

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

LAK-84-18.88
CITY OF PAINESVILLE
LAKE COUNTY

PROJECT DESCRIPTION

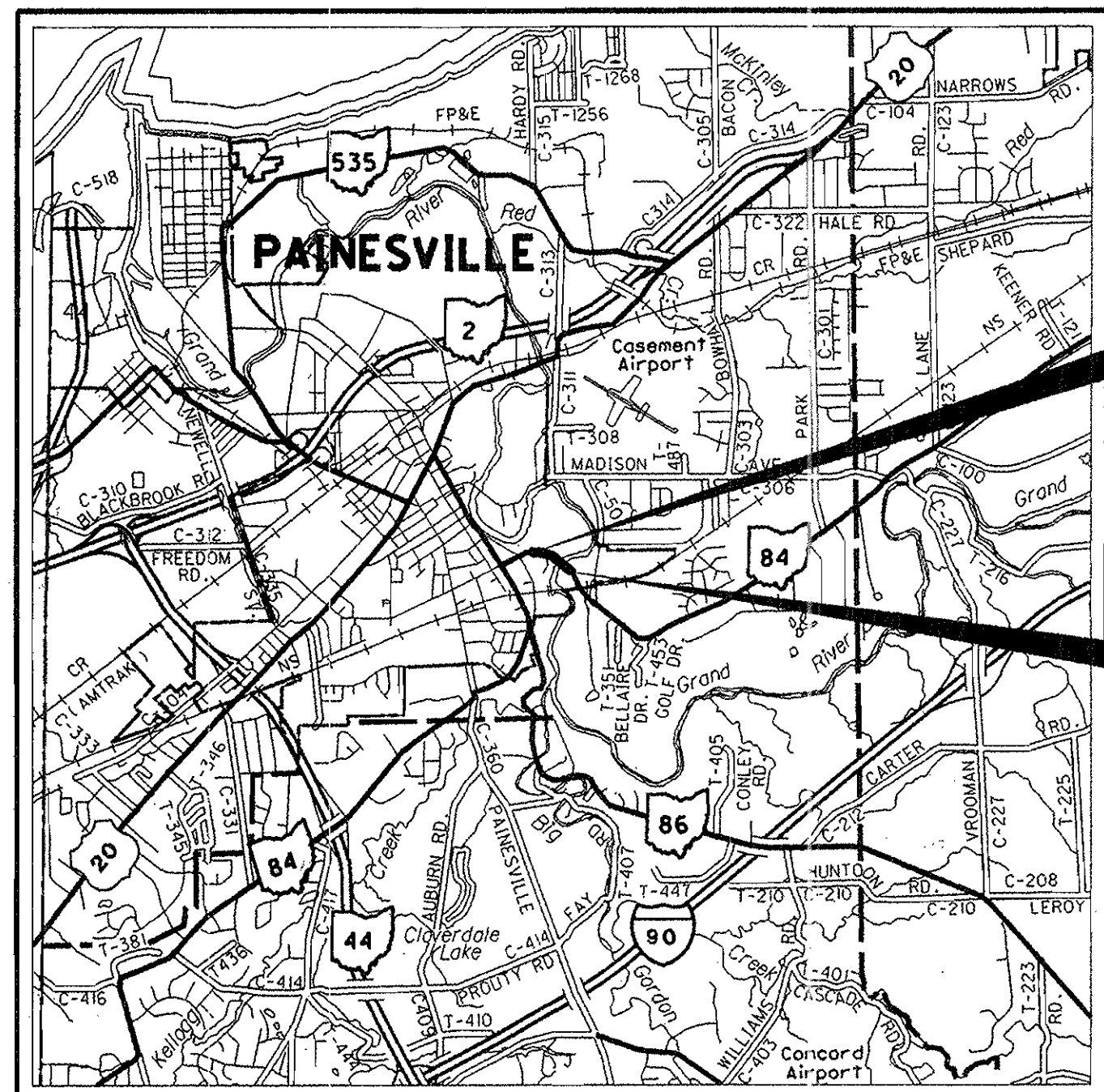
REPLACE A DETERIORATED BRIDGE WITH A NEW 7 SPAN CONCRETE I-BEAM STRUCTURE ON NEW ALIGNMENT CARRYING S.R. 84 OVER THE GRAND RIVER INCLUDING RELOCATION OF THE APPROACH ROADWAYS. PROJECT LENGTH=0.30 MILE

2002 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY EXCEPT AS NOTED ON SHEET 8, AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

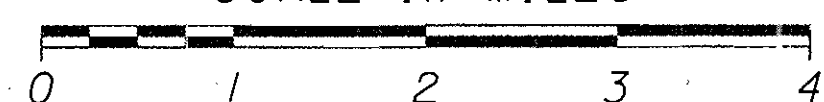
PROJECT EARTH DISTURBED AREA = 4.9 AC.
EST. CONTRACTOR EARTH DISTURBED AREA = 2.25 AC.
NOI EARTH DISTURBED AREA = 7.15 AC.



LOCATION MAP

LATITUDE: 41°43'10" N LONGITUDE: 81°13'40" W

SCALE IN MILES



PORTION TO BE IMPROVED.....
INTERSTATE & DIVIDED HIGHWAY.....
UNDIVIDED STATE & FEDERAL ROUTES.....
OTHER ROADS.....

DESIGN DESIGNATION

CURRENT ADT (2005).....10,600
DESIGN YEAR ADT (2025).....14,000
DESIGN HOURLY VOLUME (2025).....1,400
DIRECTIONAL DISTRIBUTION.....60%-40%
TRUCKS (24 HOUR B&C).....1%
DESIGN SPEED.....35 M.P.H.
LEGAL SPEED.....35 M.P.H.

DESIGN FUNCTIONAL CLASSIFICATION -
URBAN COLLECTOR

DESIGN EXCEPTIONS
NONE

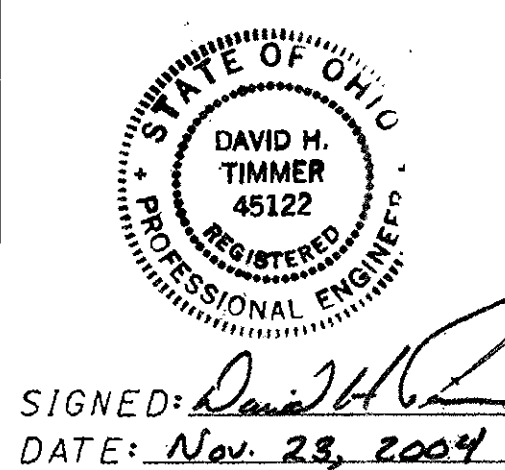
BEGIN PROJECT
STA. 8+25

END PROJECT
STA. 24+00

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PREPARED AND RECOMMENDED BY:
RICHLAND ENGINEERING LIMITED
29 NORTH PARK STREET
MANSFIELD OHIO 44902
PHONE: (419) 524-0074 FAX: (419) 524-1812

STANDARD CONSTRUCTION DRAWINGS										SUPPLEMENTAL SPECIFICATIONS	
BP-2.2	7-16-04	CB-2.2	7-19-02	HL-10.11	4-19-02	TC-41.20	1-19-01	MT-97.10	4-19-02	802	7-19-02
BP-3.1	7-16-04			HL-10.12	4-19-02	TC-41.40	7-16-04	MT-97.12	4-19-02	832	4-17-04
BP-4.1	7-16-04					TC-42.20	7-16-04	MT-99.20M	1-30-95	833	2-12-03
BP-5.1	7-28-00			HL-20.14	1-17-03			MT-101.60	10-18-02	864	7-11-00
BP-7.1	7-28-00			HL-20.21	4-19-02	TC-52.10	4-20-01	MT-105.10	10-18-02		
		DM-1.1	7-18-03	HL-30.11	4-19-02	TC-52.20	4-20-01	MT-105.11	10-18-02		
GR-1.1	7-16-04	DM-1.4	7-19-02	HL-30.31	1-17-03			MT-110.20	10-18-02		
GR-2.1	1-16-04	DM-4.1	7-19-02	HL-50.11	7-20-01	TC-65.10	10-19-01	MT-102.10	10-18-02		
GR-3.2	4-18-03	DM-4.3	7-19-02	HL-50.22	1-18-02	TC-65.12	10-19-01	AS-1-81	7-19-02		
GR-4.1	4-18-03	DM-4.4	7-19-02	HL-40.10	4-19-02	TC-73.10	1-19-01	BR-2-98	7-19-02		
GR-4.2	10-17-03	DM-5.1	7-19-02					EXJ-6-95	7-19-02		
								PSID-1-99	7-18-03		
RM-1.1	4-18-03	LA-1.1	7-28-00								
RM-4.2	4-18-03										
		MH-1.1	7-19-02							EPA ID	
		MH-1.2	7-19-02							033896	
										9-03-03	

APPROVED:
DATE: 29 Nov 2004 DISTRICT DEPUTY DIRECTOR

APPROVED: _____
DATE: _____ DIRECTOR, DEPARTMENT OF TRANSPORTATION

FEDERAL PROJECT NO.
E040 (443)

PID NO.
19686

CONSTRUCTION PROJECT NO.

RAILROAD INVOLVEMENT

NONE

LAK-84-18.88

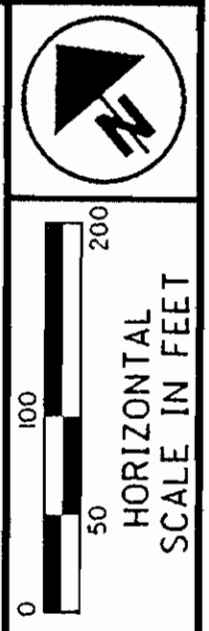
CENTERLINE REFERENCE									
ODOT REF.	STATE PLANE GRID COORDINATES (METRIC)		GROUND COORDINATES		STATION	OFFSET	SIDE	ELEV.	DESCRIPTION
	NORTH	EAST	NORTH	EAST					
C.P. #12	228774.454150	705663.322551	750591.653300	2315227.903900	7+95.79	23.86	RT.	653.58	EXIST. CONTROL POINT (P.K. NAIL SET)
C.P. #7	228753.968885	705768.823646	750524.442700	2315574.045000	11+53.60	13.40	RT.	630.11	EXIST. CONTROL POINT (5/8" REBAR W/REF. CAP)
C.P. #6	228698.772305	705818.712942	750343.346900	2315737.728000	13+99.38	90.76	RT.	618.41	EXIST. CONTROL POINT (5/8" REBAR W/REF. CAP)
C.P. #10	228560.664239	705990.952731	749890.224800	2316302.833700	21+40.29	10.07	RT.	622.11	EXIST. CONTROL POINT (P.K. NAIL SET)
C.P. #4	228507.477824	706022.041531	749715.724200	2316404.833700	23+40.94	16.26	LT.	632.52	EXIST. CONTROL POINT (5/8" REBAR W/REF. CAP)
645	228411.222782	706050.051169	749399.918700	2316496.731200	26+33.99	0.08	LT.	651.65	EXIST. MONUMENT BOX
2036	228779.804563	705574.095346	750609.207600	2314935.156200	5+00.28	45.85	RT.	676.01	EXIST. MONUMENT BOX
2140	228411.256462	706061.166452	749400.029200	2316533.199600	26+45.79	34.59	LT.	657.01	EXIST. CONCRETE MONUMENT BOX
2141	228372.089114	706081.313488	749271.524100	2316599.300500	27+98.38	39.97	LT.	661.82	EXIST. CONCRETE MONUMENT BOX
PROP. P.C.	228776.461850	705701.108033	750598.240414	2315351.875204	9+17.62	0.00			PROP. CENTERLINE CONSTRUCTION REFERENCE
PROP. P.T.	228710.825072	705847.965222	750382.891116	2315833.702515	14+52.34	0.00			PROP. CENTERLINE CONSTRUCTION REFERENCE
PROP. P.C.	228645.305885	705925.706907	750167.927627	2316088.767096	17+85.91	0.00			PROP. CENTERLINE CONSTRUCTION REFERENCE
PROP. P.T.	228517.713932	706013.266620	749749.308095	2316376.043880	22+99.80	0.00			PROP. CENTERLINE CONSTRUCTION REFERENCE

PROJECT ADJUSTMENT FACTOR (PAF)

THE PROJECT (SURFACE LEVEL) ADJUSTED OHIO STATE PLANE COORDINATE VALUES ARE RELATIVE TO NAD 83(1995) OHIO STATE PLANE GRID DATUM BY A PROJECT ADJUSTMENT FACTOR (PAF). THE (PAF) IS 3.280924245. THE FACTOR WAS DERIVED FROM A GPS SURVEY MADE IN 1999.

TO OBTAIN PROJECT GROUND COORDINATES FROM STATE PLANE GRID COORDINATES (METRIC), MULTIPLY EACH NORTHING AND EASTING BY THE PAF.

TO OBTAIN STATE PLANE GRID COORDINATES (METRIC) FROM PROJECT GROUND COORDINATES, DIVIDE EACH NORTHING AND EASTING BY THE PAF.



LEGEND

EX. WETLANDS

CURVE DATA
@ R/W S.R. 84

P.I. Sta = 21+56.92
 $\Delta = 30^\circ 50' 00''$ (RT)
 $Dc = 7^\circ 59' 37''$
 $R = 716.78'$
 $T = 197.66'$
 $L = 385.73'$
 $E = 26.75'$
 $EX. eMAX = 0.0125\pm$

CURVE DATA
@ R/W S.R. 84

P.I. Sta = 29+02.04
 $\Delta = 39^\circ 16' 31''$ (LT)
 $Dc = 7^\circ 59' 37''$
 $R = 716.78'$
 $T = 255.76'$
 $L = 491.34'$
 $E = 44.26'$
 $EX. eMAX = 0.0125\pm$

CURVE DATA
@ R/W S.R. 84

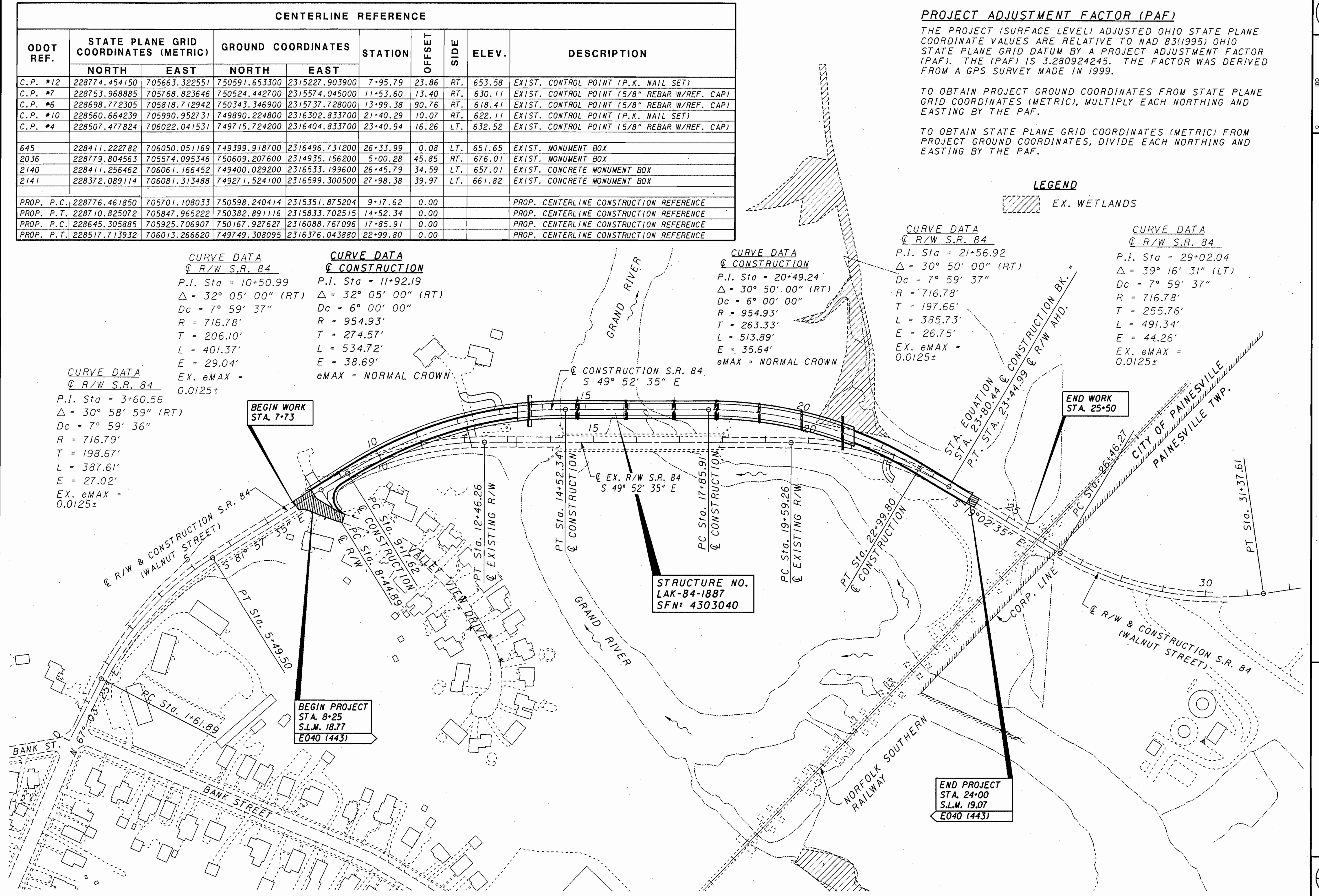
P.I. Sta = 10+50.99
 $\Delta = 32^\circ 05' 00''$ (RT)
 $Dc = 7^\circ 59' 37''$
 $R = 716.78'$
 $T = 206.10'$
 $L = 401.37'$
 $E = 29.04'$
 $EX. eMAX = 0.0125\pm$

CURVE DATA
@ CONSTRUCTION

P.I. Sta = 11+92.19
 $\Delta = 32^\circ 05' 00''$ (RT)
 $Dc = 6^\circ 00' 00''$
 $R = 954.93'$
 $T = 274.57'$
 $L = 534.72'$
 $E = 38.69'$
 $eMAX = NORMAL CROWN$

CURVE DATA
@ R/W S.R. 84

P.I. Sta = 3+60.56
 $\Delta = 30^\circ 58' 59''$ (RT)
 $Dc = 7^\circ 59' 36''$
 $R = 716.79'$
 $T = 198.67'$
 $L = 387.61'$
 $E = 27.02'$
 $EX. eMAX = 0.0125\pm$



BEGIN WORK
STA. 7+73

BEGIN PROJECT
STA. 8+25
S.L.M. 18.77
E040 (443)

STRUCTURE NO.
LAK-84-1887
SFN: 4303040

END WORK
STA. 25+50

END PROJECT
STA. 24+00
S.L.M. 19.07
E040 (443)

SCHEMATIC PLAN

LAK-84-18.88

B.M. #1 CHISELED SQUARE IN S.W. CORNER OF ABUTMENT STA. 14+29±, 97'± RT. ELEV. 619.38

CURVE DATA
 @ EXISTING R/W
 P.I. Sta - 10+50.99
 Δ = 32°05'01" (RT)
 Dc = 7° 59' 37"
 R = 716.78'
 T = 206.10'
 L = 401.37'
 E = 29.04'
 EX. @MAX. = 0.0125±

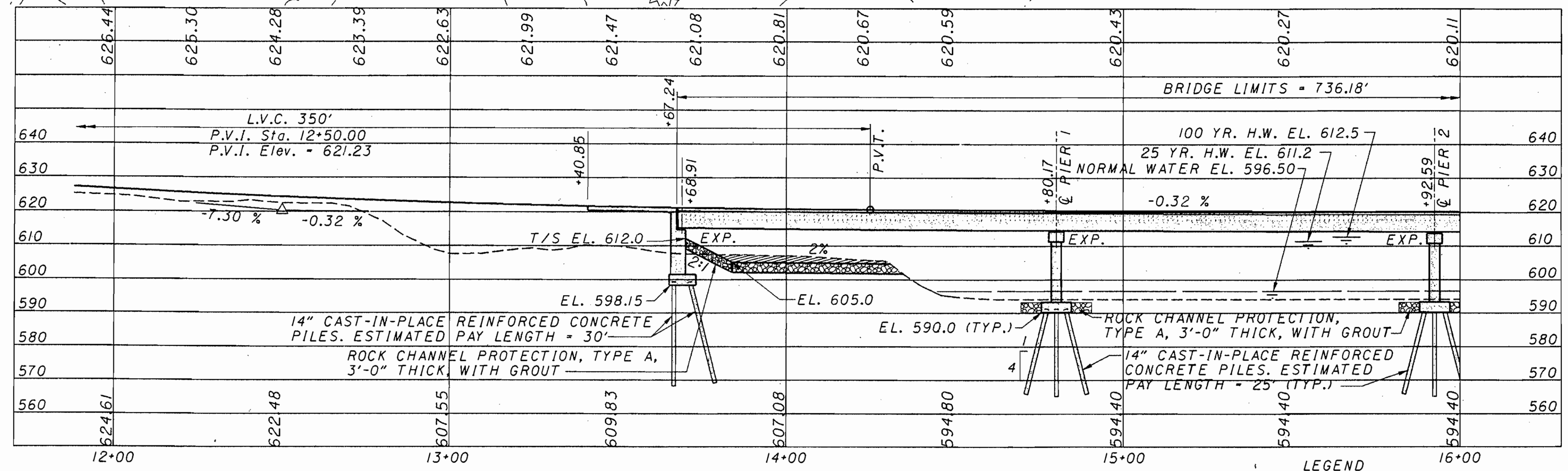
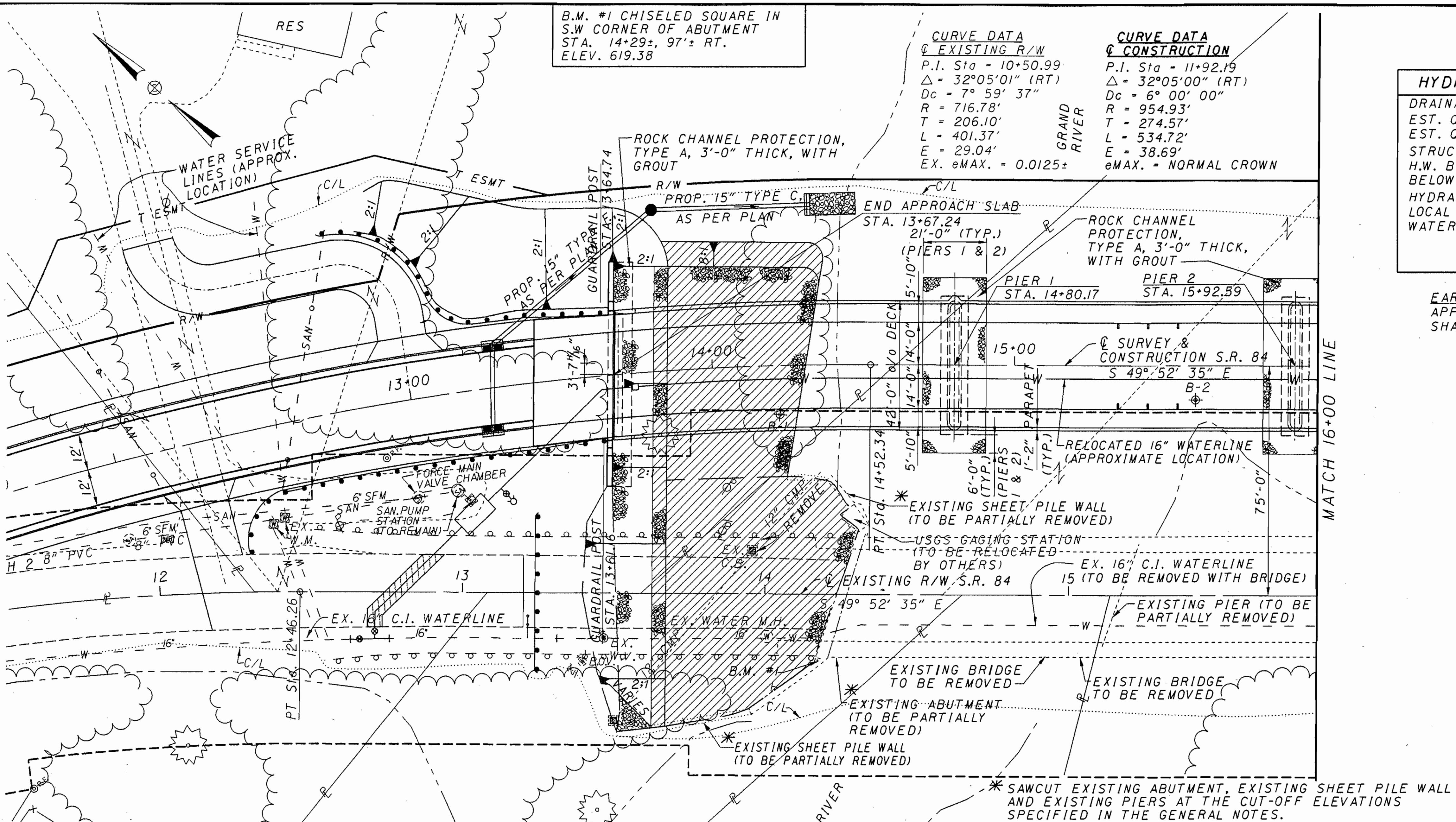
CURVE DATA
 @ CONSTRUCTION
 P.I. Sta - 11+92.19
 Δ = 32°05'00" (RT)
 Dc = 6° 00' 00"
 R = 954.93'
 T = 274.57'
 L = 534.72'
 E = 38.69'
 @MAX. = NORMAL CROWN

HYDRAULICS INFORMATION
 DRAINAGE AREA = 693 SQ. MI.
 EST. Q 25 = 23,530 cfs; V 25 = 3.1 fps
 EST. Q 100 = 30,000 cfs; V 100 = 3.5 fps
 STRUCTURE CLEARS THE EST. 25 YEAR H.W. BY 2.4'; THE EST. 100 YEAR H.W. IS 1.1' BELOW THE BOTTOM OF THE BEAM.
 HYDRAULIC INFORMATION SHOWN IS BASED ON LOCAL CHANNEL CALCULATIONS. FEMA HIGH WATER ELEVATIONS ARE : 100 YEAR - 615.4
 500 YEAR - 617.2

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.

EXISTING STRUCTURE
 TYPE: CONCRETE DECK AND SIDEWALKS WITH STEEL RAILING ON FOUR SIMPLE STEEL GIRDER SPANS. WALL TYPE REINFORCED CONCRETE ABUTMENTS AND PIERS ON TIMBER PILES
 SPANS: 4 EACH @ 90'-0"± C/C BEARINGS
 ROADWAY: 30'± F/F CURB
 LOADING: CF 130 (PER 1965 REHAB PLANS)
 SKEW: 20°02'± LF
 ALIGNMENT: TANGENT
 CONDITION: MARGINAL
 YEAR BUILT: 1930
 STRUCTURE FILE NO: 4303032
 DISPOSITION: REMOVED

PROPOSED STRUCTURE
 TYPE: COMPOSITE REINFORCED CONCRETE DECK, ON PRESTRESSED CONCRETE I-BEAMS WITH REINFORCED CONCRETE WALL TYPE PIERS ON PILE FOOTINGS & DRILLED SHAFT FOOTINGS AND STUB ABUTMENTS.
 SPANS: 110'-0"; 110'-0"; 110'-0"; 97'-0"; 97'-0"; 97'-0"; 97'-0" CHORD LINE BETWEEN C/C BEARINGS (SEE STRUCTURE LAYOUT PLAN FOR ALL DIMENSIONS)
 ROADWAY: 28'-0" F/F OF CURB + 6'-0" SIDEWALK BOTH SIDES
 LOADING: HS 25, THE ALTERNATE MILITARY LOADING AND 60 PSF FUTURE WEARING SURFACE
 SKEW: 0°00' TO REFERENCE LINE
 ALIGNMENT: 6° CURVE; TANGENT; 6° CURVE
 WEARING SURFACE: MONOLITHIC CONCRETE
 APPROACH SLABS: AS-I-81 (25'-0" LONG)
 LATITUDE: 41°43'10" N
 LONGITUDE: 81°13'40" W
 CROWN RATE: 0.0156
 HYDRAULIC DESIGN YEAR FREQUENCY: 25 YEARS
 CURRENT AVERAGE DAILY TRAFFIC: 10,600
 DESIGN AVERAGE DAILY TRAFFIC: 14,000 (2025)
 DESIGN AVERAGE DAILY TRUCK TRAFFIC: 140 (2025)



PROFILE ALONG CENTERLINE CONSTRUCTION

LEGEND
 CHANNEL EXCAVATION

FOUNDATION INVESTIGATION LEGEND
 ⊕ - INDICATES BORING LOCATION

DATE: 7/29/02
 REVIEWED: DT
 DRAWN: RB
 DESIGNED: ALP
 CHECKED: BLN
 LAK COUNTY
 STA. 13+67.24
 STA. 21+03.42
 SITE PLAN - 1
 BRIDGE NO. LAK-84-1887
 OVER THE GRAND RIVER
 LAK-84-18.88
 1/48
 92
 146

196865PA.DGN 11/19/04 CEO,JLS,TWH,HNS,KJ,RC

DATE	7/29/02
REVIEWED BY	ALP
DESIGNED BY	ALP
STRUCTURE FILE NUMBER	4303040
REVISION	BLN
CHECKED BY	BLN

COUNTY	LAKE
STATION	13+67.24
PROJECT	STA. 21+03.42

SITE PLAN - 2
 BRIDGE NO. LAK-84-1887
 OVER THE GRAND RIVER

LAK-84-18.88

B.M. #2 CHISELED SQUARE IN S.E. CORNER OF ABUTMENT STA. 18+20±, 55±RT. ELEV. 619.23

CURVE DATA @ CONSTRUCTION

P.I. Sta = 20+49.24
 Δ = 30° 50' 00" (RT)
 Dc = 6° 00' 00"
 R = 954.93'
 T = 263.33'
 L = 513.89'
 E = 35.64'
 eMAX. = NORMAL CROWN

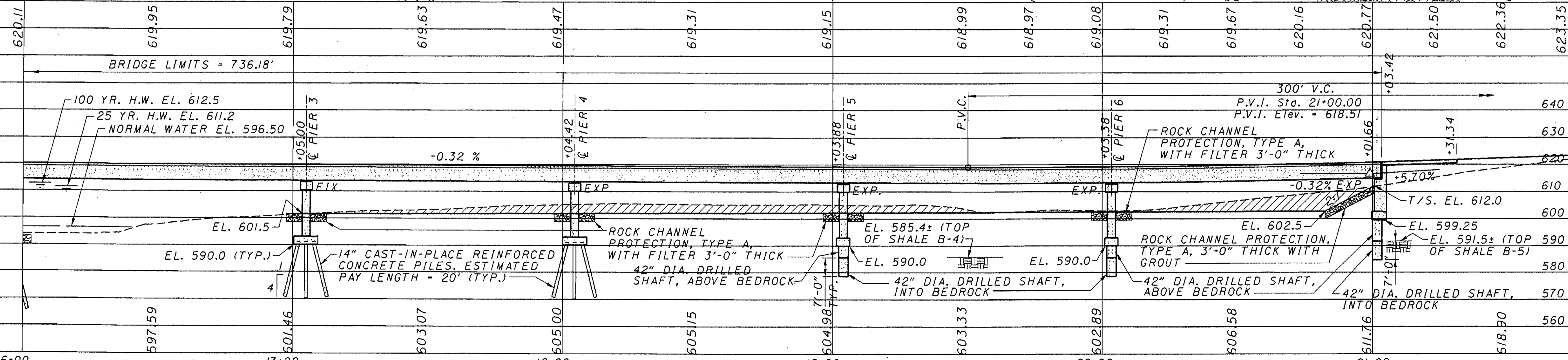
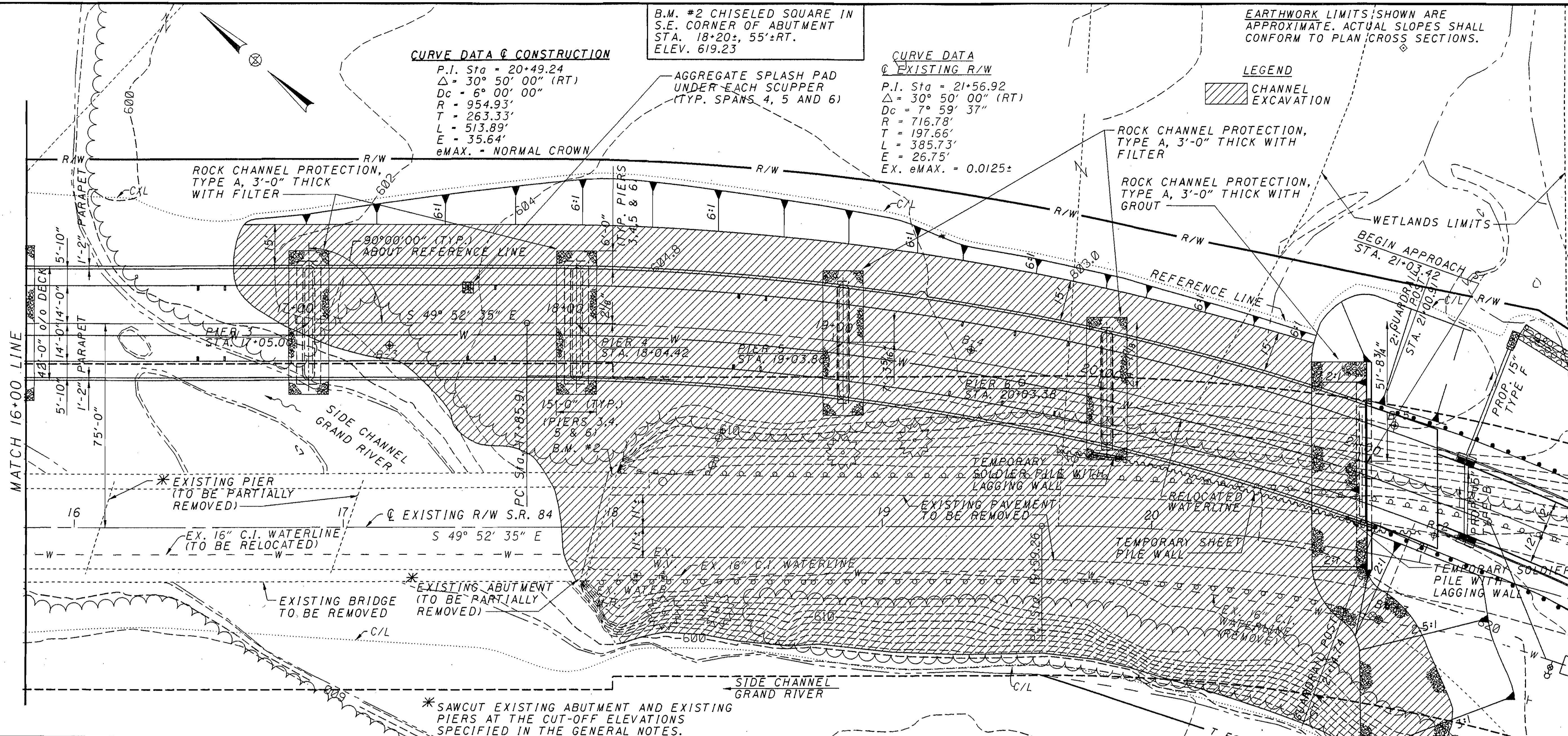
CURVE DATA @ EXISTING R/W

P.I. Sta = 21+56.92
 Δ = 30° 50' 00" (RT)
 Dc = 7° 59' 37"
 R = 716.78'
 T = 197.66'
 L = 385.73'
 E = 26.75'
 EX. eMAX. = 0.0125±

LEGEND

▨ CHANNEL EXCAVATION

EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS SECTIONS.



PROFILE ALONG CENTERLINE CONSTRUCTION

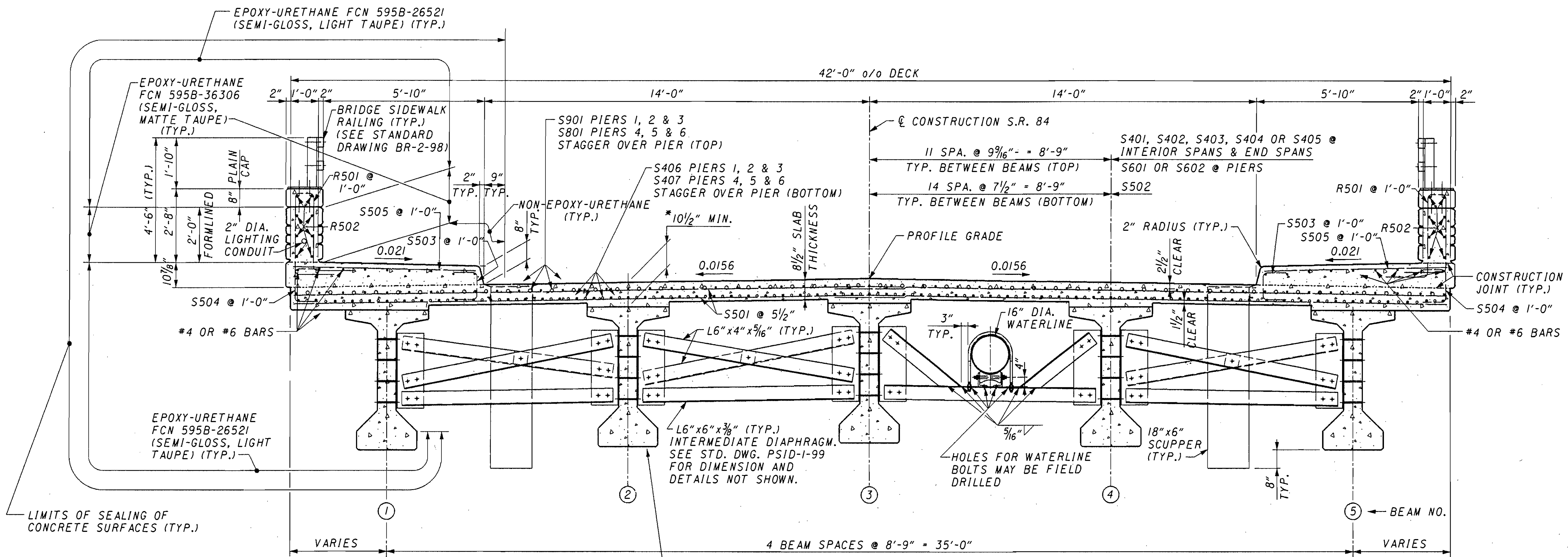
NOTES:

FOR AGGREGATE SPLASH PAD DETAILS: SEE SHEET 17 OF 146

FOR TEMPORARY SHORING DETAILS: SEE SHEET 16 OF 148

FOUNDATION INVESTIGATION LEGEND

⊙ - INDICATES BORING LOCATION



TRANSVERSE SECTION

MODIFIED AASHTO TYPE 4
(60") PRESTRESSED
CONCRETE I-BEAM (TYP.)

NOTES

* **DECK SLAB DEPTH:** THIS IS THE NOMINAL DIMENSION. THE PAY QUANTITY OF THAT PORTION OF THE DECK CONCRETE OVER THE BEAMS SHALL BE BASED ON THE AVERAGE OF THIS DIMENSION AND THE DEPTH AT BEAM BEARINGS EVEN THOUGH DEVIATION FROM THIS AVERAGE MAY OCCUR BECAUSE THE TOP OF THE BEAM MAY NOT HAVE THE CAMBER ANTICIPATED IN THE DESIGN. THE CAMBER OF BEAMS SHALL BE MEASURED IN THE FIELD BEFORE THE DECK IS PLACED. THE ACTUAL DEPTH AT MID-SPAN SHALL BE THE NOMINAL DIMENSION PLUS OR MINUS THE DIFFERENCE BETWEEN ACTUAL AND ANTICIPATED CAMBER. SEE CAMBER DIAGRAMS SHEET [28/48].

REINFORCING STEEL SPLICE LENGTHS SHALL BE 2'-0" FOR #4 BARS, 2'-6" FOR #5 BARS, 3'-0" FOR #6 BARS, 6'-3" FOR #8 BARS AND 7'-8" FOR #9 BARS.

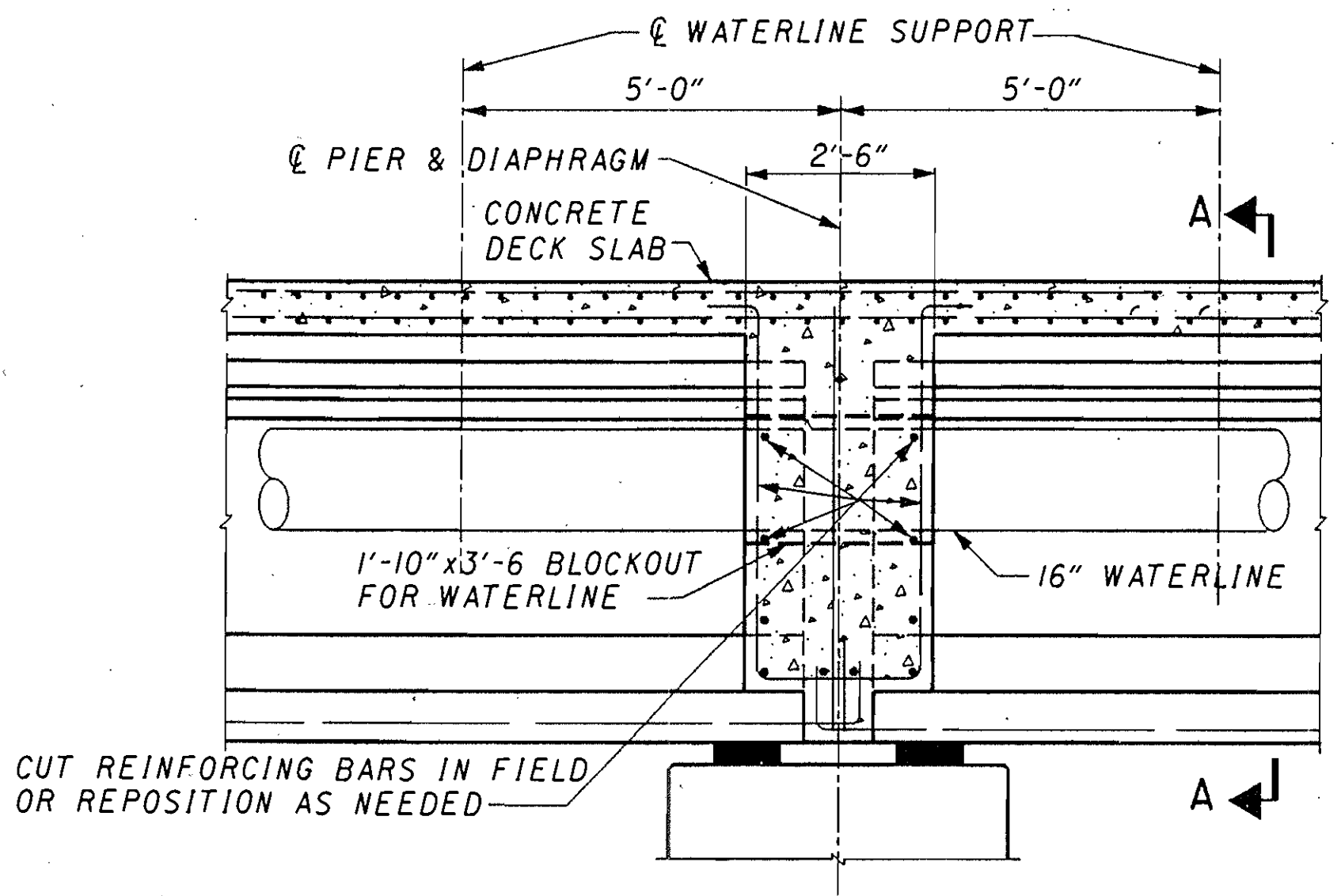
PRESTRESSED CONCRETE I-BEAM DETAILS: SEE SHEETS [22/48] TO [27/48].

SCUPPER DETAILS: SEE SHEET [43/48].

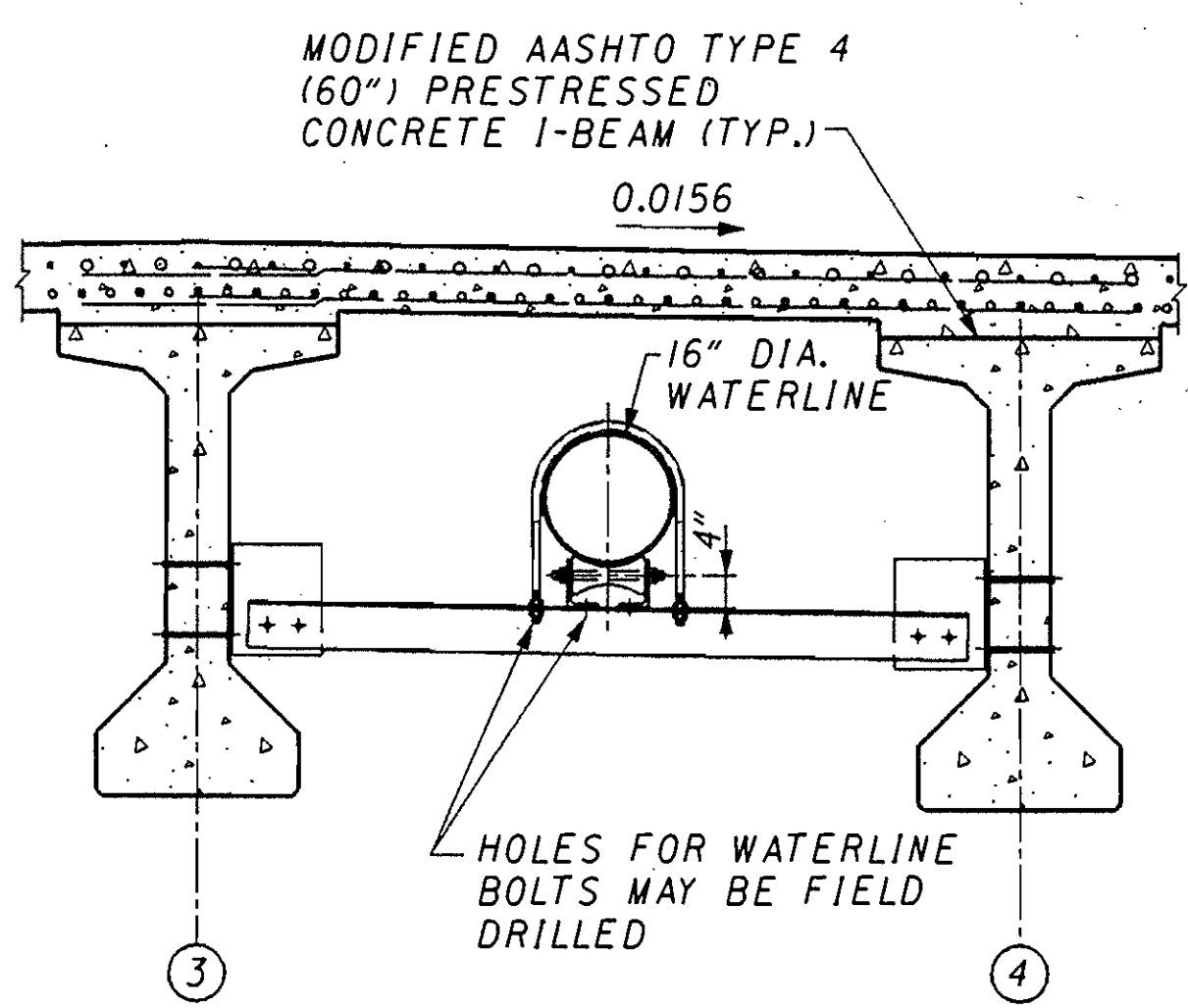
BRIDGE RAILING: FOR ADDITIONAL DETAILS SEE STANDARD DRAWING BR-2-98.

PRESTRESSED CONCRETE I-BEAM DETAILS: SEE STANDARD DRAWING PSID-I-99.

CONCRETE COVER MEASURED FROM THE STRUCTURAL SURFACE SHALL BE 2 1/2" FOR THE ROADWAY FACE, TOP OF PARAPET AND TOP OF SIDEWALK SURFACE. CONCRETE COVER MEASURED FROM THE STRUCTURAL SURFACE SHALL BE 1 1/2" FOR THE OUTSIDE FACE OF THE PARAPET.



SECTION THRU DIAPHRAGM
AT PIERS

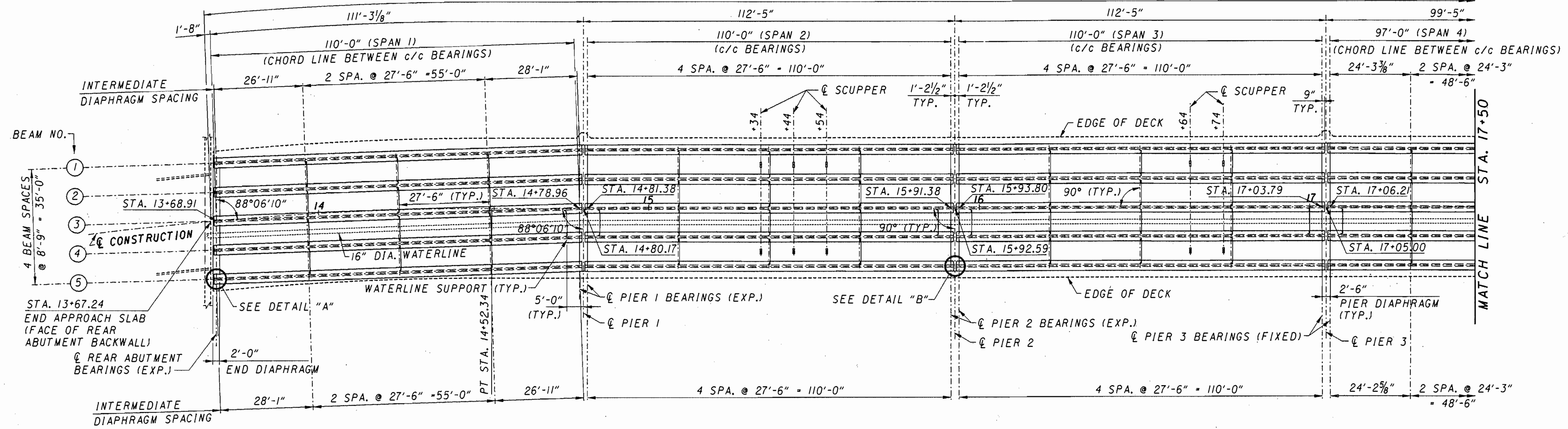


SECTION A-A

WATERLINE SUPPORT DETAIL

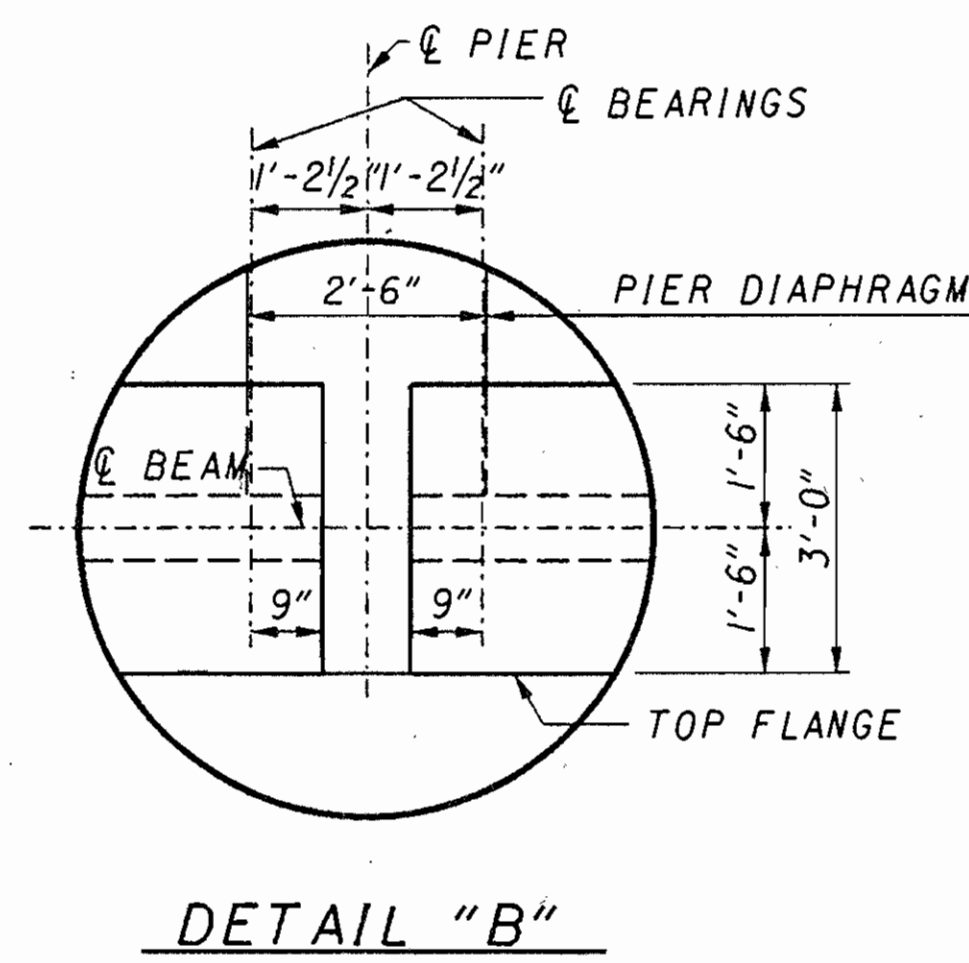
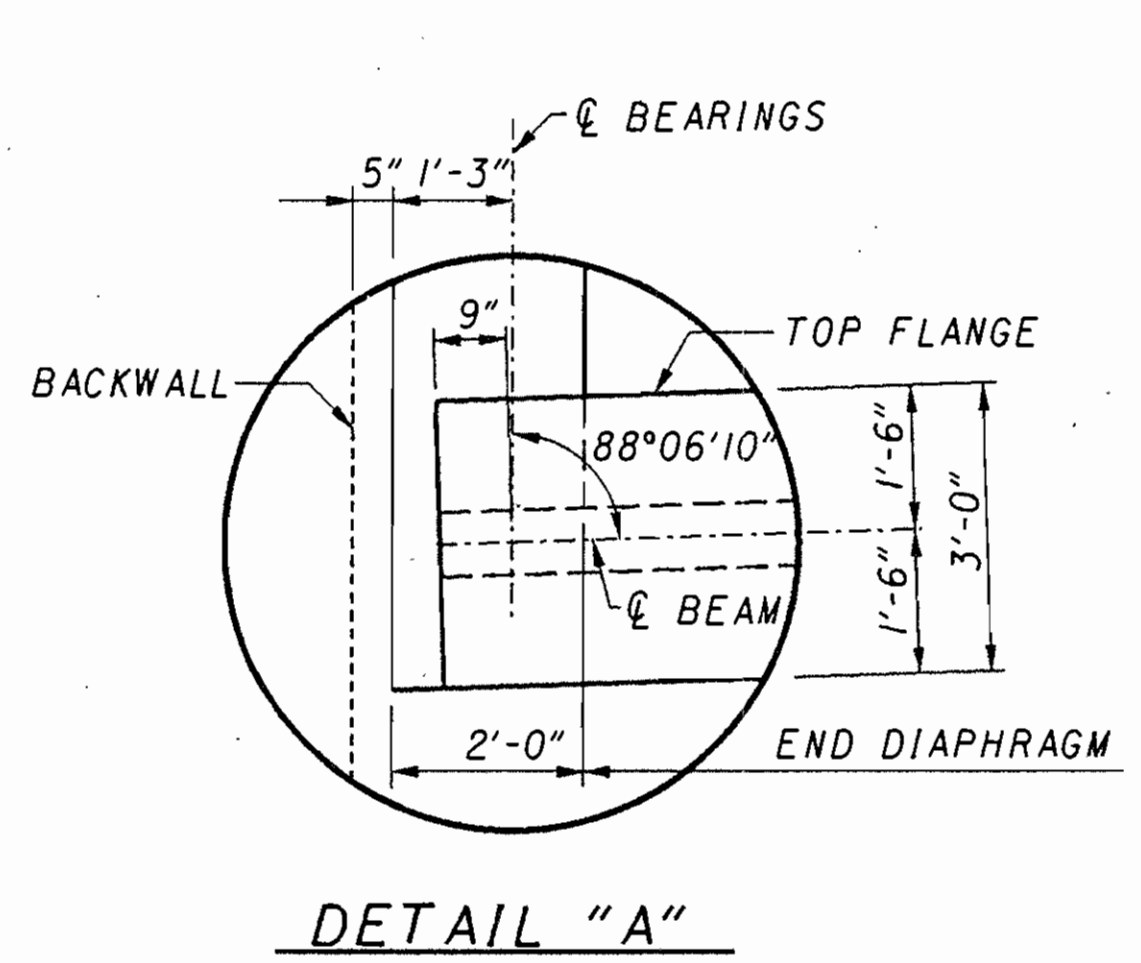
99102TRA.DGN 11/19/04 KH,TWH,HN,SJK,RC

BRIDGE LIMITS = 736.18' (MEASURED ALONG ϕ CONSTRUCTION)



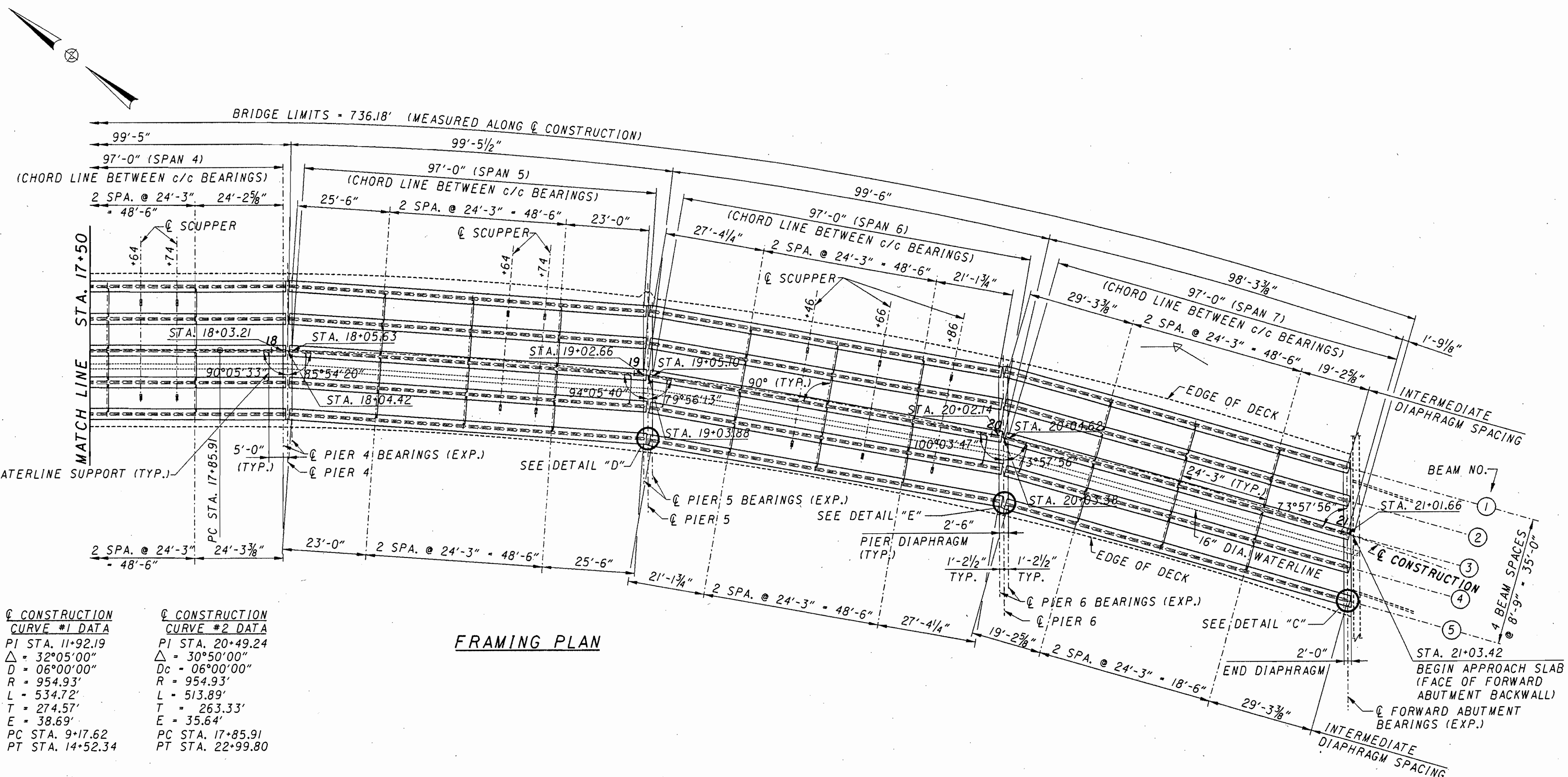
FRAMING PLAN

ϕ CONSTRUCTION CURVE #1 DATA	ϕ CONSTRUCTION CURVE #2 DATA
PI STA. 11+92.19	PI STA. 20+49.24
$\Delta = 32^{\circ}05'00''$	$\Delta = 30^{\circ}50'00''$
$D = 06^{\circ}00'00''$	$D_c = 06^{\circ}00'00''$
$R = 954.93'$	$R = 954.93'$
$L = 534.72'$	$L = 513.89'$
$T = 274.57'$	$T = 263.33'$
$E = 38.69'$	$E = 35.64'$
PC STA. 9+17.62	PC STA. 17+85.91
PT STA. 14+52.34	PT STA. 22+99.80



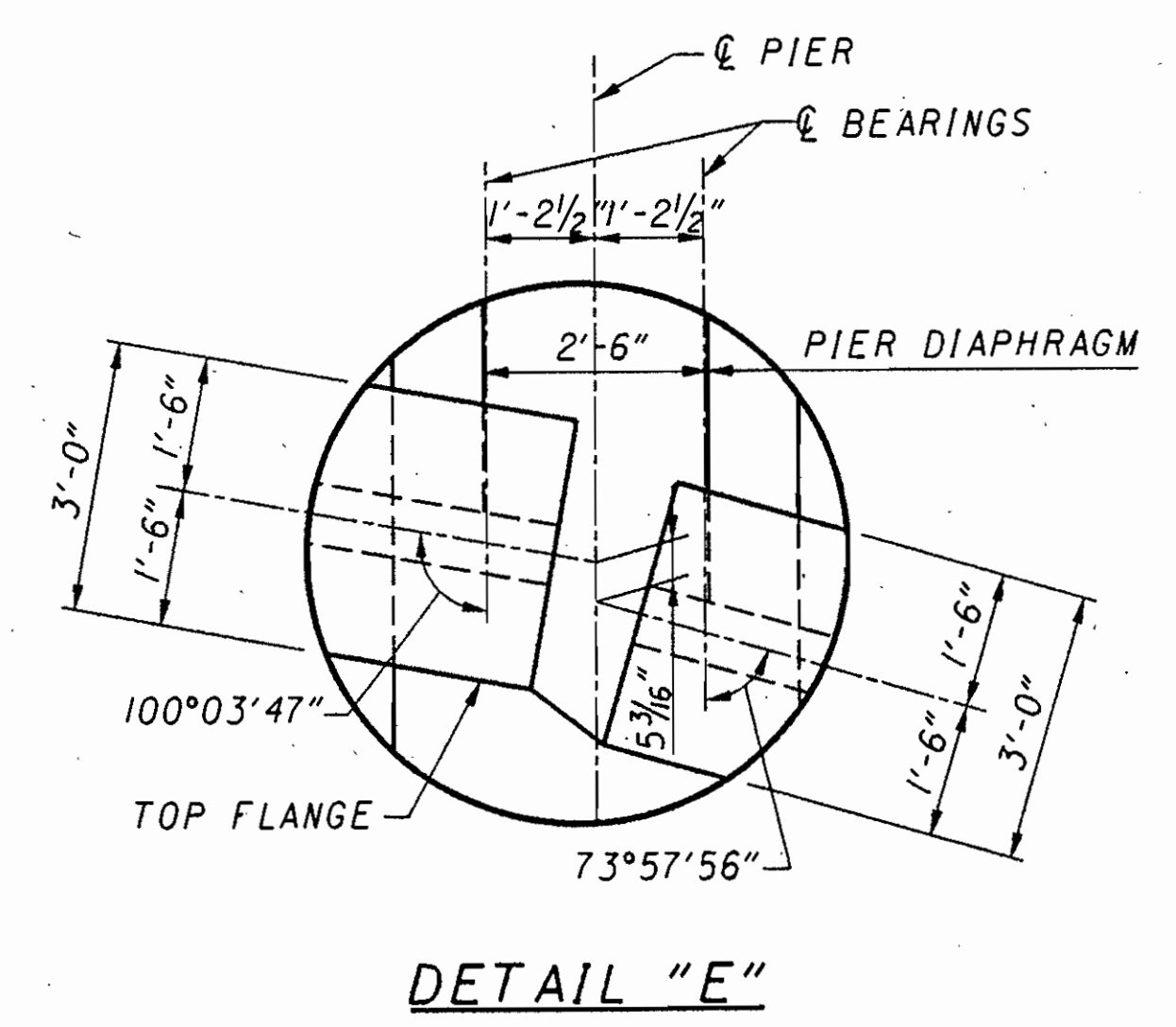
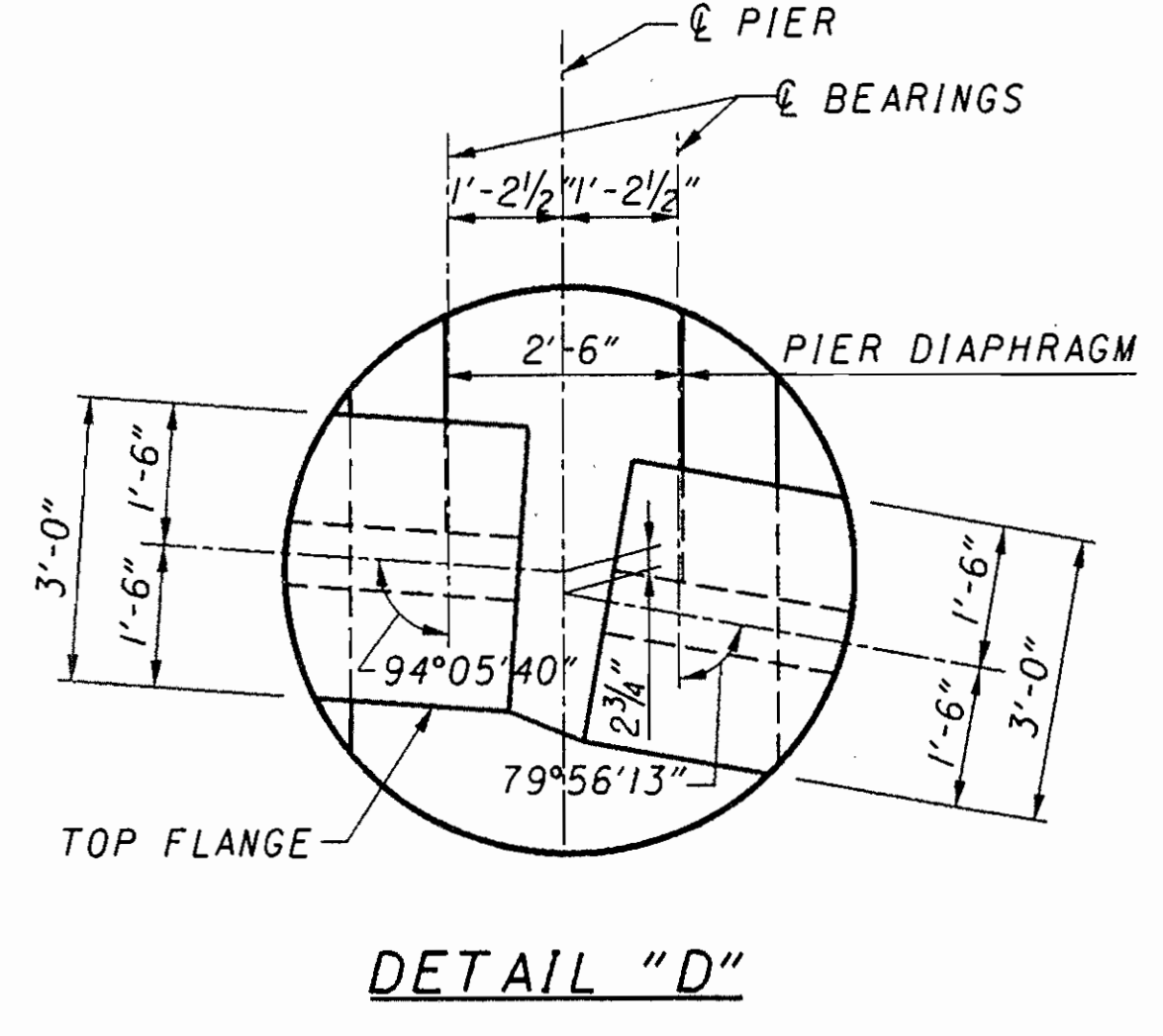
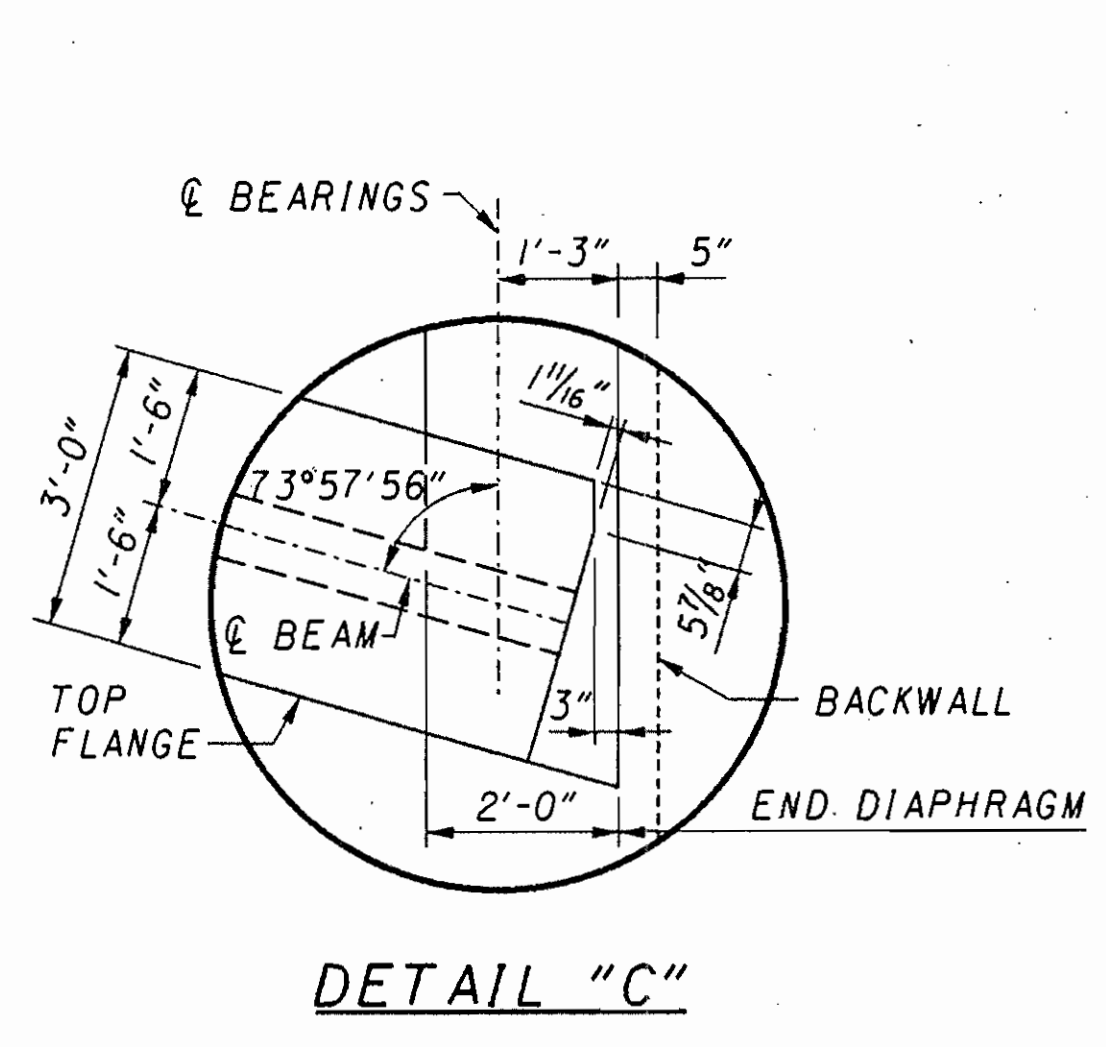
NOTES

- TRANSVERSE SECTION: SEE SHEET 19/48.
- SCUPPER DETAILS: SEE SHEET 43/48.
- WATERLINE DETAILS: SEE SHEETS 79 TO 91 OF 146



CONSTRUCTION CURVE #1 DATA	CONSTRUCTION CURVE #2 DATA
PI STA. 11+92.19	PI STA. 20+49.24
Δ = 32°05'00"	Δ = 30°50'00"
D = 06°00'00"	Dc = 06°00'00"
R = 954.93'	R = 954.93'
L = 534.72'	L = 513.89'
T = 274.57'	T = 263.33'
E = 38.69'	E = 35.64'
PC STA. 9+17.62	PC STA. 17+85.91
PT STA. 14+52.34	PT STA. 22+99.80

FRAMING PLAN



NOTES
 ADDITIONAL NOTES: SEE SHEET 20/48

99102FP.DGN 11/19/04 JLS.TWH.KH.HN.RC

RICHLAND ENGINEERING LIMITED
 29 NORTH PARK STREET
 MANSFIELD, OHIO 44902

DATE 7/29/02
 DRAWN BY KH
 DESIGNED BY ALP
 CHECKED BY BLN
 REVISION FILE NUMBER 4303040

FRAMING PLAN - 2
 BRIDGE NO. LAK-84-1887
 OVER THE GRAND RIVER

LAK-84-18.88

21 / 48

112
146