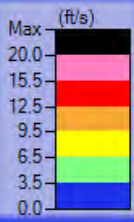




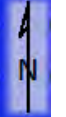
Strategy v_2a - Velocity
Q200

Velocity Ranges

Velocity (ft/s)	Description	Color
0 to 3	Low	Blue
4 to 6	Moderate Low	Light Green
7 to 9	Moderate High	Yellow
10 to 12	High	Orange
13 to 15	Very High	Red
16 to 19	Extreme	Pink
20+	Extreme	Black



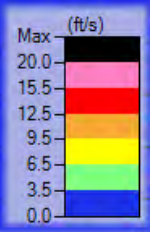
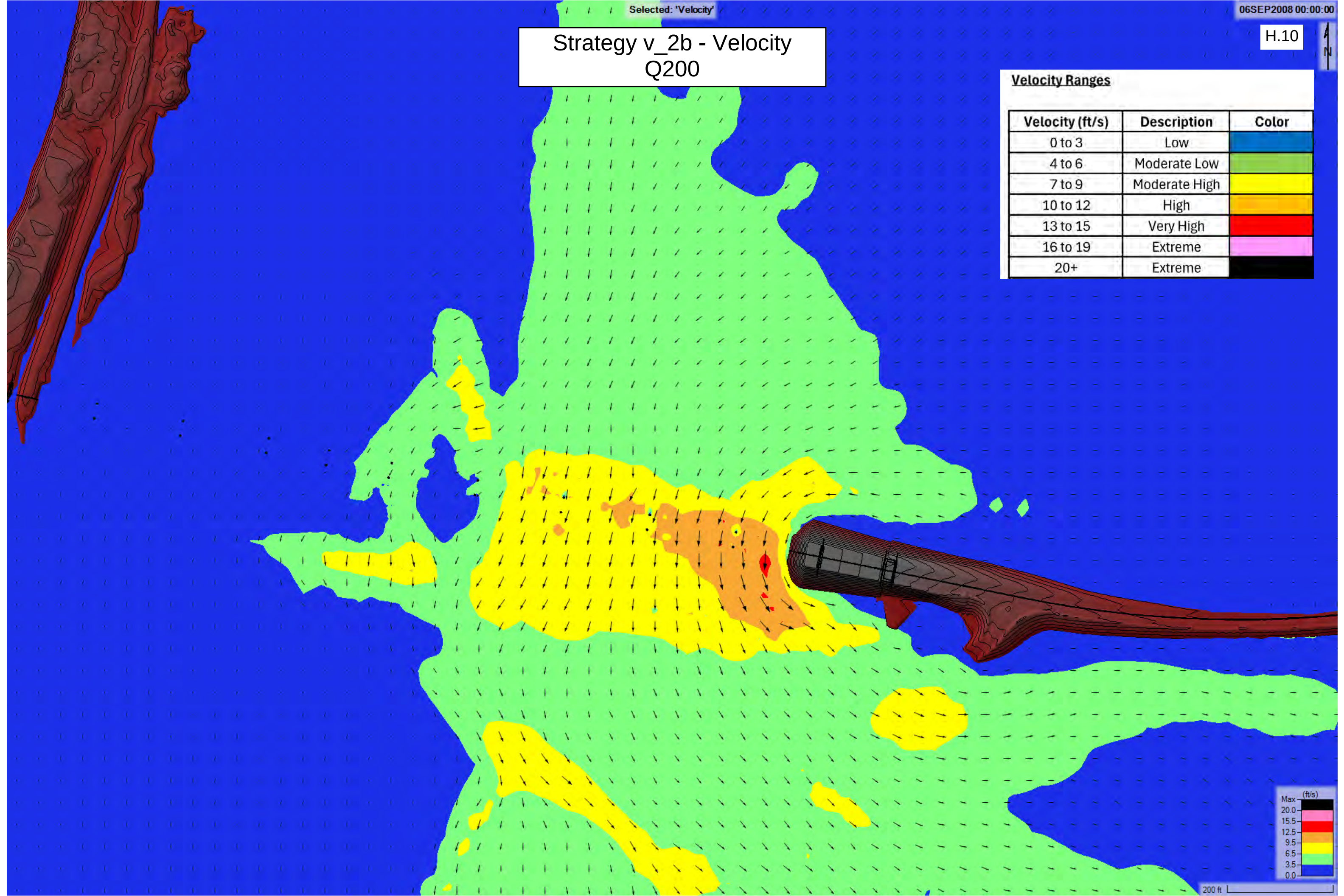
200 ft

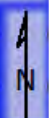


Strategy v_2b - Velocity
Q200

Velocity Ranges

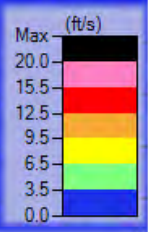
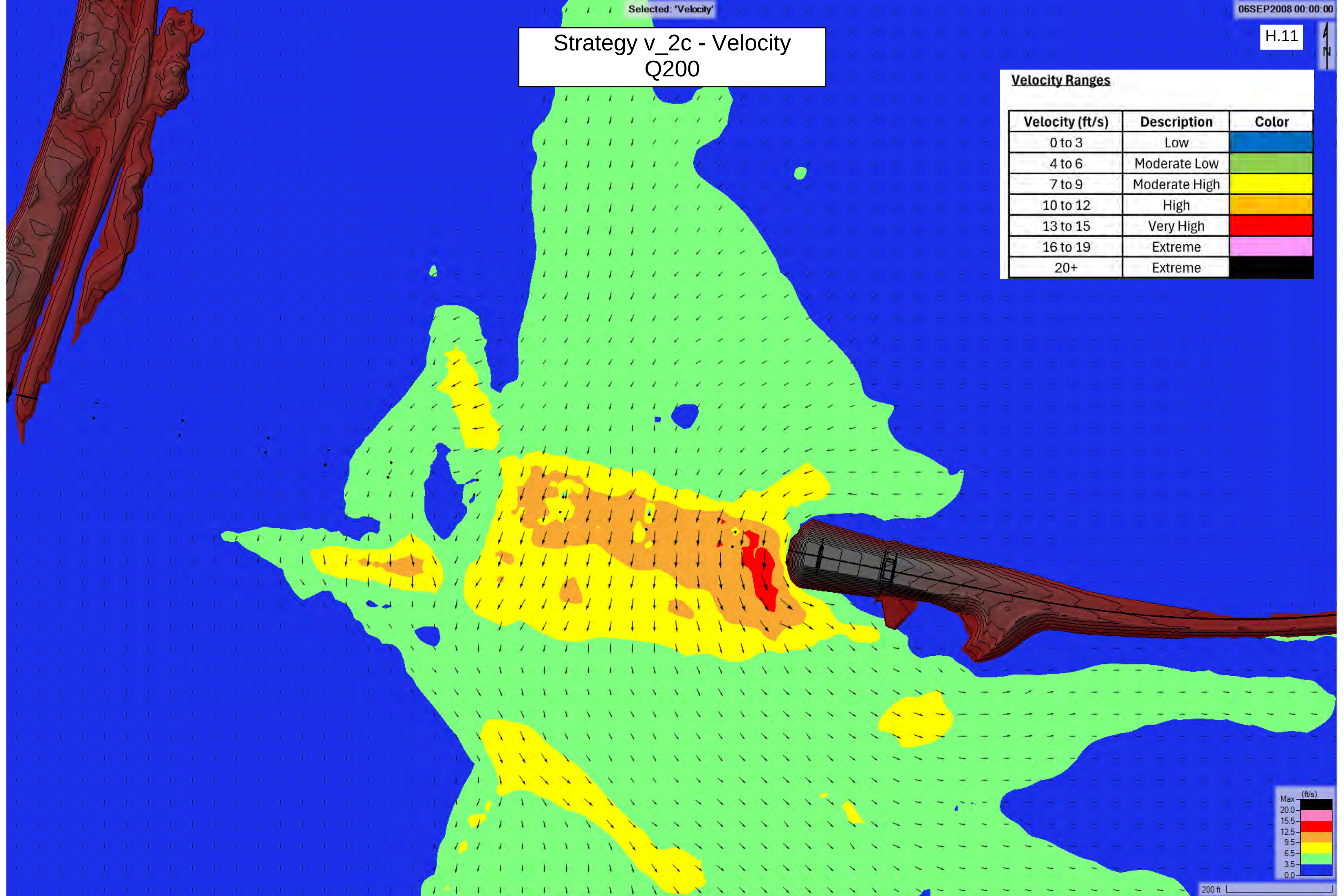
Velocity (ft/s)	Description	Color
0 to 3	Low	Blue
4 to 6	Moderate Low	Light Green
7 to 9	Moderate High	Yellow
10 to 12	High	Orange
13 to 15	Very High	Red
16 to 19	Extreme	Pink
20+	Extreme	Black





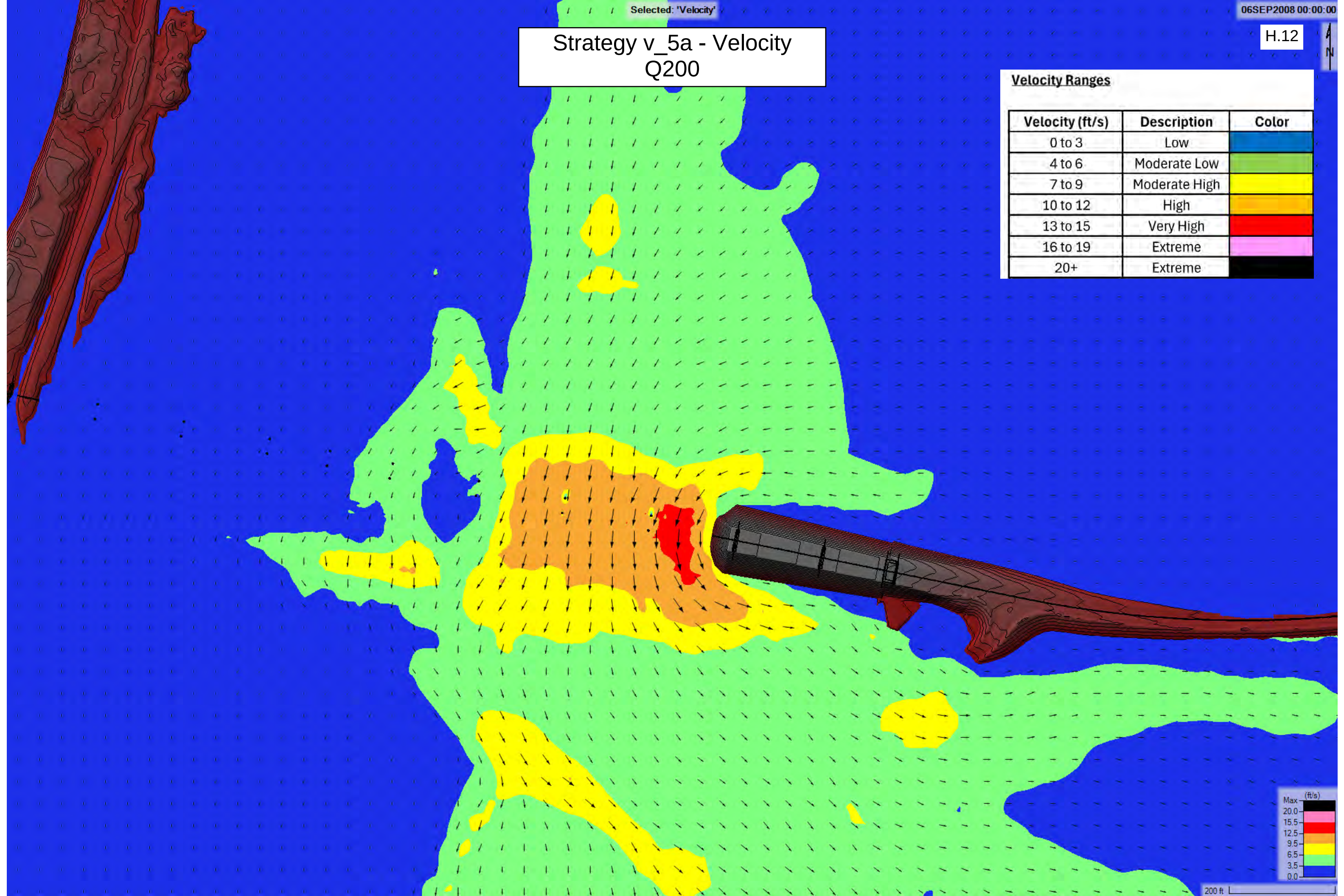
Strategy v_2c - Velocity
Q200

Velocity Ranges		
Velocity (ft/s)	Description	Color
0 to 3	Low	Blue
4 to 6	Moderate Low	Light Green
7 to 9	Moderate High	Yellow
10 to 12	High	Orange
13 to 15	Very High	Red
16 to 19	Extreme	Pink
20+	Extreme	Black



Strategy v_5a - Velocity
Q200

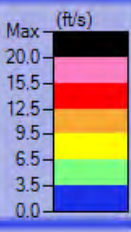
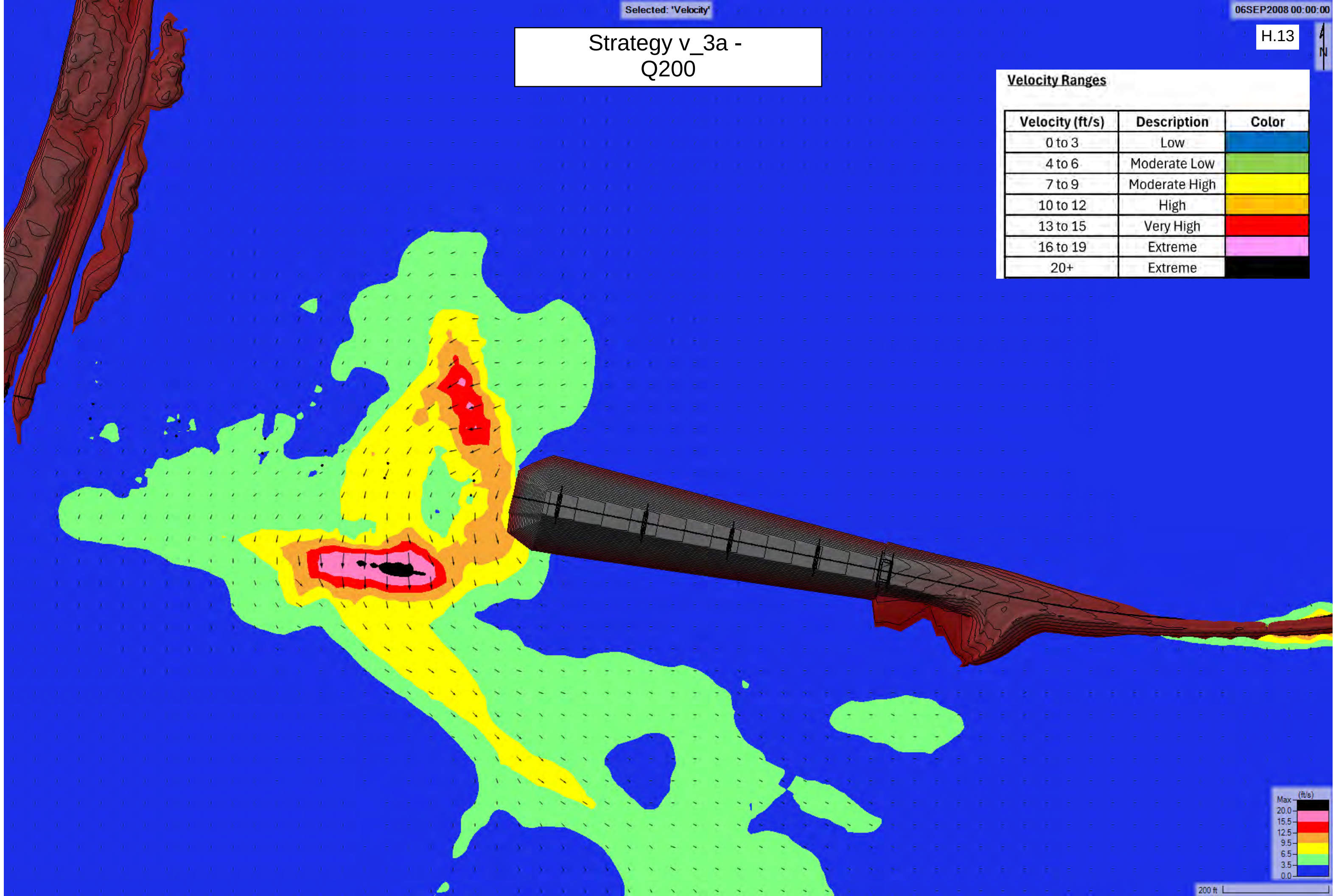
Velocity Ranges		
Velocity (ft/s)	Description	Color
0 to 3	Low	Blue
4 to 6	Moderate Low	Light Green
7 to 9	Moderate High	Yellow
10 to 12	High	Orange
13 to 15	Very High	Red
16 to 19	Extreme	Pink
20+	Extreme	Black





Strategy v_3a -
Q200

Velocity Ranges		
Velocity (ft/s)	Description	Color
0 to 3	Low	Blue
4 to 6	Moderate Low	Light Green
7 to 9	Moderate High	Yellow
10 to 12	High	Orange
13 to 15	Very High	Red
16 to 19	Extreme	Pink
20+	Extreme	Black





STATE OF NEBRASKA
DEPARTMENT OF TRANSPORTATION
BRIDGE DIVISION

PROJ. LOC.: Decatur Bridge PROJ. NO.: STP-51-7(109) BM PROJ. #: 157887
COUNTY: Burt STATION: ###+###.## MADE BY: ASF
CN: 32395 STRUCTURE: S051 03644 DATE: 02/26/25
DESC: Phase 2 Hydro Strategy Evaluation CHECK BY: ---

Shear Stress Heat Map

Shear Stress Ranges

Lower Bound (psf)	Upper Bound (psf)	Permissible Material	Material Description
0	0.04	Bare Soil	Alluvial silt, sandy loam
0.041	1	Short Grass	Vegetation Class C (6" to 11"), short native/bunch grass
1.01	2.1	Long Grass	Vegetation Class B (12" to 20"), long native grasses
2.11	6	Riprap, $D_{50} \sim 18"$	Existing riprap (Iowa DOT Class B), MODOT Type 4
6.01	10	Riprap, $D_{50} \sim 24"$	Larger than existing riprap

Sources for "Permissible Shear Stress/Material"

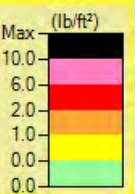
The table was developed using a combination of values from the following sources:

- MODOT Engineering Policy Guide Section 750.6, "Erosion Control and Energy Dissipation", (2025)
- HEC-15, "Design of Roadside Channels with Flexible Linings", Section 2.2.3 (2005)
- Caltrans Highway Design Manual, Chapter 860 - Roadside Channels, (2020)
- USACE ERDC, "Stability Thresholds for Stream Restoration Materials", Fischenich 2001

Strategy v_1c - Shear Stress 2011 Flood (~ Q70)

Shear Stress Ranges

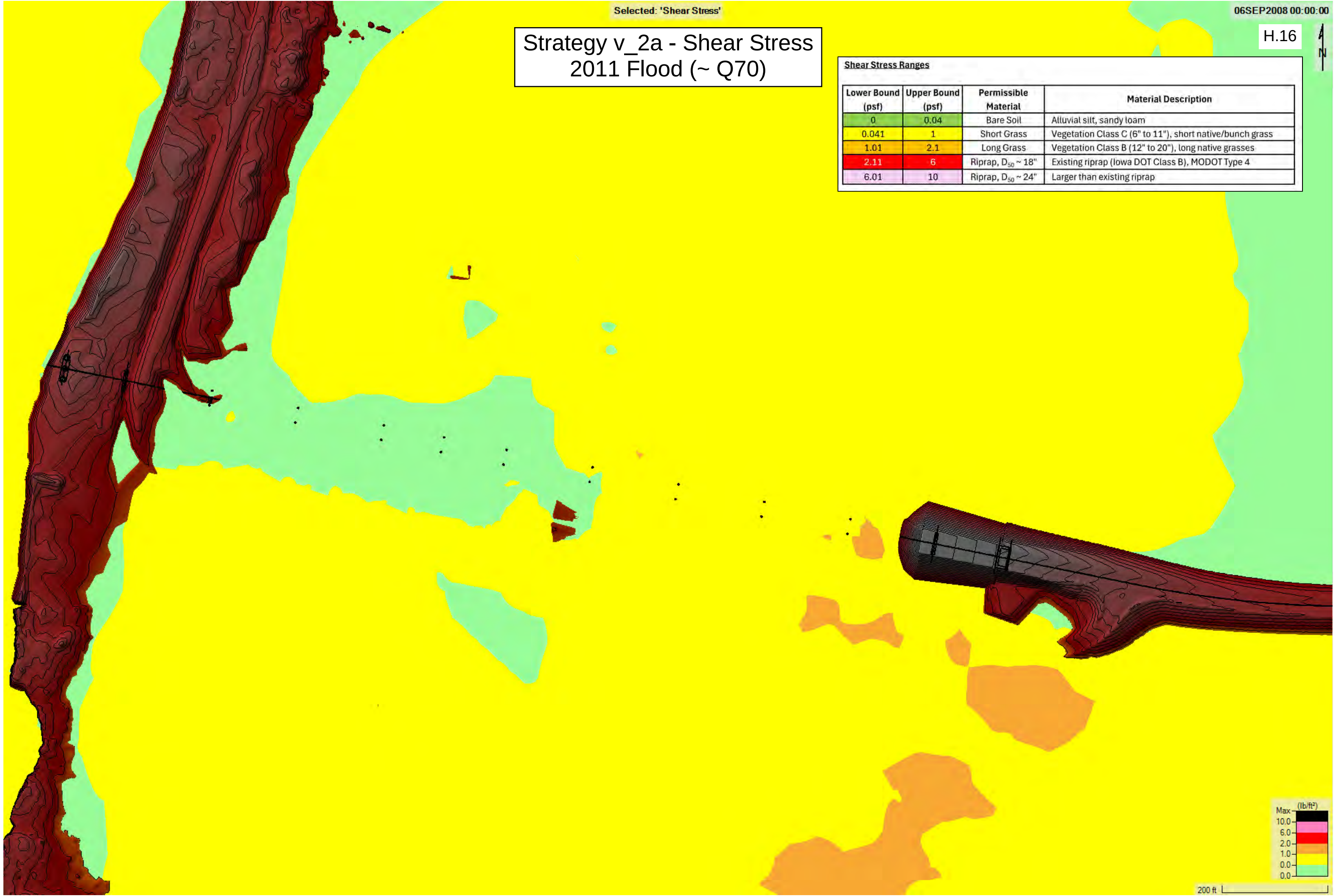
Lower Bound (psf)	Upper Bound (psf)	Permissible Material	Material Description
0	0.04	Bare Soil	Alluvial silt, sandy loam
0.041	1	Short Grass	Vegetation Class C (6" to 11"), short native/bunch grass
1.01	2.1	Long Grass	Vegetation Class B (12" to 20"), long native grasses
2.11	6	Riprap, D ₅₀ ~ 18"	Existing riprap (Iowa DOT Class B), MODOT Type 4
6.01	10	Riprap, D ₅₀ ~ 24"	Larger than existing riprap





Strategy v_2a - Shear Stress
2011 Flood (~ Q70)

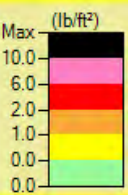
Shear Stress Ranges			
Lower Bound (psf)	Upper Bound (psf)	Permissible Material	Material Description
0	0.04	Bare Soil	Alluvial silt, sandy loam
0.041	1	Short Grass	Vegetation Class C (6" to 11"), short native/bunch grass
1.01	2.1	Long Grass	Vegetation Class B (12" to 20"), long native grasses
2.11	6	Riprap, D ₅₀ ~ 18"	Existing riprap (Iowa DOT Class B), MODOT Type 4
6.01	10	Riprap, D ₅₀ ~ 24"	Larger than existing riprap



Strategy v_2b - Shear Stress 2011 Flood (~ Q70)

Shear Stress Ranges

Lower Bound (psf)	Upper Bound (psf)	Permissible Material	Material Description
0	0.04	Bare Soil	Alluvial silt, sandy loam
0.041	1	Short Grass	Vegetation Class C (6" to 11"), short native/bunch grass
1.01	2.1	Long Grass	Vegetation Class B (12" to 20"), long native grasses
2.11	6	Riprap, D ₅₀ ~ 18"	Existing riprap (Iowa DOT Class B), MODOT Type 4
6.01	10	Riprap, D ₅₀ ~ 24"	Larger than existing riprap



Strategy v_2c - Shear Stress 2011 Flood (~ Q70)

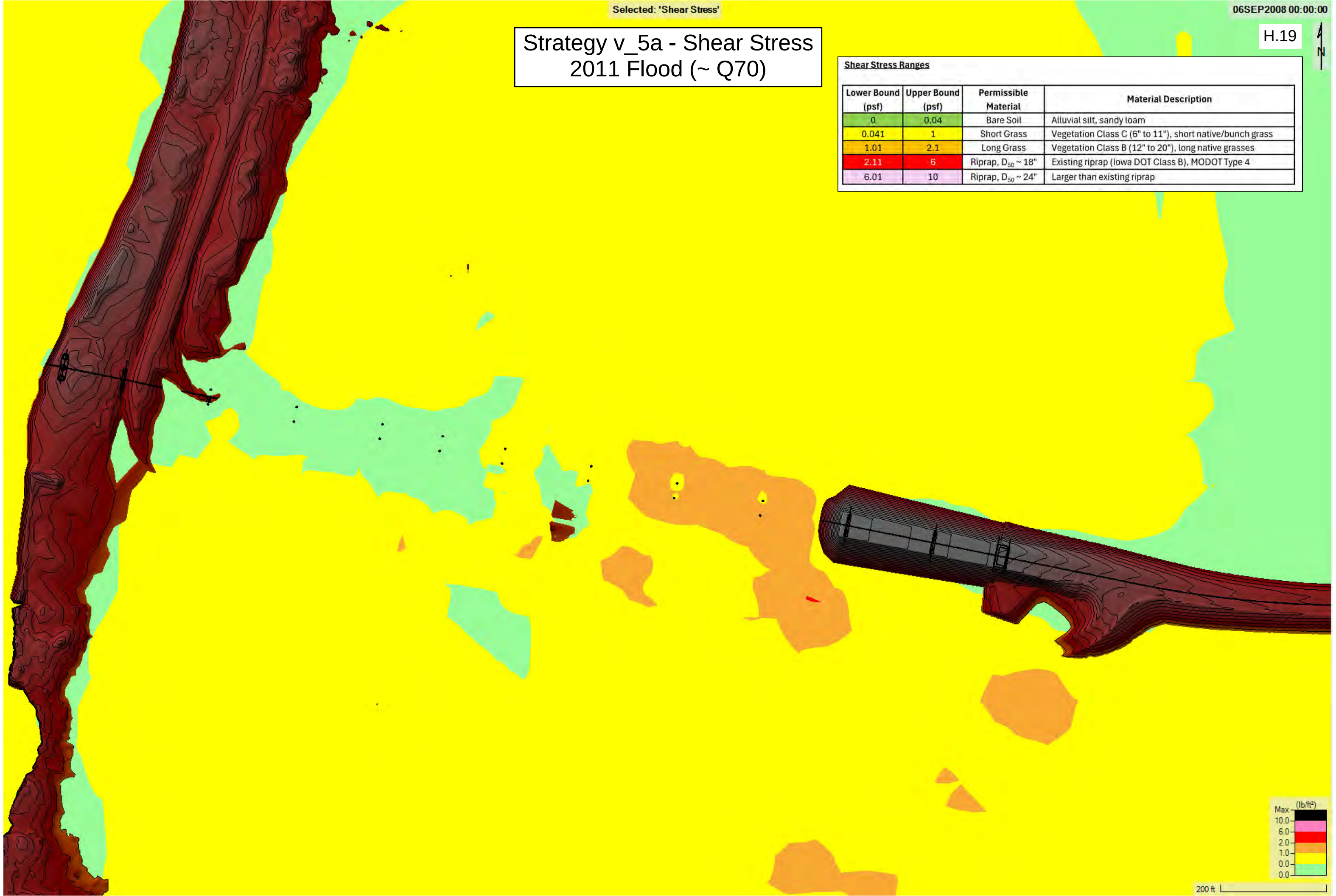
Shear Stress Ranges

Lower Bound (psf)	Upper Bound (psf)	Permissible Material	Material Description
0	0.04	Bare Soil	Alluvial silt, sandy loam
0.041	1	Short Grass	Vegetation Class C (6" to 11"), short native/bunch grass
1.01	2.1	Long Grass	Vegetation Class B (12" to 20"), long native grasses
2.11	6	Riprap, D ₅₀ ~ 18"	Existing riprap (Iowa DOT Class B), MODOT Type 4
6.01	10	Riprap, D ₅₀ ~ 24"	Larger than existing riprap



Strategy v_5a - Shear Stress
2011 Flood (~ Q70)

Shear Stress Ranges			
Lower Bound (psf)	Upper Bound (psf)	Permissible Material	Material Description
0	0.04	Bare Soil	Alluvial silt, sandy loam
0.041	1	Short Grass	Vegetation Class C (6" to 11"), short native/bunch grass
1.01	2.1	Long Grass	Vegetation Class B (12" to 20"), long native grasses
2.11	6	Riprap, D ₅₀ ~ 18"	Existing riprap (Iowa DOT Class B), MODOT Type 4
6.01	10	Riprap, D ₅₀ ~ 24"	Larger than existing riprap

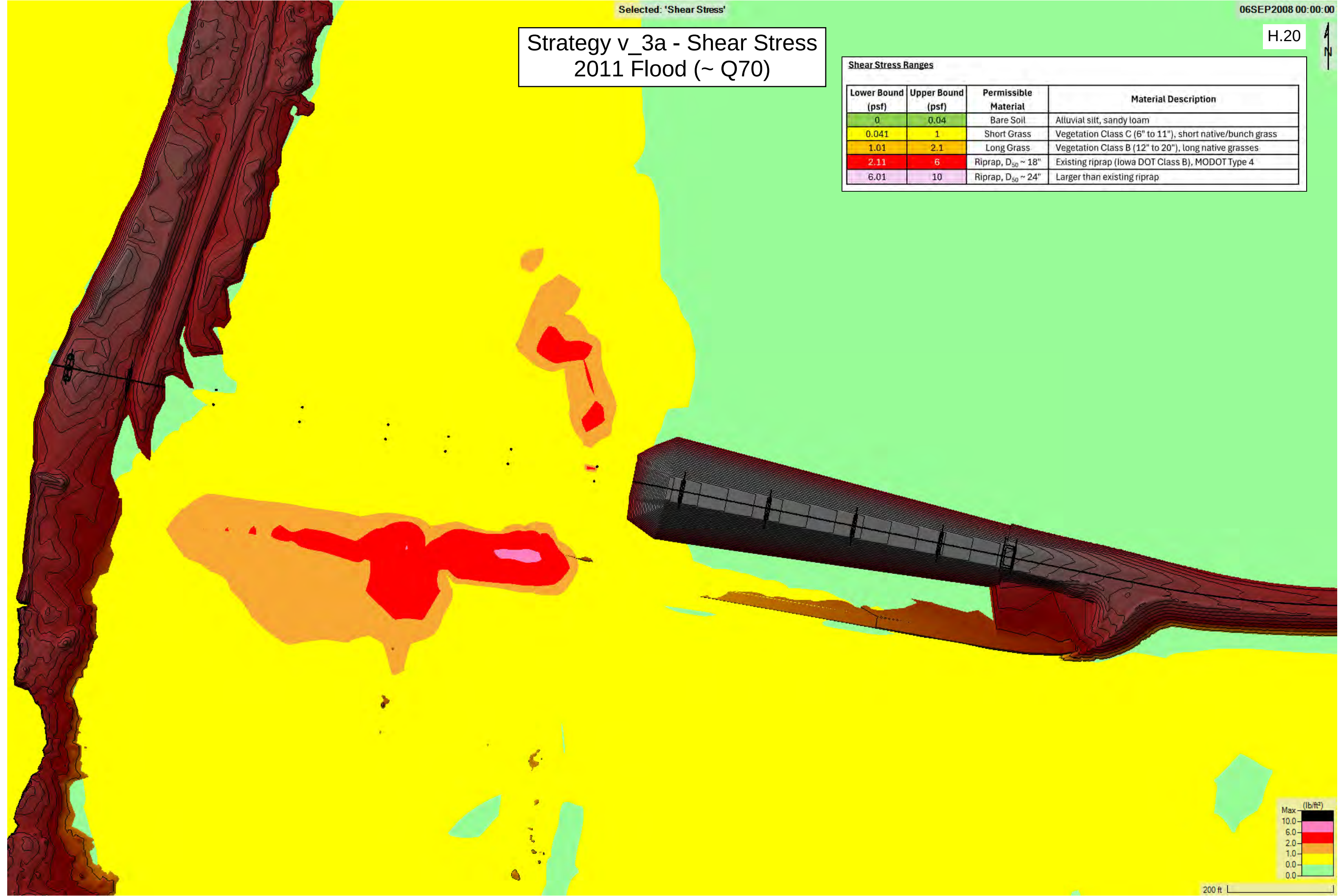


Strategy v_3a - Shear Stress 2011 Flood (~ Q70)

H.20



Shear Stress Ranges			
Lower Bound (psf)	Upper Bound (psf)	Permissible Material	Material Description
0	0.04	Bare Soil	Alluvial silt, sandy loam
0.041	1	Short Grass	Vegetation Class C (6" to 11"), short native/bunch grass
1.01	2.1	Long Grass	Vegetation Class B (12" to 20"), long native grasses
2.11	6	Riprap, D ₅₀ ~ 18"	Existing riprap (Iowa DOT Class B), MODOT Type 4
6.01	10	Riprap, D ₅₀ ~ 24"	Larger than existing riprap

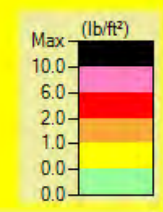
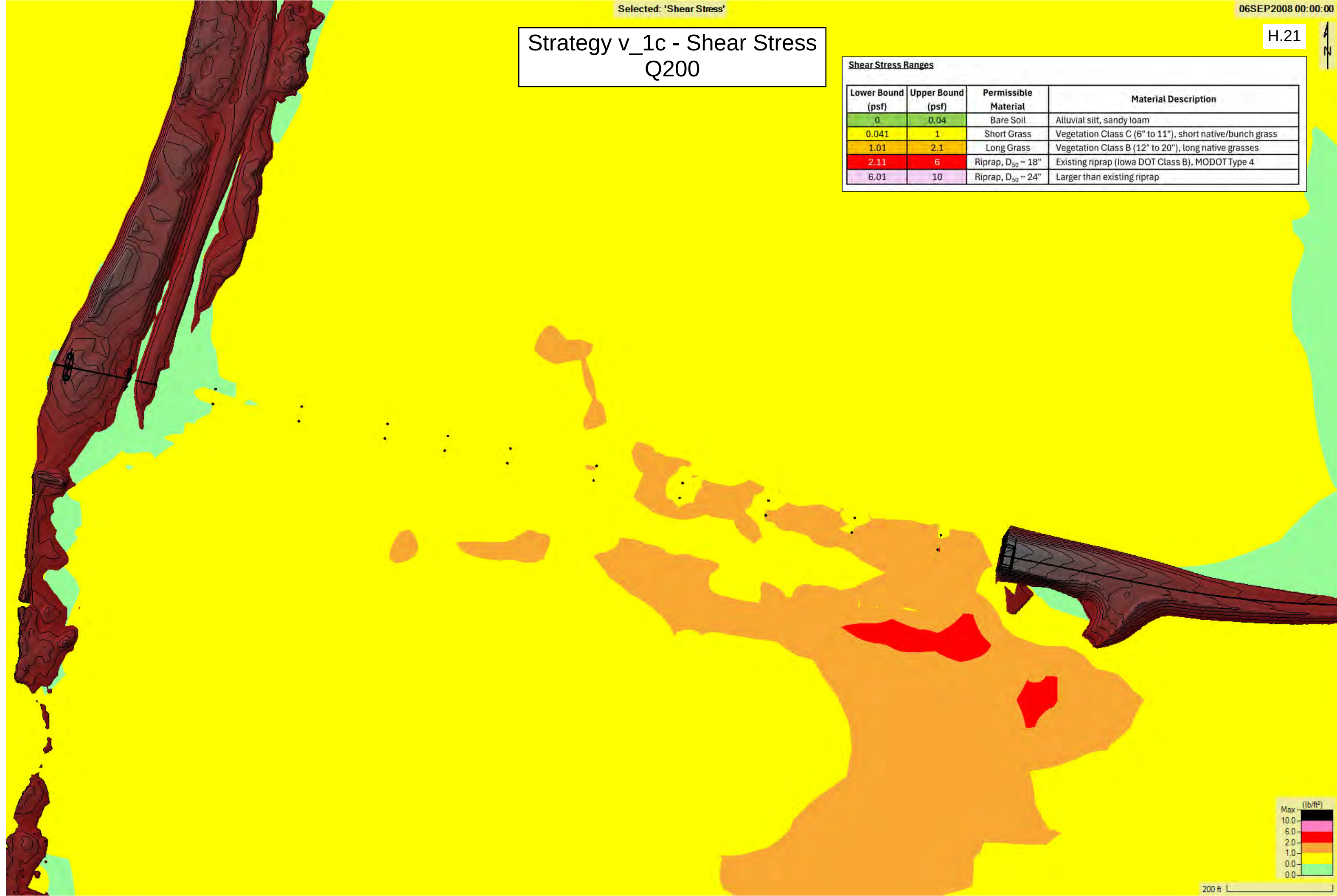


Strategy v_1c - Shear Stress Q200

H.21



Shear Stress Ranges			
Lower Bound (psf)	Upper Bound (psf)	Permissible Material	Material Description
0	0.04	Bare Soil	Alluvial silt, sandy loam
0.041	1	Short Grass	Vegetation Class C (6" to 11"), short native/bunch grass
1.01	2.1	Long Grass	Vegetation Class B (12" to 20"), long native grasses
2.11	6	Riprap, D ₅₀ ~ 18"	Existing riprap (Iowa DOT Class B), MODOT Type 4
6.01	10	Riprap, D ₅₀ ~ 24"	Larger than existing riprap

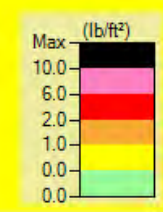
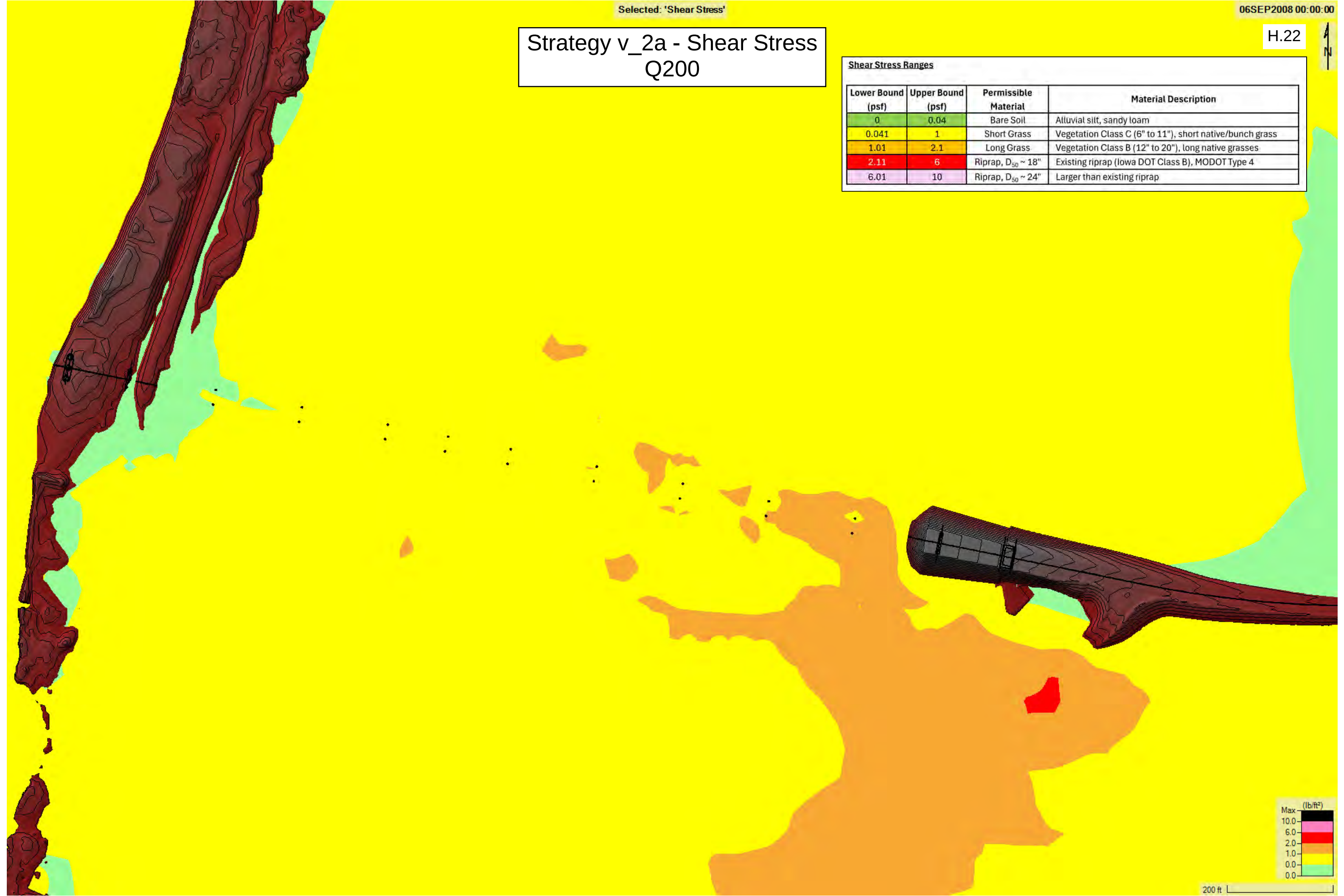


Strategy v_2a - Shear Stress Q200

H.22



Shear Stress Ranges			
Lower Bound (psf)	Upper Bound (psf)	Permissible Material	Material Description
0	0.04	Bare Soil	Alluvial silt, sandy loam
0.041	1	Short Grass	Vegetation Class C (6" to 11"), short native/bunch grass
1.01	2.1	Long Grass	Vegetation Class B (12" to 20"), long native grasses
2.11	6	Riprap, D ₅₀ ~ 18"	Existing riprap (Iowa DOT Class B), MODOT Type 4
6.01	10	Riprap, D ₅₀ ~ 24"	Larger than existing riprap

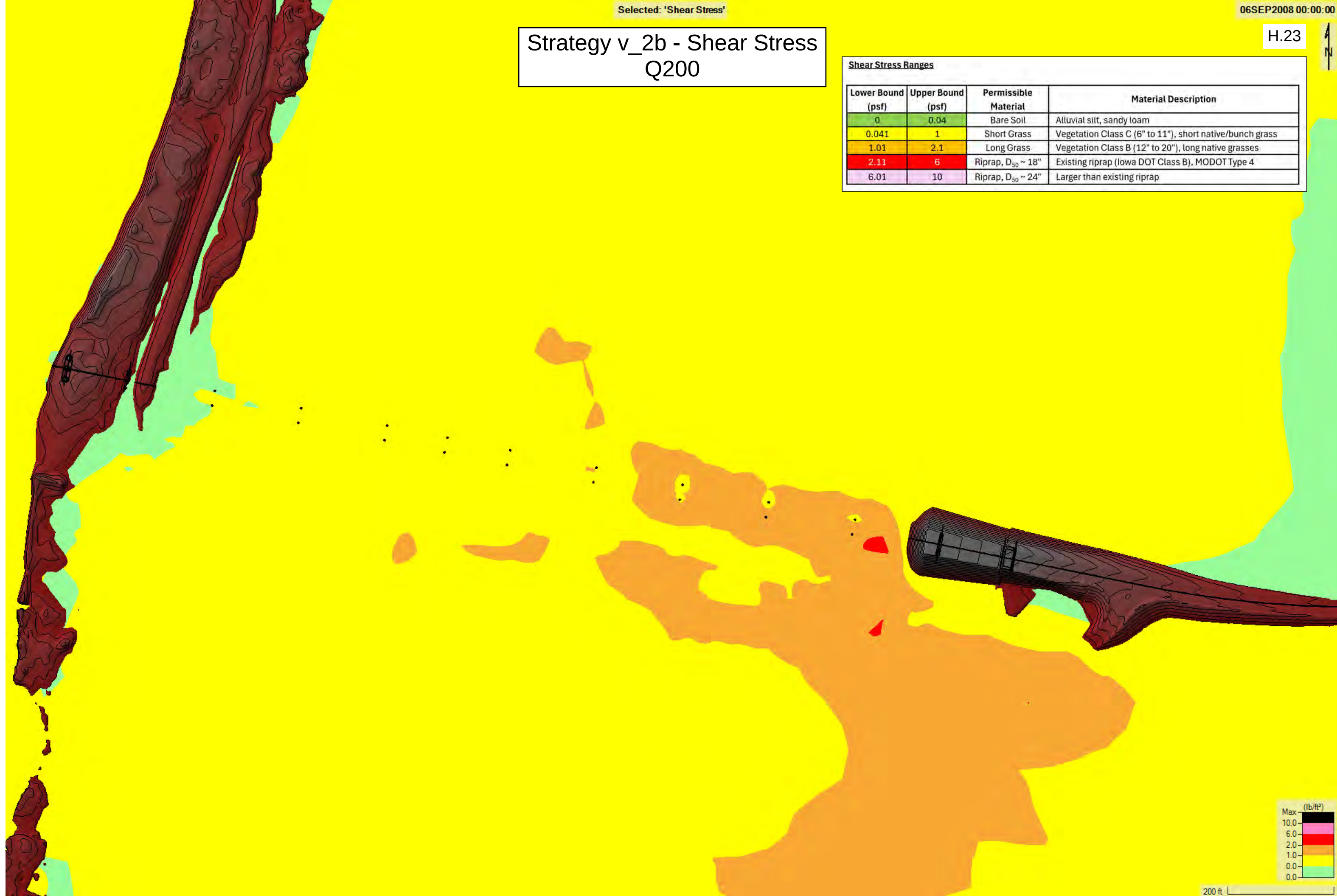


200 ft



Strategy v_2b - Shear Stress Q200

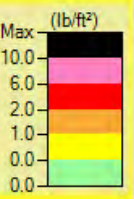
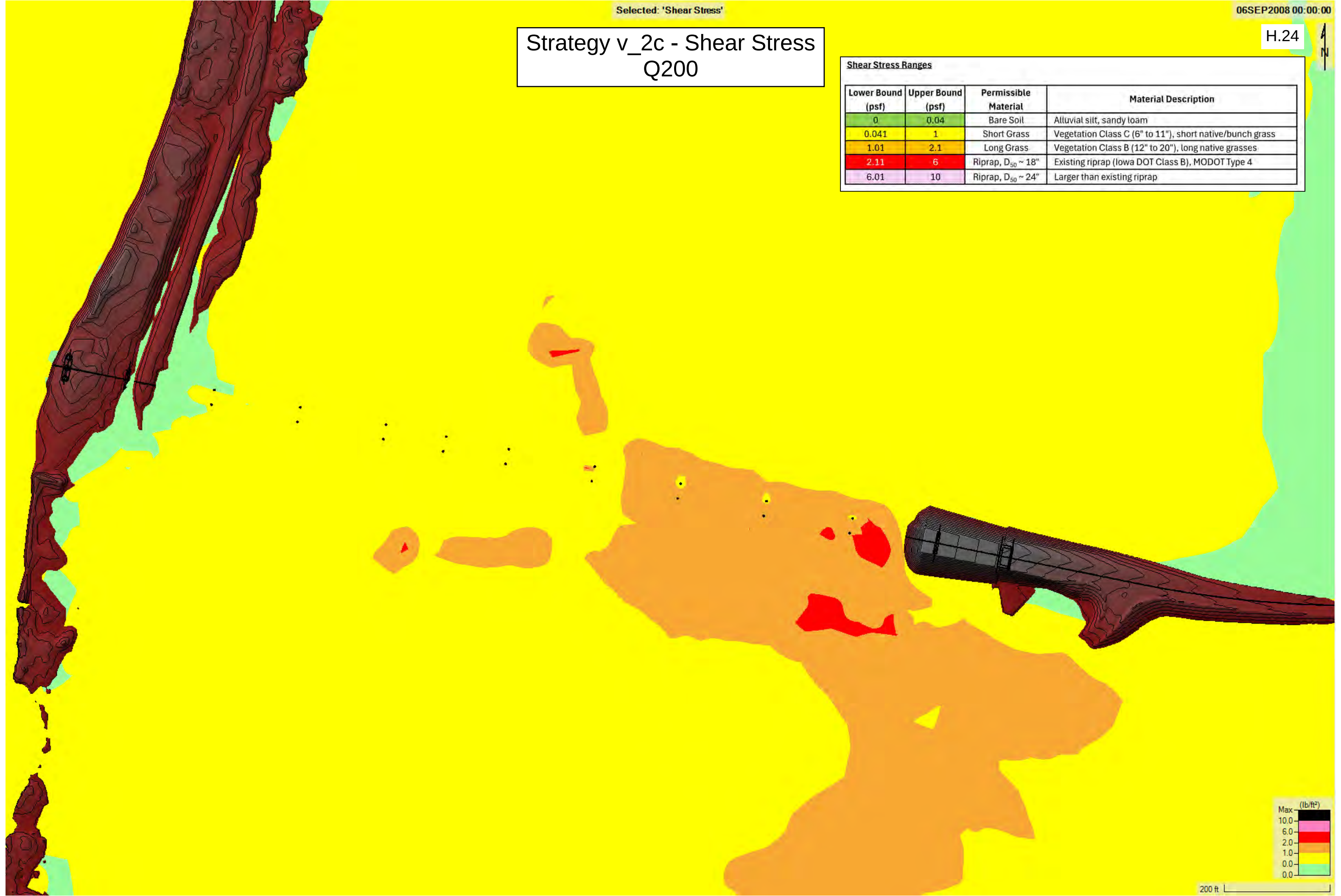
Shear Stress Ranges			
Lower Bound (psf)	Upper Bound (psf)	Permissible Material	Material Description
0	0.04	Bare Soil	Alluvial silt, sandy loam
0.041	1	Short Grass	Vegetation Class C (6" to 11"), short native/bunch grass
1.01	2.1	Long Grass	Vegetation Class B (12" to 20"), long native grasses
2.11	6	Riprap, D ₅₀ ~ 18"	Existing riprap (Iowa DOT Class B), MODOT Type 4
6.01	10	Riprap, D ₅₀ ~ 24"	Larger than existing riprap





Strategy v_2c - Shear Stress Q200

Shear Stress Ranges			
Lower Bound (psf)	Upper Bound (psf)	Permissible Material	Material Description
0	0.04	Bare Soil	Alluvial silt, sandy loam
0.041	1	Short Grass	Vegetation Class C (6" to 11"), short native/bunch grass
1.01	2.1	Long Grass	Vegetation Class B (12" to 20"), long native grasses
2.11	6	Riprap, D ₅₀ ~ 18"	Existing riprap (Iowa DOT Class B), MODOT Type 4
6.01	10	Riprap, D ₅₀ ~ 24"	Larger than existing riprap



Strategy v_5a - Shear Stress
Q200

Shear Stress Ranges

Lower Bound (psf)	Upper Bound (psf)	Permissible Material	Material Description
0	0.04	Bare Soil	Alluvial silt, sandy loam
0.041	1	Short Grass	Vegetation Class C (6" to 11"), short native/bunch grass
1.01	2.1	Long Grass	Vegetation Class B (12" to 20"), long native grasses
2.11	6	Riprap, D ₅₀ ~ 18"	Existing riprap (Iowa DOT Class B), MODOT Type 4
6.01	10	Riprap, D ₅₀ ~ 24"	Larger than existing riprap



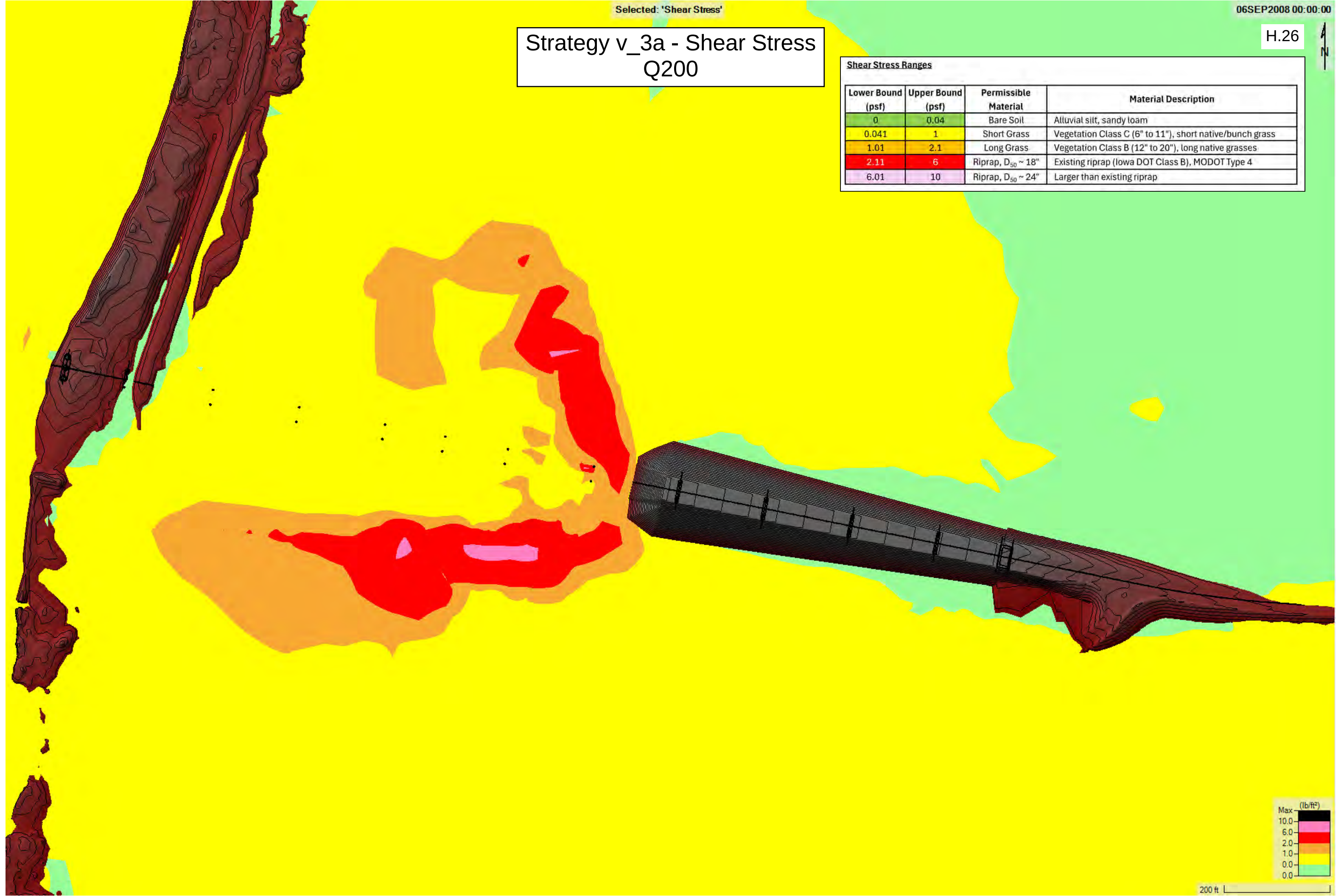
200 ft

Strategy v_3a - Shear Stress Q200

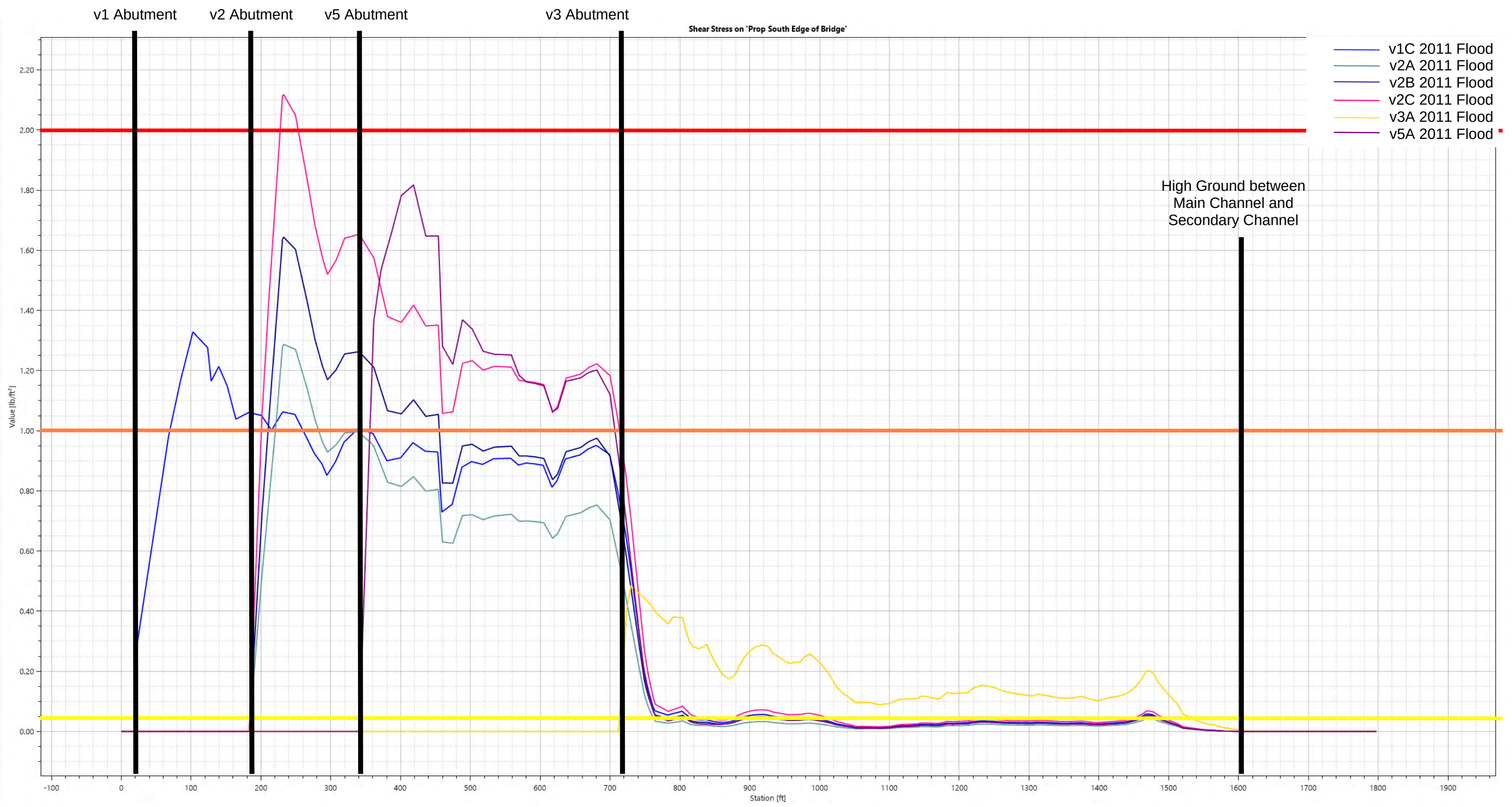
H.26



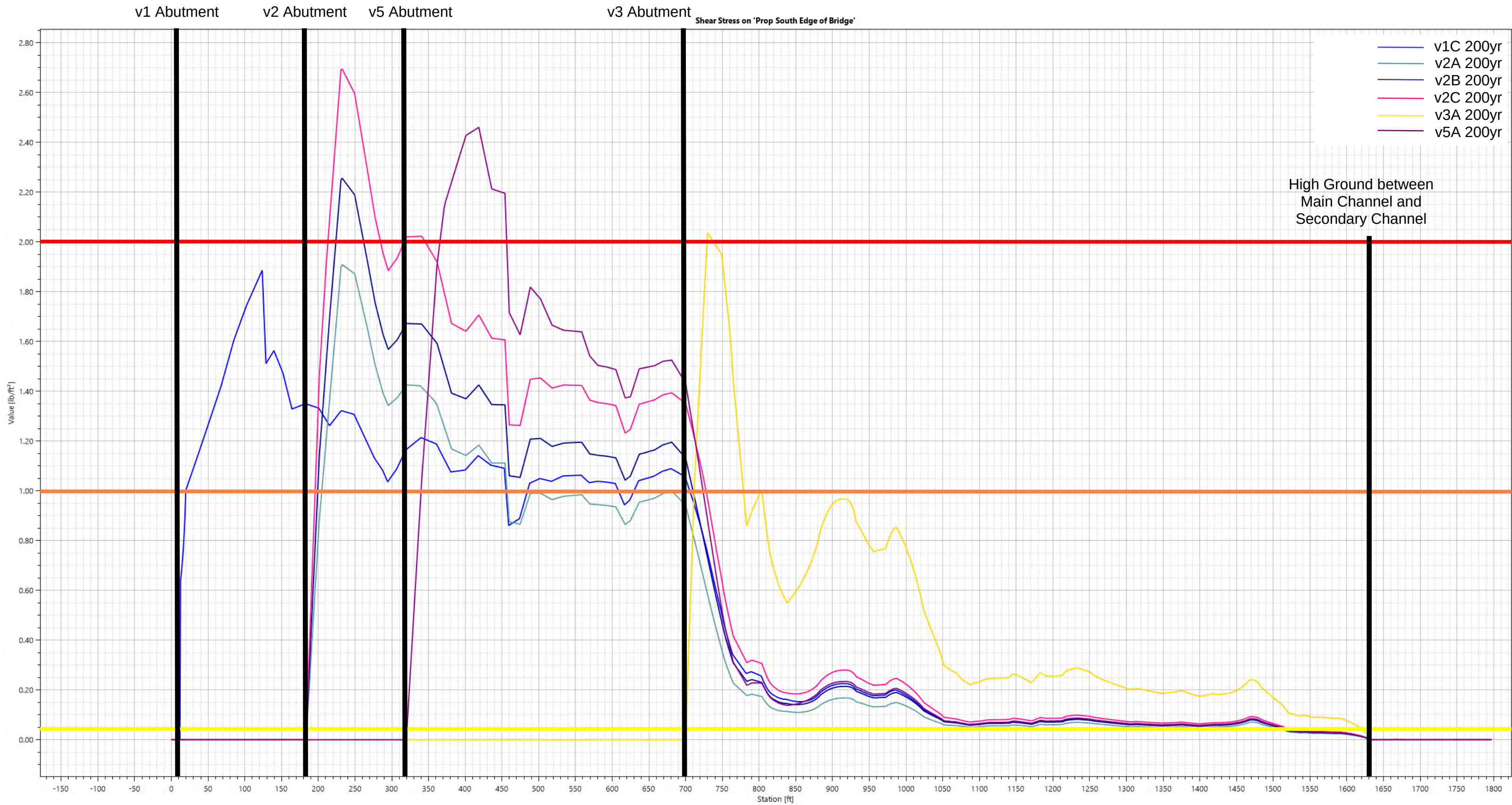
Shear Stress Ranges			
Lower Bound (psf)	Upper Bound (psf)	Permissible Material	Material Description
0	0.04	Bare Soil	Alluvial silt, sandy loam
0.041	1	Short Grass	Vegetation Class C (6" to 11"), short native/bunch grass
1.01	2.1	Long Grass	Vegetation Class B (12" to 20"), long native grasses
2.11	6	Riprap, D ₅₀ ~ 18"	Existing riprap (Iowa DOT Class B), MODOT Type 4
6.01	10	Riprap, D ₅₀ ~ 24"	Larger than existing riprap



2011 Flood Shear Stress at South Edge of Bridge

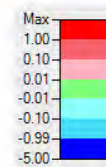


Q200 Shear Stress at South Edge of Bridge

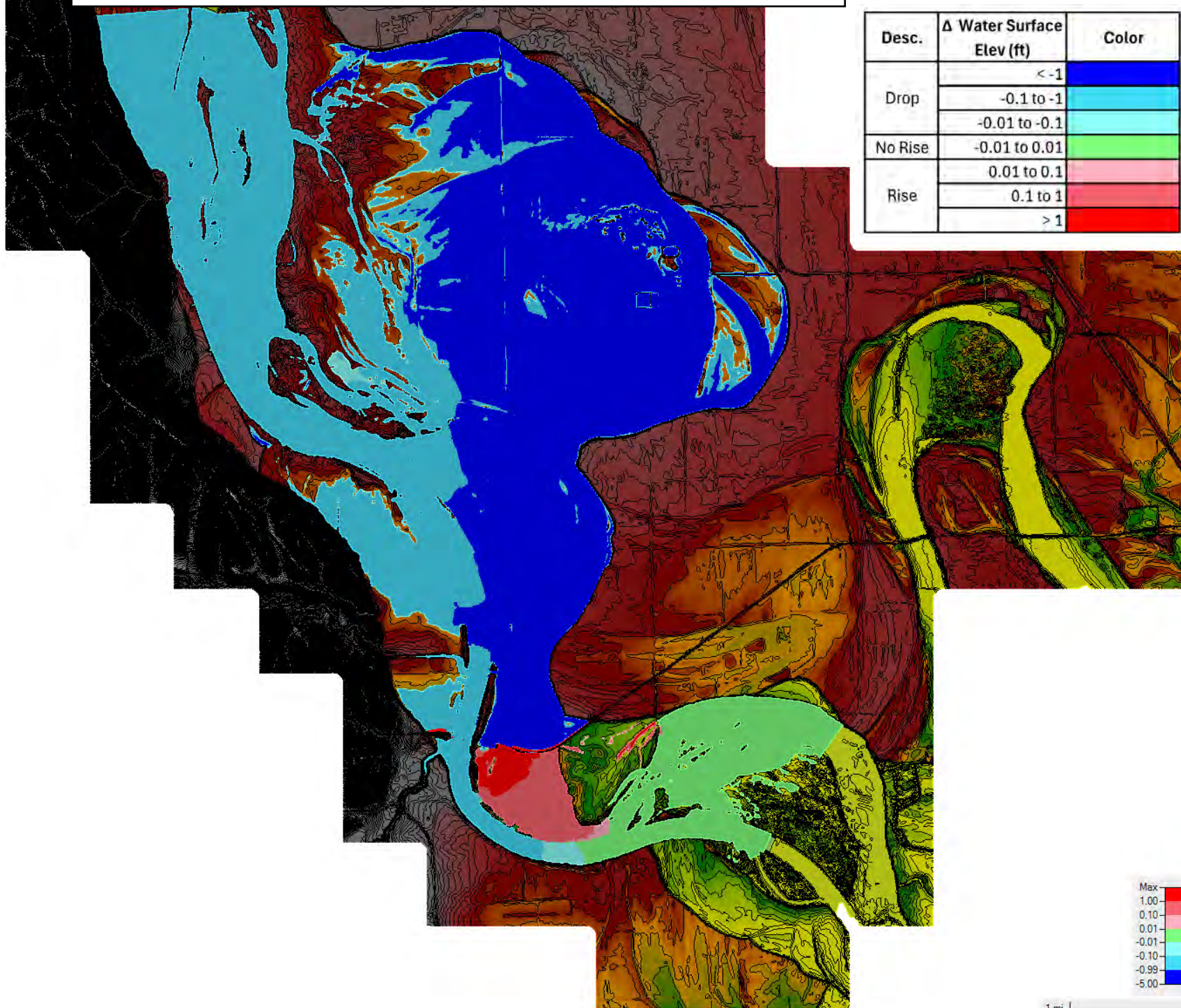


Strategy v_1c - Change in WSE vs. Existing Condition Effective FEMA Q100

Desc.	Δ Water Surface Elev (ft)	Color
Drop	< -1	Blue
	-0.1 to -1	Light Blue
	-0.01 to -0.1	Very Light Blue
No Rise	-0.01 to 0.01	Green
Rise	0.01 to 0.1	Light Pink
	0.1 to 1	Red
	> 1	Dark Red

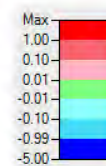


Strategy v_2a - Change in WSE vs. Existing Condition Effective FEMA Q100



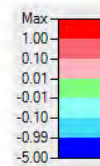
Strategy v_2b - Change in WSE vs. Existing Condition Effective FEMA Q100

Desc.	Δ Water Surface Elev (ft)	Color
Drop	< -1	Blue
	-0.1 to -1	Cyan
	-0.01 to -0.1	Light Blue
No Rise	-0.01 to 0.01	Green
Rise	0.01 to 0.1	Pink
	0.1 to 1	Red
	> 1	Dark Red



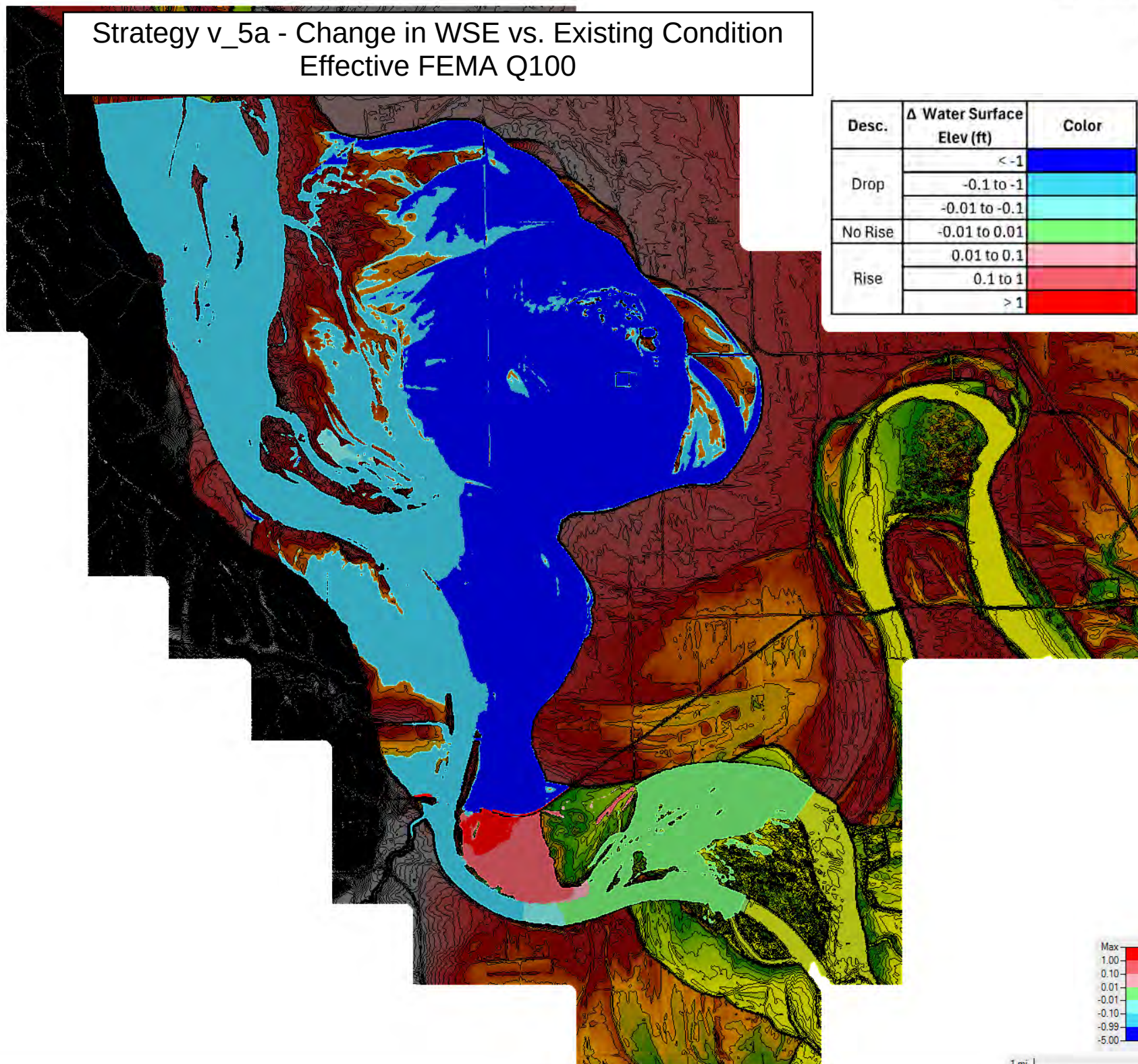
Strategy v_2c - Change in WSE vs. Existing Condition Effective FEMA Q100

Desc.	Δ Water Surface Elev (ft)	Color
Drop	< -1	Blue
	-0.1 to -1	Light Blue
	-0.01 to -0.1	Light Green
No Rise	-0.01 to 0.01	Green
Rise	0.01 to 0.1	Light Red
	0.1 to 1	Red
	> 1	Dark Red



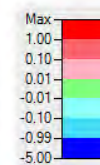
Strategy v_5a - Change in WSE vs. Existing Condition Effective FEMA Q100

Desc.	Δ Water Surface Elev (ft)	Color
Drop	< -1	Blue
	-0.1 to -1	Light Blue
	-0.01 to -0.1	Light Green
No Rise	-0.01 to 0.01	Green
Rise	0.01 to 0.1	Light Red
	0.1 to 1	Red
	> 1	Dark Red



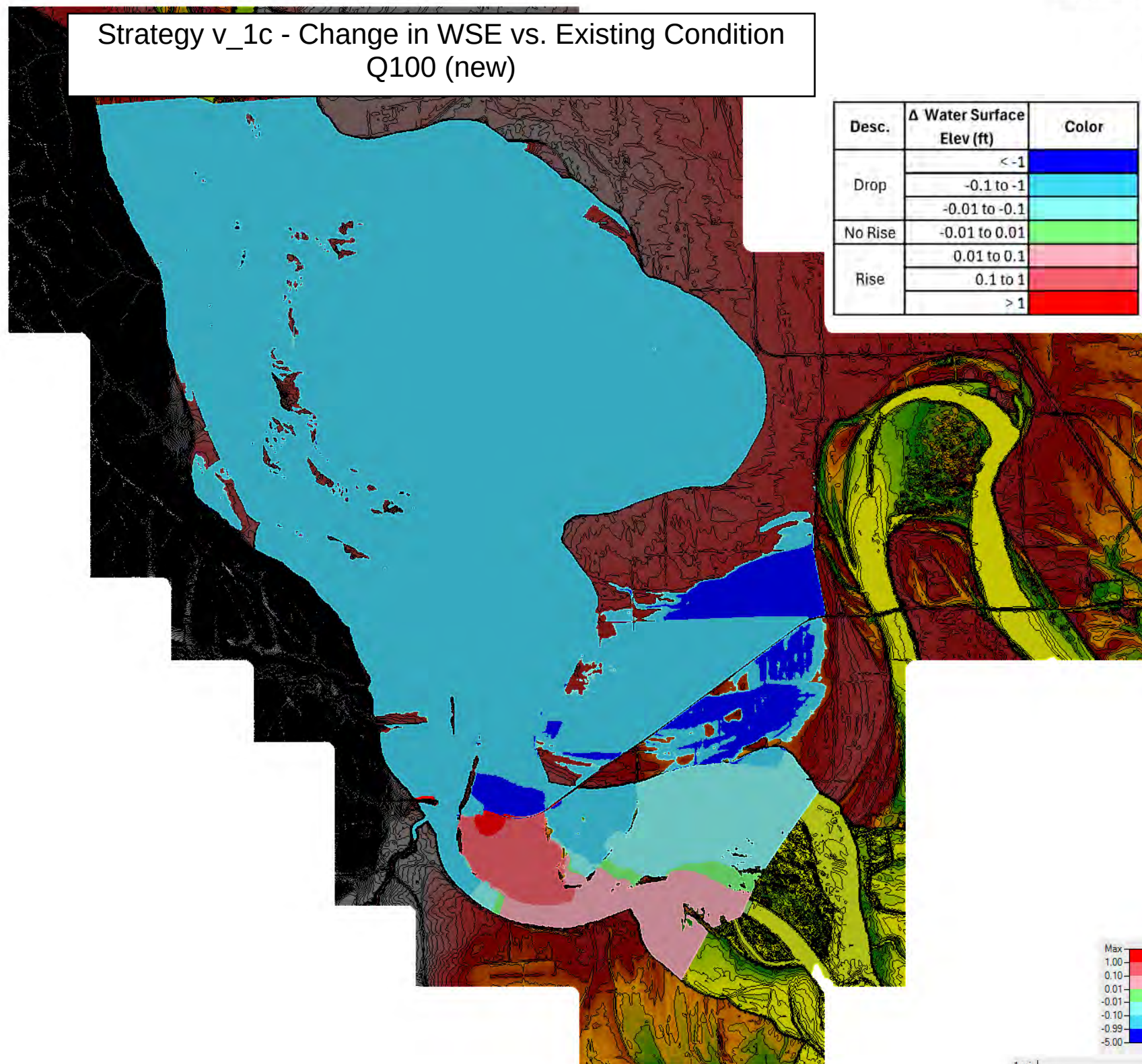
Strategy v_3a - Change in WSE vs. Existing Condition Effective FEMA Q100

Desc.	Δ Water Surface Elev (ft)	Color
Drop	< -1	Blue
	-0.1 to -1	Cyan
	-0.01 to -0.1	Light Blue
No Rise	-0.01 to 0.01	Green
Rise	0.01 to 0.1	Pink
	0.1 to 1	Red
	> 1	Dark Red

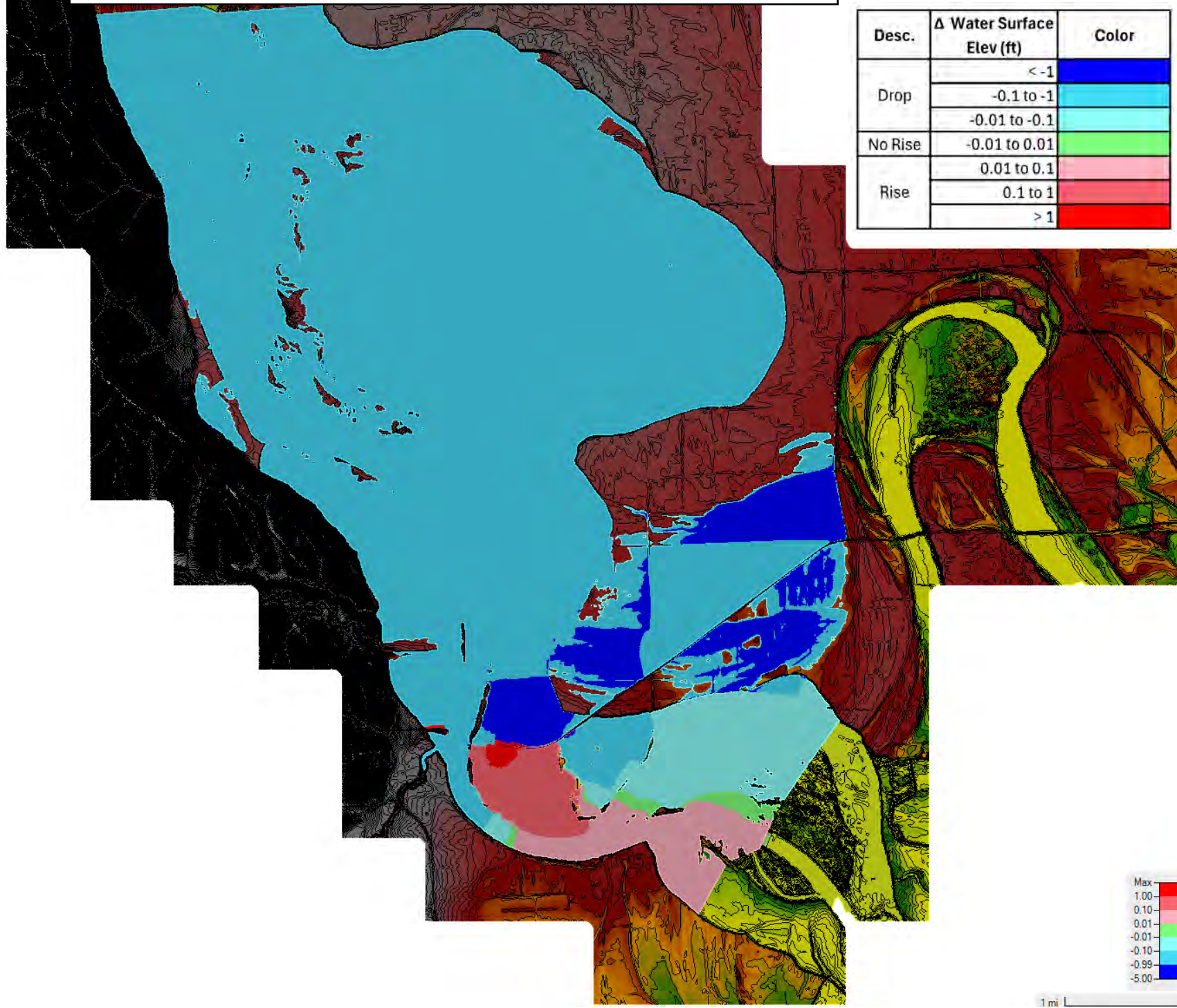


Strategy v_1c - Change in WSE vs. Existing Condition Q100 (new)

Desc.	Δ Water Surface Elev (ft)	Color
Drop	< -1	Blue
	-0.1 to -1	Light Blue
	-0.01 to -0.1	Very Light Blue
No Rise	-0.01 to 0.01	Green
Rise	0.01 to 0.1	Light Pink
	0.1 to 1	Red
	> 1	Dark Red

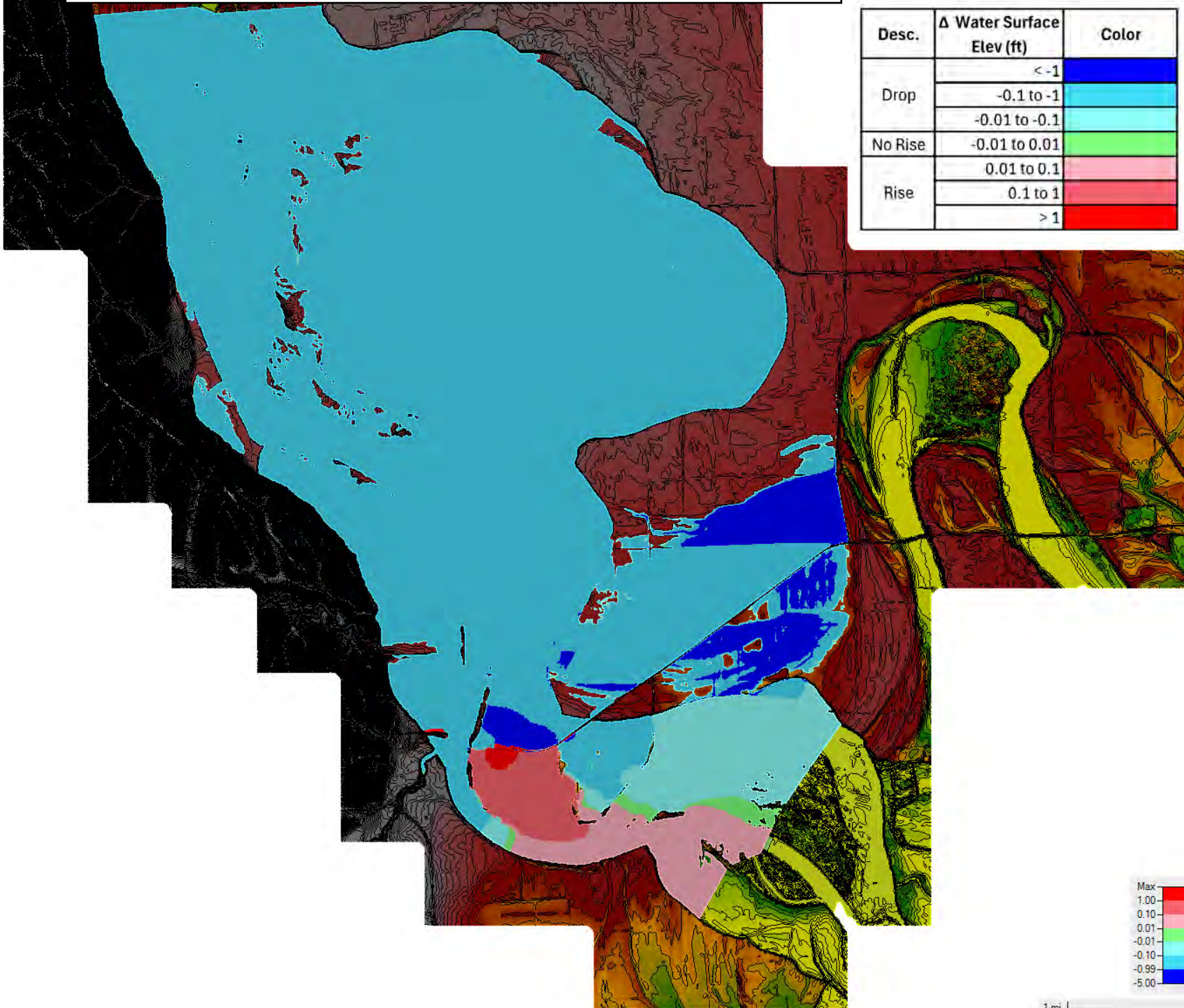


Strategy v_2a - Change in WSE vs. Existing Condition Q100 (new)



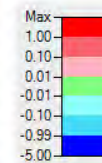
Strategy v_2b - Change in WSE vs. Existing Condition Q100 (new)

Desc.	Δ Water Surface Elev (ft)	Color
Drop	< -1	Dark Blue
	-0.1 to -1	Light Blue
	-0.01 to -0.1	Very Light Blue
No Rise	-0.01 to 0.01	Green
Rise	0.01 to 0.1	Pink
	0.1 to 1	Red
	> 1	Dark Red



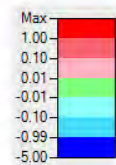
Strategy v_2c - Change in WSE vs. Existing Condition Q100 (new)

Desc.	Δ Water Surface Elev (ft)	Color
Drop	< -1	Dark Blue
	-0.1 to -1	Light Blue
	-0.01 to -0.1	Very Light Blue
No Rise	-0.01 to 0.01	Green
Rise	0.01 to 0.1	Pink
	0.1 to 1	Red
	> 1	Dark Red

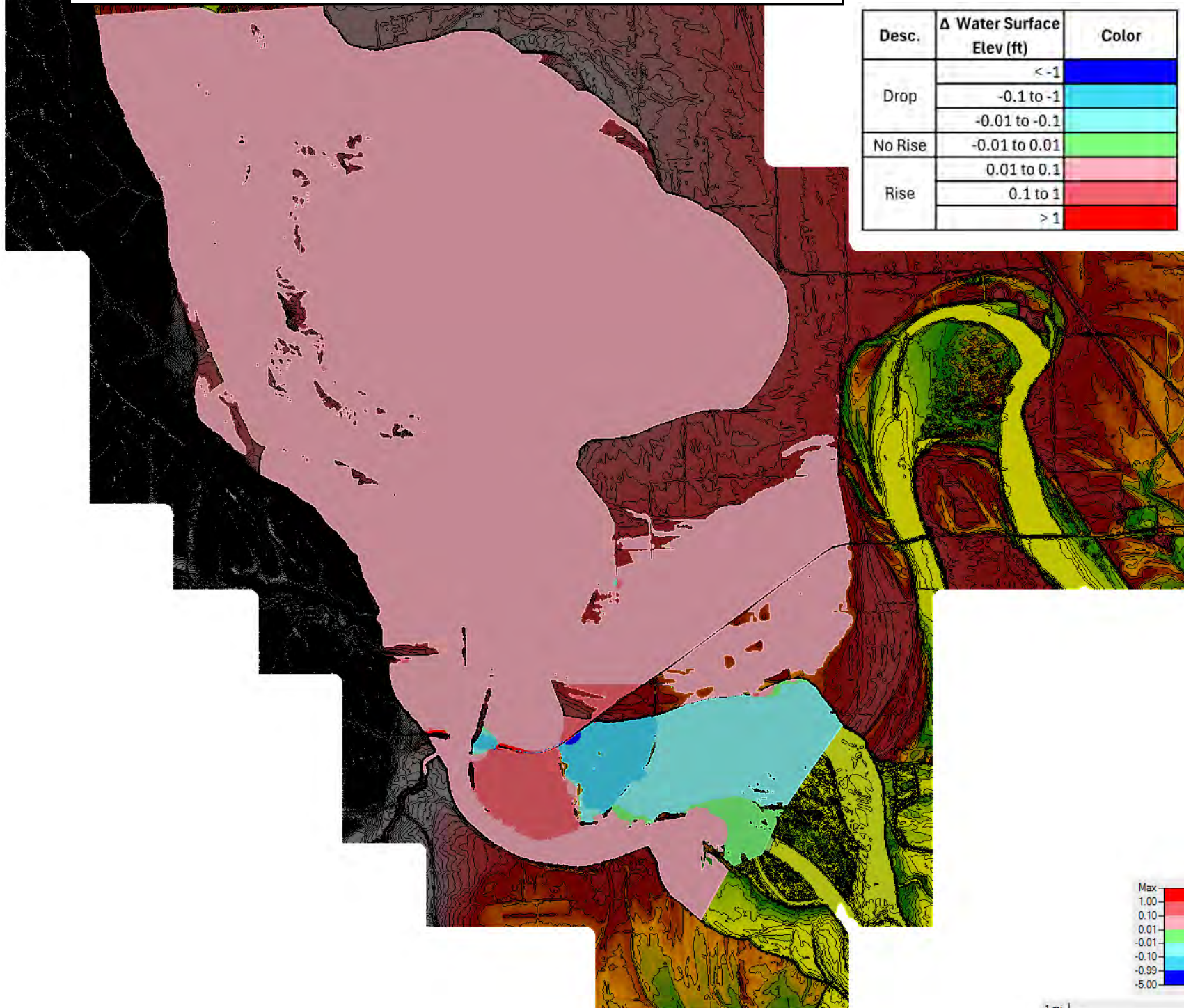


Strategy v_5a - Change in WSE vs. Existing Condition Q100 (new)

Desc.	Δ Water Surface Elev (ft)	Color
Drop	< -1	Dark Blue
	-0.1 to -1	Light Blue
	-0.01 to -0.1	Very Light Blue
No Rise	-0.01 to 0.01	Green
Rise	0.01 to 0.1	Light Pink
	0.1 to 1	Red
	> 1	Dark Red



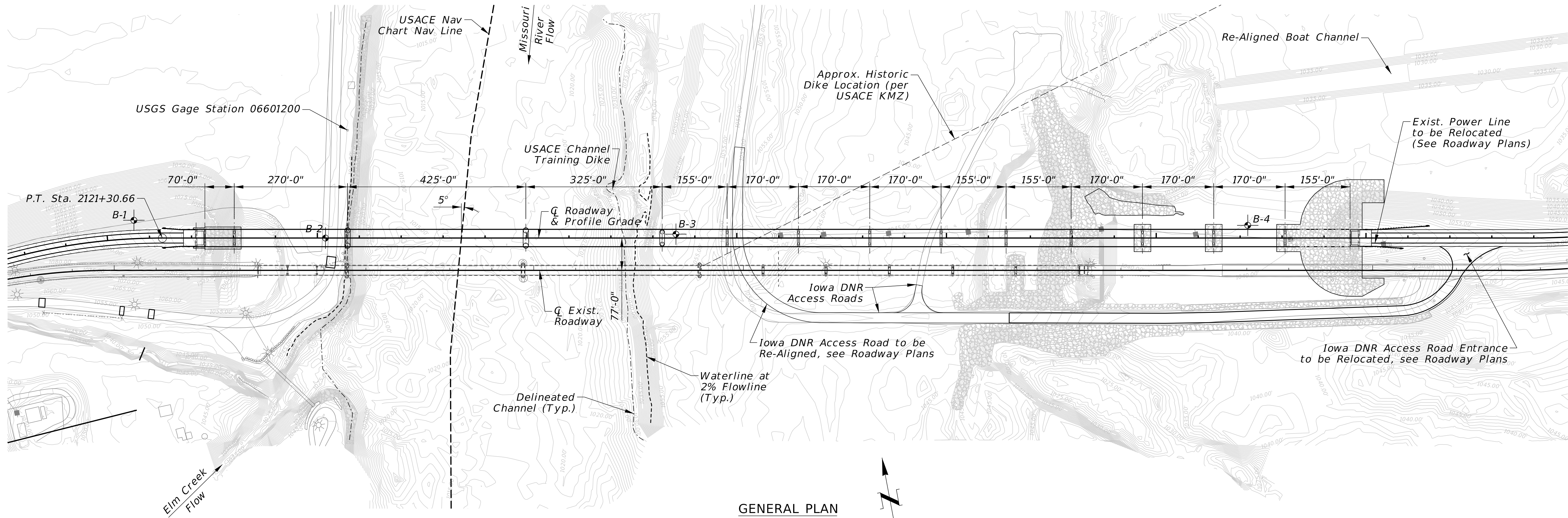
Strategy v_3a - Change in WSE vs. Existing Condition Q100 (new)



Computer: B255640

Date: 12-AUG-2025 09:52

File: S051_03644_TSL.dgn



GENERAL PLAN
Scale 1" = 120'-0"

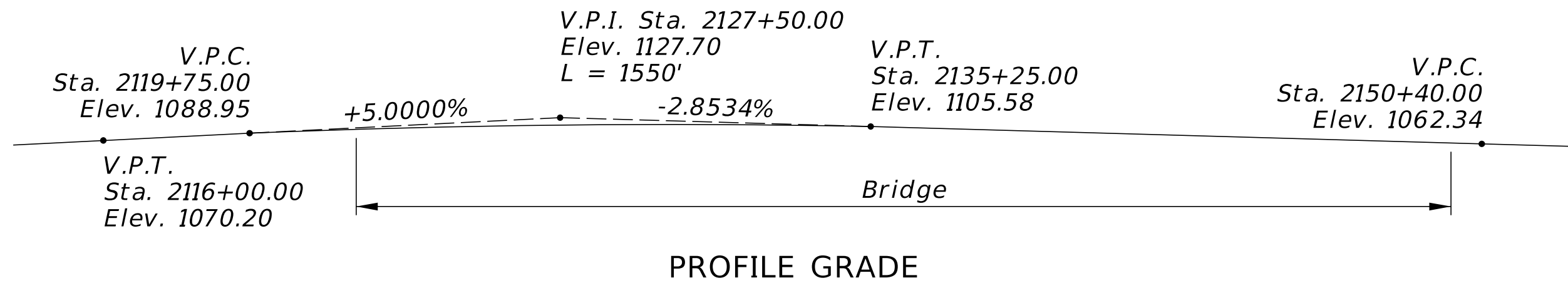
BRIDGE HYDRAULIC INFORMATION

STREAM: MISSOURI RIVER
D.A. = 316,130 SQ. MI.
Q100 = 220,600 C.F.S. (BASE FLOOD)
Q100 = 220,600 C.F.S. (BRIDGE - BASE FLOOD)
Q100 H.W. ELEV. = 1051.60 FT. (MAIN CHANNEL, UPSTREAM SIDE)
W.W.A. BELOW H. W. = 36,790 SQ. FT.
Q200 = 271,000 C.F.S. (OVERTOPPING FLOOD)
LOW ROAD ELEV. = 1053.78 FT.
Q (O.H.W.) = 47,560 C.F.S.
ORDINARY HIGH WATER ELEV. = 1035.0 FT.
SEE PLAN & ELEVATION SHEETS FOR SCOUR ELEV.

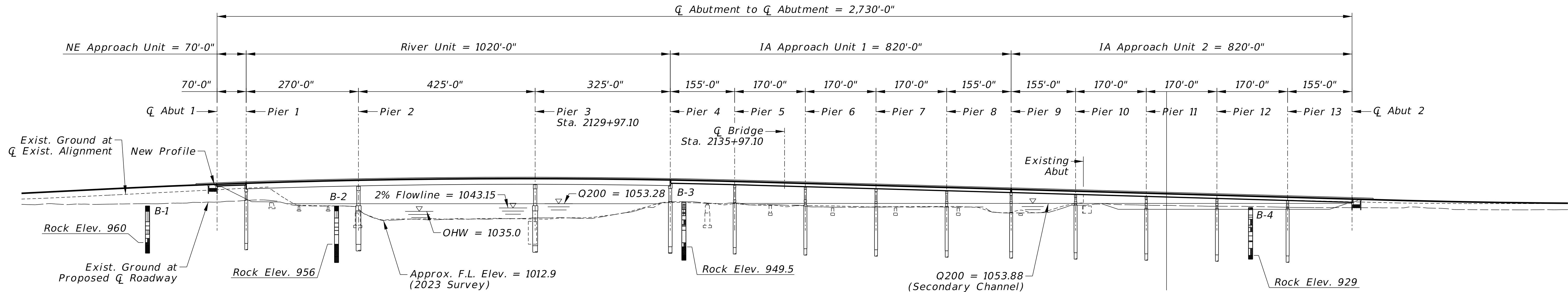
Grade Elevations shown are at the
Profile Grade Line. All Grade
Elevations shall be to top of concrete.

This structure is located on N-51 and
IA-175 across the Missouri River in
Burt County, NE and Monona County,
IA. Sec. 36-T24N-R10E.

TRAFFIC DATA		
YEAR	2029	2049
ADT	1,830	1,855
DHV	195	200
HEAVY TRUCKS	10%	10%



PROFILE GRADE



GENERAL ELEVATION
Scale 1" = 120'-0"

NOTES:

All elevations referenced to North American Vertical Datum of 1988 (NAVD88).
Contours on this sheet show proposed conditions.

BURNS & MCDONNELL
ENGINEERING COMPANY, INC.
1010 N. 102ND COURT, SUITE 200
OMAHA, NE 68114
Office: 402-408-3013
Nebraska C.O.A. #CA-0621

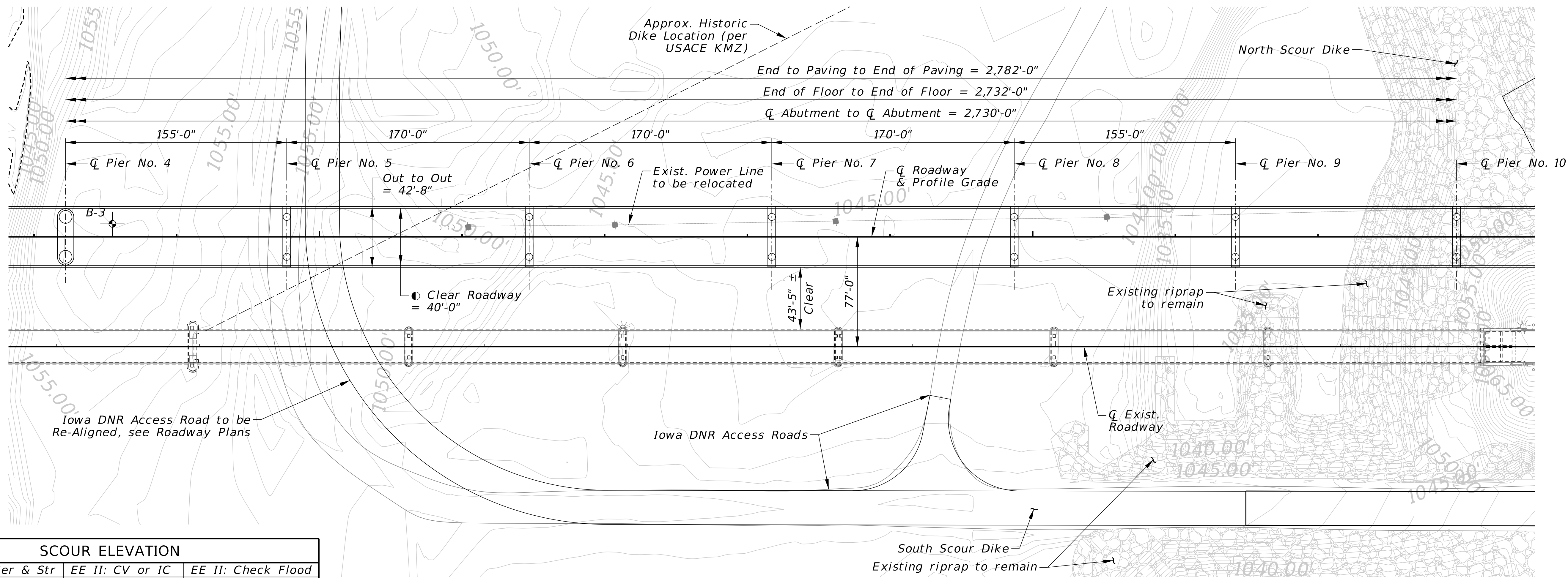
S1	PROJECT NUMBER STP-51-7(109)	C.N. 32395	LOCATION Decatur Bridge	STRUCTURE NUMBER S051 03644
2730'-0" 14-SPAN MISSOURI RIVER BRIDGE GENERAL LAYOUT				
SKW 0°	ROADWAY 40'-0"	FWHA CONST. TYPE X441	DESIGN LIVE LOAD HL-93	DATE AUG 2025
COUNTY Burt	HWY. NO. N-51	REF. POST. XXX.XX	STA. 2125+97.10	Q.C. ENGINEER: J. Sarson
DESIGNED BY: A. Fardon				
NEBRASKA Good Life. Great Journey. DEPARTMENT OF TRANSPORTATION				
BRIDGE DIVISION 1500 Nebraska Parkway Lincoln, NE 68502 Office: 402-479-4701 STATE BRIDGE ENGINEER Ross D. Barron, P.E. State of Nebraska E-14018				
NOT FINAL PRELIMINARY PLAN SUBJECT TO CHANGE				
SPECIAL PLAN NO.	1	9		

COMPUTER\$\$\$\$

DATE\$\$\$\$\$\$\$\$\$\$\$\$

DGN\$PC\$\$\$\$\$\$\$\$\$

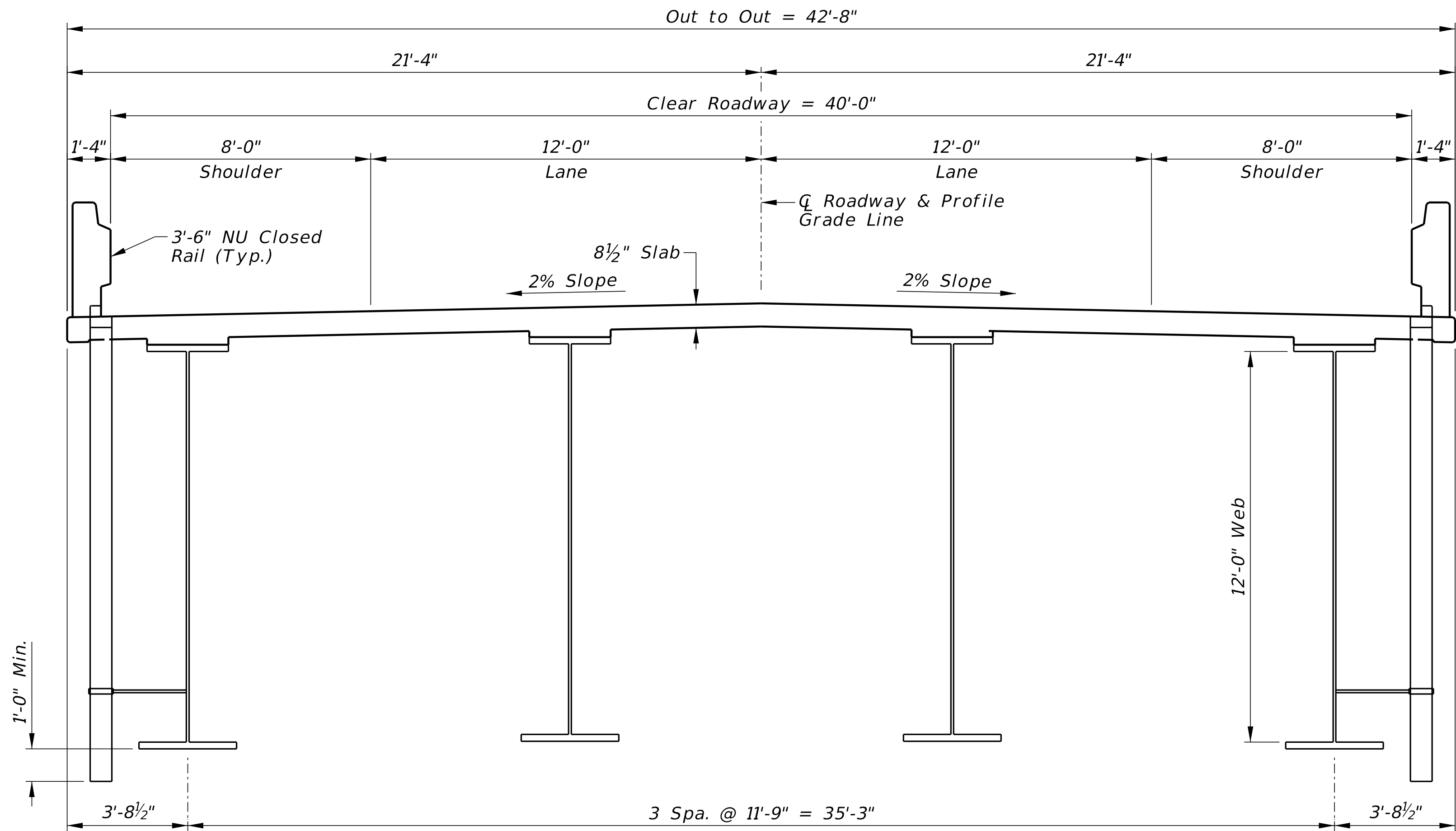
SCOUR ELEVATION			
Load Case	Ser & Str	EE II: CV or IC	EE II: Check Flood
Event	Q200	Q200	Q500
Pier 5	1042.3	1048.8	1036.1
Pier 6	1033.6	1040.1	1027.4
Pier 7	1032.3	1038.8	1026.1
Pier 8	1032.0	1038.5	1025.8
Pier 9	1009.3	1020.2	1002.9



NOTES:
Contours on this sheet show proposed conditions.

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Office: 402-408-3013
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S3	
PROJECT NUMBER STP-51-7(109)	
C.N. 32395	
LOCATION Decatur Bridge	
STRUCTURE NUMBER S051 03644	
2730'-0" 14-SPAN MISSOURI RIVER BRIDGE PLAN & ELEVATION - SHEET 2 OF 3 DATE AUG 2025 Q.C. ENGINEER: J. Sarson	
COUNTY Burt HWY. NO. N-51 REF. POST. XXX.XX STA. 2125+97.10 DESIGN CODE LRFD 10th Edition DESIGNED BY: A. Ferdon DETAILED BY: T. McDowell	
SKEW 0° ROADWAY 40'-0" FHWA CONST. TYPE X441 DESIGN LIVE LOAD HL-93	
NEBRASKA Good Life. Great Journey. DEPARTMENT OF TRANSPORTATION	
BRIDGE DIVISION 1500 Nebraska Parkway Lincoln, NE 68502 Office: 402-479-4701 STATE BRIDGE ENGINEER Ross D. Barron, P.E. State of Nebraska E-14018	
NOT FINAL PRELIMINARY PLAN SUBJECT TO CHANGE	
SPECIAL PLAN NO. 1	3 9



TYPICAL SECTION RIVER UNIT
Scale $\frac{3}{8}" = 1'-0"$

S5	
PROJECT NUMBER STP-51-7(109)	
C.N. 32395	
LOCATION Decatur Bridge	
STRUCTURE NUMBER S051 03644	
2730'-0" 14-SPAN MISSOURI RIVER BRIDGE TYPICAL SECTION - RIVER UNIT	
COUNTY Burt	SKEW 0°
HWY. NO. N-51	ROADWAY 40'-0"
REF. POST. XXX.XX	FHWA CONST. TYPE X441
STA. 2125+97.10	DESIGN LIVE LOAD HL-93
DESIGN CODE LRFD 10th Edition	
DESIGNED BY: A. Ferdon	DETAILED BY: T. McDowell
Q.C. ENGINEER: J. Sarson	DATE AUG 2025

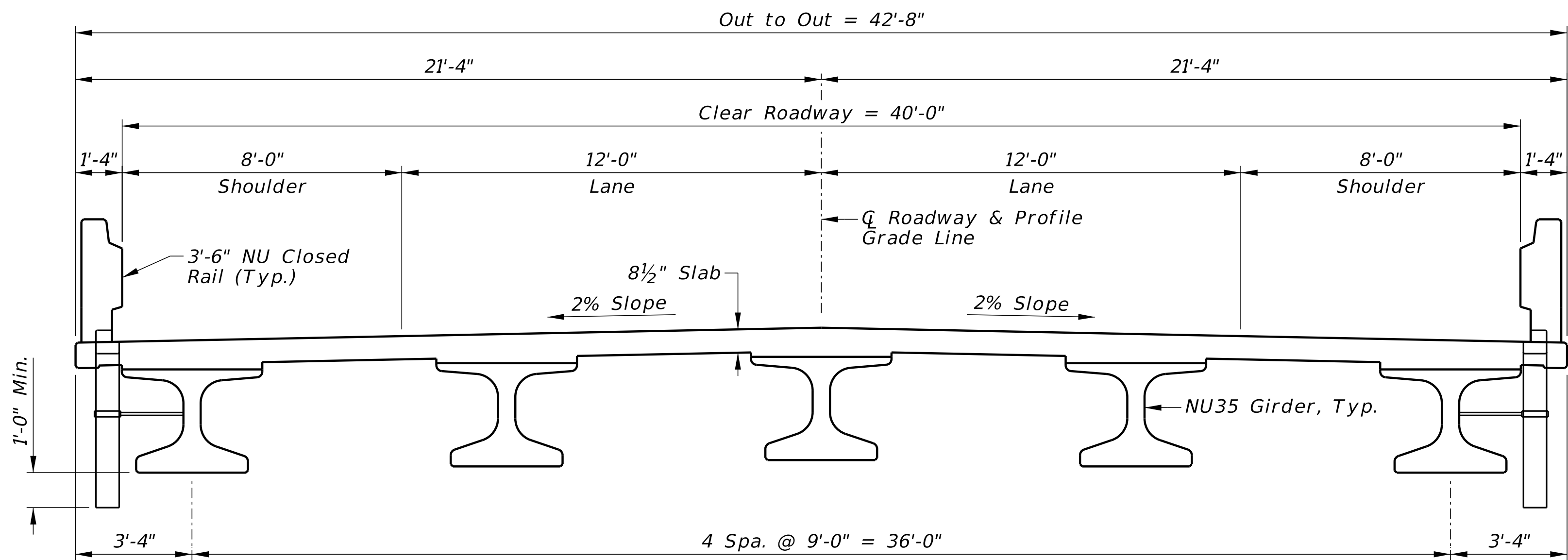
NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

BRIDGE DIVISION
1500 Nebraska Parkway
Lincoln, NE 68502
Office: 402-479-4701
STATE BRIDGE ENGINEER
Ross D. Barron, P.E.
State of Nebraska
E-14018

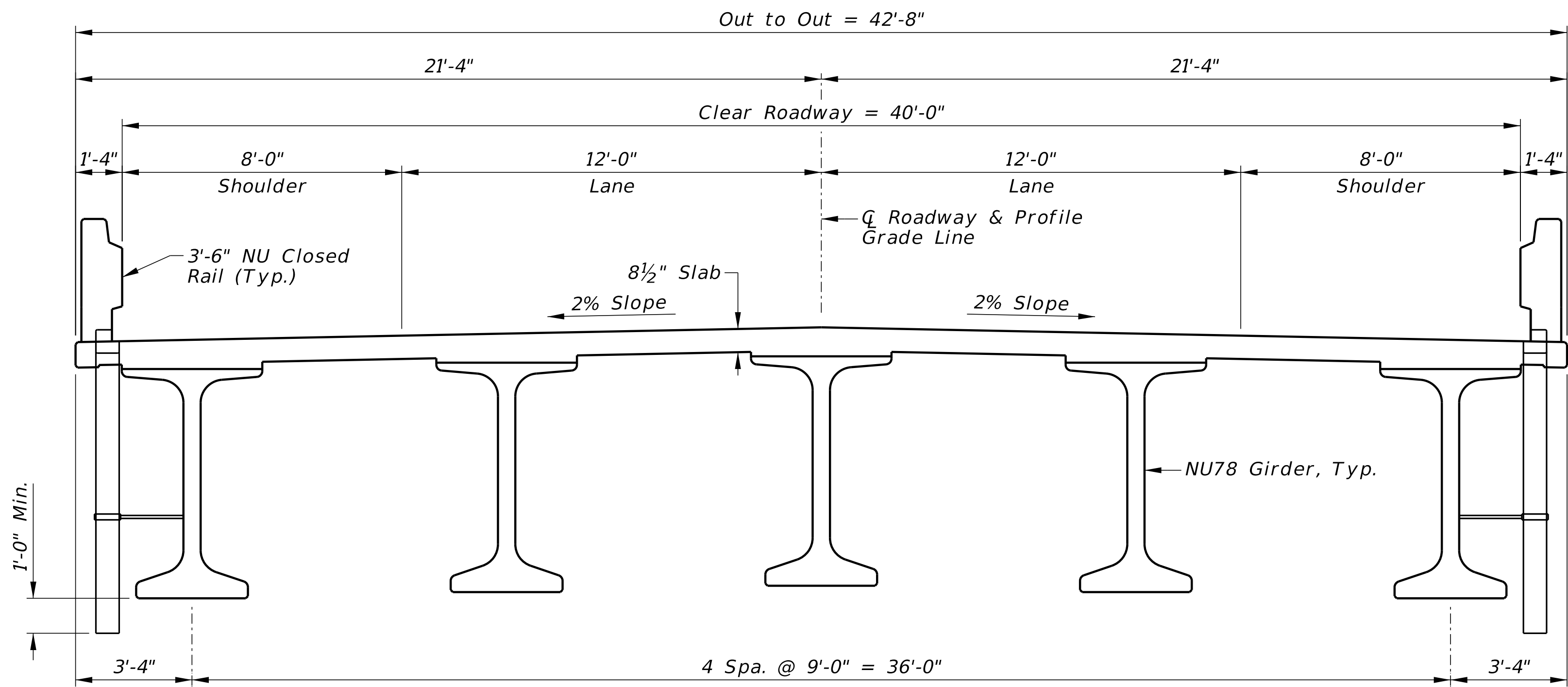
★ NOT FINAL ★
PRELIMINARY
PLAN
SUBJECT TO CHANGE

BURNS & MCDONNELL
ENGINEERING COMPANY, INC.
1010 N. 102ND COURT, SUITE 200
OMAHA, NE 68114
Office: 402-408-3013
Nebraska C.O.A. #CA-0621

SPECIAL PLAN NO.	5
1	9



TYPICAL SECTION NEBRASKA APPROACH UNIT
Scale $\frac{3}{8}" = 1'-0"$



TYPICAL SECTION IOWA APPROACH UNITS
Scale $\frac{3}{8}" = 1'-0"$

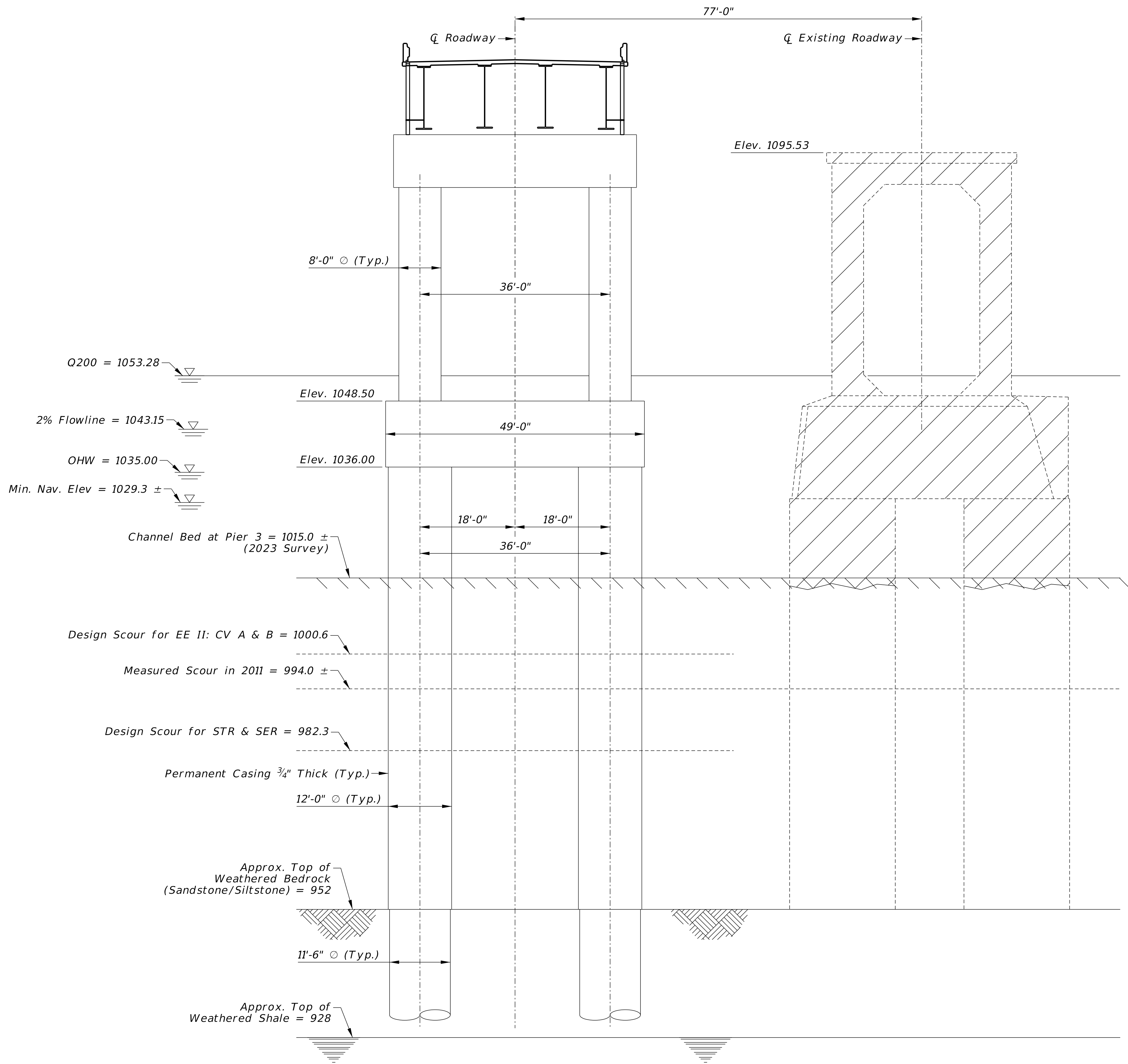
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PROJECT NUMBER STP-51-7(109)		
C.N. 32395		
LOCATION Decatur Bridge		
STRUCTURE NUMBER S051 03644		
2730'-0" 14-SPAN MISSOURI RIVER BRIDGE TYPICAL SECTION - APPROACH UNITS Q.C. ENGINEER: J. Sarson DATE AUG 2025		
COUNTY Burt	SKEW 0°	ROADWAY 40'-0"
HWY. NO. N-51		FHWA CONST. TYPE X441
REF. POST. XXX.XX		DESIGN LIVE LOAD HL-93
STA. 2125+97.10		
DESIGN CODE LRFD 10th Edition		
DESIGNED BY: A. Fardon	DETAILED BY: T. McDowell	
NEBRASKA Good Life. Great Journey. DEPARTMENT OF TRANSPORTATION		
BRIDGE DIVISION 1500 Nebraska Parkway Lincoln, NE 68502 Office: 402-479-4701 STATE BRIDGE ENGINEER Ross D. Barron, P.E. State of Nebraska E-14018		
NOT FINAL PRELIMINARY PLAN SUBJECT TO CHANGE		
SPECIAL PLAN NO.	6	9
1		

BURNS & MCDONNELL
ENGINEERING COMPANY, INC.
1010 N. 102ND COURT, SUITE 200
OMAHA, NE 68114
Office: 402-408-3013
Nebraska C.O.A. #CA-0621

Computer: B255640

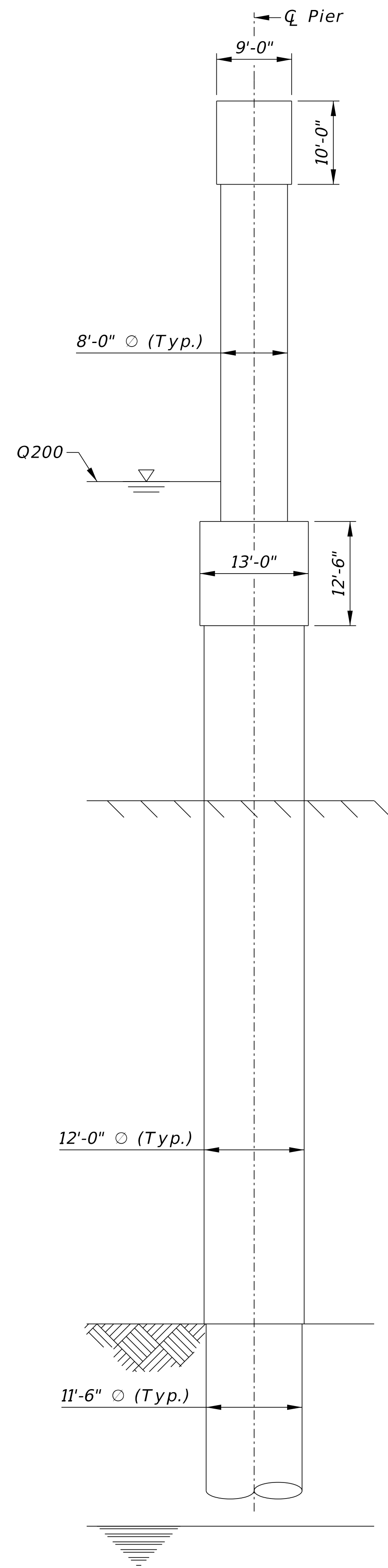
Date: 12-AUG-2025 09:58

File: S051_03644_TSL.dgn



TYPICAL RIVER PIER - PIER 3

Pier 2 Similar.
Scale 1" = 10'-0"



SECTION
Scale 1" = 10'-0"

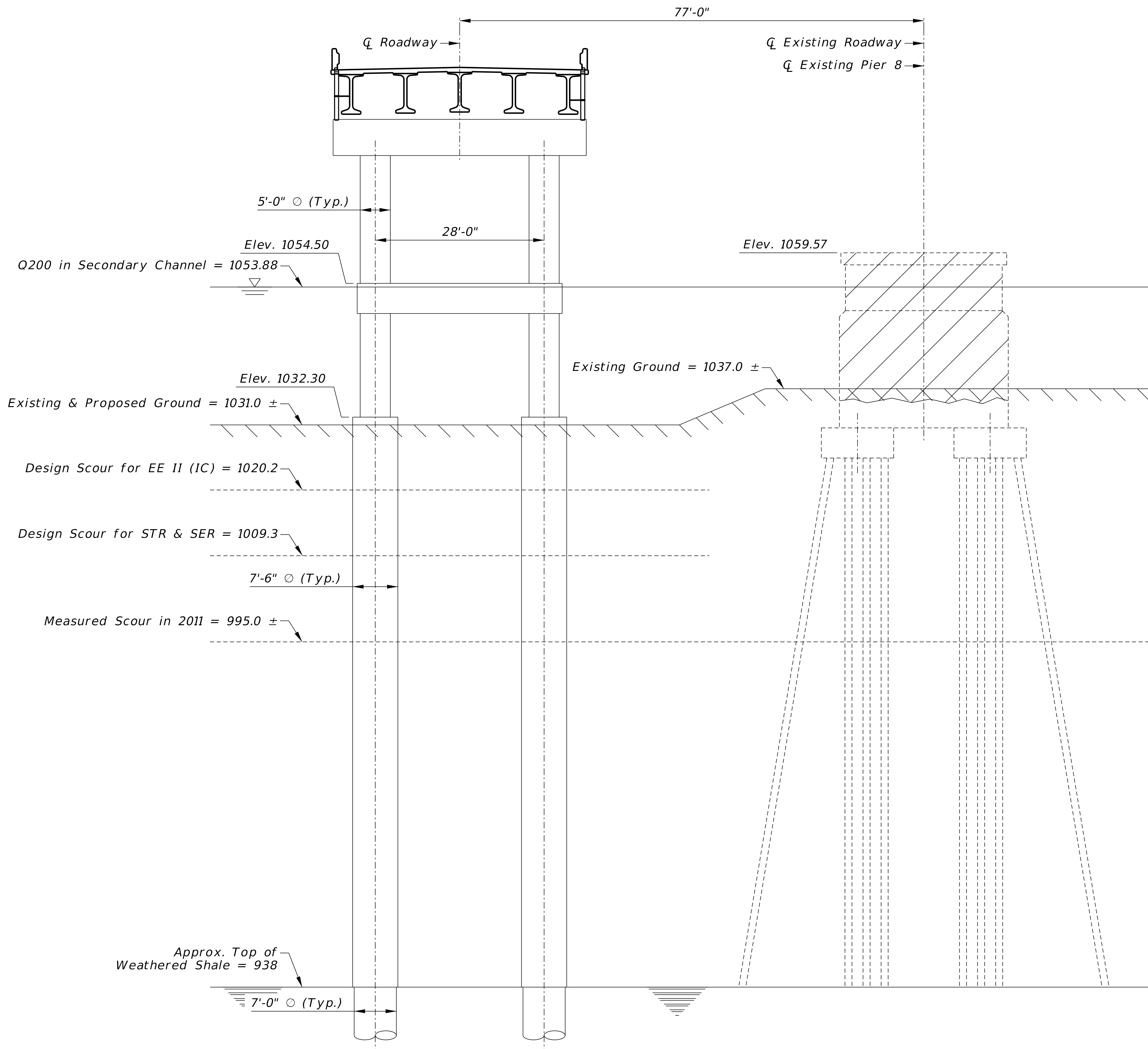
BURNS & MCDONNELL
ENGINEERING COMPANY, INC.
1010 N. 102ND COURT, SUITE 200
OMAHA, NE 68114
Office: 402-408-3013
Nebraska C.O.A. #CA-0621

S7	
PROJECT NUMBER STP-51-7(109)	
C.N. 32395	
LOCATION Decatur Bridge	
STRUCTURE NUMBER S051 03644	
2730'-0" 14-SPAN MISSOURI RIVER BRIDGE TYPICAL RIVER PIER (PIER 3)	
SKW 0° ROADWAY 40'-0" FHWA CONST. TYPE X441 DESIGN LIVE LOAD HL-93 DESIGN CODE LRFD 10th Edition	Q.C. ENGINEER: J. Sarson DATE AUG 2025
COUNTY Burt HWY. NO. N-51 REF. POST. XXX.XX STA. 2125+97.10 DESIGNED BY: A. Fardon	DETAILED BY: T. McDowell
NEBRASKA Good Life. Great Journey. DEPARTMENT OF TRANSPORTATION	
BRIDGE DIVISION 1500 Nebraska Parkway Lincoln, NE 68502 Office: 402-479-4701 STATE BRIDGE ENGINEER Ross D. Barron, P.E. State of Nebraska E-14018	
NOT FINAL PRELIMINARY PLAN SUBJECT TO CHANGE	
SPECIAL PLAN NO.	7
1	9

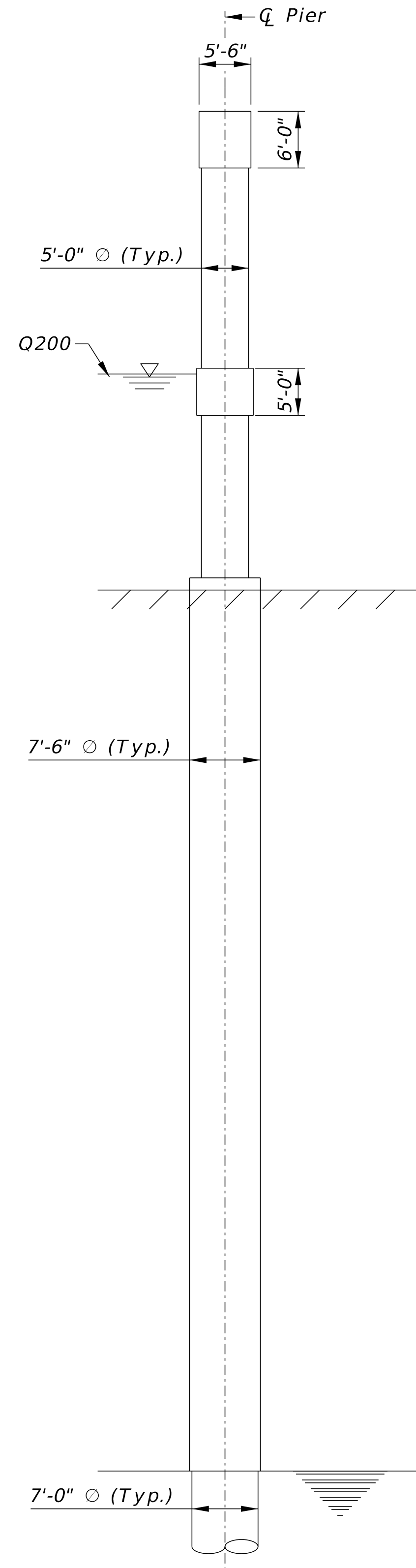
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Date: 12-AUG-2025 09:59

File: S051_03644_TSL.dgn



TYPICAL APPROACH PIER - PIER 9
Scale 1" = 10'-0"



SECTION
Scale 1" = 10'-0"

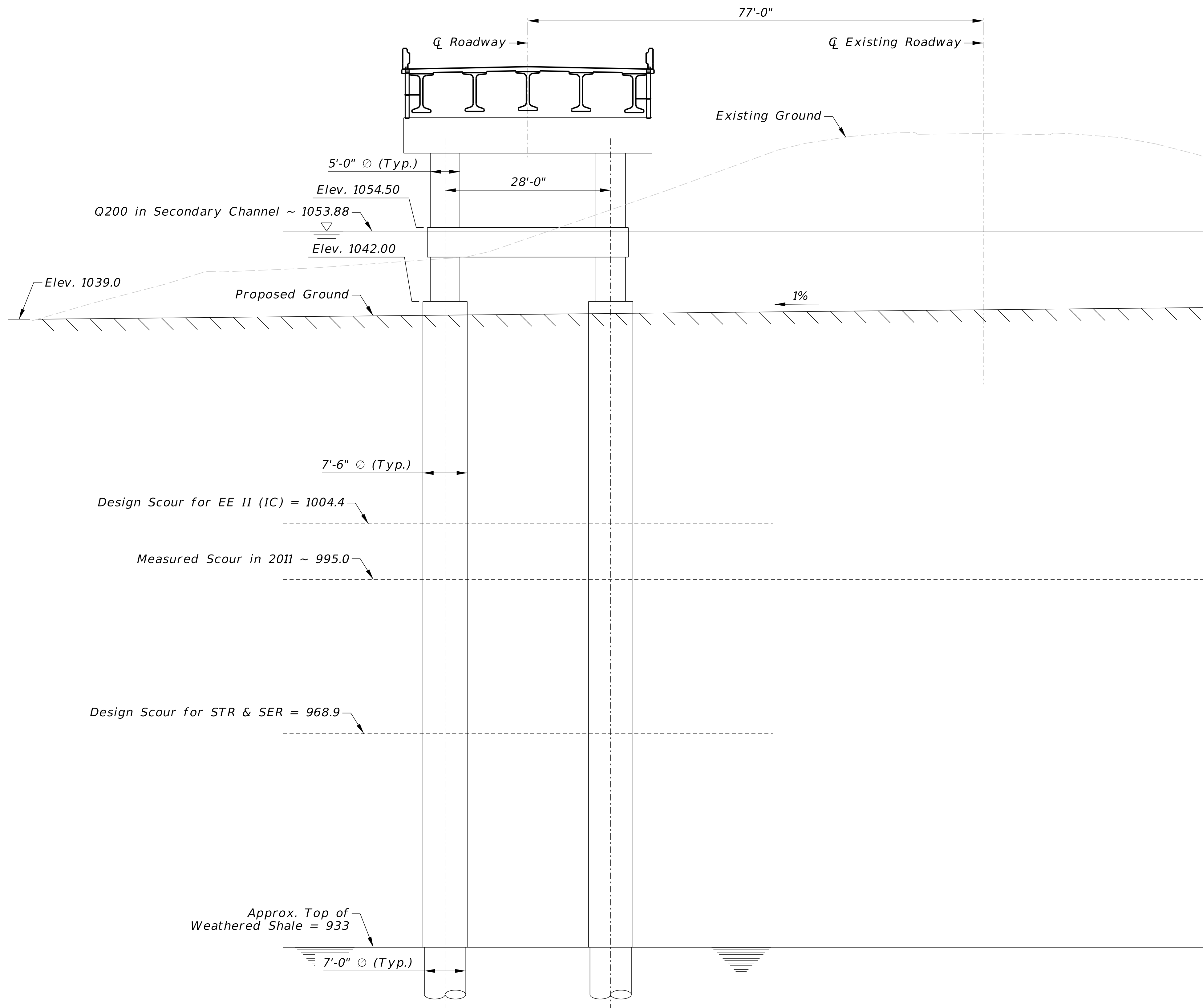
BURNS & MCDONNELL
ENGINEERING COMPANY, INC.
1010 N. 102ND COURT, SUITE 200
OMAHA, NE 68114
Office: 402-408-3013
Nebraska C.O.A. #CA-0621

S8	
PROJECT NUMBER STP-51-7(109)	
C.N. 32395	
LOCATION Decatur Bridge	
STRUCTURE NUMBER S051 03644	
2730'-0" 14-SPAN MISSOURI RIVER BRIDGE TYPICAL APPROACH PIER (PIER 9)	
SKEW 0° ROADWAY 40'-0" FHWA CONST. TYPE X441 DESIGN LIVE LOAD HL-93 COUNTY Burt HWY. NO. N-51 REF. POST. XXX.XX STA. 2125+97.10 DESIGN CODE LRFD 10th Edition	
NEBRASKA Good Life. Great Journey. DEPARTMENT OF TRANSPORTATION	
BRIDGE DIVISION 1500 Nebraska Parkway Lincoln, NE 68502 Office: 402-479-4701 STATE BRIDGE ENGINEER Ross D. Barron, P.E. State of Nebraska E-14018	
★ NOT FINAL ★ PRELIMINARY PLAN SUBJECT TO CHANGE	
SPECIAL PLAN NO.	8
1	9

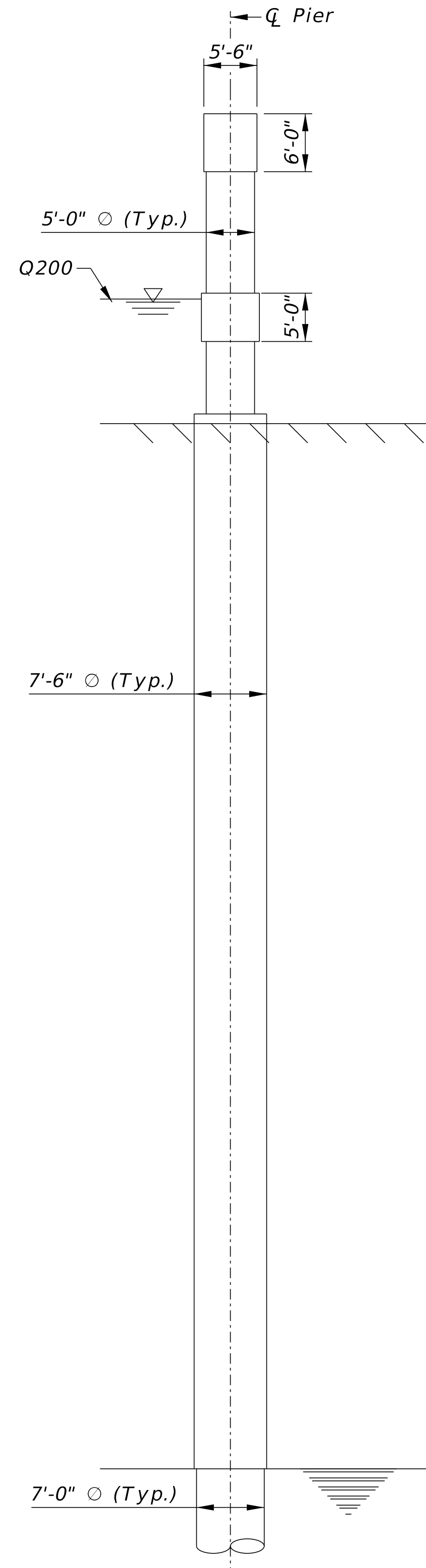
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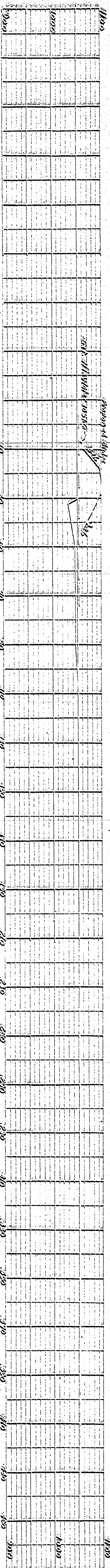
TYPICAL APPROACH PIER - PIER 13
Scale 1" = 10'-0"



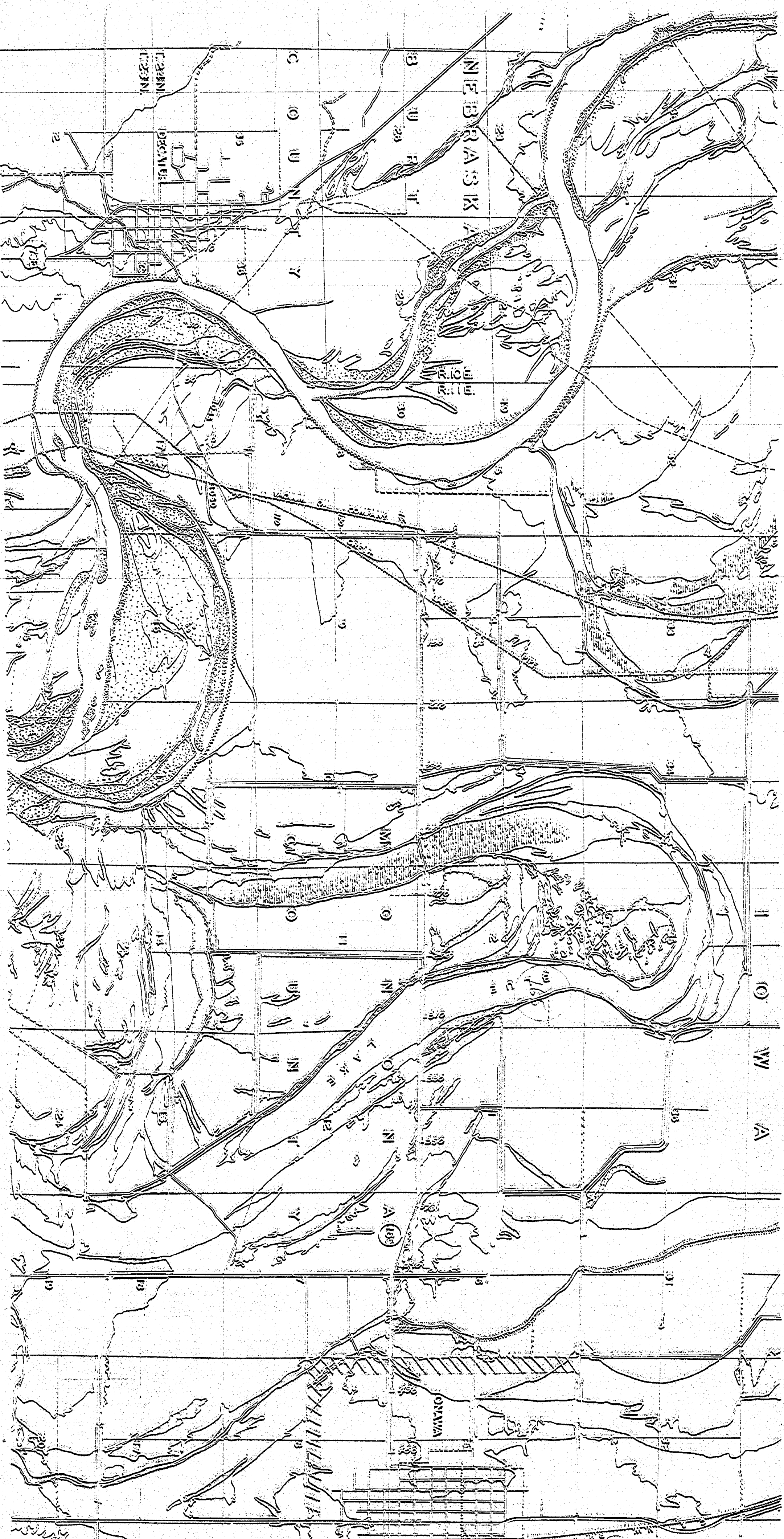
SECTION
Scale 1" = 10'-0"

BURNS & MCDONNELL
ENGINEERING COMPANY, INC.
1010 N. 102ND COURT, SUITE 200
OMAHA, NE 68114
Office: 402-408-3013
Nebraska C.O.A. #CA-0621

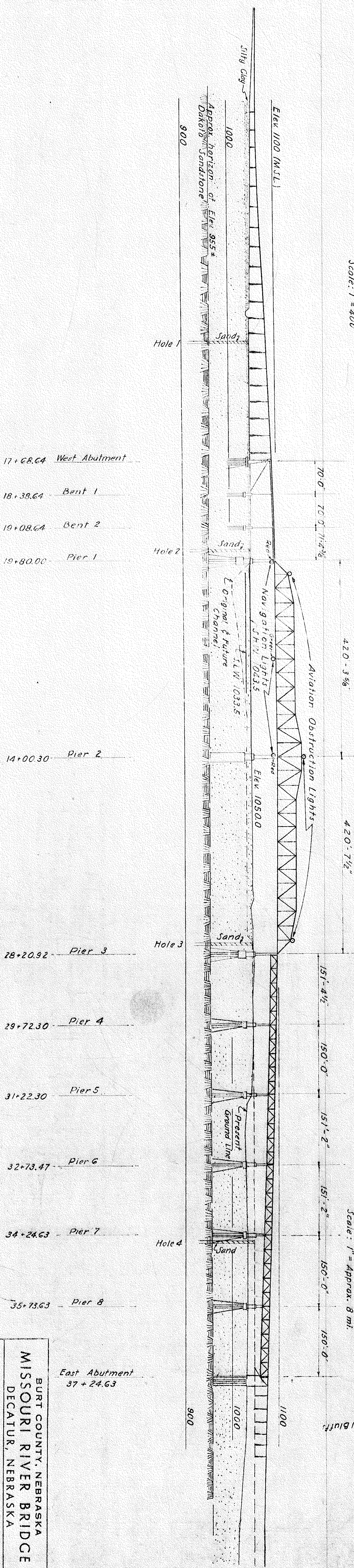
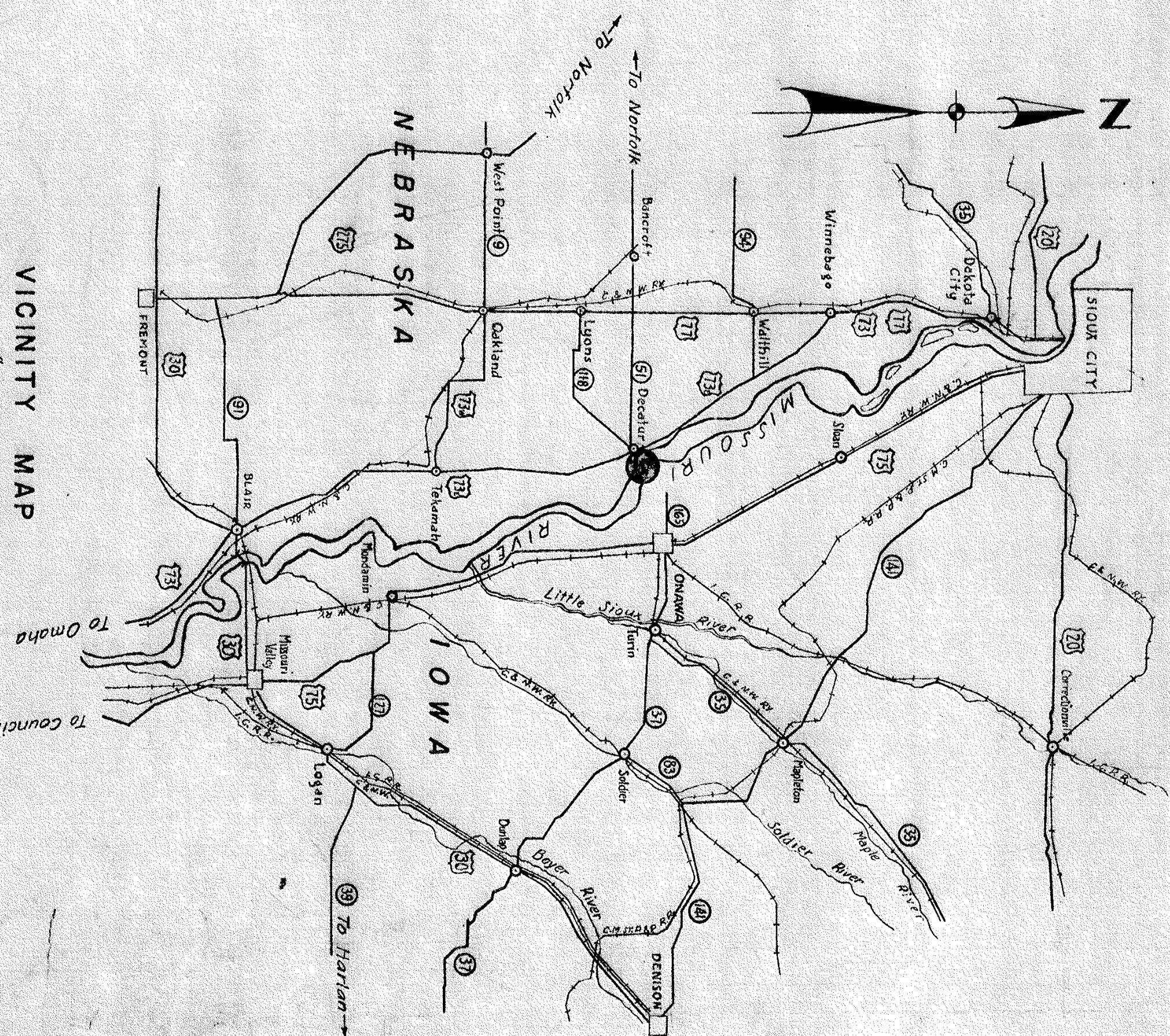
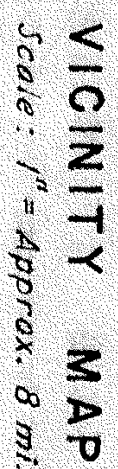
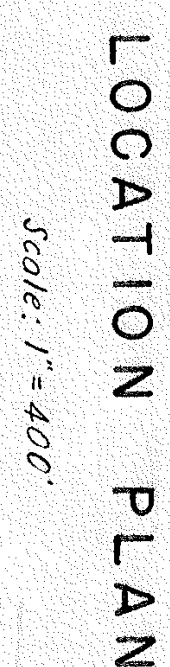
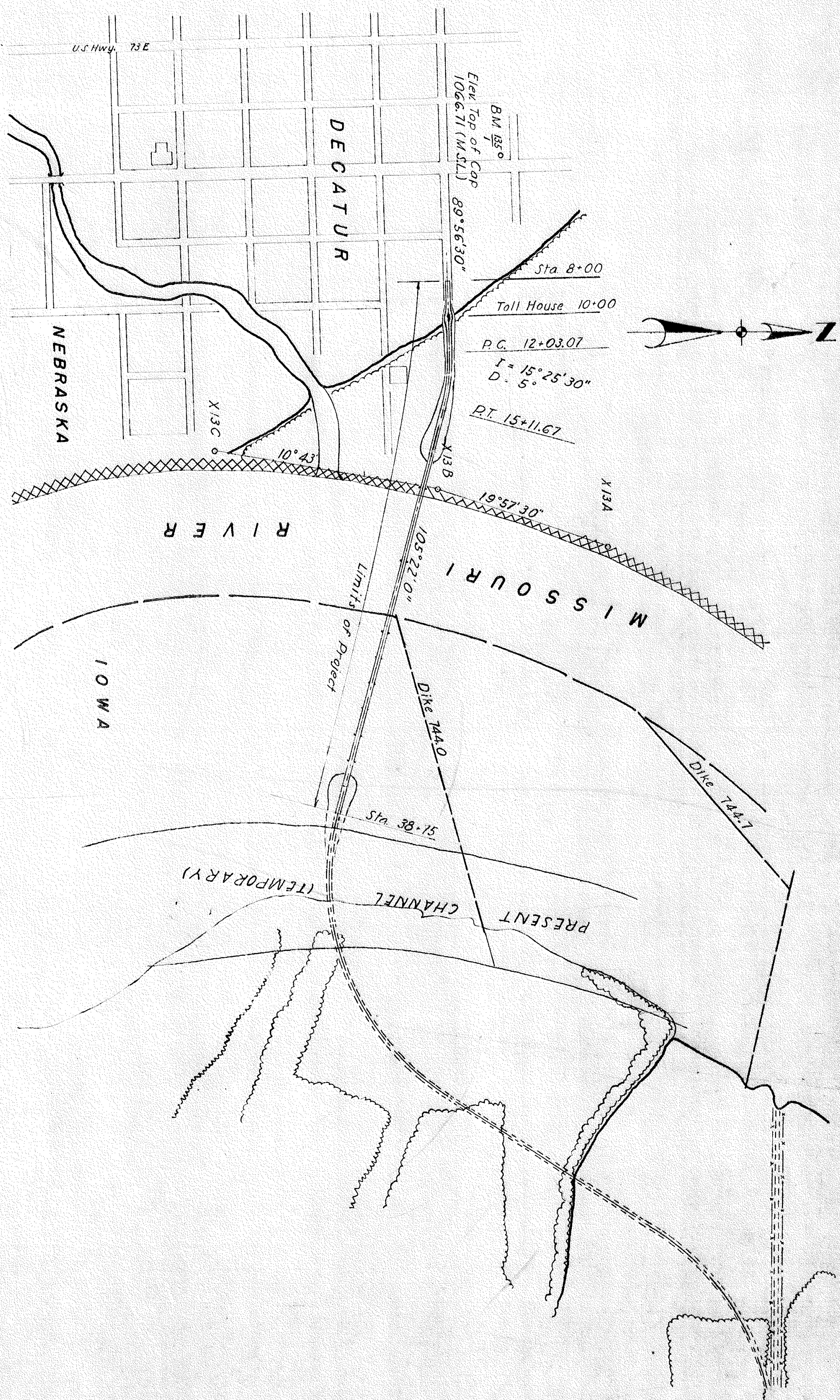
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PROJECT NUMBER STP-51-7(109)	
C.N. 32395	
LOCATION Decatur Bridge	
STRUCTURE NUMBER S051 03644	
2730'-0" 14-SPAN MISSOURI RIVER BRIDGE TYPICAL APPROACH PIER (PIER 13) Q.C. ENGINEER: J. Sarson DATE AUG 2025	
COUNTY Burt	SKED 0°
HWY. NO. N-51	ROADWAY 40'-0"
REF. POST. XXX.XX	FHWA CONST. TYPE X441
STA. 2125+97.10	DESIGN LIVE LOAD HL-93
DESIGN CODE LRFD 10th Edition	
DESIGNED BY: A. Fardon	DETAILED BY: T. McDowell
NEBRASKA Good Life. Great Journey. DEPARTMENT OF TRANSPORTATION	
BRIDGE DIVISION 1500 Nebraska Parkway Lincoln, NE 68502 Office: 402-479-4701 STATE BRIDGE ENGINEER Ross D. Barron, P.E. State of Nebraska E-14018	
★ NOT FINAL ★ PRELIMINARY PLAN SUBJECT TO CHANGE	
SPECIAL PLAN NO.	9
1	9



PROPOSED
MISSOURI RIVER BRIDGE
DECATUR, NEBRASKA
DECATUR BRIDGE
TO OMAHA, IOWA
SCALE: 1" = 4000'
IOWA STATE HIGHWAY COMMISSION - JANUARY 1930.



1000 1100 1200 1300 1400



PROFILE

Scale: 1"=100

17 + 68.64 West Abutment
18 + 38.64 Bent 1
19 + 08.64 Bent 2
20 + 80.00 Pier 1

14+00.30 - Pier 2

28+20.92

29 + 72.30 = Pier 4

31+22.30

32+73.47 - Pier 6

34 + 24.63 - Pier 7

35+73.63 = Pier 8

East Abutment
37 + 24.63

BURT COUNTY, NEBRASKA
MISSOURI RIVER BRIDGE
DECATUR, NEBRASKA

PLAN & PROFILE

SCALE: *As Shown* DATE: *Nov. 1943*

KIRKHAM ENGINEERING COMPANY CONSULTING ENGINEERS OMAHA, NEBRASKA	DRAWING	SPEC.
	DG 2	2

DECATUR BRIDGE
OVER THE
MISSOURI RIVER
AT

DECATUR NEBRASKA
1949

BURT COUNTY BRIDGE COMMISSION
W. W. SMALL — CHAIRMAN
H. C. LARSON
G. B. EAGLETON

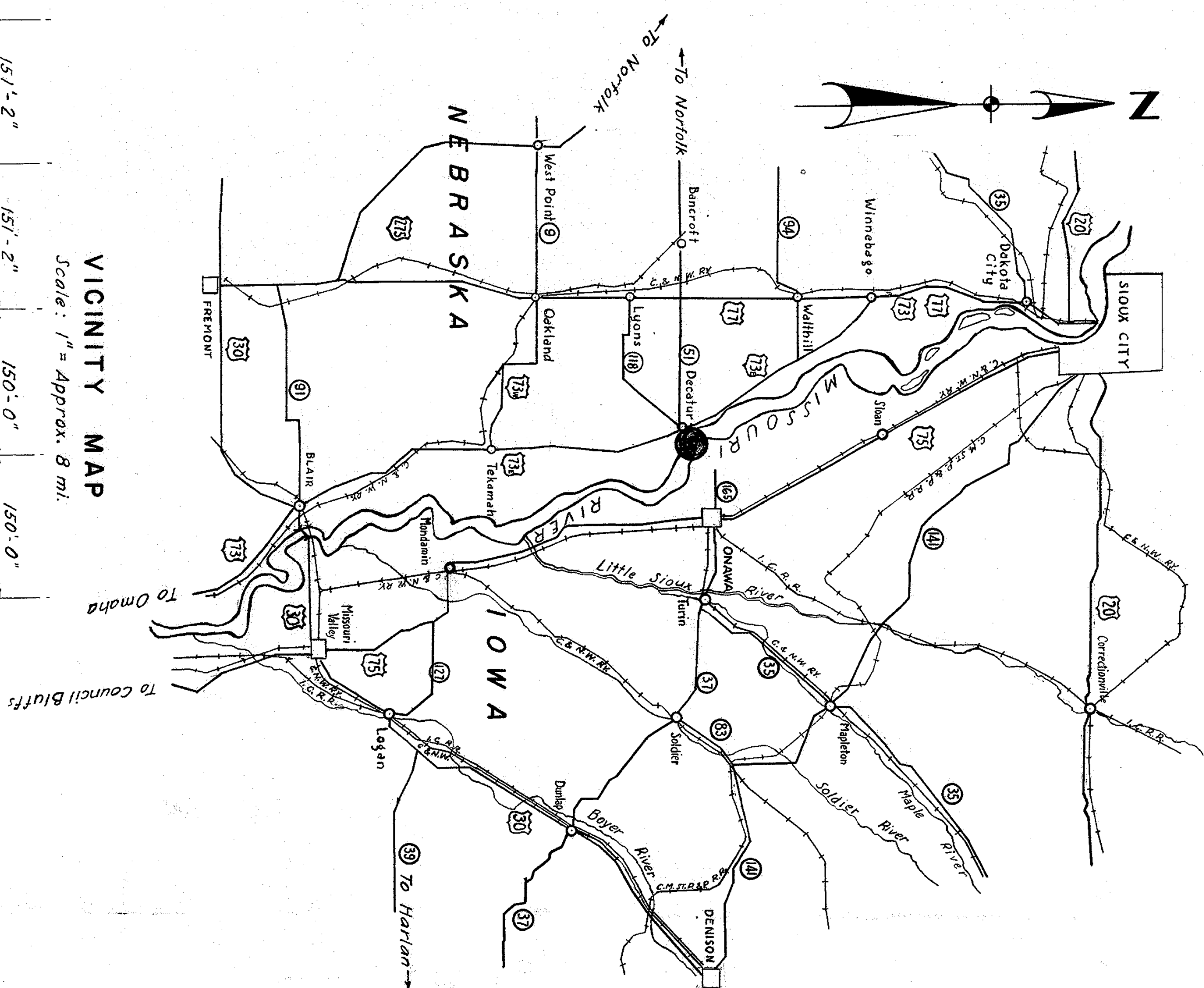
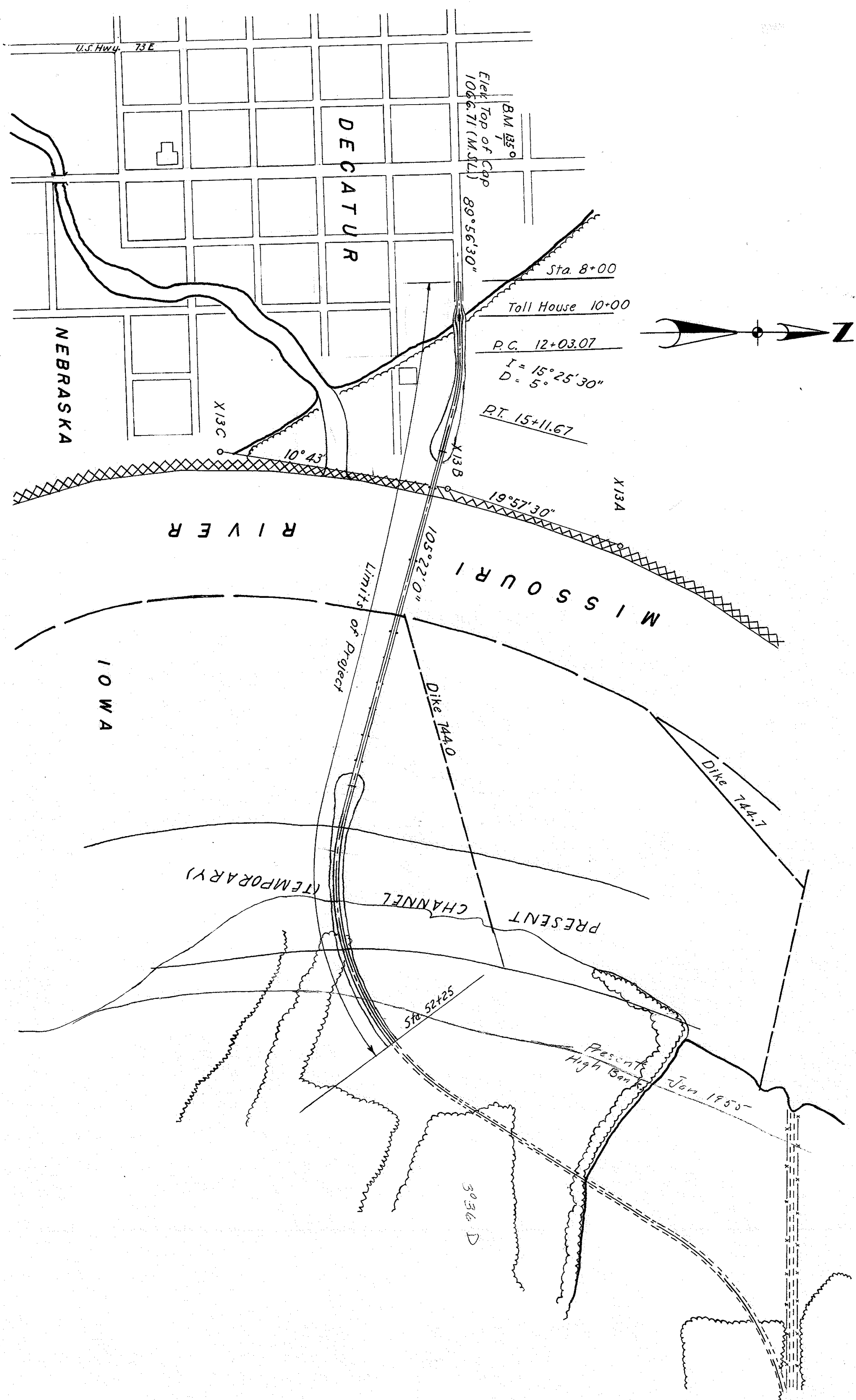
KIRKHAM ENGINEERING COMPANY
CONSULTING ENGINEERS
OMAHA, NEBRASKA

I N D E X

TITLE		DRAWING NO.	SHEET NO.
INDEX & QUANTITY SUMMARY		DG 1	1
PLAN & PROFILE		DG 2	2
BEAM SPAN & HANDRAIL DETAILS		DAS 1	3
MISCELLANEOUS DETAILS - APPROACHES		DAS 2	4
ABUTMENTS		DAI 1	5
WEST APPROACH FOUNDATIONS - BENTS 1 & 2		DAB 1	6
BENTS 1 & 2		DAB 2	7
PIER 1		DMP 1	8
PIER 2		DMP 2	9
PIER 3		DMP 3	10
PIER DETAILS		DMP 4	11
SUGGESTED COFFERDAMS - PIERS 1,2 & 3		DMP 5	12
MAIN TRUSS - STRESS SHEET AND FRAMING PLAN		DMT 1	13
" " - JOINTS L0 TO L4		DMT 2	14
" " - JOINTS L5 TO L10		DMT 3	15
" " - " L11 TO L14		DMT 4	16
" " - SWAY FRAMES AND PORTAL U3,L14		DMT 5	17
" " - EXPANSION DEVICES		DMT 6	18
" " - BEARING DEVICES		DMT 7	19
" " - FLOOR AND HANDRAIL		DMT 8	20
PIERS 4,5,6,7 & 8		DAP 1	21
STRESS DIAGRAM - DECK TRUSS		DAT 1	22
DECK TRUSS		DAT 2	23
DECK TRUSS		DAT 3	24
DECK TRUSS		DAT 4	25
APPROACH EMBANKMENT & PAVEMENT		DAF 1	26
ELECTRIC WIRING - BRIDGE & TOLL HOUSE		DGE 1	27
SEPTIC TANK, INLET & GUARDRAIL DETAILS		DAF 2	28
TOLL HOUSE		DTH 1	29
TOLL HOUSE DETAILS		DTH 2	30

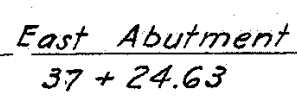
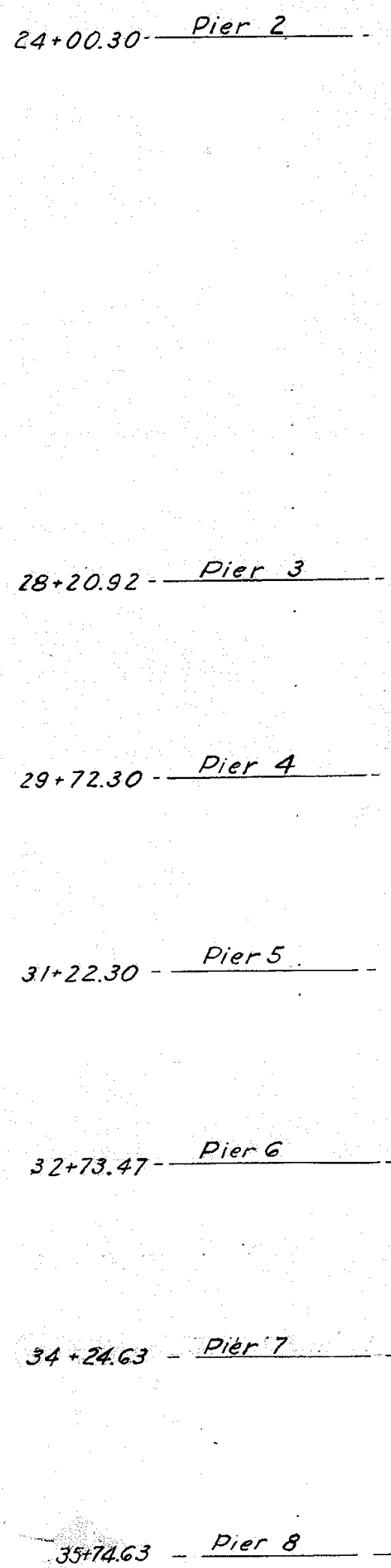
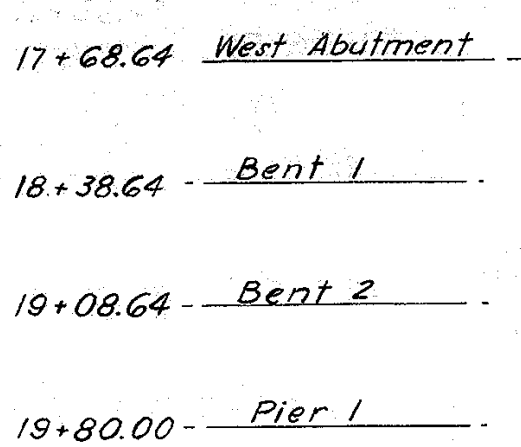
SUMMARY OF ESTIMATED QUANTITIES

	EXCAVATION		EMBANKMENT	CONCRETE FILLED TUB STEEL PILING		STEEL PILING	CONCRETE		REINFORCEMENT		STEEL CAISSONS	STRUCTURAL STEEL
	CLASS I	CLASS II		14" X 1/4"	14" X 5/8"		CLASS A	CLASS B	BAR	STRUCTURAL		
SCHEDULE "A" (SUBSTRUCTURE)	1,590 CY	5041 CY	140,000 CY	1700 L.F.	2440 L.F.	17,170 L.F.	1,621.2 C.Y.	3,989 C.Y.	93,834 LB.	218,905 LB.	151,484 LB.	8,208 LB.
	STRUCTURAL STEEL		CONCRETE CLASS A	REINFORCEMENT , BAR		GUARD POSTS	METAL GUARDRAIL	LIGHTING		CONCRETE PAVEMENT	FLUMES	
	CARBON SILICON							TOLL HOUSE			18" C.M.P	
SCHEDULE "B" (SUPERSTRUCTURE)	2009,399LB	673043LB	972.2 C.Y.	243,157 LB.		242 EA.	6,980 L.F.	LUMP SUM	LUMP SUM	5,800 S.Y.	4 EA.	188 L.F.



LOCATION PLAN

Scale: 1" = 400'



Rev. Elevations 3-1-50
Rev. Proj Limits 1-12-50
Rev. Addendum 1 - 12-29-49

PROFILE

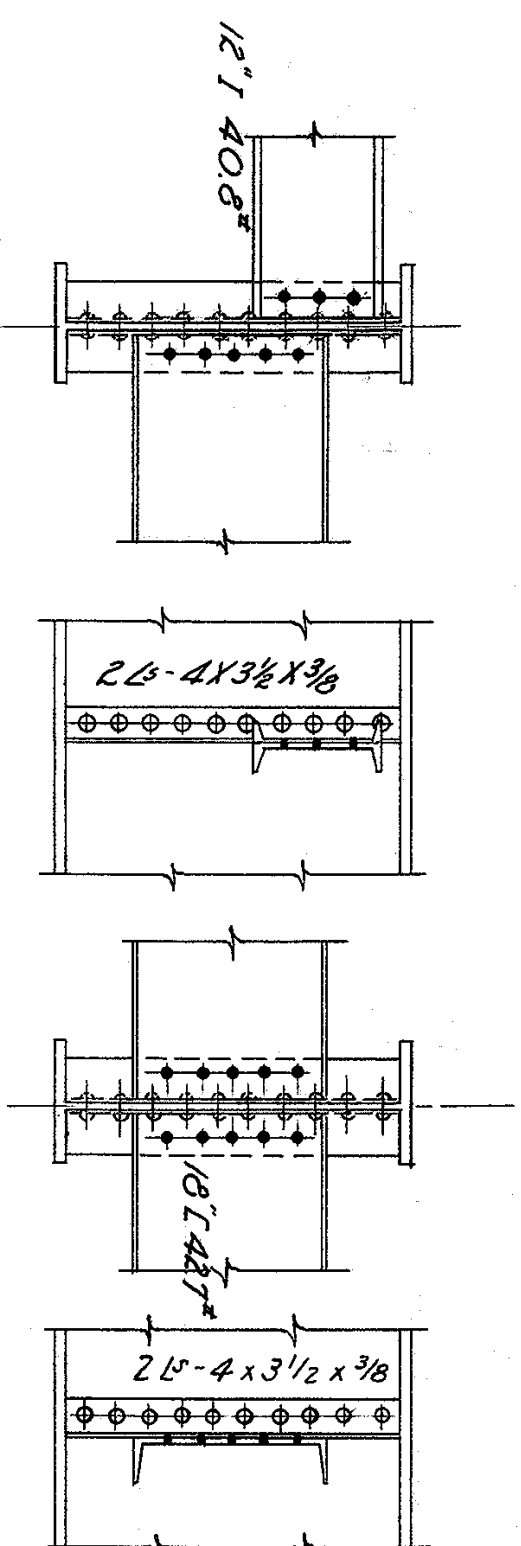
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PLAN & PROFILE

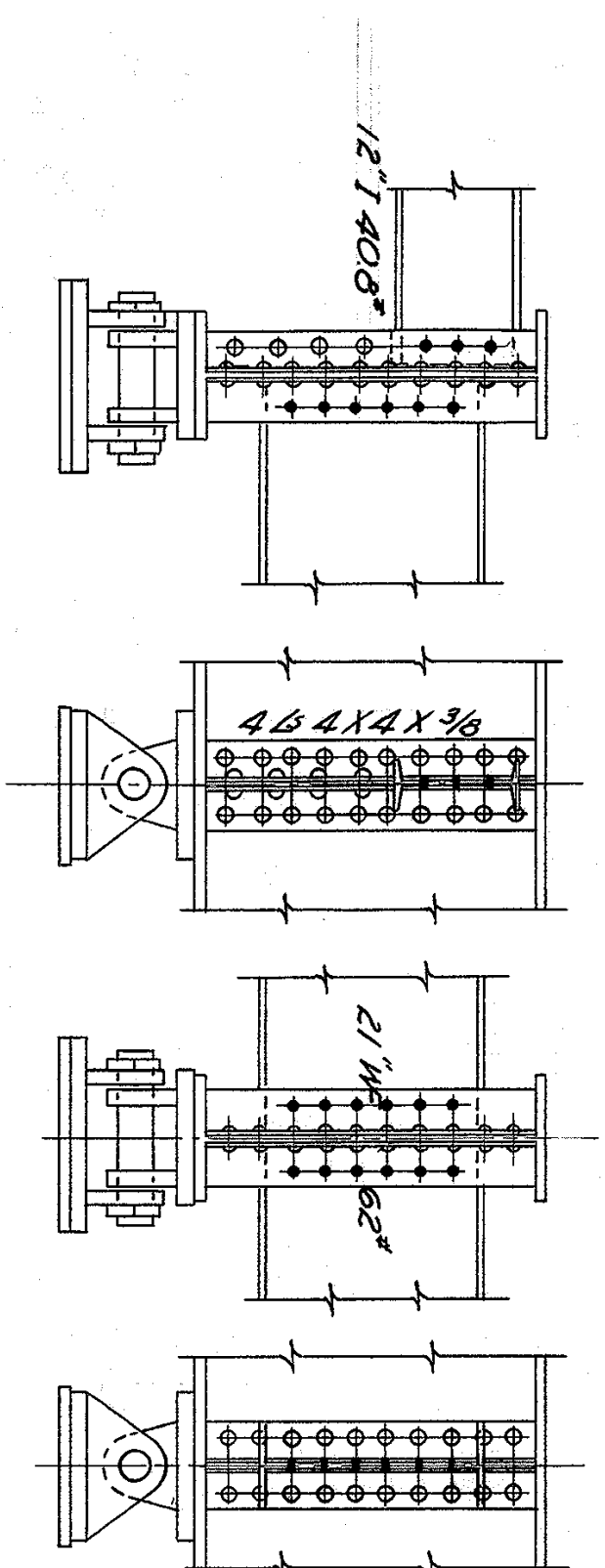
SCALE: As Shown

KIRKHAM ENGINEERING COMPANY
CONSULTING ENGINEERS

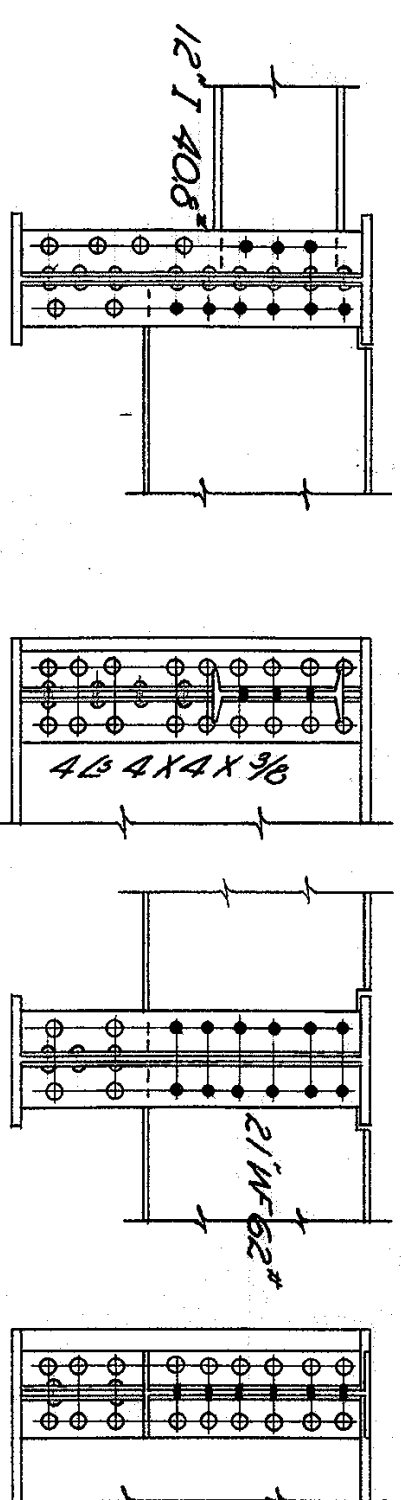
22



TYPICAL INTERMEDIATE DIAPHRAGM

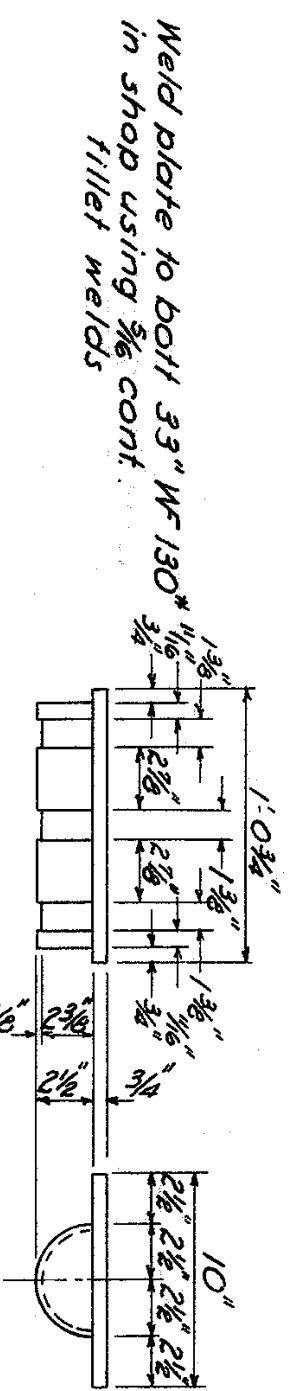


TYPICAL DIAPHRAGM AT SUPPORT

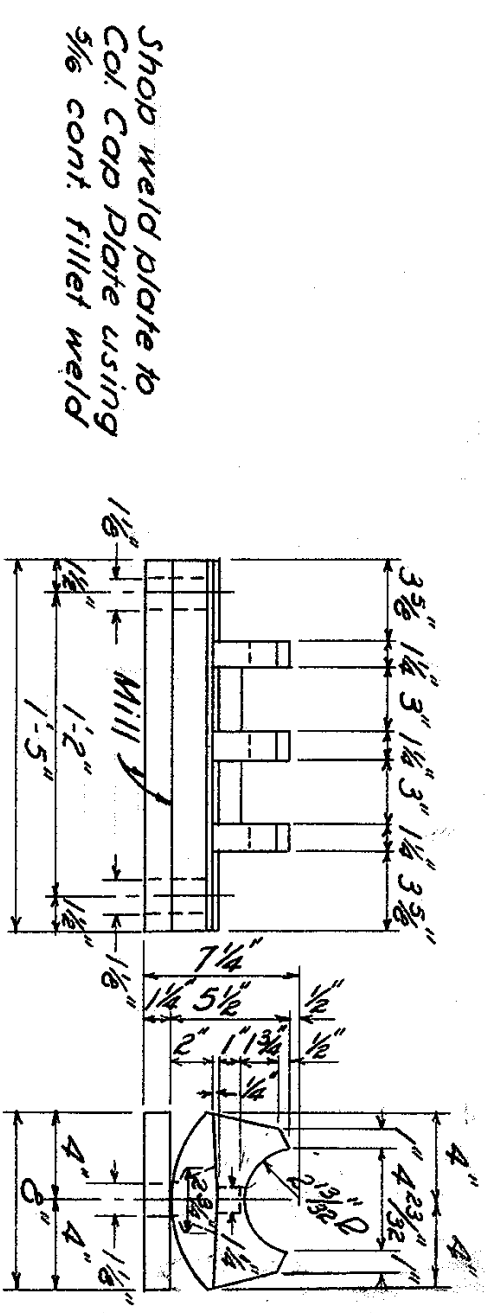


Packer or Bolster as designated

TYPICAL DIAPHRAGM AT END SUPPORTS



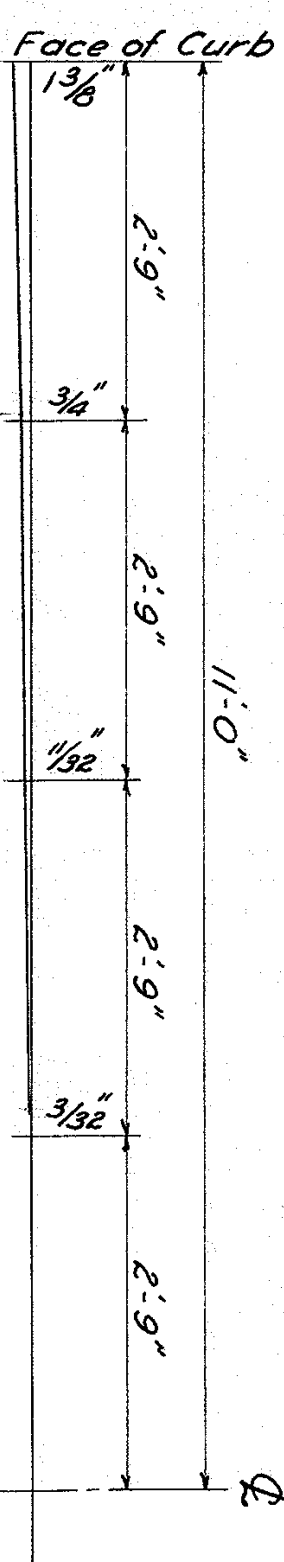
Bearing Pin & Plate	Wt. ea. 27*
Struct. st. Plate 10 X 3 1/4" X 1' 0 3/4"	Wt. ea. 30*
Half Round C.S. Pin 5" X 0 11/16"	



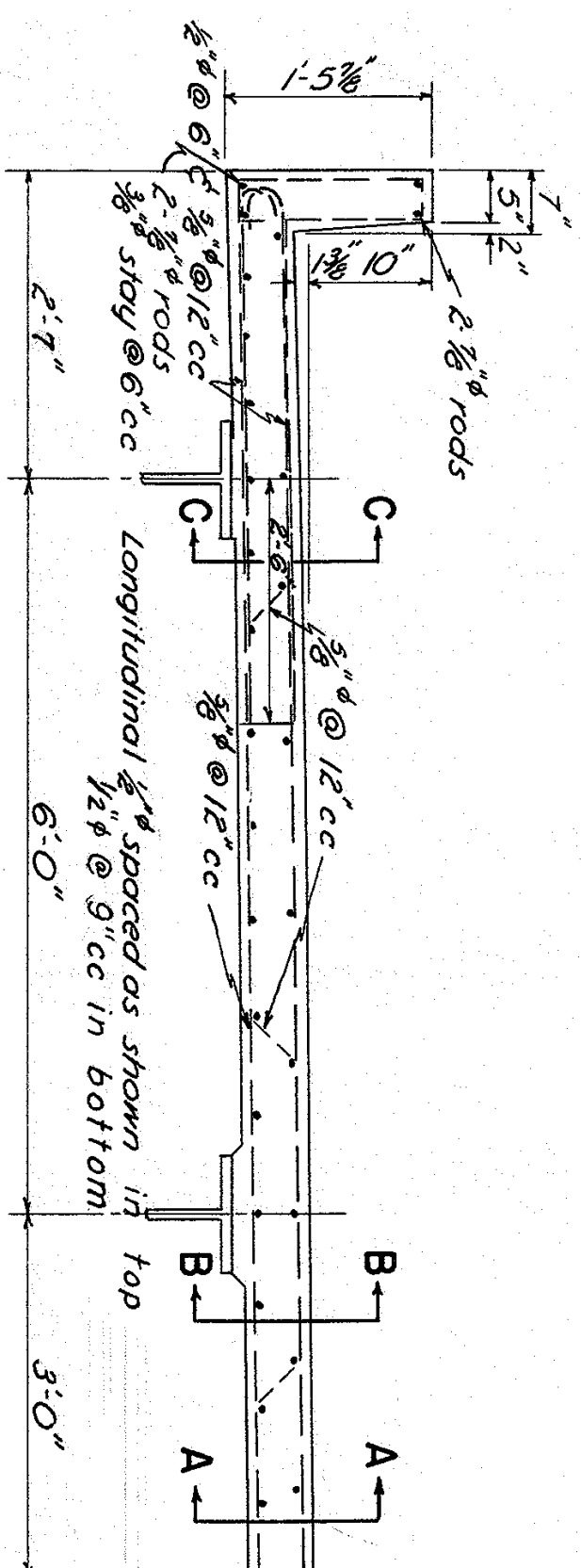
Cast Steel Rocker	Wt. ea. 88 [#]
Struct Steel Plate	Wt. ea. 47 [#]

ROCKER TYPE 1 4 REQD.

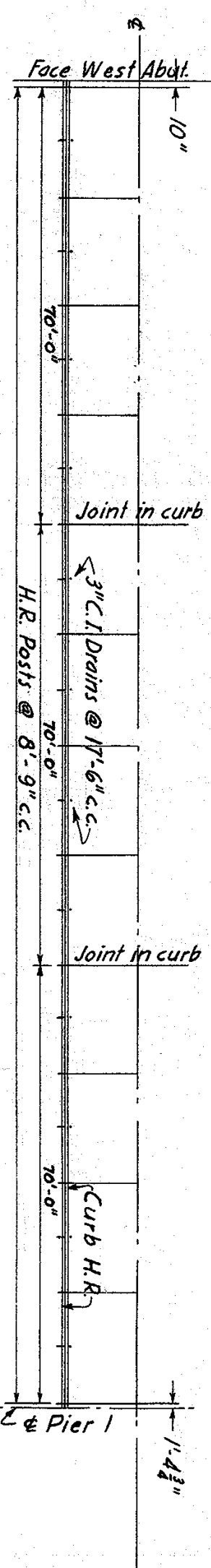
Scale: $1\frac{1}{2}'' = 1'-0''$



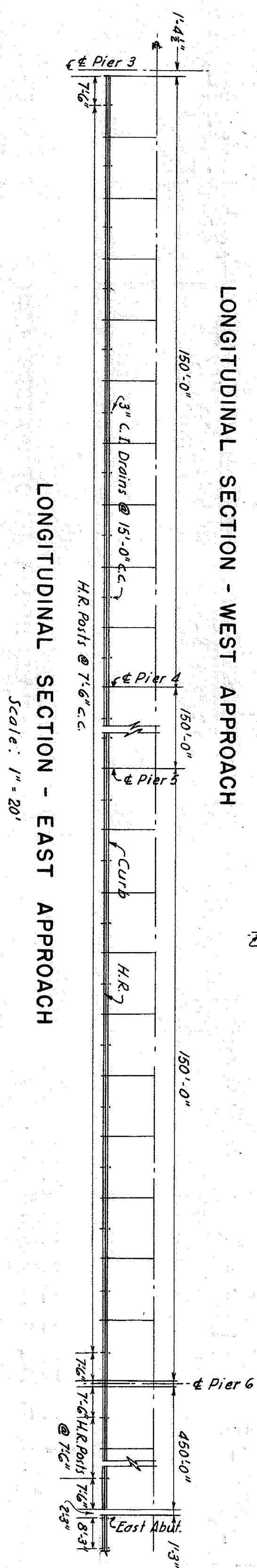
COORDINATES FOR 1 3/8" PARABOLIC CROWN



HALF SECTION 6 1/2" FLOOR SLAB

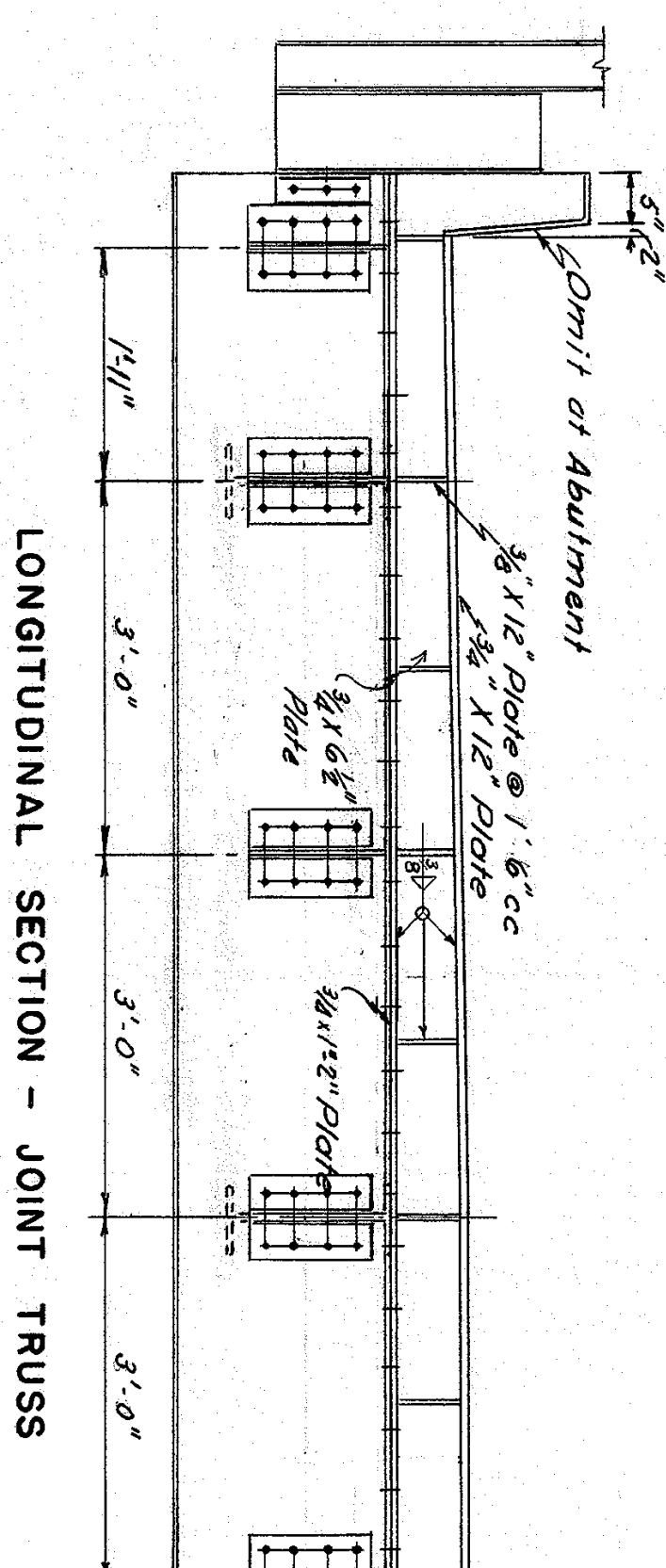


LONGITUDINAL SECTION - WEST APPROACH

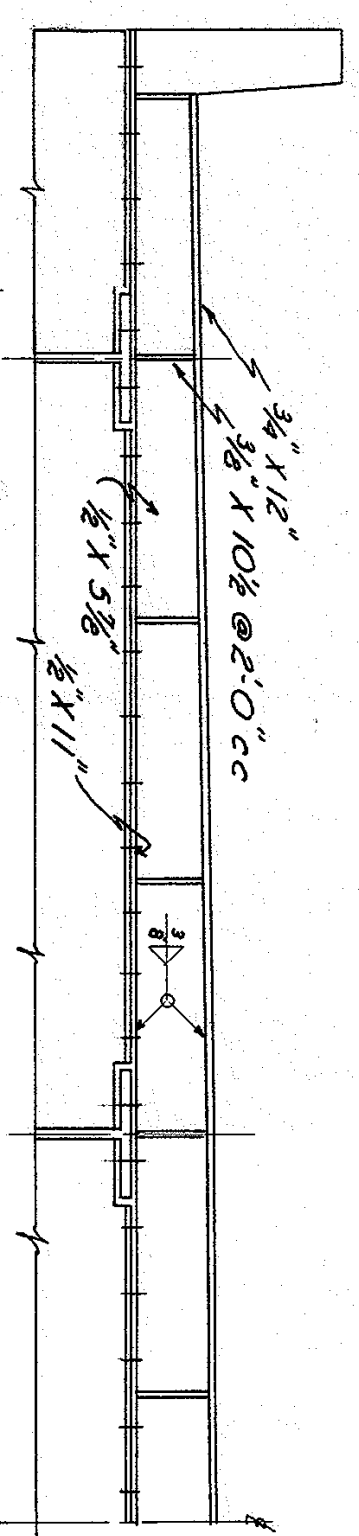


LONGITUDINAL SECTION - EAST APPROACH

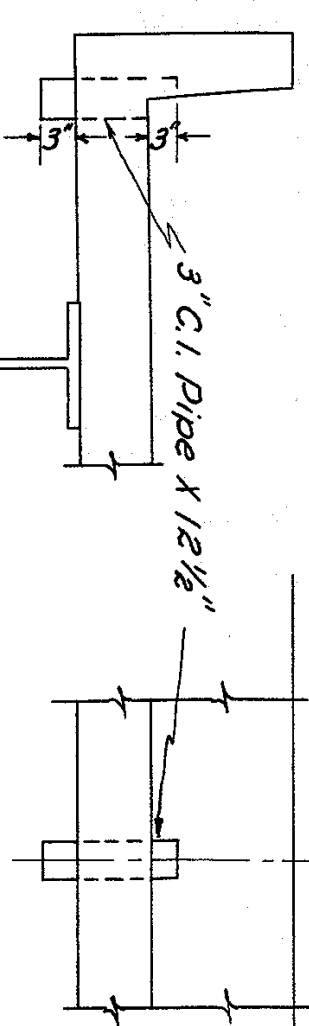
Scale: 1" = 20'



LONGITUDINAL SECTION - JOINT TRUSS

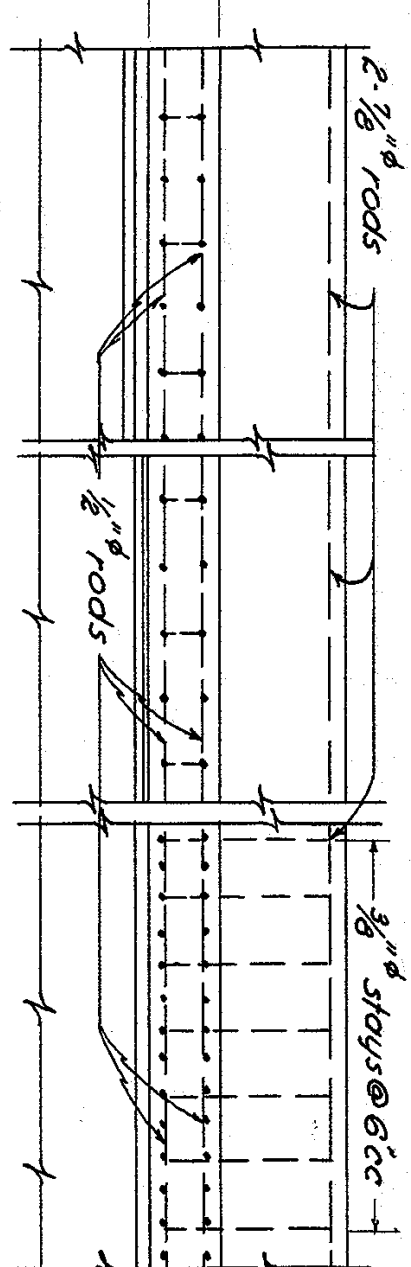


LONGITUDINAL SECTION

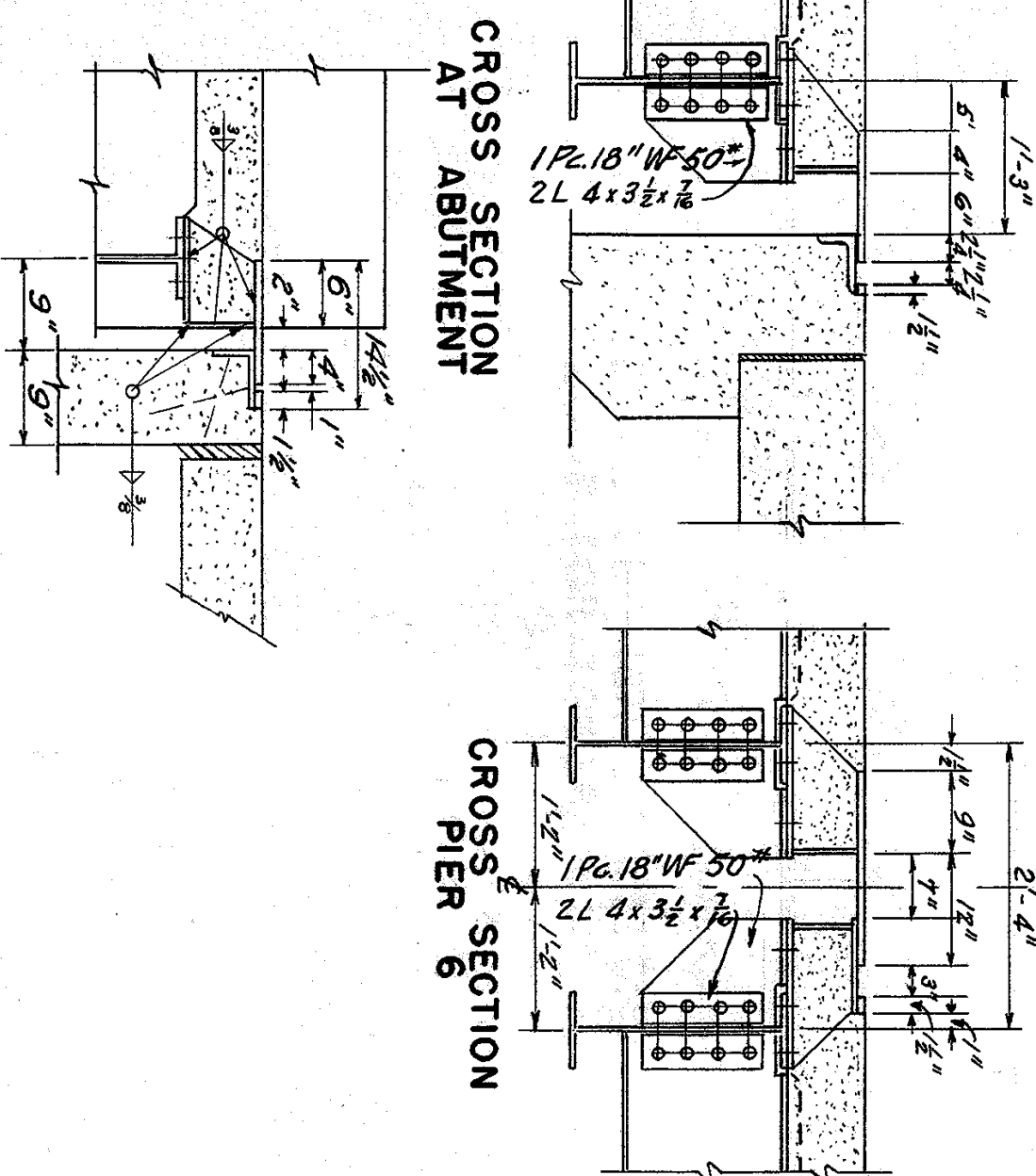


Midpoint of panel or between diaphragms

FLOOR DRAINS



LONGITUDINAL SECTION



CROSS SECTION AT ABUTMENT

**CROSS SECTION
PIER 6**

**CROSS SECTION
ABUTMENT JOINT**

BURT COUNTY, NEBRASKA
MISSOURI RIVER BRIDGE
DECATUR, NEBRASKA 245

MISCELLANEOUS DETAILS

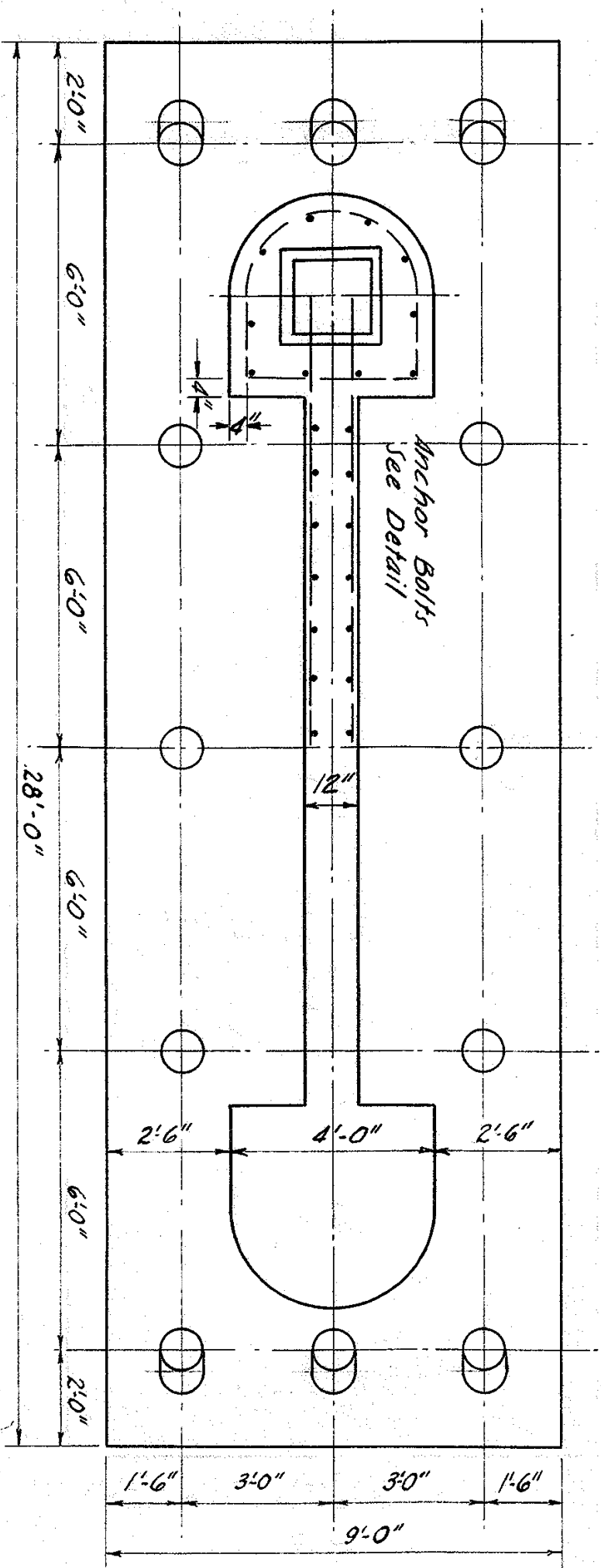
APPROACHES

SCALE: $\frac{3}{4}" = 1'-0"$

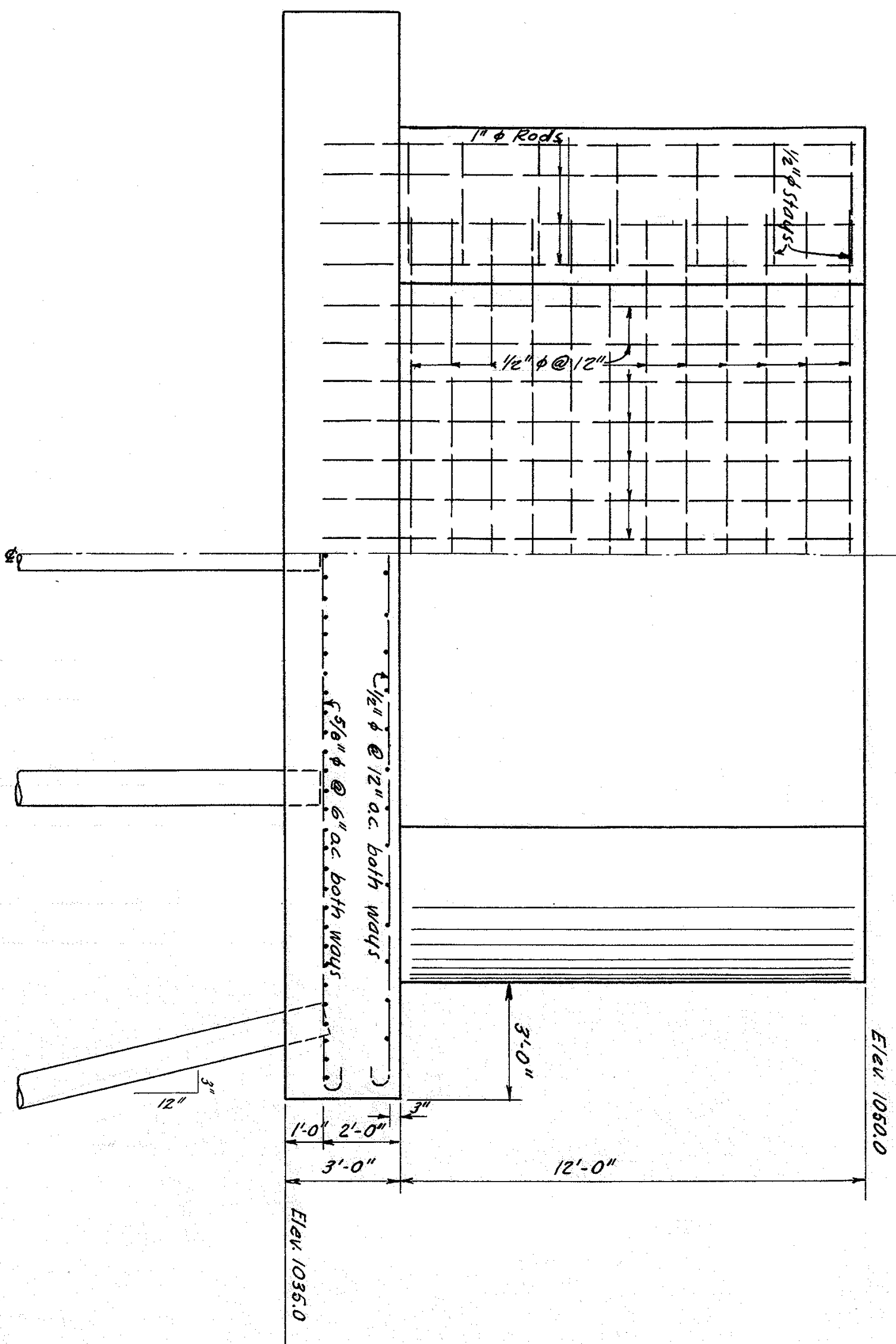
DATE: Dec 1949

KIRKHAM ENGINEERING COMPANY
CONSULTING ENGINEERS
OMAHA, NEBRASKA

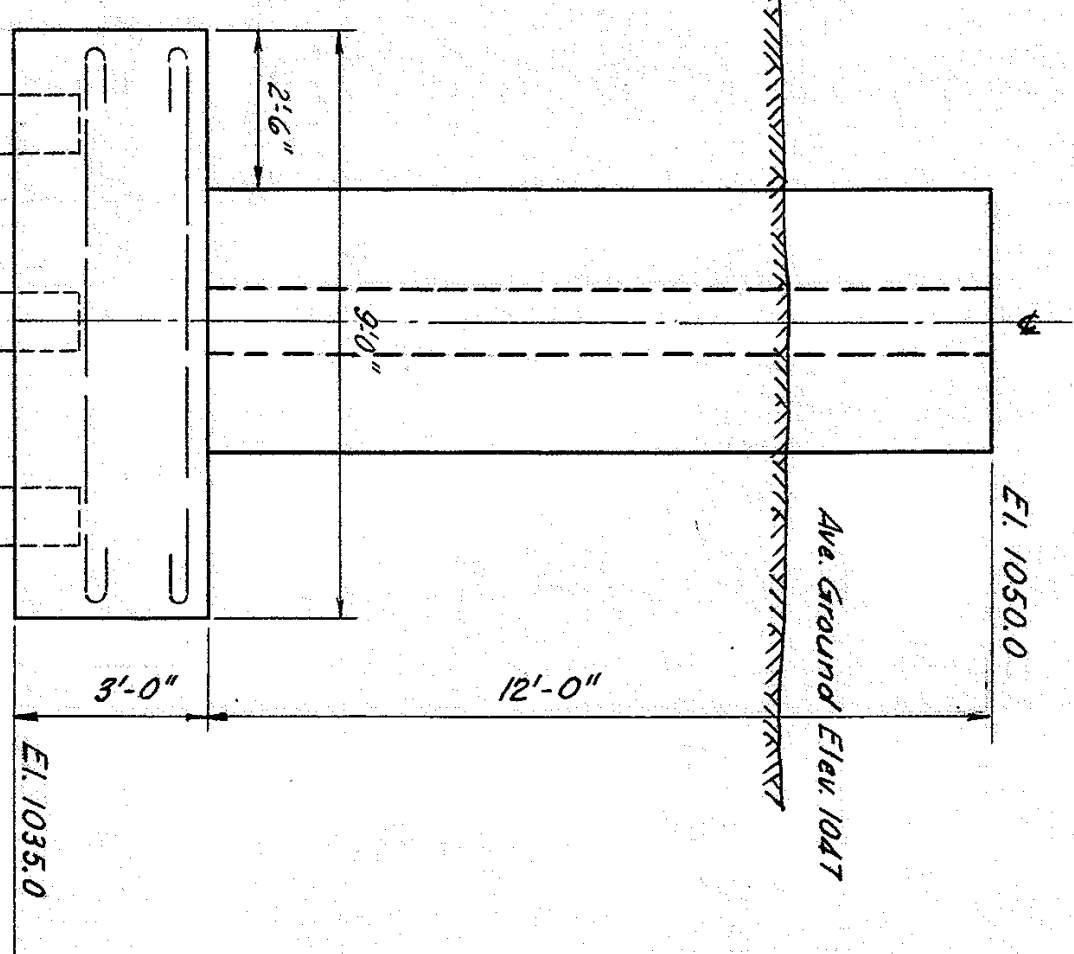
DRAWING SHEET
DAS 4



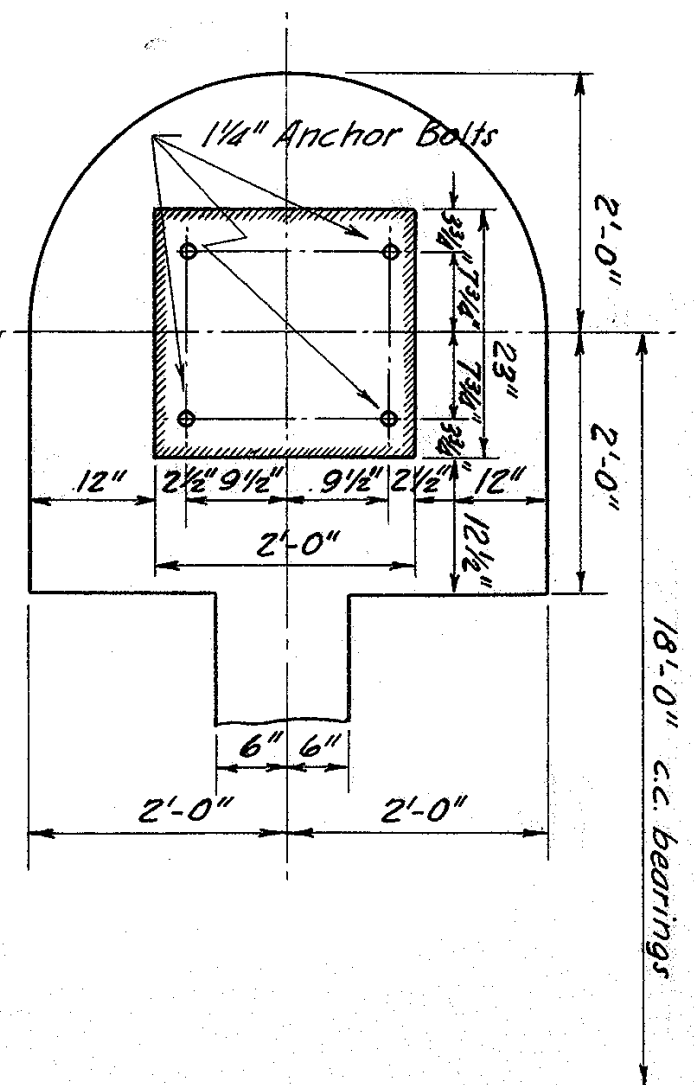
FOUNDATION PLAN - BENTS 1 & 2 FOOTING PLAN - BENTS 1 & 2



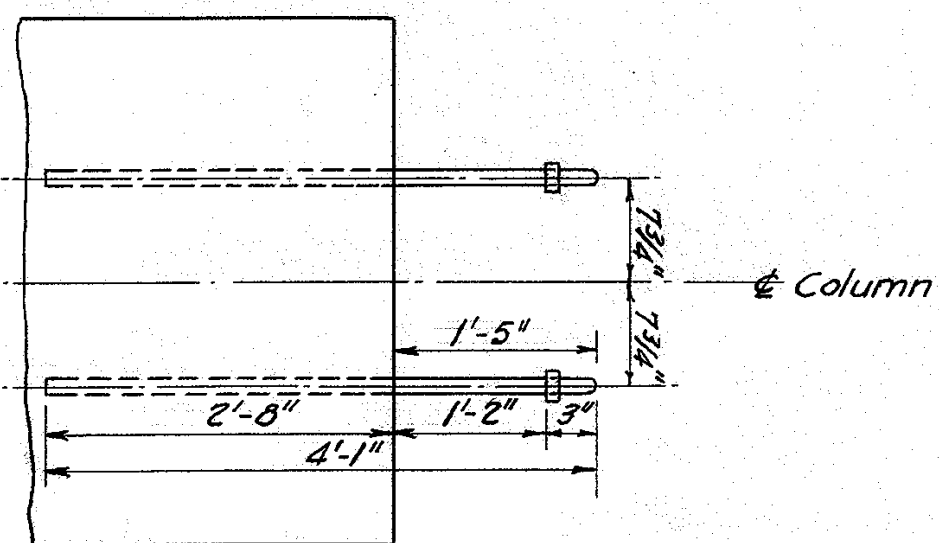
ELEVATION - FOUNDATION BENTS 1 & 2



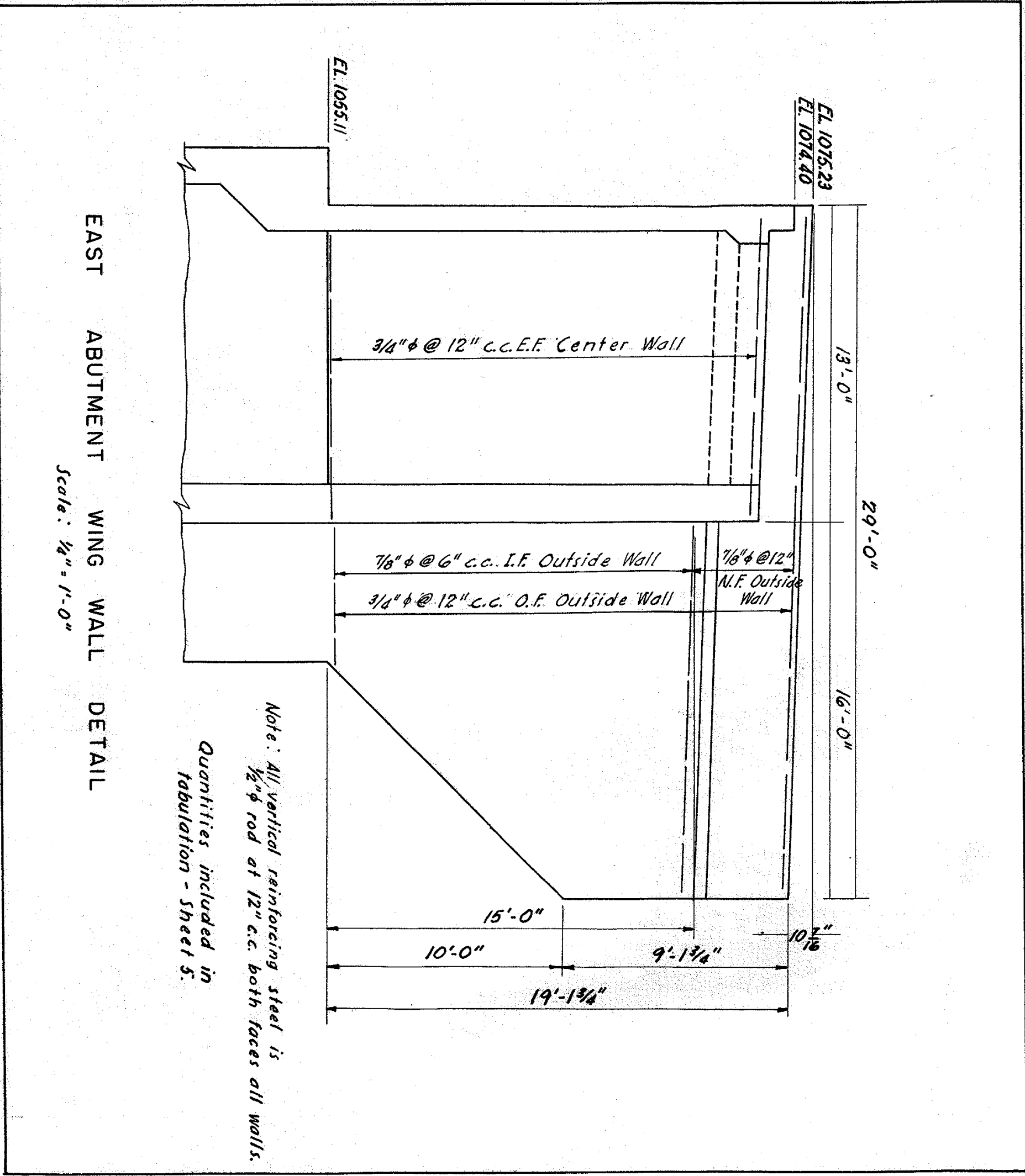
END ELEVATION BENTS 1 & 2



DETAIL - ANCHOR BOLTS - BENTS 1 & 2



See Sheet No. 7 for Base Details.



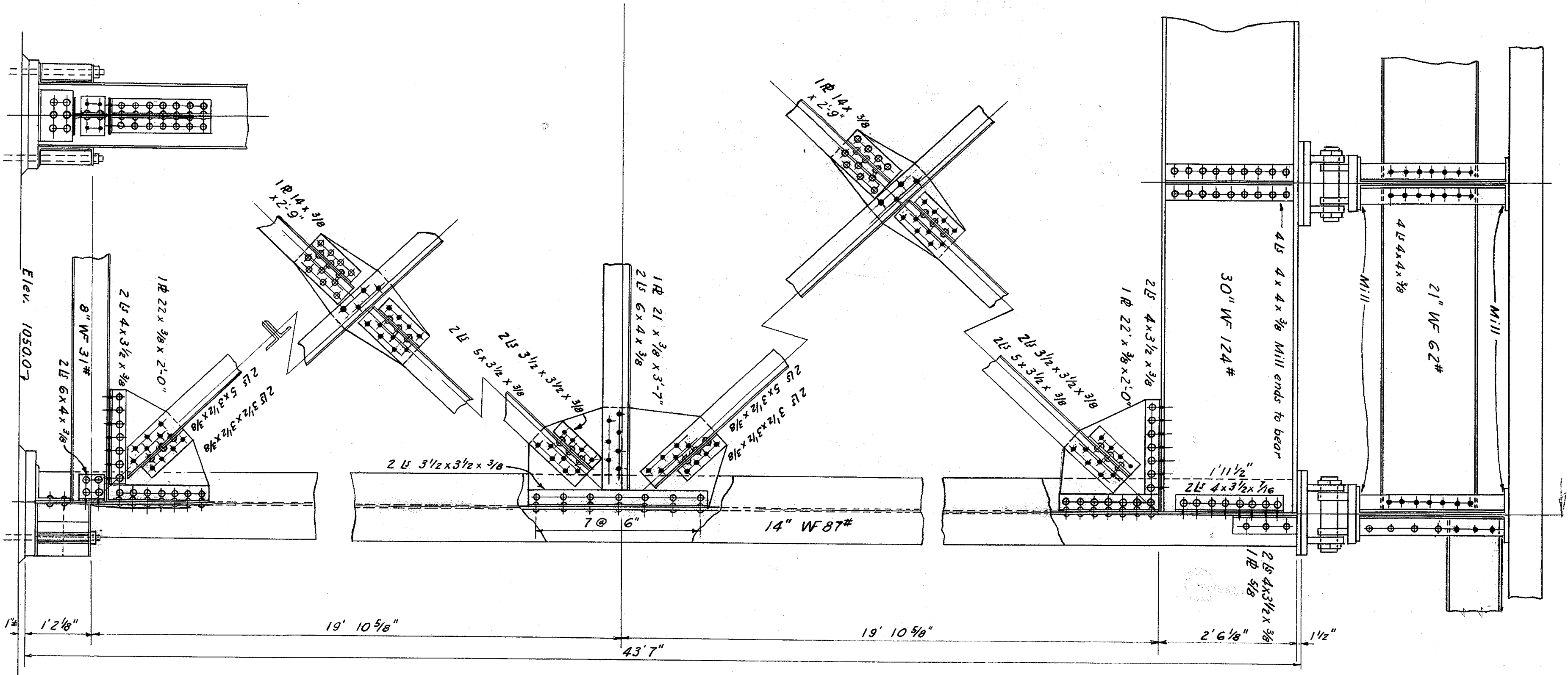
Note: All vertical reinforcing steel is 1/2" rod at 12" c.c. both faces all walls. Quantities included in tabulation - Sheet 5.

ITEM	BENT 1	BENT 2
EXCAVATION CLASS 1	334 C.Y.	334 C.Y.
CONCRETE CLASS A	98.8 C.Y.	98.8 C.Y.
REINFORCING STEEL	6058 LB.	6058 LB.
TUBULAR STEEL PILING (14")	850 L.F.	850 L.F.

Rev. Elevation 3-1-50
Rev. Abutment Wing Wall 1-12-50
Rev. Addendum 1 12-29-49

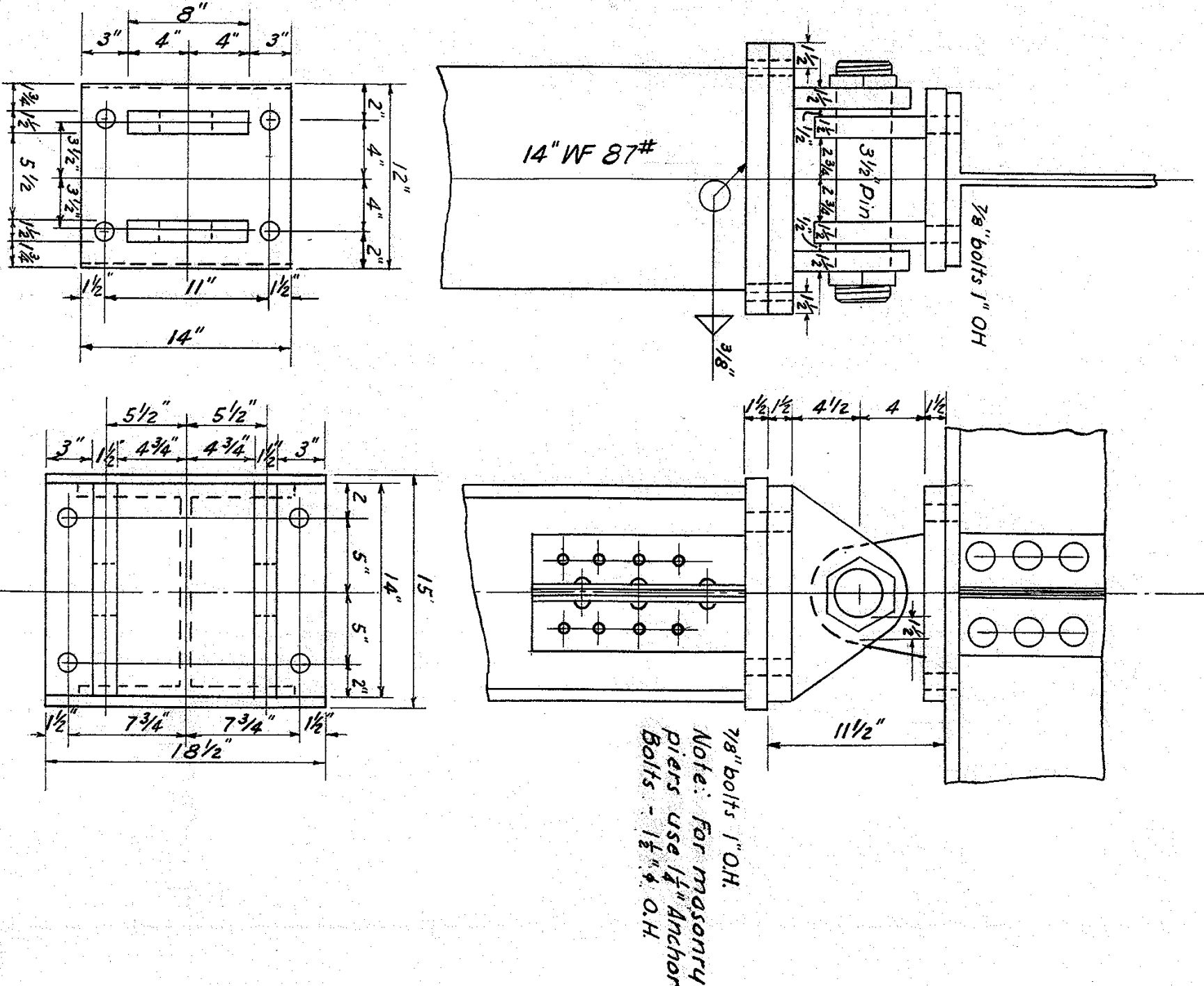
BENT 6 - TYPICAL DETAILS BENTS 1 & 2

Scale: $\frac{3}{4}" = 1'$



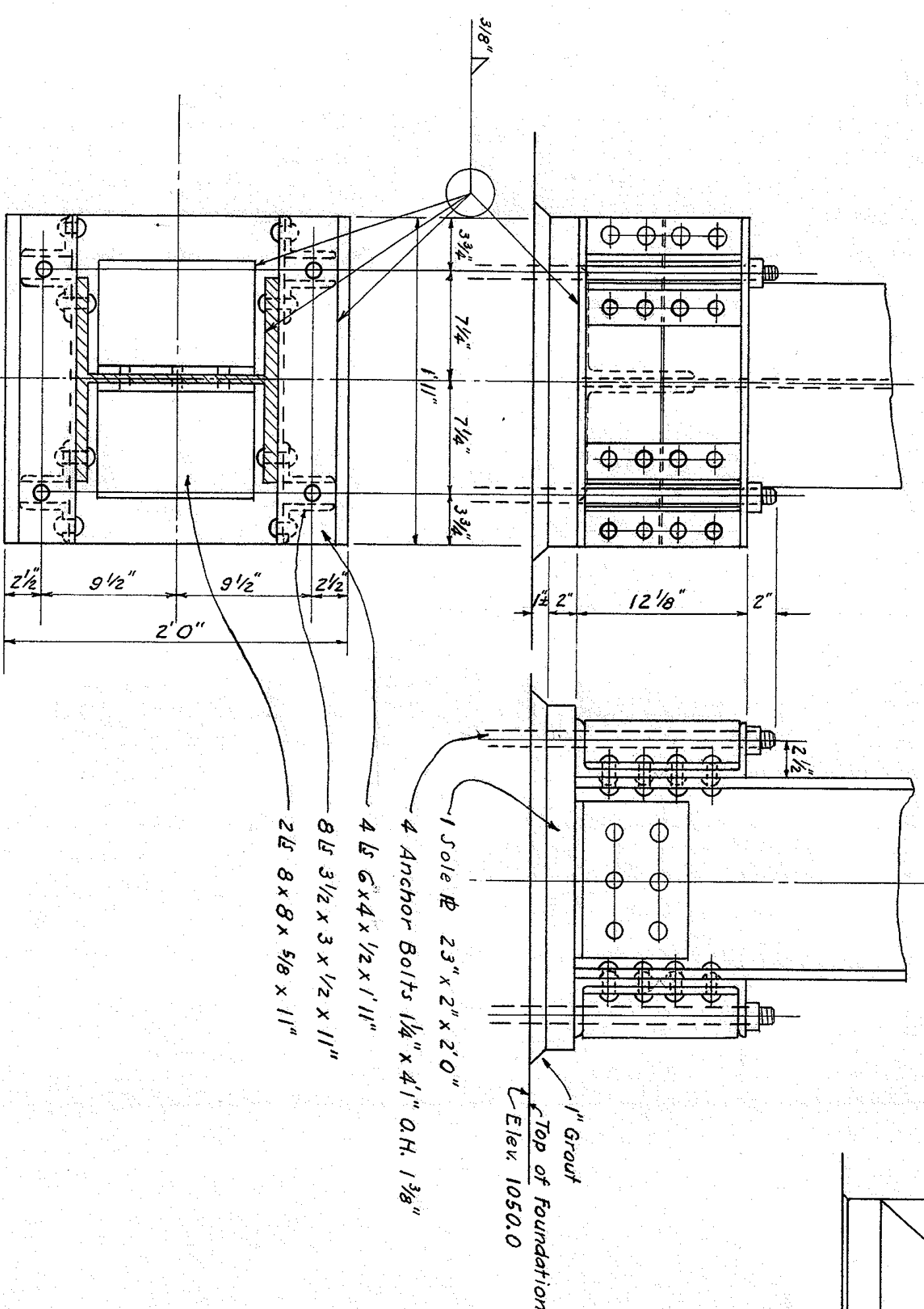
DETAIL OF BOLSTER - TOP OF COLUMN
TYPE "A" 12 REQ'D.

Scale: $\frac{1}{2}" = 1'$



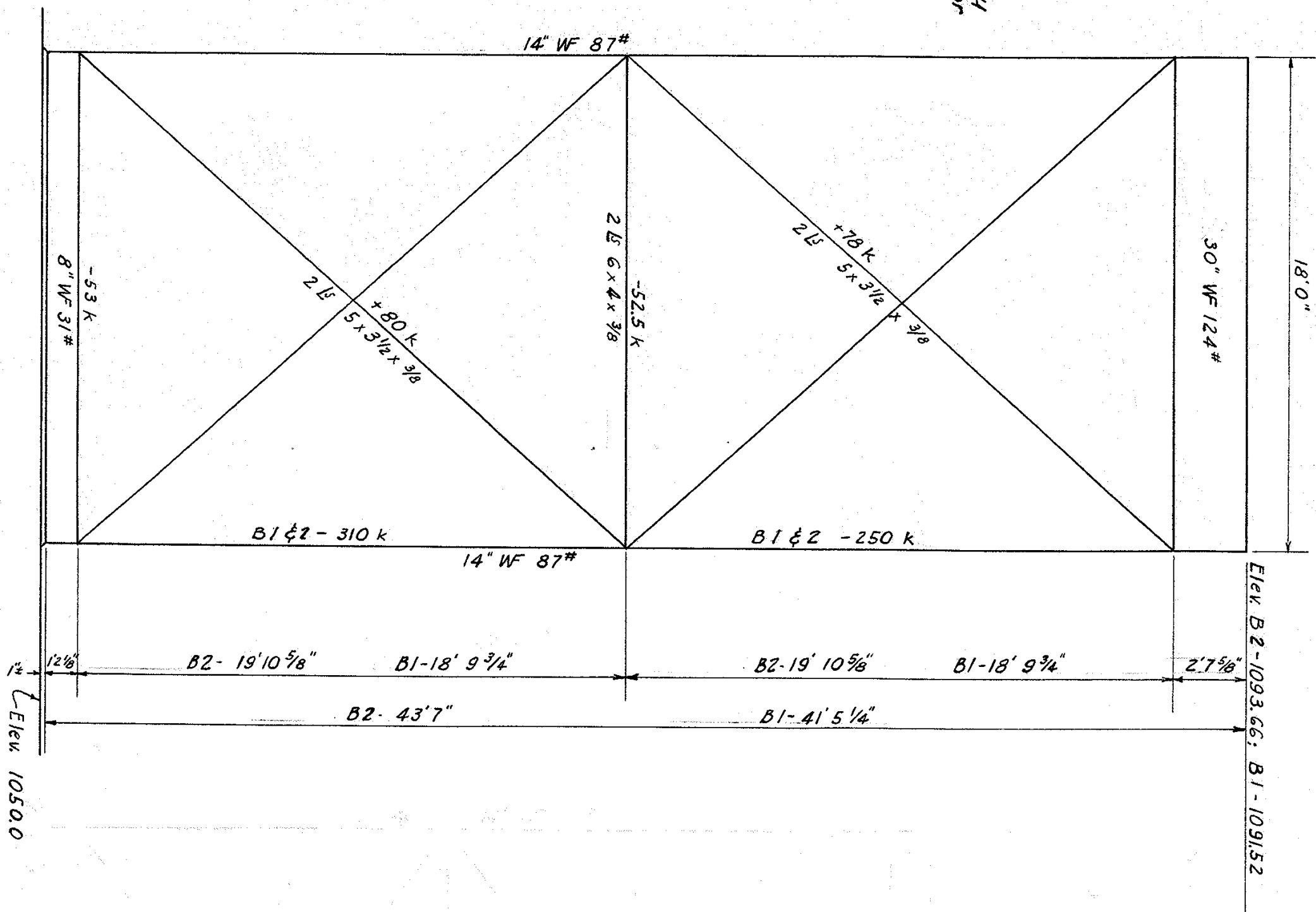
COLUMN BASE DETAILS
BENTS 1 & 2

Scale: $\frac{1}{2}" = 1'$



DIAGRAMS - BENTS 1 & 2

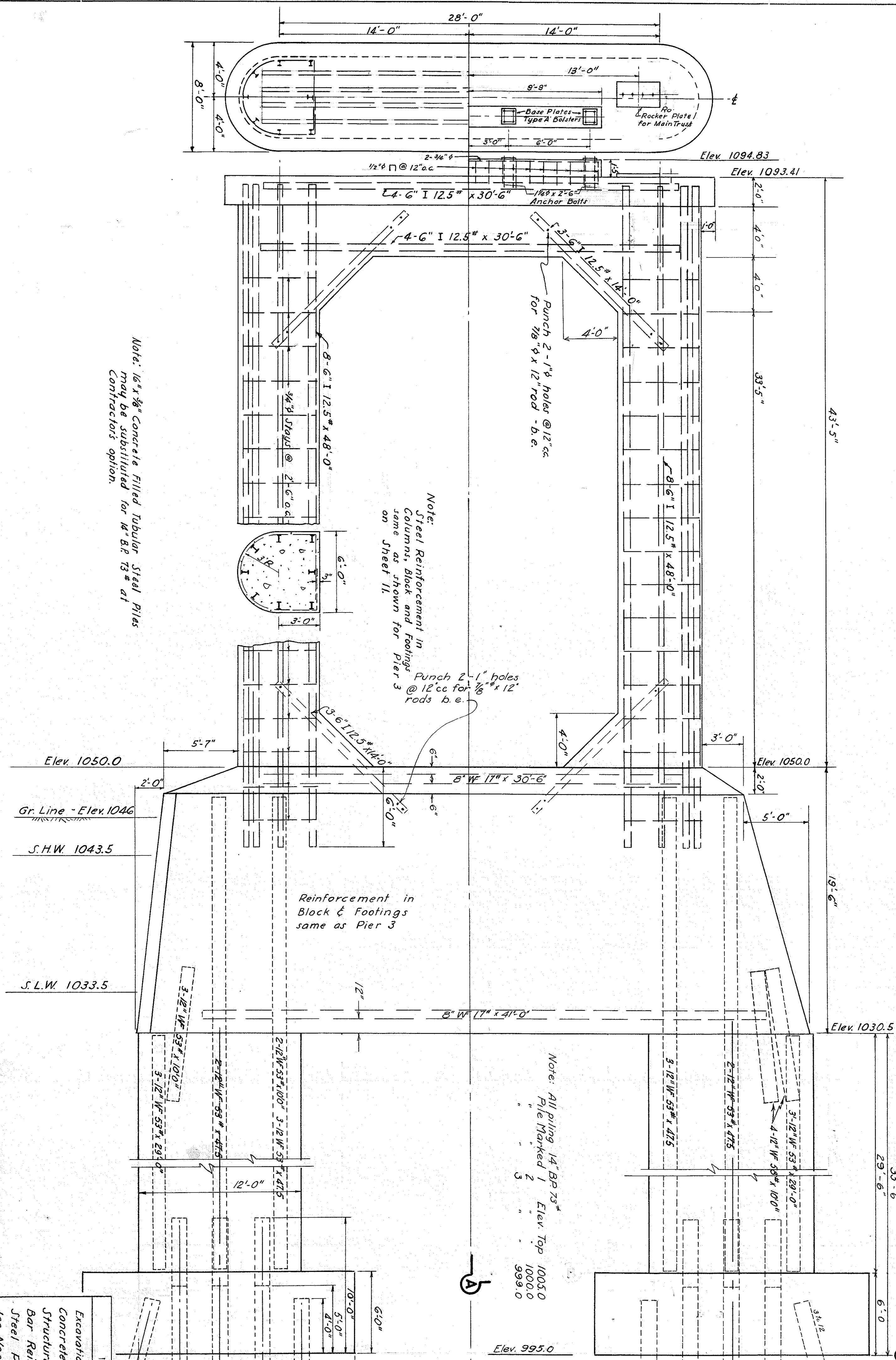
Scale: $\frac{1}{4}" = 1'$



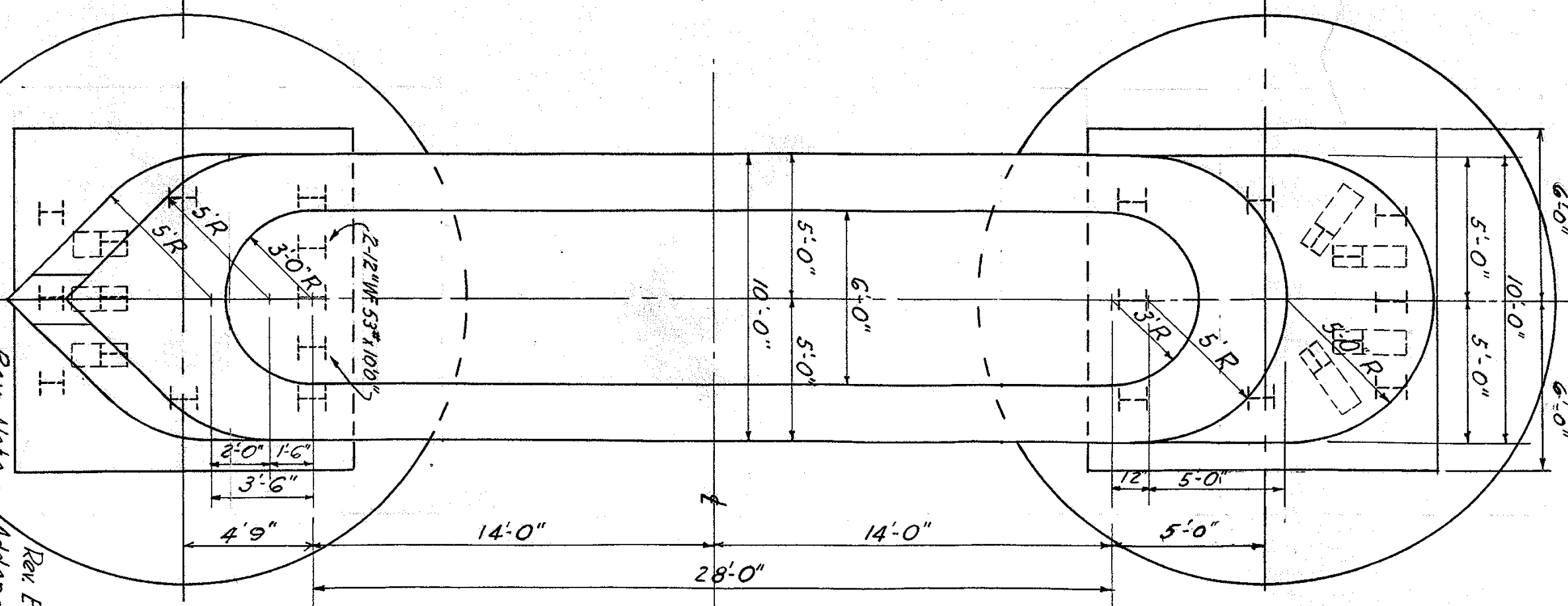
Note:
All rivets $\frac{7}{8}" @ 3"$ spacing. Stitch rivets in double angle struts with $\frac{3}{8}"$ plate washer @ 2' o.c. Same in double angle diagonals @ 3' o.c.
Column base and cap details same for all bents.

QUANTITIES

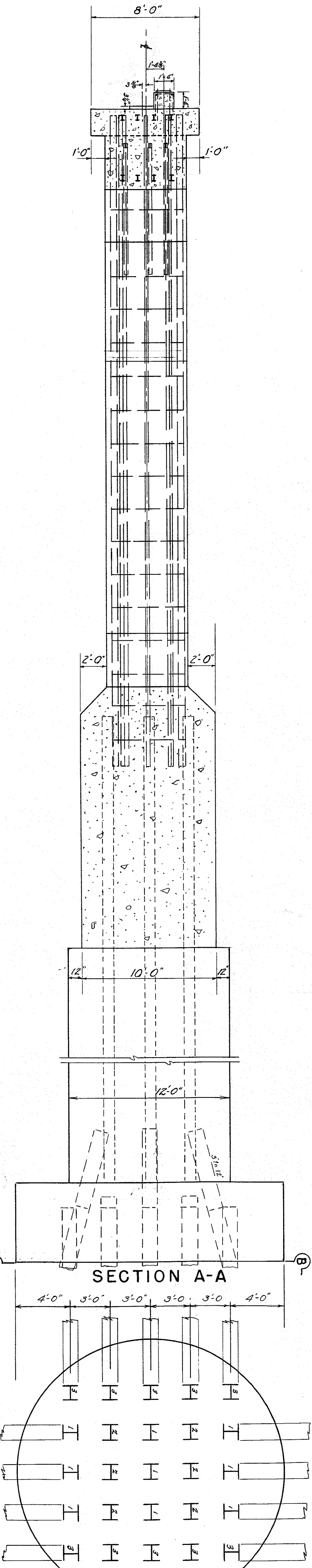
Structural Steel Bents 1 & 2 Total: 29331 lbs.



ELEVATION



PLAN OF BLOCK & FOOTINGS



SECTION A-A

SECTION B-B

QUANTITIES

Excavation - Class II	1412	c.y.
Concrete - Class B	900	c.y.
Structural Reinforcement	63160	lb.
Bar Reinforcement	2045	lb.
Steel Piles - 2460 Lft.	178580	lb.
Ice Nose - 5/8" Carbon Steel	2350	lb.

MISSOURI RIVER BRIDGE

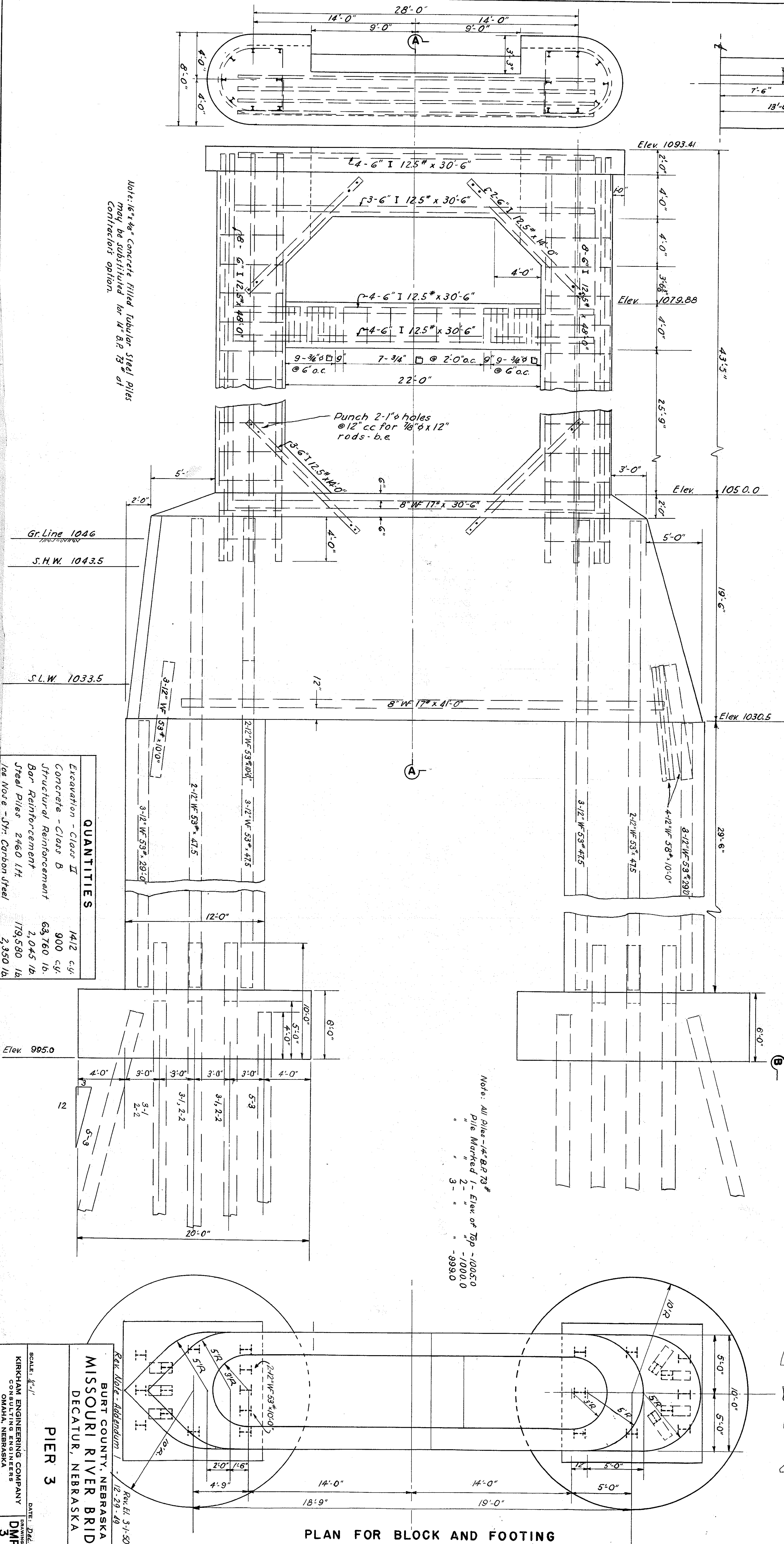
BURT COUNTY, NEBRASKA
DECATUR, NEBRASKA

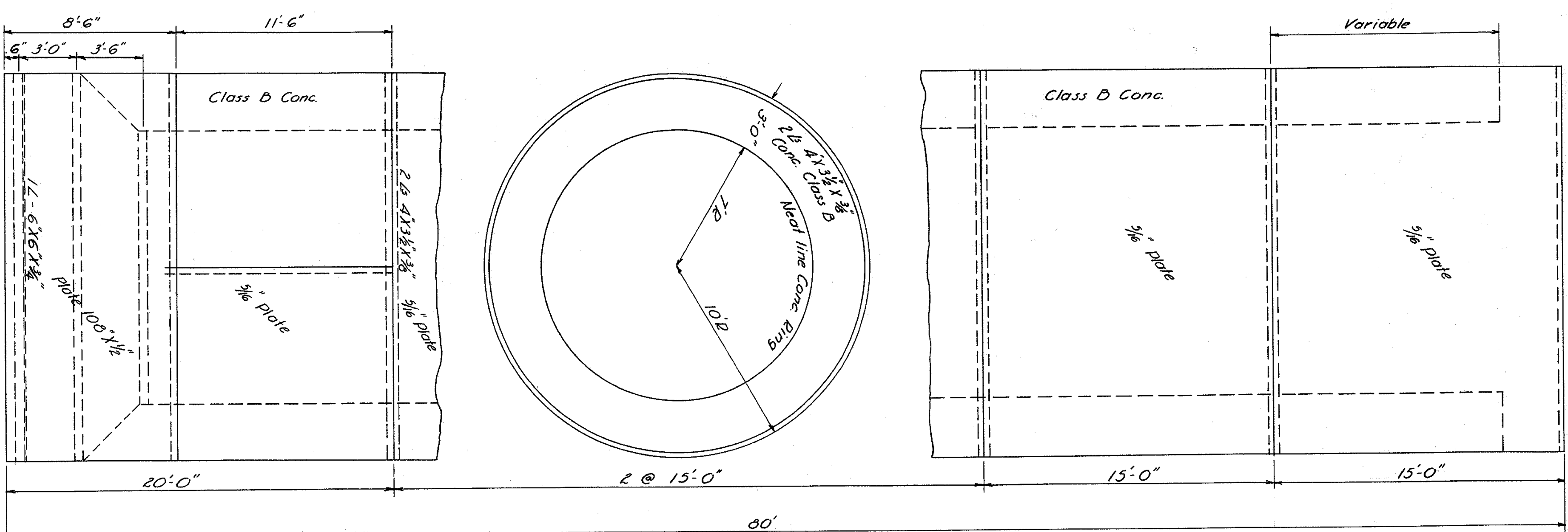
PIER 1

KIRKHAM ENGINEERING COMPANY
CONSULTING ENGINEERS
OMAHA, NEBRASKA

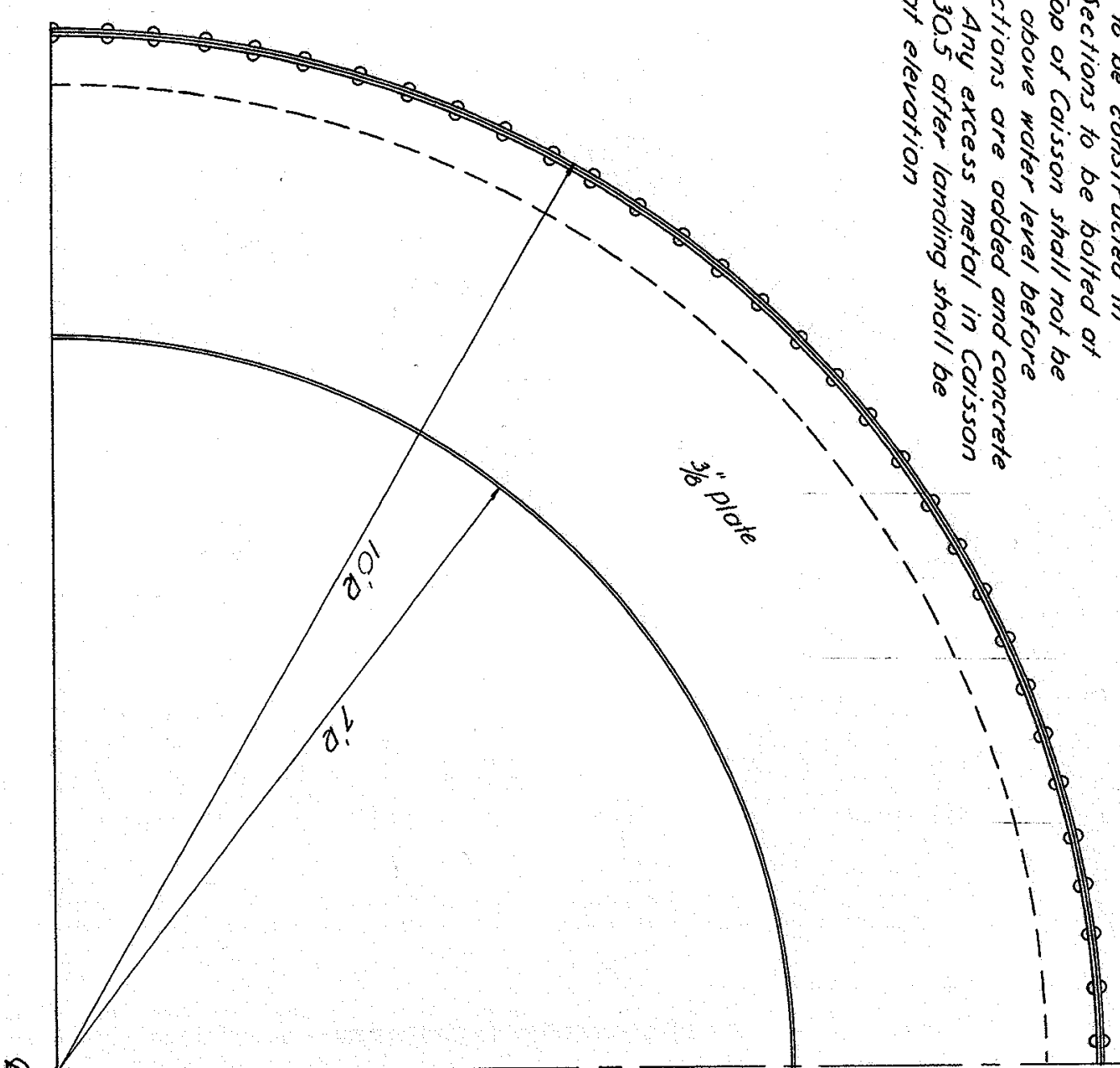
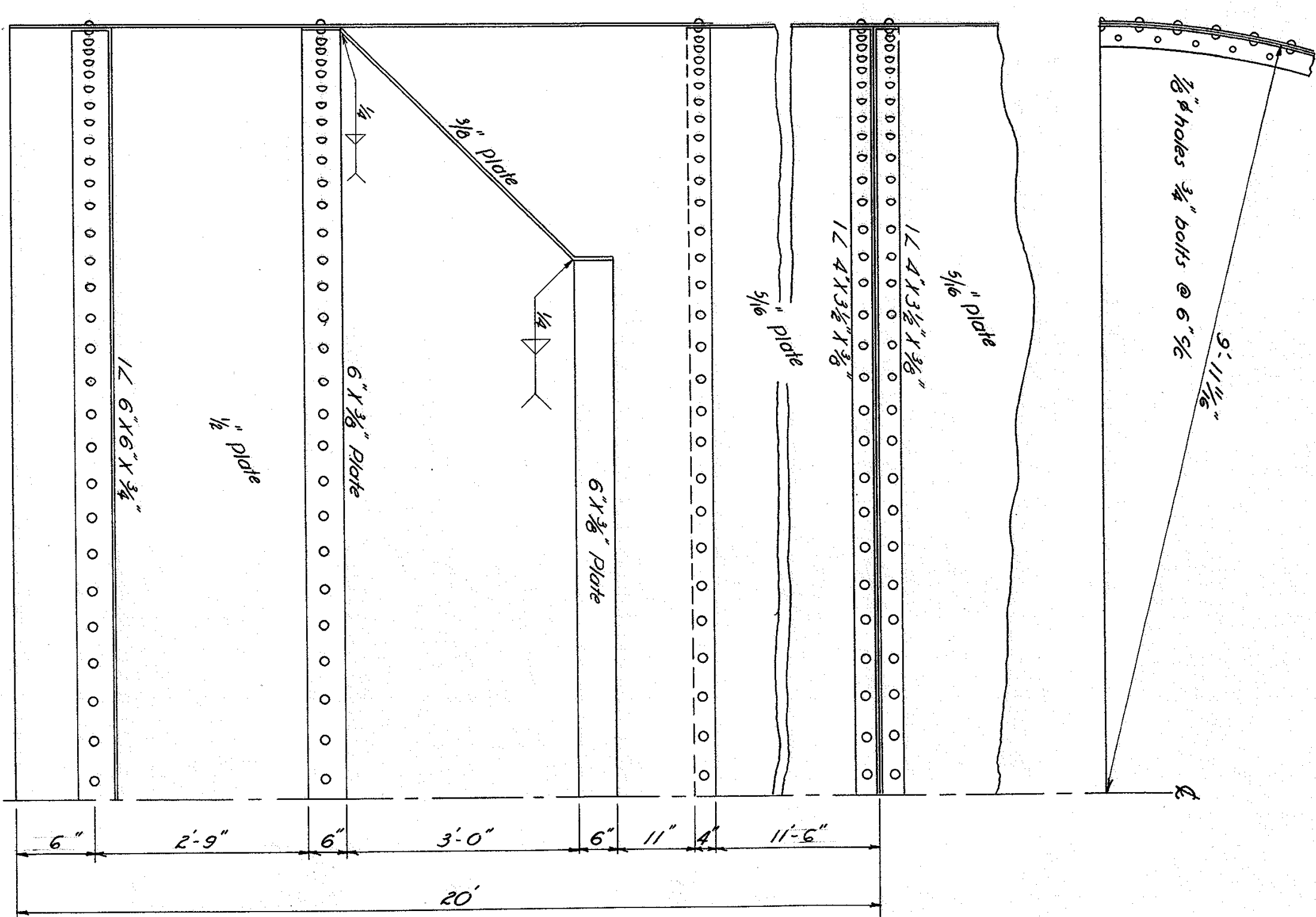
DATE: Dec. 1949
DRAWING: DMP
SHEET: 8

Note: 16"x16" concrete filled tubular steel piles
may be substituted for 14" B.P. 73 # at
Contractor's option.



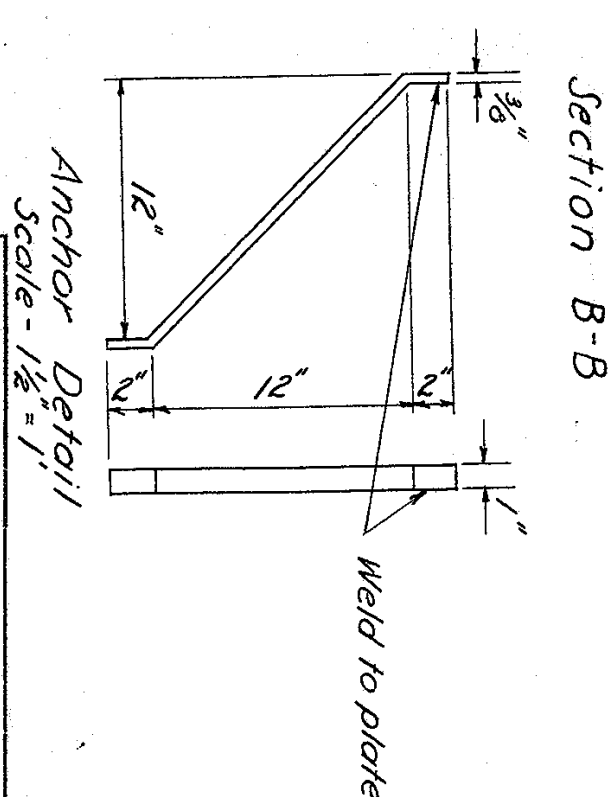
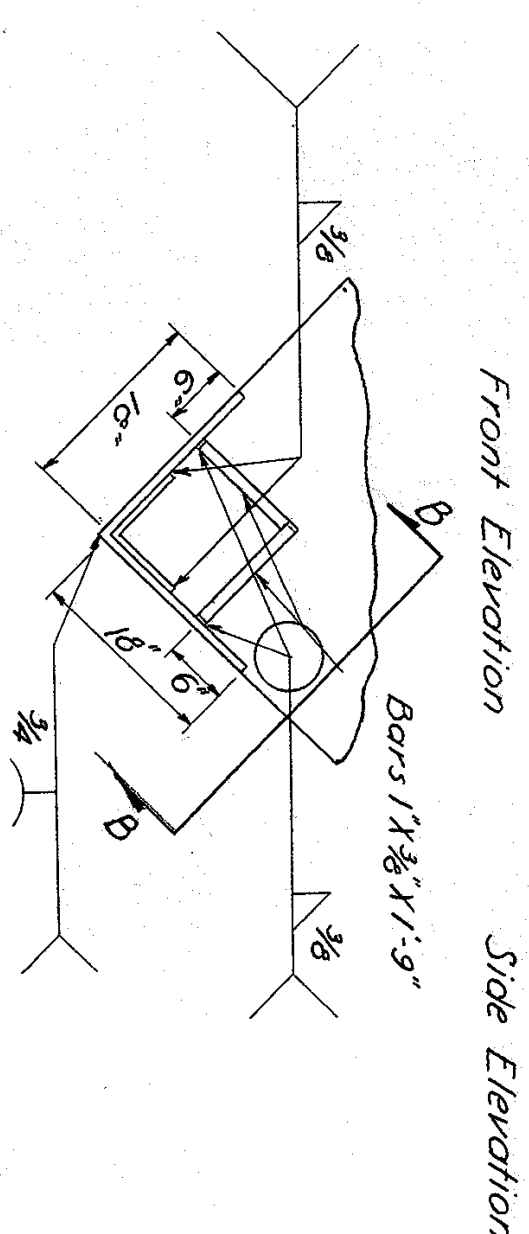
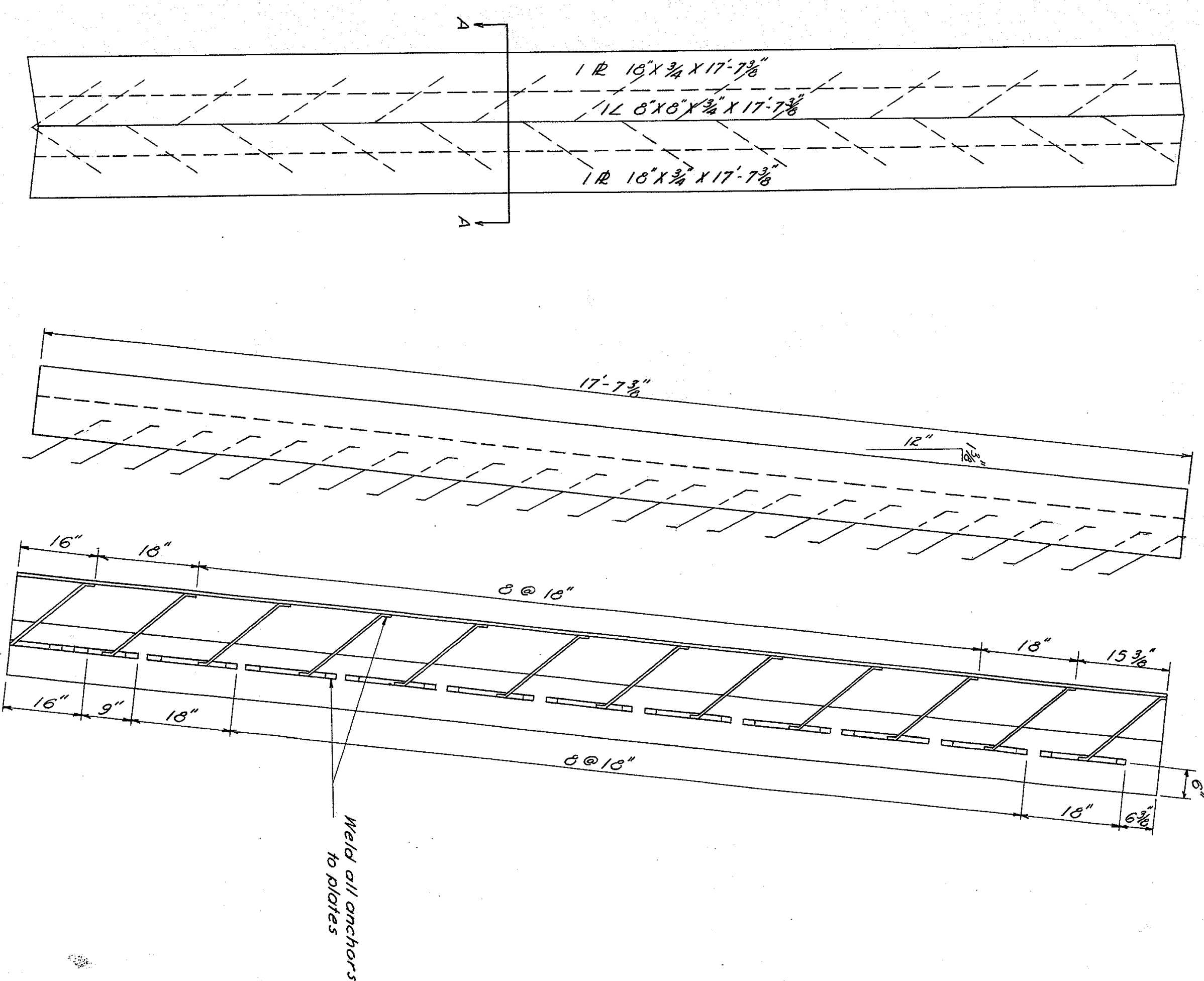


Note: Goussion is to be constructed in 1'-20" & 4'-15" sections to be bolted at connections. Top of Goussion shall not be sunk below & above water level before additional sections are added and concrete ring poured. Any excess metal in Goussion above Elev 1030.5 after landing shall be cut off at that elevation.



CAISSON PIER 2
SCALE $3/4" = 1'$

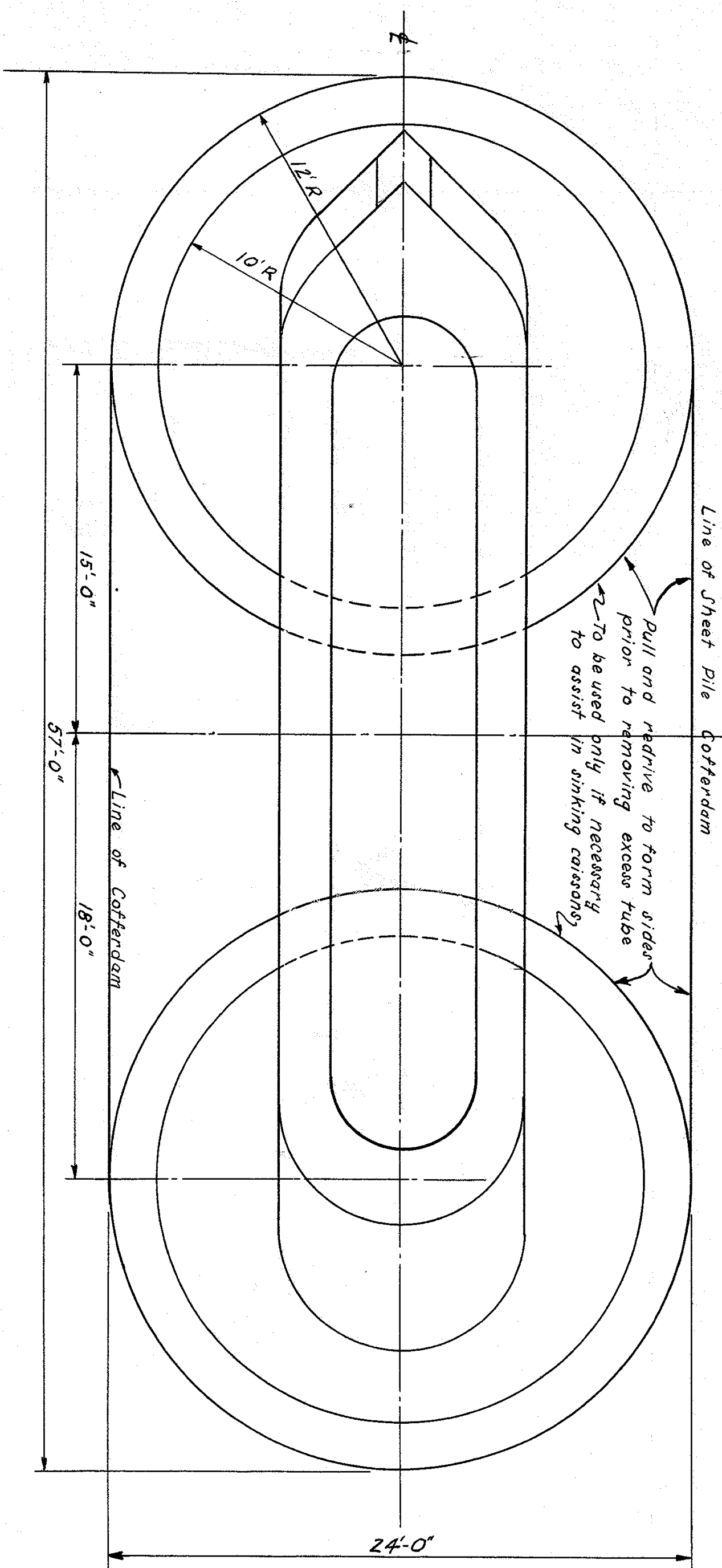
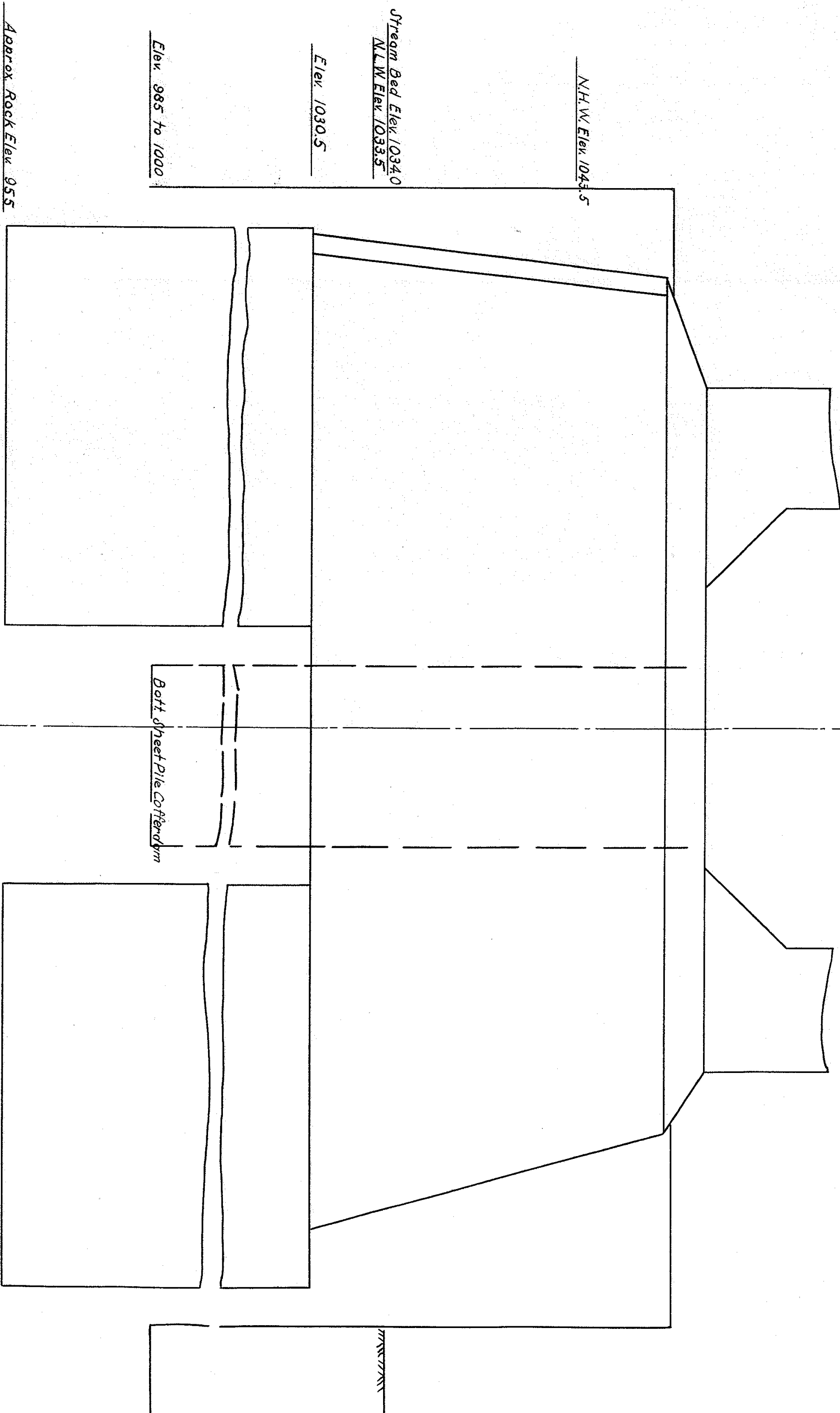
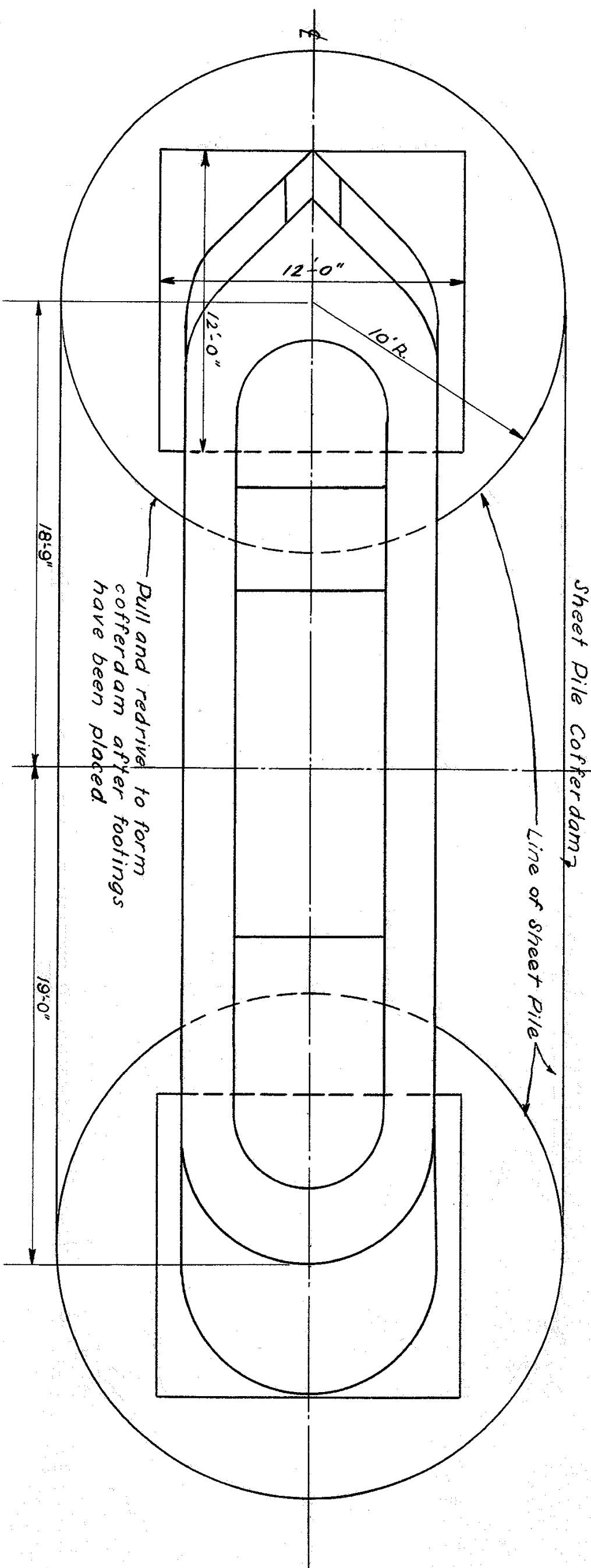
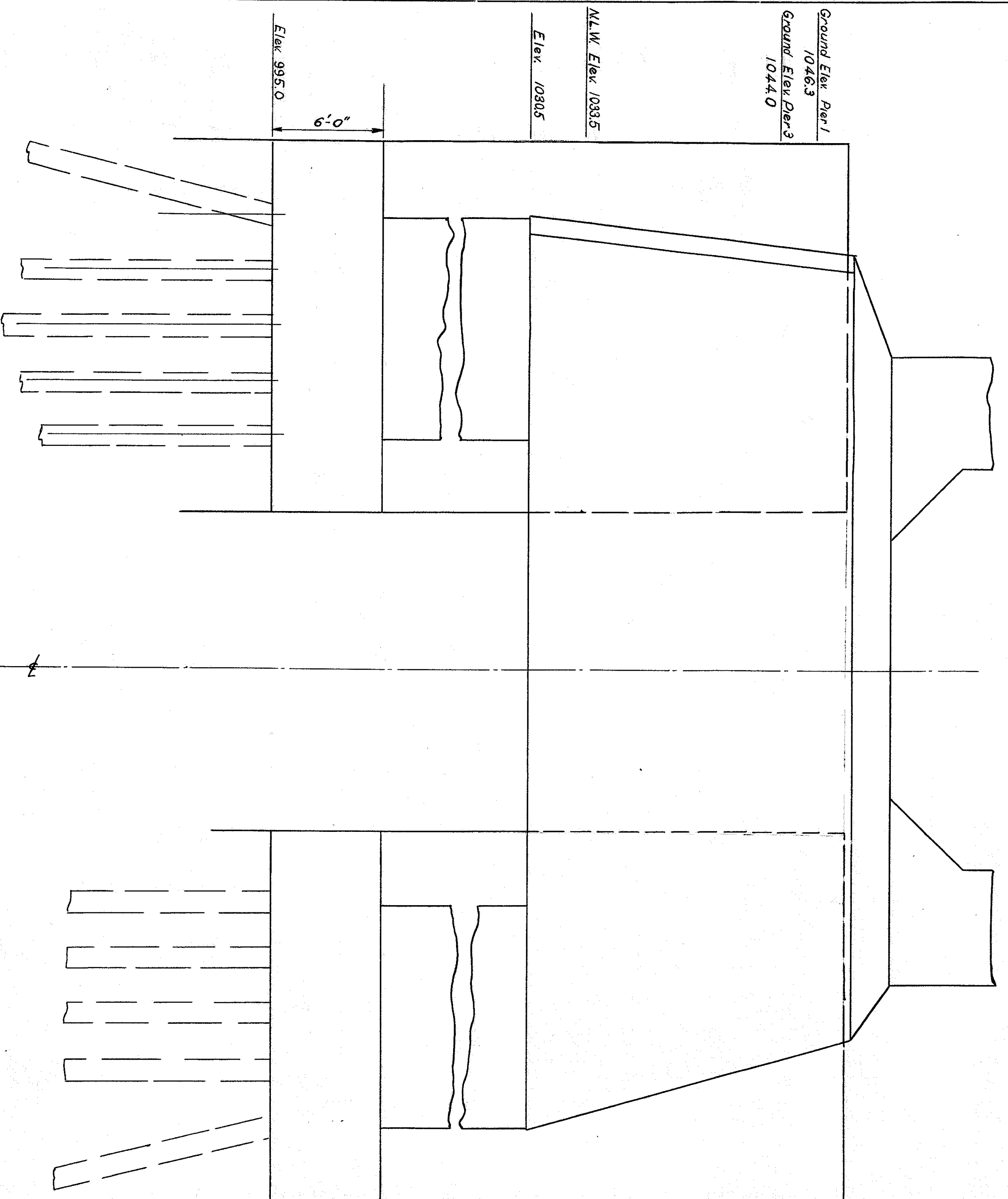
DETAILS CAISSON CUTTING EDGE
SECTION CONNECTIONS
SCALE 3/4" = 1'



ICE NOSE DETAIL
3 REQ'D
SCALE 3/4"=1'

PIER DETAILS

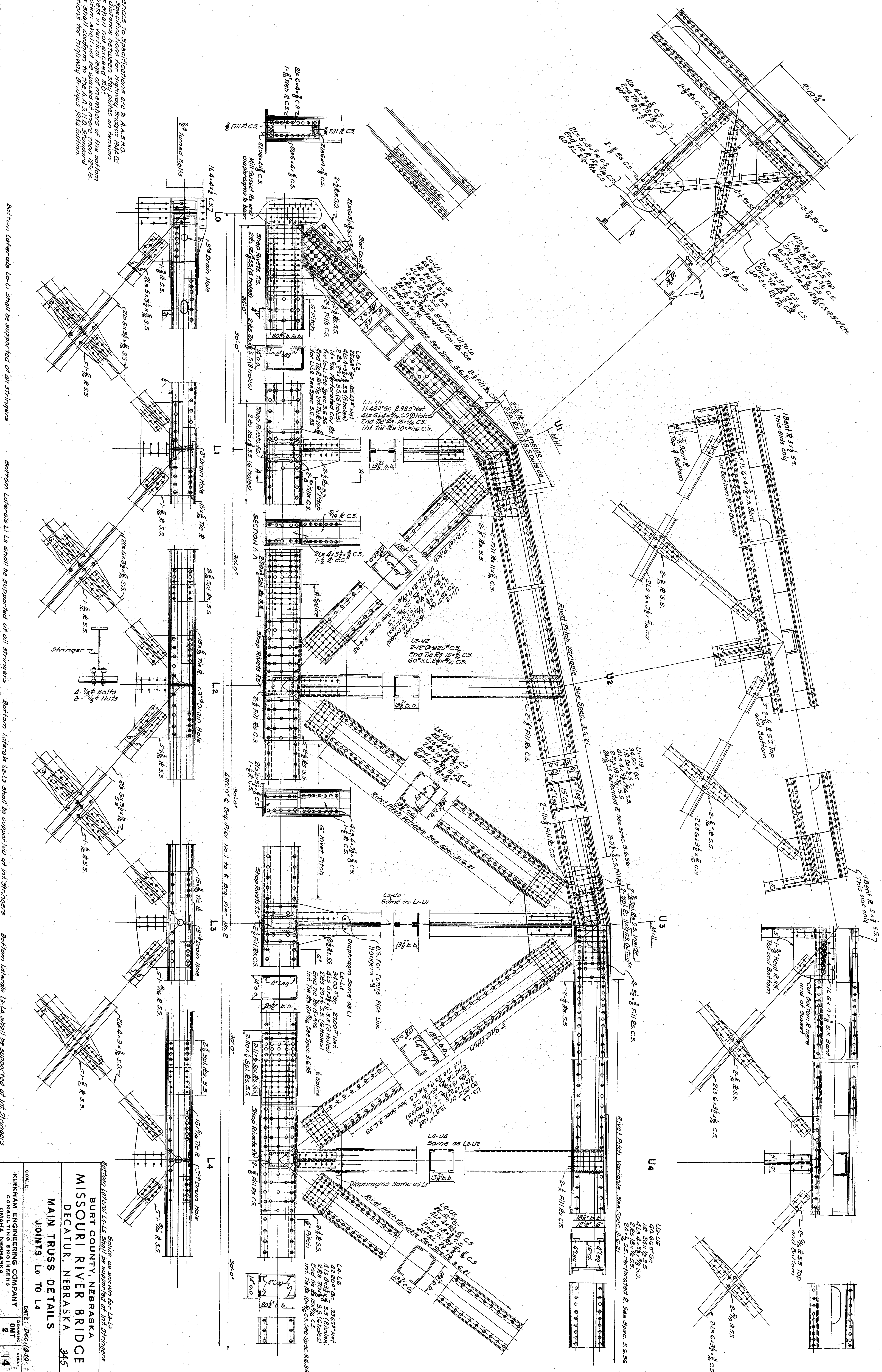
BURT COUNTY, NEBRASKA
MISSOURI RIVER BRIDGE
DECATUR, NEBRASKA 345



TYPICAL COFFERDAM - PIERS 1 & 3

TYPICAL COFFERDAM - PIER 2

NOTE: All references to Specifications are to A.4.5.1.0. Standard Specifications for Highway Bridges 1944. The clear distance between stay plates on tension splices shall not exceed 3.0'. Members of the bottom lateral system shall not be spaced at more than 12 feet. All details shall conform to the A.4.5.1.0. Standard Specifications for Highway Bridges 1944 Edition.



DESIGNED BY John W. Frazier DATE Mar 1947
TRACED BY Chas. Turripseed DATE May 6, 1947
CHECKED BY T.W. Oliver DATE May 1947

Bottom laterals L5-L6 shall be supported at int. stringers

Bottom laterals L6-L7 shall be supported at int. stringers

Bottom laterals L7-L8 shall be supported at int. stringers

Bottom laterals L8-L9 shall be supported at int. stringers

Bottom laterals L9-L10 shall be supported at int. stringers

Bottom laterals L5-L10 shall be supported at all stringers

BURT COUNTY, NEBRASKA

MISSOURI RIVER BRIDGE

DECATUR, NEBRASKA

345

MAIN TRUSS DETAILS

JOINTS L6 TO L10

SCALE:

KIRKHAM ENGINEERING COMPANY

CONSULTING ENGINEERS

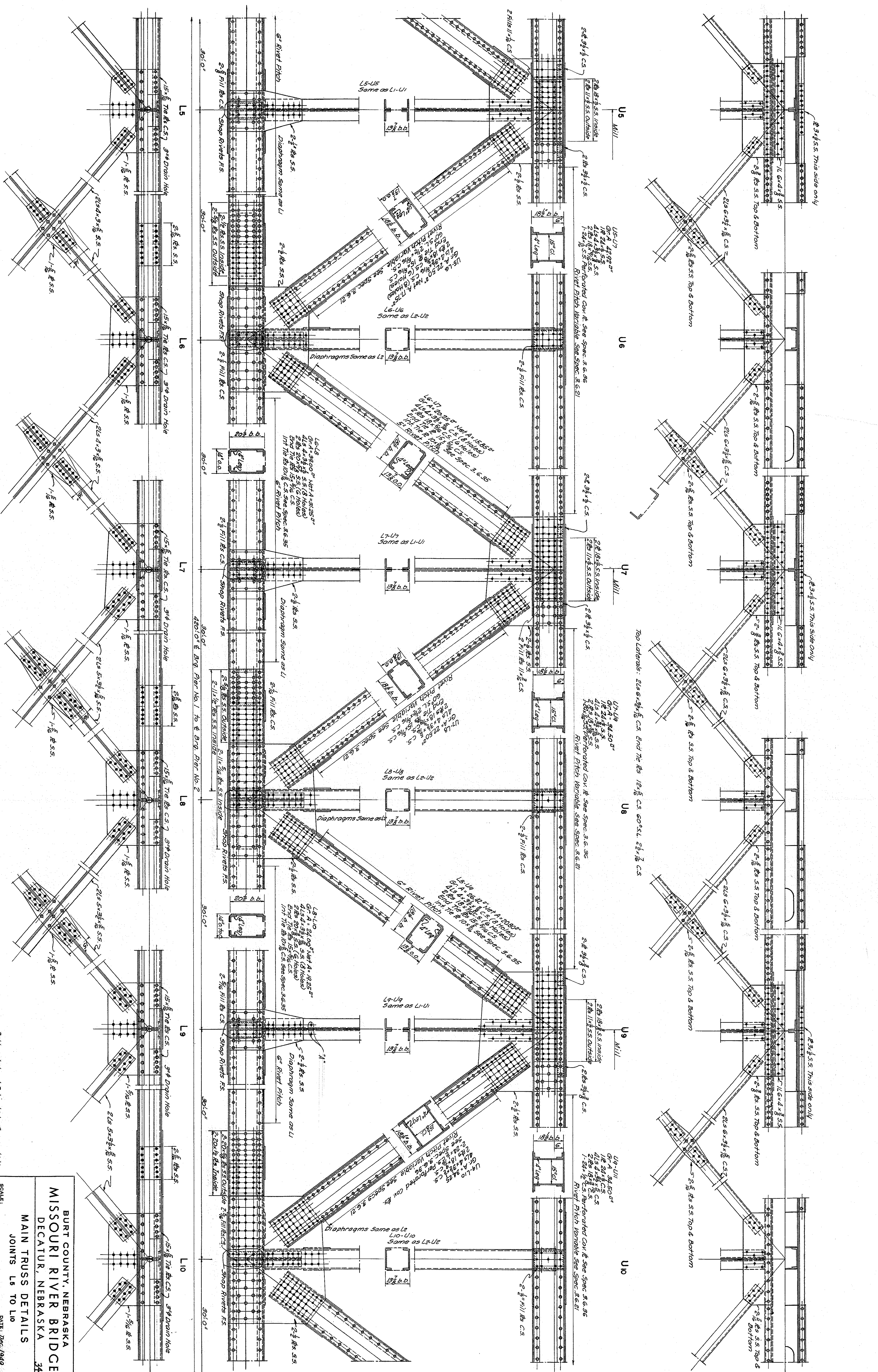
OMAHA, NEBRASKA

DATE: Dec 1949

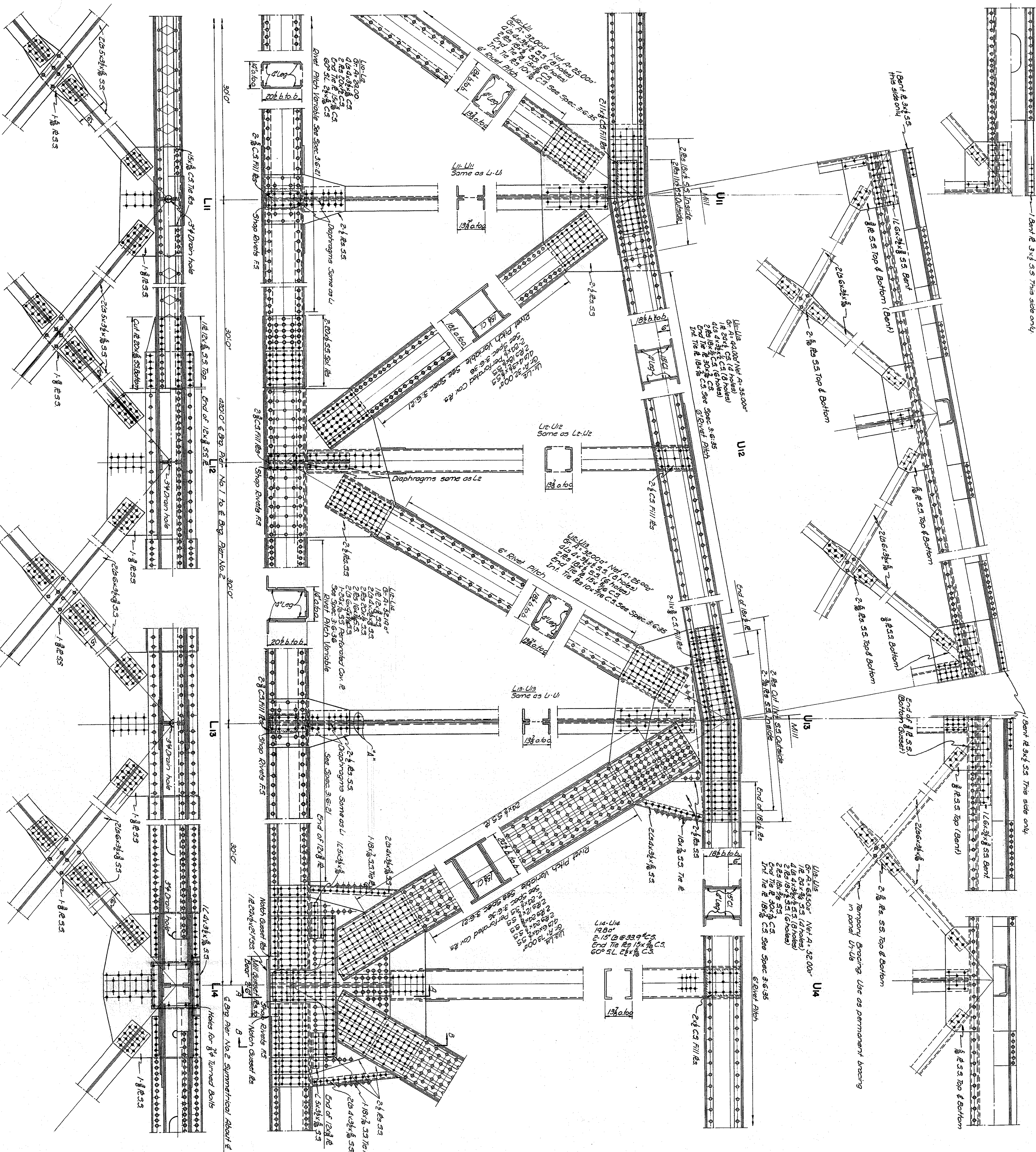
DW

3

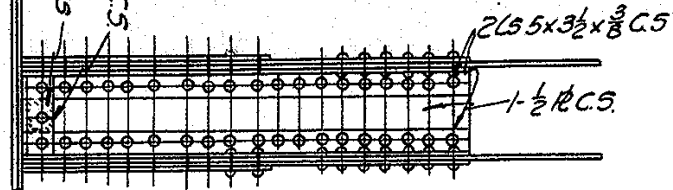
15



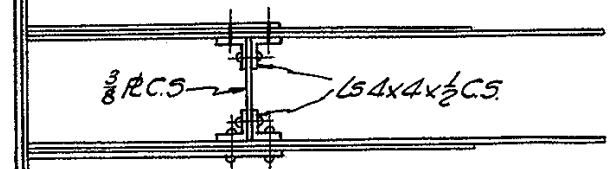
Bottom laterals L13-L14 shall be supported at all stringers



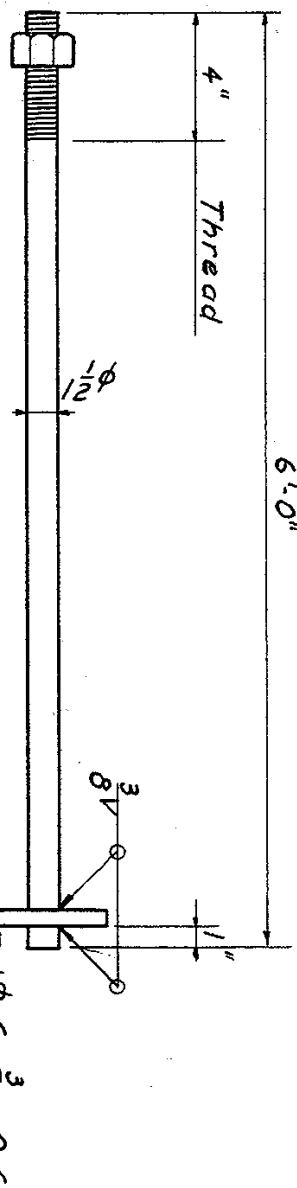
SECTION A-A



SECTION B-B



SUMMARY OF STRUCTURAL STEEL QUANTITIES	
PART	CARBON STEEL-LBS SILICON STEEL-LBS TOTAL LBS
Trusses	436,030 5,291,180 965,210
Roofs	16,410 1,049,220 1,213,630
Top Bracing	52,644 990 53,634
Bottom Bracing	15,500 378,73 53,413
Portal Bracing	35,143 35,143
Struts & Stay Frames	45,302 45,382
Floor beams	43,670 43,670
Stringers	262,420 262,420
Rail & Drains	24,270 24,270
Expansion Devices	8,490 8,490
Beaming Devices	17,580 17,580
TOTAL	1,012,469 673,043 1,685,512



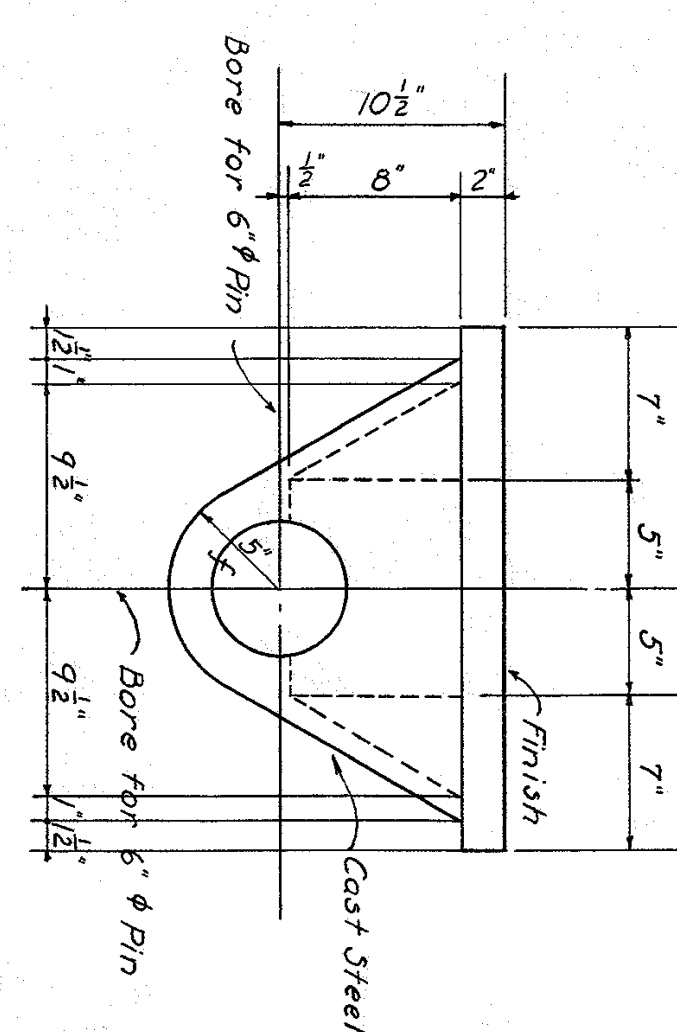
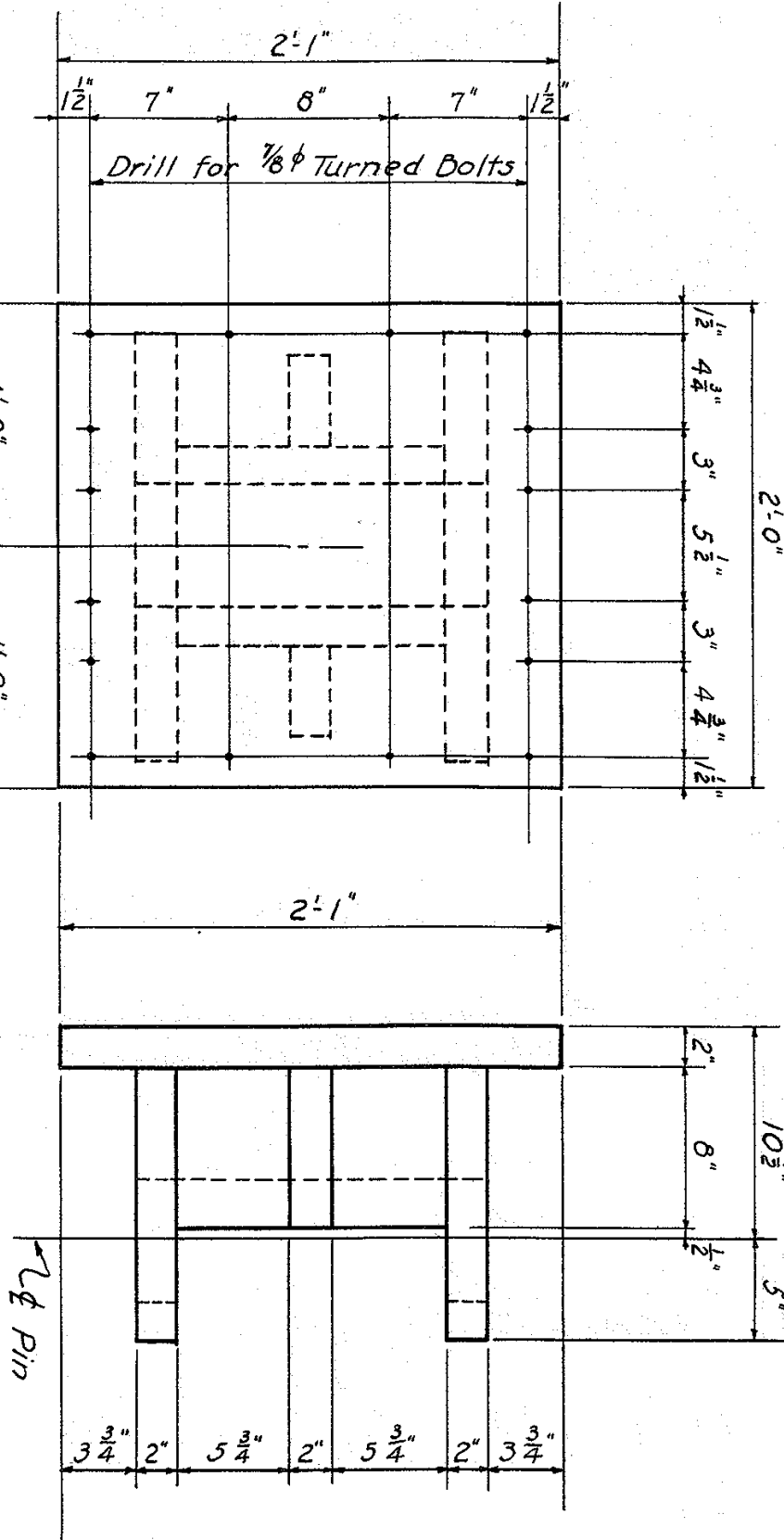
GENERAL NOTES

All material to be cast steel except as otherwise noted. All anchor bolts, stub bolts for attaching rocker to base plate, turned bolts for attaching top castings to truss, base plates, 6" pins and pin nuts top castings, rockers, and bolsters are to be paid for at the contract unit price bid for structural carbon steel.

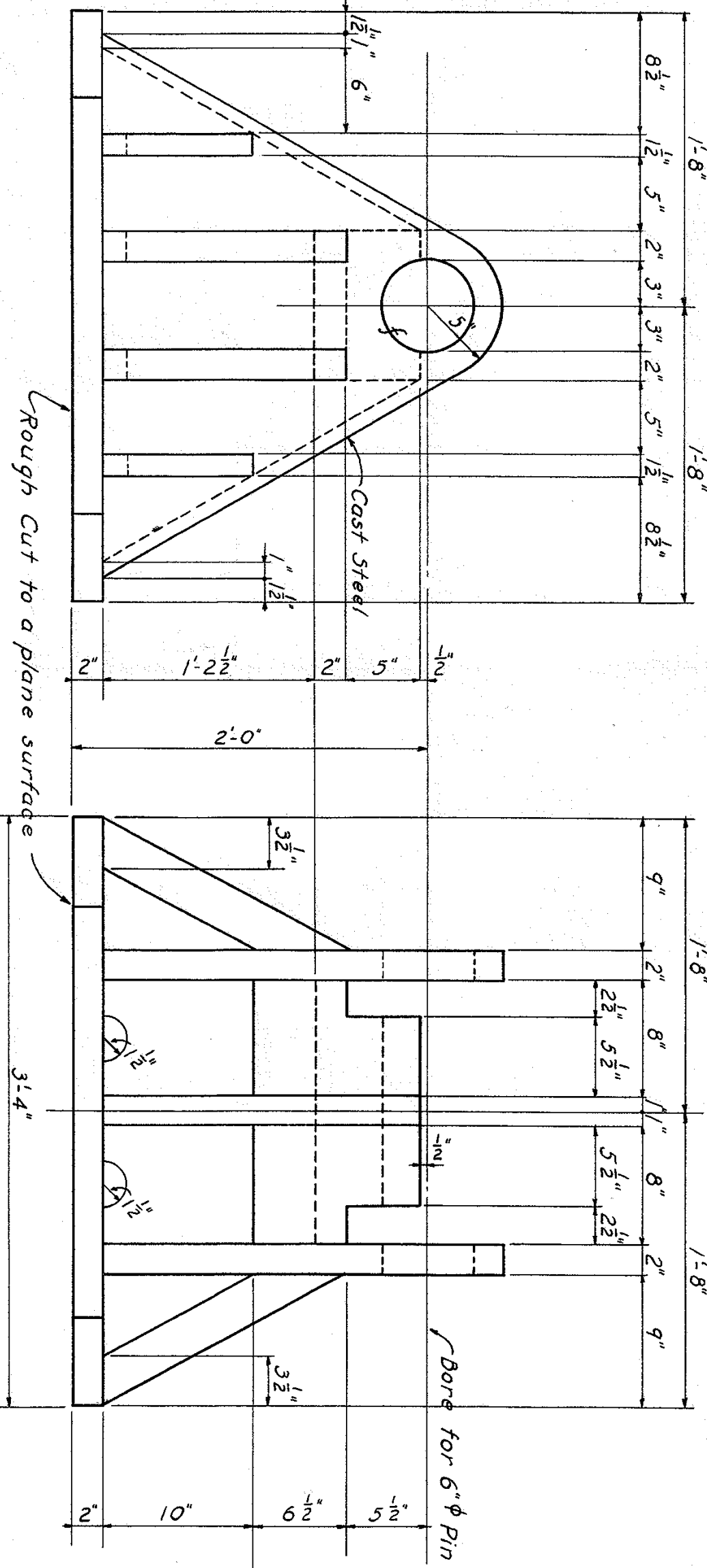
All parts of rockers and bolsters shall receive one coat of tinted aluminum paint followed by one coat of aluminum paint except finished surfaces of pins and pin bearings which shall receive one coat of white lead and tallow prior to leaving shop.

A test bar shall be cast on each casting. The specimen may be of any cross section that will provide a machined test bar 3/4" in diameter and 8" in length. It shall be cut away sufficiently from the body of the casting before annealing so that it can be easily removed but it shall not be completely removed. The heat number shall be stamped on each test specimen and on the body of the casting.

Pin plates and pin bearings shall be sufficiently true to form that they will fit slots and pins without binding.

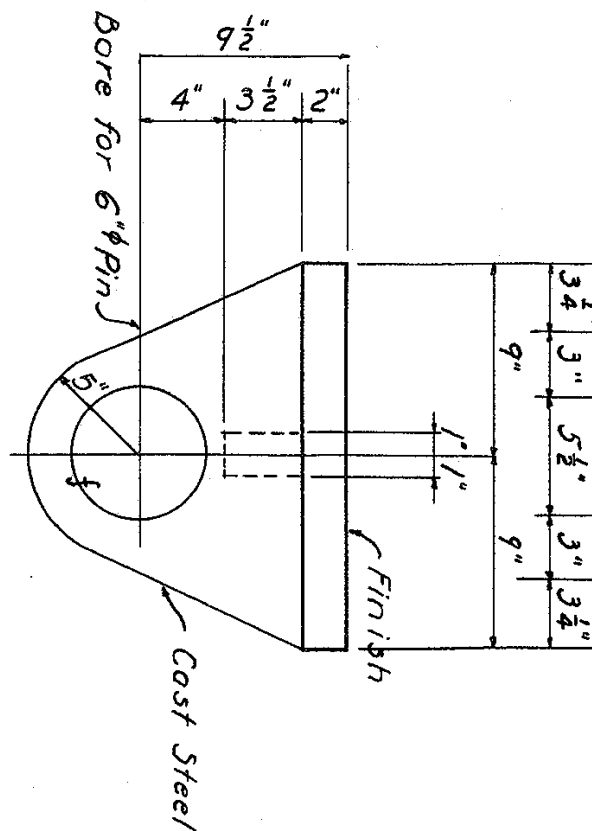
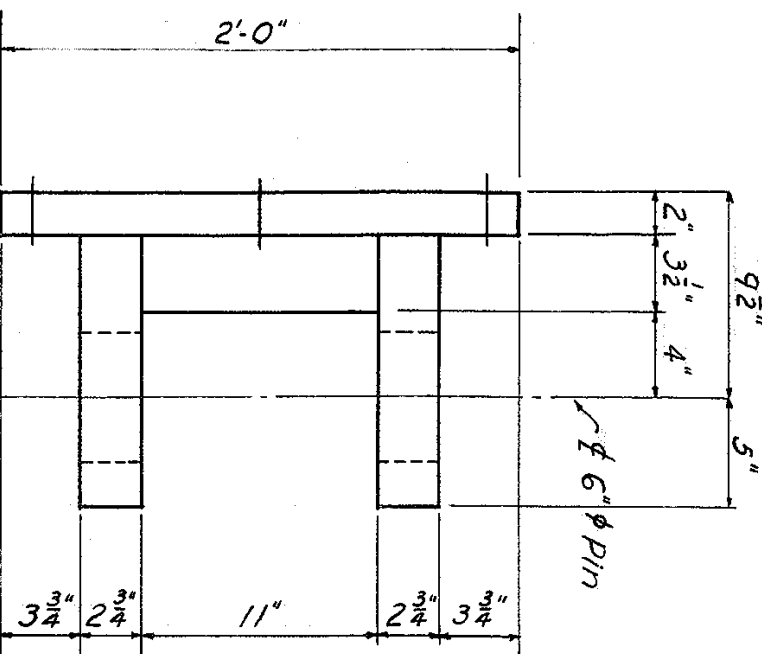


R14 TOP CASTING
2 REQUIRED

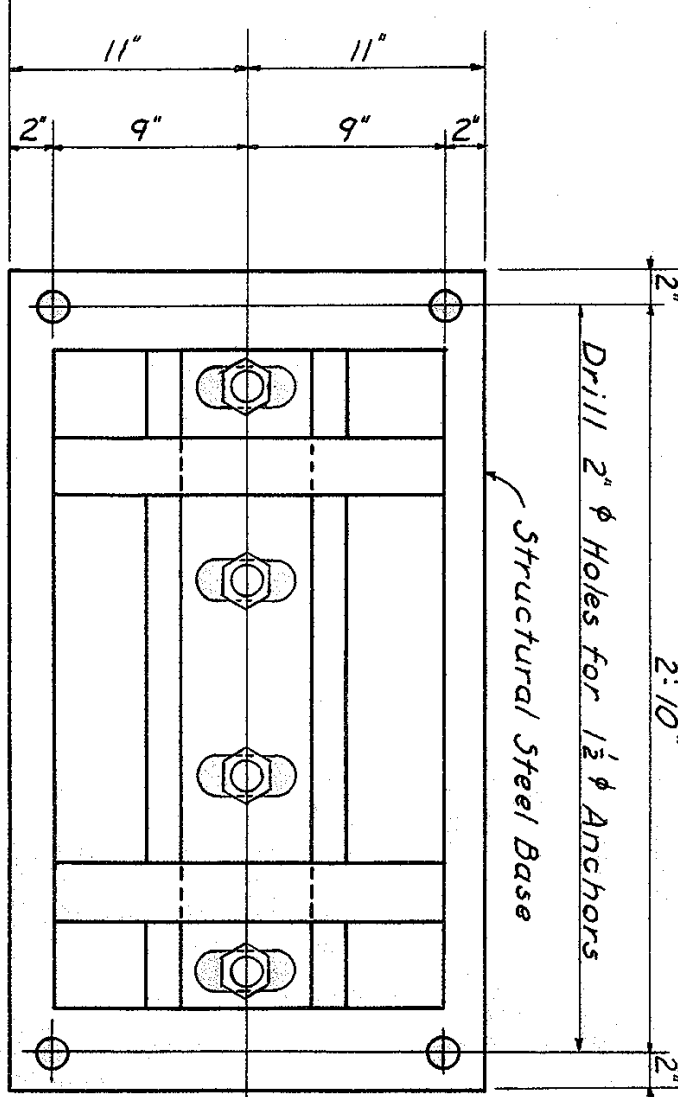
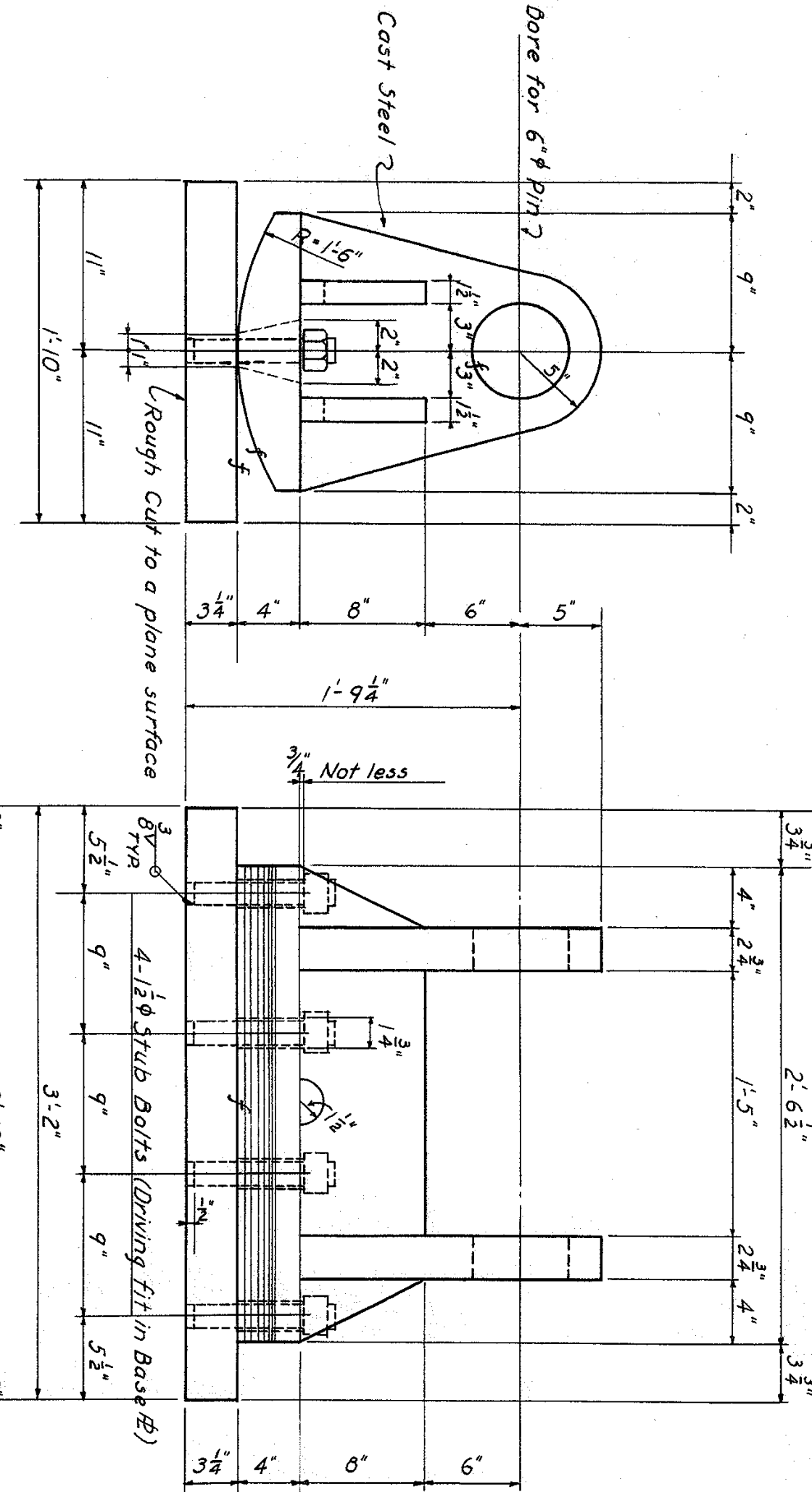


SUMMARY OF QUANTITIES	
Structural Carbon Steel	17,520 lbs*

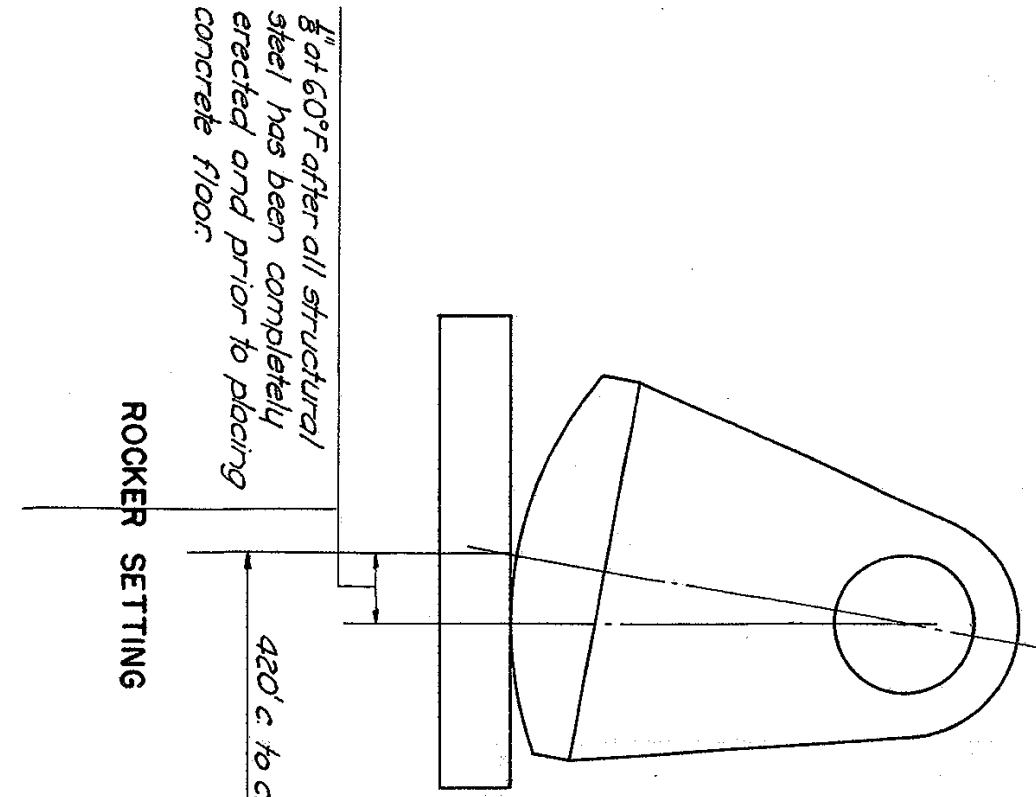
* Included in Total Quantities shown on Sheet 16



R0 TOP CASTING
4 REQUIRED

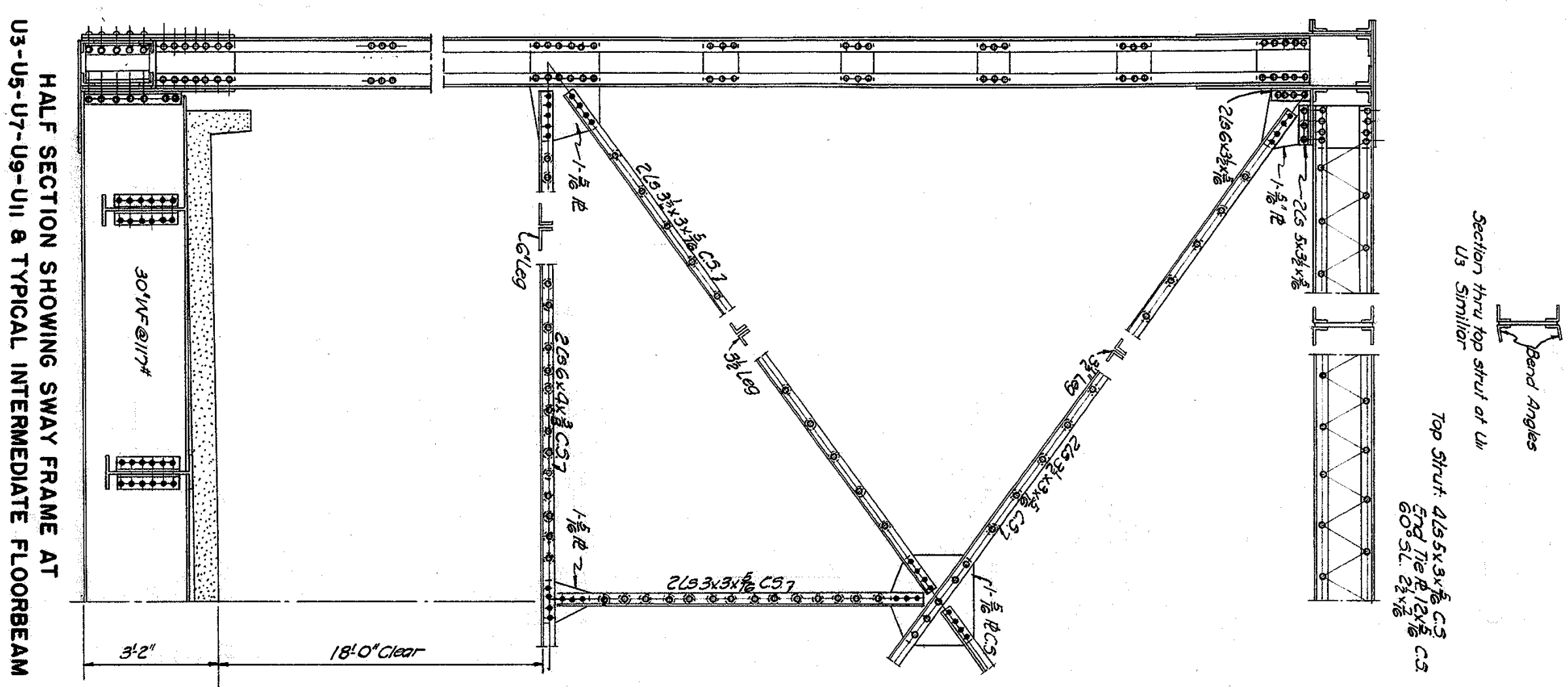


R0 ROCKER DETAILS
4 REQUIRED

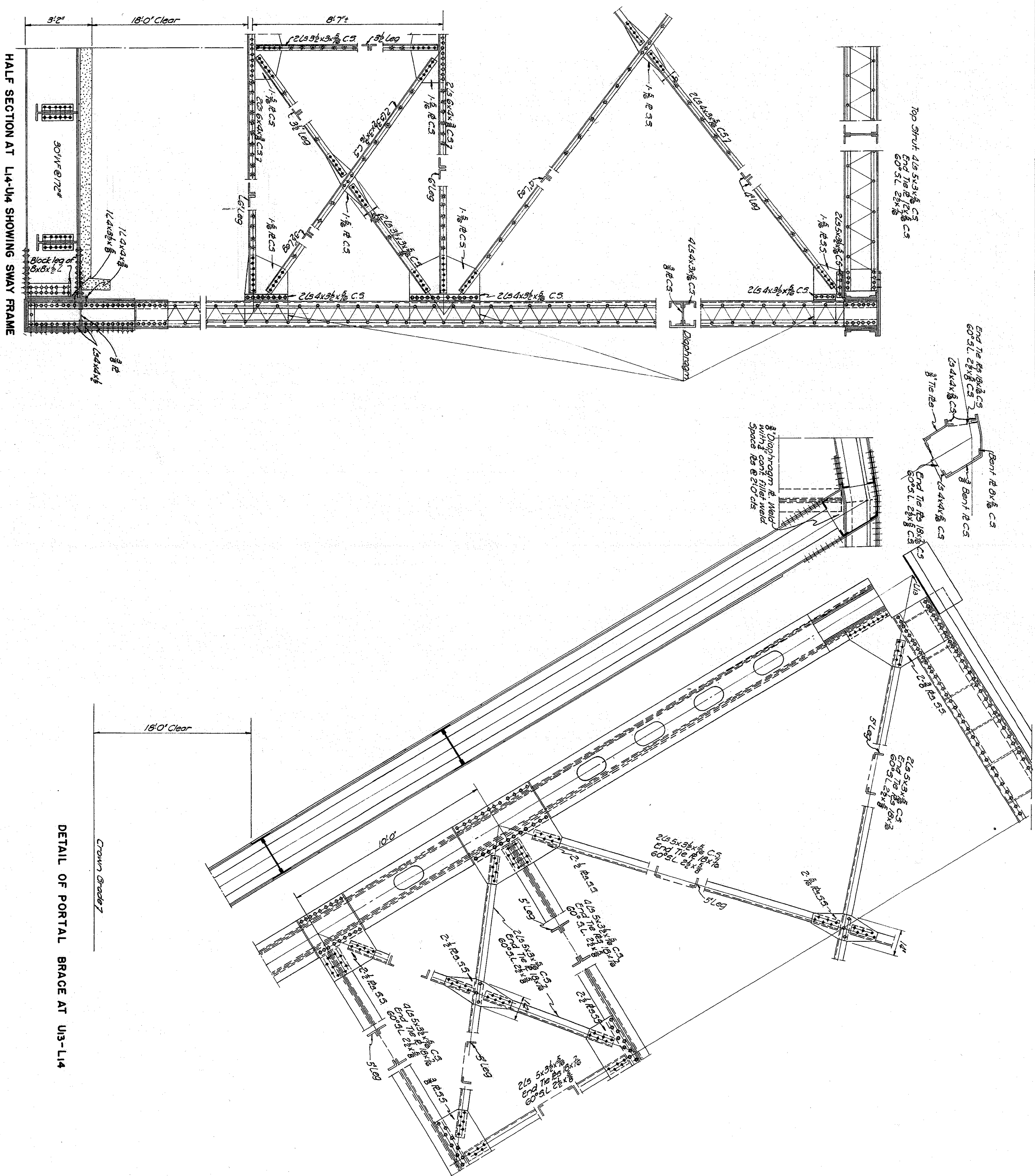


DESIGNED BY: Turnipseed DATE: 4-21-47
TRACED BY: B. G. G. DATE: 5-5-47
CHECKED BY: T. W. Oliver DATE: May 1947

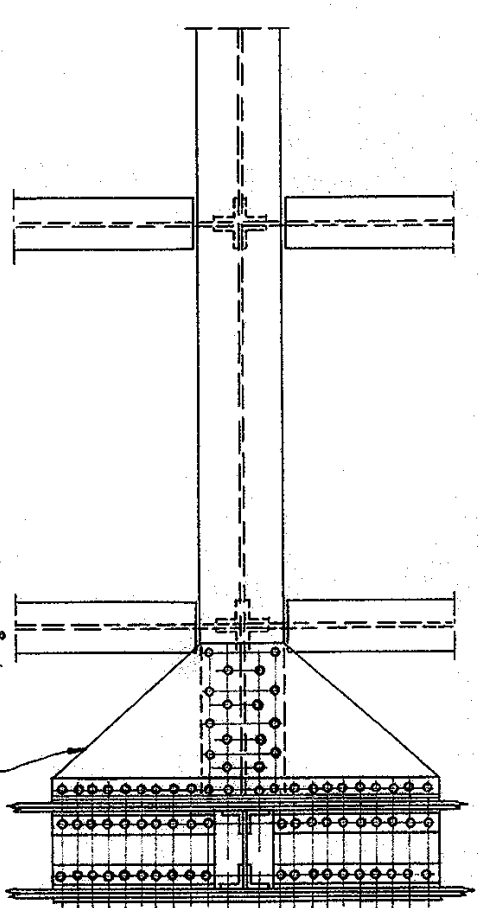
R14 BOLSTER DETAILS
2 REQUIRED



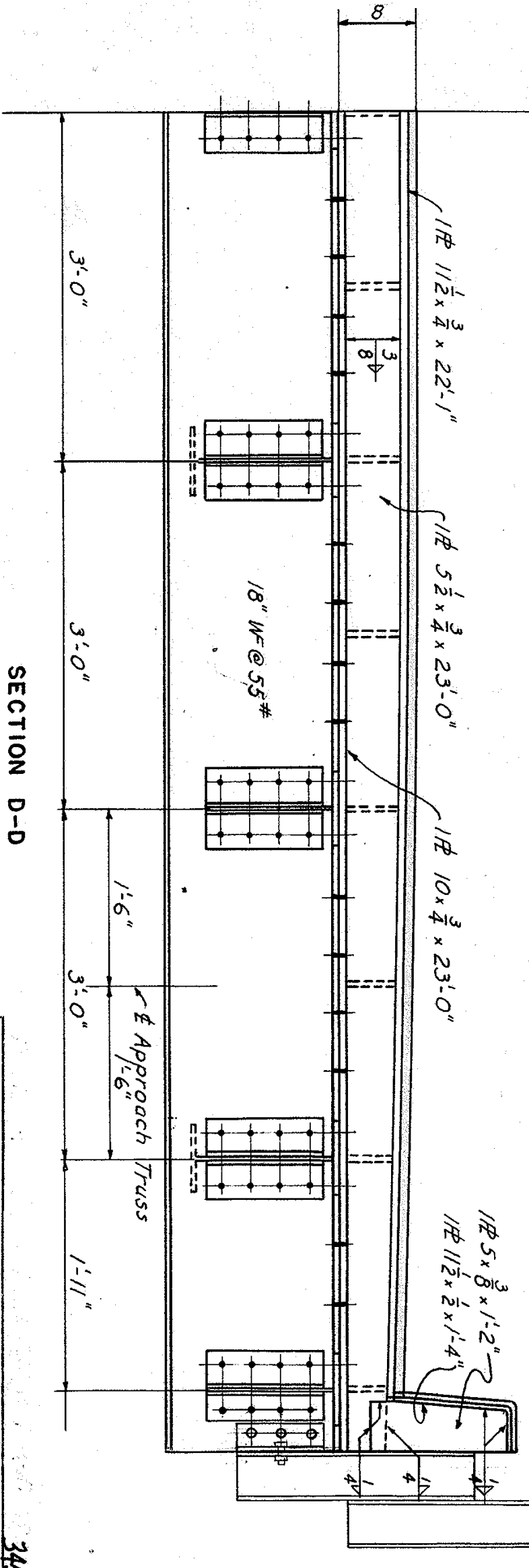
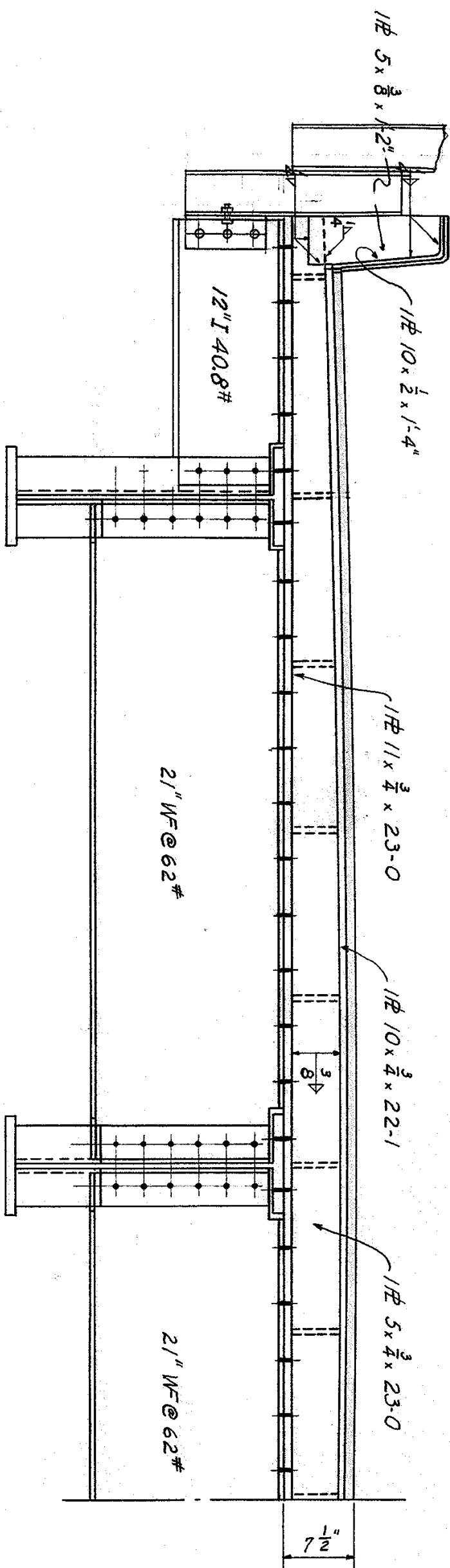
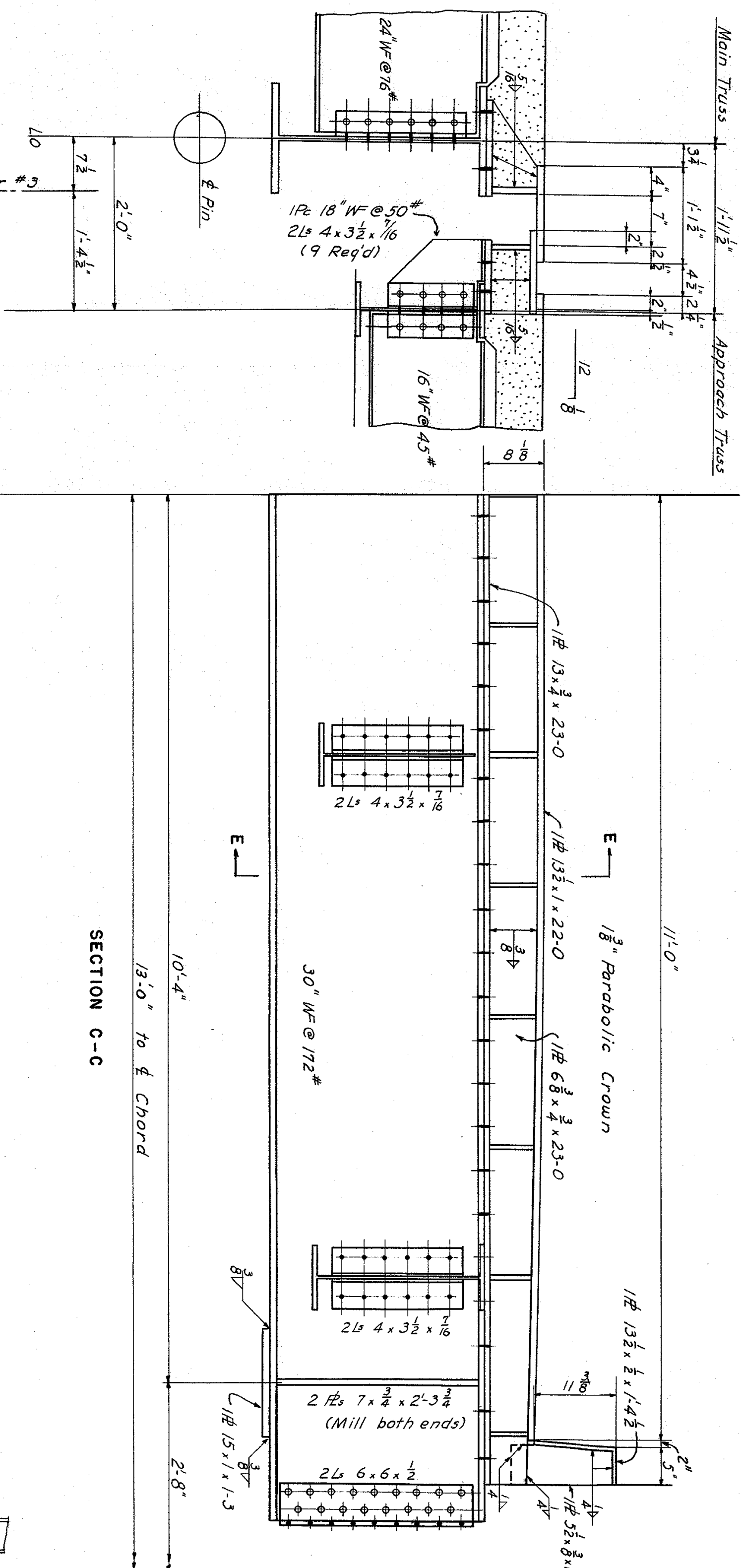
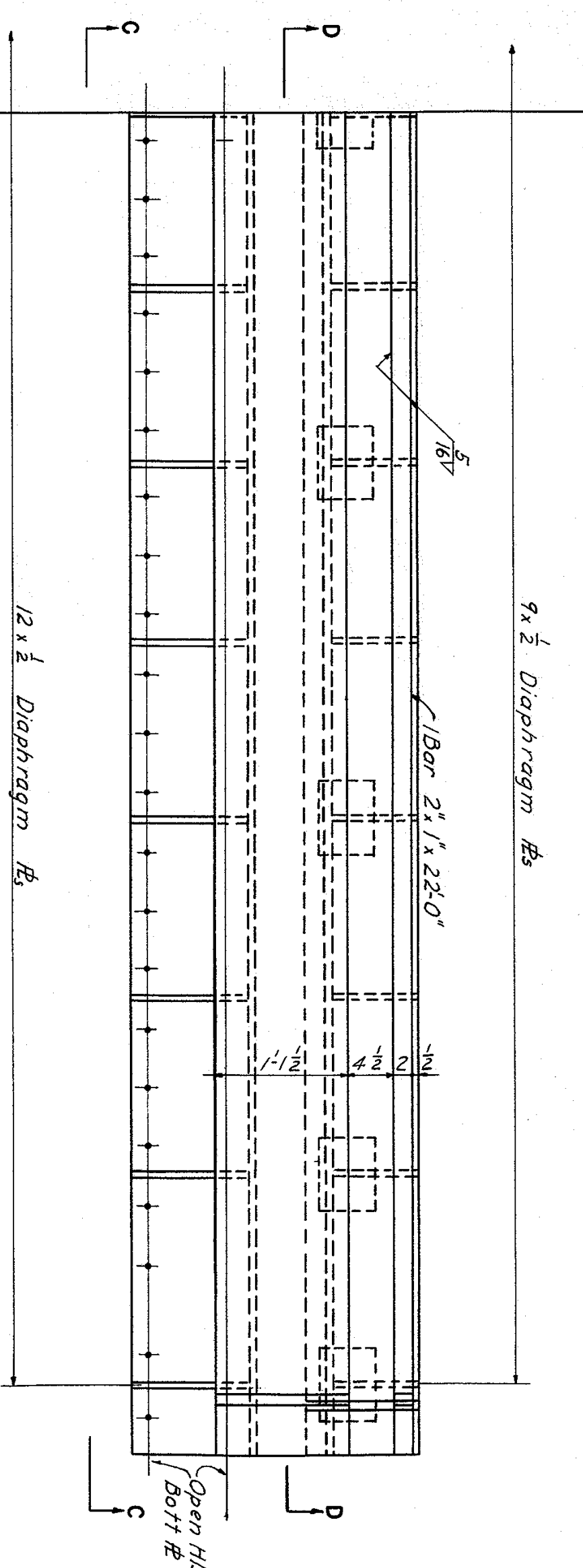
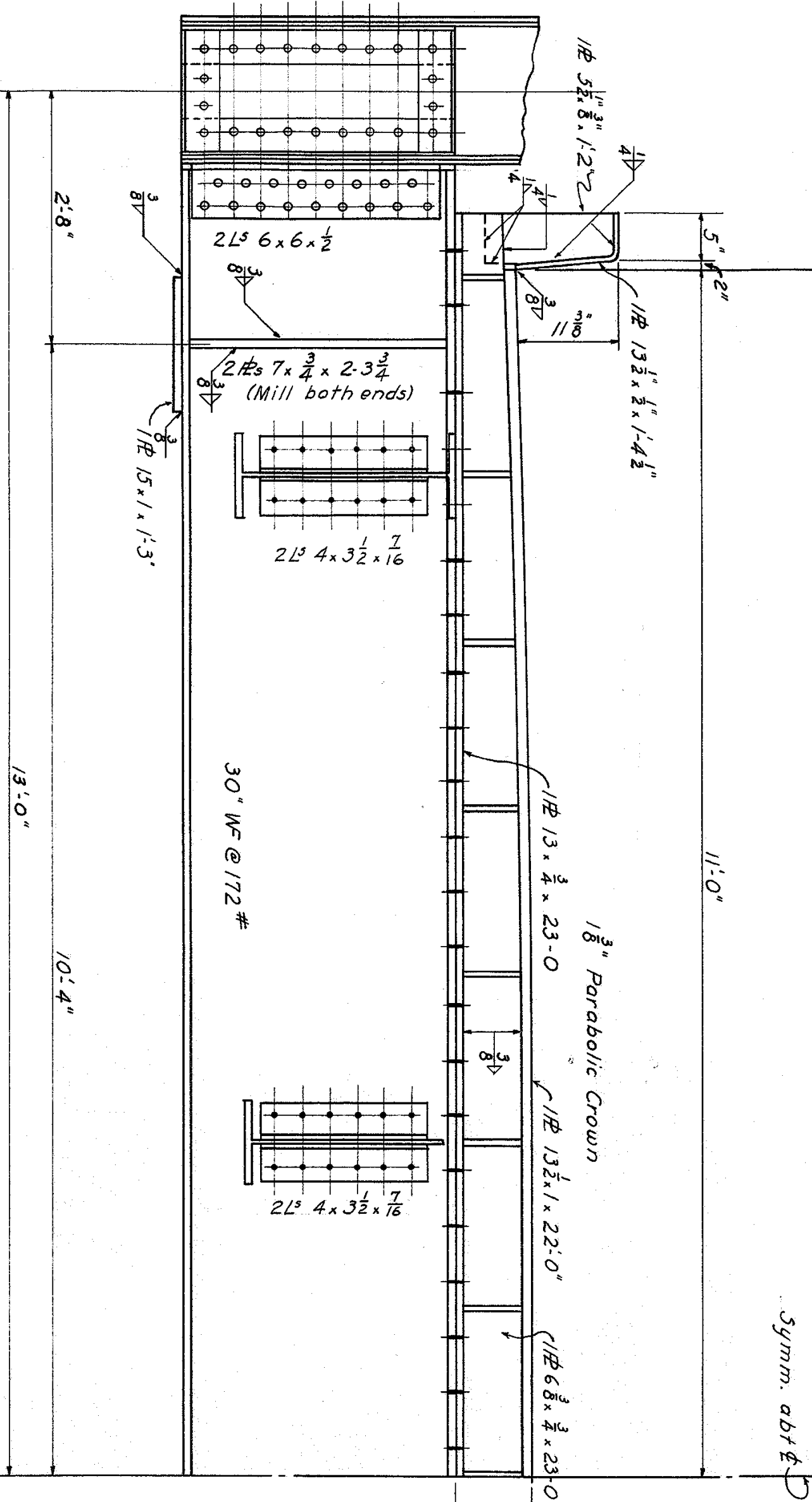
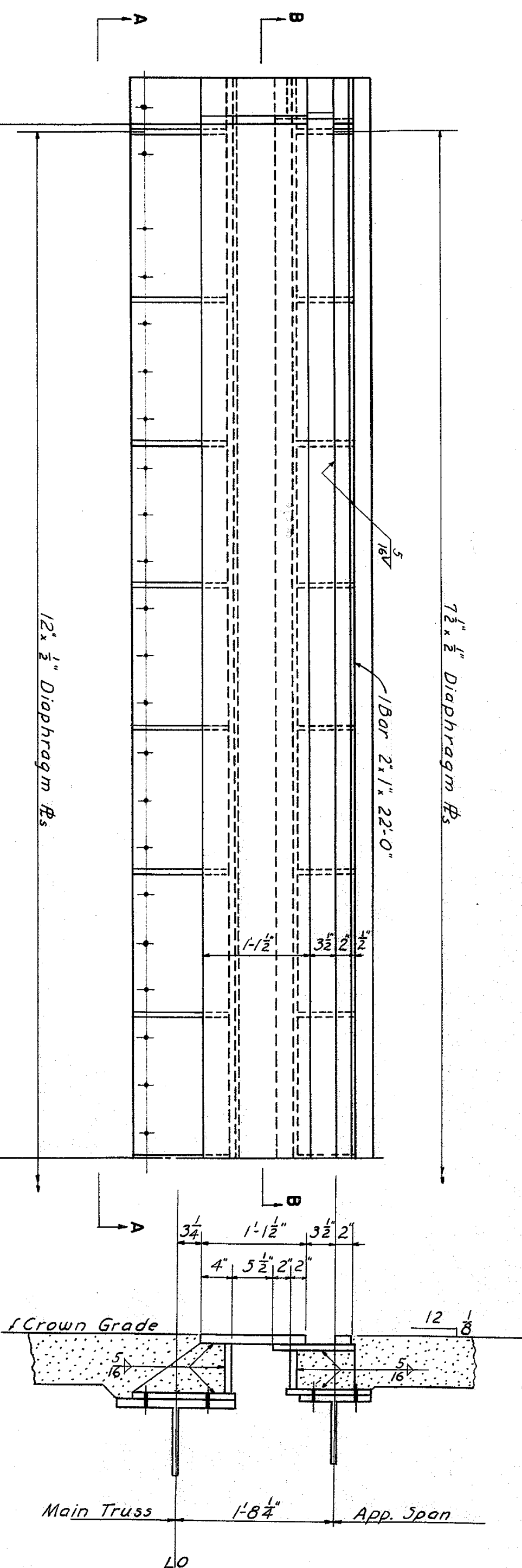
HALF SECTION SHOWING SWAY FRAME AT
U3-U5-U7-U9-U11 & TYPICAL INTERMEDIATE FLOORBEAM



HALF SECTION AT L14-U4 SHOWING SWAY FRAME



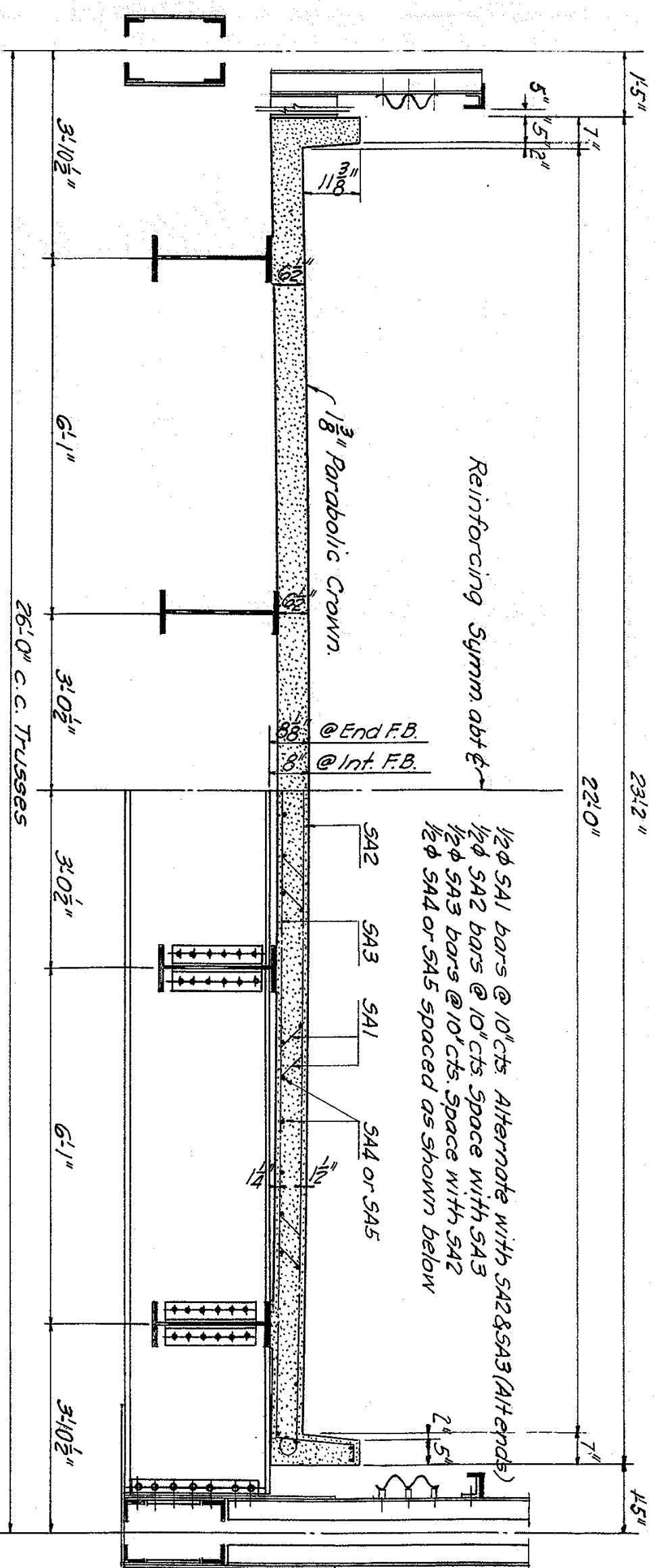
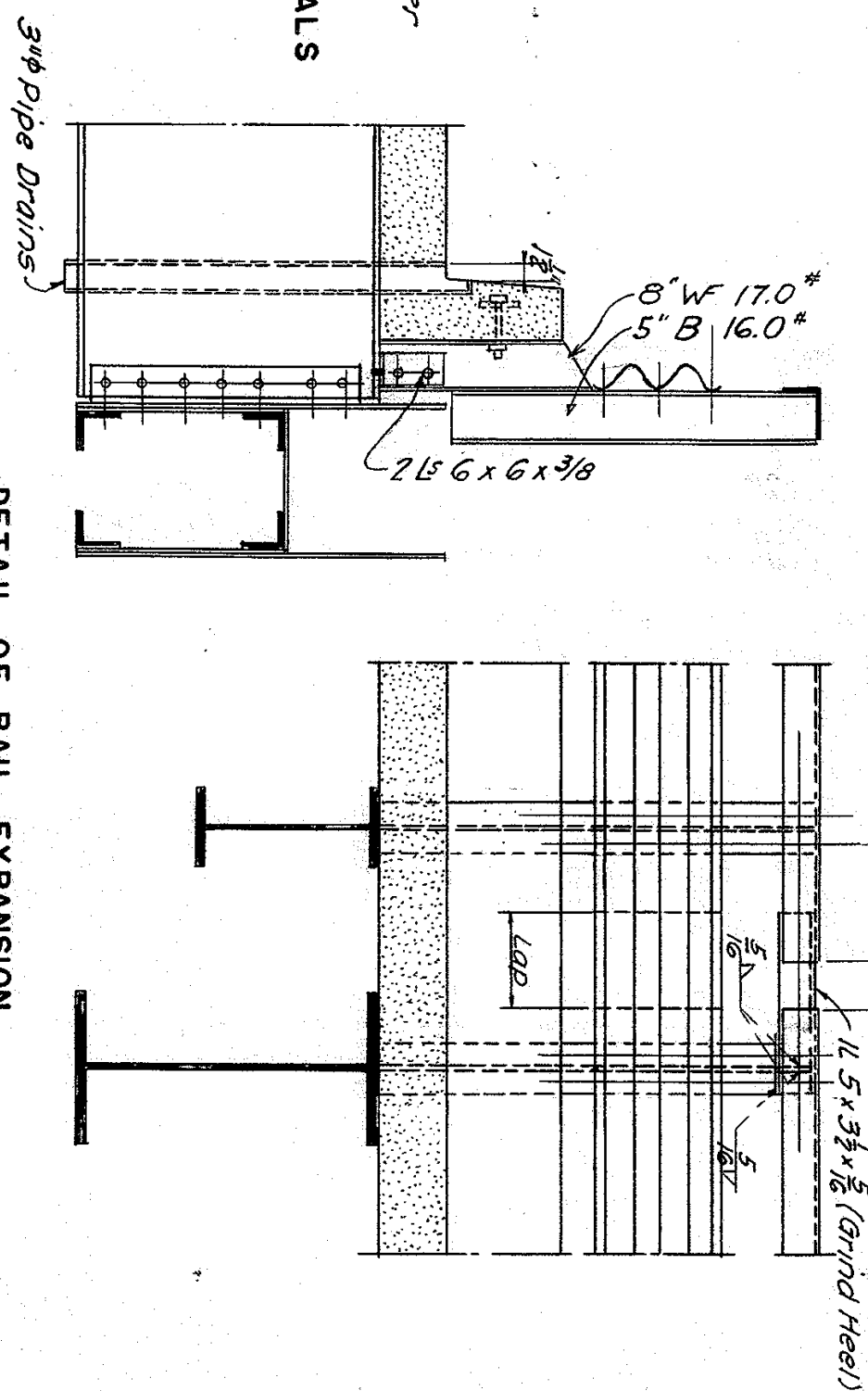
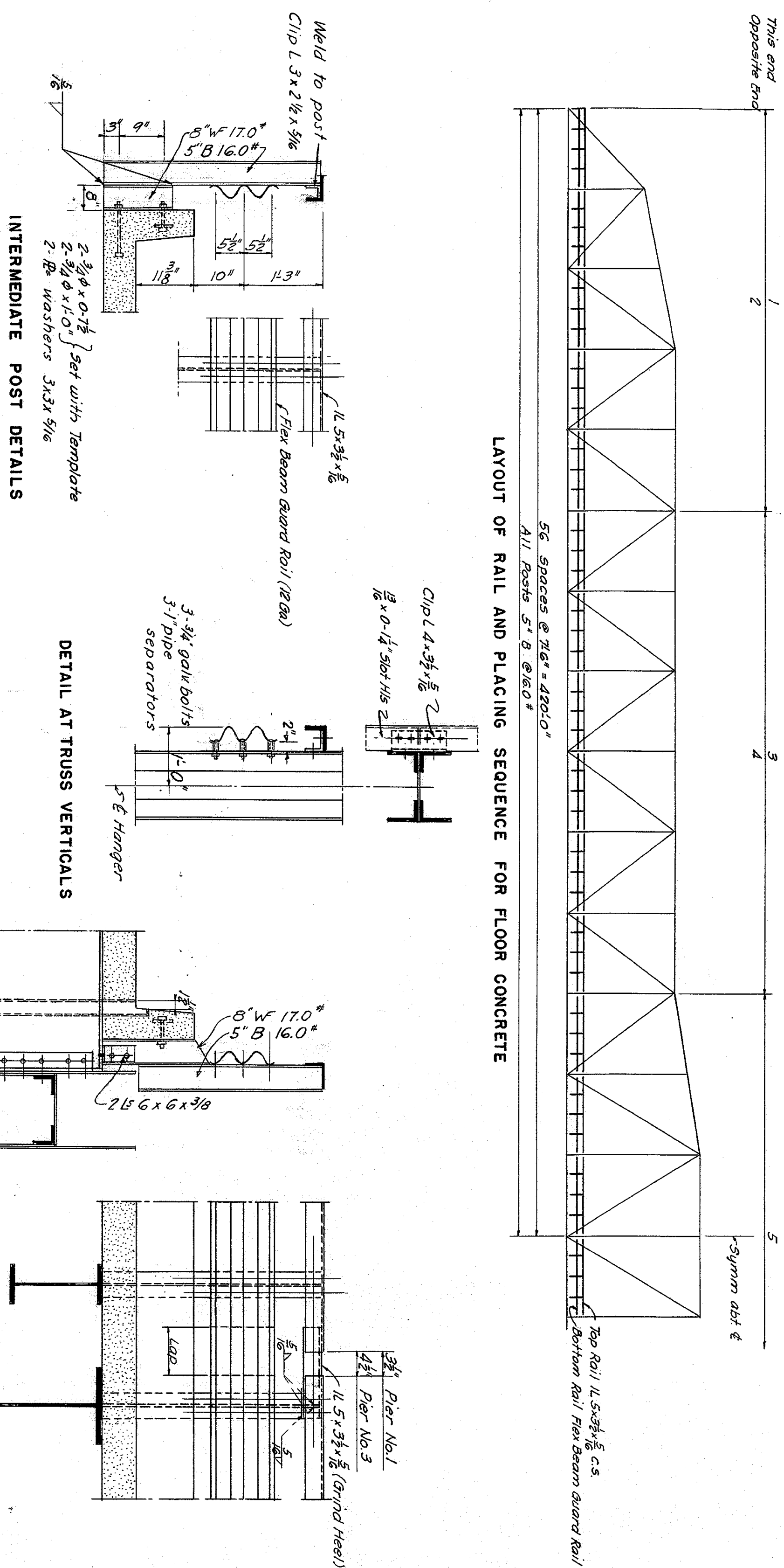
HALF PLAN OF FLOORBEAM AT L14-U14



Note: All open holes inaccessible for riveting shall be filled with structural ribbed bolts.

DETAILS FOR EXPANSION JOINT
PIER NO. 1

DETAILS FOR EXPANSION JOINT
PIER NO. 3



SCHEDULE OF REINFORCING STEEL					
Bar	541	542	543	544	545
No.	1008	1008	8832	68	58
Size	1/2"	1/2"	1/2"	1/2"	1/2"
Length	224.5"	23.8"	25.6"	31.8"	31.2"
Type					

SUMMARY OF QUANTITIES	
Class A Concrete	420.0 cu.yds.
Reinforcing Steel	67,730 lbs.
Structural Carbon Steel (Drains)	2760 lbs.
Structural Carbon Steel (Handrail)	28510 lbs.
Flex-Beam Guard Rail	1662 lin.ft.

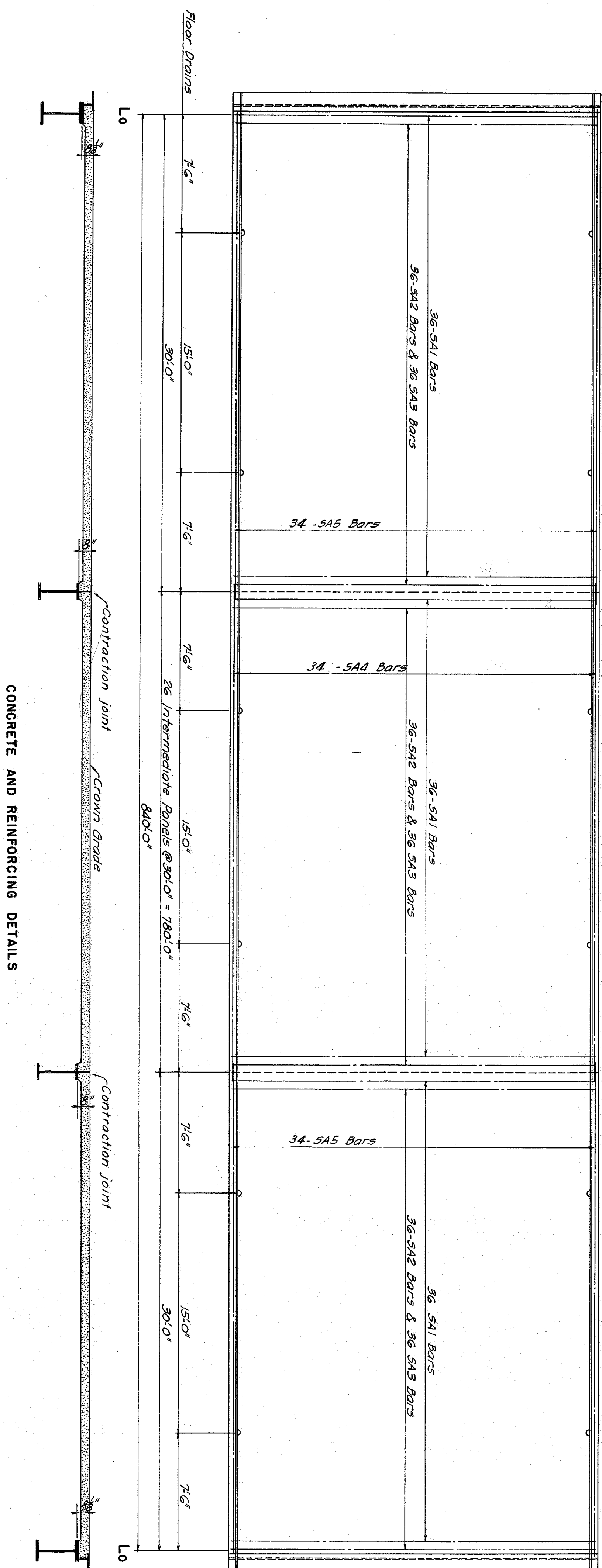
Class A Concrete shall be used throughout. Bevel all exposed edges with a $\frac{3}{4}$ " Δ molding unless otherwise noted.

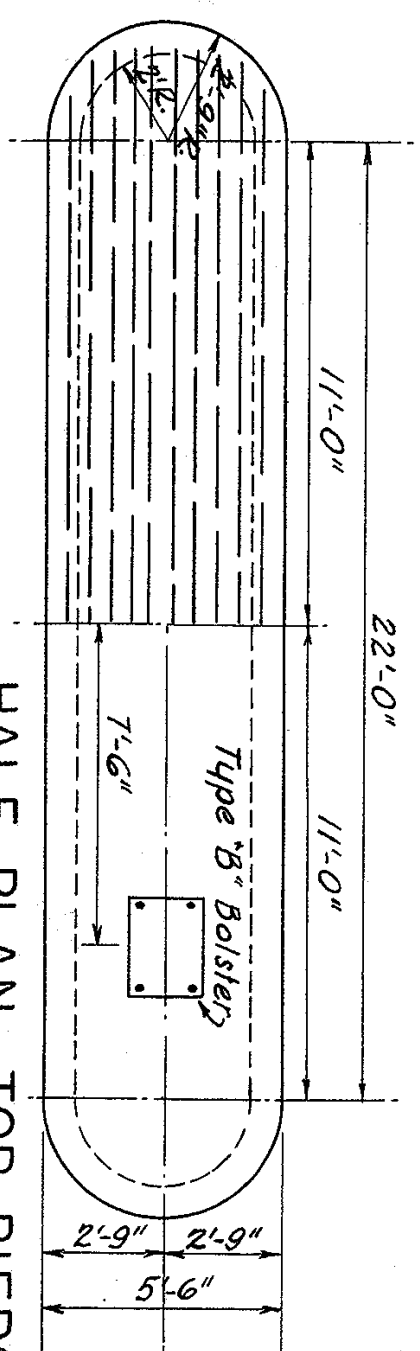
The sequence of placing concrete shall be as shown in half elevation of truss on this sheet. Construction joints shall be made only at the points indicated or as approved by the Engineer.

Handrail and pipe drains shall be paid for at the unit price bid for 'Structural Carbon Steel.'

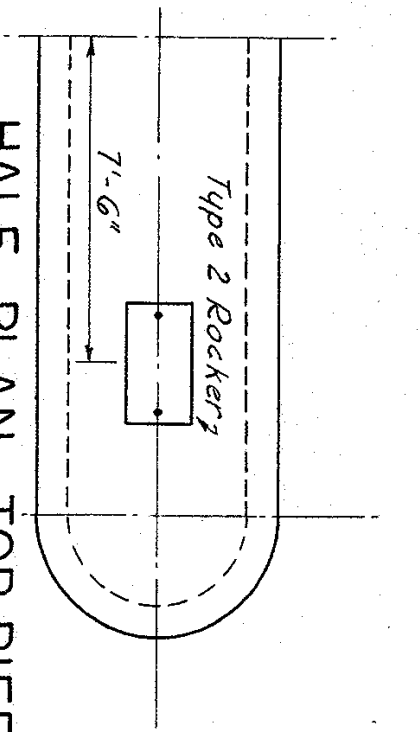
All parts of structural steel rail and drains accessible after erection shall receive one coat of red lead paint tinted light brown followed by one coat of aluminum paint.

Flex Beam Guard Rail shall be paid for at the contract unit price bid per lin. ft.

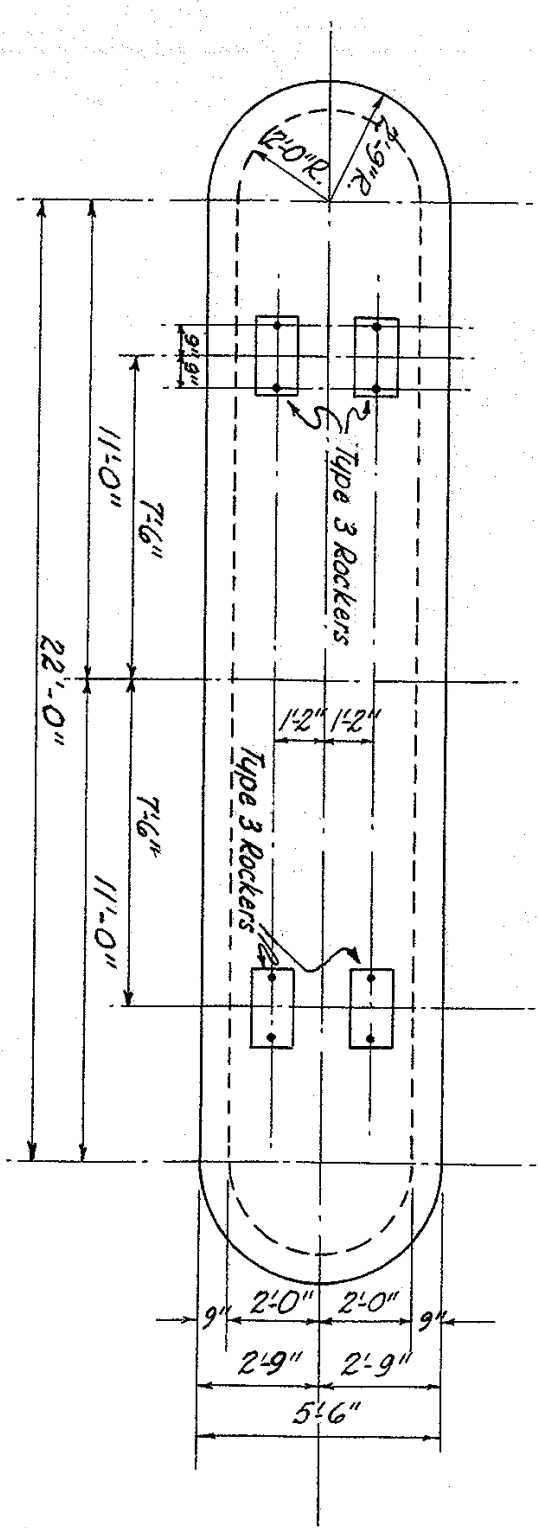




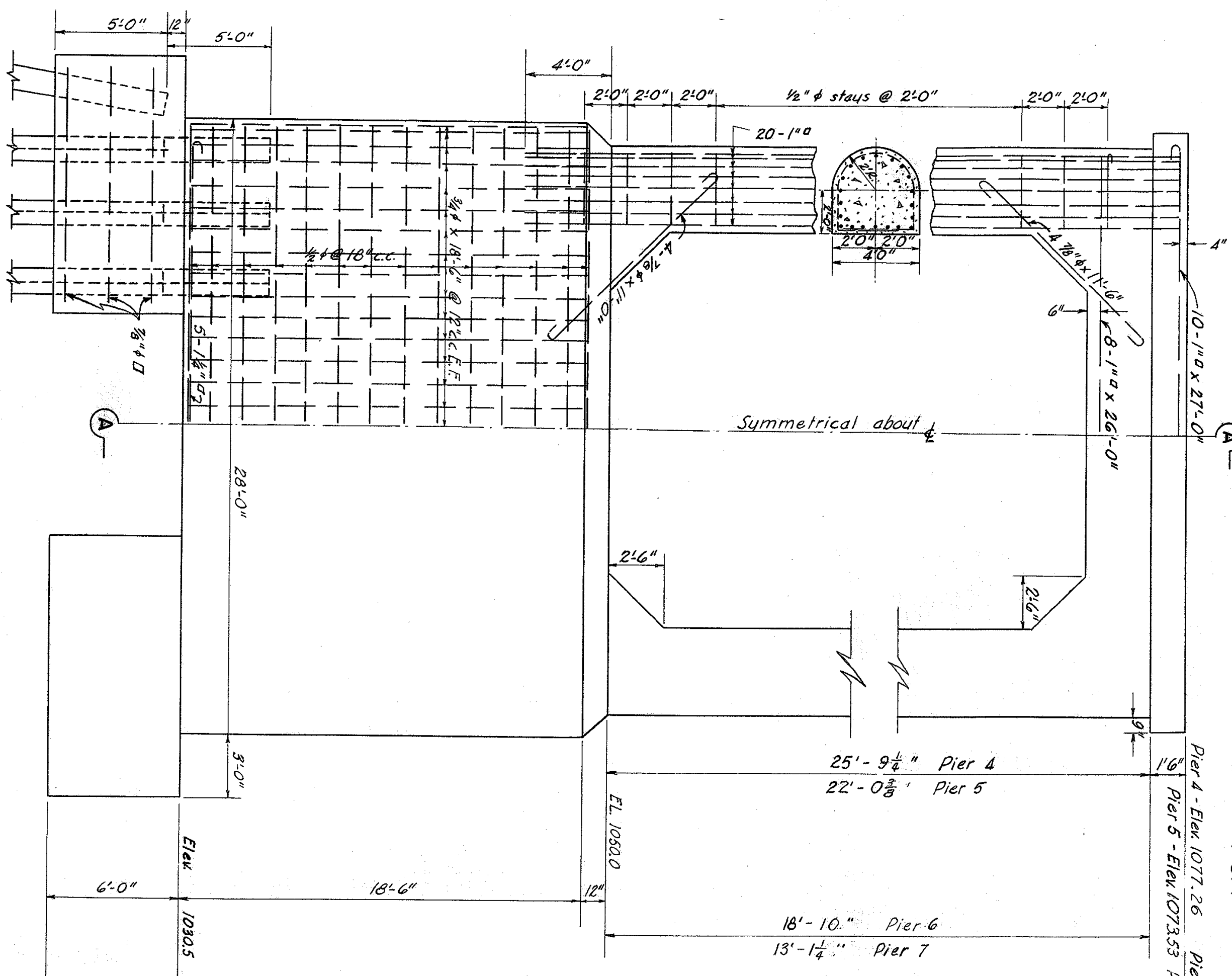
HALF PLAN - TOP PIERS 4 & 7



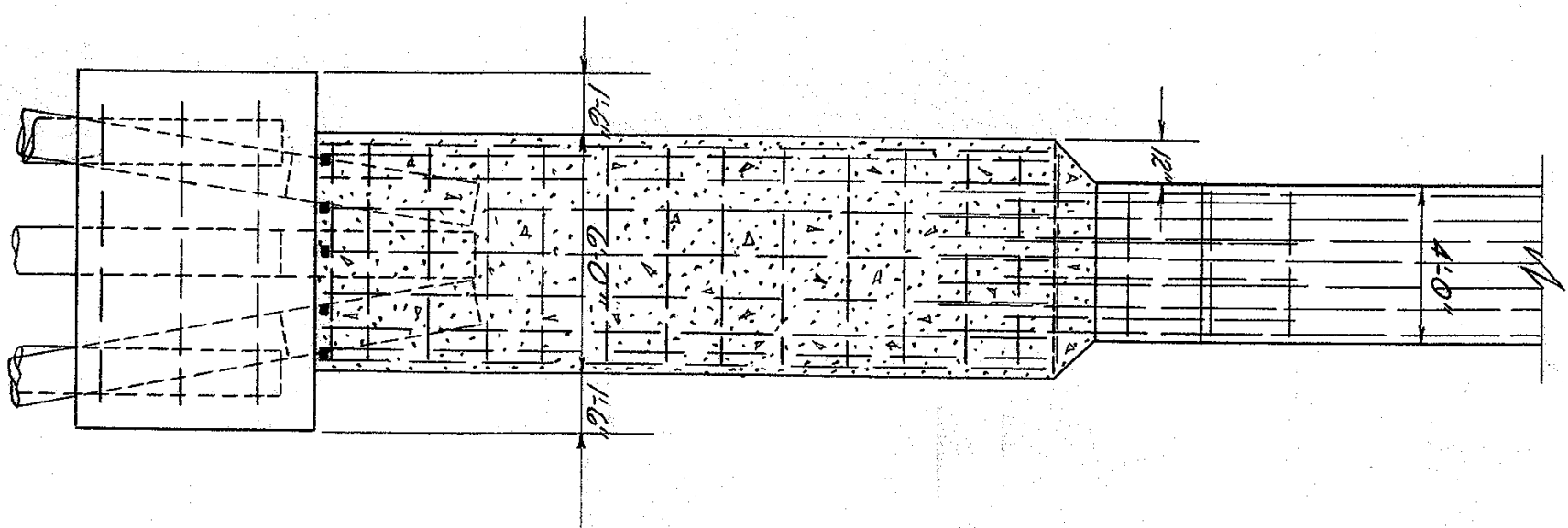
HALF PLAN - TOP PIERS 5 & 8



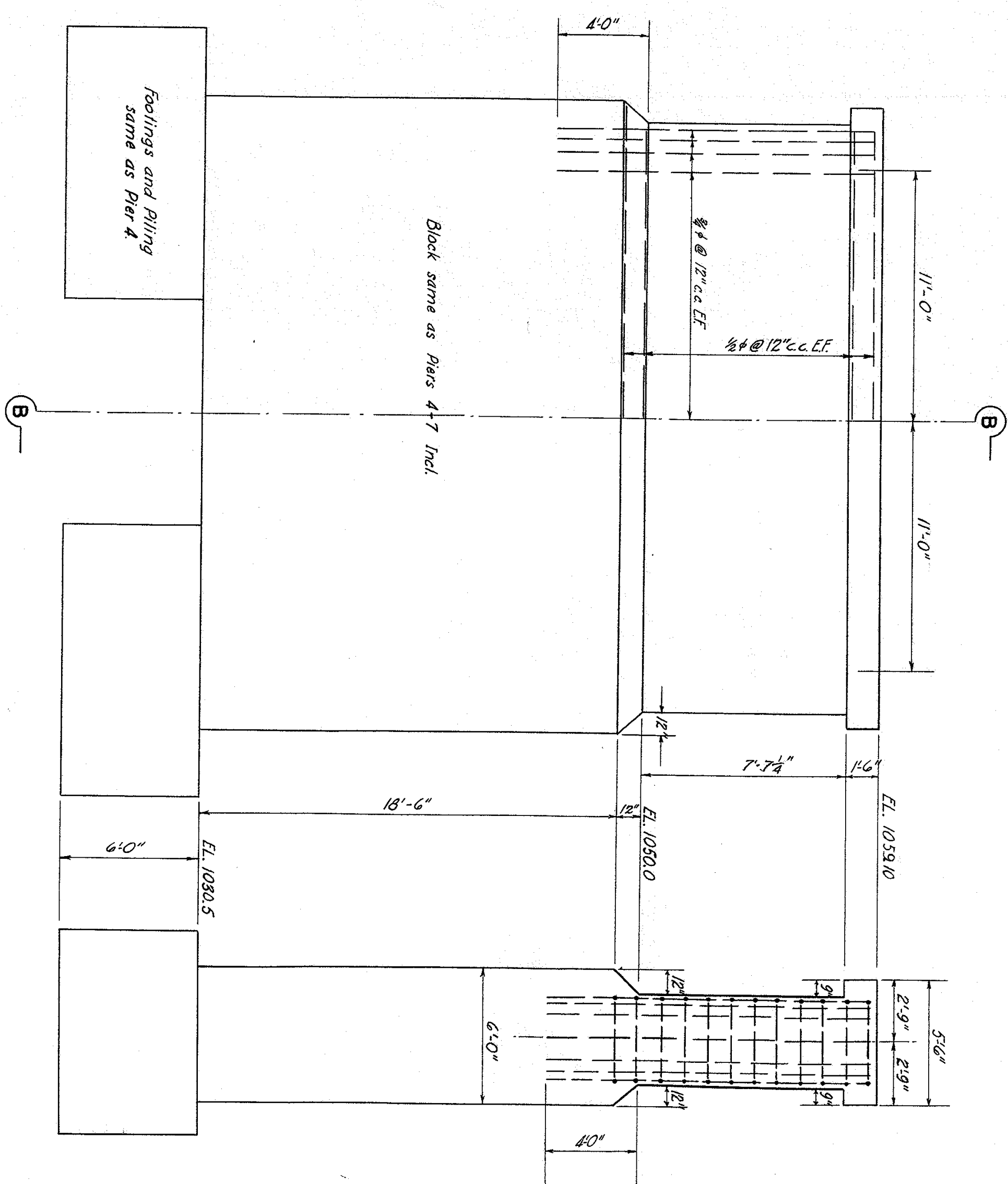
PLAN TOP - PIER 6



ELEVATION - PIERS 4, 5, 6, & 7

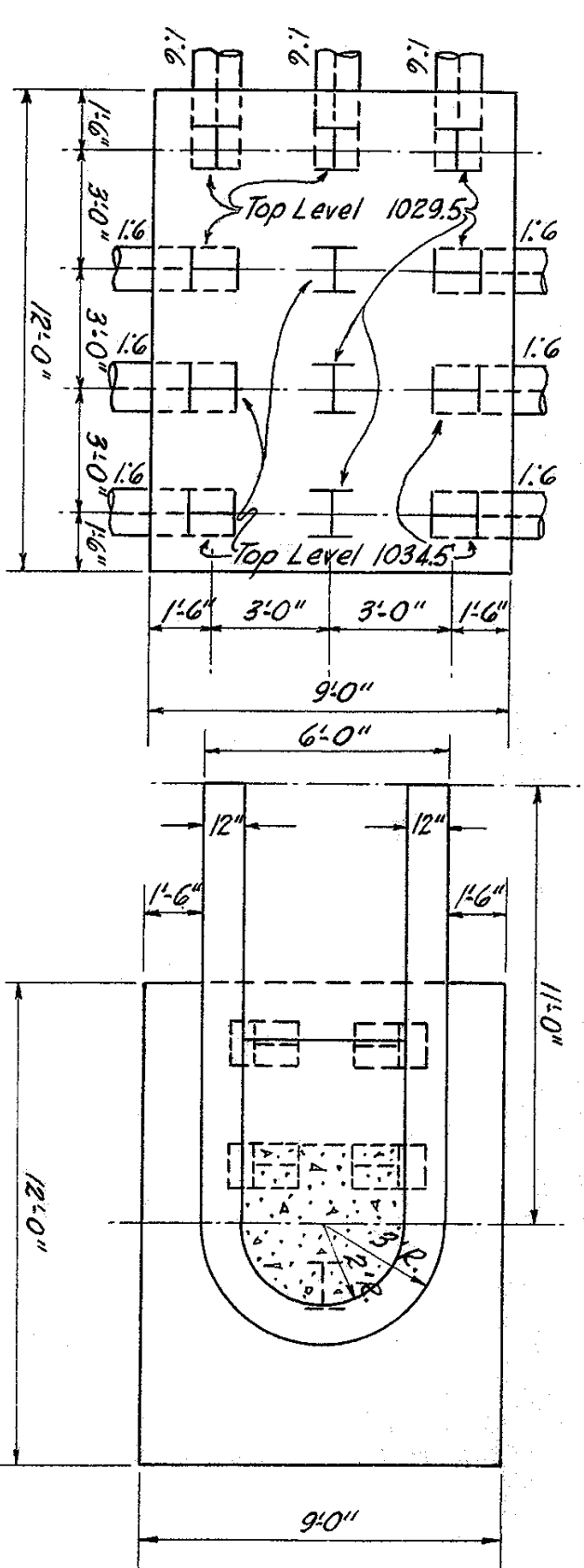


SECTION A-A



ELEVATION PIER 8

SECTION B-B



BLOCK & FOOTING PLAN - PIERS 4, 5, 6, 7, & 8

Note: All steel 3" from face of concrete except where designated otherwise. All 30" edges of exposed concrete 1/4" concrete. All steel piers 14" B.P. 73" to be driven to rock. Camber top of pier and pier block for drainage.

QUANTITIES	PIER 4	PIER 5	PIER 6	PIER 7	PIER 8
EXCAVATION CLASS I	183 CY	163 CY	152 CY	132 CY	III CY
CONCRETE CLASS A	2085 CY	2069 CY	2014 CY	1953 CY	2009 CY
REINFORCING STEEL	6361 LB.	6312 LB.	6142 LB.	5937 LB.	6193 LB.
STEEL PILING 14" X 73"	1906 L.F.	1906 L.F.	1906 L.F.	1906 L.F.	1906 L.F.

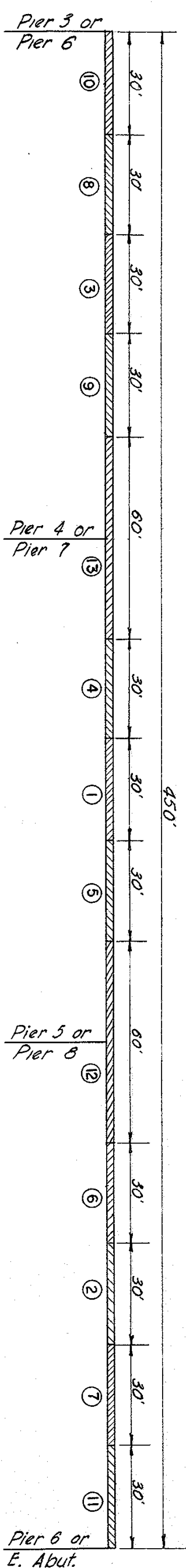
Rev. Elevations 37-50
Rev. Note - Addendum 1 12-29-49

BURT COUNTY, NEBRASKA
MISSOURI RIVER BRIDGE
DECATUR, NEBRASKA

PIERS 4, 5, 6, 7, & 8

POURING SCHEDULE - DECK TRUSSES

SCALE: 1" = 30'



QUANTITIES

Structural Carbon Steel	879310	lbs.
Cincl Bolsters & Rockers	446	cu.
Reinforcement - Bar	134040	lbs.
Guard Rail	1810	l.f.

DESIGN DATA:

LOADING

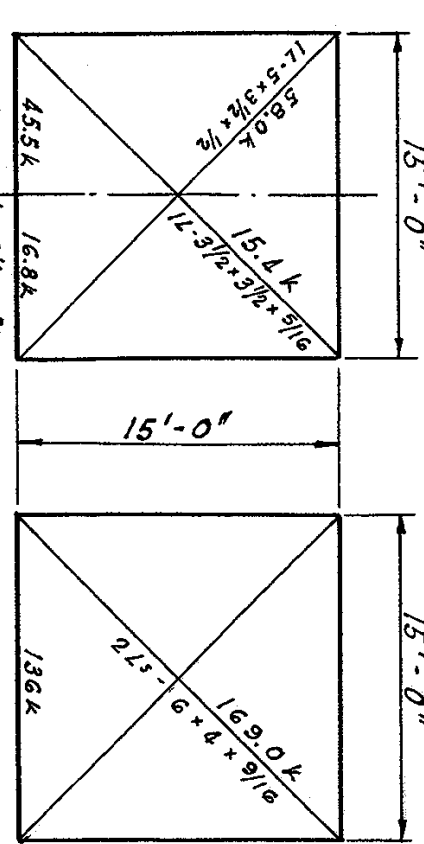
LL - Floor #20-44, Structure H15-S12-41
DL - 1530 lbs. per ft. of truss
WL - A.A.S.H.O. 1944 Specifications

H15-S12-41 A.A.S.H.O. Spec. Steel @ 18000 lb./sq.
Rivets shall be 3/4" - open holes 13/16"
All stresses are shown in kips
+ Denotes tension
- Denotes compression

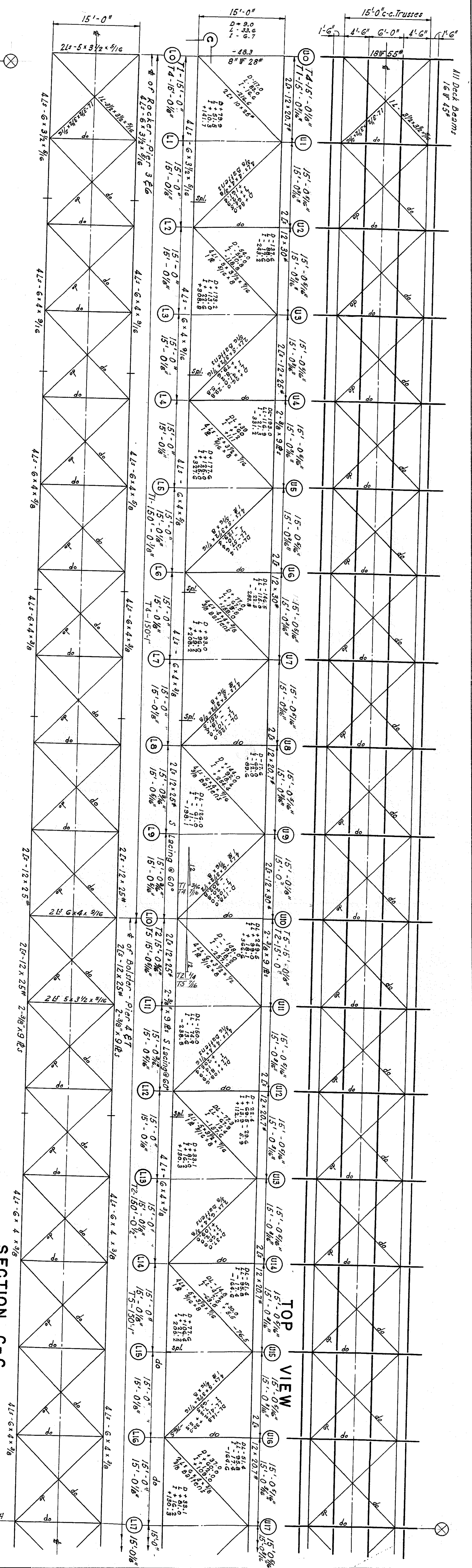
REACTION & MOMENTS:

Floor Beam Ro DL 23.0K Truss Ro DL 86.3K
LL 29.0K LL 57.8K
I 8.7K I 10.0K
MAX DL 20.3K R1 DL 245.4K
LL 145.5K LL 145.5K
I 21.6K I 26.5K

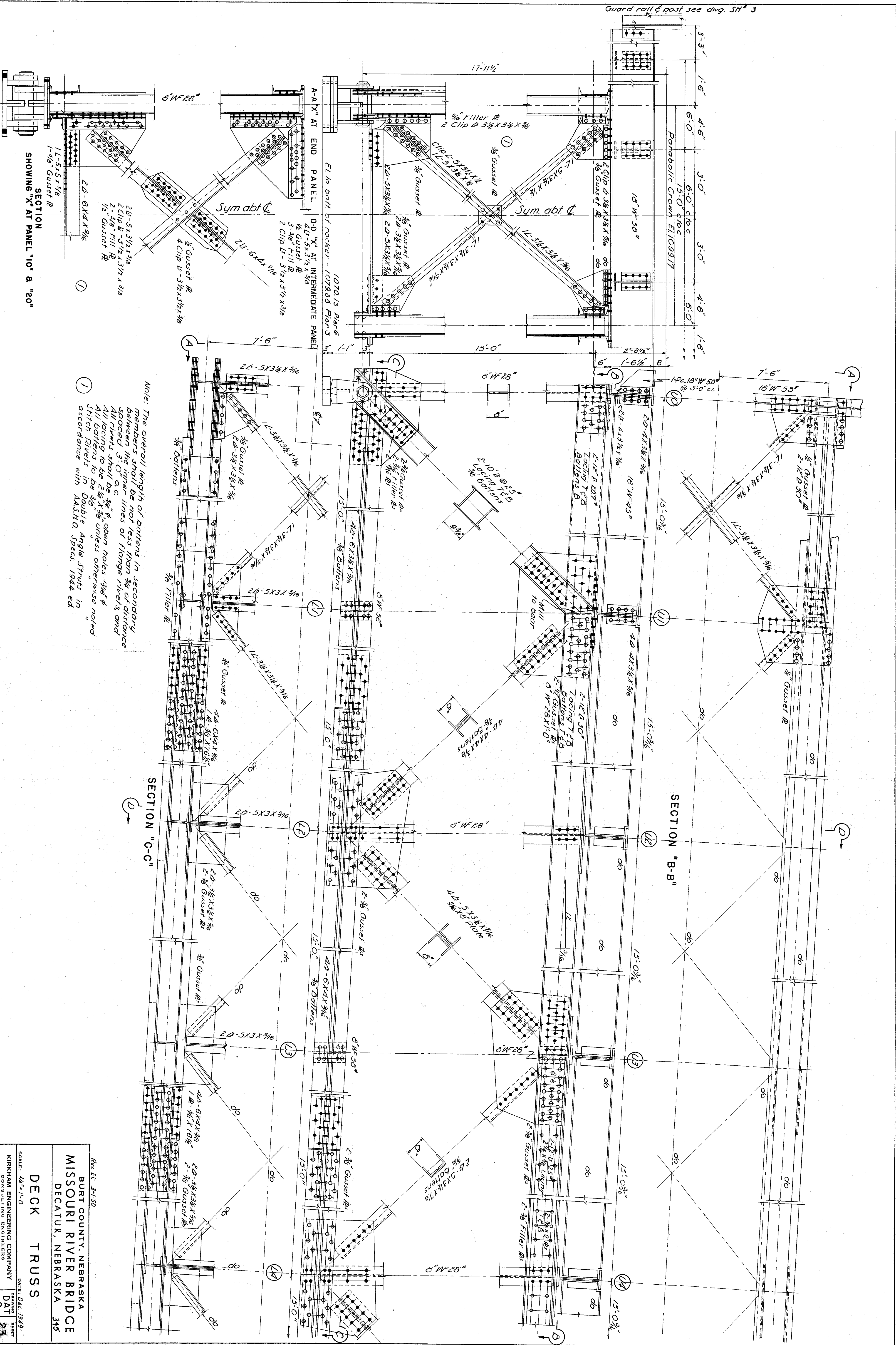
VERTICAL "X" BRACING

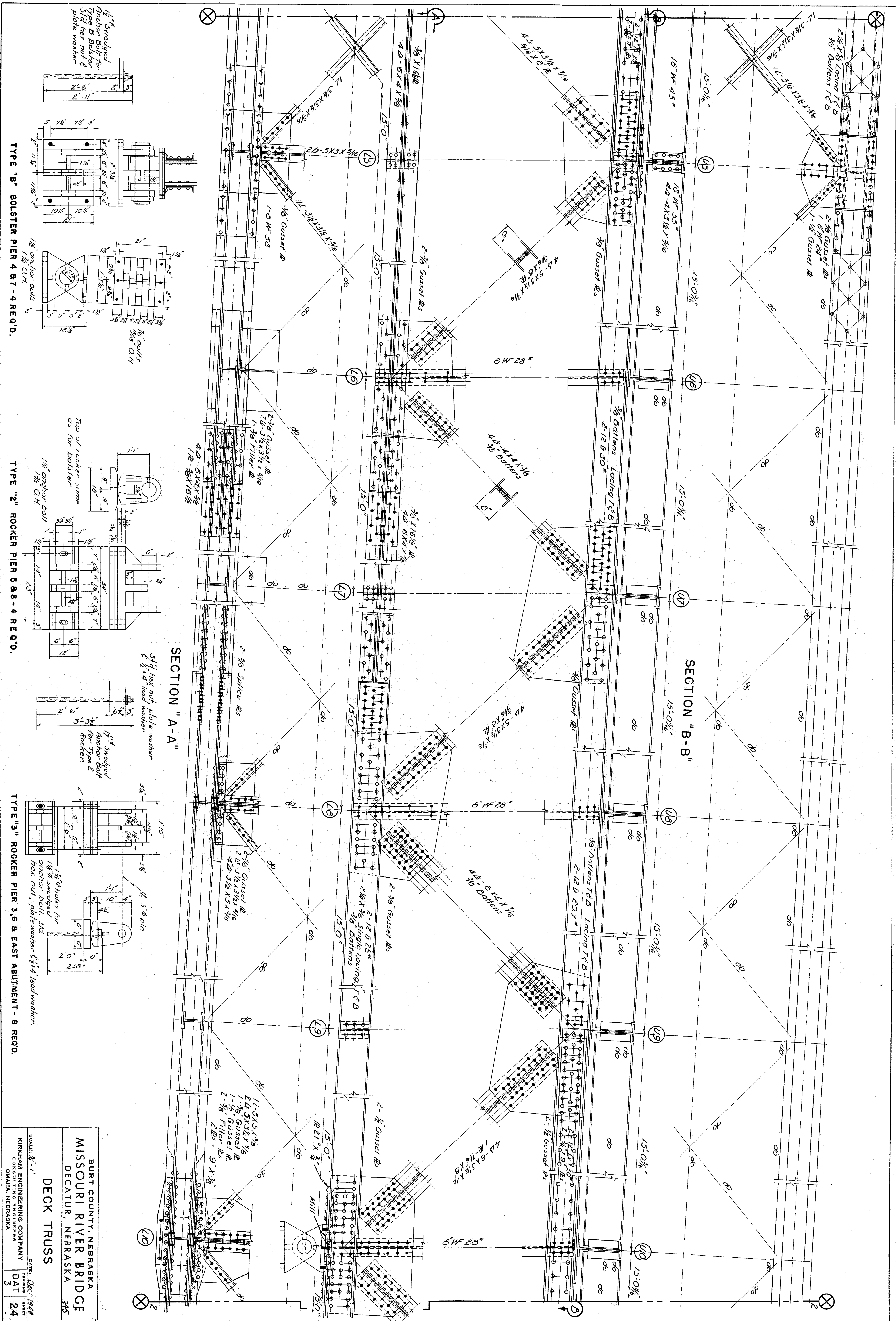


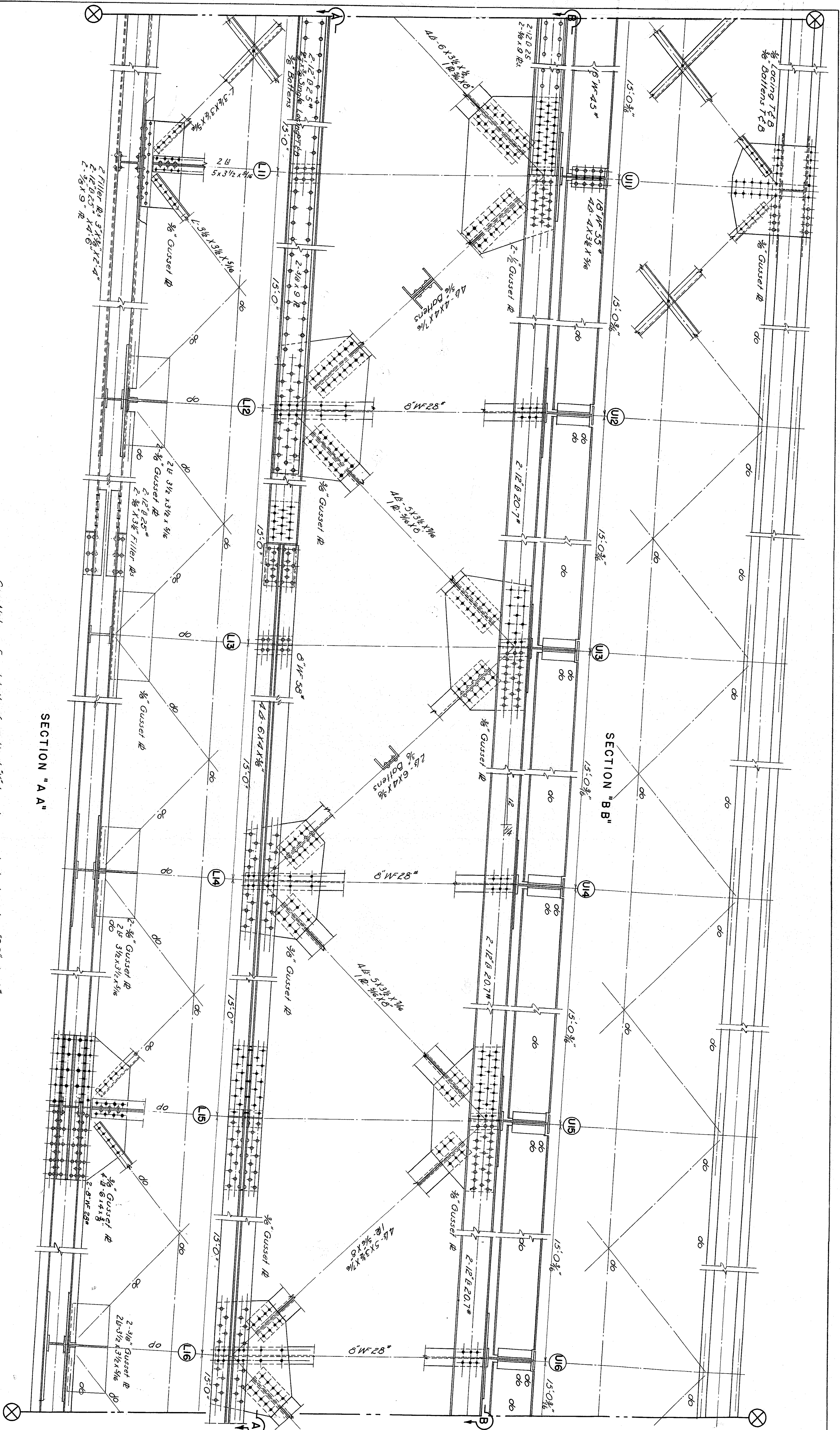
SECTION C-C



TOP VIEW

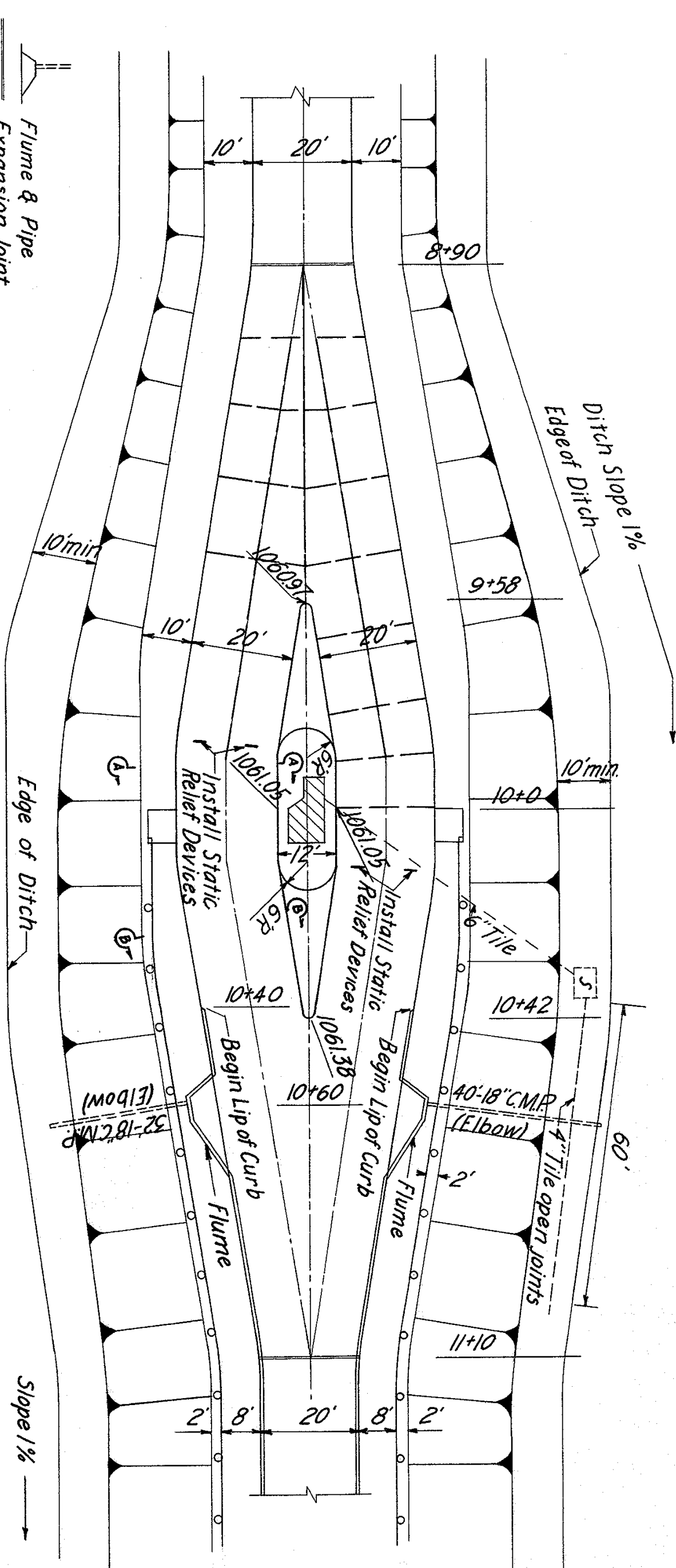




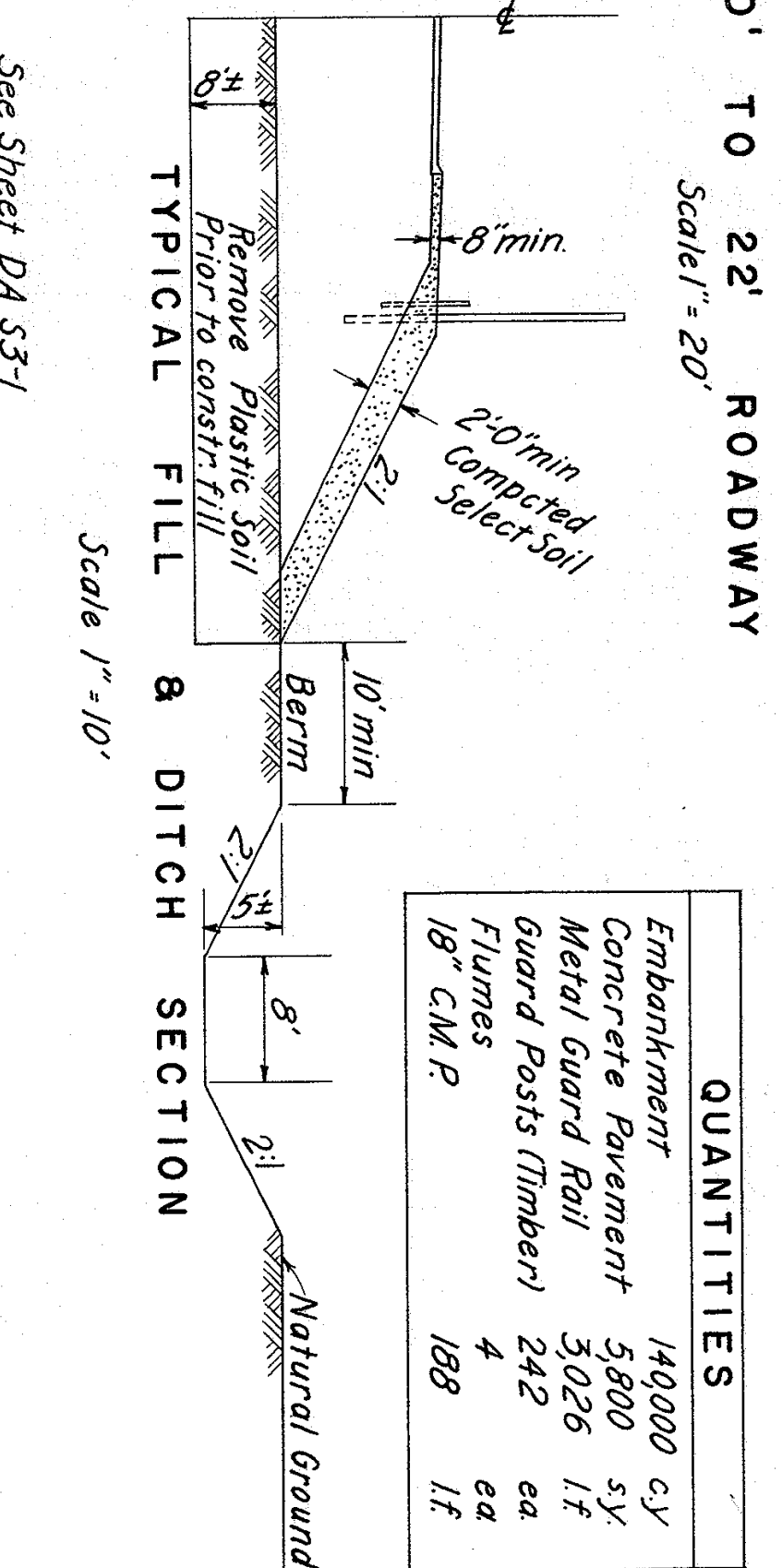
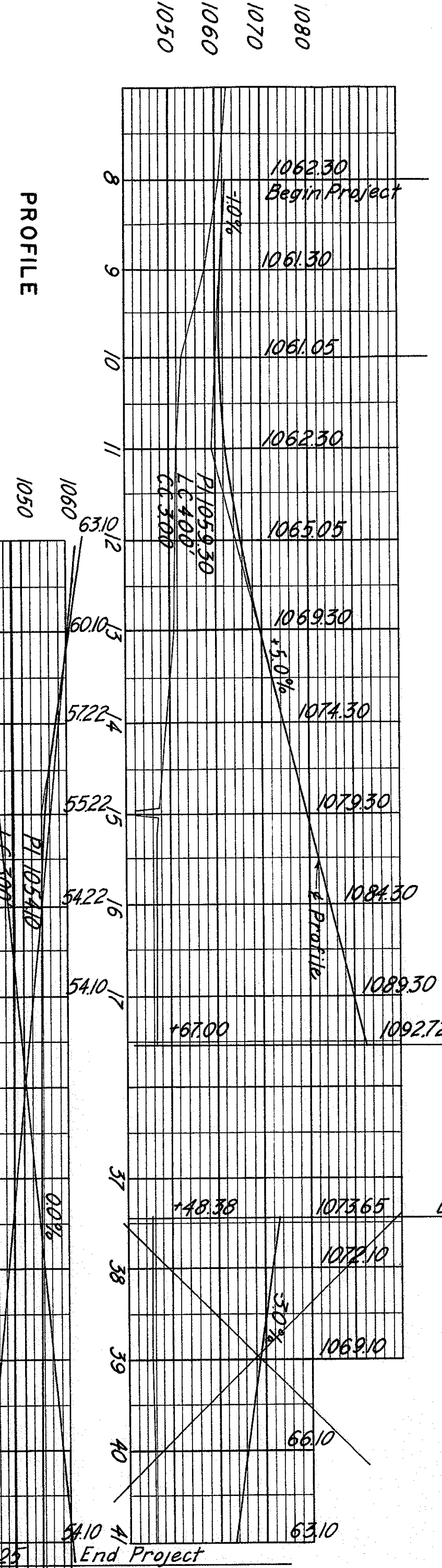
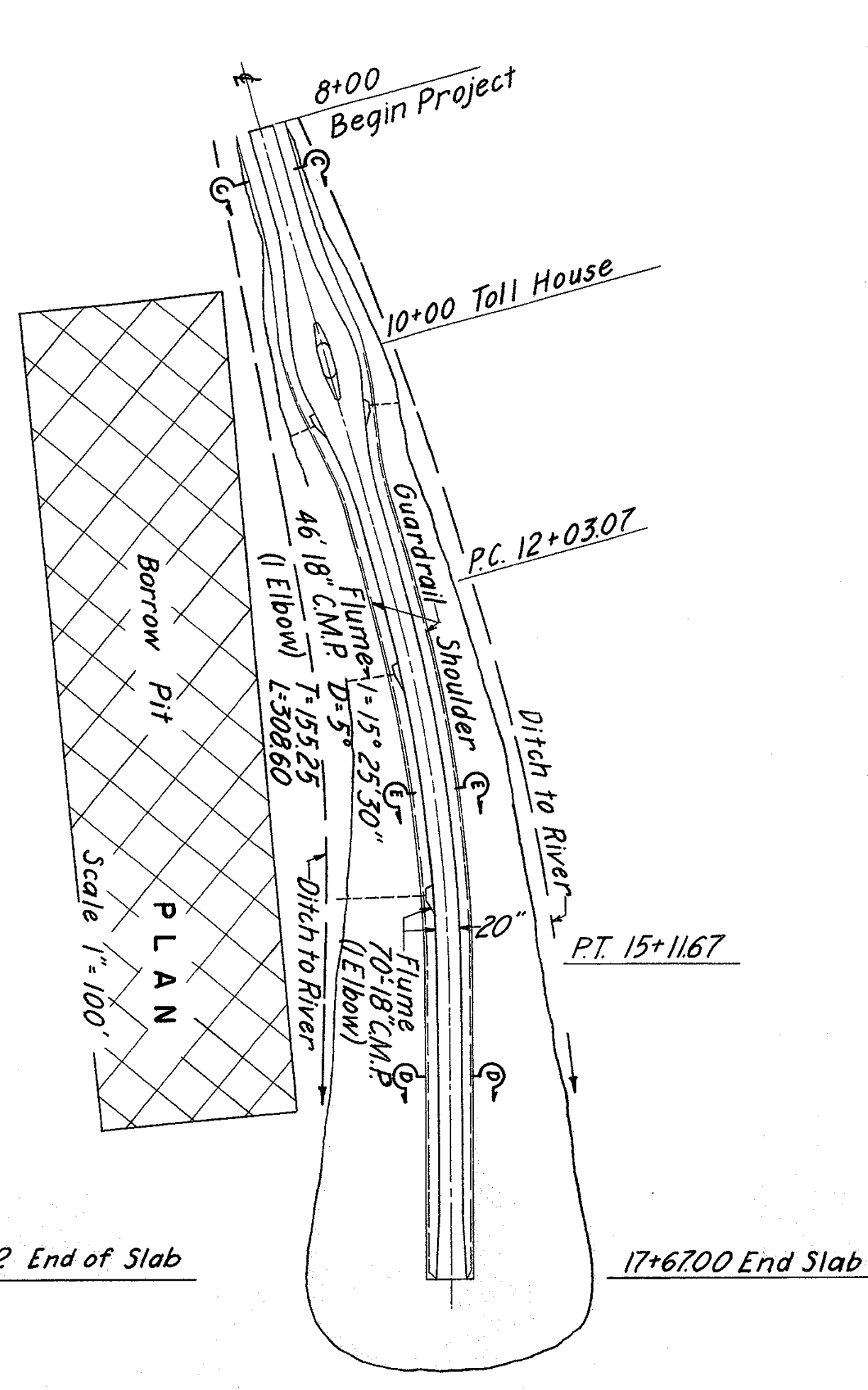


Gen. Notes

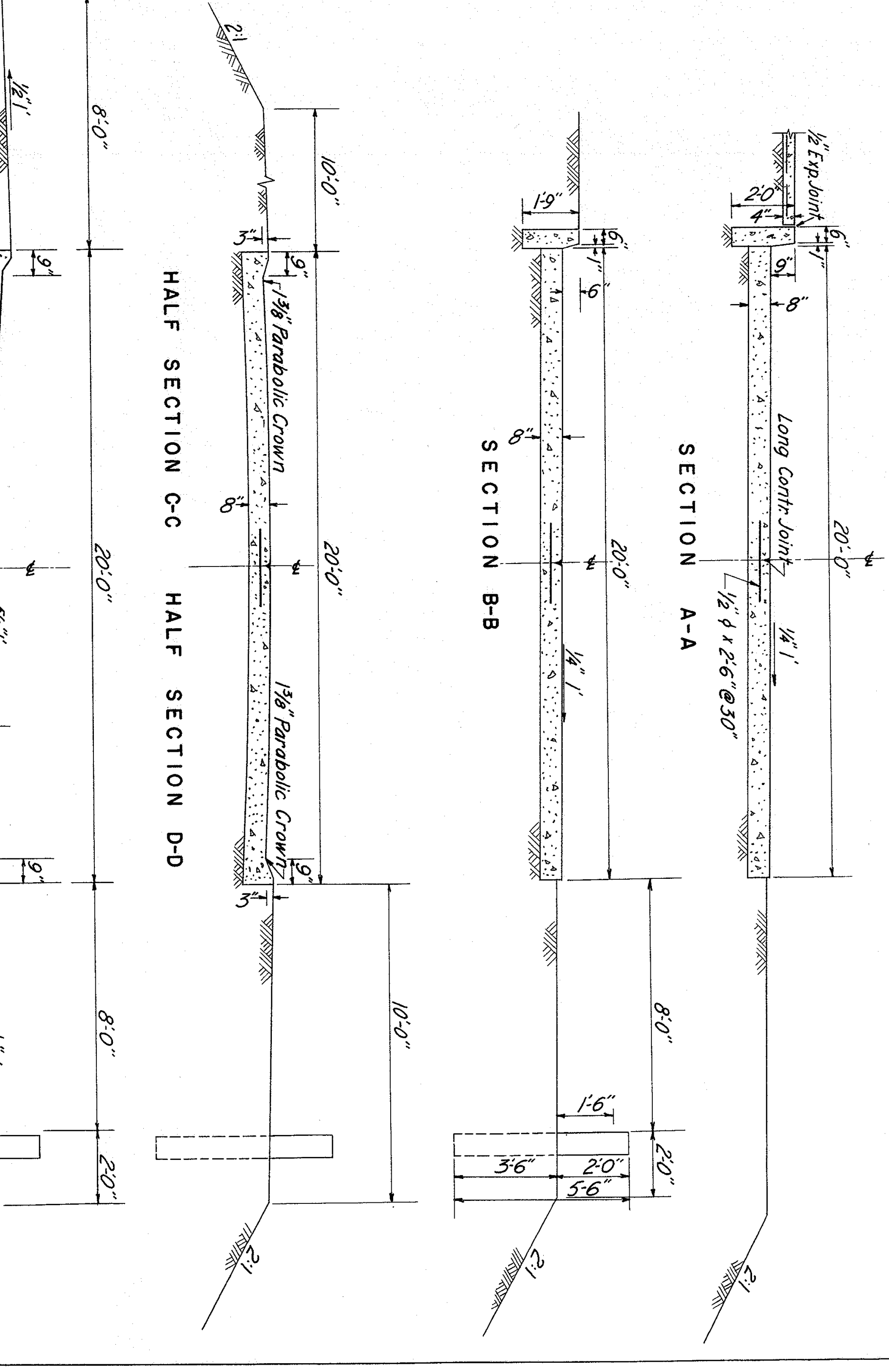
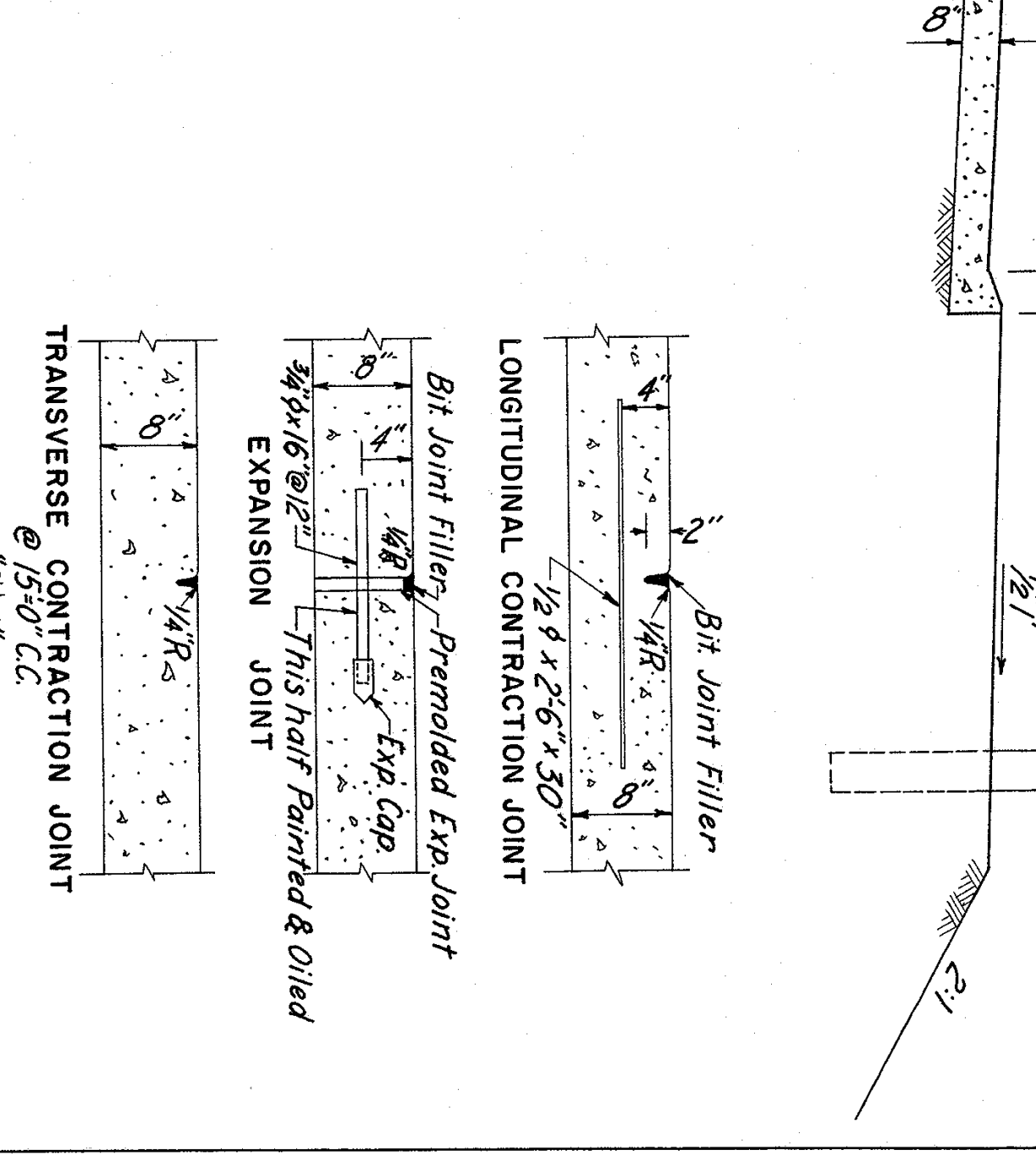
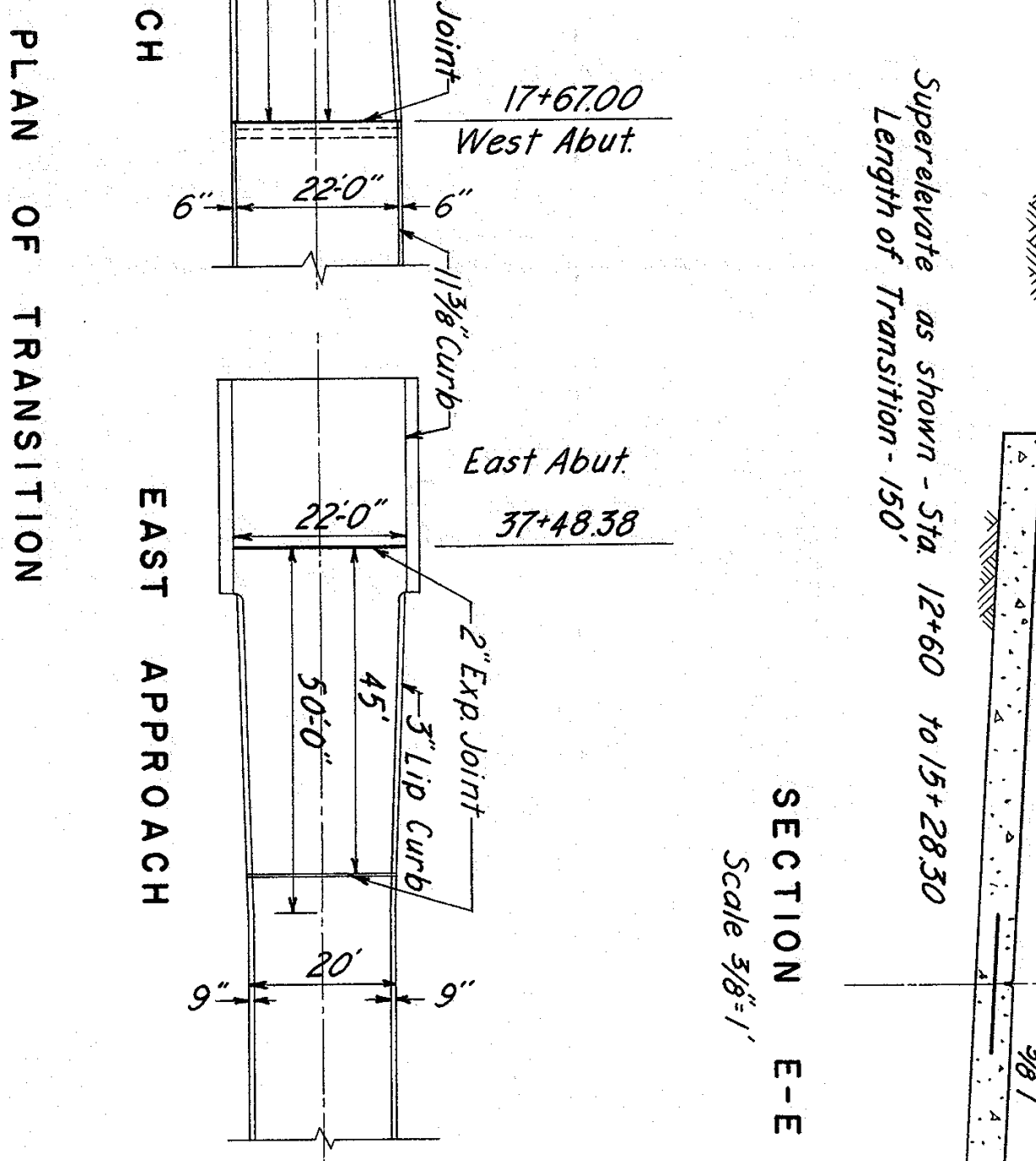
For details of vertical X° branding see typical section "D.D." sheet 16. The overall length of end battens in primary members shall be 1/4" of distance between the inner lines of fange rivets. Intermediate battens in primary members and all battens in secondary members shall be 1/4 the same distance and spaced 3'-0" on centers. 3/16" O.H. All rivets shall be 1/4" Ø.

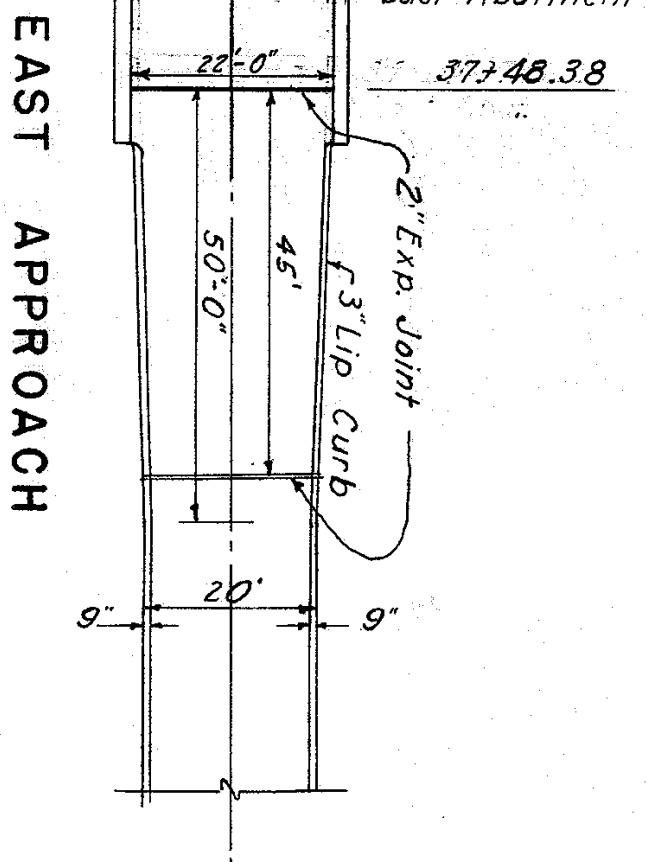
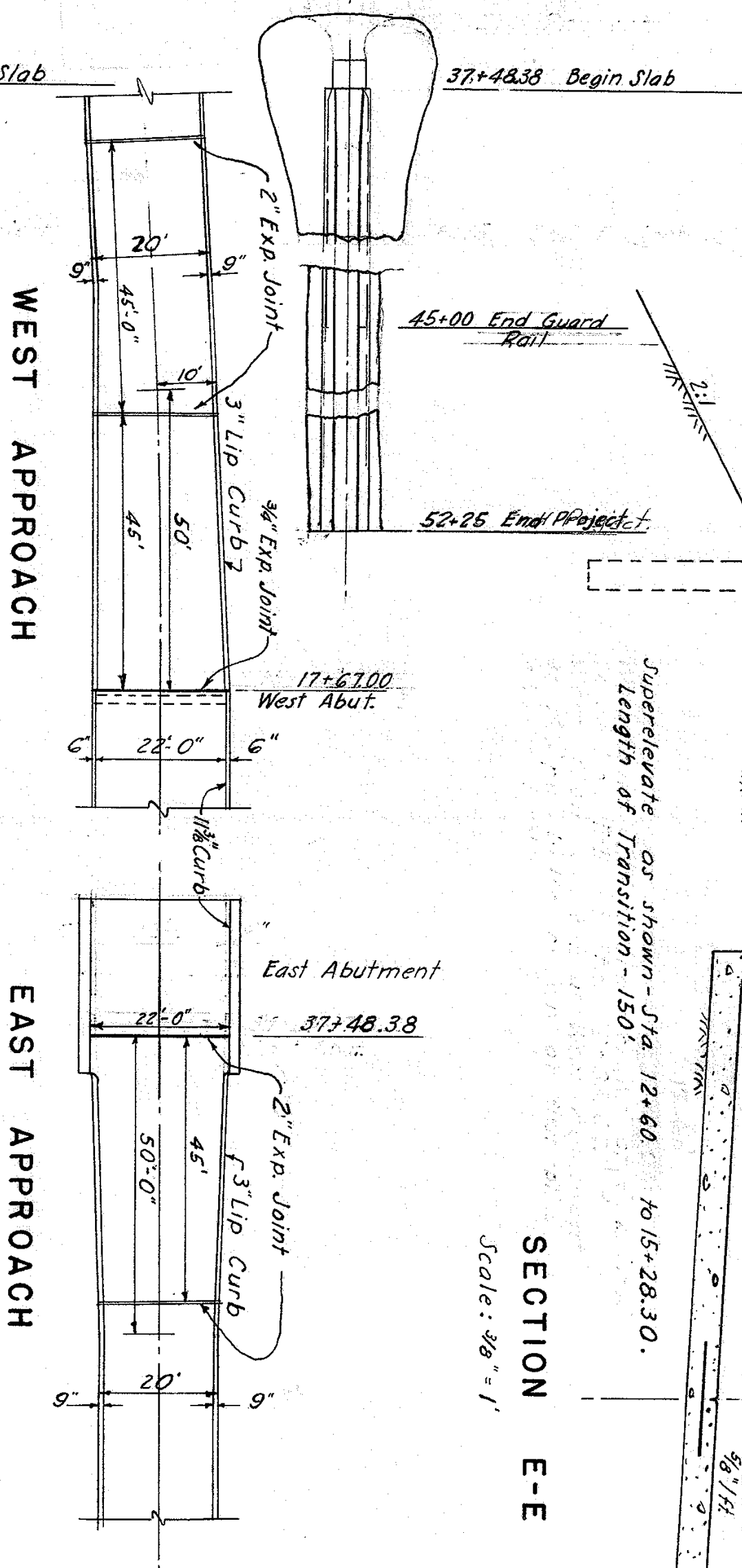
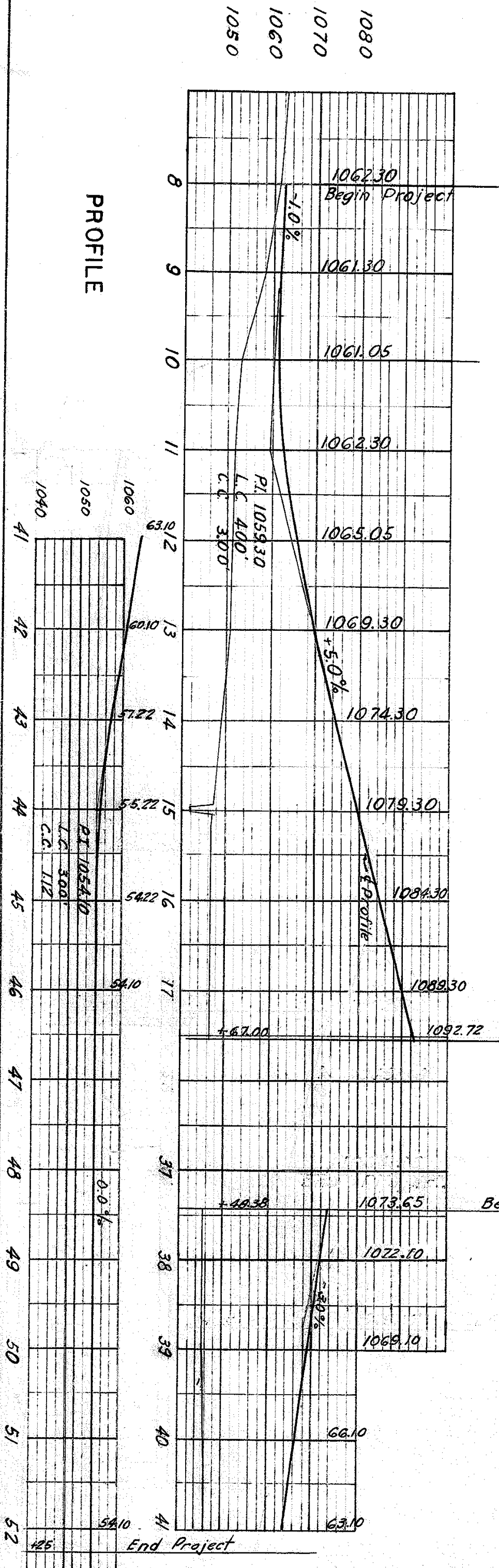
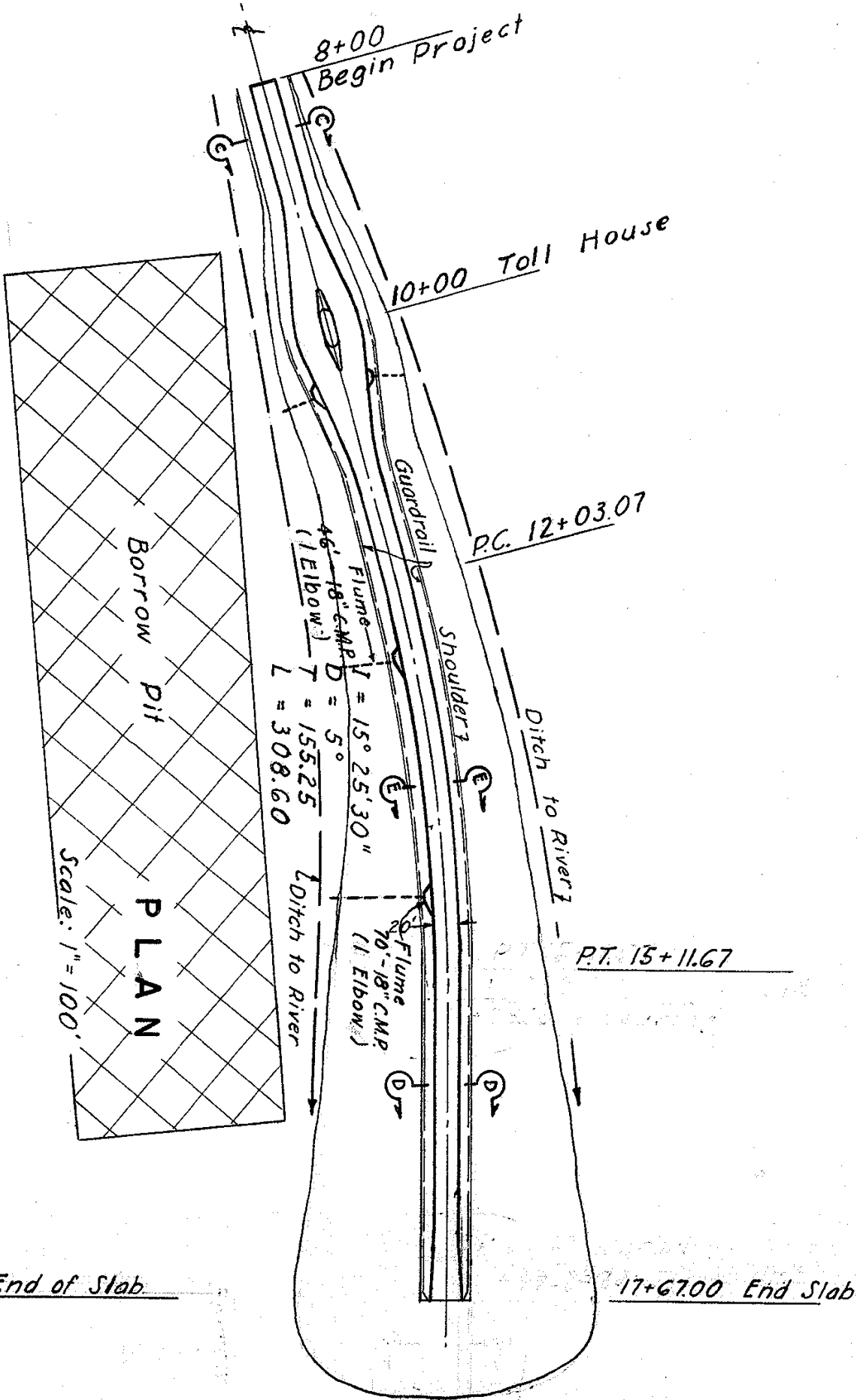
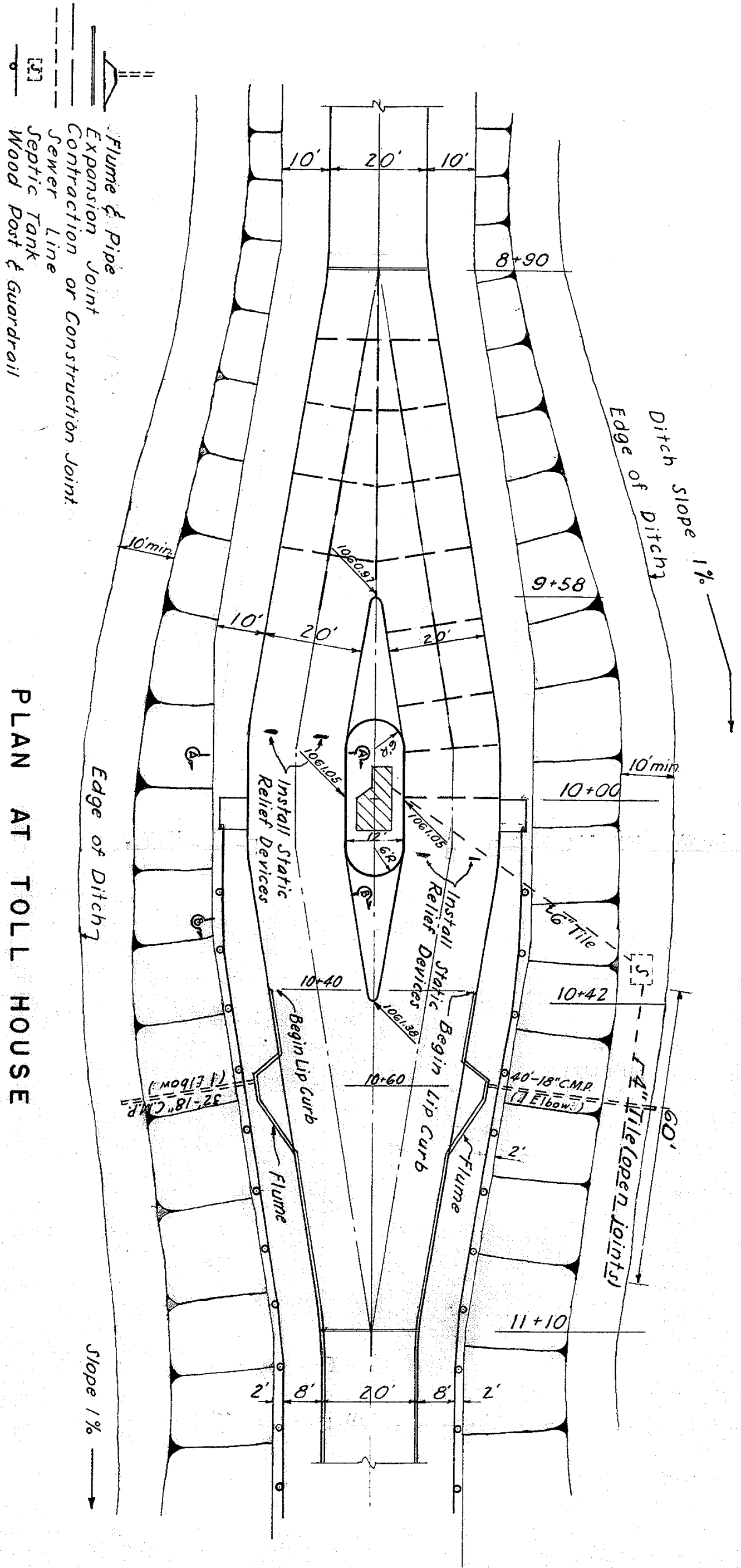


Flume & Pipe
Expansion Joint
Contraction or Construction Joint
Sewer Line
Septic Tank
Wood Post & Guardrail

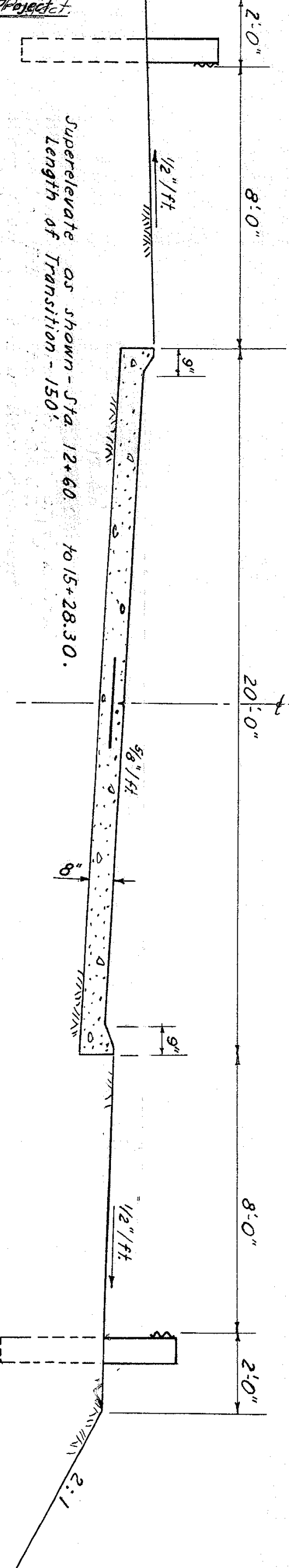


QUANTITIES	
Embankment	14000 cy
Concrete Pavement	5800 sy
Metal Guard Rail	3026 lf
Guard Posts (Timber)	242 ea
Flumes	4 ea
18" C.M.P.	188 lf

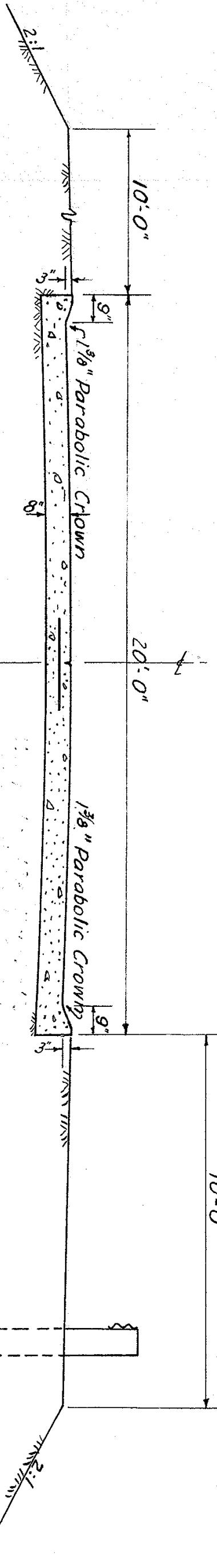




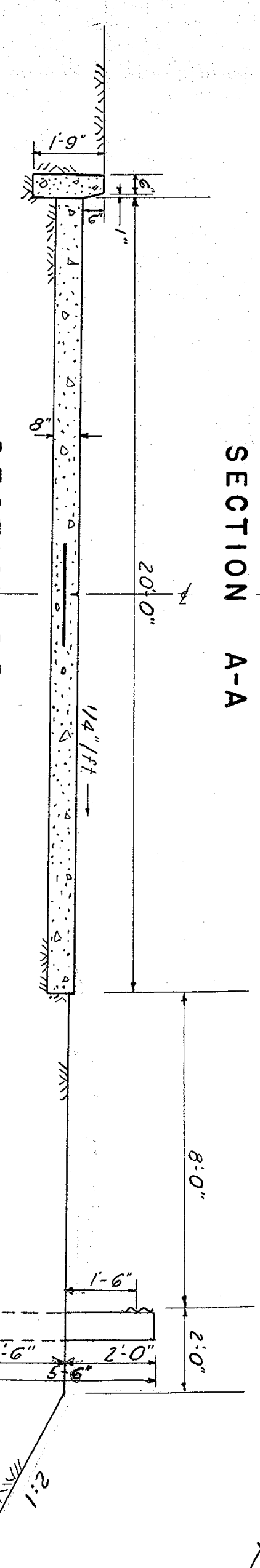
SECTION E-E
Scale: 1/8"=1'



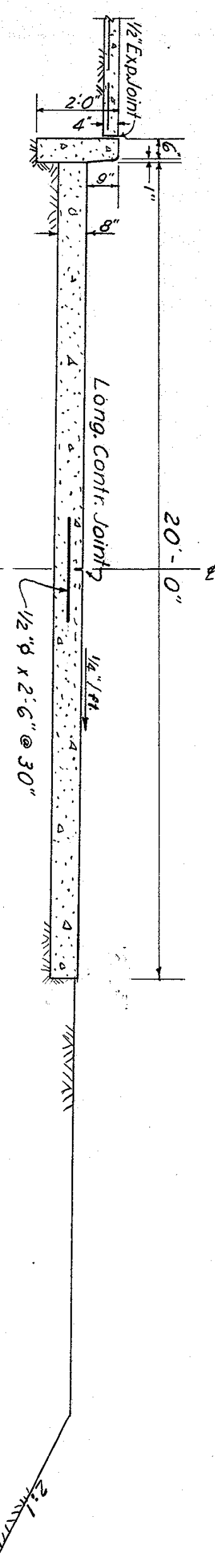
HALF SECTION C-C HALF SECTION D-D



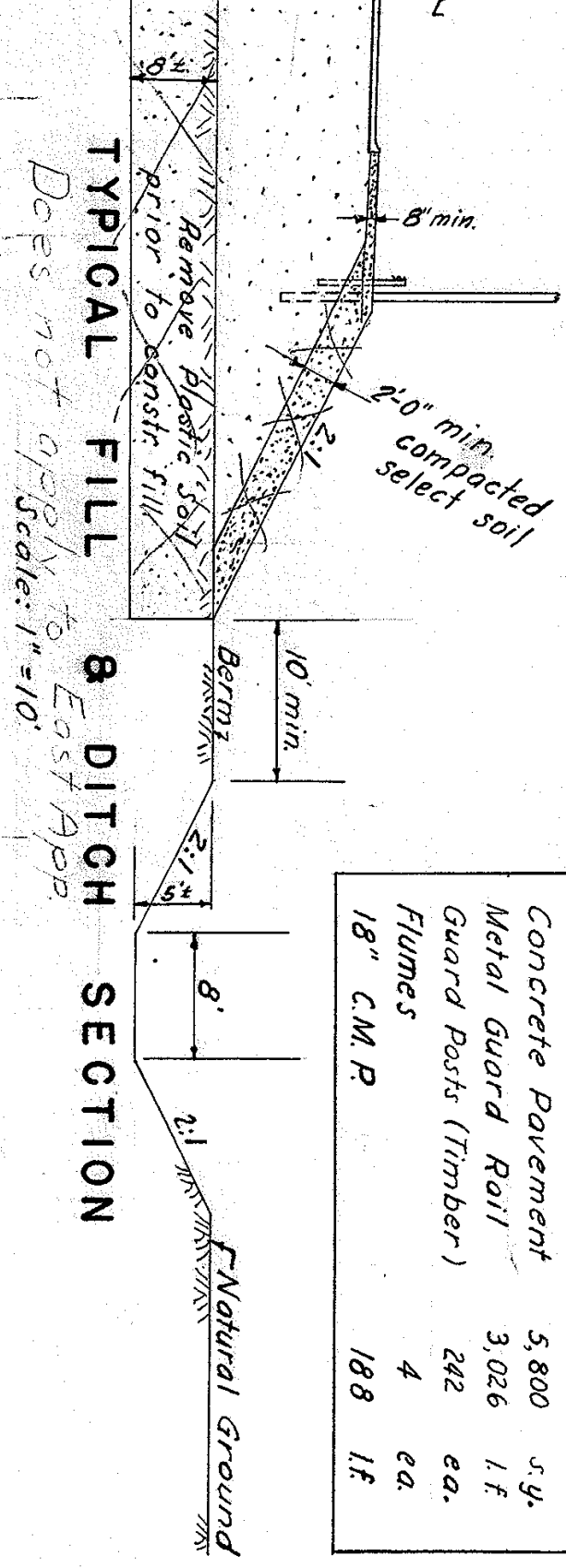
SECTION B-B



SECTION A-A

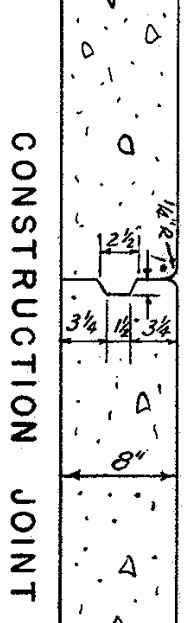


PLAN OF TRANSITION
20' TO 22' ROADWAY
Scale: 1"=20'

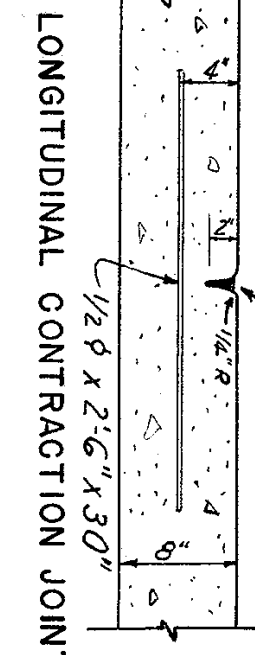
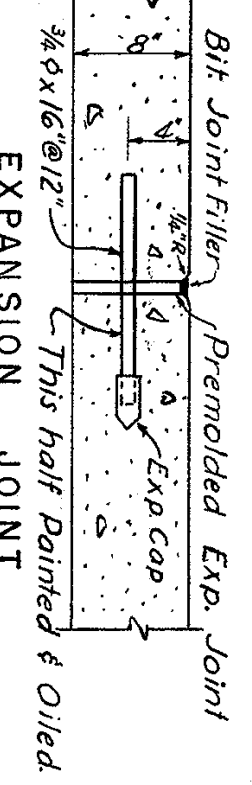
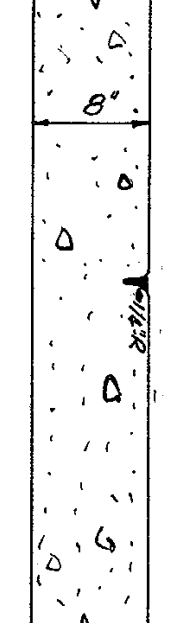


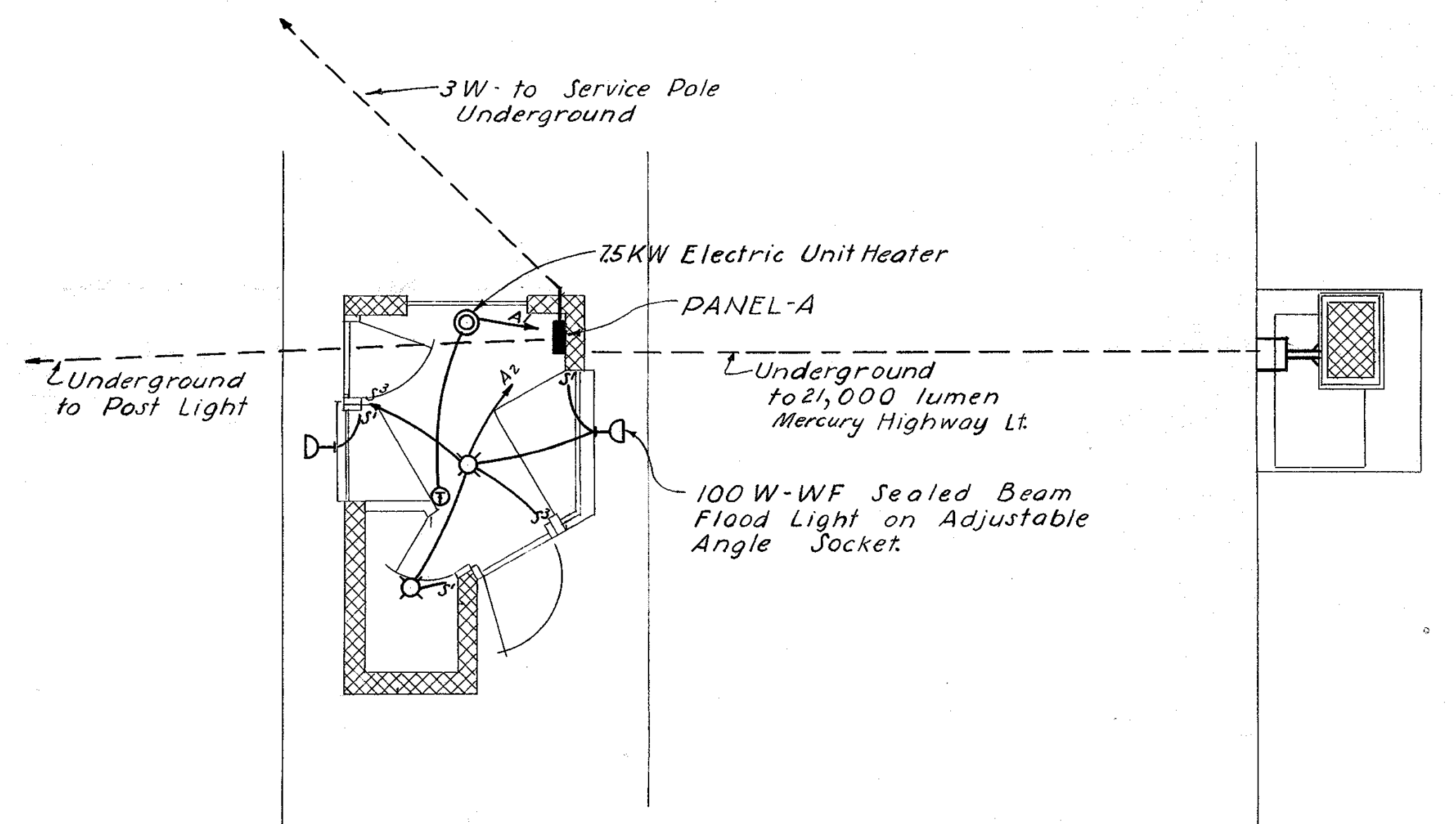
QUANTITIES	
Embankment	140,000 c.y.
Concrete Pavement	5,800 sq. yd.
Metal Guard Rail	3,026 l.f.
Guard Posts (timber)	442 ea.
Flumes	4 ea.
18" C.M.P.	188 l.f.

JOINT DETAILS
Scale: 1"=1'



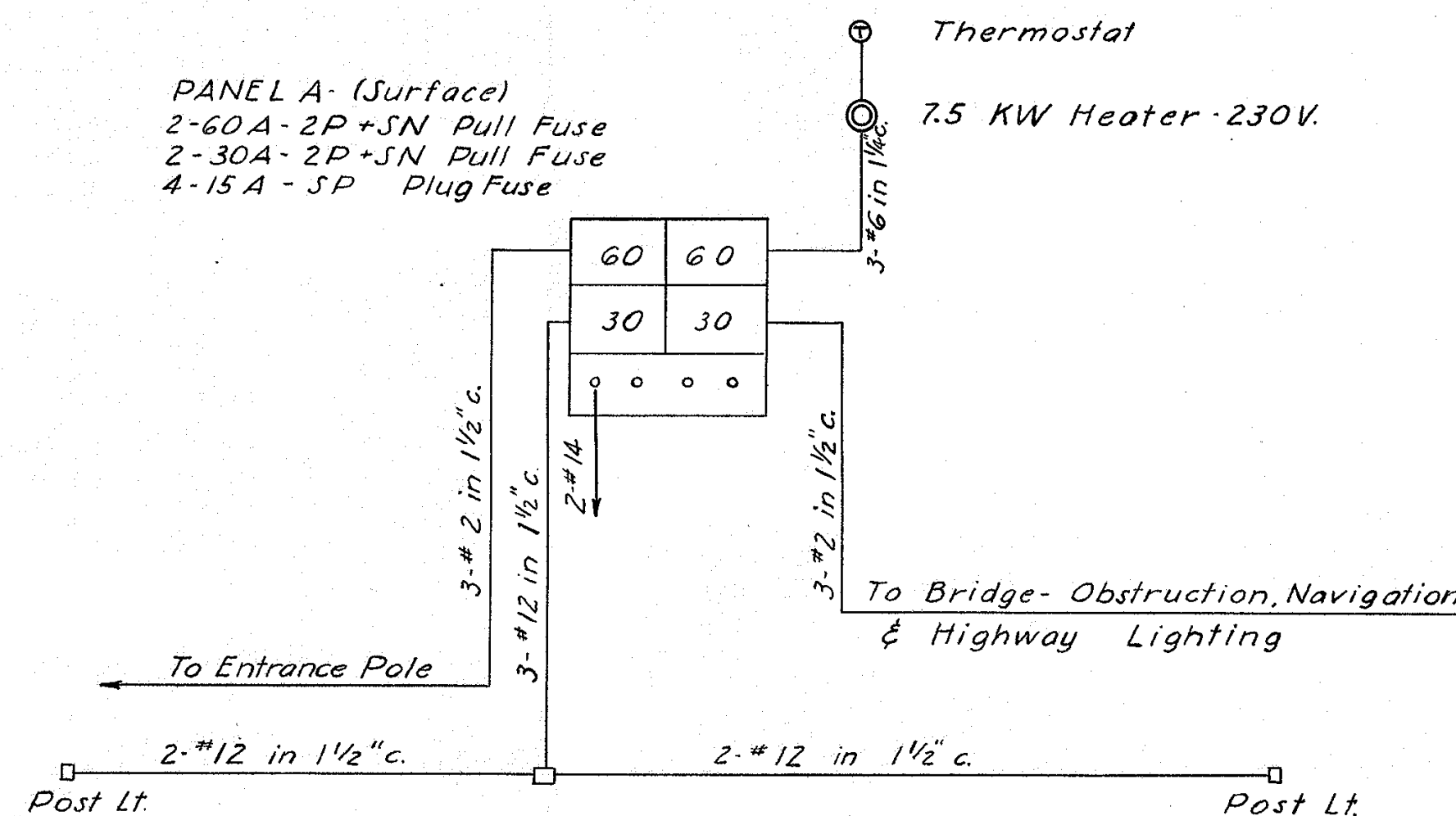
TRANSVERSE CONTRACTION JOINT
@ 15'-0" C.C.





PLAN
TOLL HOUSE WIRING

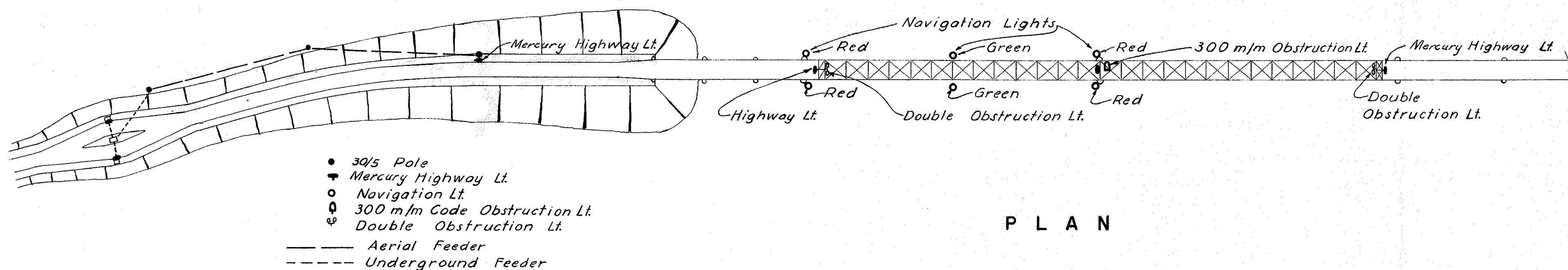
Scale: 1/4" = 1'



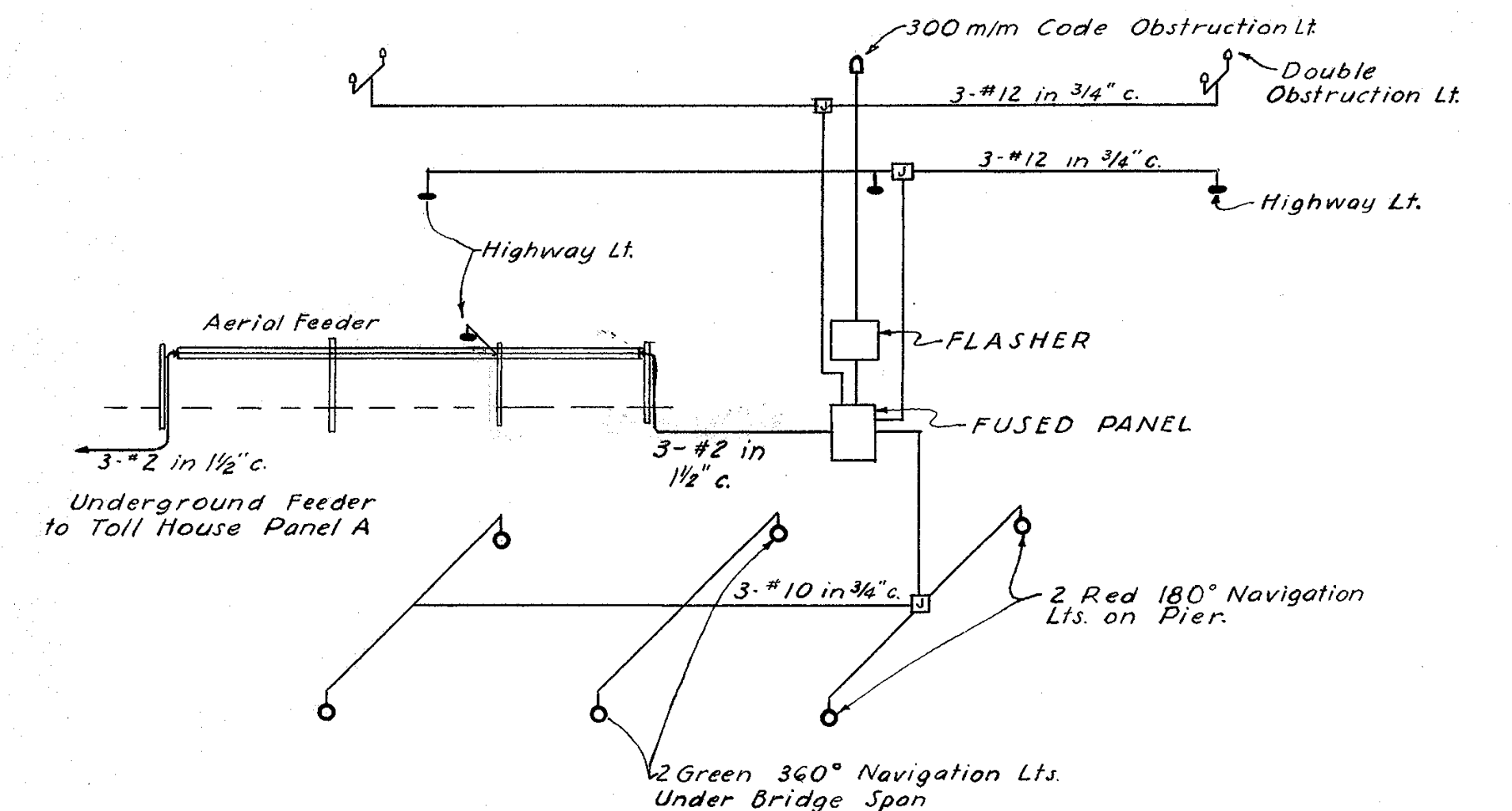
RISER DIAGRAM
TOLL HOUSE WIRING

FIXTURE SCHEDULE-TOLL HOUSE
 Ceiling Lt. - 100W - Ceiling Mounted - Westinghouse Solite
 Outside Inspection Lts. - 100W-WF - Sealed Beam
 Floodlight on adjustable angle socket.
 Toilet - Ceiling Mounted - Porcelain Receptacle with glass shade.

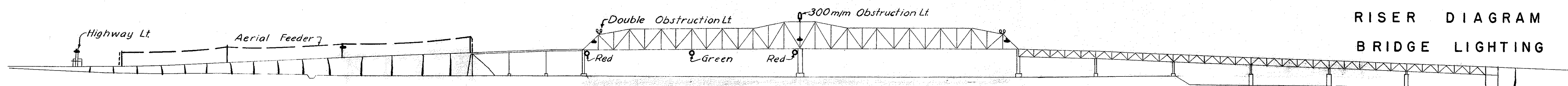
- Notes:**
1. All wiring in Toll House shall be in conduit or E.M.T.
 2. Heater shall be 7.5 KW. Ceiling Mounted adjustable angle, circulating fan- Electric Unit Heater, Thermostatically controlled; G.E. ZA178G27 or equal.
 3. Service shall enter from Transformer Pole underground, in conduit. See Riser Diagram.
 4. Feeders to Mercury Highway Lts. on Entrance Posts shall be in conduit underground.
 5. Underground Conductor shall be Type "RR" Neoprene jacketed cable.



PLAN



RISER DIAGRAM
BRIDGE LIGHTING



ELEVATION

BRIDGE LIGHTING

Scale: 1" = 100'

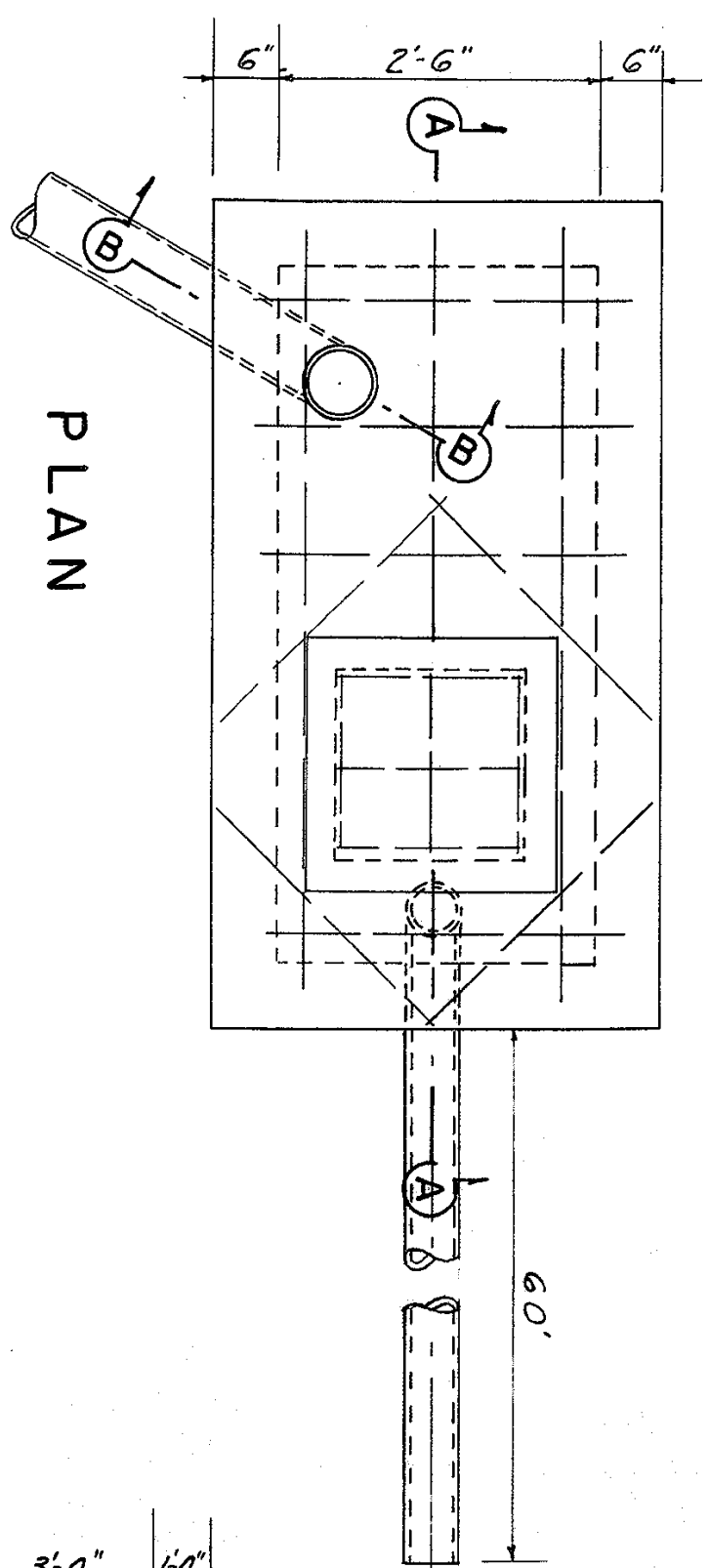
DESIGNED BY J.H.
 TRACED BY J.A.M.
 CHECKED BY
 DATE 4-47
 DATE 4-47
 DATE

Rev. Lighting 1-12-50

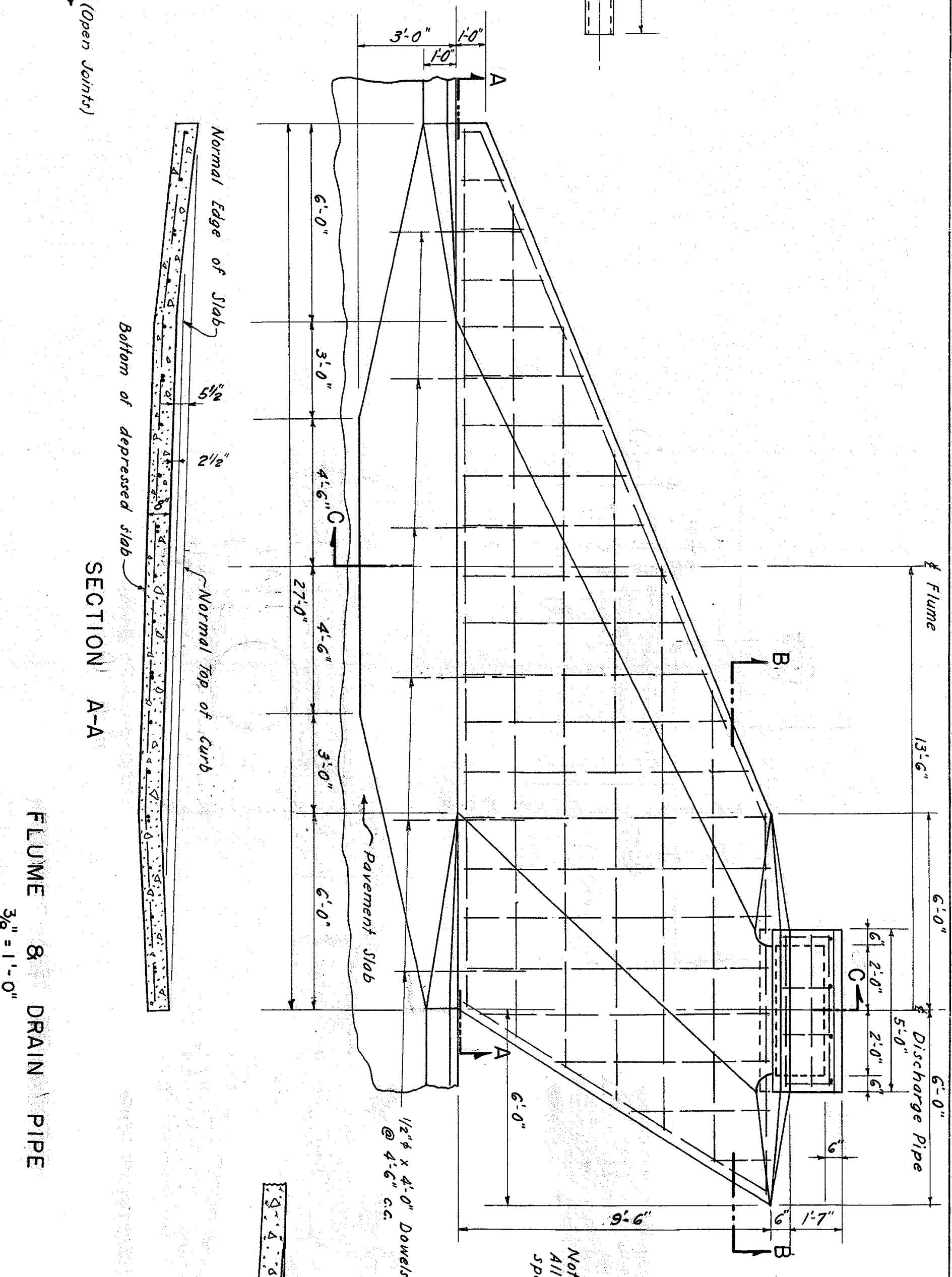
BURT COUNTY, NEBRASKA
 MISSOURI RIVER BRIDGE
 DECATUR, NEBRASKA 345

ELECTRIC WIRING
 BRIDGE & TOLL HOUSE

SCALE: As Shown DATE: Dec. 1949
 KIRKHAM ENGINEERING COMPANY
 CONSULTING ENGINEERS
 OMAHA, NEBRASKA
 DGE
 27

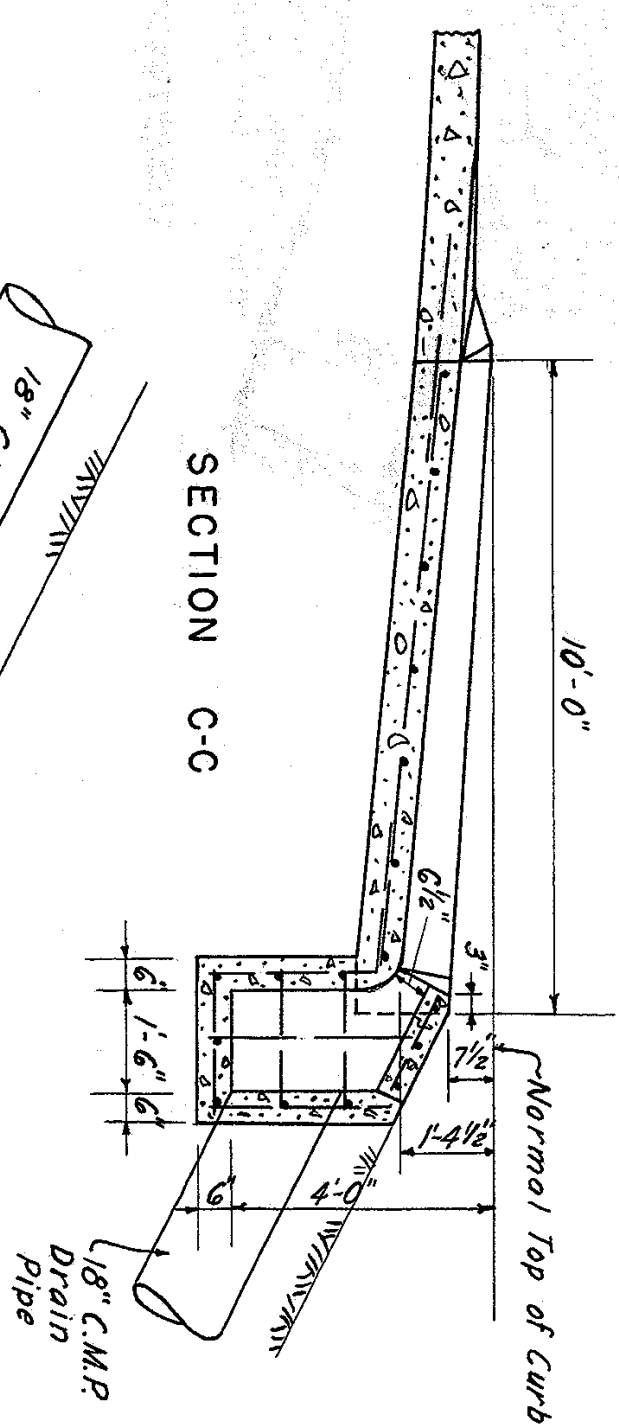


PLAN

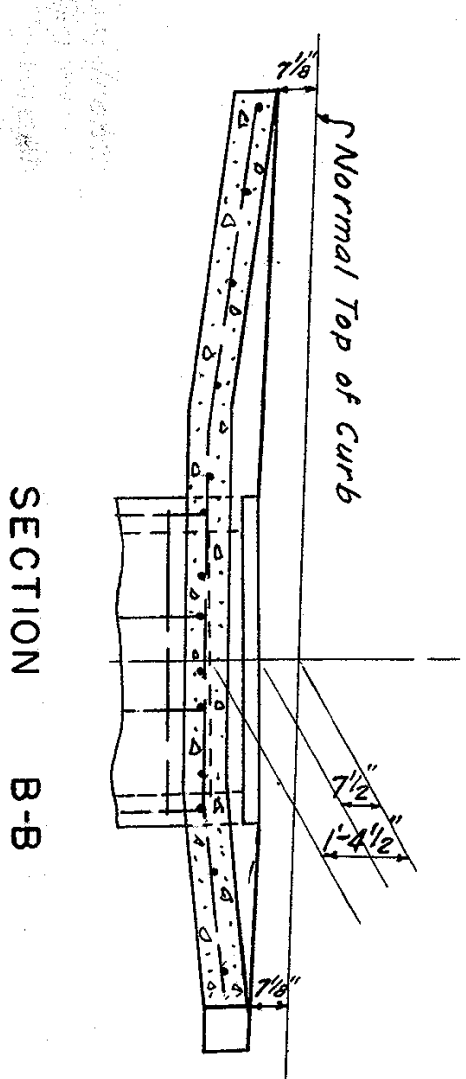


SECTION A-A

FLUME & DRAIN PIPE

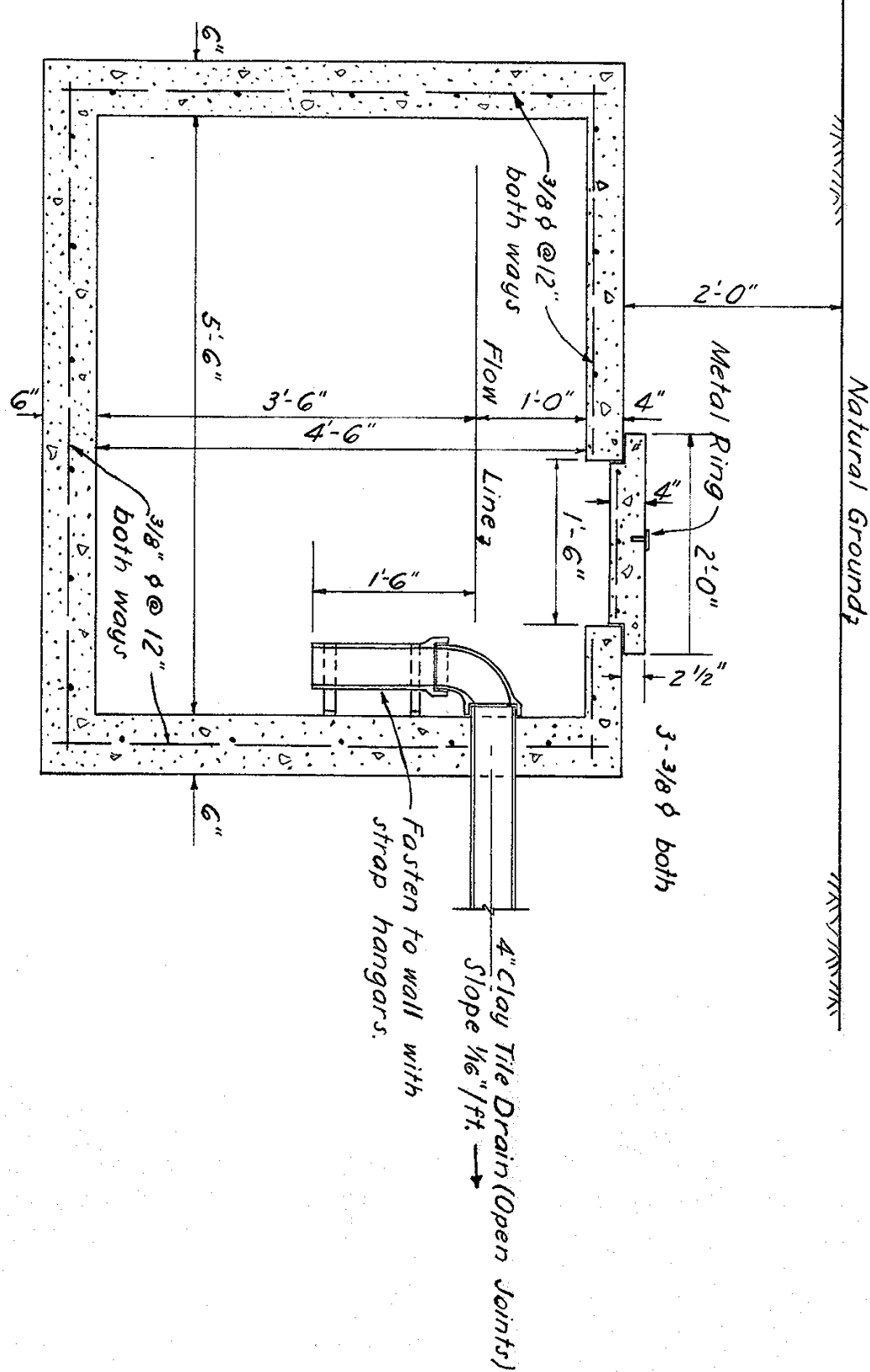


SECTION C-C

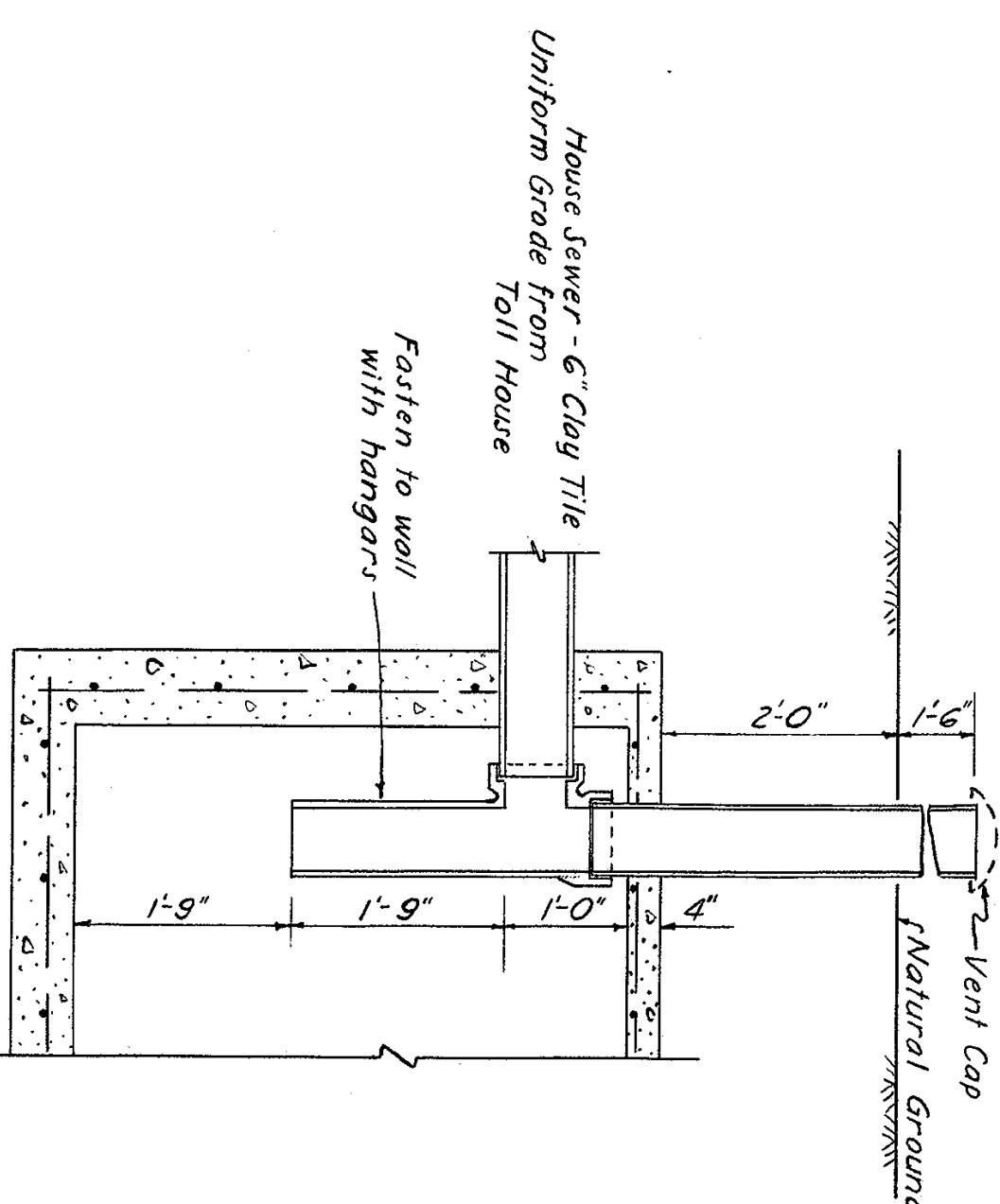


SECTION B-B

Note:
All re-bars to be $\frac{1}{2}" \phi$,
spaced as shown.



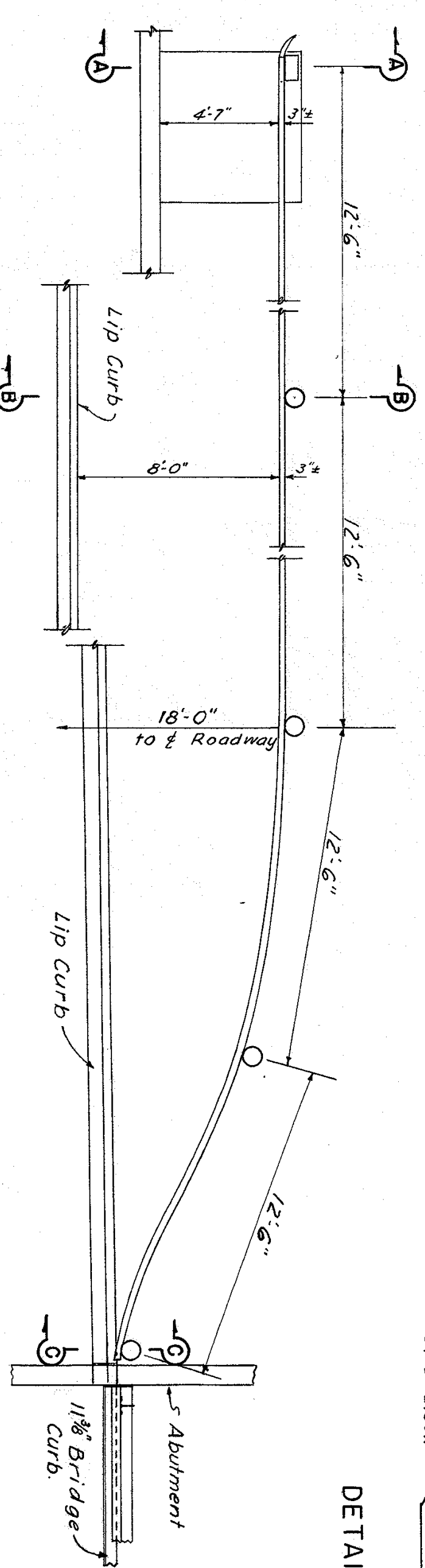
SECTION A-A



VIEW B-B

SEPTIC TANK

Scale: $3/4" = 1'$

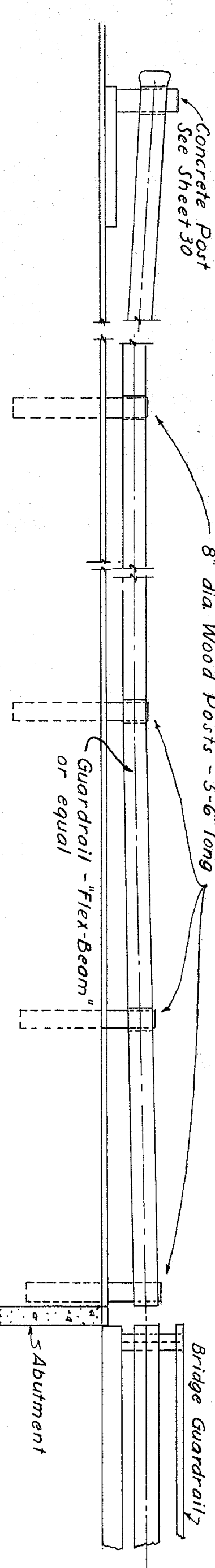


AT TOLL HOUSE

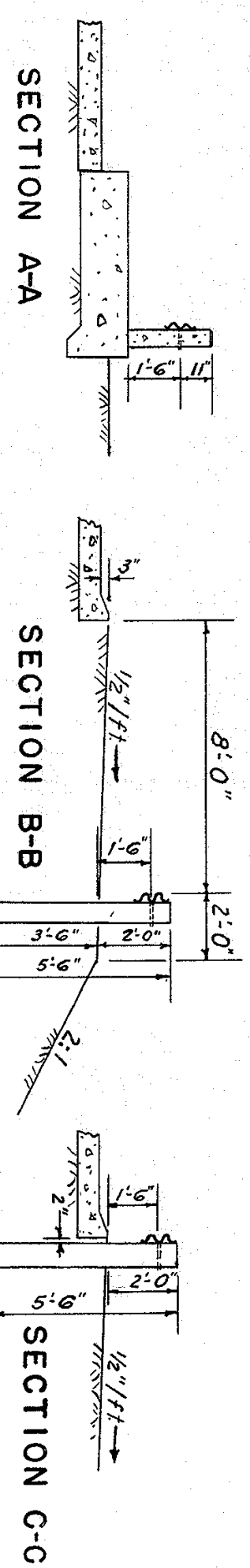
AT 20' ROADWAY

AT BRIDGE ABUTMENT

PLAN



ELEVATION



SECTION A-A

SECTION B-B

SECTION C-C

GUARDRAIL DETAILS

Scale: 1/4" = 1'

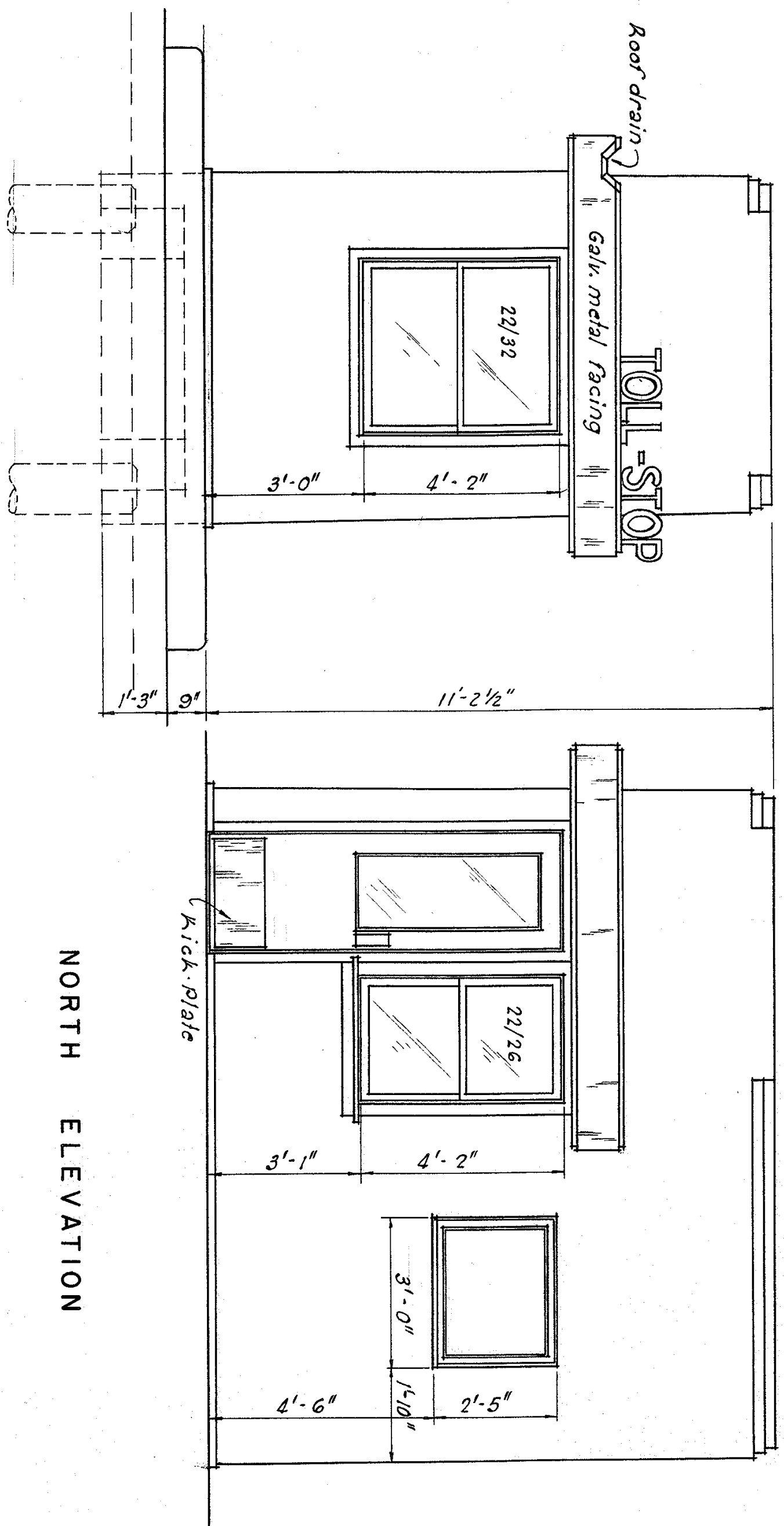
BURT COUNTY, NEBRASKA
MISSOURI RIVER BRIDGE
DECATUR, NEBRASKA 345

SEPTIC TANK, INLET
& GUARDRAIL DETAILS

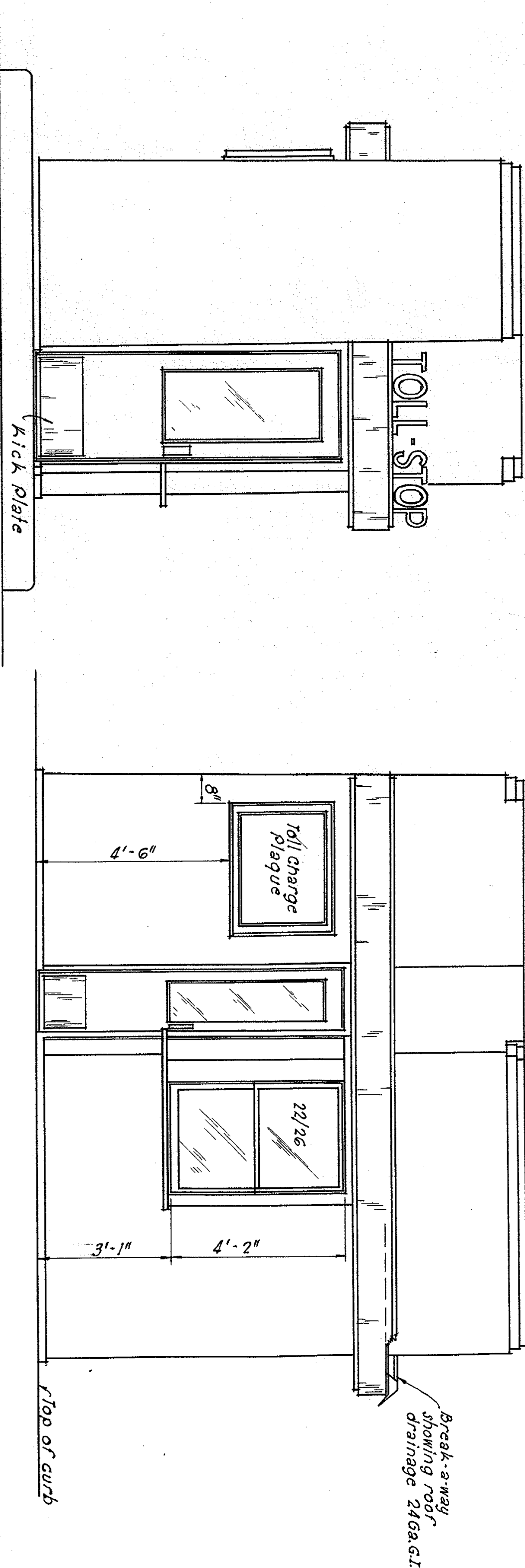
SCALE: AS SHOWN
DATE: Dec. 1940

KIRKHAM ENGINEERING COMPANY
CONSULTING ENGINEERS
OMAHA, NEBRASKA

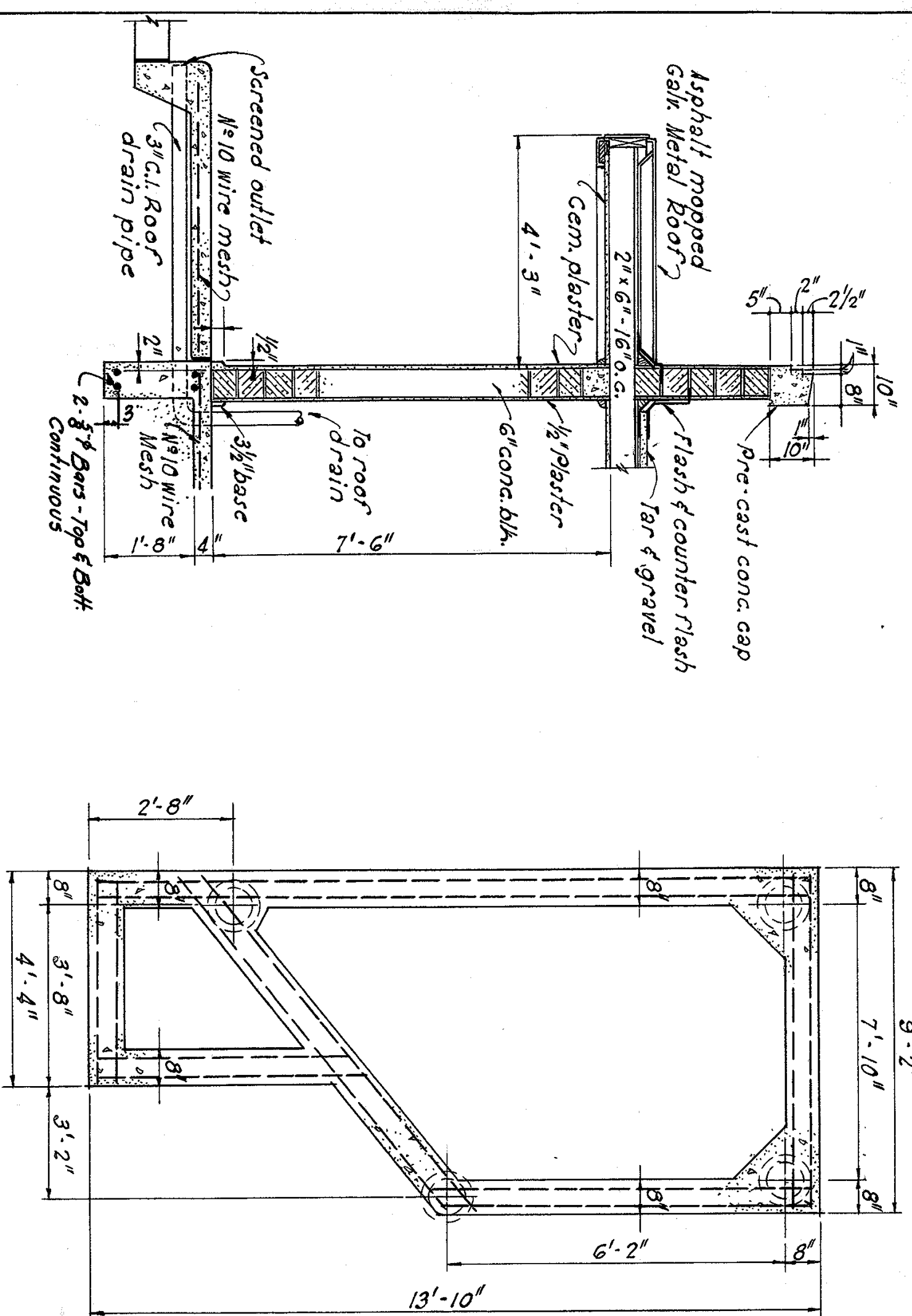
NOVEMBER	DRAWING
2	SHEET
28	



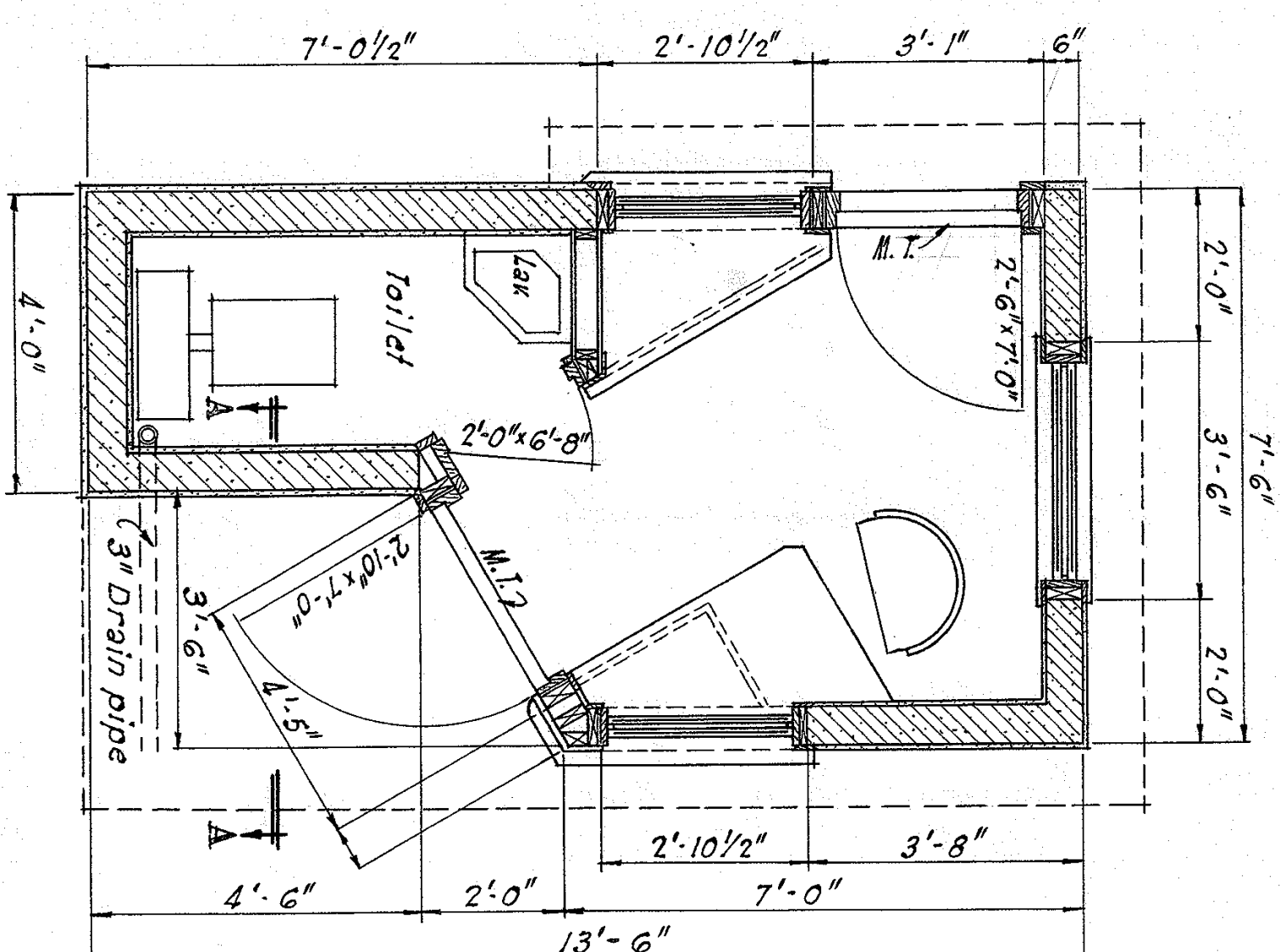
NORTH ELEVATION



SOUTH ELEV.



EAST ELEV.



PLAN

GENERAL NOTES:

All concrete shall be class "M" as specified. All masonry shall be 6" x 6" x 12" cinder block. Material and workmanship as specified.

All piling shall be 12" dia (treated). See specs on piling.

Roof shall be tar & gravel except canopy which shall be 24 ga. GI roof mopped with asphalt.

Drain for main roof shall be Josen 3" outlet №453 GWG. Leader shall be 3" C.I. with screened outlet thru curb to road surface - See details.

Drain for canopy shall be over-flow as detailed south east corner of building. Water to over-flow to road surface.

Cooping shall be pre-cast concrete surfaced and finished in position so as to show no joints on exterior of building.

"TALL" 5" x 8" letters shall be 10" in height, block type letters.

Full-stop letters shall be finished with one coat primer & red marine enamel. Letters shall be lighted with Red Neon tubing for night light.

Brong plaque pedestals shall be solid concrete and as detailed.

Pulcons shall be constructed of cinder block and faced with cement stucco. Stucco shall receive smooth troweled and honed surface finish.

Pylons & pedestals shall be located as shown and shall be a "Left" & "Right" as detailed.

Tall charge plaque shall be wood frame with glass face. Sign and location as shown secured to masonry wall with 4-1/4" x 4" lag screws in lead expanders.

SEC. A-A

SHOWING WALL CONSTRUCTION

FOUNDATION PLAN
SHOWING LOCATION OF PILES

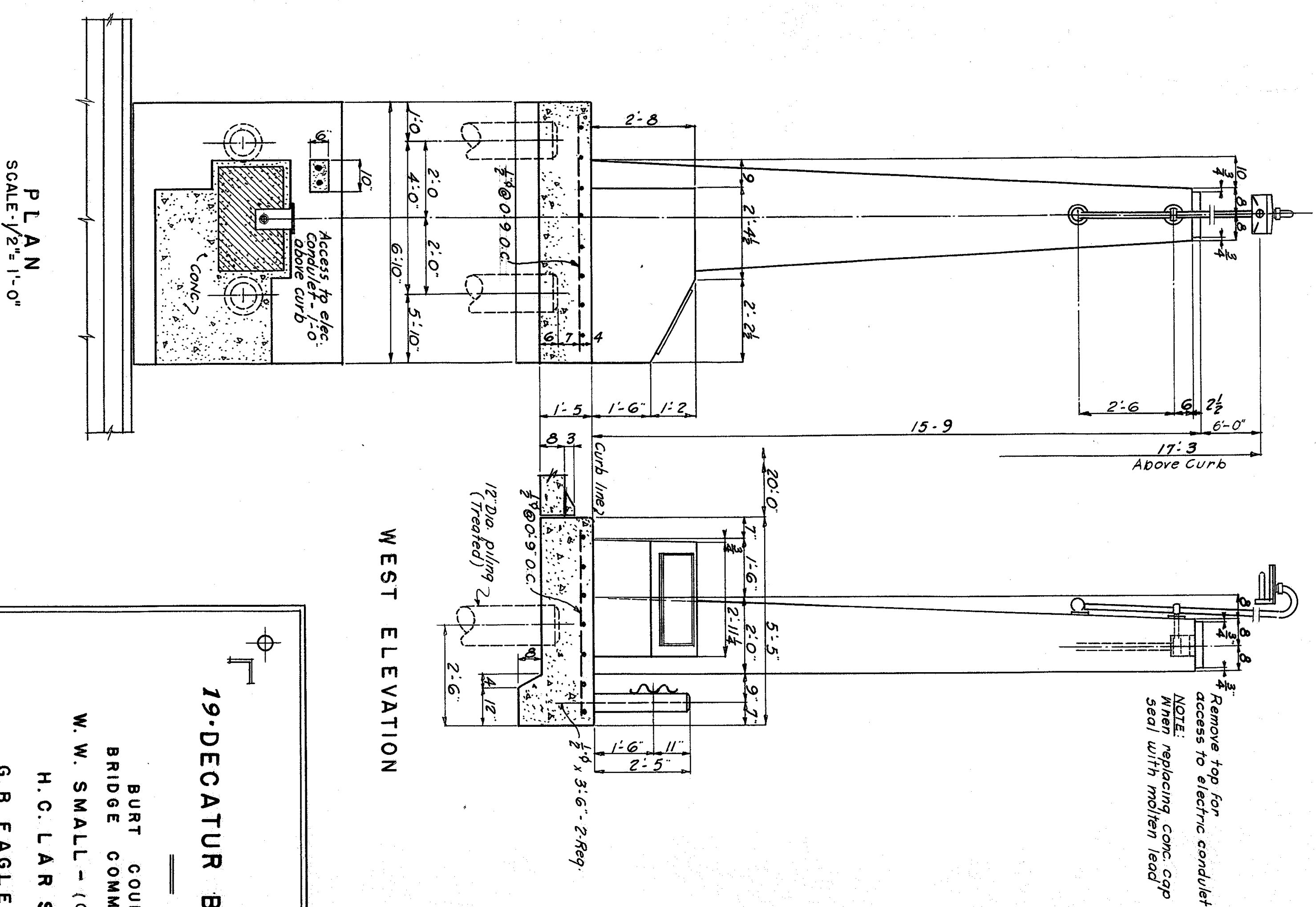
BURT COUNTY, NEBRASKA
MISSOURI RIVER BRIDGE
DECATUR, NEBRASKA 345

SCALE: 1/2" = 1'

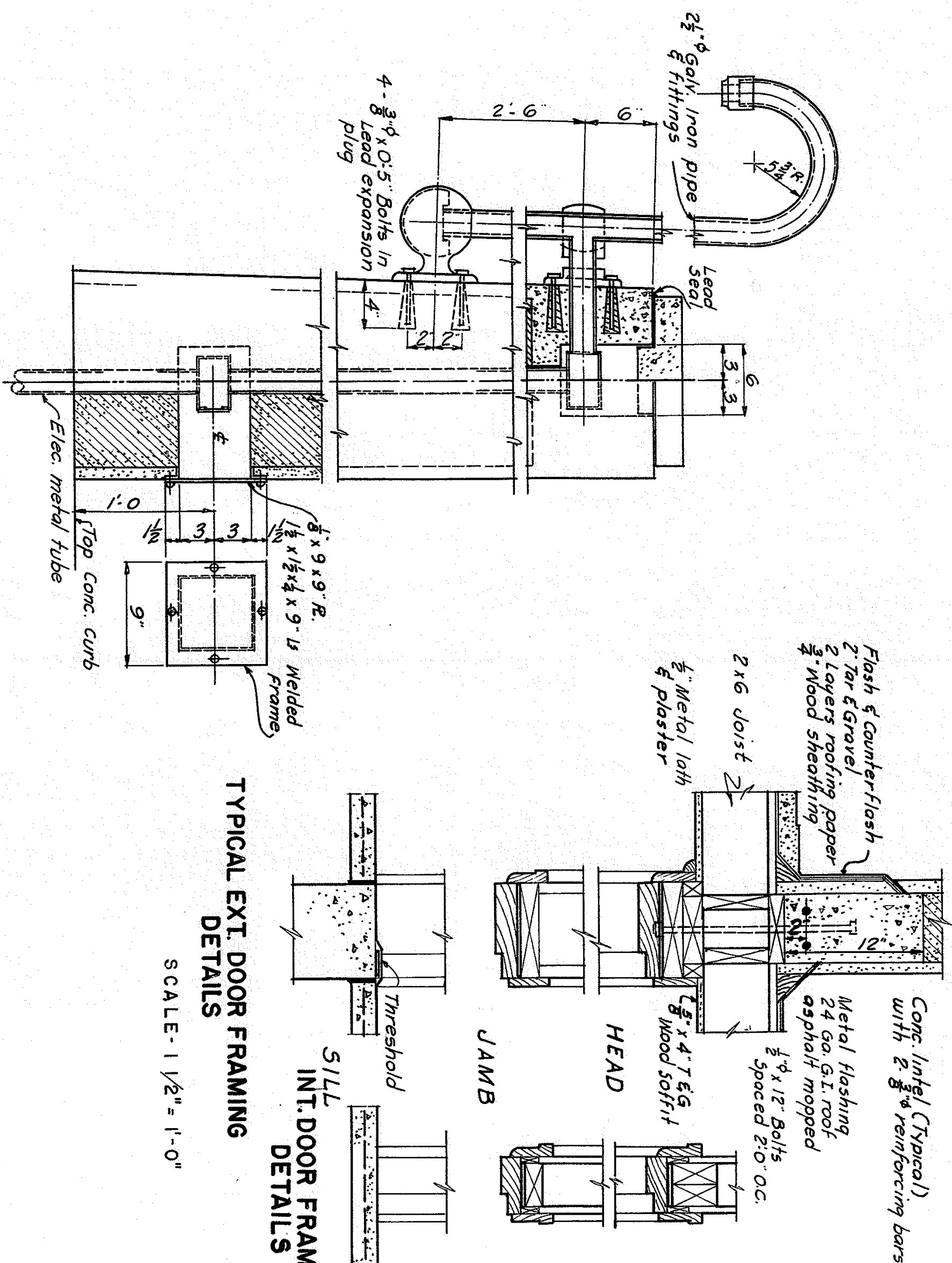
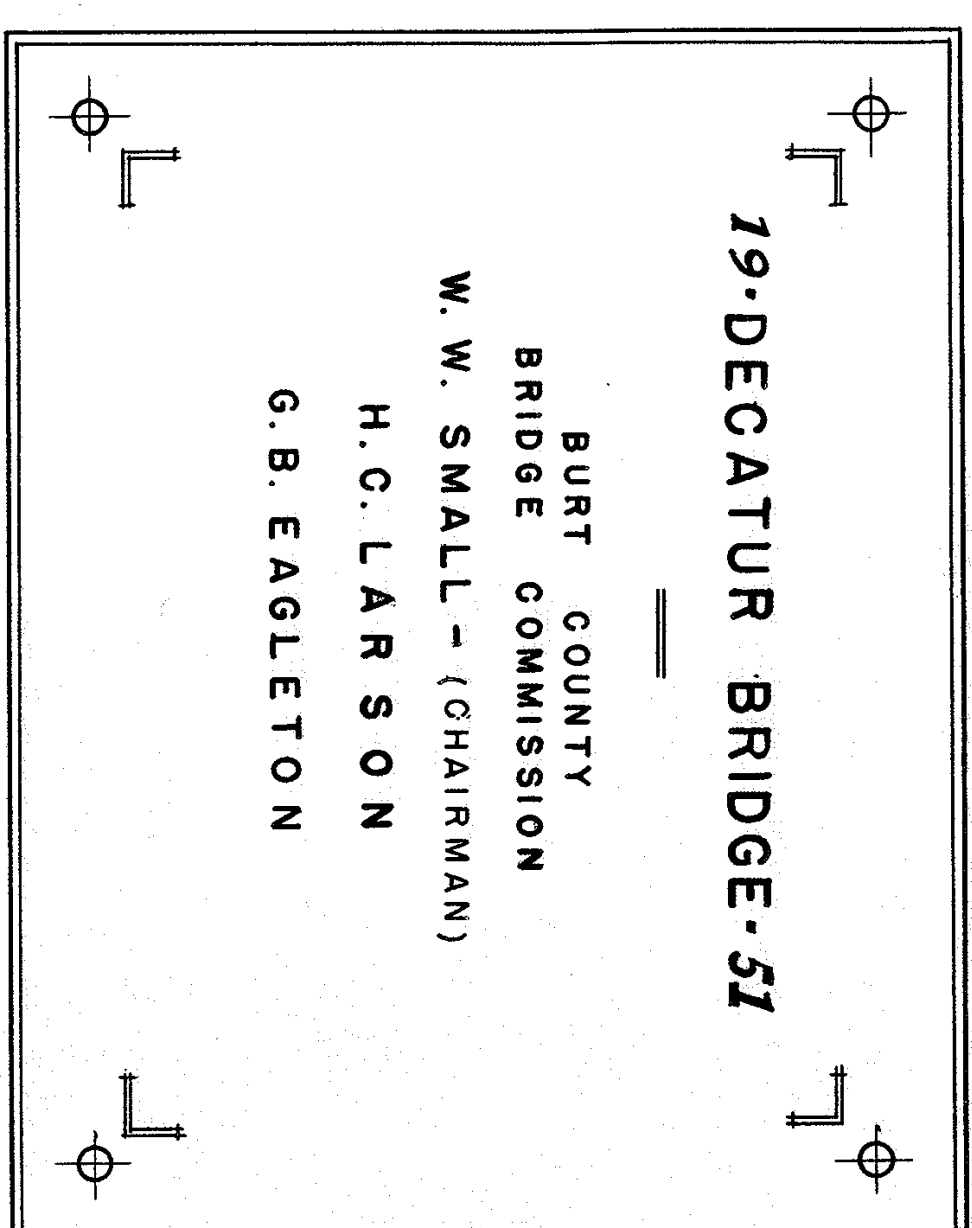
DATE: Dec. 1949

KIRKHAM ENGINEERING COMPANY
CONSULTING ENGINEERS
OMAHA, NEBRASKA

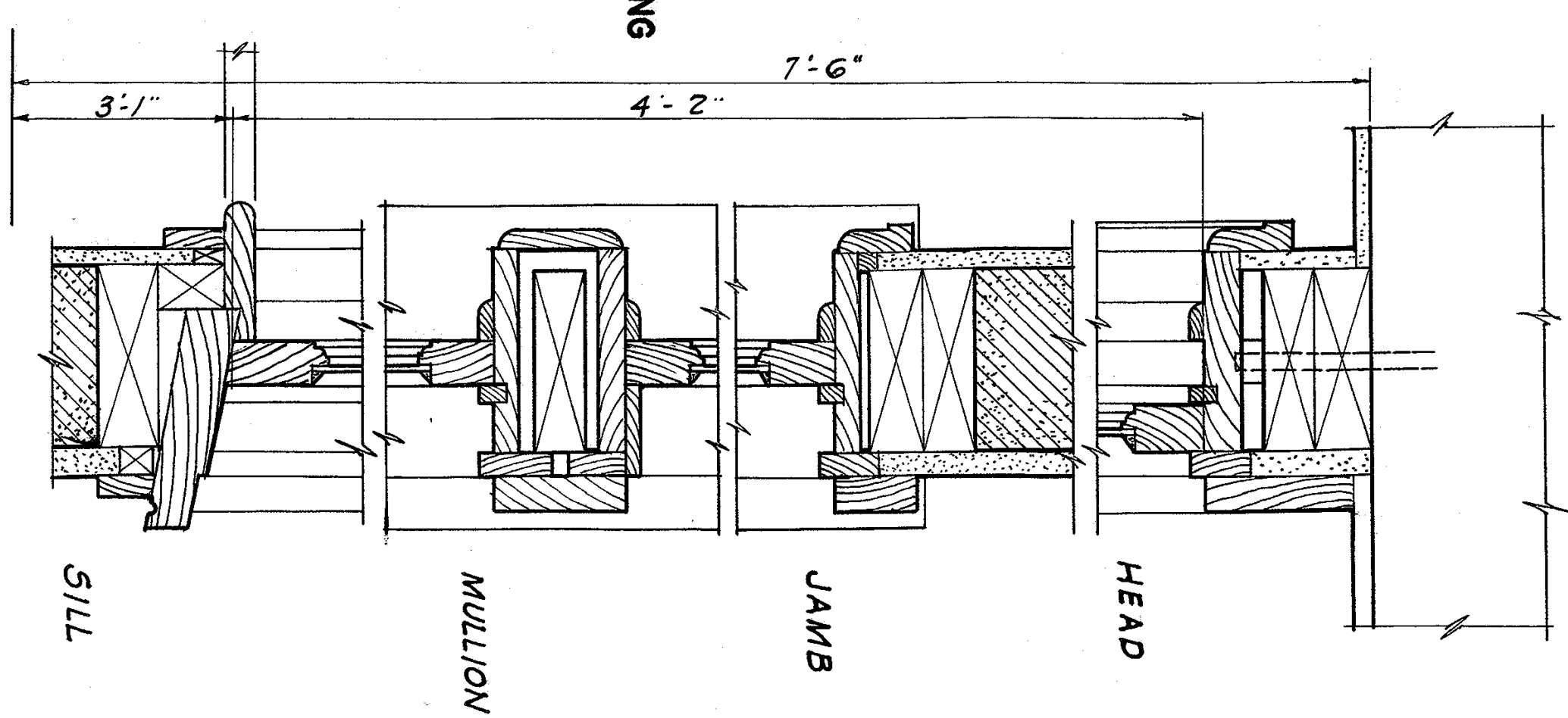
DRAWING NO. DTH 29
SHEET 1



WEST ELEVATION

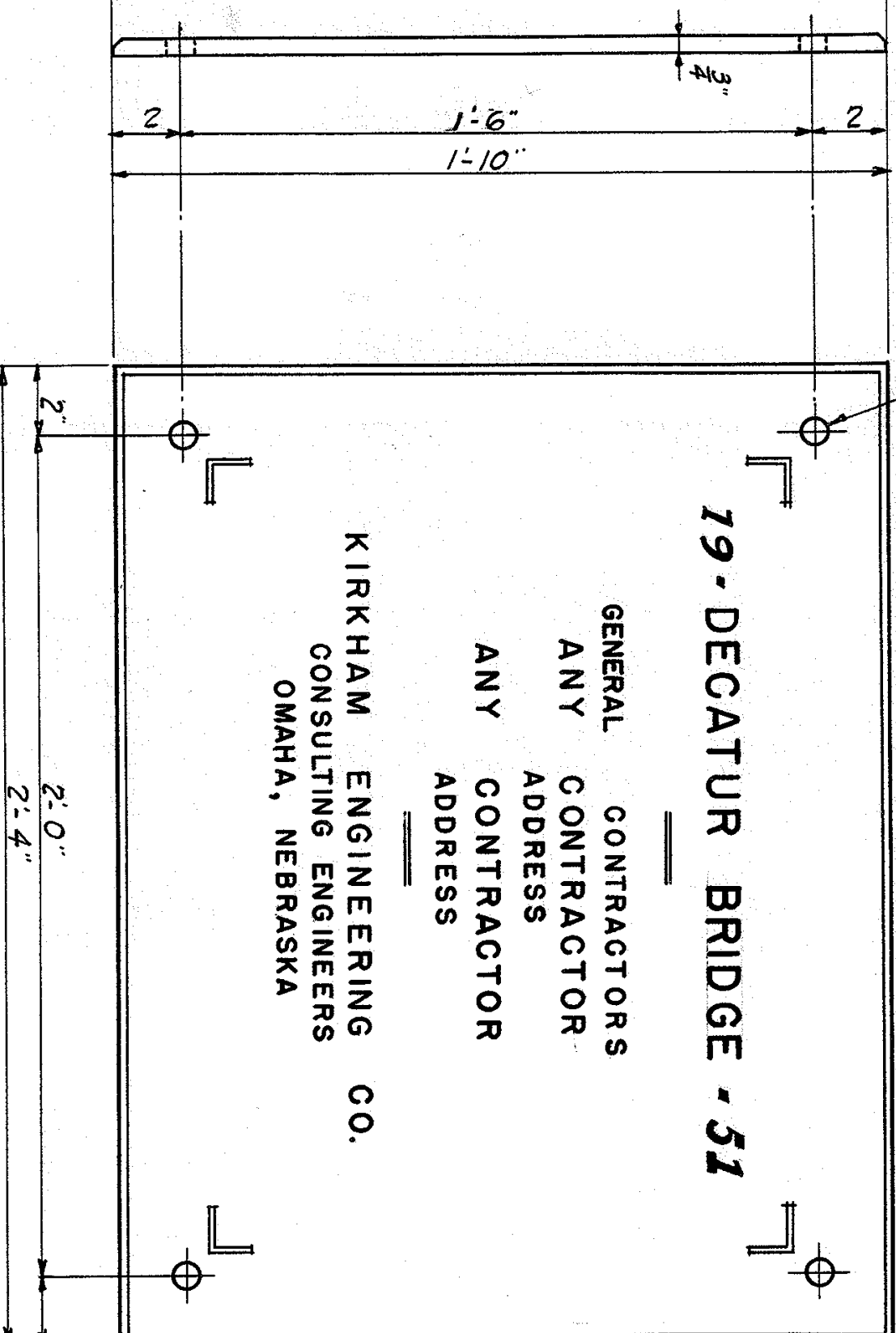


TYPICAL EXT. DOOR FRAMING DETAILS



TYPICAL WINDOW DETAILS
SCALE - 3" = 1'-0"

NOTE:
Bronze plaques to be secured
to concrete pedestals with 4-
3/8" bronze lag screws in lead
expanders



Pylon Rev. 3-1-50

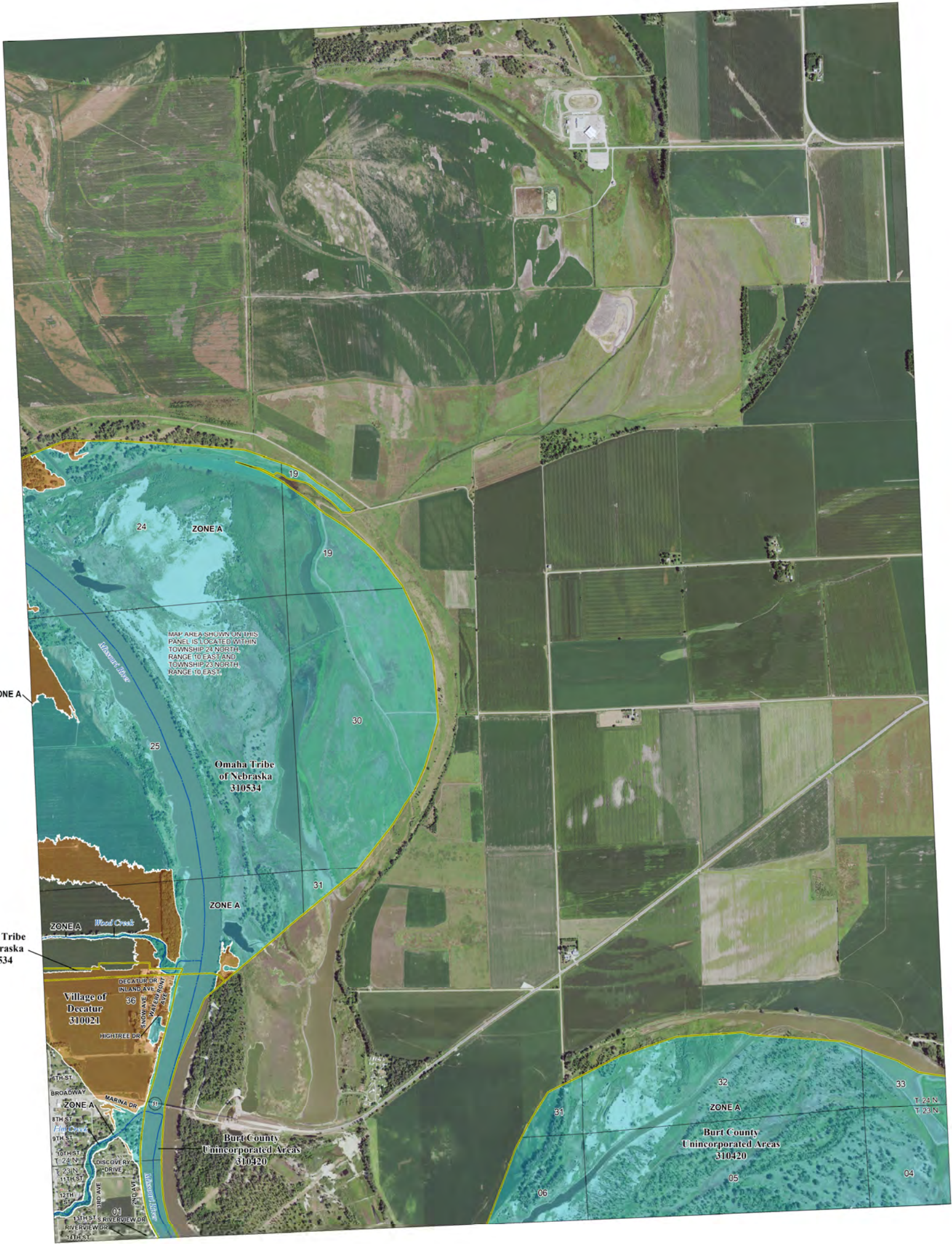
BURT COUNTY, NEBRASKA
MISSOURI RIVER BRIDGE
DECATUR, NEBRASKA 345

TOLL HOUSE DETAILS

SCALE: *As shown* DATE: *Dec. 1949*

KIRKHAM ENGINEERING COMPANY
CONSULTING ENGINEERS
OMAHA, NEBRASKA

DRAWING	SHEET
DTH	30
2	



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING
DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
[HTTP://MSC.FEMA.GOV](http://MSC.FEMA.GOV)

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
OTHER AREAS OF FLOOD HAZARD		Regulatory Floodway
		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee See Notes, Zone X
OTHER AREAS		Area with Flood Risk due to Levee Zone D
		Area of Minimal Flood Hazard Zone X
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary

NOTES TO USERS

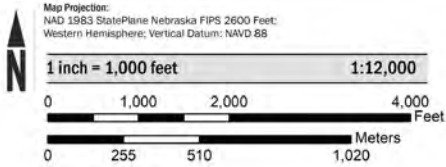
For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-6627) or visit the FEMA Flood Map Service Center website at <http://msc.fema.gov>. Available products may include: previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction. To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was derived from U.S. Census Bureau TIGER files, dated 2016, and digital data provided by the Nebraska Department of Natural Resources (NeDNR). The aerial photography was photogrammetrically compiled at a scale of 1:24,000 from aerial photography dated 2016 or later.

SCALE



PANEL LOCATOR



National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

BURT COUNTY, NEBRASKA
And Incorporated Areas

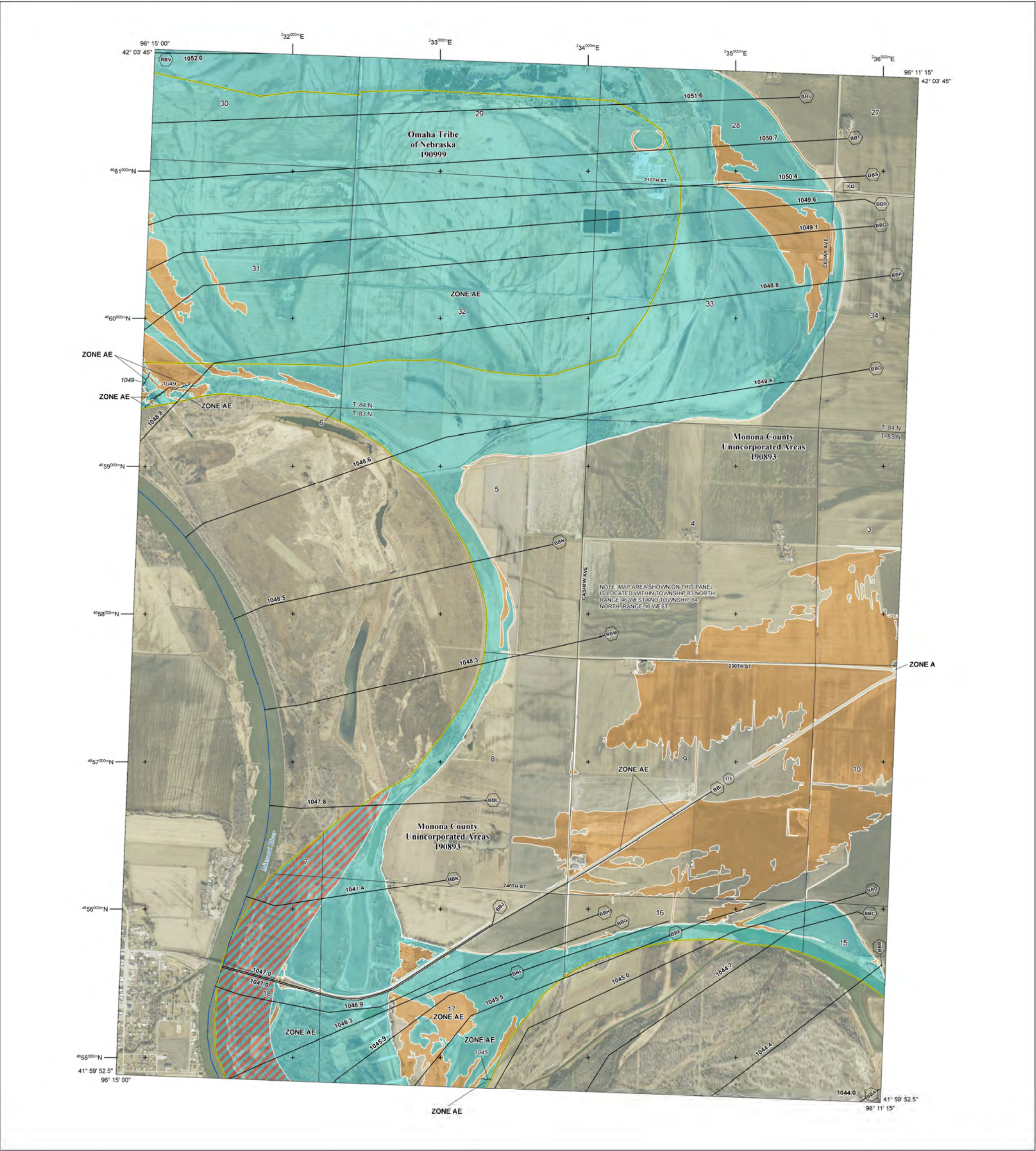
PANEL 90 OF 450

COMMUNITY	NUMBER	PANEL	SUFFIX
BURT COUNTY	310420	0090	E
DECATUR, VILLAGE OF	310021	0090	E
OMAHA TRIBE OF NEBRASKA	310534	0090	E

VERSION NUMBER
2.5.3.5

MAP NUMBER
31021C0090E

EFFECTIVE DATE
JUNE 5, 2020



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING
DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
[HTTPS://MSC.FEMA.GOV](https://MSC.FEMA.GOV)

SPECIAL FLOOD HAZARD AREAS

- Without Base Flood Elevation (BFE) Zone AE, A99
- With BFE or Depth Zone AE, AO, AH, VE, AR
- Regulatory Floodway
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
- Future Conditions 1% Annual Chance Flood Hazard Zone X
- Area with Reduced Flood Risk due to Levee See Notes, Zone X
- Area with Flood Risk due to Levee Zone D
- NO SCREEN Area of Minimal Flood Hazard Zone X
- Area of Undetermined Flood Hazard Zone D

OTHER AREAS OF FLOOD HAZARD

OTHER AREAS

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall
- Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

OTHER FEATURES

NOTES TO USERS

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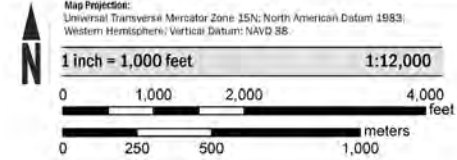
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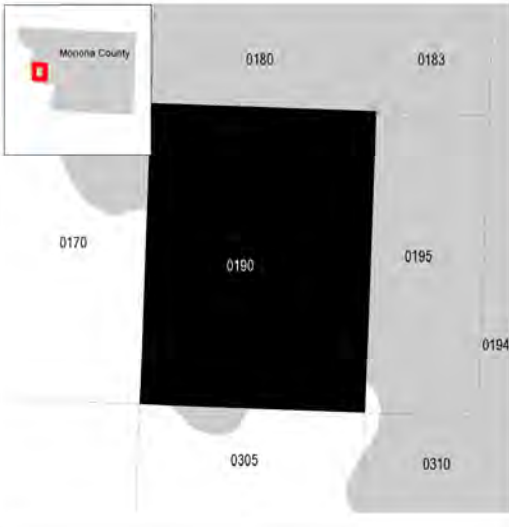
For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

Base map information shown on this FIRM was provided in digital format by the Iowa Department of Natural Resources and Iowa Department of Transportation, date 2014 or earlier.

SCALE



PANEL LOCATOR



FEMA

National Flood Insurance Program

**NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP**

**MONONA COUNTY, IOWA
and Incorporated Areas**

PANEL 190 of 550

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
MONONA COUNTY	190893	0190	D
OMAHA TRIBE OF NEBRASKA	190999	0190	D

VERSION NUMBER
2.4.3.1

MAP NUMBER
19133C0190D

MAP REVISED
JUNE 15, 2022

HYDROLOGIC REFERENCE INFORMATION

PROJECT NO:	STP-51-7(109)	DATE:	8/11/2025
CONTROL NO:	32395	COUNTY:	Burt County, NE & Monona County, IA
STRUCTURE NO:	S051 03644	LOCATION:	NE 51 & IA 175 over Missouri River
PROJECT NAME:	Decatur Bridge Project	SECTION:	36 T 24N R 10E

SITE INFORMATION:

STREAM NAME:	Missouri River	CONTRIBUTING DRAINAGE AREA:	316,130 mi ²
TOTAL DRAINAGE AREA:	316,130 mi ²		

FEMA FLOOD INSURANCE STUDY:

COMMUNITY/COUNTY:	Monona County, IA (19133CV000B)	EFFECTIVE DATE:	6/15/2022			
HYDROLOGY LOCATION:	10230001	DRAINAGE AREA:	316,200 mi ²			
FIS DISCHARGES:	Q ₂ N/A	Q ₁₀ 87,200	Q ₂₅ N/A	Q ₅₀ 120,500	Q ₁₀₀ 141,800	Q ₅₀₀ 197,700

GAGING STATION:

STATION NUMBER:	USGS 06601200 (Decatur Gage)	YEARS OF RECORD:	1987-2025			
STATION LOCATION:	350 ft. north on west bank	DRAINAGE AREA:	316,130 mi ²			
GAGE DISCHARGES:	Q ₂	Q ₁₀	Q ₂₅	Q ₅₀	Q ₁₀₀	Q ₅₀₀
DA RATIO DISCHARGES:						

REGRESSION EQUATIONS:

	Q ₂	Q ₁₀	Q ₂₅	Q ₅₀	Q ₁₀₀	Q ₅₀₀
STRAHM/ADMIRAAL:						
CORDES/HOTCHKISS:						
SOENKSEN:						
BECKMAN:						
COUNTY CHART:						

OTHER METHODS:

APPROACH NAME	Q ₂	Q ₁₀	Q ₂₅	Q ₅₀	Q ₁₀₀	Q ₅₀₀
2023 MRFFS at Dec. Gage	49,800	94,400	127,100	161,700	220,600	297,200

COMPARABLE SITES (Upstream, downstream, or nearby basins):

STRUCTURE	RELATIVE LOCATION	DA (mi ²)	Q ₁₀₀	DA RATIO	Q ₁₀₀
USGS Gage 06486000	Sioux City, IA (2023 MRFFS)	314,617	218,000	N/A	N/A
USGS Gage 06610000	Omaha, NE (2023 MRFFS)	322,820	232,000	N/A	N/A

DESIGN DISCHARGE:

METHOD/EQUATION	Q ₂	Q ₁₀	Q ₂₅	Q ₅₀	Q ₁₀₀	Q ₅₀₀
2023 MRFFS at Dec. Gage	49,800	94,400	127,100	161,700	220,600	297,200

EXPLANATION:

The Effective FEMA flows and mapping are based on the 2003 USACE Upper Mississippi River Flow Frequency Study (2003 UMRFFS). The Effective FEMA Q₁₀₀ will be used for the floodplain permits and CLOMR.

The 2023 USACE Missouri River Flow Frequency Study (2023 MRFFS) developed new expected regulated flows at the gages at Sioux City, IA and Omaha, NE. Flows at the Decatur Gage were determined using linear interpolation between these gages based on total drainage area. 2023 MRFFS flows will be used for design high water, freeboard, velocities, and scour.

Preliminary Data Sheet

PROJECT NO: STP-51-7(109)
CONTROL NO: 32395
STRUCTURE NO: S051 03644
PROJECT NAME: Decatur Bridge
USGS DATUM: NAVD 88

DATE: 8/11/2025
COUNTY: Burt County, NE & Monona County, IA
LOCATION: NE 51 & IA 175 over Missouri River
SECTION: 36 T 24N R 10E
DELTA DATUM: +0.469 ft

SITE DESCRIPTION & DISPOSITION

The Missouri River at RM 691 has a main channel and secondary channel at high flows, separated by a ridgeline. The area contains farm land, forest, and wetland with tall grass. The existing structure will be replaced on a new alignment, 77 feet north.

EXISTING STRUCTURE

ORIGINAL PLAN: 345
OTHER PLAN: STR-51-7(1006)
STATION: 2133+37.00
TYPE: Truss
LENGTH: 1956 ft
SPANS: 11
LOW STRUCTURE ELEVATION: 1056.66 ft

PLAN YEAR: 1949
PLAN YEAR: 2017
SKEW: 0°
CLEAR ROADWAY WIDTH: 22.5 ft
LOW DECK STATION: 2143+15
LOW DECK ELEVATION: (A) ft
HW ELEVATION (US): (B) ft

PROPOSED STRUCTURE

STATION: 2125+97.10
TYPE: NU35, Plate Girder, & NU78
LENGTH: 2730 ft
SPANS: 14
ABUTMENT TYPE: Semi-Int. on Piles w/ Sheet Pile
PIER TYPE: Frame Pier w/ Drilled Shafts
WING TYPE: U-Shaped

SKEW: 0°
CLEAR ROADWAY WIDTH: 40 ft
RAIL TYPE: Closed
BOTTOM OF PIER ENCASEMENT: N/A ft
OVERLAY TYPE: N/A
OVERLAY THICKNESS: N/A in

GRADE

BRIDGE GRADE ABUTMENT 1: 1100.13 ft
LOW STRUCTURE ELEVATION: 1056.69 ft
REQUIRED FREEBOARD: 1.00 ft

BRIDGE GRADE ABUTMENT 2: 1064.57 ft
SUPERSTRUCTURE DEPTH: (C) ft
DESIGN FREEBOARD: 2.21 ft

DESIGN HYDRAULIC DATA

STREAM: Missouri River
Q100: (D) cfs (BASE FLOOD)
Q100: (D) cfs (BRIDGE BASE FLOOD)
Q(200): (D) cfs (OVERTOPPING FLOOD)
Q (OHV): 47,560 cfs
ABUTMENT SCOUR Q100 ELEVATION: (F) ft
PIER/BENT SCOUR Q100 ELEVATION: (F) ft
ICE-AFFECTED: Yes FLOWLINE: 1012.84 ft

CONTRIBUTING DRAINAGE AREA: 316,130 mi²
HW ELEVATION (US): (E) ft
LOW ROAD ELEVATION: 1053.78 ft
WATERWAY AREA BELOW HW: 36790 ft²
ORDINARY HIGH WATER ELEVATION: 1035.0 ft
ABUTMENT SCOUR Q500 ELEVATION: (F) ft
PIER/BENT SCOUR Q500 ELEVATION: (F) ft
PIER WALL VELOCITY (F) ft/s

BERM DATA

TOP OF GROUND ELEVATION: (G) ft
BOTTOM OF RIP RAP WIDTH: (I) ft

TOP OF RIP RAP ELEVATION: (H) ft
RIP RAP TYPE: (J)

FLOODPLAIN CERTIFICATION

FEMA CLASSIFICATION: Zone A & Zone AE

GREATEST CHANGE IN BASE FLOOD ELEVATION: (K) ft

TRAFFIC OPTIONS

ALIGNMENT SHIFT: ☒ DETOUR: ☐ TEMPORARY ROAD: ☐ UNDER TRAFFIC: ☐
TEMPORARY STRUCTURE DESIGN: _____ Q (____): _____ cfs SAG ELEVATION: _____ ft

CONTRACTOR ACCESS CROSSING

SIZE: (L) FILL: (L) ft

COMMENTS

See attached sheets for lettered comments.

BY: _____ SHEET 1 OF _____
APPROVED BY: KIRK HARVEY _____ BRIDGE DESIGNER _____ ROSS BARRON _____ SITE _____ OF _____

Preliminary Data Sheet – Comments

(A) Existing low deck elevation not available. Existing low structure elevation estimated from existing bearing seat elevation at east abutment.

(B) Existing HW Elevation

Event	Main Channel	Secondary Channel
Project 2D Model		
Effective FEMA Q100	1047.82	1049.28
Q100	1051.98	1053.24
Q200	1053.32	1054.36
*Effective 1D Model		
Effective FEMA Q100	1047.21	1047.21

*To be updated following FEMA meeting on 9/4/25 and split flow revision of 1D model.

(C) Superstructure Depth:

NE Approach Unit = 4.19 ft.

River Unit = 13.62 ft.

Iowa Approach Unit = 7.88 ft.

(D) Base Flood and Bridge Base Flood

Effective FEMA Q100 = 141,800 cfs

Use for floodplain permits and CLOMR

Q100 = 220,600 cfs

Use for Design High Water (HW)

Q200 = 271,000 cfs

Use for Scour Design Flood, including scour depth and velocity for stream pressure.

Q200 is also the overtopping flood.

(E) HW Elevation

Event	Main Channel	Secondary Channel
Project 2D Model		
Effective FEMA Q100	1047.20	1048.07
Q100	1051.60	1052.29
Q200	1053.28	1053.88
*Effective 1D Model		
Effective FEMA Q100	1047.28	1047.28

*To be updated following FEMA meeting on 9/4/25 and split flow revision of 1D model.

Preliminary Data Sheet – Comments

(F) Scour and velocity table for piers and abutments

Location	Q200 Scour Elev.	Q500 Scour. Elev.	Q200 V (ft/s)
Abut 1	1088.0	1082.0	---
Pier 1	1057.4	1051.4	---
Pier 2	1006.0	999.8	3.7
Pier 3	982.3	976.2	8.2
Pier 4	1036.7	1030.1	1.3*
Pier 5	1042.3	1036.1	2.0*
Pier 6	1033.6	1027.4	2.1
Pier 7	1032.3	1026.1	2.0
Pier 8	1032.0	1025.8	2.0
Pier 9	1009.3	1002.9	3.7
Pier 10	1027.8	1021.4	3.7
Pier 11	992.5	990.6	7.7
Pier 12	992.2	990.6	7.2
Pier 13	968.9	967.3	8.7
Abut 2	1048.1	1042.1	---

*Equivalent velocity used for scour calculations

(G) Top of Ground Elevation

Abut 1 = 1092.00

Abut 2 = 1052.11

(H) Top of Riprap Elevation

Abut 1 = 1094.00

Abut 2 = 1054.11

(I) Bottom of Riprap Width

Abut 1 = 53 ft.

Abut 2 = 288 ft. (width from out-to-out of riprap apron)

(J) Riprap Type

Abut 1 = Broken Concrete Riprap

Abut 2 = Custom NDOT Type similar to Iowa Class X used in 2011 repair.

Piers = Custom NDOT Type similar to Iowa Class X used in 2011 repair.

(K) Greatest change in Base Flood Elevation

From Effective 1D Model at Effective FEMA Q100

Main Channel = **0.07 ft.

Secondary Channel = **0.07 ft.

**To be updated following FEMA meeting on 9/4/25 and split flow revision of 1D model.

(L) Contractor Access Crossing

Approx. low structure elevation of access bridge(s) = 1038.0 (3 ft. above OHW)

Approx. top of causeway elevation = 1038.0 (3 ft. above OHW)

Preliminary Data Sheet – Comments

Locations:

1. Either causeway or access bridge anticipated in Span 4, from east bank to west edge of Pier 3.

Approx. length = 260 ft.

Approx. causeway fill depth = 21 ft. (3 ft. above OHW)

2. Either causeway or access bridge anticipated in Span 3, riverward of Pier 2.

Approx. length = 35 ft.

Approx. causeway fill depth = 25 ft.