TRAFFIC DATA
Present Average Daily Traffic: 199
Future Average Daily Traffic: 250 (2009)
Design Speed: 35

STANDARD PLANS NOT TO BE PRINTED	
III-58G	Guardrail Endings With Cable Anchorage
III-60G	Beam Guardrail Types A, B, BD, T, and TD
IV-86C	Concrete End Section
V-96C	Soil Erosion & Sedimentation Control Measures
VI-125G	Lighted Arrows and Barricades
XI- 103C	Molding, Bevel, Light Standards, Anchor Bolt Assembly and Name Plate Details

PLAN INDEX	
1.	Title Sheet
2.	Plan of Site
3.	Log of Borings
4.	Plan of Structure
5.	Plan of Structure
6.	Quantities and Steel Reinforcement
7.	Abutment Details
8.	Abutment Details
9.	Box Beam Details
10.	Special Details

CRAWFORD COUNTY ROAD COMMISSION

IN CO-OPERATION WITH MICHIGAN DEPARTMENT OF TRANSPORTATION
AND THE FEDERAL HIGWAY ADMINISTRATION

PLAN AND PROFILE OF PROPOSED BRIDGE REPLACEMENT &
APPROACHES ON McMASTERS BRIDGE ROAD OVER THE AuSABLE RIVER

FEDERAL CRITICAL BRIDGE PROJECT NO. BRS 2093(201)
MICHIGAN CRITICAL BRIDGE PROJECT NO. MCS 20060
PARTS 1 AND 2

GENERAL NOTES

EXCEPT WHERE OTHERWISE INDICATED ON THESE PLANS OR IN THE PROPOSAL AND SUPPLEMENTAL SPECIFICATIONS CONTAINED HERRIN, ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, 1984 EDITION.

THE DESIGN OF THIS STRUCTURE IS BASED ON CURRENT AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES HS20 LOADING, LOAD FACTOR DESIGN METHOD. LIVE LOAD PLUS IMPACT DEFECTION DOES NOT EXCEED 1/1000 OF SPAN LENGTH.

THE SOIL BORING LOGS REPRESENT POINT INFORMATION. PRESENTATION OF THIS INFORMATION IN NO WAY INFERS THAT SUBSURFACE CONDITIONS ARE THE SAME AT LOCATIONS OTHER THAN EXACT LOCATION OF THE BORING.

ALL EXPOSED CONCRETE CORNERS SHOWN SQUARE ON THE PLANS SHALL BE BEVELED WITH 1/2" TRIANGULAR MOLDINGS EXCEPT AS OTHERWISE NOTED.

THE DESIGN OF THE STRUCTURAL MEMBERS IS BASED ON MATERIAL OF THE FOLLOWING GRADES AND STRESSES:

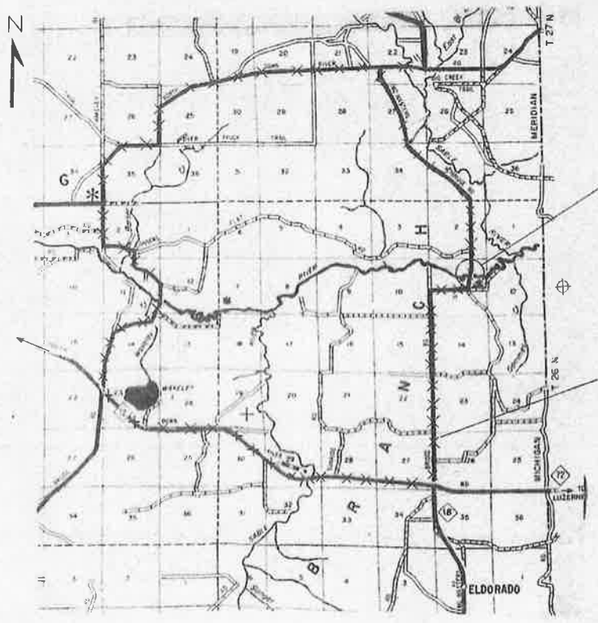
CONCRETE: GRADE 35S .....f'c = 3,000 psi
STEEL REINFORCEMENT: .....fy = 60,000 psi
STEEL REINFORCEMENT: STIRRUPS FOR
PRESTRESSED BEAMS .....fy = 40,000 psi
PRESTRESSED CONCRETE: .....f'c = 5,000 psi
PRESTRESSING STRANDS: .....f's = 270,000 psi

THE CONTRACTOR SHALL LOCATE ALL ACTIVE UNDERGROUND UTILITIES PRIOR TO STARTING WORK, AND SHALL CONDUCT HIS OPERATIONS IN SUCH A MANNER AS TO INSURE THAT THOSE UTILITIES NOT REQUIRING RELOCATION WILL NOT BE DISTURBED.

FOR PROTECTION OF UNDERGROUND UTILITIES, THE CONTRACTOR SHALL DIAL 800-482-7171 A MINIMUM OF 48 HOURS PRIOR TO EXCAVATION IN THE VICINITY OF UTILITY LINES. ALL "MISS DIG" PARTICIPATING MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.

THE CONTRACTOR IS TO EXERCISE CARE TO AVOID EXCESSIVE SILTING OF THE STREAM DURING CONSTRUCTION; PROVISIONS WILL BE MADE FOR CONTROL OF EROSION ON SHOULDERS AND SLOPES BY MEANS OF SEEDING, SODDING OR OTHER ACCEPTABLE METHODS ALLOWED BY D.N.R. PERMIT. WORK IS PERMITTED IN THE STREAM BETWEEN JUNE 15 AND SEPTEMBER 15 ONLY.

ENGINEERING
PRINT UNIT
MAY 16 1990
DEPT. of TRANSPORTATION



CONTRACT FOR BRIDGE REPLACEMENT & APPROACHES

COUNTY ROAD COMMISSION APPROVAL

Norman F. Parker — 2/28/90
CHAIRMAN - Norman F. Parker — Date

VICE CHAIRMAN - Gloria Kraus — Date

Clyde Anthony — 2/28/90
MEMBER - Clyde Anthony — Date

John M. Keir — 2/23/90
ENGINEER-MANAGER - John M. Keir, P.E. — Date

PREPARED UNDER THE SUPERVISION OF:

Allen D. Mellstead — 2/26/90
Allen D. Mellstead, P.E. — Date
REGISTERED PROFESSIONAL ENGINEER
REGISTRATION NUMBER MI 13282

STATE OF MICHIGAN
ALLEN D. MELLSTEAD
No. 13282
REGISTERED PROFESSIONAL ENGINEER

W.O. # 20-47-2

R.S. Scott Associates, Inc. — 405 RIVER ST ALPENA, MICHIGAN 49707 (517) 354-3178

REVISIONS

CRAWFORD COUNTY ROAD COMMISSION
McMASTERS BRIDGE ROAD OVER THE AU SABLE RIVER
SOUTH BRANCH TOWNSHIP
SECTION 11, T26N-R1W

TITLE SHEET

BY	DATE		SHEET NO.
CK	3/90	BI OF 20-6-13	1/10
		JN 31134 A	

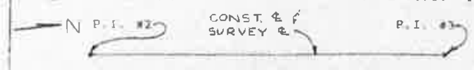
DESCRIPTION OF EXISTING BRIDGE

This structure is a single span steel stringer bridge 64' long. The bridge has a 24' wide concrete deck with a bituminous overlay. The abutments are concrete with wingwalls. The bridge railing is a fabricated steel rail connected to the concrete curb.

TO BE REMOVED

WITNESSES

P.I. #2	P.I. #3
Set P.K. Nail Sta. 16+75.16	Found Spike Sta 31+21.52
N65°W 52.90' P.P.	N50°W 71.07' P.P
S45°W 58.19' P.P.	N20°E 60.03' P.P.
S60°E 27.18' 5" Ash	N85°E 60.88' 18" Oak



ALIGNMENT SKETCH

UTILITIES

Top "O" Michigan Rural Electric Co. 319 N. Lake Street P.O. Box 70 Boyne City, MI 49712 ATT. Leo Batog (616)582-6521	Overhead line 33' left of center line. To be temporarily relocated 50' left of const. center line by others.
General Telephone Company 223 Lockwood Street Alpena, MI 49707 (517)354-8281	Overhead line 33' right of centerline. To be removed prior to construction by others.

BENCH MARKS

B.M. #1 El. 1060.95
USGS Standard tablet stamped "23 DEC 1958"

B.M. #2 El. 1025.25
Set nail in east face of P.P. 33' left of Sta. 20+65.

B.M. #3 El. 1065.62
Set P.K. nail in West face of P.P. 33' right of Sta. 31+80.

SOIL EROSION AND SEDIMENTATION CONTROL COORDINATION

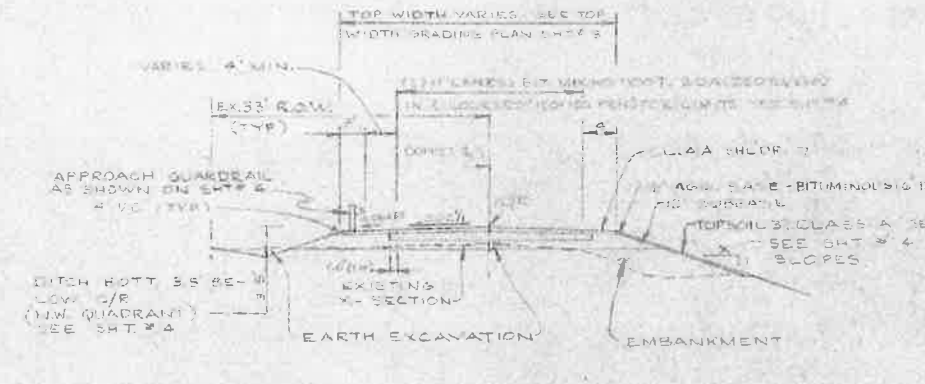
The pay items DEBRIS FRAME, GEOTEXTILE SILT FENCE MODIFIED, RIPRAP SPECIAL, and HAY OR STRAW BALES are to be used to meet Michigan Department of Natural Resources permit requirements. See proposal for specific special provisions.

The DEBRIS FRAME, is intended to catch all material which would otherwise fall into the Au Sable River while the existing bridge deck is being removed. The DEBRIS FRAME shall be in place prior to removing the existing bridge deck and may be removed immediately prior to lifting the existing beams off the foundations.

The GEOTEXTILE SILT FENCE, MODIFIED shall be placed as shown on sheet #3 Boring Location Sketch or as directed by the Engineer. The fence shall be place after the DEBRIS FRAME has been removed, but prior to removing the existing abutments.

RIPRAP, SPECIAL is graded field stone, 2" to 12", placed atop a geotextile liner to permanently protect the slopes under the bridge from erosion and scour.

The pay item HAY OR STRAW BALES shall be placed in accordance with Standard Plan V-96C, 23.



GUARDRAIL SECTION NON-GUARDRAIL SECTION

TYPICAL SECTION

UTILITY COORDINATION

After the deck has been placed and post tensioned, and before the bituminous surface is placed, the Contractor shall contact General Telephone Company, Judy Haerrygres at 616-798-5341. General Telephone workmen shall then place a buried line in the road base and through the conduit in the bridge deck. The Contractor shall cooperate with the Utility in accordance with section 1.05.06 of the Standard Specifications.

NOTES:

The work covered by these plans include: Removal of Structures, Channel Excavation, Detouring Traffic, Construction of Proposed Bridge, placing slope protection to the limits shown, and construction of approaches to the limits shown.

McMasters Bridge Road traffic is to be detoured over existing roads by the Contractor, see Special Provision "Traffic Maintenance and Control". All driven sign posts and designated sign "C" McMasters Bridge Road on sheet 2 of 7 in special provision "Traffic Maintenance and Control" shall become the property of the Crawford County Road Commission, upon completion of the project. The sign posts and above noted local signs shall be delivered to the Crawford County Road Commission yard, Huron (M-72) Grayling and neatly stacked by the Contractor.

The pay item CLEARING includes 150', one side, in the Southwest quadrant from station 21+20 to 22+70 (0.75 stations). Another 0.25 stations has been set up for miscellaneous clearing as directed by the Engineer.

The existing roadside ditches beyond station 25+00 are not to be disturbed. This is required to protect underdrains in the road base which drain into the ditches.

The pay item REMOVING BITUMINOUS SURFACE shall be completed in accordance with standard specification 4.00.07e. The existing bituminous shall be removed from station 21+00 to 21+50 and from station 25+40 to station 25+70; no other existing bituminous is to be removed.

After removing the existing bituminous surface, AGGREGATE BASE-BITUMINOUS (6" IN PLACE) shall be placed to bring the base course to grade. There shall be no reduction to the contract unit price for AGGREGATE BASE-BITUMINOUS (6" IN PLACE) as specified under 3.01.10 of the Standard Specification regardless of the depth of aggregate required to bring the base course to grade.

Removal of excess earthen material required to obtain one on two side slopes adjacent to the wingwalls in the Southwest and Northwest quadrants shall be paid for as EARTH EXCAVATION (estimated at 25 CYD). Topsoil removal and salvaging shall be done in accordance with Standard Specification 2.08.03b (Road Embankment Areas); this work is considered as preparing road foundations and is paid for as EARTH EXCAVATION (estimated at [illegible] CYD). Any soft spots encountered in the base course may require subgrade undercutting. This work must be approved by the Engineer and would be considered an extra to this contract.

The pay item CLASS AA SHOULDERS (7")(22A) shall be placed to a depth of approximately 8" one foot from the edge of pavement (see Typical Section this sheet). The minimum depth of CLASS AA SHOULDERS (7")(22A) is 4" at the hingeline. The shoulder to be sloped at rate of 0.07 foot/foot at the reference lines, transition to 0.0625 at station 22+00 south of the bridge and station 24+40 north of the bridge.

The pay item CLASS AA SHOULDERS (LM) is to be placed, graded, and compacted in the Store drive in the north quadrant as directed by the Engineer.

The existing culverts and associated concrete headwalls located under the drive at Station 24+50, 30' right, at Station 23+65, 22' left, and at Station 23+40, 20' right are to be removed and paid for as REMOVING PIPE CULVERTS.

The Standard Specifications notwithstanding, the pay item REMOVING OF STRUCTURES shall include the salvage existing bridge stringers. The Contractor shall contact John Kerr (348-2281 at the Crawford County Road Commission at least working days before removing the bridge stringers. The Commission shall then make arrangements with the Contractor to load the stringers onto trailers or stipulate an area on the site to stack the salvaged bridge components. Existing bolts may be removed by torch. Piece marking is not required. Existing bridge railing panels shall not be salvaged.

Existing mail boxes within the limits of work shall be removed and placed out side the limits of work before McMasters Bridge Road is closed to through traffic. temporary placement of the mail boxes shall be coordinated with the Grayling Post Office. After McMasters Bridge Road has opened to traffic the mail boxes shall be relocated near their original position, and as directed by the Engineer. Payment for this work is included in the pay item MOBILIZATION.

Where guardrail posts are installed over bituminous, the depression created shall be filled with bituminous material approved by the Engineer. The filler shall be neatly placed, slightly mounded to preclude puddling of water, and paid for as part of the appropriate guardrail item. The bituminous material for this work shall be visually approved by the Engineer or representative.

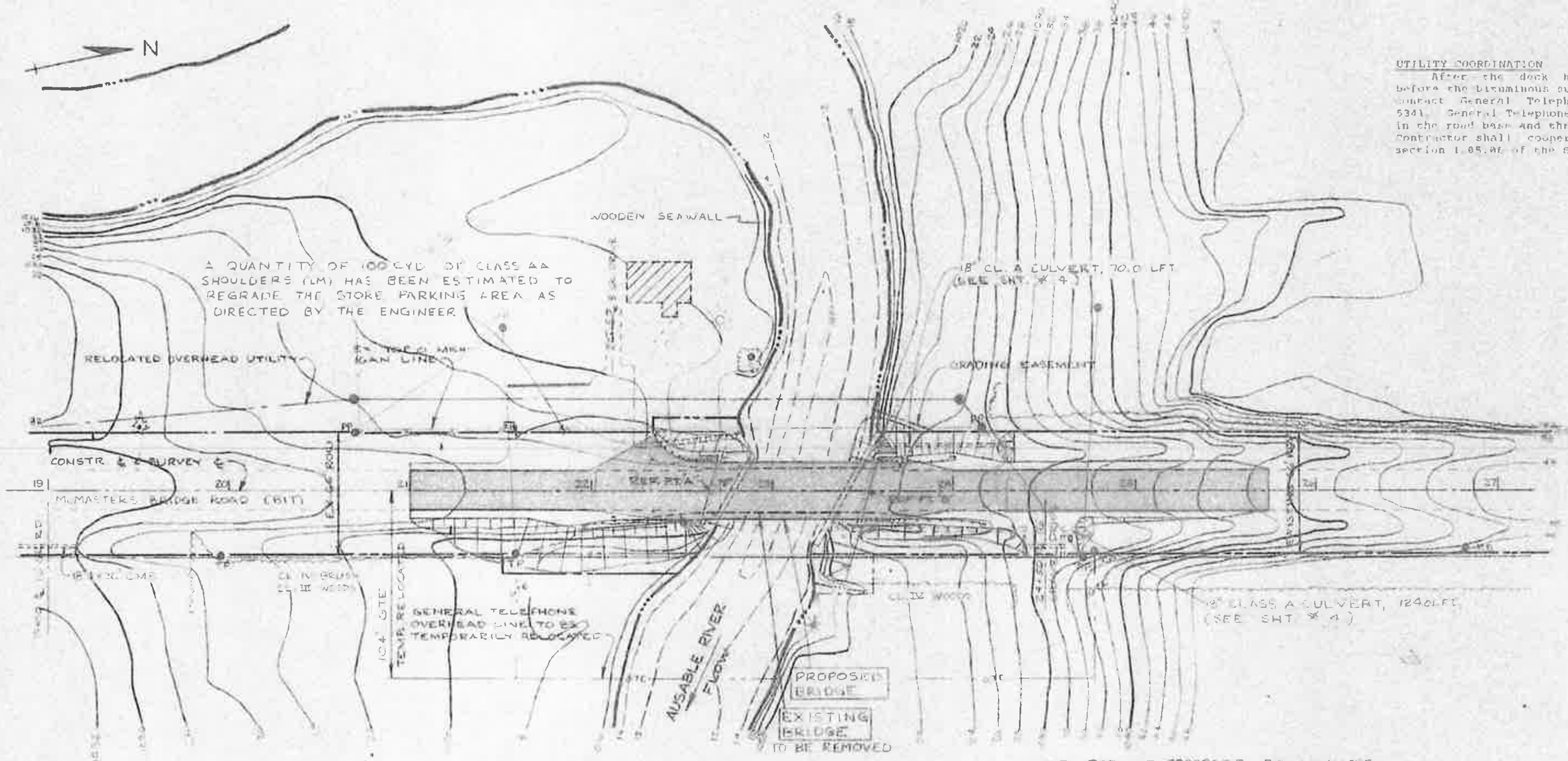
Limits of CLASS A SEEDING shall all disturbed slopes from station 21+00 to 25+70 which are not covered with riprap. The slopes shall be covered with CLASS A SEEDING, TOPSOIL 3", HB, CHEMICAL FERTILIZER NUTRIENT and NET FOR MULCHING placed on the Pegs for NET FOR MULCHING shall be biodegradable.

The pay item AGGREGATE BASE-BITUMINOUS (6" IN PLACE) to be placed one foot beyond the limits of bituminous (see Typical Road Section sheet #2 also see sheet #4).

For placement of 18" CLASS A CULVERTS see sheet #4. See sheet #10 for Brace details. End sections are to be concrete. If the contractor selects to use metal culvert pipe, the adapters as shown on sheet #10 shall be included in the pay item CLASS A CULVERTS.

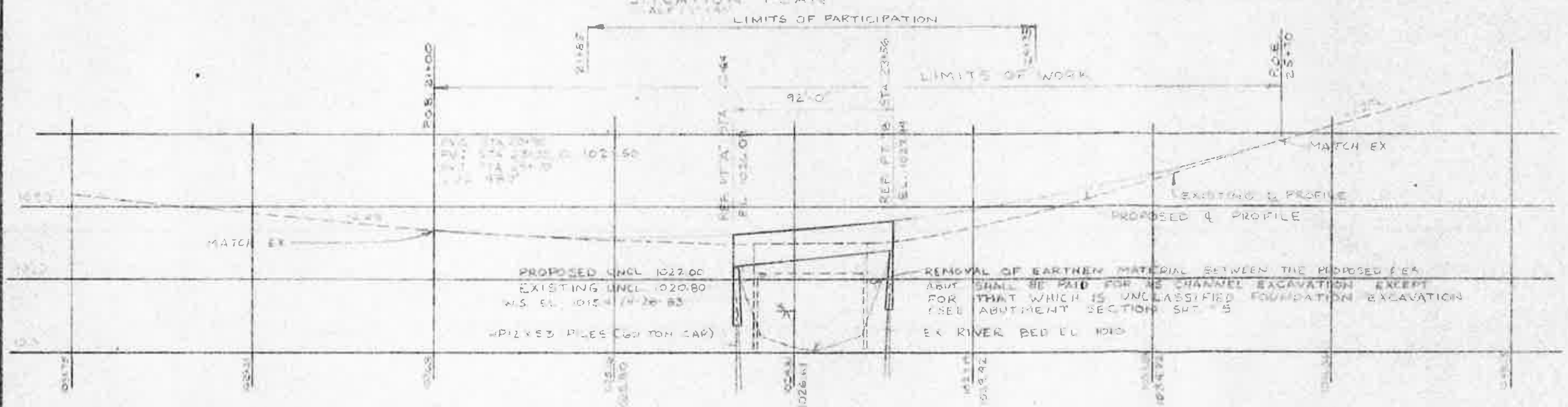
The Contractor is to maintain traffic to drives within the limits of Work at all times.

The existing beam guardrail and related items shall be removed and salvaged, and paid for as SALVAGE BEAM GUARDRAIL in accordance with section [illegible] of the Standard Specifications. The salvaged items shall be stacked in an area designated by the Engineer.



NOTE: FOR THE PROPOSED R.O.W. IN THE NE, SE & S.W. QUADRANTS SEE SHT. # 4

SITUATION PLAN



PROFILE
SCALE: HORIZ.-1"=40', VERT.-1"=10'

W.O.# 20-47-2

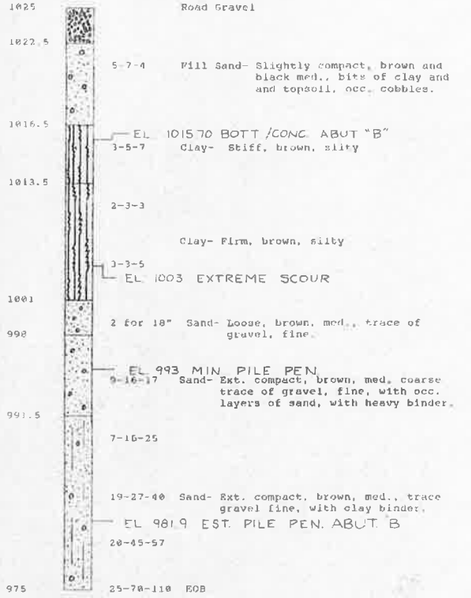
R.S. Scott Associates Inc.
ARCHITECTS
ENGINEERS
LAND SURVEYORS
405 RIVER ST. ALPENA, MICHIGAN 49707

PLAN OF SITE

CRAWFORD COUNTY ROAD COMMISSION
McMASTERS BRIDGE ROAD OVER THE AU SABLE RIVER
SOUTH BRANCH TOWNSHIP
SECTION 11, T26N-R1W

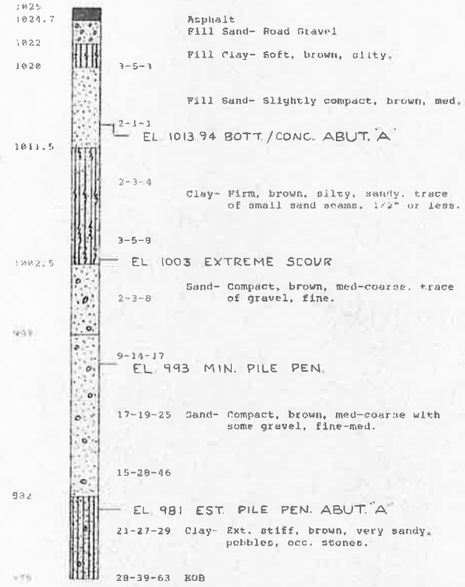
REVISIONS

T.H. #1
14' Left of Sta. 23+57



GROUND WATER ENCOUNTED @ EL 1018

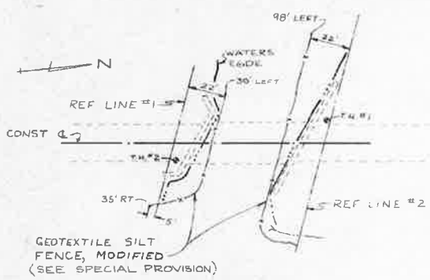
T.H. #2
10' Right of Sta. 22+66



GROUND WATER ENCOUNTED @ EL 1017.5

NOTE:
Numbers indicate number of blows required to drive a 2" O.D. sampler one foot using a 140 Lbs. hammer falling 30".

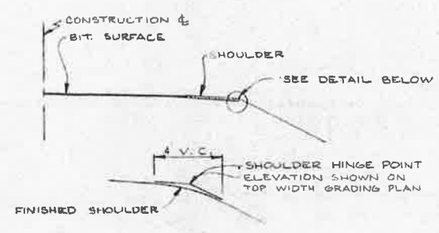
Borings completed by GEO-TEK Inc., P.O. Box 116, Lowell, MI 49331.



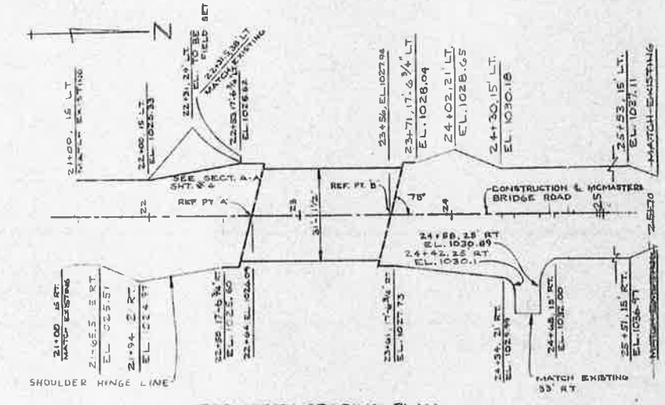
BORING LOCATION SKETCH

Flood Data Frequency (Yrs)	Discharge Cfs.	Water Surface El. Ft.	Velocity in Channel with or without Str. Ft./Sec.	Waterway Area Below W.S. El Sqft.	Backwater above W.S. El. Full Line Ft.	Final W.S. El. Ft.
Existing Structure Q Design (___ Yr.)						
*Existing Structure Q Overtopping (___ Yr.)	*					
Proposed Structure Q Design (___ Yr.)						
*Proposed Structure Q Overtopping (___ Yr.)						
Natural Channel Q Design (___ Yr.)						
Witnessed Flood of Record						

* Complete if Q Overtopping is less than 1100 and not equal to Q Design



SHOULDER DETAIL
ALSO SEE TOP WIDTH GRADING PLAN THIS SHT.



TOP WIDTH GRADING PLAN
SEE SHOULDER DETAIL THIS SHEET

W.O. # 20-47-2

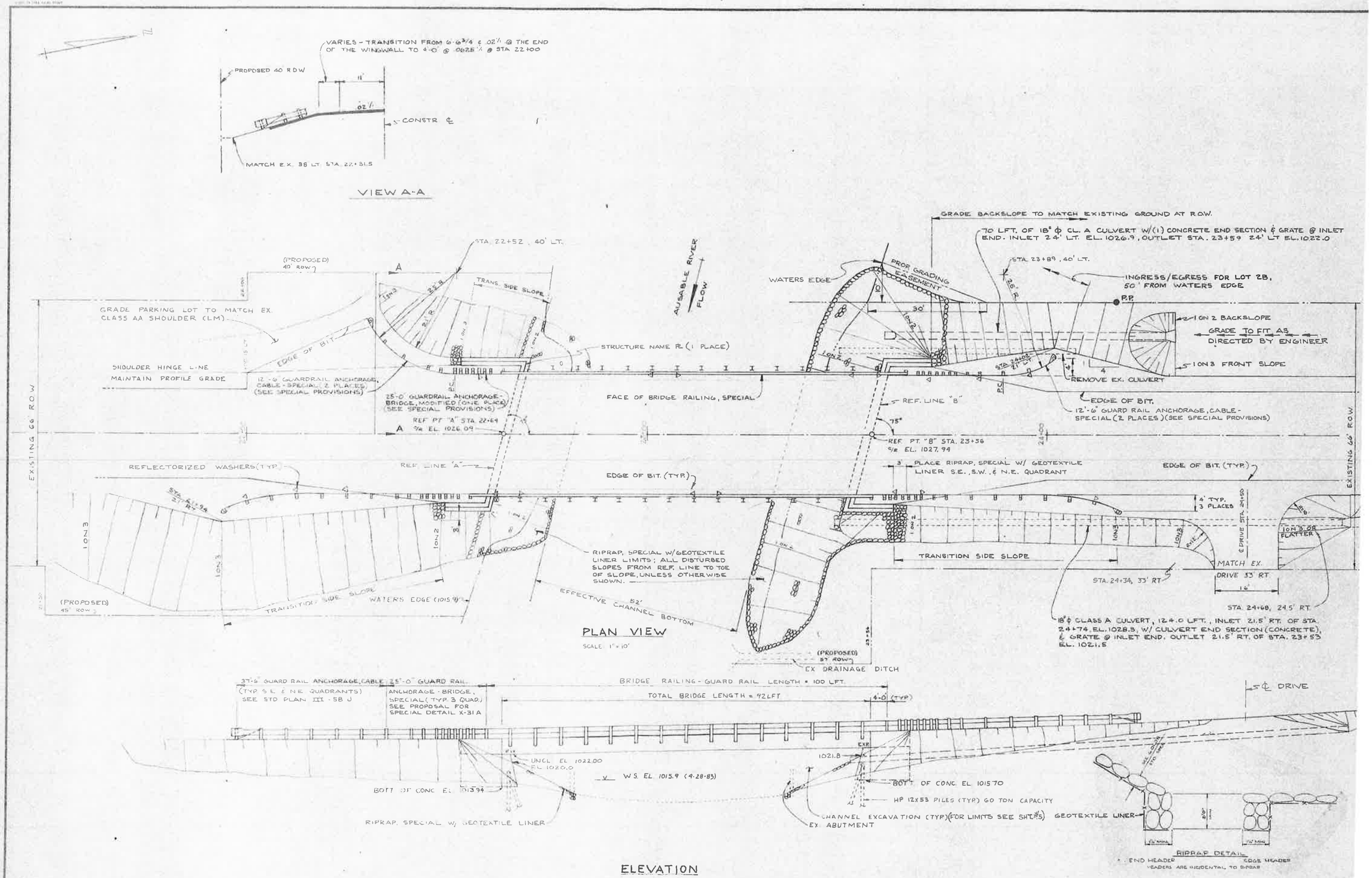
R.S. Scott Associates, Inc.
405 RIVER ST ALPENA MICHIGAN 49707 (517) 354-3178

REVISIONS

CRAWFORD COUNTY ROAD COMMISSION
McMASTERS BRIDGE ROAD OVER THE AU SABLE RIVER
SOUTH BRANCH TOWNSHIP
SECTION 11, T26N-R1W

LOG OF BORINGS AND BRIDGE RAILING

BY	DATE	BI OF 20-6-13	SHEET NO.
CK	3/90	JN 31134 A	3/10



R.S. Scott Associates, Inc.
405 RIVER ST. ALPENA MICHIGAN 49707 (517) 354-3178

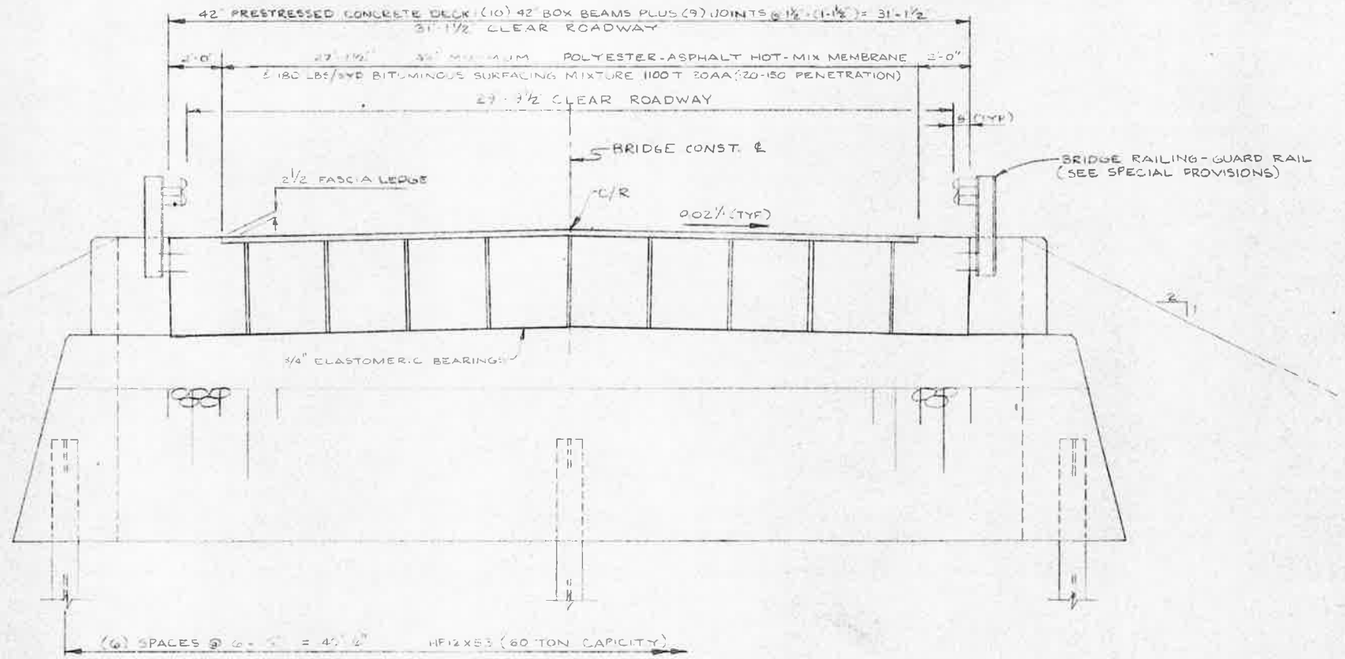
REVISIONS

CRAWFORD COUNTY ROAD COMMISSION
McMASTERS BRIDGE ROAD OVER THE AU SABLE RIVER
SOUTH BRANCH TOWNSHIP
SECTION 11, T26N-R1W

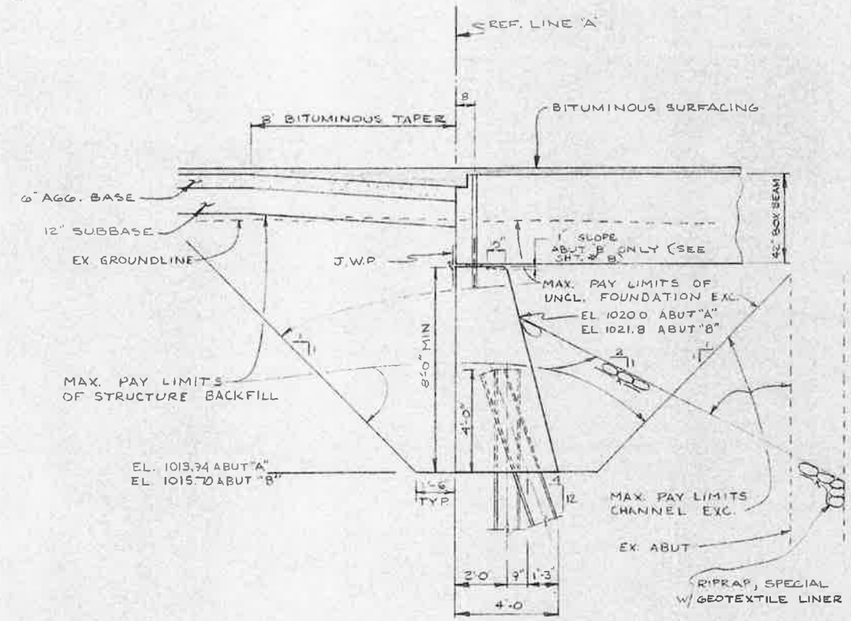
PLAN OF STRUCTURE

BY	DATE	SHEET
BI OF 20-6-13		4/10
CK	3/90	JN 31134 A

W.O. # 20-47-2



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



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

MISCELLANEOUS BRIDGE QUANTITIES		
ITEM	UNIT	AMOUNT
UNCLASSIFIED FOUNDATION EXCAVATION	CYD	450.00
CHANNEL EXCAVATION	CYD	250.00
STRUCTURE BACKFILL (CIP)	CYD	260.00
HAY OR STRAW BALES	EACH	25.00
SEDIMENT EXCAVATION-MAINTENANCE	CYD	25.00
GEOTEXTILE SILT FENCE, MODIFIED	LFT	260.00
DEBRIS FRAME	LSUM	1.00
BITUMINOUS MIXTURE NO. 1100T, 20AA	TON	40.00
CONDUIT 4 INCH	LFT	104.00
STRUCTURE NAME PLATE	EACH	1.00
JOINT WATERPROOFING	SFT	210.90
POLYESTER ASPHALT HOT-MIX MEMBRANE	SYD	277.00
PENETRATING WATER REPELLENT TREATMENT	SYD	29.40

W.O.# 20-47-2

R.S. Scott Associates, Inc.
ARCHITECTS
ENGINEERS
LAND SURVEYORS
405 RIVER ST. ALPENA, MICHIGAN 49707 (517) 354-3178

PLAN OF STRUCTURE

CRAWFORD COUNTY ROAD COMMISSION
McMASTERS BRIDGE ROAD OVER THE AU SABLE RIVER
SOUTH BRANCH TOWNSHIP
SECTION 11, T26N-R1W

REVISIONS			
NO.	DATE	REVISION	BY

BI OF 20-6-13 DATE
JN 31154 A 3/90

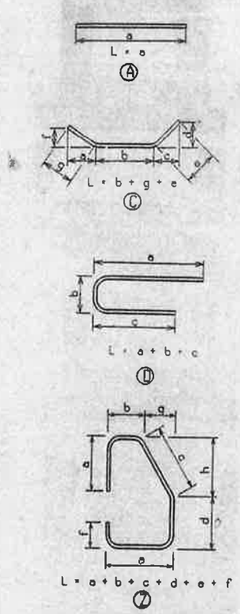
SHEET NO. 5/10

APPROACH QUANTITIES		
ITEM	UNIT	AMOUNT
CLEARING	STA	1.00
REMOVAL OF STRUCTURES	LSUM	1.00
REMOVING PIPE CULVERTS	EACH	3.00
EARTH EXCAVATION	CYD	75.00
EMBANKMENT (CIP)	CYD	750.00
SUBBASE (CIP)	CYD	250.00
AGGREGATE BASE - BITUMINOUS (6 INCHES IN PLACE)	SYD	780.00
CLASS AA SHOULDERS (LM)	CYD	100.00
CLASS AA SHOULDERS 7 INCHES IN PLACE	SYD	125.00
REMOVE BITUMINOUS SURFACE	SYD	190.00
BITUMINOUS MIXTURE NO. 1100T, 20AA	TON	95.00
18 INCH CLASS A CULVERT	LFT	104.00
CULVERT END SECTION GRATE	LBS	150.00
18 INCH CULVERT END SECTION (CONCRETE)	EACH	2.00
RIPRAP, SPECIAL	SYD	425.00
GUARD RAIL ANCHORAGE, CABLE	EACH	2.00
SALVAGE BEAM GUARD RAIL	LFT	175.00
REFLECTORIZED WASHERS	EACH	28.00
GUARD RAIL ANCHORAGE-BRIDGE, SPECIAL	EACH	3.00
GUARD RAIL ANCHORAGE-BRIDGE, MODIFIED	EACH	1.00
GUARD RAIL ANCHORAGE CABLE-SPECIAL	EACH	2.00
MOBILIZATION	LSUM	1.00
CLASS A SEEDING	LBS	20.00
CHEMICAL FERTILIZER NUTRIENT	LBS	50.00
TOPSOIL SURFACE, 4 INCHES	SYD	800.00
MULCH	TON	5.10
NET FOR MULCHING	SYD	850.00
BARRICADE, TYPE III, LIGHTED, FURNISHED	EACH	5.00
BARRICADE, TYPE III, LIGHTED, OPERATED	EACH	5.00
SIGN, TYPE B TEMPORARY	SFT	655.00

BRIDGE QUANTITIES		
ITEM	UNIT	AMOUNT
UNCLASSIFIED FOUNDATION EXCAVATION	CYD	450.00
CHANNEL EXCAVATION	CYD	250.00
STRUCTURE BACKFILL (CIP)	CYD	260.00
HAY OR STRAW BALES	EACH	25.00
SEDIMENT EXCAVATION-MAINTENANCE	CYD	25.00
GEOTEXTILE SILT FENCE, MODIFIED	LFT	200.00
DEBRIS FRAME	LSUM	1.00
BITUMINOUS MIXTURE NO. 1100T, 20AA	TON	40.00
STEEL PILES, FURNISHED AND DRIVEN (12 INCHES)	LFT	232.00
SPLICES, STEEL PILES (12 INCHES)	EACH	10.00
FURNISHING EQUIPMENT FOR DRIVING PILES	LSUM	1.00
SUBSTRUCTURE CONCRETE	CYD	127.50
STEEL REINFORCEMENT	LBS	8041.00
CONDUIT 4 INCH	LFT	184.00
STRUCTURE NAME PLATE	EACH	1.00
3/4 INCH ELASTOMERIC BEARING	SFT	12.00
42 INCH PRESTRESSED CONCRETE DECK	SFT	2861.50
POST TENSIONING	LSUM	1.00
JOINT WATERPROOFING	SFT	210.00
POLYESTER-ASPHALT HOT-MIX MEMBRANE	SYD	277.00
BRIDGE RAILING-GUARD RAIL	LFT	200.00
PENETRATING WATER REPELLENT TREATMENT	SYD	29.40

STEEL REINFORCEMENT

	MARK	DIMENSIONS a	b	c	d	e	f	g	h	SIZE	LENGTH	NO. REQD	TOTAL WEIGHT
MAINWALL, ABUTMENT "A"	A082209	22'-9"								8	22'-9"	12	728.9
	A062209	22'-9"								6	22'-9"	16	546.7
	A081703	17'-3"								8	17'-3"	3	138.2
	A061709	17'-9"								6	17'-9"	2	53.3
	A061803	18'-3"								6	18'-3"	2	54.8
	A061809	18'-9"								6	18'-9"	2	56.3
	A061903	19'-3"								6	19'-3"	2	57.8
	A061909	19'-9"								8	19'-9"	3	158.2
	A081104	11'-4"								8	11'-4"	2	90.8
	A061107	11'-7"								6	11'-7"	2	34.8
	A061110	11'-10"								6	11'-10"	2	35.5
	A061201	12'-1"								6	12'-1"	2	36.3
	A061204	12'-4"								6	12'-4"	2	37.0
	A081207	12'-7"								8	12'-7"	3	100.8
	C081702	3'-4 1/2"	11'-3 3/8"	2'-4 1/2"	1'-10"	3'-0"	1'-10"	3'-0"		8	17'-3"	1	46.1
	C081801	1'-10"	9'-1"	1'-10"	2'-4 1/2"	3'-0"	2'-4 1/2"	3'-0"		8	18'-1"	1	48.3
	C081805	1'-10"	4'-5 1/2"	1'-10"	2'-4 1/2"	3'-0"	2'-4 1/2"	3'-0"		8	18'-5"	1	20.8
	C061104	1'-10"	5'-3 3/4"	1'-10"	2'-4 1/2"	3'-0"	2'-4 1/2"	3'-0"		6	11'-4"	2	34.0
	C061303	1-10"	7'-3 1/8"	1'-10"	2'-4 1/2"	3'-0"	2'-4 1/2"	3'-0"		6	13'-3"	2	39.8
	C081109	2'-4 1/2"	5'-9 1/8"	2'-4 1/2"	1'-10"	3'-0"	1'-10"	3'-0"		8	11'-9"	1	31.4
	C061210	2'-4 1/2"	6'-10 5/8"	2'-4 1/2"	1'-10"	3'-0"	1'-10"	3'-0"		6	12'-10	2	38.6
	C061501	2'-4 1/2"	9'-1"	2'-4 1/2"	1'-10"	3'-0"	1'-10"	3'-0"		6	15'-1"	2	45.3
	Z062188	5'-10"	1'-6"	7'-7"	0	3'-0"	3'-0"	2'-0"		6	21'-8"	51	1659.7
PARAPET WALL, ABUTMENT "A"	A041606	16'-6"								4	16'-6"	6	66.1
	A041106	11'-6"								4	11'-6"	6	46.1
	D040818	4'-2"	0'-6"	4'-2"						4	8'-10"	24	141.6
MAINWALL, ABUTMENT "B"	A082209	22'-9"								8	22'-9	12	607.4
	A062209	22'-9"								6	22'-9"	16	546.7
	A081203	12'-3"								8	12'-3"	3	98.1
	A061209	12'-9"								6	12'-9"	2	68.1
	A061303	13'-3"								6	13'-3"	2	39.8
	A061309	13'-9"								6	13'-9"	2	41.3
	A061403	14'-3"								6	14'-3"	2	42.8
	A081409	14'-9"								8	14'-9"	3	78.8
	A081104	11'-4"								8	11'-4"	3	90.8
	A061109	11'-9"								6	11'-9"	2	35.3
	A061110	11'-10"								6	11'-10"	2	35.5
	A061201	12'-1"								6	12'-1"	2	36.3
	A061204	12'-4"								6	12'-4"	2	37.0
	A081207	12'-7"								8	12'-7"	3	100.8
	C081801	1'-10"	9'-1"	1'-10"	2'-4 1/2"	3'-0"	2'-4 1/2"	3'-0"		8	18'-1"	1	48.3
	C081703	3'-4 1/2"	11'-3 3/8"	2'-4 1/2"	1'-10"	3'-0"	1'-10"	3'-0"		8	17'-3"	1	46.1
	C081805	1'-10"	2'-5 1/2"	1'-10"	2'-4 1/2"	3'-0"	2'-4 1/2"	3'-0"		8	18-5"	1	28.8
	C061104	1'-10"	5'-3 3/4"	1'-10"	2'-4 1/2"	3'-0"	2'-4 1/2"	3'-0"		6	11'-4"	2	34.0
	C061303	1'-10"	7'-3 1/8"	1'-10"	2'-4 1/2"	3'-0"	2'-4 1/2"	3'-0"		6	13'-3"	2	39.8
	C081109	2'-4 1/2"	5'-9 1/8"	2'-4 1/2"	1'-10"	3'-0"	1'-10"	3'-0"		8	11'-9"	1	31.4
	C061210	2'-4 1/2"	6'-10 5/8"	2'-4 1/2"	1'-10"	3'-0"	1'-10"	3'-0"		6	12'-10	2	38.6
	C061501	2'-4 1/2"	9'-1"	2'-4 1\2"	1'-10"	3'-0"	1'-10"	3'-0"		6	15'-1"	2	47.6
	Z062188	5'-10"	1'-6"	7'-7"	0	3'-0"	3'-0"	2'-0"		6	21'-8"	46	1497.0
PARAPET WALL, ABUTMENT "B"	A041106	11'-6"								4	11'-6"	12	92.2
	D040818	4'-2"	0'-6"	4'-2"						4	8'-10"	20	118.0
									STEEL REINFORCEMENT TOTAL				8041.8



All bends in reinforcing steel are to be made about a pin of the minimum Diameter allowed by the Standard Specification.

Tolerances in cutting and bending bars are as established in Manual of Standard Practice of the Reinforcing Steel Institute and Detailing Manual of the American Concrete Institute.

Where field cutting of epoxy bars is required, the contractor shall repair the epoxy coating at the cut end as provided for in Supplemental Specification 6.03 (3 series). Repair of the epoxy coating is included in the pay item STEEL REINFORCEMENT, EPOXY COATING.

Reinforcement shall be bundled and tagged as to the location as shown on this sheet.

W.O. # 20-47-2

R.S. Scott Associates, Inc.
405 RIVER ST ALPENA, MICHIGAN 49707 (517) 354-3178

REVISIONS

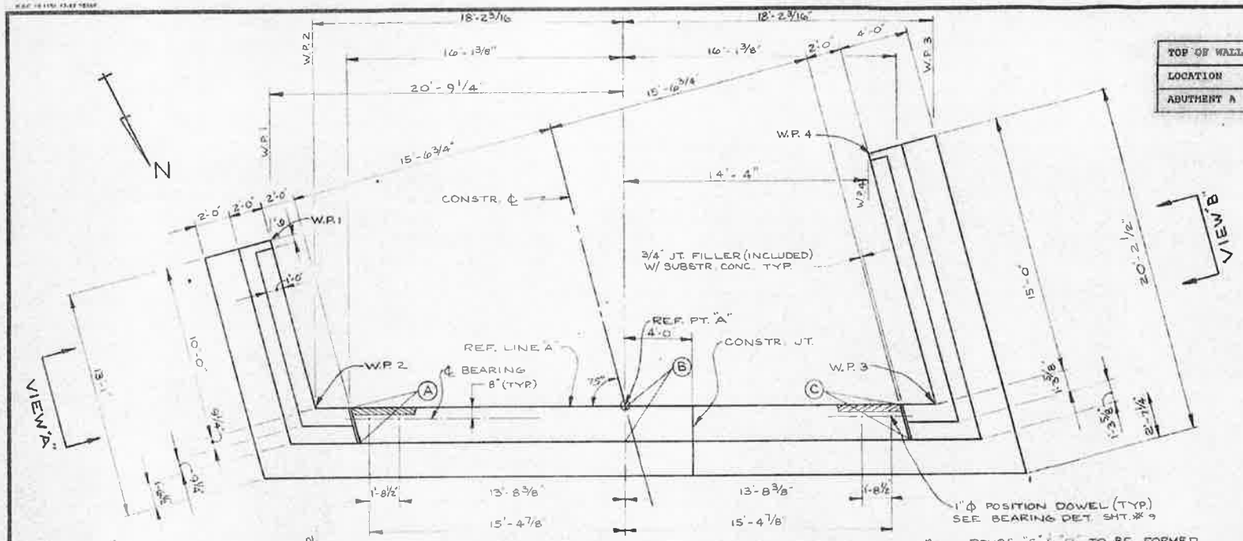
CRAWFORD COUNTY ROAD COMMISSION
McMASTERS BRIDGE ROAD OVER THE AU SABLE RIVER
SOUTH BRANCH TOWNSHIP
SECTION 11, T26N-R1W

QUANTITIES AND STEEL REINFORCEMENT

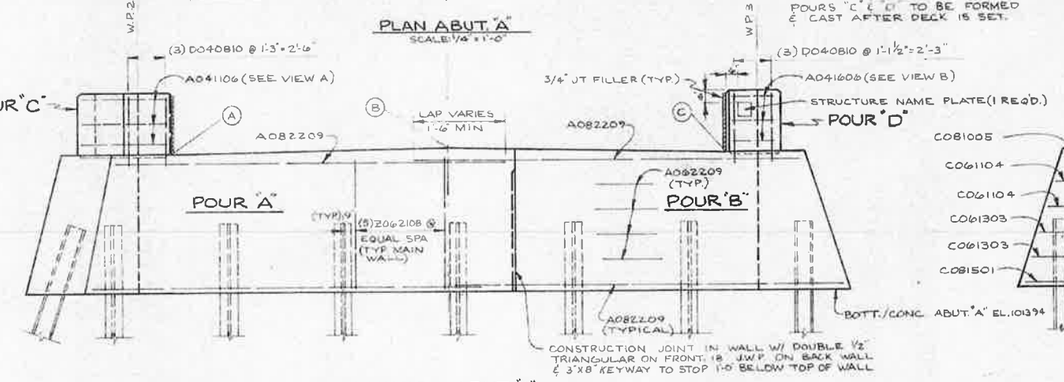
BY	DATE	BI OF 20-6-13	SHEET NO.
CK	3/90	JN 31134 A	6/10

NOTE: SEE SHT.# 8 FOR SUBSTRUCTURE CONCRETE & STEEL PILING QUANTITIES

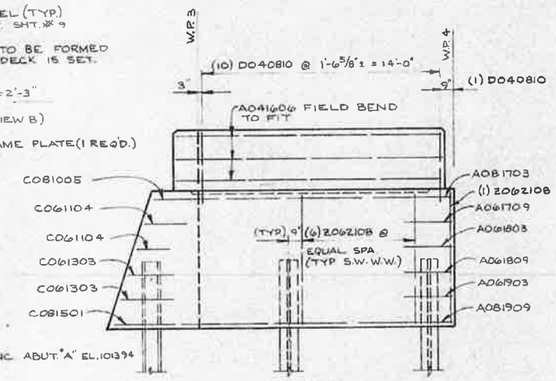
TOP OF WALL ELEVATION			
LOCATION	A	B	C
ABUTMENT A	1021.94	1022.30	1022.83



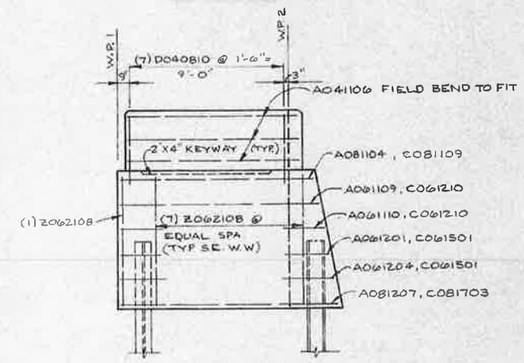
PLAN ABUT. "A"
SCALE: 1/4" = 1'-0"



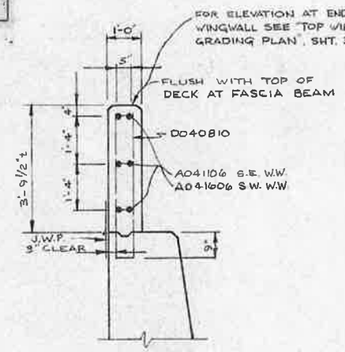
ELEVATION ABUT. "A"
SCALE: 1/4" = 1'-0"



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



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



TYP. PARAPET SECT. ABUT. "A"
SCALE: 1/2" = 1'-0"

NOTES:

OWP denotes Joint Waterproofing.

For bevel and molding detail see Standard Plan XI-1060.

Reinforcing steel shall be field fit to allow for drilling position dowels holes.

The tops of abutments shall be given a coat of Penetrating Water Repellent Treatment before bearings are placed.

S.S. denotes each side
N.S. denotes near side.
F.S. denotes far side.

PILE NOTES:

All piles shall be driven to a minimum bearing capacity of 60 tons on abutments.

Pile penetrations have been determined by the use of static formula.

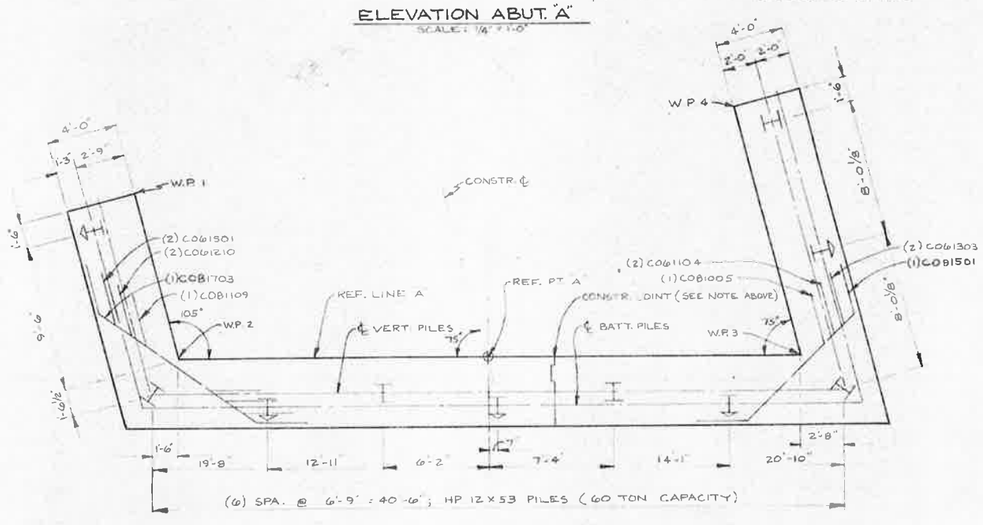
Piles for Abutments shall be driven to a 3:1 batter.

Steel piles shall be HP 12 X 53.

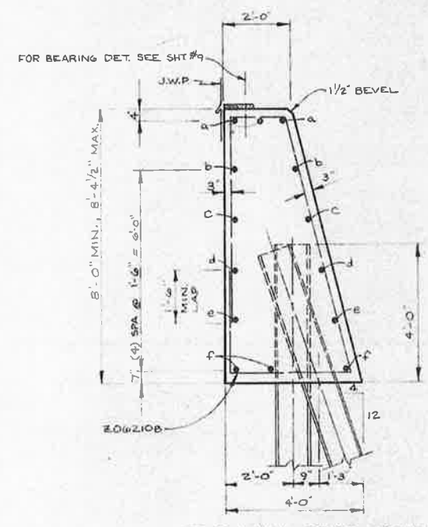
Piles are to be driven to such accuracy that the ends of the piles to be embedded in the concrete are within 3" of the location shown on the plans.

The pile driving formulas in the Standard Specifications are not to be used to determine battered pile capacity. Battered piles are to be driven to the elevation established for vertical piles.

For pile penetrations see sheet 9.



PILING PLAN ABUT. "A"
SCALE: 1/4" = 1'-0"



TYP. WALL SECT. ABUT. "A"
SCALE: 1/2" = 1'-0"

MAIN WALL	WEST COR.	EAST COR.	EAST W.W.	WEST W.W.
a: (3) A082209,	(1) C081005, &	(1) C081109,	(3) A081104,	(3) A081703
b: (2) A082209,	(1) C061104, &	(1) C061210,	(2) A061109,	(2) A061709
c: (2) A082209,	(1) C061104, &	(1) C061210,	(2) A061110,	(2) A061803
d: (2) A082209,	(1) C061303, &	(1) C061501,	(2) A061201,	(2) A061809
e: (2) A082209,	(1) C061303, &	(1) C061501,	(2) A061204,	(2) A061903
f: (3) A082209,	(1) C081501, &	(1) C081703,	(3) A081207,	(3) A081909

W.O. # 20-47-2

R.S. Scott Associates, Inc.
405 RIVER ST ALPENA, MICHIGAN 49707 (517) 354-3178

REVISIONS

CRAWFORD COUNTY ROAD COMMISSION
McMASTERS BRIDGE ROAD OVER THE AU SABLE RIVER
SOUTH BRANCH TOWNSHIP
SECTION 11, T26S-R4W

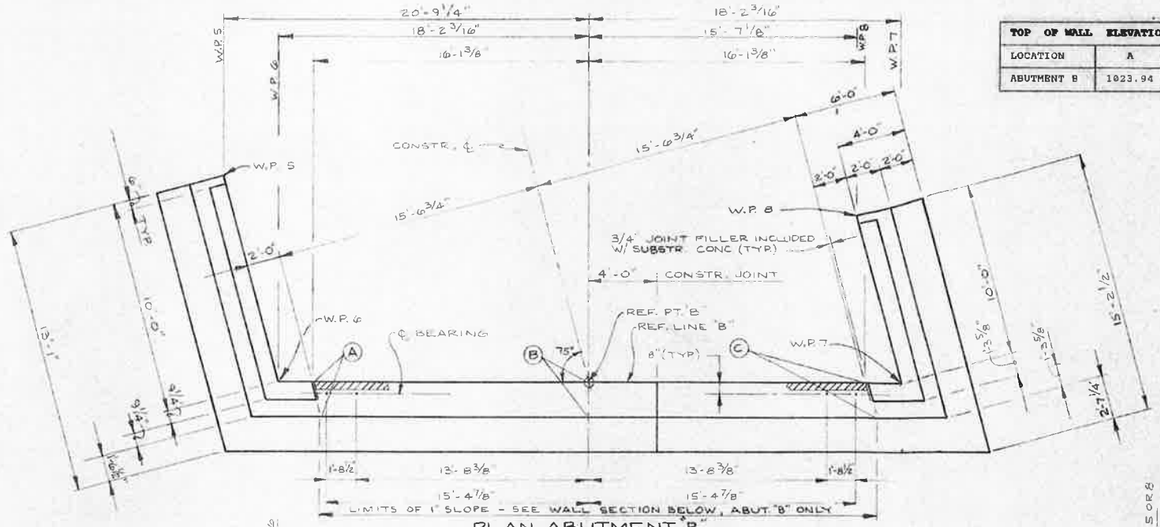
ABUTMENT "A" DETAILS

BY	DATE	SHEET NO.
K.O.	BI OF 20-6-13	7/10
CK 3/90	JN 31134 A	

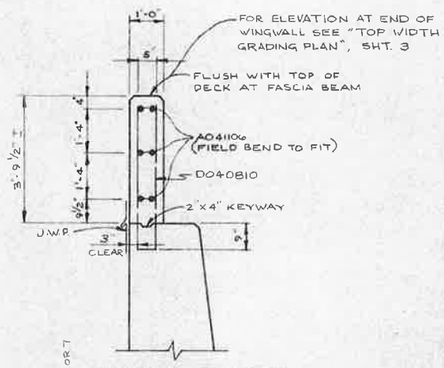
TOP OF WALL ELEVATION			
LOCATION	A	B	C
ABUTMENT B	1023.94	1024.13	1023.79

SUBSTRUCTURE CONCRETE (356)				
LOCATION	ABUTMENT A	ABUTMENT B	UNIT	AMOUNT
POUR A	31.4	31.4	CYD	
POUR B	38.6	26.2	CYD	
POUR C	1.8	1.8	CYD	
POUR D	2.5	1.8	CYD	
POUR			CYD	
		TOTAL	CYD	127.5

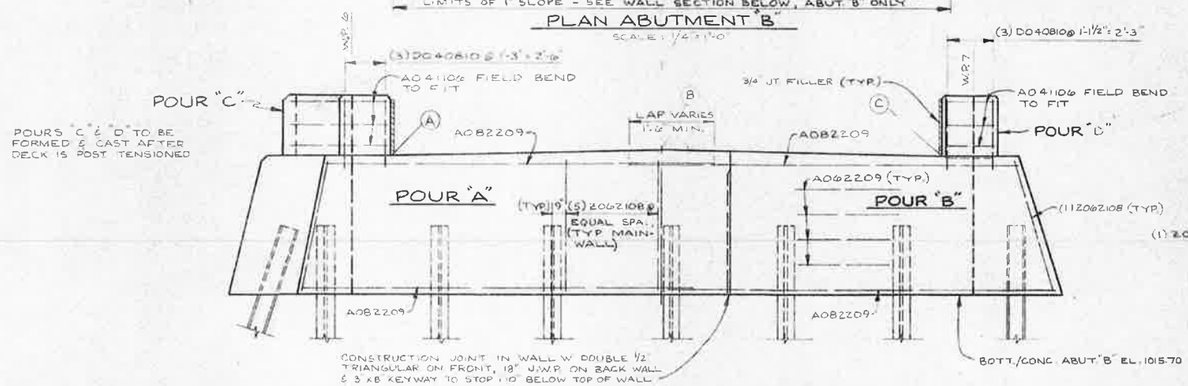
STEEL PILING (W 12X53) QUANTITIES					
LOCATION	TYPE	REQ'D	EST. L'GTH	UNIT	AMOUNT
ABUT. A	VERT.	5	37.0	LFT.	185.0
ABUT. A	BATT.	5	39.0	LFT.	195.0
ABUT. B	VERT.	4	38.0	LFT.	152.0
ABUT. B	BATT.	5	40.0	LFT.	200.0
STEEL PILES FURNISHED AND DRIVEN				LFT.	732.0
FURNISHING EQUIPMENT FOR DRIVING PILES				LSUM	1
SPLICES STEEL PILES				EACH	18



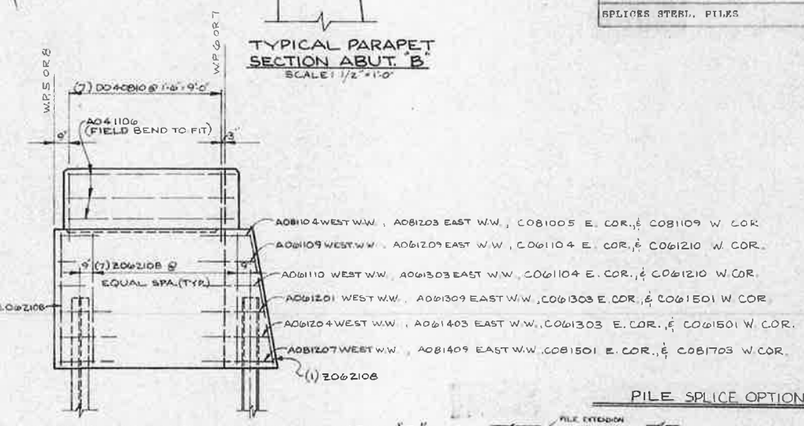
PLAN ABUTMENT "B"
SCALE: 1/4" = 1'-0"



TYPICAL PARAPET SECTION ABUT. "B"
SCALE: 1/2" = 1'-0"

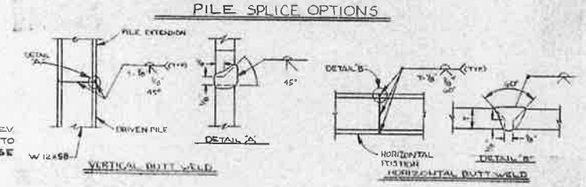


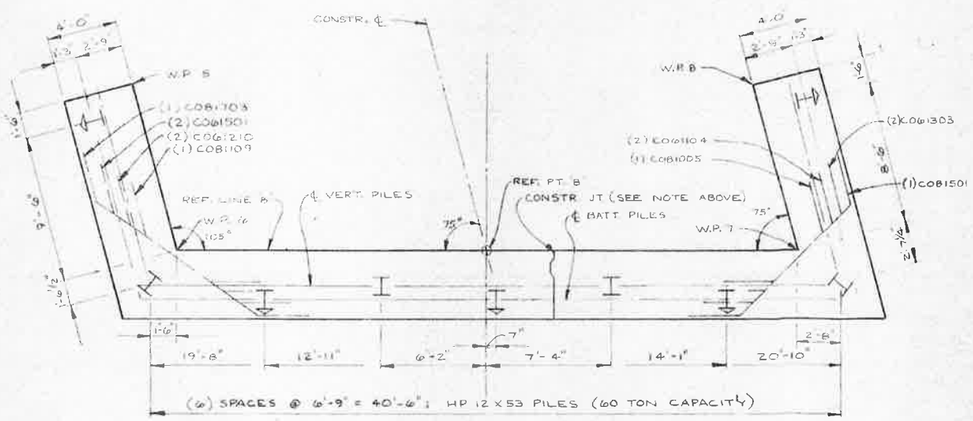
ELEVATION ABUT. "B"
SCALE: 1/4" = 1'-0"



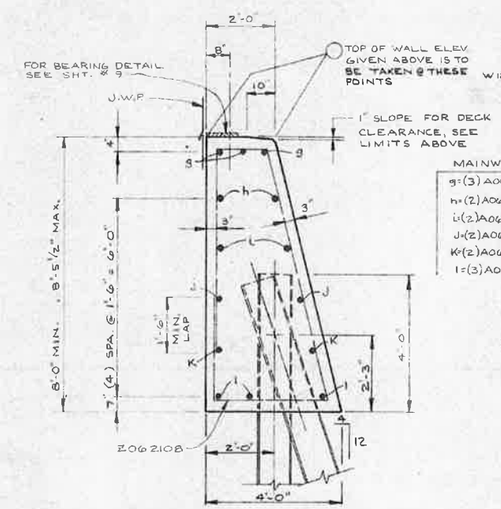
TYPICAL WINGWALL ELEVATION ABUT. "B"
SCALE: 1/4" = 1'-0"

PILE SPLICE OPTIONS



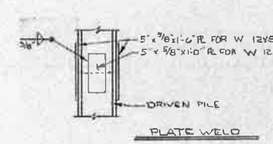


PILING PLAN ABUT. "B"
SCALE: 1/4" = 1'-0"

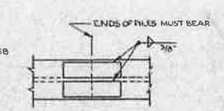


TYPICAL WALL SECTION ABUT. "B"
SCALE: 1/2" = 1'-0"

MAINWALL	EAST COR.	WEST COR.	EAST W.W.	WEST W.W.
g=(3) A082209,(1) C081005, & (1) C081109			(3) A081203	(3) A081104
h=(2) A062209,(1) C061104, & (1) C061210			(2) A061209	(2) A061109
i=(2) A062209,(1) C061104, & (1) C061210			(2) A061303	(2) A061110
J=(2) A062209,(1) C061303,(1) C061501			(2) A061309	(2) A061201
K=(2) A062209,(1) C061303, & (1) C061501			(2) A061403	(2) A061204
I=(3) A082209,(1) C081501, & (1) C081703			(3) A081409	(3) A081207



NOTE: COMMERCIAL SPLICE SLEEVES MAY BE APPROVED BY THE ENGINEER



NOTE:
ENDS OF PILES MUST BEAR. SET UPPER SPLICE SECTION IN PLACE WITH SPLICE R. ATTACHED, TAP SEVERAL WITH HAMMER TO IMPROVE BEARING CONTACT, THEN COMPLETE WELDING OF R. TO THE LOWER SECTION.

NOTE: SEE SHT. # 7 FOR ABUTMENT AND STEEL PILE NOTES

W.O. # 20-47-2

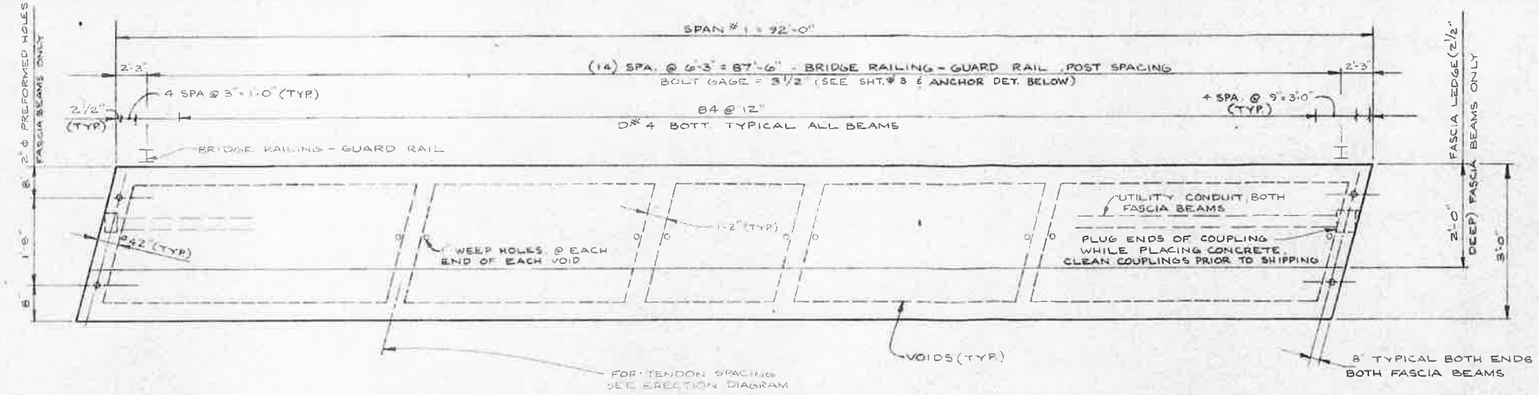
R.S. Scott Associates, Inc.
405 RIVER ST ALPENA, MICHIGAN 49707 (517) 354-3178

REVISIONS

CRAWFORD COUNTY ROAD COMMISSION
McMASTERS BRIDGE ROAD OVER THE AU SABLE RIVER
SOUTH BRANCH TOWNSHIP
SECTION 11, T26N-R1W

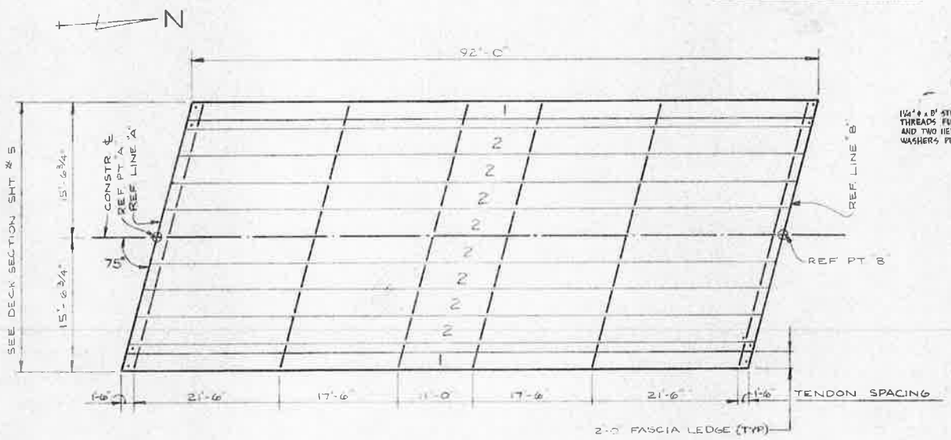
ABUTMENT "B" DETAILS

BY	DATE	SHEET NO.
KO	BI OF 20-6-13	8/10
CK	3/90	JN 31134 A

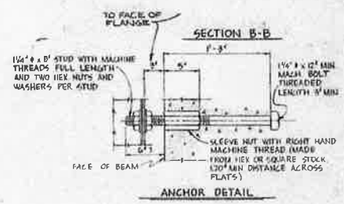


PLAN OF BEAM

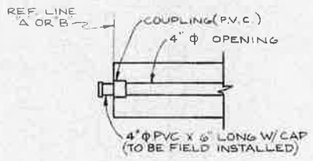
QUANTITIES		
ITEM	UNIT	AMOUNT
CONDUIT 4 INCH	LFT	184.00
3/4 INCH ELASTOMERIC BRARING	SFT	32.00
42 INCH PRESTRESSED CONCRETE DECK	SFT	2863.50
POST TENSIONING	LSUM	1.00
BRIDGE RAILING-GUARD RAIL	LFT	200.00



ERECTION DIAGRAM



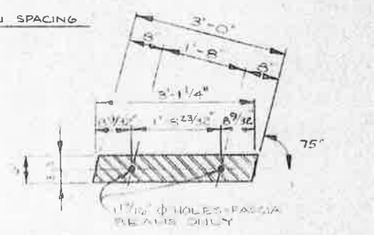
ANCHOR DETAIL



UTILITY CONDUIT DETAIL

UTILITY CONDUIT NOTES

A four inch diameter conduit shall be embedded in all fascia beams as shown hereon to provide for future use by others. The conduit shall be made continuous. The conduits shall be cleaned of debris prior to shipping, and shall be shipped with open ends. At the job site the contractor shall ensure that the conduits are clean and install a six inch length of 4" PVC with cap at the abutment ends as shown hereon. All the work and materials associated with this utility conduit shall be paid for as CONDUIT 4".



3/4" ELASTOMERIC BEARING PAD (20 DUROMETER)

NOTES:

The value of "E" used in calculating strand elongation shall be as recommended by the strand manufacturer. Strands will be placed symmetrically about the centerline of beam.

Elastomer for elastomeric bearing pads shall be nominal (70) durometer hardness unless otherwise noted. The design of these pads is based on a maximum pressure of 500 psi. D.L. and 800 psi. D.L. + L.L.

Position dowels shall be ASTM A36, galvanized (ASTM-153) and shall be included in the pay item PRESTRESSED CONCRETE DECK.

The compressive strength of the concrete shall not be less than 5000 psi at 28 days.

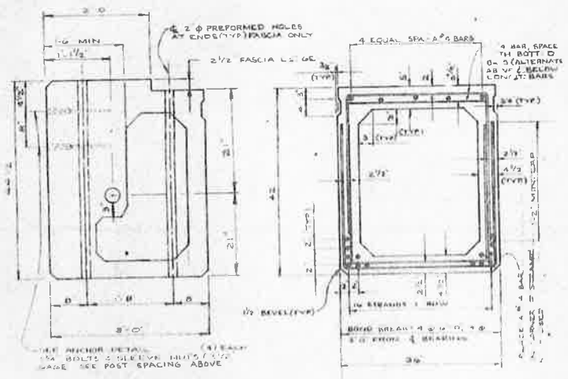
Prestressing strands shall be 1/2" diameter with an area of 0.153 square inches and shall be Grade 270 in accordance with ASTM A416 and supplement. Low relaxation strands shall be used as shown in the details, and given an initial prestress of 31,000 lbs. each.

Steel reinforcement in beams, steel bearings and concrete inserts are included in the bid item PRESTRESSED CONCRETE DECK.

When bond breakers are required, they shall be used on the strands in the bottom row and placed symmetrically about the centerline of the beam. Placing bond breakers on peripheral strands shall be avoided. The number, location, and length of the bond breakers shall be as shown in the details. Length shown is from end of beam to end of breaker. They shall consist of two tubes (one inside the other) with overlap turned in opposite directions.

The compressive strength of the concrete at the time of prestressing force release shall not be less than 4000 psi.

The initial force in the transverse post-tensioning tendons shall be 82,500 lbs. each.

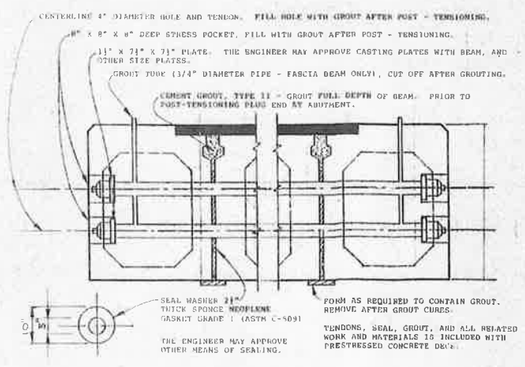


FASCIA BEAM

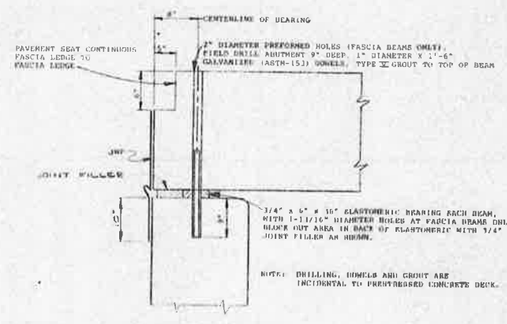
INTERIOR BEAM

42" PRESTRESSED CONCRETE BOX BEAM

STRANDS AND REINFORCEMENT IN FASCIA BEAMS ARE THE SAME AS INTERIOR BEAMS



TENDON DETAIL



ABUTMENT BEARING DETAIL

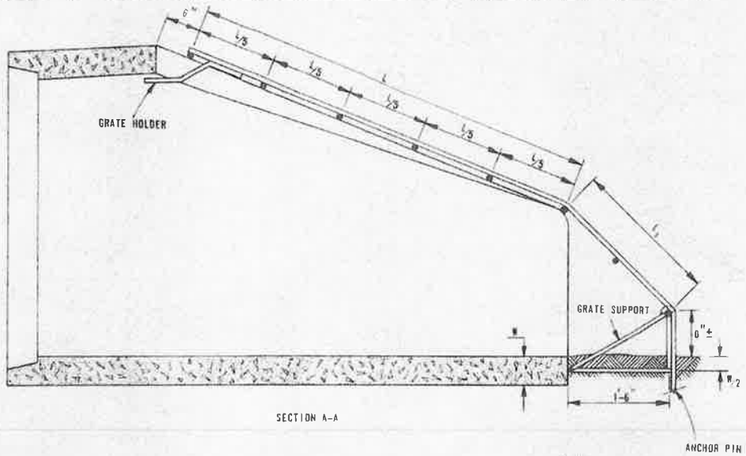
W.O. # 20-47-2

R.S. Scott Associates, Inc. 405 RIVER ST ALPENA, MICHIGAN 49707 (517) 354-3178	REVISIONS	CRAWFORD COUNTY ROAD COMMISSION McMASTERS BRIDGE ROAD OVER THE AU SABLE RIVER SOUTH BRANCH TOWNSHIP. SECTION 11, T26N-R1W	BOX BEAM DETAILS	BY: k.o. CK	DATE 3/90	BI OF 20-6-13 JN 31134 A	SHEET NO 9/10

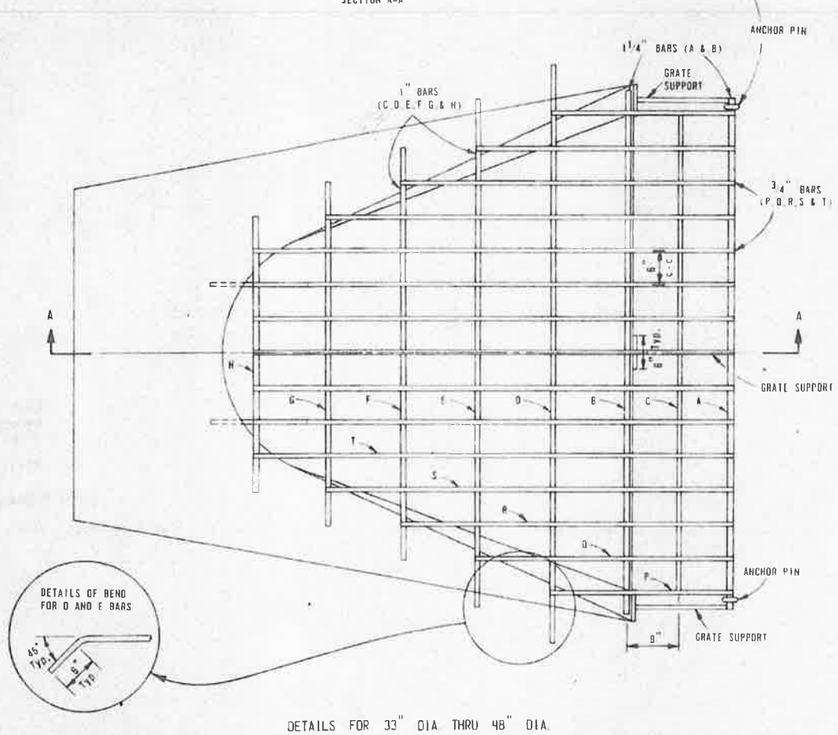
SHEET NO.
JOB NO.
CONTROL SECTION

DIMENSIONS AND ESTIMATED QUANTITIES FOR STEEL GRATE (33" THRU 48")

END SECTION DIAMETER	L *	L_1	3/4" DIA. BARS 6" c-c (P, Q, R, S, & T) P = L_1 + (1/3 L)	Q = L_1 + (2/3 L)	R = L_1 + (L)	S = L_1 + 4/3 (L)	T = L + L_1	ANCHOR PINS	GRATE HOLDER	TOTAL LENGTH 3/4" DIA. BARS	1" DIA. BARS (C, D, E, F, G, & H) C	D	E	F	G	H	GRATE SUPPORT	TOTAL LENGTH 1" DIA. BARS	1 1/4" DIA. BARS (A&B) A	B	STEEL PER GRATE LBS
33"	4'-7 3/8"	1'-8"	2 @ 2'-7 1/8"	—	2 @ 4'-5 1/4"	2 @ 5'-4 1/4"	5 @ 8'-3 3/8"	2 @ 3'	2 @ 1'-6"	66'	6'	7'	7'	5'	5'	4'	3 @ 4'	39	6'-0"	6'-2"	273
36"	5'-0"	1'-8"	2 @ 2'-8"	—	2 @ 4'-8"	2 @ 5'-8"	7 @ 8'-8"	2 @ 3'	2 @ 1'-6"	87'	6'	8'	7'	6'	5'	4'	3 @ 4'	41	6'-0"	6'-8"	307
42"	5'-0 1/8"	1'-8"	2 @ 2'-8 1/8"	2 @ 3'-8 1/4"	2 @ 4'-8 3/8"	2 @ 5'-8 1/2"	7 @ 8'-8 5/8"	2 @ 3'	2 @ 1'-6"	90	6'	8'	8'	6'	5'	4'	3 @ 4'	42	7'-0"	7'-2"	325
48"	6'-0"	2'-3"	2 @ 3'-5 3/8"	2 @ 4'-7 3/4"	2 @ 5'-10 1/8"	2 @ 7'-0 1/2"	7 @ 8'-3"	2 @ 3'	2 @ 1'-6"	109'	7'	9'	8'	6'	5'	4'	3 @ 4'	44	7'-6"	7'-9"	364



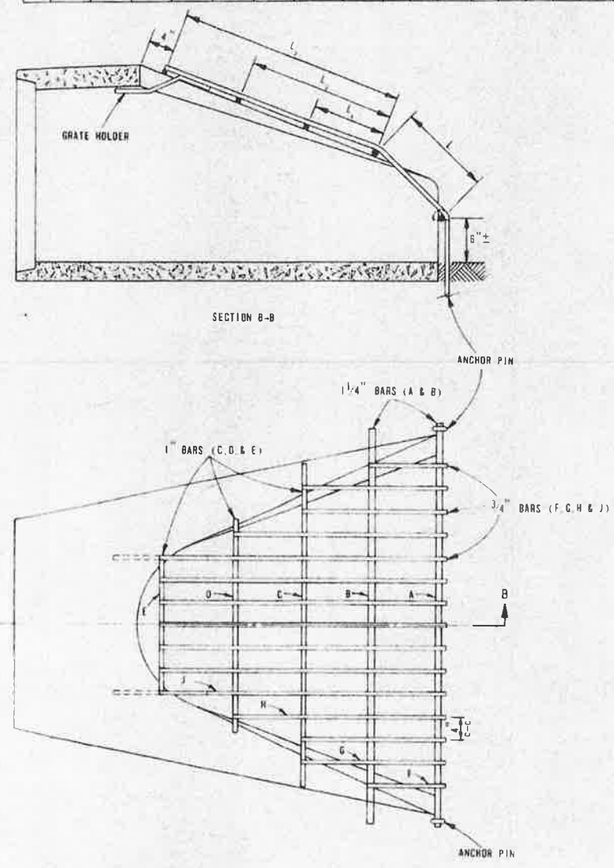
SECTION A-A



DETAILS FOR 33" DIA. THRU 48" DIA.

DIMENSIONS AND ESTIMATED QUANTITIES FOR STEEL GRATE (12" THRU 30")

END SECTION DIAMETER	L	L_1	L_2	L_3	3/4" DIA. BARS 4" c-c (F, G, H, & J) F = L	G = $L-L_1$	H = $L-L_2$	J = $L-L_3$	ANCHOR PINS	GRATE HOLDER	TOTAL LENGTH 3/4" DIA. BARS	1" DIA. BARS (C, D & E) C	D	E	TOTAL LENGTH 1" DIA. BARS	1 1/4" DIA. BARS A	B	STEEL PER GRATE LBS
12"	10 1/2"	10 1/2"	—	—	—	5 @ 1'-9"	—	—	2 @ 3'	2 @ 1'-6"	18'	2'-6"	—	—	1'-6"	2'-10"	3'-0"	58
15"	1'-0 5/8"	1'-0 5/8"	—	—	2 @ 1'-0 5/8"	5 @ 2'-1 1/4"	—	—	2 @ 3'	2 @ 1'-6"	22'	2'-6"	—	—	1'-8"	3'-4"	3'-4"	68
18"	11 1/2"	11 1/2"	—	—	2 @ 1 1/2"	7 @ 1'-11"	—	—	2 @ 3'	2 @ 1'-6"	25'	3'-0"	—	—	2'-0"	4'-0"	3'-8"	78
21"	1'-2"	10 5/8"	1'-9 1/4"	—	2 @ 1'-2"	2 @ 2'-0 5/8"	7 @ 2'-11 1/4"	—	2 @ 3'	2 @ 1'-6"	34'	3'-8"	2'-0"	—	2'-8"	4'-6"	4'-4"	103
24"	1'-2"	10 1/2"	1'-9"	2'-7 1/2"	—	2 @ 2'-0 1/2"	2 @ 2'-11"	7 @ 3'-9 1/2"	2 @ 3'	2 @ 1'-6"	45'	4'-4"	2'-6"	2'-0"	8'-0"	5'-0"	5'-0"	133
27"	1'-2 3/8"	1'-0 5/8"	2'-1 1/4"	3'-7 1/8"	2 @ 1'-2 3/8"	2 @ 2'-3"	2 @ 3'-3 5/8"	7 @ 4'-4 1/4"	2 @ 3'	2 @ 1'-6"	53'	4'-6"	2'-8"	2'-0"	8'-3"	5'-6"	5'-4"	150
30"	1'-6"	1'-1 1/4"	2'-2 1/2"	3'-3 3/4"	2 @ 1'-6"	2 @ 2'-7 1/4"	2 @ 3'-8 1/2"	7 @ 4'-8 3/4"	2 @ 3'	2 @ 1'-6"	58'	5'-0"	3'-4"	2'-0"	9'-4"	6'-0"	5'-6"	163

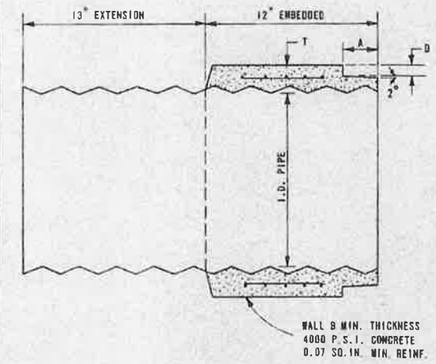


SECTION B-B

DETAILS OF BEND FOR B AND C BARS

DETAILS FOR 12" DIA. THRU 30" DIA.

ADAPTOR FOR CONNECTING CONCRETE END SECTIONS TO CORRUGATED METAL PIPE CULVERTS



I.D. PIPE	12"	15"	18"	21"	24"	27"	30"	36"	42"	48"
T	2"	2 1/4"	2 1/2"	2 3/4"	3"	3 1/4"	3 1/2"	4"	4 1/2"	5"
A	2 1/2"	2 1/2"	2 3/4"	2 3/4"	3"	4 3/32"	4 5/32"	4 9/32"	5"	5"
D	7/8"	7/8"	7/8"	7/8"	7/8"	13/16"	1 1/16"	1 9/16"	2 7/16"	2 25/32"

NOTES:

ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS.

CONVENTIONAL REINFORCING STEEL MAY BE USED FOR THE GRATE FABRICATION SHALL BE BY WELDING EACH BAR INTERSECTION.

FOR PRECAST CONCRETE END SECTION, SEE CURRENT STANDARD PLAN IX-88 SERIES.

PRECAST END SECTIONS FROM DIFFERENT MANUFACTURERS VARY IN EXACT WIDTH AND SHAPE OF THE OPENING. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT THE GRATE WILL ADEQUATELY COVER THE OPENING.

STATE OF MICHIGAN
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION
STANDARD PLAN FOR

STEEL GRATE FOR PRECAST CONCRETE END SECTION

APPROVALS

CHECKED	C. P. Zajac (Bell 12-5-77) — ENGINEER - ROAD DESIGN	12-5-77 DATE
RECOMMENDED FOR APPROVAL	ENGINEER OF DESIGN	12/15/77 DATE
RECOMMENDED FOR APPROVAL	ENGINEER OF TRAFFIC AND SAFETY	12/15/77 DATE
RECOMMENDED FOR APPROVAL	ENGINEER OF CONSTRUCTION	12-19-77 DATE

DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION
JOHN P. WOODFORD, DIRECTOR

BY Max D. Clyde — DEPUTY DIRECTOR - HIGHWAYS — 12-19-77 DATE

R. S. SCOTT ASSOCIATES, INC.
405 RIVER STREET ALPENA, MICHIGAN

SPECIAL DETAIL

DATE 3/90	SHEET 10 OF 10		
DRAWN BY		PLAN FILE 20-47-2	

DRAWN BY O.F.M.	CHECKED BY V.R.	REVISED BY	11-23-77 DATE
APPROVED F.H.W.A. DATE	SPECIAL DETAIL		

CONTROL SECTION B1 OF 20-6-13 | JOB NO. JN 31134 A | SHEET 1