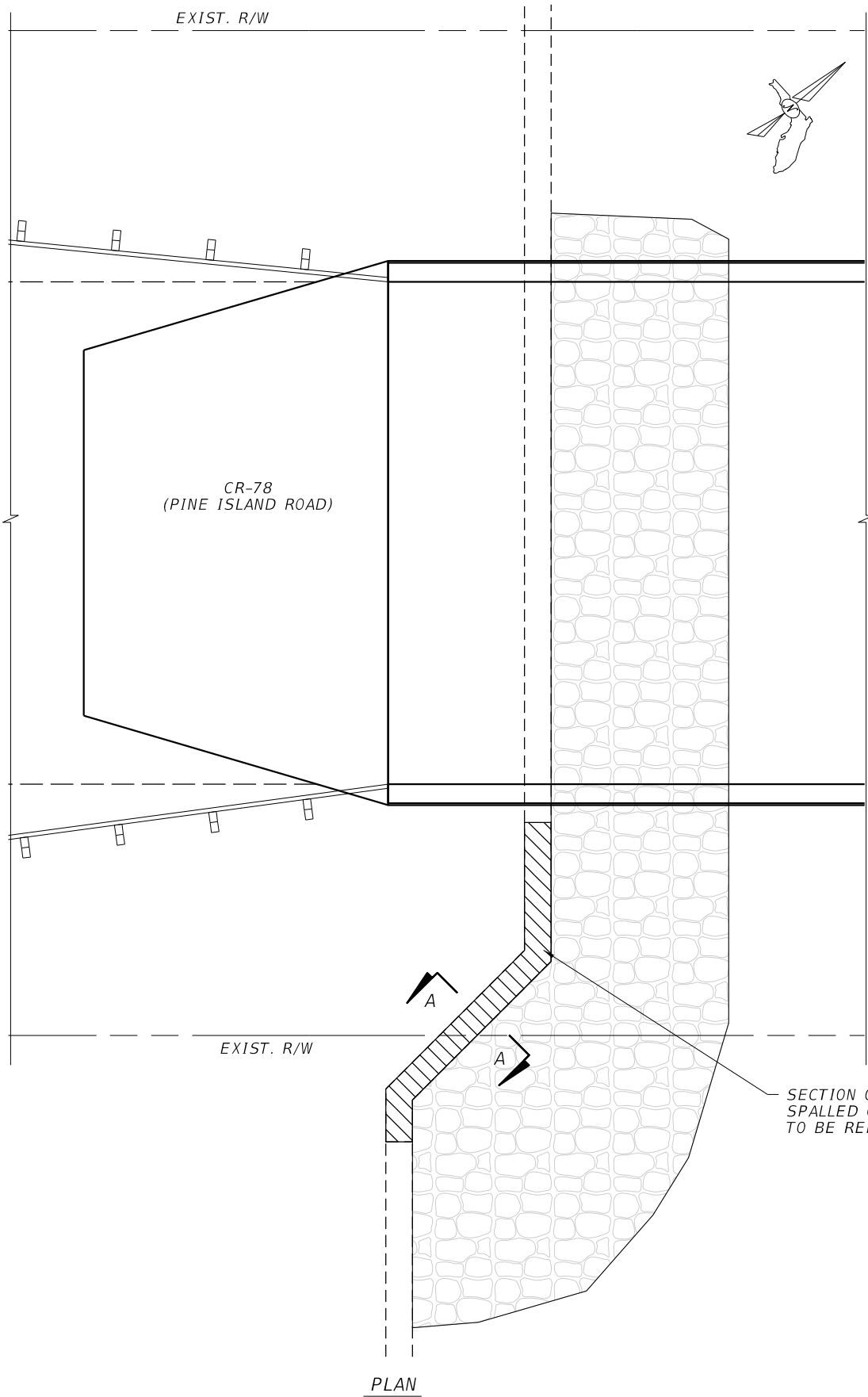
PILE JACKET NOTES

1. THE CONTRACTOR SHALL CLEAN ALL MARINE GROWTH AND PERFORM AN UNDERWATER INSPECTION OF PILE 7-3 PRIOR TO BEGINNING PILE JACKET WORK. CONTRACTOR SHALL SUBMIT INSPECTION RESULTS TO THE ENGINEER.
2. CLEAN PILES IN ACCORDANCE WITH FDOT SPECIFICATIONS 457 (SEE SPECIAL PROVISIONS).
3. IN CASES WHERE PRESTRESSED STRANDS HAVE BEEN EXPOSED AND DETERIORATED, THEY ARE TO BE SUPPLEMENTED WITH ADDITIONAL REINFORCEMENT (TBD).
4. ENSURE THE FORM IS CAPABLE OF MAINTAINING ITS ORIGINAL SHAPE WITHOUT ADDITIONAL SUPPORT.
5. PROVIDE A PUMPING PORT WITHIN 6" INCHES OF THE PILE JACKET BOTTOM OR GROUNDLINE TO APPLY FILLER. IF ADDITIONAL PUMPING PORTS ARE REQUIRED TO ENSURE PROPER FILLING, THEY SHALL BE LOCATED ABOVE THE BOTTOM PORT HOLE.
6. EPOXY INJECT CRACKS ABOVE M.H.W. PER FDOT STANDARD SPECIFICATIONS 411.
7. STANDARD INTEGRAL PILE JACKET PER FDOT STANDARD SPECIFICATIONS 457.

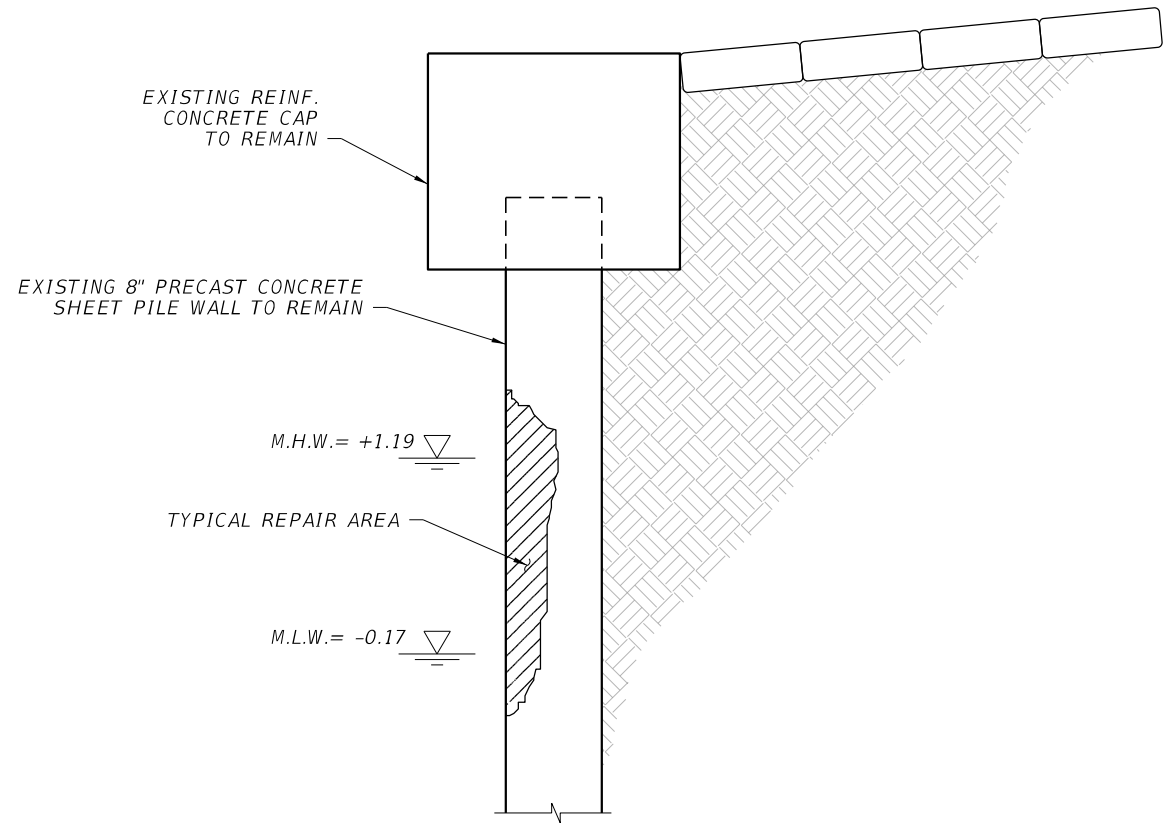
BRIDGE NO. 120111

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DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	PROJECT ID	PROJECT NAME:	SHEET NO.	
									CR 78	LEE		CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	13

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PLAN



SECTION A - SPALL REPAIR AT SEAWALL

SEAWALL AND PILE REPAIR NOTES

1. PREPARE REPAIR AREA BY REMOVING ANY MARINE GROWTH ON CONCRETE SURFACE TO EXPOSE FULL EXTENT OF CRACKS OR SPALLS.
2. REMOVE ALL LOOSE AND SPALLED CONCRETE.
3. CLEAN EXISTING REINFORCEMENT AND REMOVE RUST BY POWER TOOL CLEANING.
4. TROWEL IN APPROVED MARINE-GRADE EPOXY MORTAR, AND FINISH FLUSH WITH SURROUNDING SURFACE.

BRIDGE NO. 120111

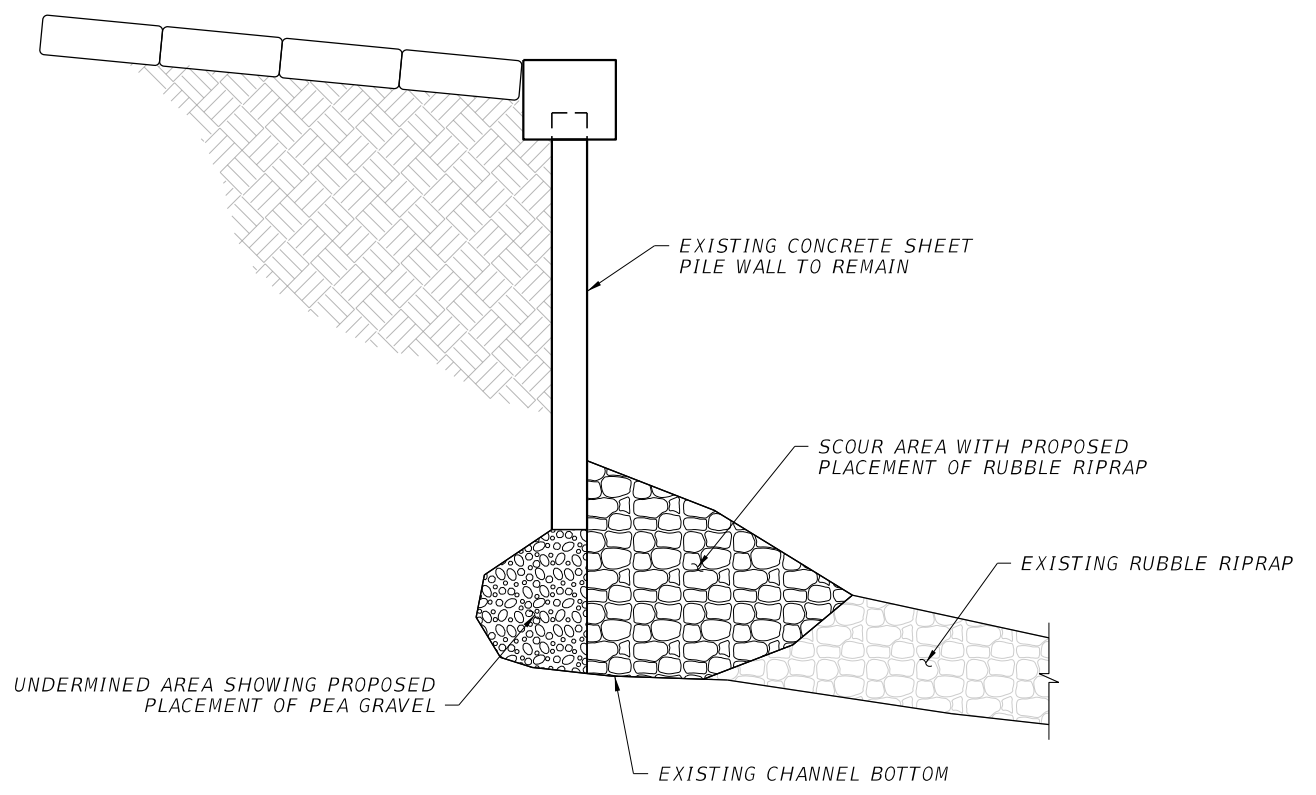
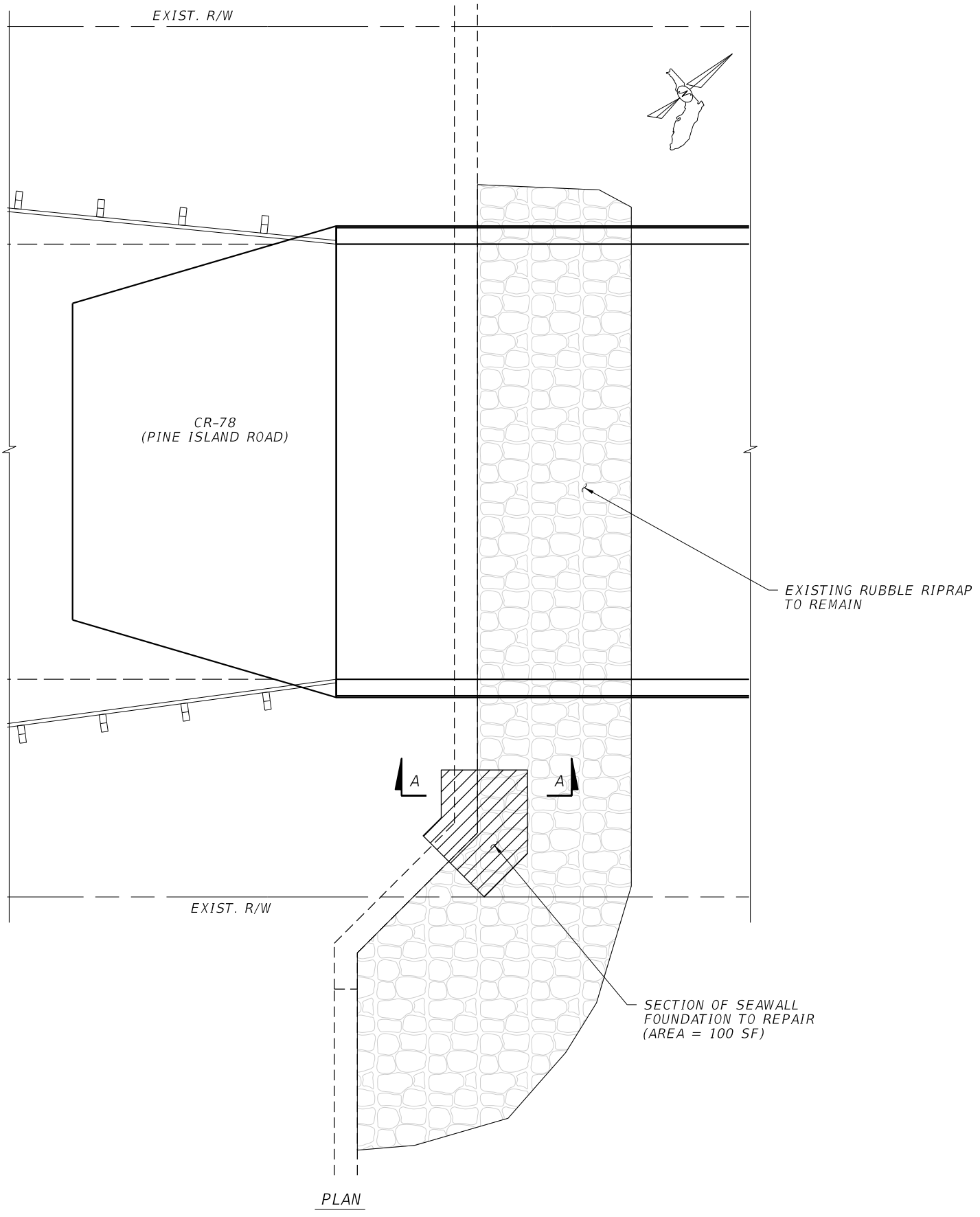
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DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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SHEET TITLE: REPAIR TYPE 5 DETAILS	REF. DWG. NO.
PROJECT NAME: CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	SHEET NO. 14

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SECTION A - REPAIR DETAIL

SHEET PILE UNDERMINING NOTES

1. REMOVE ANY LOOSE DEBRIS AND MARINE GROWTH FROM UNDERMINED PANELS.
2. USE A SHOVEL TO PACK APPROVED FILL MATERIAL IN THE UNDERMINED AREA BENEATH SHEET PILES.
3. PLACE RIPRAP IN FRONT OF NEW FILL MATERIAL, AND EXTEND 1 FOOT ABOVE AND 2 FEET TO EITHER SIDE OF THE FILL LIMITS. USE RUBBLE RIPRAP ACCORDANCE WITH FDOT SPECIFICATION 530-2.1.3.2

BRIDGE NO. 120111

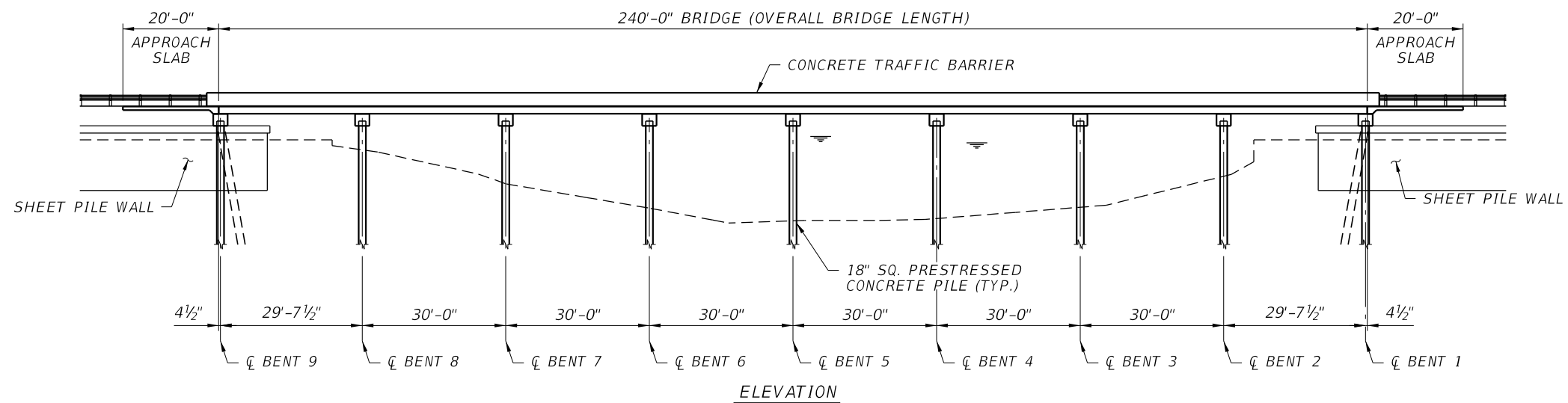
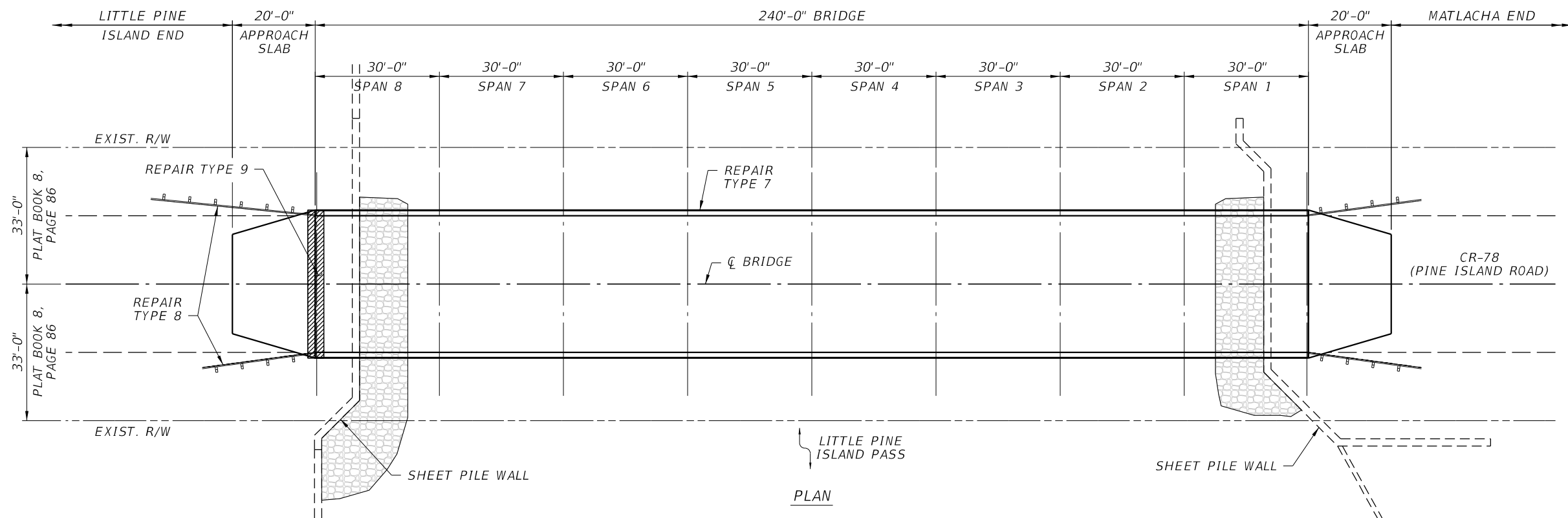
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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DESIGNED BY: RMW 11/20	CR 78	LEE	
CHECKED BY: TMW 11/20			

SHEET TITLE: REPAIR TYPE 6 DETAILS	REF. DWG. NO.
PROJECT NAME: CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	SHEET NO. 15

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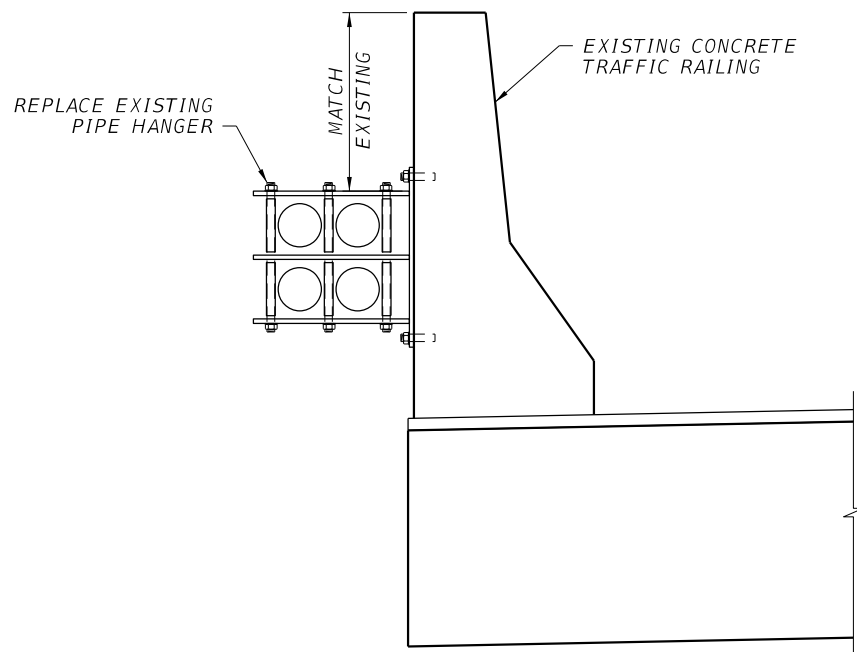
REPAIR TYPE	EXISTING REPAIR CONDITION	REPAIR PROCEDURE
7	CORRODED UTILITY (PIPE) BRACKETS (NORTH EDGE OF BRIDGE)	NEW STAINLESS STEEL BRACKETS BY OTHERS
8	METAL GUARDRAIL POST REFLECTORS	INSTALL REFLECTOR TO TOP OF POST AT METAL GUARD RAIL IN ACCORDANCE WITH STANDARD INDEX 400
9	CRACKING OF ASPHALT OVERLAY AT BRIDGE ENDS	APPLY ASPHALT CRACK SEALANT AS INDICATED

BRIDGE NO. 120111

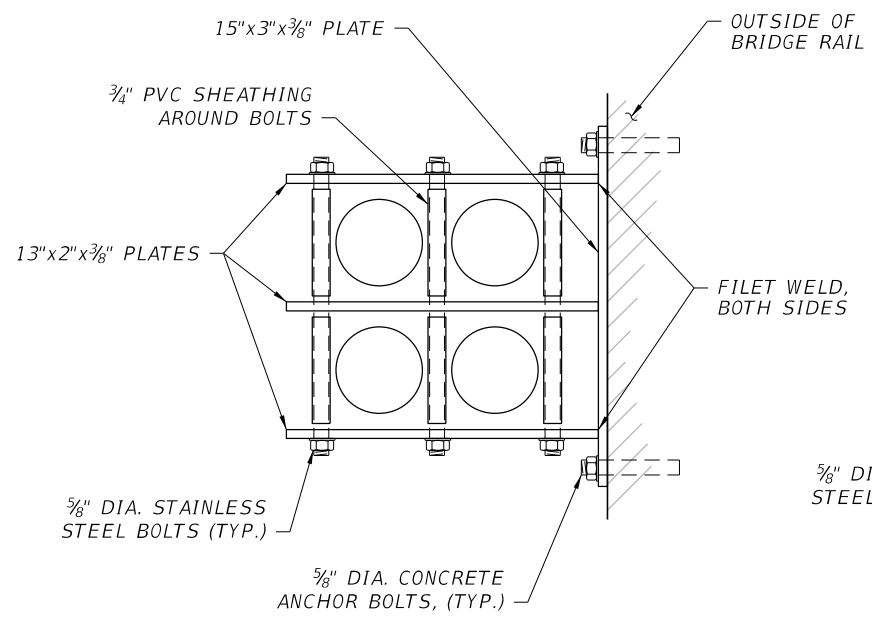
REVISIONS						THOMAS M. WAITS, P.E. P.E. LICENSE NUMBER 55460 HIGHSPANS ENGINEERING, INC. 2121 MCGREGOR BOULEVARD SUITE 200 FORT MYERS, FL 33901 REGISTRY NO. 27559	DRAWN BY: SDS 11/20 CHECKED BY: TMW 11/20 DESIGNED BY: RMW 11/20 CHECKED BY: TMW 11/20	LEE COUNTY DEPARTMENT OF TRANSPORTATION			SHEET TITLE:	REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	PROJECT ID	PROJECT NAME:	SHEET NO.
						CR 78	LEE		CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	16		

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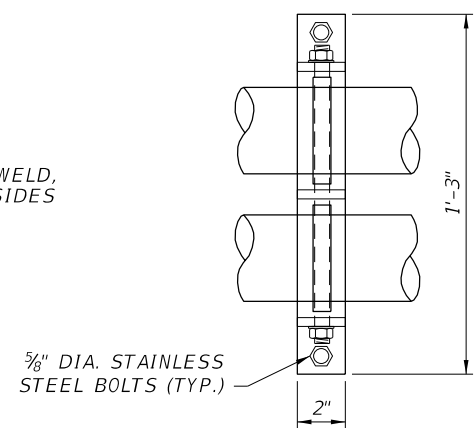
WORK TO BE PERFORMED BY OTHERS UNDER SEPARATE CONTRACT



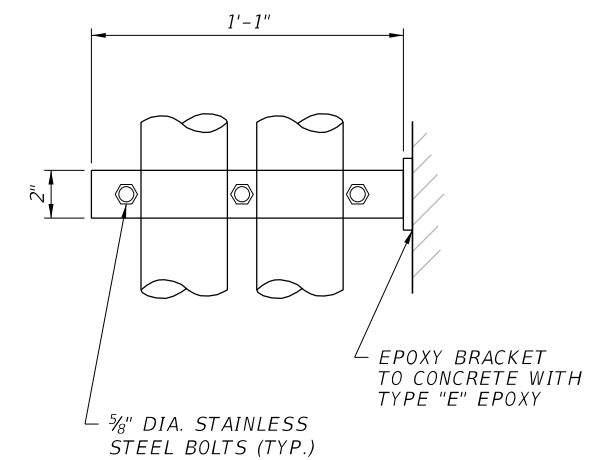
UTILITY PIPE HANGER ASSEMBLY
TYPICAL SECTION AT BARRIER



ELEVATION VIEW



FRONT VIEW



TOP VIEW

UTILITY PIPE HANGER ASSEMBLY DETAILS

1. NEW BRACKETS SHALL BE INSTALLED WITHIN 1-FT OF THE EXISTING BRACKETS TO BE REPLACED. DO NOT REMOVE EXISTING BRACKETS UNTIL A NEW BRACKET IS INSTALLED ADJACENT TO IT.
2. SPACING OF THE BRACKETS ALONG THE TRAFFIC RAILING SHALL MATCH EXISTING SPACING.
3. BRACKETS SHALL BE GRADE 304 STAINLESS STEEL, OR APPROVED EQUAL.
4. BOLTS SHALL BE GRADE 304 STAINLESS STEEL, OR APPROVED EQUAL.
5. 3/4" PVC SHEATHING SHALL BE PLACED AROUND BOLTS TO PREVENT PIPE DAMAGE.
6. 5/8" A325 BOLTS TO BE ANCHORED TO CONCRETE WITH TYPE 'E' EPOXY.
7. CONTRACTOR SHALL SUBMIT A SHOP DRAWING OF THE PROPOSED REPLACEMENT BRACKET THAT SHALL RESIST THE FOLLOWING LOADS:
 SHEAR: 0.25 KIPS
 TENSION: 0.5 KIPS

BRIDGE NO. 120111

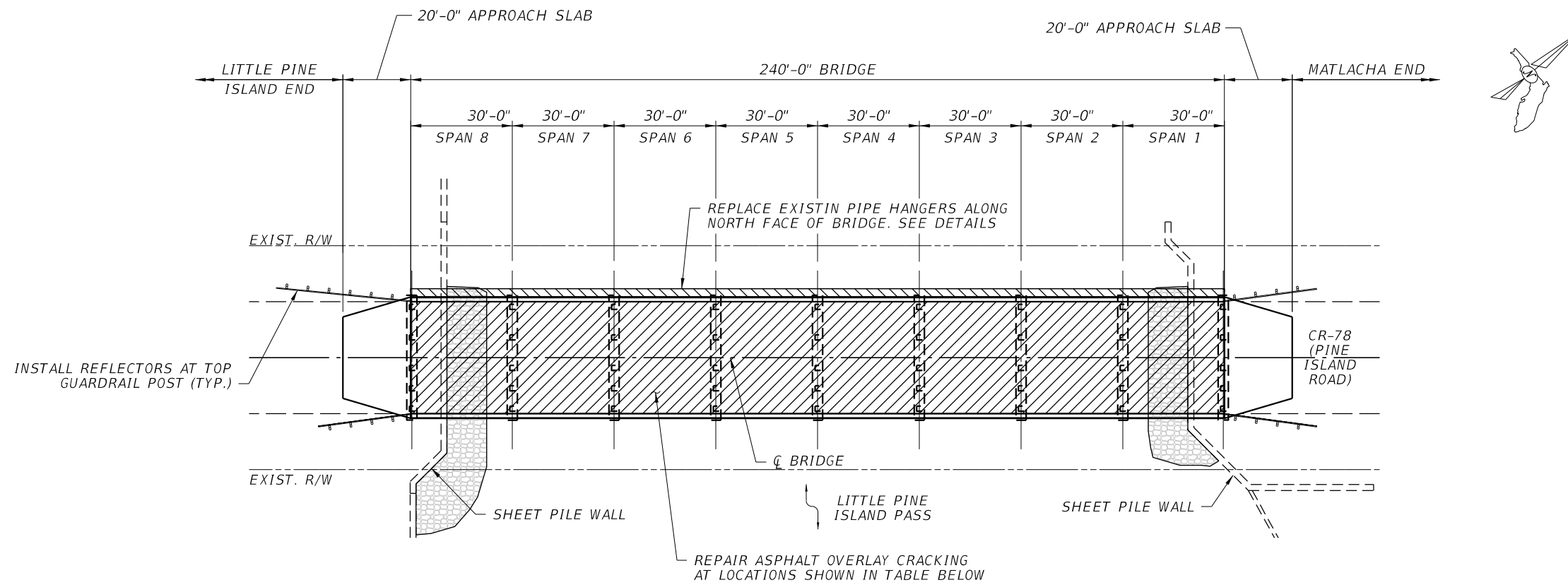
REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

THOMAS M. WAITS, P.E.
P.E. LICENSE NUMBER 55460
HIGHSPANS ENGINEERING, INC.
2121 MCGREGOR BOULEVARD
SUITE 200
FORT MYERS, FL 33901
REGISTRY NO. 27559

DRAWN BY: SDS 11/20	LEE COUNTY DEPARTMENT OF TRANSPORTATION	
CHECKED BY: TMW 11/20	ROAD NO.	COUNTY
DESIGNED BY: RMW 11/20	CR 78	LEE
CHECKED BY: TMW 11/20	PROJECT ID	

SHEET TITLE: REPAIR TYPE 7 DETAILS	REF. DWG. NO.
PROJECT NAME: CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	SHEET NO. 17

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



PLAN

BRIDGE RAIL POST REFLECTOR INSTALLATION		
LOCATION	UNIT OF REPAIR	TOTAL
NORTH END BRIDGE APPROACH	EA	10
SOUTH END BRIDGE APPROACH	EA	8

UTILITY PIPE BRACKET INSTALLATION		
LOCATION	UNIT OF REPAIR	TOTAL
NORTH BRIDGE RAIL	EA	30

ASPHALT OVERLAY CRACK REPAIR SCHEDULE	
SPAN	DESCRIPTION
1	NO CRACKS FOUND
2	CRACK 14'-0", 7' FROM BENT 2, 15' EAST OF WEST EDGE
2	CRACK 0'-6", BENT 3 JOINT, EAST OF WEST EDGE
3	CRACK 32", 64" FROM BENT 3, 8' EAST OF WEST EDGE
4	CRACK 24", 6'-8" SOUTH OF BENT 4, 14'-8" EAST OF WEST EDGE
4	CRACK 32", 15'-10" SOUTH OF BENT 4, 14'-6" EAST OF WEST EDGE
4	CRACK 26", 0'-0" SOUTH OF BENT 4, 8'-0" EAST OF WEST EDGE
5	CRACK 22'-8", 3" SOUTH OF BENT 5, 8'-0" EAST OF WEST EDGE
5	CRACK 20'-0", 45" SOUTH OF BENT 5, 6'-6" EAST OF WEST EDGE
6	CRACK 1'-0", 24'-10" SOUTH OF BENT 6 14'-0" EAST OF WEST EDGE
7	CRACK 4'-8", 3'-0" SOUTH OF BENT 7, 14'-11" EAST OF WEST EDGE
8	CRACK 1'-0", 8'-0" SOUTH OF BENT 8, 8'-0" EAST OF WEST EDGE
8	CRACK 24'-0", 2'-0" SOUTH OF BENT 8, 14'-8" EAST OF WEST EDGE

BARRIER REFLECTOR NOTES

1. BARRIER REFLECTORS USED SHALL BE FROM THE FDOT APL.
2. SEE STANDARD INDEX 536-001 FOR INSTALLATION REQUIREMENTS.

ASPHALT RESURFACING NOTES

1. FILL ASPHALT CRACKS WITH A FLOWABLE, BITUMINOUS CRACK FILLING PRODUCT, SUCH AS KOLD-FLO, OR APPROVED EQUAL. SUBMIT PRODUCT TO ENGINEER FOR APPROVAL, AND FOLLOW ALL MANUFACTURER'S INSTALLATION PROCEDURES.

BRIDGE NO. 120111

REVISIONS						THOMAS M. WAITS, P.E. P.E. LICENSE NUMBER 55460 HIGHSPANS ENGINEERING, INC. 2121 MCGREGOR BOULEVARD SUITE 200 FORT MYERS, FL 33901 REGISTRY NO. 27559	DRAWN BY: SDS 11/20 CHECKED BY: TMW 11/20 DESIGNED BY: RMW 11/20 CHECKED BY: TMW 11/20	LEE COUNTY DEPARTMENT OF TRANSPORTATION			SHEET TITLE: REPAIR TYPE 8 AND 9 DETAILS PROJECT NAME: CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	PROJECT ID		SHEET NO.
								CR 78	LEE			18

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



SPAN 2 - BENT 3 - BEAM 8



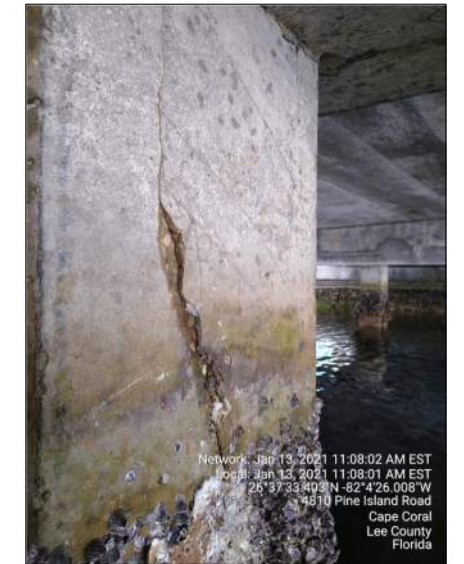
SPAN 4 - BENT 5 - BEAM 4



SPAN 3 - BENT 3 - BEAMS 8 & 9



SPAN 1 - BENT 2 - BEAM 1



BENT 3 - EAST FACE PILE 3



SPAN 1 - BENT 2 - BEAM 9



SPAN 4 - BENT 5 - BEAM 9



SPAN 3 - BEAM 4



SPAN 4 - BENT 5 - BEAM 8



SPAN 2 - BEAM 5



SPAN 4 - BENT 4 - BEAM 2



SPAN 2 - BENT 3 - BEAM 5



SPAN 7 - BENT 8 - BEAM 9



SPAN 4 - BENT 4 - BEAM 8

BRIDGE NO. 120111

REVISIONS						THOMAS M. WAITS, P.E. P.E. LICENSE NUMBER 55460 HIGHSPANS ENGINEERING, INC. 2121 MCGREGOR BOULEVARD SUITE 200 FORT MYERS, FL 33901 REGISTRY NO. 27559	DRAWN BY: SDS 11/20 CHECKED BY: TMW 11/20 DESIGNED BY: RMW 11/20 CHECKED BY: TMW 11/20	LEE COUNTY DEPARTMENT OF TRANSPORTATION			SHEET TITLE: INSPECTION FINDINGS SITE PHOTOGRAPHS PROJECT NAME: CR-78 OVER LITTLE PINE ISLAND PASS BRIDGE REPAIR	REF. DWG. NO.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			ROAD NO.	COUNTY	PROJECT ID		
								CR 78	LEE			

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

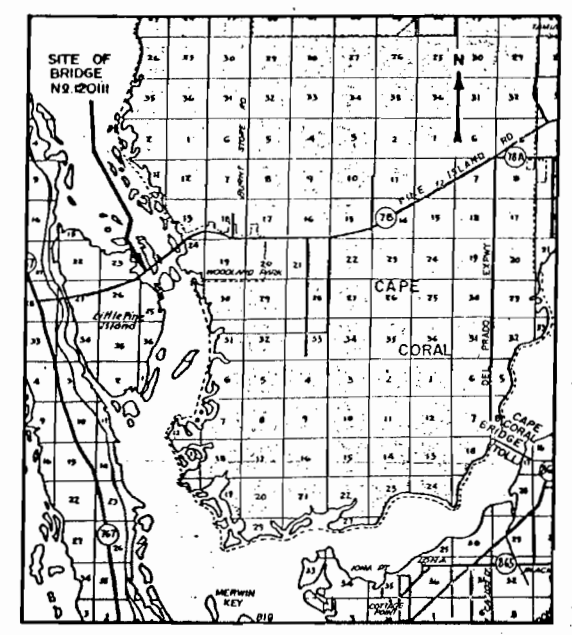
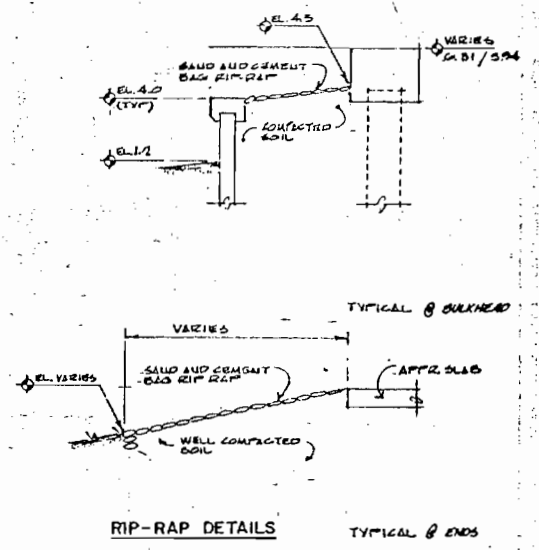
SUMMARY OF ESTIMATED BRIDGE QUANTITIES			
ITEM NO	ITEM	UNIT	QUANTITY
* 110-3	REMOVAL OF EXISTING STRUCTURES	L.S.	1
400-2-4	CLASS II CONCRETE (SUPERSTRUCTURE)	C.Y.	30.1
400-4-5	CLASS III CONCRETE (SUBSTRUCTURE)	C.Y.	90.6
400-4-8	CLASS IV CONCRETE (BULKHEAD)	C.Y.	25.3
400-5-4	CONCRETE HANDRAIL (BARRIER)	L.F.	480
400-6	PRECAST ANCHOR BEAMS	EA.	24
415-1-4	REINFORCING STEEL (SUPERSTRUCTURE)	LB.	65.67
415-1-5	REINFORCING STEEL (SUBSTRUCTURE)	LB.	192.83
415-1-8	REINFORCING STEEL (BULKHEAD)	LB.	2920
450-2-3	PRESTRESSED SLAB UNITS (36" x 18")	L.F.	468
450-2-4	PRESTRESSED SLAB UNITS (48" x 18")	L.F.	1638
455-3-2	PRESTRESSED CONCRETE PILING FURNISHED (18" sq.)	L.F.	3570
455-4-2	PRESTRESSED CONCRETE PILING DRIVEN (18" sq.)	L.F.	3570
455-9-12	UNLOADED TEST PILES (PRESTRESSED CONCRETE) (18" sq.)	L.F.	255
455-10-70	TEST LOADS (70 TONS)	EA.	1
455-10-90	TEST LOADS (90 TONS)	EA.	1
455-14-2	CONCRETE SHEET PILING (8" x 30")	L.F.	1136
455-17-2	PILE SPLICES (18")	EA.	5
530-1-2	RIPRAP (SAND-CEMENT) (BRIDGE)	C.Y.	59

* ITEM NO. 110-3 REMOVAL OF EXISTING STRUCTURES INCLUDE REMOVAL OF EXISTING BULKHEAD AND OTHER CONDITIONS NECESSARY WITHIN THE LIMITS SHOWN ON GENERAL PLAN AND ELEVATION SHEET NO. B-2

INDEX OF BRIDGE SHEETS

- B-1 SUMMARY OF ESTIMATED BRIDGE PAY ITEMS AND INDEX
- B-2 GENERAL PLAN & ELEVATIONS
- B-3 BORING LOGS & GENERAL NOTES
- B-4 BRIDGE DESIGN DATA SHEET
- B-5 PILING & SLAB PLAN
- B-6 END BENTS
- B-7 INTERMEDIATE BENTS
- B-8 PRESTRESSED SLAB UNITS
- B-9 PRECAST CONCRETE SHEET PILING (8" x 30") (INDEX No. 4057)
- B-10 PRESTRESSED CONCRETE PILES (INDEX No. 3400)
- B-11 CONCRETE HANDRAIL BARRIER (INDEX No. 11407)
- B-12 BULKHEAD AT BEGIN BRIDGE
- B-13 BULKHEAD AT END BRIDGE

NOTE: THE NUMBER OF TEST LOADS MAY BE INCREASED OR OMITTED AS DIRECTED BY THE ENGINEER.
 PAYMENT FOR INCIDENTAL ITEMS NOT SPECIFICALLY COVERED IN INDIVIDUAL ITEMS SHALL BE IN THE CONTRACT PRICE FOR BID ITEMS
 FOR GENERAL NOTES SEE SHEET B-3.



LOCATION MAP

SUMMARY OF ESTIMATED BRIDGE PAY ITEMS AND INDEX OF BRIDGE SHEETS

MATLACHA BRIDGE NO. 120111

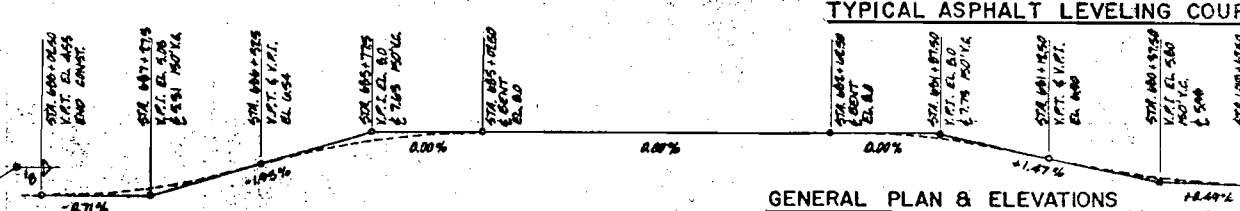
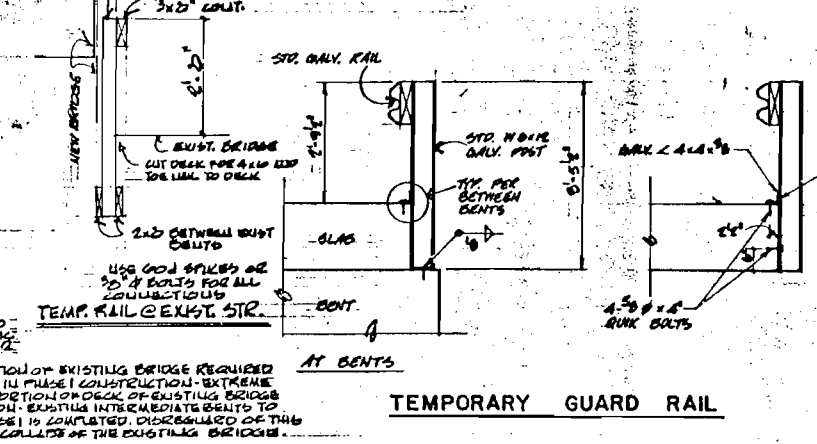
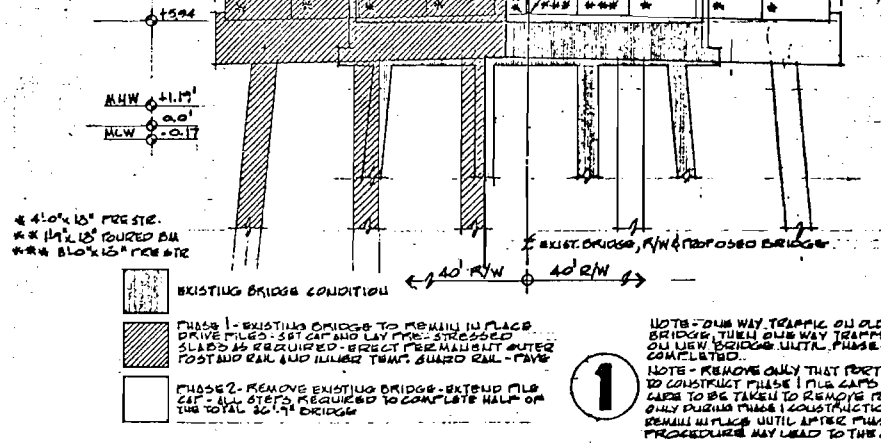
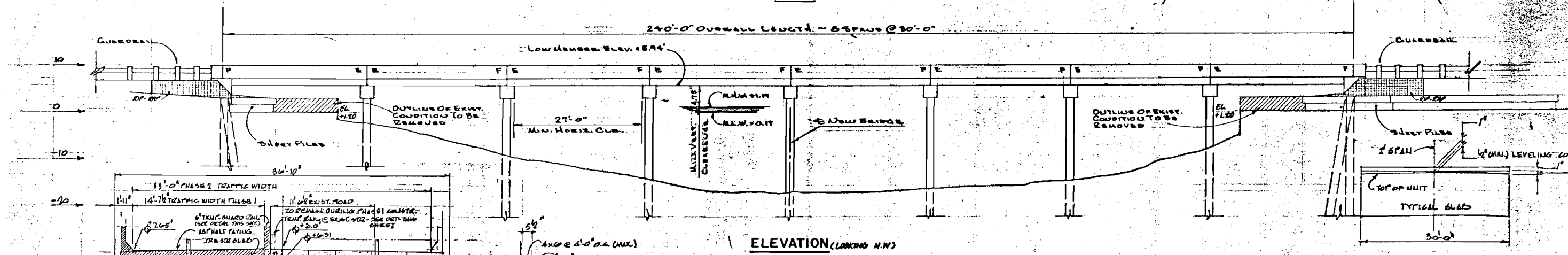
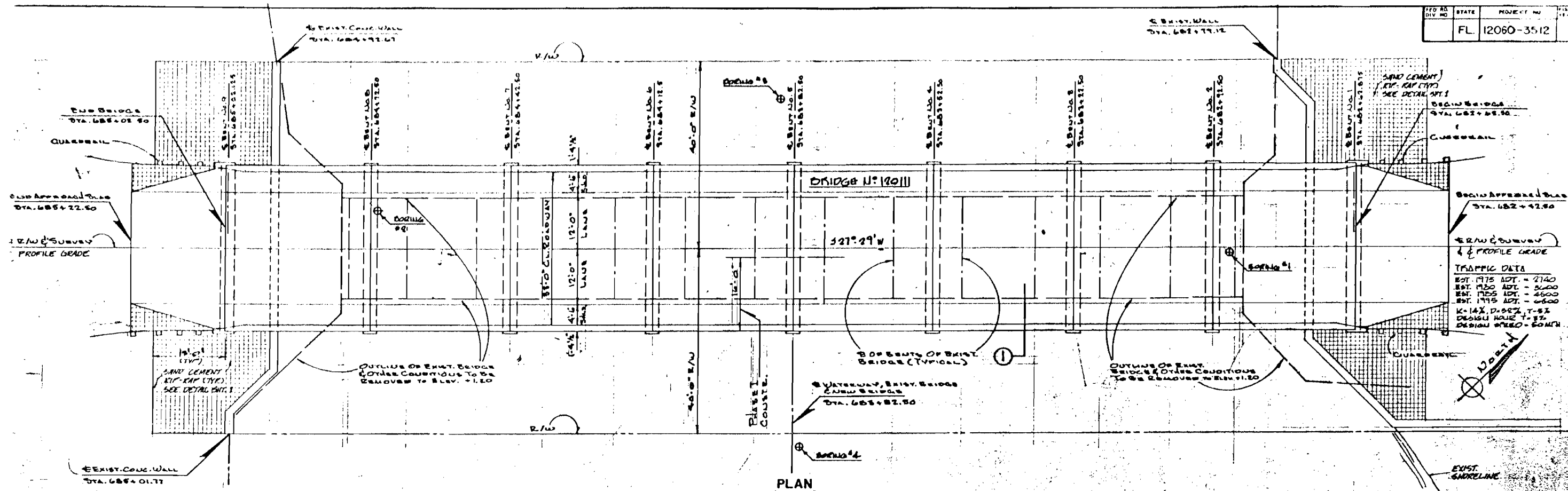
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description	78	LEE	12060-3512
Designed by	S.M.	11/4/76	APPROVED BY	
Checked by	S.K.I.	2/1/76	<i>T. Callahan</i>	
Quantities by	S.K.I.	2/1/76		
Created by	S.M.	2/1/76		
Supervised by			Drawing No.	Index No.
			1 of 10	11868

Consulting Engineer
ENK ENGINEERING, INC.
 980 PROFESSIONAL PLACE,
 NORTH FORT MYERS, FLORIDA

FOR INFORMATION ONLY

May '76

120111



EXISTING BRIDGE CONDITION
 PHASE 1 - EXISTING BRIDGE TO REMAIN IN PLACE. DRIVE PILES - SET CAP AND LAY PRE-STRESSED SLAB AS REQUIRED. RELOC. PILES AND SET OUTER POST AND RAIL AND INNER TEMP. GUARD RAIL - PAVE
 PHASE 2 - REMOVE EXISTING BRIDGE - EXTEND PILE CAP - ALL STEPS REQUIRED TO COMPLETE HALF OF THE TOTAL 30' W. BRIDGE

1 NOTE - DUE TO ONE WAY TRAFFIC ON OLD BRIDGE, THEN ONE WAY TRAFFIC ON NEW BRIDGE UNTIL PHASE 2 IS COMPLETED.
 NOTE - REMOVE ONLY THAT PORTION OF EXISTING BRIDGE REQUIRED TO CONSTRUCT PHASE 1 PILE CAPS IN PHASE 1 CONSTRUCTION - EXTREME CARE TO BE TAKEN TO REMOVE PORTION OF EXISTING BRIDGE ONLY DURING PHASE 1 CONSTRUCTION - EXISTING INTERMEDIATE BENTS TO REMAIN IN PLACE UNTIL PHASE 1 IS COMPLETED. DISREGARD OF THIS PROCEDURE MAY LEAD TO THE COLLAPSE OF THE EXISTING BRIDGE.

TEMPORARY GUARD RAIL

GENERAL PLAN & ELEVATIONS

ROAD NO		COUNTY		PROJECT NO	
78		LEE		12060-3512	
DESIGNED	DATE	APPROVED BY			
DESIGNED	12-15-75				
CHECKED	1-29-76				
QUANTITIES		DEPUTY DESIGN ENGINEER, STRUCTURES			
CHECKED		DRAWING NO.	INDEX NO.		
SUPERVISED		2 of 10	11168		

Consulting Engineer
INK ENGINEERING, INC.
 800 PROFESSIONAL PLACE
 NORTH FORT MYERS, FLORIDA

BORING LOGS

FL	12060-3512	B3
----	------------	----

BORING No. 1		BORING No. 2		BORING No. 3		BORING No. 4	
BLOWS/FT	DEPTH	BLOWS/FT	DEPTH	BLOWS/FT	DEPTH	BLOWS/FT	DEPTH
0	0	0	0	0	0	0	0
1	4	1	4	1	4	1	4
5	14	5	14	5	14	5	14
10	24	10	24	10	24	10	24
20	39	20	39	20	39	20	39
30	49	30	49	30	49	30	49
40	59	40	59	40	59	40	59
50	69	50	69	50	69	50	69
60	79	60	79	60	79	60	79
70	89	70	89	70	89	70	89
80	99	80	99	80	99	80	99
90	109	90	109	90	109	90	109
100	119	100	119	100	119	100	119
110	129	110	129	110	129	110	129
120	139	120	139	120	139	120	139
130	149	130	149	130	149	130	149
140	159	140	159	140	159	140	159
150	169	150	169	150	169	150	169
160	179	160	179	160	179	160	179
170	189	170	189	170	189	170	189
180	199	180	199	180	199	180	199

GENERAL NOTES

BORINGS #1 & #2 FROM LAW ENGINEERING TESTING CO. JOB NO. T-8308 DATED DEC. 10, 1974

BORINGS #3 & #4 FROM FLORIDA DEPARTMENT OF TRANSPORTATION DATED AUG., 1974

BORINGS HEREON ARE TABULATED FOR BIDDERS CONVENIENCE. PREPARED BY ACTUAL LOGS BY FIELD CONSULTING ENGINEERS OFFICE FOR VERIFICATION AND CLARIFICATION.

GENERAL SPECIFICATIONS: FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (1973) AND SUPPLEMENT THERE TO DATED JUNE 1975 AND SPECIAL PROVISIONS.

DESIGN SPECIFICATIONS: DESIGNED IN ACCORDANCE WITH THE 1973 EDITION OF A.A.S.H.O. STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES AND APPROVED REVISIONS.

DESIGN LOADING: HS 20-44

MUTUAL WEARING SURFACE ALLOWANCE: 15 PPM

MATERIAL STRENGTHS: ALL ALLOWABLE STRESSES ARE IN ACCORDANCE WITH THE 1975 EDITION OF THE A.A.S.H.O. STANDARD SPECIFICATIONS FOR ALL THE MATERIALS SHOWN ON PLANS. MAXIMUM WORKING STRESSES FOR CONCRETE: CLASS II OR III - 1500 PSI, CLASS III 2,000 PSI. MAXIMUM WORKING STRESS FOR REINFORCING STEEL - 24,000 PSI. (GRADE 60); 18,000 PSI. (GRADE 40)

REINFORCING STEEL: ASTM A-615 GRADE 60, EXCEPT FOR PRESTRESSED CONG. PILES, SHEET PILES, PRESTRESSED CONCRETE PILES, GRADE 40 AND GRADE 60 CONCRETE STRENGTH (28 DAYS): CLASS I 2500 PSI, CLASS II OR III 3400 PSI AND CLASS III 5000 PSI

ALL ELEVATIONS ARE REFERRED TO U.S.C. & G.S. DATUM (MSL SEA LEVEL)

PILE DESIGN LOADS: END BENT PILES - 36 TONS
INTERMEDIATE BENT PILES - 45 TONS

ALL EXPOSED CONCRETE EDGES SHALL BE CHAMFERED 1/4" UNLESS OTHERWISE NOTED.

SURFACE FINISH: HANDRAILS AND WINGS TO RECEIVE A CLASS 3 SURFACE FINISH

CONCRETE CLASS: SUPER STRUCTURE AND RAIL - CLASS II
SUB STRUCTURE - CLASS III
PRESTRESSED MEMBERS - CLASS III

ENVIRONMENT: COASTAL

NOTE: ALL DEPTHS ARE GIVEN IN DISTANCE BELOW WATER SURFACE

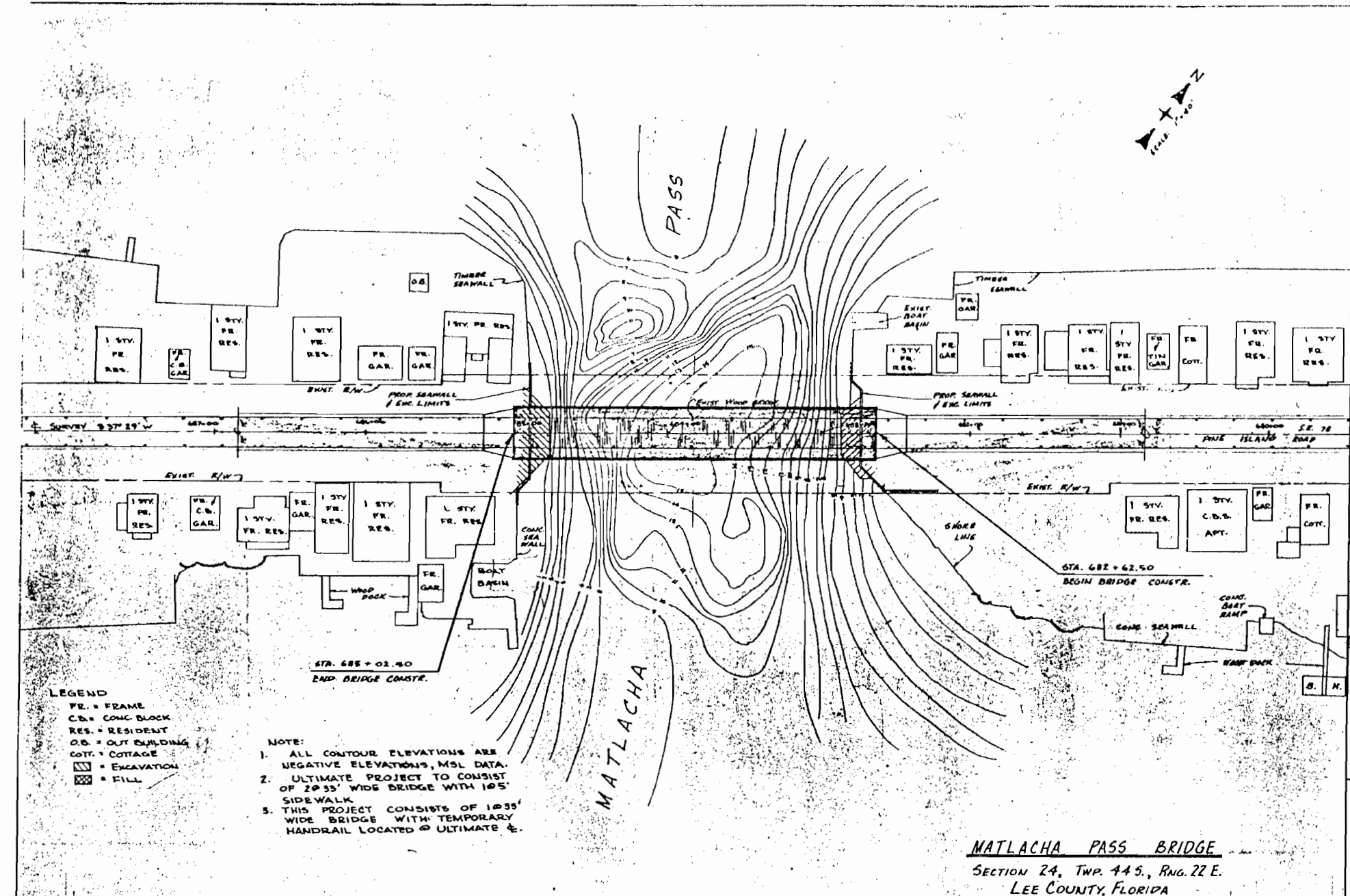
NUMBERS TO THE LEFT OF THE BORING LOG INDICATED BLOWS ON THE 600# PILE & 12" PENETRATION.

SPIN - INSIDE DIAMETER - 1 1/2 INCHES
OUTSIDE DIAMETER - 2 INCHES
WEIGHT OF HAMMER - 140 LBS
AVERAGE DROP OF HAMMER - 30 INCHES

BORING LOGS & NOTES

MATLACHA BRIDGE NO. 120111			
ROAD NO.	COUNTY	PROJECT NO.	
78	LEE	12060-3512	
DESIGNED BY		APPROVED BY	
SKL		R-15-76	
CHECKED BY		1-29-76	
DEVELOPED BY		DEPUTY DESIGN ENGINEER	
CHECKED BY		3 OF 10	
SUPERVISED BY		11/8/76	

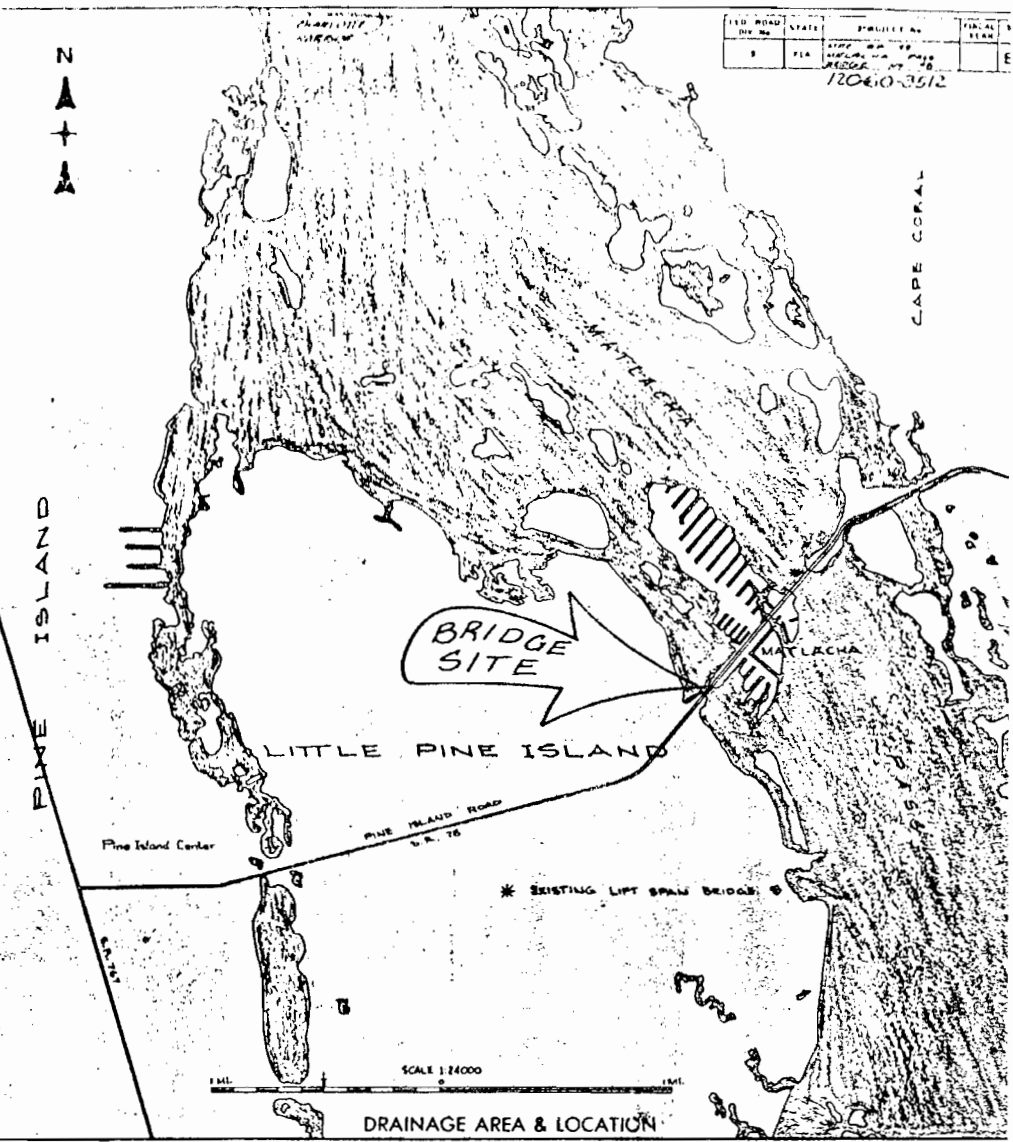
Consulting Engineer
INK ENGINEERING, INC.
200 PROFESSIONAL PLACE
NORTH FORT MYERS, FLORIDA



LEGEND
 FR. = FRAME
 C.B. = CONC. BLOCK
 RES. = RESIDENT
 O.B. = OUT BUILDING
 COTT. = COTTAGE
 [Hatched] = EXCAVATION
 [Stippled] = FILL

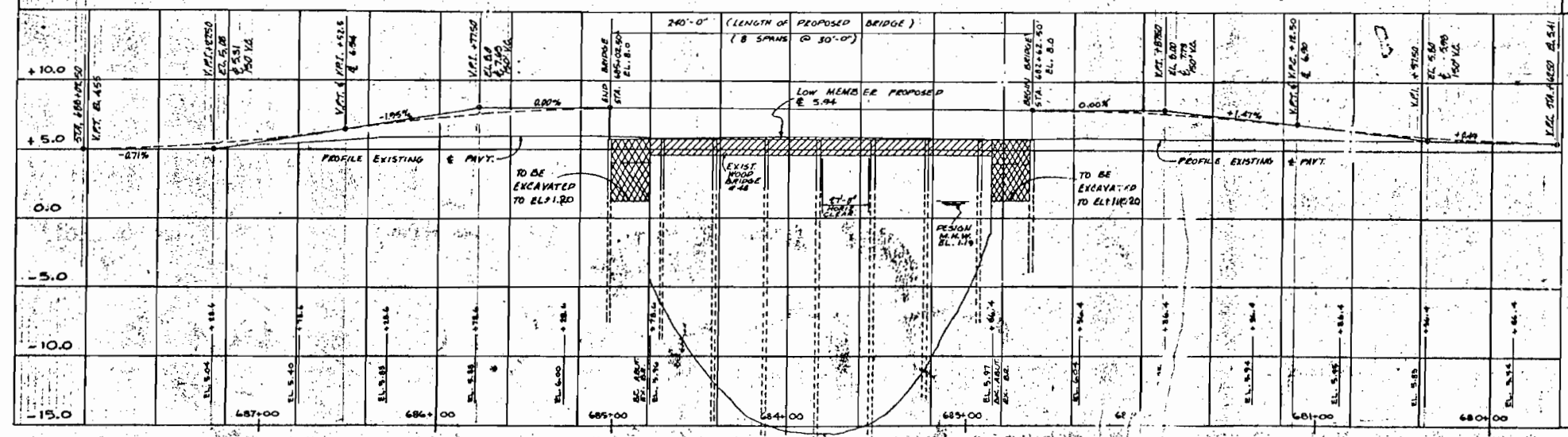
NOTE:
 1. ALL CONTOUR ELEVATIONS ARE NEGATIVE ELEVATIONS, MSL DATA.
 2. ULTIMATE PROJECT TO CONSIST OF 2033' WIDE BRIDGE WITH 105' SIDEWALK.
 3. THIS PROJECT CONSISTS OF 1033' WIDE BRIDGE WITH TEMPORARY HANDRAIL LOCATED @ ULTIMATE E.

MATLACHA PASS BRIDGE
 SECTION 24, TWP. 44 S., RNG. 22 E.
 LEE COUNTY, FLORIDA



(REFERENCE)	EXISTING STRUCTURES				
	(1)	(2)	(3)	(4)	(5)
FOUNDATION	TIMBER PILE	STATE ROAD 78	BRIDGE # 48		
OVERALL LENGTH	192.8'				
SPAN LENGTH	150 14.75'				
TYPE CONSTRUCTION	TIMBER				
SIDEWALKS	ADJAC.				
ROADWAY WIDTH	21.5'				
ELEV LOW MEMBER	+4.58	(EXISTING AREA OF OPENING = 3000 sq ft)			

(NOTE: EXISTING BRIDGE HAS WEIGHT RESTRICTION OF 50,000 LBS. GROSS & 18,000 LBS. PER AXEL.)



DESIGN DATA

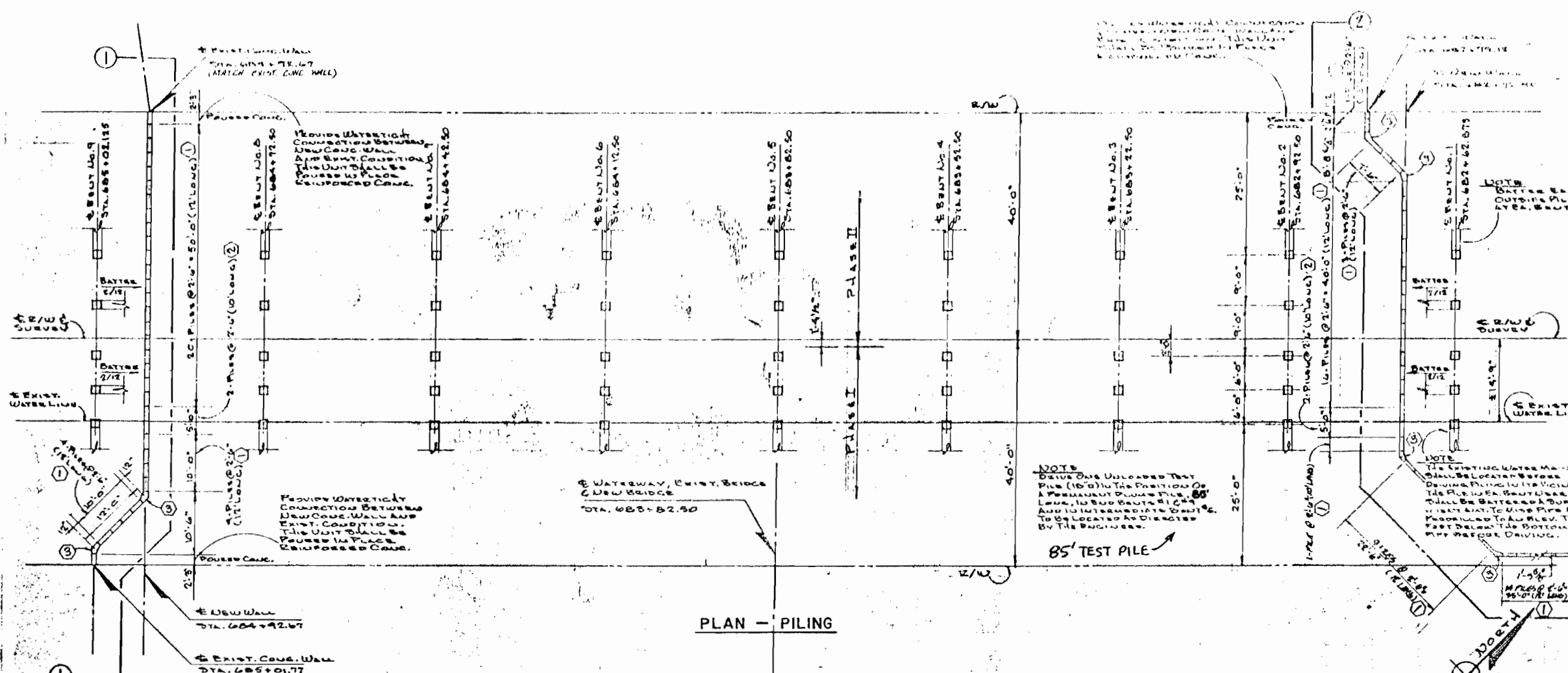
STRUCTURE RECOMMENDATIONS
 1. LOADING MS 20-84
 2. BRIDGE ROADWAY WIDTH 33' FT.
 3. SIDEWALKS ADJAC. THIS PROJECT, 10' @ ULTIMATE

DRAINAGE RECOMMENDATIONS
 1. BEGIN BRIDGE STATION 687+00.00
 2. CENTERLINE GRADE ELEVATION +8.0
 3. BRIDGE SKEW ANGLE 0°
 4. CHANNEL BOTTOM WIDTH 30' / YAR.
 5. CENTERLINE CHANNEL BOTTOM, STATION 683+82.5
 6. LIMITS OF CHANNEL EXCAVATION RT. NO WORK PROPOSED LT. NO WORK PROPOSED
 7. CLEARANCE: NAVIGATION: HORIZ. 27'-0" DRIFT: HORIZ. _____
 VERT. 4.75' ABOVE EL. 1.19' VERT. _____ ABOVE EL. _____
 8. DESIGN DISCHARGE _____ CFS SOURCE _____
 9. DESIGN VELOCITY _____ FPS

REMARKS: PROPOSED BRIDGE IS A TIMBER PASS BRIDGE LOCATED BETWEEN TWO ISLANDS. BRIDGE LENGTH IS DETERMINED BY ECOLOGICAL CONSIDERATIONS, SO THAT NO FILL WILL BE REQUIRED BELOW MEAN HIGH WATER LINE. PROPOSED STRUCTURE WILL SURPASS AN EXISTING STRUCTURE WHICH HAS SERVED ADEQUATELY FOR MANY YEARS. DETERMINED FROM TIDE GAUGE RECORDS IN FLORIDA, AS RELATED TO COASTAL TOPOGRAPHY, PUBLISHED IN JANUARY 1962 BY THE UNIVERSITY OF FLORIDA.

RECOMMENDED DISTRICT DR. ENGR. _____
 APPROVED ENGINEER OF DRAINAGE _____
 REV. 1-15-70

FOR INFORMATION ONLY

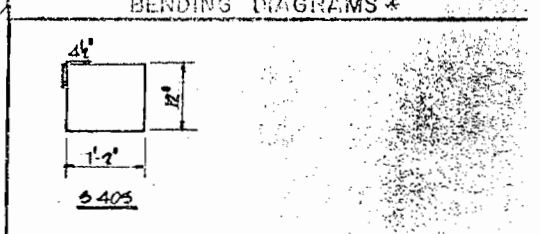


BILL OF MATERIALS

MARK	SIZE	QTY.	LENGTH	NOTE
PRESTRESSING SLABS				
A	4"Ø	92	29'-5"	SEE DRAWING FOR D.
B	4"Ø	10	29'-5"	"
C	4"Ø	5	29'-5"	"
D	3"Ø	6	29'-5"	"
E	3"Ø	6	29'-5"	"

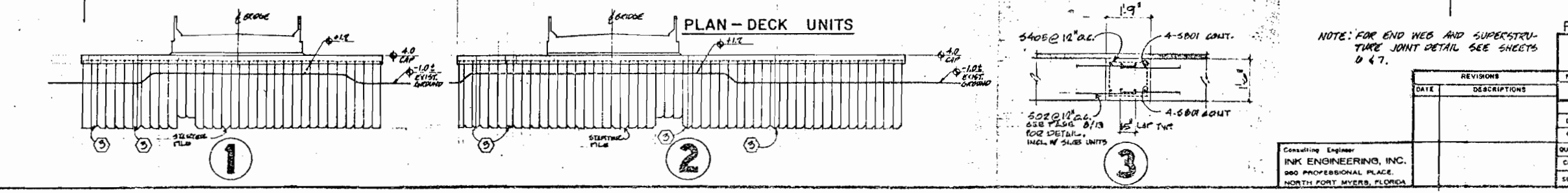
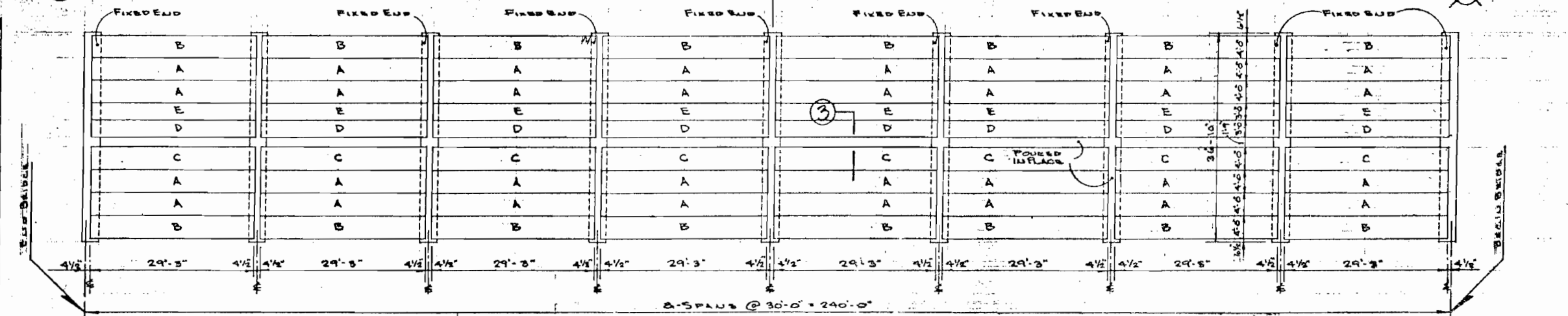
BILL OF REINFORCING STEEL

MARK	SIZE	QTY.	LENGTH	NOTE
5403	4	92	16'-5"	STRAIGHT
5404	4	92	14'-0"	"
5405	4	240	5'-1"	SEE DRAWING
5801	D	64	29'-5"	STRAIGHT



ESTIMATED QUANTITIES *

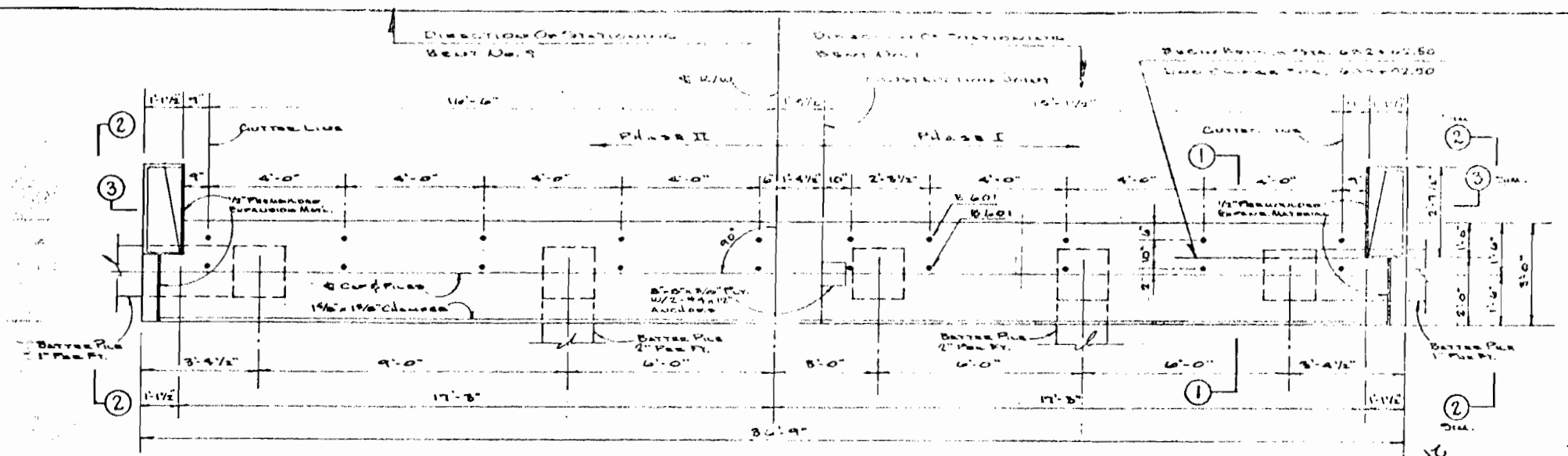
ITEM	UNIT	QUANTITY
CLASS II CONC. (SUPERSTRUCTURE)	CY	381
REINFORCING STL. (SUPERSTRUCTURE)	LB.	4547
PRESTRESSED SLAB UNIT (36"Ø)	LF	410
" " " (48"Ø)	LF	1,638



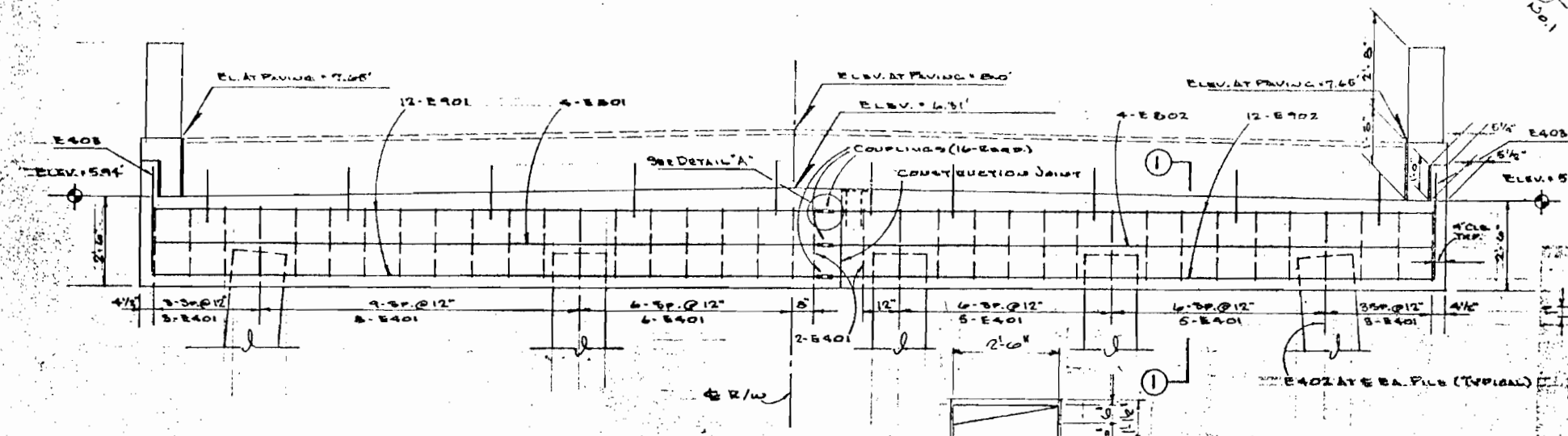
Consulting Engineer
INK ENGINEERING, INC.
 900 PROFESSIONAL PLACE
 NORTH FORT MYERS, FLORIDA

PILING & SLAB PLAN

ROAD NO. 78		COUNTY LEE		PROJECT NO. 12060-3512	
DESIGN	S.K.I.	DATES	12-15-75	APPROVED BY	
CHECK	J.H.	DATES	1-29-76	DEPUTY DESIGN ENGINEER, STRUCTURES	
QUANTITIES	S.K.I.	DATES	2-2-76	DRAWING NO.	5 of 10
CHECK	G.A.	DATES	2/3/76	INDEX NO.	11868
SUPERVISED					

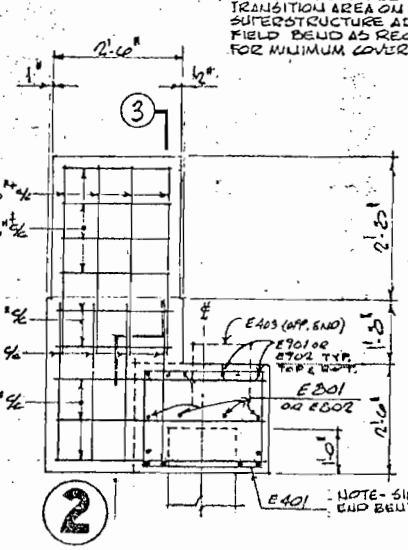


PLAN END BENT NO. 1 SHOWN
(END BENT NO. 9 OPPOSITE)



ELEVATION

PLAN (TYPICAL)



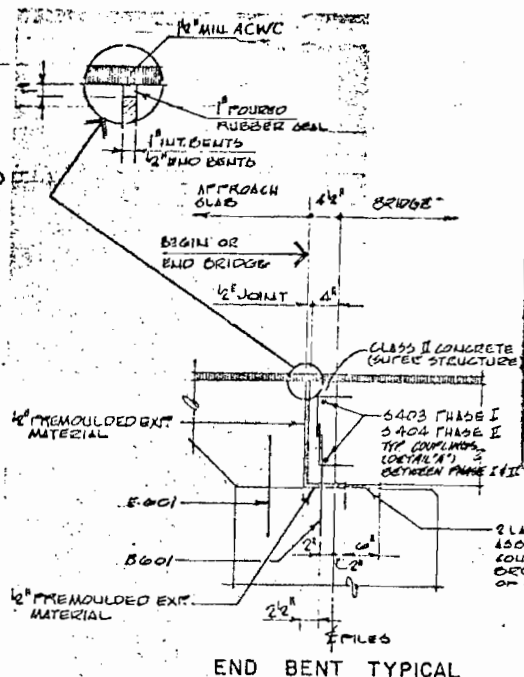
NOTE - FOR REINFORCING STEEL IN TRANSITION AREA ON GIRD TYPE SUPERSTRUCTURE ADJUST AND FIELD BEND AS REQUIRED FOR MINIMUM COVER

NOTE - SIDE OPPOSITE BENT #1 END BENT #9 OPPOSITE BENT



"THERMIT" WELD, THERMAX METALLURGICAL WELD, LACKHURST, N.J., OR "GAD WELD" WILL TENSILE WELDED, EPICO PRODUCTS INC., CLEVELAND, OHIO, SHALL BE APPLIED PER MFG. SPEC. OR EQUIV.

COUPLING DETAIL
TYP. 10 BARS/BENT

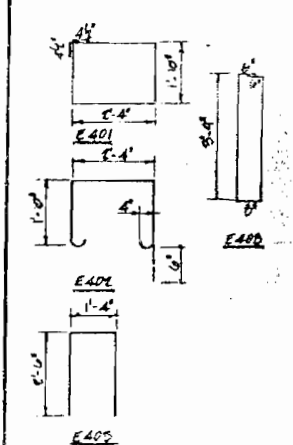


END BENT TYPICAL

NOTE: DESIGN LOAD FOR PILES = 35 TONS

MARK	SIZE	QTY.	LENGTH	BENDING
E-401	4	52	7'-1"	SEE DRAWING
E-402	4	5	7'-0"	"
E-403	4	2	5'-4"	"
E-404	4	16	2'-4"	STRAIGHT
E-405	4	16	2'-0"	"
E-406	4	8	2'-0"	"
E-407	4	12	4'-0"	"
E-408	4	8	7'-0"	SEE DRAWING
E-601	6	10	7'-6"	STRAIGHT
E-602	6	10	7'-6"	"
E-603	6	4	15'-11"	"
E-604	6	4	17'-2"	"
E-605	6	12	15'-11"	"
E-606	6	12	17'-2"	"

BENDING DIAGRAMS



NOTE - ALL DIM. DIMENSIONS ARE OUT TO OUT

ITEM	UNIT	QUANTITY
CLASS II CONG. (SUB STRUCTURE)	CY	11.0
REINFORCING STL ()	LB	2200
PRESTRESSED CONG. PILES (18")	LF	* *

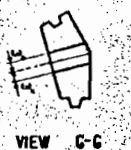
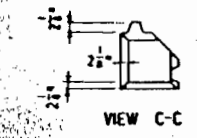
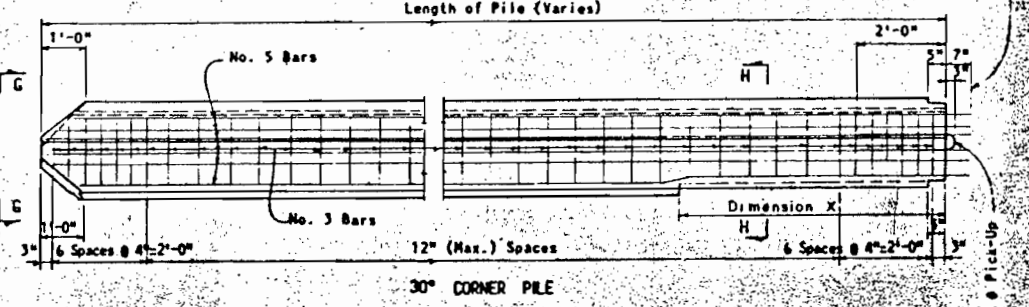
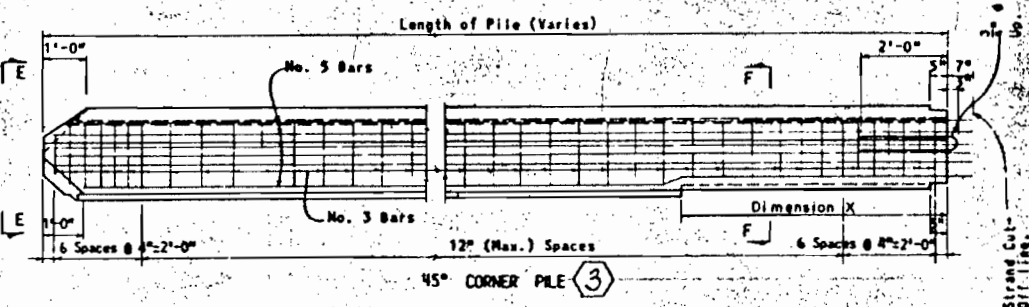
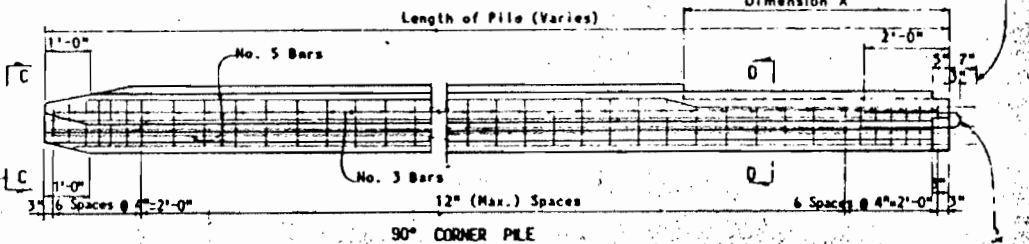
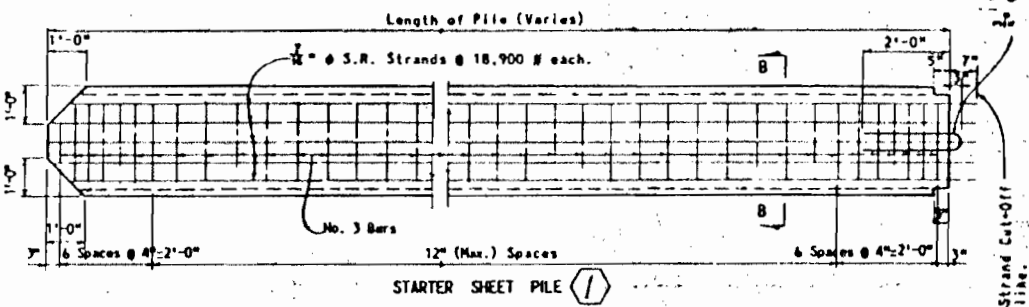
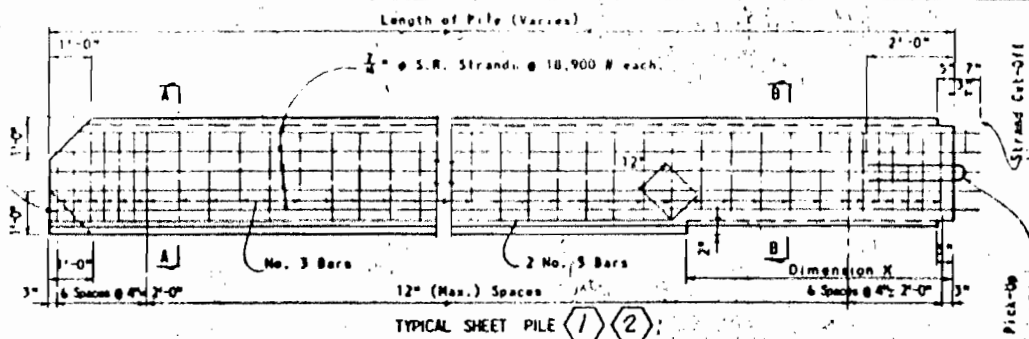
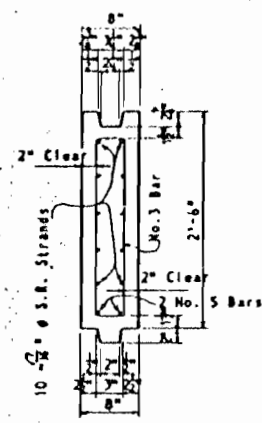
* FOR SUPERSTRUCTURE QUANTITIES AND BILL OF REINFORCING STEEL, SEE SHEET B-5
** SEE SUMMARY OF ESTIMATED BRIDGE QUANTITIES SHEET B-1

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description	78	LEE	12060-3512
Designed by	S.K.I.	12-15-75	APPROVED BY	
Checked by	S.K.I.	1-29-76		
Quantity by	S.K.I.	2/12/76	Deddy Design Engineer, Structures	
Checked by	G.M.	2/13/76	Drawing No. 6 of 10	
Supervised by			Ink Eng. Inc.	

Consulting Engineer
INK ENGINEERING, INC.
900 PROFESSIONAL PLACE,
NORTH FORT MYERS, FLORIDA

FOR INFORMATION ONLY

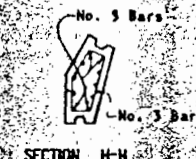
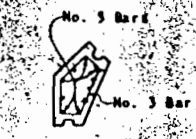
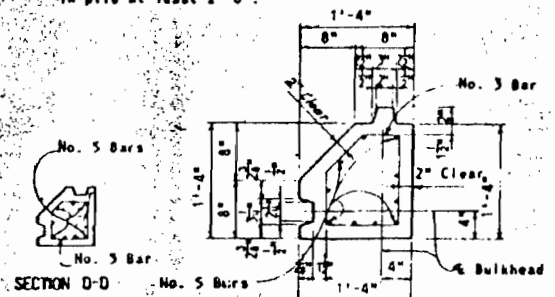
NOTE: Cut as required to force pile against adjacent pile.



NOTE: All Corner Piles shall be paid for at the Contract Unit Price for Precast Concrete Sheet Piling (8"x30").

NOTE: Tongues and Grooves may be on either side of Corner Piles as required.

SECTION B-B
NOTE: At the option of the Contractor, 2 1/2" #5 Strands may be substituted for 3/4" # pick-up bar. Strands shall be imbeded in pile at least 2'-0".



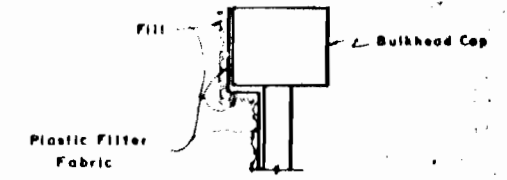
TYPICAL SECTION THRU 90° CORNER PILE
NOTE: All Corner Piles to be constructed with tongues or grooves as required to fit adjacent piles.

TYPICAL SECTION THRU 45° CORNER PILE

TYPICAL SECTION THRU 30° CORNER PILE

DIMENSION X	
PILE LENGTH	DIMENSION X
10'-0"	4'-0"
12'-0"	4'-0"

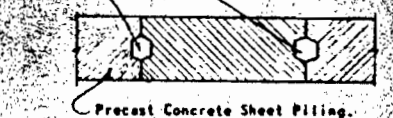
SEE DETAILS ON PAGE B-5



SECTION THRU BULKHEAD SHOWING PLASTIC FILTER FABRIC

NOTE: A Plastic Filter Fabric shall be placed between fill and Bulkhead Cap and between fill and Precast Sheet Piles to 2' below natural ground. Cost of all Labor and Materials required for installing Plastic Filter Fabric shall be included in the Contract Unit Price for Sheet Piles.

NOTE: After the Sheet Piling is driven the slot shall be filled with grout or Class II Concrete, using size 16 Gravel. Cost of mortar is included in the Contract Unit Price for Precast Concrete Sheet Piling.



DETAIL FOR PLACING MORTAR IN SLOTS BETWEEN CONCRETE SHEET PILING

GENERAL NOTES
CONCRETE: (Class III (f'c=6000 p.s.i.) for Prestressed Concrete Construction

PAYMENT: The Contract Unit Price for Precast Concrete Sheet Piling shall include Reinforcing Steel and S.R. Cables.
TONGUES & GROOVES: Minor variations in tongues & grooves will be permitted, subject to approval by the Engineer. Anchor piles may have tongue and/or grooves or no tongue or groove.

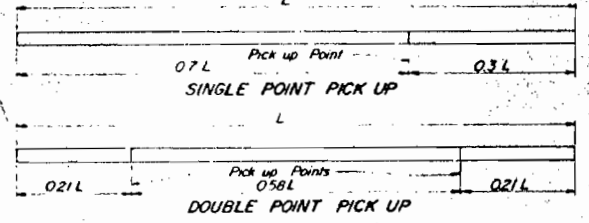
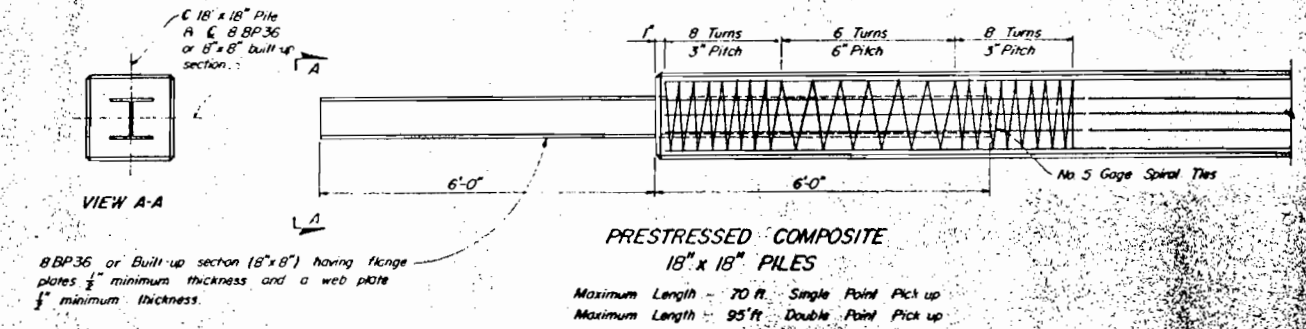
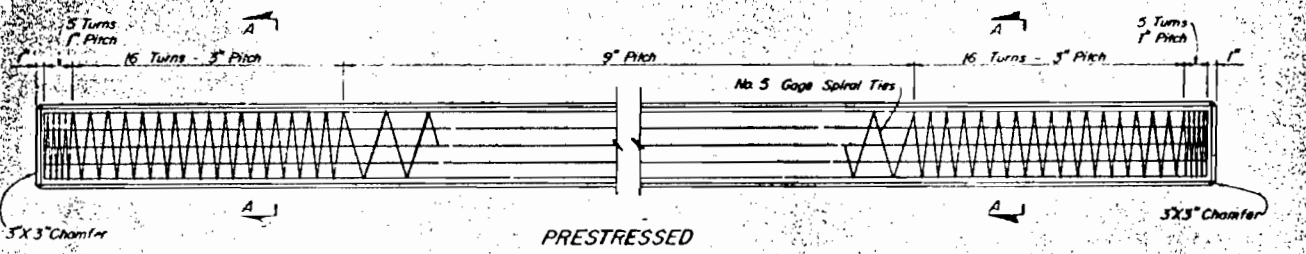
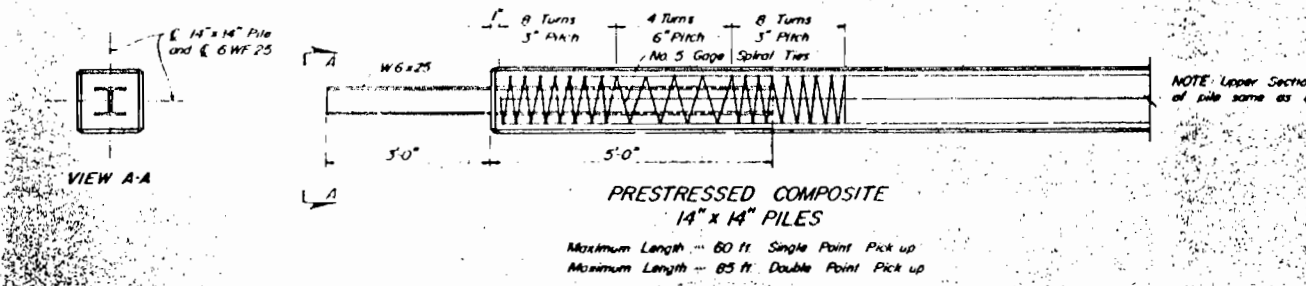
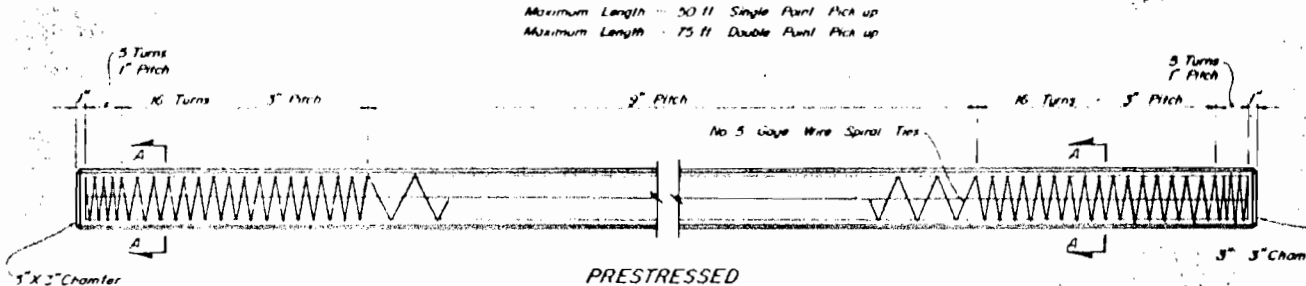
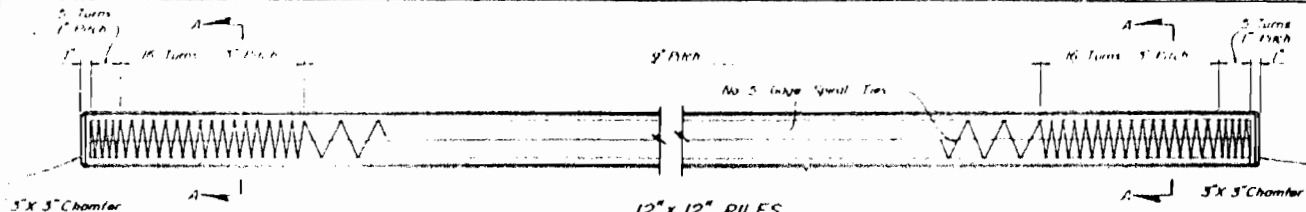
NOTE: All Corner Piles shall be paid for at the Contract Unit Price for Concrete Sheet Piling.

NOTE: All Reinforcing Steel shall be Grade 40 or 60

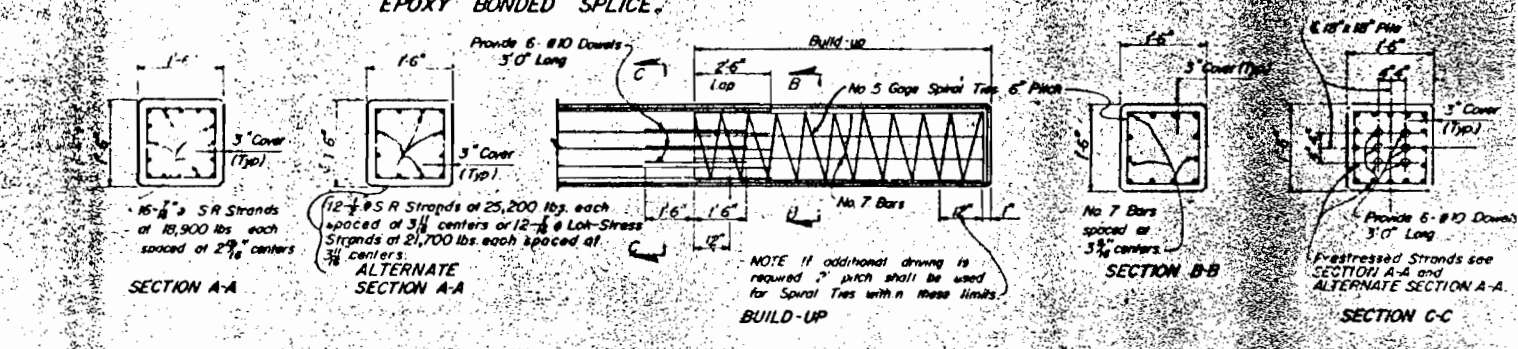
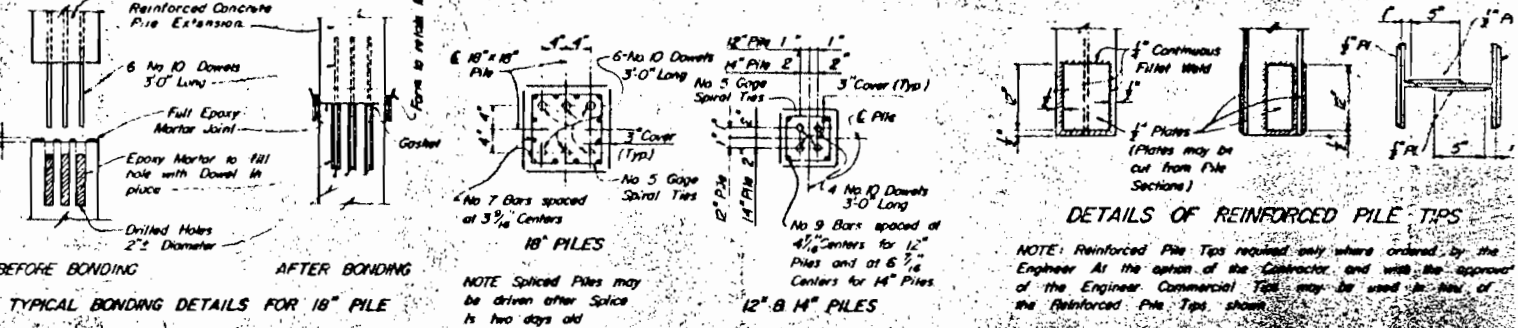
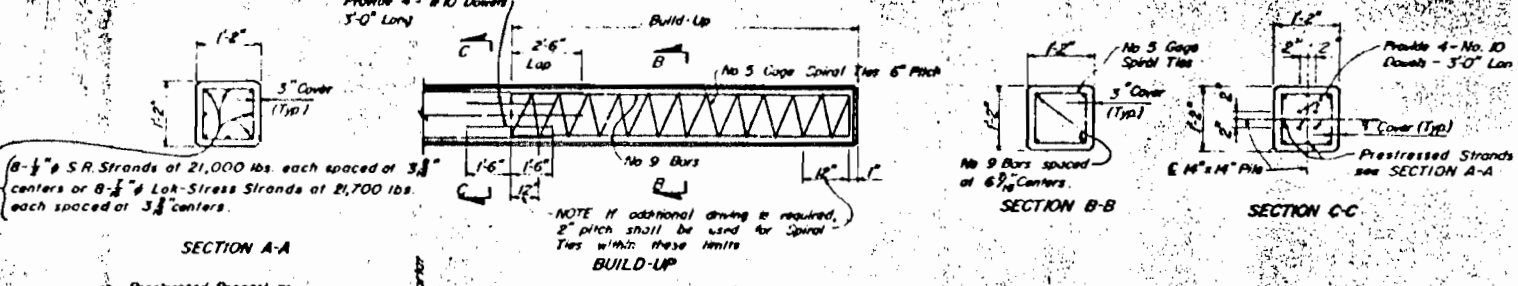
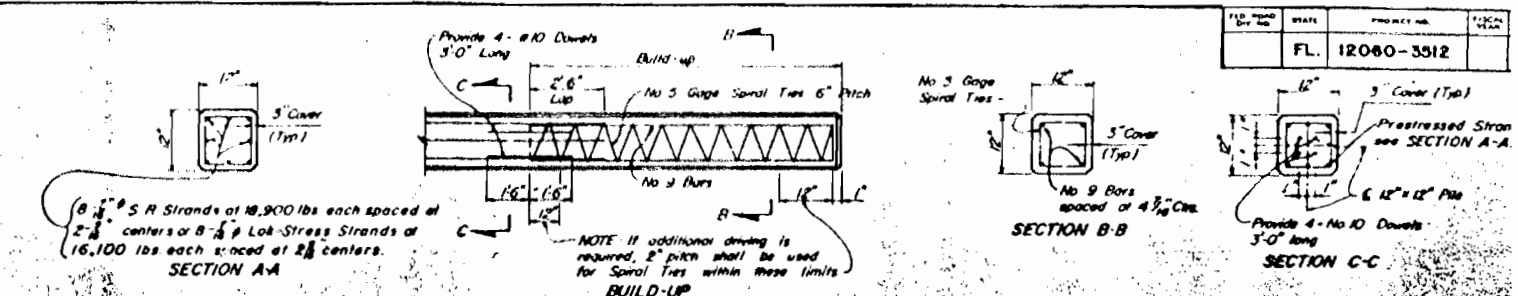
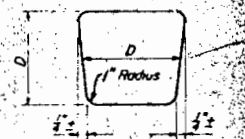
STATE ROAD DEPARTMENT OF FLORIDA
BRIDGE DIVISION
PRECAST CONCRETE SHEET PILING (8"x30")

REVISIONS	ROAD NO.	COUNTY	PROJECT NO.
	78	LEE	12060-3512
Date	Description	Checked by	Approved by
5-20-77	Add Section thru Bulkhead showing Plastic Filter Fabric	R.C.B.	J-60
11-17-77	Added Breaks on Steel Bars	NEF	3-60
12-14-77	Added Breaks on Sheet Piles and changed Concrete Class		
	Checked by	5-30-75	Engineer at Signature
	Drawn by		1 of 1
	Transit by		4057

FOR INFORMATION ONLY



NOTE: Piles shall be marked at pick up points to indicate proper points for attaching handling lines.



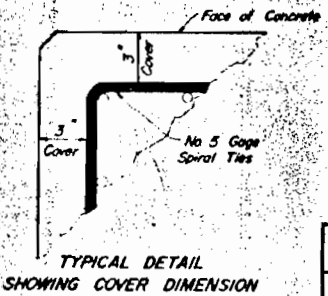
GENERAL NOTES

- APPROVAL: Prior Approval in Writing By the Engineer is Required for Reinforced Concrete Build-Up in Excess of 2'-0".
- OCTAGONAL PILES: Prestressed Octagonal Piles of equivalent strength may be substituted for square piles. Details of Pile shall be submitted to the Engineer for approval.
- SPIRAL TIES: Each wrap of spiral shall be tied to at least two corner strands.
- MATERIAL FOR SPIRAL TIES: Spirals may be manufactured from stock meeting requirements of any grade of reinforcing steel or hard drawn steel.
- PILE CUTOFFS: In cutting off Concrete Piles on abrasive saw shall be used to score the Concrete at put off elevation to the approximate depth of Reinforcing Steel.
- CONCRETE STRENGTH: For Class III Concrete the Cylinder Strength shall be 5,000 p.s.i. minimum at 28 days and 4,000 p.s.i. minimum at transfer of the Prestressing Force.

WFS: Webs of Wide Flange sections shall be in a vertical position when Composite Pile is cast

NOTE: All Reinforcing Steel shall be Grade 40 or 60

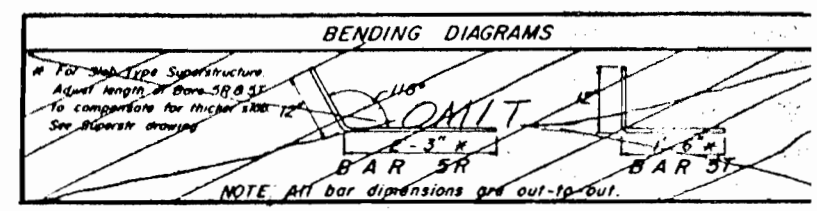
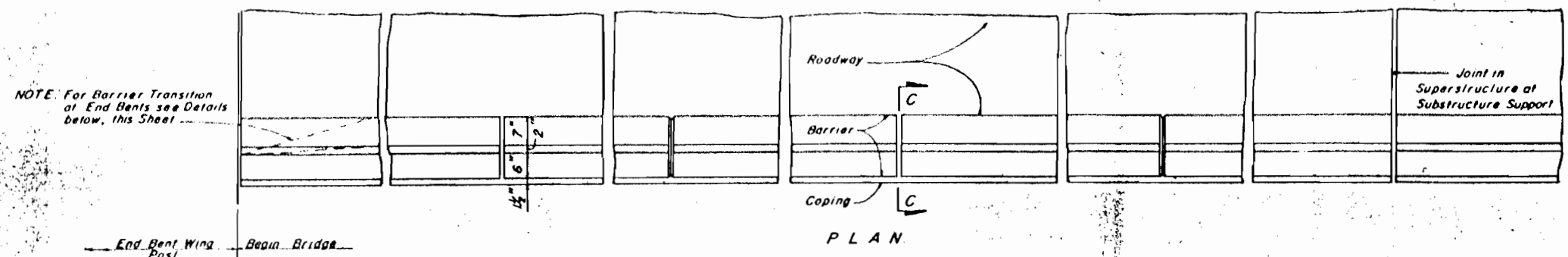
Date	Description	Drawn	Checked
1-24-73	Change Chart		
5-18-73	Add Lab-Straps Strands		



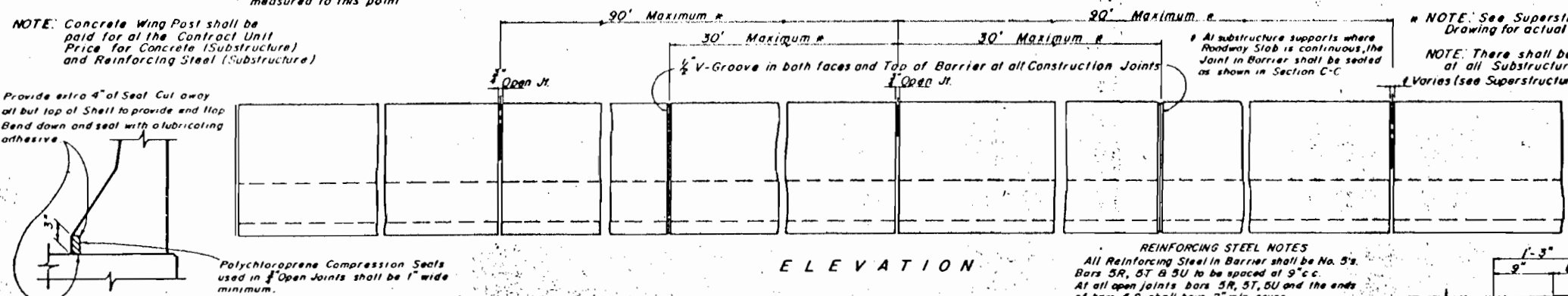
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

12", 14" AND 18" PRESTRESSED CONCRETE PILES

ROAD NO.	COUNTY	PROJECT NO.
78	LEE	12060-3512
DESIGNED BY	CHECKED BY	APPROVED BY
SAB	LAL	T. Albert
DATE	DATE	DATE
4-77	11-77	1-86-76
101	3400	



QUANTITIES: Class II Concrete = 0.07594 Cu. Yds per linear ft. of Barrier (Based on Roadway Cross Slope of 0.2/1).
 REINFORCING STEEL = 20.744 lbs per linear ft. of Barrier.



GENERAL NOTES

CONCRETE: Class II Concrete shall be used in Barrier.

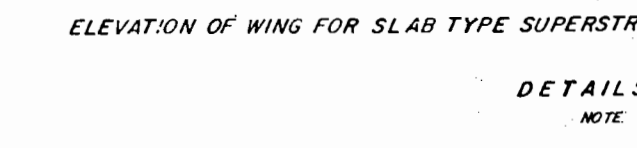
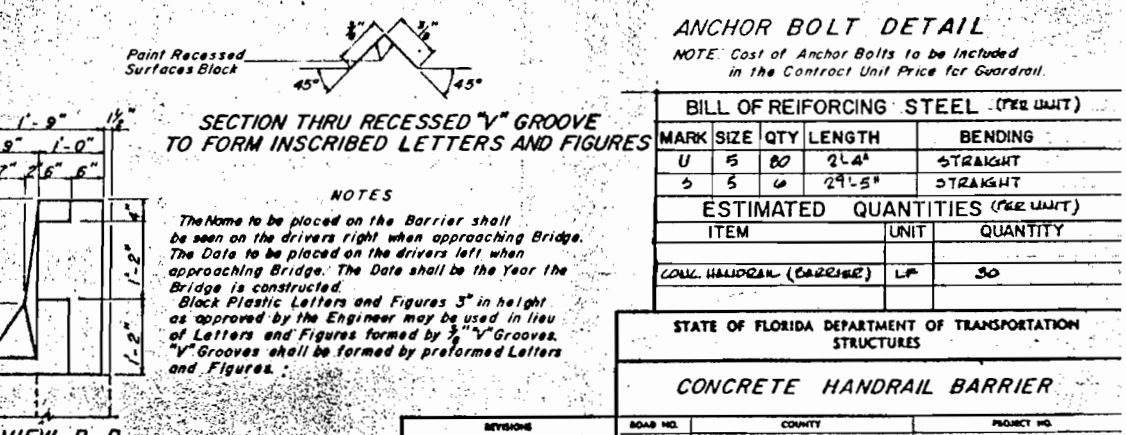
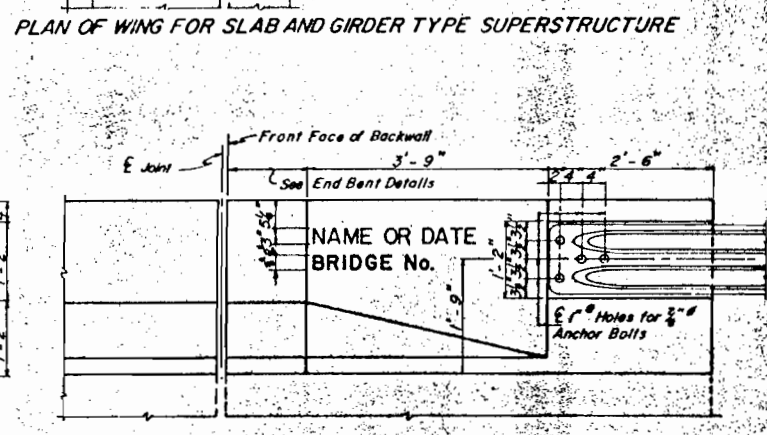
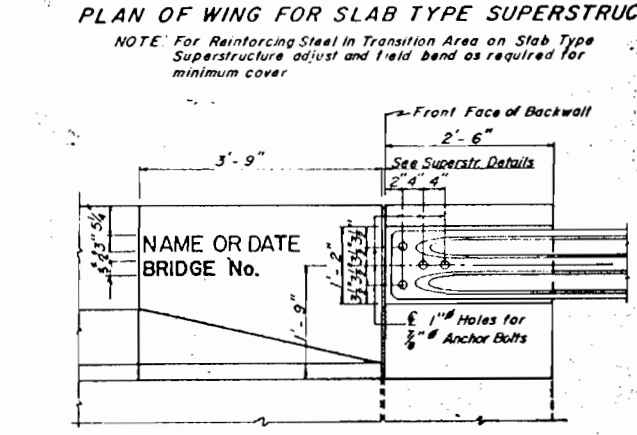
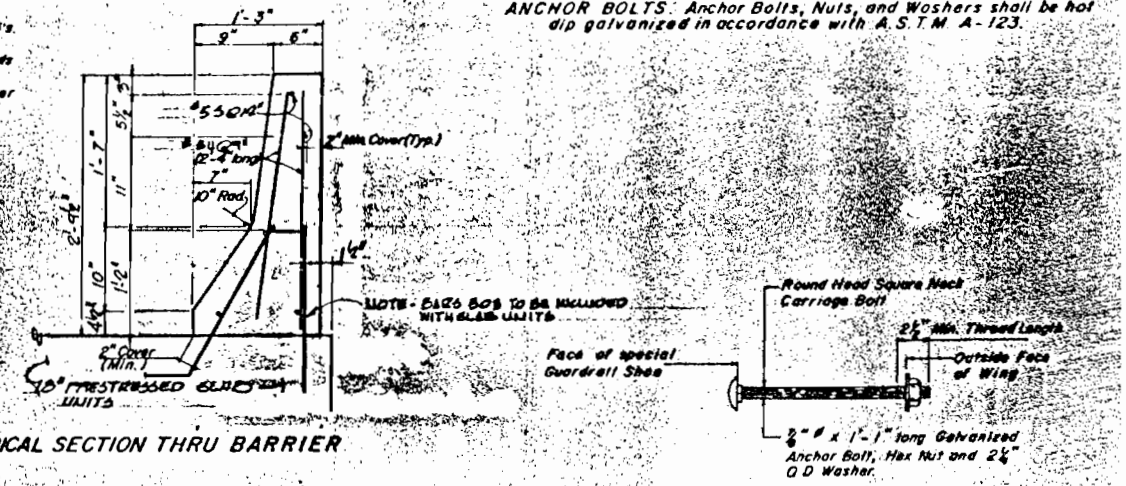
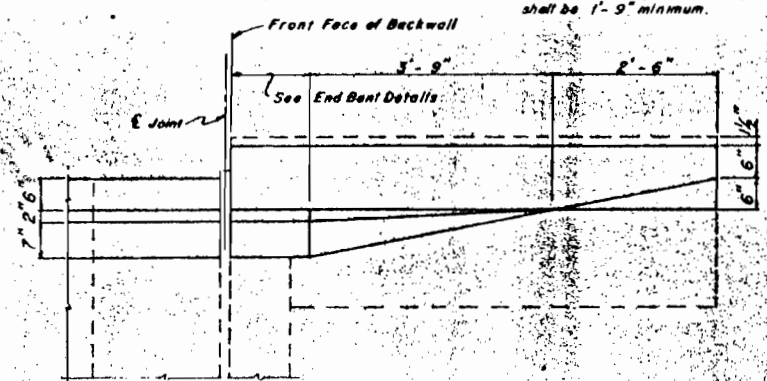
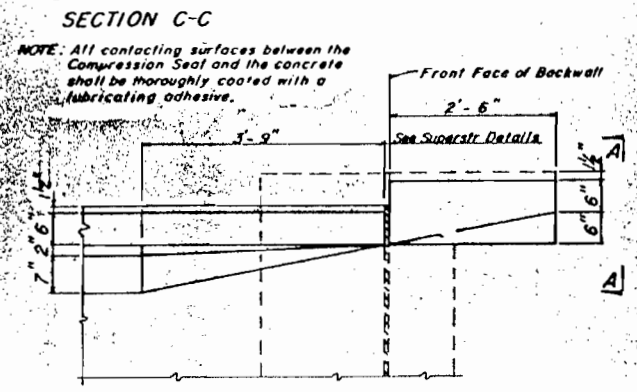
REINFORCING STEEL: Reinforcing Steel shall be Grade 60.

PAYMENT: Barrier shall be paid for per linear foot, which shall include all Concrete and Reinforcing Steel. Barrier shall be measured along the center line of the top surface of the Barrier.

CYLINDER STRENGTH: The Cylinder Strength of the Concrete shall be 3,400 p.s.i. minimum at 28 days.

MARKERS: Markers recording the Elevation shall be placed on top of the Barrier at End Bents. On Bridges longer than 100 ft. one marker shall be placed at each end of the Bridge. On Bridges less than 100 ft. long, one marker shall be placed at one end of the Bridge only. Markers are to be furnished by the Department of Transportation and installed by the Contractor. The Cost of installing the Markers shall be included in the Contract Unit Price for Concrete Barrier.

ANCHOR BOLTS: Anchor Bolts, Nuts, and Washers shall be hot dip galvanized in accordance with A.S.T.M. A-123.

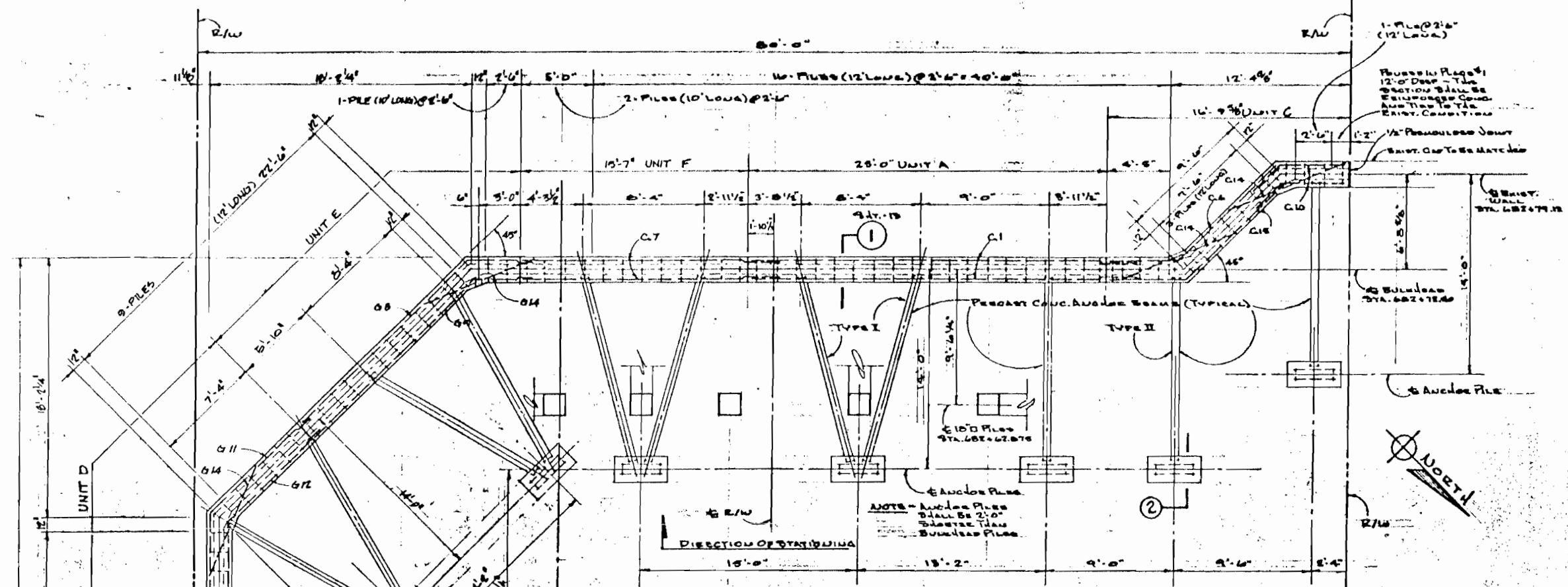


BILL OF REINFORCING STEEL (PER UNIT)	
MARK	SIZE QTY LENGTH BENDING
U	5 20 2L 4" STRAIGHT
S	5 50 29 L 5" STRAIGHT
ESTIMATED QUANTITIES (PER UNIT)	
ITEM	UNIT QUANTITY
CONC. HANDRAIL (ELEVATION)	LF 30

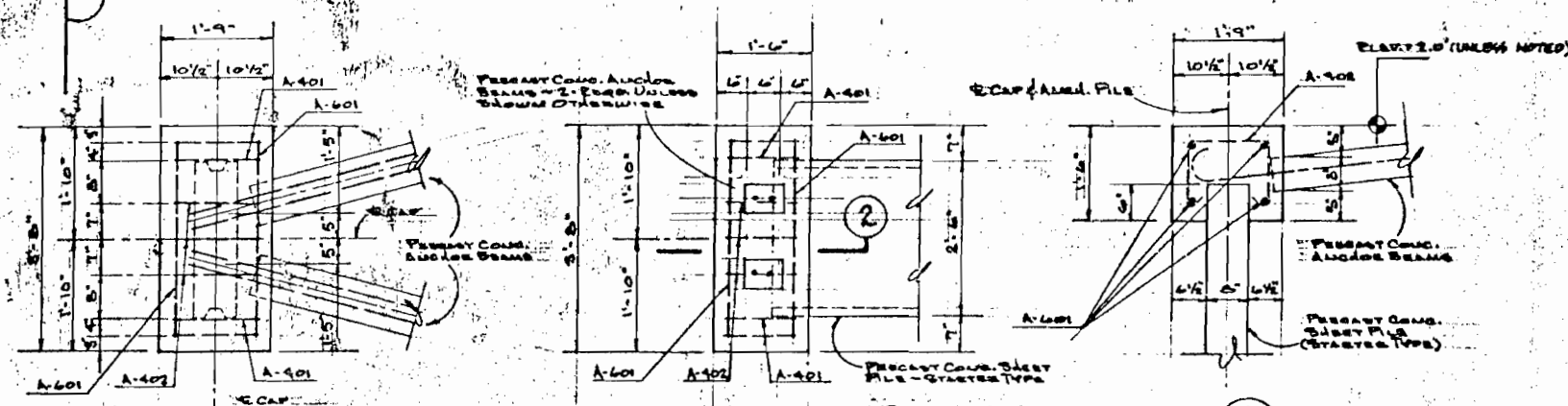
DETAILS OF GUARDRAIL ATTACHMENT AT WING POSTS
 NOTE: For Guardrail Shoe See Standard Drawing in Roadway Plans.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION STRUCTURES			
CONCRETE HANDRAIL BARRIER			
ROAD NO.	COUNTY	PROJECT NO.	
78	LEE	12060-351Z	
DESIGNED BY	CHECKED BY	DATE	APPROVED BY
L.A.L.	J.R.A.	3-74	T. All...
QUANTITY BY	CHECKED BY	DATE	
G.M.	S.P.J.	2/2/76	
SUBMITTED BY	DATE	SHEET NO.	INDEX NO.
S.P.J.	1 of 1		11407

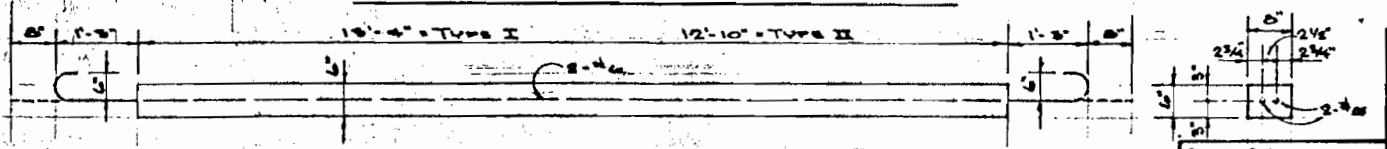
FOR INFORMATION ONLY



PLAN AT BULKHEAD AT BEGIN BRIDGE



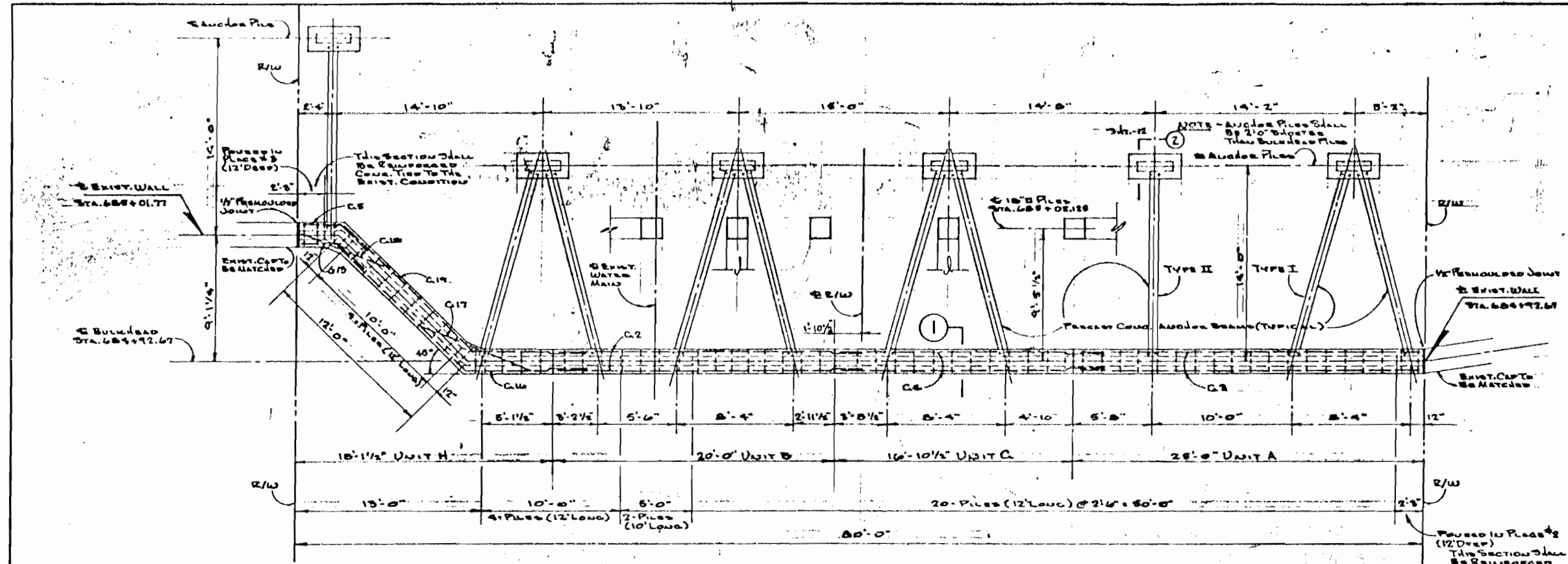
DETAIL OF CAP FOR ANCHOR PILES



DETAILS OF PRECAST ANCHOR BEAMS

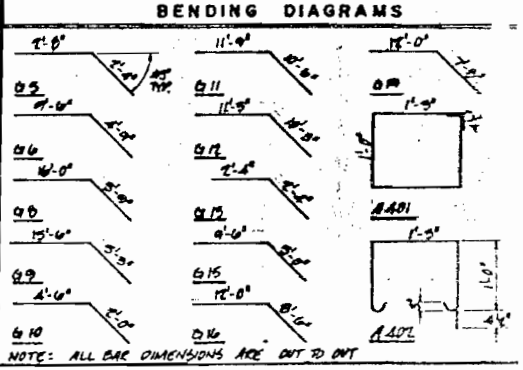
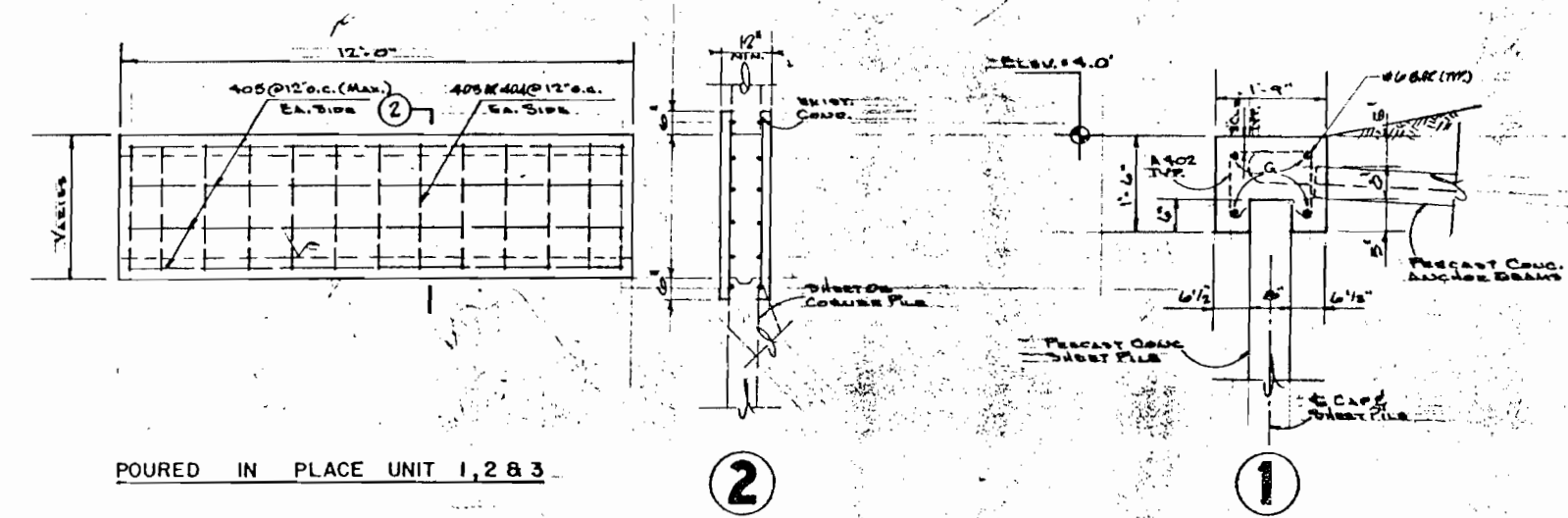
NOTE: SEE SHEET B-5 FOR WALL ELEVATION
SEE SHEET B-13 FOR TYPICAL IN PLACE UNIT

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description	78	LEE	12060-3512
DESIGNED BY: S.K.I.		APPROVED BY:		
CHECKED BY: [Signature]		Deputy Design Engineer, Structures		
QUANTITY BY: [Signature]		Drawing No. 9 of 10		
CHECKED BY: [Signature]		Scale No. 11868		
SUPERVISOR BY: [Signature]				



MARK	SIZE	QTY.	LENGTH	BENDING
G 1	6	8	27'-0"	STRAIGHT
G 2	6	4	22'-0"	"
G 3	6	4	24'-8"	"
G 4	6	4	20'-11"	STRAIGHT
G 5	6	2	5'-0"	SEE DIAGRAM
G 6	6	2	14'-5"	SEE DIAGRAM
G 7	6	4	17'-7"	STRAIGHT
G 8	6	2	21'-0"	SEE DIAGRAM
G 9	6	2	20'-0"	"
G 10	6	4	6'-6"	"
G 11	6	2	22'-5"	"
G 12	6	2	21'-0"	"
G 13	6	2	4'-0"	SEE DIAGRAM
G 14	6	6	8'-6"	STRAIGHT
G 15	6	2	14'-6"	SEE DT. PLAN
G 16	6	2	20'-6"	SEE DT. PLAN
G 17	6	2	21'-0"	STRAIGHT
G 18	6	2	6'-6"	STRAIGHT
G 19	6	2	19'-8"	SEE DIAGRAM
A 401	4	96	5'-2"	STRAIGHT
A 401	4	64	5'-5"	SEE DIAGRAM
A 401	4	209	4'-0"	SEE DIAGRAM
A 405	4	26	0'-0"	STRAIGHT
A 406	4	52	1'-0"	"
A 406	4	16	11'-6"	STRAIGHT

PLAN BULKHEAD AT END BRIDGE



ITEM	UNIT	QUANTITY
CLASS II CONC. (BULKHEAD)	CY.	25
REINFORCING STL. (")	LB.	2920
PRECAST CON. SHEET PILES (3x30)	LF.	1150
PRECAST CON. ANCHOR BEAM	EA.	24

NOTES:
 1. IF SHEET PILES INCLUDES REINFORCING BARS AND CONCRETE.
 2. CLASS II CONCRETE (BULKHEAD) INCLUDES CONCRETE CAP, ANCHOR CAPS, AND PAURED IN PLACE UNITS.
 3. BOTH TYPES ANCHOR BEAMS - EACH INCLUDE REINFORCING STEEL.
 4. REINFORCING STEEL FOR BULKHEAD MAY BE GRADE 40 OR GRADE 60.
 5. SEE SHEET 6-5 FOR WALL ELEVATION.

UNIT DESIGNATION	UNIT	QUANTITY
UNIT A	CUBIC YARD	2.2
UNIT B	CUBIC YARD	1.7
UNIT C	CUBIC YARD	1.7
UNIT D	CUBIC YARD	1.7
UNIT E	CUBIC YARD	1.7
UNIT F	CUBIC YARD	1.7
UNIT G	CUBIC YARD	1.7
UNIT H	CUBIC YARD	1.7
UNIT I	CUBIC YARD	1.7
UNIT J	CUBIC YARD	1.7
UNIT K	CUBIC YARD	1.7
UNIT L	CUBIC YARD	1.7
UNIT M	CUBIC YARD	1.7
UNIT N	CUBIC YARD	1.7
UNIT O	CUBIC YARD	1.7
UNIT P	CUBIC YARD	1.7
UNIT Q	CUBIC YARD	1.7
UNIT R	CUBIC YARD	1.7
UNIT S	CUBIC YARD	1.7
UNIT T	CUBIC YARD	1.7
UNIT U	CUBIC YARD	1.7
UNIT V	CUBIC YARD	1.7
UNIT W	CUBIC YARD	1.7
UNIT X	CUBIC YARD	1.7
UNIT Y	CUBIC YARD	1.7
UNIT Z	CUBIC YARD	1.7

No. REQ'D. AT	LENGTH	STARTER				TOTAL (Ln Ft)
		10'	12'	45° CORNER		
8	45	1	1	1	1	890
2	21	1	1	1	1	440

BULKHEAD AT END BRIDGE
 MATLACHA BRIDGE NO 120111

ROAD NO.	COUNTY	PROJECT NO.
78	LEE	12060-35

REVISIONS

Date	Description	APPROVED BY:

Designed by: S.K.L. 12-15-75
 Checked by: S.K.L. 1-29-76
 Quantity by: S.K.L. 2-2-76
 Checked by: S.M. 2-15-76

Supervised by: 10 of 10 11/68

Consulting Engineer
 INK ENGINEERING, INC.
 200 PROFESSIONAL PLACE,
 NORTH FORT MYERS, FLORIDA

GENERAL NOTES

- The illustrations for guardrail applications are standard configurations; adjustments are to be made as required by site specific conditions to attain optimum design for function, economy and serviceability.
- The beginning of guardrail need shall be at the greatest of the upstream distances from the hazard, as determined from Figures 1 and 2, and other application details of this Index.
- One Panel (i.e., panel length) equals 12'-6". Guardrail shall be constructed with rail elements 12'-6" in length except where 25'-0" elements are called for by this and other standards (indexes) or specifically called for in the plans.

Post spacing shall be 6'-3" except that reduced spacing shall be used for (a) transitions to anchorages at rigid structures such as bridges (See Detail J and Index No. 402) and transitions to redirective crash cushions, (b) the conditions in Note No. 7 below, (c) special post applications, (d) reduced post spacing required for specific end anchorage assemblies, and, (e) specific spacing called for in the plans.

- Guardrail mounting height for the W-beam without rubrail and for thrie-beam is 1'-9" to the center of beam, and for W-beam with rubrail 2'-0" to center of beam. Modified thrie-beam shall be mounted at a height of 2'-0" to center of beam. The height is critical and shall be attained in all cases; a tolerance of 3" above and 1" below the standard mounting heights is permissible over necessary surface irregularities (e.g., across shoulder gutters, inlets and roadway surface break lines). For guardrail placed on slopes beyond the shoulder point, there shall be no deviation more than 1" below to 3" above the desired height within any 25 foot section of guardrail.
- All guardrail panels, end sections and special end shoes shall be lapped in the direction of adjacent traffic.
- Flared end anchorage assemblies providing 4' offset are the standard end treatments for single face free standing guardrail approach ends. Parallel end anchorage assemblies for guardrail approach end treatments will be constructed only when restraints prevent construction of flared end anchorages.

Guardrail end anchorage assemblies shall be of the type called for in the plans. If the plans call for end anchorage assembly "flared" and does not identify the specific system(s) to be used, the contractor has the option to construct any FDOT approved flared assembly provided in this Index or identified on the Qualified Products List (QPL), subject to the conditions identified in the approved Index drawings, or QPL drawings if applicable.

If the plans call for end anchorage assembly "parallel" and does not identify the specific system(s) to be used, the contractor has the option to construct any FDOT approved parallel assembly provided in this Index or identified on the QPL, subject to the conditions identified in the approved Index drawings, or QPL drawings if applicable.

If the plans call for a specific end anchorage assembly, substitutions with other end anchorage assemblies will not be permitted unless approved by the Engineer. Approved substitutions will not be eligible for CSIP consideration.

When an end treatment is attached to guardrail with Pedestrian Safety Treatment, only end treatment systems with timber posts are to be used.


Proprietary end anchorage systems must be identified on the QPL. Manufacturers seeking approval of proprietary end anchorage systems for inclusion on the QPL must submit application along with design documentation showing the end anchorage system is crash tested to NCHRP Report 350 Test Level 3 criteria, is accepted by FHWA for use as a guardrail end anchorage system, and is compatible with FDOT guardrail systems. System approvals will be contingent on FDOT's evaluation of crash test performance results for consistency with FDOT guardrail application and use. If approved, installation drawings signed and sealed by a professional engineer licensed in the State of Florida will be required.

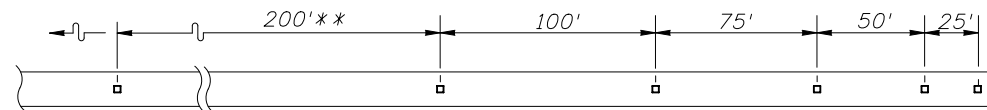
- At above ground rigid hazards where the face of guardrail is offset from the hazard less than the 4' minimum for standard W-beam, other guardrail configurations may be applicable; see General Note No. 11 and the minimum offset table on Sheet 19. For guardrail with post spacing less than 6'-3" the reduced spacing should extend a minimum of one panel in advance of the hazard. When minimum offset cannot be attained safety shape concrete barrier shall be used unless other shielding is approved by the Engineer of Record. See Index No. 410 for safety shape concrete barriers and typical applications, and the plans for special barrier shapes and applications.
- In addition to use at roadside hazards or other areas where the Engineer has deemed guardrail necessary, guardrail should be considered on flush shoulder sections where fill slopes are steeper than 1:3 within the clear zone and fill heights are 6' or greater. Curbed sections where fill slopes are steeper than 1:3 and fill heights are 6' or greater within 22' of the traveled way should be evaluated for installation of guardrail. Additional guidance for evaluating the need for guardrail can be found in the Plans Preparation Manual.
- The guardrail to bridge connections contained in this Index are for bridges with Test Level 4 traffic railing barriers. For guardrail to concrete barrier wall connections see Index No. 410. For existing bridges receiving retrofit traffic railing barriers see Index No. 402.
- The W-beam guardrail system in this index is the standard system to be used on the State Highway System where a Test Level 3 semi-rigid barrier is required.

- Thrie-beam guardrail panels shall be used in guardrail transitions to bridge traffic railing barriers, to concrete and certain water filled safety shaped barriers, certain crash cushions and as a continuous barrier when called for in the plans. For additional information on rail attachment, post spacings, nested rails, location of thrie-beam transition panels and offset block configurations see details elsewhere in this Index, and Index Nos. 402, 410 and 414. The use of thrie-beam guardrail with standard offset blocks (Test Level 3 semi-rigid system) may be considered where one or more of the conditions listed below or similar conditions are anticipated or exist:
 - W-beam deflection is marginal,
 - W-beam with rubrail considered functionally deficient,
 - Vehicle overriding W-beam is probable,
 - Drainage will be impeded or blocked by the use of concrete barrier wall (subject to deflection space requirements),
 - High frequency of repairs to W-beam,
 - Spandrel beam with low deflection needed around unrelocatable structure,
 - Accommodating passenger vehicles heavier or larger than the standard passenger car (e.g., passenger vans and small buses).

The modified thrie-beam guardrail is a Test Level 4 semi-rigid system and may be used where a Test Level 4 guardrail is required.

- Single face median guardrail for bridges located on divided roadways shall be constructed the same as outer roadway guardrail under the following conditions:
 - Wide medians where approach end anchor is located outside of opposing roadway clear zone,
 - Medians of uniform width that are occupied by other transportation and joint use facilities,
 - Medians of uniform or variable widths with independent vertical alignments not suited to normal median guardrail installations,
 - Medians of bifurcated roadways.
- Straight rail sections may be used to construct radii of 125' or greater. For radii less than 125' the rail must be fabricated (shop-bent) to fit.
- Crash cushions may be required in lieu of or in conjunction with guardrail at locations where space does not permit development of sufficient guardrail length, offset or crashworthiness at terminals. Crash cushions shall be constructed at or in lieu of Type II assemblies located in the approach clear zones.
- Corrugated sheet steel beams, end shoes, end sections and back-up plates shall conform to the current requirements of AASHTO M180, Class A, Type II (zinc) coating. All other metallic components, hardware and accessories shall be in conformance with the appropriate current AASHTO requirements.
- Steel offset blocks other than modified thrie-beam offset blocks are not permitted for new guardrail construction. Existing steel offset blocks may remain throughout the service life of the existing guardrail. Permissible post and offset block combinations are tabulated on Sheet 16.
- Where necessary to enlarge or add holes to galvanized guardrail, the work will be done by drilling or reaming. Damaged galvanized guardrail will be metalized in accordance with Sections 562 and 971 of the Standard Specifications. No burning of holes will be permitted.
- For guardrail reflector details see Sheet 17.
- Any run of guardrail with existing concrete posts that is being reset under a construction or maintenance contract shall be reset using timber or steel posts. Repair within a run of guardrail with existing concrete posts can be made with either steel, timber, sound salvaged concrete posts; replacement in kind of damaged posts is to be made when like posts are on hand at time of repair.
- Substitutions between thrie-beam guardrail and concrete barrier wall are not eligible for CSIP consideration.
- On roadways designated for reverse laning, all downstream ends of guardrail that are not shielded or that are not designed as approach end terminals shall be marked with post-mounted Type 3 Object Markers. Trailing bridge ends and trailing shoulder concrete barrier wall ends shall be marked with Type 3 Object Markers except where there is trailing end guardrail. Object markers to be installed facing reverse laning traffic. The cost of the object marker shall be included in the cost of the guardrail.

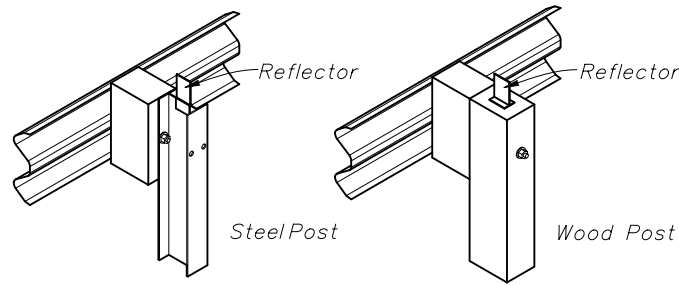
REVISIONS							2010 Interim Design Standard	Interim Date	Sheet No.
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			01/01/11	1 of 26
01/01/11	MTP	Deleted the note that allowed the use of recycled guardrail beams.Changed VECP (Value Engineering Change Proposal) to CSIP (Cost Savings Initiative Proposal)				GUARDRAIL 400	Index No. 400		



Note: Adjustment in spacing may be required to fit exact guardrail lengths as directed by the Engineer. For minimum installations (length 62.5') provide one reflector at each end and one at the approximate center.

**For curves greater than 2° the spacing shall be reduced to 100' through the curve.

REFLECTOR SPACING



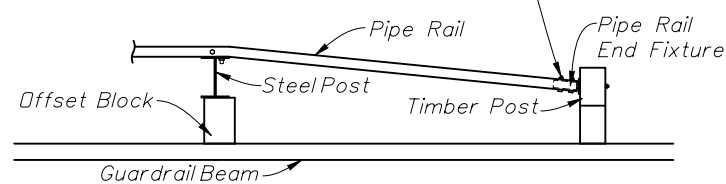
PICTORIAL VIEW
REFLECTOR MOUNTING

REFLECTOR NOTES

1. Reflectors shall conform to Section 993 of the Standard Specifications.
2. Reflector color (white or yellow) shall conform to the color of the near lane edgeline.
3. Reflectors installed on median guardrail shall have retro-reflective sheeting on both sides of the reflector.
4. The cost for reflectors shall be included in the contract unit price for Guardrail.

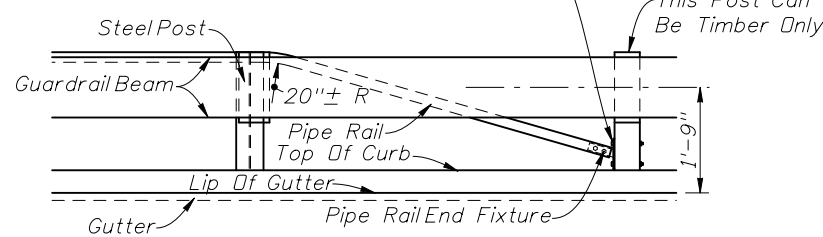
REFLECTORS-DETAIL M

Install Pipe Rail Over Pipe Rail End Fixture And Thru-bolt With 1/2"x3 1/2" Long Hex Bolts And Nuts With 1/2" Plain Round Washers Under Heads And Nuts (2 Reqd.) (Upset Threads After Tightening)

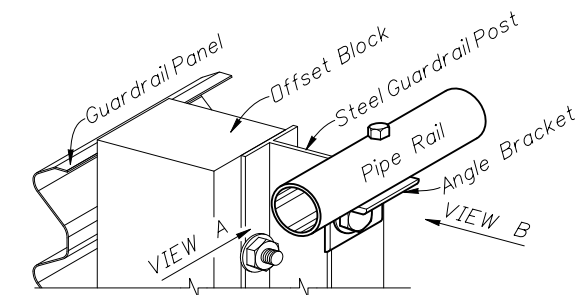


PLAN

Attach Pipe Rail End Fixture To Post With 1/2"x7" Long Hex Bolts And Nuts With 1/2" Plain Round Washers Under Heads And Nuts (2 Reqd.) (Upset Threads After Tightening)



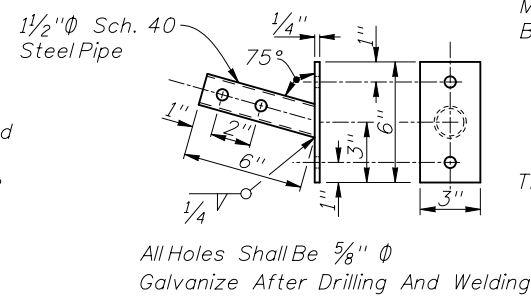
ELEVATION



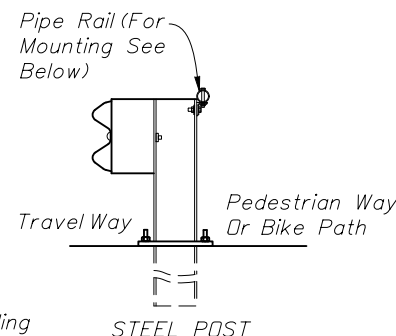
PICTORIAL

NOTES

1. Pipe Rail required on steel guardrail posts when pedestrian ways and bikeways are located 4' or less from back of the posts. Pipe rail shall not extend beyond the last post of the approach end anchorage assemblies. Begin and end the pipe rail in accordance with the Pipe Rail End detail.
2. When guardrails with timber posts are located with the back of posts 4' or less from the near edge of the pedestrian way or bikeway, the bolt ends will require one of the following treatments:
 - (a) Trimming back flush with the face of nut and metalizing or
 - (b) Use of post bolts 15" in length with the washers and nuts counter sunk into sinks 1" to 1 1/2" deep or
 - (c) Use of post bolts 15" in length with sleeve nuts and washers.
3. The cost for Pipe Rail, mounting components and installation shall be included in the contract unit price for guardrail. Bolt end treatment for timber post shall be included in the contract unit price for guardrail.



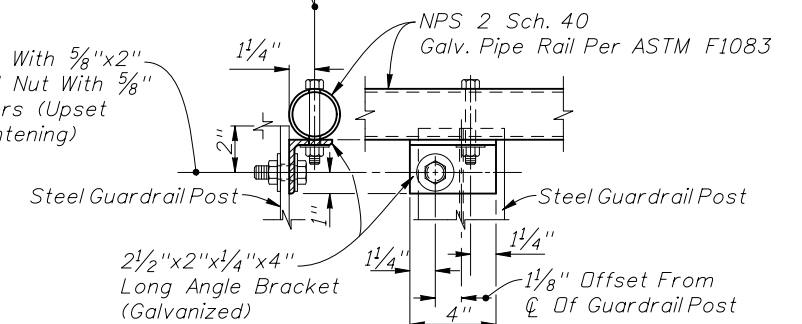
PIPE RAIL END FIXTURE



STEEL POST SECTION

5/8" Bracket And Pipe Holes With 1/2"x3 1/2" Long Hex Bolt And Nut With 1/2" Plain Round Washer (Upset Threads After Tightening)

3/4" Bracket Hole With 5/8"x2" Long Hex Bolt And Nut With 5/8" Plain Round Washers (Upset Threads After Tightening)



VIEW A

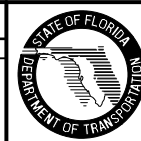
VIEW B

PIPE RAIL MOUNTING

**FOR LOCATIONS USED BY PEDESTRIANS OR CYCLISTS
PEDESTRIAN SAFETY TREATMENTS**

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
01/01/11	MTP	Changed 2" Nom. Diameter to NPS 2 Sch. 40 Galv. Pipe Rail Per ASTM F1083.			



2010 Interim Design Standard

GUARDRAIL

Interim Date 01/01/11	Sheet No. 17 of 26
Index No. 400	