

DESIGN DATA
 1972 A.R.E.A. DESIGN SPEC
 DESIGN LOADING, COOP
 $f_c = 1800$ P.S.I. $n = 8$
 $f_s = 24,000$ P.S.I. REINF. AS
 $f_s = 27,500$ P.S.I. STRUCT.
 $f_s = 20,000$ P.S.I. STRUCT.

DECK AREA: 2834

LIST OF SHEET

NO.	DESCRIPTION
B-1	GENERAL PLAN & ELEV.
B-2	RETAINING WALLS 1W, 1E AND 2E
B-19	AND RETAINING WALL
B-20	ABUTMENTS
B-21	ABUTMENT FOOTINGS
B-22	STRESS SHEET & TYPICAL
B-23	FRAMING PLAN & DETAIL
B-24	DECK SLAB
B-25	SUPERSTRUCTURE DETAIL
B-26	WATERPROOFING & DRAIN
B-27	STANDARD DETAILS
B-28	BRIDGE SURVEY
B-29	SURVEY PLAN & PROFILE

CONSTRUCTION NOTES

THE MINNESOTA HIGHWAY "STANDARD SPECIFICATION FOR HIGHWAY CONSTRUCTION" JANUARY 1, 1972, SHALL APPLY ALONG WITH "SUPPLEMENTAL SPECIFICATIONS" DATED JANUARY 1, 1974.

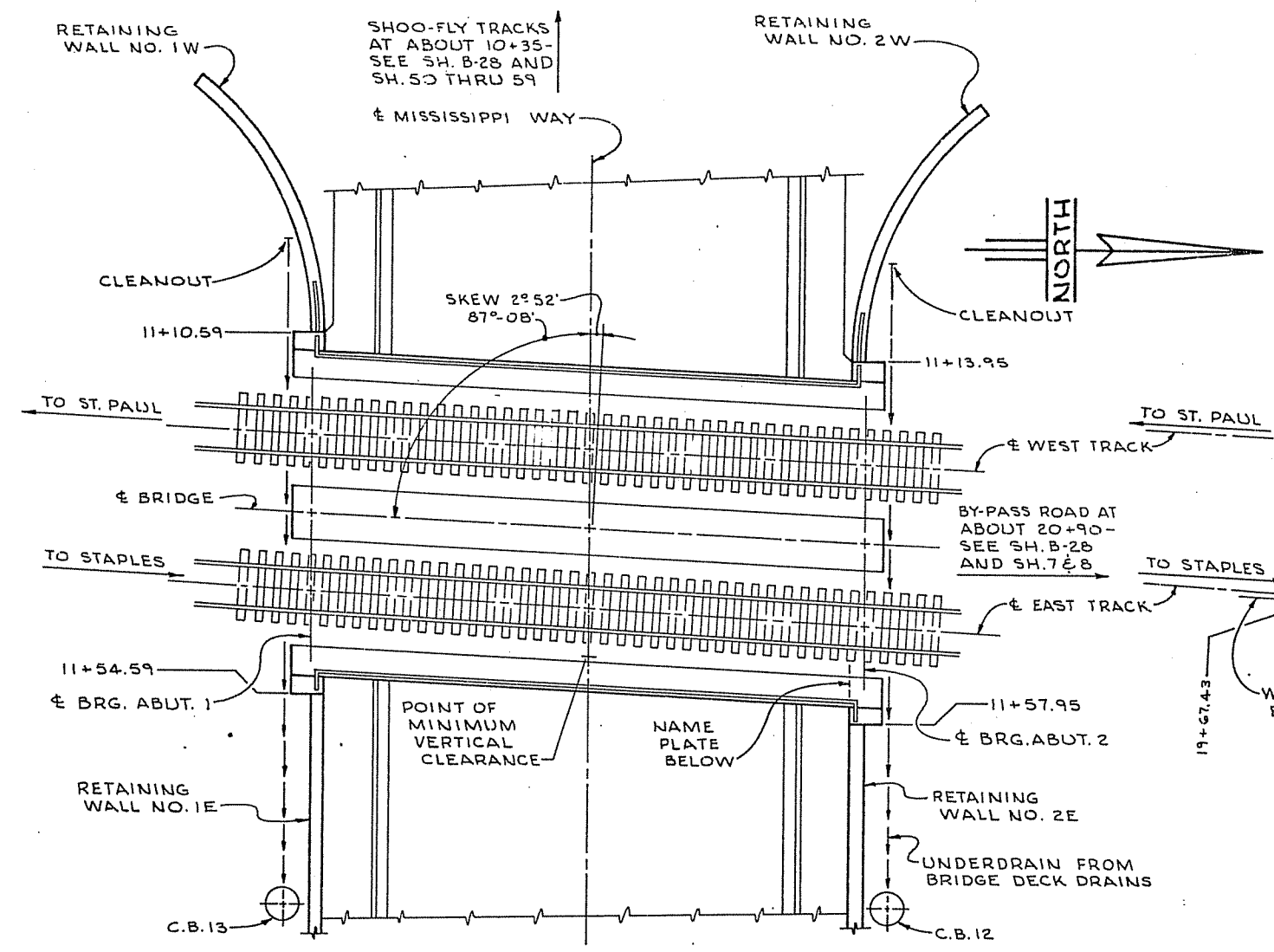
BENCH MARK ELEV. 847.4 (ADJ.) TOP OF SOUTHEAST CORNER CONCRETE BASE OF CURB 81-FT. LEFT OF STATION MISSISSIPPI WAY)

PLANS PREPARED BY:
BARTON-ASCHMAN ASSOCIATES INC.
 MINNEAPOLIS, MINN.

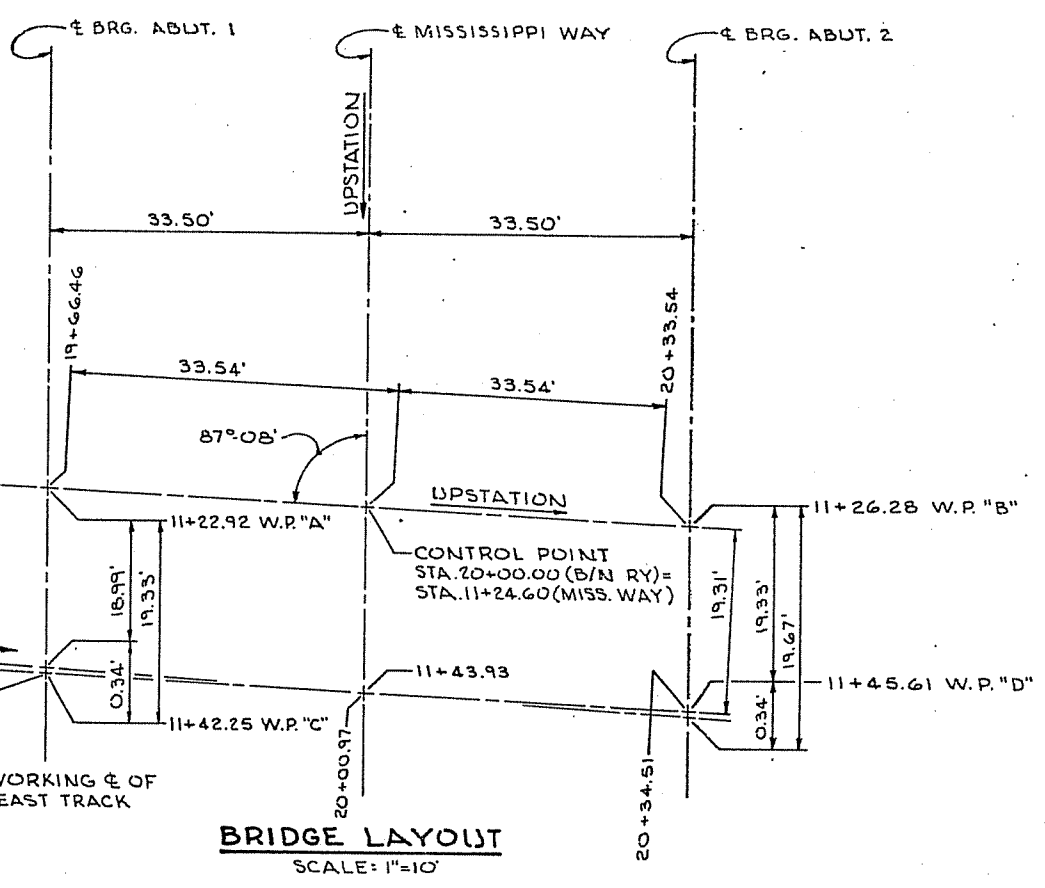
BY: *Robert J. McLaughlin*
 DATE 5/22/74

ANDKA COUNTY STATE-AID
 STATE OF MINNESOTA
 DEPARTMENT OF HIGHWAYS

Bridge No. 16.5
 BURLINGTON-NORTHERN, INC.
 APPROVED: *R.K. Paulman*
 ASST. VICE PRESIDENT, ENGINEERING



GENERAL PLAN
 SCALE: 1" = 10'



BRIDGE LAYOUT
 SCALE: 1" = 10'

DIMENSIONS BETWEEN WORKING POINTS

POINT	STATION ON B-N RAILWAY	STATION ON MISS. WAY	A	B	C	D	P.G.(B/R) ELEV.	SUPERST. THICKNESS	SEAT ELEV.
A	19+66.46	11+22.92	—	—	—	—	849.28	5.92	843.36
B	20+33.54	11+26.28	67.08	—	—	—	849.28	6.07	843.21
C	19+67.43	11+42.25	19.33	68.88	—	—	849.28	5.92	843.36
D	20+34.51	11+45.61	70.74	19.33	67.08	—	849.28	6.07	843.21

REINFORCEMENT BAR NOTES

REINFORCEMENT BARS SHALL BE DEFORMED BILLET STEEL BARS CONFORMING TO ASTM-A615, GRADE 60.
 BAR DETAILS SHALL CONFORM TO A.C.I. 315, LATEST EDITION.
 ALL BAR DIMENSIONS ARE OUT-TO-OUT.
 THE FIRST DIGIT OF A THREE-DIGIT BAR MARK, OR THE FIRST TWO DIGITS OF A FOUR-DIGIT BAR MARK, DENOTES THE BAR SIZE.

NOTE ON SHEET NUMBERS

FOR INTERNAL CROSS-REFERENCING, THE BRIDGE DRAWINGS (INCLUDING RETAINING WALLS) ARE NUMBERED B-1 THRU B-29, CORRESPONDING TO PROJECT DRAWING NUMBERS 21 THRU 49. ON THAT SYSTEM, THIS IS SHEET **B-1**.

UTILITY NOTE

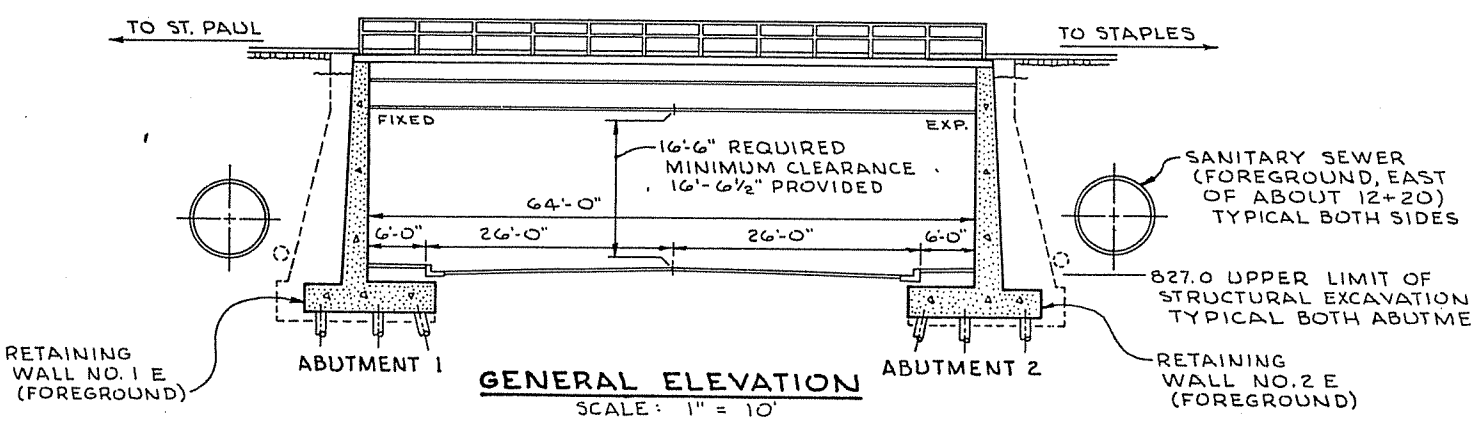
SEE ROADWAY AND SHOO-FLY TRACK PLANS FOR TREATMENT OF UNDERGROUND WATER, GAS, AND TELEPHONE LINES; OF UNDERGROUND RAILWAY CABLE; AND OF ALL POLE LINES.

NOTE ON DESIGN SPECS.

THE BRIDGE IS DESIGNED BY THE 1972 A.R.E.A. SPECIFICATIONS, BUT THE RETAINING WALLS ARE DESIGNED BY THE 1973 A.A.S.H.O. SPECIFICATIONS.

SCHEDULE NOTE

CONTRACTOR SHALL DETERMINE DELIVERY DATE OF STEEL, AND WORK BACK FROM SUCH DATE IN SCHEDULING, SO SHOO-FLY IS BUILT ON LATEST POSSIBLE DATE.



GENERAL ELEVATION
 SCALE: 1" = 10'

SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE

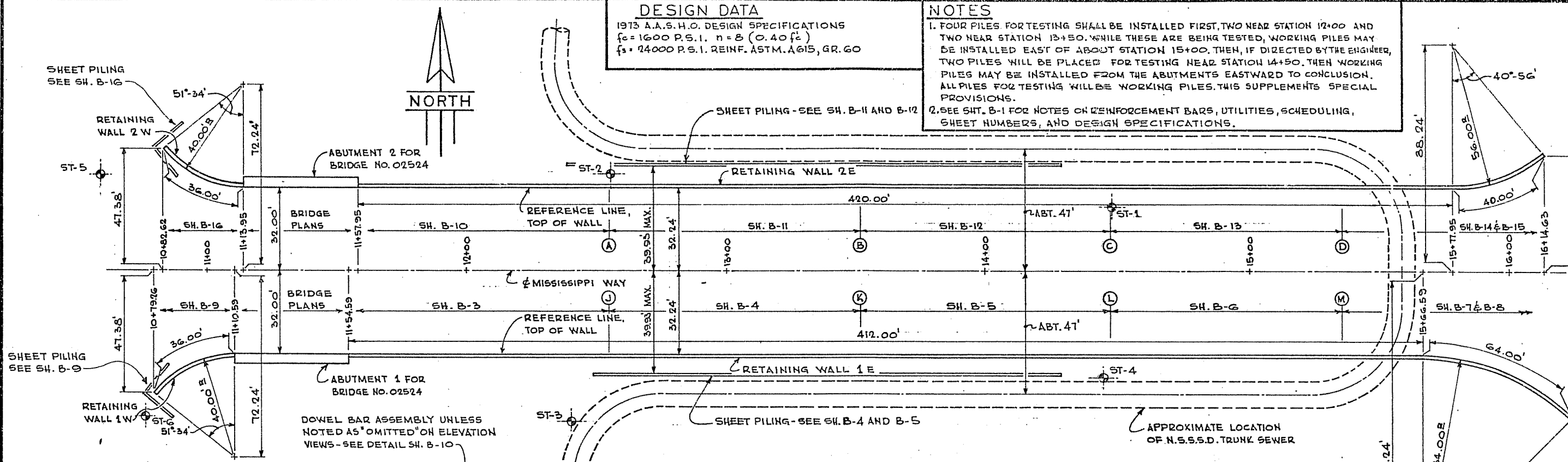
ITEM NO	2401.501	2401.501	2401.501	2451.501	2401.541	2402.521	2402.521	2402.593	2402.594	2451.511	2452.510	2452.511	2452.520	402.612	481.603
ITEM	CONCRETE MIX NO. 1A43	CONCRETE MIX NO. 3Y43	CONCRETE MIX NO. 3Y33	STRUCTURE EXCAVATION CLASS U	REINFORCEMENT BARS	STRUCTURAL STEEL (M.H.D.3301)	STRUCTURAL STEEL (M.H.D.3306)	FIXED BEARING ASSEMBLIES (TYPE 1)	EXPANSION BEARING ASSEMBLIES (TYPE 1)	COARSE FILTER AGGREGATE (CU)	STEEL H-PILING DRIVEN	STEEL H-PILING DELIVERED	STEEL-H TEST PILES 70-FT. LONG	DECK DRAINAGE SYSTEM	DECK WATERPROOFING
UNIT	CU. YD.	CU. YD.	CU. YD.	CU. YD.	POUND	POUND	POUND	EACH	EACH	CU. YD.	LIN. FT.	LIN. FT.	EACH	SYSTEM	SQ. FT.
QUANTITY	202(P)	388(P)	95(P)	341(P)	45,500(P)	263,880	9,710	2	2	130	5085	5085	4	1	2170(P)

DESIGN DATA

1973 A.A.S.H.O. DESIGN SPECIFICATIONS
 $f_c = 1600$ P.S.I. $n = 8$ ($0.40 f_c$)
 $f_s = 74000$ P.S.I. REINF. ASTM. A615, GR. 60

NOTES

1. FOUR PILES FOR TESTING SHALL BE INSTALLED FIRST, TWO NEAR STATION 12+00 AND TWO NEAR STATION 13+50. WHILE THESE ARE BEING TESTED, WORKING PILES MAY BE INSTALLED EAST OF ABOUT STATION 15+00. THEN, IF DIRECTED BY THE ENGINEER, TWO PILES WILL BE PLACED FOR TESTING NEAR STATION 14+50. THEN WORKING PILES MAY BE INSTALLED FROM THE ABUTMENTS EASTWARD TO CONCLUSION. ALL PILES FOR TESTING WILL BE WORKING PILES. THIS SUPPLEMENTS SPECIAL PROVISIONS.
 2. SEE SHEET B-1 FOR NOTES ON REINFORCEMENT BARS, UTILITIES, SCHEDULING, SHEET NUMBERS, AND DESIGN SPECIFICATIONS.



LAYOUT PLAN FOR RETAINING WALLS

SCALE: 1" = 20'

NOTE: SOIL BORING DENOTED THUS: \odot
 SEE SH. B-29 FOR LOGS, BORINGS ST-2, ST-3, ST-5 AND ST-6.
 SEE SH. B-19 FOR LOGS, BORINGS ST-1 AND ST-4.

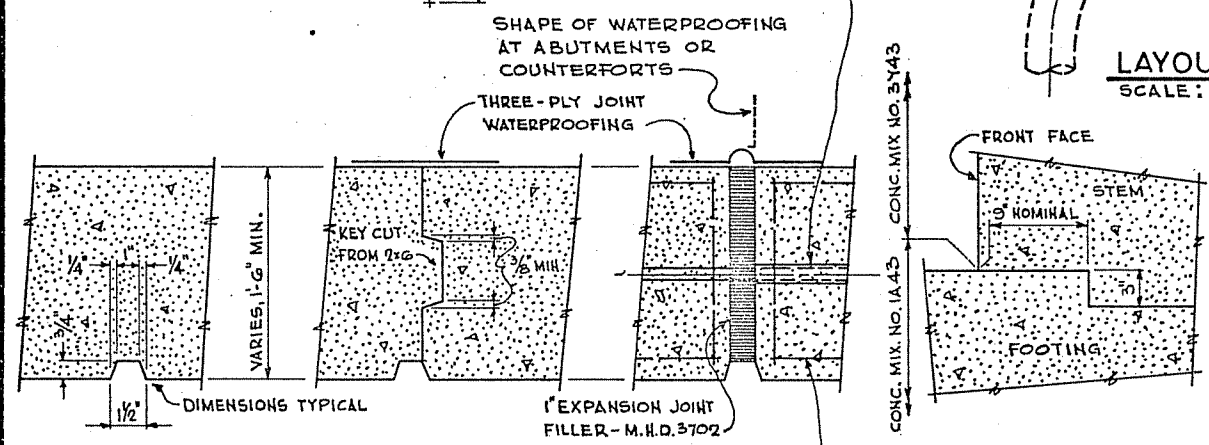
NOTE: THESE QUANTITIES ARE INCLUDED ON SHEET 2 STATEMENT OF ESTIMATED QUANTITIES

SUMMARY OF QUANTITIES FOR RETAINING WALLS

ITEM	DESCRIPTION	UNIT	WALL 1E	WALL 1W	WALL 2E	WALL 2W	TOTAL QUANT.
2411.511	STRUCTURE EXCAVATION CLASS U (P)	CU. YD.	1740	90	1670	90	3590
2452.510	STEEL H-PILING DRIVEN	LIN. FT.	—	500	—	500	1000
2452.511	STEEL H-PILING DELIVERED	LIN. FT.	—	500	—	500	1000
452.606	PRESSURIZED CAST-IN-PLACE CONC. PILING, COMPLETE	LIN. FT.	7740	—	6430	—	14,170
2452.526	PILE LOAD TESTS	EACH	3	—	3	—	6
2411.501	CONCRETE MIX NO 1A43	CU. YD.	566	30	508	30	1134
2411.501	CONCRETE MIX NO 3Y43	CU. YD.	605	41	522	40	1208
2411.541	REINFORCEMENT BARS	POUND	76,280	410	68,420	4080	152,890
2451.511	COARSE FILTER AGGREGATE (CV)	CU. YD.	420	35	355	35	845
557.603	DESIGN SPECIAL FENCE	LIN. FT.	460	—	476	—	936
2451.501	THREE-PLY JOINT WATERPROOFING	LIN. FT.	342	55	311	54	762
452.601	STEEL SHEET PILING (P)	SQ. FT.	3545	420	3815	420	8200

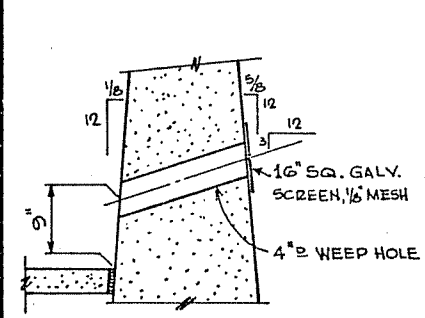
LIST OF SHEETS FOR RETAINING WALLS

NO.	DESCRIPTION
B-2	LAYOUT PLAN AND DETAILS
B-3-B-8	PLANS & ELEVATIONS WALL 1E & 1W
B-9	PLANS & ELEVATIONS WALL 2E & 2W
B-10-B-15	PLANS & ELEVATIONS WALL 1E & 1W
B-16	PLANS & ELEVATIONS WALL 2E & 2W
B-17	DETAILS & BAR LISTS - WALL 1E & 1W
B-18	BAR LISTS - WALLS 2E & 2W
B-19	TYPICAL SECTIONS - WALLS 1E & 1W



RETAINING WALL JOINT DETAILS

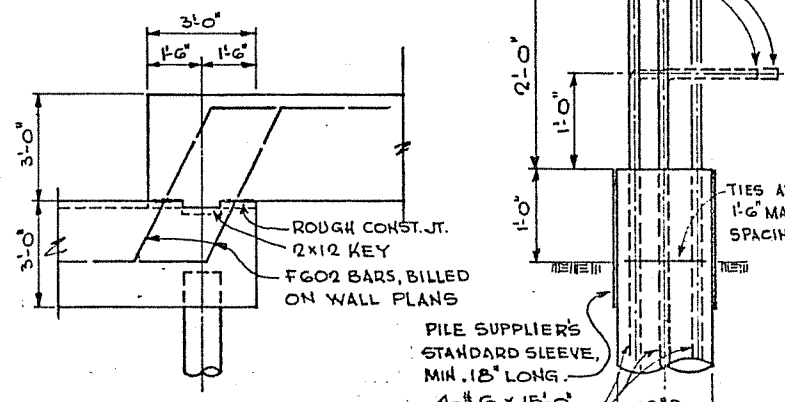
NOT TO SCALE



WEEP HOLE DETAIL

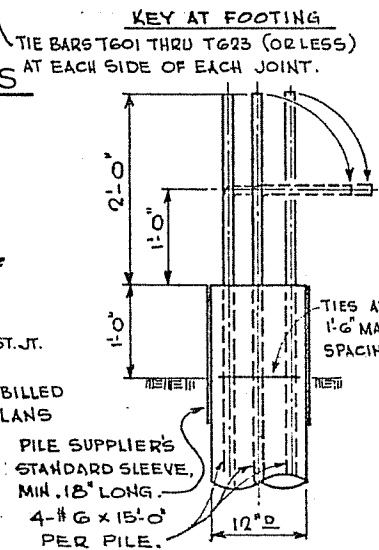
NOT TO SCALE

NOTE: SEE SH. B-3 FOR SPACING IN 24'-0" PANEL
 SEE SH. B-6 FOR SPACING IN 20'-0" PANEL
 SEE SH. B-3 FOR SPACING IN 28'-0" PANEL
 SEE SH. B-7 FOR SPACING IN 32'-0" PANEL
 SEE SH. B-9 & B-16 FOR SPACING IN WALLS 1W AND 2W.
 SEE SH. B-14 FOR SPACING IN 12'-0" PANEL.



STEPPED FOOTING CONST. JOINT

SCALE: 3/8" = 1'-0"



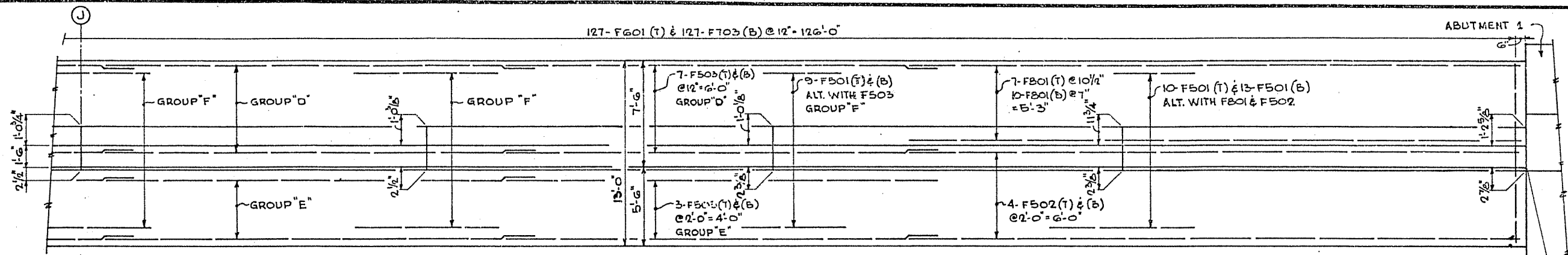
CONCRETE PILE DETAIL

SCALE: 1" = 1'-0"

CONSTRUCTION NOTES

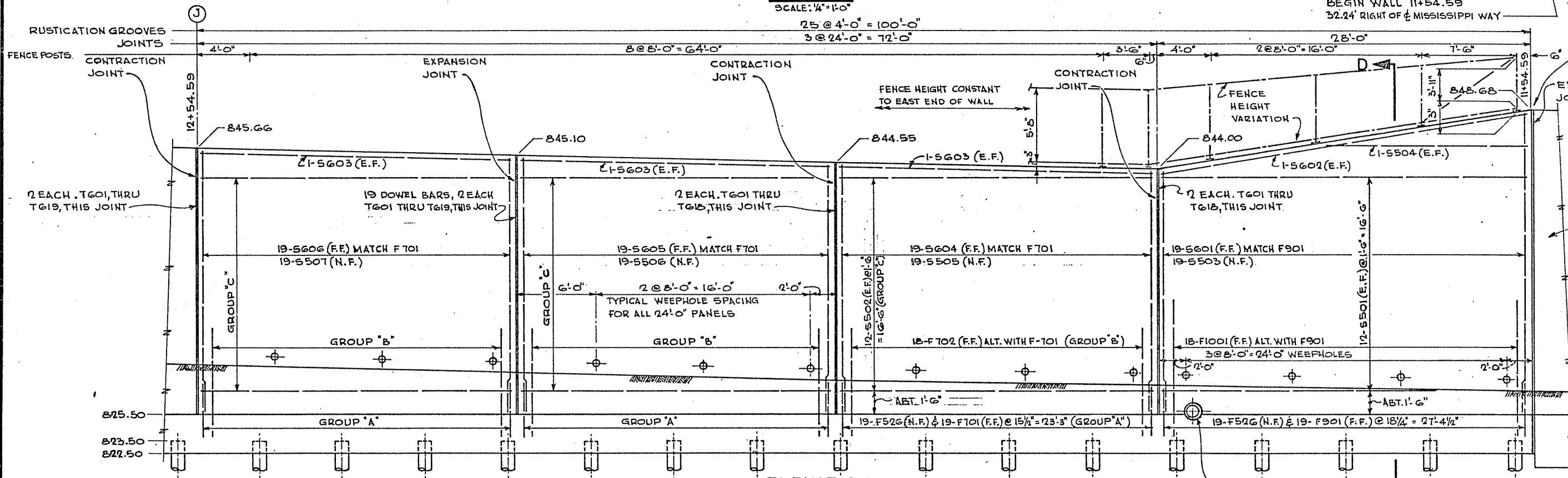
THE MINNESOTA HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED JANUARY 1973 SHALL GOVERN, ALONG WITH THE STANDARD SPECIFICATIONS DATED JANUARY 1973.

BENCH MARK ELEV. 847.45 (M.S. TOP OF SOUTHEAST CORNER OF BASE OF CHURCH SIGN, STATION G+21 (ON MISSISSIPPI))



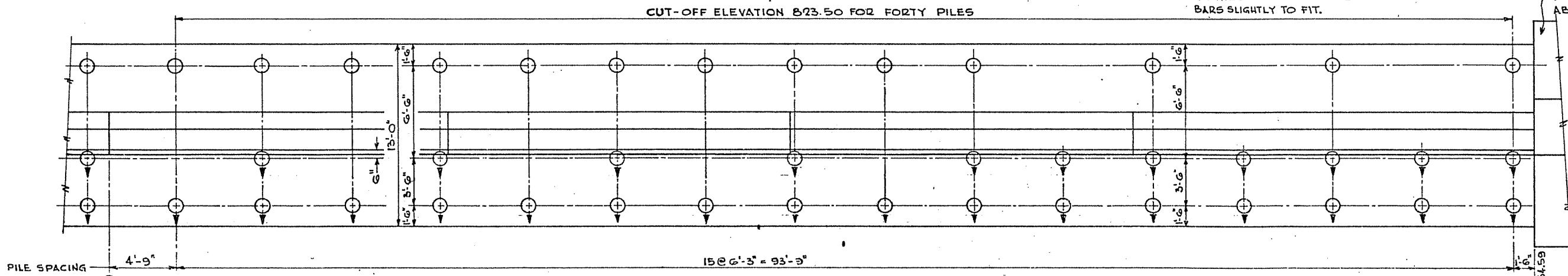
PLAN

SCALE: 1/4" = 1'-0"



ELEVATION

SCALE: 1/4" = 1'-0"



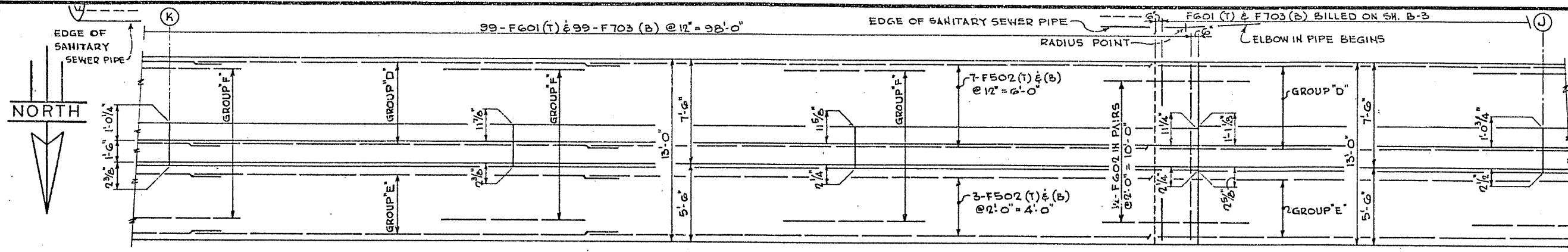
PILE LAYOUT PLAN

SCALE: 1/4" = 1'-0"

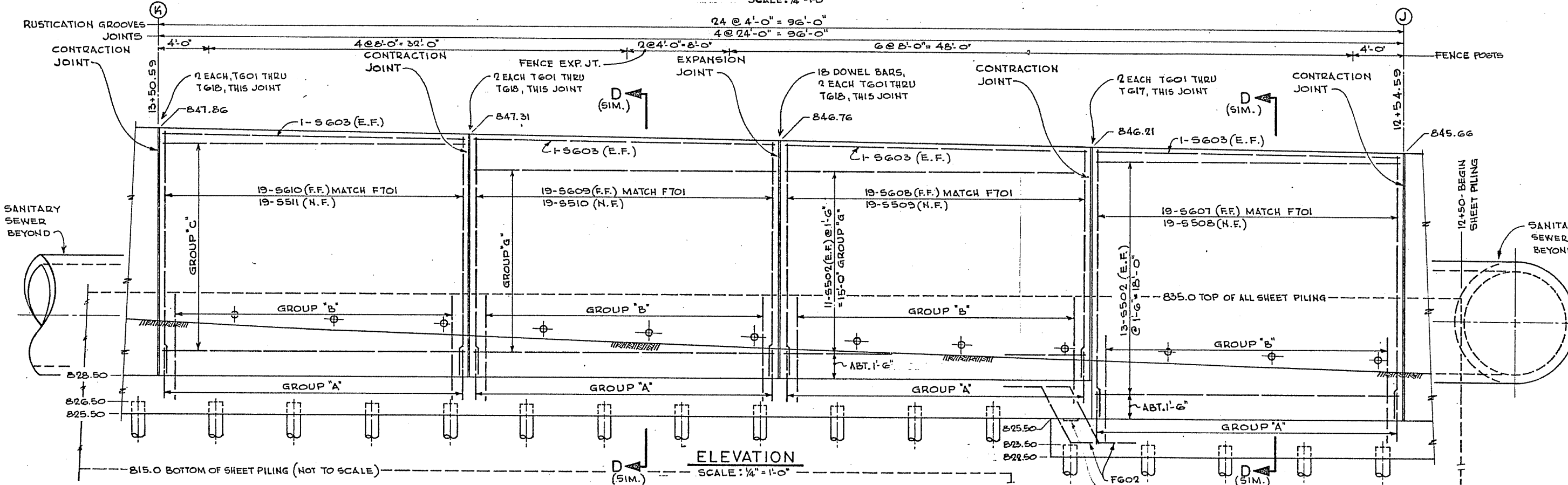
NOTES:

1. SEE SH. B-2 FOR GENERAL NOTES, ESTIMATED QUANTITIES, AND STANDARD DETAILS.
2. SEE SH. B-18 FOR BILL OF REINFORCEMENT.
3. WORK THIS SHEET WITH SHEETS B4 THRU B8.
4. SEE SH. B-19 FOR SECTIONS.

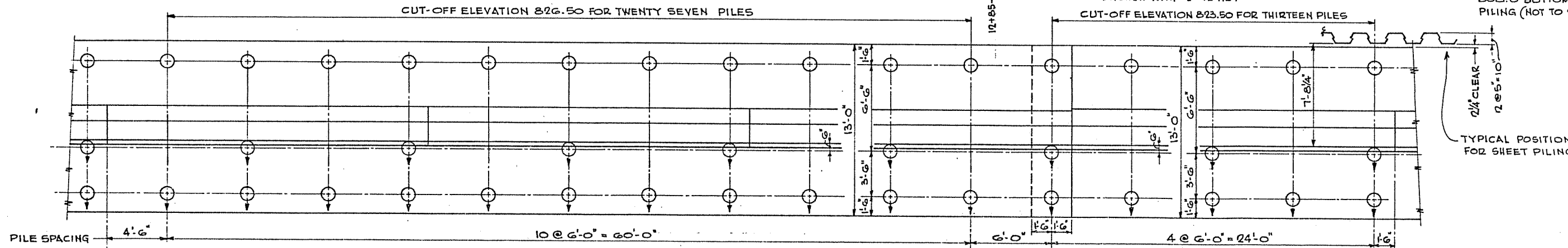
DES: RYM		DR: W.K.	APPROVED:	Bri
CHK: RYM		CHK: RYM		
B-3 RETAINING WALL IE			Sheet No. 23 of 59	Sheets 023



PLAN
SCALE: 1/4" = 1'-0"



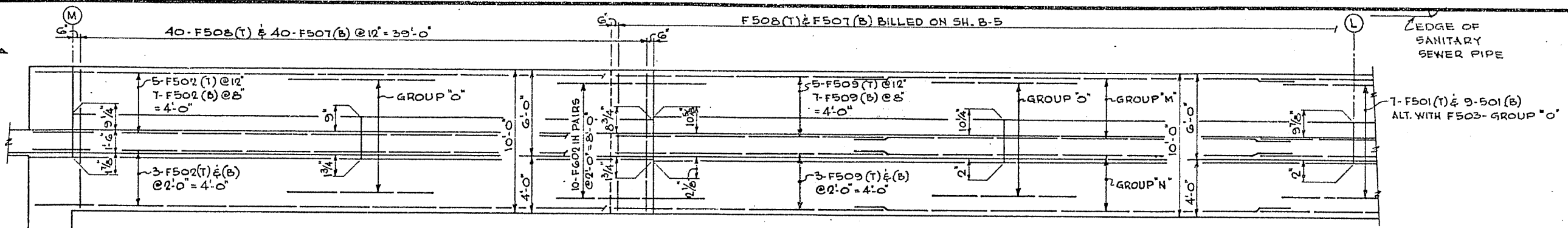
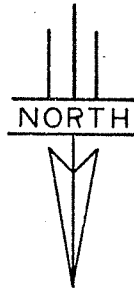
ELEVATION
SCALE: 1/4" = 1'-0"



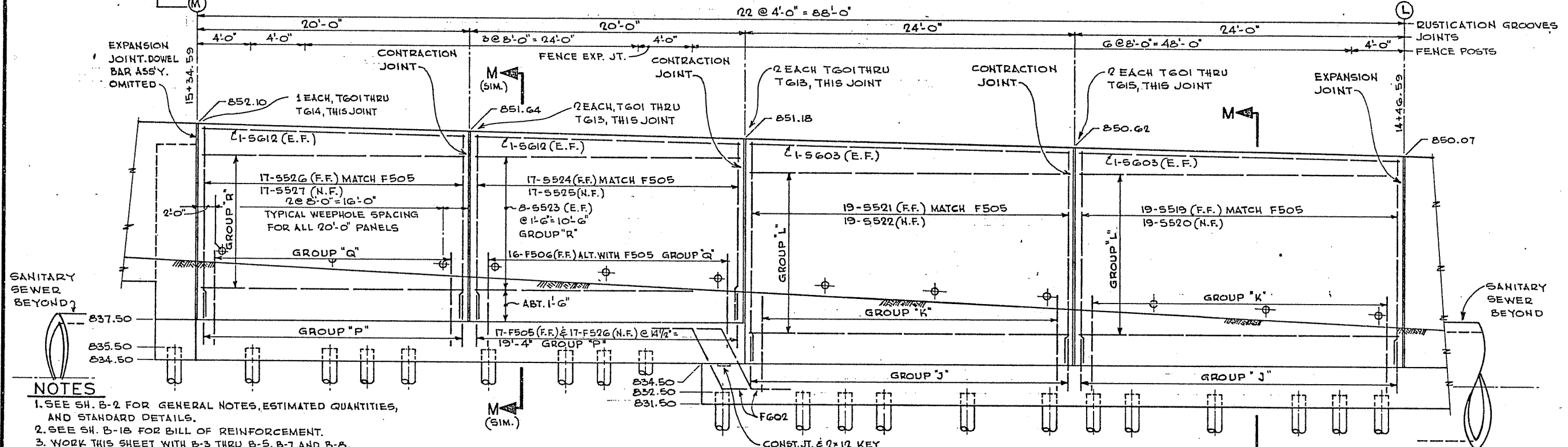
PILE LAYOUT PLAN
SCALE: 1/4" = 1'-0"

- NOTES:**
1. SEE SH. B-2 FOR GENERAL NOTES, ESTIMATED QUANTITIES, AND STANDARD DETAILS.
 2. SEE SH. B-18 FOR BILL OF REINFORCEMENT.
 3. WORK THIS SHEET WITH SHEETS B-3 AND B-5 THRU B-8.
 4. SEE SH. B-19 FOR SECTIONS.

SEE SH. B-8 FOR
SANITARY SEWER
LOCATION



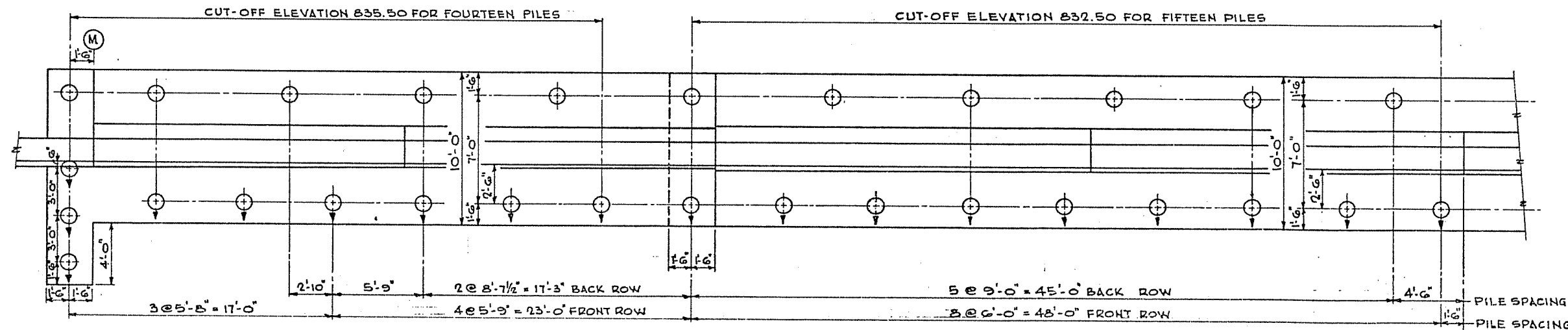
PLAN
SCALE: 1/4" = 1'-0"



ELEVATION
SCALE: 1/4" = 1'-0"

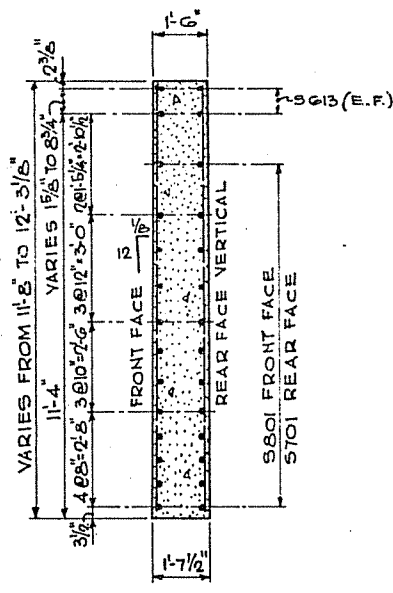
NOTES

1. SEE SH. B-2 FOR GENERAL NOTES, ESTIMATED QUANTITIES, AND STANDARD DETAILS.
2. SEE SH. B-18 FOR BILL OF REINFORCEMENT.
3. WORK THIS SHEET WITH B-3 THRU B-5, B-7 AND B-8.
4. SEE SH. B-19 FOR SECTIONS.

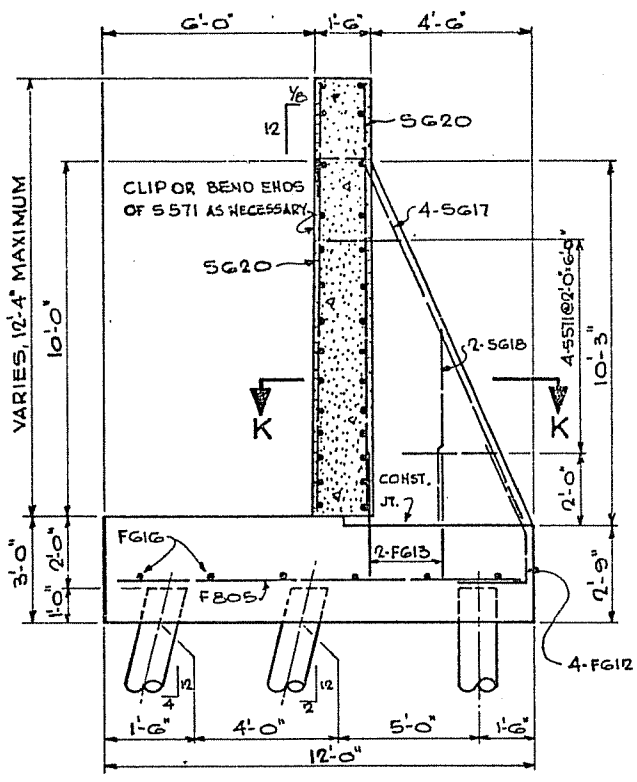


PILE LAYOUT PLAN
SCALE: 1/4" = 1'-0"

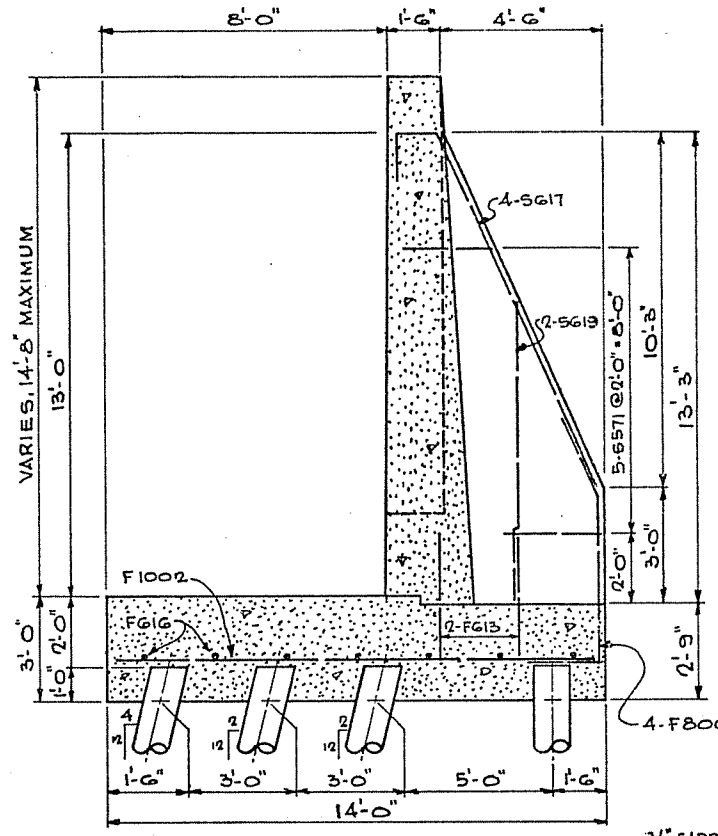
DES: RYM	DR: W.K.	APPROVED:	BR			
				CHK: RYM	CHK: RYM	
B-6		RETAINING WALL IE		Sheet No. 26 of 59 Sheets		02



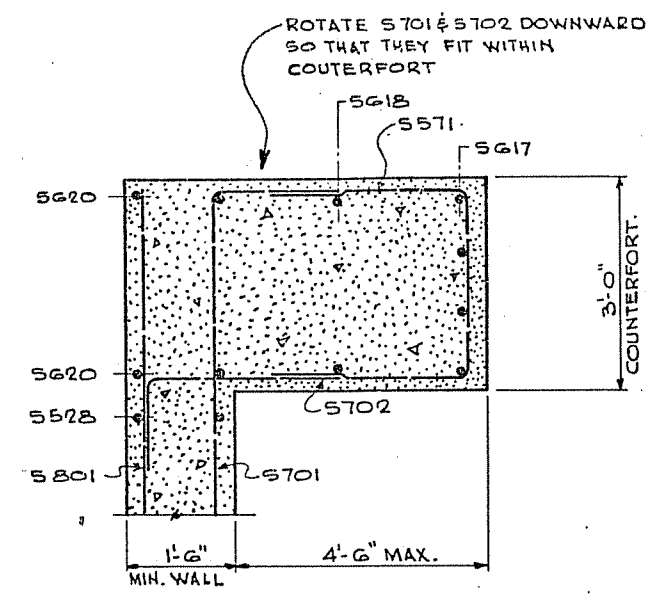
SECTION E-E
SCALE: 3/8" = 1'-0"



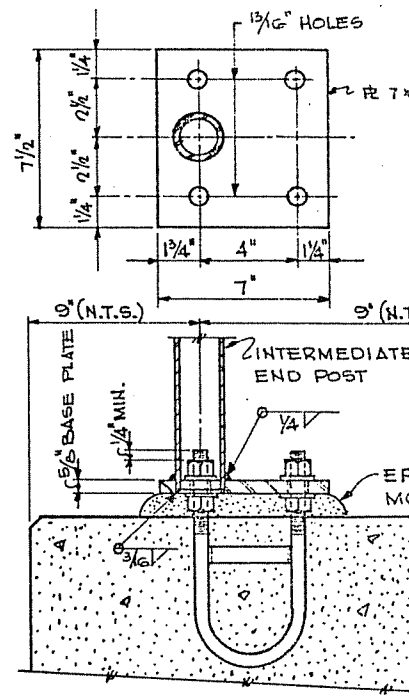
SECTION F-F
SCALE: 3/8" = 1'-0"



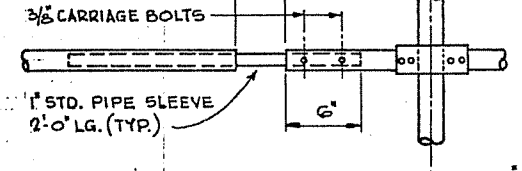
SECTION G-G
SCALE: 3/8" = 1'-0"



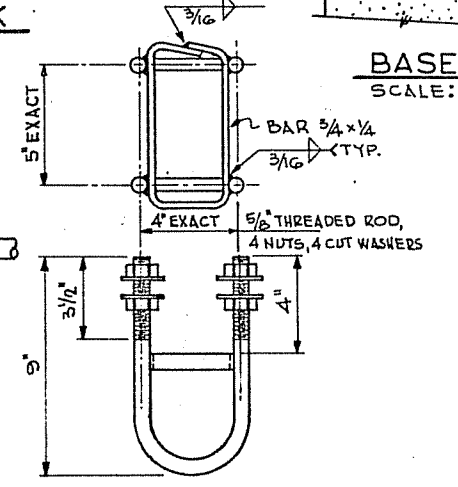
SECTION K-K
SCALE: 3/4" = 1'-0"



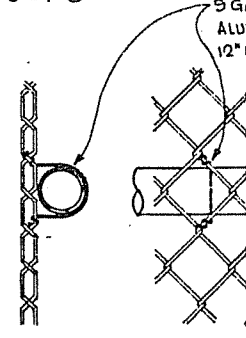
BASE PLATE DETAIL
SCALE: 3" = 1'-0"



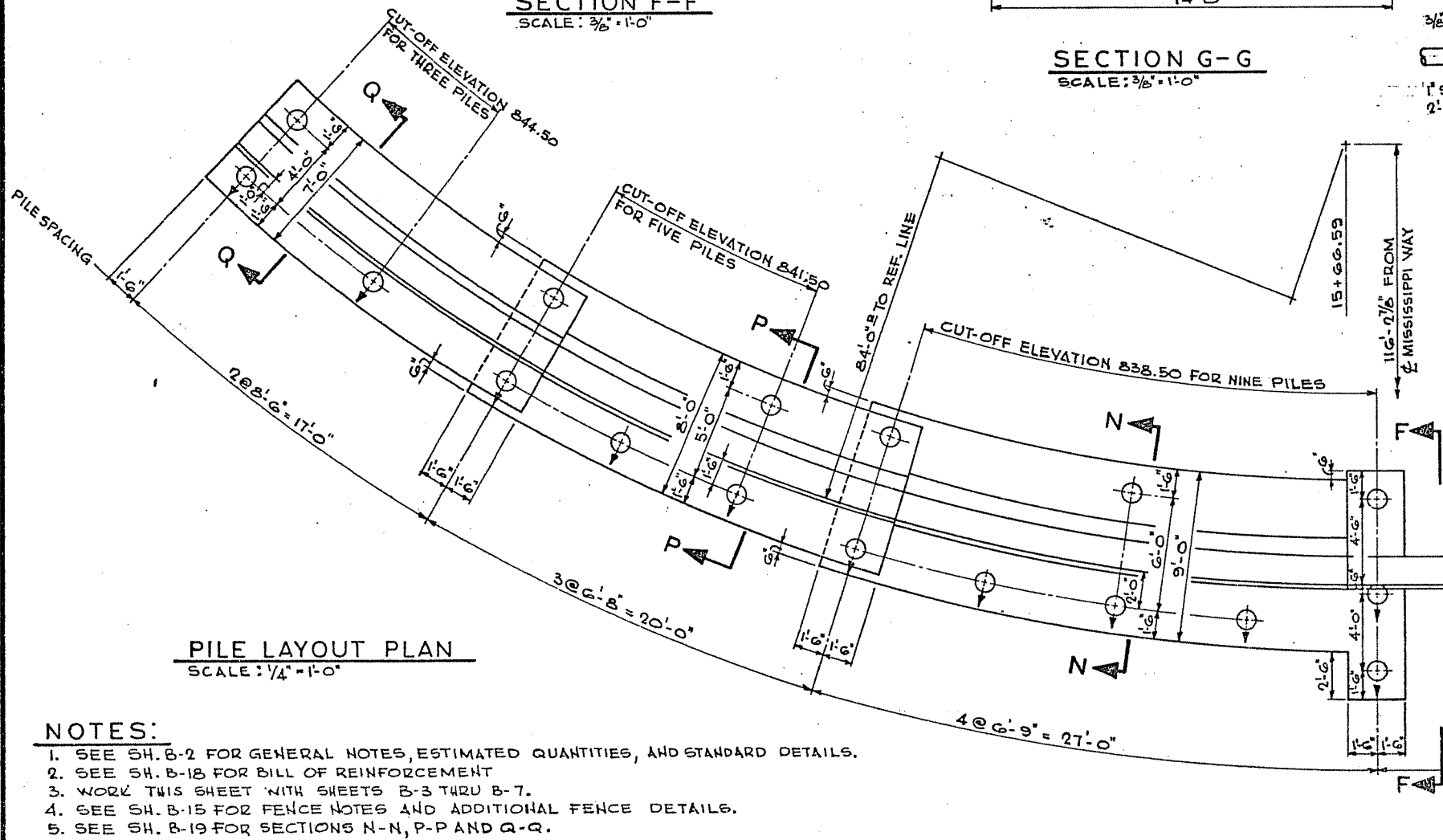
PIPE SLEEVE DETAIL
SCALE: 1 1/2" = 1'-0"
(USE IN TOP AND BOTTOM RAILS WHERE "FENCE EXP. J.T." IS SHOWN ON WALL ELEVATIONS.)



ANCHORAGE
SCALE: 3" = 1'-0"

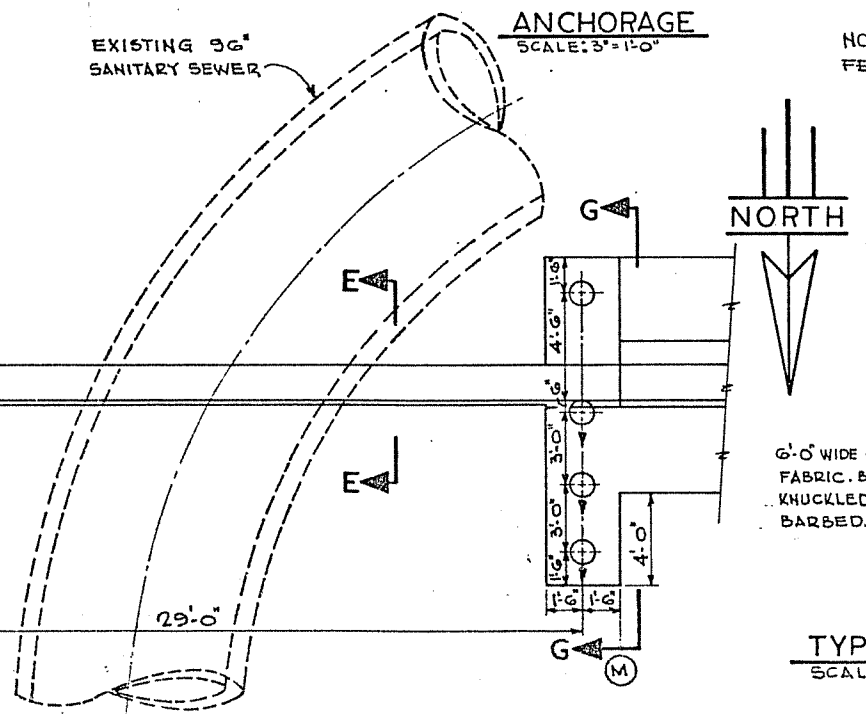


FABRIC TIE
NOT TO SCALE
NOTE: FENCE NOTES AND FENCE DETAILS ARE ON SHEET B-7



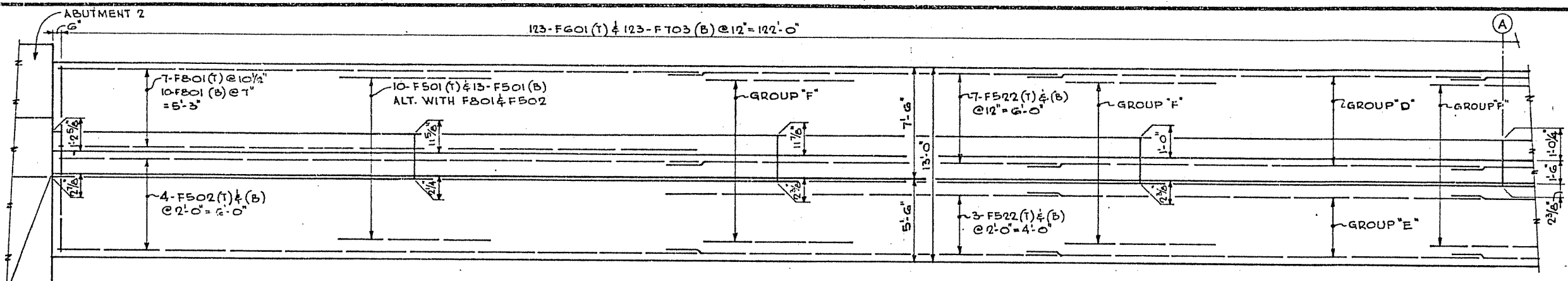
PILE LAYOUT PLAN
SCALE: 1/4" = 1'-0"

- NOTES:**
1. SEE SH. B-2 FOR GENERAL NOTES, ESTIMATED QUANTITIES, AND STANDARD DETAILS.
 2. SEE SH. B-18 FOR BILL OF REINFORCEMENT
 3. WORK THIS SHEET WITH SHEETS B-3 THRU B-7.
 4. SEE SH. B-15 FOR FENCE NOTES AND ADDITIONAL FENCE DETAILS.
 5. SEE SH. B-19 FOR SECTIONS N-N, P-P AND Q-Q.

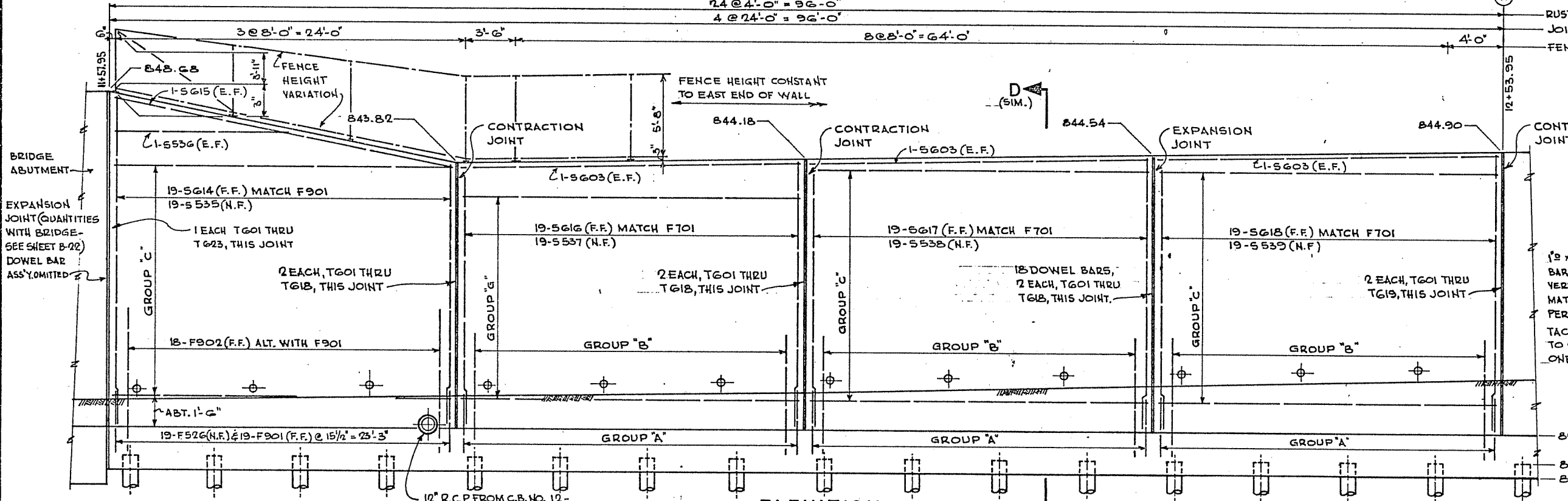


TYP. SECTION THRU
SCALE: 1" = 1'-0"

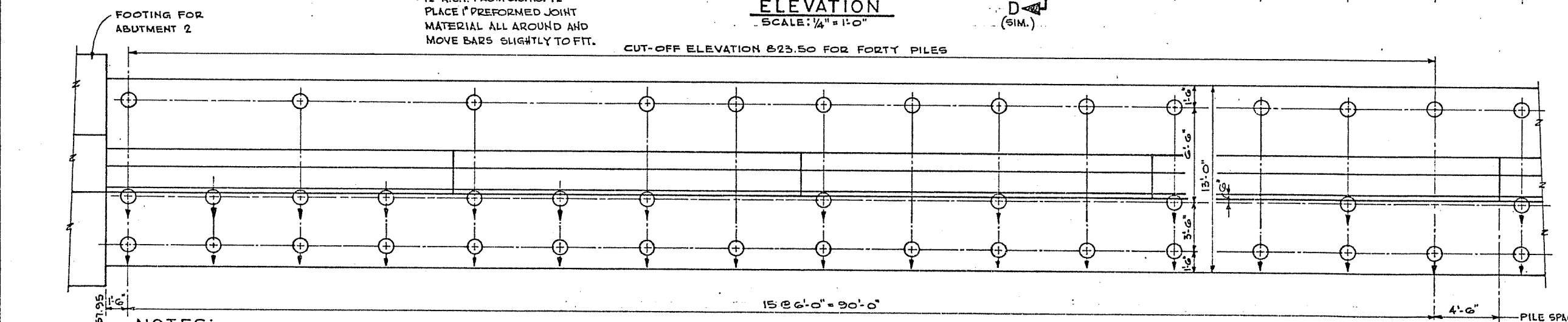
TITLE:	DES: RHM	DR: W.V.	APPROVED:
B-8 RETAINING WALL IE	CHK: RHM	CHK: RHM	
Sheet No. 28 of 59 Sheets			



PLAN
SCALE: 1/4" = 1'-0"

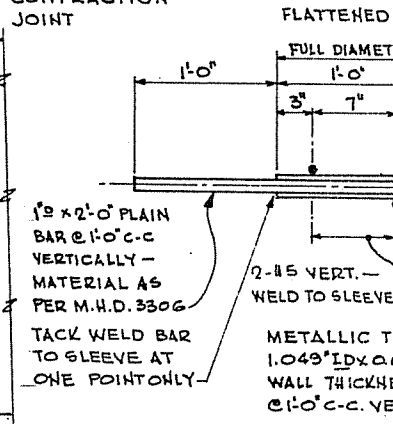


ELEVATION
SCALE: 1/4" = 1'-0"

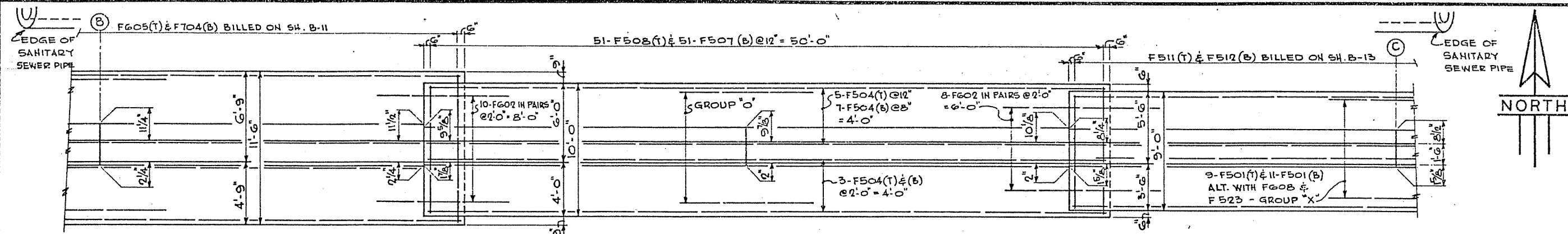


PILE LAYOUT PLAN
SCALE: 1/4" = 1'-0"

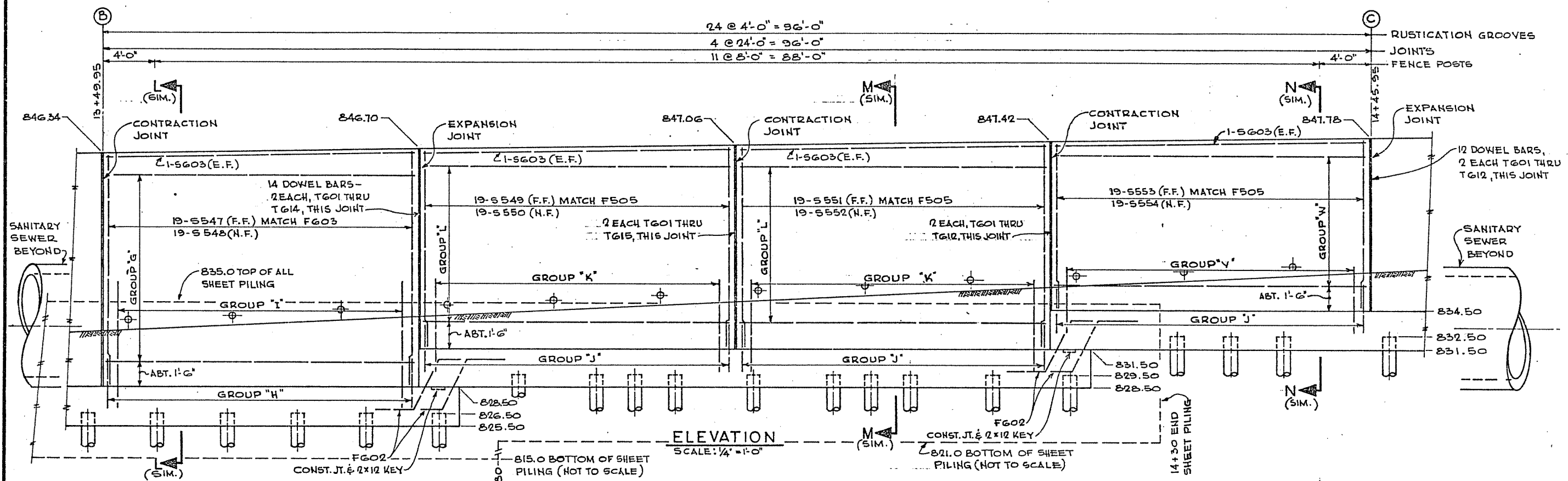
- NOTES:**
1. SEE SH. B-2 FOR GENERAL NOTES, ESTIMATED QUANTITIES, AND STANDARD DETAILS.
 2. SEE SH. B-18 FOR BILL OF REINFORCEMENT.
 3. WORK THIS SHEET WITH SHEETS B-11 THRU B-15.
 4. SEE SH. B-19 FOR SECTIONS.



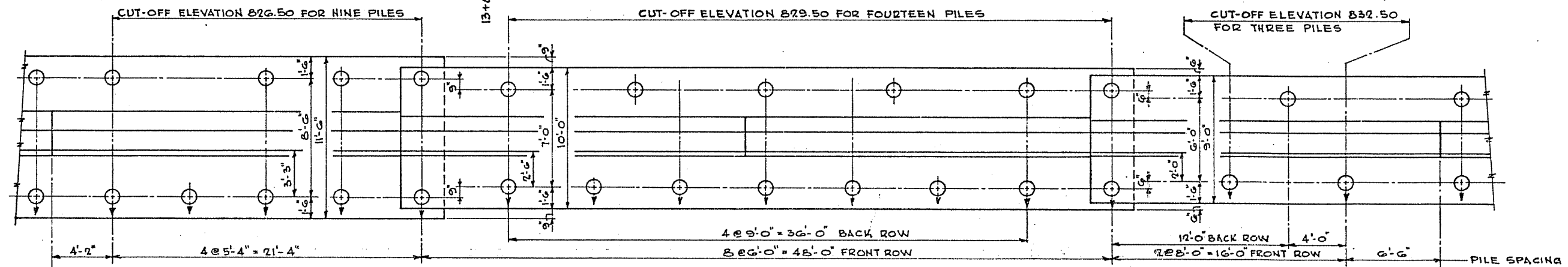
DOWEL BAR ASSY.
(USE AT EACH EXPANSION JOINT NOTED ON ELEVATION VIEW)
ALL MATERIAL AND PLACEMENT INCLUDED IN PRICE BIDDING
TOTAL OF 63 REQ'D FOR WALL 2E
AND 60 FOR WALL 2E
SCALE: 1/2" = 1'-0"



PLAN
SCALE: 1/4" = 1'-0"

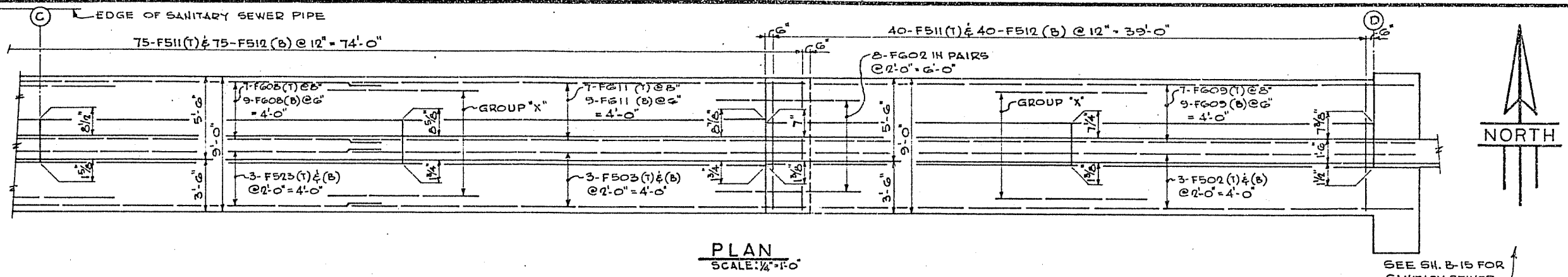


ELEVATION
SCALE: 1/4" = 1'-0"



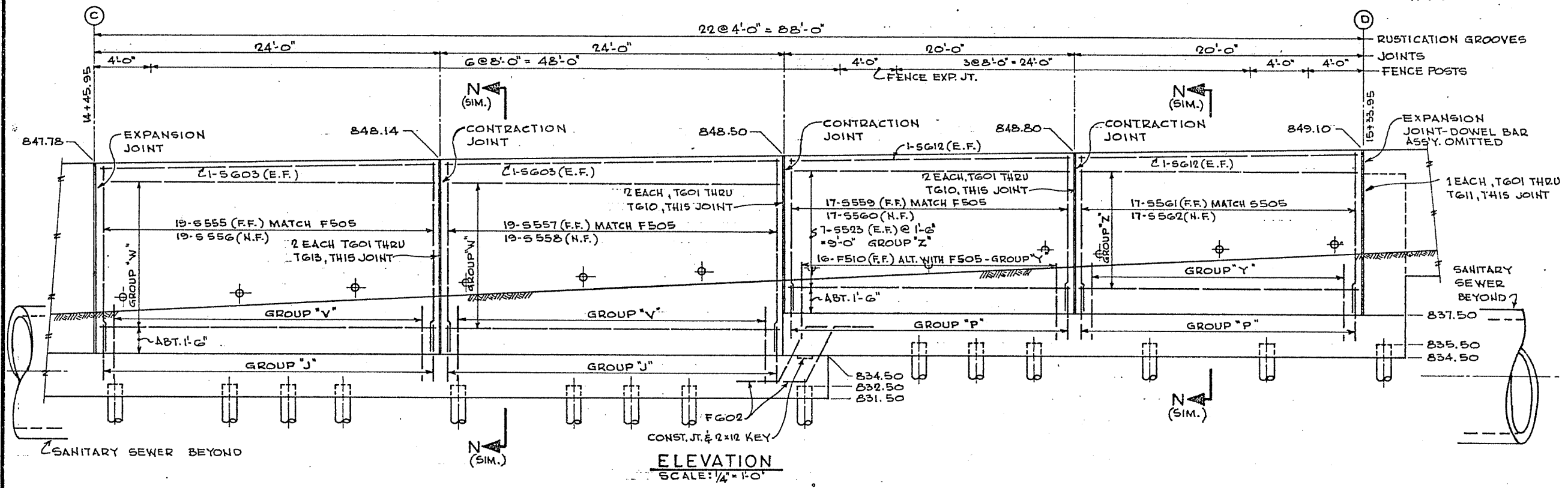
PILE LAYOUT PLAN
SCALE: 1/4" = 1'-0"

- NOTES:**
1. SEE SH. B-2 FOR GENERAL NOTES, ESTIMATED QUANTITIES, AND STANDARD DETAILS.
 2. SEE SH. B-1B FOR BILL OF REINFORCEMENT.
 3. WORK THIS SHEET WITH SHEETS B-10, B-11, AND B-13 THRU B-15.
 4. SEE SH. B-19 FOR SECTIONS.

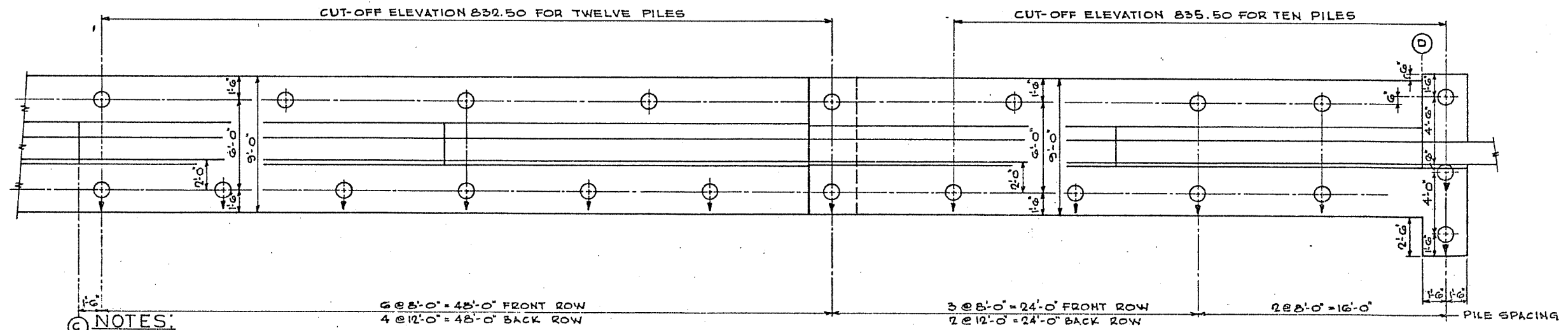


PLAN
SCALE: 1/4" = 1'-0"

SEE SH. B-15 FOR
SANITARY SEWER
LOCATION



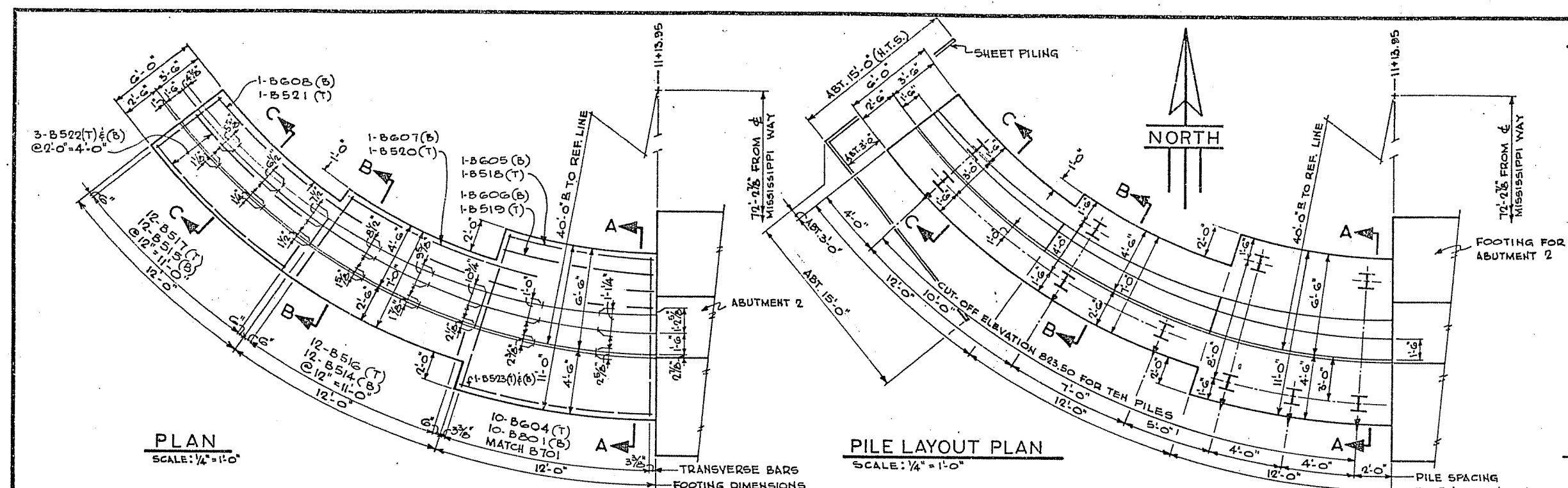
ELEVATION
SCALE: 1/4" = 1'-0"



PILE LAYOUT PLAN
SCALE: 1/4" = 1'-0"

- NOTES:
1. SEE SH. B-2 FOR GENERAL NOTES, ESTIMATED QUANTITIES, AND STANDARD DETAILS.
 2. SEE SH. B-18 FOR BILL OF REINFORCEMENT.
 3. WORK THIS SHEET WITH SHEETS B-10 THRU B-12, B-14 & B-15.
 4. SEE SH. B-19 FOR SECTIONS.

DES: <i>RM</i>		DR: W.K.		APPROVED:
CHR: <i>RM</i>		CHR: <i>RM</i>		
B-13		RETAINING WALL 2E		Sheet No. 33 of 59 Sheets



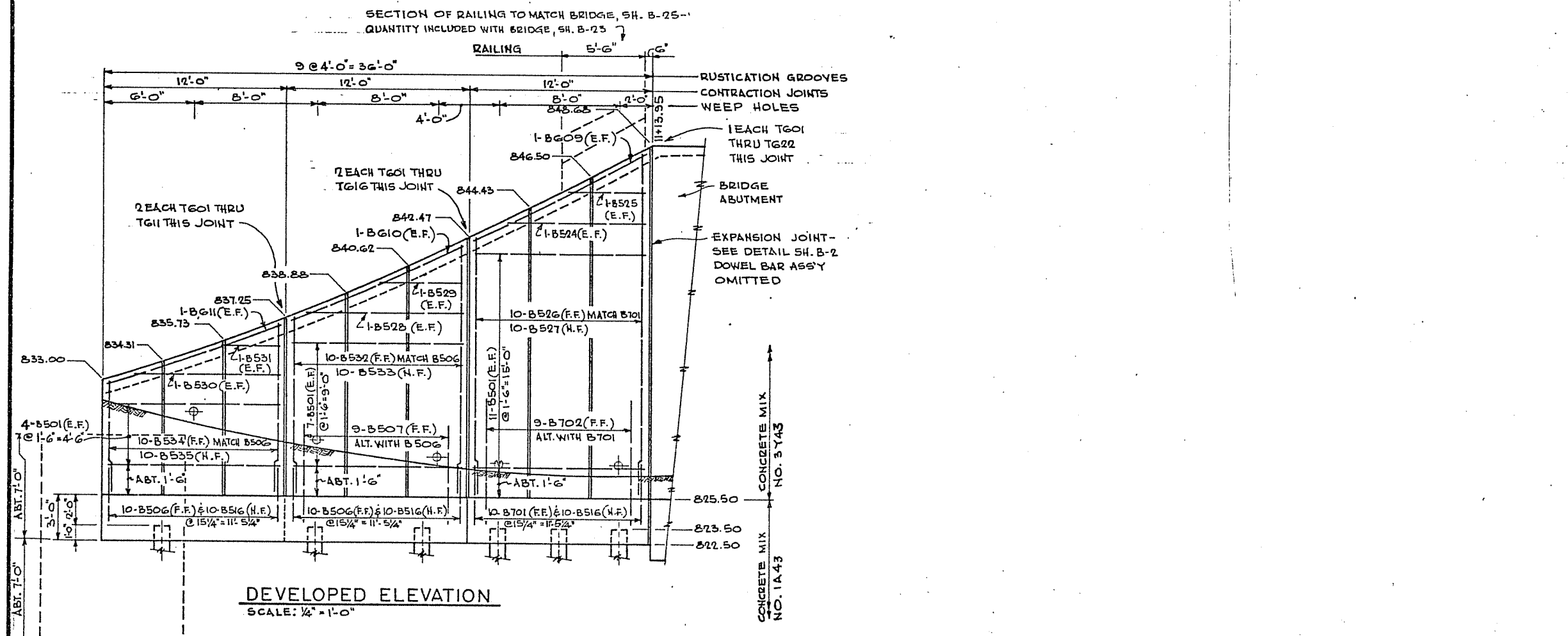
PLAN
SCALE: 1/4" = 1'-0"

PILE LAYOUT PLAN
SCALE: 1/4" = 1'-0"

- NOTES:**
1. ALL LONGITUDINAL DIMENSIONS ARE MEASURED ALONG REFERENCE LINE.
 2. ALL TRANSVERSE DIMENSIONS ARE MEASURED RADIALLY.
 3. SEE SH. B-2 FOR ESTIMATED QUANTITIES, DETAILS, AND FOR LAYOUT PLAN.
 4. SEE SH. B-17 FOR SECTIONS A-A, B-B, AND C-C FOR BILL OF REINFORCEMENT.
 5. LONGITUDINAL REINFORCEMENT BARS SHALL BE SHOWN IN SHOP IF NECESSARY FOR PROPER PLACEMENT.
 6. EXPANSION JOINT FILLER QUANTITIES ARE FOR PAYMENT WITH BRIDGE. SEE SHEET B-16.

COMPUTED PILE LOADS TONS PER PILE	
ITEM	FRONT
DEAD LOAD AND EARTH	32.5
LIVE LOAD	NONE
TOTAL	32.5

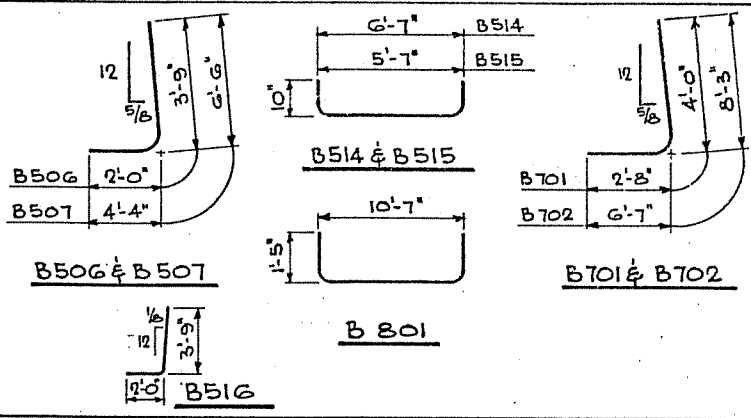
- PILE NOTES:**
1. FRONT ROW PILES SHALL BE BATTERED 3" PER 10' IN THE DIRECTION SHOWN THUS: \nearrow
 2. ALL PILES ARE STEEL "H", 12 BP53, CONFORMING TO M.H.D. 3372.
 3. PILE SPACING SHOWN IS AT BOTTOM OF PILE.
 4. FOR SPLICES, SEE DETAIL B202, SHEET B-16.
 5. NO STEEL TEST PILES FOR WALL 2W. TEN STEEL PILES, TOTAL FOR WALL 2W.



DEVELOPED ELEVATION
SCALE: 1/4" = 1'-0"

TEMPORARY SHEET PILING AS IN QUANTITY NOTE 5 SHEET B-2, TO PROTECT TOE OF FILL OF RAILWAY SHOOLY TRACK.

REINFORCEMENT BAR BENDING DIAGRAMS



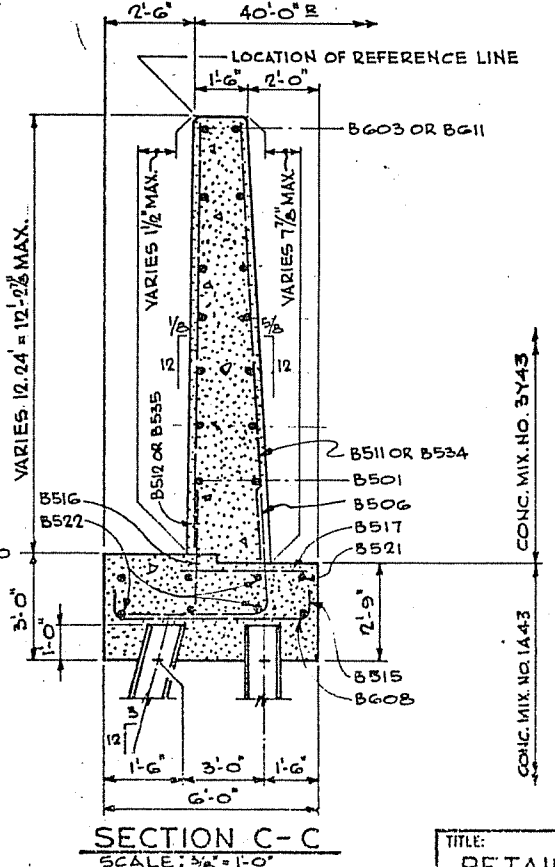
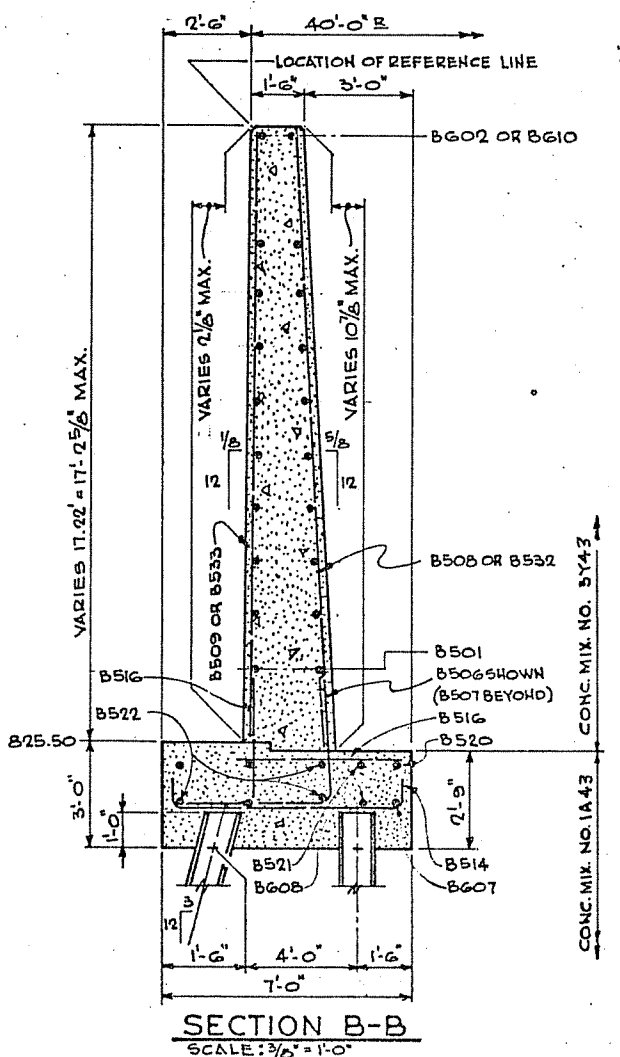
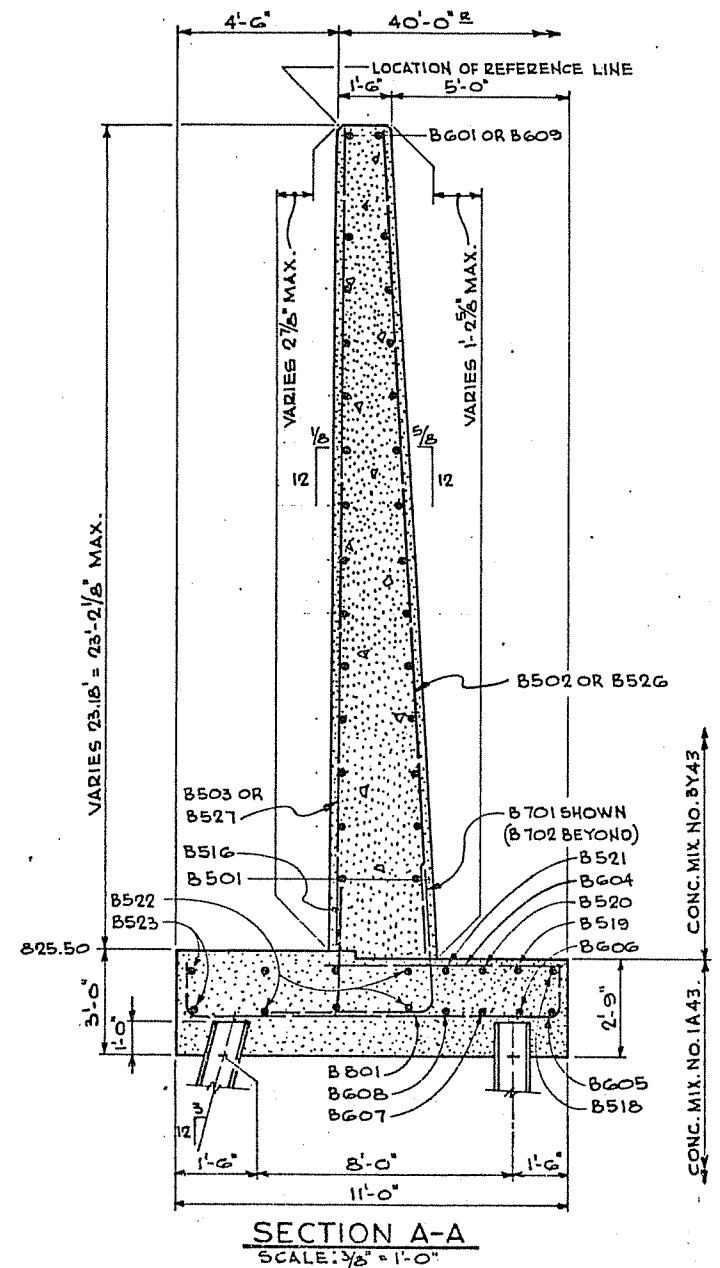
BILL OF REINFORCEMENT FOR RETAINING WALLS 1W AND 2W

MARK	WALL 1W		WALL 2W		MINIMUM LENGTH	MAXIMUM LENGTH	INCREMENT	LOCATION
	NUMBER OF SERIES	BAR PER SERIES	NUMBER OF SERIES	BAR PER SERIES				
B502	1	10	—	—	17'-3"	23'-0 1/2"	7 3/4"	STEM VERT.
B503	1	10	—	—	17'-0"	22'-9 3/4"	7 3/4"	STEM VERT.
B508	1	10	—	—	12'-3"	17'-1 1/2"	6 1/2"	STEM VERT.
B509	1	10	—	—	12'-0"	16'-10 1/2"	6 1/2"	STEM VERT.
B511	1	10	—	—	8'-4"	12'-1"	5"	STEM VERT.
B512	1	10	—	—	8'-1"	11'-10"	5"	STEM VERT.
B522	2	3	2	3	33'-11"	37'-7"	1'-10"	FOOTING LONG
B526	—	—	1	10	17'-1"	23'-1"	8"	STEM VERT.
B527	—	—	1	10	16'-10"	22'-10"	8"	STEM VERT.
B532	—	—	1	10	11'-10"	16'-10 3/4"	6 3/4"	STEM VERT.
B533	—	—	1	10	11'-7"	16'-7 3/4"	6 3/4"	STEM VERT.
B534	—	—	1	10	7'-6"	11'-7 1/2"	5 1/2"	STEM VERT.
B535	—	—	1	10	7'-8"	11'-4 1/2"	5 1/2"	STEM VERT.

MARK	NUMBER WALL 1W	NUMBER WALL 2W	LENGTH	SHAPE	LOCATION
B507	9	9	10'-9"	L	STEM DOWEL
B514	12	12	8'-1"	□	FOOTING TRANS.
B515	12	12	7'-1"	□	FOOTING TRANS.
B516	30	30	5'-8"	J	STEM DOWEL
B701	10	10	6'-6"	L	STEM DOWEL
B702	9	9	14'-8"	L	STEM DOWEL
B801	10	10	13'-1"	□	FOOTING TRANS.

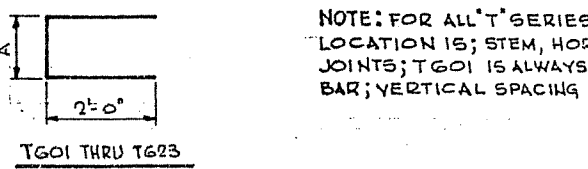
STRAIGHT BARS

MARK	NUMBER WALL 1W	NUMBER WALL 2W	LENGTH	LOCATION
B501	48	44	11'-7"	STEM
B504	2	—	9'-10"	STEM
B505	2	—	8'-4"	STEM
B510	2	—	6'-10"	STEM
B513	2	—	6'-2"	STEM
B516	12	12	4'-4"	FOOTING
B517	12	12	3'-4"	FOOTING
B518	1	1	9'-7"	FOOTING
B519	1	1	9'-11"	FOOTING
B520	1	1	23'-11"	FOOTING
B521	1	1	32'-6"	FOOTING
B523	2	2	12'-9"	FOOTING
B524	—	2	9'-4"	STEM
B525	—	2	5'-2"	STEM
B528	—	2	10'-4"	STEM
B529	—	2	8'-10"	STEM
B530	—	2	9'-8"	STEM
B531	—	2	4'-4"	STEM
B601	2	—	13'-0"	STEM
B602	2	—	12'-7"	STEM
B603	2	—	12'-3"	STEM
B604	10	10	6'-4"	FOOTING
B605	1	1	9'-7"	FOOTING
B606	1	1	9'-11"	FOOTING
B607	1	1	20'-11"	FOOTING
B608	1	1	32'-6"	FOOTING
B609	—	2	13'-1"	STEM
B610	—	2	12'-8"	STEM
B611	—	2	12'-4"	STEM



BILL OF TIE BARS FOR ALL FOUR WALLS

MARK	NO. WALL 1E	NO. WALL 1W	NO. WALL 2E	NO. WALL 2W	TOTAL NUMBER	DIM. "A"
T601	38	5	38	5	86	1'-1"
T602	38	5	38	5	86	1'-1 1/2"
T603	38	5	38	5	86	1'-2"
T604	38	5	38	5	86	1'-3"
T605	38	5	38	5	86	1'-4"
T606	38	5	38	5	86	1'-4 1/2"
T607	38	5	38	5	86	1'-5"
T608	35	5	35	5	80	1'-6"
T609	35	5	34	5	79	1'-7"
T610	33	5	32	5	75	1'-7 1/2"
T611	33	5	28	5	71	1'-8"
T612	33	3	27	3	66	1'-9"
T613	32	3	23	3	61	1'-10"
T614	28	3	21	3	55	1'-10 1/2"
T615	25	3	19	3	50	1'-11"
T616	21	3	17	3	44	2'-0"
T617	17	1	13	1	32	2'-1"
T618	15	1	9	1	26	2'-1 1/2"
T619	5	1	3	1	10	2'-2"
T620	1	1	1	1	4	2'-3"
T621	1	1	1	1	4	2'-4"
T622	1	1	1	1	4	2'-4 1/2"
T623	1	—	1	—	2	2'-5"



NOTE: FOR ALL "T" SERIES LOCATION IS; STEM, HORIZONTAL JOINTS; T601 IS ALWAYS TIE BAR; VERTICAL SPACING IS

NOTES:

1. ABBREVIATIONS FOR PLACEMENT OF REINFORCEMENT BARS:

- N.F. NEAR FACE, WALL
- F.F. FAR FACE, WALL
- E.F. EACH FACE, WALL
- T TOP, FOOTING
- B BOTTOM (JUST ABOVE PILE CUT-OFF), FOOTING
- T&B TOP & BOTTOM, FOOTING

2. BAR DETAILS SHALL CONFORM TO A.C.I. 315, LATEST EDITION.

3. ALL BAR DIMENSIONS ARE OUT-TO-OUT.

4. RECOMMENDED BAR BEND DIAMETERS ARE REQUIRED, UNLESS NOTED OTHERWISE.

5. ALL REINFORCEMENT BARS SHALL BE DEFORMED BILLET STEEL BARS CONFORMING TO ASTM-A615, GRADE 60.

6. EACH BAR SIZE IS DENOTED BY THE BAR MARK. THE BAR SIZE IS SHOWN BY THE FIRST DIGIT OF A THREE-DIGIT BAR MARK, OR THE FIRST TWO DIGITS OF A FOUR-DIGIT BAR MARK.

7. SINGLE #6 BARS IN EACH CAST-IN-PLACE PILE SHALL BE INCLUDED IN PRICE BID FOR PILING. THESE BARS ARE NOT INCLUDED IN THE BILLS OF REINFORCEMENT BARS.

8. LONGITUDINAL F501 BARS IN FOOTINGS ARE ALWAYS CENTERED ON WALL JOINT ABOVE.

9. CONFIRM LOCATION OF SANITARY SEWER BEFORE ORDERING REINFORCEMENT BETWEEN STATIONS 15+00 AND 16+00.

10. FOR ALL FOUR WALLS, TIE BARS DENOTED "T" ARE DETAILED AND TABULATED ON SHEET B-17

**BILL OF VARIABLE LENGTH REINFORCEMENT BARS
(VERTICAL, IN STEMS OF RETAINING WALLS)**

MARK	NUMBER OF SERIES	BARS PER SERIES	MINIMUM LENGTH	MAXIMUM LENGTH	INCREMENT
S 535	1	19	17'-11 1/2"	22'-10"	3/4"
S 537	1	19	17'-9 1/2"	18'-2"	1/4"
S 538	1	19	18'-2"	18'-6 1/2"	1/4"
S 539	1	19	18'-6 1/2"	18'-11"	1/4"
S 540	1	19	18'-11"	19'-3 1/2"	1/4"
S 541	1	19	18'-9"	17'-1 1/2"	1/4"
S 542	1	19	16'-6"	16'-10 1/2"	1/4"
S 543	1	19	17'-1 1/2"	17'-6"	1/4"
S 544	1	19	16'-10 1/2"	17'-3"	1/4"
S 545	1	19	17'-6"	17'-10 1/2"	1/4"
S 546	1	19	17'-3"	17'-7 1/2"	1/4"
S 547	1	19	17'-10 1/2"	18'-3"	1/4"
S 548	1	19	17'-7 1/2"	18'-0"	1/4"
S 549	1	19	15'-3"	15'-7 1/2"	1/4"
S 550	1	19	15'-0"	15'-4 1/2"	1/4"
S 551	1	19	15'-7 1/2"	16'-0"	1/4"
S 552	1	19	15'-4 1/2"	15'-9"	1/4"
S 553	1	19	12'-11 1/2"	13'-4"	1/4"
S 554	1	19	12'-8 1/2"	13'-1"	1/4"
S 555	1	19	13'-4"	13'-8 1/2"	1/4"
S 556	1	19	13'-1"	13'-5 1/2"	1/4"
S 557	1	19	13'-8 1/2"	14'-1"	1/4"
S 558	1	19	13'-5 1/2"	13'-10"	1/4"
S 559	1	17	11'-0"	11'-4"	1/4"
S 560	1	17	10'-9"	11'-1"	1/4"
S 561	1	17	11'-4"	11'-8"	1/4"
S 562	1	17	11'-1"	11'-5"	1/4"
S 564	1	10	9'-1 3/4"	9'-4"	1/4"
S 565	1	10	8'-10 3/4"	9'-1"	1/4"
S 566	1	17	9'-3 3/4"	9'-7 3/4"	1/4"
S 567	1	17	9'-0 3/4"	9'-4 3/4"	1/4"
S 568	1	17	6'-7"	6'-11"	1/4"
S 569	1	17	6'-4"	6'-8"	1/4"
S 570	2	14	8'-2 5/8"	8'-7 1/2"	3/8"
S 614	1	19	18'-2 1/2"	23'-1"	3/4"
S 616	1	19	18'-0 1/2"	18'-5"	1/4"
S 617	1	19	18'-5"	18'-9 1/2"	1/4"
S 618	1	19	18'-9 1/2"	19'-2"	1/4"
S 619	1	19	19'-2"	19'-6 1/2"	1/4"

MARK	NUMBER OF SERIES	BARS PER SERIES	MINIMUM LENGTH	MAXIMUM LENGTH	INCREMENT
S 503	1	19	18'-4"	22'-10"	3"
S 505	1	19	18'-3 3/4"	18'-10 1/2"	3/8"
S 506	1	19	18'-10 1/2"	19'-5 1/4"	3/8"
S 507	1	19	19'-5 1/4"	20'-0"	3/8"
S 508	1	19	20'-0"	20'-6 3/4"	3/8"
S 509	1	19	17'-6"	18'-0 3/4"	3/8"
S 510	1	19	18'-0 3/4"	18'-7 1/2"	3/8"
S 511	1	19	18'-7 1/2"	19'-2 1/4"	3/8"
S 512	1	19	19'-2 1/4"	19'-9"	3/8"
S 513	1	19	16'-11 3/4"	17'-6 1/2"	3/8"
S 514	1	19	16'-8 3/4"	17'-3 1/2"	3/8"
S 515	1	19	17'-6 1/2"	18'-1 1/4"	3/8"
S 516	1	19	17'-3 1/4"	17'-10 1/4"	3/8"
S 517	1	19	15'-0 7/8"	15'-7 7/8"	3/8"
S 518	1	19	14'-9 7/8"	15'-4 7/8"	3/8"
S 519	1	19	15'-7 7/8"	16'-2 7/8"	3/8"
S 520	1	19	15'-4 7/8"	15'-11 7/8"	3/8"
S 521	1	19	16'-2 7/8"	16'-9 7/8"	3/8"
S 522	1	19	15'-11 3/8"	16'-6 1/8"	3/8"
S 524	1	17	13'-8 3/8"	14'-2 7/8"	3/8"
S 525	1	17	13'-5 7/8"	13'-11 3/8"	3/8"
S 526	1	17	14'-2 7/8"	14'-8 1/8"	3/8"
S 527	1	17	13'-11 1/8"	14'-5 1/8"	3/8"
S 528	2	14	11'-3"	11'-9 1/2"	1/2"
S 529	1	19	12'-4 3/4"	12'-11 1/2"	3/8"
S 530	1	19	12'-1 3/4"	12'-8 1/2"	3/8"
S 531	1	17	9'-11"	10'-5"	3/8"
S 532	1	17	9'-8"	10'-2"	3/8"
S 533	1	17	7'-5"	7'-11"	3/8"
S 534	1	17	7'-2"	7'-8"	3/8"
S 601	1	19	18'-7"	23'-1"	3"
S 604	1	19	18'-6 3/4"	19'-1 1/2"	3/8"
S 605	1	19	19'-1 1/2"	19'-8 1/4"	3/8"
S 606	1	19	19'-8 1/4"	20'-3"	3/8"
S 607	1	19	20'-3"	20'-9 3/4"	3/8"
S 608	1	19	17'-9"	18'-3 3/4"	3/8"
S 609	1	19	18'-3 3/4"	18'-10 1/2"	3/8"
S 610	1	19	18'-10 1/2"	19'-5 1/4"	3/8"
S 611	1	19	19'-5 1/4"	20'-0"	3/8"

BILL OF CONSTANT LENGTH REINFORCEMENT BARS

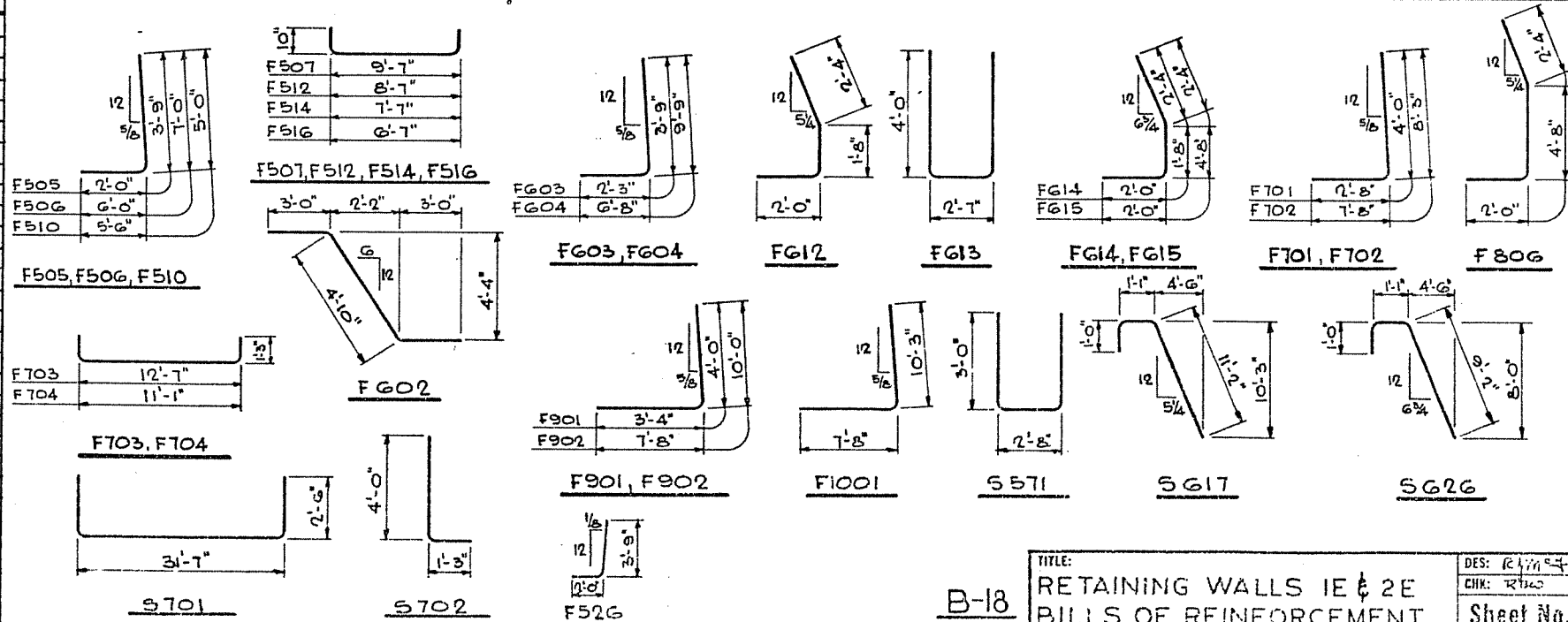
MARK	NUMBER WALL 1E	NUMBER WALL 2E	LENGTH	SHAPE	LOCATION
F 505	144	173	5'-8"	∟	STEM DOWEL
F 506	86	36	12'-11"	∟	STEM DOWEL
F 507	115	51	11'-1"	∟	FOOTING TRANS.
F 510	18	86	10'-5"	∟	STEM DOWEL
F 512	27	115	10'-1"	∟	FOOTING TRANS.
F 514	23	35	9'-1"	∟	FOOTING TRANS.
F 516	20	20	8'-1"	∟	FOOTING TRANS.
F 526	353	344	5'-8"	∟	STEM DOWEL
F 602	58	44	10'-10"	∟	FOOTING DOWEL
F 603	38	76	5'-10"	∟	STEM DOWEL
F 604	36	72	16'-3"	∟	STEM DOWEL
F 612	4	—	5'-10"	∟	COUNTERFORT FOOTING
F 613	4	4	10'-3"	∟	COUNTERFORT DOWEL
F 614	—	4	5'-10"	∟	COUNTERFORT FOOTING
F 615	—	4	8'-10"	∟	COUNTERFORT FOOTING
F 701	152	76	6'-6"	∟	STEM DOWEL
F 702	144	72	15'-9"	∟	STEM DOWEL
F 703	226	123	14'-9"	∟	FOOTING TRANS.
F 704	51	99	13'-3"	∟	FOOTING TRANS.
F 806	4	—	8'-10"	∟	COUNTERFORT FOOTING
F 901	19	19	7'-1"	∟	STEM DOWEL
F 902	—	18	17'-5"	∟	STEM DOWEL
F1001	18	—	17'-8"	∟	STEM DOWEL
S 571	9	7	8'-6"	∟	COUNTERFORT TIE
S 617	8	—	13'-1"	∟	COUNTERFORT
S 626	—	8	11'-1"	∟	COUNTERFORT
S 701	12	8	26'-3"	∟	STEM HORIZ.
S 702	24	16	5'-1"	∟	COUNTERFORT DOWEL

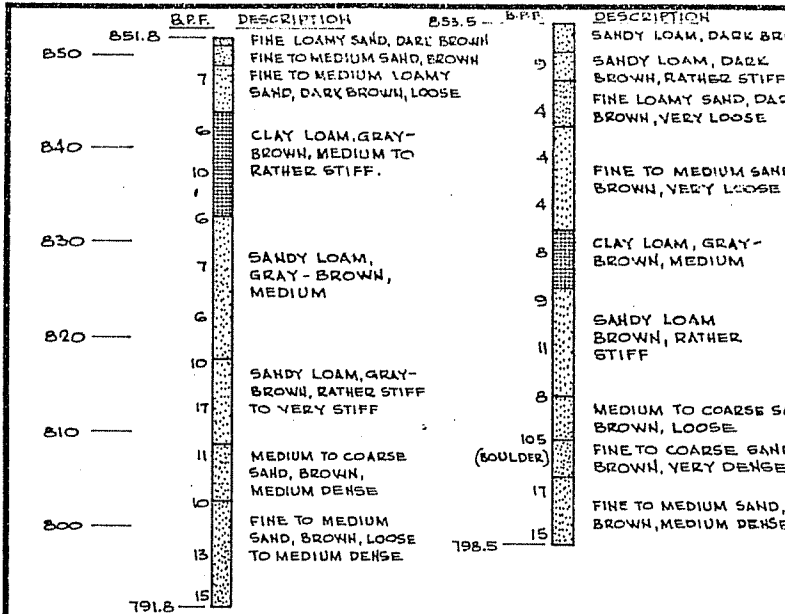
MARK	NUMBER WALL 1E	NUMBER WALL 2E	LENGTH	LOC.
F 501	195	201	10'-0"	FOOTING
F 502	46	20	42'-6"	FOOTING
F 503	136	58	30'-0"	FOOTING
F 504	6	18	50'-3"	FOOTING
F 508	115	51	5'-10"	FOOTING
F 509	18	—	18'-6"	FOOTING
F 511	27	115	5'-4"	FOOTING
F 513	23	35	4'-10"	FOOTING
F 515	20	20	4'-4"	FOOTING
F 517	6	—	29'-4"	FOOTING
F 518	8	—	21'-4"	FOOTING
F 519	4	—	22'-8"	FOOTING
F 520	7	7	18'-8"	FOOTING
F 521	4	4	19'-8"	FOOTING
F 522	—	20	26'-0"	FOOTING
F 523	—	6	46'-6"	FOOTING
F 524	—	8	35'-6"	FOOTING
F 525	—	4	37'-6"	FOOTING
F 601	226	123	7'-4"	FOOTING
F 605	51	99	6'-7"	FOOTING
F 606	16	—	27'-4"	FOOTING
F 607	8	—	21'-4"	FOOTING
F 608	—	16	46'-9"	FOOTING
F 609	—	16	42'-6"	FOOTING
F 610	—	8	38'-6"	FOOTING
F 611	—	16	30'-0"	FOOTING
F 616	13	12	2'-6"	COUNTERFORT
F 705	6	—	50'-6"	FOOTING
F 706	7	7	18'-8"	FOOTING
F 707	—	6	43'-10"	FOOTING
F 708	—	12	30'-0"	FOOTING
F 801	17	17	42'-6"	FOOTING
F 802	6	—	50'-6"	FOOTING
F 803	—	12	30'-0"	FOOTING
F 804	—	6	44'-6"	FOOTING
F 805	4	8	11'-6"	COUNTERFORT
F1002	5	—	13'-6"	COUNTERFORT
S 501	24	—	27'-7"	STEM
S 502	304	290	23'-7"	STEM
S 504	2	—	13'-10"	STEM
S 523	52	46	19'-7"	STEM
S 536	—	2	11'-10"	STEM
S 563	—	10	11'-7"	STEM
S 602	2	—	28'-0"	STEM
S 603	28	26	23'-7"	STEM
S 612	8	8	19'-7"	STEM
S 613	4	4	31'-7"	STEM
S 615	—	2	24'-1"	STEM
S 616	—	2	11'-7"	STEM
S 618	2	—	5'-2"	COUNTERFORT
S 619	2	—	8'-2"	COUNTERFORT
S 620	4	—	12'-1"	STEM V
S 621	4	—	14'-5"	STEM
S 622	—	2	4'-2"	COUNTERFORT
S 623	—	2	7'-2"	COUNTERFORT
S 624	—	4	11'-5"	STEM V
S 625	—	4	8'-10"	STEM V
S 801	12	8	31'-7"	STEM

BAR GROUP TABULATION

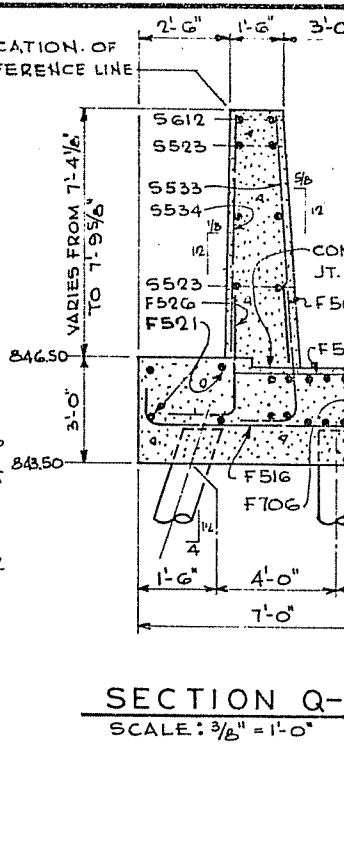
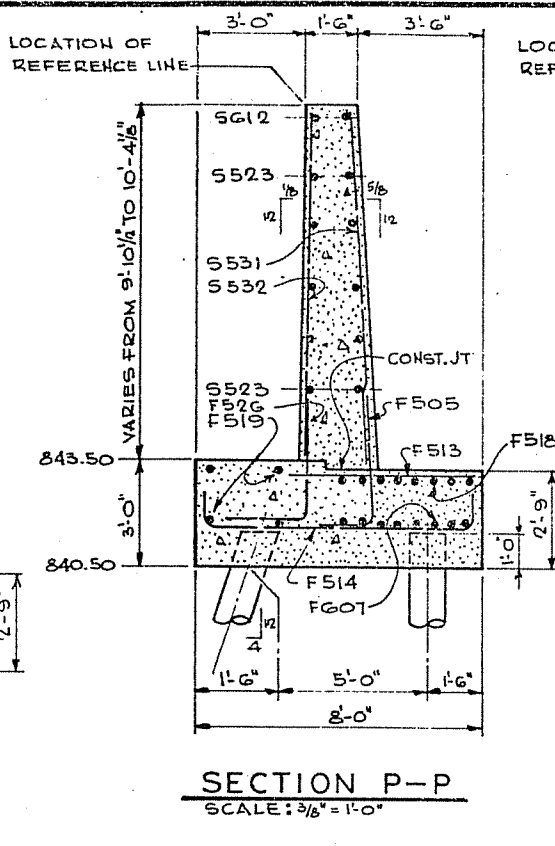
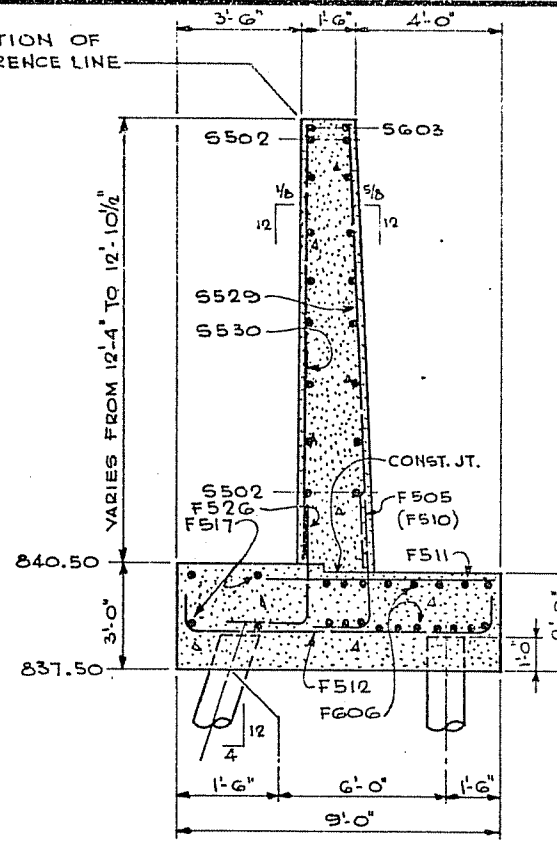
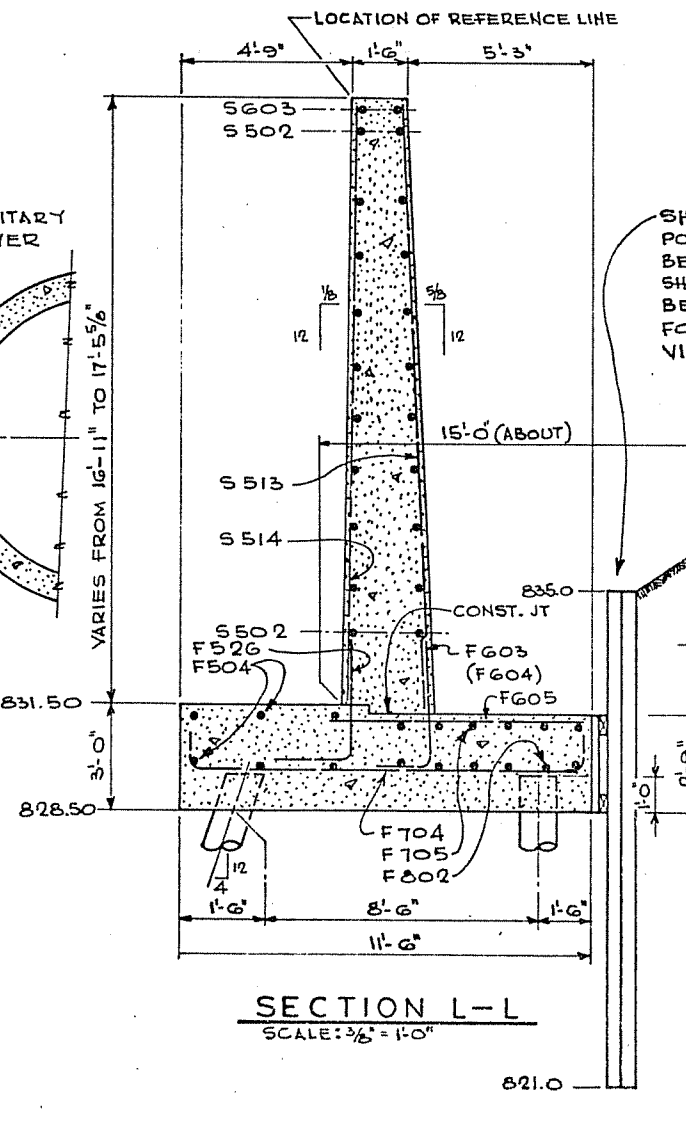
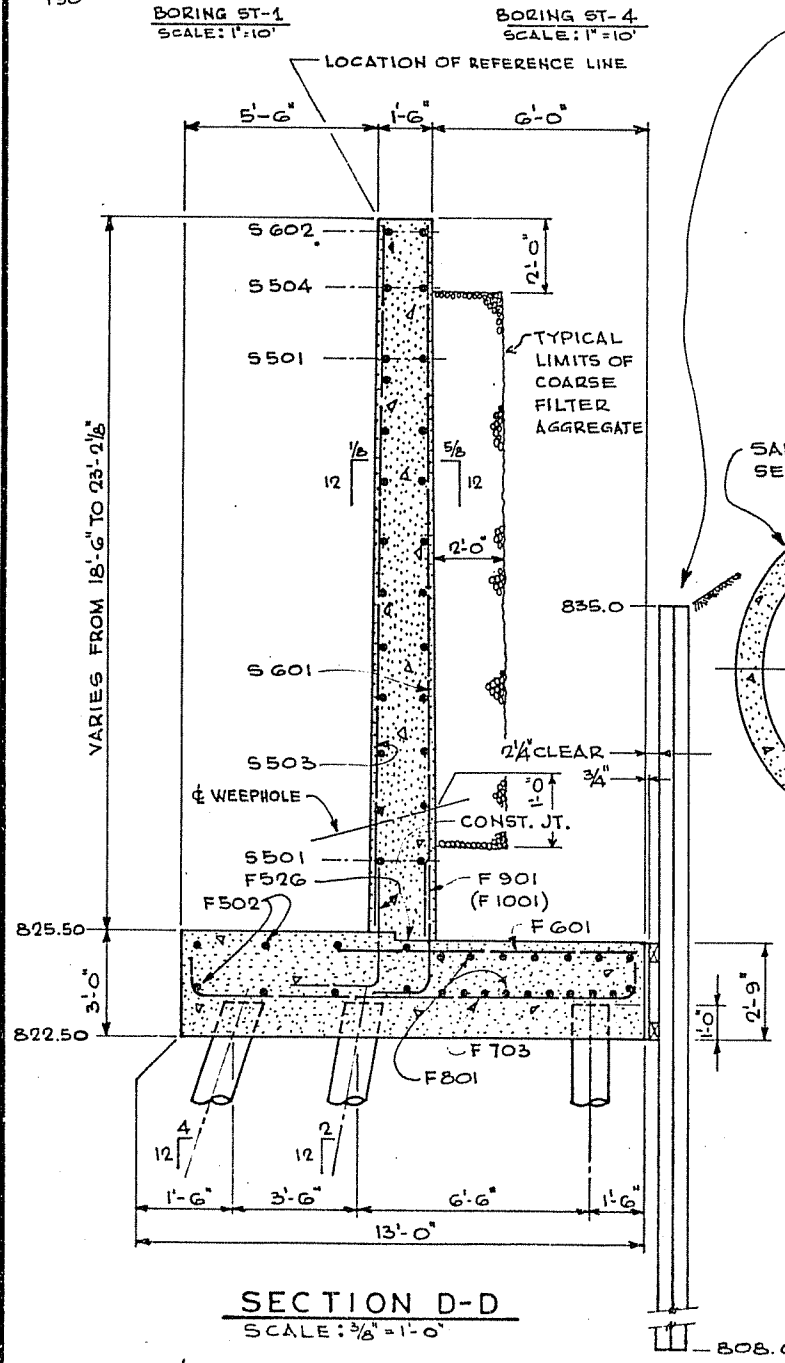
GROUP	BILLED ON SH.	USED ON SH.
A	B-3	B-3, B-4, B-5, B-10, B-11
B	B-3	B-3, B-4, B-5, B-10, B-11
C	B-3	B-3, B-4, B-5, B-10, B-11
D	B-3	B-3, B-4, B-5, B-10, B-11
E	B-3	B-3, B-4, B-5, B-10, B-11
F	B-3	B-3, B-4, B-10
G	B-4	B-4, B-5, B-10, B-11, B-12
H	B-5	B-5, B-11, B-12
I	B-5	B-5, B-11, B-12
J	B-5	B-5, B-6, B-7, B-12, B-13
K	B-5	B-5, B-6, B-12
L	B-5	B-5, B-6, B-12
M	B-5	B-5, B-6
N	B-5	B-5, B-6
O	B-6	B-6, B-12
P	B-6	B-6, B-7, B-13, B-14
Q	B-6	B-6
R	B-6	B-6
S	B-11	B-11
T	B-11	B-11
U	B-11	B-11
V	B-7	B-7, B-12, B-13
W	B-7	B-7, B-12, B-13
X	B-12	B-12, B-13
Y	B-13	B-13
Z	B-13	B-13

REINFORCEMENT BAR BENDING DIAGRAMS





TYPICAL SHEET PILING SHOWN IN PLACE AT MOST SEVERE LOCATION, ABOUT STA. 12+75 (SEE SH. B-4 AND B-11) RELATION TO FOOTING FORM IS SUGGESTION ONLY AND MAY BE VARIED BY CONTRACTOR. CONTRACTOR IS RESPONSIBLE FOR METHODS, WHETHER HE ACCEPTS SUGGESTED ARRANGEMENT OR NOT. MAXIMUM TEMPORARY SLOPE ALLOWED IS 1/2:1 ABOVE SHEET PILES. SEE ALSO NOTE 5, SH. B-2



B-19

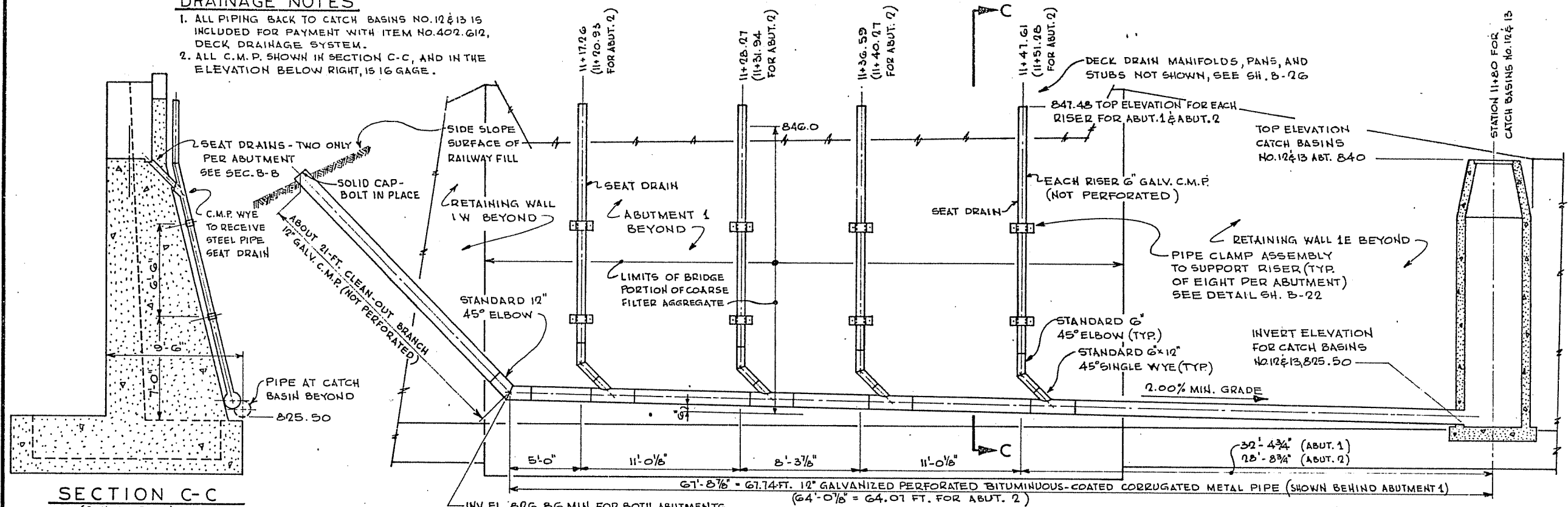
TITLE: WALLS 1E AND 2E
TYPICAL SECTIONS

DES: RYM	DR: W.K.	APPROVED:
CHK: RBW	CHK: RYM	
Sheet No. 39 of 59	Sheets 0	

- NOTES:**
- SEC. D-D IS FROM SH. B-3. SIMILAR SECTION ON SH. B-4, B-5, B-10, AND B-11
 - SEC. L-L IS FROM SH. B-5. SIMILAR SECTION ON SH. B-11 AND B-12.
 - SEC. M-M IS FROM SH. B-6. SIMILAR SECTION ON SH. B-5, B-6 AND B-12.
 - SECTIONS N-N, P-P AND Q-Q ARE FROM SH. B-8. SIMILAR SECTIONS ARE B-13, AND B-14.
 - IN GENERAL, SECTIONS ARE SHOWN FOR WALL 1E AND THE SECTIONS FOR WALL 2E ARE "SIM." MEANING "SIMILAR". IN THE SECTION MARKS ARE SHOWN FOR WALL 1E AND BAR MARKS FOR WALL 2E MAY BE FOR THE PLAN AND ELEVATION VIEWS.

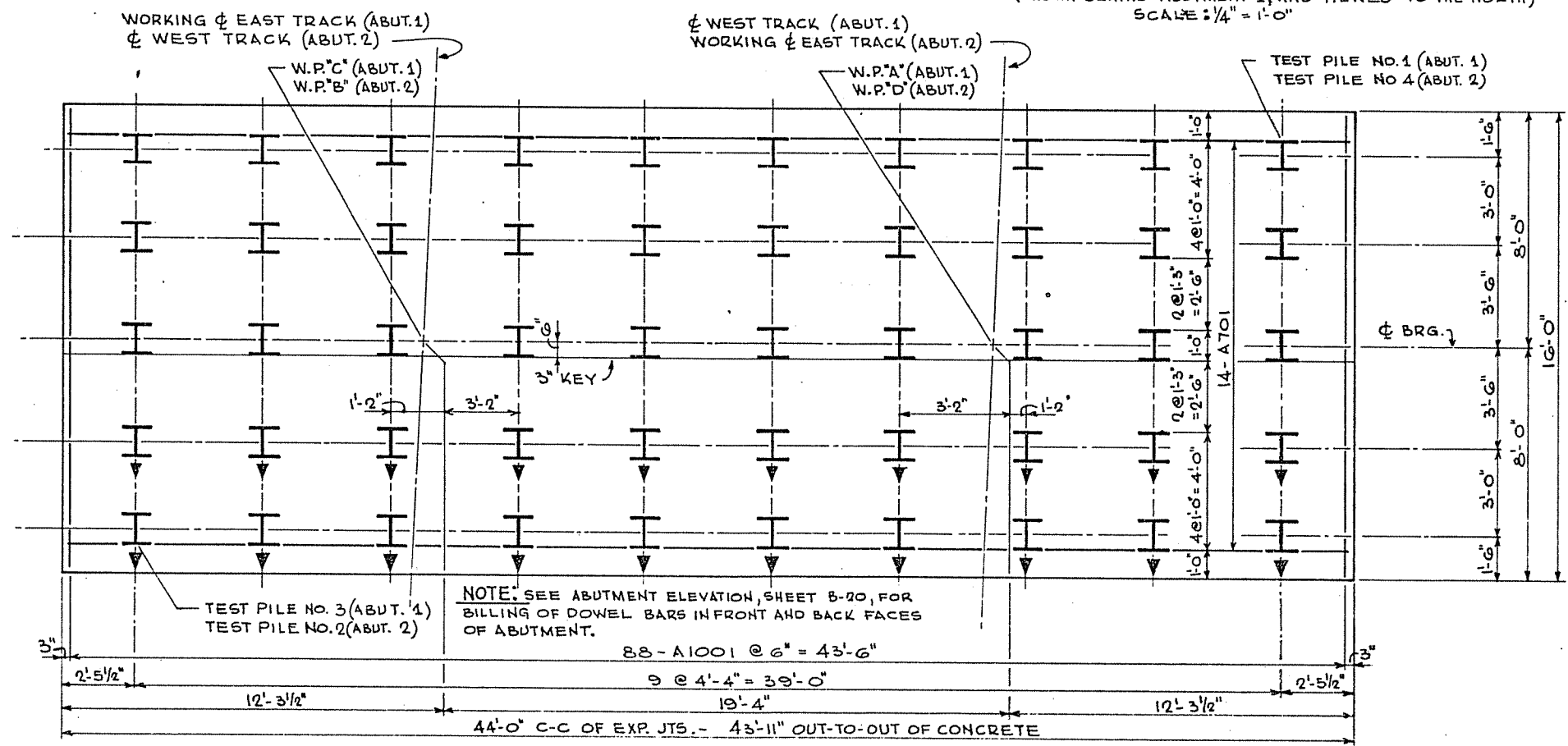
DRAINAGE NOTES

1. ALL PIPING BACK TO CATCH BASINS NO. 12 & 13 IS INCLUDED FOR PAYMENT WITH ITEM NO. 402.612, DECK DRAINAGE SYSTEM.
2. ALL C.M.P. SHOWN IN SECTION C-C, AND IN THE ELEVATION BELOW RIGHT, IS 16 GAGE.



SECTION C-C
(SCHEMATIC)
SCALE: 1/4" = 1'-0"

ELEVATION OF DECK DRAIN AND UNDERDRAIN PIPING BEHIND ABUTMENTS
(SHOWN BEHIND ABUTMENT 1, AND VIEWED TO THE NORTH)
SCALE: 1/4" = 1'-0"



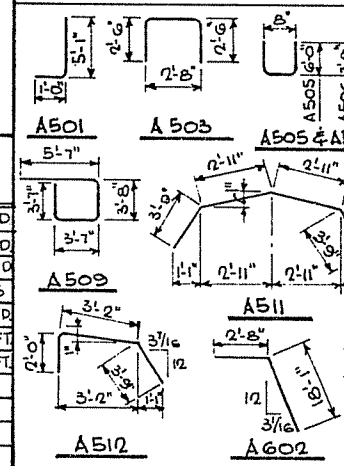
FOOTINGS PLAN
SCALE: 3/8" = 1'-0"

BILL OF REINFORCEMENT FOR TWO ABUTMENTS

MARK	NO.	LENGTH	SHAPE	LO.
A501	60	6'-0"	┘	DO
A502	60	17'-6"	┘	VE
A503	48	7'-6"	┘	TR
A504	56	43'-6"	┘	AB
A505	52	12'-6"	┘	BAC
A506	30	16'-0"	┘	BAC
A507	82	4'-6"	┘	BAC
A508	20	33'-0"	┘	BAC
A509	24	16'-2"	┘	AB
A510	44	7'-8"	┘	AB
A511	4	13'-2"	┘	BAC
A512	8	8'-9"	┘	BAC
A513	4	6'-4"	┘	BAC
A514	8	3'-5"	┘	BAC

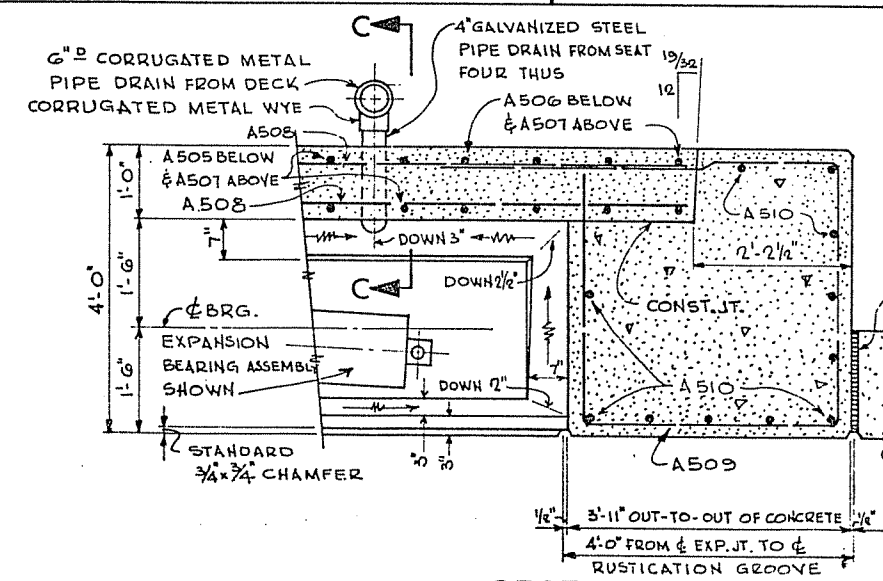
A601	60	6'-4"	┘	DO
A602	60	20'-9"	┘	VE
AT01	28	43'-6"	┘	FO
A1001	176	17'-1"	┘	FO

REINFORCEMENT BENDING DIAGRAM

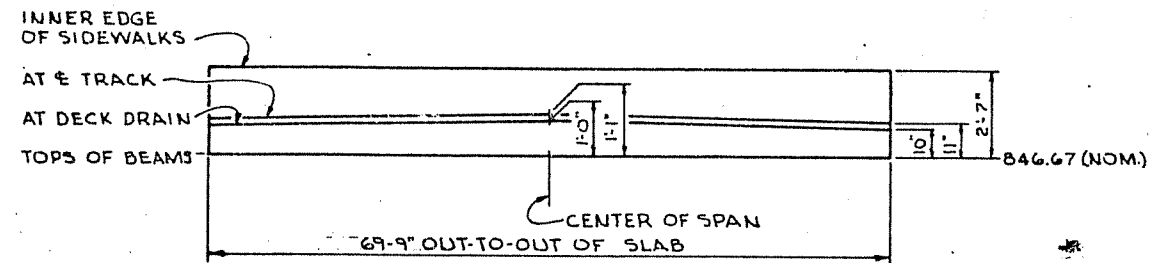


SUMMARY OF QUANTITIES FOR TWO ABUTMENTS

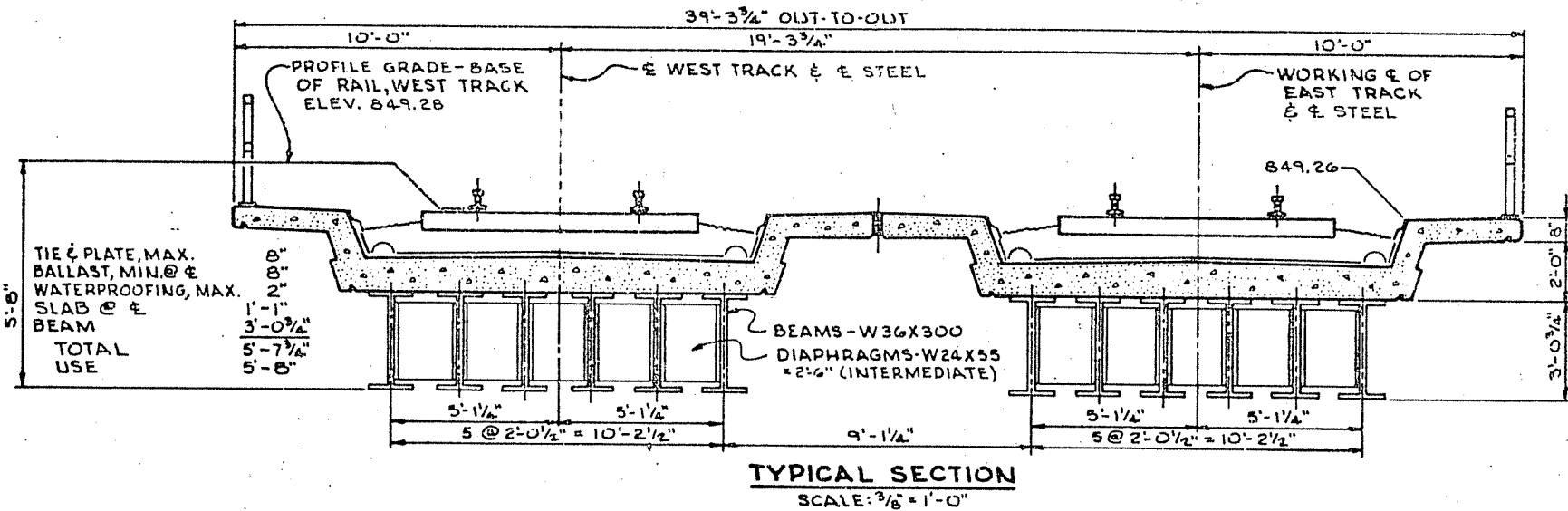
CONCRETE, MIX NO. 1A43	202 CU.YD.
CONCRETE, MIX NO. 3Y43	388 CU.YD.
STRUCTURE EXCAVATION, CLASS U (P)	341 CU.YD.
REINFORCEMENT BARS	25,580 LBS.
COARSE FILTERED AGGREGATE	130 CU.YD.
STEEL H-PILING DRIVEN	5090 LIN.FT.
STEEL H-PILING DELIVERED	5090 LIN.FT.
FOUR STEEL H-TEST PILES IN PLACE, 70-FT. LONG	



SECTION B-B
SCALE: 3/4" = 1'-0"
(FROM SH. B-20)



DECK PROFILE FOR DRAINAGE
NOT TO SCALE



DESIGN DATA FOR BEAMS:

LIVE LOAD: COOPER'S E-80 WITH DIESEL IMPACT
DEAD LOAD PER BEAM:

BEAM & DETAILS	316 LB/FT
CONCRETE DECK	492 LB/FT
SUB-TOTAL, NON-COMPOSITE	808 LB/FT
BALLAST, TIES & TRACK	263 LB/FT
SUB-TOTAL, COMPOSITE	263 LB/FT
TOTAL DEAD LOAD PER BEAM	1071 LB/FT

PROPERTIES OF BEAM:

NON-COMPOSITE:	COMPOSITE (LONG-TERM)	COMPOSITE (SHORT-TERM)
A = 88.17 SQ. IN.	A = 99.91 SQ. IN. EQUIV.	A = 123.39 SQ. IN. EQUIV.
A _w = 34.73 SQ. IN.	A _w = 34.73 SQ. IN.	A _w = 34.73 SQ. IN.
I = 20,290 IN ⁴	I = 26,441 IN ⁴	I = 35,308 IN ⁴
Y _T = 18.36 IN.	Y _T = 27.02 IN.	Y _T = 22.97 IN.
Y _B = 18.36 IN.	Y _B = 21.20 IN.	Y _B = 25.25 IN.
S _T = 1105 IN ³	S _T = 979 IN ³	S _T = 1537 IN ³
S _B = 1105 IN ³	S _B = 1247 IN ³	S _B = 1398 IN ³

TABULATION OF FORCES AND MOMENTS:

	MAX. SHEAR	MAX. MOMENT
D.L. (N. COMP.)	27.05 K/BEAM	2719 FT-K/TRACK
D.L. (COMP. LT.)	8.82 K/BEAM	887 FT-K/TRACK
L.L.+I (COMP. ST.)	101.48 K/BEAM	9053 FT-K/TRACK

TABULATION OF STRESSES:

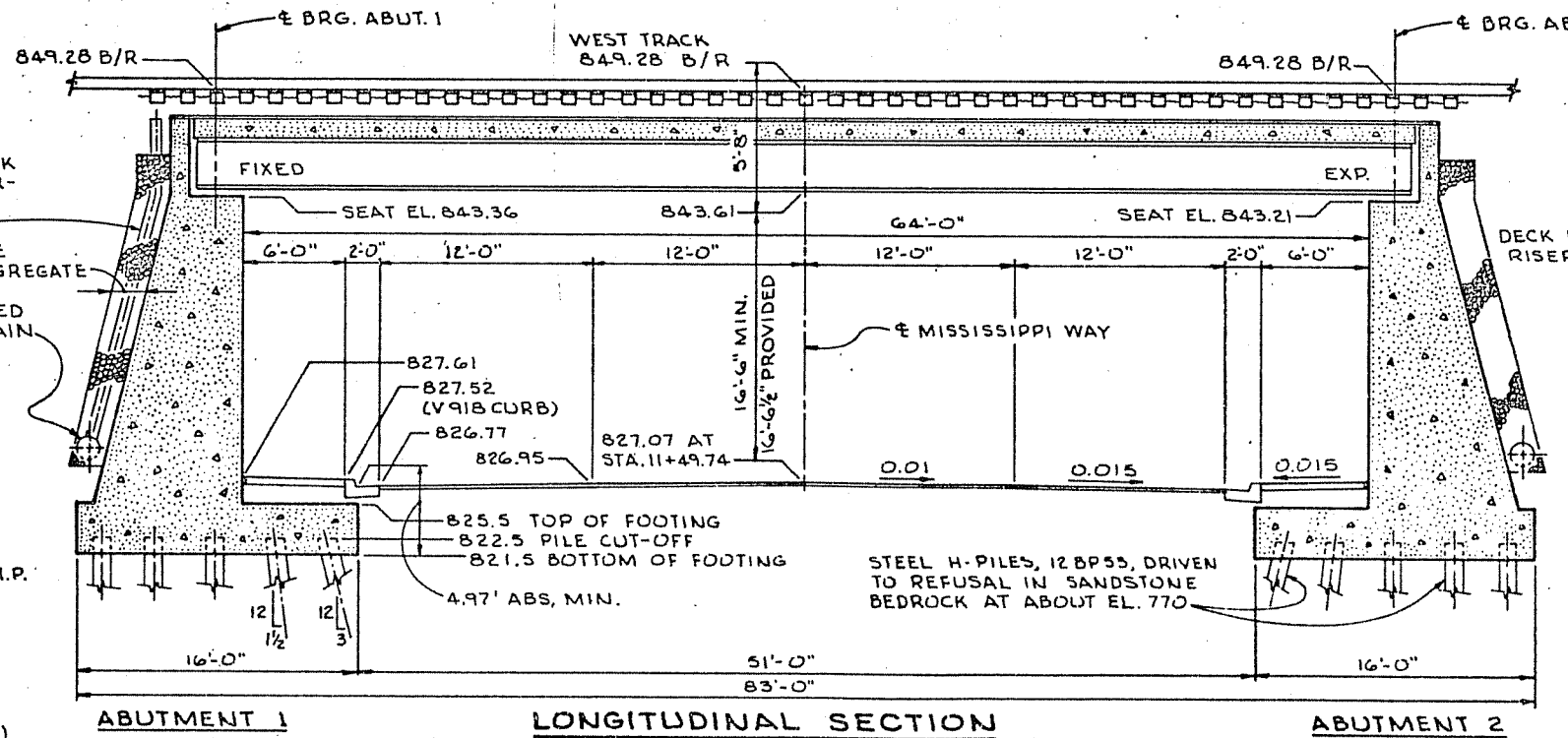
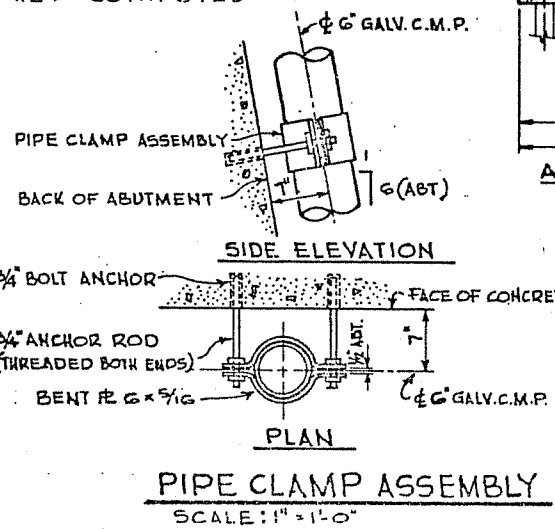
MAXIMUM SHEAR STRESS:	MAX. BENDING STRESS, STL.	MAX. BENDING STRESS, CONC.
D.L. (N. COMP.) 27.05/34.73 = 0.78 KSI	12 (2719)/(1105)(6) = 4.92 KSI	12 (887)/(24) (179)(6) = -0.076 KSI
D.L. (COMPLT.) 8.82/34.73 = 0.25 KSI	12 (887)/(1247)(6) = 1.42 KSI	12 (9053)/(6) (1537)(6) = -1.472 KSI
LL+I (COMP. ST.) 101.48/34.73 = 2.92 KSI	12 (9053)/(1398)(6) = 12.95 KSI	TOTAL - 1.548 KSI
TOTAL 3.95 KSI	TOTAL 19.29 KSI	

TABULATION OF LIVE LOAD DEFLECTIONS:

NOTE: THIS DESIGN IS GOVERNED BY DEFLECTIONS, NOT BY STRESSES, AS FOLLOWS:
 $\Delta_{L+I} = 12 (67) / (640) = 1.26$ PERMITTED
 $\Delta_{L+I} = (5)(67)^2 (12)^3 (1.431) (808/67) / (384)(29,000)(35,308)(6) = 1.24$ COMPUTED

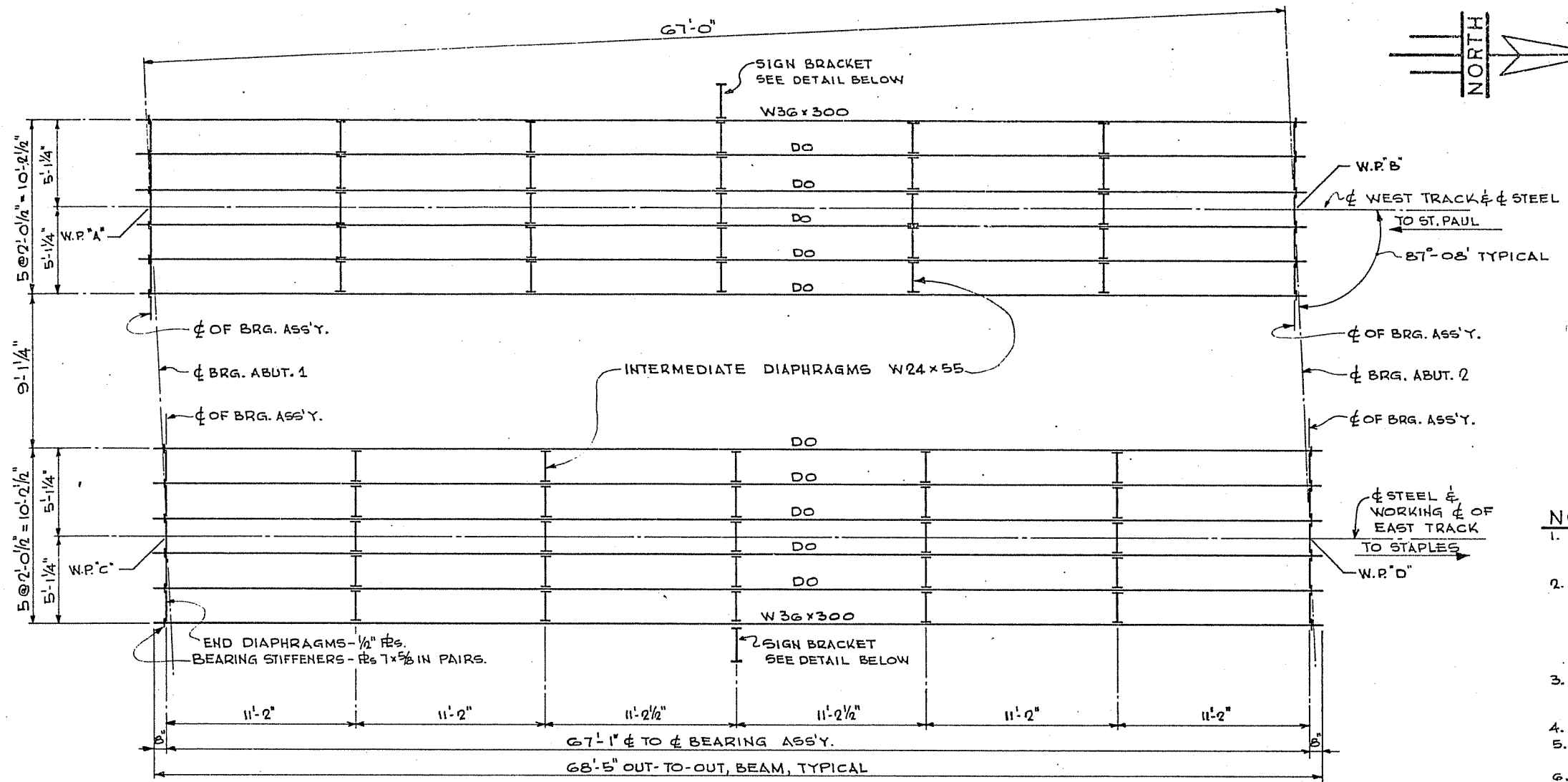
PREFORMED JOINT FILLER LIST				
TYPE	NO.	SIZE	LOCATION	SEE SH. NO.
CORK	4	18'-2" x 3'-0" MAX.	ENDS OF ABUTS	B-2, B-20
CORK	4	13'-0" x 3'-0" MAX.	ENDS OF ABUT. FIG.	B-20
POLYSTYRENE	1	2" x 6" x 69'-9"	LONG. MEDIAN	B-24
CORK	6	3/4" x 8" x 4'-11" NET.	TRANS. MEDIAN	B-24
CORK	6	3/4" x 8" x 5'-4" NET.	TRANS. SWK.	B-24

ALL JOINT FILLERS, BUTYL RODS, SEALERS, ETC. REQUIRED BY THE PLANS, SHALL BE PROVIDED WHETHER IN THIS LIST OR NOT, AND INCLUDED WITH OTHER ITEMS FOR PAYMENT.

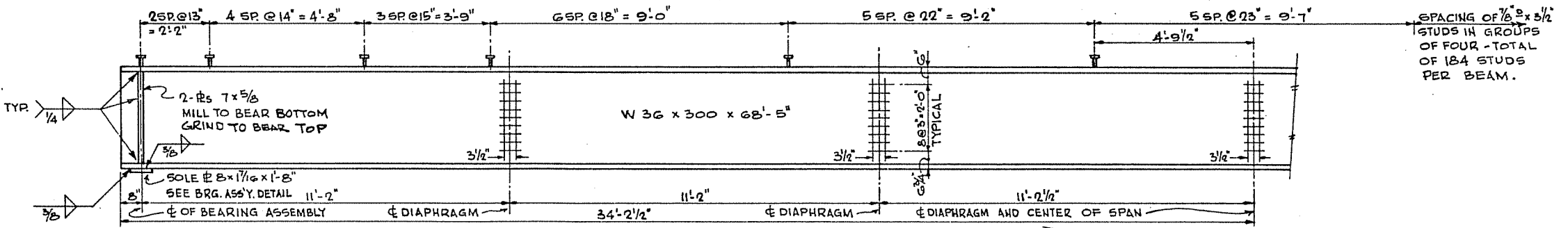


PIPE CLAMP ASSEMBLY NOTES

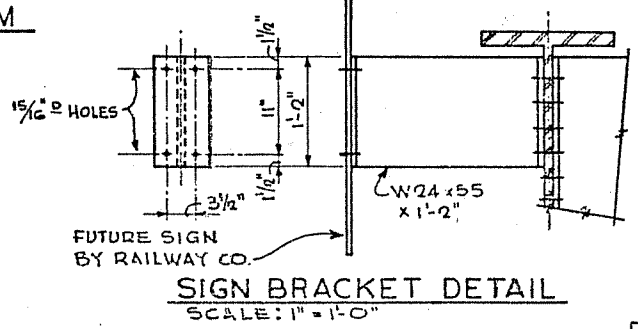
- ASSEMBLIES SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH M.H.D. 3302 & 3304
- TOTAL OF SIXTEEN ASSEMBLIES REQUIRED, EIGHT PER ABUTMENT. SEE SH. B-21.
- PIPE CLAMP ASSEMBLIES, COMPLETE AND IN PLACE ARE INCLUDED FOR PAYMENT WITH ITEM 402, G12, DECK DRAINAGE SYSTEM.



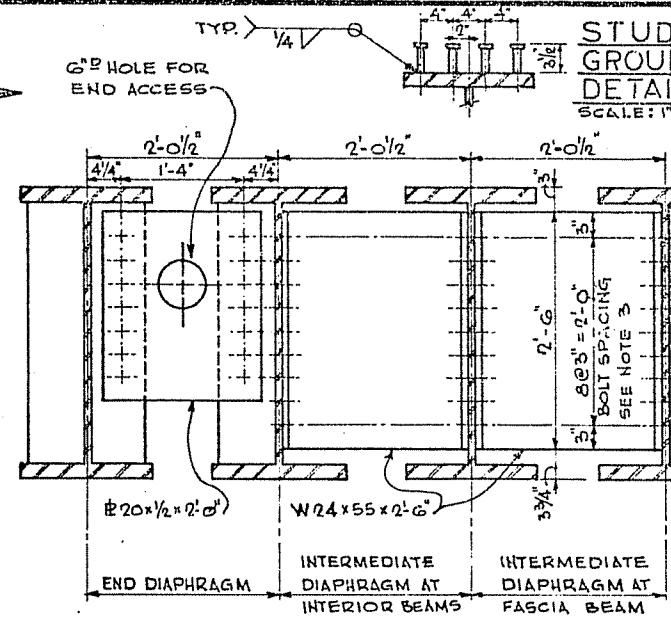
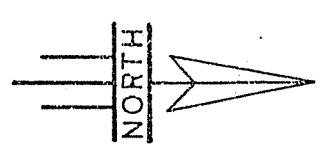
FRAMING PLAN
SCALE: 1/4" = 1'-0"



TYPICAL ELEVATION OF HALF-BEAM
SCALE: 1/2" = 1'-0"



SIGN BRACKET DETAIL
SCALE: 1" = 1'-0"



DIAPHRAGM DETAILS
SCALE: 1" = 1'-0"

NOTES:

1. STRUCTURAL STEEL FOR EXPANSION DEVICES, BEARING ASSEMBLY, RAILINGS SHALL CONFORM TO M.H.D. 3306 (ASTM - A36). ALL OTHER STEEL SHALL CONFORM TO M.H.D. 3309 (ASTM - A588).
2. NO STRUCTURAL STEEL SHALL BE PAINTED. THE M.H.D. 3306 SHALL BE GALVANIZED IN ACCORDANCE WITH M.H.D. 3392 OR M.H.D. 3393 APPLICABLE. THE M.H.D. 3309 STEEL SHALL BE ALLOWED TO WEATHER. ALL WELDS AND ALL BOLTS USED FOR M.H.D. 3309 STEEL SHALL BE COMPATIBLE WITH SUCH STEEL AS TO WEATHERING PROPERTIES. SEE SPECIAL PROVISIONS.
3. BOLTS FOR DIAPHRAGMS SHALL BE HIGH-STRENGTH STRUCTURAL BOLTS CONFORMING TO AT LEAST ASTM - A325 AS TO STRENGTH AND TO NOTE 2 AS TO WEATHERING PROPERTIES. ALL BOLTS SHALL BE GALVANIZED.
4. SEE SHEET B-25 FOR BEARING ASSEMBLIES.
5. NO BEAM CAMBER IS REQUIRED, BUT BEAMS MUST BE PLACED AS TO EXISTING NATURAL CAMBER IS UPWARD.
6. FULL ASSEMBLY REAMING WILL BE REQUIRED AS PER M.H.D. 247.
7. SEE SPECIAL PROVISIONS FOR CLEANING OF STEEL FOR UNIFORM APPEARANCE.

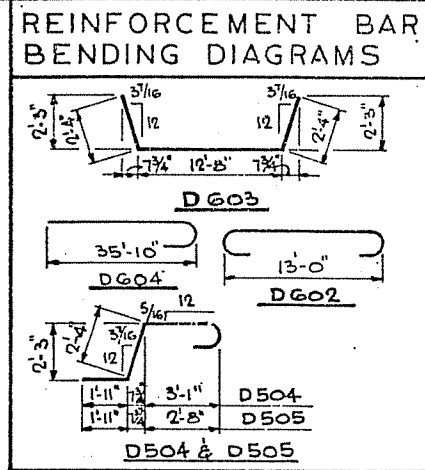
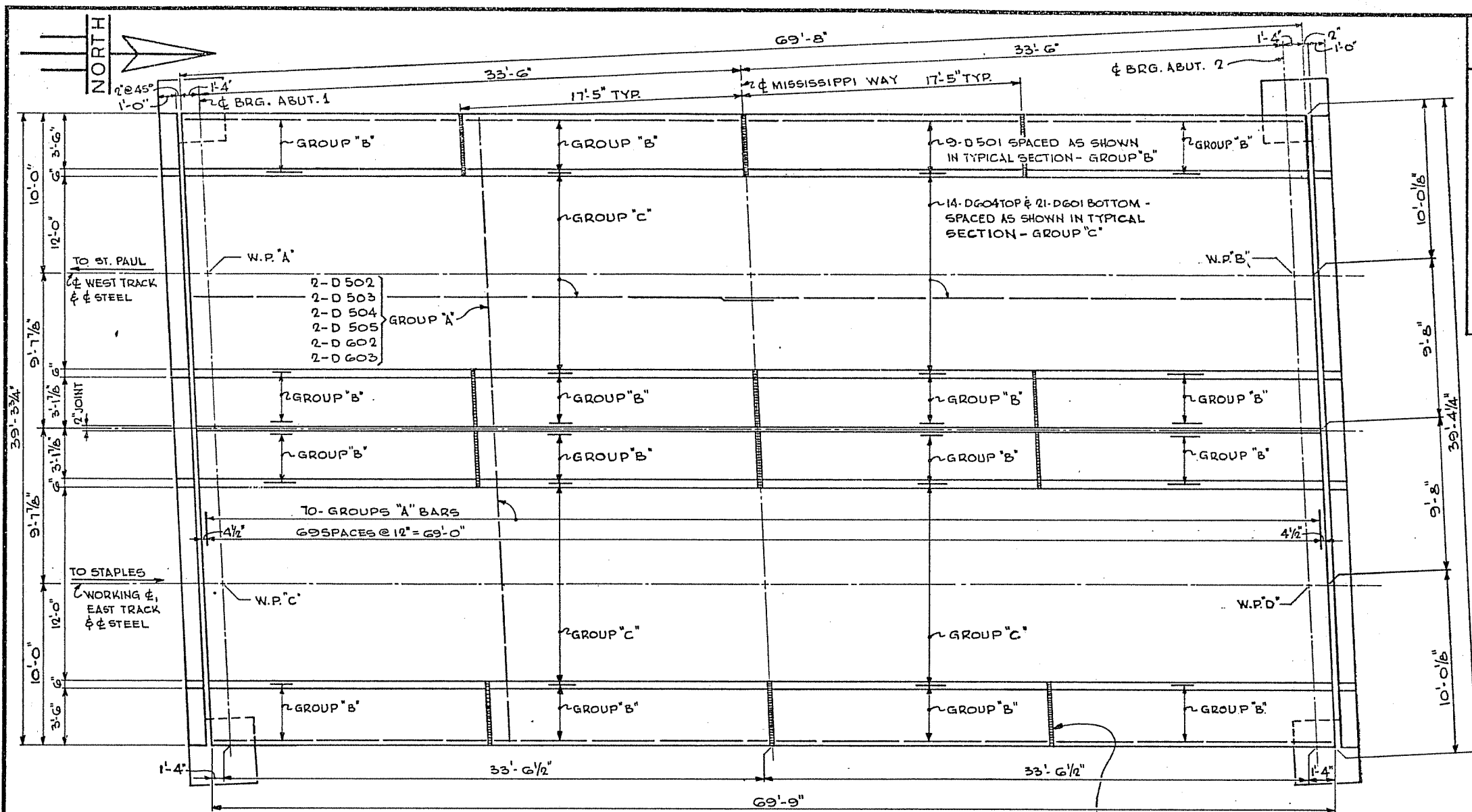
QUANTITY NOTES:

1. ALL BEAMS, SOLE PLATES, DIAPHRAGMS, AND THEIR BOLTS AND WELD METAL, ARE TO BE WEIGHED IN ITEM 2402.521, STRUCTURAL STEEL.
2. EXPANSION DEVICES, RAILINGS, FLASHING, DECK WATERPROOFING, WITH THEIR ANCHORAGES, BOLTS, AND WELD METAL, ARE TO BE WEIGHED IN ITEM 2402.522, DECK WATERPROOFING.
3. BEARING ASSEMBLIES SHALL INCLUDE FILLERS, SHEET LEAD, AND ANCHOR BOLTS.
4. DECK DRAINAGE SYSTEM INCLUDES ALL MATERIALS AND LABOR AS NOTED IN NOTES ON SHEETS B-21 AND B-26.
5. DECK WATERPROOFING INCLUDES COATING, SHEET, ANTI-BONDING PAPER, ALL MATERIALS AND LABOR AS NOTED IN NOTES ON SHEETS B-21 AND B-26.

SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE

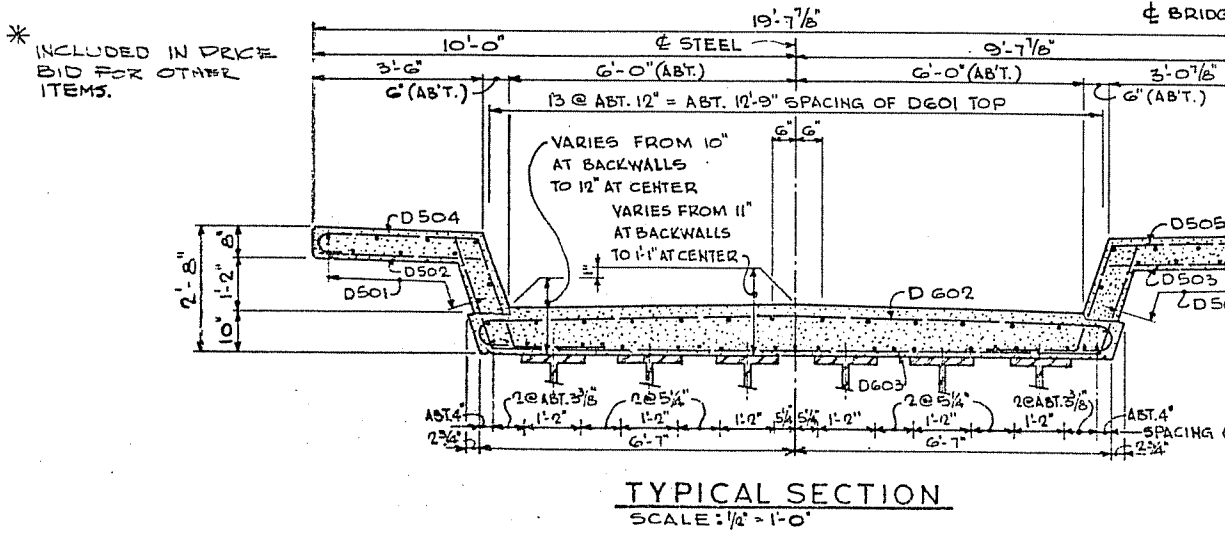
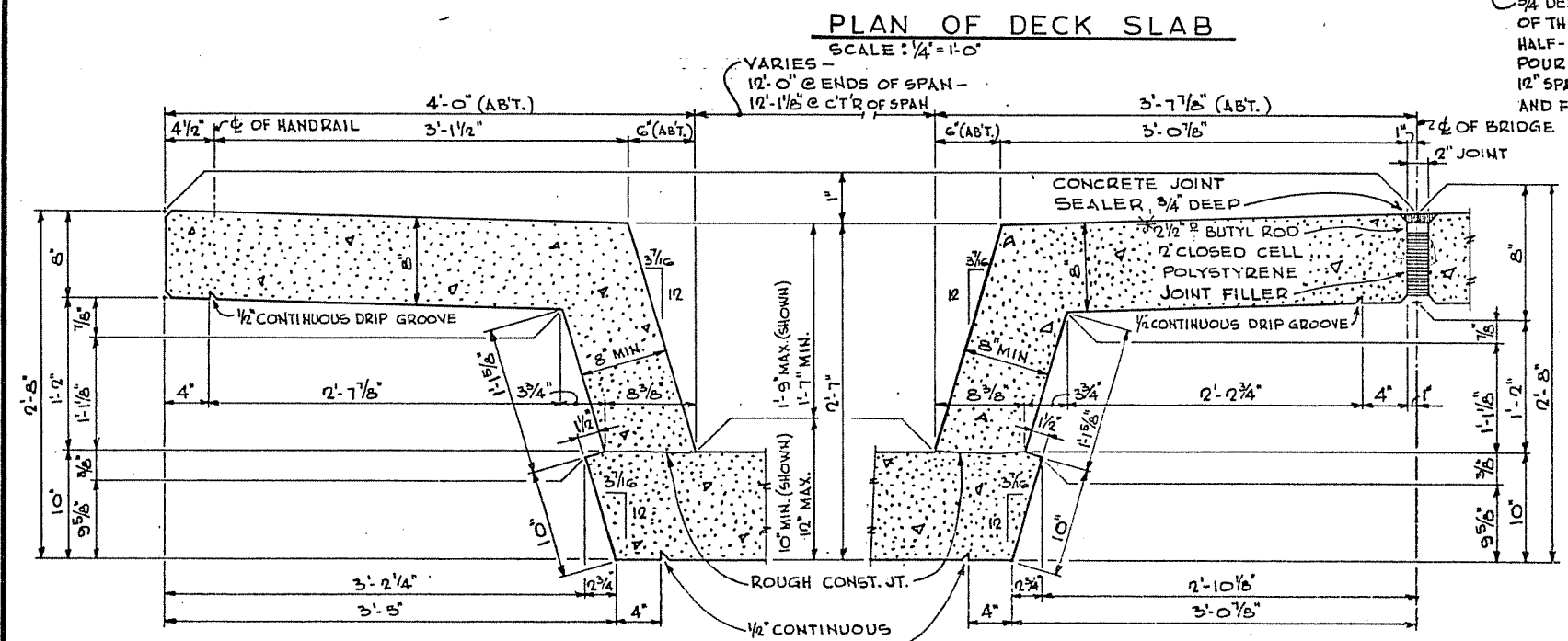
CONCRETE MIX NO 3433	19,9
REINFORCEMENT BARS	19,9
STRUCTURAL STEEL, M.H.D. 3309	263,8
STRUCTURAL STEEL, M.H.D. 3306	9,7
FIXED BEARING ASSEMBLIES (TYPE 1)	
EXPANSION BEARING ASSEMBLIES (TYPE 1)	
DECK DRAINAGE SYSTEM	
DECK WATERPROOFING (P)	2,17

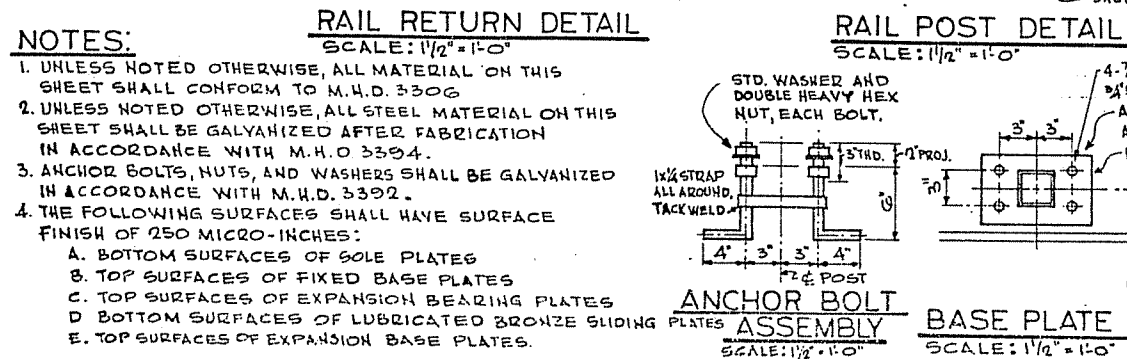
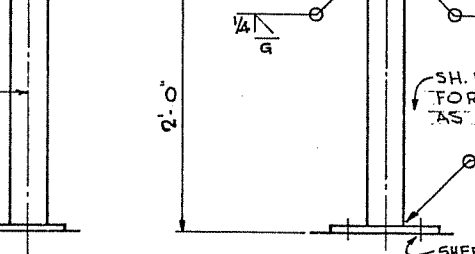
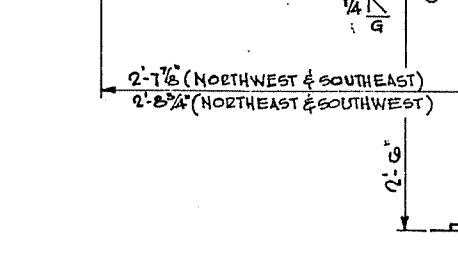
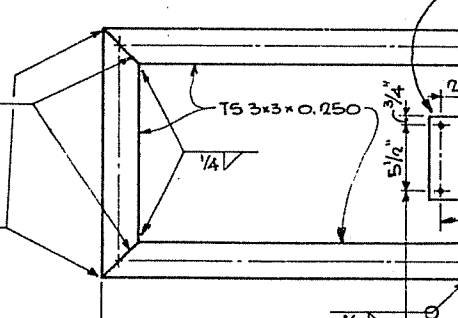
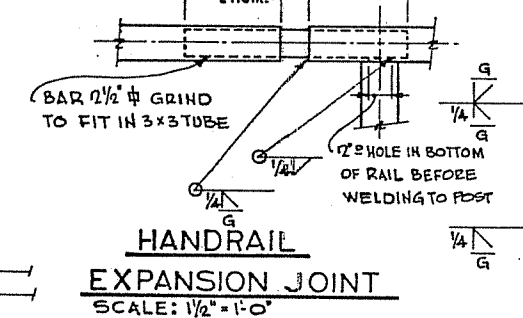
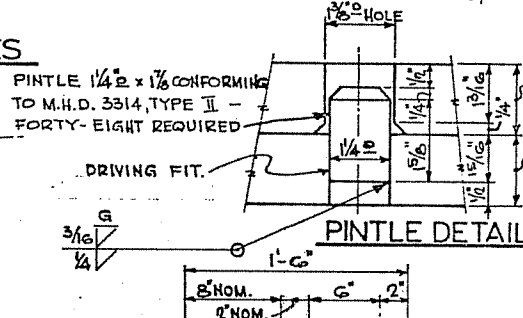
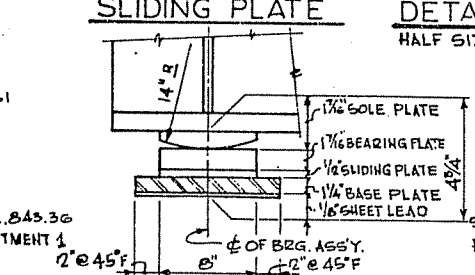
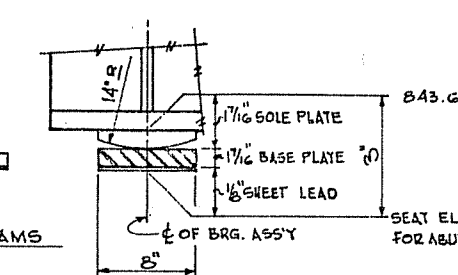
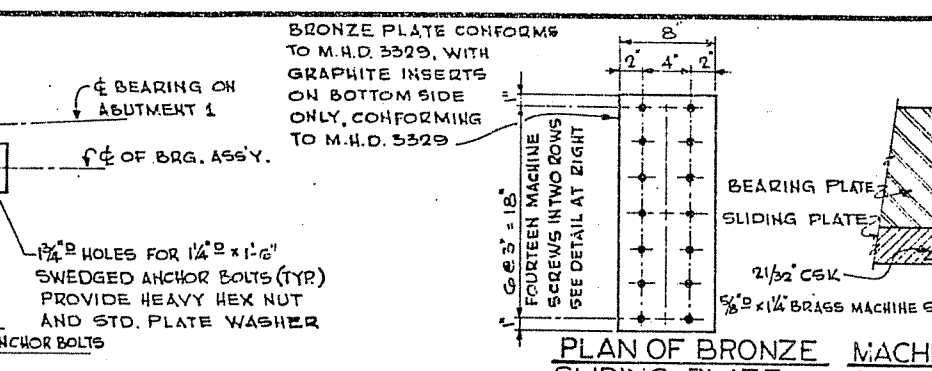
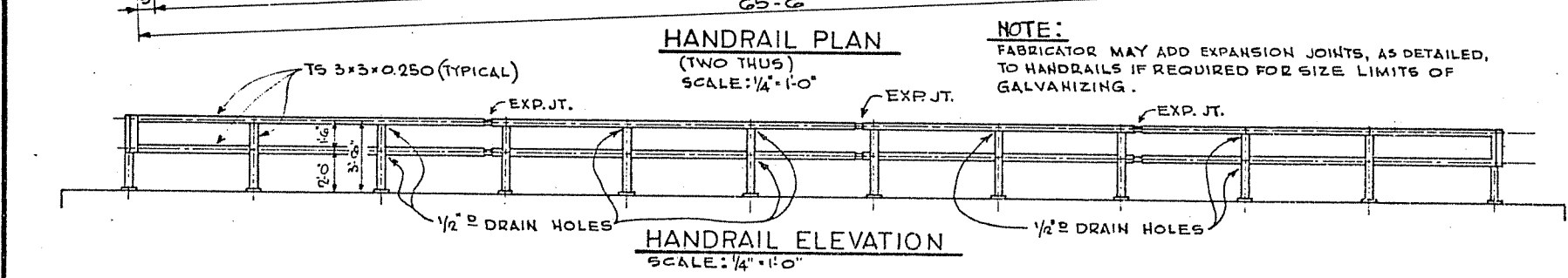
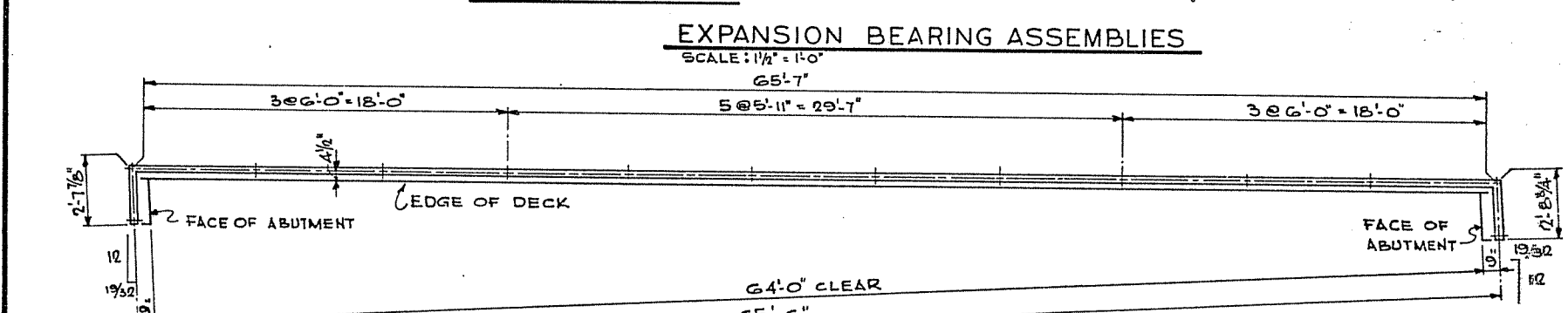
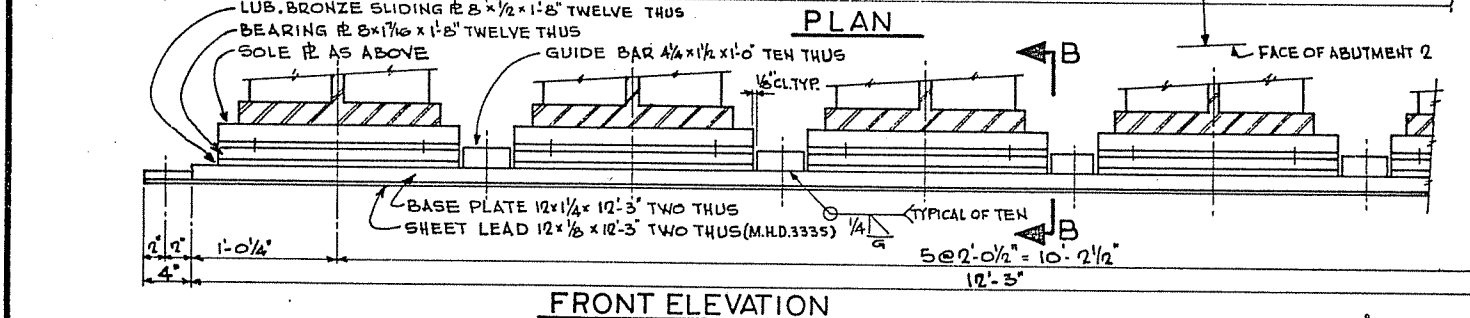
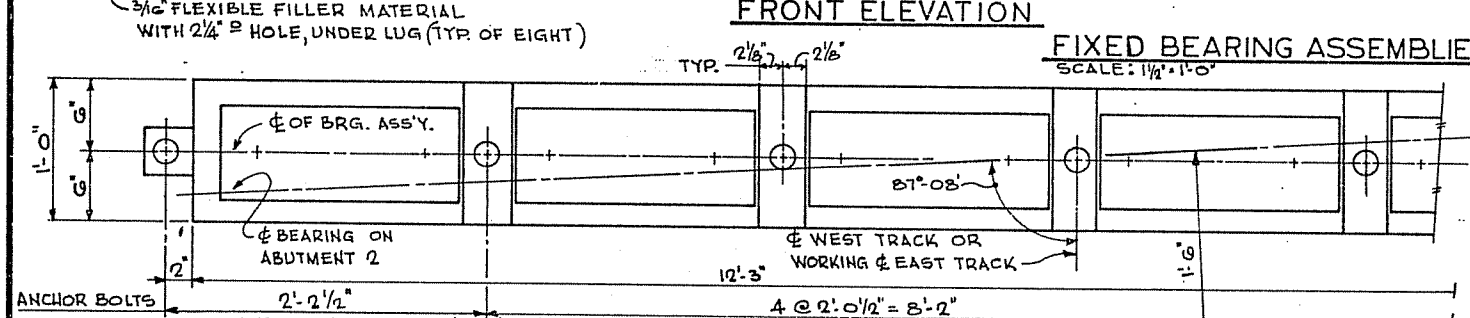
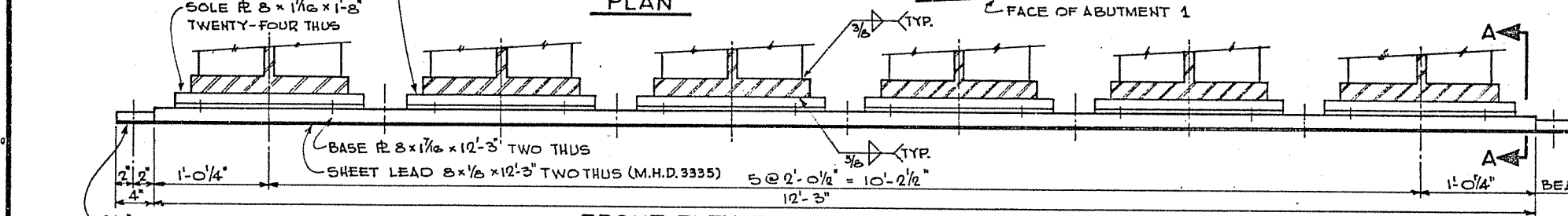
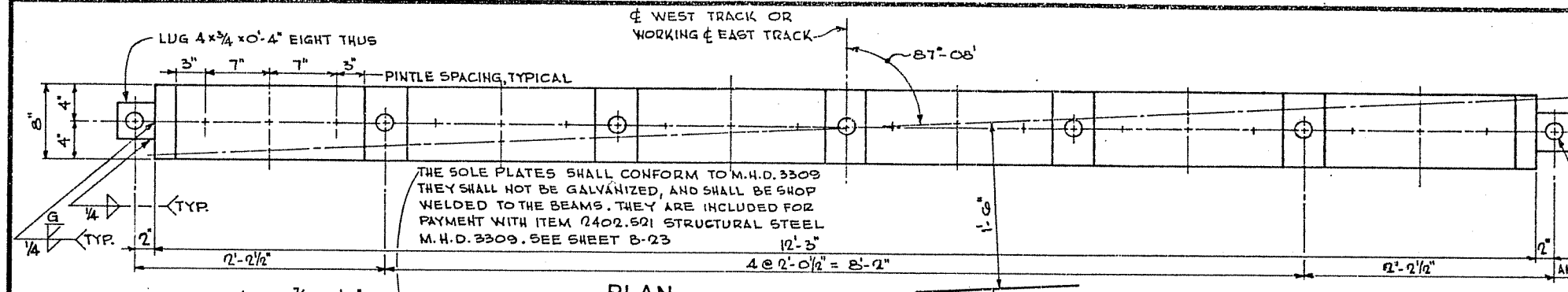
DES: R.M.M.	DR: W.K.	APPROVED:
CHK: W.C.M.	CHK: R.M.M.	



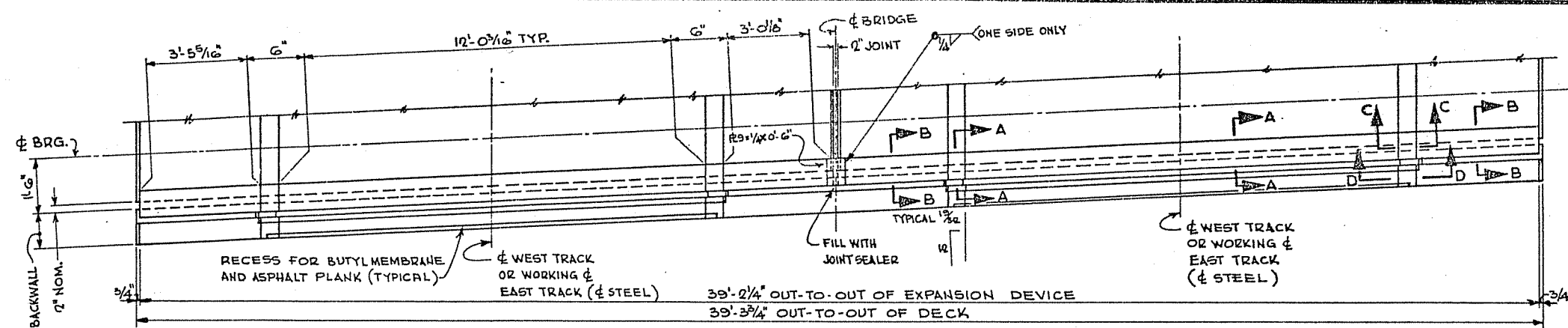
MARK	NO.	LENGTH	SHAPE	L
D501	144	17'-0"	—	SW
D502	140	3'-3"	—	SID
D503	140	2'-10"	—	ME
D504	140	7'-10"	—	SID
D505	140	7'-5"	—	ME
D601	84	35'-10"	—	SL
D602	140	14'-4"	—	SL
D603	140	17'-4"	—	SL
D604	56	36'-6"	—	SL

- NOTES:**
- CONCRETE FOR DECK SLABS, MEDIANS, AND SIDEWALKS SHALL BE...
 - SEE SHEET B-26 FOR DETAILS OF WATERPROOFING, DRAINAGE, AND FOR EXPANSION.
 - THE 2" OPENING AT THE EXPANSION END IS COMPUTED, WITH 2" BEING THE 2" OPENING AT THE FIXED END IS A JUDGEMENT AS TO THE MINIMUM. THUS BOTH OPENINGS, AND BOTH DEVICES, ARE TH SHOWN ON SHEET B-26.
 - ALL CHAMFERS ARE 3/4" x 3/4"
 - COVER OF TRANSVERSE BARS D 602 AND D 603 IS 2" CLEAR. COVER #5 BARS IN SIDEWALKS AND MEDIANS IS 1 1/2" CLEAR.
 - THE POLYSTYRENE JOINT FILLER SHALL BE NAILED TO THE CO WHICHEVER HALF-MEDIAN IS PLACED FIRST; WITH TWO COPPER NAILS AT ABOUT 12" SPACING.
 - SEE SHEET B-25 FOR SIDEWALK RAILING AND ANCHOR BOLTS
 - EXPOSED EDGES AND UNDERSIDES OF SIDEWALKS; SLOPES SLABS SHALL RECEIVE SPECIAL SURFACE FINISH (NOT BOTTOM BETWEEN BEAMS.) TOPS OF SIDEWALKS AND MEDIANS SHALL STANDARD SIDEWALK FINISH. TOPS OF SLABS, AND UPPER S OF SIDEWALKS AND MEDIANS SHALL RECEIVE ORDINARY SU TO THE DEGREE REQUIRED FOR SURFACES TO BE WATERPR NOT EXPOSED TO VIEW. (SEE SPECIAL PROVISIONS FOR SPECIAL
 - SEE SHEET B-22 FOR PROFILE DRAWING OF DECK FOR DRAIN
 - GROUP "A" BARS MAY BE SHIFTED SLIGHTLY IF NECESSARY T DEFLECTION JOINTS.
 - BALLAST, TIES, HARDWARE, AND TRACK ARE BY THE RAILWAY C ARE NOT A PART OF THIS PROJECT.

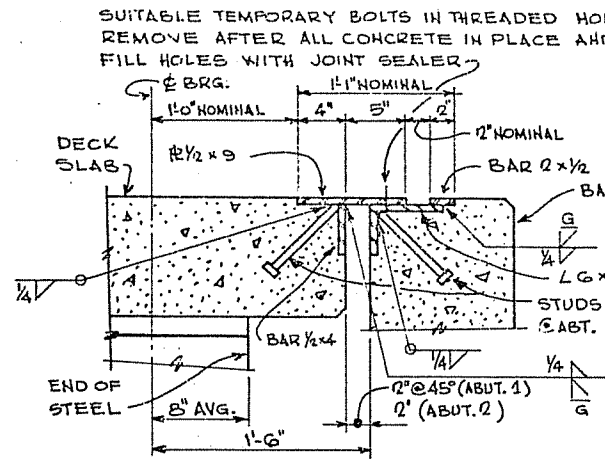




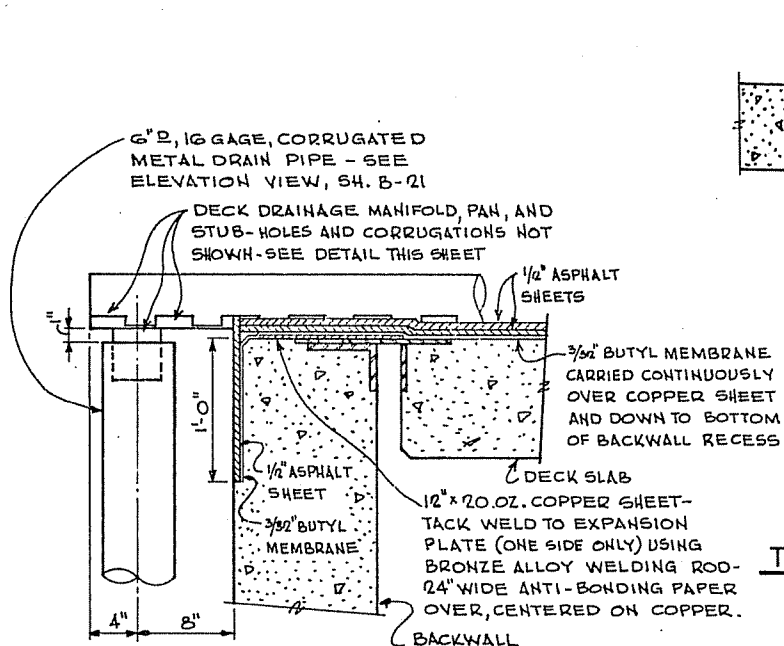
- NOTES:
- UNLESS NOTED OTHERWISE, ALL MATERIAL ON THIS SHEET SHALL CONFORM TO M.H.D. 3306
 - UNLESS NOTED OTHERWISE, ALL STEEL MATERIAL ON THIS SHEET SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH M.H.D. 3304.
 - ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH M.H.D. 3302.
 - THE FOLLOWING SURFACES SHALL HAVE SURFACE FINISH OF 250 MICRO-INCHES:
 - A. BOTTOM SURFACES OF SOLE PLATES
 - B. TOP SURFACES OF FIXED BASE PLATES
 - C. TOP SURFACES OF EXPANSION BEARING PLATES
 - D. BOTTOM SURFACES OF LUBRICATED BRONZE SLIDING PLATES
 - E. TOP SURFACES OF EXPANSION BASE PLATES.



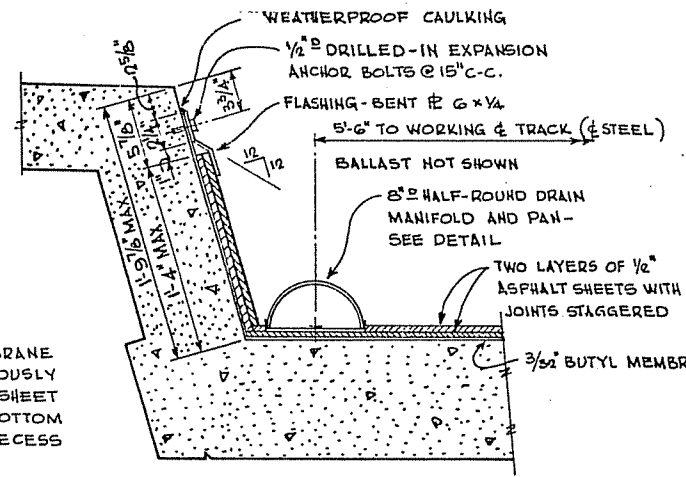
PLAN OF DEVICE FOR EXPANSION (ABUT. 1) AND FOR CONTRACTION (ABUT. 2)
SCALE: 1/2" = 1'-0"



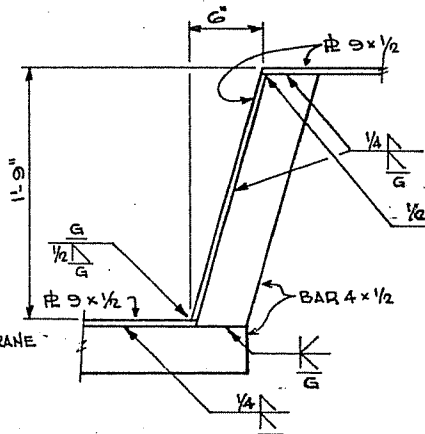
SECTION A-A
SCALE: 1/2" = 1'-0"



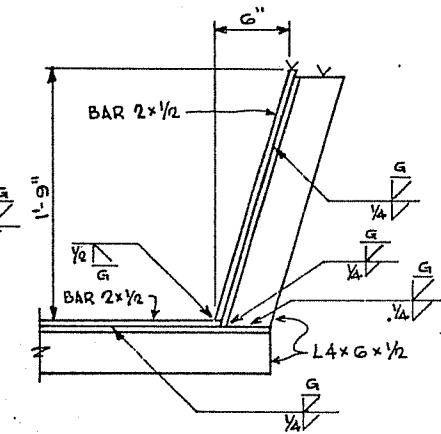
DECK WATERPROOFING AND DRAINAGE AT ABUTMENTS
(APPLIES TO DECK SLABS AND SLOPING SIDES, BETWEEN FLASHINGS)
SCALE: 1/2" = 1'-0"



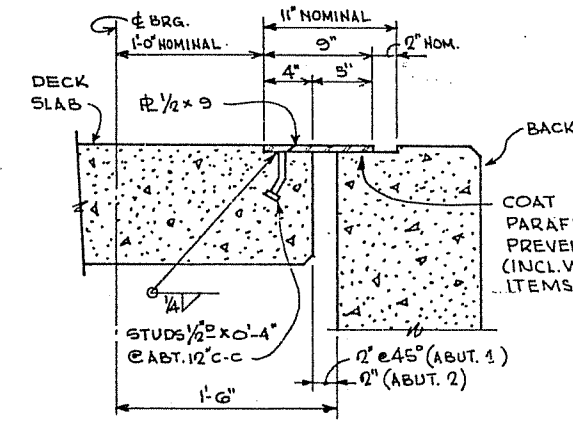
TYPICAL DECK WATERPROOFING AND DRAINAGE
SCALE: 1/2" = 1'-0"



SECTION C-C
SCALE: 1/2" = 1'-0"
(STUD ANCHORS, CONCRETE AND LG X 4 IN FOREGROUND, NOT SHOWN)



SECTION D-D
SCALE: 1/2" = 1'-0"
(STUD ANCHORS AND CONCRETE NOT SHOWN)



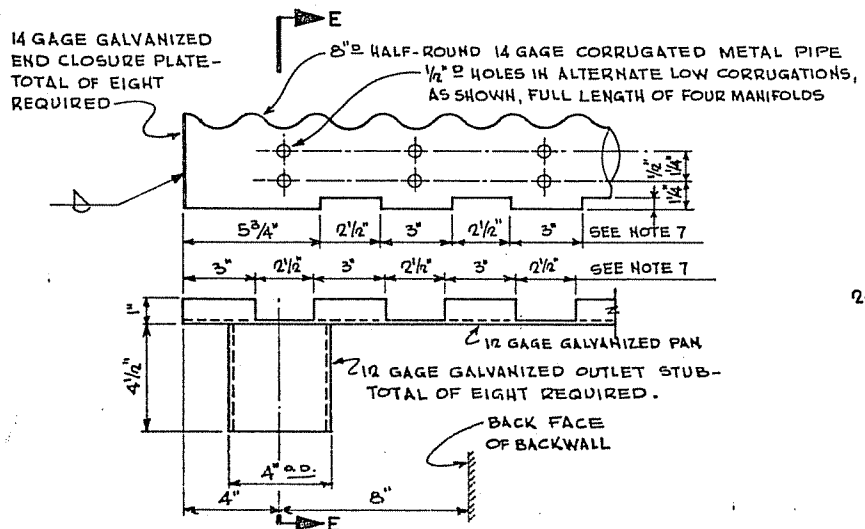
SECTION B-B
SCALE: 1/2" = 1'-0"

NOTES FOR WATERPROOFING AND DRAINAGE

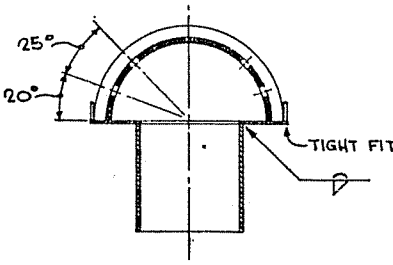
1. AT THE EXPANSION JOINT (ABUT. 1) AND AT ALL OF THE CONTRACTION JOINTS (ABUT. 2, MEDIANS AND SIDEWALKS) WELD A 1/4" BENT PLATE OVER TOP OF FLASHING ON ONE SIDE OF JOINT, AND SLOT THE OPPOSITE SIDE AS NECESSARY TO CLEAR FLASHING ANCHORAGE.
2. FLASHING SHALL BE GALVANIZED IN ACCORDANCE WITH M. H. D. 3394, BOLTS IN ACCORDANCE WITH M. H. D. 3392, AND REPAIRED AFTER WELDING IN ACCORDANCE WITH M. H. D. 2471.313
3. FLASHINGS AND BOLTS ARE MEASURED AND INCLUDED FOR PAYMENT WITH ITEM 2402.521, STRUCTURAL STEEL, (M. H. D. 3306).
4. HALF-ROUND DRAIN MANIFOLDS, PANS, AND DRAIN PIPE IN PLACE TO CATCH BASINS NO 12 AND 13, COMPLETE AND READY FOR OPERATION, COMPRISE ITEM 402.612, DECK DRAINAGE SYSTEM. PIPING FROM ABUTMENT SEATS IS SPECIFICALLY INCLUDED.
5. BUTYL MEMBRANE, ASPHALT SHEETS, ANTI-BONDING PAPER, COPPER SHEET, AND ALL REQUIRED ADHESIVES, COATINGS, AND INCIDENTALS, COMPLETE AND READY TO RECEIVE BALLAST, COMPRISE ITEM 481.603, DECK WATERPROOFING.
6. REFER TO THE RELEVANT SECTIONS OF SPECIAL PROVISIONS DEALING WITH DECK WATERPROOFING AND DRAINAGE.
7. THE HALF-ROUND DRAIN MANIFOLDS ARE 8" DIA, 14 GAGE, CORRUGATED METAL PIPE WITH NOMINAL 2 3/8" x 1/2" CORRUGATIONS. THE ALTERNATING 3" AND 2 1/2" DIMENSIONS ALONG MANIFOLD AND PAN SHALL BE ADJUSTED AS NECESSARY TO EXACTLY MATCH CORRUGATIONS.
8. DRAIN MANIFOLDS AND PANS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH M. H. D. 3394, BUT HOLES MAY BE DRILLED AFTER GALVANIZING.
9. GALVANIZING DAMAGE IN FIELD SHALL BE REPAIRED IN ACCORDANCE WITH M. H. D. 2471.313, AND M. H. D. 3227 TYPE A.
10. PAN SECTIONS MAY BE PLACED BY ABUTTING TIGHTLY END-TO-END. MANIFOLD SECTIONS SHALL BE OVERLAPPED ONE CORRUGATION.

NOTES FOR EXPANSION & CONTRACTION

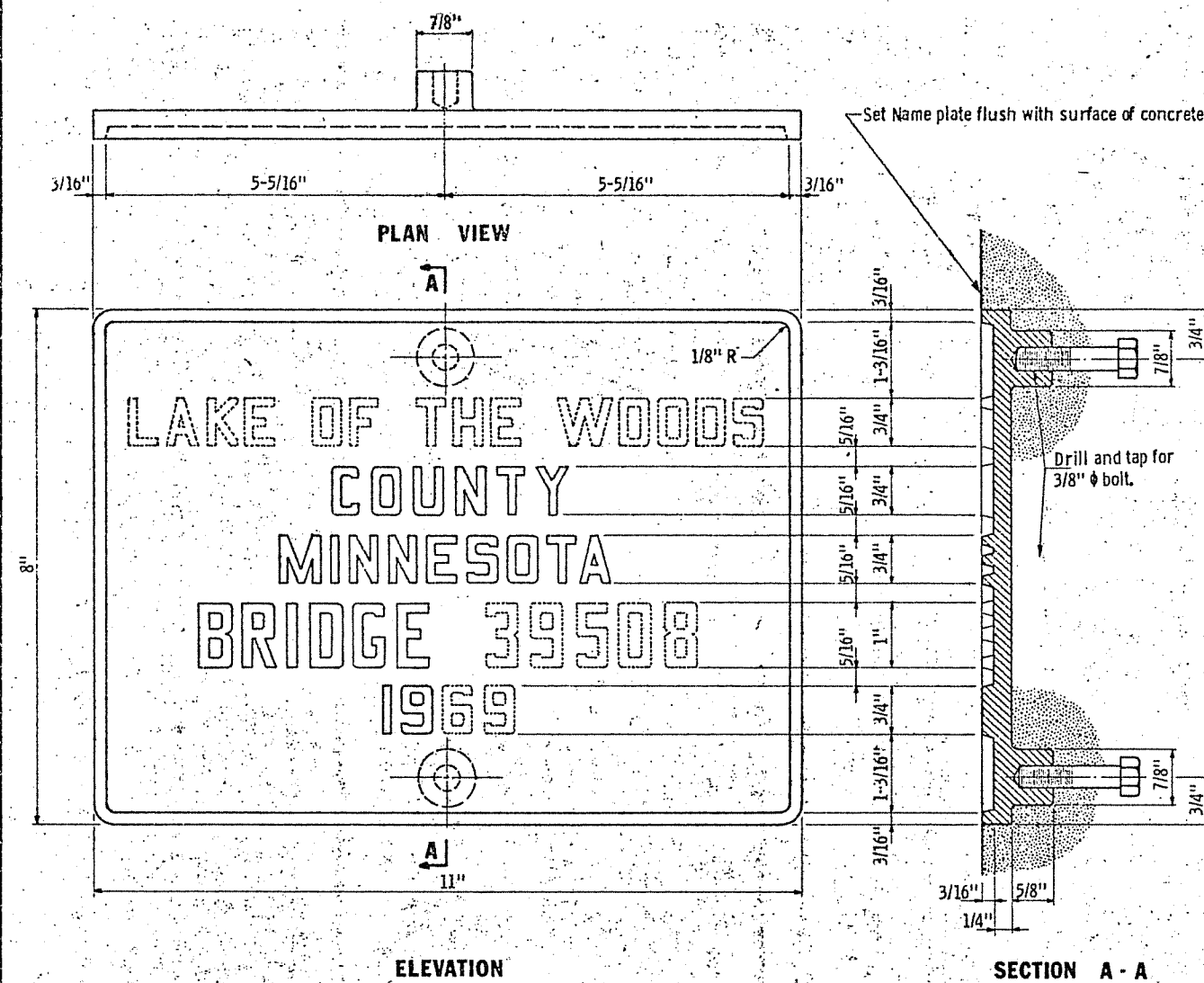
1. ALL MATERIAL IN EXPANSION AND CONTRACTION DEVICES SHALL CONFORM TO M. H. D. 3306
2. ALL EXPANSION AND CONTRACTION DEVICES SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH M. H. D. 3394.
3. SECTION A-A IS TYPICAL OF ALL DECK SLABS AND SIDEWALKS AND MEDIANS. SECTION B-B IS TYPICAL OF ALL SIDEWALKS AND MEDIANS. SECTION C-C AND D-D ARE TYPICAL OF ALL INTERSECTIONS, BOTTOMS AND TOPS OF SIDE SLOPES.
4. THE 1/4" PLATES TO COVER THE JOINTS AT BRIDGE JOINTS SHALL BE GALVANIZED IN ACCORDANCE WITH M. H. D. 3394, FILED TIGHTLY INTO PLACE, GALVANIZING REPAIRED IN ACCORDANCE WITH M. H. D. 2471.313. JOINT SEALER PLACED TO PREVENT VOID UNDER, AND THEN CAULKED ON THE THREE UNEXPOSED SIDES.
5. AFTER FABRICATION AND BEFORE GALVANIZING, EXPANSION AND CONTRACTION DEVICES SHALL BE STRAIGHTENED TO A TOLERANCE OF NOT MORE THAN 1/16" IN 10 FEET.



DECK DRAIN MANIFOLD AND PAN
SCALE: 3" = 1'-0"



SECTION E-E
(AS ASSEMBLED)
SCALE: 3" = 1'-0"



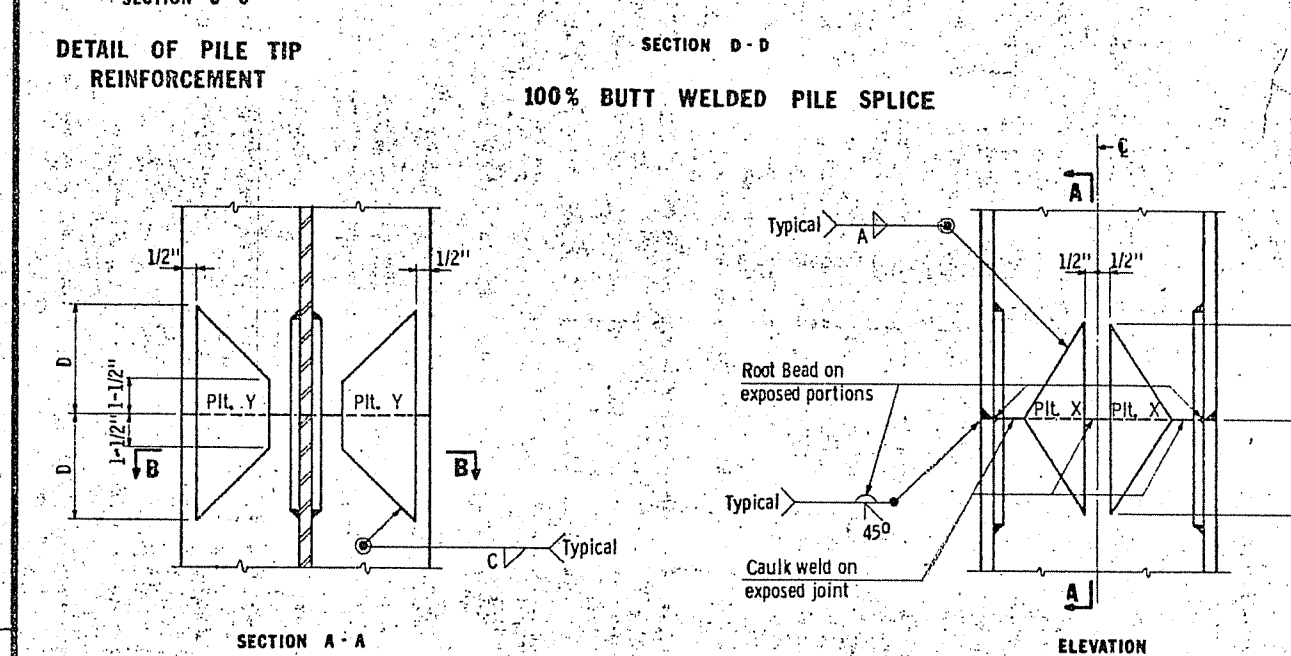
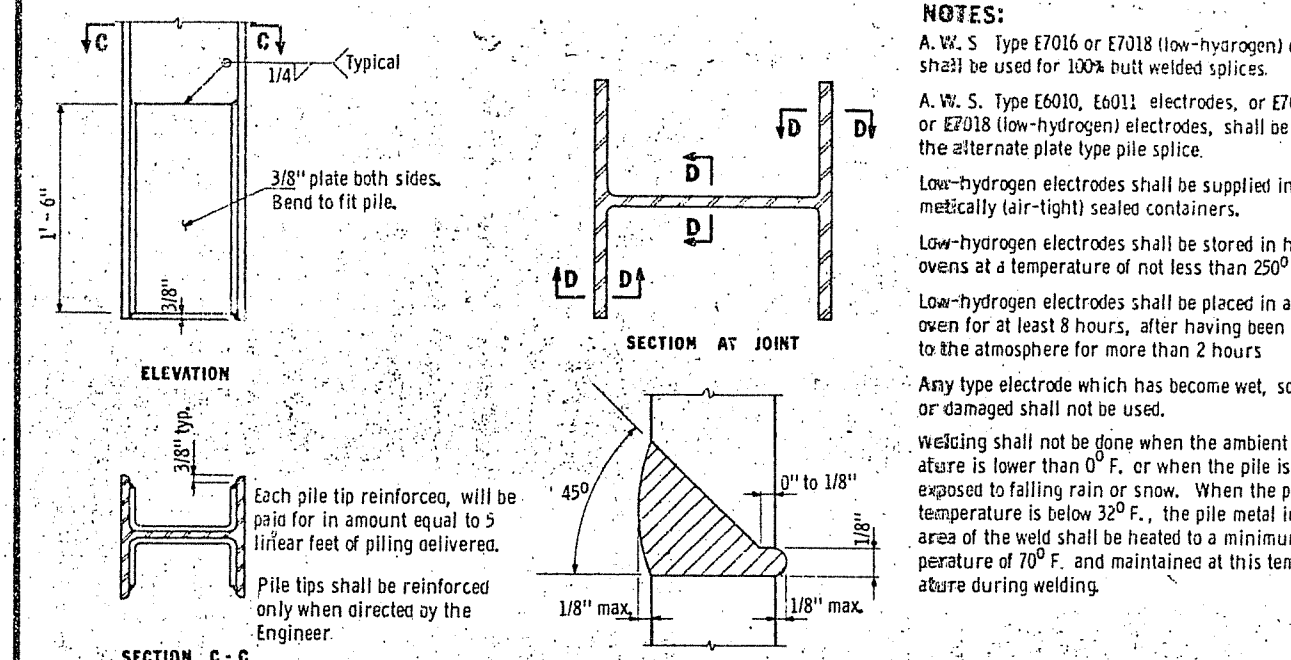
LETTERS FOR NAME PLATES

ABCDEFGHIJKLMN
 OPQRSTUVWXYZ
 1234567890

NOTES:
 Numbers and letters shall conform to those shown.
 Draft on letters shall not be more than 3" in 12"
 Horizontal spacing of letters shall produce a balanced layout in proportion to spacing shown.
 Top surface of letters and frames shall be burnished.
 Background of plate shall have a deep brown oxidized finish.
 Furnish 2 steel bolts 3/8" ϕ x 3" long with each plate.
 Plates ordered in pairs shall be cast from the same heat.
 Numbers and letters shown dotted are to be obtained from Bridge plans, Sheet B-20.
 All dimensions for 3/4" high letters and numbers shall be in direct proportion to those shown for the 1" high letters and numbers.

Specification reference:
 247L 3H, 3327 (Bronze castings)

APPROVED July 1, 1969 Design Standards Engineer ENGINEERING STANDARDS DIVISION	STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS BRIDGE NAME PLATE COUNTY BRIDGES	REVISION	DETAIL NO. B103
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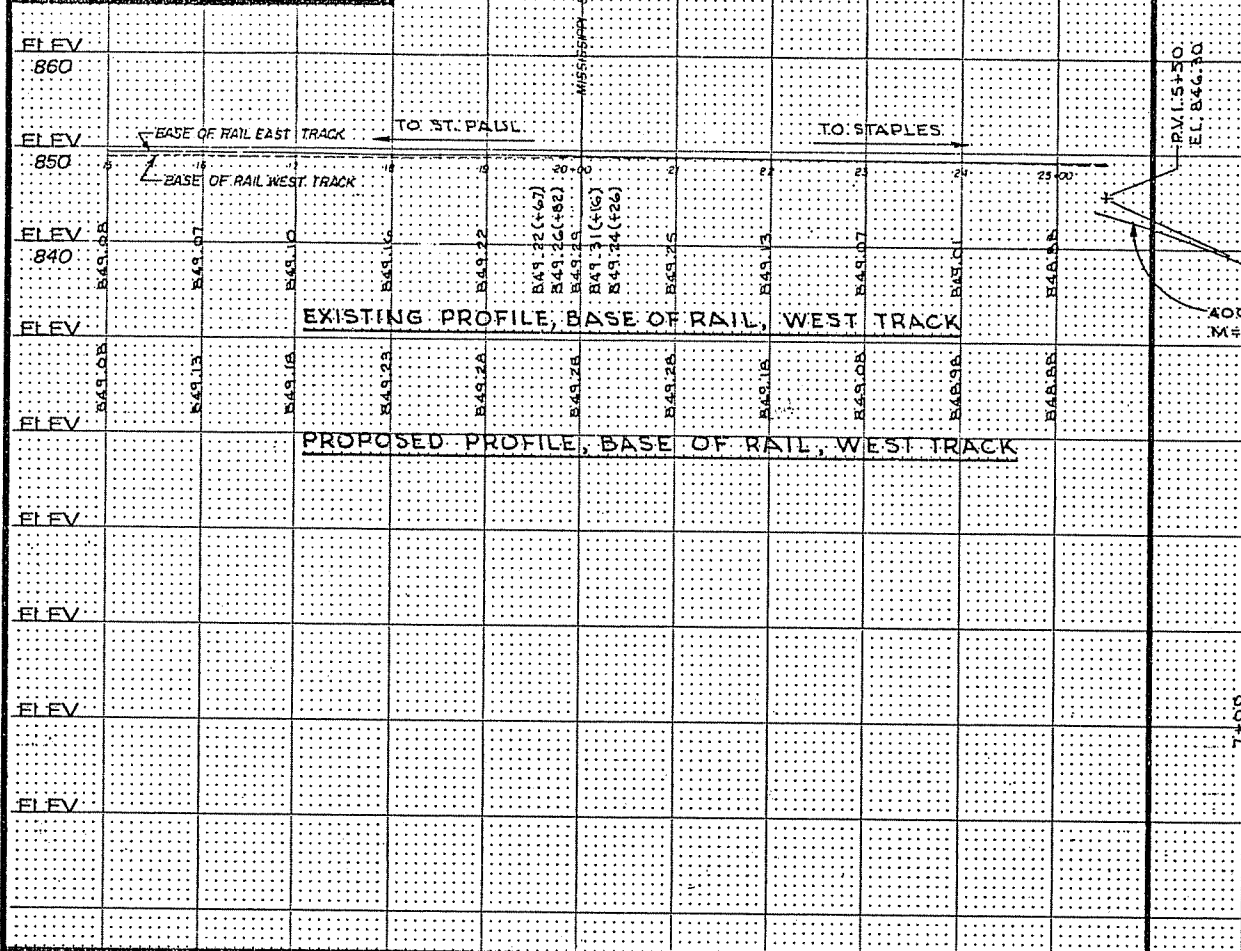
PILE SECTION	PLATE X		PLATE Y			
	Size	A	B	Size	C	D
HP10 x 42	2-1/2 x 3/8	1/4	4	3 x 3/8	5/16	4
HP10 x 57	2-1/2 x 1/2	5/16	4	3 x 1/2	5/16	5
HP12 x 53	3-1/2 x 3/8	1/4	5	4 x 3/8	5/16	5
HP12 x 74	3-1/2 x 1/2	5/16	6	4 x 1/2	5/16	6
HP14 x 73	4-1/2 x 3/8	1/4	7	5 x 3/8	5/16	6
HP14 x 87	4-1/2 x 7/16	5/16	7	5 x 1/2	5/16	7
HP14 x 132	4-1/2 x 1/2	5/16	7	5 x 9/16	3/8	7
HP14 x 117	4-1/2 x 9/16	3/8	7	5 x 5/8	3/8	8

APPROVED July 21, 1972 <i>Charles D. Light</i> Engineering Standards Engineer RESEARCH AND STANDARDS DIVISION	STATE OF MINNESOTA DEPARTMENT OF HIGHWAYS PILE SPLICE and TIP REINFORCEMENT STEEL H BEARING PILES 10" TO 14"	DETAIL NO. B20
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NOTES:
 A. W. S. Type E7016 or E7018 (low-hydrogen) electrodes shall be used for 100% butt welded splices.
 A. W. S. Type E6010, E6011 electrodes, or E7018 (low-hydrogen) electrodes, shall be used for alternate plate type pile splice.
 Low-hydrogen electrodes shall be supplied in hermetically (air-tight) sealed containers.
 Low-hydrogen electrodes shall be stored in hermetic ovens at a temperature of not less than 250° F.
 Low-hydrogen electrodes shall be placed in a hermetic oven for at least 8 hours, after having been exposed to the atmosphere for more than 2 hours.
 Any type electrode which has become wet, soiled or damaged shall not be used.
 Welding shall not be done when the ambient temperature is lower than 0° F., or when the pile is exposed to falling rain or snow. When the pile temperature is below 32° F., the pile metal in the area of the weld shall be heated to a minimum temperature of 70° F. and maintained at this temperature during welding.

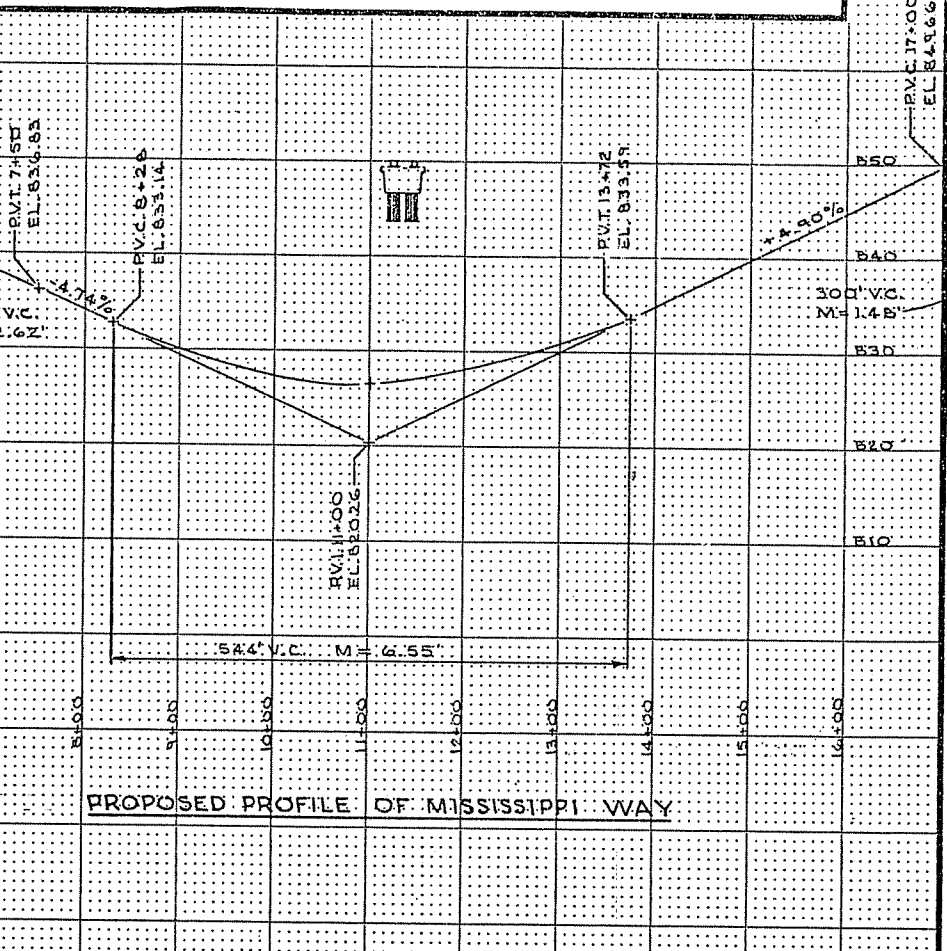
CONTRACTED PROFILE

SCALE: HOR. 1" = 100' VER. 1" = 10'

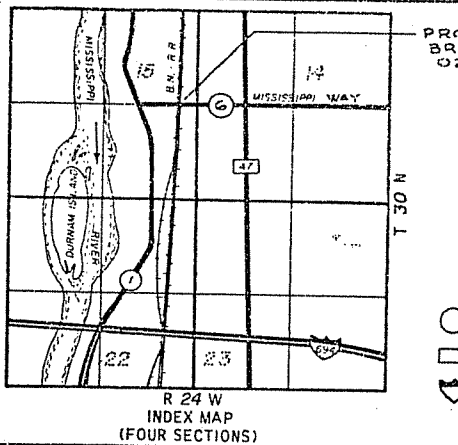


TYPICAL SECTIONS & PERTINENT DATA

SCALES AS SHOWN

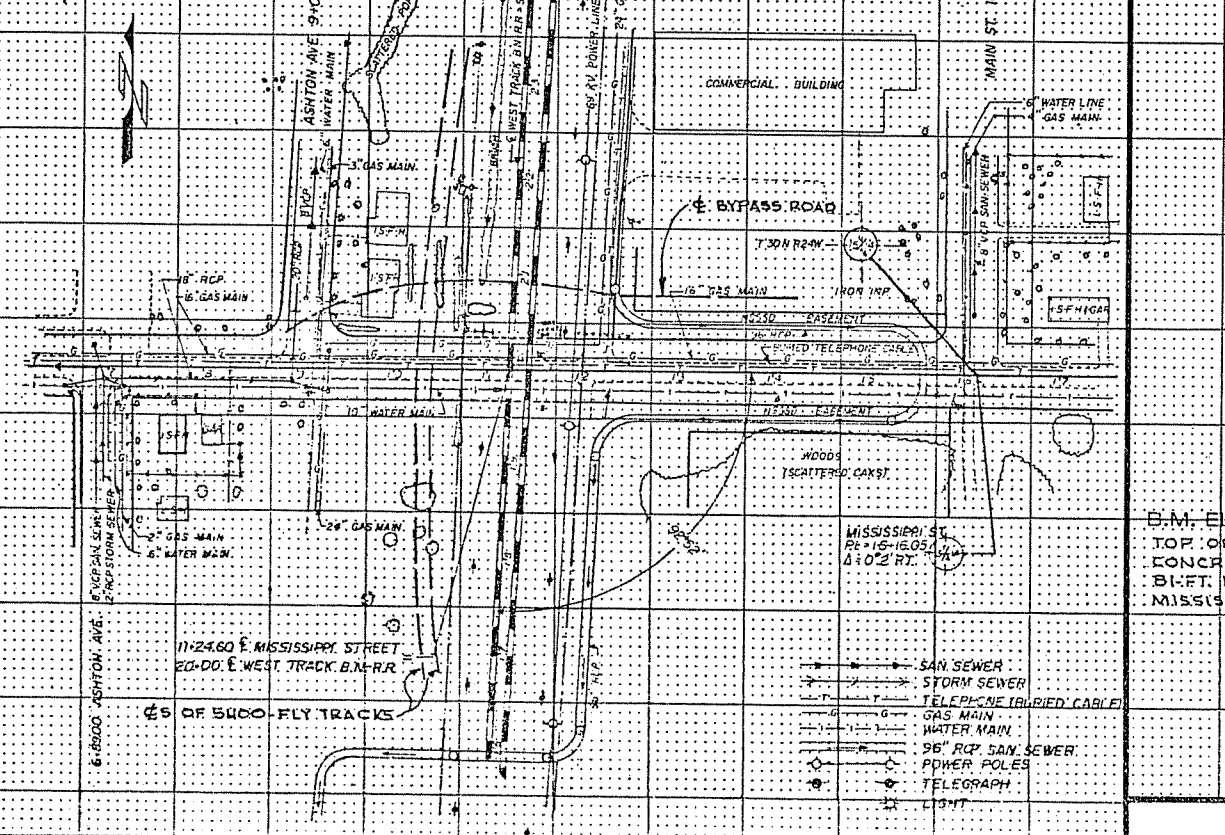


Fed. Proj. No. M-51



PLAT

SCALE: 1" = 100'



FOLLOW SEPARATE "INSTRUCTIONS FOR PREPARATION OF BRIDGE SURVEYS" WHEN MAKING BRIDGE SURVEYS

- DATA**
- Preliminary recommendations of Engineer in charge of Bridge Survey:
 - a. Net span length and type of bridge... **SINGLE 67-FT. SPAN, STEEL BEAMS, COMPOSITE**
 - b. Width of roadway on bridge... **DOUBLE TRACKS AT ABOUT 19-FT. & TO 4'**
 - c. Number and width of sidewalks, if any... **TWO 3'-6" SIDEWALKS**
 - d. Locate center of bridge at station... **11+24.60 (MISSISSIPPI WAY)**
 - e. If a skew bridge is recommended, the angle of skew should be... **2°-52'**
 - f. Is piling required? ... **YES**
 - Special features: Waterfalls, dams, exceptional floods, ice, driftwood, sliding banks, logging, etc.
 - Changes: In height or length from that of old bridge, and reasons why.
 - Other bridges in vicinity:
 - a. Over same stream (particularly structures which carry high water without overflow of roadway); give location, water, net cross-sectional area at high water stage and estimated age
 - b. Over or under same highway or railroad; give location, length, horizontal and vertical clearances and estimated age
 - c. Reasons why these bridges are, or are not, fair indications of what length the proposed bridge should be
 - If structure is over a drainage ditch, is ditch gradient liable to be altered?
 - Navigation clearances required, if any
 - Information and evidence in regard to high water stages was obtained as follows
 - Must contractor provide for traffic during construction of proposed bridge? **YES**
If so, by what means? **BOTH HIGHWAY AND RAILWAY TRAFFIC WILL DETOUR**

HYDRAULIC ENGINEERS RECOMMENDATION

.....

HIGH AND LOW WATER ELEVATIONS
 Data obtained from.....
 reflects highest water elevation in the area of this construction to be..... and the lowest water elevation to be..... The above figures are for informational purposes only. The state neither warrants nor represents that these figures for high water and low water are in any way indicative of the high water or low water to be expected or encountered during this construction.

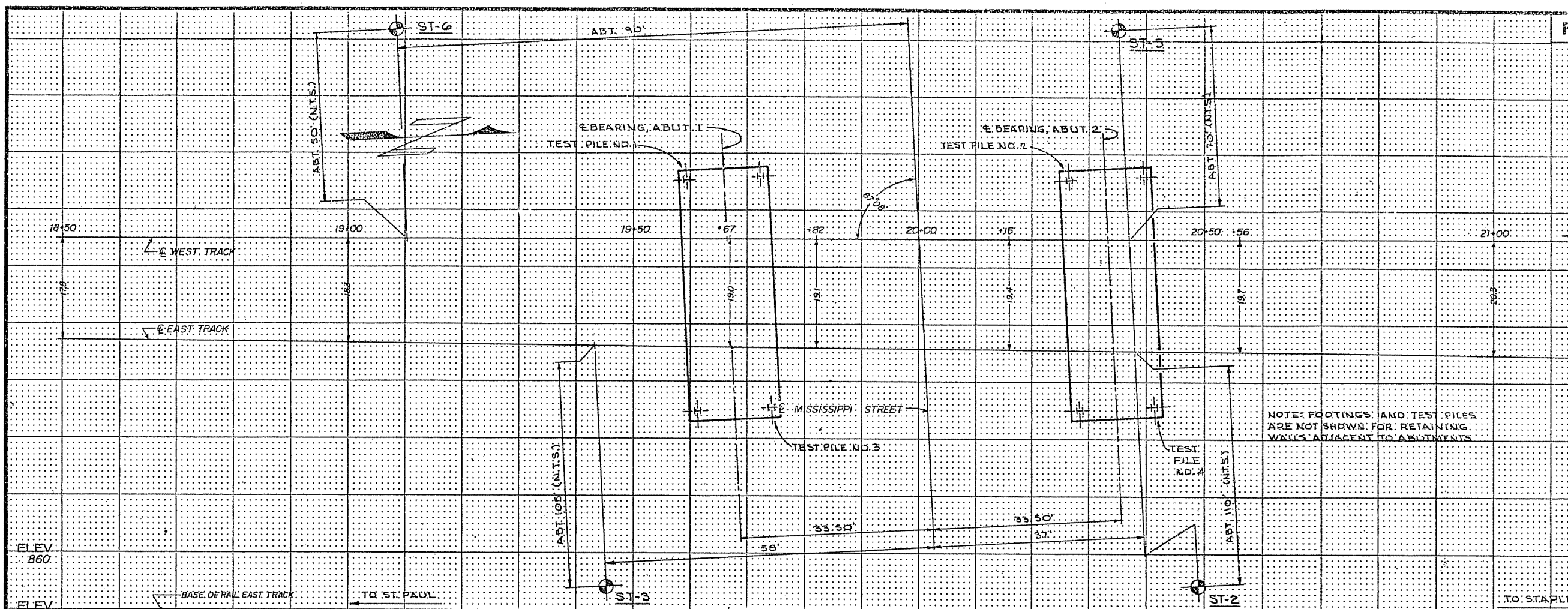
SHIPPING POINT
 Proposed Bridge is IN THE CITY of..... of.....
 + FRIDLEY..... which is the nearest
 Railroad shipping point.
 *(Give name of town, station or siding)

Date.....
 Project or County Engineer.....
 District Engineer.....

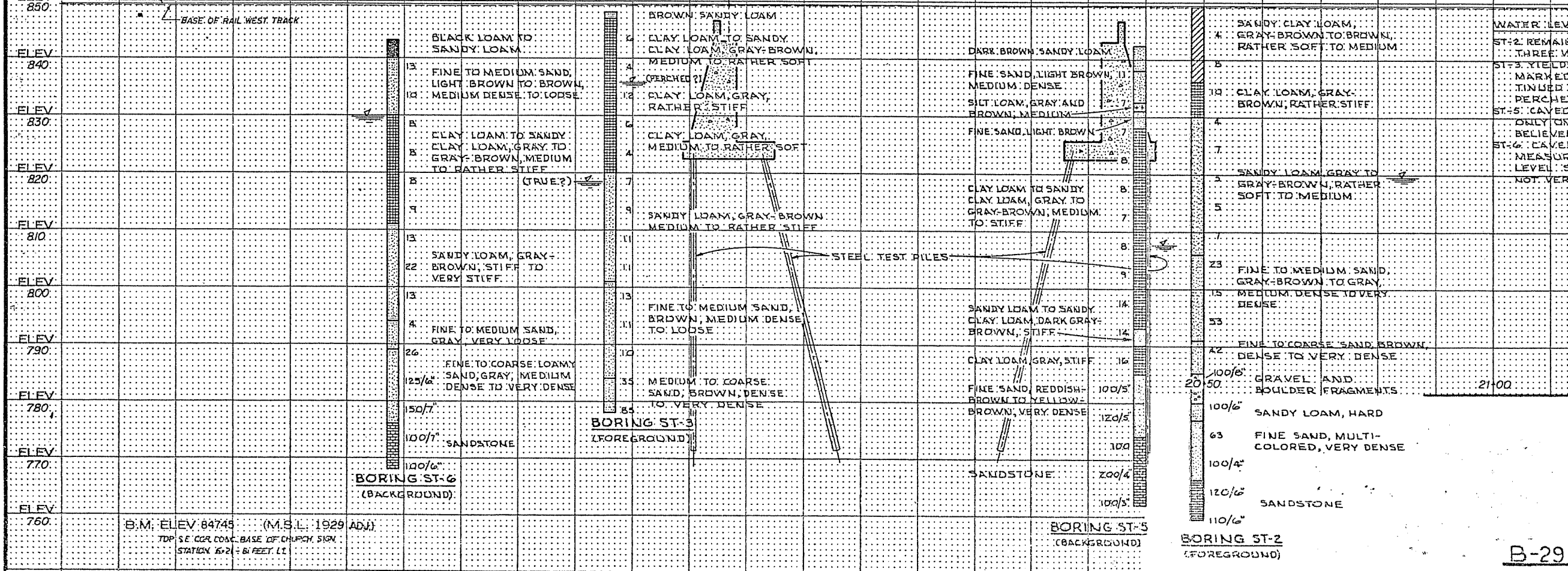
STATE OF MINNESOTA
 DEPARTMENT OF HIGHWAYS
BRIDGE SURVEY
 FOR
 PROPOSED BRIDGE LOCATED IN THE CITY OF.....
 FRIDLEY..... ON.....
 SEC. 15..... TWP. 30 N.....
 CITY OF FRIDLEY COUNTY.....
 SURVEY MADE DURING MONTH OF..... DECEMBER.....
 SURVEY MADE BY..... JOHN W. GORMAN, JR.
 BRIDGE NO. 025

SEE SHEET B-27 OF 29 SHEETS FOR PLAN AND PROFILE

B-28



NOTE: FOOTINGS AND TEST PILES ARE NOT SHOWN FOR RETAINING WALLS ADJACENT TO ABUTMENTS



WATER LEVEL NOTES:
 ST-2 REMAINED OPEN FOR MEASUREMENTS THREE WEEKS, VERY CONSTANT AND ACCURATE.
 ST-3 YIELDED MOIST SOIL AT 30 FEET DEPTH. MARKED (TRUE?) ON LOG. WATER LEVEL TENDED TO RISE FOR THREE WEEKS. PERCHED AND MARKED (PERCHED?).
 ST-5: CAVED SO WATER LEVEL WAS MEASURED ONLY ON DAY OF DRILLING. AS SHOWN BELIEVED ACCURATE OR SLIGHTLY LOW.
 ST-6 CAVED IMMEDIATELY AND NO WATER MEASUREMENT COULD BE MADE. THE LEVEL SHOWN IS FROM A WELLPPOINT NOT VERY RELIABLE.

BORINGS SHOWN ST-2, ST-3, ST-5, ST-6
 STD. 140 LB. HAMMER
 30 INCH DROP
 2 INCH O.D. SAMPLER

ANDOKA COUNTY STATE-AID HIGHWAY
 STATE OF MINNESOTA
 DEPARTMENT OF HIGHWAYS

BRIDGE NO. 025

BRIDGE SURVEY
 PLAN AND PROFILE

B-29

SEE SHEET NO. B-28 FOR ADDITIONAL INFORMATION

18 JULY 1966
 Bridge Survey Sheet (Sheet 2 of 2)

B.M. ELEV. 84745 (M.S.L. 1929 ADJ.)
 TDP SE COR. CONC. BASE OF CHURCH SIGN
 STATION 6+21.86 FEET LL