

AASHTO T-3 TRIAL DESIGN BRIDGE DESCRIPTION

State: Washington

Trial Design Designation: WA-1

Bridge Name: South 48th Street to Pacific Avenue

Superstructure Type: Steel box girder with composite concrete deck

Span Length(s): Two spans 76.0m (249.3ft.) and 54.5m (178.8ft.)

Substructure Type: Four rectangular 1.53m by 1.39m (5.02ft. by 4.56ft.) reinforced concrete columns at bent 2

Foundation: Spread footings @ abutments and 3.05m (10.0ft) dia. concrete shaft @ Bent 2

Abutments: Seat type abutments with abutment back walls extending down to the footings

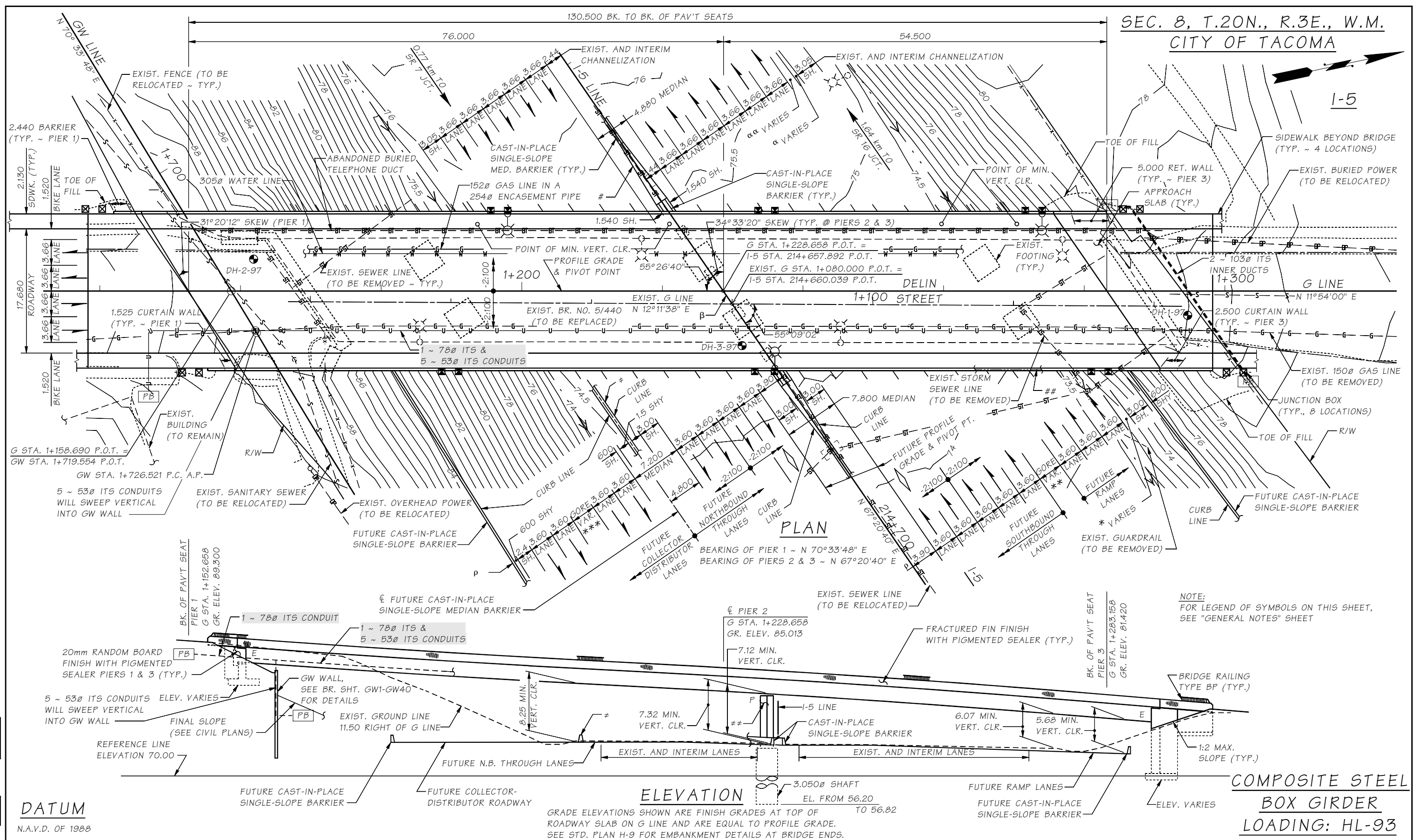
Seismic Design Category (SDC): _____

Seismic Design Strategy (Type 1, 2 or 3): _____

Design Spectral Acceleration at 1-second Period (S_{D1}): _____

Additional Description (Optional): Seismic design is currently being conducted.

1-5



NOTE:
FOR LEGEND OF SYMBOLS ON THIS SHEET,
SEE "GENERAL NOTES" SHEET

DATUM

N.A.V.D. OF 1988

GRADE ELEVATIONS SHOWN ARE FINISH GRADES AT TOP OF
ROADWAY SLAB ON G LINE AND ARE EQUAL TO PROFILE GRADE.
SEE STD. PLAN H-9 FOR EMBANKMENT DETAILS AT BRIDGE ENDS.

COMPOSITE STEEL
BOX GIRDER
LOADING: HL-93

SR I-5 JOB NO. 7177 SHEET D11

Bridge Design Engr.	Kapur, J	M:\X-Team\delin\window files\LAYO.WND
Supervisor	Anderson, MW	
Designed By	Hsieh, JC/Tran, LH	
Checked By	Tran, LH/Nash, PM	
Detailed By	Nguyen, V 07/02	
Bridge Projects Engr.	Kirker, KN 04/97	04/05 REVISED CONDUITS, ADDED
Prelim. Plan By	Braxmeyer, RD 03/97	WATER LINE
Architect/Specialist	Young, A 03/97	DATE REVISION BY APPD

Wed Aug 16 09:08:10 2006

BRIDGE
AND
STRUCTURES
OFFICE



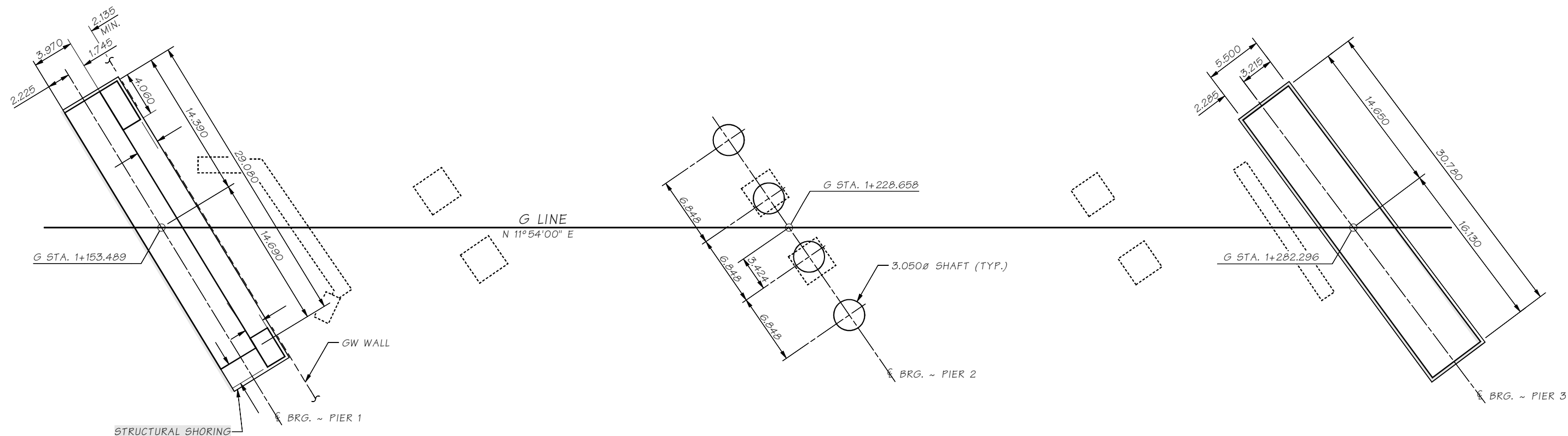
I-5
SOUTH 48TH STREET TO PACIFIC AVENUE

DELIN STREET U'XING 5/440 REPLACEMENT

LAYOUT

BRIDGE SHEET NO. GW
OF SHEETS

C.S. 2799 ~ PROJ. NO. 01-3459A ~ OLYMPIC REGION ~ S. 48TH ST. TO PACIFIC AVE. ~ I-5 ~ DELIN STREET U-XING BR. NO. 5/440 REPL.



FOUNDATION PLAN

BEARING OF PIER 1 IS N 70°33'48" E.
 BEARING OF PIERS 2 & 3 ARE N 67°20'40" E.

THE CONTRACTOR SHALL REMOVE THE EXISTING FOOTINGS, THAT CONFLICT WITH THE NEW FOOTINGS OR SHAFTS TO FULL DEPTH AND AT LEAST 610 mm CLEAR AROUND THE PERIMETER OF NEW CONSTRUCTION. OTHER PORTIONS OF THE EXISTING SUBSTRUCTURE SHALL BE REMOVED 610 mm MINIMUM BENEATH THE FINISH GROUND LINE. EXCAVATION REQUIRED TO PERFORM SUBSTRUCTURE REMOVAL BEYOND THE LIMITS OF THE NEW CONSTRUCTION SHALL BE SHORED WITH STRUCTURAL SHORING.

PIER 1 ABUTMENT AND CURTAIN WALLS CONSTRUCTION NOTES:

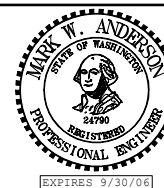
1. PIER 1 ABUTMENT AND CURTAIN WALLS SHALL BE CONSTRUCTED BEFORE CONSTRUCTING THE GW WALL. AFTER THE CONCRETE STRENGTH IN THE ABUTMENT HAS ATTAINED 20 MPa, THE ENTIRE ABUTMENT SHALL BE BACK FILLED. THE CONTRACTOR SUBMITS THE REBAR SPLICED LOCATIONS TO THE ENGINEERS FOR APPROVAL. PLEASE SEE THE TRAFFIC CONTROL PLANS FOR STAGING.
2. THE STRUCTURAL SHORING SYSTEM SHALL NOT INTERFERE WITH THE GW WALL'S PERMANENT SOIL NAIL AND TIEBACK ANCHORS.

SR I-5 JOB NO. 7177 SHEET DL10

Bridge Design Engr.	Kapur, J	M:\X-Team\delin\window files\FTG.WND		REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor	Anderson, MW			10	WASH.			
Designed By	Tran, LH	03/03		JOB NUMBER				
Checked By	Nash, PM	03/03		02C513				
Detailed By	Nguyen, V	02/02						
Bridge Projects Engr.								
Prelim. Plan By		04/05	REVISED CALLOUT & NOTE	LT				
Architect/Specialist		DATE	REVISION	BY	APPD			



BRIDGE AND STRUCTURES OFFICE



I-5
SOUTH 48TH STREET TO PACIFIC AVENUE

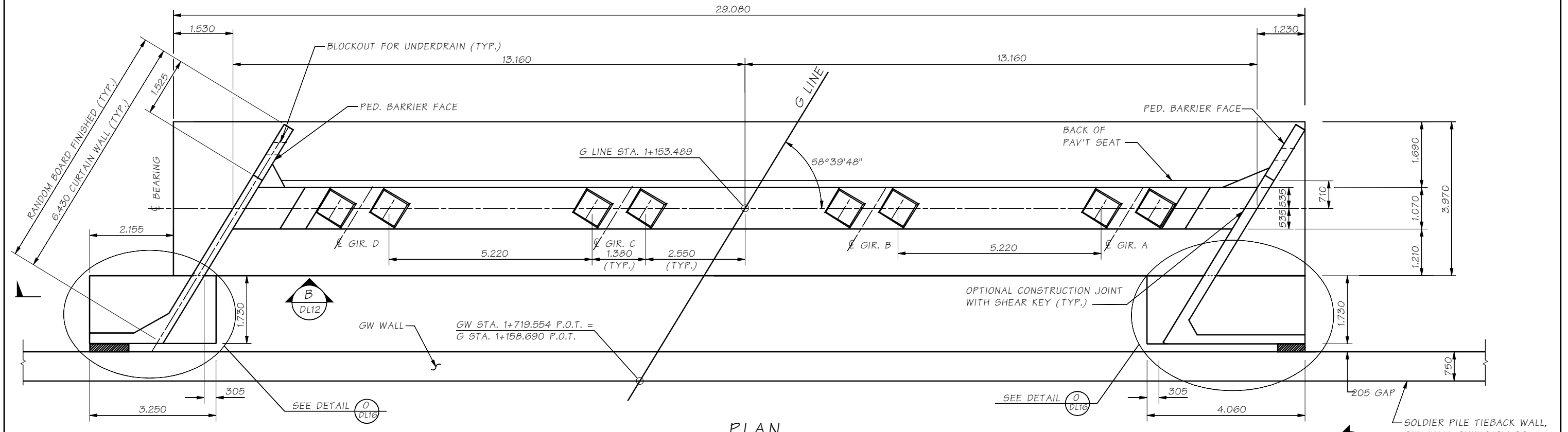
DELIN STREET U'XING 5/440 REPLACEMENT

FOUNDATION LAYOUT

BRIDGE SHEET NO. GW10
SHEET OF SHEETS

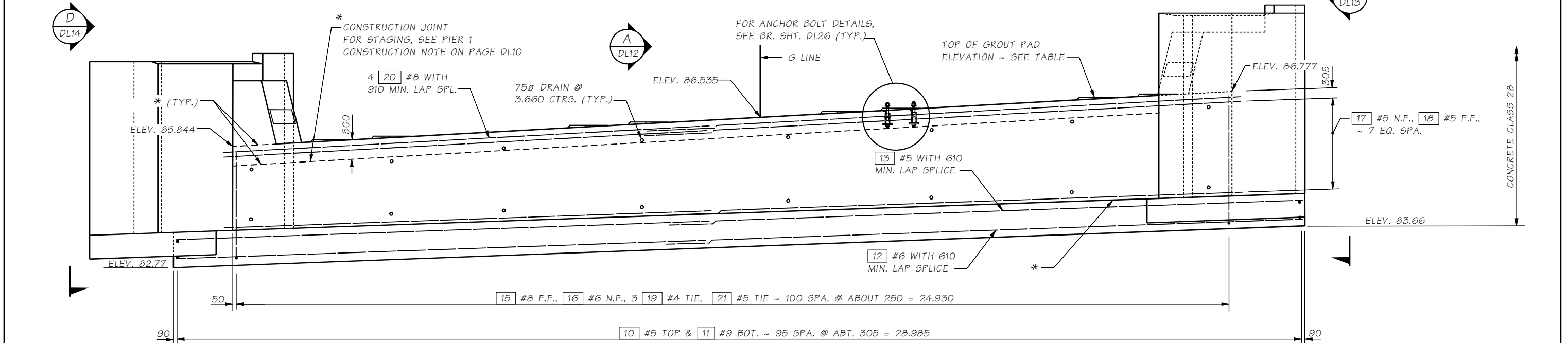
TOP OF GROUT PAD ELEVATION

GIR. A LT.	GIR. A RT.	GIR. B LT.	GIR. B RT.	GIR. C LT.	GIR. C RT.	GIR. D LT.	GIR. D RT.
86.769	86.743	86.647	86.622	86.441	86.369	86.094	86.022



PLAN

BEARING ANCHOR BOLTS NOT SHOWN FOR CLARITY.



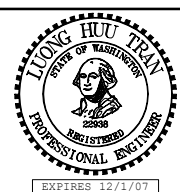
ELEVATION

LOOKING BACK ON STATIONING

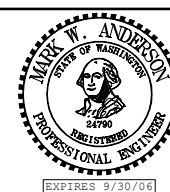
NOTE: THE CONTRACTOR SHALL PROVIDE CONSTRUCTION JOINTS WITH ROUGHENED SURFACE AND STEEL REINFORCEMENT BAR MECHANICAL SPLICES AS NECESSARY FOR THE TEMPORARY BACKFILL.

SR I-5 JOB NO. 7177 SHEET DL11

Bridge Design Engr.	Kapur, J	M:\X-Team\delin\window files\PRI.WND
Supervisor	Anderson, MW	
Designed By	Tran, LH	03/03
Checked By	Nash, PM	03/03
Detailed By	Nguyen, V	02/02
Bridge Projects Engr.		
Prelim. Plan By		04/05 ADDED NOTE
Architect/Specialist		DATE REVISION BY APPD



BRIDGE AND STRUCTURES OFFICE

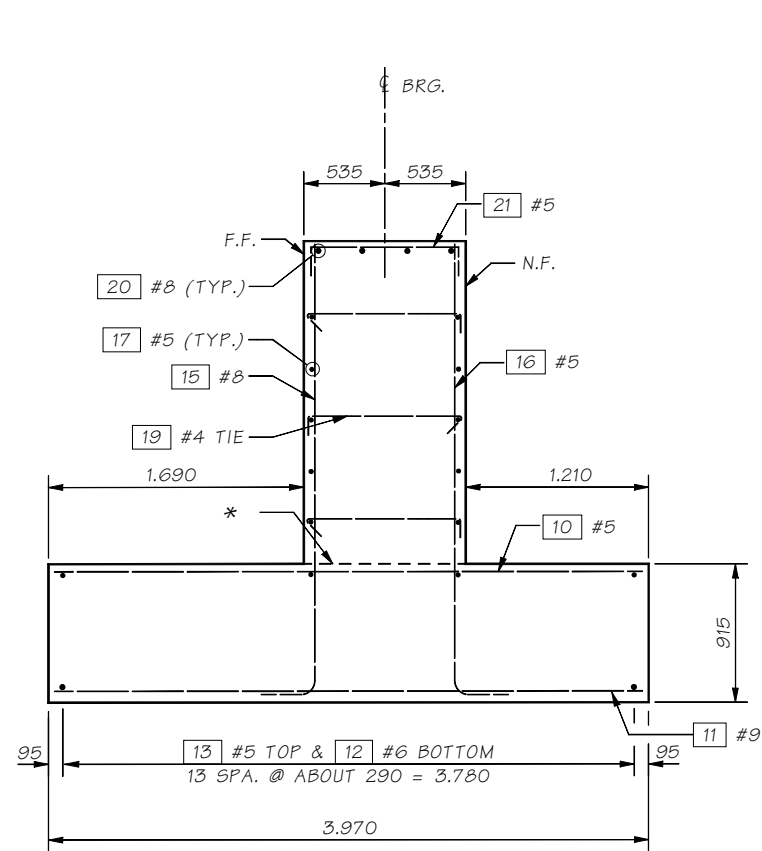


I-5
SOUTH 48TH STREET TO PACIFIC AVENUE

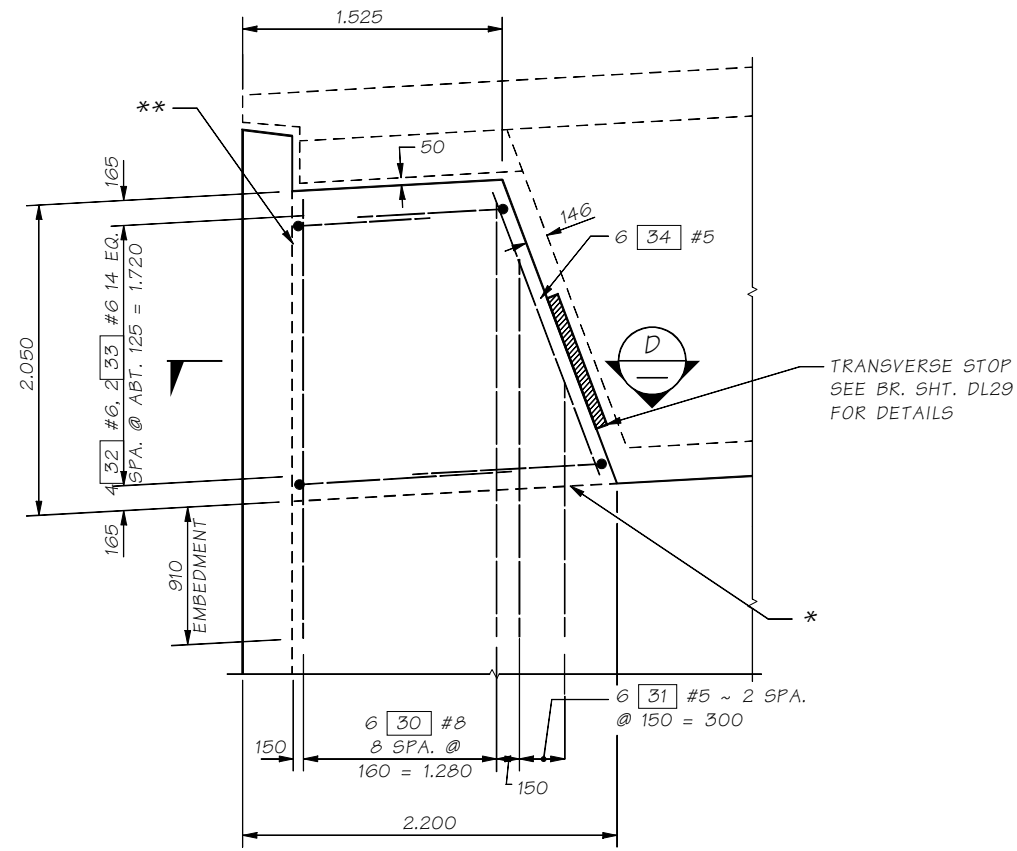
DELIN STREET U'XING 5/440 REPLACEMENT

PIER 1 ABUTMENT

BRIDGE SHEET NO. GW1
SHEET OF SHEETS

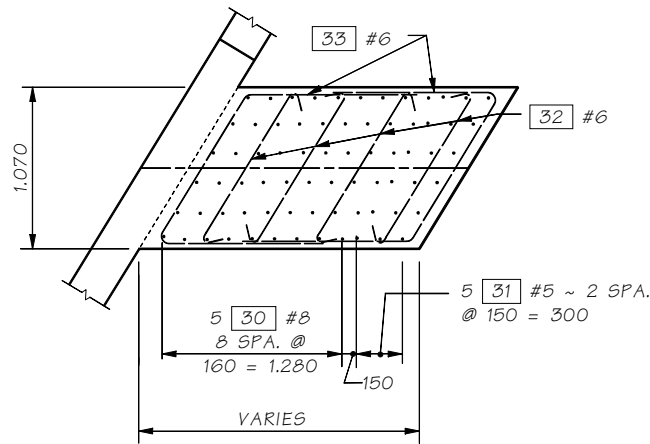


SECTION A
DL11



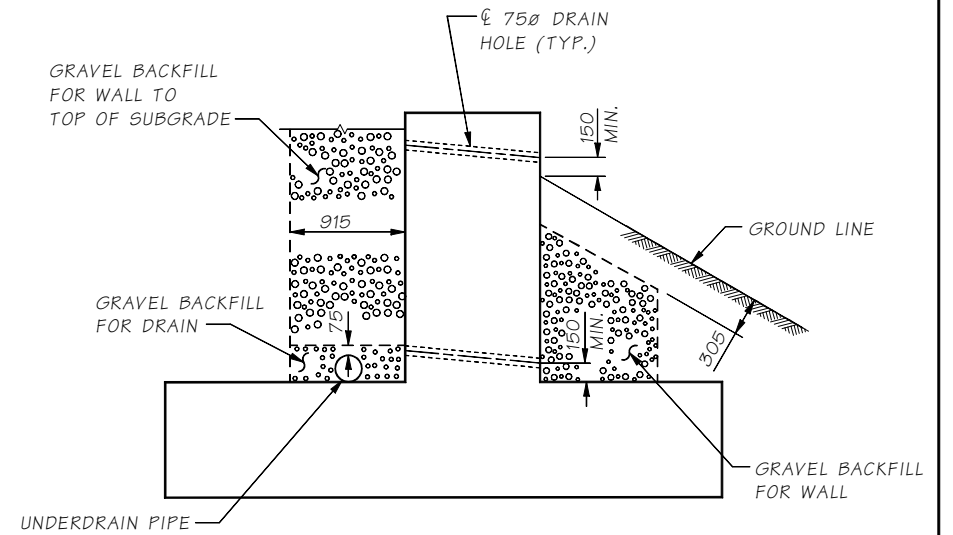
SECTION B
DL11

NOTE: FOR CURTAIN WALL REINFORCEMENT
SEE BR. SHT. DL14

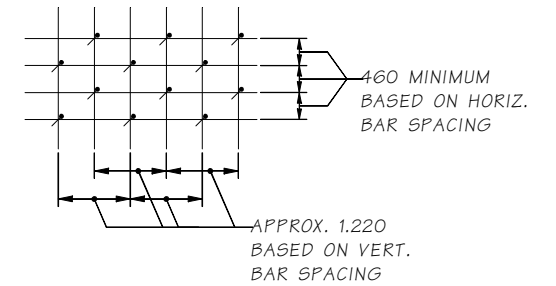


SECTION D

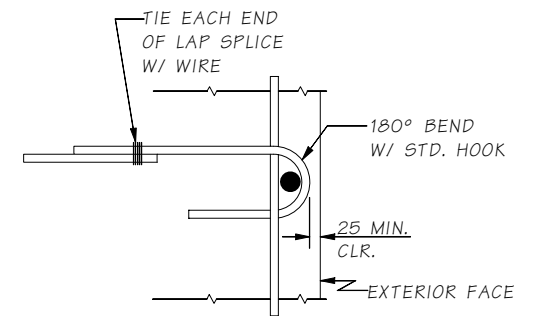
* CONSTRUCTION JOINT WITH ROUGHENED SURFACE



DRAINAGE DETAIL



TIE SPACING DETAIL



ALTERNATE TIE BAR DETAIL

SR I-5 JOB NO. 7177 SHEET DL12

Bridge Design Engr.	Kapur, J	M:\X-Team\delin\window files\PRID.WND		REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor	Anderson, MW			10	WASH.			
Designed By	Tran, LH	03/03						
Checked By	Nash, PM	03/03						
Detailed By	Nguyen, V	02/02						
Bridge Projects Engr.								
Prelim. Plan By								
Architect/Specialist		DATE	REVISION	BY	APPD			



BRIDGE AND STRUCTURES OFFICE



I-5
SOUTH 48TH STREET TO PACIFIC AVENUE

DELIN STREET U'XING 5/440 REPLACEMENT

PIER 1 ABUTMENT DETAILS 1

BRIDGE SHEET NO. GW2
SHEET OF SHEETS

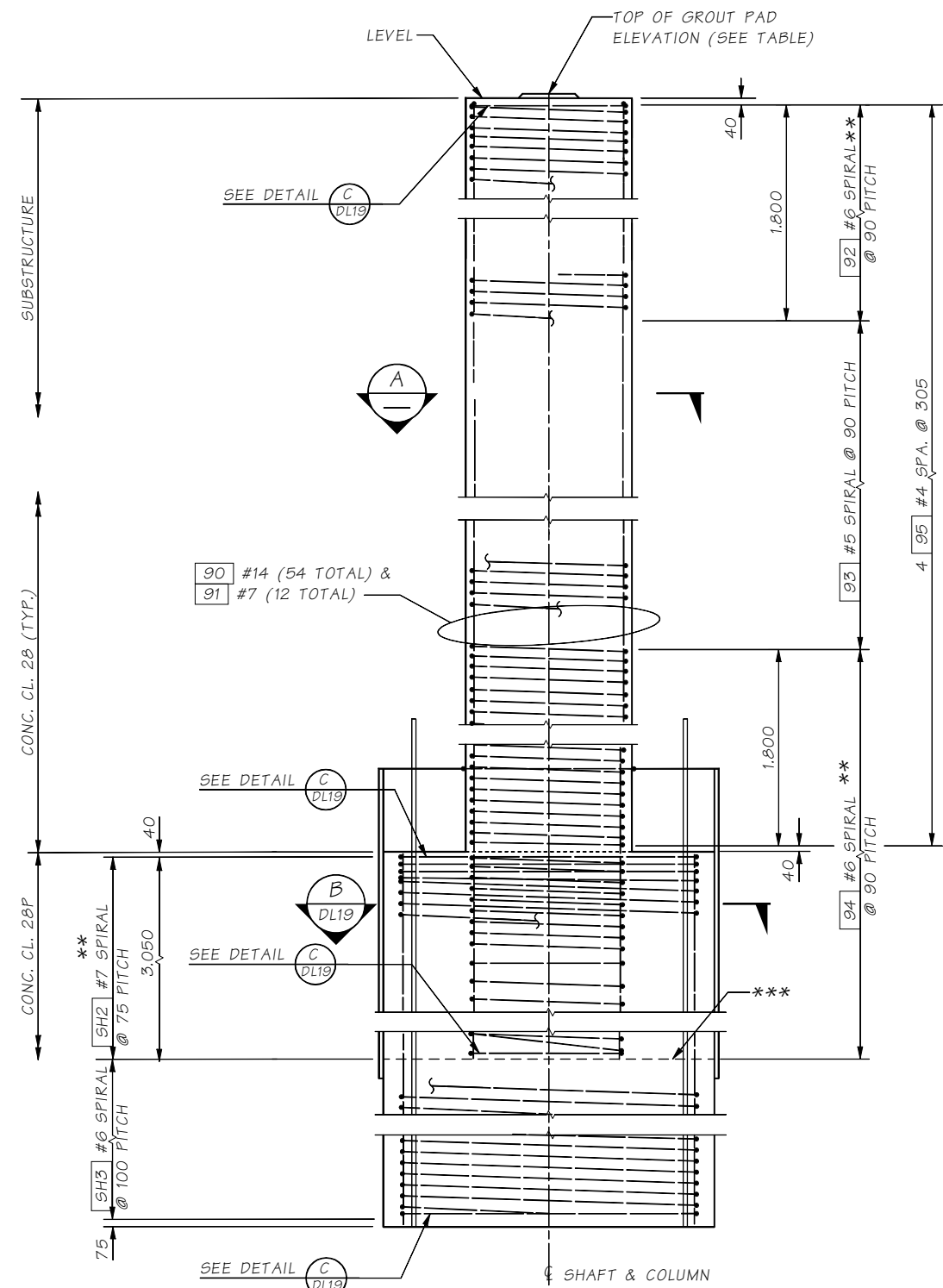
TOP OF GROUT PAD ELEVATION TABLE

COLUMN	A	B	C	D
ELEVATION	82.342	82.279	82.107	81.811

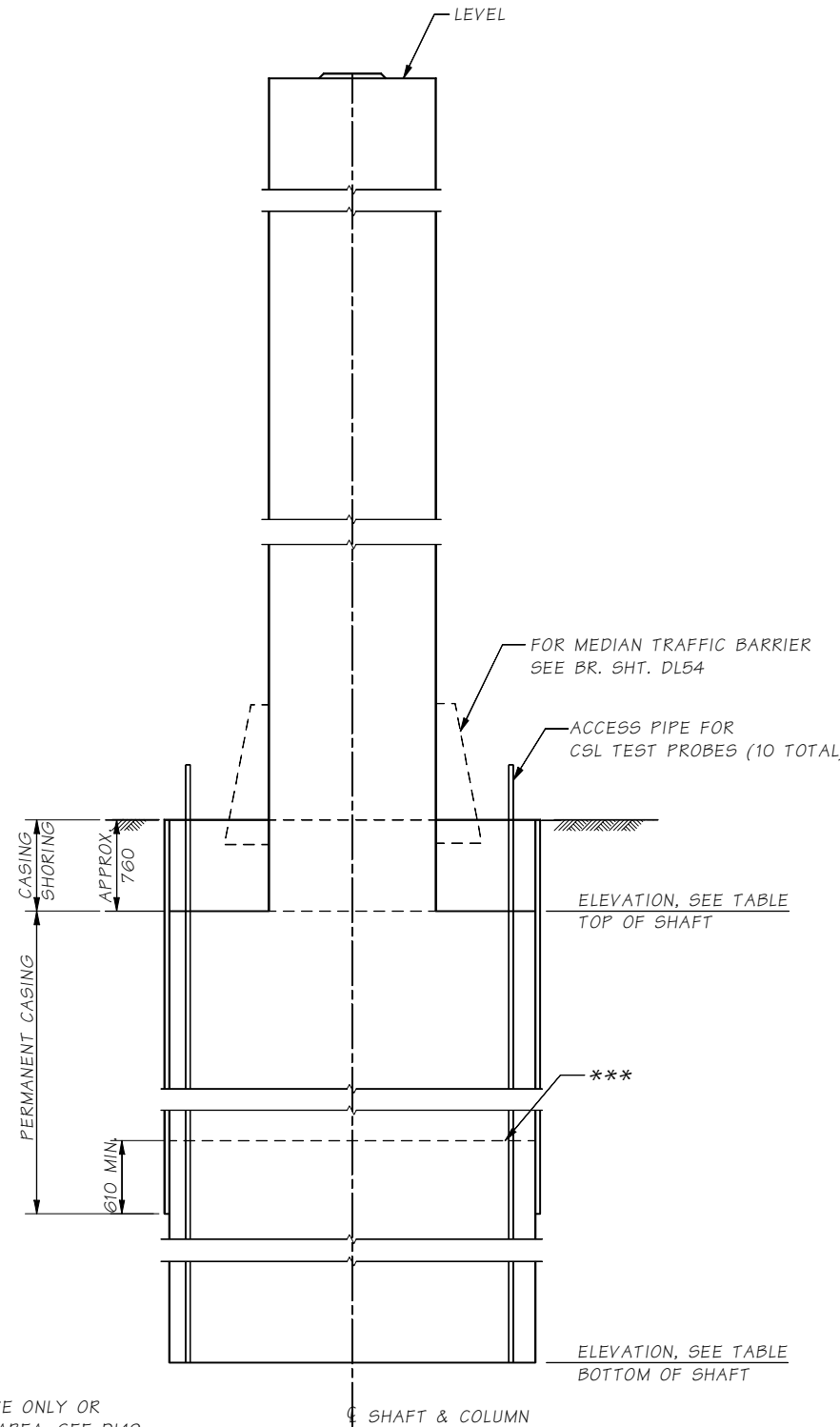
COLUMN LAYOUT IS THE SAME AS THE SHAFT LAYOUT. TOP OF GROUT PAD ELEVATIONS FOR ASSUMED DISC BEARINGS ONLY, ADJUST THE ELEVATIONS FOR DISC OR SPHERICAL BEARINGS DESIGNED BY THE MANUFACTURER.

SHAFT ELEVATION TABLE

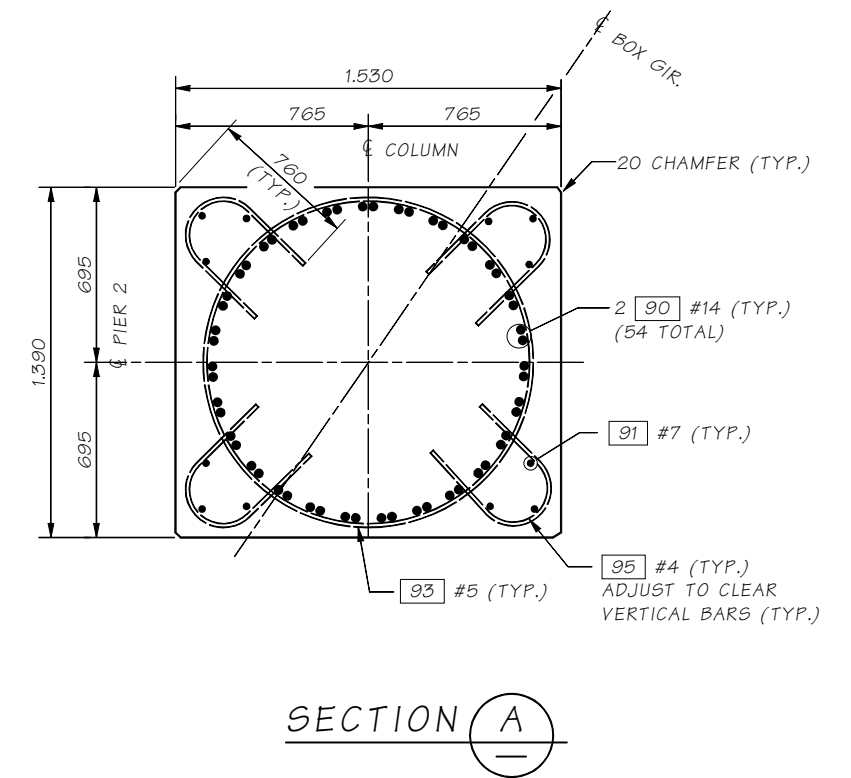
SHAFT	A	B	C	D
TOP	75.125	74.915	74.710	74.500
BOTTOM	56.825	56.615	56.410	56.200



ELEVATION



SIDE VIEW



SECTION A

** WELD SPLICE ONLY OR NO SPLICE AREA. SEE DL19 FOR WELDED SPLICE DETAIL

*** CONSTRUCTION JOINT W/ ROUGHENED SURFACE

SR I-5 JOB NO. 7177 SHEET DL18

Bridge Design Engr.	Kapur, J	M:\X-Team\delin\window files\P2C.WND	REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor	Anderson, MW		10	WASH.			
Designed By	Tran, LH	03/03	JOB NUMBER				
Checked By	Nash, PM	03/03	02C513				
Detailed By	Nguyen, V	02/02					
Bridge Projects Engr.							
Prelim. Plan By							
Architect/Specialist		DATE	REVISION	BY	APPD		



BRIDGE AND STRUCTURES OFFICE

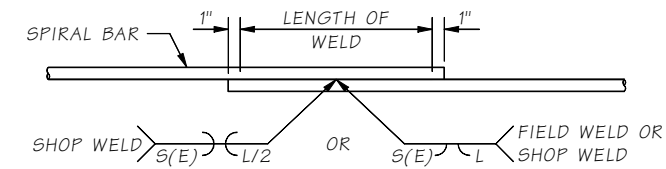


I-5
SOUTH 48TH STREET TO PACIFIC AVENUE
DELIN STREET U'XING 5/440 REPLACEMENT
PIER 2 COLUMN & SHAFT

BRIDGE SHEET NO. GWB SHEET OF SHEETS

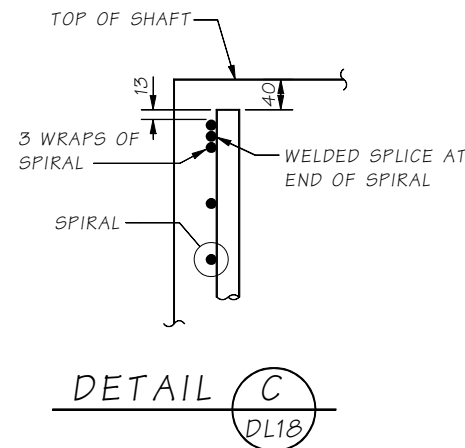
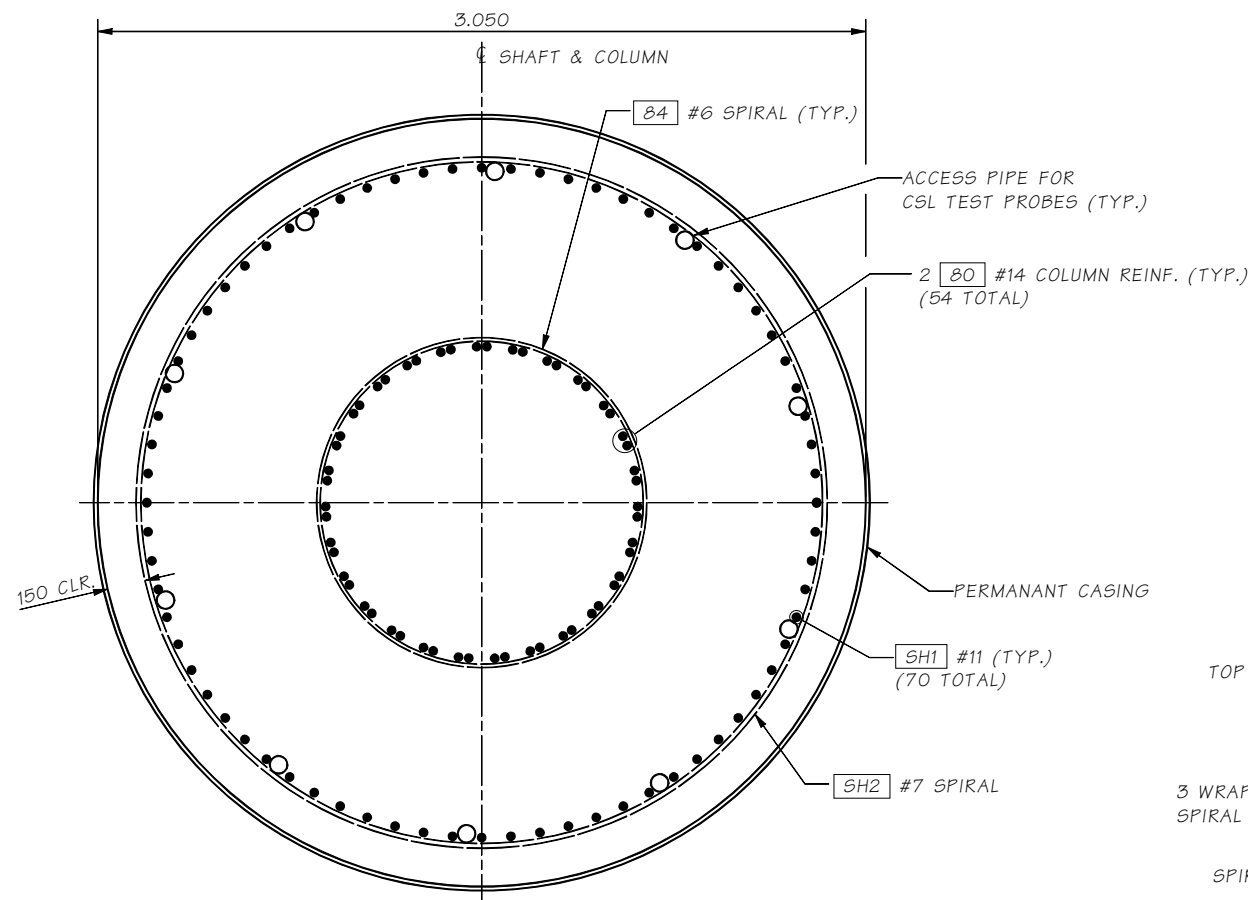
SPIRAL OPTIONS

DEFORMED BAR AASHTO M 31 GR. 60	PLAIN STEEL BAR AASHTO M 31 GR. 60	COLD DRAWN WIRE AASHTO M 32	DEFORMED WIRE AASHTO M225	WELD DIMENSIONS		
				S	E	LENGTH (L)
#5	17ø	W31	D31	10	8	150
#6	19ø	W44	D44	10	8	150
#7	21ø	W60	D60	10	8	150



WELDED LAP SPLICE DETAIL

WELDING SHALL MEET THE REQUIREMENTS OF STD. SPEC. 6-02.3(24)E FOR WELD DIMENSIONS, SEE TABLE BELOW. FOR SPIRAL TERMINUS OR BREAK IN SPIRAL WELD SPIRAL BACK ONTO ITSELF (TYP. SHAFT & COLUMNS)

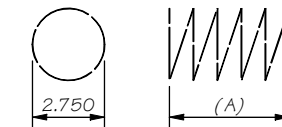


SHAFT BAR LIST

ALL REINFORCING SHALL BE AASHTO M31, GR. 60

MARK	SIZE	NO.	LENGTH	BEND TYPE	WT. (kgs.)
SH1	#11	280	18.225	STRAIGHT	40349
SH2	#7	4	(A)	SPIRAL	4339
SH3	#6	4	(A)	SPIRAL	11968

QUANTITIES PER PIER



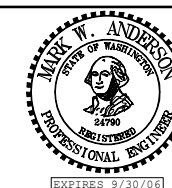
(A) DIMENSION FROM PLANS

SR I-5 JOB NO. 7177 SHEET DL19

Bridge Design Engr.	Kapur, J	M:\X-Team\delin\window files\P2S.WND		REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor	Anderson, MW			10	WASH.			
Designed By	Tran, LH	03/03		JOB NUMBER				
Checked By	Nash, PM	03/03		02C513				
Detailed By	Nguyen, V	02/02						
Bridge Projects Engr.								
Prelim. Plan By								
Architect/Specialist		DATE	REVISION	BY	APPD			



BRIDGE AND STRUCTURES OFFICE

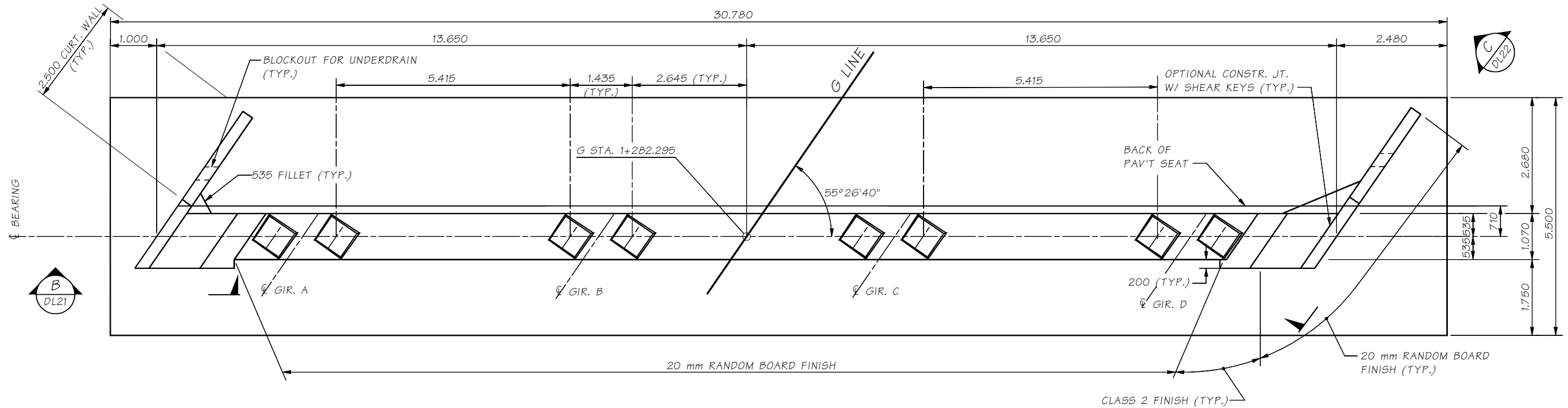


I-5
SOUTH 48TH STREET TO PACIFIC AVENUE

DELIN STREET U'XING 5/440 REPLACEMENT

PIER 2 - SHAFT DETAILS

BRIDGE SHEET NO. GW9
SHEET OF SHEETS

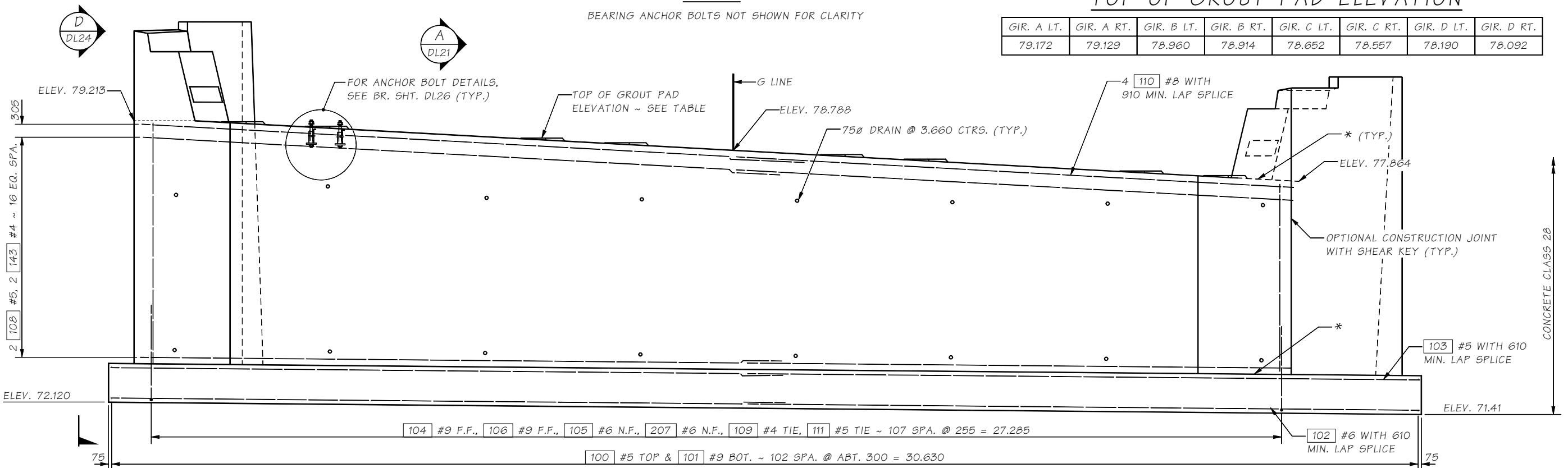


PLAN

BEARING ANCHOR BOLTS NOT SHOWN FOR CLARITY

TOP OF GROUT PAD ELEVATION

GIR. A LT.	GIR. A RT.	GIR. B LT.	GIR. B RT.	GIR. C LT.	GIR. C RT.	GIR. D LT.	GIR. D RT.
79.172	79.129	78.960	78.914	78.652	78.557	78.190	78.092



ELEVATION

CURTAIN WALLS ARE NOT SHOWN FOR CLARITY.

* CONSTRUCTION JOINT WITH ROUGHENED SURFACE

SR I-5 JOB NO. 7177 SHEET DL20

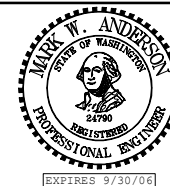
Bridge Design Engr.	Kapur, J
Supervisor	Anderson, MW
Designed By	Tran, LH 03/03
Checked By	Nash, PM 03/03
Detailed By	Nguyen, V 02/02
Bridge Projects Engr.	
Prelim. Plan By	
Architect/Specialist	

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REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10	WASH.			
JOB NUMBER				
02C513				
DATE	REVISION	BY	APPD	

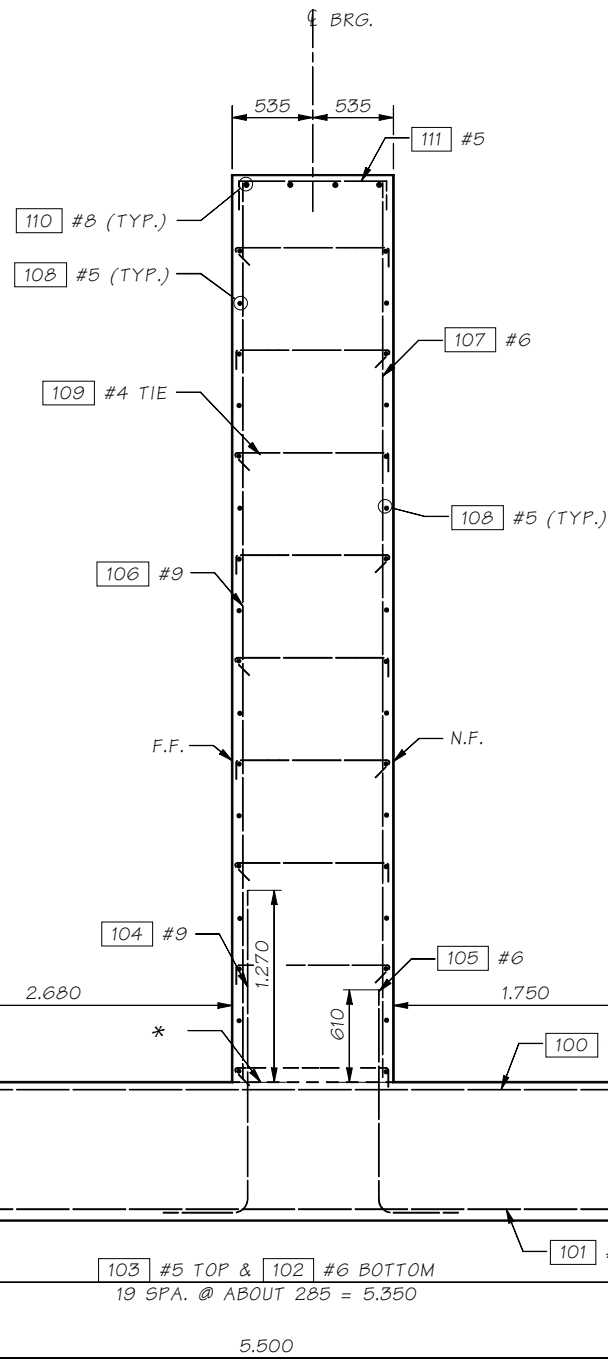


BRIDGE AND STRUCTURES OFFICE

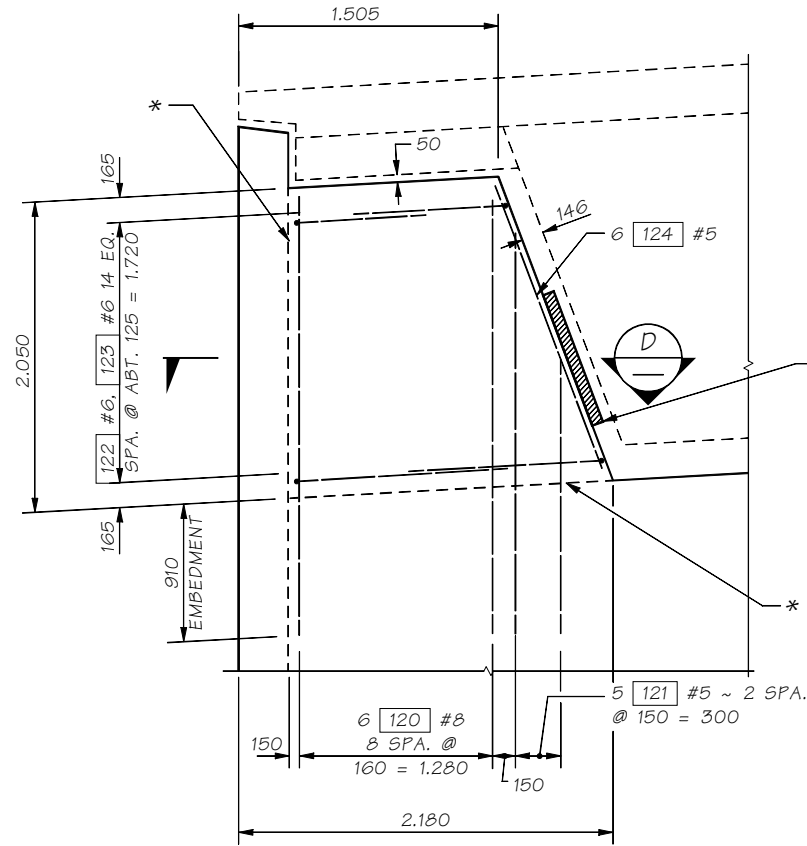


I-5
SOUTH 48TH STREET TO PACIFIC AVENUE
DELIN STREET U'XING 5/440 REPLACEMENT
PIER 3 ABUTMENT

BRIDGE SHEET NO. GW20
SHEET OF SHEETS

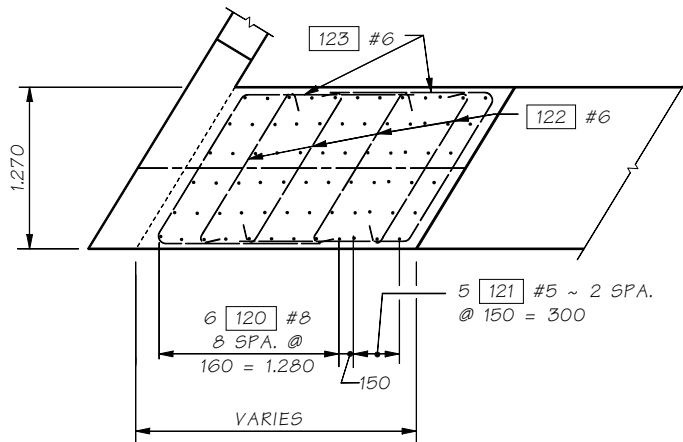


SECTION A
DL20



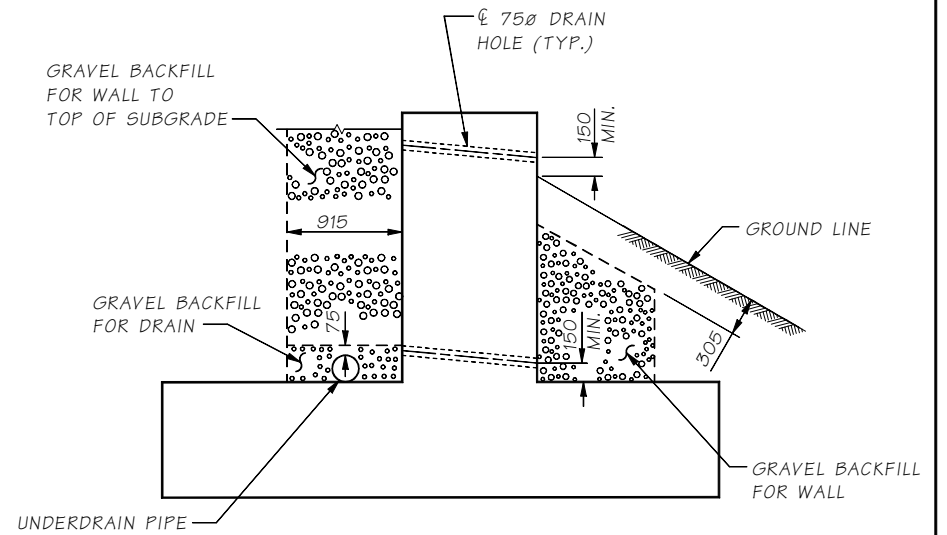
SECTION B
DL20

NOTE: FOR CURTAIN WALL REINFORCEMENT
SEE BR. SHT. DL22 & DL24

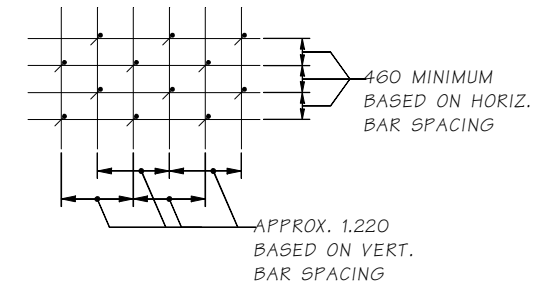


SECTION D

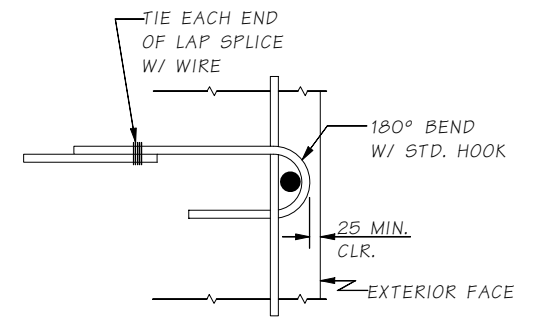
* CONSTRUCTION JOINT WITH ROUGHENED SURFACE



DRAINAGE DETAIL



TIE SPACING DETAIL

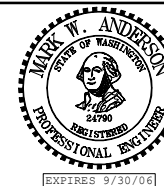


ALTERNATE TIE BAR DETAIL

Bridge Design Engr.	Kapur, J	M:\X-Team\delin\window files\PR3D.WND		REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor	Anderson, MW			10	WASH.			
Designed By	Tran, LH	03/03						
Checked By	Nash, PM	03/03						
Detailed By	Nguyen, V	02/02						
Bridge Projects Engr.								
Prelim. Plan By								
Architect/Specialist		DATE	REVISION	BY	APPD			



BRIDGE AND STRUCTURES OFFICE

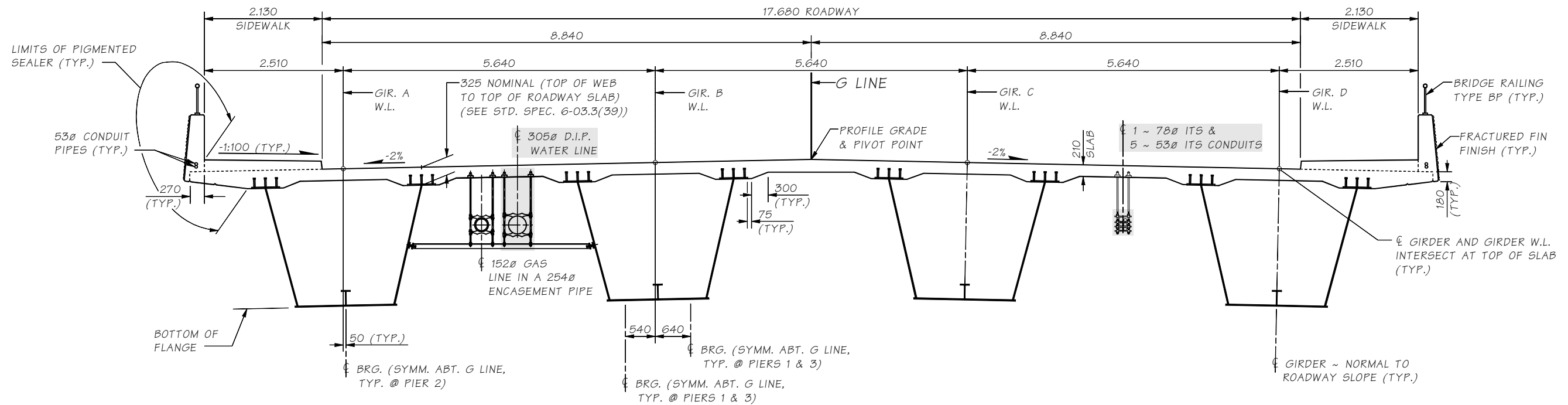


I-5
SOUTH 48TH STREET TO PACIFIC AVENUE

DELIN STREET U'XING 5/440 REPLACEMENT

PIER 3 ABUTMENT DETAILS

BRIDGE SHEET NO.	GW21
SHEET	
OF	
SHEETS	



TYPICAL ROADWAY SECTION

TYPICAL BOX GIRDER ϕ IS ROTATED 2:100 SLOPE ABOUT W.L. (WORK LINE) AT TOP OF DECK.
DIAPHRAGMS NOT SHOWN.
DIMENSIONS GIVEN ARE NORMAL TO G LINE.

STRUCTURAL STEEL NOTES

- ALL STRUCTURAL STEEL SHALL BE STRUCTURAL LOW ALLOY STEEL AASHTO M 270M, GRADE 345W, EXCEPT MEMBERS MARKED WITH \textcircled{H} SHALL BE ASTM A 709, GRADE HPS 485W, AND MEMBERS MARKED \textcircled{C} MAY BE FABRICATED FROM AASHTO M 270M, GRADE 250. FABRICATOR MAY SUBSTITUTE SECTIONS OF EQUAL OR GREATER STRENGTH AND STIFFNESS BASED ON AVAILABILITY, SUBJECT TO APPROVAL BY THE ENGINEER.
- ALL FIELD AND SHOP CONNECTIONS SHALL BE MADE WITH HIGH STRENGTH BOLTS, WITH THE BOLT HEADS TOWARD THE OUTSIDE OF THE BOX GIRDER. HIGH STRENGTH BOLTS SHALL BE AASHTO M 164M TYPE 3 AND SHALL BE M22. NUTS AND WASHERS SHALL CONFORM TO STANDARD SPECIFICATIONS SECTION 9-06.5(3). THE MINIMUM CENTER-TO-CENTER DIMENSION SHALL BE 75 mm UNLESS SHOWN OTHERWISE.
- ALL WELDING SHALL BE DONE TO MINIMIZE DISTORTION. THE WELDING SEQUENCES AND PROCEDURES TO BE USED SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO THE START OF WELDING.
WELDING SEQUENCE:
(1) FLANGE AND WEB SPLICES.
(2) FLANGES TO WEB.
(3) STIFFENERS TO WEBS AND FLANGES.
(4) SHEAR CONNECTORS TO TOP FLANGE.
- ONE BUTT SPlice WILL BE PERMITTED FOR FLANGE AND WEB PLATES EXCEEDING 18.000 m IN LENGTH. A PERMISSIBLE LOCATION WILL BE SHOWN IN THE PLANS. ALL PROPOSED BUTT SPLICES SHALL BE SHOWN ON THE SHOP DRAWINGS SUBMITTED FOR APPROVAL.
- INTERMEDIATE TRANSVERSE STIFFENERS, WEB SPLICES AND ALL INTERMEDIATE CROSSFRAMES SHALL BE NORMAL TO THE FLANGES. BEARING AND JACKING STIFFENERS SHALL BE VERTICAL UNDER TOTAL SUPERSTRUCTURE DEAD LOAD APPLICATION.
- ALL WELDED SHEAR STUDS SHALL BE 22 mm DIAMETER.
- MEMBERS MARKED \textcircled{C} ARE MAIN LOAD CARRYING TENSILE MEMBERS OR TENSION COMPONENTS OF FLEXURAL MEMBERS AND SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH TESTS AS DESCRIBED IN SECTION 6-03.2 OF THE STANDARD SPECIFICATIONS.
- \textcircled{X} DENOTES TENSION BUTT WELD FOR FLANGES OR WEBS.
- BOLT HOLES REMAINING IN GIRDER WEBS UPON REMOVAL OF DECK FORMWORK AND TEMPORARY BRACING SHALL BE TREATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 6-02.3(17)K. DECK FORMWORK SHOULD NOT BE SUPPORTED ON TOP LATERALS.
- REMOVE TEMPORARY CROSS FRAMES BETWEEN BOX GIRDERS AFTER THE ENTIRE BRIDGE DECK HAS BEEN PLACED AND REACHED A MINIMUM STRENGTH OF 28 MPa.
- THE CONTRACTOR SHALL PROVIDE, AS REQUIRED, TEMPORARY BRACING AND/OR WEB STIFFENING AT LOCATIONS WHERE SLAB FORMS ARE ATTACHED TO UNBRACED OR UNSTIFFENED WEBS.
- ALL STRUCTURAL STEEL SHALL BE PAINTED.

NOMINAL DEPTH OF SECTION (mm)		MASS OF ROLLED SHAPES (kg/m)	
W	250 x 167	W Shapes	
C	250 x 45	Channels	
WT	125 x 83.5	Structural Tees	
DIMENSIONS IN mm			
L	203 x 152 x 12.7	Angles	
TS	76 x 76 x 4.8	Structural Tubing	

LEGEND FOR METRIC ROLLED SHAPES

SR I-5 JOB NO. 7177 SHEET DL30

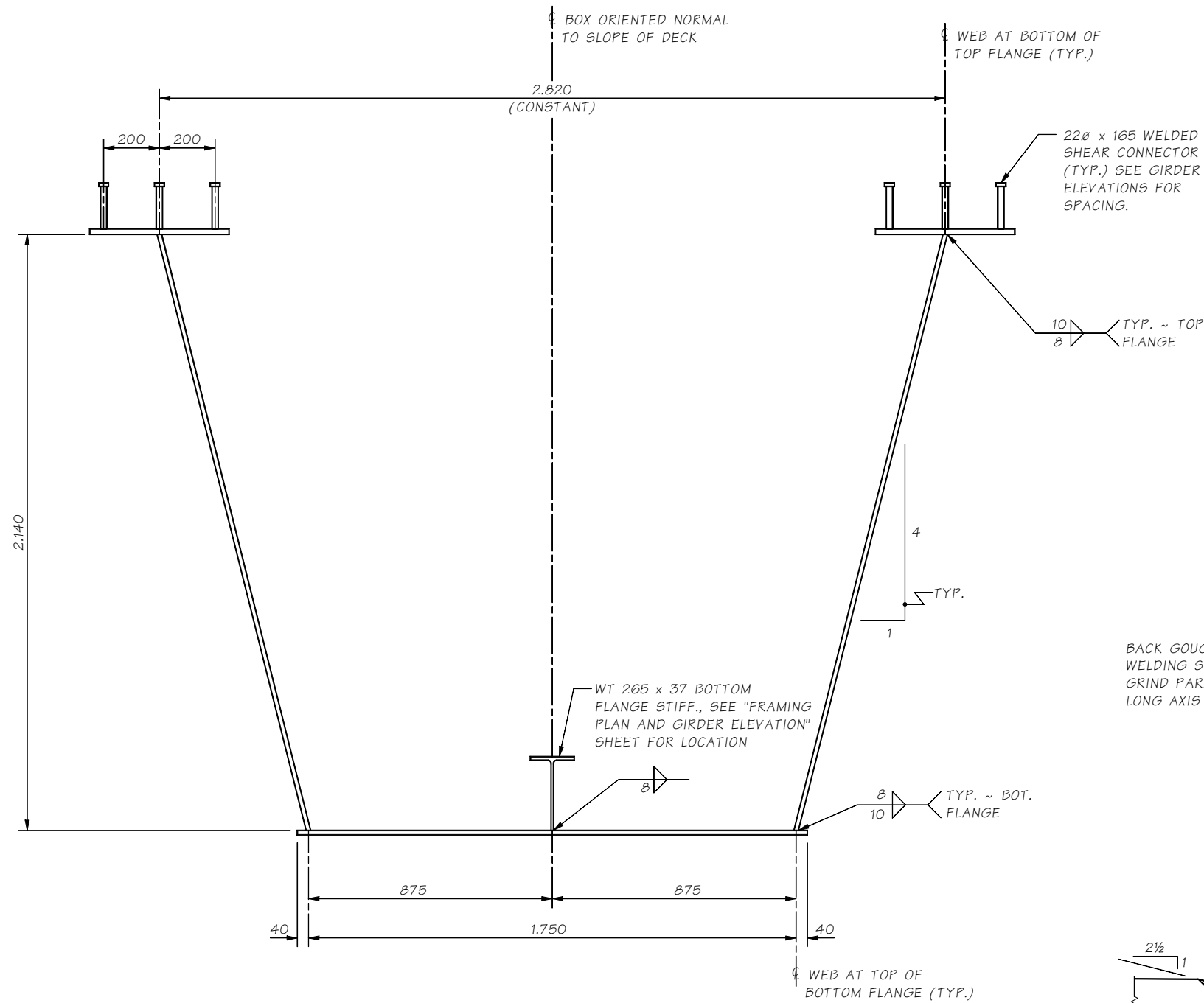
Bridge Design Engr.	Kapur, J	M:\X-Team\delin\window files\SEC.WND		REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor	Anderson, MW			10	WASH.			
Designed By	HsTeh, JC	02/02						
Checked By	Tran, LH	02/02						
Detailed By	Nguyen, V	02/02						
Bridge Projects Engr.		04/05	ADDED WATER LINE, REVISED					
Prelim. Plan By			CONDUITS					
Architect/Specialist	N. S. BROWN	01/97	DATE	REVISION	BY	APPD		



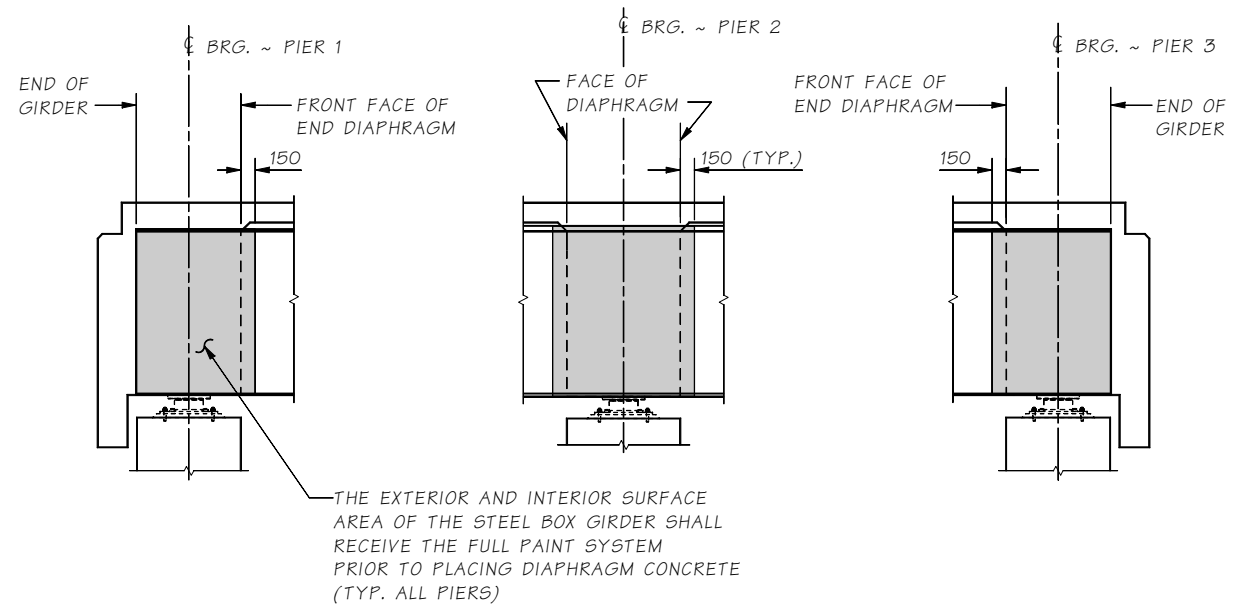
BRIDGE AND STRUCTURES OFFICE



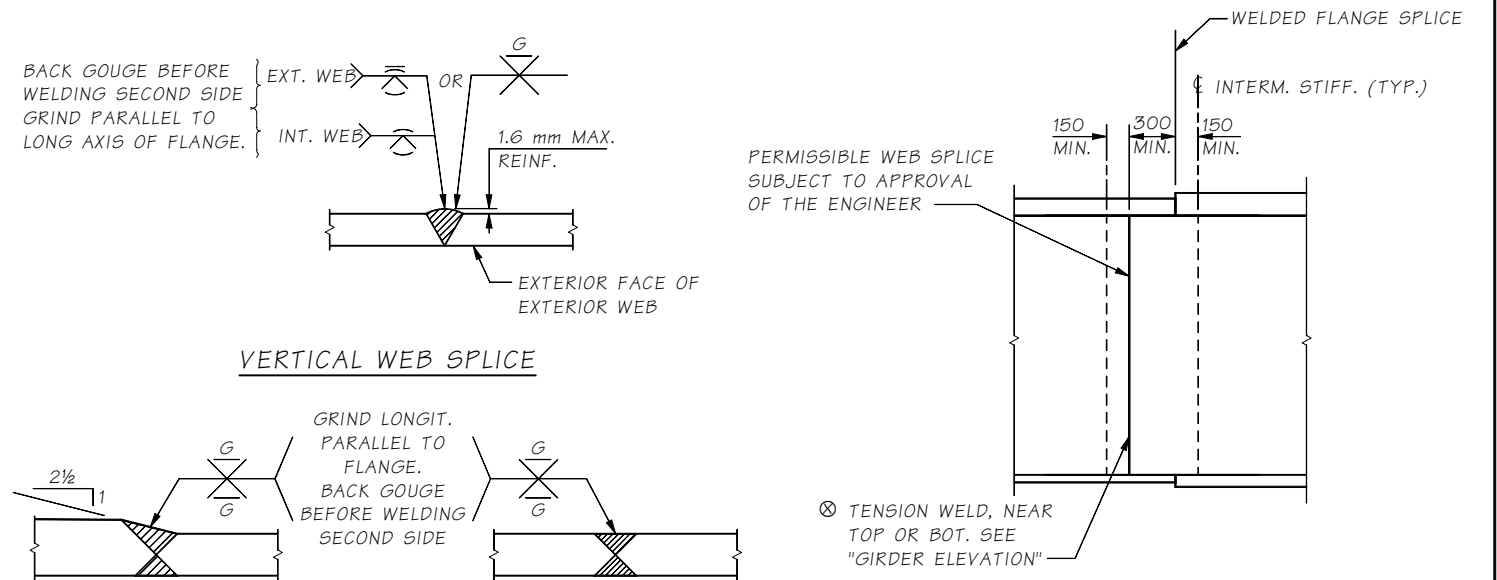
I-5	BRIDGE SHEET NO.
SOUTH 48TH STREET TO PACIFIC AVENUE	GW50
DELIN STREET U'XING 5/440 REPLACEMENT	SHEET
TYPICAL SECTION & STRUCTURAL STEEL NOTES	OF
	SHEETS



TYPICAL GIRDER SECTION



PRE-DIAPHRAGM PLACEMENT GIRDER PAINTING DETAIL



WELDED GIRDER SPLICE DETAILS

FABRICATOR MAY SUBSTITUTE B-L2C-S AND B-U2-GF FOR B-U3C-S AND B-U3-GF RESPECTIVELY, SUBJECT TO THICKNESS LIMITATIONS.

Bridge Design Engr.	Kapur, J	M:\X-Team\delin\window files\BOX.WND		REGION NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
Supervisor	Anderson, MW			10	WASH.			
Designed By	Hsieh, JC	02/02						
Checked By	Tran, LH	02/02						
Detailed By	Nguyen, V	02/02						
Bridge Projects Engr.								
Prelim. Plan By								
Architect/Specialist	Brown, NS	02/02	DATE	REVISION	BY	APPD		



BRIDGE AND STRUCTURES OFFICE



I-5
SOUTH 48TH STREET TO PACIFIC AVENUE

DELIN STREET U'XING 5/440 REPLACEMENT

TYPICAL GIRDER SECTION

BRIDGE SHEET NO. GW54
SHEET OF SHEETS