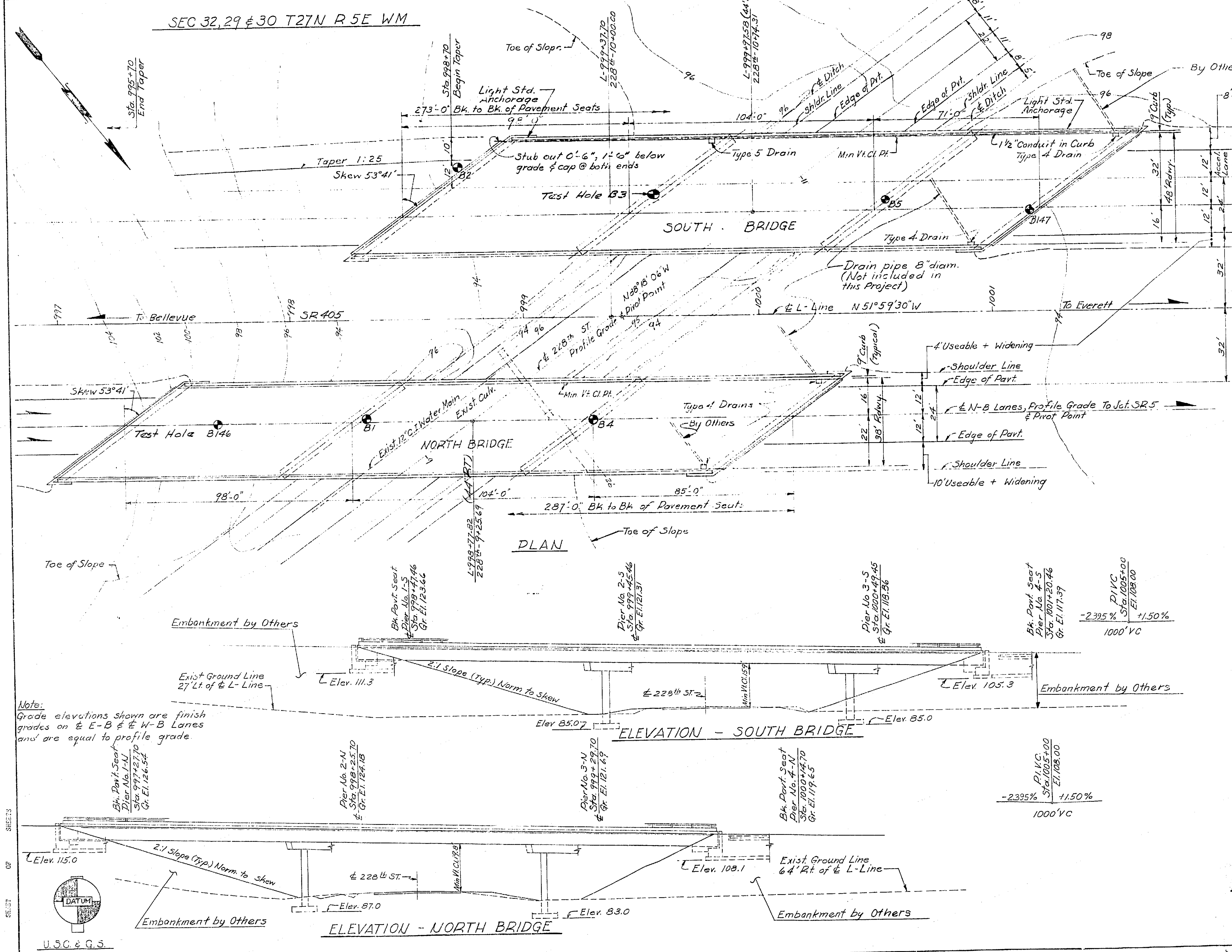
REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
8	WASH	I-405-3(294)178 UNIT 1	10 of 26



GENERAL NOTES

All material and work shall be in accordance with requirements of the State of Washington, Dept. of Highways, Standard Specifications for Road & Bridge Construction, dated 1963 and Amendment No. 1, dated Jan. 1966.

Footing elevations are subject to change depending upon foundation material encountered. Reinforcing steel for footings and columns shall not be cut until final footing elevations have been determined in the field.

The concrete in the footings of all piers and the walls of Piers No. 1 & 4 except as shown in the plans shall be Class "B" mix. All other poured in place concrete shall be class AX mix.

The roadway slab shall be placed in one continuous pour after the falsework for piers No 2 & 3 has been removed. Falsework shall be carefully released to prevent impact or undue stress in the structure.

The maximum design soil pressure per square foot is two (2) tons for piers No. 1 & 4 and two and one half (2.5) tons for piers No. 2 & 3.

APPROXIMATE QUANTITIES

	NORTH BRIDGE	SOUTH BRIDGE	
Structure Excavation	900	1000	Cu. Yds.
Steel Reinforcing Bars	50,000	62,000	Pounds
Concrete Class B	221	251	Cu. Yds.
Concrete Class AX	106	126	Cu. Yds.
Superstructure - 228th St. O-Xing - North Bridge	Lump Sum		
Superstructure - 228th St. O-Xing - South Bridge		Lump Sum	
Downspouts		30	Lin. Ft.
Water Reducing Additive	410	500	Dollars

LOADING: HS-20
OR
TWO-24^K AXLES @ 4' CTRS.

SR 405
MP 24.28 TO MP 26.37
NORTH CR. BR. AND 228TH ST. O'XING
KING & SNOHOMISH COUNTIES
228TH ST. OVERCROSSING

LAYOUT

WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS
OLYMPIA, WASHINGTON

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APPROVED: Nov. 22, 1967

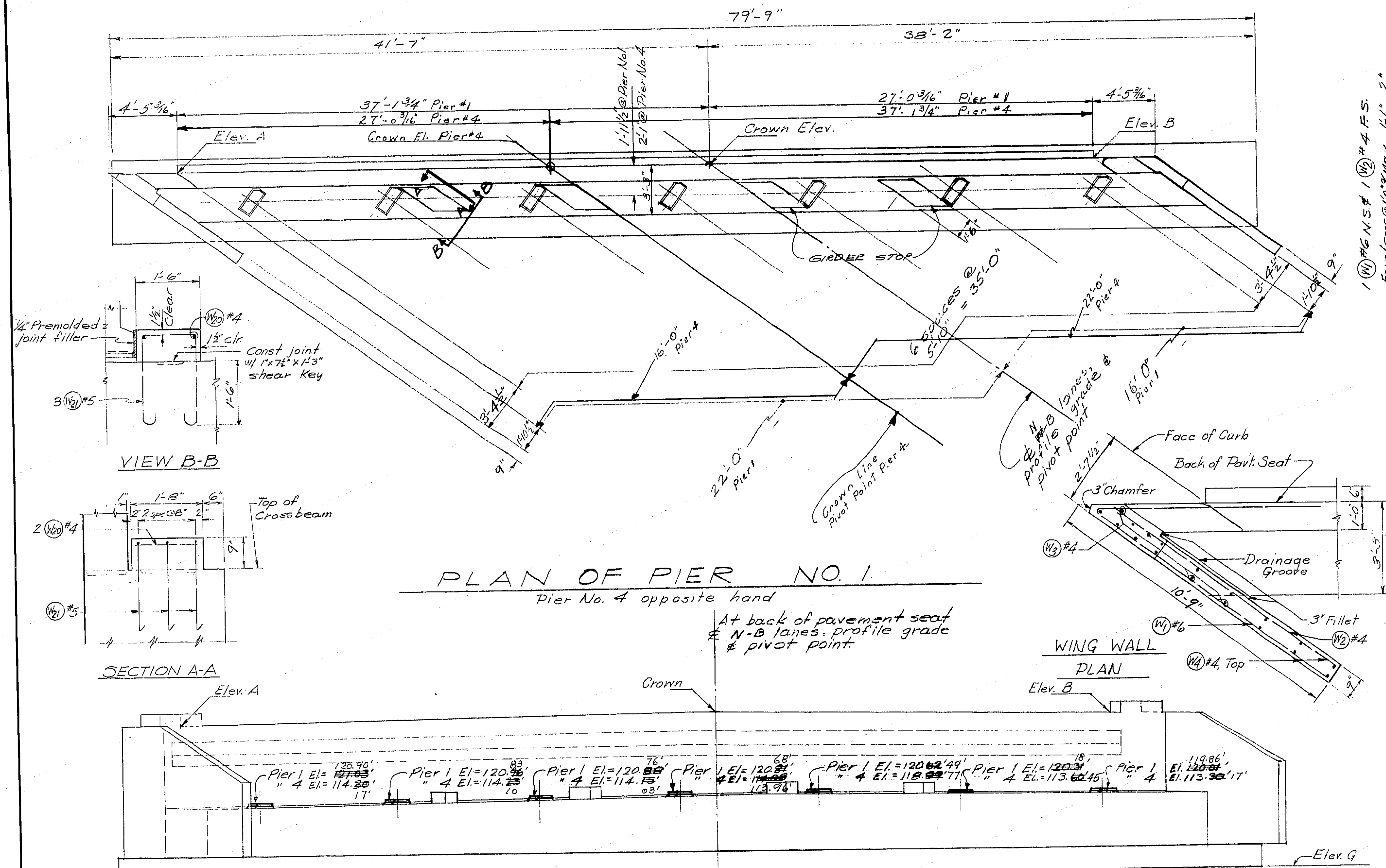
SHEET 10 OF 26 SHEETS

CONTRACT NUMBER 8376

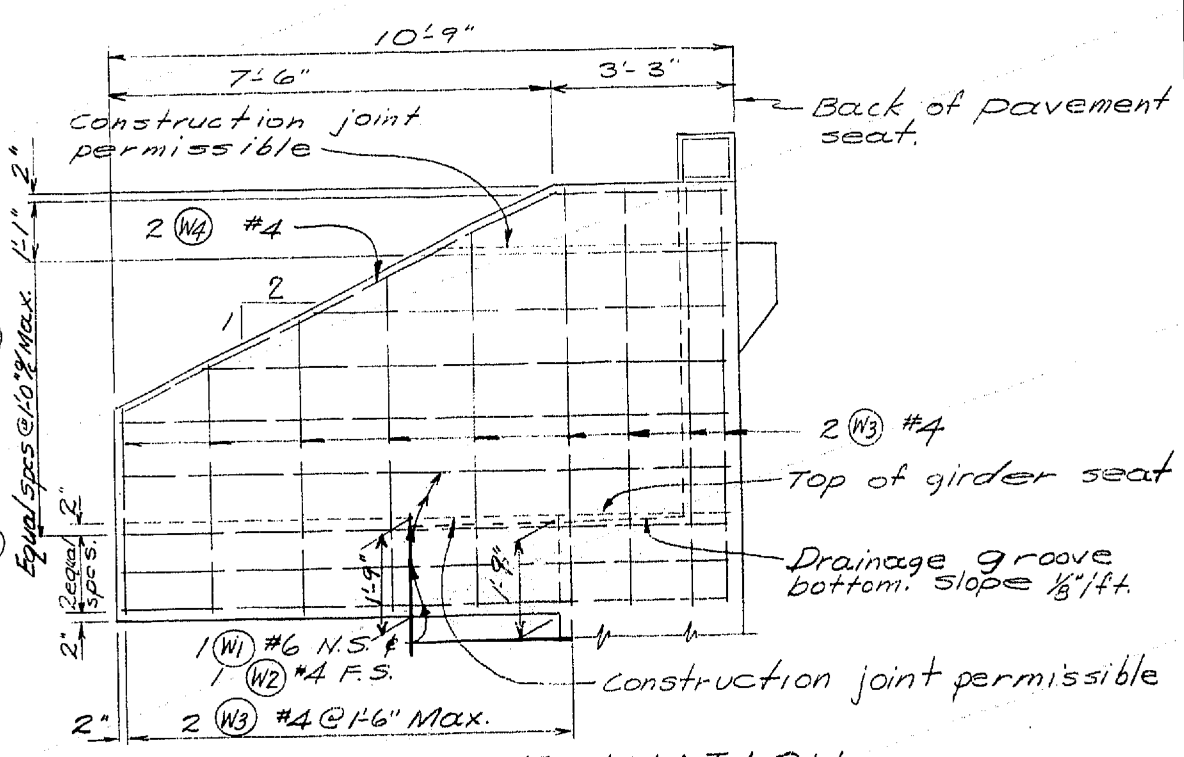
P/1992

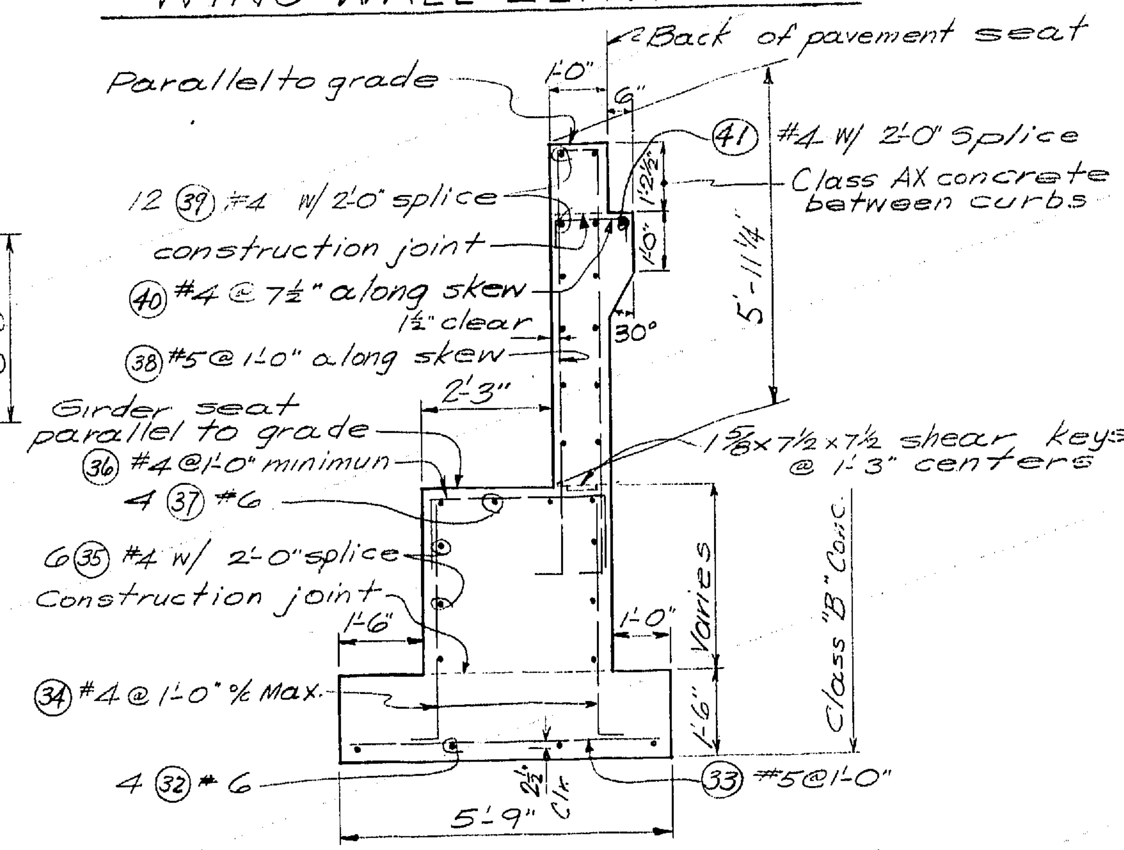
6/34

REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
8	WASH	I-405-3(294)178 UNIT 1	11 of 26



ELEVATION OF PIERS NO. 1 & 4





SECTION THRU PIER

Normal to skew

Location	At back of Pav't. Seat			Footing Elevation G
	Elev. A	Crown	Elev. B	
Pier No. 1	126.82'	126.54'	125.~~70~~ 68'	115.00'
Pier No. 4	119.93'	119.65'	118.83'	108.10'

As Built Changes in Red 1-21-70

SR 405
MP 24.28 TO MP 26.37
NORTH CR. BR. AND 228TH ST. O'XING
KING & SNOHOMISH COUNTIES
228TH ST. OVERCROSSING

PIERS 1 & 4 - NO. BR.

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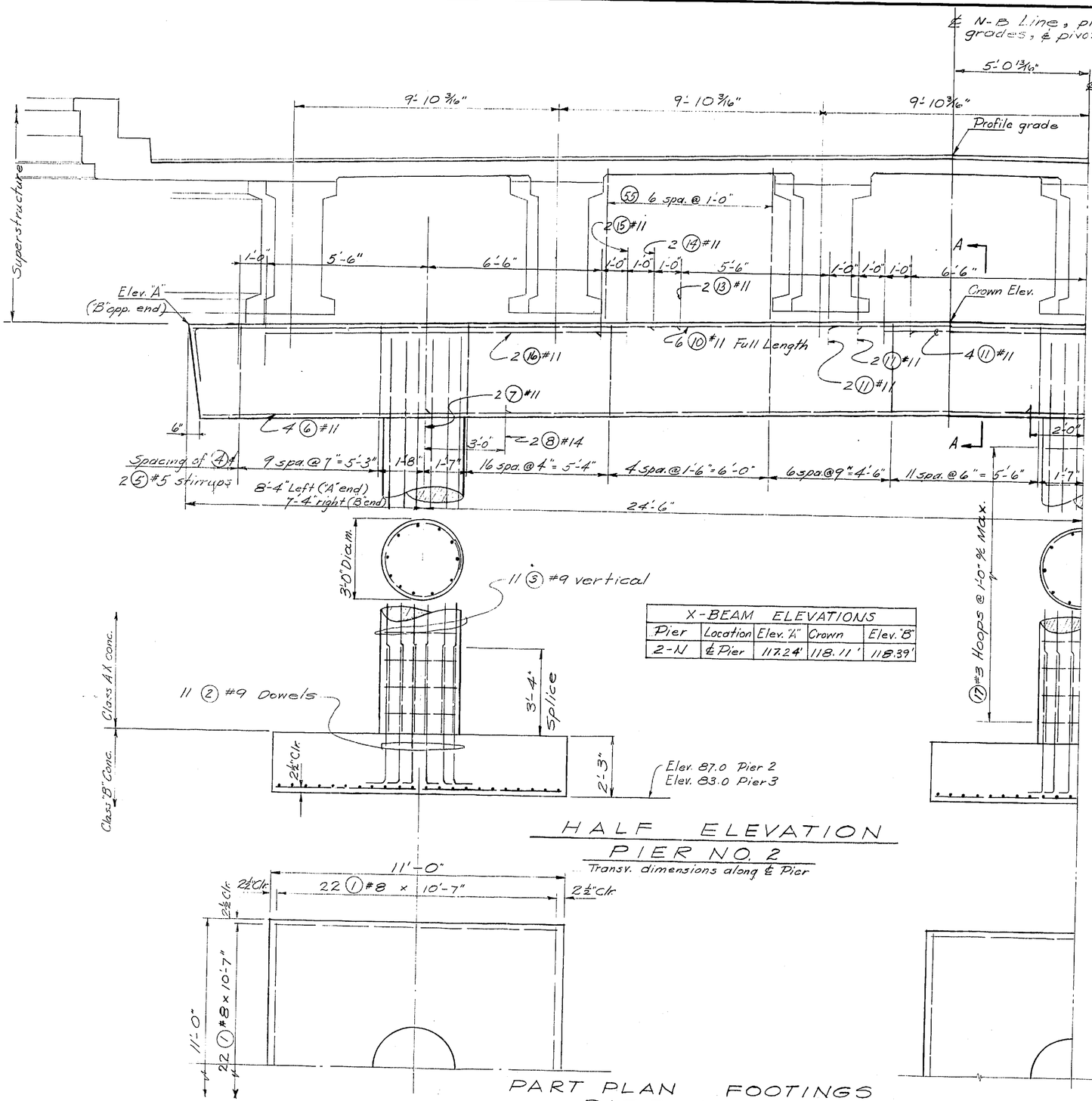
CONT. NO. 8376 (CONTRACT NUMBER) SHEET 11 OF 26 SHEETS
P/1992

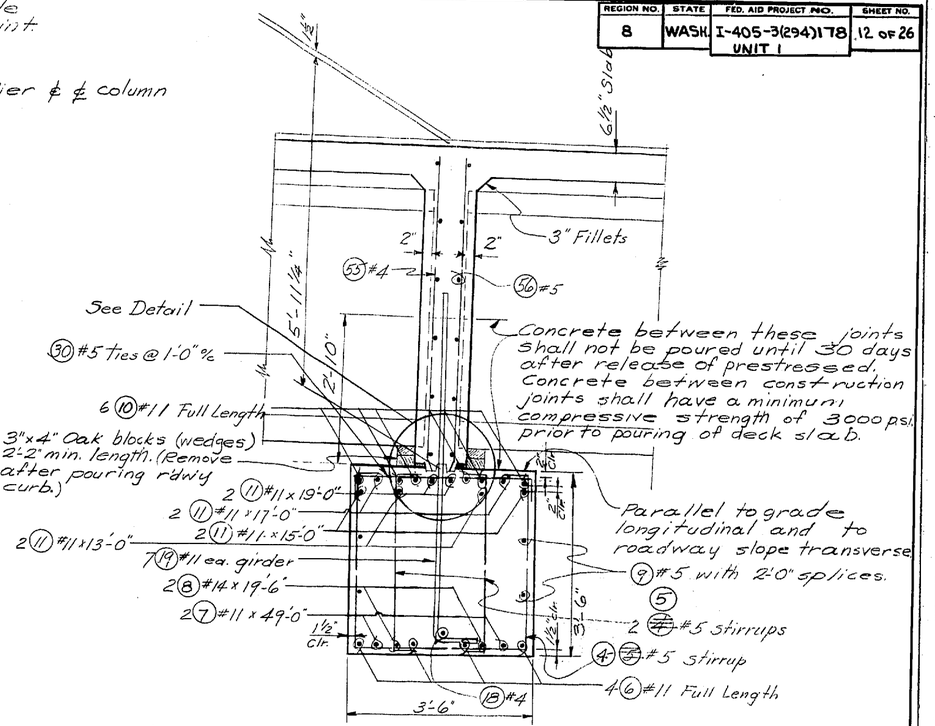
REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
8	WASH.	I-405-3(294)178 UNIT 1	12 OF 26



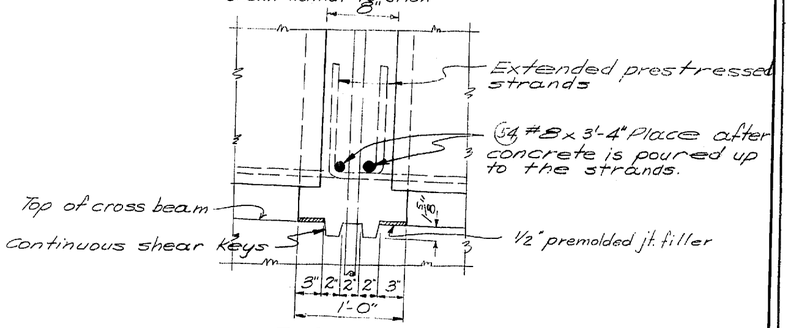
X-BEAM ELEVATIONS				
Pier	Location	Elev. "A"	Crown	Elev. "B"
2-N	℄ Pier	117.24'	118.11'	118.39'

HALF ELEVATION
PIER NO. 2
Transv. dimensions along ℄ Pier

PART PLAN FOOTINGS
PIER NO. 2



SECTION A-A
Shown normal to ℄ skew



DETAIL

SR 405
MP 24.28 TO MP 26.37
NORTH CR. BR. AND 228TH ST. O'XING
KING & SNOHOMISH COUNTIES
228TH ST. OVERCROSSING

PIER NO. 2 - NO. BR.

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SHEET 12 OF 26 SHEETS

CONTRACT NUMBER 8375

As Built Changes in Red 1-21-70

P/1992

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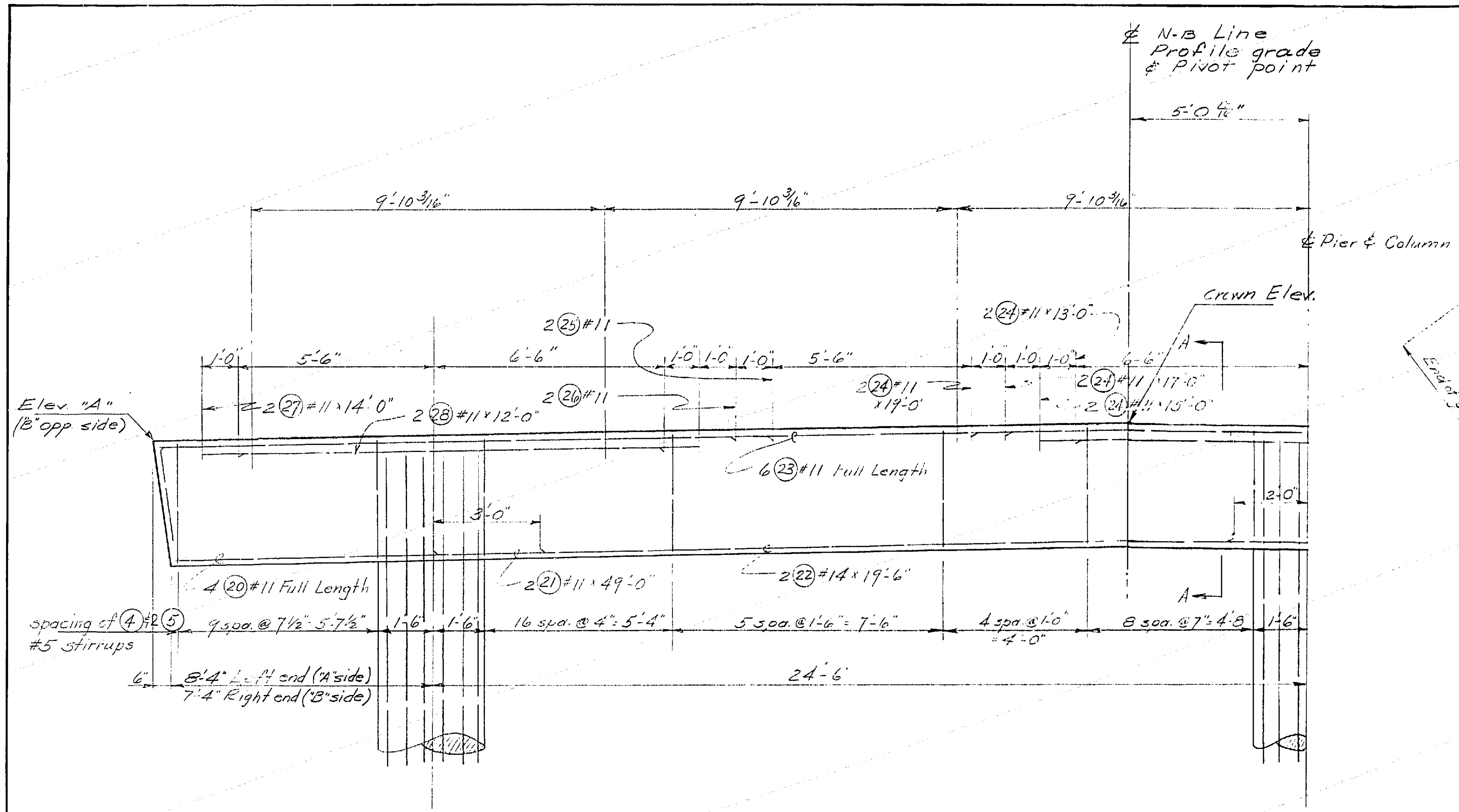
SHEET OF SHEETS
8 STRUCTURES
KING & SNOHOMISH COUNTIES
I-405-3 C.S. 1752H & 3111D

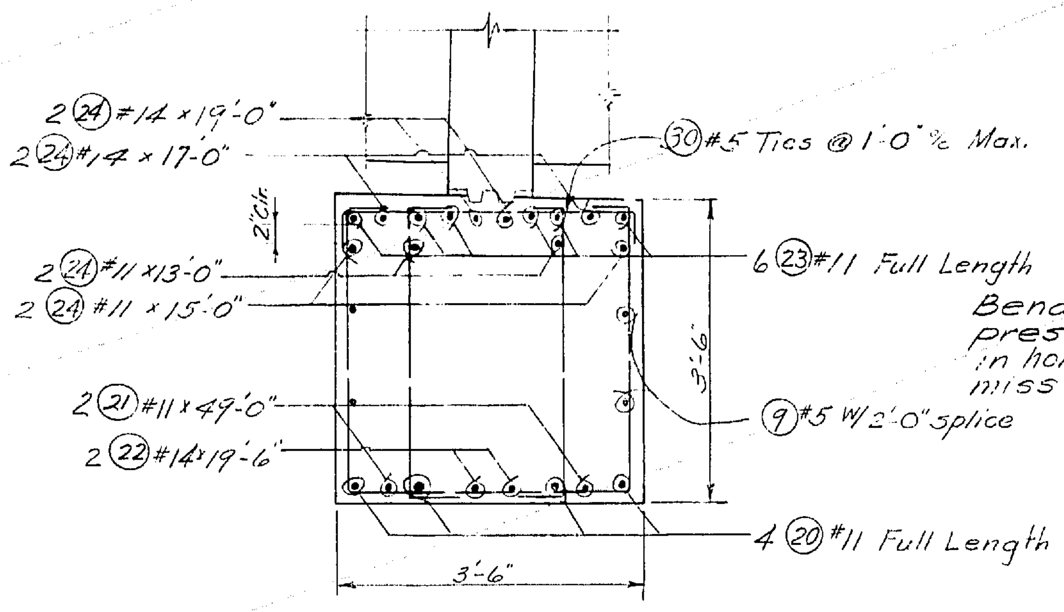
REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
8	WASH.	I-405-3(294)178 UNIT I	13 of 26



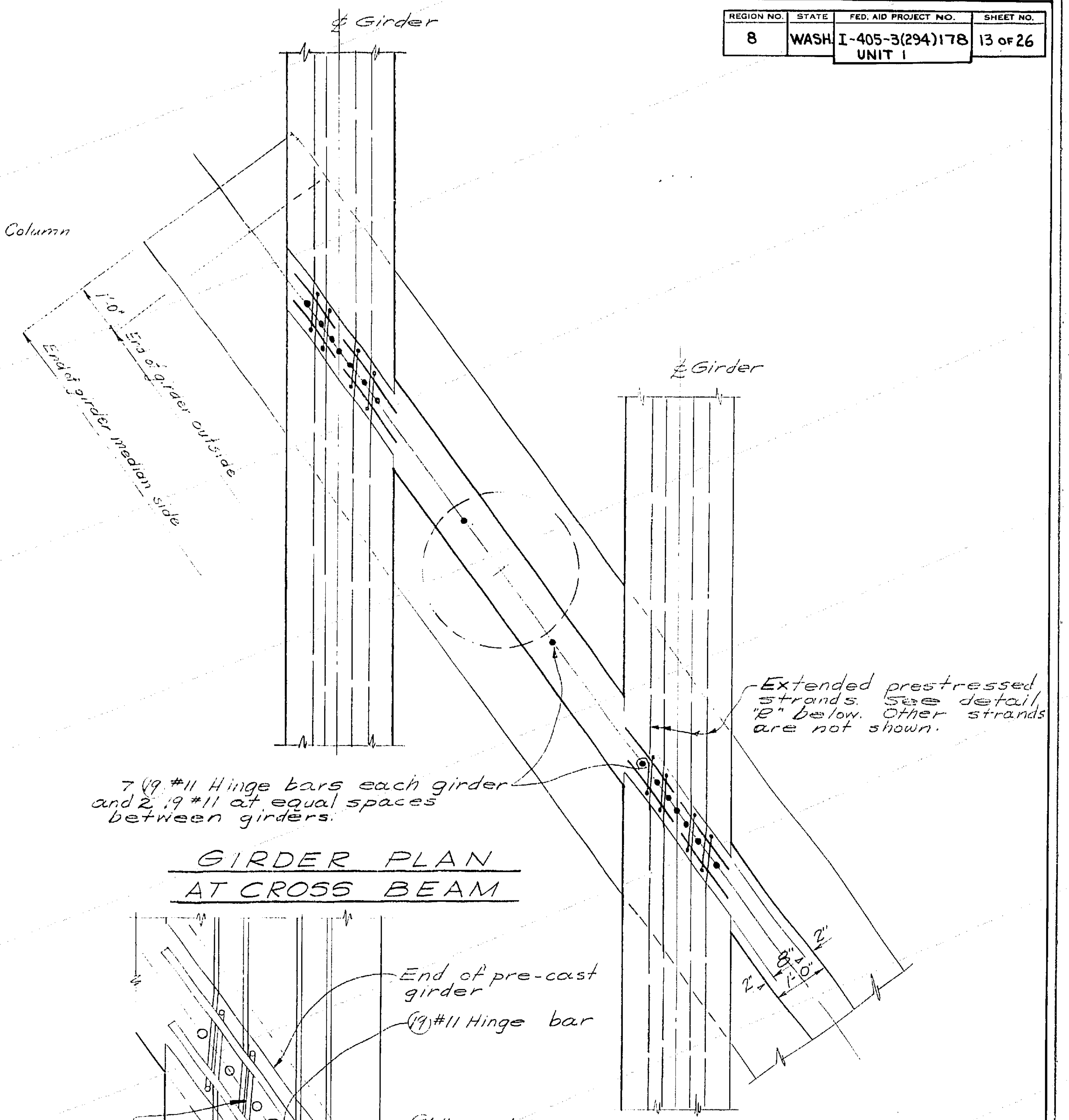
HALF ELEVATION
PIER NO. 3

See detail of columns and footings on Pier No. 2

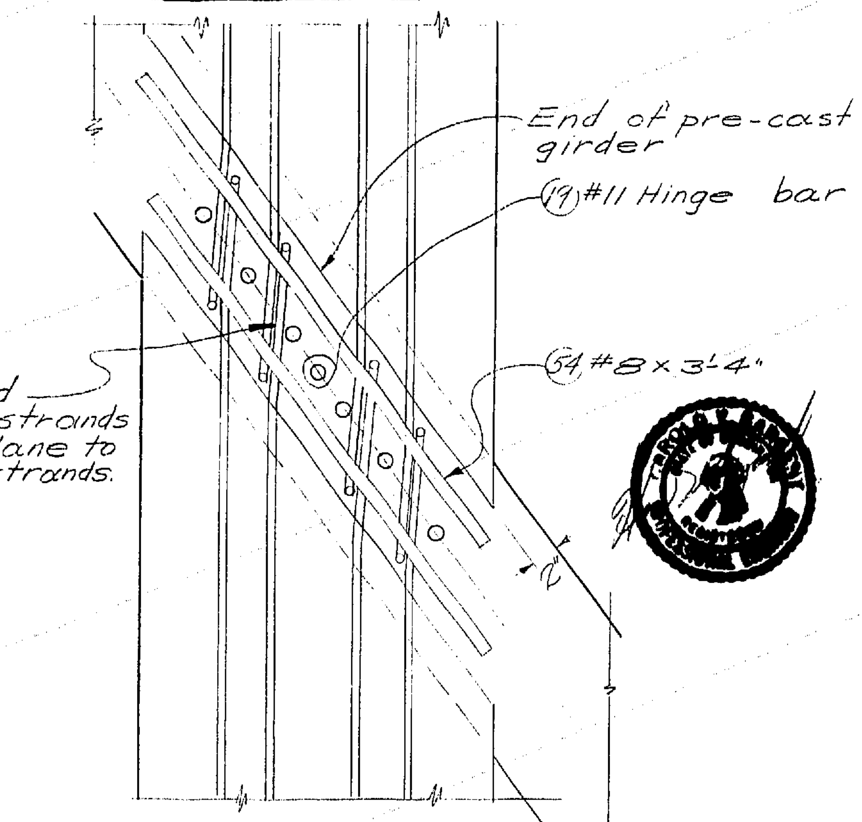
X-BEAM ELEVATIONS				
Pier	Location	Elev. "A"	Crown	Elev "B"
No. 3-N	℄ Pier	114.74'	115.63'	115.90'



SECTION A-A
Shown normal to skew



GIRDER PLAN AT CROSS BEAM



DETAIL "R"

SR 405
MP 24.28 TO MP 26.37
NORTH CR. BR. AND 228TH ST. O'XING
KING & SNOHOMISH COUNTIES
228TH ST. OVERCROSSING

PIER NO. 3 - NO. BR.

WASHINGTON STATE HIGHWAY COMMISSION
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APPROVED Nov. 22, 1967
SHEET 13 OF 26 SHEETS
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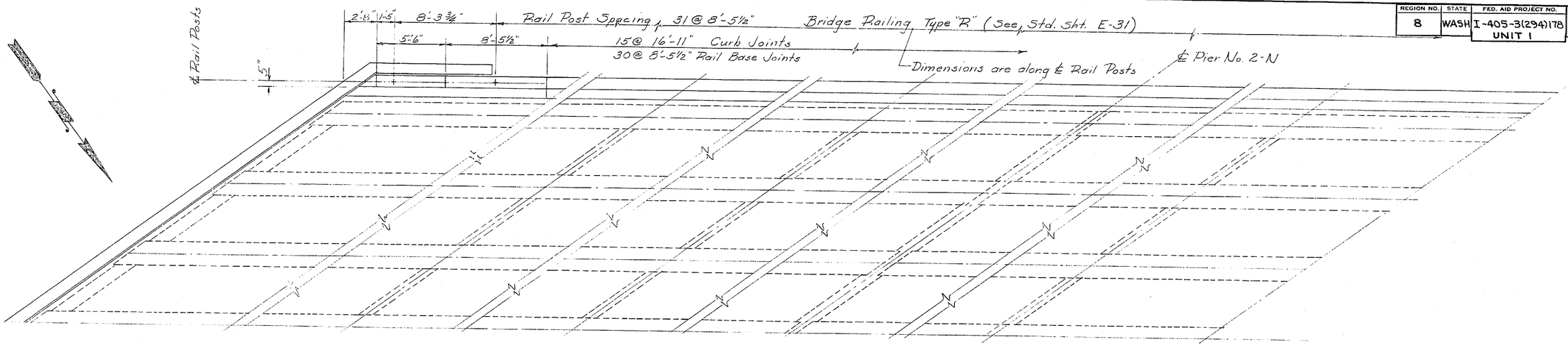
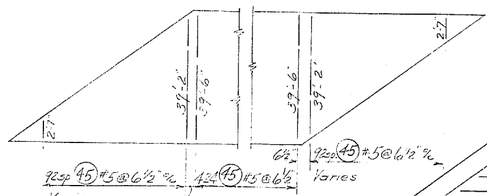
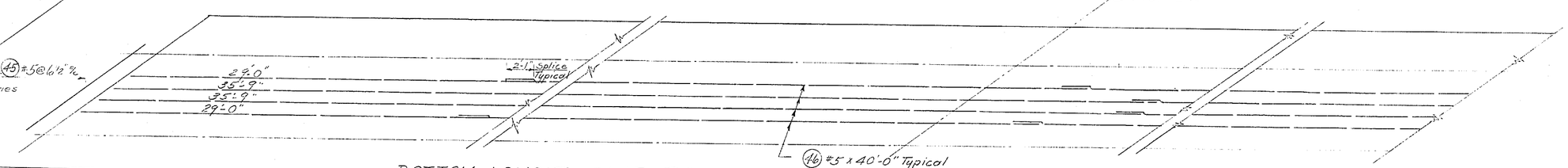
REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
8	WASH	I-405-3(294)178 UNIT 1	14 of 26



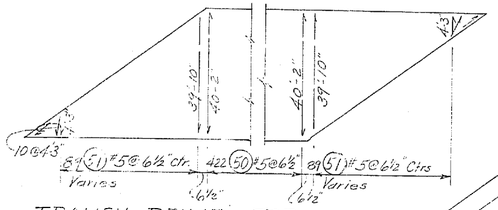
PART FRAMING PLAN — NORTH BRIDGE



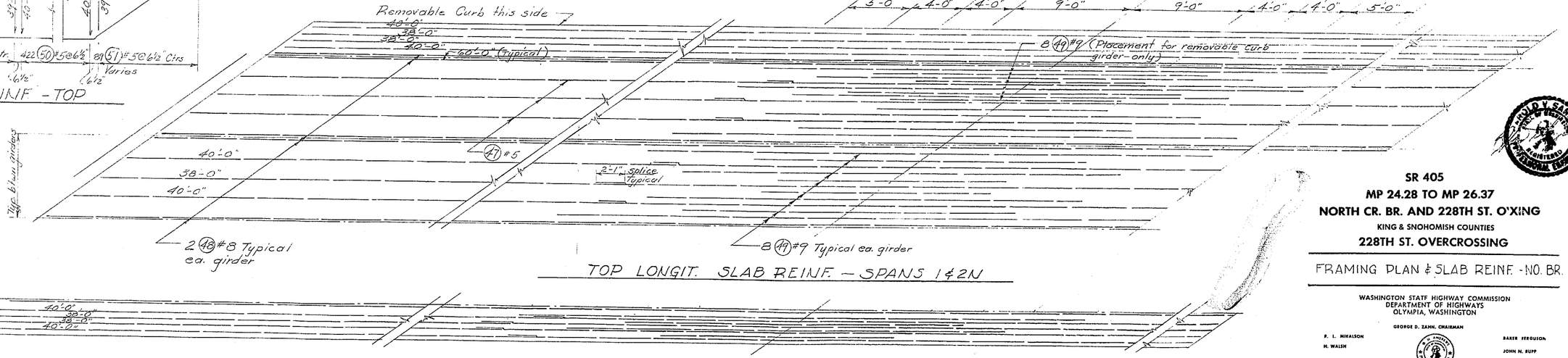
TRANSV. REINF. - BOTTOM



BOTTOM LONGIT. SLAB REINF. — SPANS 1 & 2 N



TRANSV. REINF. - TOP



TOP LONGIT. SLAB REINF. — SPANS 1 & 2N

SR 405
MP 24.28 TO MP 26.37
NORTH CR. BR. AND 228TH ST. O'XING
KING & SNOHOMISH COUNTIES
228TH ST. OVERCROSSING

FRAMING PLAN & SLAB REINF. - NO. BR.

WASHINGTON STATE HIGHWAY COMMISSION
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OLYMPIA, WASHINGTON

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APPROVED: Nov. 22, 1967

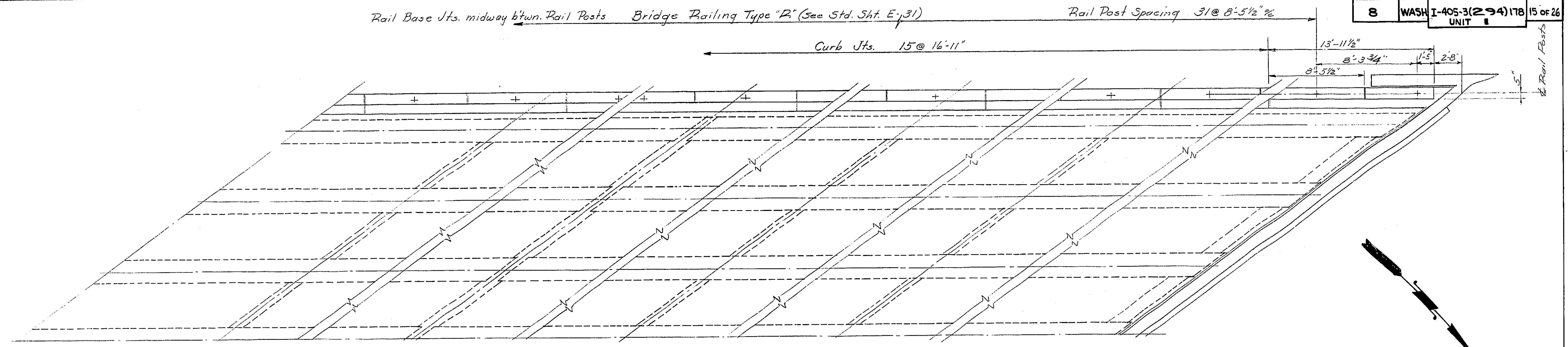
SHEET 14 OF 26 SHEETS

CONTRACT NUMBER 8375

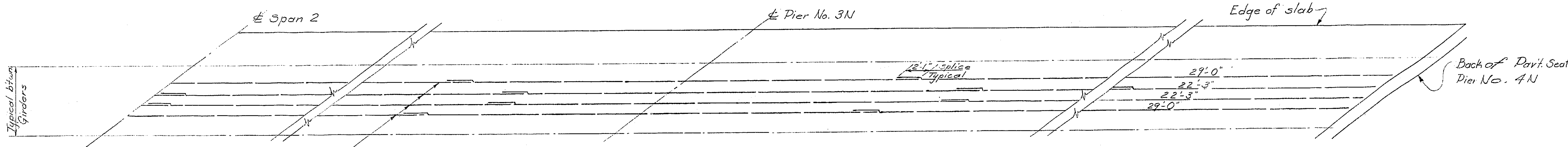
P/1992 6/32

SHEETS OF SHEETS

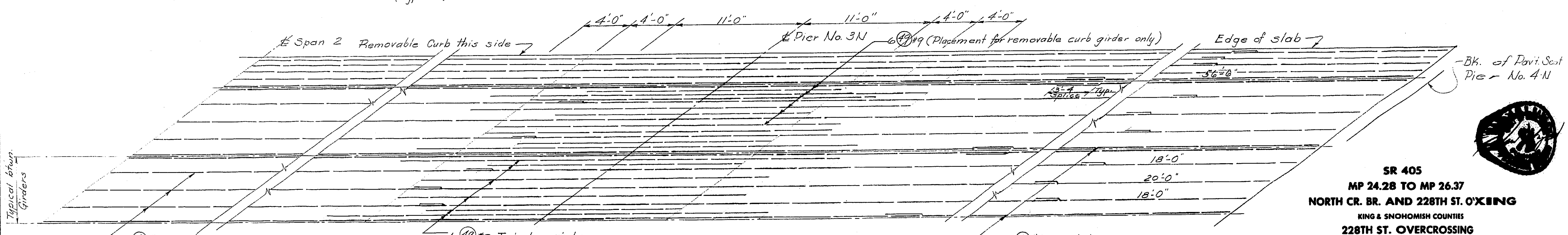
REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
8	WASH	I-405-3(294)178 UNIT 1	15 OF 26



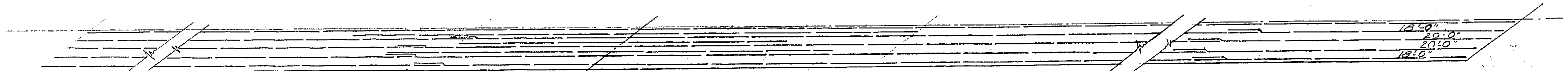
PART. FRAMING PLAN — NORTH BRIDGE



BOTTOM LONGIT. SLAB REINF. — SPANS 2 & 3N



TOP LONGIT. SLAB REINF. — SPANS 2 & 3N



SR 405
MP 24.28 TO MP 26.37
NORTH CR. BR. AND 228TH ST. O'XING
KING & SNOHOMISH COUNTIES
228TH ST. OVERCROSSING

FRAMING & SLAB REINF. — NO. BRIDGE

WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS
OLYMPIA, WASHINGTON

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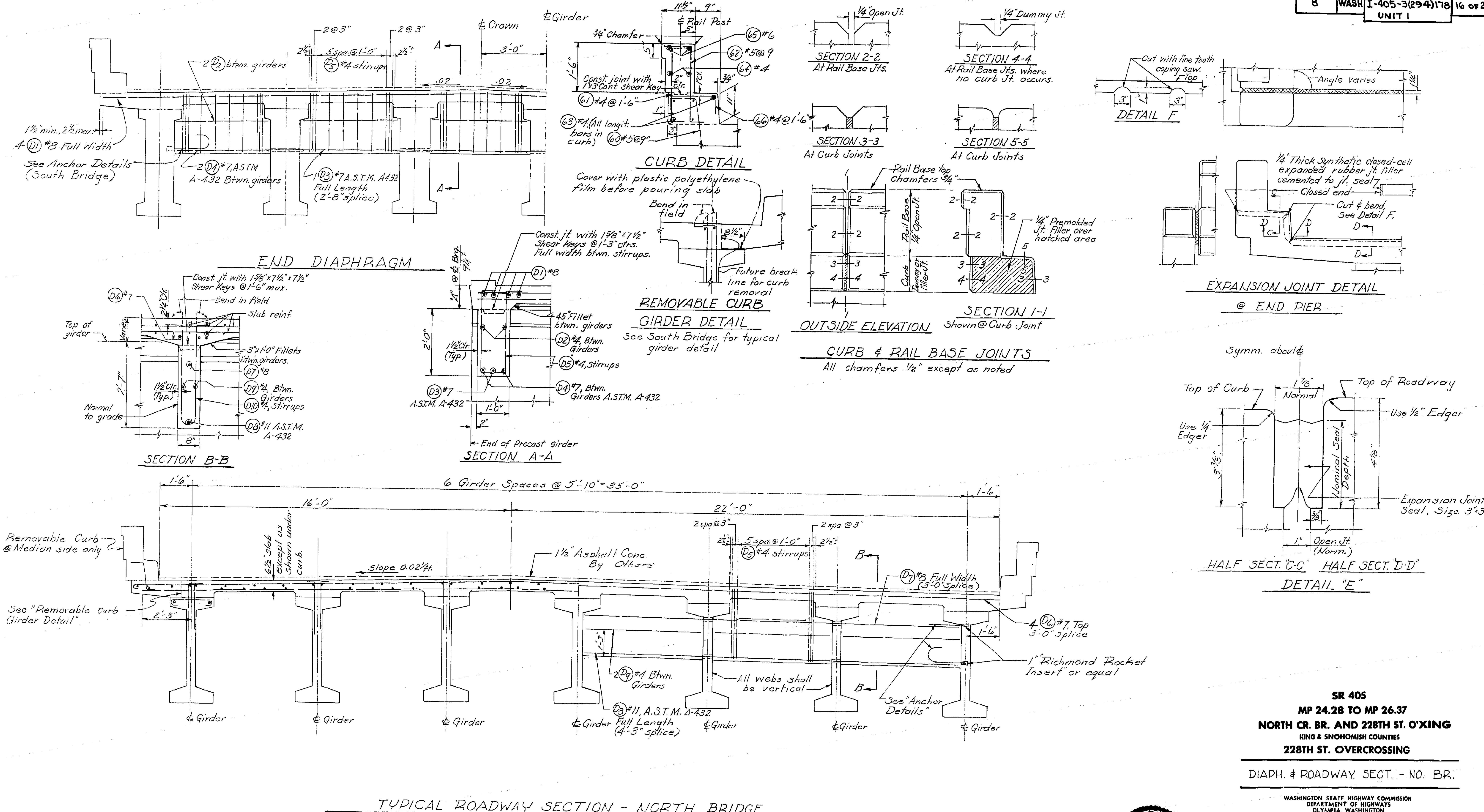
APPROVED: Nov. 22, 1967
SHEET 15 OF 26 SHEETS
CONTRACT NUMBER 8375

P/1992   6/31

REGION NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
8	WASH	I-405-3(294)178 UNIT I	16 OF 26



END DIAPHRAGM
SECTION B-B
SECTION A-A
CURB DETAIL
REMOVABLE CURB GIRDER DETAIL
See South Bridge for typical girder detail
SECTION 2-2
At Rail Base Jts.
SECTION 4-4
At Rail Base Jts. where no curb Jt. occurs.
SECTION 3-3
At Curb Joints
SECTION 5-5
At Curb Joints
OUTSIDE ELEVATION
SECTION 1-1
Shown @ Curb Joint
CURB & RAIL BASE JOINTS
All chamfers 1/2" except as noted
DETAIL F
EXPANSION JOINT DETAIL
@ END PIER
HALF SECT. "C-C"
HALF SECT. "D-D"
DETAIL "E"
Symm. about ℄
Expansion Joint Seal, Size 3"-3"
6 Girder Spaces @ 5'-10" = 35'-0"
16'-0"
22'-0"
Removable Curb @ Median side only
See "Removable Curb Girder Detail"
1 1/2" Asphalt Conc. By Others
Slope 0.02'/ft.
All webs shall be vertical
1" Richmond Rocket Insert" or equal
See "Anchor Details"
See Anchor Details (South Bridge)
TYPICAL ROADWAY SECTION - NORTH BRIDGE

SR 405
MP 24.28 TO MP 26.37
NORTH CR. BR. AND 228TH ST. O'XING
KING & SNOHOMISH COUNTIES
228TH ST. OVERCROSSING

DIAPH. & ROADWAY SECT. - NO. BR.

WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS
OLYMPIA, WASHINGTON

APPROVED: Nov. 22, 1967
SHEET 16 OF 26 SHEETS
CONTRACT NUMBER 8375

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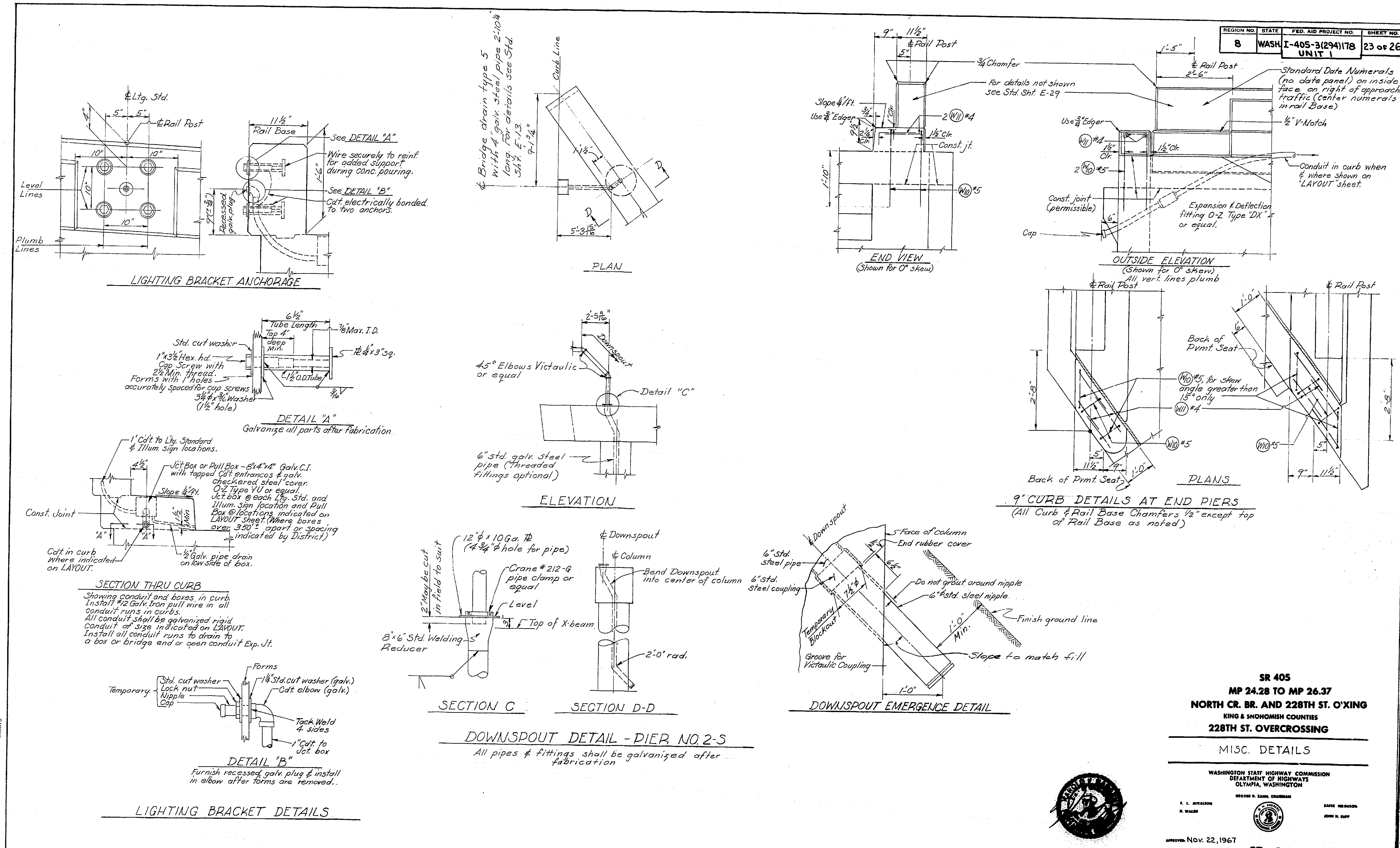
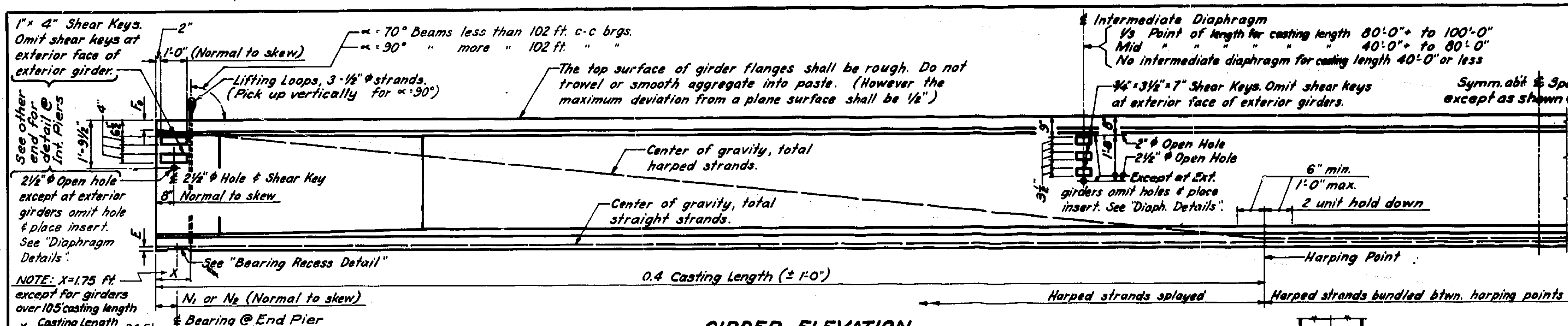


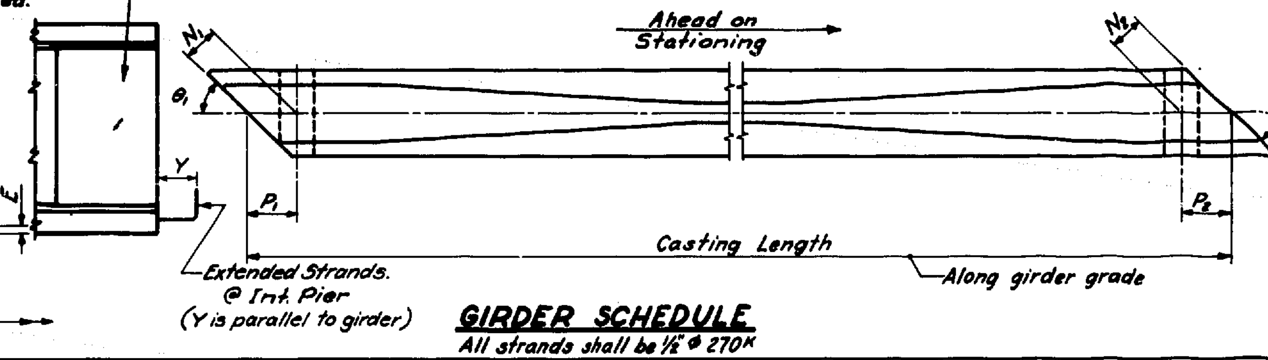
REGION NO. 8 | STATE WASH. | FED. AID PROJECT NO. I-405-3(294)178 UNIT I | SHEET NO. 23 OF 26
LIGHTING BRACKET ANCHORAGE
℄ Ltg. Std.
℄ Rail Post
Level Lines
Plumb Lines
Rail Base
See DETAIL "A"
Wire securely to reinf. for added support during conc. pouring.
See DETAIL "B"
Cdt. electrically bonded to two anchors.
Recessed galv. plug
DETAIL "A"
Galvanize all parts after fabrication
Std. cut washer
1"x3½" Hex. hd. Cap Screw with 2½" Min. thread.
Forms with 1" holes accurately spaced for cap screws
3¼"x 3/16" Washer (1½" hole)
Tube Length
Tap 4" deep Min.
1½" O.D. Tube
7/8" Max. I.D.
SECTION THRU CURB
1" Cdt. to Ltg. Standard & Illum. sign locations.
Jct. Box or Pull Box - 8"x4"x4" Galv. C.I. with tapped Cdt. entrances & galv. checkered steel cover. O-Z Type YU or equal. Jct. box @ each Ltg. Std. and Illum. Sign location and Pull Box @ locations indicated on LAYOUT Sheet. (Where boxes over 350'± apart or spacing indicated by District)
Const. Joint
Slope ¼"/ft.
Cdt. in curb where indicated on LAYOUT.
½" Galv. pipe drain on low side of box.
Showing conduit and boxes in curb. Install #12 Galv. Iron pull wire in all conduit runs in curbs. All conduit shall be galvanized rigid conduit of size indicated on LAYOUT. Install all conduit runs to drain to a box or bridge end or open conduit Exp. Jt.
DETAIL "B"
Forms
Temporary
Std. cut washer
Lock nut
Nipple
Cap
1¼" Std. cut washer (galv.)
Cdt. elbow (galv.)
Tack Weld 4 sides
1" Cdt. to Jct. box
Furnish recessed galv. plug & install in elbow after forms are removed.
LIGHTING BRACKET DETAILS
℄ Bridge drain type 5 with 4" galv. steel pipe 2'-10¼" long. For details see Std. Sht. E-13.
Curb Line
PLAN
45° Elbows Victaulic or equal
Downspout
Detail "C"
6" std. galv. steel pipe (Threaded fittings optional)
ELEVATION
12"ɸ x 10 Ga. ℘ (4¾"ɸ hole for pipe)
Crane #212-G pipe clamp or equal
Level
Top of X-beam
2" May be cut in field to suit
8"x6" Std. Welding Reducer
SECTION C
℄ Downspout
℄ Column
Bend Downspout into center of column
2'-0" rad.
SECTION D-D
DOWNSPOUT DETAIL - PIER NO. 2-S
All pipes & fittings shall be galvanized after fabrication
Face of column
End rubber cover
6" Std. steel pipe
6" Std. Steel coupling
Do not grout around nipple
6" Std. steel nipple
Finish ground line
Temporary Blockout
Groove for Victaulic Coupling
Slope to match fill
DOWNSPOUT EMERGENCE DETAIL
¾" Chamfer
For details not shown see Std. Sht. E-29
Slope ¼"/ft.
Use ¾" Edger
Const. jt.
END VIEW
(Shown for 0° skew)
Standard Date Numerals (no date panel) on inside face on right of approaching traffic (center numerals in rail Base)
½" V-Notch
Conduit in curb when & where shown on "LAYOUT" sheet.
Const. joint (permissible)
Expansion & Deflection fitting O-Z Type "DX" or equal.
Cap
OUTSIDE ELEVATION
(Shown for 0° skew) All vert. lines plumb
Back of Pvmt. Seat
(W10) #5, for skew angle greater than 15° only
(W11) #4
(W10) #5
PLANS
9" CURB DETAILS AT END PIERS
(All Curb & Rail Base Chamfers ½" except top of Rail Base as noted)
SR 405
MP 24.28 TO MP 26.37
NORTH CR. BR. AND 228TH ST. O'XING
KING & SNOHOMISH COUNTIES
228TH ST. OVERCROSSING
MISC. DETAILS
WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS
OLYMPIA, WASHINGTON
APPROVED Nov. 22, 1967
SHEET 23 OF 26 SHEETS
CONTRACT NUMBER 8375
P/1992
6/23

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	WASH.	I-405-3(294)178 UNIT 1	24	26

NOTE: ALL DETAILS ON THIS SHEET ARE FOR PRETENSIONED STRAND DESIGN ONLY



GIRDER ELEVATION



GIRDER SCHEDULE

All strands shall be 1/2" ϕ 270K

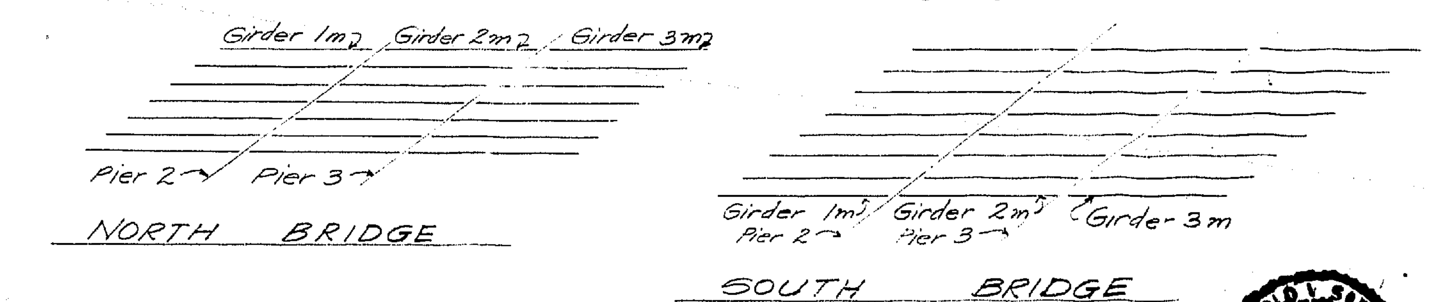
"A" Dimen. @ ℄ Bearings 9 1/4"

SPAN	GIRDER	DIMENSIONS θ1	θ2	N1	N2	P1	P2	Y	Casting Length	Minimum Stirrup Spacing S	HARPED No. of Strands	HARPED Jacking Force (Kips)	STRAIGHT No. of Strands	STRAIGHT Jacking Force (Kips)	Total Number of Strands	Location of C. G. Steel Area (In.) E	F℄	Fo	Camber C (In.)
								NORTH	BRIDGE										
1	7*	143°41'	143°41'	9 1/2	–	15	–	11 3/4"	95'-5 7/8"	14@16 1/2"	8	232	20	580	28	2 5/8	3	4 5/8	1 1/2
2	7*	143°41'	143°41'	–	–	–	–	11 3/4"	102'-10 7/8"	18@15"	9	261	24	696	33	3 1/16	3	5 1/8	1 1/2
3	7*	143°41'	143°41'	–	9 1/2	–	15	11 3/4"	83'-3 1/2"	1'-6"	8	232	14	406	22	2 1/4	3	4 5/8	1 1/4
								SOUTH	BRIDGE										
1	8*	143°41'	143°41'	9 1/2	–	15	–	11 3/4"	95'-5 7/8"	22@14 3/4"	8	232	22	638	30	2 7/8	3	4 5/8	1 5/8
2	8*	143°41'	143°41'	–	–	–	–	11 3/4"	102'-10 7/8"	20@14"	11	319	24	696	35	3 1/16	3	6	2
3	8*	143°41'	143°41'	–	9 1/2	–	15	11 3/4"	68'-3 5/16"	1'-6"	6	174	10	290	16	1 3/4	3	3 3/4	5/16

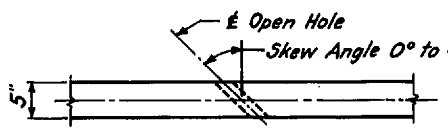
The concrete strength @ strand release for girders in Span No. 2, South Bridge, shall be 5300 P.S.I. min.

For all other girders the concrete strength @ strand release shall be 5000 P.S.I. min.

*The girder quantity listed includes (1) girder designated "m" which shall be similar to the other girders except for reinforcing as shown in Girder Cross Section. See diagrams below for location of "m" (median edge) girders.

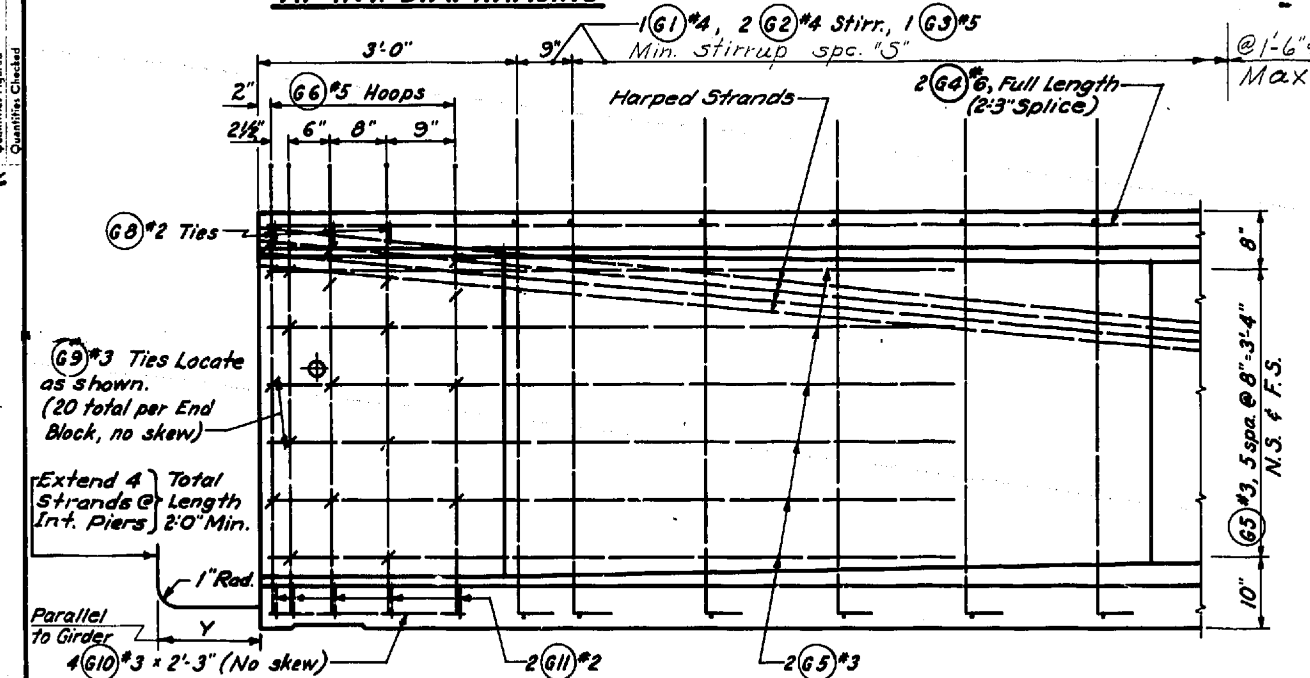


GIRDER LAYOUT



SECTION THRU WEB AT INT. DIAPHRAGMS

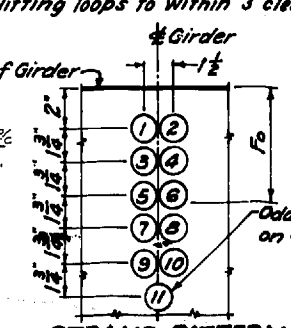
If the lifting loops extend thru the roadway slab they shall be cut off prior to pouring of roadway slab. All lifting strands are of same material and strength as prestressing strands. Wrap lifting loops so that each strand will carry its share of the total load. Extend lifting loops to within 3" clear of the bottom of the girder.



END BLOCK ELEVATION

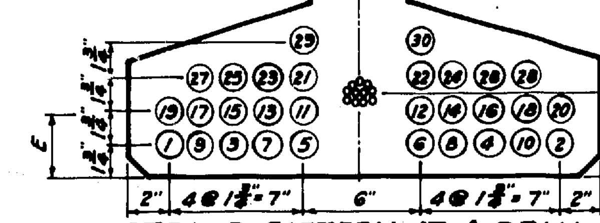
Cut all strands flush with the girder ends except as indicated for Int. Piers. Paint ends of flush strands with an approved epoxy resin @ End Piers

$$Y = \frac{7.0"}{\sin \theta_1 \text{ or } \theta_2}$$



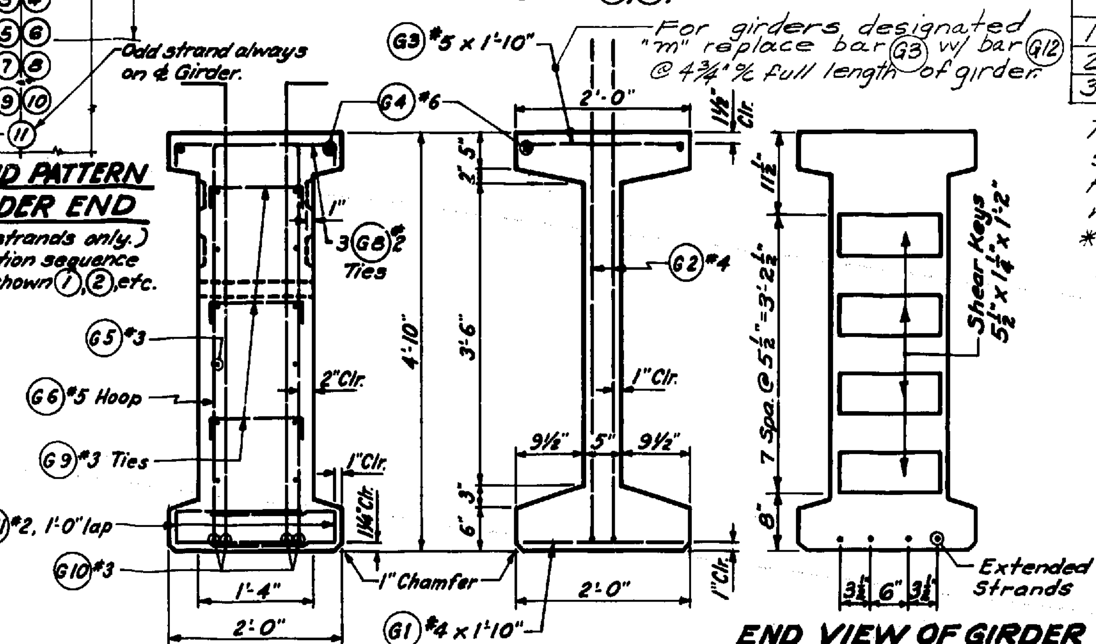
STRAND PATTERN AT GIRDER END

(Harped strands only.) Strand location sequence shall be as shown (1), (2), etc.



STRAND PATTERN AT ℄ SPAN

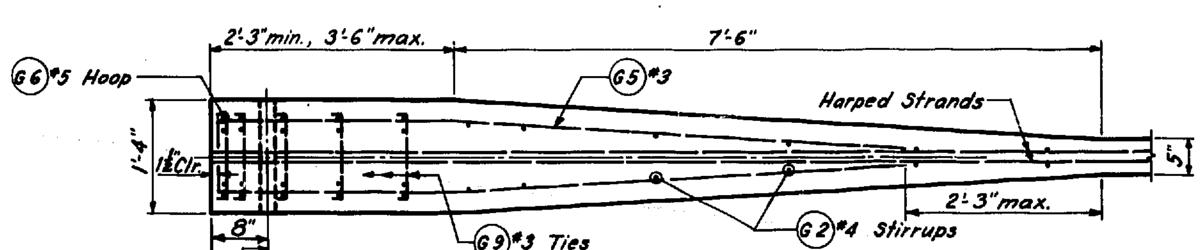
Strand location sequence shall be as shown (1), (2), etc.



END BLOCK — GIRDER

TYPICAL CROSS-SECTIONS

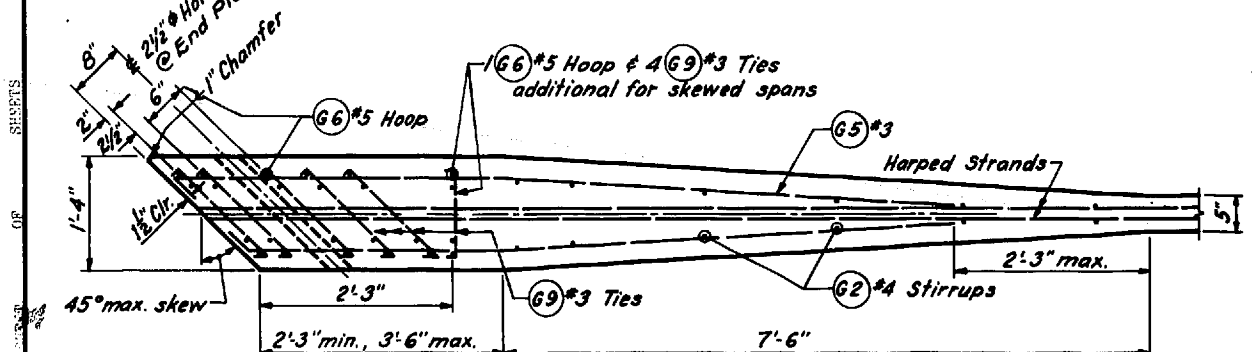
END VIEW OF GIRDER AT INTERMEDIATE PIERS



PLAN SECTION THRU END BLOCK

No Skew

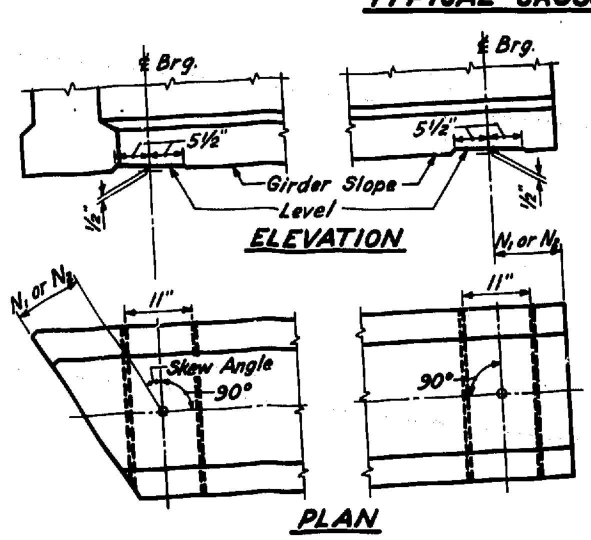
Extended strands not shown.



PLAN SECTION THRU END BLOCK

Skewed Spans

Extended strands not shown.



BEARING RECESS DETAIL

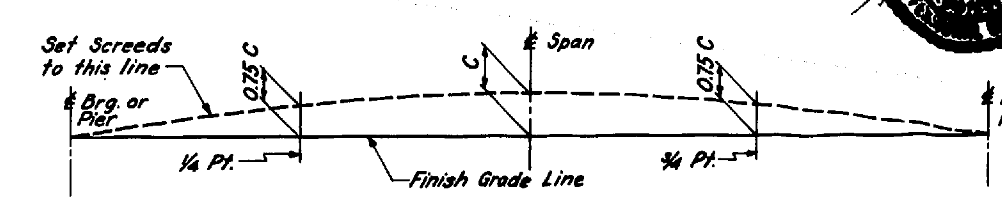
All girders @ End Piers only.

NOTE: Forms for bearing pad recesses shall be constructed and fastened in such a manner so as not to cause damage to the girders during the strand release operation.

GIRDER WEIGHTS

SECTION		
End Blk. lb/lin. ft.	Girder lb/lin. ft.	
1137	607	

NOTE: Extra caution must be exercised in handling and placing girders over 100' long. If necessary the girders shall be braced laterally to prevent tipping or buckling.



SCREED CAMBER FOR GIRDER DEFLECTION

For camber (C) see "Girder Schedule".

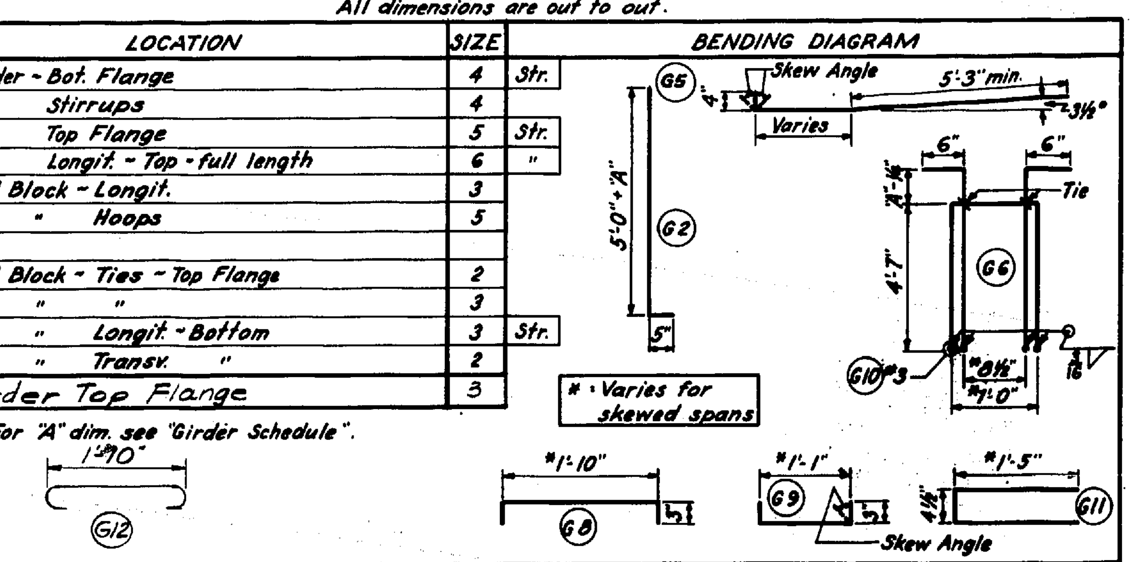
As Built Changes in Red 1-21-70

BAR LIST

All dimensions are out to out.

MARK	LOCATION	SIZE	
G 1	Girder - Bot. Flange	4	Str.
G 2	" Stirrups	4	
G 3	" Top Flange	5	Str.
G 4	" Longit. - Top - full length	6	"
G 5	End Block - Longit.	3	
G 6	" " Hoops	5	
G 8	End Block - Ties - Top Flange	2	
G 9	" " "	3	
G 10	" " Longit. - Bottom	3	Str.
G 11	" " Transv. "	2	
G12	Girder Top Flange	3	

NOTE: For "A" dim. see "Girder Schedule".



SERIES 100 GIRDER

SR 405
MP 24.28 TO MP 26.37
NORTH CR. BR. AND 228TH ST. O'XING
KING & SNOHOMISH COUNTIES
228TH ST. OVERCROSSING

GIRDER DETAILS

WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS
OLYMPIA, WASHINGTON

APPROVED: Nov. 22, 1967

CONT. NO. 8375 SHEET 24 OF 26 SHEETS

P/1992

10-24-66

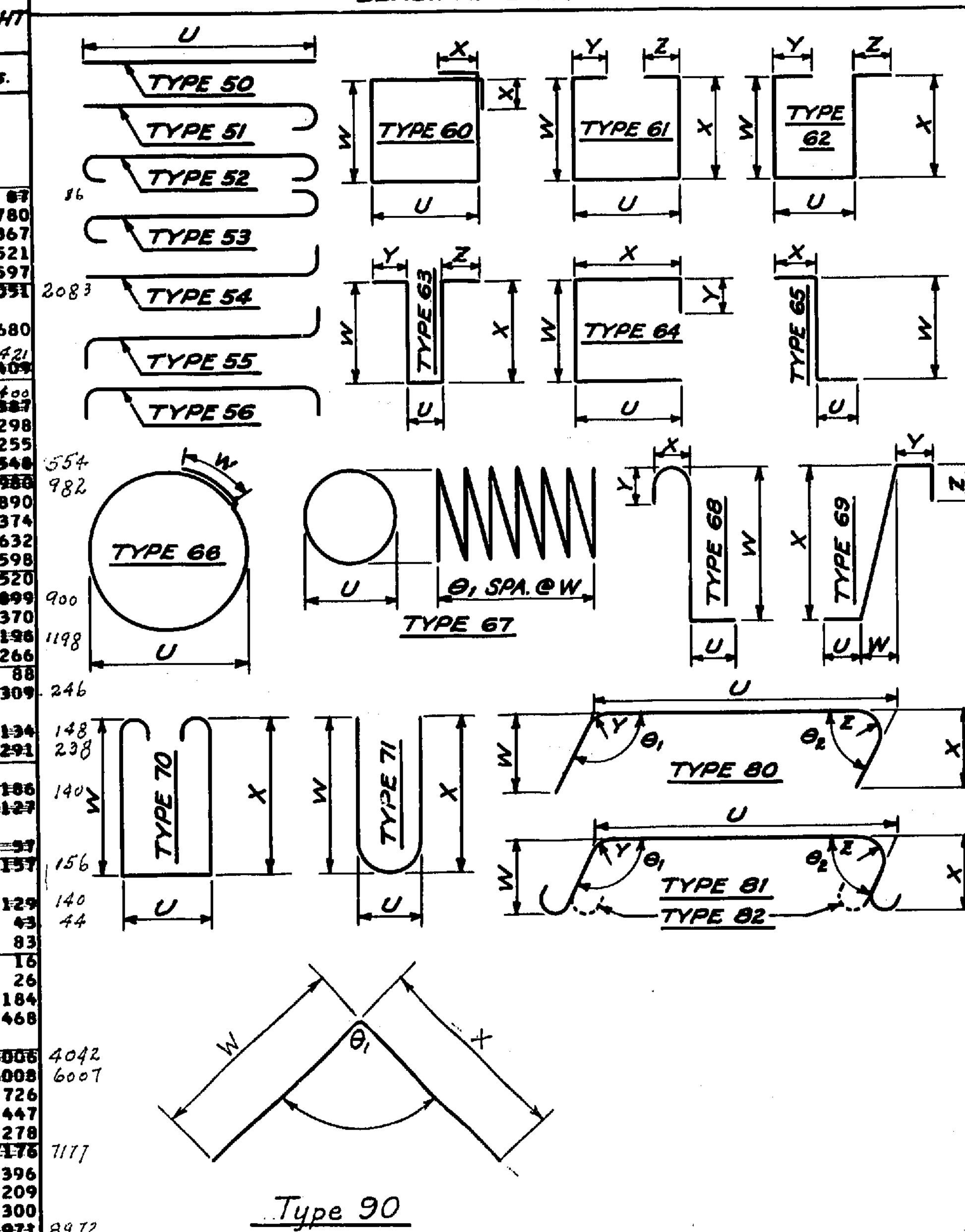
6/22

S = Bar is included in substructure quantities.
F = Bar to be field welded.
T = Tie or Stirrup.
H = A.S.T.M. A-432.
V = Bar dimensions vary between dimensions shown on this line and the following line.

Mark No.	Location	Size	No. Req'd	Bend Type	Tie or Stir	Fld. Weld	Substr.	A-432	Varies	No. Each	U Ft.	U In.	W Ft.	W In.	X Ft.	X In.	Y Ft.	Y In.	Z Ft.	Z In.	θ1 Deg.	θ2 Deg.	Length Ft.	Length In.	Weight Lbs.
1	PIER NO 2+3 FTG	8	264	50			S				10	7.0											10	7.	~~7460~~ 7458
2	PIERS NO 2+3 DOWELS	9	66	65			S				1	7.0	5	2.0		0.0							6	6.	~~1449~~ 1458
3	PIER NO 2 COL VERTS	9	11	50			S				27	8.0											27	8.	~~1039~~ 1038
3	PIER NO 2 COL VERTS	9	11	50			S				28	5.0											28	5.	1063
3	PIER NO 2 COL VERTS	9	11	50			S				28	9.0											28	9.	1075
3	PIER NO 3 ~~2~~ COL VERTS	9	11	50			S				29	1.0											29	1.	1088
3	PIER NO 3 ~~2~~ COL VERTS	9	11	50			S				30	0.0											30	0.	1122
3	PIER NO 3 ~~2~~ COL VERTS	9	11	50			S				30	4.0											30	4.	1134
4	X-BEAM PIERS 2+3	5	184	61	T		S				3	3.0	3	2.5	3	2.5		6.0		6.0			10	3.	1967
5	X-BEAM PIERS 2+3	5	368	64	T		S					6.0	3	2.5		6.0		0.0					4	0.	1535
6	X-BEAM PIER 2 BOT	11	4	50			S				64 ~~63~~	4.0											64 ~~63~~	4.	~~1340~~ 1367
7	X-BEAM PIER 2 BOT	11	2	50			S				49	0.0											49	0.	521
8	X-BEAM PIER 2 BOT	14	4	50			S				19	6.0											19	6.	597
9	X-BEAM PIERS 2+3	5	16	50			S				33	2.0											33	2.	~~553~~ 554
10	X-BEAM PIER 2 TOP	11	6	50			S				65 ~~64~~	4.0											65 ~~64~~	4.	~~2051~~ 2083
11	X-BEAM PIER 2 TOP	11	8	50			S		V	2	13	0.0											13	0.	
											19	0.0											19	0.	680
13	X-BEAM PIER 2 TOP	11	4	80			S		V	2	17 ~~16~~	8.0		0.0	2	7.0		0.0		9.0	0	82	19 ~~18~~	9.4	~~409~~ 421
											18 ~~17~~	8.0		0.0	2	7.0		0.0		9.0	0	82	20 ~~19~~	9.4	
14	X-BEAM PIER 2 TOP	11	4	80			S		V	2	16 ~~15~~	8.0		0.0	2	7.0		0.0		9.0	0	82	18 ~~17~~	9.4	~~387~~ 400
											17 ~~16~~	8.0		0.0	2	7.0		0.0		9.0	0	82	19 ~~18~~	9.4	
15	X-BEAM PIER 2 TOP	11	4	50			S				14	0.0											14	0.	298
16	X-BEAM PIER 2 TOP	11	4	50			S				12	0.0											12	0.	255
17	PIERS 2+3 COL TIES	3	162	66	T		S				2	9.0	1	0.0									9	6.	~~581~~ 578

Mark No.	Location	Size	No. Req'd	Bend Type	Tie or Stir	Fld. Weld	Substr.	A-432	Varies	No. Each	U Ft.	U In.	W Ft.	W In.	X Ft.	X In.	Y Ft.	Y In.	Z Ft.	Z In.	θ1 Deg.	θ2 Deg.	Length Ft.	Length In.	Weight Lbs.
18	X-BEAM PIERS 2+3	4	4	50			S				32	6.0											32	6.	~~87~~ 86
19	HINGE BARS	11	122	65			S				2	2.0	7	2.0		0.0							8	11.	5780
20	X-BEAM PIER 3 BOT	11	4	50			S				64	4.0											64	4.	1367
21	X-BEAM PIER 3 BOT	11	2	50			S				49	0.0											49	0.	521
22	X-BEAM PIER 3 BOT	14	4	50			S				19	6.0											19	6.	597
23	X-BEAM PIER 3 TOP	11	6	50			S				65 ~~64~~	4.0											65 ~~64~~	4.	~~2051~~ 2083
24	X-BEAM PIER 3 TOP	11	8	50			S		V	2	13	0.0											13	0.	
											19	0.0											19	0.	680
25	X-BEAM PIER 3 TOP	11	4	80			S		V	2	17 ~~16~~	~~8.0~~ 2.0		0.0	2	7.0		0.0		9.0	0	82	19 ~~18~~	9.4	421
											18 ~~17~~	~~8.0~~ 2.0		0.0	2	7.0		0.0		9.0	0	82	20 ~~19~~	9.4	~~409~~
26	X-BEAM PIER 3 TOP	11	4	80			S		V	2	16 ~~15~~	~~8.0~~ 2.0		0.0	2	7.0		0.0		9.0	0	82	18 ~~17~~	9.4	400
											17 ~~16~~	~~8.0~~ 2.0		0.0	2	7.0		0.0		9.0	0	82	19 ~~18~~	9.4	~~387~~
27	X-BEAM PIER 3 TOP	11	4	50			S				14	0.0											14	0.	298
28	X-BEAM PIER 3 TOP	11	4	50			S				12	0.0											12	0.	255
30	X-BEAM PIER 2+3 TOP	5	130	61	T		S				3	3.0		6.0		6.0		0.0		0.0			4	1.	~~548~~ 554
32	PIERS 1+4 FTG	6	16	50			S				40	9.5											40	10.	~~980~~ 982
33	PIERS 1+4 FTG	5	160	50			S				5	4.0											5	4.	890
34	PIERS 1+4 GIRD SEAT	4	120	65	T		S					5.0	4	4.0		0.0							4	8.	374
34	PIERS 1+4 GIRD SEAT	4	172	65	T		S					5.0	5	2.0		0.0							5	6.	632
35	PIERS 1+4 GIRD SEAT	4	24	50			S				37	3.5											37	4.	598
36	PIERS 1+4 GIRD SEAT	4	146	61	T		S				3	0.0	1	3.0	1	3.0		0.0		0.0			5	4.	520
37	PIERS 1+4 GIRD SEAT	6	16	50			S				37	5.0											37	5.	~~899~~ 900
38	PIERS 1+4 BACK WALL	5	142	62	T		S					9.0	7	4.0	7	4.0		6.0		6.0			16	0.	2370
39	PIERS 1+4 BACK WALL	4	48	50			S				37	3.5											37	4.	~~1196~~ 1198
40	PIERS 1+4 PAVT SEAT	4	208	64	T		S					5.0	1	3.0		5.0		0.0					1	11.	266
41	PIERS 1+4 PAVT SEAT	4	4	50			S				32	11.0											32	11.	88
W1	WING WALLS	6	10	~~80~~ 90			S				16	3.0	10	5.0	6	0.0					144	0	16	3.4	309 246
W1	WING WALLS	6	8	~~80~~ 90			S		V	2	8	11.0	3	1.0	6	0.0					144	0	9 ~~8~~	11.0	
											14	11.0	9	1.0	6	0.0					144	0	15 ~~14~~	11.0	~~134~~ 148
W1	WING WALLS	6	10	~~80~~ 90			S				15	10.0	10	0.0	6	0.0					36	0	15	10.10	~~291~~ 238
W1	WING WALLS	6	8	~~80~~ 90			S		V	2	8	11.0	2 3	1.0	6	0.0					36	0	8	11.6	
											14	11.0	8 9	1.0	6	0.0					36	0	14	11.6	~~186~~ 140
~~W2~~	~~WING WALL~~	~~4~~	~~20~~	~~50~~			~~S~~				~~9~~	~~6.0~~											~~9~~	~~6.~~	~~127~~
~~W2~~	~~WING WALL~~	~~4~~	~~16~~	~~50~~			~~S~~		~~V~~	~~4~~	~~2~~	~~11.0~~											~~2~~	~~11.~~	
											~~7~~	~~9.0~~											~~7~~	~~9.~~	~~97~~
W3	WING WALL	4	32	50			S				7	4.0											7	4.	~~157~~ 156
W3	WING WALL	4	40	50			S		V	8	3	10.0											3	10.	
											6 ~~5~~	10.0											~~5~~	10.	~~129~~ 140
W4	WING WALL	4	8	50			S				8	0.0											8	0.	~~43~~ 44
W10	CURB END	5	14	63								9.0	2	7.0	2	7.0		0.0		0.0			5	8.	83
W11	CURB END	4	16	65			S					5.0	1	3.0		0.0							1	7.	16
W20	GIRDER STOPS	4	16	50			S				2	5.0											2	5.	26
W21	GIRDER STOPS	5	24	70			S				2	2.0	2	1.5	2	1.5							7	4.	184
45	SLAB BOT TRANSV	5	424	50							39	6.0											39	6.	17468
45	SLAB BOT TRANSV	5	184	50					V	2	2	7.0											2	7.	
											39	2.0											39	2.	~~4006~~ 4042
46	SLAB BOT LONGIT	5	144	50							40	0.0											40	0.	6008 6007
46	SLAB BOT LONGIT	5	24	50							29	0.0											29	0.	726
46	SLAB BOT LONGIT	5	12	50							35	9.0											35	9.	447
46	SLAB BOT LONGIT	5	12	50							22	3.0											22	3.	278
47	SLAB TOP LONGIT	5	172	50							40	0.0											40	0.	~~7176~~ 7177
47	SLAB TOP LONGIT	5	10	50							38	0.0											38	0.	396
47	SLAB TOP LONGIT	5	10	50							20	0.0											20	0.	209
47	SLAB TOP LONGIT	5	16	50							18	0.0											18	0.	300
48	SLAB TOP GIRDER	8	56	50							60	0.0											60	0.	~~8971~~ 8972
48	SLAB TOP GIRDER	8	14	50							56	6.0											56	6.	2112
49	SLAB TOP PIER 2N	9	14	50							18	0.0											18	0.	857
49	SLAB TOP PIER 2N	9	14	50							26	0.0											26	0.	1238
49	SLAB TOP PIER 2N	9	14	50							34	0.0											34	0.	1618
49	SLAB TOP PIER 2N	9	14	50							44	0.0											44	0.	2094
49	SLAB TOP PIER 3N	9	14	50							22	0.0											22	0.	1047
49	SLAB TOP PIER 3N	9	14	50							30	0.0											30	0.	1428
49	SLAB TOP PIER 3N	9	14	50							38	0.0											38	0.	1809
50	SLAB TOP TRANSV	5	422	52							40	2.0											41	4.	~~18193~~ 18192
51	SLAB TOP TRANSV	5	178	51					V	2	39	9.0											~~40~~	4.	
											4	3.0											4	10.	~~4193~~ 4216
51	SLAB TOP	5	20	51							4	3.0											4	10.	~~101~~ 100
D1	END DIAPHRAGM PIERS 1+4	8	8	50							67	10.0											67	10.	~~1449~~ 1448
D2	END DIAPHRAGM PIERS 1+4	4	24	50							7	4.0											7	4.	118
D3	END DIAPHRAGM PIERS 1+4	7	2	50				H			34	7.0											34	7.	~~141~~ 142
D3	END DIAPHRAGM PIERS 1+4	7	2	50				H			24	10.0											24	10.	102
D4	END DIAPHRAGM PIERS 1+4	7	24	50				H			7	4.0											7	4.	360
D5	END DIAPHRAGM PIERS 1+4	4	120	62	T							9.0	2	6.0	2	6.0		5.0		5.0			6	3.	~~501~~ 500
D6	INT DIAPHRAGMS	7	24	50							29	2.0											29	2.	1431
D6	INT DIAPHRAGMS	7	16 ~~24~~	50							38	1.0											38	1.	~~1060~~ 1246
D7	INT DIAPHRAGMS	8	6	50							31	0.0											31	0.	~~497~~ 498
D7	INT DIAPHRAGMS	8	12	50							16	7.0											16	7.	531
D8	INT DIAPHRAGMS	11	6	50				H			31	0.0											31	0.	~~988~~ 981
D8	INT DIAPHRAGMS	11	12	50				H			17	10.0											17	10.	1137
D9	INT DIAPHRAGMS	4	72	50							9	1.0											9	1.	~~437~~ 438
D10	INT DIAPHRAGMS	4	360	71	T							5.0	3	6.5	3	6.5							7	3.	~~1745~~ 1743
54	PIERS 2+3	8	28	50							3	4.0											3	4.	~~249~~ 250
55	DIAPHRAGMS PIERS 2+3	4	168	80							5	7.0		2.0		0.0		0.0		0.0	150	0	5	11.	664
56	DIAPHRAGMS PIERS 2+3	5	48	50							31	7.0											31	7.	~~1587~~ 1582
60	CURB-SLAB TIE	5	758	69	T							6.0		4.0	1	3.5		8.0		6.0			2	9.	~~2167~~ 2174
61	CURB-RAILBASE	4	380	64	T							5.0	2	2.0		5.0		0.0					2	10.	~~719~~ 720
62	CURB-RAILBASE	5	752	65	T							8.5	2	2.5		8.5							3	5.	2680
63	CURB LONGIT	4	150	50							16	8.0											16	8.	1670
63	CURB LONGIT	4	20	50							13	8.5											13	9.	~~183~~ 184
64	RAIL BASE	4	128	50							8	2.5											8	3.	~~702~~ 706
64	RAIL BASE	4	8	50							5	3.0											5	3.	28
65	RAIL BASE	6	128	50							8	2.5											8	3.	~~1570~~ 1586
65	RAIL BASE	6	8	50							5	3.0											5	3.	~~63~~ 64
66	CURB TRANSV.	4	380	65	T							5.0	1	3.0		0.0							1	7.	402
~~W10~~	~~CURB END~~	~~5~~	~~8~~	~~62~~			~~S~~					~~8.0~~	~~2~~	~~7.0~~	~~2~~	~~7.0~~							~~5~~	~~8.~~	~~48~~
~~W10~~	~~CURB END~~	~~5~~	~~6~~	~~63~~			~~S~~					~~2.0~~	~~2~~	~~7.5~~	~~2~~	~~7.0~~							~~6~~	~~2.~~	~~38~~
~~W2~~	~~WING WALL~~	~~4~~	~~10~~	~~50~~			~~S~~				~~9~~	~~6.0~~											~~9~~	~~6.~~	~~64~~
~~W2~~	~~WING WALL~~	~~4~~	~~10~~	~~50~~							~~11~~	~~5.0~~											~~11~~	~~4.~~	~~76~~
~~W2~~	~~WING WALL~~	~~4~~	~~8~~	~~50~~			~~S~~		~~V~~	~~2~~	~~1~~	~~11.0~~											~~7~~	~~9.~~	~~26~~
W2	WING WALL	4	8	50			S		V	2	3	11.0											3	11	
											9	11.0											9	11	38
W6	INT. DIAPHRAGMS	7	8	50							38	1.0											38	1	639

BENDING DIAGRAMS



Note: Bends for transverse bars due to roadway crown conditions have not been shown. These bars shall be bent as required to conform to the configuration of the structure.

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	WASH.	I-405-3(294)178	25	26

UNIT 1

As Built Changes in Red 1-22-70

SR 405

MP 24.28 TO MP 26.37

NORTH CR. BR. AND 228TH ST. O'XING

KING & SNOHOMISH COUNTIES

228TH ST. OVERCROSSING

BAR LIST

WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS
OLYMPIA, WASHINGTON

GEORGE D. ZAHN, CHAIRMAN

F. L. MIKALSON — BAKER FERGUSON
H. WALSH — JOHN N. RUPP

APPROVED: Nov. 22, 1967

CONT. NO. 8375 (CONTRACT NUMBER)

SHEET 25 OF 26 SHEETS

228th North Bridge - P/1992

Bridge Design Engineer
Supervising Bridge Engr.
Designed
Design Checked

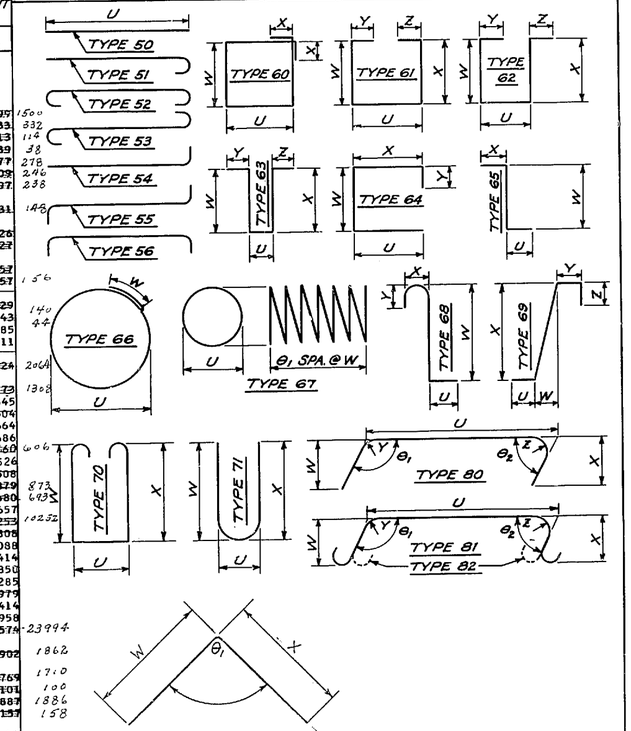
S = Bar is included in substructure quantities.
F = Bar to be field welded.
T = Tie or Stirrup.
H = A.S.T.M. A-432.
V = Bar dimensions vary between dimensions shown on this line and the following line.

MARK NO.	LOCATION	SIZE	NO. REQ'D.	BEND TYPE	TIE OR STIR	FLD. WELD	SUBSTR.	A-432	VARIES	NO. EACH	DIMENSIONS (Out to out) U Ft.	U In.	W Ft.	W In.	X Ft.	X In.	Y Ft.	Y In.	Z Ft.	Z In.	θ1 Deg.	θ2 Deg.	LENGTH Ft.	LENGTH In.	WEIGHT Lbs.	
101	PIER NO2 FTG	9	126	50			S				11	1.0											11	1.	4748	4749
102	PIER NO3 FTG	8	132	50			S				10	7.0											10	7.	3730	3729
103	PIERS NO 2+3 DOWELS	9	66	65			S				5	2.0	1	7.0		0.0							6	6.	1449	1458
104	PIER NO 2 COL VERTS	9	11	50			S				27	9.0											27	9.	1038	
104	PIER NO 2 COL VERTS	9	11	50			S				27	3.0											27	3.	1019	
104	PIER NO 2 COL VERTS	9	11	50			S				26	2.0											26	2.	979	
104	PIER NO 2 COL VERTS	9	11	50			S				25	3.0											25	3.	944	
104	PIER NO 3 COL VERTS	9	11	50			S				24	9.0											24	9.	926	
104	PIER NO 3 COL VERTS	9	11	50			S				23	9.0											23	9.	888	
104	PIER NO 3 COL VERTS	9	11	50			S				9	6.											9	6.	491	489
105	PIERS NO 2+3 COL HOOPS	3	137	66			S				2	9.0	1	0.0									11	10.	2271	2270
107	X-BEAM STIRRUPS PIERS 2+3	5	184	61			S				3	3.0	4	0.5	4	0.5	6.0	6.0					4	10.	1839	1856
108	X-BEAM STIRRUPS PIERS 2+3	5	368	64			S				6.0		4	0.5		6.0	0.0						81	0.	2479	
109	X-BEAM PIER 2 BOT	14	4	50			S				81	0.0											30	0.	918	
110	X-BEAM PIER 2 BOT	14	4	50			S				30	0.0											23	0.	704	
111	X-BEAM PIER 2 BOT	14	4	50			S				23	0.0											41	6.	693	692
112	X-BEAM PIERS 2+3	5	16	50			S				41	6.0											40	0.	107	106
113	X-BEAM PIERS 2+3	4	4	50			S				40	0.0											8	11.	6632	
114	HINGE BARS	11	140	65			S				2	2.0	7	2.0		0.0							82	0.	3764	
115	X-BEAM TOP PIER 2	14	6	50			S				82	0.0											20	0.	306	
116	X-BEAM TOP PIER 2	14	2	50			S				20	0.0											18	0.	275	
117	X-BEAM TOP PIER 2	14	2	50			S				18	0.0											16	0.	245	
118	X-BEAM TOP PIER 2	14	2	50			S				16	0.0											20	6.0	346	
119	X-BEAM TOP PIER 2	14	2	80			S				20	6.0		0.0	2	7.0	0.0	9.0	0	82	23	7.	360	361
119	X-BEAM TOP PIER 2	14	2	80			S				21	6.0		0.0	2	7.0	0.0	9.0	0	82	21	7.	330	
120	X-BEAM TOP PIER 2	14	2	80			S				19	6.0		0.0	2	7.0	0.0	9.0	0	82	22	7.	345	346
120	X-BEAM TOP PIER 2	14	2	80			S				20	6.0		0.0	2	7.0	0.0	9.0	0	82	22	7.	345	490
121	X-BEAM TOP PIER 2	14	2	50			S				16	0.0											14	0.	214	
122	X-BEAM PIER 2	14	2	50			S				14	0.0											4	0.	693	692
123	X-BEAM PIERS 2+3	5	166	61			S				3	3.0		6.0		6.0	0.0	0.0					81	0.	2479	
124	X-BEAM PIER 3 BOT	14	4	50			S				81	0.0											30	0.	918	
125	X-BEAM PIER 3 BOT	14	4	50			S				30	0.0											23	0.	469	
126	X-BEAM PIER 3 BOT	11	4	50			S				23	0.0											16	0.	170	
127	X-BEAM PIER 3 TOP	11	2	50			S				16	0.0											82	0.	3764	
128	X-BEAM PIER 3 TOP	14	6	50			S				82	0.0											20	0.	306	
129	X-BEAM PIER 3 TOP	14	2	50			S				20	0.0											18	0.	191	
130	X-BEAM PIER 3 TOP	11	2	50			S				18	0.0											16	0.	340	
131	X-BEAM PIER 3 TOP	11	4	50			S				16	0.0											14	7.		
132	X-BEAM PIER 3 TOP	14	4	80			S	V	2		21	6.0		0.0	2	7.0	0.0	9.0	0	82	22	7.	705	707
											20	6.0		0.0	2	7.0	0.0	9.0	0	82	21	7.		
132	X-BEAM PIER 3 TOP	14	4	80			S	V	2		19	6.0		0.0	2	7.0	0.0	9.0	0	82	22	7.	673	676
											20	6.0		0.0	2	7.0	0.0	9.0	0	82	49	4.	1185	1186
135	PIERS NO 1+4 FTG	6	16	50			S				49	3.5											5	4.	1079	1080
136	PIERS NO 1+4 FTG	5	194	50			S				5	4.0											4	8.	309	312
137	PIERS NO 1+4	4	100	65	T		S					5.0	4	3.5		0.0							5	4.	456	
137	PIERS NO 1+4	4	128	65	T		S					5.0	5	0.0		0.0							6	1.	536	
137	PIERS NO 1+4	4	132	65	T		S					5.0	5	9.0		0.0							31	2.	749	750
138	PIERS NO 1+4 GIRDER SEAT	4	36	50			S				31	2.0											45	11.	1103	1104
139	PIERS NO 1+4 GIRDER SEAT	6	16	50			S				45	11.0											5	4.	641	642
140	PIERS NO 1+4 GIRDER SEAT	4	180	61	T		S				3	0.0	1	3.0	1	3.0	0.0	0.0					16	4.	3066	
141	PIERS NO 1+4 BK WALL	5	180	62	T		S					9.0	7	6.0	7	6.0	6.0	6.0								

S = Bar is included in substructure quantities.
F = Bar to be field welded.
T = Tie or Stirrup
H = A.S.T.M. A-432.
V = Bar dimensions vary between dimensions shown on this line and the following line.

MARK NO.	LOCATION	SIZE	NO. REQ'D.	BEND TYPE	TIE OR STIR	FLD. WELD	SUBSTR.	A-432	VARIES	NO. EACH	DIMENSIONS (Out to out) U Ft.	U In.	W Ft.	W In.	X Ft.	X In.	Y Ft.	Y In.	Z Ft.	Z In.	θ1 Deg.	θ2 Deg.	LENGTH Ft.	LENGTH In.	WEIGHT Lbs.	
142	PIERS NO 1+4 BK WALL	4	72	50			S			31	2.0												31	2.	1496	1500
143	PIERS 1+4 PAVT SEAT	4	260	64	T		S				5.0		1	3.0		5.0		0.0					1	11.	333	332
144	PIERS 1+4 PAVT SEAT	4	6	50			S			28	3.0												28	3.	113	114
W20	GIRDER STOP-LONGIT	4	24	50			S			2	5.0												2	5.	39	38
W21	GIRDER STOP-TRANSV	5	36	70	T		S			2	2.0	2	1.5	2	1.5								7	5.	277	278
W1	WING WALL	6	10	90			S			16	3.0	10	5.0	6	0.0						144		16	11.	247	246
W1	WING WALL	6	10	90			S			16	3.0	10	5.0	6	0.0						36		15	10.	240	238
W1	WING WALL	6	8	90			S	V	2	14	4.0	9	8.0	6	0.0						144		15	11.	131	148
W1	WING WALL									8	11.0	3	1.0	4	0.0								3	8.		
																					36		14	4.		
W1	WING WALL	6	8	90			S	V	2	14	4.0	8	8.0	6	0.0								8	11.	126	
										8	11.0	2	9.0	6	0.0								9	6.	127	
										9	6.0												9	9.		
W2	WING WALL	4	20	50			S			7	9.0												7	11.	57	
W2	WING WALL	4	16	50			S	V	4	2	11.0												7	4.	157	156
W3	WING WALL	4	32	50			S			7	4.0												5	10.		
W3	WING WALL	4	40	50			S	V	8	6	10.0												3	10.	129	140
										3	10.0												8	0.	43	44
W4	WING WALL	4	8	50			S			8	0.0												29	0.	12885	
150	SLAB BOT TRANSV	5	426	50						29	0.0												22	7.	10411	
150	SLAB BOT TRANSV	5	442	50						22	7.0												28	7.		
150	SLAB BOT TRANSV	5	130	50				V	2	28	7.0												2	9.	2124	2064
										2	9.0												2	9.		
150	SLAB BOT TRANSV	5	98	50				V	2	2	9.0												22	2.	1273	1308
										22	2.0												40	0.	9345	
151	SLAB BOT LONGIT	5	224	50						40	0.0												34	6.	504	
151	SLAB BOT LONGIT	5	14	50						34	6.0												45	6.	664	
151	SLAB BOT LONGIT	5	14	50						45	6.0												47	0.	686	
151	SLAB BOT LONGIT	5	14	50						47	0.0												41	6.	460	466
151	SLAB BOT LONGIT	5	14	50						41	6.0												36	0.	526	
151	SLAB BOT LONGIT	5	14	50						36	0.0												40	0.	6508	
152	SLAB TOP LONGIT	5	156	50						40	0.0												46	10.	879	873
152	SLAB TOP LONGIT	5	18	50						46	10.0	6	0										41	10.	480	493
152	SLAB TOP LONGIT	5	18	50						41	10.0	6	0										35	0.	657	
152	SLAB TOP LONGIT	5	18	50						35	0.0												60	0.	10252	10232
153	SLAB TOP GIRDER	8	64	50						60	0.0												42	4.	1808	
153	SLAB TOP GIRDER	8	16	50						42	4.0												20	0.	1088	
154	SLAB TOP PIER 2	9	16	50						20	0.0												26	0.	1414	
154	SLAB TOP PIER 2	9	16	50						26	0.0												34	0.	1850	
154	SLAB TOP PIER 2	9	16	50						34	0.0												42	0.	2285	
154	SLAB TOP PIER 2	9	16	50						42	0.0												18	0.	979	
154	SLAB TOP PIER 3	9	16	50						18	0.0												26	0.	1414	
154	SLAB TOP PIER 3	9	16	50						26	0.0												36	0.	1958	
154	SLAB TOP PIER 3	9	16	50						36	0.0												2627	4.9	24574	23994
155	SLAB TOP TRANSV	5	862	52						26	2.0												27	2.		
155	SLAB TOP TRANSV	5	114	51				V	2	26	7.0												4	10.	1902	1862
										4	3.0												25	9.		
155	SLAB TOP TRANSV	5	118	50				V	2	25	9.0												3	0.	1769	1710
										3	0.0												4	10.	101	100
156	SLAB TOP	5	20	51						4	3.0												44	2.	1887	1886
01	END DIAPHRAGMS	8	16	50						44	2.0												8	5.	157	158
D2	END DIAPHRAGMS	4	28	50						8	5.0															
W2	WING WALL	4	10	50			5			9	6.0												9	6.	64	
W2	WING WALL	4	10	50			5			11	4.0												11	4.	76	
W2	WING WALL	4	8	50			5	V	2	7	11.0												7	11.		
W2	WING WALL	4	8	50			5	V	2	7	9.0												7	9.	26	
										3	11.0												3	11.		
										9	11.0												9	11.	38	
03	END DIAPHRAGMS	7	4	50			H			16	8.5	0											16	9.	137	136
03	END DIAPHRAGMS	7	2	50			H			46	8.0												46	8.	191	190
D4	END DIAPHRAGMS	7	28	50			H			8	5.0												8	5.	482	
05	END DIAPHRAGMS	4	154	62	T						9.0	2	6.0	2	6.0	5.0		5.0					6	3.	643	642
D6	INTER DIAPH	7	40	50						42	0.0												42	0.	3434	3435
D7	INTER DIAPH	8	10	50						38	10.5	0											38	11.	1038	1035
08	INTERMED DIAPH	11	10	50			H			39	8.0												39	8.	2107	2110
09	INTERMED DIAPH	4	70	50						10	0.0												10	0.	468	470
D10	INTERMED DIAPH	4	420	71	T						5.0	3	6.5	3	6.5								7	3.	2036	2035
159	PIERS 2/3	8	32	50						3	4.0												3	4.	285	284
160	PIER DIAPHRAGMS	4	224	80	T					5	7.0		2.0		0.0	0.0	0.0	150	0				5	11.	885	886
161	PIER DIAPHRAGMS	5	48	50						39	11.0												39	11.	1998	2048
165	SLAB TO CURB TIES	5	714	69	T						6.0		4.0	1	3.5	8.0	6.0						2	9.	2041	
166	CURB-RAILBASE	4	358	64	T						5.0	2	2.0		5.0	0.0							2	10.	678	
167	CURB-RAILBASE	5	714	65	T						8.5	2	2.5		8.5								3	5.	2545	
168	CURB LONGIT	4	150	50						15	9.0												15	9.	1578	
160	CURB LONGIT	4	20	50						13	7.0												13	7.	181	
169	CURB TIE	4	358	65	T						5.0	1	3.0		0.0								1	7.	179	182
170	RAIL BASE LONGIT	4	120	50						7	9.0												7	9.	621	618
170	RAIL BASE LONGIT	4	8	50						7	11.5												8	0.	43	42
170	RAIL BASE LONGIT	4	8	50						5	4.0												5	4.	29	28
171	RAIL BASE LONGIT	6	120	50						7	9.0												7	9.	1397	1376
171	RAIL BASE LONGIT	6	8	50						7	11.5												8	0.	96	
171	RAIL BASE LONGIT	6	8	50						5	4.0												5	4.	64	
W10	CURB END	5	814	63			5				9.0	2	7.0	2	7.0	0.0	0.0						5	8.	83	98
W11	CURB END	4	16	65			5				5.0	1	3.0		0.0								1	7.	16	
W10	CURB END	5	6	63			5				9.0	2	7.0	2	7.0								5	2.	38	

BENDING DIAGRAMS



Type 90

Note:
182 Bends for transverse bars due to roadway crown conditions 378 have not been shown. These bars shall be bent as required to 62 conform to the configuration of the structure.

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	WASH.	I-405-3(294)118 UNIT 1	26	26

SR 405
MP 24.28 TO MP 26.37
NORTH CR. BR. AND 228TH ST. O'XING
KING & SNOHOMISH COUNTIES
228TH ST. OVERCROSSING

BAR LIST

As Built Changes in Red 1-22-70

WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS
OLYMPIA, WASHINGTON

GEORGE D. ZAHN, CHAIRMAN
R. L. MIKALSON — BAKER FERGUSON
H. WALSH — JOHN M. RUPP

APPROVED Nov. 22, 1967

CONT. No. 8375 (CONTRACT NUMBER)

SHEET 26 OF 26 SHEETS

228th - Sou... 1992

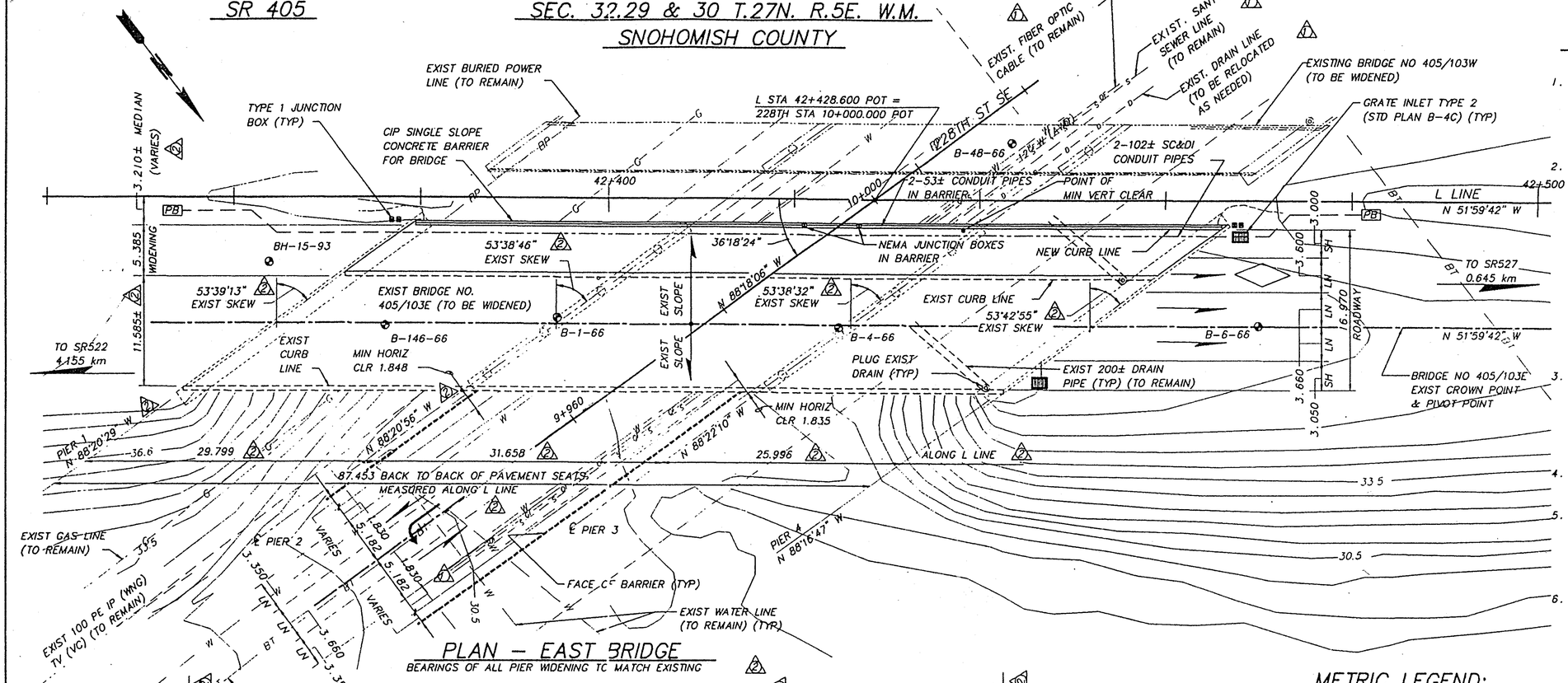
6/2

Bridge Design Engineer
Supervising Bridge Engr.
Detailed
Design Checked

SR 405
NORTH CREEK TO DAMSON ROAD
S. STRUCTURES
KING & SNOHOMISH COUNTIES
FED. AID PROJ. NO. I-405-3(294)118
UNIT 1

SR 405

SEC. 32,29 & 30 T.27N. R.5E. W.M.
SNOHOMISH COUNTY



PLAN – EAST BRIDGE

BEARINGS OF ALL PIER WIDENING TO MATCH EXISTING

ELEVATION

SEE STANDARD PLAN H-9 FOR EMBANKMENT DETAILS AT BRIDGE ENDS
SEE BRIDGE SHEET 4 FOR TEMPORARY CONSTRUCTION OPENING ALONG 228TH ST SE

GENERAL NOTES

1. ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION METRIC DATED 1996, AND AMENDMENTS.
2. THE WIDENED PORTION OF THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES FIFTEENTH EDITION – 1992 AND INTERIMS THROUGH 1995. ALL PRESTRESSED CONCRETE ELEMENTS HAVE BEEN DESIGNED FOR SERVICE LOAD STRESS AND CHECKED FOR THE REQUIREMENTS OF LOAD FACTOR DESIGN. ALL NEW STRUCTURAL ELEMENTS ARE DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS FOR LOAD FACTOR DESIGN. SEISMIC DESIGN OF THE WIDENED STRUCTURE HAS BEEN PERFORMED USING AN ACCELERATION COEFFICIENT OF 0.25 WITH A TYPE II SOIL PROFILE SPECTRUM.
3. SUBSTRUCTURE DETAILS ARE SUBJECT TO CHANGE, DEPENDING UPON FOUNDATION MATERIAL ENCOUNTERED. REINFORCING STEEL FOR FOOTINGS, ABUTMENT WALLS AND COLUMNS SHALL NOT BE CUT UNTIL FINAL FOOTING ELEVATIONS HAVE BEEN DETERMINED AND SUBSTRUCTURE DETAILS HAVE BEEN MODIFIED IF NECESSARY.
4. THE MAXIMUM DESIGN SOIL PRESSURE IS 290 kPa FOR PIERS 1 & 4 AND 770 kPa FOR PIERS 2 & 3.
5. THE CONCRETE IN THE ROADWAY DECK SHALL BE CLASS 28D. THE CONCRETE IN THE SEALS SHALL BE CLASS 28W. ALL OTHER CAST-IN-PLACE CONCRETE SHALL BE CLASS 28, EXCEPT WHERE SPECIFICALLY SHOWN OTHERWISE ON THE PLANS.
6. THE CONCRETE SEALS AT PIERS 2 & 3 ARE DESIGNED FOR A WATER SURFACE ELEVATION OF 28.000. AFTER SEALS ARE PLACED, COFFERDAMS SHALL NOT BE DEWATERED WHEN THE WATER LEVEL IS ABOVE ELEVATION OF 28.000. PROVISIONS SHALL BE PROVIDED TO FLOOD THE COFFERDAM IN THE EVENT THAT THE WATER SURFACE RISES ABOVE THE DESIGN ELEVATION.
7. FALSEWORK SHALL BE CAREFULLY RELEASED TO PREVENT IMPACT OR UNDUE STRESS IN THE STRUCTURE. THE TRAFFIC BARRIER SHALL NOT BE PLACED UNTIL THE FALSEWORK HAS BEEN RELEASED.
8. UNLESS OTHERWISE SHOWN ON THE PLANS, CONCRETE COVER MEASURED FROM THE FACE OF THE CONCRETE TO THE FACE OF ANY REINFORCEMENT STEEL SHALL BE 50 AT THE TOP OF THE ROADWAY SLAB, 25 AT THE BOTTOM OF THE ROADWAY SLAB, 50 AT THE TOP OF THE FOOTING, 75 AT THE BOTTOM OF THE FOOTINGS AND 40 AT ALL OTHER LOCATIONS.
9. THE BACKFILL BEHIND THE PIER ABUTMENTS MAY BE PLACED PRIOR TO PLACEMENT OF THE SUPERSTRUCTURE.
10. ALL EXISTING DIMENSIONS AND ELEVATIONS SHALL BE MEASURED & VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ORDERING OR FABRICATING ANY MATERIAL (SEE SPECIAL PROVISIONS).

METRIC LEGEND:

126.175 DENOTES METERS
175 DENOTES MILLIMETERS

SOIL BORING TEST HOLE

B / 12 — IDENTIFIES SECTION, VIEW OR DETAIL — TAKEN OR SHOWN ON BRIDGE SHEET 12

B / – — TAKEN OR SHOWN ON THE SAME SHEET

P.C. GIRDERS (W58MG) WIDENING CONTINUOUS FOR LIVE LOAD

LOADING: HS-25
OR
TWO 107 kN AXLES @ 1.220 CTRS

FOR "AS CONSTRUCTED PLANS" ONLY

BRIDGE DESIGN ENGR	C.C. RUTH	4/96			
SUPERVISOR					
DESIGNED BY	M. TRAGESSER	6/96			
CHECKED BY	S. ANDERSON	6/96			
DETAILED BY	R. MOHN	6/96	11/13/98	CHANGE ORDER 25	MT
BRIDGE PROJECTS ENGR	K.N. KIRKER	4/96	10/97 2	REVISED AS-BUILT SURVEY DATA	MT
PRELIM PLAN BY	Y. TEO	3/96	9/97 1	REVISED PIER 3 FOOTING-FIT UTILITIES	JZ
ARCHITECT/SPECIALIST	A. YOUNG	3/96	DATE	REVISION	BY APPR

REGION NO	STATE	FED AID PROJ NO	SHEET NO	TOTAL SHEETS
1	WASH			
JOB NUMBER 96W035				
CONTRACT NO.				

MARVIN R. WILSON — 20537 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES OCTOBER 8, 1998

BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH
FEDERAL WAY, WASHINGTON 98003-6398
(206)431-2300 FAX:(206)431-2250

Washington State Department of Transportation

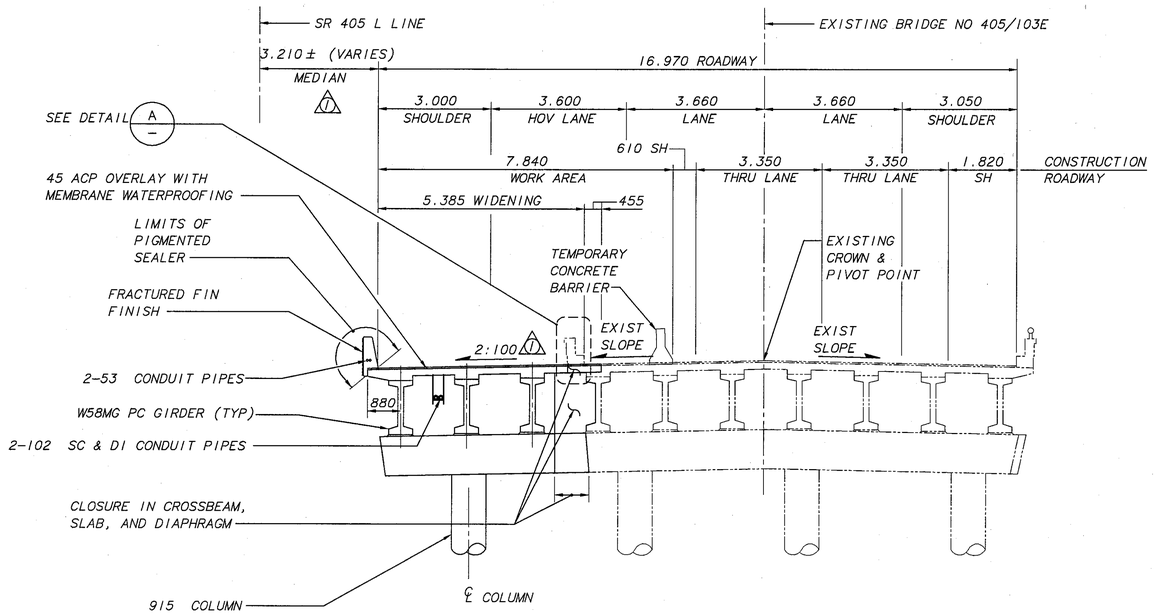
SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

LAYOUT

BRIDGE SHEET NO. 1
SHEET 499 OF 663 SHEETS

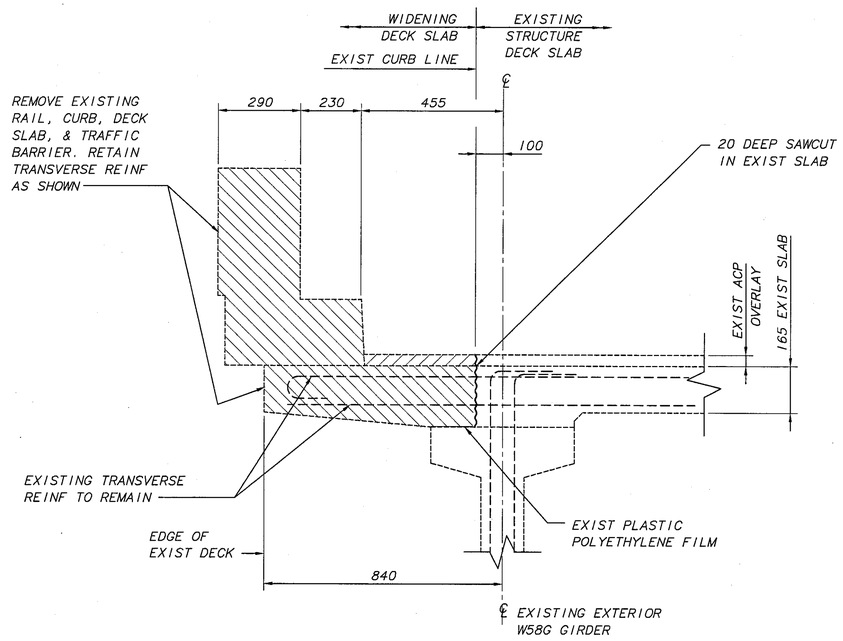
SR 405 JOB NO. 7079 SHEET 1 OF 3L

LOTET, Mon Oct 13 1997 7:51am FILENAME: V:\A96077\405-103E\1.dwg SCALE: 250



TYPICAL SECTION

ALL DIMENSIONS NORMAL TO L LINE



DEMOLITION DETAIL (A)

NOTE: FOR REMOVAL DETAILS @ PIER 1 & 4, SEE BRIDGE SHEET 6 & 7.

NOTES:

1. THE DIMENSIONS SHOWN ON THE PLANS ARE BASED ON ORIGINAL CONSTRUCTION RECORDS TOGETHER WITH FIELD SURVEY DATA. THE WIDENED PORTION OF THE STRUCTURE IS INTENDED TO MATCH THE EXISTING BRIDGE. THESE DIMENSIONS AND ELEVATIONS SHALL BE VERIFIED BY THE CONTRACTOR IN THE FIELD.

SR 405 JOB NO. 7079 SHEET 2 OF 31

PLOTTED: Mon Oct 13 1997 4:26pm FILENAME: v:\A96077\405-103E\2.dwg SCALE: 7.5

BRIDGE DESIGN ENGR					
SUPERVISOR					
DESIGNED BY	M. TRAGESSER	6/96			
CHECKED BY	S. ANDERSON	6/96			
DETAILED BY	R. MOHN	6/96			
BRIDGE PROJECTS ENGR					
PRELIM PLAN BY			10/97 (1)	REVISED AS-BUILT SURVEY DATA	MLT
ARCHITECT/SPECIALIST			DATE	REVISION	BY APPR

REGION NO.	STATE	FED AID PROJ NO	SHEET NO.	TOTAL SHEETS
1	WASH			
JOB NUMBER 96W035				
CONTRACT NO. 5054				

WARREN E. WILSON — STATE OF WASHINGTON — 20527 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES OCTOBER 8, 1998

BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH
FEDERAL WAY, WASHINGTON 98003-6395
(206)431-2300 FAX:(206)431-2250

Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

TYPICAL SECTION & DEMOLITION DETAILS

BRIDGE SHEET NO. 2

SHEET 500 OF 663 SHEETS

BRIDGE NO. 405/103E
EXISTING ELEVATIONS

L LINE STATION	ACP ELEVATION LEFT CURB LINE ⚠	ACP ELEVATION PROFILE GRADE LINE	ACP ELEVATION RIGHT CURB LINE	CCP ELEVATION SAW-CUT LINE ⚠
42+355.360	–	–	38.632	–
42+357.000	–	38.716	38.598	–
42+360.000	–	38.640	38.550	–
42+363.000	–	38.585	38.486	–
42+366.000	–	38.498	38.401	–
42+369.000	–	38.435	38.328	–
42+371.340	–	–	–	–
42+372.000	38.285	38.372	38.250	38.241
42+375.000	38.220	38.316	38.170	38.184
42+378.000	38.154	38.257	38.092	38.124
42+381.000	38.090	38.187	38.019	38.057
42+384.000	38.024	38.115	37.946	37.993
42+387.000	37.952	38.044	37.871	37.920
42+390.000	37.880	37.968	37.791	37.843
42+393.000	37.806	37.890	37.719	37.767
42+396.000	37.729	37.818	37.654	37.690
42+399.000	37.657	37.749	37.587	37.614
42+402.000	37.581	37.679	37.516	37.546
42+405.000	37.514	37.612	37.446	37.479
42+408.000	37.450	37.544	37.379	37.413
42+411.000	37.382	37.471	37.308	37.346
42+414.000	37.309	37.398	37.232	37.276
42+417.000	37.242	37.321	37.162	37.204
42+420.000	37.165	37.242	37.098	37.130
42+423.000	37.090	37.167	37.038	37.055
42+426.000	37.020	37.091	36.967	36.982
42+429.000	36.954	37.022	36.895	36.908
42+432.000	36.878	36.959	36.821	36.833
42+435.000	36.805	36.893	36.747	36.758
42+438.000	36.737	36.817	36.665	36.690
42+441.000	36.660	36.740	36.583	38.624
42+442.410	–	–	36.542	–
42+444.000	36.591	36.653	–	36.547
42+447.000	36.508	36.563	–	36.469
42+450.000	36.437	36.474	–	36.396
42+453.000	36.363	36.388	–	36.319
⚠ 42+456.925	–	–	–	36.216
42+456.000	36.282	36.308	–	36.237
42+458.610	36.226	–	–	–

228TH ST SE
EXISTING ELEVATIONS

	LEFT						228TH ST SE	RIGHT					
	BARRIER		FOG STRIPE		LANE EDGE		CENTERLINE	LANE EDGE		FOG STRIPE		BARRIER	
228TH ST SE STATION	OFFSET	ELEVATION	OFFSET	ELEVATION	OFFSET	ELEVATION	ELEVATION	OFFSET	ELEVATION	OFFSET	ELEVATION	OFFSET	ELEVATION
9+960.376							29.858						
9+963.424							29.801						
9+966.472							29.745	5.182	29.663	7.010	29.595	9.309	29.519
9+969.520	8.580	29.532	7.010	29.554	5.182	29.587	29.688	5.182	29.627	7.010	29.561	9.091	29.491
9+972.568	8.549	29.504	7.010	29.525	5.182	29.556	29.831	5.182	29.591	7.010	29.527	8.843	29.463
9+975.616	8.529	29.476	7.010	29.495	5.182	29.526	29.600	5.182	29.554	7.010	29.493	8.623	29.435
9+978.664	8.510	29.448	7.010	29.466	5.182	29.495	29.574	5.182	29.518	7.010	29.459	8.402	29.407
9+981.712	8.491	29.420	7.010	29.437	5.182	29.464	29.548	5.182	29.482	7.010	29.425	8.362	29.384
9+984.760	8.471	29.392	7.010	29.407	5.182	29.434	29.521	5.182	29.446	7.010	29.391	8.379	29.364
9+987.808	8.454	29.364	7.010	29.378	5.182	29.403	29.495	5.182	29.421	7.010	29.367	8.396	29.344
9+990.856	8.494	29.345	7.010	29.360	5.182	29.384	29.482	5.182	29.408	7.010	29.353	8.371	29.324
9+993.904	8.503	29.332	7.010	29.349	5.182	29.374	29.470	5.182	29.396	7.010	29.340	8.347	29.303
9+996.952	8.512	29.318	7.010	29.338	5.182	29.364	29.457	5.182	29.382	7.010	29.326	8.322	29.283
10+000.000	8.521	29.305	7.010	29.327	5.182	29.353	29.445	5.182	29.370	7.010	29.312	8.298	29.263
10+003.048	8.503	29.302	7.010	29.325	5.182	29.351	29.442	5.182	29.380	7.010	29.321	8.304	29.274
10+006.096	8.445	29.314	7.010	29.334	5.182	29.358	29.453	5.182	29.393	7.010	29.335	8.347	29.290
10+009.144	8.388	29.326	7.010	29.343	5.182	29.365	29.463	5.182	29.406	7.010	29.348	8.391	29.307
10+012.192	8.331	29.339	7.010	29.353	5.182	29.372	29.474	5.182	29.420	7.010	29.362	8.434	29.323
10+015.240	8.315	29.353	7.010	29.362	5.182	29.379	29.499	5.182	29.440	7.010	29.382	8.440	29.344
10+018.288	8.373	29.384	7.010	29.387	5.182	29.405	29.540	5.182	29.478	7.010	29.420	8.400	29.380
10+021.336	8.431	29.414	7.010	29.434	5.182	29.453	29.581	5.182	29.516	7.010	29.458	8.361	29.416
10+024.384	8.522	29.450	7.010	29.481	5.182	29.502	29.623	5.182	29.554	7.010	29.496	8.322	29.452
10+027.432	8.782	29.509	7.010	29.528	5.182	29.550	29.664	5.182	29.592	7.010	29.534	8.283	29.488
10+030.480	9.101	29.524	7.010	29.574	5.182	29.599	29.719	5.182	29.630	7.010	29.572	8.286	29.526
10+033.528	9.443	29.535	7.010	29.621	5.182	29.647	29.775	5.182	29.666	7.010	29.609	8.295	29.566
10+036.576	9.784	29.546	7.010	29.679	5.182	29.726	29.831	5.182	29.702	7.010	29.647	8.304	29.606
10+039.624			7.010	29.758	5.182	29.805	29.887	5.182	29.738	7.010	29.684	8.312	29.645
10+042.672			7.010	29.837	5.182	29.885	29.950	5.182	29.801	7.010	29.750	8.338	29.713
10+045.720			7.010	29.917	5.182	29.964	30.052	5.182	29.896	7.010	29.849	8.385	29.806
10+048.768			7.010	29.996	5.182	30.043	30.154	5.182	29.991	7.010	29.948	8.432	29.900
10+051.816			7.010	30.076	5.182	30.122	30.256	5.182	30.087	7.010	30.047	8.480	29.993
10+054.864							30.357						
10+057.912							30.460						
10+060.960							30.561						

PLOTTED: Mon Oct 13 1997 8:07am FILENAME: V:\A960771\405-103E\3.dwg SCALE: 1

SR 405 JOB NO. 7079 SHEET 3 OF 31

BRIDGE DESIGN ENGR					
SUPERVISOR					
DESIGNED BY	M. TRAGESSER	6/96			
CHECKED BY	S. ANDERSON	6/96			
DETAILED BY	R. MOHN	6/96			
BRIDGE PROJECTS ENGR					
PRELIM PLAN BY			10/97 ⚠	REVISED AS-BUILT SURVEY DATA	MLT
ARCHITECT/SPECIALIST			DATE	REVISION	BY APPR

REGION NO	STATE	FED AID PROJ NO	SHEET NO	TOTAL SHEETS
1	WASH			
JOB NUMBER 96W035				
CONTRACT NO. 5054				

WARREN E. WILSON — STATE OF WASHINGTON — 20527 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES OCTOBER 8, 1998

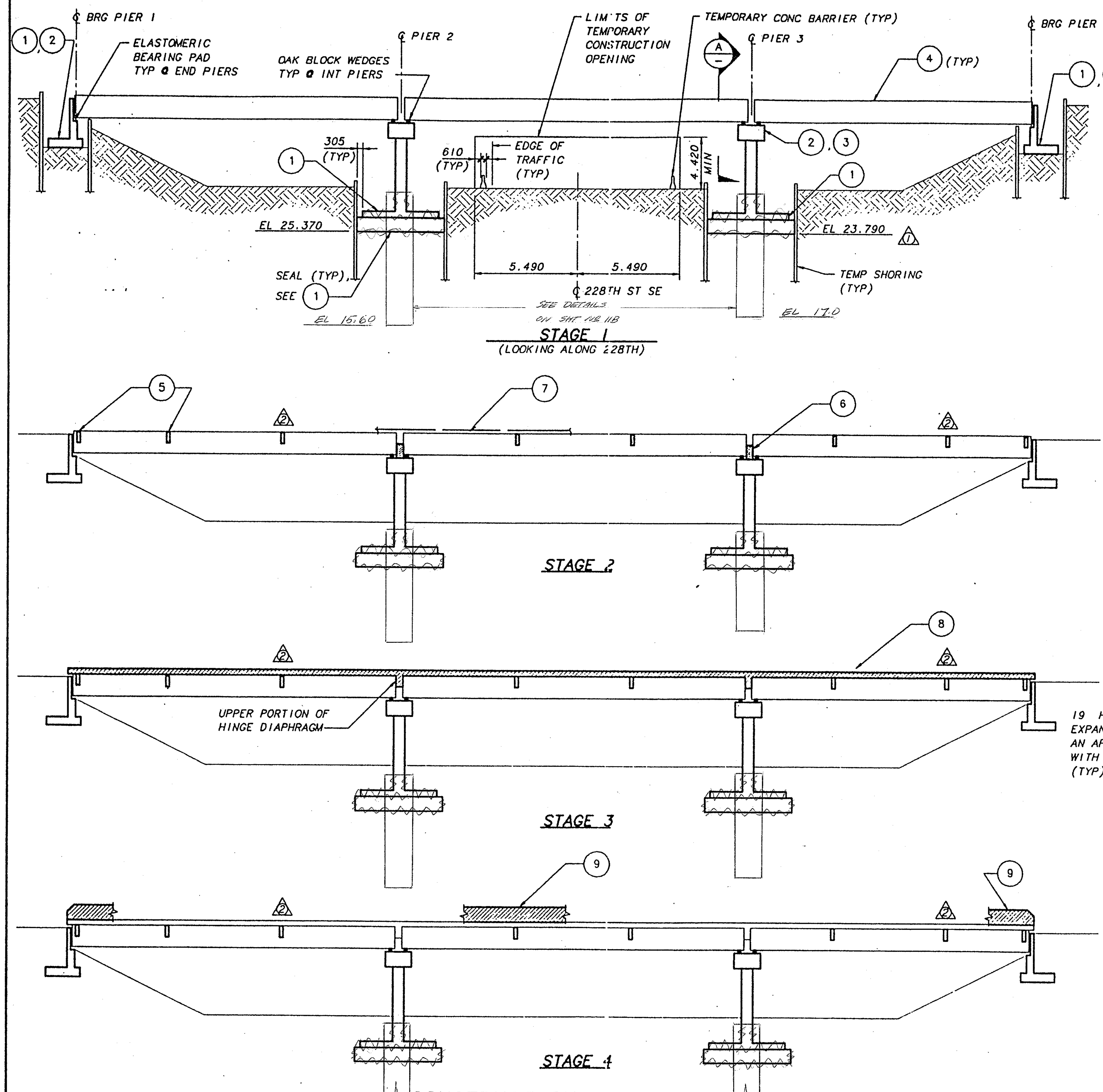
BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH
FEDERAL WAY, WASHINGTON 98003-6395
(206)431-2300 FAX:(206)431-2250

Washington State Department of Transportation

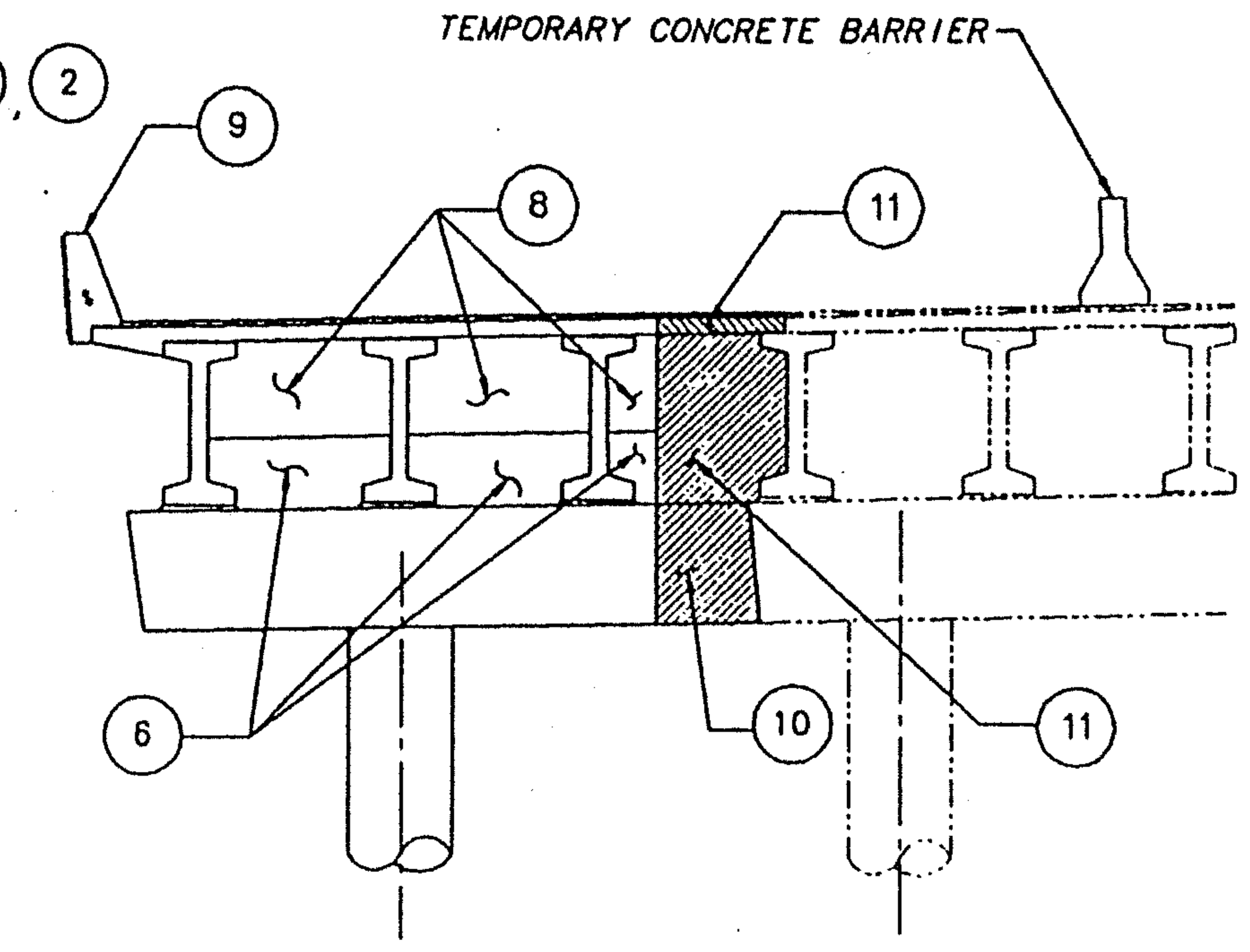
SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

GEOMETRIC DATA

BRIDGE SHEET NO. 3
SHEET 501 OF 663 SHEETS



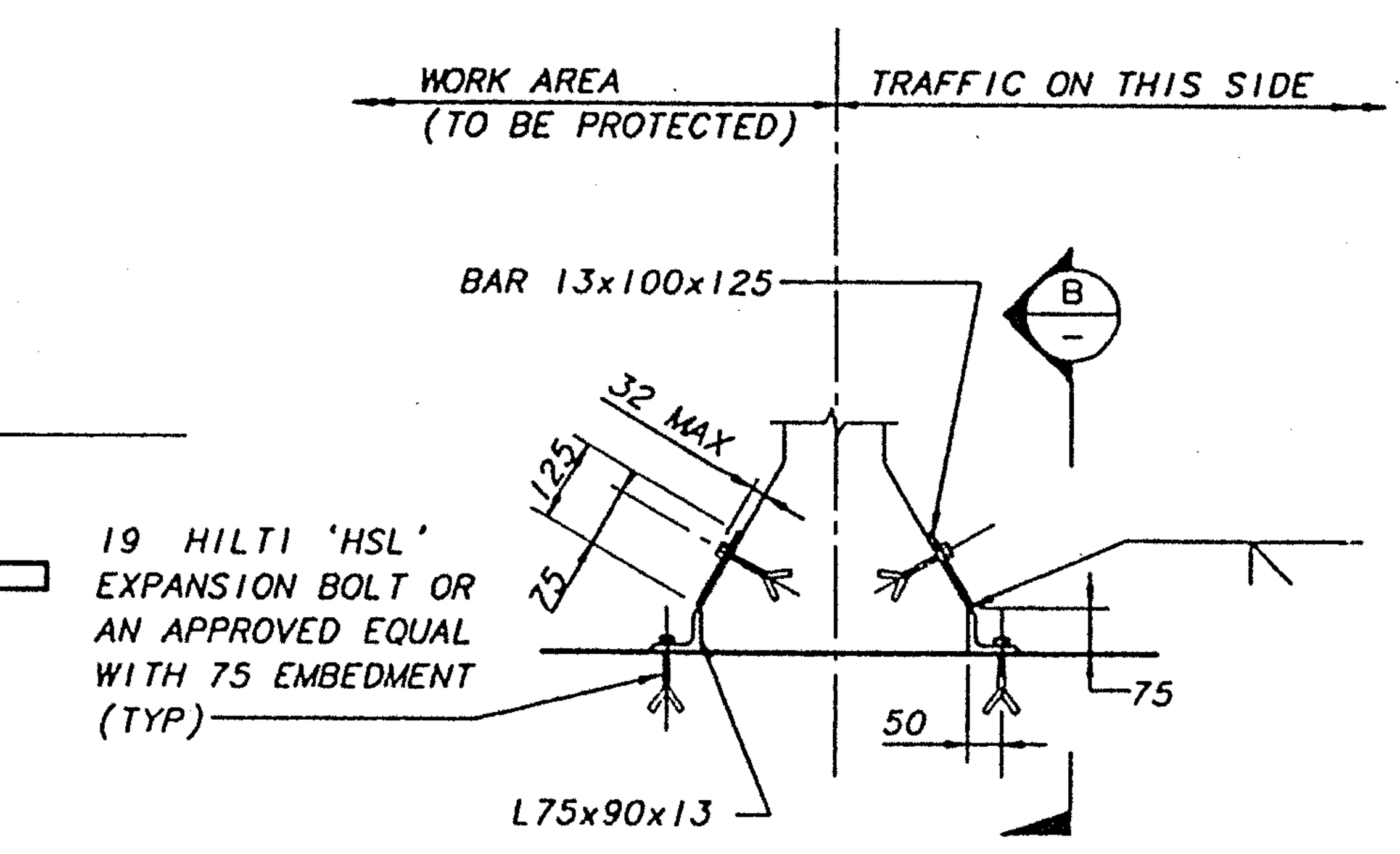
CONSTRUCTION SEQUENCE



SECTION A

CONSTRUCTION SEQUENCE:

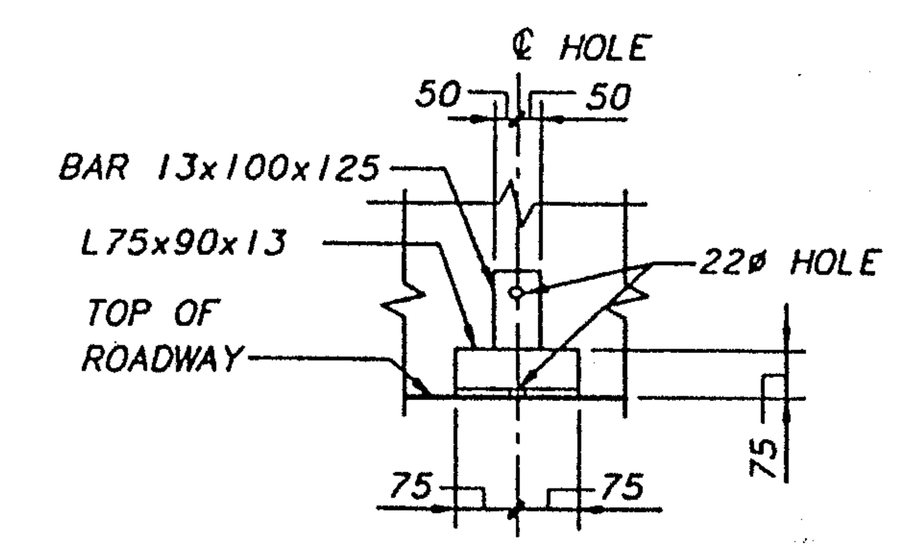
1. EXCAVATION @ PIERS: PROVIDE TEMPORARY SHORING AT PIERS 1 & 4. PROVIDE TEMPORARY SHORING & SEAL AT PIERS 2 & 3. SEAL MAY BE DELETED FROM THE CONTRACT IF IT IS DETERMINED THAT DEWATERING IS ADEQUATE TO CONSTRUCT THE FOOTING IN THE DRY. REMOVE SHORING & BACKFILL AFTER FOOTINGS HAVE ATTAINED REQUIRED STRENGTH PER THE STANDARD SPECIFICATIONS.
2. DRILL & SET DOWELS INTO EXISTING CROSS BEAMS, ABUTMENTS & DIAPHRAGMS. ERECT FALSEWORK FOR PIERS 2 & 3 AND CONSTRUCT CROSS BEAMS. CONSTRUCT ABUTMENTS.
3. RELEASE FALSEWORK AFTER PIER CONCRETE HAS REACHED 28 MPa.
4. PLACE GIRDERS.
5. PLACE END & INTERMEDIATE DIAPHRAGMS.
6. PLACE LOWER PORTION OF HINGE DIAPHRAGM. PLACEMENT SHALL NOT BE MADE UNTIL 30 DAYS MIN AFTER RELEASE OF PRESTRESS.
7. PLACE DECK REINFORCEMENT.
8. PLACE DECK AND UPPER HINGE DIAPHRAGM 24 HOURS MIN AFTER PLACING INTERMEDIATE AND LOWER HINGE DIAPHRAGMS. REMOVE FALSE WORK FOR DECK AFTER DECK HAS REACHED 28 MPa.
9. BARRIERS SHALL BE PLACED AFTER DIAPHRAGM TOP PLACEMENT HAS ATTAINED A MIN STRENGTH OF 21 MPa.
10. CAST CROSS BEAM CLOSURE.
11. CAST DIAPHRAGM & DECK CLOSURES AFTER CROSS BEAM CLOSURE HAS REACHED 28 MPa.



ANCHOR ASSEMBLY DETAIL

ANCHOR ASSEMBLY NOTES:

1. SHIMS MAY BE REQUIRED TO FIT THE BRACKET TO THE TEMPORARY CONCRETE BARRIER AND ROADWAY SURFACE.
2. LOCATION OF ANCHORS IS TO BE ADJUSTED TO CIRCUMVENT THE MAIN REINFORCING IN THE DECK WHEN DRILLING HOLES.
3. PROVIDE TWO (2) ANCHOR ASSEMBLIES FOR EACH SECTION OF THE TEMPORARY CONCRETE BARRIER ON THE ROADWAY SURFACE.
4. FOR DETAILS NOT SHOWN, SEE STANDARD C-8.
5. LOCATE ANCHORS APPROXIMATELY 760 FROM BOTH ENDS OF EACH SECTION.
6. AFTER REMOVING THE TEMPORARY CONCRETE BARRIER, CLEAN AND FILL BOLT HOLES WITH A 2:1 SAND/CEMENT GROUT BY VOLUME.



SECTION B

FOR "AS CONSTRUCTED PLANS" ONLY

BRIDGE DESIGN ENGR				
SUPERVISOR				
DESIGNED BY	M. TRAGESSER	6/96		
CHECKED BY	S. ANDERSON	6/96		
DETAILED BY	R. MOHN	6/96	4/13/98 CHANGE ORDER # 25	MB
BRIDGE PROJECTS ENGR			10/97 REVISED AS-BUILT SURVEY DATA	MLT
PRELIM PLAN BY			9/97 REVISED PIER 3 FOOTING-FIT UTILITIES	JZ
ARCHITECT/SPECIALIST			DATE / REVISION	BY / APPR

REGION NO. 1 | STATE WASH | FED AID PROJ NO | JOB NUMBER 96W035 | CONTRACT NO

EXPIRES OCTOBER 8, 1998

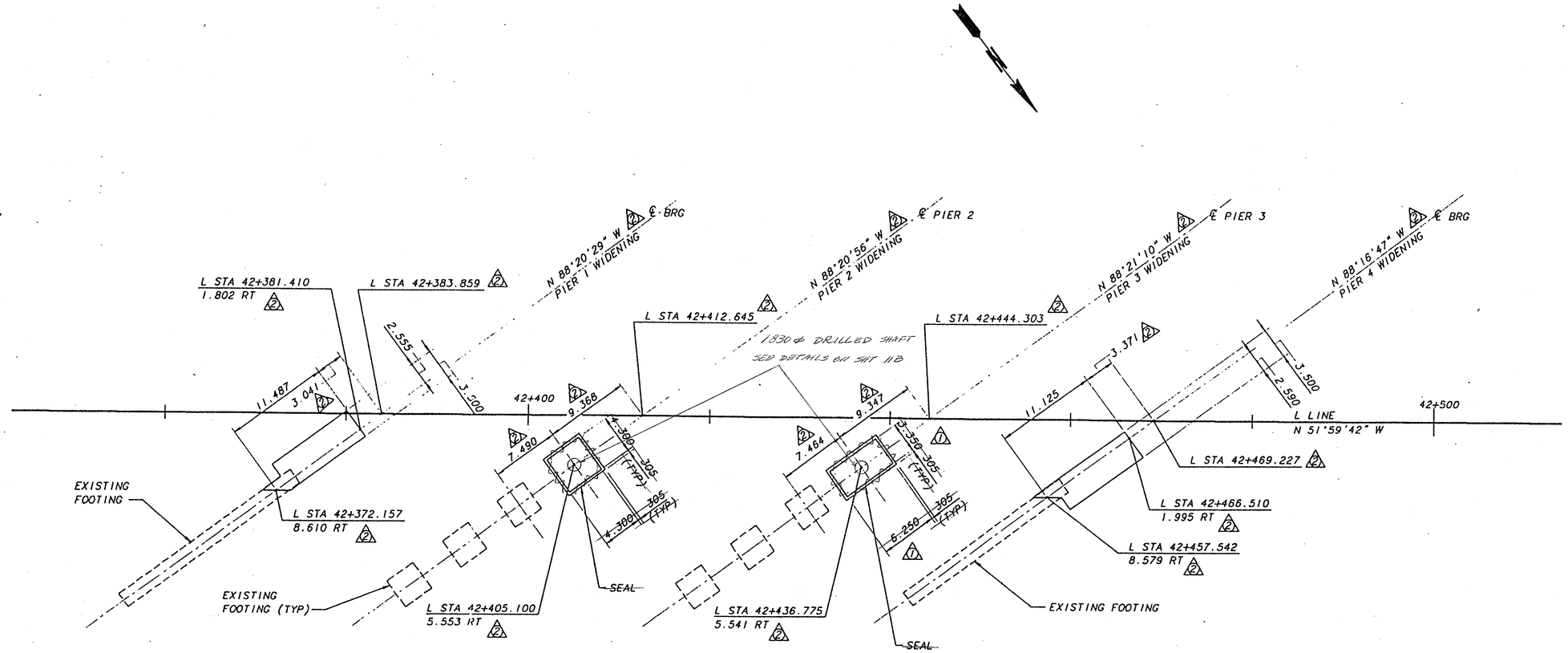
BERGER/ABAM ENGINEERS INC.

Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E
CONSTRUCTION SEQUENCE - SUPERSTRUCTURE

BRIDGE SHEET NO. 4
SHEET 502 OF 663 SHEETS

SR 405 JOB NO. 7079 SHEET 4 OF 31



FOOTING PLAN

NOTE:
1. CONTRACTOR SHALL MEASURE & VERIFY EXISTING FOOTING LOCATION, SIZE AND ELEVATIONS PRIOR TO CONSTRUCTION OF NEW FOUNDATIONS.

FOR "AS CONSTRUCTED PLANS" ONLY

BRIDGE DESIGN ENGR					
SUPERVISOR					
DESIGNED BY	M. TRAGESSER	6/96			
CHECKED BY	S. ANDERSON	6/96			
DETAILED BY	R. MOHN	6/96	4/13/98	CHANGE ORDER #25	
BRIDGE PROJECTS ENGR			10/97 (2)	REVISED AS-BUILT SURVEY DATA	M.T
PRELIM PLAN BY			9/97 (1)	REVISED PIER 3 FOOTING-FIT UTILITIES	JZ
ARCHITECT/SPECIALIST			DATE	REVISION	BY / APPR

REGION NO.	STATE	FED AID PROJ NO	SHEET NO.	TOTAL SHEETS
1	WASH			

JOB NUMBER 96W035
CONTRACT NO.

WARREN E. WILSON — STATE OF WASHINGTON — 20837 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES OCTOBER 6, 1998

BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH
FEDERAL WAY, WASHINGTON 98003-6388
(206)431-2300 FAX:(206)431-2250

Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

FOOTING PLAN

BRIDGE SHEET NO. 5
SHEET 503 OF 663 SHEETS

SR 405 JOB NO. 7079 SHEET 5 OF 31

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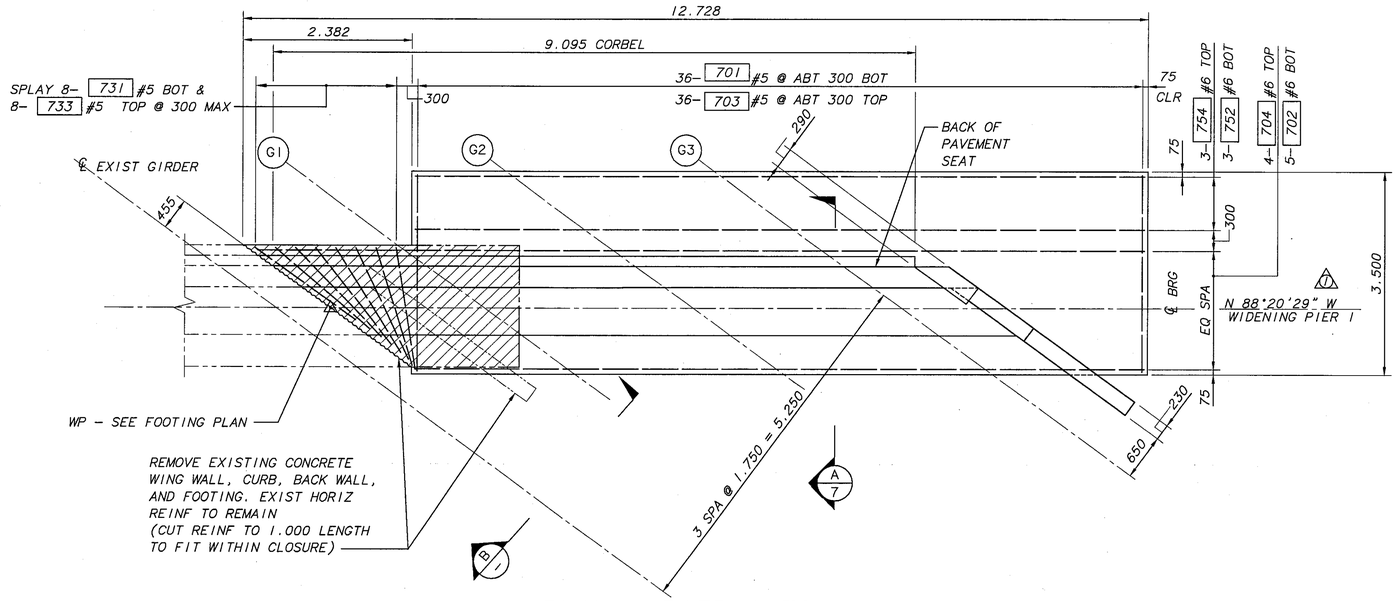
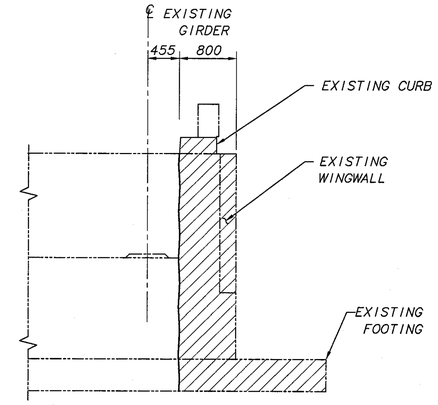
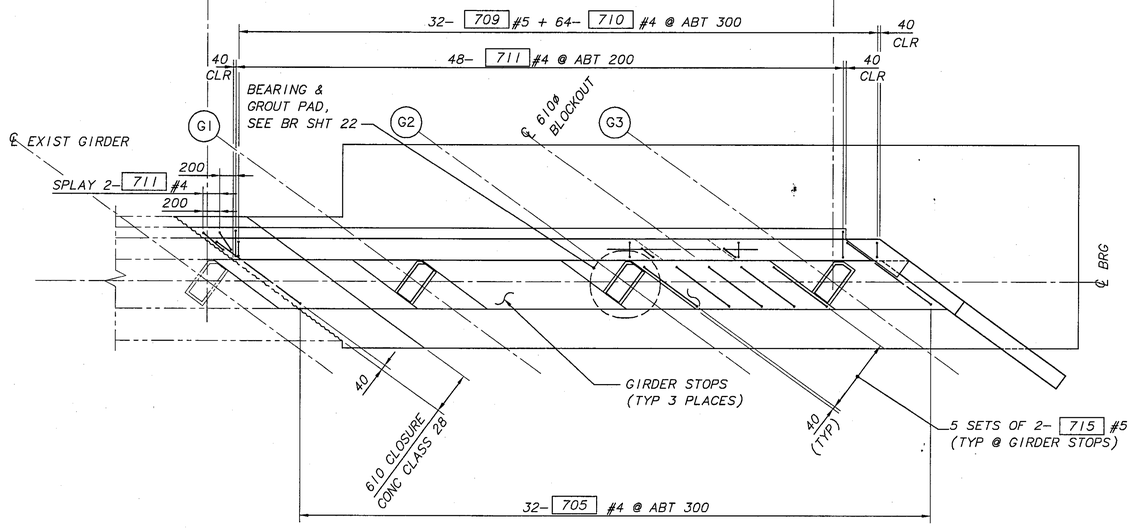


PLAN – PIER 1 FOOTING
(LOOKING BACK ON STATION)



DEMOLITION DETAIL – PIER 1
(LOOKING ALONG L LINE)

B –



PLAN – PIER 1
(LOOKING BACK ON STATION)

BRIDGE DESIGN ENGR					
SUPERVISOR					
DESIGNED BY	M. TRAGESSER	6/96			
CHECKED BY	S. ANDERSON	6/96			
DETAILED BY	R. MOHN	6/96			
BRIDGE PROJECTS ENGR					
PRELIM PLAN BY			10/97 1	REVISED AS-BUILT SURVEY DATA	MLT
ARCHITECT/SPECIALIST			DATE	REVISION	BY APPR

REGION NO.	STATE	FED AID PROJ NO	SHEET NO.	TOTAL SHEETS
1	WASH			

JOB NUMBER 96W035
CONTRACT NO. 5054

WARREN E. WILSON STATE OF WASHINGTON 20587 REGISTERED PROFESSIONAL ENGINEER
EXPIRES OCTOBER 8, 1998

BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH
FEDERAL WAY, WASHINGTON 98003-6395
(206)431-2300 FAX:(206)431-2250

Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

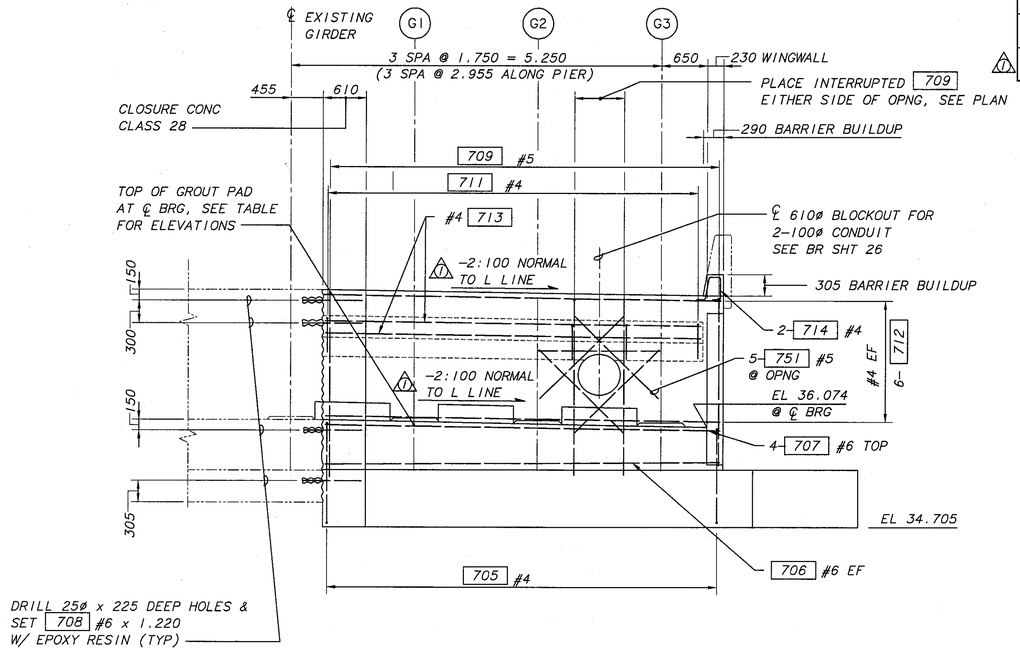
PIER 1 PLAN & DETAILS

BRIDGE SHEET NO. 6
SHEET 504 OF 663 SHEETS

SR 405 JOB NO. 7079 SHEET 6 OF 31

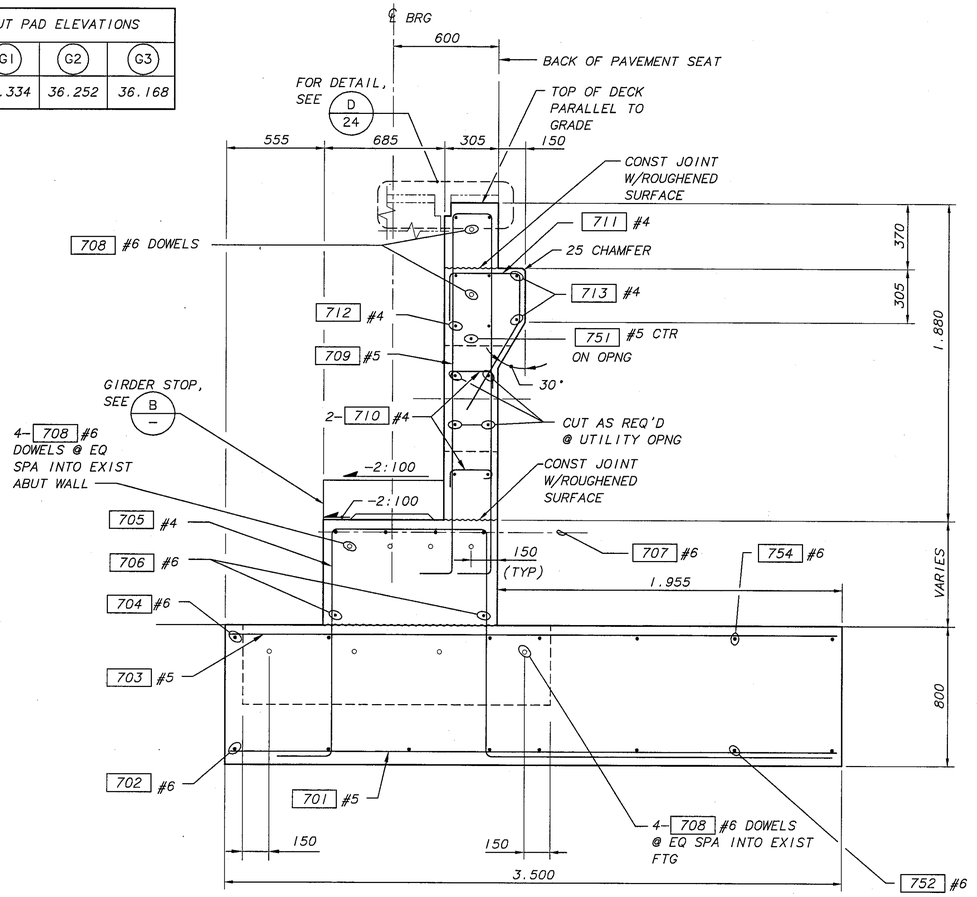
PLOTTED: Mon Oct 13 1997 4:50pm FILENAME: V:\J96077\405-103E\6.dwg SCALE: 40

TOP OF GROUT PAD ELEVATIONS			
GIRDER	G1	G2	G3
① ELEVATION	36.334	36.252	36.168



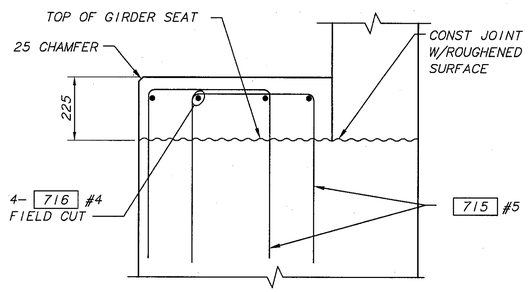
ELEVATION – PIER 1

(DIMENSIONS NORMAL TO L LINE)
(LOOKING BACK ON STATION)



NOTE: FOR DRAINAGE & BACKFILL, SEE DETAIL A 10

SECTION A 6



DETAIL B –,9

SR 405 JOB NO. 7079 SHEET 7 OF 31

PLOTTED: Mon Oct 13 1997 4:53pm FILENAME: V:\A96077\405-103E\7.dwg SCALE: 40

BRIDGE DESIGN ENGR						REGION NO	STATE	FED AID PROJ NO	SHEET NO	TOTAL SHEETS	
SUPERVISOR						1	WASH				
DESIGNED BY	M. TRAGESSER	6/96				JOB NUMBER 96W035					
CHECKED BY	S. ANDERSON	6/96				CONTRACT NO. 5054					
DETAILED BY	R. MOHN	6/96									
BRIDGE PROJECTS ENGR											
PRELIM PLAN BY			10/97	REVISED AS-BUILT SURVEY DATA	MLT						
ARCHITECT/SPECIALIST			DATE	REVISION	BY	APPR					

KATHLEEN E. WILSON — STATE OF WASHINGTON — 20627 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES OCTOBER 6, 1998

BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH
FEDERAL WAY, WASHINGTON 98003-6395
(206)431-2300 FAX: (206)431-2250

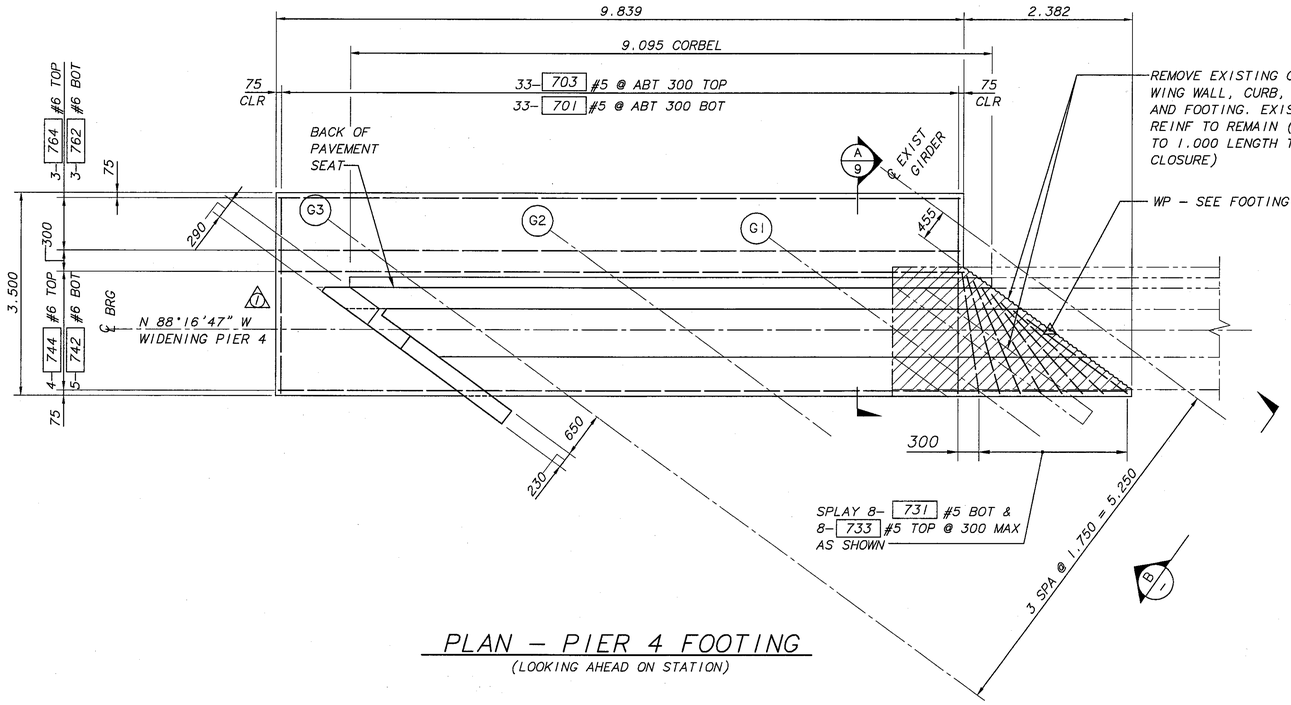
Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

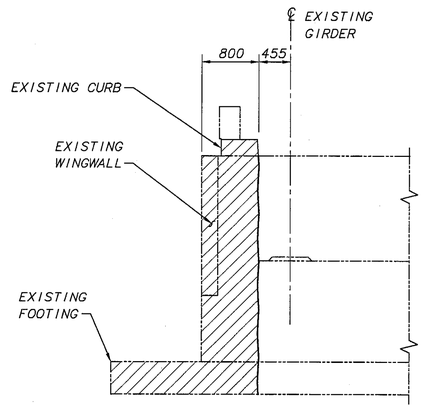
PIER 1 ELEVATION & SECTIONS

BRIDGE SHEET NO. 7

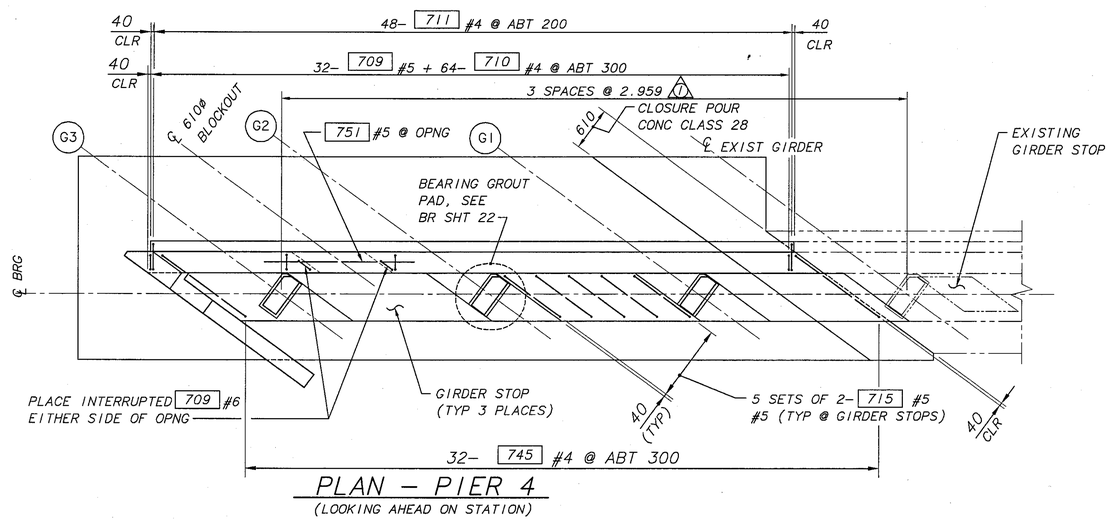
SHEET 505 OF 663 SHEETS



PLAN – PIER 4 FOOTING
(LOOKING AHEAD ON STATION)



DEMOLITION DETAIL – PIER 4 (B/–)
(LOOKING ALONG L LINE)



PLAN – PIER 4
(LOOKING AHEAD ON STATION)

BRIDGE DESIGN ENGR						REGION NO	STATE	FED AID PROJ NO	SHEET NO	TOTAL SHEETS	
SUPERVISOR						1	WASH				
DESIGNED BY	M. TRAGESSER	6/96				JOB NUMBER 96W035					
CHECKED BY	S. ANDERSON	6/96				CONTRACT NO. 5054					
DETAILED BY	R. MOHN	6/96									
BRIDGE PROJECTS ENGR											
PRELIM PLAN BY			10/97 1	REVISED AS-BUILT SURVEY DATA	MLT						
ARCHITECT/SPECIALIST			DATE	REVISION	BY	APPR					

MILTON E. WILSON — STATE OF WASHINGTON — 20627 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES OCTOBER 6, 1998

BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH
FEDERAL WAY, WASHINGTON 98003-6395
(206)431-2300 FAX:(206)431-2250

Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

PIER 4 PLAN & DETAILS

BRIDGE SHEET NO. 8
SHEET 506 OF 663 SHEETS

SR 405 JOB NO. 7079 SHEET 8 OF 31

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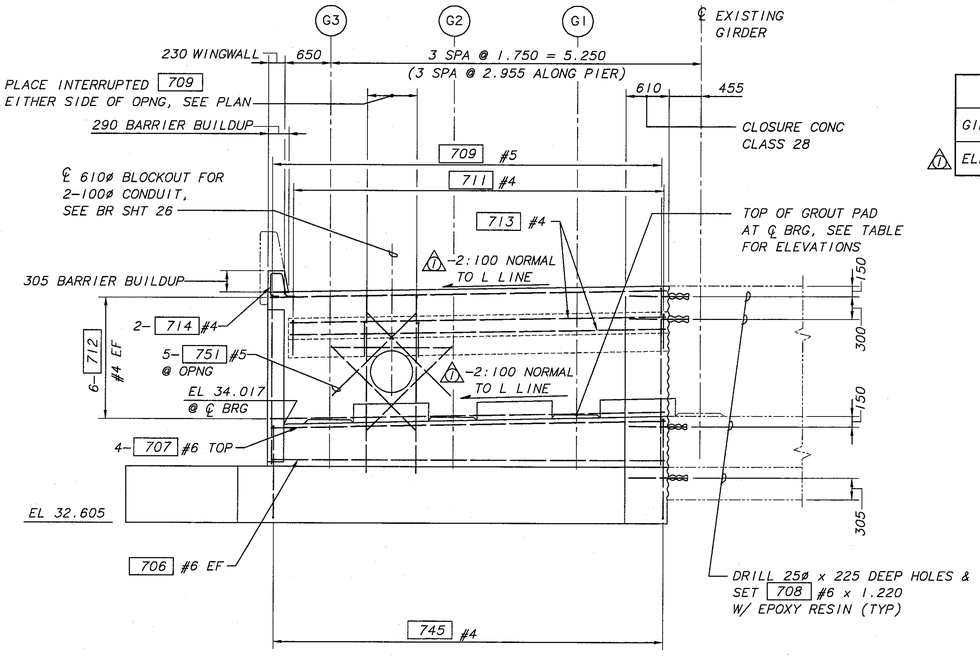
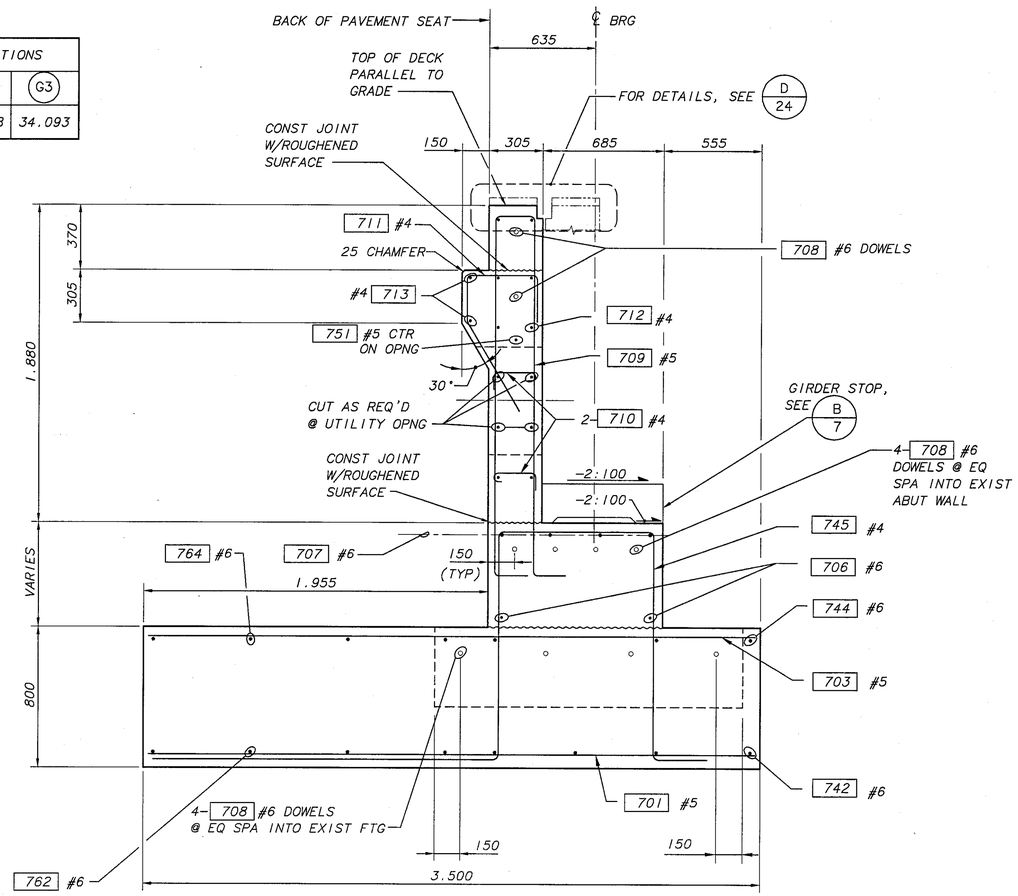


ELEVATION – PIER 4

(DIMENSIONS NORMAL TO L LINE)
(LOOKING AHEAD ON STATION)

TOP OF GROUT PAD ELEVATIONS			
GIRDER	G1	G2	G3
1 ELEVATION	34.284	34.188	34.093



NOTE: FOR DRAINAGE & BACKFILL, SEE DETAIL A 10

SECTION A 8

SR 405 JOB NO. 7079 SHEET 9 OF 31

PLOTTED: Mon Oct 13 1997 4:58pm FILENAME: V:\A96077\1405-103E\9.dwg SCALE: 40

BRIDGE DESIGN ENGR						REGION NO	STATE	FED AID PROJ NO	SHEET NO	TOTAL SHEETS	
SUPERVISOR						1	WASH				
DESIGNED BY	M. TRAGESSER	6/96				JOB NUMBER 96W035					
CHECKED BY	S. ANDERSON	6/96				CONTRACT NO. 5054					
DETAILED BY	R. MOHN	6/96									
BRIDGE PROJECTS ENGR											
PRELIM PLAN BY			1 10/97	REVISED AS-BUILT SURVEY DATA	MLT						
ARCHITECT/SPECIALIST			DATE	REVISION	BY	APPR					

WARREN E. WILSON — STATE OF WASHINGTON — 20527 REGISTERED PROFESSIONAL ENGINEER
EXPIRES OCTOBER 6, 1998

BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH
FEDERAL WAY, WASHINGTON 98003-6395
(206)431-2300 FAX:(206)431-2250

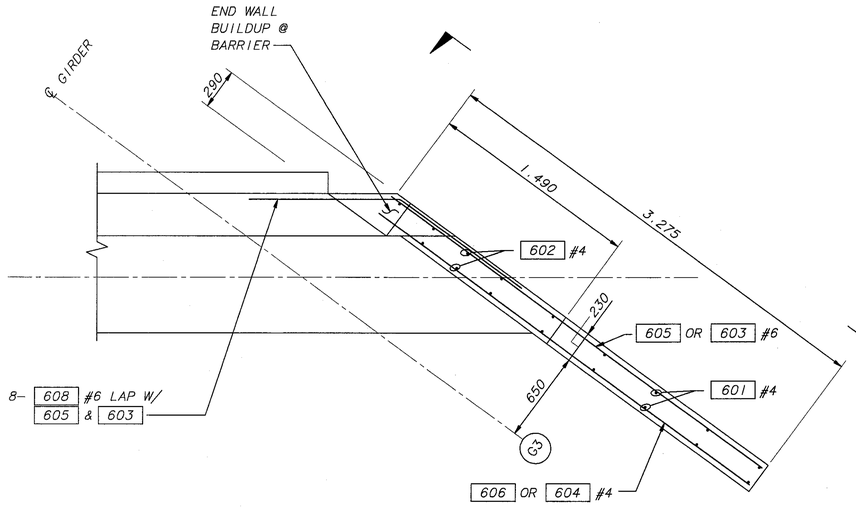
Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

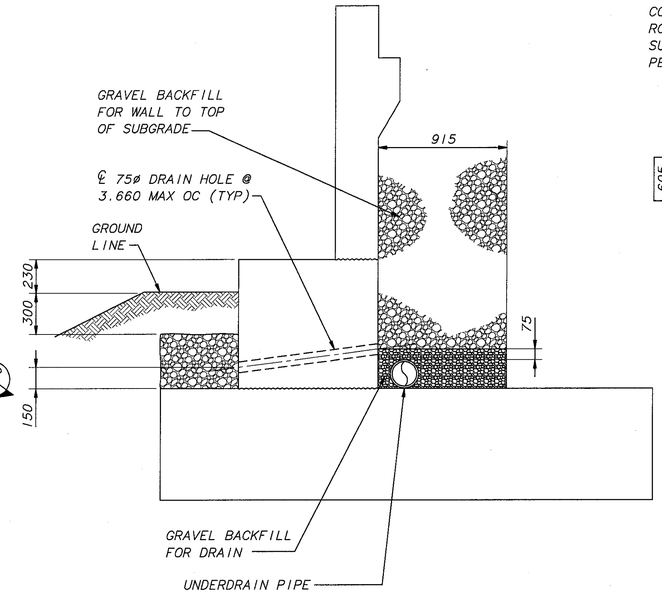
PIER 4 ELEVATION AND SECTIONS

BRIDGE SHEET NO. 9

SHEET 507 OF 663 SHEETS

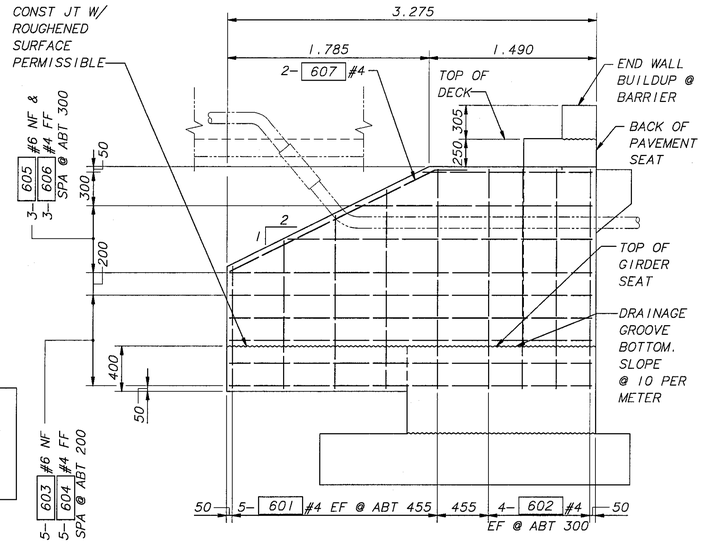


PARTIAL PLAN – PIER 1 CURTAIN WALL

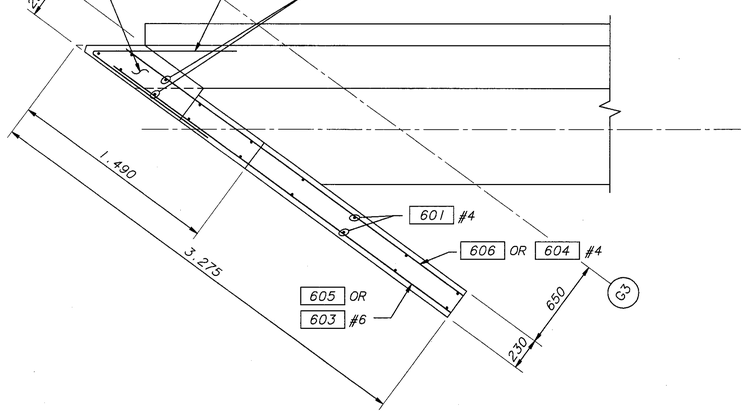


DRAINAGE & BACKFILL DETAIL (A 7,9)

TYPICAL FOR ALL END PIERS



ELEVATION – CURTAIN WALL (B –)



PARTIAL PLAN – PIER 4 CURTAIN WALL

PLOTTED: Tue Nov 12 1996 1:56pm FILENAME: X:\A96077\405-103E\10.DWG SCALE: 20

SR 405 JOB NO. 7079 SHEET 10 OF 31

BRIDGE DESIGN ENGR						REGION NO	STATE	FED AID PROJ NO	SHEET NO	TOTAL SHEETS	
SUPERVISOR						1	WASH				
DESIGNED BY	M. TRAGESSER	6/96				JOB NUMBER					
CHECKED BY	S. ANDERSON	6/96				96W035					
DETAILED BY	R. MOHN	6/96				CONTRACT NO.					
BRIDGE PROJECTS ENGR						5054					
PRELIM PLAN BY											
ARCHITECT/SPECIALIST			DATE	REVISION	BY	APPR					

WARREN E. WILSON — STATE OF WASHINGTON — 20527 REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/8/98

BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH
FEDERAL WAY, WASHINGTON 98003-6395
(206)431-2300 FAX:(206)431-2250

Washington State Department of Transportation

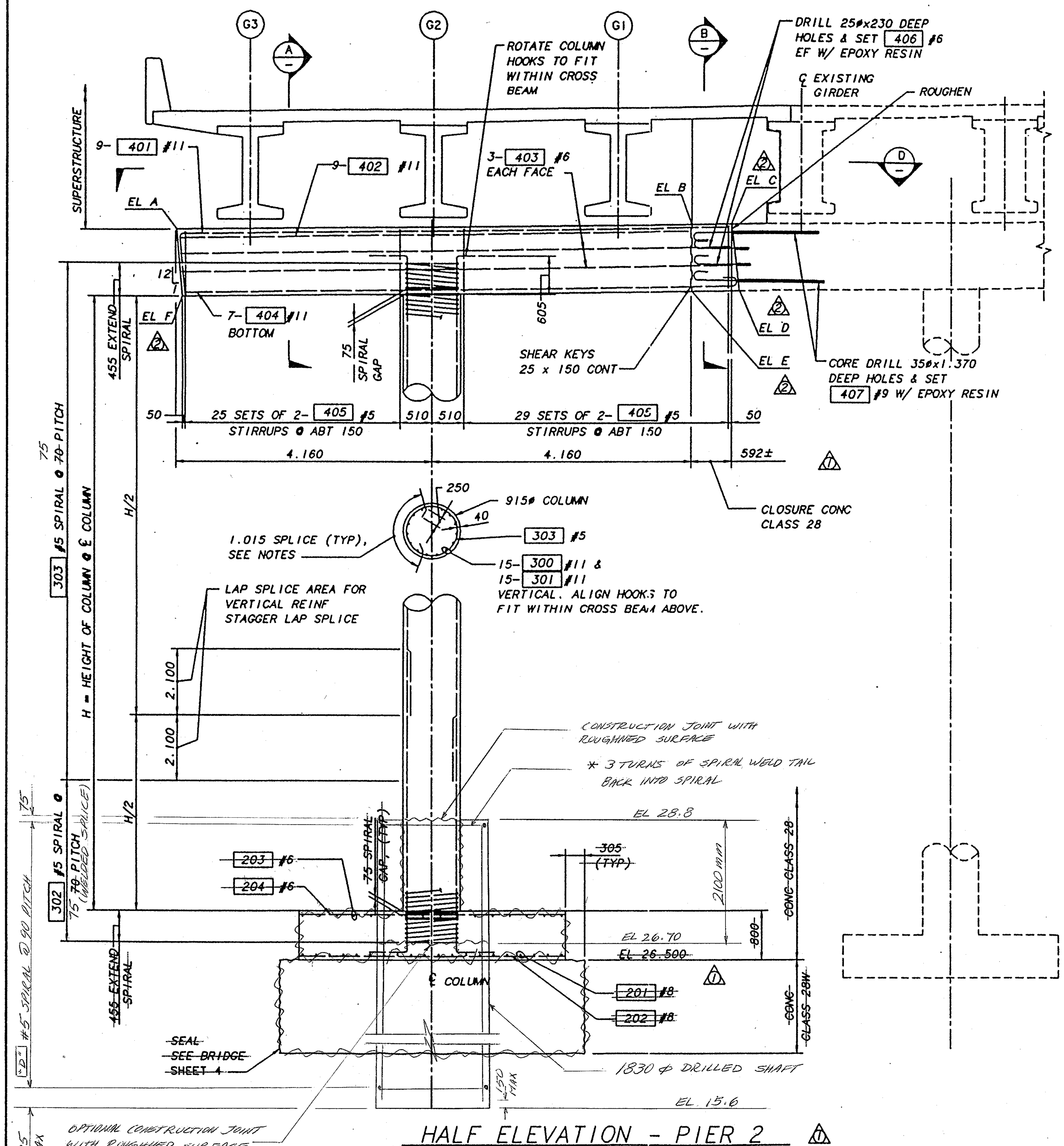
SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

PIER 1 & 4 MISC DETAILS

BRIDGE SHEET NO. 10

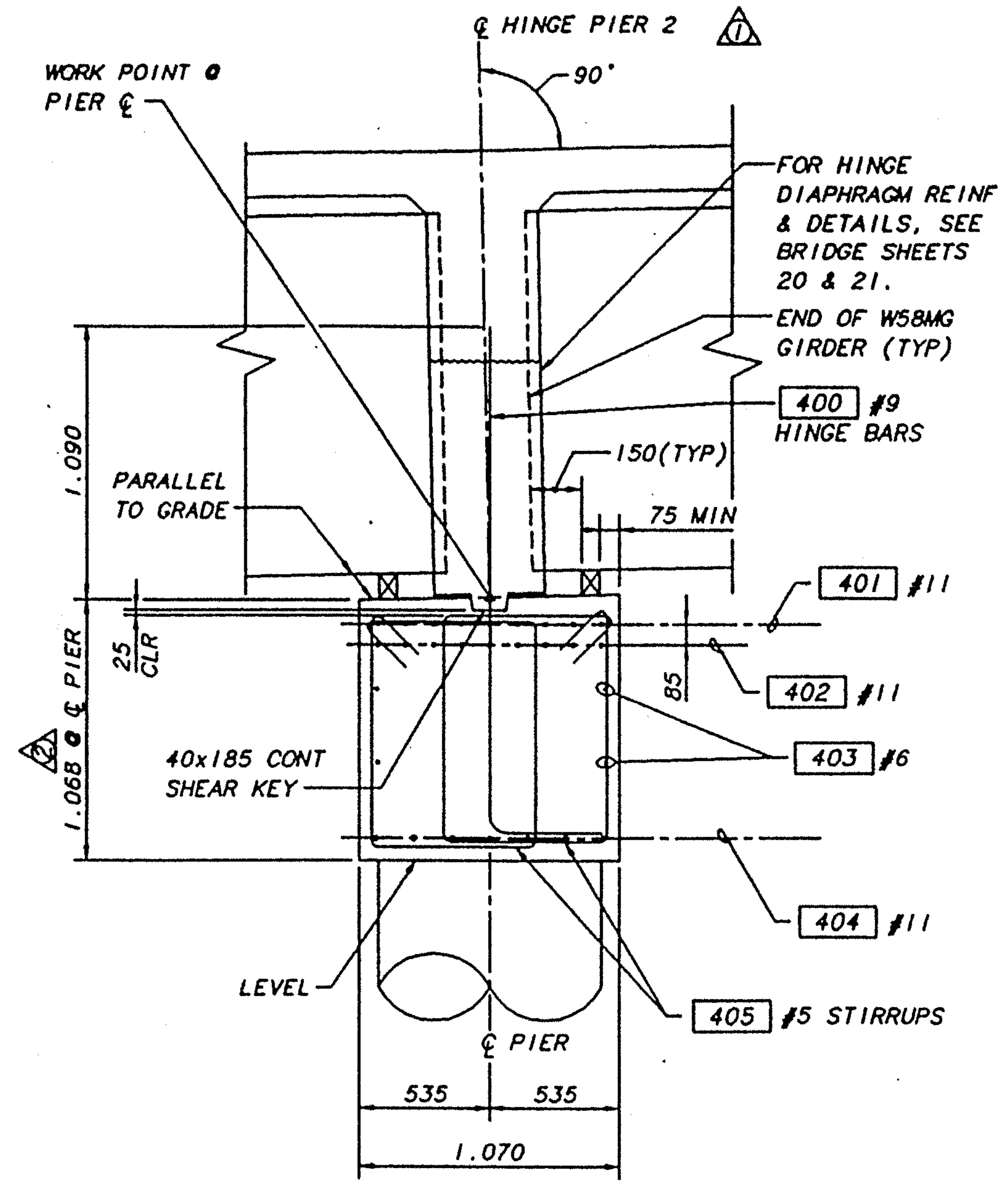
SHEET 508 OF 663 SHEETS

241/118

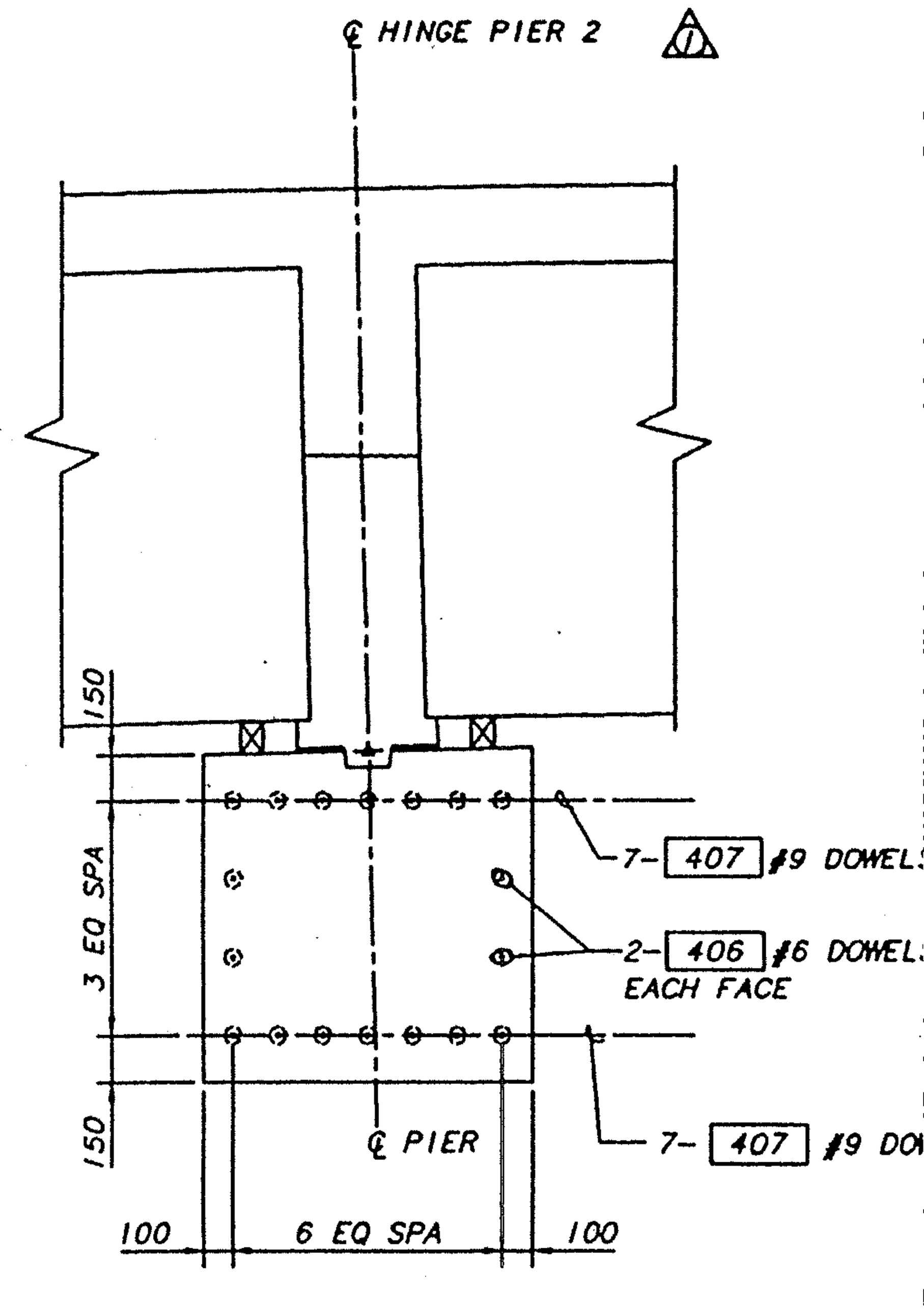


HALF ELEVATION - PIER 2

TRANSVERSE DIMENSIONS ALONG ℄ PIER

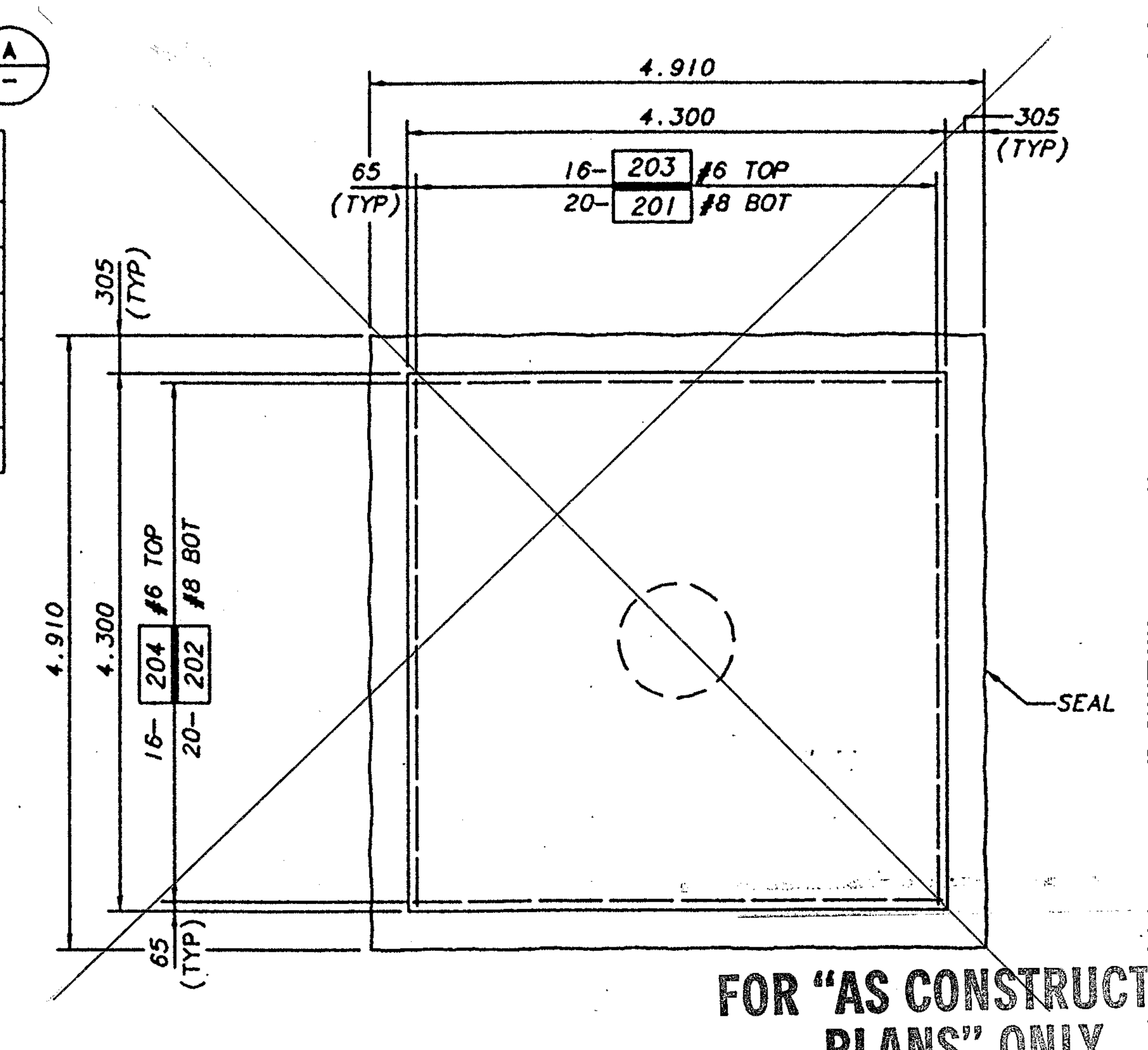


SECTION A



SECTION B

PIER ℄ ELEVATIONS	
EL A	35.446
EL B	35.694
EL C	35.714
EL D	34.649
EL E	34.626
EL F	34.381



~~PLAN - FOOTING PIER 2~~

FOR "AS CONSTRUCTED PLANS" ONLY

COLUMN NOTES:

1. COLUMN SPIRAL BARS SHALL BE #5 DEFORMED BARS, 16 PLAIN STEEL BAR, W31 COLD DRAWN WIRE, OR D31 DEFORMED WIRE.
2. SEE DETAIL ON BR SHT 12 FOR SPIRAL WELD SPLICE ALTERNATE.
3. SPIRAL LAP SPLICE MAY BE USED ONLY WITHIN THE CENTER HALF OF COLUMN HEIGHT. WELD SPLICE SHALL BE USED EXCEPT AS NOTED.
4. TERMINATE SPIRAL WITH 1 1/2 TURNS OF SPIRAL. WELD TAIL BACK ONTO SPIRAL (SEE WELDED LAP SPLICE DETAIL) * OR OTHER WISE AS NOTED
5. SEE DRILLED SHAFT DETAILS ON SHT NO 11B

BRIDGE DESIGN ENGR					
SUPERVISOR					
DESIGNED BY	M. TRAGESSER	6/96			
CHECKED BY	S. ANDERSON	6/96			
DETAILED BY	R. MOHN	6/96	4/13/98	CHANGE ORDER # 25	MZ
BRIDGE PROJECTS ENGR			10/97 △	REVISED AS-BUILT SURVEY DATA	JM
PRELIM PLAN BY			9/97 △	REVISED PIER 3 FOOTING-FIT UTILITIES	JZ
ARCHITECT/SPECIALIST			DATE	REVISION	BY / APPR

REGION NO	STATE	FED AID PROJ NO	SHEET NO	TOTAL SHEETS
1	WASH			

JOB NUMBER 96W035

CONTRACT NO.

WARREN E. WILSON — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER — EXPIRES OCTOBER 8, 19__

BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH FEDERAL WAY, WASHINGTON 98003-6395
(206)431-2300 FAX:(206)431-2250

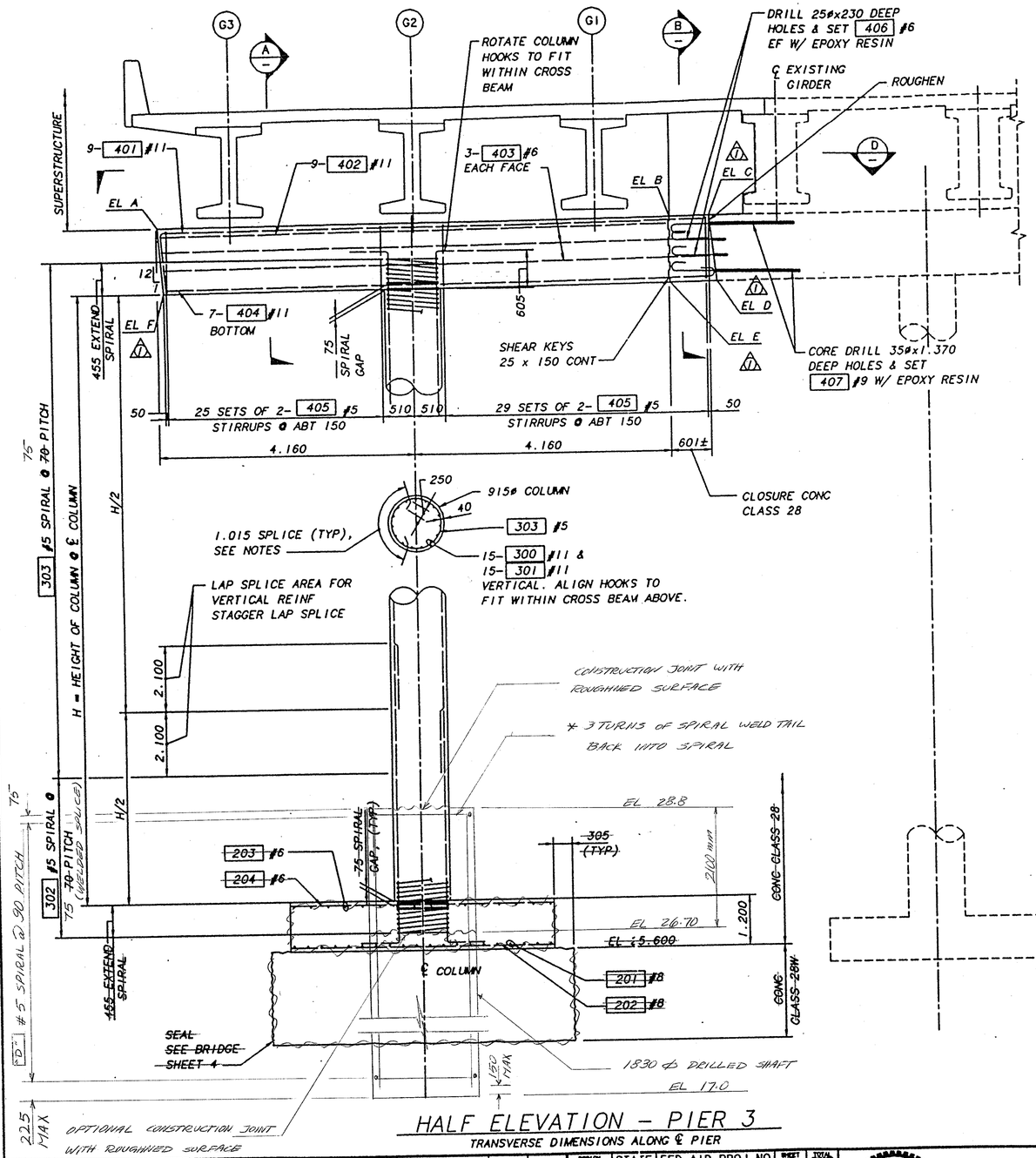
Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

PIER 2 PLAN, ELEVATION & SECTIONS

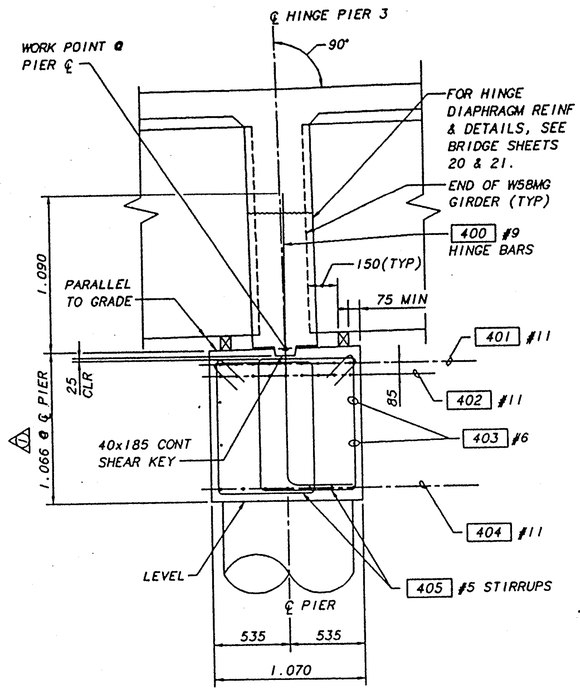
PLOTTER: Tue Oct 14 1997 10:21am FILENAME: V:\96077\405-103E\11.dwg SCALE: 40

SR 405 JOB NO. 7079 SHEET 11 OF 31

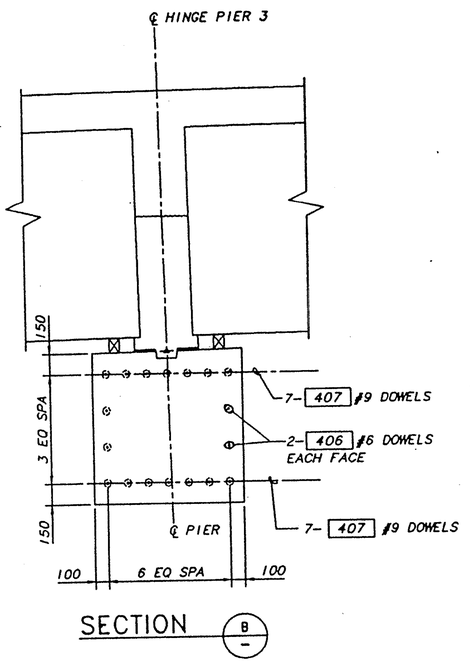


HALF ELEVATION – PIER 3

TRANSVERSE DIMENSIONS ALONG ℄ PIER



SECTION A



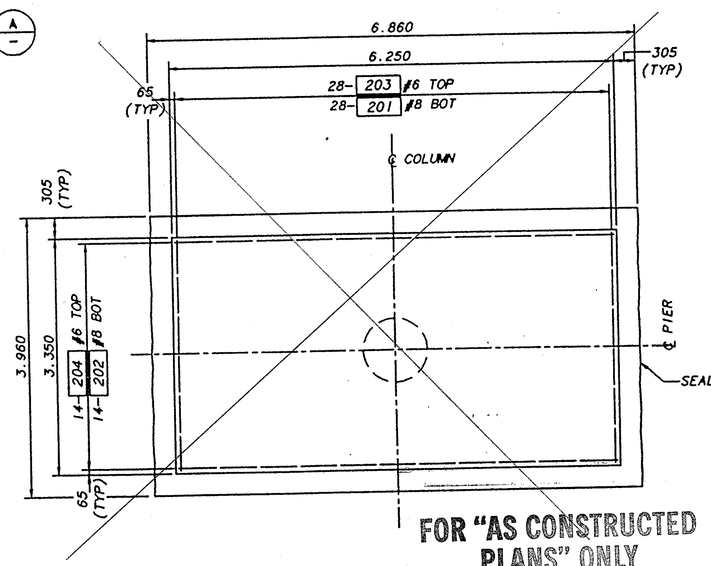
SECTION B

PIER ℄ ELEVATIONS ⚠1

EL A	34.683
EL B	34.940
EL C	34.972
EL D	33.899
EL E	33.874
EL F	33.620

COLUMN NOTES:

1. COLUMN SPIRAL BARS SHALL BE #5 DEFORMED BARS, 16 PLAIN STEEL BAR, W31 COLD DRAWN WIRE, OR D31 DEFORMED WIRE.
2. SEE DETAIL ON BR SHT 12 FOR SPIRAL WELD SPLICE ALTERNATE.
3. SPIRAL LAP SPLICE MAY BE USED ONLY WITHIN THE CENTER HALF OF COLUMN HEIGHT. WELD SPLICE SHALL BE USED EXCEPT AS NOTED.
4. TERMINATE SPIRAL WITH 1 1/2 TURNS OF SPIRAL. WELD TAIL BACK ONTO SPIRAL (SEE WELDED LAP SPLICE DETAIL)
5. SEE DRILLED SHAFT DETAILS ON SHT NO. 11B



FOR "AS CONSTRUCTED PLANS" ONLY

PLAN – FOOTING PIER 3

BRIDGE DESIGN ENGR			
SUPERVISOR			
DESIGNED BY	M. TRAGESSER	6/96	
CHECKED BY	S. ANDERSON	6/96	
DETAILED BY	R. MOHN	6/96	
BRIDGE PROJECTS ENGR			
PRELIM PLAN BY			
ARCHITECT/SPECIALIST			

DATE	REVISION	BY	APPR
4/13/98	CHANGE ORDER #25		
10/98 ⚠2	REVISED AS-BUILT SURVEY DATA	JM	

REGION NO.	STATE	FED AID PROJ NO	SHEET NO.	TOTAL SHEETS
1	WASH			
JOB NUMBER 96W035				
CONTRACT NO.				

KATHLEEN R. WILSON — STATE OF WASHINGTON — 19547 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES: OCTOBER 6, 1998

BERGER/ABAM ENGINEERS INC. 33301 9TH AVENUE SOUTH FEDERAL WAY, WASHINGTON 98003-2396 (206)431-2300 FAX:(206)431-2290

Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

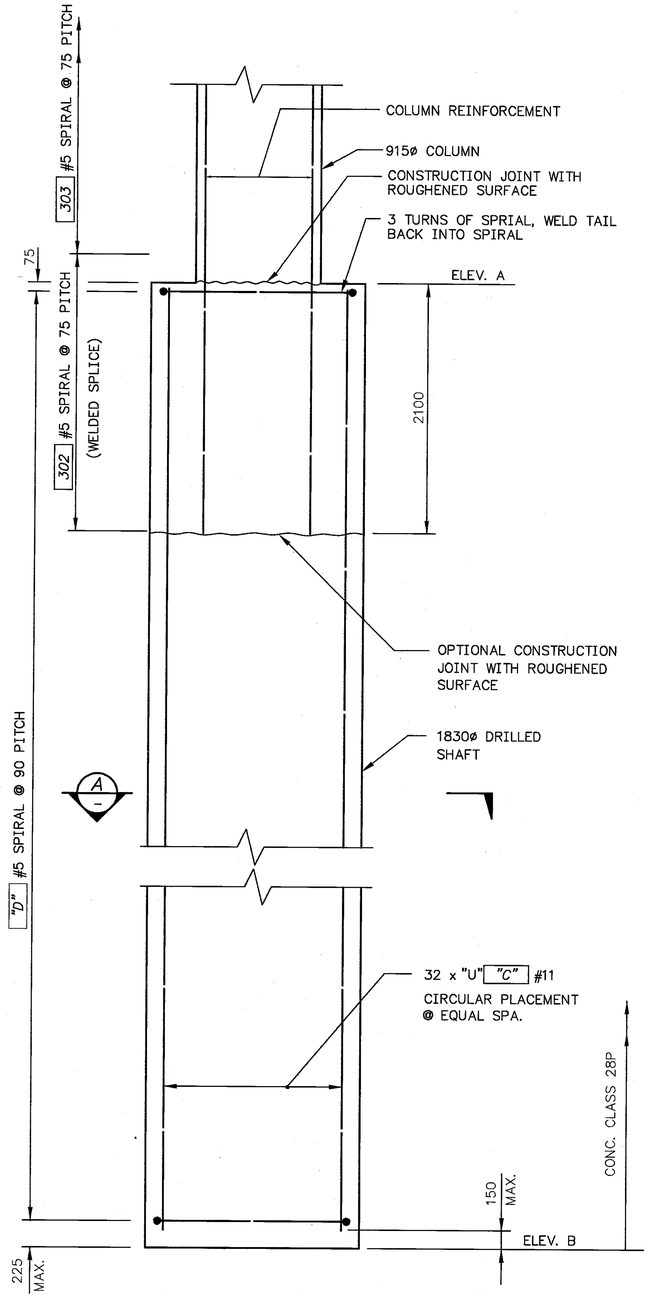
PIER 3 PLAN, ELEVATION & SECTIONS

BRIDGE SHEET NO. 11A

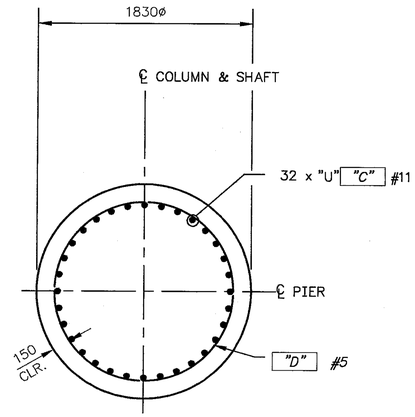
SHEET 509A OF 663 SHEETS

SR 405 JOB NO. 7079 SHEET 11 OF 31

PLOTTED: Tue Oct 14 1997 10:27am FILENAME: V:\96077\405-103E\11A.dwg SCALE: 40



PIERS 2 & 3



SECTION A

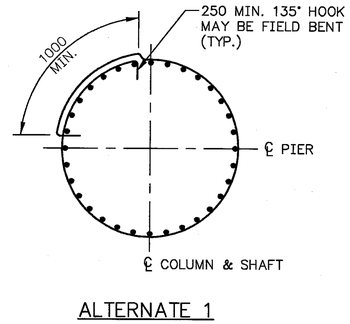
NOTES:

1. THE CONTRACTOR SHALL PROVIDE ADQUATE REINFORCING TIES AND BRACING FOR CONSTRUCTION AND PLACEMENT OF REINFORCING CAGE. THE CAGE LIFTING POINTS SHALL BE DETERMINED BY THE CONTRACTOR.
2. THE CONTRACTOR SHALL PROVIDE CASING AS REQUIRED TO MAINTAIN ALL DRILLED HOLES AND SHAFTS FREE FROM SLOUGHING AND CAVING OF SURROUNDING SOIL.
3. FOR #5 SPIRAL, 16ø PLAIN STEEL BAR, D31 DEFORMED WIRE OR W31 COLD DRAWN WIRE MAY BE USED AS ALTERNATIVES.
4. THE CONCRETE IN THE SHAFTS SHALL BE CLASS 28P.
5. THE MAXIMUM DESIGN LOAD OF EACH SHAFT IS 4000 KN DEVELOPED THROUGH A COMBINATION OF POINT BEARING AND SKIN FRICTION.

PIERS 2 & 3 DRILLED SHAFT TABLE *					
EAST BRIDGE					
SHAFT AT PIER	ELEV. A **	ELEV. B	MARK "C"	MARK "D"	"U" (M)
2	28.8	15.6	900	902	13.025
3	28.8	17.0	901	903	11.625

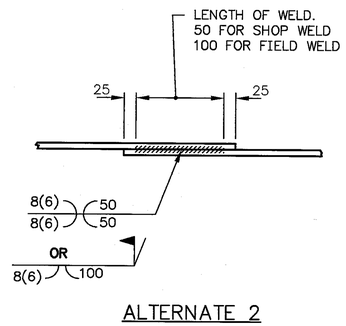
* ELEV. GIVEN IN METERS

** BASED ON GROUND SURACE ELEVATION OF 29.4 (VERIFY IN THE FIELD.)



ALTERNATE 1

LAP SPLICE



ALTERNATE 2

WELDED SPLICE

TYPICAL SPIRAL AND HOOP TIE SPLICE DETAILS

NOTES:

1. END OF SPIRAL SHALL BE SPLICED BACK ONTO ITSELF WHERE SPIRAL IS DISCONTINUOUS.

						REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
						1	WASH			
DRAWN	V.P.					JOB NUMBER				
CHECKED BY	B.R.					96W035				
PROJ. ENGR.	A.A.					CONTRACT NO.				
DIST. ADM.		3/98	NEW DRILL SHAFT SHEET	MV		5054				
		DATE	REVISION	BY	APP'D					

INCA ENGINEERS INC.
400 112th Avenue NE
Bellevue, WA 98004
(425) 635-1000

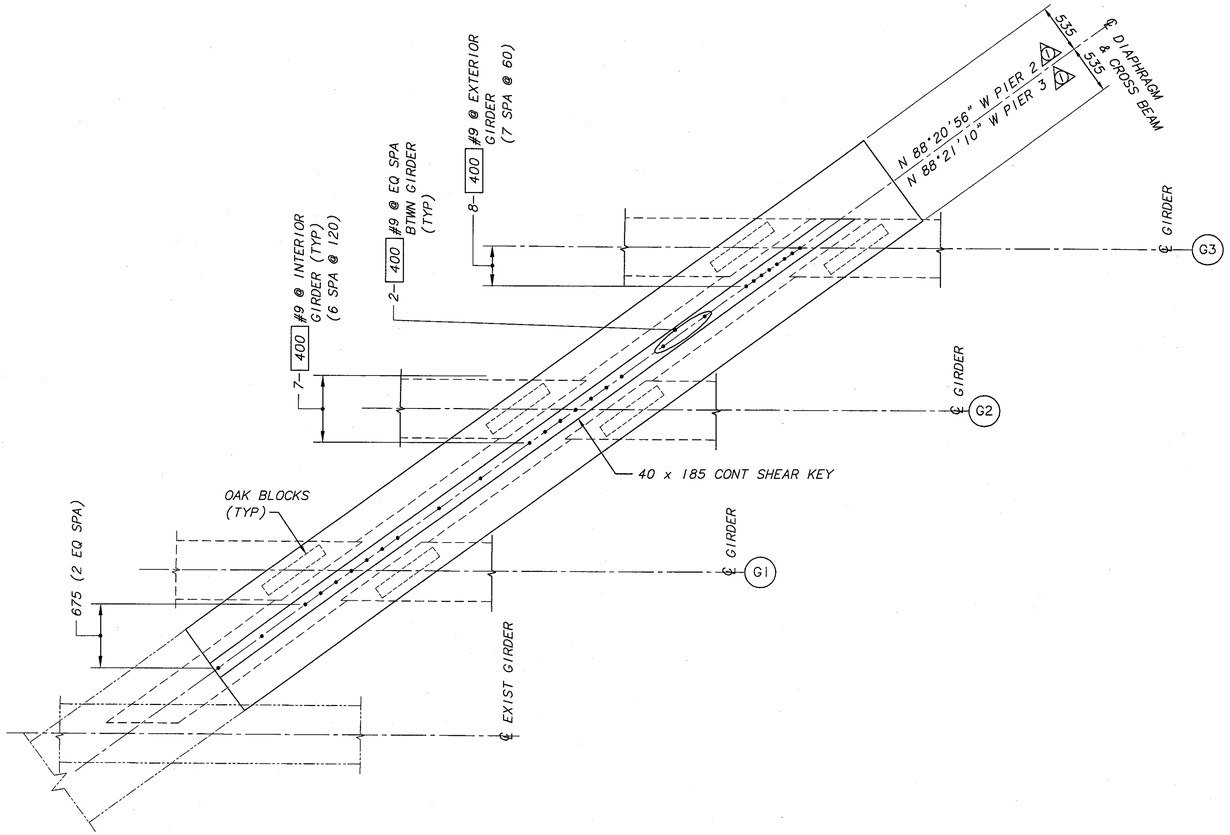
Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228th BRIDGE 405/103 E

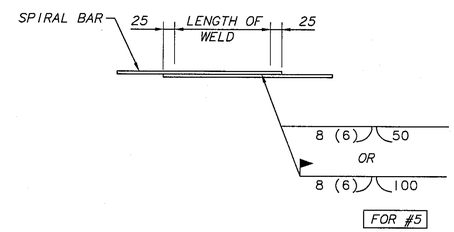
PIER 2 & 3 DRILLED SHAFTS

BRIDGE SHEET #11B

SHEET 509B OF 663 SHEETS



PLAN – HINGE BARS



WELDED LAP SPLICE DETAIL

SR 405 JOB NO. 7079 SHEET 12 OF 31

PLOTTED: Mon Oct 13 1997 9:20am FILENAME: V:\96077\405-103E\12.dwg SCALE: 30

BRIDGE DESIGN ENGR						REGION NO	STATE	FED AID PROJ NO	SHEET NO	TOTAL SHEETS	
SUPERVISOR						1	WASH				
DESIGNED BY	M. TRAGESSER	6/96				JOB NUMBER 96W035					
CHECKED BY	S. ANDERSON	6/96				CONTRACT NO. 5054					
DETAILED BY	R. MOHN	6/96									
BRIDGE PROJECTS ENGR											
PRELIM PLAN BY			10/97 2	REVISED AS-BUILT SURVEY DATA	MLT						
ARCHITECT/SPECIALIST			DATE	REVISION	BY	APPR					

WARREN E. WILSON STATE OF WASHINGTON 20527 REGISTERED PROFESSIONAL ENGINEER
EXPIRES OCTOBER 8, 1998

BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH
FEDERAL WAY, WASHINGTON 98003-8395
(206)431-2300 FAX:(206)431-2250

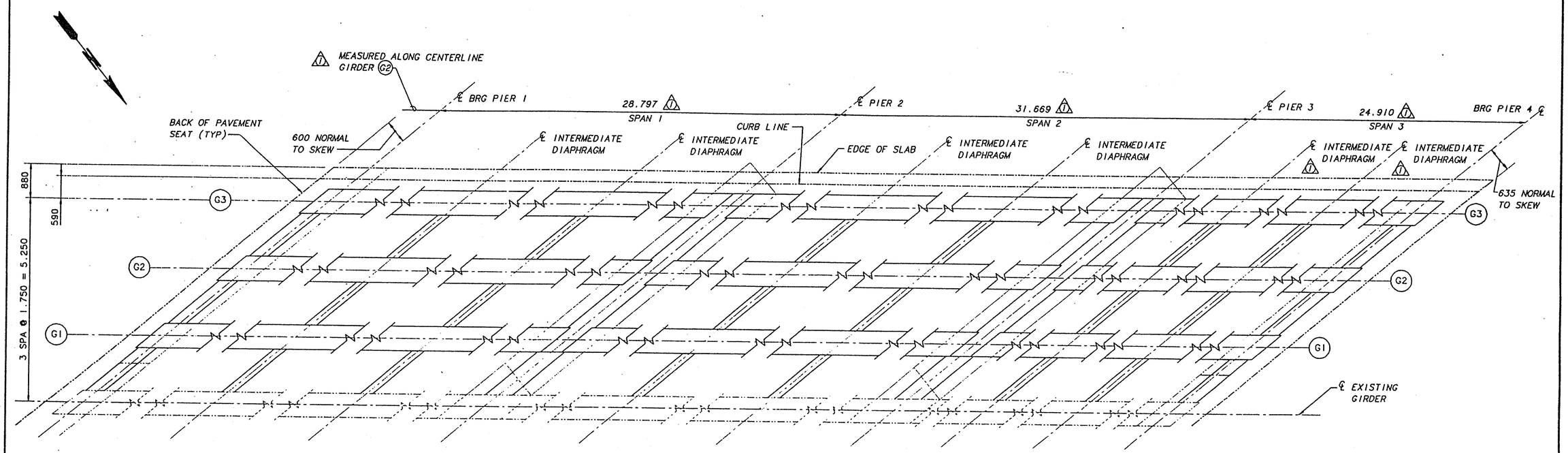
Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

PIER 2 & 3 DETAILS

BRIDGE SHEET NO. 12

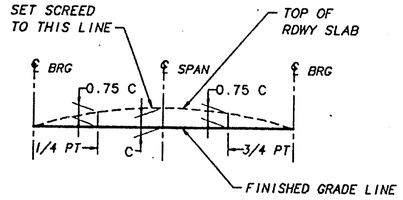
SHEET 510 OF 663 SHEETS



FRAMING PLAN

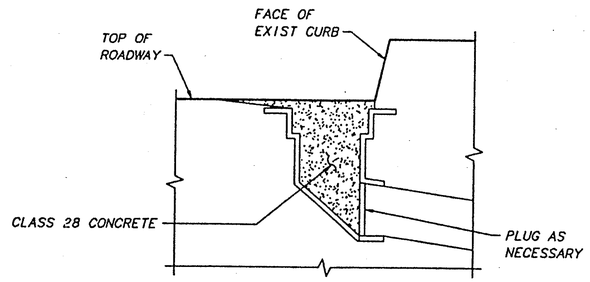
BEARINGS OF ALL PIER WIDENING TO MATCH EXISTING 1

INTERMEDIATE DIAPHRAGM LOCATIONS TO MATCH EXISTING – SEE BRIDGE SHEET 16 1



SCREED SETTING DIMENSIONS

FOR DIMENSION 'C', SEE GIRDER SCHEDULE BR SHT 16



BRIDGE DRAIN PLUG DETAIL 1/–

REMOVE DRAIN GRATING & GALV STEEL CHAIN
FILL DRAIN W/CLASS 28 CONCRETE AFTER PLUGGING (2 REQ'D)

FOR "AS CONSTRUCTED PLANS" ONLY

BRIDGE DESIGN ENGR						REGION NO	STATE	FED AID PROJ NO	SHEET NO	TOTAL SHEETS	
SUPERVISOR						1	WASH				
DESIGNED BY	M. TRAGESSER	6/96				JOB NUMBER 96W035					
CHECKED BY	S. ANDERSON	6/96				CONTRACT NO.					
DETAILED BY	R. MOHN	6/96									
BRIDGE PROJECTS ENGR											
PRELIM PLAN BY			10/97 1	REVISED AS-BUILT SURVEY DATA	MLT						
ARCHITECT/SPECIALIST			DATE	REVISION	BY	APPR					

KARSTEN E. WILSON — STATE OF WASHINGTON — 20447 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES OCTOBER 6, 1998

BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH
FEDERAL WAY, WASHINGTON 98003-6388
(206)431-2300 FAX:(206)431-2250

Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

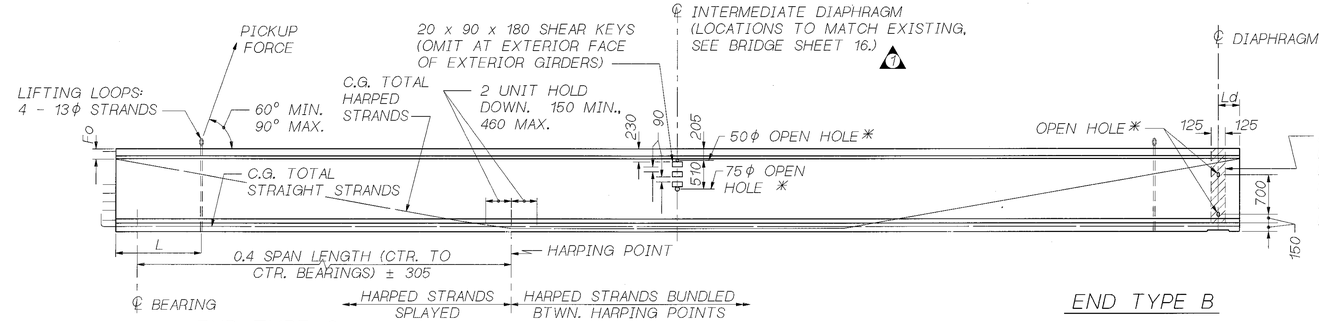
FRAMING PLAN

BRIDGE SHEET NO. 13

SHEET 511 OF 663 SHEETS

SR 405 JOB NO. 7079 SHEET 13 OF 31

PLOTTED: Mon Oct 13 1997 8:27am FILENAME: V:\A96077\405-103E\13.dwg SCALE: 50



GIRDER ELEVATION

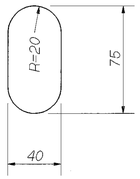
END TYPE C

TYPICAL AT PIERS 2 & 3

END TYPE B

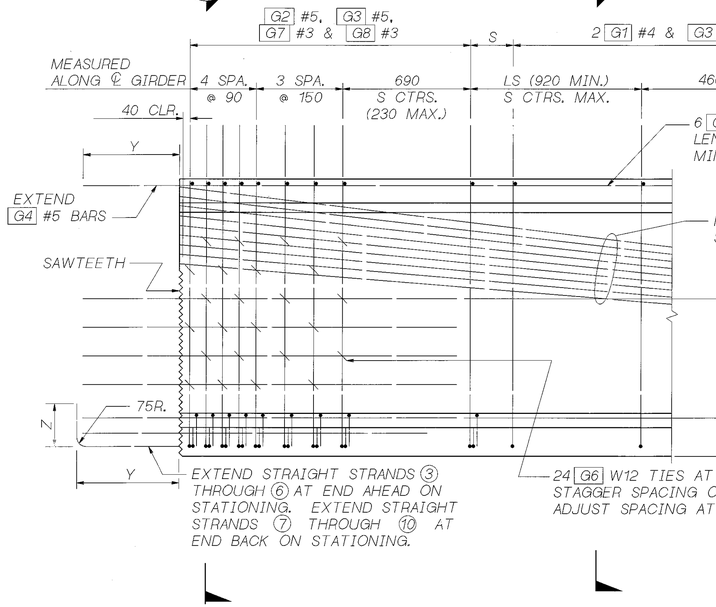
TYPICAL AT PIERS 1 & 4

*OMIT HOLES AND PLACE INSERTS ON THE INTERIOR FACE OF EXTERIOR GIRDERS. PLACE HOLES AND INSERTS PARALLEL TO SKEW. INSERTS SHALL BE 25 RICHMOND ROCKET, BURKE HI-TENSILE, LANCASTER MALLEABLE OR APPROVED EQUAL.



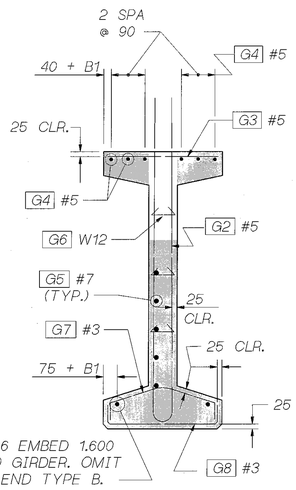
OPEN HOLE

AT END TYPE B ONLY



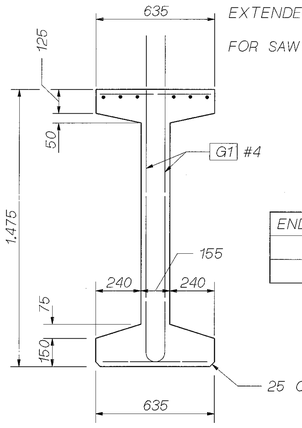
TYPICAL END ELEVATION

END TYPE C SHOWN.
OTHER ENDS SIMILAR.



SECTION B

SAWTEETH SHOWN BY SHADED AREA.



SECTION C

NOTES

ALL DETAILS ON THIS SHEET ARE FOR PRETENSIONED DESIGN ONLY.

PLAN LENGTH SHALL BE INCREASED AS NECESSARY TO COMPENSATE FOR SHORTENING DUE TO PRESTRESS AND SHRINKAGE.

EXTRA CAUTION MUST BE EXERCISED IN HANDLING AND PLACING ALL GIRDERS.

ALL GIRDERS OVER 32.000 LONG SHALL BE BRACED LATERALLY TO PREVENT TIPPING OR BUCKLING.

THE TOP SURFACE OF THE GIRDER FLANGE SHALL BE ROUGHENED IN ACCORDANCE WITH SECTION 6-02.3(25)H OF THE STANDARD SPECIFICATIONS.

IF THE LIFTING LOOPS EXTEND WITHIN 75 OF THE TOP OF THE ROADWAY SLAB THEY SHALL BE CUT OFF PRIOR TO PLACING THE ROADWAY SLAB. ALL LIFTING STRANDS SHALL BE OF THE SAME MATERIAL AND STRENGTH AS THE PRESTRESSING STRANDS. WRAP THE LIFTING LOOPS SO THAT EACH STRAND WILL CARRY ITS SHARE OF THE TOTAL LOAD. EXTEND LIFTING LOOPS ENDING WITH A 230 LONG 90° HOOK TO WITHIN 75 CLEAR OF THE BOTTOM OF THE GIRDER.

CUT ALL STRANDS FLUSH WITH THE GIRDER ENDS AND PAINT WITH AN APPROVED EPOXY RESIN EXCEPT FOR EXTENDED STRANDS AS SHOWN.

FORMS FOR BEARING PAD RECESSES SHALL BE CONSTRUCTED AND FASTENED IN SUCH A MANNER AS NOT TO CAUSE DAMAGE TO THE GIRDER DURING THE STRAND RELEASE OPERATION.

ALL STRANDS ARE 13ϕ LOW RELAXATION STRANDS (AASHTO M203 GRADE 1860).

EXTENDED STRANDS AND BARS ARE PARALLEL TO GIRDER.

FOR SAWTEETH DETAILS SEE W58MG GIRDER DETAILS 2 OF 2.

END TYPE	BEARING RECESS	Y	Z	SAWTEETH
B	YES	0	0	NO
C	NO	325	465	YES

ENDS AHEAD ON STATION
G5 BARS LEFT OF ℄
B1 = 0 (G4 , G9)
B2 = 0 (G5)
ENDS BACK ON STATION
G5 BARS RIGHT OF ℄
B1 = 40 (G4 , G9)
B2 = 75 (G5)

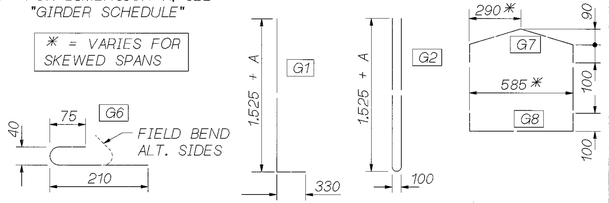
MARK	LOCATION	SIZE	
G1	GIRDER STIRRUPS	4	
G2	GIRDER END STIRRUPS	5	
G3	GIRDER TOP FLANGE	5	STR.
G4	GIRDER LONGIT. FULL LENGTH	5	STR.
G5	GIRDER END LONGIT.	7	STR.
G6	GIRDER END TIES	W12	≠
G7	GIRDER END TIES	3	
G8	GIRDER END TIES	3	
G9	GIRDER LONGIT.	6	STR.

≠ #3 OR #4 MAY BE SUBSTITUDED. FIELD BENDING IS OPTIONAL.

BENDING DIAGRAM (ALL DIMENSIONS ARE OUT TO OUT)

NOTE: FOR DIMENSION A, SEE "GIRDER SCHEDULE"

* = VARIES FOR SKEWED SPANS



Bridge Design Engr.	S405D103R00T:[FGB]W58MG_1.FGB;1				REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor W. WILSON					10	WASH.			
Designed By M. TRAGESSER 6/96									
Checked By S. ANDERSON 6/96					JOB NUMBER				
Detailed By D.W. PULSE JR. 6/96					96W035				
Bridge Projects Engr.									
Prelim. Plan By	10/97	1	REVISED AS-BUILT SURVEY DATA	MLT					
Architect/Specialist	DATE		REVISION	BY	APP'D	5054			

WARREN E. WILSON STATE OF WASHINGTON 20527 REGISTERED PROFESSIONAL ENGINEER
EXPIRES 8 OCT 98

Washington State Department of Transportation

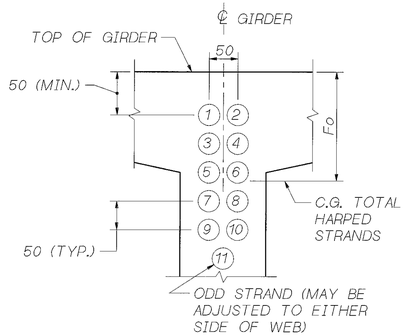
SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

W58MG GIRDER 1 OF 2

BRIDGE SHEET NO. 15
SHEET 513 OF 663 SHEETS

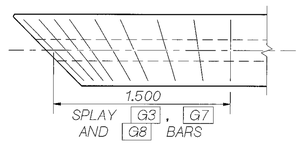
SR 405 JOB NO. 7079 SHEET 15

16-OCT-97



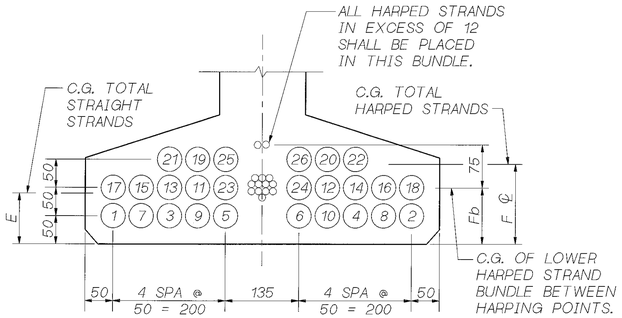
STRAND PATTERN AT GIRDER END

HARPED STRAND LOCATION SEQUENCE SHALL BE AS SHOWN (1) , (2) ETC.



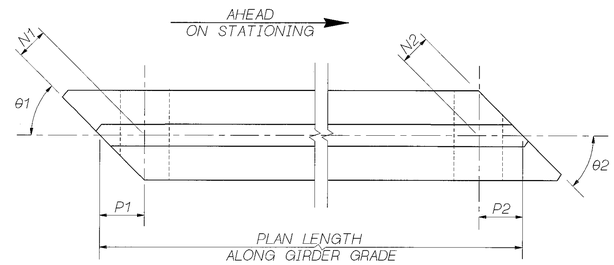
TRANSVERSE REINFORCING SKEWED ENDS

ONLY TRANSVERSE REINF. SHOWN

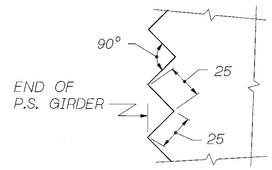


STRAND PATTERN AT ℄ SPAN

STRAND LOCATION SEQUENCE SHALL BE AS SHOWN (1) , (2) ETC.



END 1 END 2



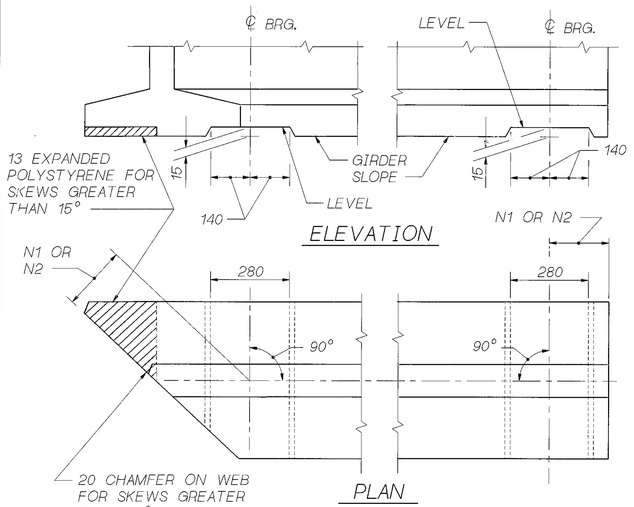
SAWTEETH DETAILS

SAWTEETH ARE FULL WIDTH - USE SAWTEETH KEYS FROM BOTTOM OF BOTTOM FLANGE TO BOTTOM OF LOWEST HARPED STRAND AS WELL AS TOP FLANGE ADJACENT TO HARPED STRANDS AS SHOWN IN SECTION B - W58MG GIRDER DETAILS 1 OF 2.

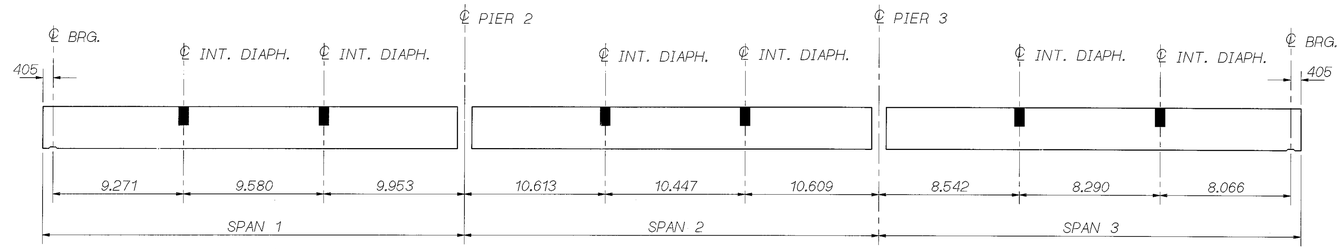
DIMENSION A AT ℄ BEARINGS = 305 — BASED ON GIRDER DEFLECTION = D AT TIME OF SLAB POUR (120 DAYS)

SPAN	GIRDER	END 1 TYPE	END 2 TYPE	L * (mm)	θ1	θ2	N1 (mm)	N2 (mm)	P1 (mm)	P2 (mm)	7 PLAN LENGTH ALONG GIRDER GRADE (m)	MIN. CONC. COMPR. STRENGTH @ 28 DAYS F'C (MPa)	MIN. CONC. COMPR. STRENGTH @ RELEASE F'CI (MPa)	S (mm)	LS (mm)	HARPED NO. OF STRANDS	HARPED JACKING FORCE (kN)	STRAIGHT NO. OF STRANDS	STRAIGHT JACKING FORCE (kN)	LOCATION OF C.G. STRANDS E (mm)	LOCATION OF C.G. STRANDS ℄ (mm)	LOCATION OF C.G. STRANDS Fb (mm)	LOCATION OF C.G. STRANDS Fo (mm)	C (mm)	D (mm)	Ld (mm)
1	ALL	B	C	900	143°41'	143°41'	240	-	405	-	28.920	48	35	400	5600	8	1100	22	3030	85	75	75	125	25	60	340
2	ALL	C	C	900	143°41'	143°41'	-	-	-	-	31.093	48	38	400	6400	9	1240	26	3580	95	75	75	140	35	85	-
3	ALL	C	B	900	143°41'	143°41'	-	240	-	405	25.034	48	35	400	4800	7	965	16	2205	70	75	75	115	15	35	340

* FINAL LOCATION TO BE DETERMINED BY GIRDER MANUFACTURER.



BEARING RECESS DETAIL



AS-BUILT SURVEY DIMENSIONS SHOWN AT EXISTING MEDIAN GIRDER CENTERLINE

INTERMEDIATE DIAPHRAGMS

(BEARINGS SHOWN ON BRIDGE SHEET 13)

7

Bridge Design Engr.	S405D103R00T:[FGB]W58MG_2.FGB;1			REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
Supervisor W. WILSON				10	WASH.				
Designed By M. TRAGESSER 6/96				JOB NUMBER					
Checked By S. ANDERSON 6/96				96W035					
Detailed By D.W. PULSE JR. 6/96									
Bridge Projects Engr.									
Prelim. Plan By 10/97	7 REVISED AS-BUILT SURVEY DATA	MLT		5054					
Architect/Specialist DATE	REVISION	BY	APP'D						

16-OCT-97

WARREN E. WILSON — STATE OF WASHINGTON — 20527 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 8 Oct 98

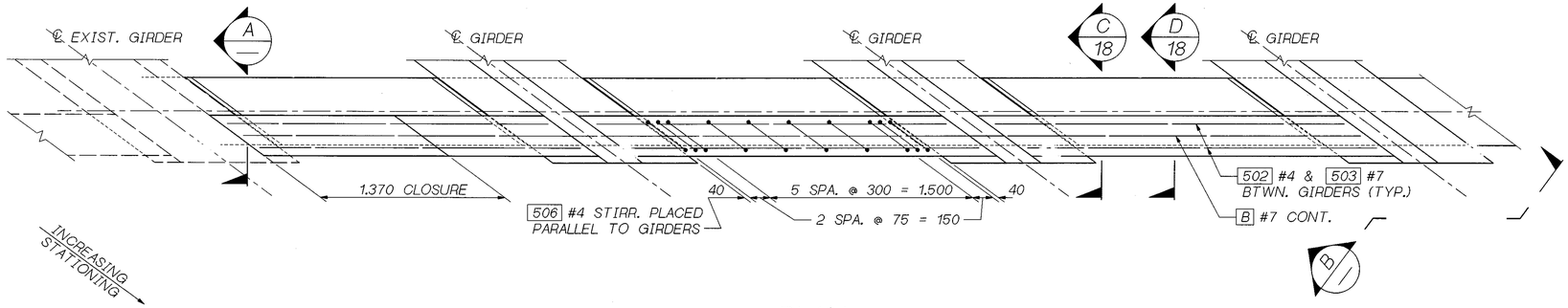
Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

W58MG GIRDER 2 OF 2

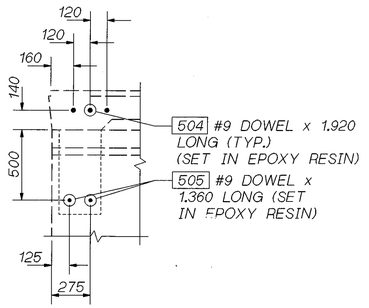
BRIDGE SHEET NO. 16
SHEET 514 OF 663 SHEETS

SR 405 JOB NO. 7079 SHEET 16

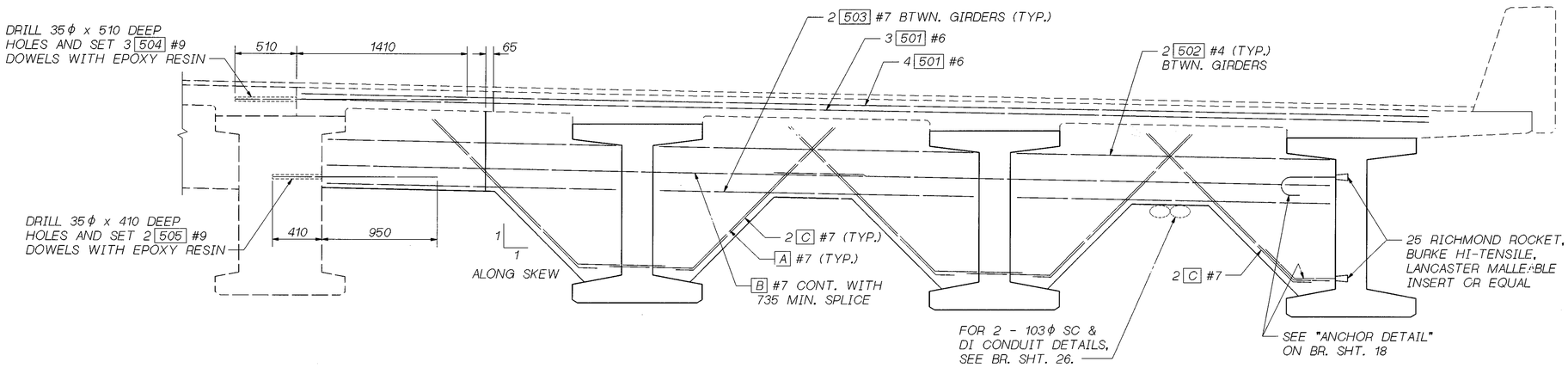


PLAN

SLAB NOT SHOWN FOR CLARITY.
PIER 1 SHOWN, PIER 4 SIMILAR

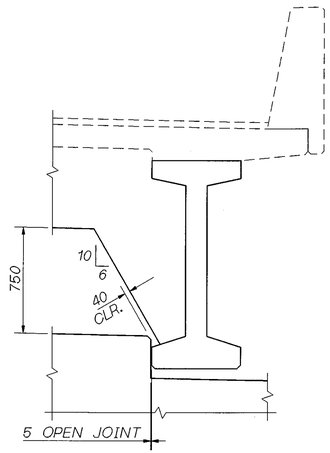


VIEW A



ELEVATION

506 #4 STIRR. NOT SHOWN FOR CLARITY.



VIEW B

HORIZONTAL DIMENSIONS SHOWN ARE NORMAL TO L LINE

SR 405 JOB NO. 7079 SHEET 17

Bridge Design Engr.	S405D103R00T:\000000.FGB\DIA_ENDE.FGB;1				REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor W. WILSON					10	WASH.			
Designed By M. TRAGESSER 6/96					JOB NUMBER 96W035				
Checked By S. ANDERSON 6/96									
Detailed By D.W. PULSE JR. 6/96									
Bridge Projects Engr.									
Prelim. Plan By									
Architect/Specialist	DATE	REVISION	BY	APP'D	5054				

12-NOV-96

WARREN E. WILSON — STATE OF WASHINGTON — 6057 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/8/98

Washington State Department of Transportation

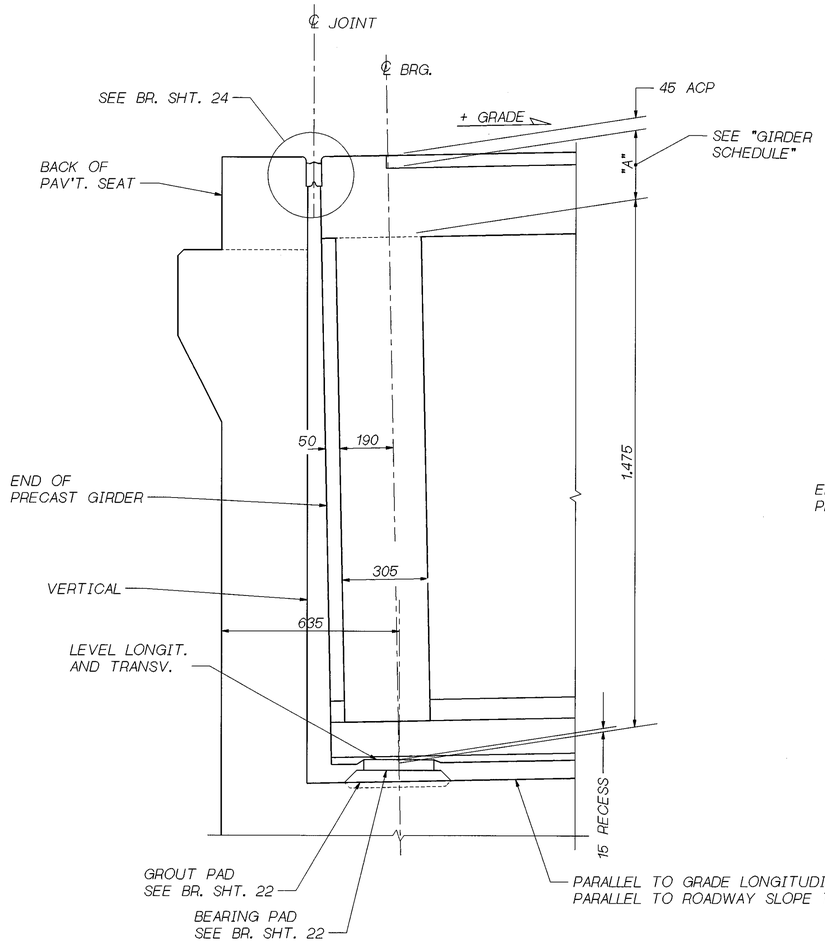
SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

END DIAPHRAGM - 1 OF 2

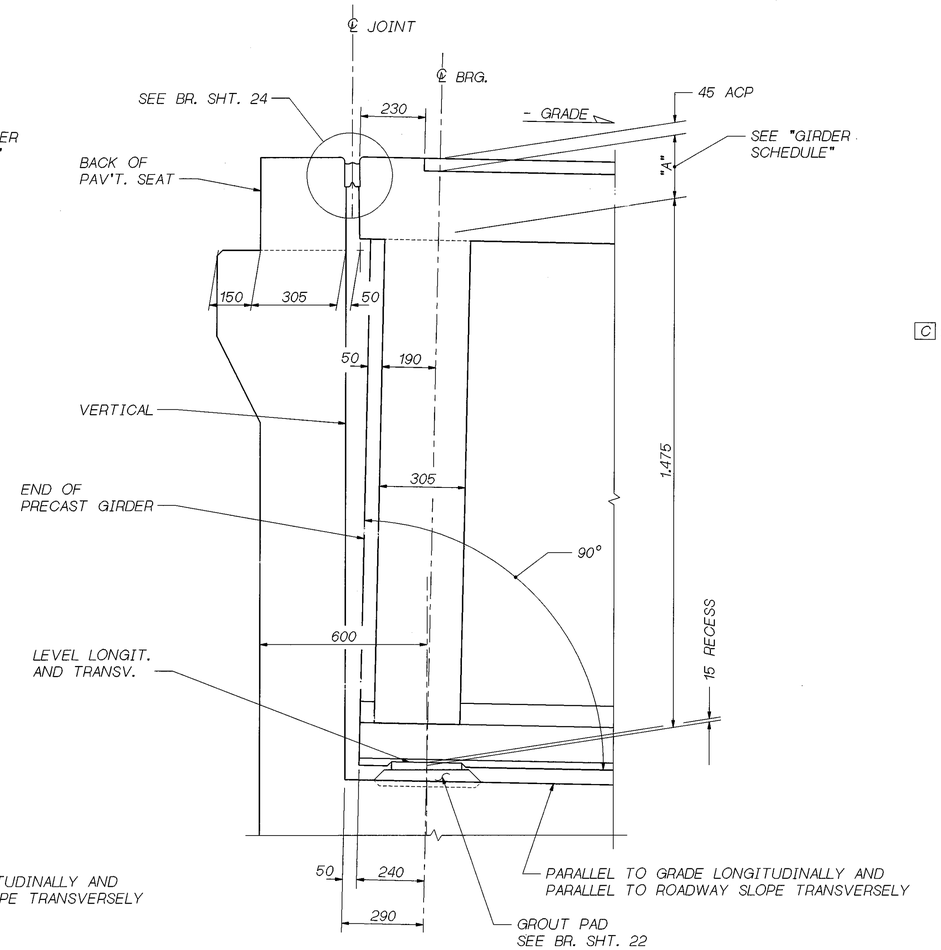
BRIDGE SHEET NO. 17

SHEET 515 OF 663 SHEETS

241/112



PIER 4

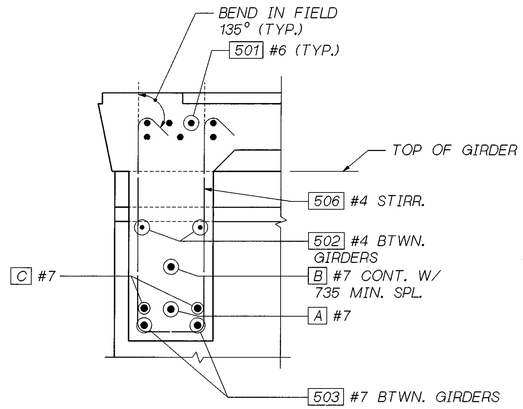


PIER 1

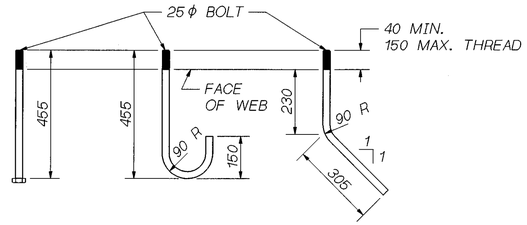
SECTION C 17

ROADWAY EXPANSION JOINT AT END PIERS

LONGITUDINAL DIMENSIONS ARE NORMAL TO SKEW.



SECTION D 17



TOP ANCHOR INTERM. DIAPHRAGM | BOTTOM ANCHOR | BOTTOM ANCHOR END DIAPHRAGM

ANCHOR DETAILS

A.S.T.M. A-307

SR 405 JOB NO. 7079 SHEET 18

Bridge Design Engr.	S405D103ROOT:[000000.FGB]DIAEND2.FGB;1			REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
Supervisor W. WILSON				10	WASH.				
Designed By M. TRAGESSER 6/96									
Checked By S. ANDERSON 6/96				JOB NUMBER					
Detailed By D.W. PULSE JR. 6/96				96W035					
Bridge Projects Engr.									
Prelim. Plan By									
Architect/Specialist	DATE	REVISION	BY	APP'D	5054				

12-NOV-96

WARREN E. WILSON — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/8/98

Washington State Department of Transportation

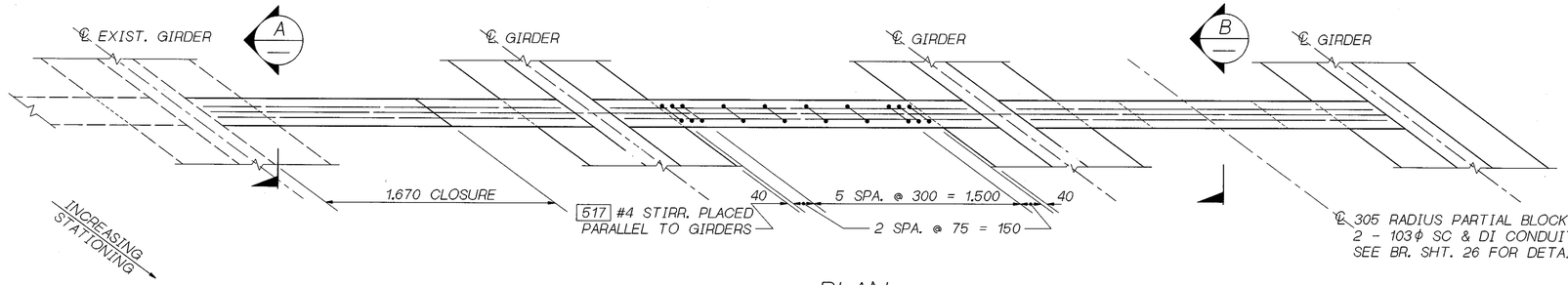
SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

END DIAPHRAGM - 2 OF 2

BRIDGE SHEET NO. 18

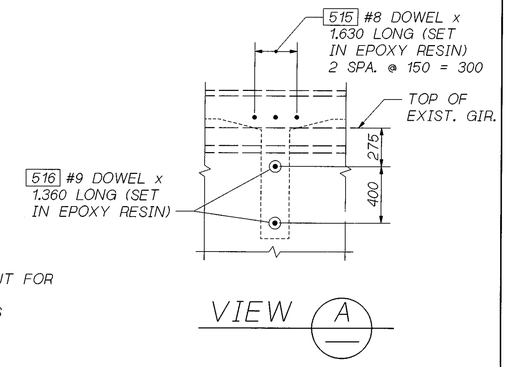
SHEET 516 OF 663 SHEETS

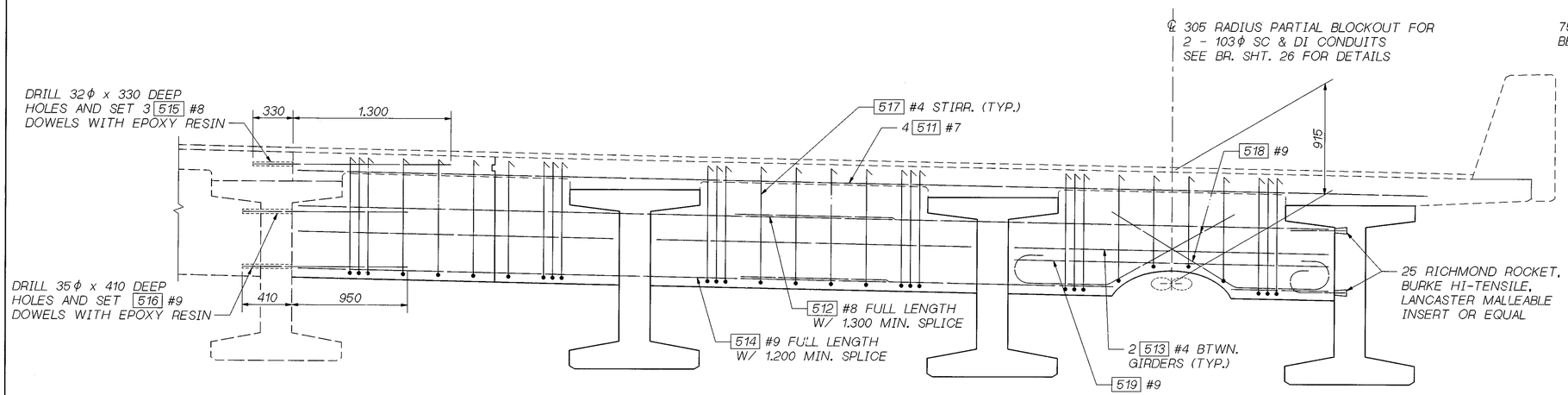
2A1 101



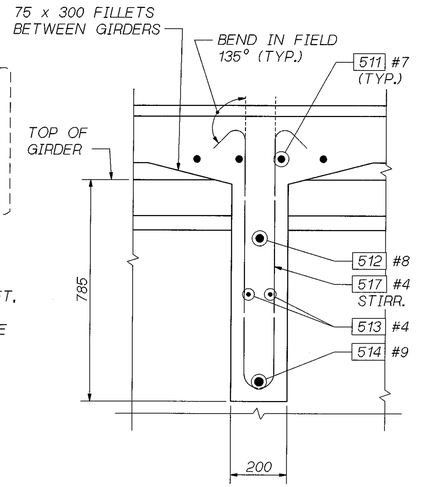
PLAN

SLAB NOT SHOWN FOR CLARITY.





ELEVATION



SECTION B

NOTE:

GIRDERS SHALL BE HELD RIGIDLY IN PLACE WHEN DIAPHRAGMS ARE PLACED. REINFORCING BARS SHALL BE THREADED THROUGH HOLES IN GIRDERS PRIOR TO PLACING OF EXTERIOR GIRDERS. SEE "GIRDER DETAILS" SHEET FOR DIMENSION "A".

SR 405 JOB NO. 7079 SHEET 19

Bridge Design Engr.		S405D103R00T:\000000.FGB\DIA_INTE.FGB;1			REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
Supervisor W. WILSON					10	WASH.				
Designed By M. TRAGESSER	6/96				JOB NUMBER					
Checked By S. ANDERSON	6/96				96W035					
Detailed By D.W. PULSE JR.	6/96				5054					
Bridge Projects Engr.										
Prelim. Plan By										
Architect/Specialist		DATE	REVISION	BY	APP'D					

12-NOV-96

WARREN E. WILSON — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/8/98

Washington State Department of Transportation

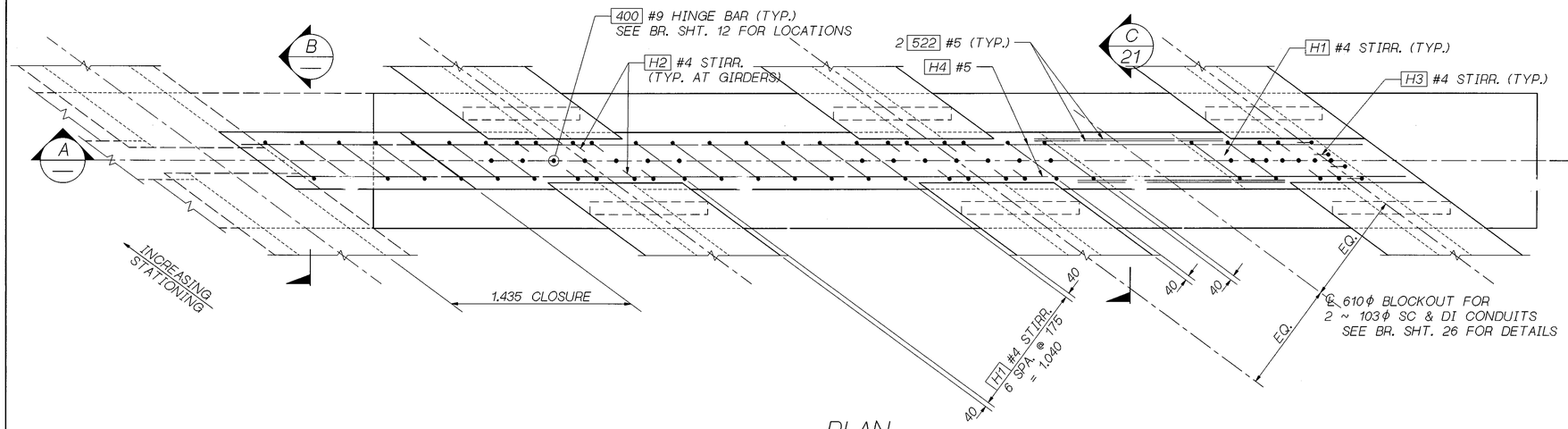
SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

INTERMEDIATE DIAPHRAGMS

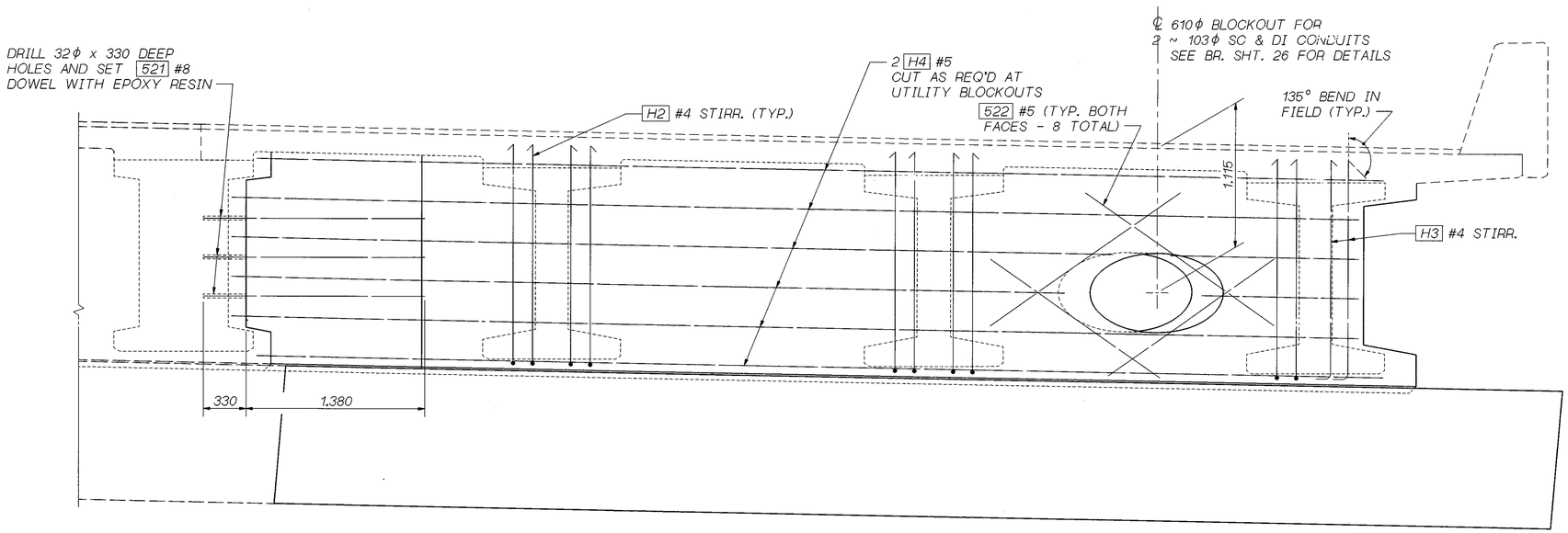
BRIDGE SHEET NO. 19

SHEET 517 OF 663 SHEETS

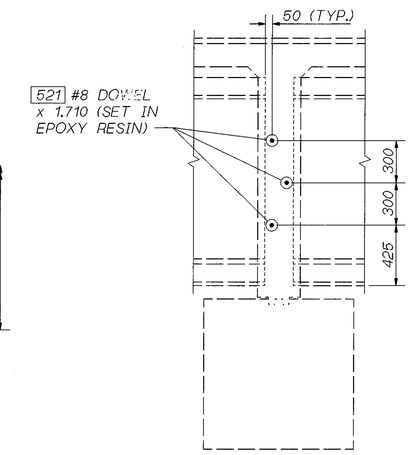
241/116



PLAN



SECTION A



VIEW B

Bridge Design Engr.	S405D103ROOT:\000000.FGB\HINGEE.FGB:1				REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor W. WILSON					10	WASH.			
Designed By M. TRAGESSER 6/96									
Checked By S. ANDERSON 6/96					JOB NUMBER				
Detailed By D.W. PULSE JR. 6/96					96W035				
Bridge Projects Engr.									
Prelim. Plan By					5054				
Architect/Specialist	DATE	REVISION	BY	APP'D					

12-NOV-96

WAYNE D. WILSON — STATE OF WASHINGTON — 20827 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES 10/31/98

Washington State Department of Transportation

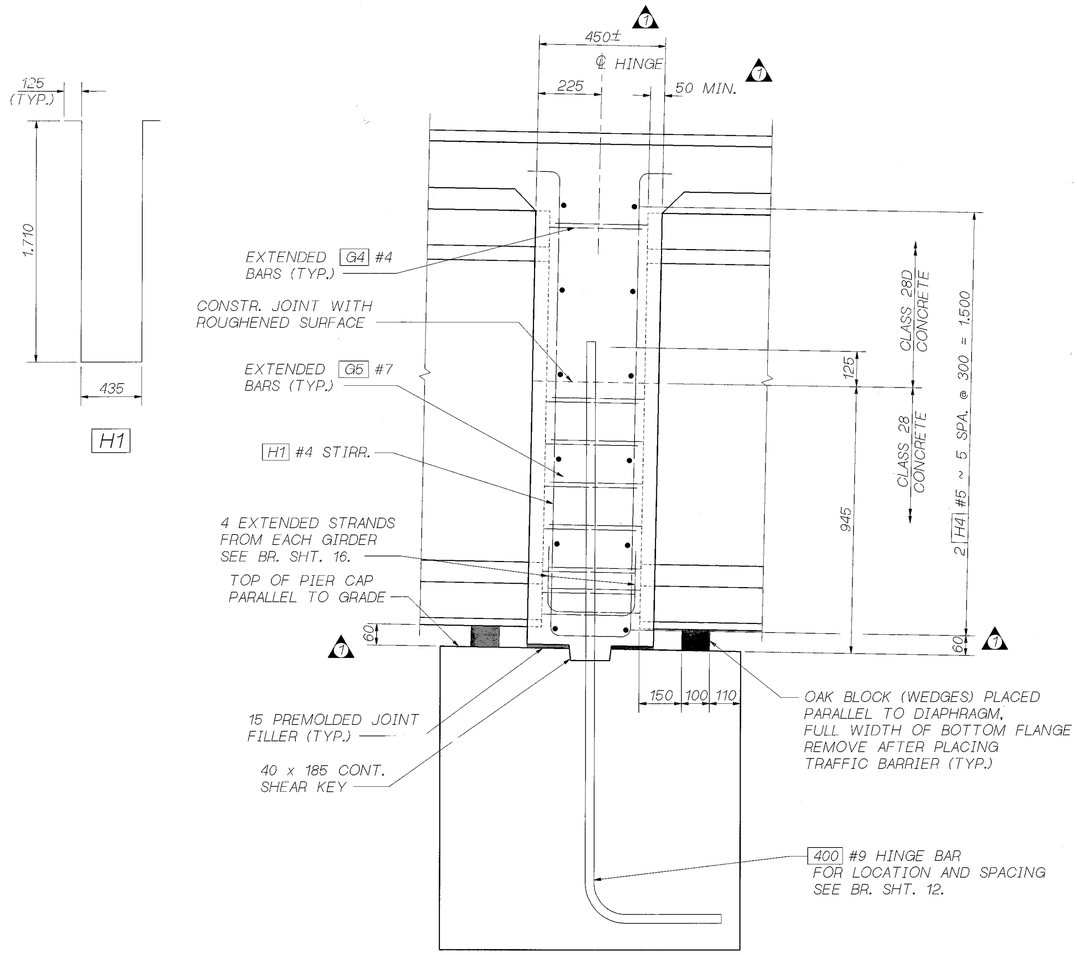
SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

HINGE DIAPHRAGMS - 1 OF 2

BRIDGE SHEET NO. 20
SHEET 518 OF 663 SHEETS

SR 405 JOB NO. 7079 SHEET 20

24/109



SECTION C
20

SR 405 JOB NO. 7079 SHEET 21

Bridge Design Engr.	S405D103R00T:\FGB\DIA_DET.FGB; 1				REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor W. WILSON					10	WASH.			
Designed By M. TRAGESSER 6/96									
Checked By S. ANDERSON 6/96					JOB NUMBER 96W035				
Detailed By D.W. PULSE JR. 6/96									
Bridge Projects Engr.									
Prelim. Plan By 10/97	1	REVISED AS-BUILT SURVEY DATA	MLT		5054				
Architect/Specialist	DATE	REVISION	BY	APP'D					

16-OCT-97

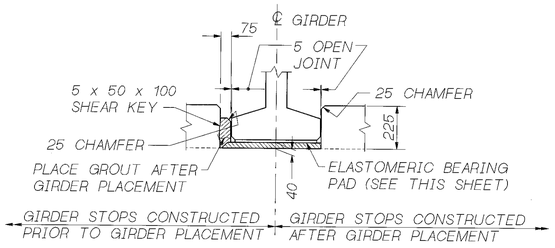
WARREN E. WILSON — STATE OF WASHINGTON — 20527 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES 8 OCT 98

Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

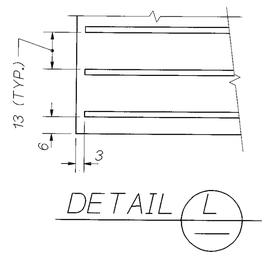
HINGE DIAPHRAGMS - 2 OF 2

BRIDGE SHEET NO. 21
SHEET 519 OF 663 SHEETS

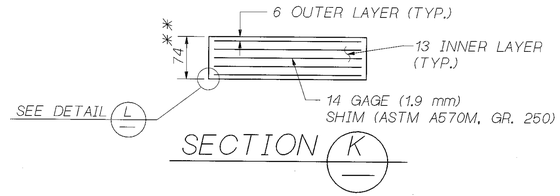


GIRDER SEAT GROUTING DETAIL

GIRDER STOPS MAY BE CONSTRUCTED EITHER PRIOR TO GIRDER PLACEMENT OR AFTER GIRDER PLACEMENT. THE SAME METHOD SHALL BE USED FOR EACH PIER.

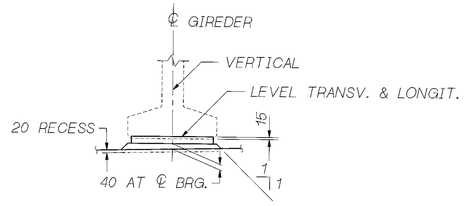


DETAIL L

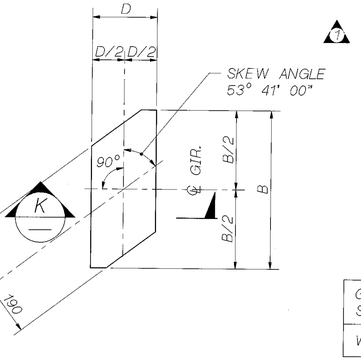


SECTION K

** TOTAL THICKNESS INCUDING SHIMS



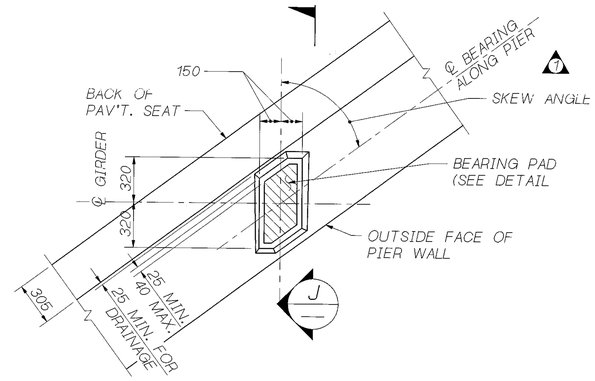
VIEW J



GIRDER SERIES	B	D
W58MG	560	230

BEARING PAD

LAMINATED ELASTOMERIC BRG. PAD 74 THICK (5 SHIMS) DUROMETER HARDNESS = 60.



AT END PIER WITH "L" ABUTMENTS

GROUT PAD

SR 405 JOB NO. 7079 SHEET 22

Bridge Design Engr.	S405D103ROOT.[FGB]MISC.FGB;1				REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor W. WILSON					10	WASH.			
Designed By M. TRAGESSER 6/96									
Checked By S. ANDERSON 6/96					JOB NUMBER 96W035				
Detailed By D.W. PULSE JR. 6/96									
Bridge Projects Engr.									
Prelim. Plan By	10/97	7	REVISED AS-BUILT SURVEY DATA	JZ	5054				
Architect/Specialist	DATE		REVISION	BY APP'D					

16-OCT-97

WARREN E. WILSON — STATE OF WASHINGTON — 20527 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES 8 OCT 98

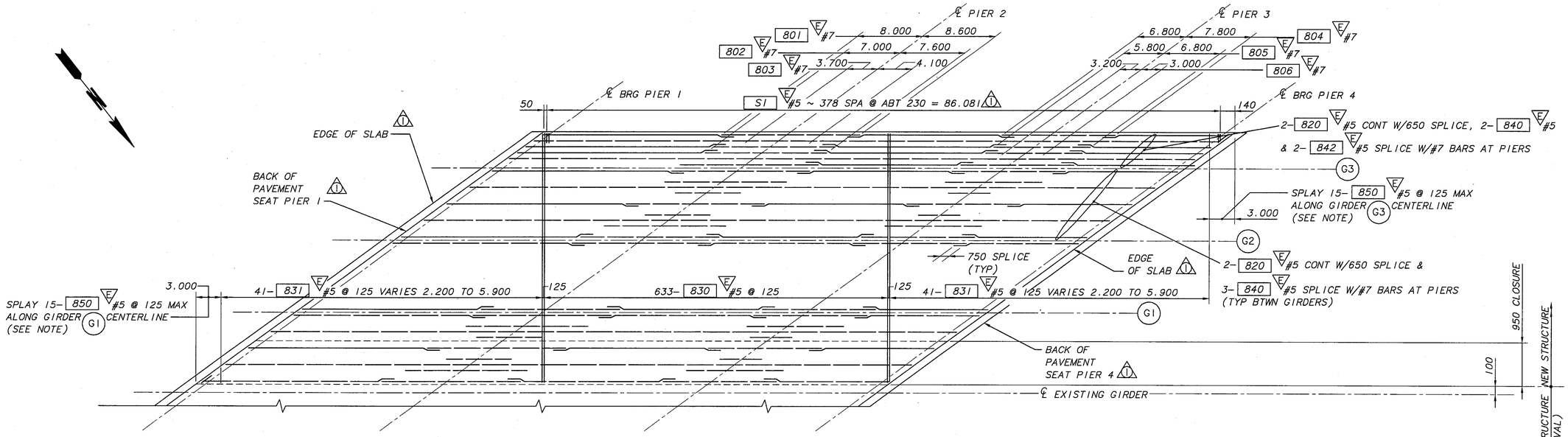
Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

MISCELLANEOUS DETAILS

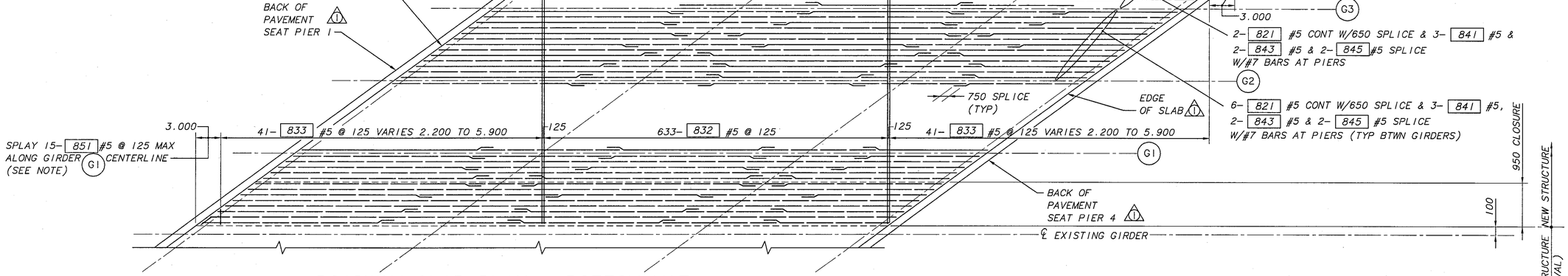
BRIDGE SHEET NO. 22

SHEET 520 OF 663 SHEETS



ROADWAY SLAB PLAN – TOP MAT

E DENOTES EPOXY COATED BARS



ROADWAY SLAB PLAN – BOTTOM MAT

E DENOTES EPOXY COATED BARS

NOTE: HORIZONTAL & VERTICAL SCALES ARE DIFFERENT. SPLAYED BARS ARE NOT SHOWN PROPORTIONALLY.

BRIDGE DESIGN ENGR						REGION NO	STATE	FED AID PROJ NO	SHEET NO	TOTAL SHEETS	
SUPERVISOR						1	WASH				
DESIGNED BY	M. TRAGESSER	6/96				JOB NUMBER					
CHECKED BY	S. ANDERSON	6/96				96W035					
DETAILED BY	R. MOHN	6/96				CONTRACT NO.					
BRIDGE PROJECTS ENGR						5054					
PRELIM PLAN BY			10/97 1	REVISED AS-BUILT SURVEY DATA	JM						
ARCHITECT/SPECIALIST			DATE	REVISION	BY	APPR					

WARREN E. WILSON — STATE OF WASHINGTON — 20537 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES OCTOBER 8, 1998

BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH
FEDERAL WAY, WASHINGTON 98003-8395
(206)431-2300 FAX:(206)431-2250

Washington State Department of Transportation

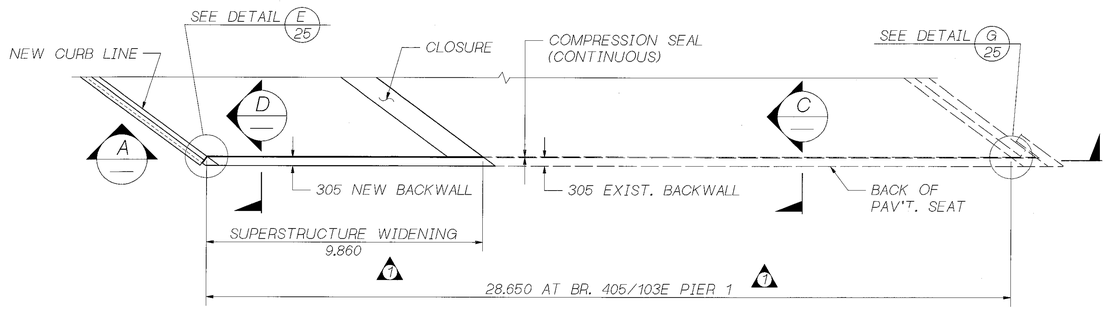
SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

ROADWAY SLAB PLAN

BRIDGE SHEET NO. 23
SHEET 521 OF 663 SHEETS

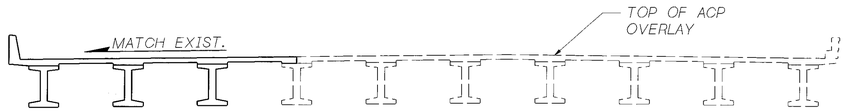
SR 405 JOB NO. 7079 SHEET 23 OF 31

PLOTTED: Wed Oct 22 1997 11:37am FILENAME: V:\A96077\405-103E\23.dwg SCALE: 25

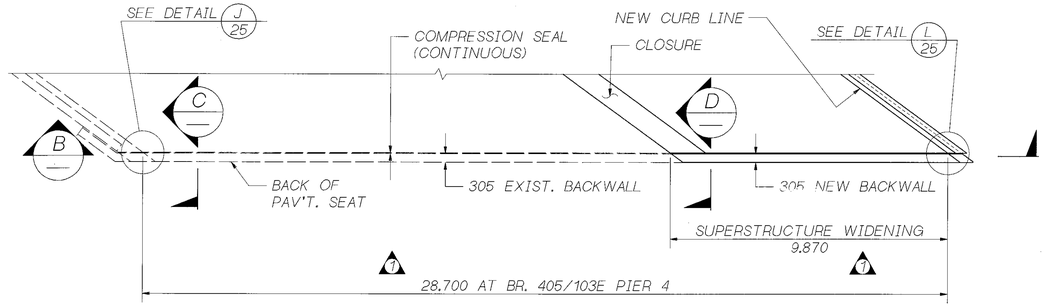


PLAN

BR. 405/103E PIER 1 SHOWN
LOOKING AHEAD ON STATIONING.
BR. 405/103W PIER 4 SIMILAR.

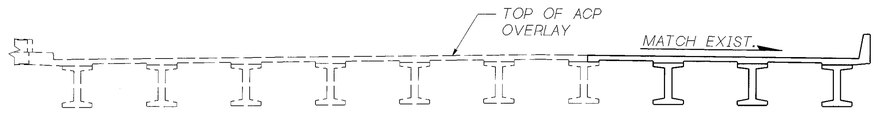


SECTION A



PLAN

BR. 405/103E PIER 4 SHOWN
LOOKING BACK ON STATIONING.
BR. 405/103W PIER 1 SIMILAR.



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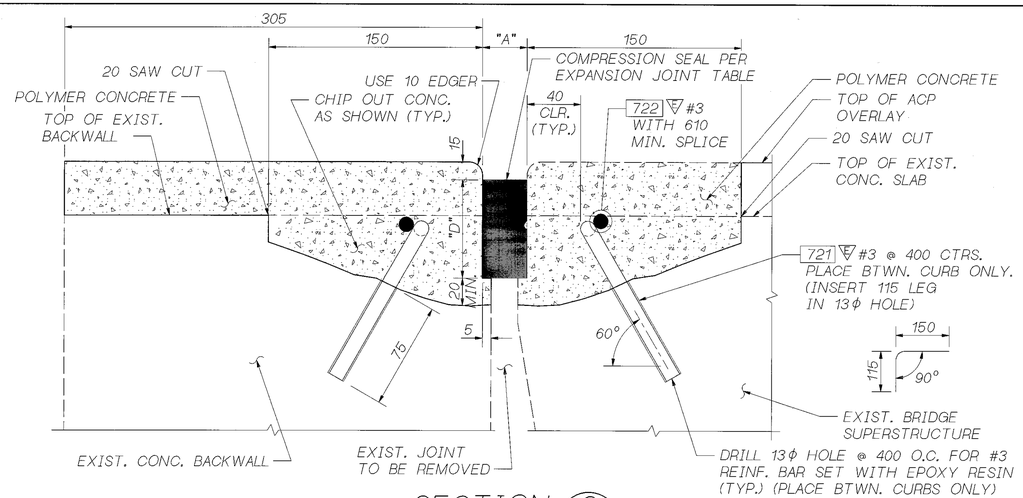


SECTION C

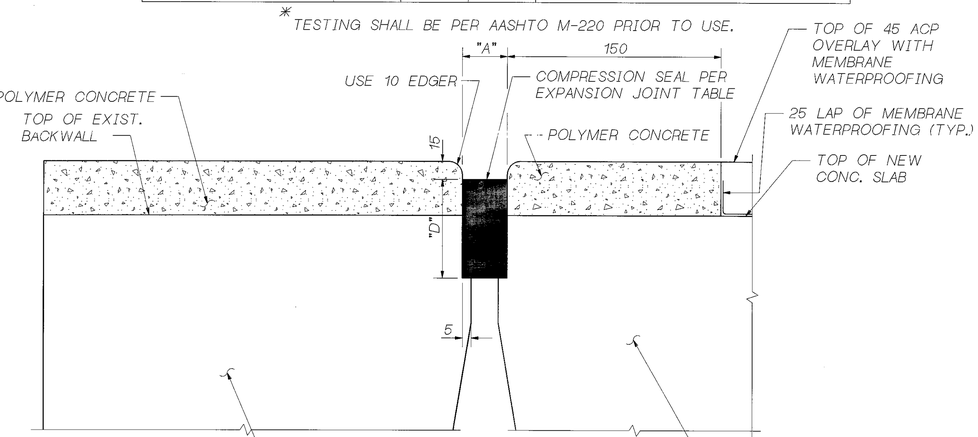
(EXISTING)

"D" DENOTES FULLY COMPRESSED SEAL HEIGHT

COMPRESSION SEAL TABLE*

LOCATION	OPENING "A" (NORMAL TO JOINT) @ 5°C	@ 20°C	@ 25°C	EXPANSION JOINT TYPE
PIERS (1 AND 4) (2 LOCATIONS)	64	60	59	D.S. BROWN CV-4000 WATSON BOWMAN ACME WA-400 ELASTOMER SEALS X-4000 STRUCTURAL ACCESSORIES SA 4000

* TESTING SHALL BE PER AASHTO M-220 PRIOR TO USE.



SECTION D

(WIDENING)

FOR DETAILS NOT SHOWN SEE "SECTION C", THIS SHEET.

"D" DENOTES FULLY COMPRESSED SEAL HEIGHT

Bridge Design Engr.	S405D103R00T:(FGB)EXP1.FGB; 1				REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor W. WILSON					10	WASH.			
Designed By M. TRAGESSER 6/96					JOB NUMBER 96W035				
Checked By S. ANDERSON 6/96									
Detailed By D.W. PULSE JR. 6/96									
Bridge Projects Engr.									
Prelim. Plan By	10/97	7	REVISED AS-BUILT SURVEY DATA	JZ					
Architect/Specialist	DATE		REVISION	BY APP'D	5054				

WARREN E. WILSON — STATE OF WASHINGTON — 20521 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 8 OCT 98

16-OCT-97

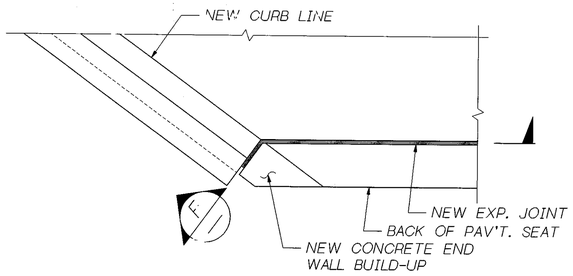
Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

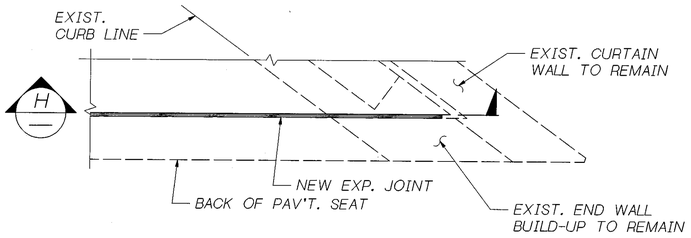
EXPANSION JOINT DETAILS
1 OF 2

BRIDGE SHEET NO. 24
SHEET 522 OF 663 SHEETS

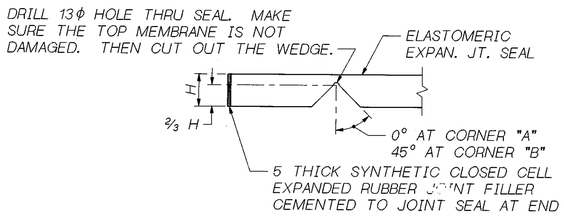
SR 405 JOB NO. 7079 SHEET 24



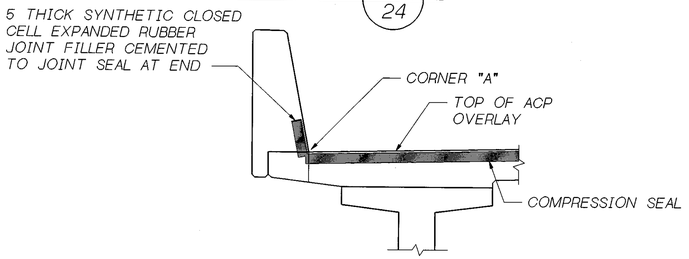
DETAIL E 24



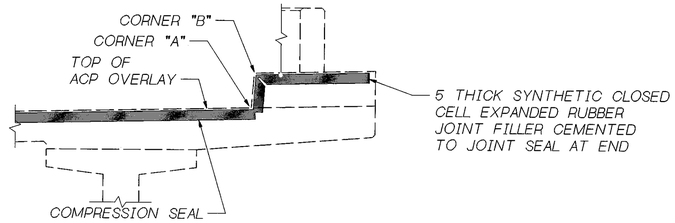
DETAIL G 24



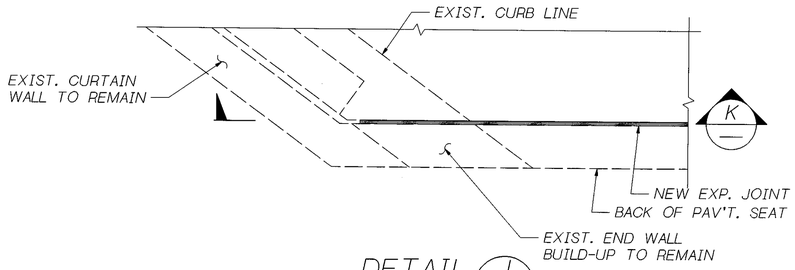
SEAL CUTTING DETAIL



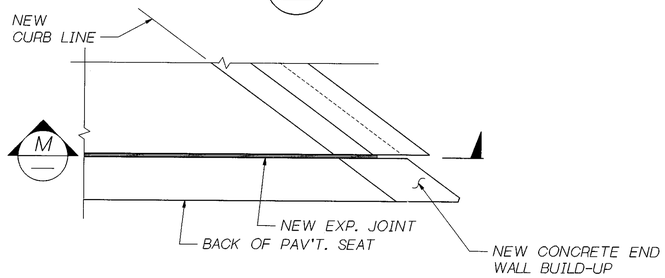
SECTION F



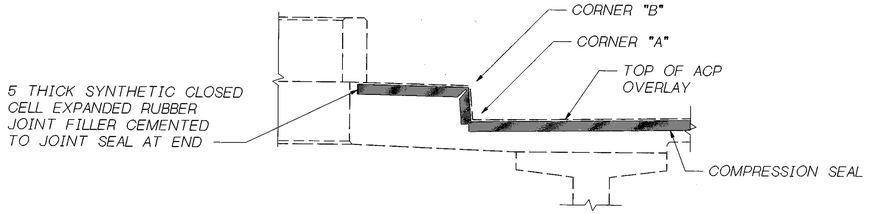
SECTION H



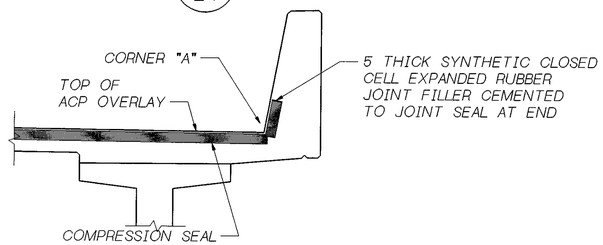
DETAIL J 24



DETAIL L 24



SECTION K



SECTION M

SR 405 JOB NO. 7079 SHEET 25

Bridge Design Engr.	S405D103ROOT:(000000.FGB)EXP.FGB;1			REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor W. WILSON				10	WASH.			
Designed By M. TRAGESSER 6/96				JOB NUMBER				
Checked By S. ANDERSON 6/96				96W035				
Detailed By D.W. PULSE JR. 6/96								
Bridge Projects Engr.								
Prelim. Plan By								
Architect/Specialist	DATE	REVISION	BY	APP'D	5054			

12-NOV-96

WARREN E. WILSON — STATE OF WASHINGTON — 20527 — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/8/98

Washington State Department of Transportation

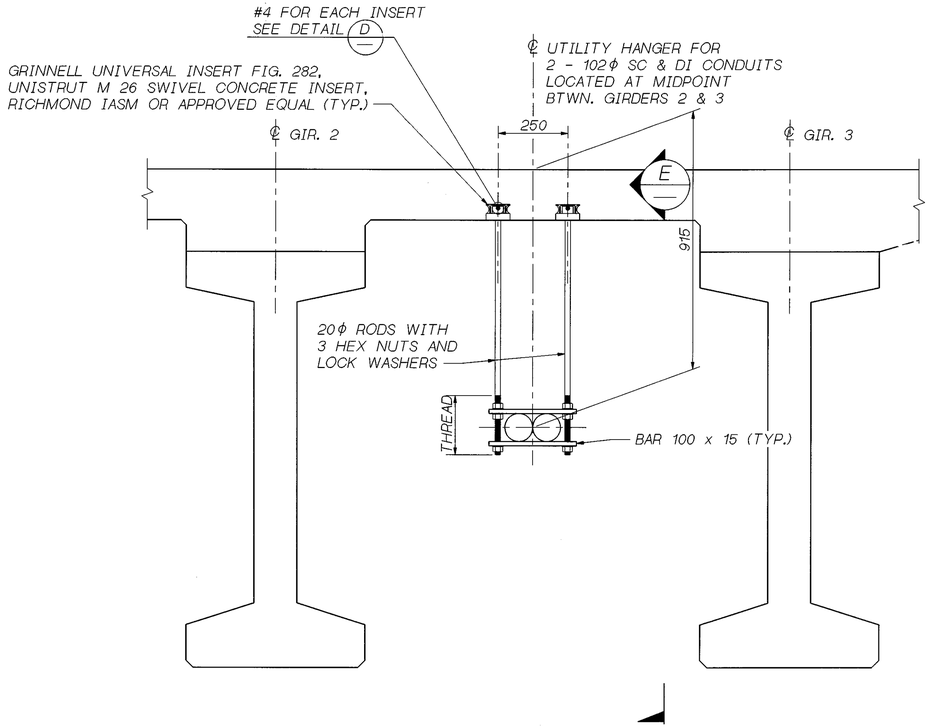
SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

EXPANSION JOINT DETAILS
SHEET 2

BRIDGE SHEET NO. 25

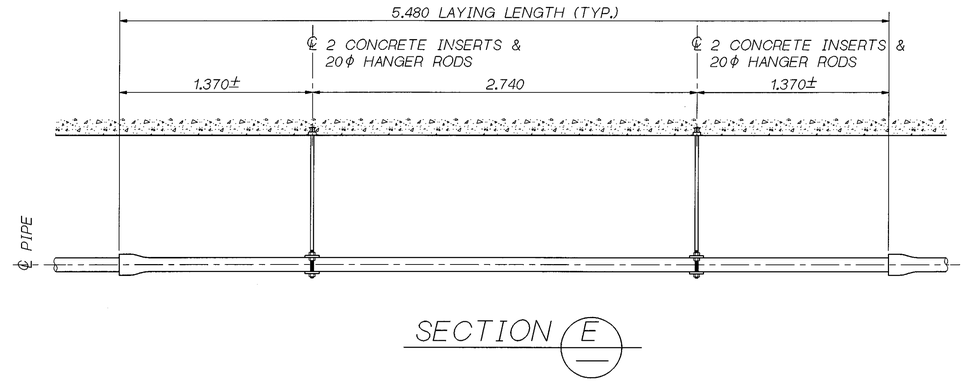
SHEET 523 OF 663 SHEETS

2.21.104

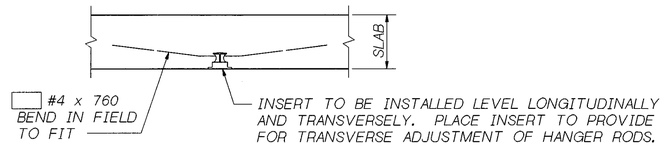


HANGER UTILITY SUPPORT

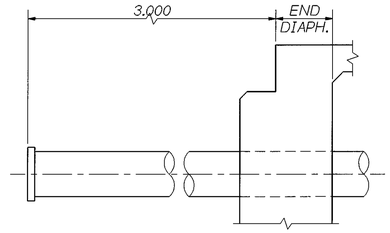
SC & DI



SECTION E



DETAIL D



UTILITY CONDUIT PLACEMENT DETAIL

SR 405 JOB NO. 7079 SHEET 26

Bridge Design Engr.	S405D103ROOT:[000000.FGB1UTILITY.FGB;1				REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor W. WILSON					10	WASH.			
Designed By M. TRAGESSER 6/96									
Checked By S. ANDERSON 6/96					JOB NUMBER 96W035				
Detailed By D.W. PULSE JR. 6/96									
Bridge Projects Engr.									
Prelim. Plan By									
Architect/Specialist	DATE	REVISION	BY	APP'D	5054				

12-NOV-96

WARREN E. WILSON STATE OF WASHINGTON 20527 REGISTERED PROFESSIONAL ENGINEER

EXPIRES 10/8/98

Washington State Department of Transportation

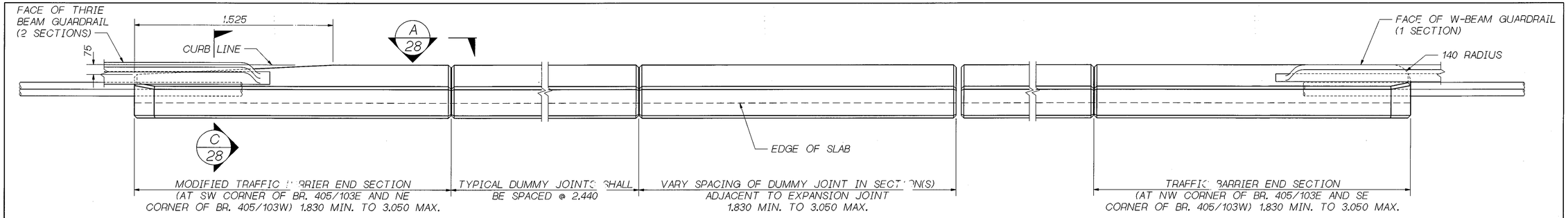
SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

HANGER UTILITY DETAILS

BRIDGE SHEET NO. 26

SHEET 524 OF 663 SHEETS

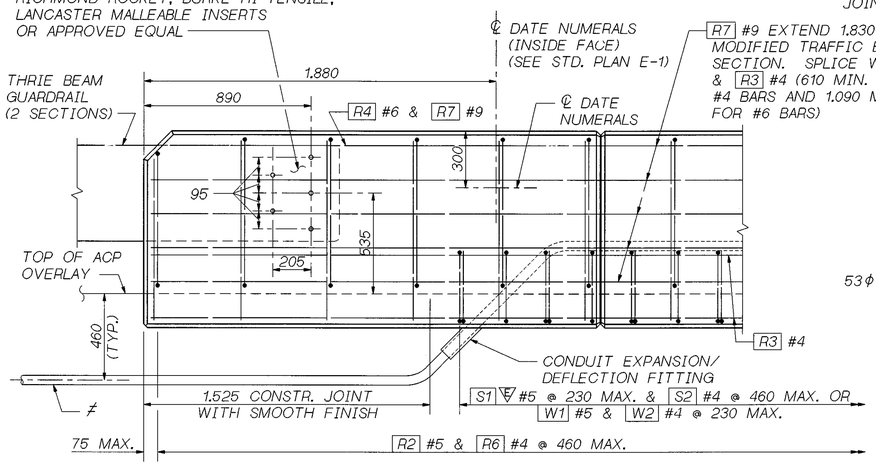
241/103



PLAN
TRAFFIC BARRIER

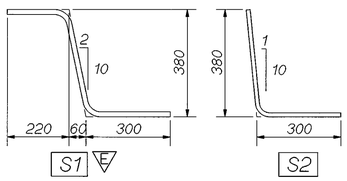
BARRIER CONTINUOUS BETWEEN ROADWAY EXPANSION JOINTS. CONSTRUCTION JOINTS WITH SHEAR KEYS ARE PERMISSIBLE AT DUMMY JOINT LOCATIONS. FORM JOINTS BETWEEN DUMMY JOINTS SHALL NOT BE PERMITTED.

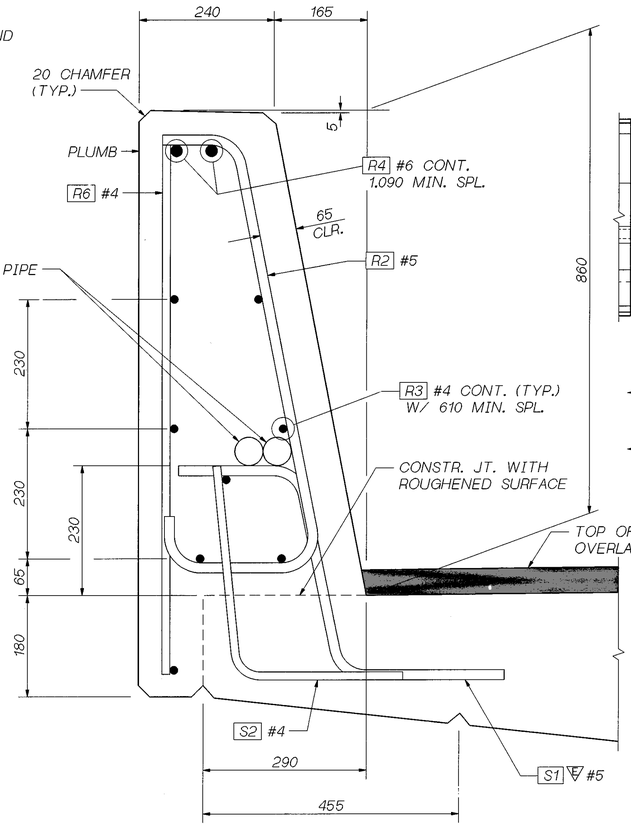
TYPE 1 GUARDRAIL TRANSITION WITH D CONNECTION, FAR SIDE (SEE STD. PLANS C-3 & C-5) (WHERE SHOWN ON LAYOUT) PROVIDE 5 - 22φ GALV. RICHMOND ROCKET, BURKE HI-TENSILE, LANCASTER MALLEABLE INSERTS OR APPROVED EQUAL



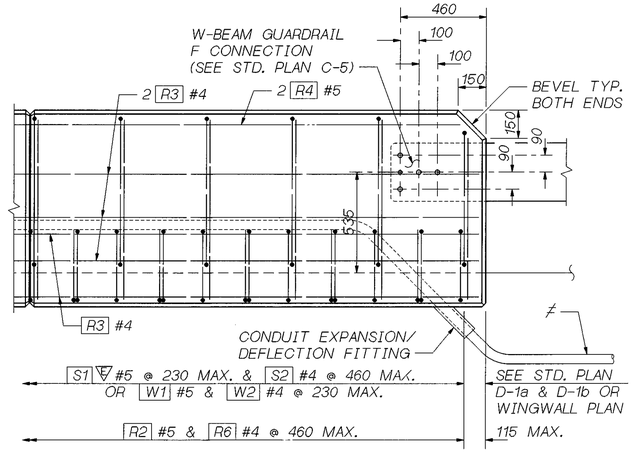
OUTSIDE ELEVATION
END OF MODIFIED TRAFFIC BARRIER

FOR D CONNECTION GUARDRAIL ANCHORAGE





TYPICAL SECTION - TRAFFIC BARRIER



OUTSIDE ELEVATION
TRAFFIC BARRIER

AT TRAILING END OF BRIDGE

≠ TERMINATE EACH CONDUIT PIPE AT SEPARATE TYPE 1 JUNCTION BOX OFF END OF BRIDGE.

SR 405 JOB NO. 7079 SHEET 27

Bridge Design Engr.		S405D103ROOT:[000000.FGB]MSS_1.FGB;1				REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor W. WILSON						10	WASH.			
Designed By M. TRAGESSER	6/96									
Checked By S. ANDERSON	6/96					JOB NUMBER 96W035				
Detailed By D.W. PULSE JR.	6/96									
Bridge Projects Engr.										
Prelim. Plan By										
Architect/Specialist		DATE	REVISION	BY	APP'D	5054				

12-NOV-96

WARREN E. WILSON STATE OF WASHINGTON 20527 REGISTERED PROFESSIONAL ENGINEER
EXPIRES 10/8/98

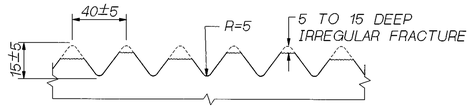
Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

TRAFFIC BARRIER 1 OF 3

BRIDGE SHEET NO. 27
SHEET 525 OF 663 SHEETS

241/102



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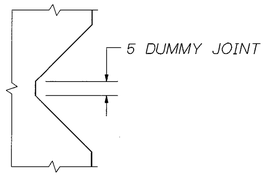
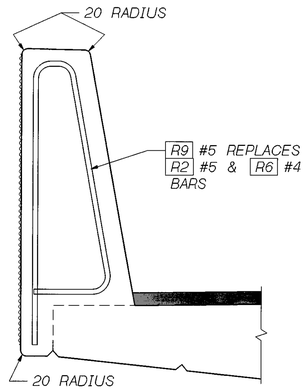
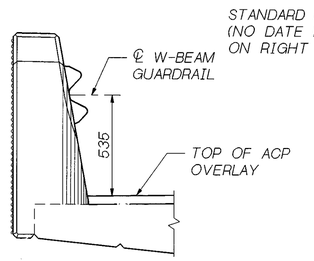


DUMMY JOINT DETAIL



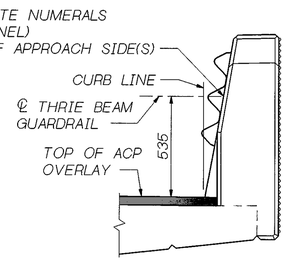
SLIPFORM ALTERNATE

SEE TYPICAL SECTION - TRAFFIC BARRIER FOR ADDITIONAL DETAILS.



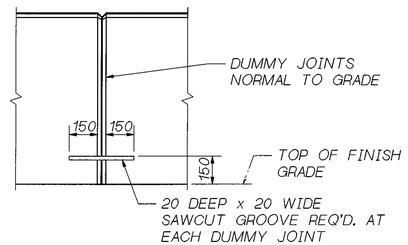
END VIEW

WITH F CONNECTION



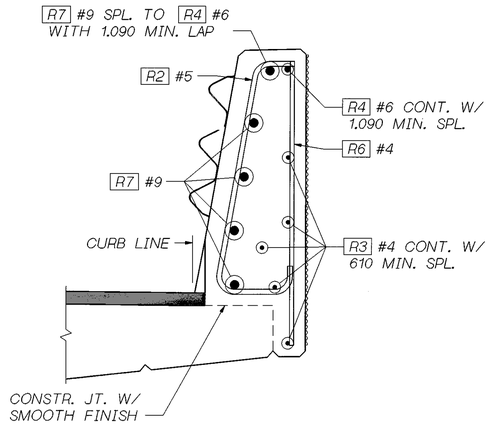
END VIEW

WITH D CONNECTION



VIEW A / 27

NOTE: CONCRETE SURFACE CONSTRUCTION TOLERANCE OF 3 IN 3.000 (MAX.) IS REQ'D. FOR TRAFFIC SIDE OF BARRIER.



SECTION C / 27 BRIDGE

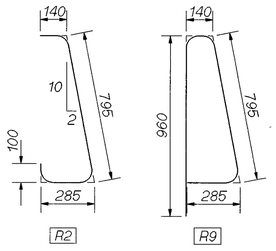
DETAIL FOR BRIDGE
FOR DETAILS NOT SHOWN SEE "OUTSIDE ELEVATION" AND "TYPICAL SECTION"

▽ : EPOXY COATED ≠ DIMENSIONS TO POINTS OF INTERSECTION.

TRAFFIC BARRIER BAR LIST

ALL REINFORCING SHALL BE AASHTO M31, GR. 60.

MARK	SIZE	LENGTH	BENDING DIAGRAM (ALL DIMENSIONS ARE OUT TO OUT)
R2	5	1.320	
R3	4	(A)	STR.
R4	6	(A)	STR.
R6	4	960	STR.
R7	9	4.265	STR.
R9	5	2.180	



(A) DETERMINE FROM PLANS

FOR W1 & W2 BARS SEE WINGWALL OR RETAINING WALL PLANS. FOR S1 ▽ & S2 BARS SEE BARLIST.

Bridge Design Engr.	S405D103R00T:\000000.FGB\MSS_2.FGB; 1				REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor W. WILSON					10	WASH.			
Designed By M. TRAGESSER 6/96					JOB NUMBER				
Checked By S. ANDERSON 6/96					96W035				
Detailed By D.W. PULSE JR. 6/96					5054				
Bridge Projects Engr.									
Prelim. Plan By									
Architect/Specialist	DATE	REVISION		BY	APP'D				

12-NOV-96

WARREN E. WILSON — STATE OF WASHINGTON — 20527 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES 10/8/98

Washington State Department of Transportation

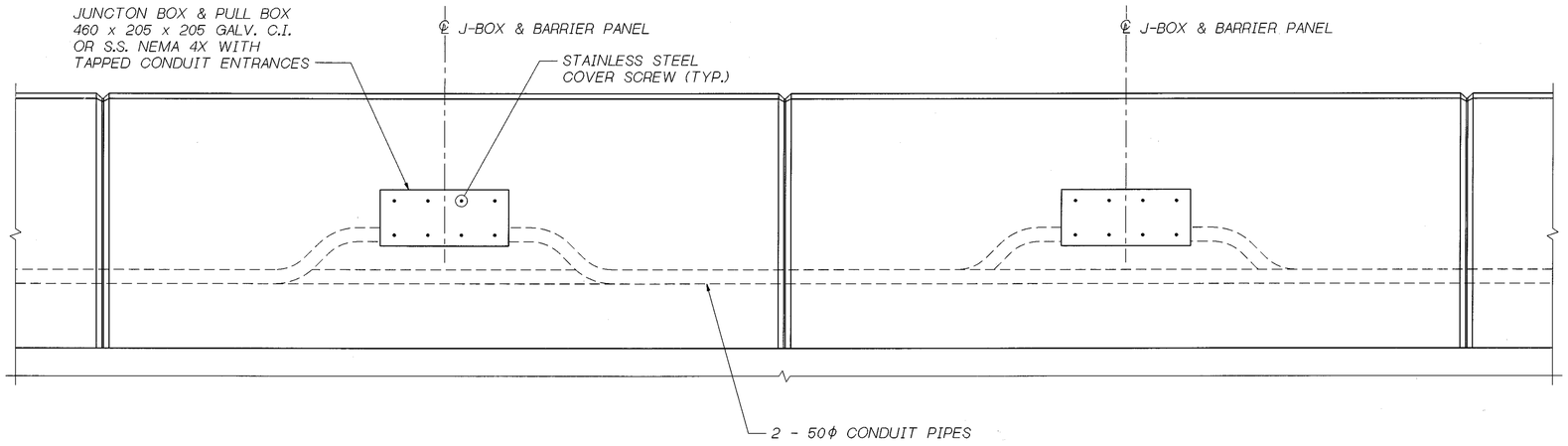
SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

TRAFFIC BARRIER 2 OF 3

BRIDGE SHEET NO. 28
SHEET 526 OF 663 SHEETS

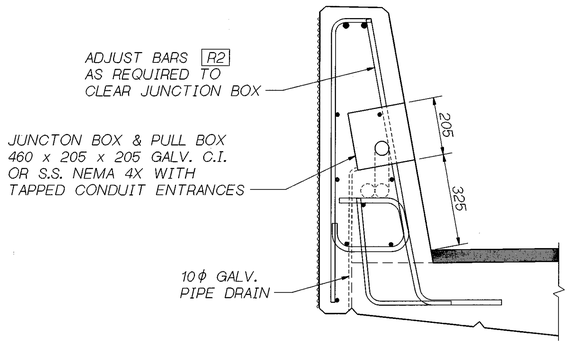
SR 405 JOB NO. 7079 SHEET 28

2.41(10)

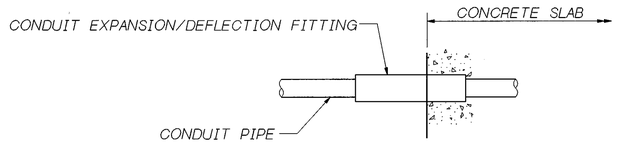


ELEVATION - CONDUIT & J-BOX IN TRAFFIC BARRIER

LABEL JUNCTION BOX COVER IN ACCORDANCE WITH STANDARD PLAN J-11a AND SPECIAL PROVISIONS.



TYPICAL SECTION TRAFFIC BARRIER



CONDUIT EXPANSION/DEFLECTION FITTING

TYPE AX/DX CONDUIT FITTING
FOR DEFLECTION OF 30° AND 50 MOVEMENT
PLACE AT CONDUIT PIPE EXIT FROM STRUCTURE.

JUNCTION BOX LOCATIONS

L STA. 42+423.090 RT.
L STA. 42+425.530 RT.

SR 405 JOB NO. 7079 SHEET 29

Bridge Design Engr.	S405D103R00T:[000000.FGB]MSS_3.FGB;1				REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor W. WILSON					10	WASH.			
Designed By M. TRAGESSER 6/96									
Checked By S. ANDERSON 6/96					JOB NUMBER 96W035				
Detailed By D.W. PULSE JR. 6/96									
Bridge Projects Engr.									
Prelim. Plan By									
Architect/Specialist	DATE	REVISION	BY	APP'D	5054				

12-NOV-96

WARREN E. WILSON — STATE OF WASHINGTON — 20527 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES 10/8/98

Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES - STAGE 1
228TH BRIDGE 405/103E

TRAFFIC BARRIER 3 OF 3

BRIDGE SHEET NO. 29

SHEET 527 OF 663 SHEETS

24\100

S=BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES
LUMP SUM QUANTITY
T OR S=TIE OR STIRRUP RADIUS
E=EARTHQUAKE TAIL W/ TIE OR STIRRUP RADIUS
E=BAR IS EPOXY COATED
V=BAR DIMENSIONS VARY BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE

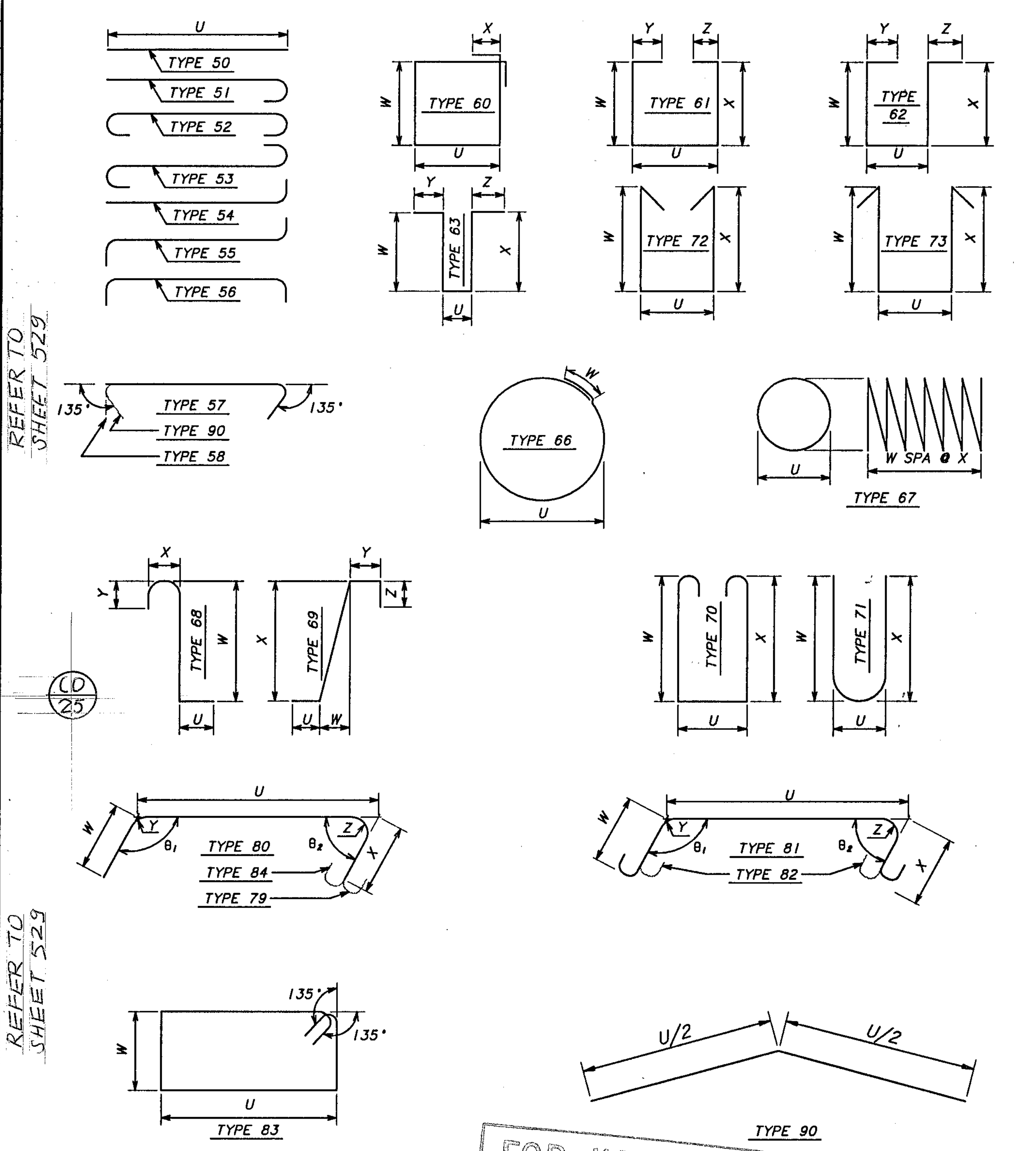
MARK NO.	LOCATION	SIZE	NO. REQ'D	BEND TYPE	BEND RADIUS	LUMP SUM	SUBSTRUCT	EPOXY COATED	VARIES	DIMENSIONS U (M)	W (M)	X (M)	Y (M)	Z (M)	θ1 (DEG)	θ2 (DEG)	LENGTH (EACH) (M)	TOTAL WEIGHT (KG)
	PIERS 1 & 4																	
501	PIER 1 & 4 END DIAPHRAGM	6	14	50						9.400							9.400	293
502	PIER 1 & 4 END DIAPHRAGM	4	12	50						2.700							2.700	32
503	PIER 1 & 4 END DIAPHRAGM	7	12	50						2.700							2.700	98
504	PIER 1 & 4 END DIAPHRAGM	9	3	50						1.920							1.920	29
505	PIER 1 & 4 END DIAPHRAGM	9	2	50						1.360							1.360	13
D	PIER 1 & 4 END DIAPHRAGM	7	2	69						0.720	0.840	1.205						
A	PIER 1 & 4 END DIAPHRAGM	7	8	69						0.720	1.310	1.310					2.565	62
B	PIER 1 & 4 END DIAPHRAGM	7	2	50						9.130							9.130	55
C	PIER 1 & 4 END DIAPHRAGM	7	22	69						0.305	1.310	1.310					2.160	143
C1	PIER 1 & 4 END DIAPHRAGM	7	10	69						0.300	0.840	1.205						
601	PIER 1 & 4 CURTAIN WALL	4	20	50			S		V	2.050							2.050	
										1.158							1.158	31
602	PIER 1 & 4 CURTAIN WALL	4	16	50			S			2.050							2.050	32
603	PIER 1 & 4 CURTAIN WALL	6	10	50			S			2.812							2.812	62
604	PIER 1 & 4 CURTAIN WALL	4	10	50			S			2.812							2.812	28
605	PIER 1 & 4 CURTAIN WALL	6	6	50			S		V	2.812							2.812	
	PIER 1 & 4 CURTAIN WALL									2.040							2.040	32
606	PIER 1 & 4 CURTAIN WALL	4	6	50			S		V	2.812							2.812	
	PIER 1 & 4 CURTAIN WALL									2.040							2.040	14
607	PIER 1 & 4 CURTAIN WALL	4	4	80			S			1.390	1.940		0.038		153		3.325	13
608	PIER 1 & 4 CURTAIN WALL	6	8	80			S			1.145	1.145		0.055		144		2.285	40
609	PIER 1 & 4 CURTAIN WALL	6	8	80			S			1.145	1.145		0.055		36		2.080	37
701	PIER 1 & 4 FOOTING	5	69	50			S			3.350							3.350	359
702	PIER 1 FOOTING	6	5	50			S		V	12.578							12.578	
	PIER 1 FOOTING									10.196							10.196	127
703	PIER 1 & 4 FOOTING	5	69	50			S			3.350							3.350	359
704	PIER 1 FOOTING	6	4	50			S		V	12.578							12.578	
	PIER 1 FOOTING									10.196							10.196	101
705	PIER 1 & 4 FOOTING	4	32	63			S		V	1.104	1.219	1.219	0.205	0.205			3.835	
	PIER 1 & 4 FOOTING									1.104	1.510	1.510	0.205	0.205			4.420	131
706	PIER 1 & 4 ABUTMENT	6	24	50			S			9.485							9.485	508
707	PIER 1 & 4 ABUTMENT	6	8	50			S			9.485							9.485	169
708	PIER 1 & 4 ABUTMENT	6	32	50			S			1.220							1.220	87
709	PIER 1 & 4 ABUTMENT	5	64	62			S			0.205	2.420	2.420	0.255	0.255			5.410	537
710	PIER 1 & 4 ABUTMENT	4	128	70			S			0.205	0.150						0.480	60
711	PIER 1 & 4 ABUTMENT	4	96	50			S			1.515							1.515	144
712	PIER 1 & 4 ABUTMENT	4	24	50			S			9.485							9.485	226
713	PIER 1 & 4 ABUTMENT	4	4	50			S			9.485							9.485	37
714	PIER 1 & 4 ABUTMENT	4	4	62			S			0.140	0.405	0.405	0.205	0.205			1.245	4
715	PIER 1 & 4 ABUTMENT	5	60	62			S			0.585	0.575	0.575					1.650	153
731	PIER 1 & 4 FOOTING	5	16	50			S			1.700							1.700	42
733	PIER 1 & 4 FOOTING	5	16	50			S			1.700							1.700	42
742	PIER 4 FOOTING	6	5	50			S		V	12.071							12.071	
	PIER 4 FOOTING									9.689							9.689	121
744	PIER 4 FOOTING	6	4	50			S		V	12.071							12.071	
	PIER 4 FOOTING									9.689							9.689	97
745	PIER 4 FOOTING	4	32	63			S		V	1.104	1.262	1.262	0.205	0.205			3.910	
	PIER 4 FOOTING									1.104	1.580	1.580	0.205	0.205			4.545	134
751	PIER 1 & 4 ABUTMENT	5	10	50			S			2.000							2.000	30
752	PIER 1 FOOTING	6	3	50			S			10.196							10.196	68
754	PIER 1 FOOTING	6	3	50			S			10.196							10.196	68

MARK NO.	LOCATION	SIZE	NO. REQ'D	BEND TYPE	BEND RADIUS	LUMP SUM	SUBSTRUCT	EPOXY COATED	VARIES	DIMENSIONS U (M)	W (M)	X (M)	Y (M)	Z (M)	θ1 (DEG)	θ2 (DEG)	LENGTH (EACH) (M)	TOTAL WEIGHT (KG)
762	PIER 4 FOOTING	6	3	50			S			9.689							9.689	65
764	PIER 4 FOOTING	6	3	50			S			9.689							9.689	65
	PIER 2																	
~~201~~	~~FOOTING BOTTOM MAT~~	~~8~~	~~20~~	~~50~~			~~S~~			~~4.220~~							~~4.220~~	~~335~~
~~202~~	~~FOOTING BOTTOM MAT~~	~~8~~	~~20~~	~~50~~			~~S~~			~~4.220~~							~~4.220~~	~~335~~
~~203~~	~~FOOTING TOP MAT~~	~~6~~	~~16~~	~~50~~			~~S~~			~~4.220~~							~~4.220~~	~~150~~
~~204~~	~~FOOTING TOP MAT~~	~~6~~	~~16~~	~~50~~			~~S~~			~~4.220~~							~~4.220~~	~~150~~
~~300~~	~~COLUMN VERTICAL~~	~~11~~	~~15~~	~~54~~			~~S~~			~~4.255~~							~~4.865~~	~~576~~
~~301~~	~~COLUMN VERTICAL~~	~~11~~	~~15~~	~~54~~			~~S~~			~~6.351~~							~~6.961~~	~~824~~
~~302~~	~~COLUMN SPIRAL (XBEAM & FTG)~~	~~5~~	~~2~~	~~67~~			~~S~~			~~0.835~~	~~33~~	~~0.070~~					~~85.295~~	~~264~~
~~303~~	~~COLUMN SPIRAL~~	~~5~~	~~1~~	~~67~~			~~S~~			~~0.835~~	~~59~~	~~0.070~~					~~152.475~~	~~236~~
400	HINGE BAR	9	28	54			S			2.060							2.465	348
401	CROSSBEAM HORIZONTAL TOP	11	9	80			S			8.840		0.985		0.185		85	9.830	699
402	CROSSBEAM HORIZONTAL SIDES	11	9	50			S			8.840							8.840	629
403	CROSSBEAM HORIZONTAL SIDES	6	4	50			S			8.840							8.840	78
404	CROSSBEAM HORIZONTAL BOTTOM	11	7	51			S			8.840							9.320	515
405	CROSSBEAM STIRRUPS	5	108	72	S		S			0.650	0.960	0.960					2.795	468
406	CROSSBEAM DOWELS	6	4	51			S			0.800							1.015	9
407	CROSSBEAM DOWELS	9	14	51			S			1.900							2.285	161
	PIER 3																	
~~201~~	~~FOOTING BOTTOM MAT~~	~~8~~	~~20~~	~~50~~			~~S~~			~~4.220~~							~~4.220~~	~~335~~
~~202~~	~~FOOTING BOTTOM MAT~~	~~8~~	~~20~~	~~50~~			~~S~~			~~4.220~~							~~4.220~~	~~335~~
~~203~~	~~FOOTING TOP MAT~~	~~6~~	~~16~~	~~50~~			~~S~~			~~4.220~~							~~4.220~~	~~150~~
~~204~~	~~FOOTING TOP MAT~~	~~6~~	~~16~~	~~50~~			~~S~~			~~4.220~~							~~4.220~~	~~150~~
~~301~~	~~COLUMN VERTICAL~~	~~11~~	~~15~~	~~80~~			~~S~~			~~8.202~~	~~0.610~~	~~0.610~~	~~0.185~~	~~0.185~~	~~90~~	~~90~~	~~9.174~~	~~1089~~
~~302~~	~~COLUMN SPIRAL (XBEAM & FTG)~~	~~5~~	~~2~~	~~67~~			~~S~~			~~0.835~~	~~33~~	~~0.070~~					~~85.295~~	~~264~~
~~303~~	~~COLUMN SPIRAL~~	~~5~~	~~1~~	~~67~~			~~S~~			~~0.835~~	~~55~~	~~0.070~~					~~142.140~~	~~220~~
400	HINGE BAR	9	28	54			S			2.060							2.465	348
401	CROSSBEAM HORIZONTAL TOP	11	9	80			S			8.840		0.985		0.185		85	9.830	699
402	CROSSBEAM HORIZONTAL SIDES	11	9	50			S			8.840							8.840	629
403	CROSSBEAM HORIZONTAL SIDES	6	4	50			S			8.840							8.840	78
404	CROSSBEAM HORIZONTAL BOTTOM	11	7	51			S			8.840							9.320	515
405	CROSSBEAM STIRRUPS	5	108	72	S		S			0.650	0.960	0.960					2.795	468
406	CROSSBEAM DOWELS	6	4	51			S			0.800							1.015	9
407	CROSSBEAM DOWELS	9	14	51			S			1.900							2.285	161
	ROADWAY SLAB																	
801	LONGITUDINAL TOP	7	11	50				E		16.600							16.600	555
802	LONGITUDINAL TOP	7	8	50				E		14.600							14.600	355
803	LONGITUDINAL TOP	7	6	50				E		7.800							7.800	142
804	LONGITUDINAL TOP	7	11	50				E		14.600							14.600	488
805	LONGITUDINAL TOP	7	8	50				E		12.600							12.600	306
806	LONGITUDINAL TOP	7	6	50				E		6.200							6.200	112
811	LONGITUDINAL BOTTOM	7	11	50						16.600							16.600	555
812	LONGITUDINAL BOTTOM	7	8	50						14.600							14.600	355
813	LONGITUDINAL BOTTOM	7	6	50						7.800							7.800	142

REFER TO SHEET 529

REFER TO SHEET 529

BENDING DIAGRAMS



FOR "AS CONSTRUCTED PLANS" ONLY

NOTES:
1. ALL REINFORCING BARS ON THIS SHEET SHALL BE AASHTO M31 GRADE 60 UNLESS SHOWN OTHERWISE.
2. REINFORCING FOR TRAFFIC BARRIER IS NOT SHOWN IN THIS BAR LIST EXCEPT FOR BARS S1 & S2. SEE TRAFFIC BARRIER, SHEETS 27, 28 & 29.
3. BEND FOR TRANSVERSE BARS DUE TO ROADWAY CROWN CONDITIONS HAVE NOT BEEN SHOWN. THESE BARS SHALL BE BENT AS REQUIRED TO CONFORM TO THE CONFIGURATION OF THE STRUCTURE.
4. $ NUMBER AND LENGTH OF BARS TO BE DETERMINED BY THE CONTRACTOR FROM THE PLANS.
5. LENGTHS OF SPIRAL SHOWN IN BAR LIST DOES NOT INCLUDE LENGTH OF SPLICES.
6. DIMENSIONS FOR BENT REINFORCING BARS (INCLUDING LENGTH) ARE POINTS OF INTERSECTION (OUT TO OUT).
7. BEND FOR TRANSVERSE BARS DUE TO ROADWAY CROWN CONDITIONS HAVE NOT BEEN SHOWN. THESE BARS SHALL BE BENT AS REQUIRED TO CONFORM TO THE CONFIGURATION OF THE STRUCTURE.

BRIDGE DESIGN ENGR					
SUPERVISOR					
DESIGNED BY	M. TRAGESSER	6/96			
CHECKED BY	S. ANDERSON	6/96			
DETAILED BY	R. MOHN	6/96	6/22/98	RFI-122	ALM
BRIDGE PROJECTS ENGR				⚠ INCREASE UTILITY OPENING	JCH
PRELIM PLAN BY			4.13.98	CHANGE ORDER #25	ALM
ARCHITECT/SPECIALIST			DATE	REVISION	BY / APPR

REGION NO: 1 | STATE: WASH | FED AID PROJ NO | SHEET NO | TOTAL SHEETS

JOB NUMBER 96W035

CONTRACT NO. 5054

WARREN E. WILSON — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/8/98

BERGER/ABAM ENGINEERS INC. 33301 9TH AVENUE SOUTH FEDERAL WAY, WASHINGTON 98003-6395 (206)431-2300 FAX:(206)431-2250

Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

BAR LIST

BRIDGE SHEET NO. 30

SHEET 528 OF 663 SHEETS

PLOTTED: Tue Nov 12 1996 2:02pm FILENAME: X:\A96077\405-103E\30.DWG SCALE: 1

SR 405 JOB NO. 7079 SHEET 30 OF 31

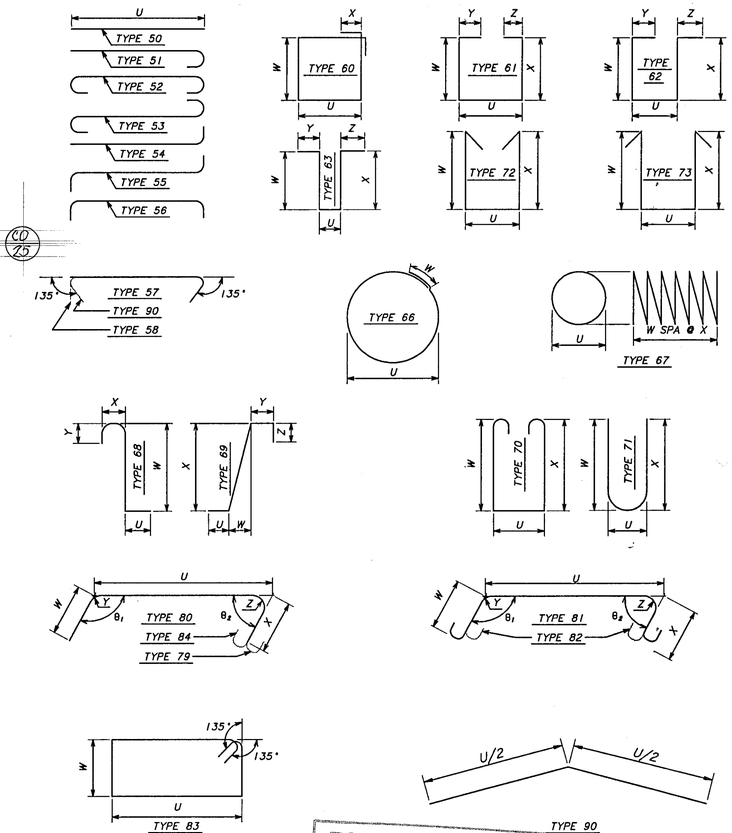
S=BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES
LUMP SUM QUANTITY
T OR S=TIE OR STIRRUP RADIUS
E=EARTHQUAKE TAIL W/ TIE OR STIRRUP RADIUS
E=BAR IS EPOXY COATED
V=BAR DIMENSIONS VARY BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE

MARK NO.	LOCATION	SIZE	NO. REQ'D	BEND TYPE	BEND RADIUS	LUMP SUM	SUBSTRUCT	EPOXY COATED	VARIES	DIMENSIONS U	W	X	Y	Z	θ1	θ2	LENGTH (EACH)	TOTAL WEIGHT
										M	M	M	M	M	DEG	DEG	M	KG
814	LONGITUDINAL BOTTOM	7	11	50						14.600							14.600	488
815	LONGITUDINAL BOTTOM	7	8	50						12.600							12.600	306
816	LONGITUDINAL BOTTOM	7	6	50						6.200							6.200	112
820	LONGITUDINAL TOP (CONT)	5	64	50				E		11.470							11.470	1139
821	LONGITUDINAL BOTTOM (CONT)	5	160	50						11.470							11.470	2848
840	LONGITUDINAL TOP (CONT W#7)	5	66	50				E		9.660							9.660	990
841	LONGITUDINAL BOT (CONT W#7)	5	66	50						9.660							9.660	990
842	LONGITUDINAL TOP (CONT W#7)	5	12	50						10.660							10.660	198
843	LONGITUDINAL BOT (CONT W#7)	5	48	50						10.660							10.660	793
845	LONGITUDINAL BOT (CONT W#7)	5	48	50						9.930							9.930	739
830	TRANSVERSE TOP	5	633	51				E		5.980							6.145	6048
831	TRANSVERSE TOP	5	41	51				E	V	2.200							2.360	
										5.900							6.070	268
832	TRANSVERSE BOTTOM	5	633	51						5.980							6.145	6048
833	TRANSVERSE BOTTOM	5	41	51					V	2.200							2.360	
										5.900							6.070	268
850	SPLAYED TOP	5	30	51				E		2.100							2.260	105
851	SPLAYED BOT	5	30	51						2.100							2.260	105
S1	TRAFFIC BARRIER TIE	4	379	69				E		0.300	0.060	0.380	0.220				0.865	329
S2	TRAFFIC BARRIER TIE	4	194	69						0.300	0.030	0.380					0.660	127
	HINGE DIAPHRAGMS																	
521	HORIZONTAL BAR	8	6	50						1.710							1.710	40
522	HORIZONTAL BAR	5	16	50						3.800							3.800	94
H1	STIRRUP	4	36	63						0.435	1.710	1.710	2.050	2.050			7.825	279
H2	VERTICAL TIES	4	40	68						1.835	0.150						1.930	76
H3	VERTICAL TIES	4	8	68						1.835	0.150						1.930	15
H4	HORIZONTAL BAR	5	24	50						9.400							9.400	350
	INTERMEDIATE DIAPHRAGMS																	
511	HORIZONTAL BAR	7	24	50						9.400							9.400	686
512	HORIZONTAL BAR	8	6	50						9.817							9.817	234
513	HORIZONTAL BAR BTWN GIRDERS	4	36	50						2.700							2.700	96
514	HORIZONTAL BAR	9	12	50						8.980							8.980	545
515	DOWEL	9	18	50						1.630							1.630	147
516	DOWEL	9	12	50						1.360							1.360	82
517	STIRRUP	4	180	71						0.200	1.090	1.090					2.285	408
518	BLOCKOUT BAR	9	12	81						1.030	0.785		0.153		225		2.565	155
519	HORIZONTAL BAR	9	6	50						2.700							2.700	82

S=BAR IS INCLUDED IN SUBSTRUCTURE QUANTITIES
LUMP SUM QUANTITY
T OR S=TIE OR STIRRUP RADIUS
E=EARTHQUAKE TAIL W/ TIE OR STIRRUP RADIUS
E=BAR IS EPOXY COATED
V=BAR DIMENSIONS VARY BETWEEN DIMENSIONS SHOWN ON THIS LINE AND THE FOLLOWING LINE

MARK NO.	LOCATION	SIZE	NO. REQ'D	BEND TYPE	BEND RADIUS	LUMP SUM	SUBSTRUCT	EPOXY COATED	VARIES	DIMENSIONS U	W	X	Y	Z	θ1	θ2	LENGTH (EACH)	TOTAL WEIGHT
										M	M	M	M	M	DEG	DEG	M	KG
	PIER 2																	
300	COLUMN VERTICAL	11	8	54		S				4.26							4.87	307
301	COLUMN VERTICAL	11	7	54		S				6.35							6.96	385
301A	COLUMN VERTICAL	11	8	50		S				6.23							6.84	439
301A	COLUMN VERTICAL	11	7	50		S				4.14							4.75	269
302	COLUMN SPIRAL	5	1	67		S				0.84	36	0.07					93.05	144
303	COLUMN SPIRAL	5	1	67		S				0.84	84	0.07					217.10	336
900	DRILLED SHAFT VERT	11	32	50		S				12.97							13.0	3283
902	DRILLED SHAFT SPIRAL	5	1	67		S				1.53	145	0.09					68.7	1067
	PIER 3																	
301	COLUMN VERTICAL	11	15	54		S				7.58							8.19	972
302	COLUMN SPIRAL	5	1	67		S				0.84	36	0.07					93.05	144
303	COLUMN SPIRAL	5	1	67		S				0.84	73	0.07					188.60	292
901	DRILLED SHAFT VERT	11	32	50		S				11.57							11.60	2928
903	DRILLED SHAFT SPIRAL	5	1	67		S				11.53	129	0.09					612	949

BENDING DIAGRAMS



FOR "AS CONSTRUCTED PLANS" ONLY

NOTES:
1. ALL REINFORCING BARS ON THIS SHEET SHALL BE AASHTO M31 GRADE 60 UNLESS SHOWN OTHERWISE.
2. REINFORCING FOR TRAFFIC BARRIER IS NOT SHOWN IN THIS BAR LIST EXCEPT FOR BARS S1 & S2. SEE TRAFFIC BARRIER, SHEETS 27, 28 & 29.
3. BEND FOR TRANSVERSE BARS DUE TO ROADWAY CROWN CONDITIONS HAVE NOT BEEN SHOWN. THESE BARS SHALL BE BENT AS REQUIRED TO CONFORM TO THE CONFIGURATION OF THE STRUCTURE.
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7. BEND FOR TRANSVERSE BARS DUE TO ROADWAY CROWN CONDITIONS HAVE NOT BEEN SHOWN. THESE BARS SHALL BE BENT AS REQUIRED TO CONFORM TO THE CONFIGURATION OF THE STRUCTURE.

BRIDGE DESIGN ENGR				
SUPERVISOR				
DESIGNED BY	M. TRAGESSER	6/96		
CHECKED BY	S. ANDERSON	6/96		
DETAILED BY	R. MOHN	6/96		
BRIDGE PROJECTS ENGR				
PRELIM PLAN BY				
ARCHITECT/SPECIALIST				

DATE	REVISION	BY	APPR
11-3-98	CHANGE ORDER #25	ALM	

REGION NO	STATE	FED AID PROJ NO	SHEET NO	TOTAL SHEETS
1	WASH			
JOB NUMBER 96W035				
CONTRACT NO. 5054				

WARREN E. WILSON — STATE OF WASHINGTON — 20527 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES 10/8/98

BERGER/ABAM ENGINEERS INC.
33301 9TH AVENUE SOUTH
FEDERAL WAY, WASHINGTON 98003-8395
(206)431-2300 FAX:(206)431-2250

Washington State Department of Transportation

SR 405
BOTHELL TO SWAMP CREEK I/C
HOV LANES – STAGE 1
228TH BRIDGE 405/103E

BAR LIST

BRIDGE SHEET NO. 31
SHEET 529 OF 663 SHEETS

PLOTTED: Tue Nov 12 1996 2:04pm FILENAME: X:\A96027\405-103E\31.DWG SCALE: 1
SR 405 JOB NO. 7079 SHEET 31 OF 31