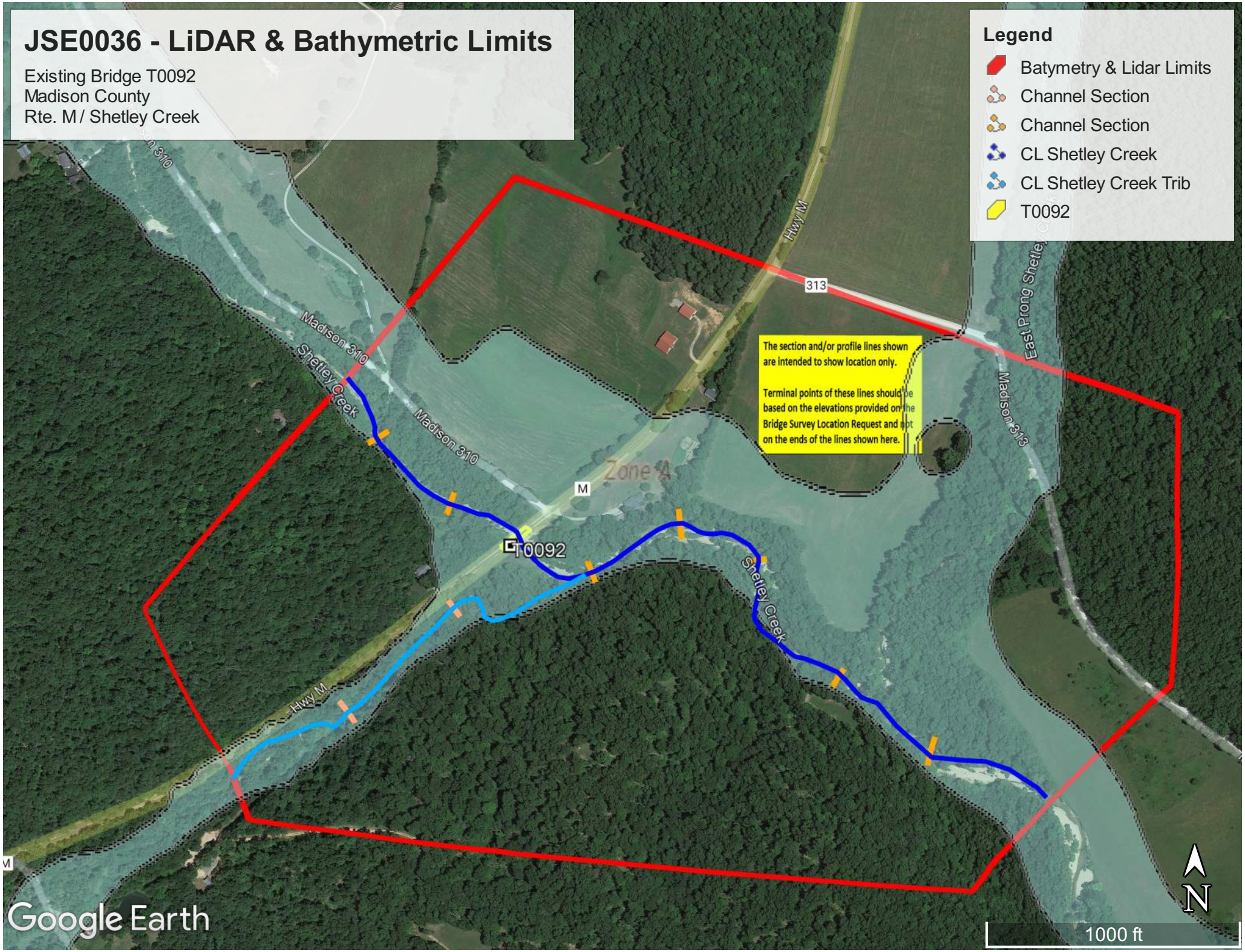

JSE0036 - LiDAR & Bathymetric Limits
Existing Bridge T0092
Madison County
Rte. M / Shetley Creek
Legend
Batymetry & Lidar Limits
Channel Section
Channel Section
CL Shetley Creek
CL Shetley Creek Trib
T0092
The section and/or profile lines shown are intended to show location only.
Terminal points of these lines should be based on the elevations provided on the Bridge Survey Location Request and not on the ends of the lines shown here.
Hwy M
313
Madison 310
Shetley Creek
Madison 310
Zone A
M
T0092
Shetley Creek
East Prong Shetley
Madison 313
Hwy M
Google Earth
N
1000 ft

12/19

Job No. SE0036

Replaces Bridge No. T0092

Missouri Department of Transportation

Bridge Survey Location Request

Page 1 to be completed by District staff.

Bridge over: Shetley Creek Route: M

County: Madison Section: 12 Township: 31 North Range: 7 East

Latitude: 37°22'41.64"N Longitude: 90°13'35.89"W

District Contact: Garrett Galyean (573-472-5221) Date: 5/4/2023

HIGH WATER ELEVATIONS AT PROPOSED BRIDGE SITE

Recorded high water elevations or elevation of high water marks

Extreme High Water (EHW) (Give date(s) of occurrence)		
Elevations and date(s) of same	Location	Source of information
3.4" Below (2008)	Below North End of Bridge Deck	HW Marks 2008

Existing Bridge Overtopped ☐ Yes ☐No ☒Unknown	Existing Roadway Overtopped ☐ Yes ☐No ☒Unknown Approx. Overtopping Location(s):

LOCATION OF NEW BRIDGE

Replace in Existing Location	☒	Provide details of any proposed changes to profile grade below or as an attachment.
Relocation (near existing Structure)	☐	Provide details of proposed location and grade of the roadway across the floodplain, any proposed/potential channel changes or modifications, etc. below or as an attachment.
New Route	☐	
Other:	☐	

Additional Information:

Page 2 & subsequent pages to be completed by Bridge Division

Note: Proposed elevations, distances, etc. are based on the best available data at the time the form was completed. Actual field conditions or recently acquired data may require deviation from the proposed values. Please contact the Bridge Division with concerns regarding the proposed values or if large deviations from these values are required.

Note: The information below supplements the survey requirements noted in the EPG, please consult EPG 238 for additional surveying requirements.

Bridge Contact: Travis Stump, 573-522-8716, Travis.Stump@modot.mo.gov

Survey Type: **2D Survey**

Stream Crossing Survey Location Details (2D)

Item	Requirement	Standard Guidance		Specific Guidance	
LIDAR Data (EPG 238.3.36.3.5.1)	Elevation	5' min. Above Extreme High Water [on Overbanks Perpendicular (more or less) to Stream Flow]		Minimum Elevation =	590
	Upstream & Downstream Distance	Contraction and Expansion Limits of Existing/Proposed Crossing		Use Upstream and Downstream Limits shown in Image and kmz files	
Streambed Profiles** (EPG 238.3.36.3.6)	Length	To limits of LIDAR data		Use Standard Guidance	
	Elevation Intervals	Within 500' of Crossing	Natural Stream 25'	Use Standard Guidance	
		Beyond 500' from Crossing	At Vertical and Horizontal Break Points (200' max.)	Use Standard Guidance (see EPG 238.3.36.3.6 if a significant slope change is encountered)	
Bathymetric Channel Sections	Location	At or near the locations shown in the image and kmz files.		Use Standard Guidance Location of sections may be moved to nearby locations that are transition points in width or slope of the channel. Additional sections may be added if more sections are needed to capture these transitions adequately.	
	Orientation	Perpendicular to channel		Use Standard Guidance	
	Terminal Point	Water Surface Elevation or Ordinary High Water Elevation Mark for dry or shallow streams (EPG 127.4.1.1) **Note: OHW Mark may be different at each section**.		See Bathymetric Channel Section Details Below	

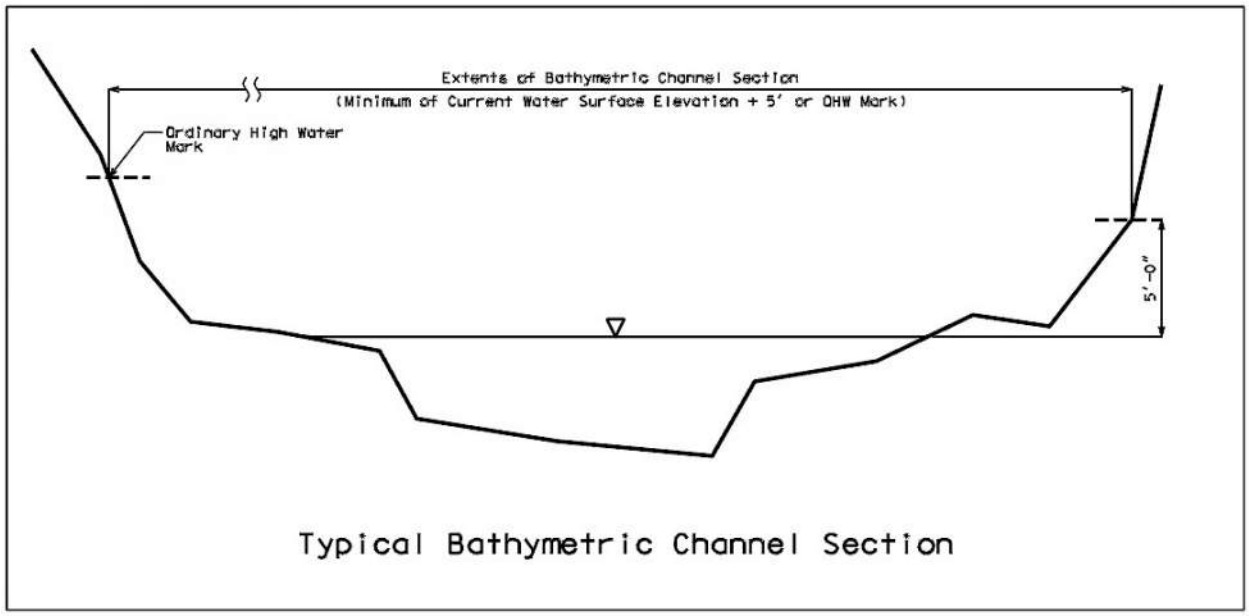
Item	Requirement	Standard Guidance		Specific Guidance
Water Surface Profile (EPG 238.3.36.3.7)	**Water Surface Profile Data Needed?** ☐ Yes ☒ No			
	Locations with flowing water	Drainage Ditch	100' and 200' each side of Crossing	Use Water Surface Profile Standard Guidance

Item	Requirement	Standard Guidance	Specific Guidance
Existing Bridge Data	**Existing Bridge Data Needed?** ☐ Yes ☒ No		
	Description	Provide General Description	N/A

Item	Requirement	Standard Guidance	Specific Guidance
Other Bridges (EPG 238.3.36.3.10)	**Other Bridge Data Needed?** ☐ Yes ☒ No		
	Description	Provide General Description	N/A

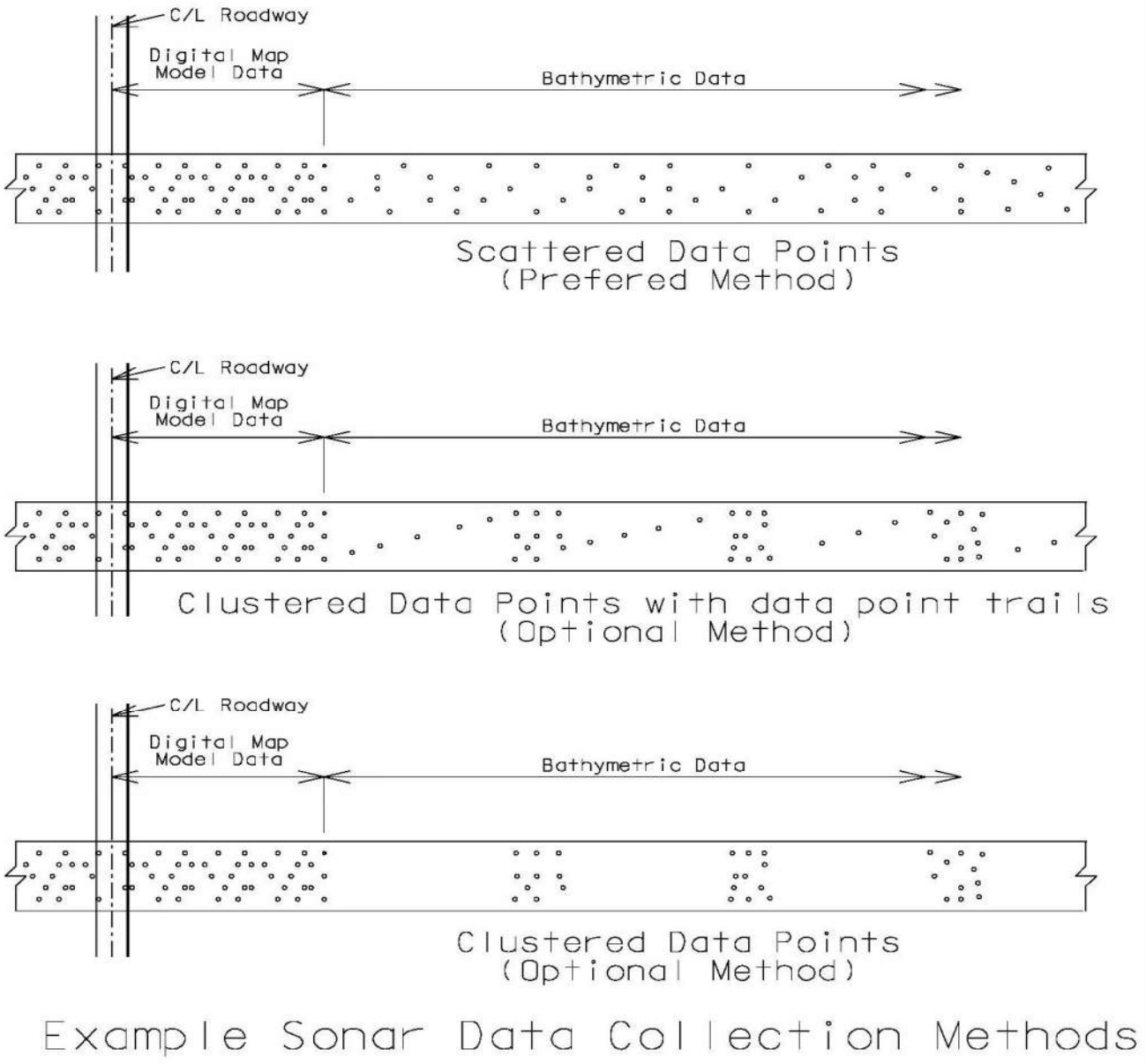
Bathymetric Channel Section Details:

- **Dry or Shallow Streams** - Sections should extend to an elevation equal to:
  - Minimum of the current water surface plus 5',
  - or the Ordinary High Water mark (EPG 127.4.1.1.)
  - May be single row of field shots or cluster of shots near the section location.



Typical Bathymetric Channel Section

- **Floatable Streams:**
  - Conventional Survey:
    - Sections should extend to an elevation equal to the current water surface elevation.
    - May be single row of field shots or cluster of shots near the section location.
  - Sonar Survey:
    - Data should extend as near to the current water surface elevation as feasible.
    - Example data collection methods are shown below:
      - Scattered data points for the full extent of the survey are preferred.
      - Data points concentrated at survey cross section locations are an acceptable alternative.



Example Sonar Data Collection Methods

Additional Information:

The streambed profile data and bathymetric channel section data should **not** be included in the terrain file. 3rd party LIDAR, MoDOT survey data (conventional or LIDAR) should be provided as separate terrain files.

Additional Documents Provided:

Image & kmz file showing LIDAR Data Limits and special channel section locations.

Details for Completion of Stream Crossing Bridge Survey				
Item	**Requirement**	**Standard Guidance**		**Specific Guidance**
Centerline and Offset (3 Line) Profiles (EPG 238.3.36.1.3 & EPG 747.2.3.4.1)	**Centerline and Offset (3-Line) Profiles Needed?** ☒ Yes ☐ No			
	C/L Profile	Terminal Point	Sufficiently Past End of Bridge	Use Standard 3-Line Profile Guidance
	Upstream Offset Profile	Terminal Point	Sufficiently Past End of Bridge	Use Standard 3-Line Profile Guidance
		Offset Distance	On Natural Ground	Estimated Distance = 30
	Downstream Offset Profile	Terminal Point	Sufficiently Past End of Bridge	Use Standard 3-Line Profile Guidance
		Offset Distance	On Natural Ground	Estimated Distance = 30
	Special	Adjust offsets as necessary so they are on natural ground.		
Contracted Profile (EPG 747.2.3.4.2)	C/L Profile	Terminal Point of Grade Change		Use Standard Contracted Profile Guidance
	Note: • **Only the centerline profile is needed.** • **The full centerline profile may be included with 3-Line profile when practical, and the Contracted Profile Sheet eliminated.**			

Roadway Design Notes for Bridge Survey:

The Bridge Survey should include all the pertinent items listed in EPG 747 and the Bridge Survey Checklist except for the following:

- Valley Section sheets
- Channel Section sheets
- Water Surface Profile
- Other structures

A geo file will be needed for use in developing the bathymetric terrain in the hydraulic model.

Geo file requirements:

- The geo file should contain:
  - the streambed profile,
  - offset profiles
  - and Bathymetric Channel Section survey data
- In the GEO/HEC Converter spreadsheet the Bathymetric Channel Sections can be placed in either the Valley Section or Channel Section fields.
- If the stream bed profile is not provided, or does not extend to all the sections, use the coordinates and elevation of the low point of channel section as the coordinates and elevations to create a profile or extend the surveyed profile.

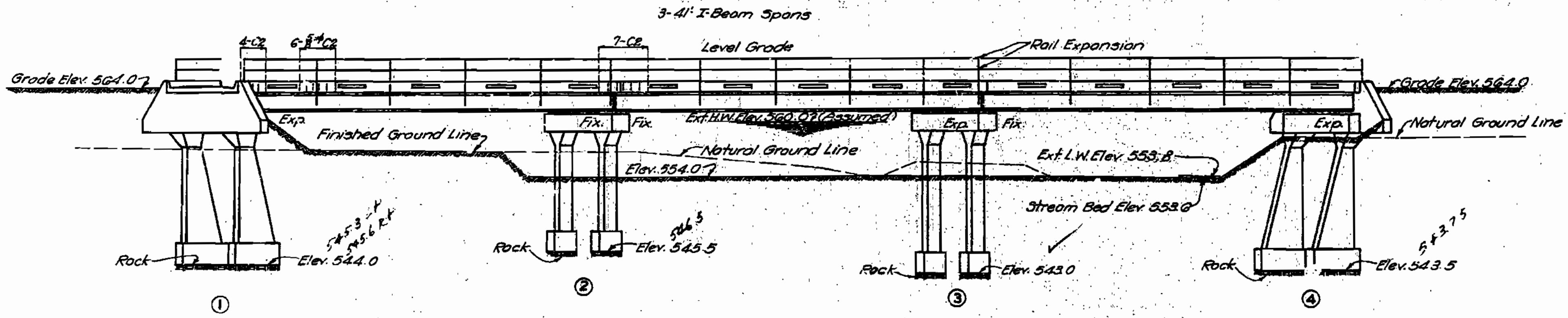
Bridge Design Notes:

FEMA Zone A. No road closers due to flooding listed in TMS, however, rough 2D model shows roadway overtopping for the 100-year flood. The downstream tributary, East Prong Shetley Creek, had no to little affect on water surface elevation near this crossing. The first tributary downstream did have an affect.

MISSOURI STATE HIGHWAY DEPARTMENT

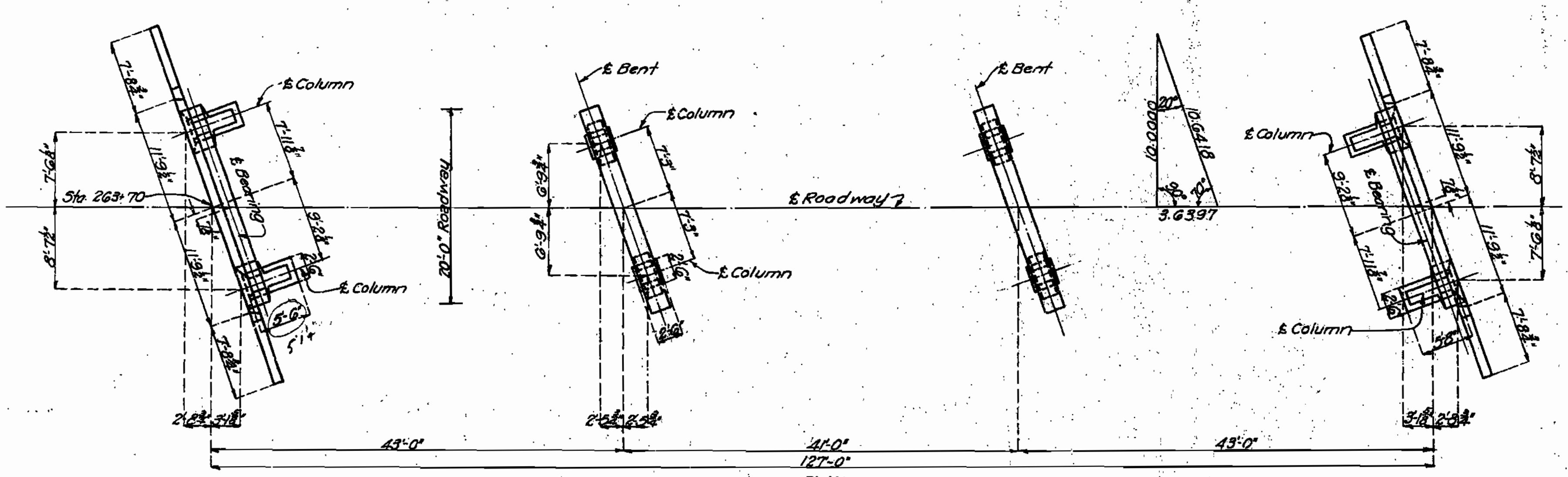
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	MO.	Ref. # 6 (S.B) S1	19		

Note: Outlets in curbs to be centered between railposts.

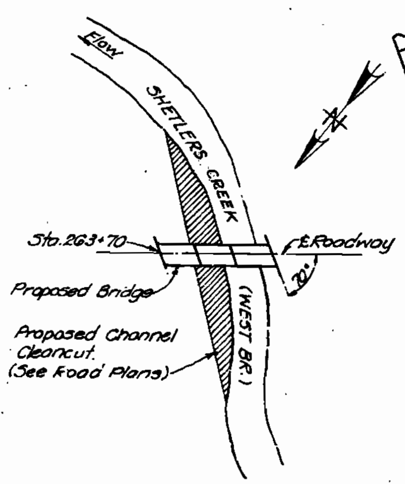


Note: All loose, shelly, or disintegrated rock shall be removed and the footings placed on hard, solid undisturbed rock. If soft rock or shale is encountered, the footings shall be carried at least 18" into the same.

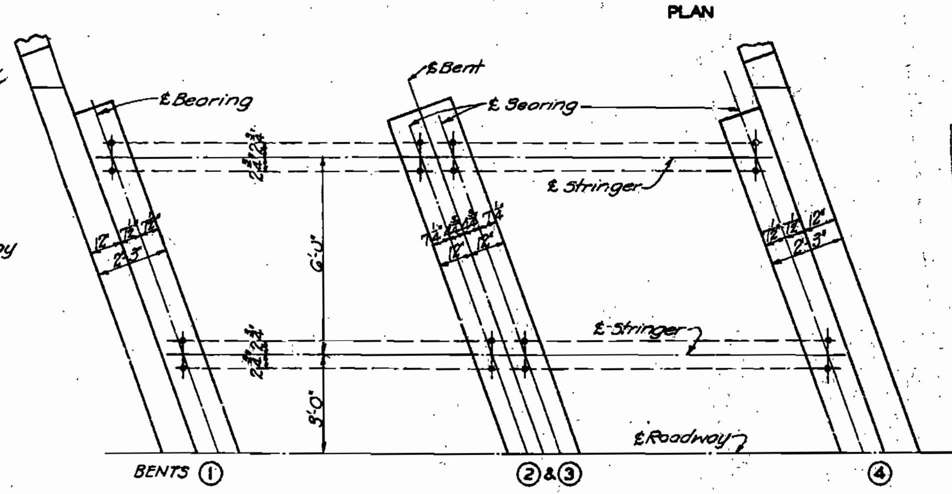
GENERAL ELEVATION



PLAN



LOCATION SKETCH



HALF ANCHOR BOLT PLAN

BILL OF REINFORCING STEEL FOR SUPERSTRUCTURE					
No.	Size	Length	Mark	Location	Bending Sketch and Cutting Diagram
32	5/8"φ	22'-6"	C1	Curb	
188	3/8"φ	2'-0"	C2	"	
16	5/8"φ	21'-6"	C3	"	
454	5/8"φ	21'-0"	S1	Slab	
104	1/2"φ	22'-3"	S2	"	
90	5/8"φ	22'-5"	S3	"	15-S3 CUT 90 BARS
12	1/2"φ	22'-3"	S4	"	
52	1/2"φ	21'-3"	S5	"	C2

Note: Dimensions given are along centerline of bars and are for computed lengths.

GENERAL NOTES:

Concrete in slab and curbs to be 1:2:3½ mix; Class "X." All other concrete to be 1:2:4 mix; Class "B."
Exposed edges to be beveled ¾" where no other bevel is noted.
Bridge excavation in accordance with Section I of Standard Specifications issued April 1, 1930, except that quantities paid for will be computed from extreme low water Elev. 553.8, where existing ground line is below this elevation.

I-Beams with fastenings, spacers, handrail, handrail posts with fastenings will be paid for as structural steel.
Cost of metallic edge moulding will be included in price bid for concrete.
Detail shop drawings shall be submitted to the State Highway Department in duplicate and shall be approved before steel is fabricated.
Where rubber compound is specified on plans for use in partition and expansion joints, the premoulded joint shall be securely stitched to one face of concrete with copper wire.
Paint: Shop, none: Field, contact surfaces of bolted field connections one coat red lead and surfaces inaccessible after erection three coats of red lead. No other paint to be applied by contractor. Red lead required shall be furnished by the contractor. See Special Provisions.
See Special Provisions in regard to permissible beam substitutions and basis of payment.

Rivets ¾"φ, holes 13/16"φ, except in handrail where rivets shall be 5/8"φ, holes 11/16"φ. Field connections for handrail channels shall be 5/8"φ button head bolts and for connection of rail to railposts shall be 5/8"φ bolts, holes 11/16"φ. All other field connections riveted except as noted.

FINAL QUAN.	ESTIMATED QUANTITIES				
	ITEM		SUPERSTR.	SUBSTR.	TOTAL
24.5	Excavation Class 1	Cu. Yds.		25	25
124.0	Excavation Class 2	Cu. Yds.		126	126
43.9	Concrete 1:2:4 mix, Class "B"	Cu. Yds.		43.3	43.3
63.3	Concrete 1:2:3½ mix, Class "X"	Cu. Yds.	63.3		63.3
55610	Fabricated Structural Steel	Lbs.	56250		56250
21980	Reinforcing Steel	Lbs.	16000	5980	21980
7.5	Test Holes.	Lin. Ft.			

Note: Bridge excavation above Elev. 555.0 will be paid for as Class 1 Bridge Excavation.
Bridge excavation below Elev. 555.0 will be paid for as Class 2 Bridge Excavation.

B.M. #27 - Elev. 559.49 N.I.R. 12" Sugar Maple 60' Rt. Sta. ... 20.

BRIDGE OVER SHETLERS CREEK (WEST BR.)

STATE ROAD FROM MARQUAND TO BUCKHORN

ABOUT 5.25 MILES S.W. OF MARQUAND

PROJECT NO. REF. NO. 6 (SB) S1 STA. 263+70

FINISHED

MADISON COUNTY

SUBMITTED BY M R Loy DATE 2/16/34 BRIDGE ENGINEER

APPROVED BY T H Cutler DATE 2/16/34 CHIEF ENGINEER

372

Drawn Aug. 1933 By R.J.G.
Traced Aug. 1933 By R.J.G. Assembled Feb. 1934 By R.J.G.-G.W.
Checked Aug. 1933 By N.W.R. Checked Feb. 1934 By N.W.R.

Note: This drawing is not to scale. Follow dimensions.

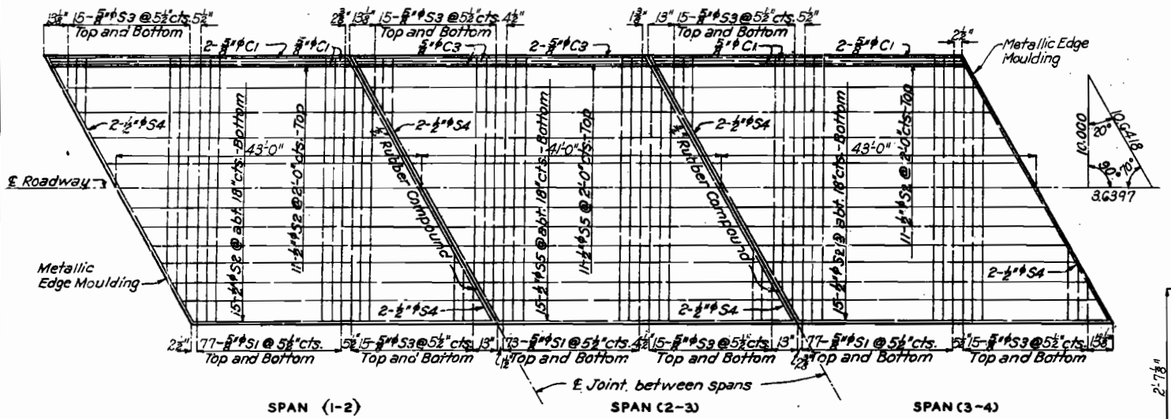
Sheet No. 1 of 3.

T-92

MISSOURI STATE HIGHWAY DEPARTMENT

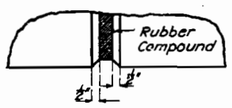
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
S	MO.	Ref. #6 (SB) S1	19		

Note: Space dowel bars "C2" at approximately 12" cts. in curbs between outlets and at ends.



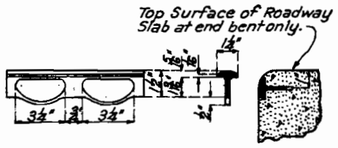
PLAN OF SLAB SHOWING REINFORCING

Note: Modify curbs as shown in "Location of Posts at End Bents" on this sheet.



Note: Use bevel as shown for exposed faces of all joints consisting of rubber compound except at top surface of roadway slab. Use edging tool with ¼" radius at top surface of roadway slab each side of rubber compound joint.

DETAIL OF BEVEL FOR RUBBER COMPOUND JOINTS



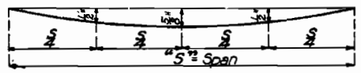
METALLIC EDGE MOULDING

Note: An approved equivalent may be substituted for edge moulding shown above.

PERMISSIBLE BEAM SUBSTITUTIONS.

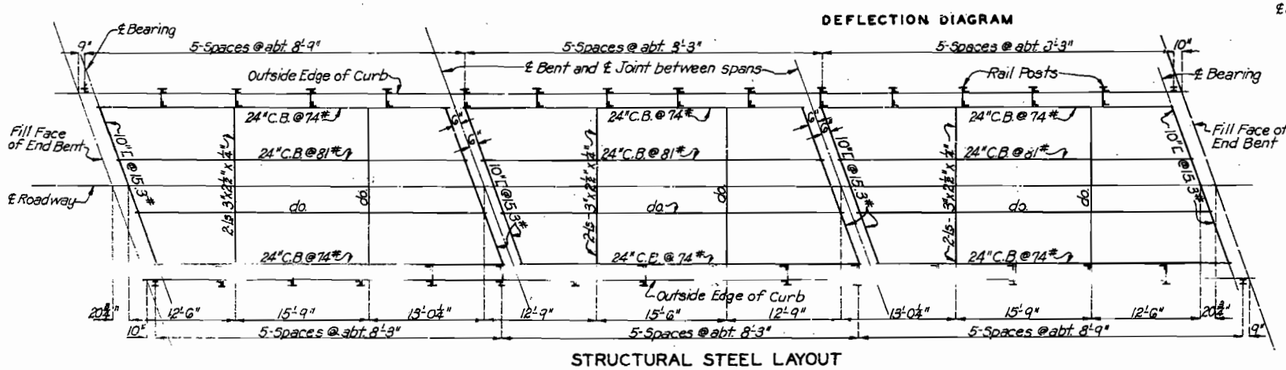
Std. I Beams		Beth. Beams.	
Inside	Outside	Inside	Outside
24"@85#	24"@79#	24"@81#	24"@74#

Note: Top of curbs under end posts shall be finished to a smooth surface parallel to grade. Not less than one nor more than four soft lead plates of 1/16" thickness shall be used under angles of each end rail post for aligning rail to correct elevation. Plates shall be 3½" x 6" and shall be punched ¾" ϕ on same gauge as the angles. No grouting permitted. Cost of lead plates to be included in price bid for other items.

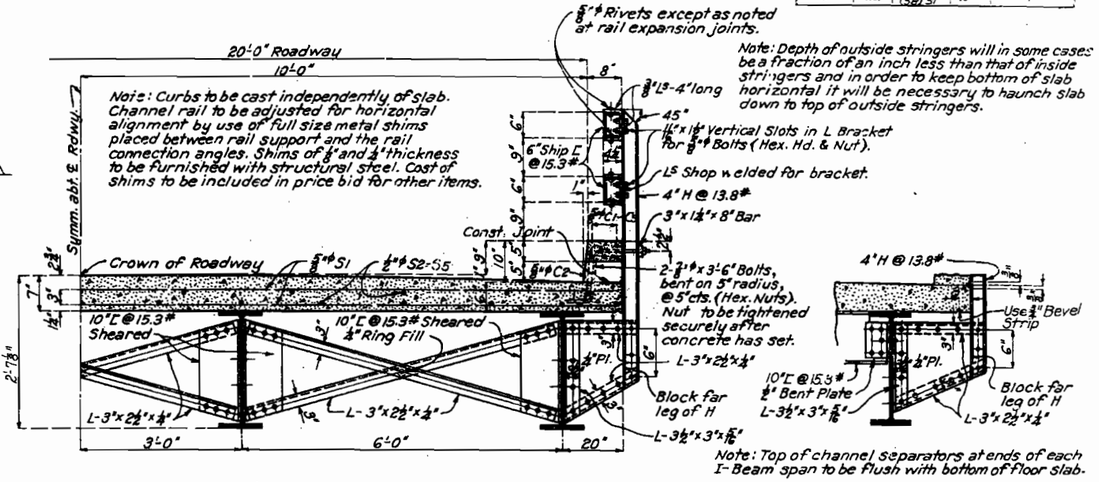


Note: Floor slab to be brought to grade and dead load deflection taken care of by increasing slab thickness. Depth of slab at outside face of curb to be kept uniform and bottom surface of slab warped between curb and outside beam to obtain required thickness at beam. Payment will be allowed for additional concrete required for thickening slab. This additional concrete is included in "Estimated Quantities".

DEFLECTION DIAGRAM

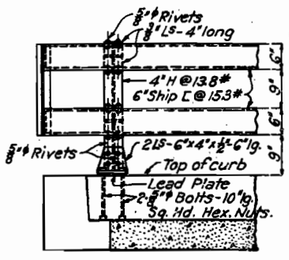


STRUCTURAL STEEL LAYOUT

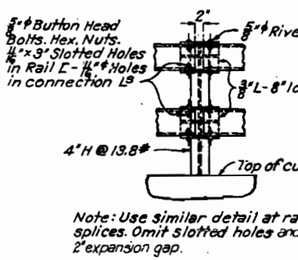


HALF SECTION THRU SPAN

DETAIL OF RAIL BRACKETS AT ENDS OF SPAN

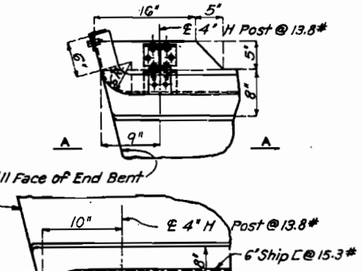


SECTION A-A

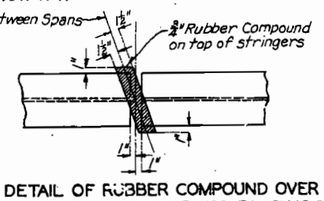


Note: Use similar detail at rail splices. Omit slotted holes and 2" expansion gap.

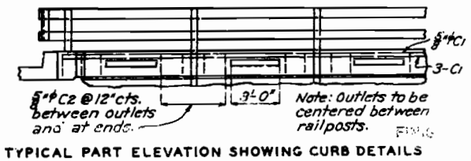
RAIL EXPANSION JOINT



LOCATION OF POSTS AT END BENTS



DETAIL OF RUBBER COMPOUND OVER STRINGERS AT EXP. JOINT-BENT NO.3



TYPICAL PART ELEVATION SHOWING CURB DETAILS

BRIDGE OVER SHETLERS CREEK-WEST BRANCH

STATE ROAD FROM MARQUAND TO BUCKHORN

ABOUT 5.25 MILES S.W. OF MARQUAND

PROJECT NO. REF. NO. 6 (SB) S1 STA. 263+70

MADISON COUNTY

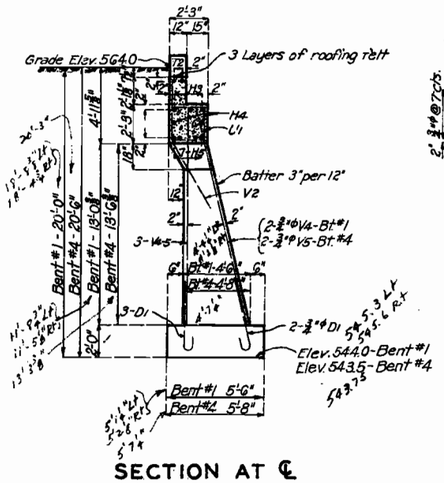
T-92

Drawn Aug. 1933 By R.J.G.
Traced Aug. 1933 By R.J.G. Assembled Feb. 1934 By P.J.S.-H.W.H.
Checked Aug. 1933 By N.W.R. Checked Feb. 1934 By N.W.R.

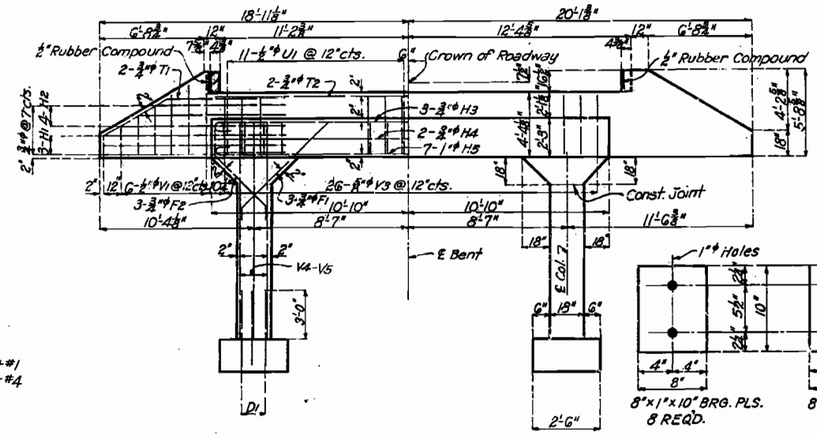
Note: This drawing is not to scale. Follow dimensions.

MISSOURI STATE HIGHWAY DEPARTMENT

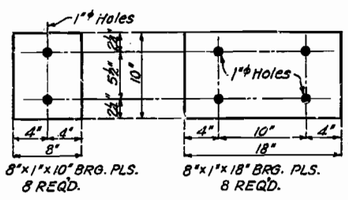
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	TOTAL SHEETS
5	MO.	Ref. #5 (-) 257	19	



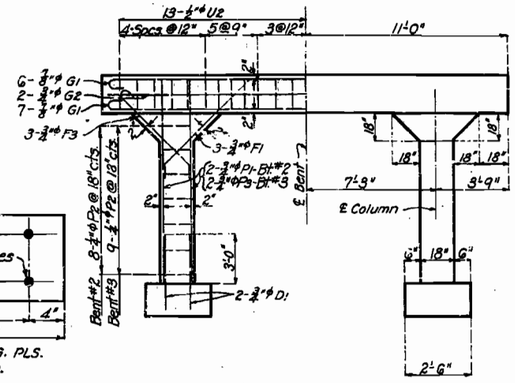
SECTION AT ℄



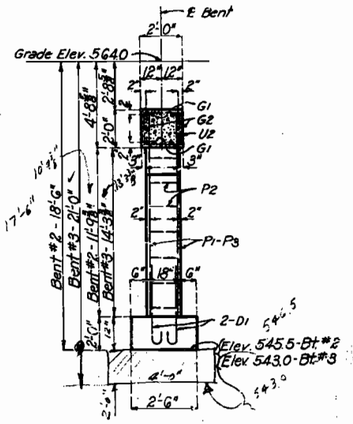
ELEVATION



DETAILS OF BEARING PLATES

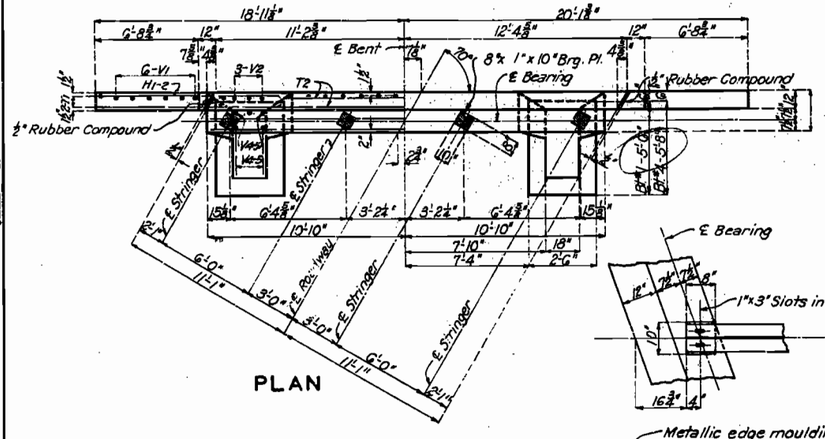


ELEVATION

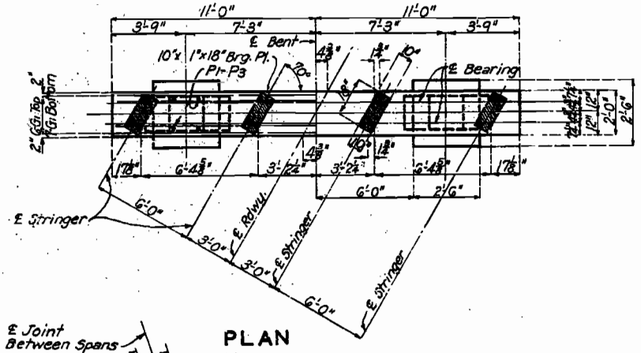


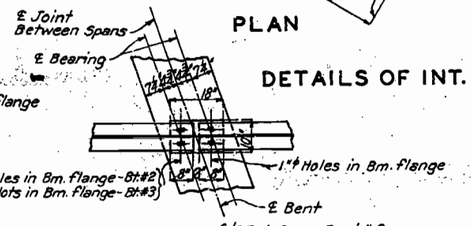
SECTION AT ℄

Note: This drawing is not to scale. Follow dimensions.

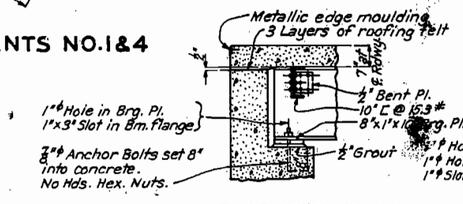


DETAILS OF END BENTS NO. 1 & 4

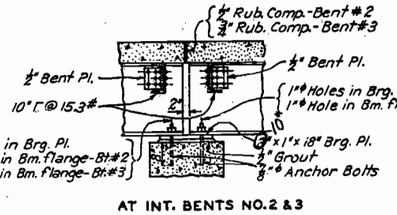




DETAILS OF INT. BENTS NO. 2 & 3



AT END BENTS NO. 1 & 4



AT INT. BENTS NO. 2 & 3

DETAILS OF BEARINGS

BILL OF REINFORCING STEEL FOR SUBSTRUCTURE					
No.	Size	Length	Mark	Location	Cuts & Bends
END BENTS NO. 1 & 4					
20	¾"ϕ	5'-3"	D1	Footing	
12	¾"ϕ	7'-3"	F1	Haunch	
12	¾"ϕ	7'-9"	F2	"	
12	¾"ϕ	12'-3"	H1	Wings	
8	¾"ϕ	19'-9"	H2	"	
6	¾"ϕ	23'-6"	H3	Beam	
4	¾"ϕ	21'-9"	H4	"	
14	1"ϕ	23'-6"	H5	"	
8	¾"ϕ	14'-9"	T1	Wings	
4	¾"ϕ	21'-9"	T2	Bkwall.	
44	½"ϕ	9'-0"	U1	Beam	
12	¾"ϕ	6'-9"	V1	Wing	
12	¾"ϕ	7'-6"	V2	Column	
52	⅝"ϕ	4'-0"	V3	Bkwall.	
10	¾"ϕ	15'-0"	V4	Col. Bt. #1	
10	¾"ϕ	15'-6"	V5	Col. Bt. #4	
INT. BENTS NO. 2 & 3					
16	¾"ϕ	5'-3"	D1	Footing	
12	¾"ϕ	7'-3"	F1	Haunch	
12	¾"ϕ	8'-0"	F3	"	
26	¾"ϕ	23'-9"	G1	Beam	
4	¾"ϕ	21'-9"	G2	"	
8	¾"ϕ	13'-6"	P1	Col. Bt. #2	
34	½"ϕ	6'-0"	P2	Cols.	
8	¾"ϕ	16'-0"	P3	Col. Bt. #3	
50	½"ϕ	8'-0"	U2	Beam	

Cuts & Bends: F1 6'-3"; D1 3'-11½"; H3-H5-20'-11½"; G1-21'-2"; G1-H3-H5; F2 3'-8½"; V2 4'-6"; 4-H2 BARS, CUT 8 6-V1 BARS, CUT 12; P2-U1-U2 2'-0" U1, 21'-0" U2, 15'-0" P2; F3; T1 5'-2¼"

Note: Dimensions given are along centerline of bars and are for computed lengths. Reinforcing bars ¾" or over in diameter, which are bent to an angle greater than 90°, shall be of structural grade. For bill of reinforcing in superstructure see Sheet No. 1 of 3.

Assembled Feb 1934 By P.H.S.-H.W.H.-R.J.G.
Checked Feb. 1934 By N.W.R.
Drawn April 1932 By R.J.G.
Checked Aug. 1932 By P.H.S.

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BRIDGE OVER SHETLERS CREEK-WEST BRANCH

STATE ROAD FROM MARQUAND TO BUCKHORN

ABOUT 5.25 MILES S.W. OF MARQUAND

PROJECT NO. REF. NO. 6 (SB) SI STA 263+70

MADISON COUNTY

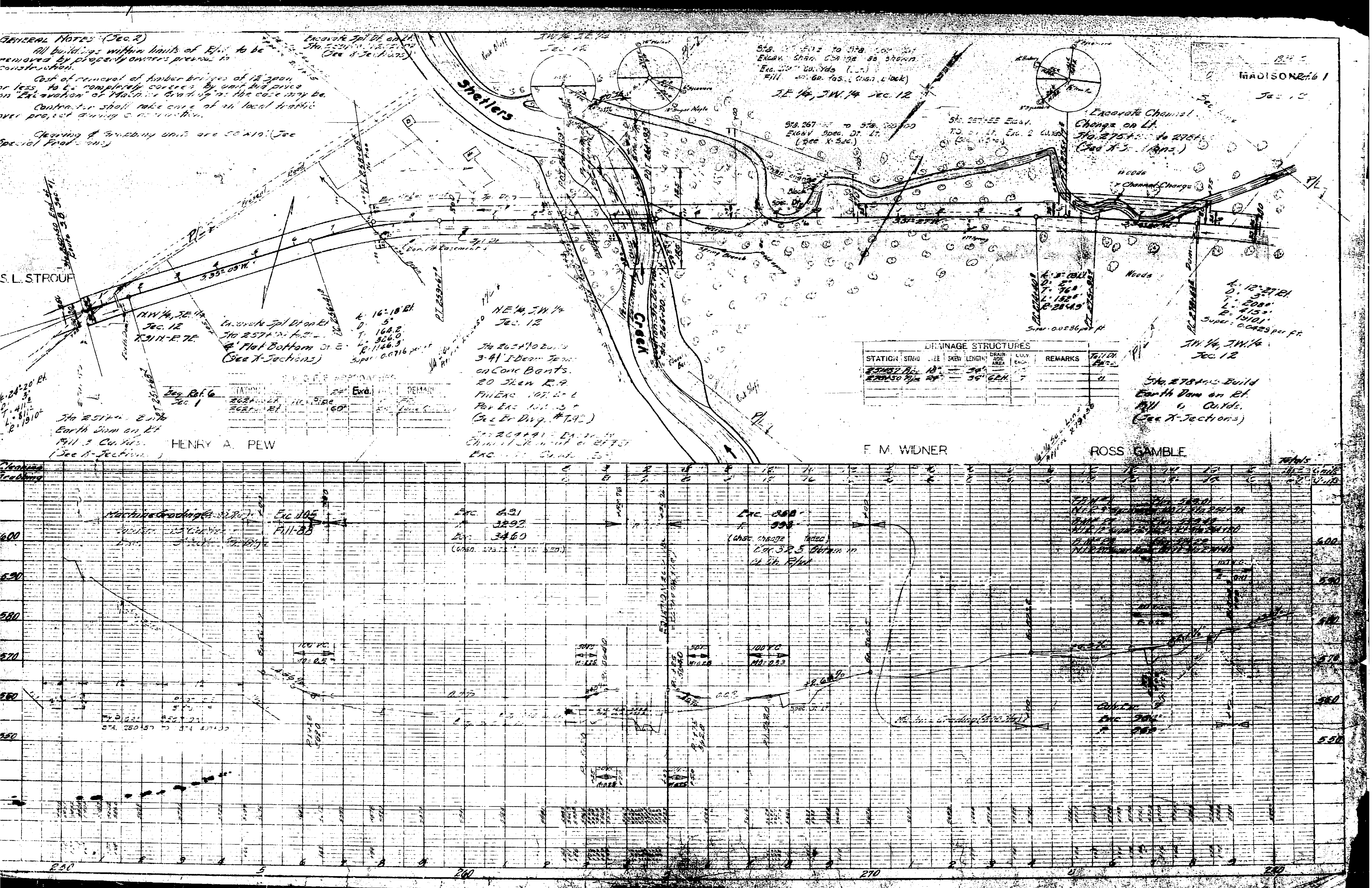
FINISHED

FINISHED

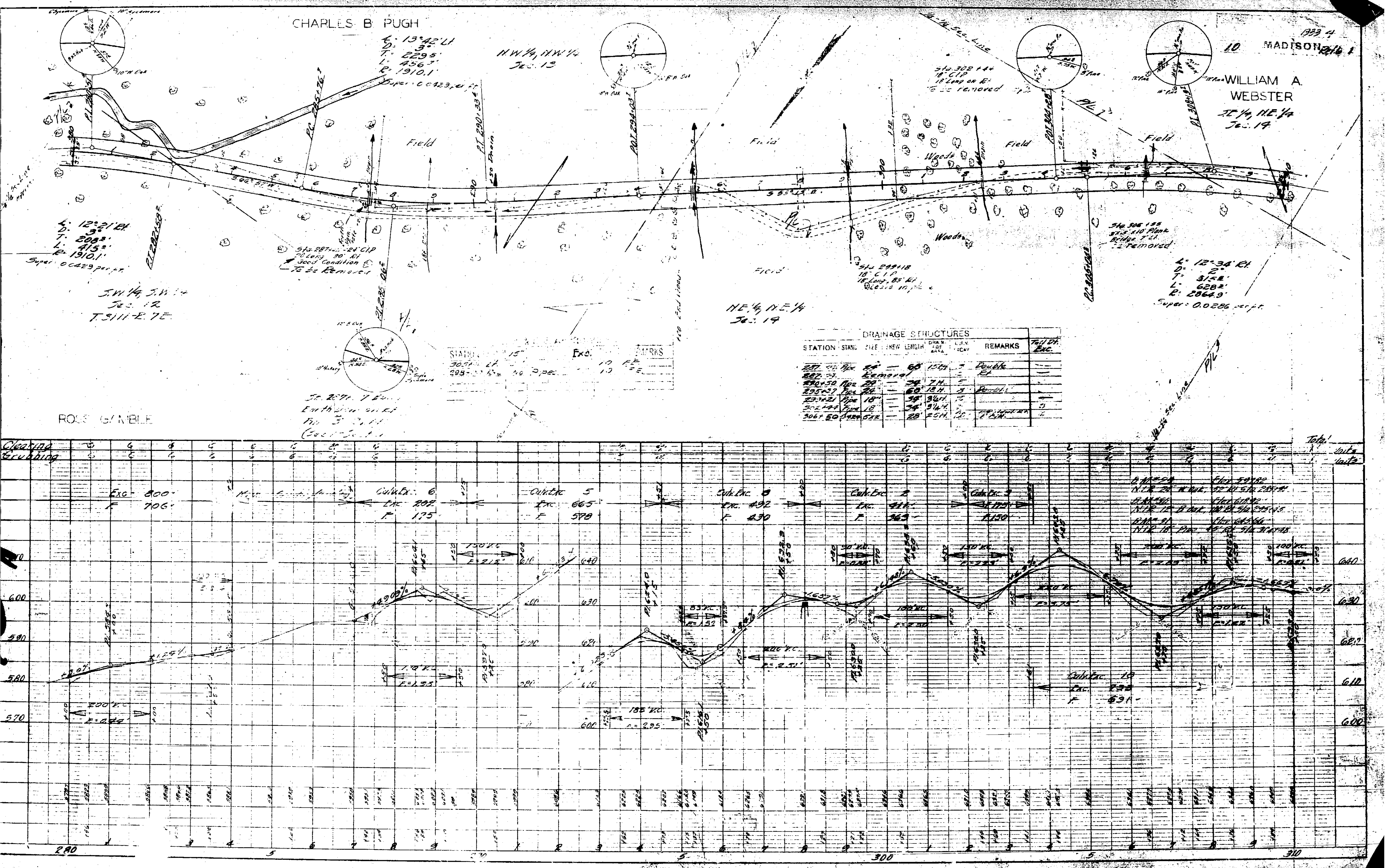
Sheet No. 3 of 3.

T-92

8-20-32



GENERAL NOTES (Sec. 2)
All buildings within limits of R/W to be removed by property owners previous to construction.
Contractor shall take care of all local traffic over project during construction.
Shetlers
Creek
Sec. 12
S.E.1/4, S.W.1/4 Sec. 12
N.E.1/4, S.W.1/4 Sec. 12
S.W.1/4, S.W.1/4 Sec. 12
N.W.1/4, S.E.1/4 Sec. 12 T.31 N.-R.7E.
Excavate Channel Change on Lt.
Woods
Channel Change
S.L. STROUP
HENRY A. PEW
F. M. WIDNER
ROSS GAMBLE
MADISON
DRAINAGE STRUCTURES
STATION
REMARKS
4' Flat Bottom
(See X-Sections)
Sta. 278+45 Build Earth Dam on Rt. Fill 6 Cu.Yds. (See X-Sections)
Sta. 251+ Build Earth Dam on Rt. Fill 3 Cu.Yds. (See X-Sections)
3-41' I-Beam Span on Conc. Bents.
20 Skew R.A.
Exc. 631
Exc. 3292
Exc. 3460
Exc. 105
Fill 88
Machine Grading
Clearing
Grubbing
Totals
600
590
580
570
560
550
250
5
260
270



STATION	STAND	SIZE	SKEW	LENGTH	DRAIN-AGE AREA	CU. YD. EXCAV	REMARKS	Tail Dt. Exc.
287+[illegible]	Pipe	24"	—	60'	15 H.	[illegible]	Double	—
287+[illegible]		Removal				[illegible]	Rt	—
290+50	Pipe	24"	—	34'	7 H.	5		
295+37	Pipe	24"	—	60'	18 H.	9	Double	
299+21	Pipe	18"	—	34'	3 1/4 H.	[illegible]		—
302+44	Pipe	18"	—	34'	3 1/4 H.	[illegible]		3
306+50	[illegible]	5x2	—	28'	25 H.	120	[illegible]	[illegible]