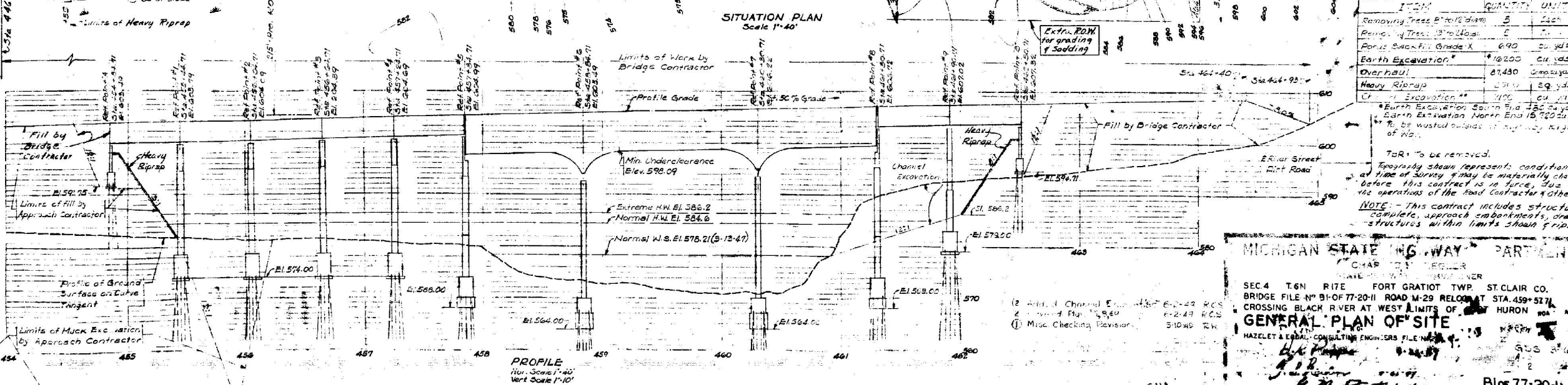
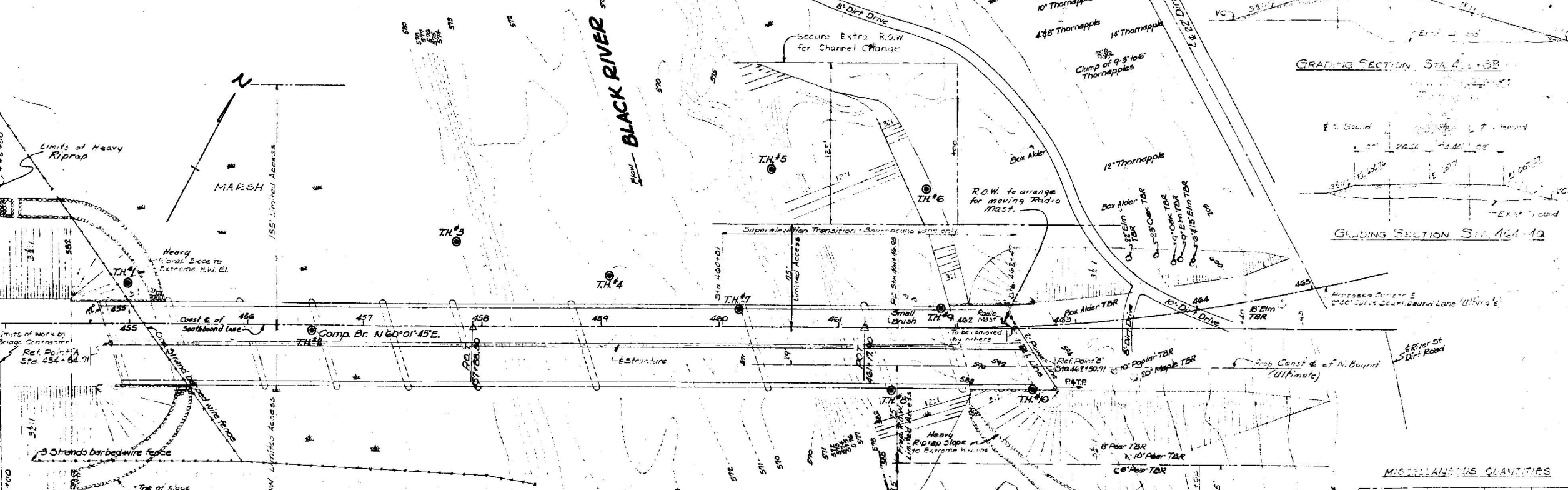


CURVE DATA
 Δ = 65° 22' 45" L
 D = 2' 40"
 R = 2128.79'
 T = 1378.95'
 L = 251.72'
 E = 404.40'
 P2 = 441 + 46.73
 P1 = 475 + 25.88
 PT = 485 + 78.65

BENCH MARKS

- Lisee Survey: B.M. #5 Elev. 603.90 MSHD tag in 18" Maple 134' Rt. of Sta. 411 + 09
- Rosendale Survey: B.M. #4 Elev. 602.31 MSHD tag in 22" twin Elm 6' Rt. of Sta. 464 + 72
- Rosendale Survey: B.M. #5 Elev. 583.42 MSHD tag in 26" Oak 110' Rt. of Sta. 444 + 66



MISCELLANEOUS QUANTITIES

ITEM	QUANTITY	UNIT
Removing Trees 8" to 12" diam	5	Each
Removing Trees 13" to 14" diam	5	Each
Portland Cement Concrete	6.90	cu. yds.
Earth Excavation*	18200	cu. yds.
Overhaul	87430	cu. yds.
Heavy Riprap	2000	sq. yds.
Cr. Excavation**	7100	cu. yds.

* Earth Excavation South End 455 cu. yds.
 * Earth Excavation North End 18,720 cu. yds.
 * To be wasted outside of highway right of way.

TBR: To be removed.
 Topography shown represents conditions at time of survey & may be materially changed before this contract is in force, due to the operations of the road contractor & others.

NOTE - This contract includes structure, complete, approach embankments, drainage structures within limits shown & riprap.

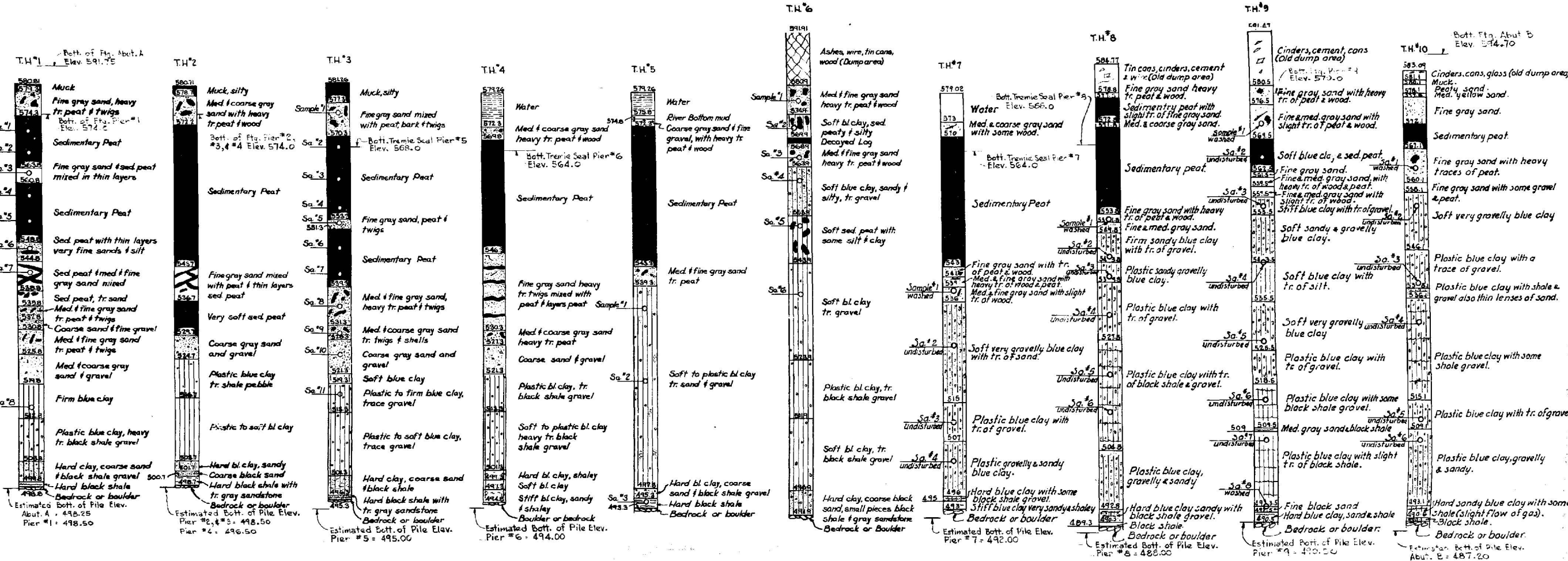
MICHIGAN STATE HIGHWAY DEPARTMENT
 STATE ENGINEER

SEC 4 T 6 N R 17 E FORT GRATIOT TWP. ST. CLAIR CO.
 BRIDGE FILE NO. B1-OF 77-20-11 ROAD M-29 REL. CD. STA. 459+57.71
 CROSSING BLACK RIVER AT WEST LIMITS OF HURON

GENERAL PLAN OF SITE

HAZELET & EDGAR, CONSULTING ENGINEERS
 1111 E. 10th St. Lansing, Michigan

APPROVED: *[Signature]* 1-22-49
 B1-OF 77-20-11



Notes:
 Slight flow of gas at all T.H.'s, which stopped after casing was pulled. All T.H.'s were bored through black shale to good hard rock or boulder.
 Consistency determined by inspection of samples and substantiated by soil resistance to casing and Jet Rod. This note applies to all T.H.'s.
 For location of T.H.'s, see Sheet #2

MICHIGAN STATE HIGHWAY DEPARTMENT
 DIVISION OF HIGHWAYS
 M29 RELOC CROSSING BLACK RIVER AT THE W. LIMITS OF PORT HURON

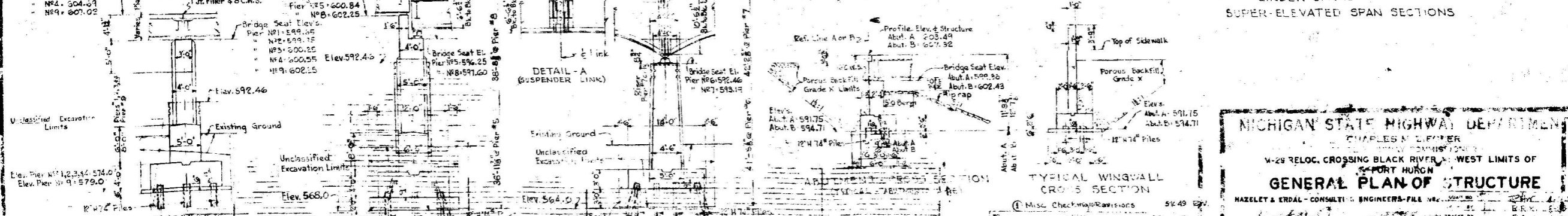
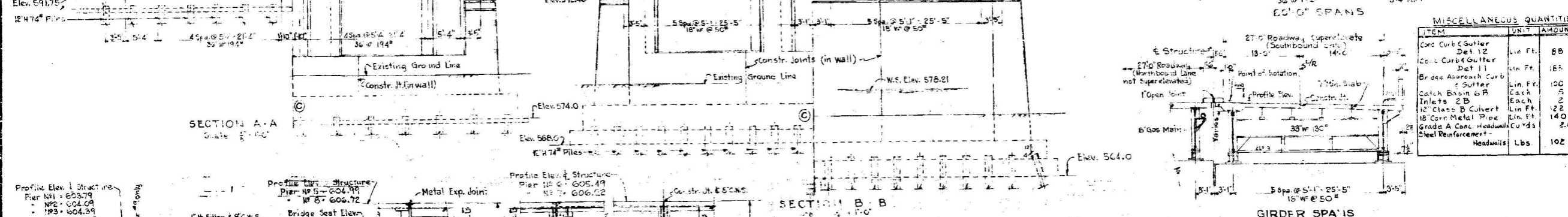
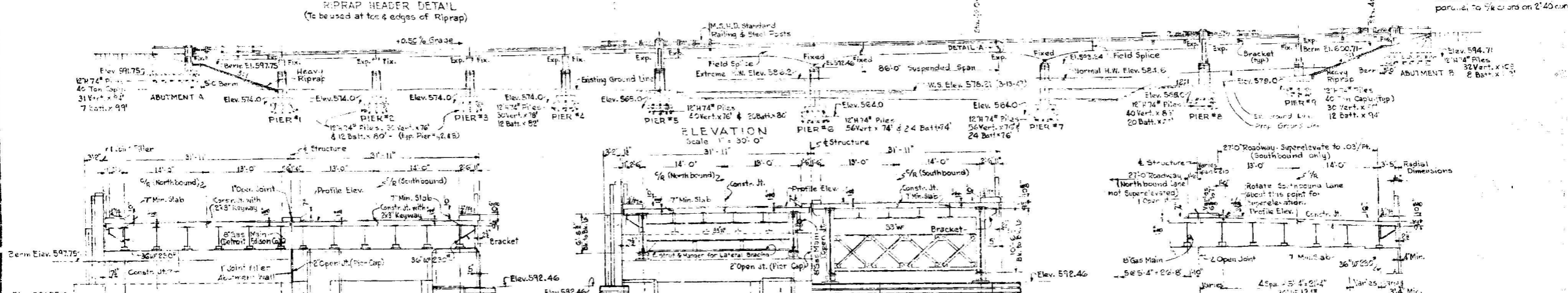
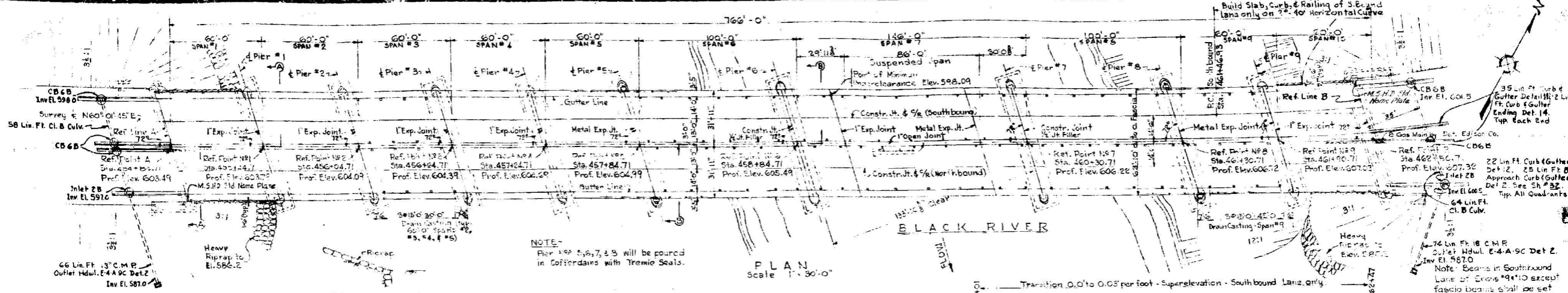
LOG OF BORING #

HAZELT & ERDAL CONSULTING ENGINEERS FILE #203

Revised Figs. No. 5, 8, 27 6-2-49 RCS

APPROVED: [Signature] ENGINEER

Bl of 77-20-11



MISCELLANEOUS QUANTITIES

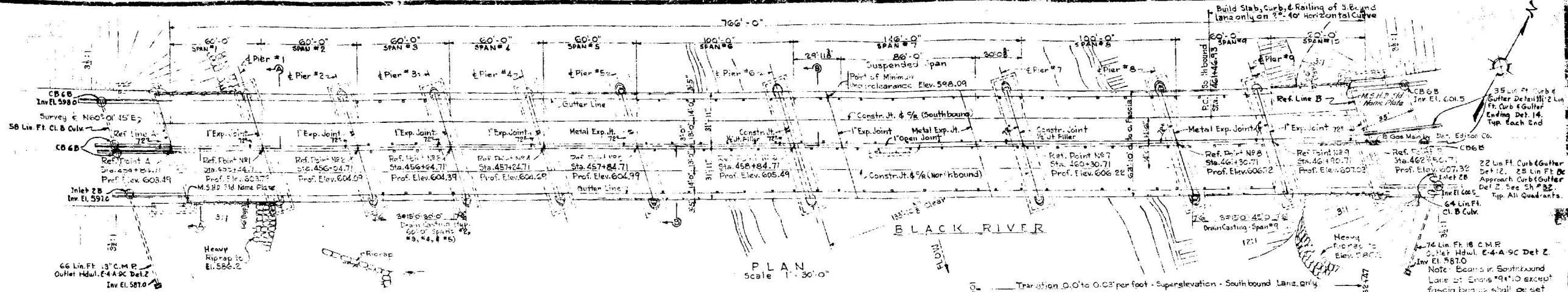
ITEM	UNIT	AMOUNT
Conc. Curb & Gutter Det. 12	Lin. Ft.	88
Conc. Curb & Gutter Det. 11	Lin. Ft.	185
Br. app. Approach Curb & Suffer	Lin. Ft.	100
Catch Basin 6" B	Each	5
Inlets 2" B	Each	2
18" Class B Culvert	Lin. Ft.	122
18" Conc. Metal Pipe	Lin. Ft.	140
Grade A Conc. Headwall Curbs		2.0
Steel Reinforcement - Headwalls	Lbs.	102

MICHIGAN STATE HIGHWAY DEPARTMENT
 CHARLES M. LEFFLER
 HIGHWAY COMMISSIONER

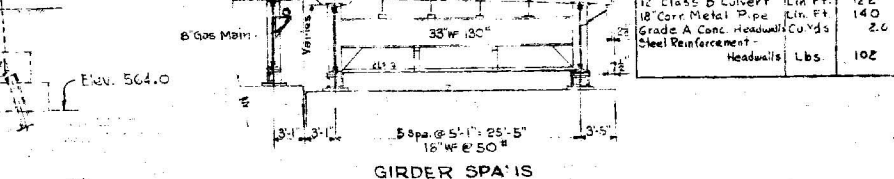
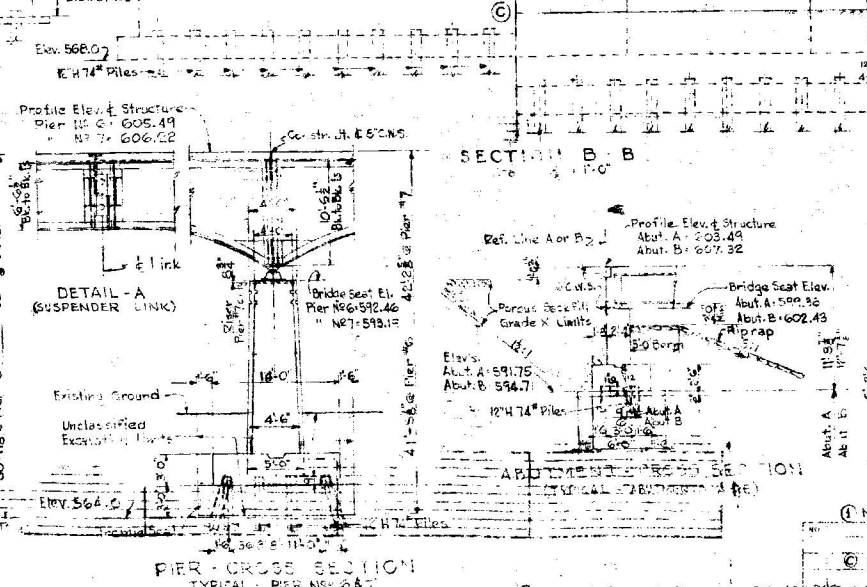
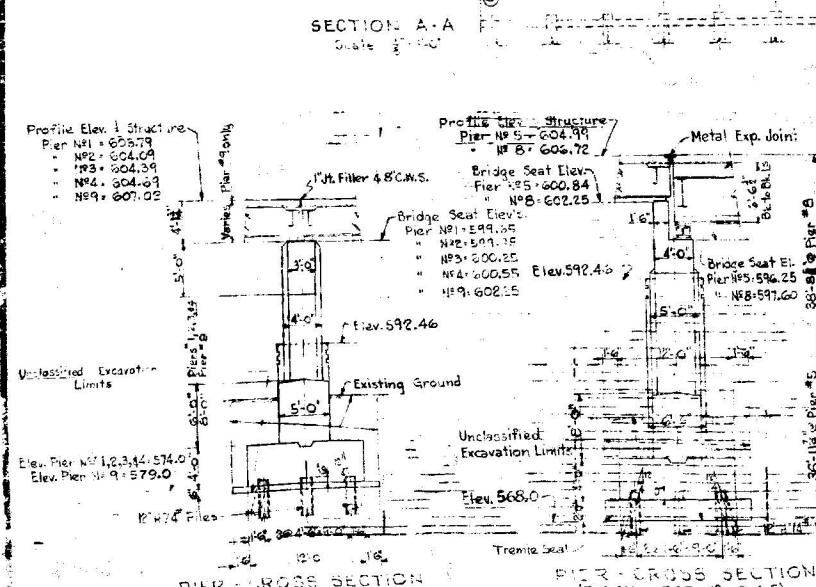
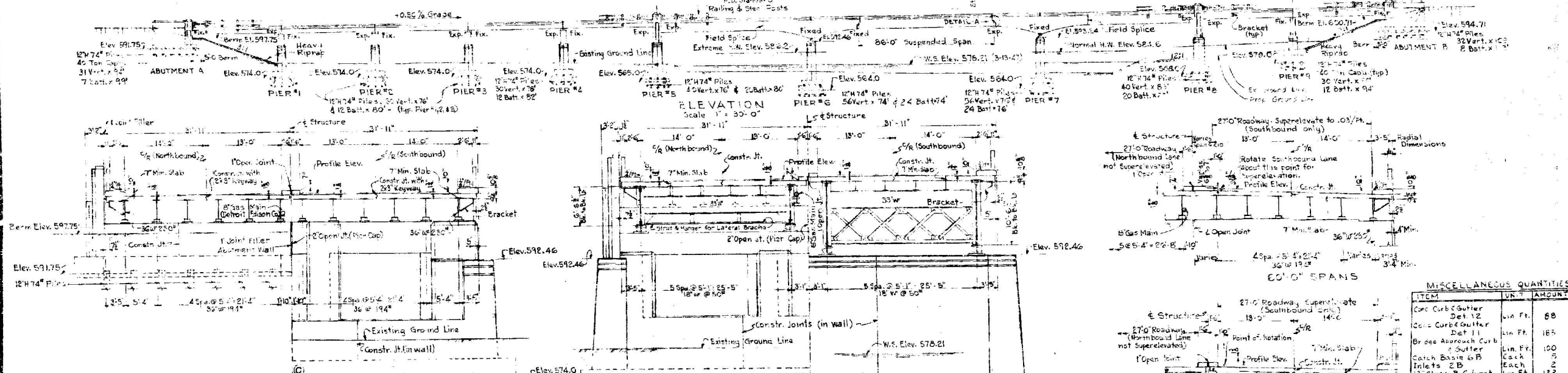
W-29 RELOC. CROSSING BLACK RIVER - WEST LIMITS OF
GENERAL PLAN OF STRUCTURE

HAZELT & ERDAL - CONSULTING ENGINEERS - FILE NO. 100-100-100

Bl of 77-20-11

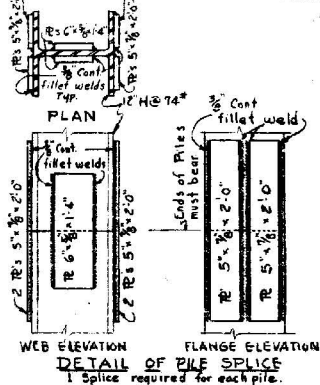
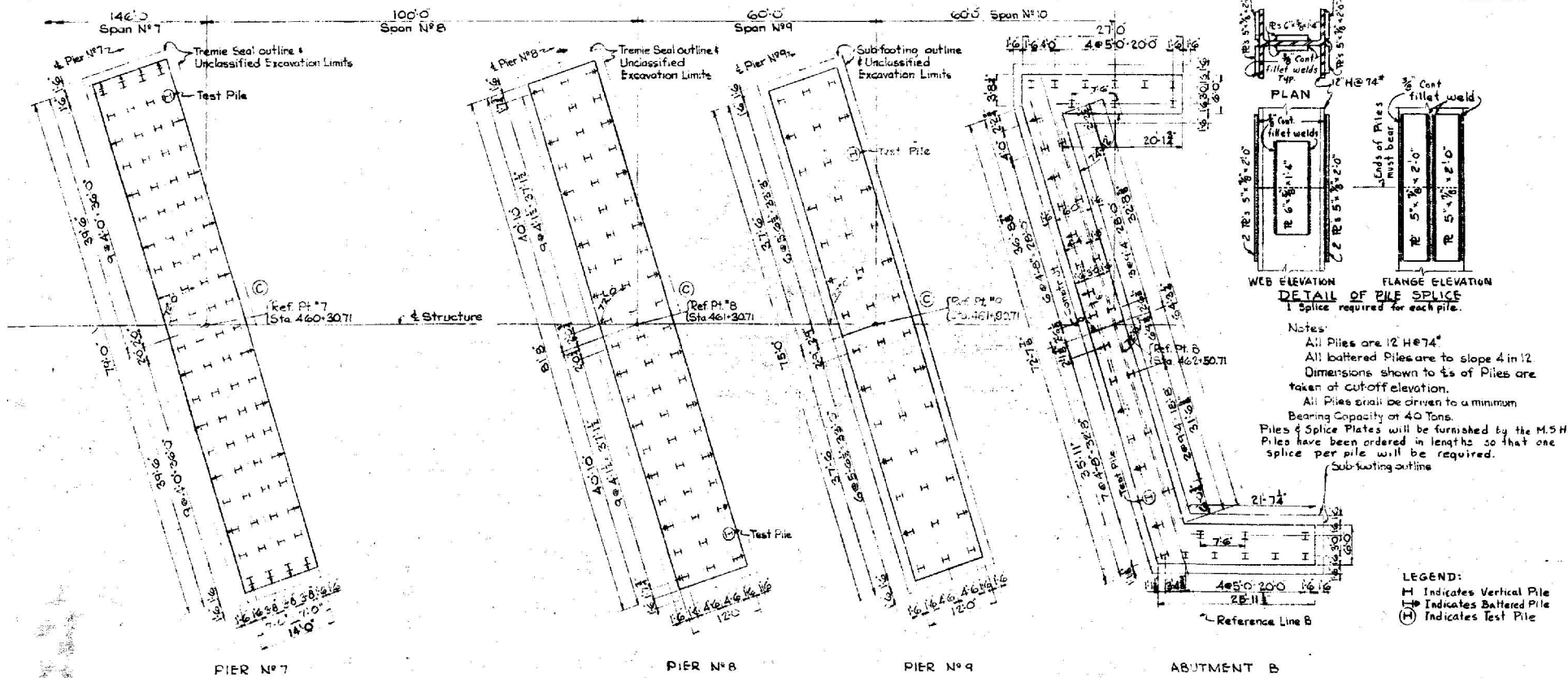
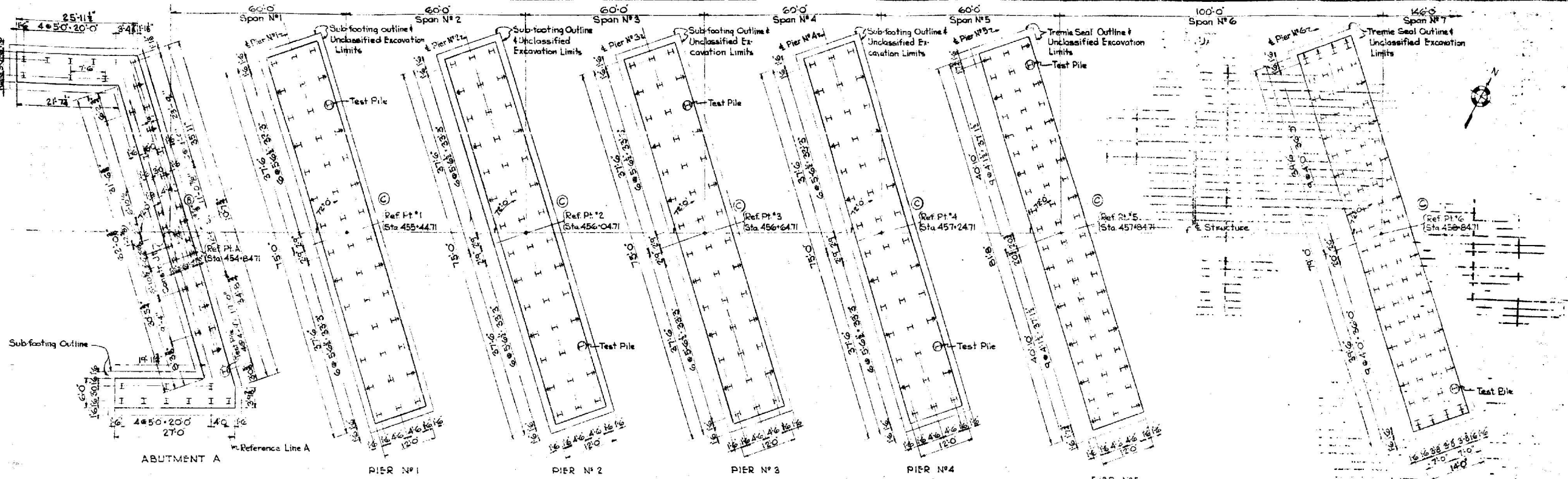


RIPRAP HEADER DETAIL
(To be used at top & edges of Riprap)



ITEM	UNIT	AMOUNT
Conc. Curb & Gutter Det. 12	Lin. Ft.	68
Conc. Curb & Gutter Det. 11	Lin. Ft.	185
Brass Approach Curb & Gutter	Lin. Ft.	120
Catch Basin 6" B	Each	5
Inlets 2 B	Each	2
12" Class B Culvert	Lin. Ft.	122
18" Corr. Metal Pipe	Lin. Ft.	140
Grade A Conc. Roadway C&G's	Sq. Yds.	2.6
Steel Reinforcement	Lbs.	102

NICHIGAN STATE HIGHWAY DEPARTMENT
 CHARLES M. LEPPER
 CHIEF ENGINEER
 W-29 RELOC. CROSSING BLACK RIVER - WEST LIMITS OF
 PORT HURON
GENERAL PLAN OF STRUCTURE
 HAZELT & ENDAL - CONSULTING ENGINEERS - FILE NO. 100-100-100
 Bldg 77-20-11



Notes:
 All Piles are 12 H#74
 All battered Piles are to slope 4 in 12
 Dimensions shown to 1/8 of Piles are taken at cut-off elevation.
 All Piles shall be driven to a minimum Bearing Capacity of 40 Tons.
 Piles & Splice Plates will be furnished by the M.S.H.D
 Piles have been ordered in lengths so that one splice per pile will be required.
 Sub-footing outline

LOCATION	NO. PILES	EST. TOTAL LENGTH		EST. TOTAL NO. CUT-OFF SPLICES	TOTAL NO. CUT-OFF SPLICES	MARK-UP
		EST. LENGTH EACH PILE	EST. TOTAL LENGTH			
ABUTMENT A	33	94	3080'	41	41	584.25
PIER #1	7	99	2240'	42	42	574.50
PIER #2	12	80	2240'	42	42	574.50
PIER #3	12	80	3240'	42	42	574.50
PIER #4	12	80	4640'	60	60	570.75
PIER #5	12	80	5920'	80	80	567.75
PIER #6	12	80	6080'	80	80	567.75
PIER #7	12	80	5080'	60	60	570.75
PIER #8	12	80	3798'	42	42	574.50
ABUTMENT B	33	115	4362'	40	40	595.21
TOTAL	115	120	46,614'	571	571	571.00

LEGEND:
 H Indicates Vertical Pile
 B Indicates Battered Pile
 T Indicates Test Pile

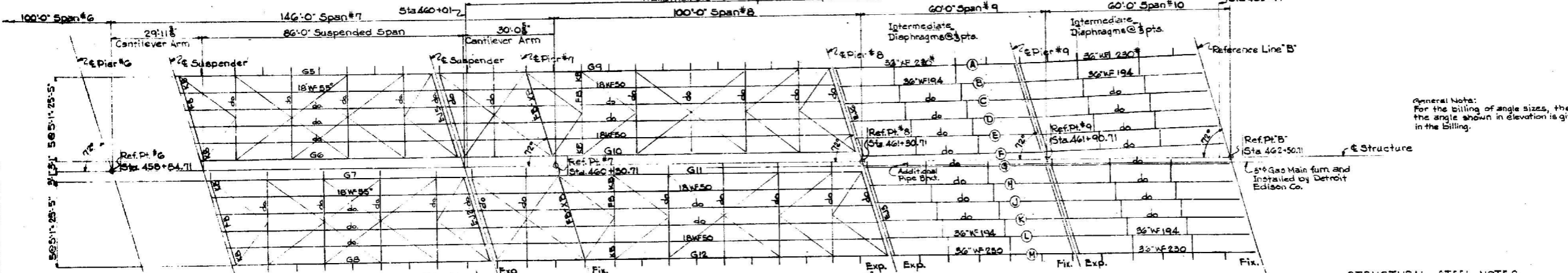
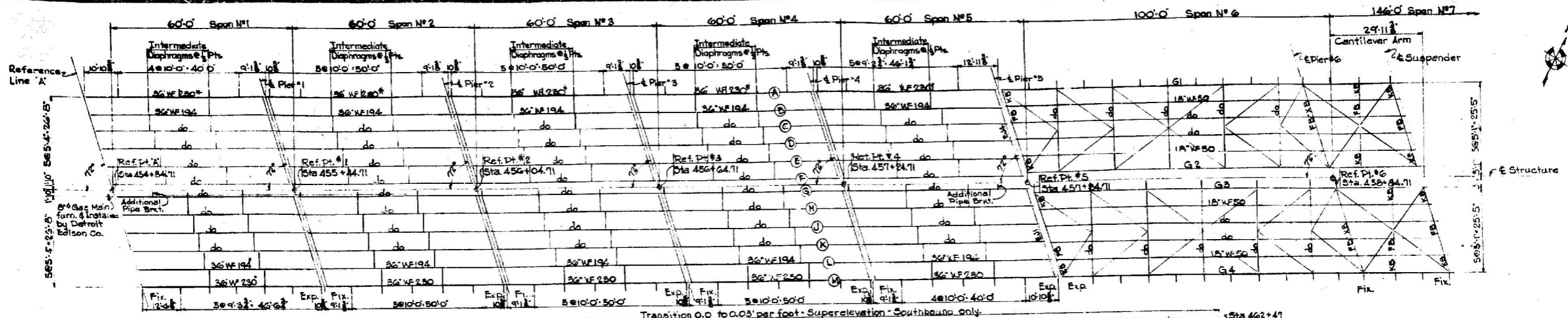
Revised Pile Lengths 6-2-49 K.C.S.
 Miscellaneous Checking Revisions 1/4/49 M.L.
 Revisions
 Revised pile layout in Abut. A 1/2/49 R.C.S.
 General Check in footing 1/2/49 K.C.S.

MICHIGAN STATE HIGHWAY DEPARTMENT
 CHARLES M. ZIEGLER
 STATE HIGHWAY COMMISSIONER
 M-29 RELOC. CROSSING BLACK RIVER AT WEST LIMITS OF PORT HURON

PILING PLAN

HAZELTINE & ERDAL CONSULTING ENGINEERS FILE NO. 203
 DRAWN BY: CPW 4-22-49
 CHECKED BY: H.E. 3-11-49
 APPROVED: [Signature] 4-22-49
 APPROVED: [Signature] 4-11-49

Bior 77-20-11



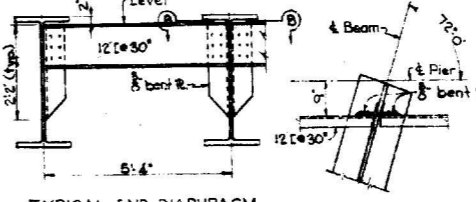
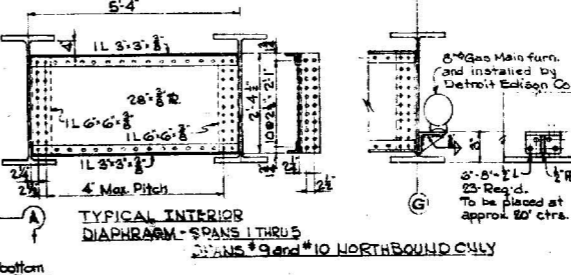
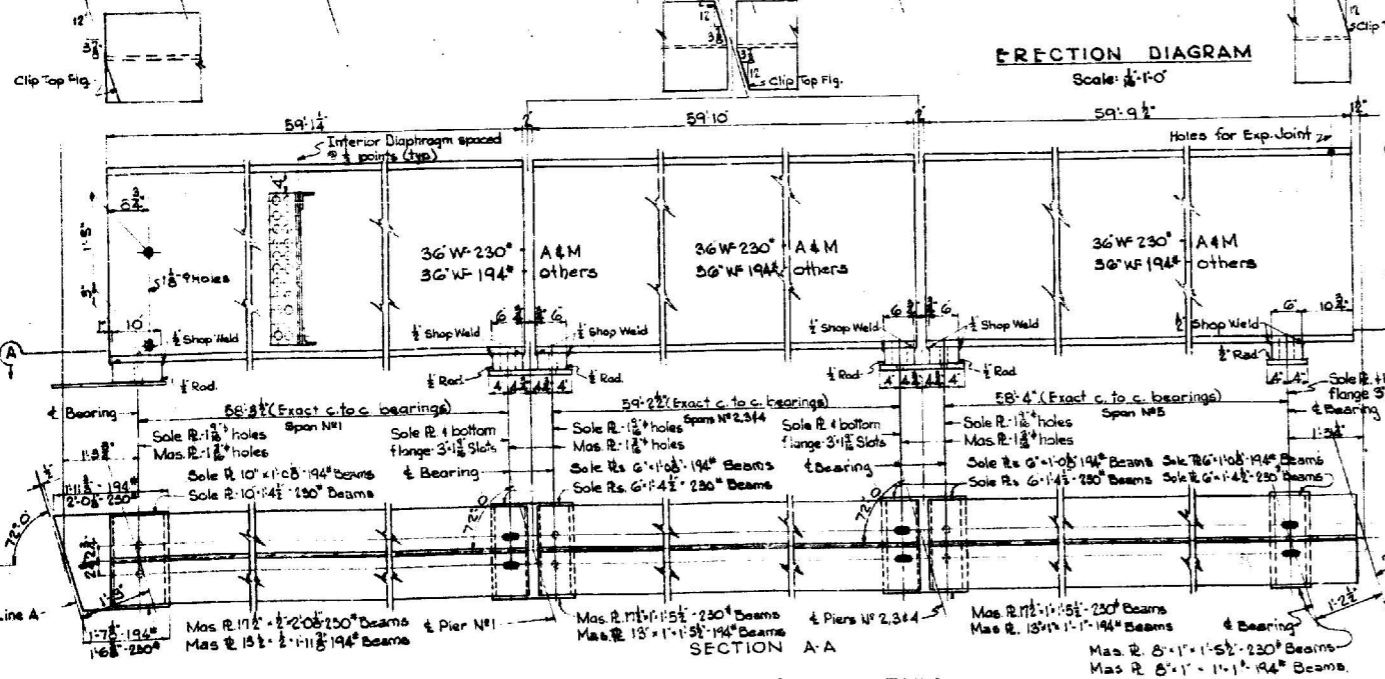
ERECTION DIAGRAM
Scale: 1/4" = 1'-0"

Note: For Details not shown in Spans #7 & 8 see Sheet #17.
For Details not shown in Spans #9 & 10 see Sheet #16.
For Bracket Details see Sheet #16.
For Position Dowel Detail see Sheet #16.

STRUCTURAL STEEL NOTES

Fabrication: Michigan State Highway Department's Standard Specifications for Road & Bridge Construction, 1942 Edition.
Design: Michigan State Highway Department's Specifications for the Design of Highway Bridges, 1936 Edition (H 20S 1044 Loading). Max. Live Load + Impact Deflection: 1/400 of Span Length or 1/800 of Cantilever Arm.
Shop Connections: All shop connections shall be riveted unless otherwise shown or noted.
Field Connections: Plate Girder Spans - field connections unless otherwise shown or noted shall be riveted with 3/8" rivets. Rolled Beam Spans - field connections unless otherwise shown or noted shall be riveted with 3/4" rivets.
Rivets: Plate Girder Spans 7/8" & Rolled Beam Spans 7/8" & Open Holes: Open holes shall be 1/2" for Rolled Beam Spans and 5/16" for Plate Girder Spans, except as noted.
Shop Paint: In addition to the shop paint provisions of the Standard Specifications, the top surfaces of expansion and masonry plates, the curved surfaces of rockers, and the surface of sole plates in contact with the rockers shall be coated in accordance with the requirements for machine finished surfaces.
Sole Plates: Sole plates 3" or more in thickness may be built up by welding together plates not less than 1/2" in thickness. Bevel edges 1/4" and weld continuous around the entire perimeter. Grind welds flush with faces of plates.
Camber: No Camber in 60' Beam Spans. See Sheet #14 for Girder Camber Diagrams.
Splices: Splices shall be completely assembled in the shop, reamed and match marked.
Field Painting: Parts of structure which will be inaccessible for painting after erecting shall be field painted before erection.

Field Painting Structural Steel - Lump Sum
Total Estimated Structural Steel Weight - 2,314,500
(Railing Weight not included) (Includes Brackets for Gas Main)
Total Estimated Weight Brackets for Gas Main - 1,670



SECTION B-B

Note: For Sole Pl. Thickness Table see Sheet #16

① Misc. Checking Revisions 5/10/49 RW
Note: Work Sheets #4, incl. together

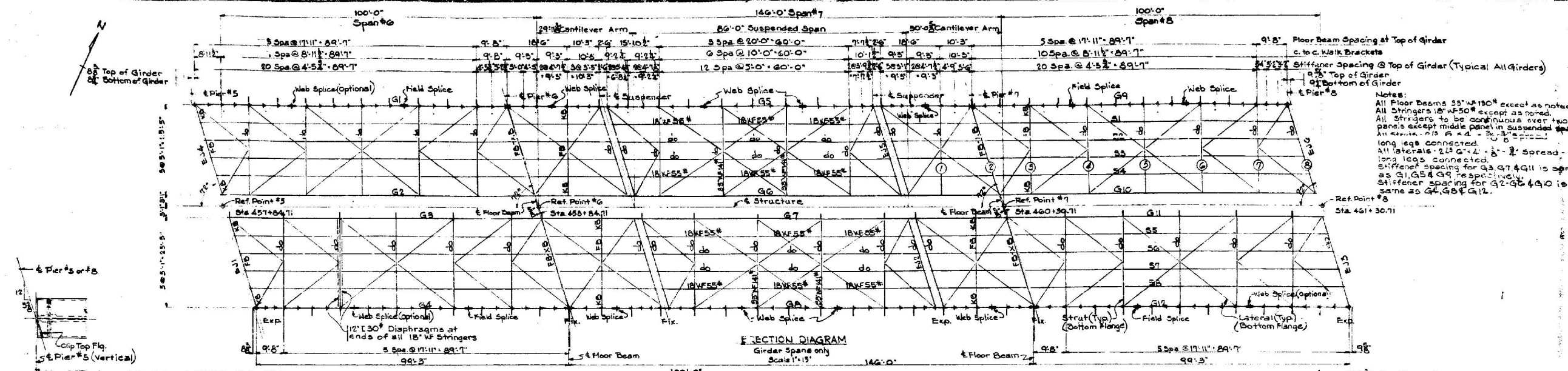
MICHIGAN STATE HIGHWAY DEPARTMENT
CHARLES M. ZIEGLER
STATE HIGHWAY COMMISSIONER
M-29 RELOC. CROSSING BLACK RIVER AT WEST LIMITS OF PORT HURON

STRUCTURAL STEEL DETAILS

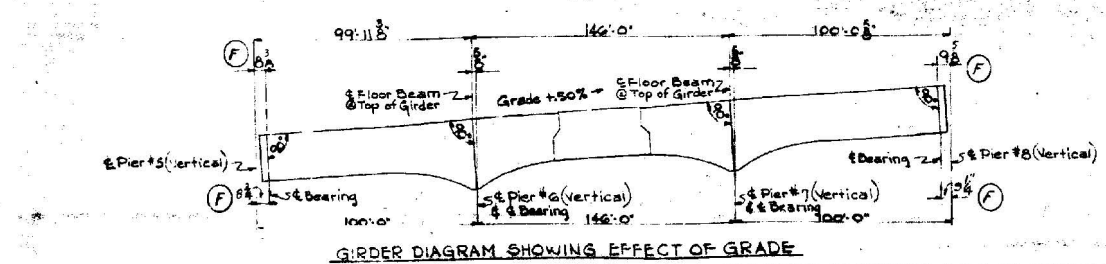
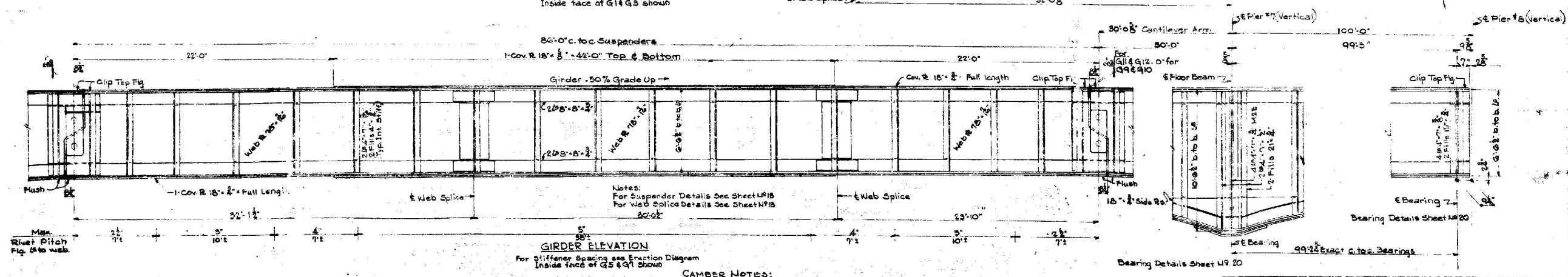
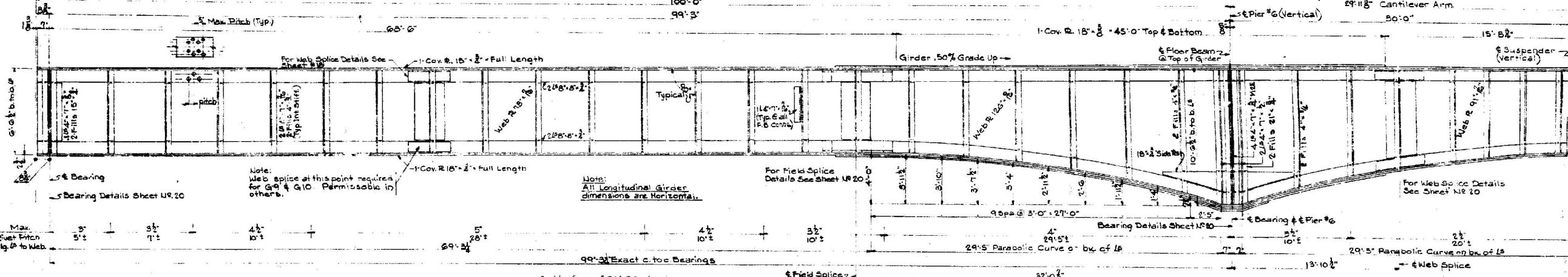
HAZLET & ERDAL CONSULTING ENGINEERS FILE # 203

APPROVED: [Signature]

Blot 77-20-11



Notes:
 All Floor Beams 35" x 130" except as noted.
 All Stringers 18" x 50" except as noted.
 All Stringers to be continuous over two panels except middle panel in suspended span.
 All laterals 2 1/2" x 2" x 8' spread long legs connected.
 All laterals 2 1/2" x 2" x 8' spread long legs connected.
 Stiffener spacing for G3, G7 & G11 is same as G1, G5 & G9 respectively.
 Stiffener spacing for G2, G6 & G10 is same as G4, G8 & G12.



CAMBER NOTES:
 G1-G2-G3 No camber required. Fabricate Top Flange straight; Bottom Flange as shown. Note that bottom flange in Cantilever Arm is adjusted up 1/2" at end to allow for total D.L. deflection.
 G5-G6-G7-G8 Camber for D.L. deflection. See Sheet #14 for diagram.
 G9-G10 Camber for D.L. deflection plus effect of Super-elevation Transition. See Sheet #14

① Misc Checking Revisions 5-10-49 E.W.
 Note: Work Sheets #14-#21 incl. together
 F Connected & of Pier to & of Br.

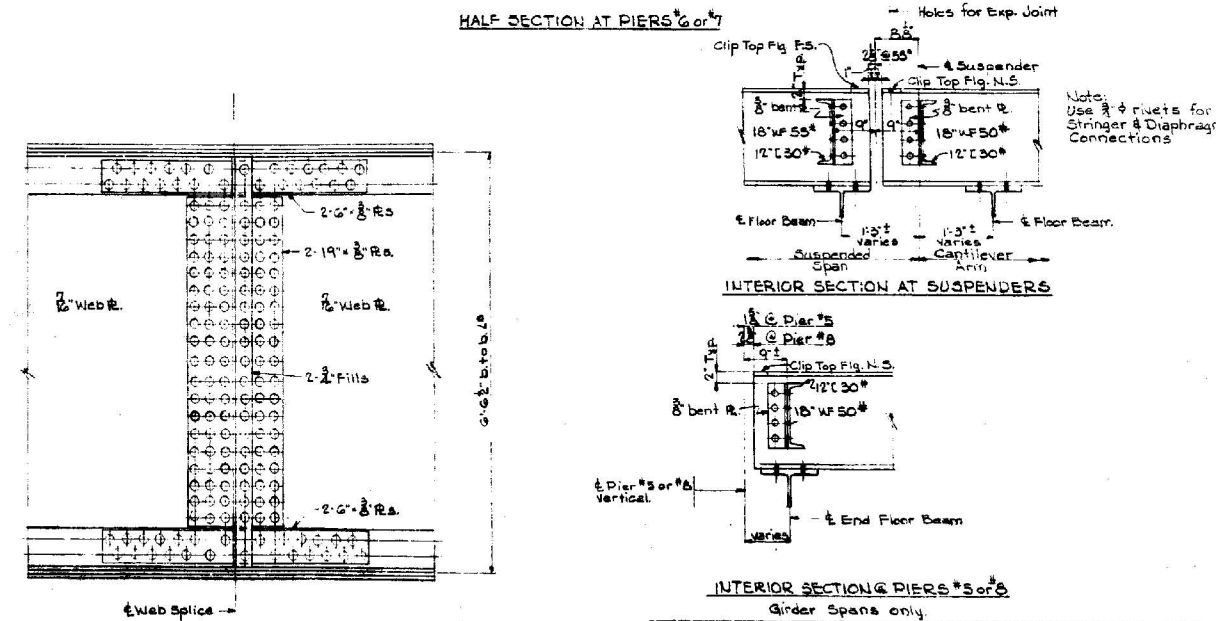
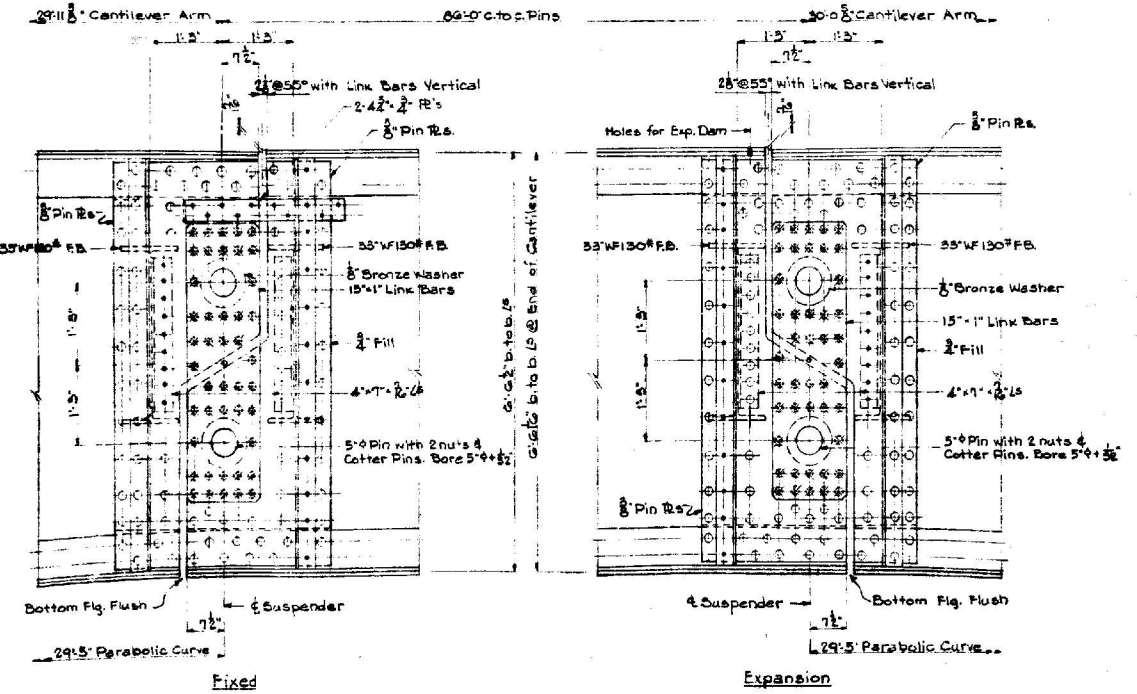
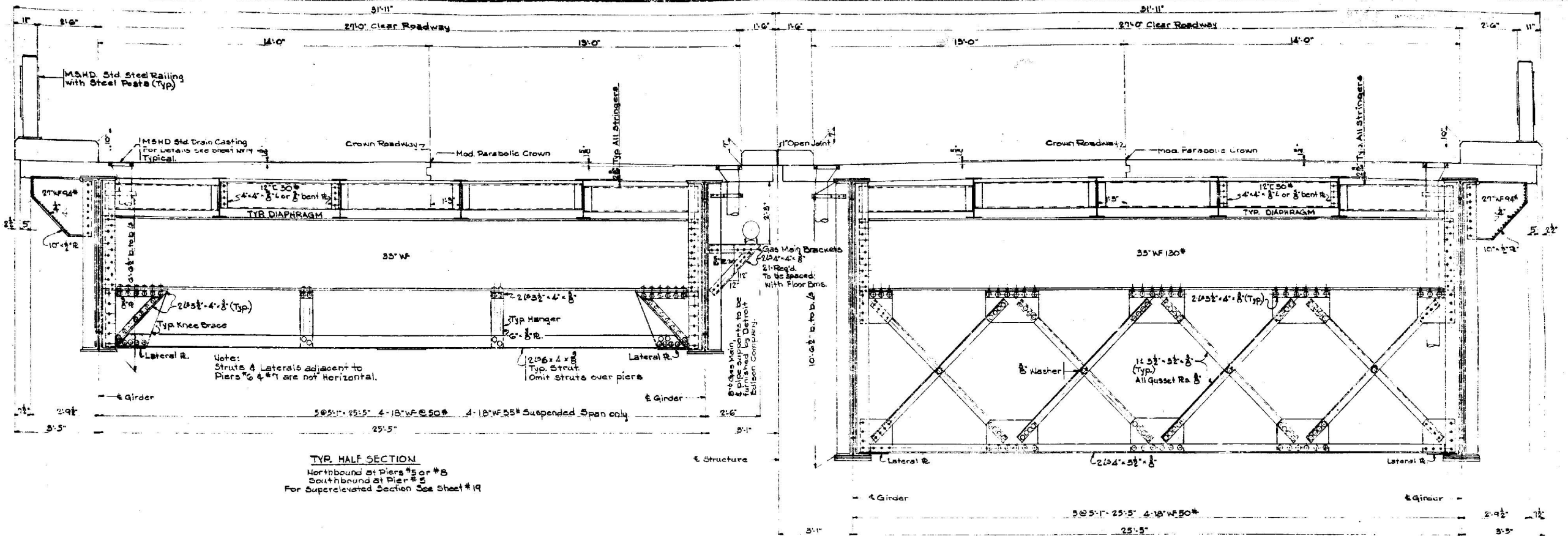
CAMBER FOR G9&G10
 (Dimensions in inches)

MICHIGAN STATE HIGHWAY DEPARTMENT
 CHARLES M. ZIEGLER
 STATE HIGHWAY COMMISSIONER
 M-29 RELOC. CROSSING BLACK RIVER AT WEST LIMITS OF PORT HURON

STRUCTURAL STEEL DETAILS

HAYLEY & KIRAL - CONSULTING ENGINEERS FILE #203
 APPROVED: [Signature] 4-15-49
 APPROVED: [Signature] 4-18-49
 APPROVED: [Signature] 4-22-49

Bl of 77-20-11



③ Misc. Checking Revisions 5-10-49 R.W.
 Note: Work Sheets #14-#21 incl. together.

NO.	DESCRIPTION	DATE	BY

MICHIGAN STATE HIGHWAY DEPARTMENT
 CHARLES M. ZIEGLER
 STATE HIGHWAY COMMISSIONER
 M-29 RELOC. CROSSING BLACK RIVER AT WEST LIMITS OF
 PORT HURON

STRUCTURAL STEEL DETAILS

HAZELET & ERDAL - CONSULTING ENGINEERS FILE #P 200

APPROVED: *[Signature]* 4-22-49
 APPROVED: *[Signature]* 4-22-49
 APPROVED: *[Signature]* 4-22-49

REVISIONS

1-1-49
 GDS 1-20-49
 GDS 1-21-49
 AHE 4-1-49
 IB 31

B1 of 77-20-11