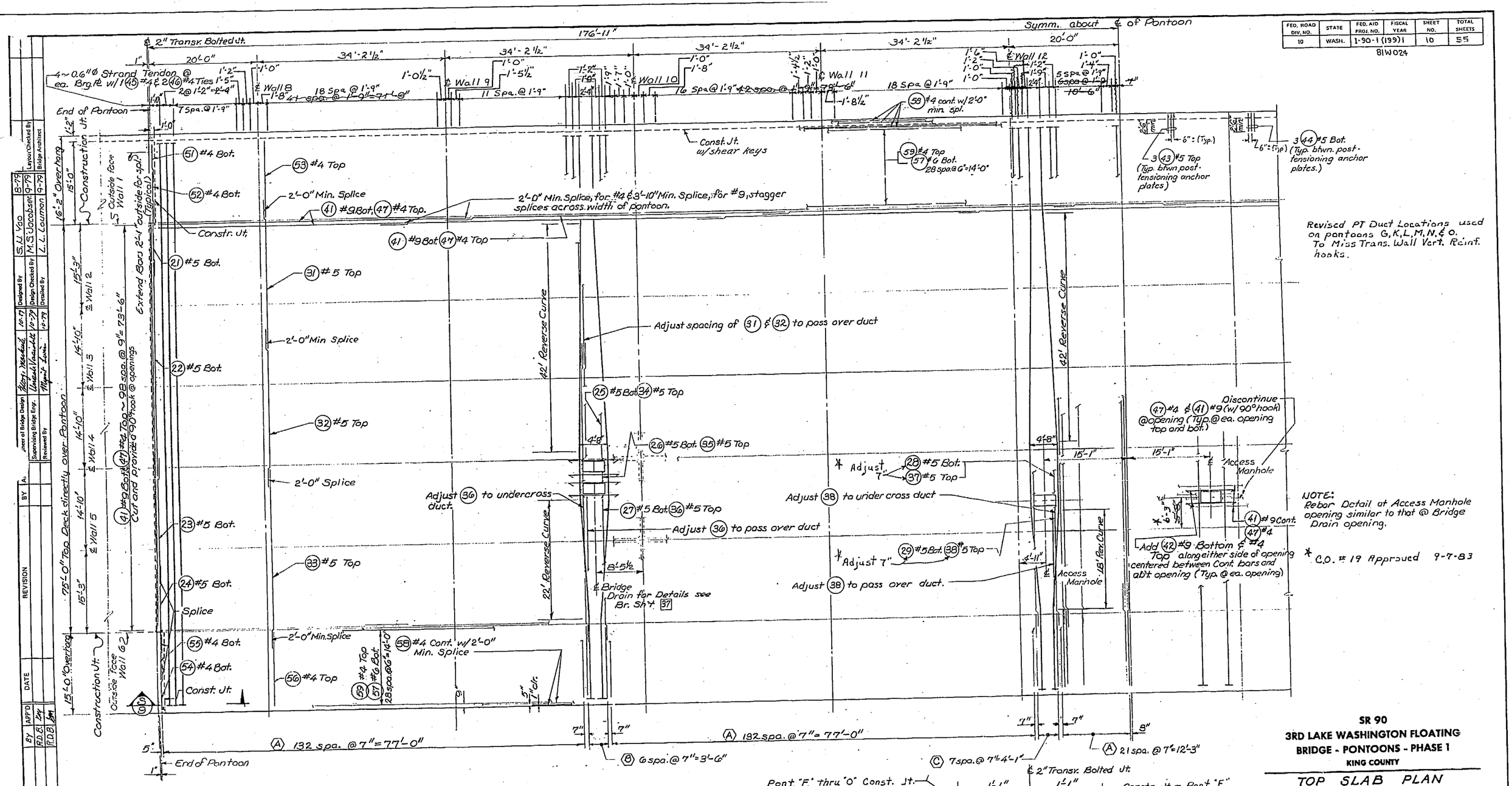
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
10	WASH.	1-90-1 (199)1		10	55

81W024



Revised PT Duct Locations used on pontoons G, K, L, M, N & O. To Miss Trans. Wall Vert. Reinf. hooks.

NOTE: Rebar Detail at Access Manhole opening similar to that @ Bridge Drain opening.

* C.O. # 19 Approved 9-7-83

TRANSVERSE REINFORCEMENT

Location Symbol	Reinforcement in this Area
A	31 ~ 33, 59 & 56 Top 21 ~ 24, 51, 52, 54 & 55 Bot.
B	31, 34 ~ 36, 53 & 56 Top 21, 24 ~ 27, 51, 52, 54 & 55 Bot.
C	31, 32, 37, 38, 53 & 56 Top 21, 22, 28, 29, 51, 52, 54 & 55 Bot.

TOP SLAB REINF. ~ PONTOONS F, G, H, I, K, L, M, N & O

For Cross Section see Br. Sht 10
For additional reinforcement in top slab see Br. Sht 38
Pontoons F-I & K-M shown. Pontoons N+O similar.
For Traffic Detection System in top slab see Br. Sht. 41

Note: Const. Jt. Shall be 1'-1" from East & West end on Pont "F." Pont "G" thru "O" Shall have Const Jt. 1'-1" from East End only.

9 SECTION

Revised C.O. 42 Appd 5-31-84

As Built Changes in Red 8-8-86

SR 90
3RD LAKE WASHINGTON FLOATING BRIDGE - PONTOONS - PHASE 1
KING COUNTY

TOP SLAB PLAN PONTOONS F-I & K-O

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
OLYMPIA, WASHINGTON

C. S. Hibyd
BRIDGE ENGINEER

APPROVED April 24, 1981

CONTRACT NUMBER 2271 SHEET 10 OF 55 SHEETS

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DATE	REVISION
3-5-82	Editorial change
5-6-82	Duct size

SR 90 JOB NO. 1546 SHEET 1

BY	DATE	REVISION
A1		

By	APP'D	
R.D.B.		
R.D.B.		

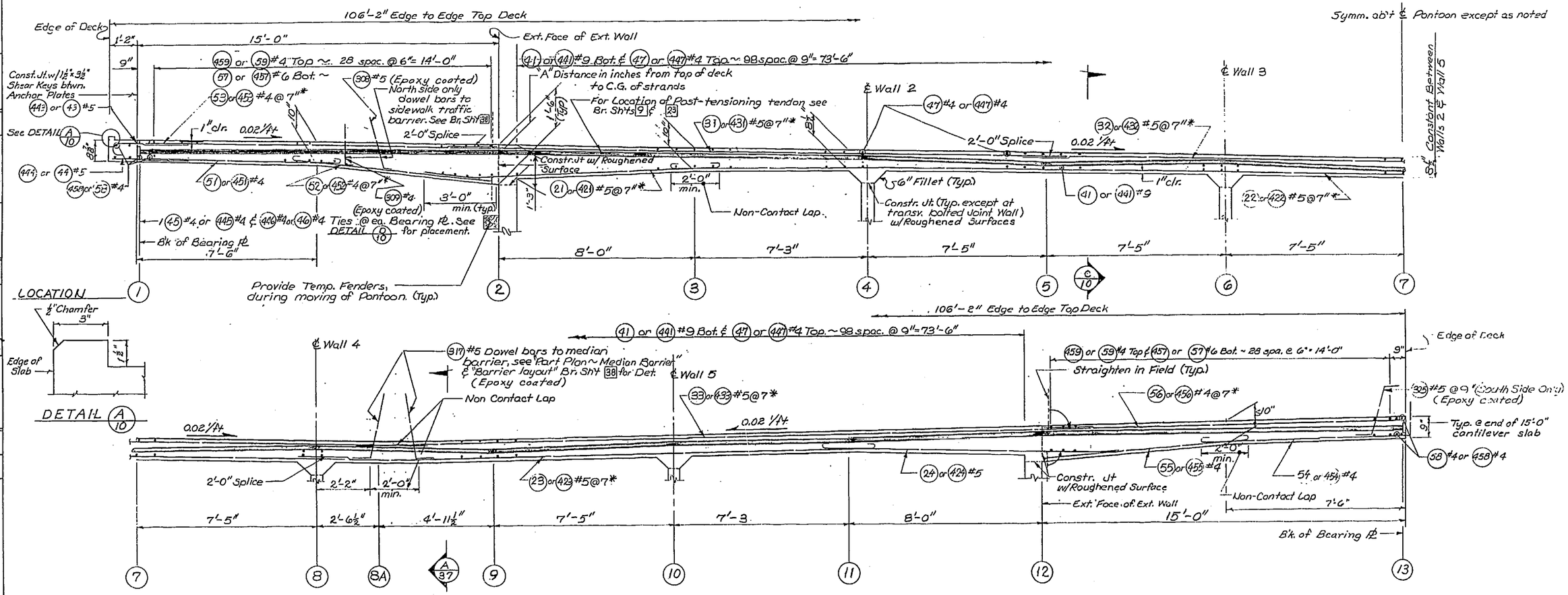
Designer of Bridge Design: Alan J. Marshall 10-79
Supervising Bridge Engr.: Under Vincent 10-79
Reviewed By: Miguel Lopez 10-79

Designed By: S.U. Vao 8-79
Design Checked By: M.S. Jacobsen 9-79
Drafted By: L. L. Lauman 9-79

Layout Checked By:
Bridge Architect:

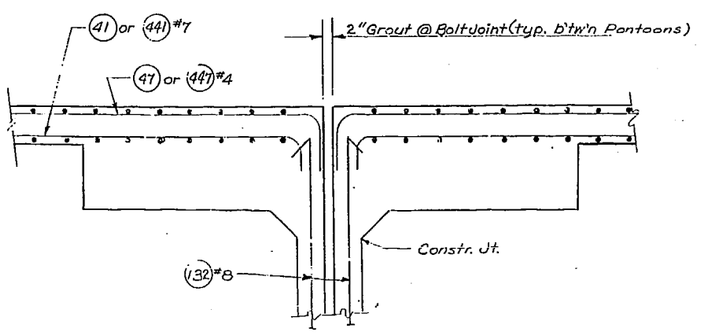
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
10	WASH.	I-90-1 (193) 1 IR-90-1 (193) 1	11 8	55 13	

81W024



TYPICAL TRANSVERSE ROADWAY SLAB SECTION

1. * Indicates typical except as noted on Bridge Sheet 9 & 23.
2. For "A" distance see "Tendon C.G. Profile Layout Table." Tendon Duct Support Ht. Shall be submitted for approval.
3. Post-tensioning Duct shall be firmly supported @ 2'-4" max. spacing, use a continuous smooth parabolic curve thru all control points.
4. Transverse post-tensioning shall not take place until concrete obtains a strength of 3600 psi.
5. The forms for the cantilevered portion of the slab shall not be removed until completion of post-tensioning.
6. P.T. Ducts shall be 19 gage.

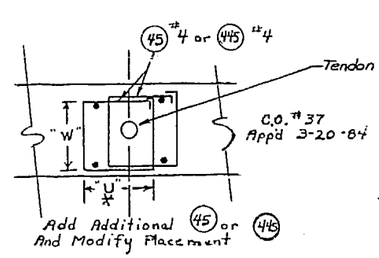


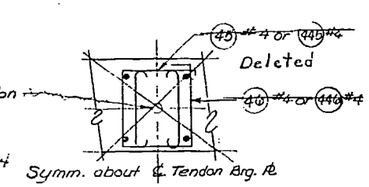
C/10 SECTION
Showing Slab Rebars @ Bolted Joints
For details not shown see Br. Sht 22

TENDON C.G. PROFILE LAYOUT TABLE

LOCATION	1	2	3	4	5	6	7	8	8A	9	10	11	12	13
"A"	4½"	2¾"	3½"	2¾"	4½"	2⅞"	4½"	2⅞"	3¼"	4½"	2¾"	3½"	2¾"	4½"

* Note: Mark 45 in Pontoons K, L, M, N, & O Will have an increased "U" Dimension from 8.5" to 9.5".





D/10 DETAIL
At tendon anchorage

As Built Changes in Red 8-8-86

SR 90
3RD LAKE WASHINGTON FLOATING BRIDGE - PONTOONS - PHASE 1
KING COUNTY

TOP SLAB SECTIONS
PONTOONS F-O

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
OLYMPIA, WASHINGTON

BRIDGE ENGINEER
APPROVED April 24, 1981

CONTRACT NUMBER 2271 SHEET 11 OF 55 SHEETS

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BY	REVISION	DATE	APP'D

Layout Checked By	Bridge Architect	AY	
Designed By	Design Checked By	Detailed By	
10-79	10-79	10-79	
Engineer of Bridge Design	Supervising Bridge Engr.	Reviewed By	
Harry Manfield	Donald Lundell	Miguel Lim	

DATE	REVIS.
3-5-82	Editorial Change

SR 90 JOB NO. 15/4 SHEET.

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
10	WASH.	I-90-1(139)1		12	55

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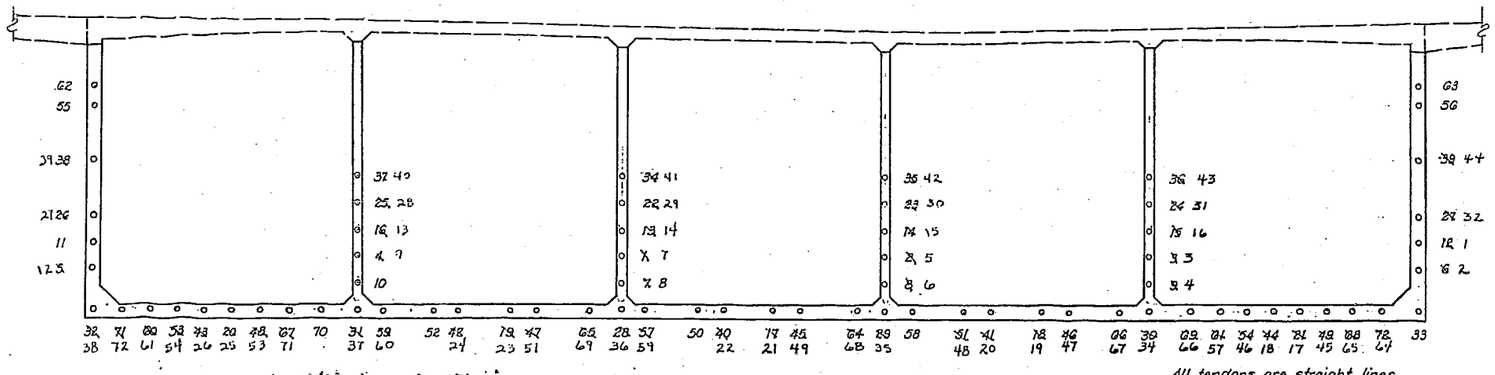


All tendons are straight lines except bottom slab tendons in Pontoon J.

STRESSING SEQUENCE OF LONGITUDINAL TENDONS

Longitudinal Tendons shall be stressed before construction of top slab.
Optional stressing sequence following the two rules stated below may be submitted for Engineer's approval.
1. Stress no more than ⅙ of the tendons in one wall before an equal number are stressed in adjacent walls.
2. At no time during the stressing operations will more than ⅙ of the total prestressing force be eccentric about the centerline of the pontoon.

POST-TENSIONING

THE MINIMUM CONCRETE COMPRESSIVE STRENGTH AT THE TIME OF POST-TENSIONING SHALL BE AT LEAST 3,000 POUNDS PER SQUARE INCH FOR THE LONGITUDINAL TENDONS AND 3,600 POUNDS PER SQUARE INCH FOR THE TRANSVERSE TENDONS.

THE DESIGN IS BASED ON THE FOLLOWING FRICTION COEFFICIENT -U- FRICTION WOBBLE COEFFICIENT K AND ANCHOR SET:

TYPE OF STEEL	TYPE OF DUCT	U	K	ANCHOR SET
PRESTRESSING STEEL STRANDS	GALVANIZED RIGID FERROUS METAL	0.25	0.0002	3/8 IN.
PRESTRESSING STEEL BARS	GALVANIZED METAL SHEATHING	0.15	0.0002	1/16 IN.

THE STRESSING SEQUENCE SHALL BE SUCH AS TO MINIMIZE THE OCCURRENCE OF UNDESIRABLE CONSTRUCTION STRESSES IN THE STRUCTURE.

THE TRAFFIC BARRIER SHALL NOT BE POURED UNTIL AFTER ALL POST-TENSIONING HAS BEEN COMPLETED.

ROADWAY SLAB

FOR THE TRANSVERSE POST-TENSIONING IN THE ROADWAY SLAB, EACH TENDON NEEDS TO BE JACKED FROM ONE END ONLY AND SHALL START FROM CENTER OF EACH PONTOON ALTERNATELY TOWARDS THE ENDS. HOWEVER, ADJACENT TENDONS SHALL BE JACKED FROM OPPOSITE ENDS.

	4-0.6" STRAND TENDON
JACKING FORCE	176 KIPS
FORCE AT TRANSFER AFTER ANCHOR SET	151 KIPS

THE MINIMUM STRAND ELONGATION DUE TO THE JACKING FORCE AND BASED ON ES= 28,000 KSI SHALL BE 8-1/2 INCHES.

LONGITUDINAL POST-TENSIONING

THE PRESTRESSING TENDONS SHALL BE STRESSED BY JACKING AT EACH END OF EACH TENDON. THE JACKING DOES NOT NEED TO BE DONE SIMULTANEOUSLY.

THE PRESTRESSING REINFORCEMENT SHALL BE 1/2" DIAMETER ASTM A416 GRADE 270. USE A 7-STRAND TENDON WITH THE 2-1/4" DIAMETER CONDUIT AND A 4-STRAND TENDON WITH THE 1-3/4" DIAMETER CONDUIT.

	7-STRAND TENDON	4-STRAND TENDON
JACKING FORCE	210 KIPS	120 KIPS
FORCE AT TRANSFER AFTER ANCHOR SET	166 KIPS	95 KIPS

	MINIMUM STRAND ELONGATION*	
JACKING FORCE	FIRST JACKING END	LAST JACKING END
7-STRAND TENDON	2'-4"	1-1/4"
4-STRAND TENDON	2'-4"	1-1/4"

*BASED ON ES= 28,000 KSI

THE STRESSING SEQUENCE IS SHOWN ON THE ABOVE SKETCH.

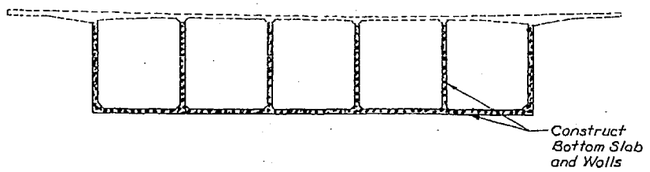
OPTIONAL PRECAST CANTILEVER

FOR THE TRANSVERSE POST-TENSIONING IN THE ROADWAY SLAB, EACH TENDON NEEDS TO BE JACKED FROM ONE END ONLY AND SHALL START FROM CENTER OF EACH PONTOON ALTERNATELY TOWARDS THE ENDS. HOWEVER, ADJACENT TENDONS SHALL BE JACKED FROM OPPOSITE ENDS.

THE PRESTRESSING STEEL BARS, BETWEEN EXTERIOR WALLS, SHALL BE JACKED BEFORE THE CONSTRUCTION OF CANTILEVER SLAB AND THE REST OF PRESTRESSING STEEL SHALL BE JACKED AFTER THE CLOSURE POUR OF THE CANTILEVER SLAB.

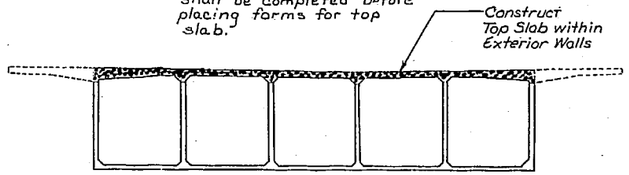
	4-0.6 STRAND TENDON	1-1/4" DIAMETER P.S. BAR
JACKING FORCE	176 KIPS	131 KIPS
FORCE AT TRANSFER AFTER ANCHOR SET	151 KIPS	112 KIPS

THE MINIMUM STRAND ELONGATION OF THE STRAND TENDONS DUE TO THE JACKING FORCE AND BASED ON ES=28,000 KSI SHALL BE 8-1/2 INCHES.

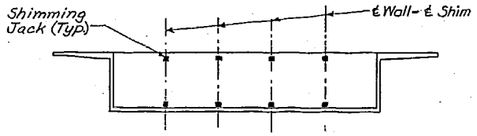


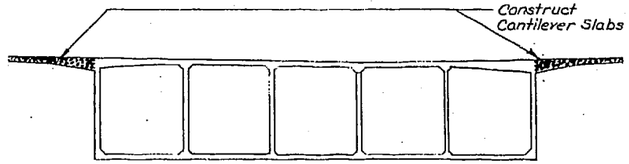
STAGE 1

Longit. post-tensioning shall be completed before placing forms for top slab.



STAGE 2





STAGE 3

Shall be done in Lake Washington only.

CONSTRUCTION SEQUENCE

PONTOON BOLTED JOINTS

METHOD OF SHIMMING BOLTED JOINT

MINIMUM TEMPORARY TOTAL TENSIONING FORCE = 3680 KIPS.
FLAT JACKS CAPABLE OF PROVIDING A TOTAL FORCE OF 7360 KIPS SHALL BE USED AS SHIMS AT LOCATIONS SHOWN ON ABOVE SKETCH.
THE CONTRACTOR SHALL SUBMIT, FOR APPROVAL, DETAILS OF JACKS AND TENSIONING PROCEDURE.
TEMPORARY TENSIONING FORCE SHALL BE INCREASED, IF NECESSARY, TO RIGIDLY CLAMP THE JOINT FOR GROUTING.
AFTER TEMPORARY TENSIONING THE JACKS SHALL BE DEPRESSURIZED AND PRESSURE GROUTED.

BOLTED JOINT TENSIONING SEQUENCE

THE TENSIONING SEQUENCE SHALL BE SUCH AS TO MINIMIZE THE OCCURRENCE OF UNDESIRABLE CONSTRUCTION STRESSES IN THE STRUCTURE. AT NO TIME DURING THE TENSIONING OPERATIONS WILL MORE THAN 1/6 OF THE TOTAL TENSIONING FORCES BE APPLIED ECCENTRICALLY ABOUT THE CENTERLINE OF THE STRUCTURE. THE CONTRACTOR'S PROPOSED TENSIONING SEQUENCE SHALL BE SHOWN ON THE SHOP DRAWINGS.

STRESS A449 BOLTS TO PROOF LOAD OF 179 K/BOLT.

SR 90
3RD LAKE WASHINGTON FLOATING BRIDGE - PONTOONS - PHASE 1
KING COUNTY

CONSTRUCTION SEQUENCE
PONTOONS F-O

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
OLYMPIA, WASHINGTON

C. S. Lloyd
BRIDGE ENGINEER

APPROVED April 24, 1981

As Built Changes in Red 8-8-86

CONTRACT NUMBER 2271 SHEET 12 OF 55 SHEETS

11

141/1k.

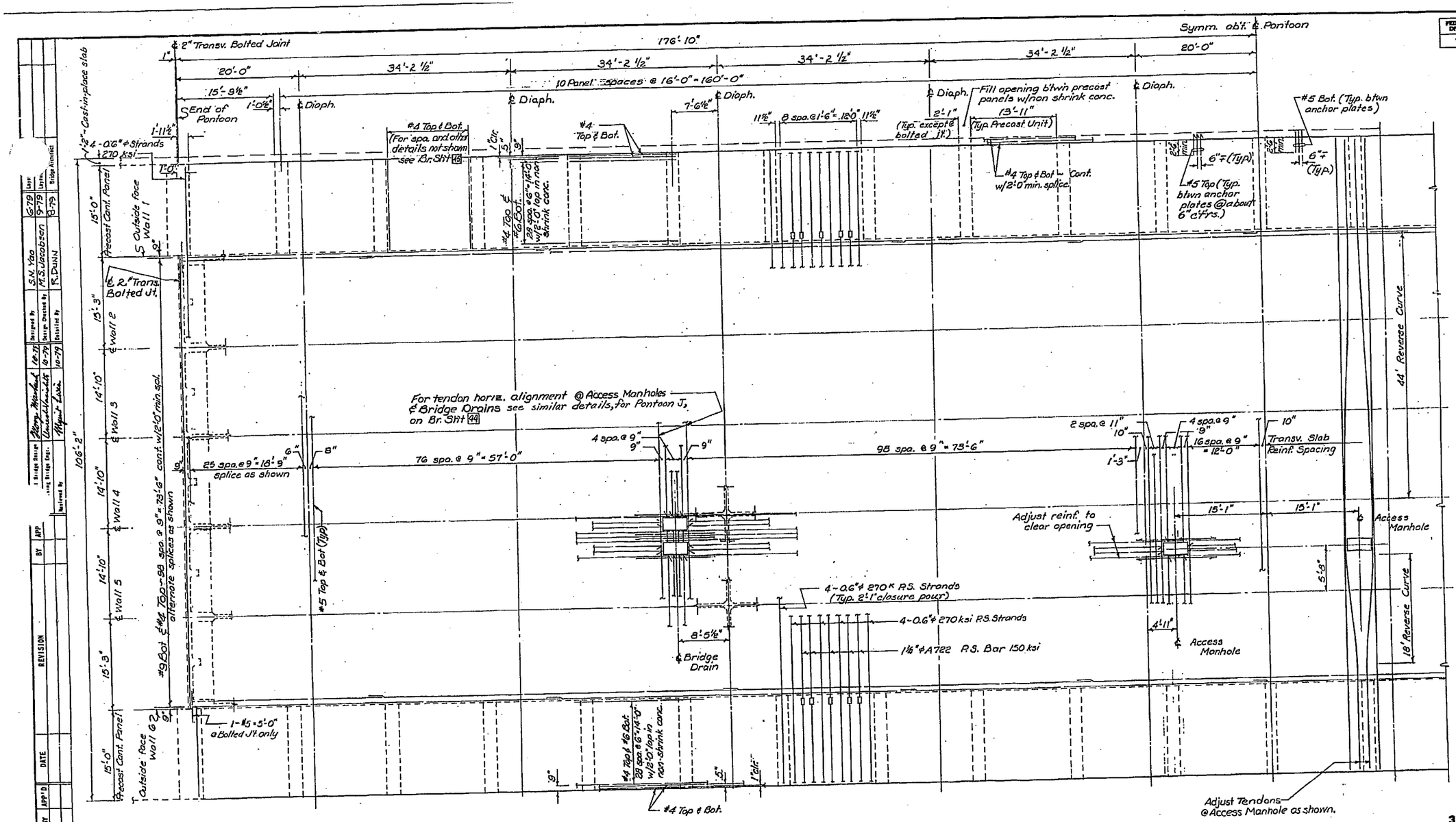
Engineer of Bridge Design: Alexander Hamilton
Supervising Bridge Engr.: Alexander Hamilton
Reviewed By: Myint Lwin
Designed By: F. Holt 9-79
Design Checked By: M.S. Jacobsen 9-79
Detailed By: L.L. Lowman 9-79
Layout Checked By
Bridge Architect

REVISION | DATE | APP'D | BY

SR 90 JOB NO. 1514 SHEET

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
10	WASH.	I-90-1(199)	1	44	55

81W024



TOP SLAB REINF. ~ TYPICAL PONTOON

Total 44 Precast Units per pontoon, for details see Br. Sheet 45. Details of reinforcement and post-tensioning tendon directly over pontoon box girder similar to the cast-in-place design as shown on Br. Sheets 9 & 10 except spacing of transv. slab bars and arrangement of post-tensioning tendons. Spacing is as shown on the above PLAN. See Br. Sheet 10 for Strand Tendon profile. Bar Tendons are straight except for 6' curve @ Median Barrier. Also see Br. Sheet 38. P.T. Ducts shall be 19 gage.

SR 90
3RD LAKE WASHINGTON FLOATING BRIDGE - PONTOONS - PHASE 1
KING COUNTY

OPTIONAL PRECAST CANTILEVER TOP SLAB PONTOONS FGHIKLMNO

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
OLYMPIA, WASHINGTON

BRIDGE ENGINEER

APPROVED April 24, 1981

CONTRACT NUMBER 2271 SHEET 44 OF 55 SHEETS

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14C/130

SR 90 JOB NO. 1514 SHEET 4

DATE	REVISION	BY	APP'D	DATE	REVISION	BY	APP

Designed By S.N. Yao 6-79
Design Checked By M.S. Jacobsen 9-79
Detailed By R. DUNN 8-79
Bridge Architect