LOR–20–2.16	OHIO / FHWA REGION 5	1 / 22
BRF–69(96)	FEDERAL PROJECT	

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

LOR–20–2.16 BRF–69(96)

CAMDEN TOWNSHIP
LORAIN COUNTY

DESIGN DESIGNATION

CURRENT (1987) A.D.T.	=	2840
DESIGN YEAR (2007) A.D.T.	=	3460
D.H.V.	=	346
D DIRECTIONAL DISTRIBUTION	=	50%
T PERCENT B & C TRUCKS	=	18%
V DESIGN SPEED	=	70 mph
LEGAL SPEED	=	55 mph

CONVENTIONAL SIGNS

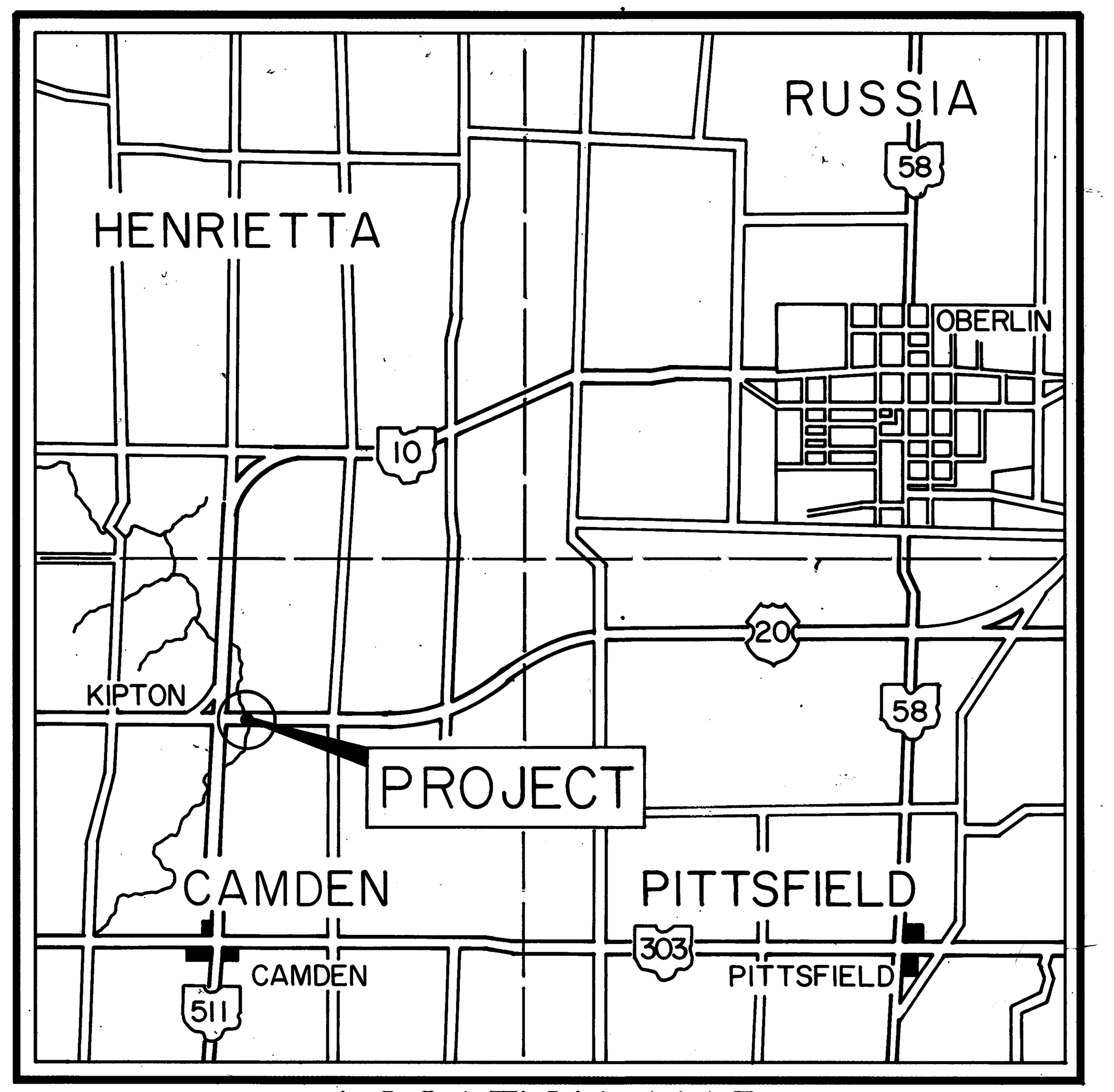
County Line
Township Line
Section Line
Corporation Line or
Fence Line (existing) —X—X— (proposed) —X—X—
Center Line 352 353
Trees Stumps (to be removed)
Utility Poles Telephone Power Light
Limited Access (only) LA
Right of Way (only) RW
Limited Access & Right of Way LA & RW
Existing Right of Way
Property Line (in existing fence)
Railroad OR
Guardrail (existing) (proposed)
Waterline —W— W.V. Gasline —G— G.V.
Telephone — — T — —

INDEX OF SHEETS

LINE DATA

BEGIN PROJECT STA. 113+77.92
END PROJECT STA. 114+69.08
NET PROJECT LENGTH 91.16 FT. OR .017 MILES

BEGIN WORK STA. 108+40.00
END WORK STA. 120+00.00
NET WORK LENGTH 1160.00 FT. OR .220 MILES



LOCATION MAP

SCALE IN MILES
0 1 2 3 4

Portion to be improved
State & Federal Routes
Other Roads

SCALES

Plan 0 50 100'
Profile Horizontal 0 50 100' Vertical 0 5 10'
Cross Section: Horizontal 0 5 10' Vertical 0 5 10'

MICROFILMED JUN 18 1992

MICROFILMED JUN 19 1992

1987 SPECIFICATIONS

The Standard Specifications of the State of Ohio Department of Transportation, including changes and supplemental specifications listed in the proposal shall govern this improvement.

I hereby approve these plans and declare that the making of this improvement will not require the closing to traffic of the highway and that provisions for maintenance and safety of traffic will be as set forth on the plans and estimates.

Approved *Gary W. P...*
Date *6/11/87* District Deputy Director of Transportation

Approved *Walter J. Jestings/...*
Date *6-30-87* Engineer, Bureau of Bridges and Structural Design
B+N 6/30/87

Approved *Wayne H. Kauble*
Date *8-7-87* Chief Engineer, Planning and Design
7/6/87

Approved *Warren J. Smith*
Date *8-7-87* Director, Department of Transportation

SUPPLEMENTAL SPECIFICATIONS		
824	10–8–82	
836	11–12–85	
847	10–17–83	
947	10–17–83	

UNDERGROUND UTILITIES
TWO WORKING DAYS BEFORE YOU DIG CALL 800–362–2764 (TOLL FREE) OHIO UTILITIES PROTECTION SERVICE NON–MEMBERS MUST BE CALLED DIRECTLY

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS									
BP–5	1–11–85	AS–1–81	11–27–81						
		DBR–2–73	4–10–73						
GR–1	1–11–85								
GR–2B	2–5–82	PSBD–1–81	9–18–81						
GR–3	1–21–85	*LA-1*	*6-1-79*						
GR–4B	2–5–82								
GR–4A	1–30–84								
GR–6	2–5–82	MC–11	8–1–78						
		MT–99.10	11–14–86						
		TC–42.20	3–26–79						

PLAN PREPARED BY:

R.E.WARNER & ASSOCIATES

ROADWAY AND STRUCTURE PLANS

STATE OF OHIO JOSEPH DONALD O'BRIEN E-33803 REGISTERED PROFESSIONAL ENGINEER

Project LOR–20–2.16
Date of Letting ________ 198 Contract No. ____

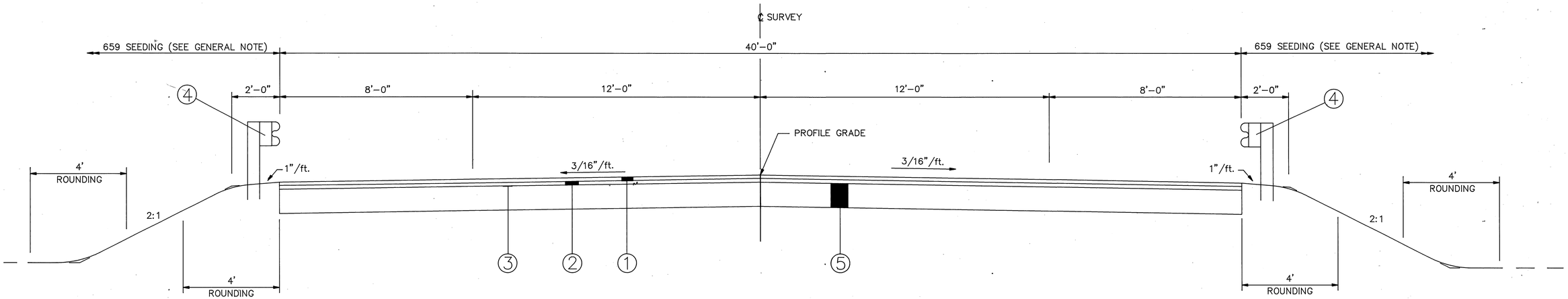
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

CALC. BY EW DATE 2-9-87	LOR-20-2.16	OHIO
CALC. BY MEW DATE 3-31-87		FHWA REGION 5

TYPICAL SECTION
TYPE 404



NORMAL SECTION

STATION	113+77.92	TO	113+92.92	=	15.00	LIN. FT.
STATION	114+54.08	TO	114+69.08	=	15.00	LIN. FT.
			TOTAL	=	30.00	LIN. FT.

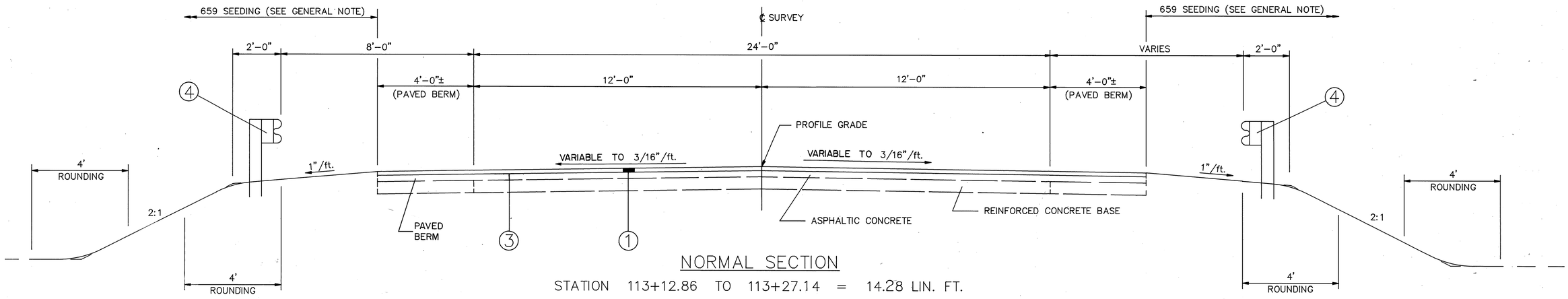
BRIDGE LIMITS – STA 113+92.92 TO STA 114+54.08

LEGEND

1. ITEM 404 – 1-1/4" Asphalt Concrete, AC-20
2. ITEM 403 – Variable (1-1/4" to 2-3/4") Asphalt Concrete, AC-20
3. ITEM 407 – Tack Coat, As Per Plan (See General Note)
4. ITEM 606 – Guardrail, Type 5
5. ITEM 611 – Reinforced Concrete Approach Slab (T=12").

CALC. BY CW DATE 3-25-97	LOR-20-2.16	OHIO
CALC. BY EAP DATE 3-31-97		FHWA REGION 5

TYPICAL SECTION
TYPE 404



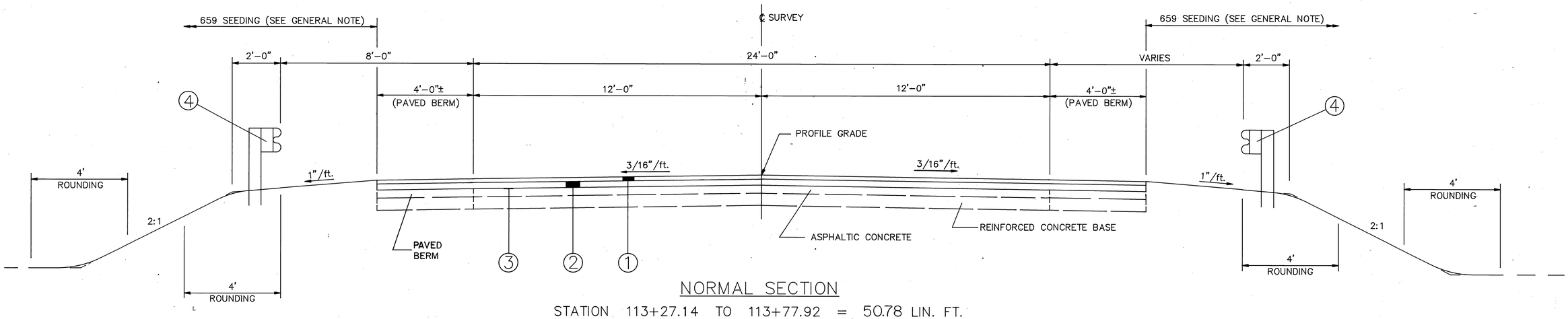
NORMAL SECTION

STATION	113+12.86	TO	113+27.14	=	14.28	LIN. FT.
STATION	115+36.76	TO	115+52.78	=	16.02	LIN. FT.
TOTAL				=	30.30	LIN. FT.

LEGEND

1. ITEM 404 – 1–1/4" Asphalt Concrete, AC–20
2. ITEM 403 – Variable Thickness Asphalt Concrete, AC–20 (0" Min.)
3. ITEM 407 – Tack Coat, As Per Plan (See General Note)
4. ITEM 606 – Guardrail, Type 5

TYPICAL SECTION
TYPE 404



NORMAL SECTION

STATION	113+27.14	TO	113+77.92	=	50.78	LIN. FT.
STATION	114+69.08	TO	115+36.76	=	67.68	LIN. FT.
TOTAL				=	118.46	LIN. FT.

GENERAL NOTES

FIELD OFFICE:

THE CONTRACTOR SHALL PROVIDE A SUITABLE FIELD OFFICE HAVING A MINIMUM OF 300 SQ.FT. OF FLOOR SPACE. PAYMENT SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 619, FIELD OFFICE. IT SHALL BE PLACED IN ACCORDANCE WITH SECTION 614.03.

ROUNDING OF CORNERS SHOWN ON CROSS SECTIONS:

THE ROUNDED CORNERS SHOWN ON THE TYPICAL SECTIONS, APPLY TO ALL CROSS SECTIONS EVEN THOUGH OTHERWISE SHOWN ON THESE PLANS.

CONTINGENCY QUANTITIES:

THE CONTRACTOR SHALL NOT ORDER MATERIALS OR PERFORM WORK FOR PLAN ITEMS SET UP TO BE USED "AS DIRECTED BY THE ENGINEER" UNLESS AUTHORIZED BY THE ENGINEER. THE ACTUAL WORK LOCATIONS AND QUANTITIES USED AT THE ENGINEER'S DISCRETION SHALL BE MADE A MATTER OF RECORD BY INCORPORATION INTO THE FINAL CHANGE ORDER GOVERNING COMPLETION OF THIS PROJECT.

ELEVATION DATUM:

ALL ELEVATIONS ARE BASED ON U.S.G.S. DATUM.

LOCATION OF GUARDRAIL:

THE LOCATION OF GUARDRAIL RUNS, AS SHOWN IN THESE PLANS, ARE SUBJECT TO ADJUSTMENT PRIOR TO FINAL ACCEPTANCE. THE ENGINEER SHALL BE SATISFIED THAT ALL INSTALLATIONS WILL AFFORD MAXIMUM PROTECTION FOR TRAFFIC.

ITEM 407 – TACK COAT AS PER PLAN:

THE RATE OF APPLICATION OF 407 TACK COAT SHALL BE SUBJECT TO ADJUSTMENT, AS DIRECTED BY THE ENGINEER. WHERE COVER AGGREGATE IS NEEDED ON THIS PROJECT, IT SHALL BE USED AS DIRECTED BY THE ENGINEER, AND IT SHALL BECOME INCIDENTAL TO, AND INCLUDED IN, ITEM 407 TACK COAT, AS PER PLAN.

WORK WITHIN RIGHT OF WAY:

ALL WORK ON THIS PROJECT SHALL BE PERFORMED WITHIN THE EXISTING RIGHT OF WAY.

SUBGRADE COMPACTION:

IN LIEU OF THE REQUIREMENTS OF 203.13 (a) FOR COMPACTION OF THE SUBGRADE UNDER NEW PAVEMENT, THE SUBGRADE SHALL BE COMPACTED TO A DEPTH OF 6" AND THE COST OF SAME SHALL BE INCLUDED IN THE UNIT PRICE BID FOR 203 EXCAVATION.

DUST CONTROL:

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN PROVIDED IN THE GENERAL SUMMARY TO BE USED FOR DUST CONTROL AS DIRECTED BY THE ENGINEER:

ITEM 616	WATER	10 M-GAL.

UNDERGROUND UTILITIES:

THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS OF THE UTILITY AS REQUIRED BY SECTION 153.64 O.R.C.

UTILITY OWNERSHIP:

THE FOLLOWING UTILITIES AND OWNERS ARE LOCATED WITHIN THE WORK LIMITS OF THIS PROJECT:

TELEPHONE: GENERAL TELEPHONE COMPANY
6223 NORWALK ROAD
P.O. BOX 585
MEDINA, OHIO 44256
(216) 722-9580

WATER: RURAL LORAIN WATER AUTHORITY
P.O.BOX 567
42401 ROUTE 303
LAGRANGE, OHIO 44050
(216) 355-6060

GAS: COLUMBIA GAS OF OHIO
827 WALNUT STREET
ELYRIA, OHIO 44035
(216) 233-7216

POWER: LORAIN-MEDINA RURAL ELECTRIC CO-OP
P.O. BOX 158
WELLINGTON, OHIO 44090
(216) 647-2133

REMOVAL OF TREES OR STUMPS:

ALL TREES AND STUMPS SPECIFICALLY MARKED FOR REMOVAL WITHIN THE CONSTRUCTION LIMITS OF THIS PROJECT SHALL BE REMOVED UNDER THE LUMP SUM PRICE BID FOR ITEM 201, CLEARING AND GRUBBING, EXCEPT THAT THOSE TREES FOR WHICH PROTECTION AND PRESERVATION WORK IS INDICATED ELSEWHERE IN THESE PLANS SHALL NOT BE REMOVED.

THE FOLLOWING IS AN APPROXIMATE ESTIMATE OF THE NUMBER OF TREES AND STUMPS TO BE REMOVED:

SIZES	No.TREES	No.STUMPS	TOTAL
18"	0	0	0
30"	0	0	0
48"	0	0	0
60"	0	0	0

THE ABOVE ESTIMATE IS APPROXIMATE AND THE STATE OF OHIO RESERVES THE RIGHT TO ORDER REMOVAL OF ADDITIONAL TREES OR STUMPS OUTSIDE OF THE LIMITS OF CONSTRUCTION BUT WITHIN THE RIGHT-OF-WAY AND/OR EASEMENT LINES. PAYMENT FOR THE REMOVAL OF THESE ADDITIONAL TREES OR STUMPS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 201, CLEARING AND GRUBBING.

SEEDING:

QUANTITIES FOR SEEDING ARE CALCULATED FOR THE SOIL AREAS BETWEEN TEN (10) FEET OUTSIDE THE WORK LIMITS, AS SHOWN ON THE CROSS SECTIONS, OR TO THE RIGHT-OF-WAY IF SUCH LINE IS LESS THAN TEN (10) FEET FROM THE WORK LIMITS.

WATERING PERMANENT SEEDED AREAS:

THE FOLLOWING ESTIMATED QUANTITY IS TO BE USED AS DIRECTED BY THE ENGINNEER TO PROMOTE GROWTH OF THE PERMANENT SEEDED AREAS AS PER 659.09

ITEM 659	WATER	4 M-GAL.

TEMPORARY SOIL EROSION AND SEDIMENT CONTROL:

THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER, FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES.

ITEM 207	STRAW OR HAY BALES	30 EACH

ITEM 614 – MAINTAINING TRAFFIC:

THE CONTRACTOR SHALL MAINTAIN TRAFFIC AT ALL TIMES IN ACCORDANCE WITH THE REQUIREMENTS OF SPECIFICATION 614. TWO WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES BY USE OF EXISTING PAVEMENT, ITEM 502 TEMPORARY STRUCTURE, AND ITEM 615 TEMPORARY ROADS AND PAVEMENTS. THE LIMITS AND DURATION OF USE OF THE TEMPORARY ROAD-WAY SHALL BE HELD TO AN ABSOLUTE MINIMUM, AND IN ALL CASES SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

LOCAL TRAFFIC TO ALL DRIVES WITHIN THE WORK AREA SHALL BE MAINTAINED AS PER ITEM 614.02.

SEPARATE PAYMENT SHALL BE MADE FOR ITEM 502 AND 615 NOTED ABOVE. ITEM 614 WORK ZONE PAVEMENT MARKINGS SHALL ALSO BE ITEMIZED AND PAID FOR SEPARATELY. ALL OTHER WORK REQUIRED FOR TRAFFIC MAINTENANCE SHALL BE INCLUDED WITH THE LUMP SUM PAYMENT FOR ITEM 614 – MAINTAINING TRAFFIC.

TEMPORARY STRUCTURE AS PER PLAN:

THE TEMPORARY STRUCTURE SHALL HAVE MINIMUM CLEAR ROADWAY WIDTH OF 28 FEET FACE-TO-FACE OF GUARDRAILS.

ITEM 615 – TEMPORARY ROADS AND PAVEMENTS

THE ALIGNMENT, PROFILE, AND TYPICAL SECTION SHALL BE AS DETAILED ON SHEET NO. 14.

ESTIMATED QUANTITIES HAVE BEEN PROVIDED IN THE GENERAL SUMMARY FOR CONSTRUCTING THE TEMPORARY PAVEMENT (ITEM 615 – TEMPORARY PAVEMENT, CLASS B). ALTHOUGH ESTIMATES FOR TEMPORARY GUARDRAIL AND TEMPORARY EARTHWORK HAVE BEEN SHOWN ON THE PLAN DETAILS, THESE ITEM SHALL BE CONSIDERED INCIDENTAL TO, AND INCLUDED WITH, PAYMENT FOR ITEM 615 – TEMPORARY ROADS.

TRENCH FOR TEMPORARY PAVEMENT CONSTRUCTION:

ANY OPEN TRENCH FOR TEMPORARY PAVEMENT CONSTRUCTION (OR REMOVAL, IF THE ROADWAY HAS BEEN RE-OPENED TO TRAFFIC) SHALL BE PROTECTED WITH DRUMS OR BARRICADES AT ALL TIMES. ANY SUCH TRENCH THAT IS WITHIN TEN (10) FEET OF THE EDGE OF THE EXISTING PAVEMENT SHALL NOT REMAIN OPEN OVERNIGHT. WHENEVER WORK IS SUSPEND-ED, THE TRENCH SHALL BE BACKFILLED AT THE DIRECTION OF THE ENGINEER.

TEMPORARY PAVEMENT MARKINGS:

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER:

614 – TEMPORARY CENTERLINE, CLASS II .05 MI.
SEE MT-99.10 FOR REQUIREMENTS

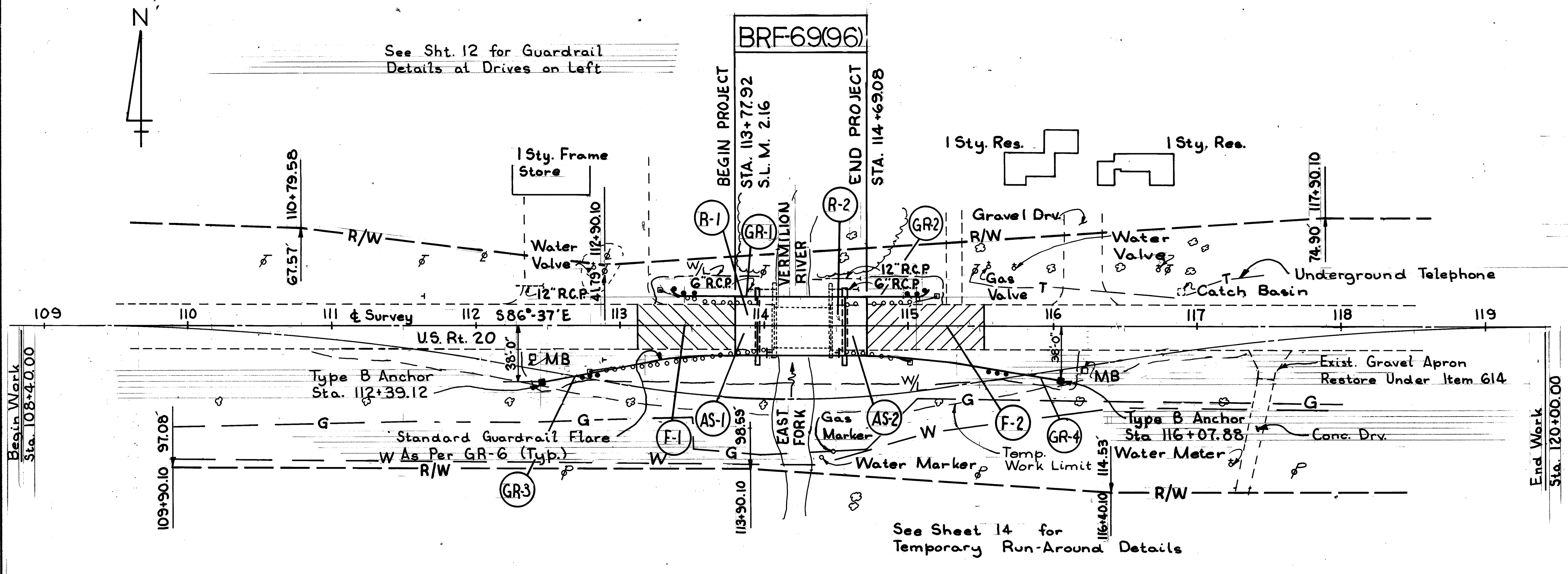
THIS ITEM MAY BE NON-PERFORMED IF THE 621 PAVEMENT MARKINGS ARE IN PLACE PRIOR TO OPENING THE ROAD TO TRAFFIC.

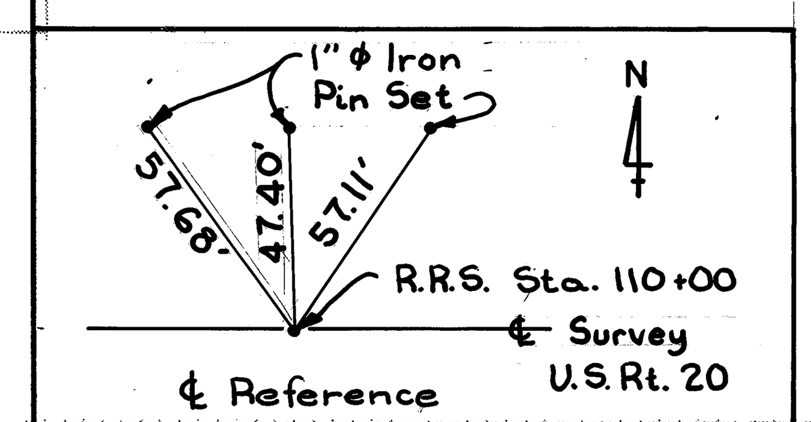
ITEM 659 COMMERCIAL FERTILIZER

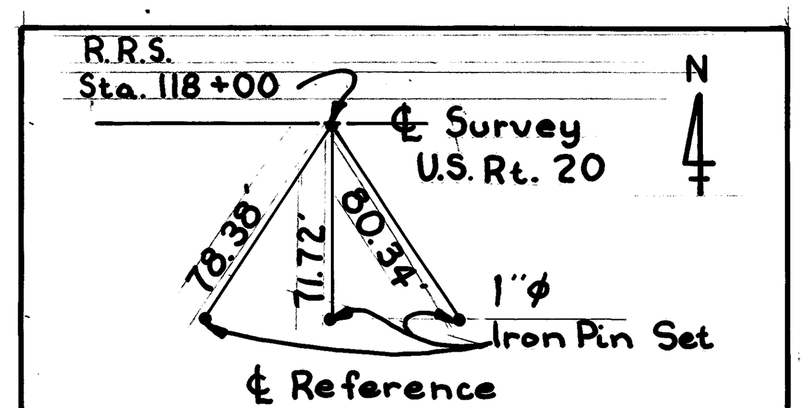
ITEM 659 SEEDING = 3398 SQ. YDS.
FERTILIZER = 3398x9x20 / 1000x2000 = .31 TON

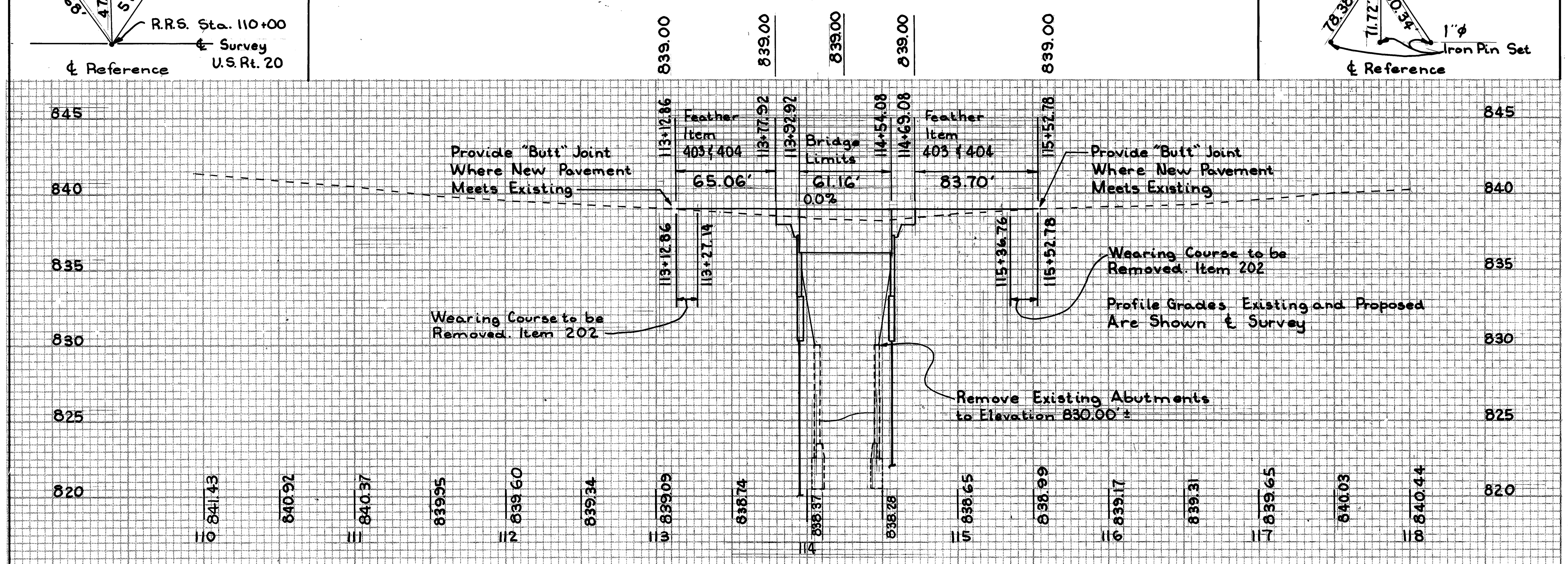
GENERAL SUMMARY

ITEM	SHEET NUMBER 4	5	6	12	14	ITEM	QUANT.	UNIT	DESCRIPTION
									ROADWAY
201	LUMP					201	LUMP		CLEARING AND GRUBBING
202			123			202	123	SQ. YD.	PAVEMENT REMOVED
202			108			202	108	SQ. YD.	WEARING COURSE REMOVED
203			347			203	347	CU. YD.	EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION
203			43			203	43	CU. YD.	EMBANKMENT
606			368.75			606	368.75	LIN. FT.	GUARDRAIL, TYPE 5
606			2			606	2	EACH	ANCHOR ASSEMBLY, STANDARD TYPE B
606			4			606	4	EACH	BRIDGE TERMINAL ASSEMBLY, STANDARD TYPE B
606			2			606	2	EACH	ANCHOR ASSEMBLY, STANDARD TYPE T
615					1678	615	1678	SQ. YD.	TEMPORARY PAVEMENT, CLASS B
615					LUMP	615	LUMP		TEMPORARY ROADS
616	10					616	10	M-GAL	WATER
									EROSION CONTROL
601				129		601	129	CU. YD.	ROCK CHANNEL PROTECTION, TYPE C WITH FABRIC FILTER
659			3398			659	3398	SQ. YD.	SEEDING AND MULCHING
659		0.31				659	0.31	TON	COMMERCIAL FERTILIZER
659	4					659	4	M-GAL	WATER
207	30					207	30	EACH	STRAW OR HAY BALES
									TRAFFIC CONTROL
614					0.12	614	0.12	MILE	TEMPORARY CENTERLINES, CLASS I
614					0.08	614	0.08	MILE	TEMPORARY CENTERLINES, CLASS I, 947.03 TYPE C
614					0.27	614	0.27	MILE	TEMPORARY EDGE LINES, CLASS I
614					0.13	614	0.13	MILE	TEMPORARY EDGELINES, CLASS I, 947.03 TYPE C
614	0.05					614	0.05	MILE	TEMPORARY CENTERLINES, CLASS II
621					0.44	621	0.44	MILE	EDGE LINES
621					0.22	621	0.22	MILE	CENTER LINES
									PAVEMENT
403			45			403	45	CU. YD.	ASPHALT CONCRETE, AC-20
404			23			404	23	CU. YD.	ASPHALT CONCRETE, AC-20
407			66			407	66	GAL.	TACK COAT, AS PER PLAN
611			133			611	133	SQ. YD.	REINFORCED CONCRETE APPROACH SLAB (T=12")
									STRUCTURE OVER 20 FEET
									LOR-20-0217 Sheet 19
619	LUMP					619	LUMP		FIELD OFFICE
623						623	LUMP		CONSTRUCTION LAYOUT STAKES
624						624	LUMP		MOBILIZATION
614	LUMP					614	LUMP		MAINTAINING TRAFFIC









NOTES:
1. Existing guardrail and signs within the work area are removed incidental to Item 203.
2. R.R.S. - Railroad Spike
3. ⊢ = Existing Sign

Item	Description		Unit	AS-1	AS-2	F-1	F-2	GR-1	GR-2	GR-3	GR-4	R-1	R-2	TOTAL
611	Reinf. Conc. App. Slab	T=12"	S.Y.	66.7	66.7									133
407	Tack Coat, As Per Plan.		Gal.	6.7	6.7	23.1	29.8							66
404	Asphalt Conc. AC-20	1¼"	C.Y.	2.3	2.3	8.0	10.3							23
403	Asphalt Conc. AC-20	Var.	C.Y.	6.7	7.9	11.1	19.3							45
202	Wearing Course Removed		S.Y.			50.8	57.0							108
202	Pavement Removed		S.Y.									61.4	61.2	123
606	Type B Anchor Assy.		Each							1	1			2
606	Type B Bridge Terminal Assy.		Each					1	1	1	1			4
606	Type T Anchor Assy		Each					1	1					2
606	Type 5 Guardrail		L.F.					43.75	50.00	137.5	137.5			368.75
	Side							L	L	R	R			
	STATION LIMITS			113+77.92 to 113+92.92	114+54.08 to 114+69.08	113+12.86 to 113+77.92	114+69.08 to 115+52.78	113+35.88 to 113+89.12	114+57.88 to 115+17.37	112+39.12 to 113+89.12	114+57.88 to 116+07.88	113+77.92 to 114+03.05	114+44.05 to 114+69.08	
	Reference Number			AS-1	AS-2	F-1	F-2	GR-1	GR-2	GR-3	GR-4	R-1	R-2	

EXISTING BRIDGE DATA
LOR-20-0217

TYPE Concrete Beam
SPAN 36'-0" Clear
ROADWAY 24'-0"
SKEW None
LOADING H-15-33
SUBSTRUCTURE Concrete Gravity
WEARING SURFACE Asphalt
ALIGNMENT Tangent
CONDITION Poor
DATE BUILT 1936

B.M. Top S.E. Anchor Bolt
Light-Sign Foundation
Lt. 48.8', Sta. 112+3.5
Elev. 841.03

EXCAVATION	347	Cu. Yd.
EMBANKMENT	43	Cu. Yd.
SEEDING & MULCHING	3398	Sq. Yd.

PROPOSED STRUCTURE

TYPE Single Span Precast Box Beams on Capped Pile Abutments
SPAN 60'-0" c/c Bearings
ROADWAY 40'-0" Face to Face of Guardrail
SKEW None
LOADING HS-20-44 and Alternate Military Loading
WEARING COURSE 2½" Min. Asphalt Concrete
APPROACH SLAB (AS-1-81) 15'-0" Long
ALIGNMENT Tangent
SUPERELEVATION None

PLAN & PROFILE STA. 108+40 TO 120+00

SEEDING	
END WIDTH	SQ. YDS.

CALC. BY DWB DATE 3-27-95
CHKD. BY CDW DATE 3-27-95

LOR-20-2.16

OHIO
FHWA REGION 5

7
22

END AREA		VOLUME	
CUT	FILL	CUT	FILL

Earthwork for Temporary Road

STATION	END AREA	
	CUT	FILL
109+00	0	0
109+50	0	0
110+00	4	0
110+50	5	0
111+00	8	1
111+50	11	1
112+00	20	1
112+50	18	3
113+00	15	5
113+50	8	17
113+98± Bk.	0	309
114+48± Ah.	0	257
115+00	8	21
115+50	5	7
116+00	20	4
116+50	11	0
117+00	8	2
117+50	4	0
118+00	4	0
118+50	4	0
119+00	0	0
119+50	0	0

60 50 40 30 20 10 ℄ 10 20 30 40 50 60

R/W @ 69.22'±

℄ Temp. Road

110+00
841.43

Temporary Pavement

R/W @ 97.02'±

845
840

R/W @ 69.40'±

℄ Temp. Road

109+50
841.95

R/W @ 96.73'±

845
840

R/W @ 83.52'±

109+00
842.64

R/W @ 106.03'±

845
840

Begin Work Sta. 108+40.00

X-SECTIONS STA. 109+00 TO STA. 110+00

CALC. BY DWB DATE 3-27-89
CHKD. BY CDW DATE 3-27-89

LOR-20-2.16

OHIO
FHWA REGION 5

8 / 22

X-SECTIONS STA 110+50 TO STA 112+50

SEEDING END WIDTH	SEEDING SQ. YDS.
86	550
86	374
83	382
55	

CALC. BY DWB DATE 3-17-97
CHKD. BY CDW DATE 3-17-97

LOR-20-2.16

OHIO FHWA REGION 5

9 / 22

60 50 40 30 20 10 ℄ 10 20 30 40 50 60

114+69.08 End Project

Asphalt Concrete Overlay on Approach Slab Item 404

Approach Slab +69.08 Back

Wingwall 114+53.50 Ahead

6" R.C.P. Outlet at 114+44±

12" R.C.P. Outlet at 114+39±

R/W

S

2:1

835.0

839.00
114+60
838.40

℄ Temp. Road

0.038 ft/ft

1½:1

835.0 To Channel

R/W @ 103.04± 840 835 830

114+54.08 Forward Bridge Limit

113+92.92 Rear Bridge Limit

Asphalt Concrete Overlay on Approach Slab Item 404

Approach Slab +77.92 Ahead

Wingwall 113+93.50 Back

6" R.C.P. Outlet at 114+05±

839.00
113+90
838.40

To Channel

℄ Temp. Road

0.038 ft/ft

835.0

R/W @ 98.59± 840 835 830

Contractor to Provide Adequate Drainage During Construction as Required

113+77.92 Begin Project

℄ Temp. Road

0.033 ft/ft

12:1 2.5:1 2:1 1½:1

836.50

836.11

839.00
113+50
838.74

R/W @ 98.43± 840 835

113+35.88 Begin Guardrail Radius at Drive (See Sht. 12)

113+12.86 Ahead Wearing Course to be Removed to Form Butt Joint As Per Standard Construction Dwg. BP-5

℄ Temp. Road

0.016 ft/ft

3:1

837.5

R/W @ 98.25± 840 835

113+00
839.09

	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
114+69.08 Ahead	57	5		
Back	57	5	19	2
Sta. 114+60	57	5		
			13	1
114+54.08 Ahead	57	5		
Back	0	0		
Quantities for Channel Work from Sheet 13			203	0
113+92.92 Ahead	0	0		
Back	67	8		
			7	1
Sta. 113+50	67	8		
			20	4
113+77.92 Ahead	23	11		
Back	0	5	10	5
Sta. 113+50	15	5		
			15	3
113+12.86 Ahead	3	0		
Back	3	0		
			1	0
Sta. 113+00	3	0		
			3	0
Sta. 112+50	0	0		

60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80

X-SECTIONS STA 113+00 TO STA 114+60

SEEDING	
END WIDTH	SQ. YDS.
118	
25	
156	
31	
201	
42	
331	
78	
435	
79	

60 50 40 30 20 10 ℄ 10 20 30 40 50 60

CALC. BY DWS DATE 3-17-97
CHKD. BY GDW DATE 3-21-97

LOR-20-2.16

OHIO | FHWA REGION 5 | 10 / 22

END AREA		VOLUME	
CUT	FILL	CUT	FILL

R/W @ 68.93'±

℄ Temp. Road

S

845
840
835

R/W @ 114.76'±

117+00
839.65

Sta. 117+00 — 0 0

R/W @ 65.62' ±

℄ Temp. Road

0.016 %

S

845
840
835

R/W @ 114.57'±

116+50
839.31

116+07.88 End Type "B" Anchor Assembly

Sta. 116+50 — 0 0

R/W

℄ Temp. Road

0.016 %

0.003 %

3:1

S

840
835

R/W @ 111.97'±

116+00
839.17

Sta. 116+00 — 0 0

115+52.78 Back Wearing Course to be Removed to Form Butt Joint As Per Standard Construction Dwg. BP-5

115+52.78 Ahead — 1 1
115+52.78 Back — 1 1

R/W

S

℄ Temp. Road

0.016 %

0.013 %

3:1

2:1

837.5

2:1

S

840
835

R/W @ 108.79'±

839.00
115+50
838.99

Sta. 115+50 — 1 1

115+17.37 End Guardrail Radius at Drive (See Sht. 12)

R/W

S

2:1

2.5:1

836.11

B

12:1

12:1

℄ Temp. Road

0.028 %

2.5:1

2:1

836.11

B

1½:1

840
835

R/W @ 105.60'±

839.00
115+00
838.65

Sta. 115+00 — 13 15

14 14

40 11

Ahead — 57 5

114+69.08

60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80

X-SECTIONS STA 115+00 TO STA 117+00

SEEDING	
END WIDTH	SQ. YDS.
0	
0	
0	
0	
0	
49	
18	

60 50 40 30 20 10 ℄ 10 20 30 40 50 60

CALC. BY DWB DATE 3-27-89
CHKD BY CDW DATE 3-31-89

LOR-20-2.16

OHIO FHWA REGION 5

11 / 22

R/W @ 74.90'±

End Work Sta 120+00.00

119+50
841.50

R/W @ 115.71'±

R/W@74.90'±

℄ Temp. Road

119+00
841.04

R/W@ 115.52'±

R/W @ 74.90'±

℄ Temp. Road

118+50
840.76

Temporary Pavement

R/W@ 115.33'±

R/W @ 74.90'±

℄ Temp. Road

118+00
840.44

R/W @ 115.14'±

R/W @ 72.24'±

℄ Temp. Road

S

117+50
840.03

R/W@ 114.95'±

	END AREA		VOLUME	
	CUT	FILL	CUT	FILL
Sta. 119+42.96	0	0		
Sta. 119+00	0	0	0	0
Sta. 118+50	0	0	0	0
Sta. 118+00	0	0	0	0
Sta. 117+50	0	0	0	0

845 840 835

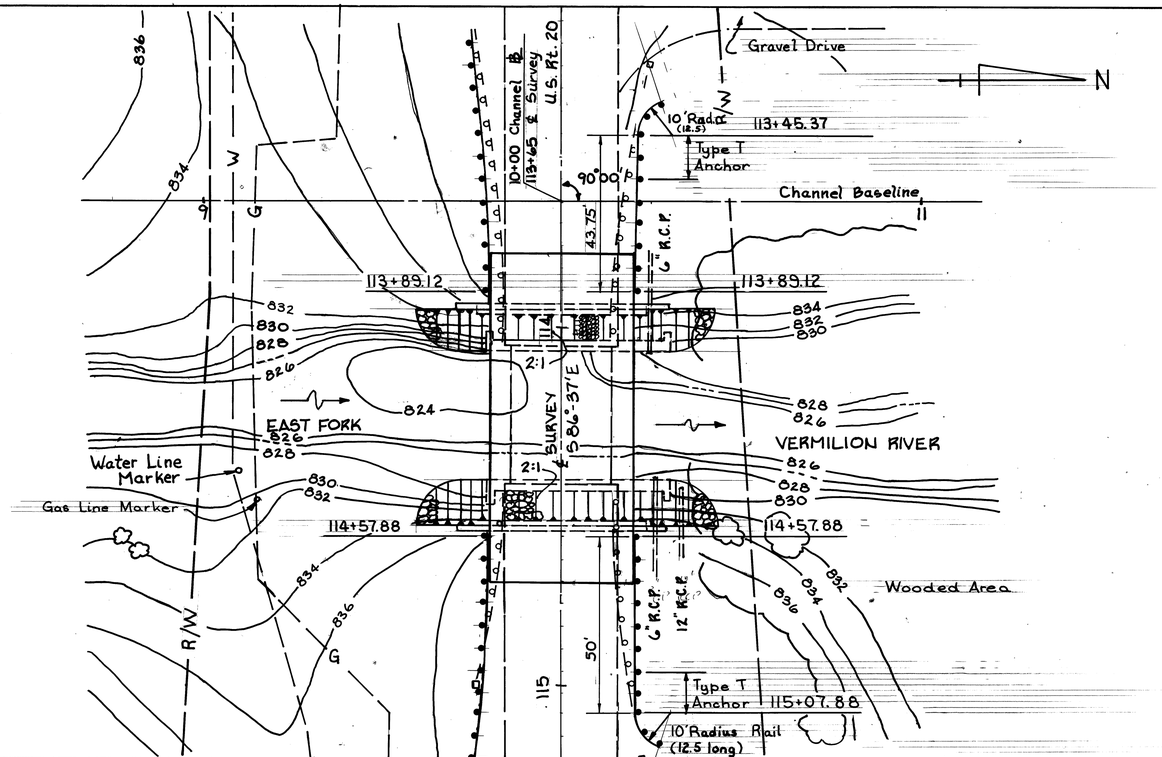
60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70 80

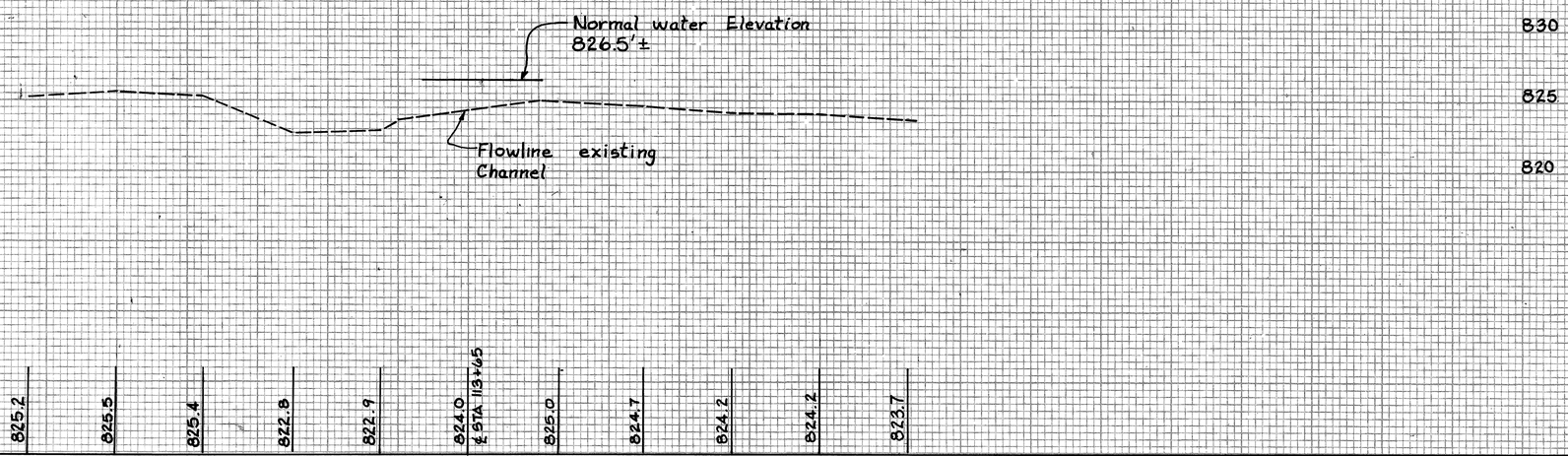
X-SECTIONS STA 117+50 TO STA 119+50

CALC. BY DW/S DATE 5-27-97	LOR-20-2.16	OHIO	12/22
CHKD. BY GDW DATE 5-27-97		FHWA REGION 5	

ESTIMATED QUANITITIES

601 Rock Channel Protection, Type C with Fabric Filter 129 Cu. Yds.





CHANNEL DETAILS

11+00
836.8
10+75
836.7
10+50
836.7
10+40± END CHANNEL WORK
10+25
837.0
Remove Pipe Under Item 203 Excav.
Wingwall 10+29± Ahead to be Removed to Elev. 830.00'±
Exist. 6" R.C.P. 10+25.5 Ahead
Exist. 6" R.C.P. 10+27± to Remain
Exist. 12" R.C.P. 10+33± Ahead to Remain
2:1
10+15
Existing Abutment to be Removed to Elev. 830.00'±
9+85
2'-0 Thick Type C Rock Channel Protection With Fabric Filter Typical
9+75
838.4
Wingwall 9+78± Ahead to be Removed to Elev. 830.00'±
9+50
837.6
9+35± BEGIN CHANNEL WORK
9+25
835.4
9+00
832.9
8+75
835.0
835
830
825
10
20
30
40
50
60
70
80
90

CHANNEL EARTHWORK

STATION	END AREA CUT	END AREA FILL	CU. YDS. CUT	CU. YDS. FILL
9+35	0	0		
9+50	19	0	5	0
9+75	15	0	16	0
9+85±	110	0	23	0
10+15±	110	0	121	0
10+25	40	0	27	0
10+40	0	0	11	0
TOTALS - To Sht. 9			203	0

Westbound Signage	
Sign	Station
OW-6-30	120+00
OW-143-18	120+00
OW-127-36	125+00
OW-128-36	130+00

NOTES:
Quantity For Temporary Structure Carried On Structure Plans

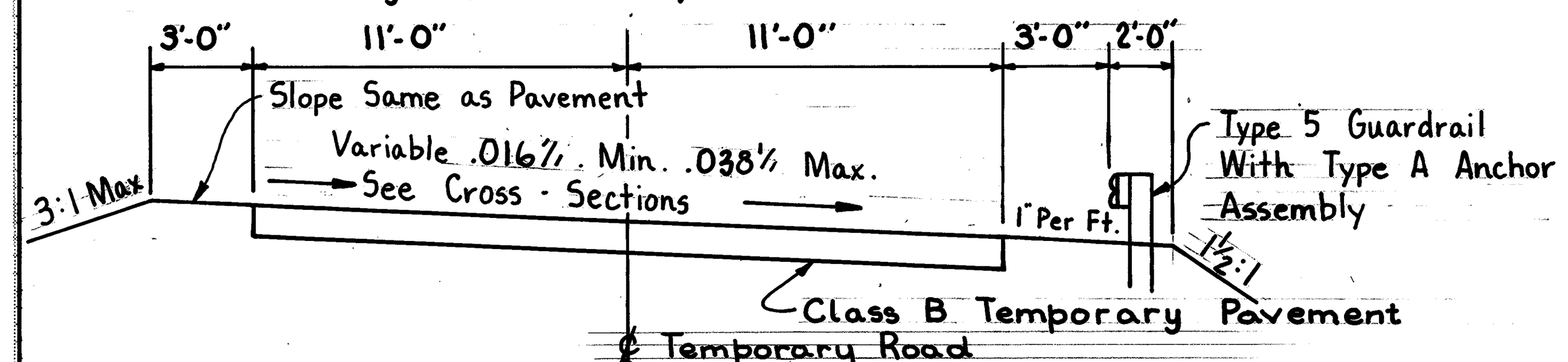
CURVE DATA
TEMPORARY RUN-AROUND

	Curve #1 & #3	Curve #2
Δ	9°-00'-00"	18°-00'-00"
D_c	3°-00'-00"	8°-00'-00"
T	150.31'	113.43'
L	300.00'	225.00'
R	1909.86'	716.20'
E	5.90'	8.93'

ESTIMATED QUANTITIES

615 Temporary Pavement Class B		1678 Sq. Yds.
615 Temporary Roads		Lump Sum
614 Temporary Edge Lines, Class I,		0.27 Mi.
614 Temporary Center Lines, Class I,		0.12 Mi.
614 Temporary Edge Lines, Class I, Type C	947.03	0.13 Mi.
614 Temporary Center Lines, Class I, Type C	947.03	0.08 Mi.
621 Edge Lines (White)		0.44 Mi.
621 Center Lines*		0.22 Mi.

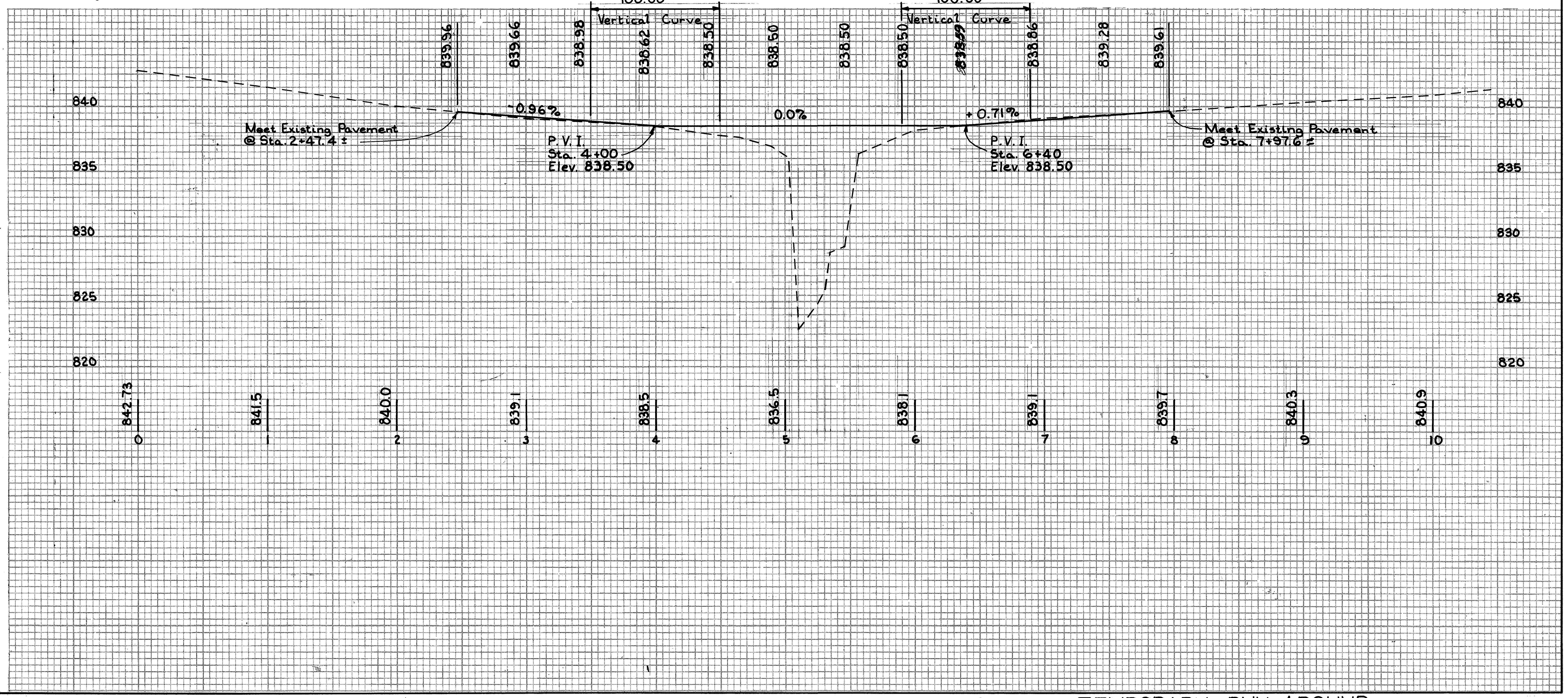
* 350' Broken & Solid Double (Intersection Approach)
Broken Single (Remainder)



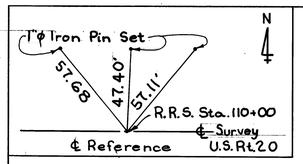
TEMPORARY RUN-AROUND (TYPICAL)

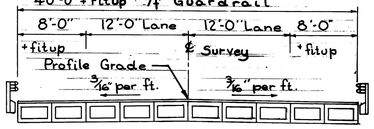
NOTES:

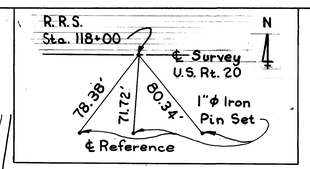
1. For Requirements For 614 Work Zone Pavement Markings See MT-99.10 .
2. Final Pavement Markings Are Required From Station 108+40 to 120+00 .
3. Temporary Pavement Markings That Will Not Be Removed By, Or Covered Over By, Subsequent Construction Are To Be As Per Specification 947.03 Type C Preformed Material .
4. 4' of Temporary Pavement Adjacent to the Existing Pavement Shall Remain in Place as Paved Berm.
5. Temporary edge lines shall be white.
6. Temporary center lines, class I shall be solid, double.



CALC. BY DATE	LOR-20-2.16	OHIO	15/22
CHKD. BY DATE		FHWA REGION 5	







TRANSVERSE SECTION

ABBREVIATIONS
R.R.S. – Railroad Spike

FOUNDATION INVESTIGATION LEGEND
● Indicates Boring Location

EARTHWORK Limits Shown Are Approximate. Actual Slopes Shall Conform To Plan Cross-Sections.

DRAINAGE DATA	
Drainage Area	11.8 Sq. Mi.
Est. Q_{25} = 1865 C.F.S.	V_{25} = 6.64 F.P.S.
Est. Q_{100} = 2575 C.F.S.	V_{100} = 7.75 F.P.S.

DESIGN TRAFFIC
1987 ADT 2840
2007 ADT 3460
% Trucks 18%
Traffic will be maintained on temporary run-around.

NOTE: Profile Grades Are on ℄ Survey

All Piles to be 12"ϕ Cast in Place Reinforced Concrete Piles, Estimated Length 50 Ft.

BM Top S.E. Anchor Bolt Light-Sign Foundation
Lt. 48.8', Sta. 112+03.50
Elev. 841.03'

REVIEWED BY BURGESS & NIPLE, LTD.
J.L.G. 12/24/86

EXISTING BRIDGE DATA
LOR-20-0217
STRUCTURE FILE NO. 4701860

TYPE	Concrete Beam
SPAN	36'-0" Clear
ROADWAY	24'-0"
SKEW	None
LOADING	H-15-33
SUBSTRUCTURE	Concrete Gravity
WEARING SURFACE	Asphalt
ALIGNMENT	Tangent
CONDITION	Poor
DATE BUILT	1936

PROPOSED STRUCTURE

TYPE	Single Span Precast Box Beams on Capped Pile Abutments
SPAN	60'-0" ℄ Bearings
ROADWAY	40'-0" Face to Face of Guardrail
SKEW	None
LOADING	HS-20-44 and Alternate Military Loading
WEARING COURSE	2½ Min Asphalt Concrete
APPROACH SLAB	(AS-1-81) 15'-0" Long
ALIGNMENT	Tangent
SUPERELEVATION	None

R.E. WARNER & ASSOCIATES
CONSULTING ENGINEERS
WESTLAKE OHIO

1/7

SITE PLAN

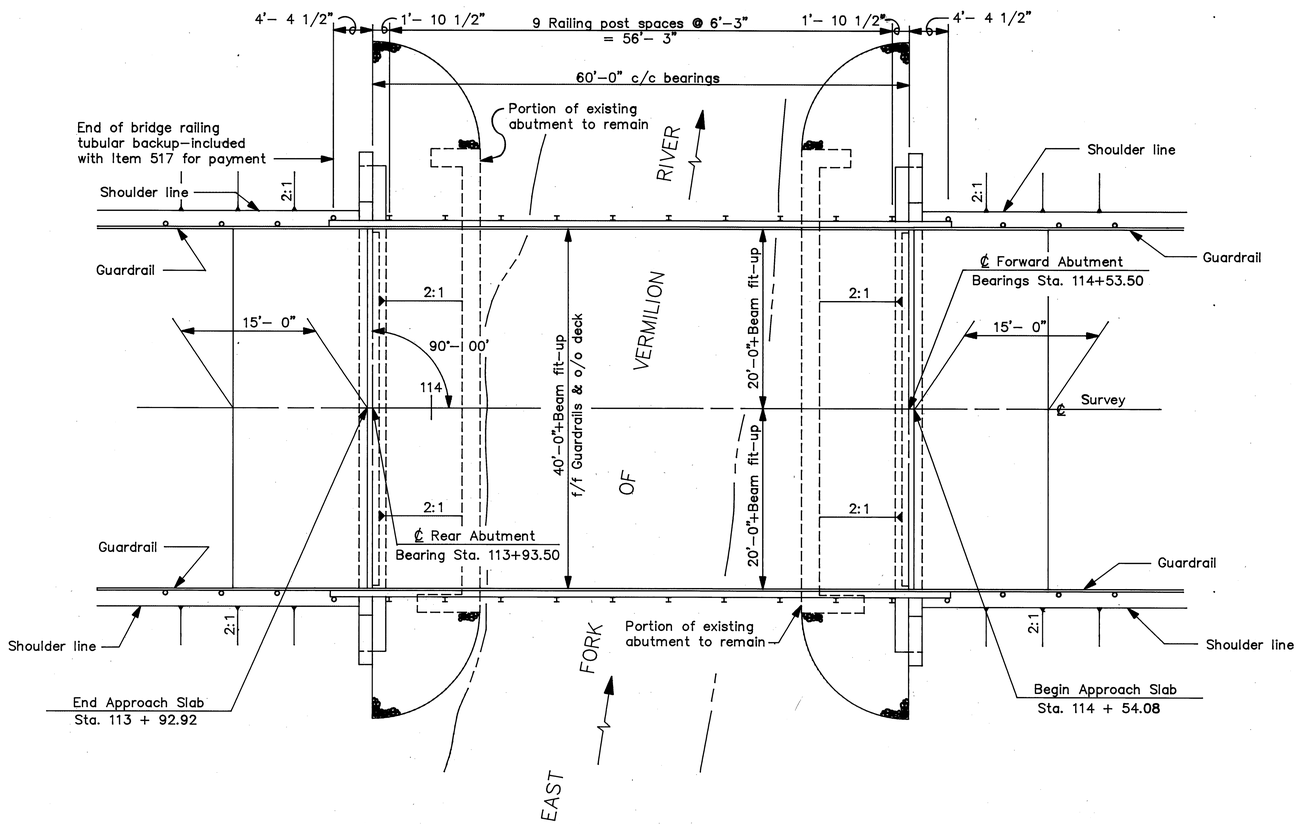
BRIDGE NO. LOR-20-0217
OVER EAST FORK OF VERMILION RIVER
LORAIN COUNTY STA 113+92.92
114+54.08

SCALE 1 INCH = 20 FEET

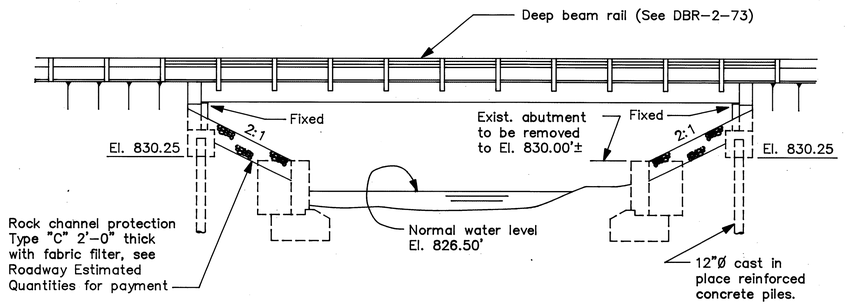
PRESENT TOPOGRAPHY		PROPOSED WORK				
SURVEY BY	DRAWN BY	DESIGN BY	DRAWN BY	CHECKED BY		REVIEWED BY
WLS	DWB	COW	DWB	EAD		JDDB

SHEET 17 DELETED

CALC. BY	LOR-20-2.16	OHIO	16
DATE		FHWA REGION 5	22
CHKD. BY			



GENERAL PLAN



GENERAL ELEVATION

GENERAL NOTES

REFERENCE shall be made to Standard Drawings: DBR-2-73 (dated 4-10-73), PSBD-1-81 sheets 1,2,3 and 4 of 4 (dated 9-18-81), AS-1-81 sheets 1,2 and 3 of 3 (dated 11-27-81) and to Supplemental Specifications: 836 (dated 11-12-85), and 824 (dated 10-8-82).

DESIGN SPECIFICATION This structure conforms to "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officals, 1983 including the 1984 & 1985 Interim Specifications, and the Ohio "Supplement" to these specifications.

DESIGN DATA Design Loading – HS20-44 and the Alternate Military Loading.
Concrete Class C – f'c = 4000 p.s.i. for substructure.
Reinforcing Steel – ASTM A615,A616 or A617 – Fy = 60,000 p.s.i.
Splices indicated are for Grade 60 steel.
Concrete for prestressed concrete beams-unit stresses, 2200 p.s.i. compression
444 p.s.i. tension
Prestressing strand ASTM A416 – f's =270,000 p.s.i. initial stress 0.70 f's.

Reinforcing steel in the prestressed box beams may be Grade 40, 40,000 p.s.i. yield or Grade 60, 60,000 p.s.i. yield.

Abutment Piling: Abutment piling bending stress may approach, reach or exceed yield stress.

DECK PROTECTION METHOD Type "D" waterproofing, asphalt concrete overlay, and sealing of concrete surfaces.

PILES shall be driven to a minimum bearing capacity of 50 tons per pile.

Pile Hammer The pile hammer used to install the cast-in-place reinforced concrete piles shall have a State's Energy Rating of not less than 16,500 foot-pounds. This requirement does not relieve the Contractor from 108.05 which states that the Contractor is to provide sufficient equipment for prosecuting the required work. Refer to "ODOT's Manual of Procedures for Structures" to obtain the State's Energy Rating.

Pile Wall Thickness The responsibility of choosing and providing a satisfactory pile wall thickness for this project shall be borne by Contractor except that the pile wall thickness shall not be less than 0.20 inches. If a pile wall thickness greater than 0.20 inches is necessary to resist the pile installation driving stresses, the Contractor shall make the determination and shall furnish a pile with an acceptable wall thickness.

12 INCH PRECAST PRESTRESSED CONCRETE PILES May be substituted for the 12 inch cast-in-place reinforced concrete piles shown on these plans. Drawings showing details of and specification for prestressed concrete piles are available from the Director (Bureau of Bridges). If the prestressed pile alternate is chosen, the method of measurement and basis of payment shall be the same as for cast-in-place reinforced concrete piles per 507.

TRAFFIC MAINTENANCE Traffic maintenace information can be found on sheets 4 and 14.

UTILITY LINES All expense involved in relocating the affected utility lines shall be borne by the owners. The Contractor and Owners are requested to cooperate by arranging their work in such a manner that inconvenience to either will be held to a minimum.

REMOVAL OF EXISTING STRUCTURE When no longer needed to maintain traffic the existing structure shall be removed. Rear and Forward Abutment shall be removed to Elev. 830.00'± or closest rustication groove. Suitable waste masonry may be placed as bank protection as directed by the Engineer.

CLASS C CONCRETE, AS PER PLAN All coarse aggregate for abutment concrete shall be limestone or slag, and not gravel.

ESTIMATED QUANTITIES See sheet 5/7 for tabulation of Estimated Quantities.

EXISTING STRUCTURE VERIFICATION Details and dimensions shown on these plans pertaining to the existing structure have been obtained from plans of the existing structure and/or from field observations and measurements. Consequently, they are indictive of the existing structure and the proposed work but they shall be considered tentative and approximate. The contracter is referred to CMS sections 102.05 and 105.02.

ITEM SPECIAL, SEALING OF CONCRETE SURFACES A concrete sealer, shall be applied to the following concrete surfaces and as shown on the plans: The exposed face and the first 6 inches of the bottom surface of the fascia box beams. For sealer limits on abutments, See sheet 4/7 See the proposal for surface preparation requirements, application rates, materials requirements and application procedures.

TEMPORARY STRUCTURE The temporary structure shall have a minimum clear roadway width of 28 feet face-to-face of guardrails.

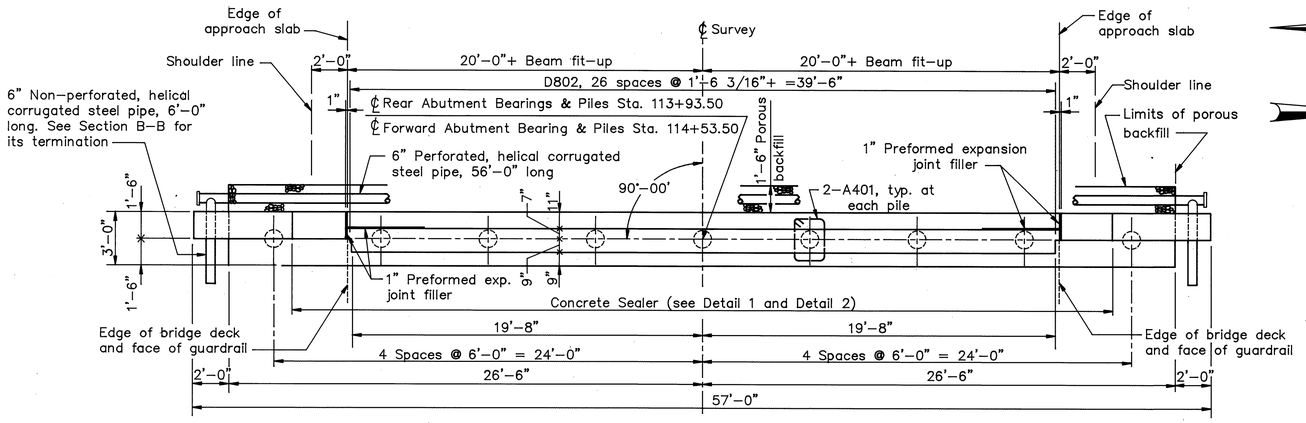
Structure drawing 3/7 was not used.

R.E.WARNER & ASSOCIATES CONSULTING ENGINEERS WESTLAKE OHIO 2/7

GENERAL PLAN AND GENERAL NOTES
BRIDGE NO. LOR-20-0217
OVER EAST FORK OF VERMILION RIVER

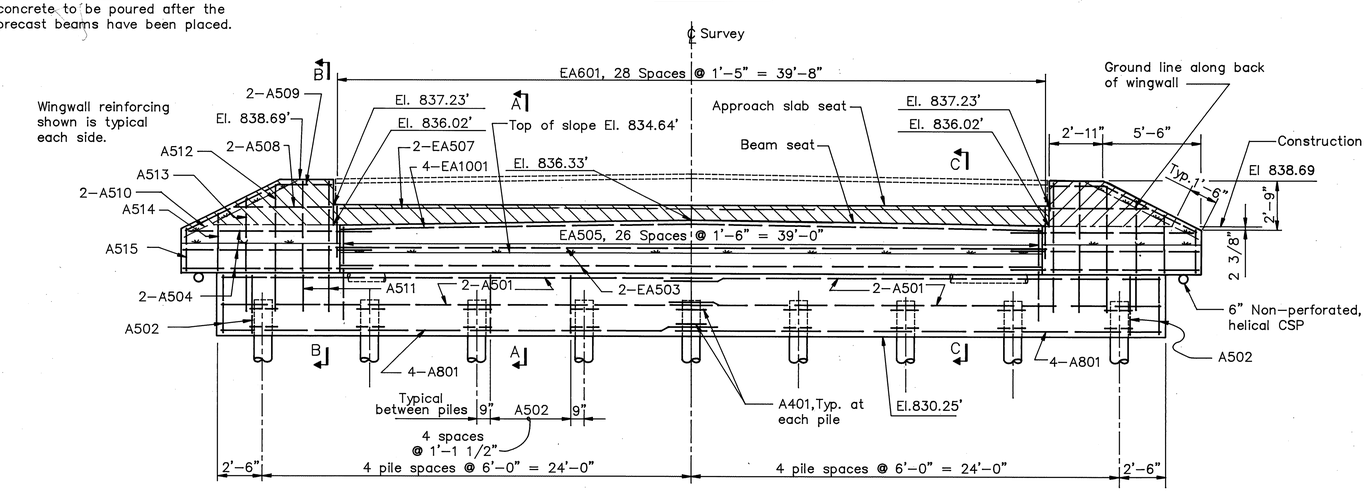
DESIGN	DRAWN	TRACED	CHECKED	REVIEW	DATE	REVISED
CDW	VMB		SAP	JDB	5-21-87	

CALC. BY		LOR-20-2.16	OHIO	18
DATE			FHWA REGION 5	22
CHKD. BY				
DATE				

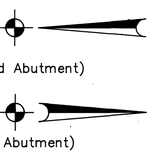


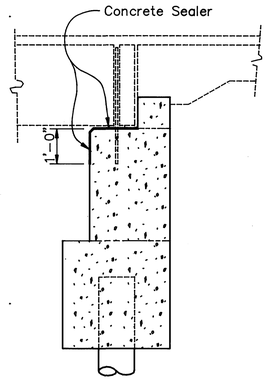
PLAN

Note: Shaded areas indicate concrete to be poured after the precast beams have been placed.



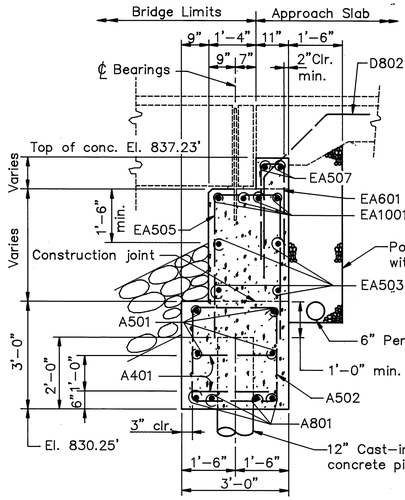
ELEVATION



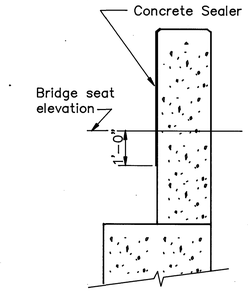


DETAIL "1"

CONCRETE SEALER AT BRIDGE SEAT

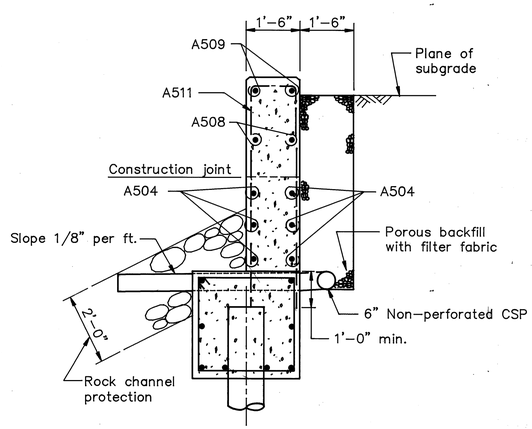


SECTION A-A



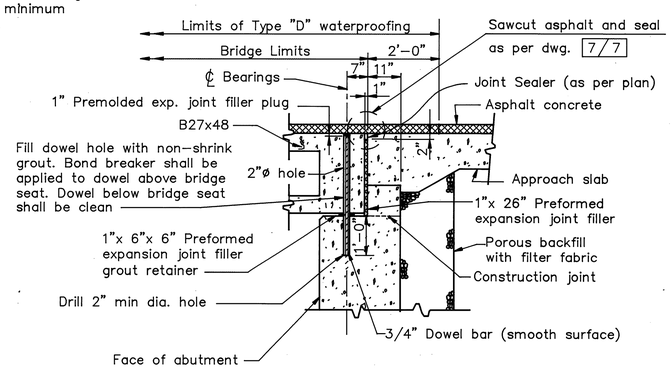
DETAIL "2"

CONCRETE SEALER AT WINGWALL

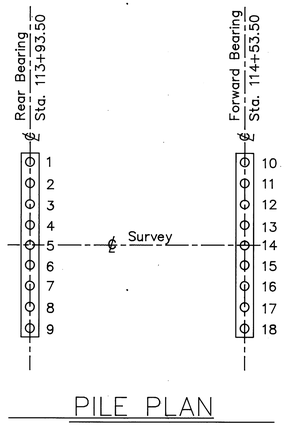


SECTION B-B

FIXED ANCHOR DOWEL PROCEDURE:
Place preformed expansion joint filler grout retainer. Drill and clean dowel holes. Then place non-shrinking grout, dowel and 1" minimum thickness PEJF plug.



SECTION C-C



PILE PLAN

NOTES

1. POROUS BACKFILL shall extend upward to the plane of the subgrade and laterally as shown. Porous backfill shall be gravel and encased with filter fabric. Filter fabric, type A, shall conform to item 712.09 and shall be included with porous backfill for payment.
2. BRIDGE SEAT REINFORCING Reinforcing steel in the vicinity of the bridge seat shall be accurately placed to avoid interference with the drilling of anchor bar holes.
3. For Reinforcing Bending Schedules see dwg. 5/7
4. REINFORCING SPLICE LENGTHS shall be 1'-8" for #5 bars and 3'- 3" for #8 bars.
5. Seal top and front surfaces of bridge seat wall and wingwall as shown in Detail 1 and Detail 2.

R.E.WARNER & ASSOCIATES
CONSULTING ENGINEERS
WESTLAKE OHIO

4/7

FORWARD AND REAR ABUTMENT DETAILS
BRIDGE NO. LOR-20-0217
OVER EAST FORK OF VERMILION RIVER

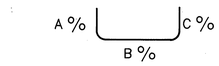
DESIGN	DRAWN	TRACED	CHECKED	REVIEW	DATE	REVISED
CDW	FJW		EAT	JDB	5-21-87	

REINFORCING BENDING SCHEDULE

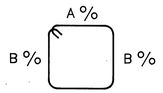
MARK	REAR	FWD	NO.	LENGTH	TYPE	A	B	C	D		WEIGHT
A401	18	18	36	8'-8 1/2"	4	2'-4 3/4"	1'-9"				209
A501	8	8	16	27'-1"	STR.						452
A502	44	44	88	10'-5"	4	2'-6"	2'-6"				956
A504	12	12	24	10'-0"	STR.						250
A508	4	4	8	5'-7"	STR.						47
A509	4	4	8	2'-11"	STR.						24
A510	4	4	8	6'-0"	STR.						50
A511	4	4	8	14'-11"	2	7'-0"	1'-2"	7'-0"			124
A512	2	2	4	14'-7"	2	6'-10"	1'-2"	6'-10"			61
A513	2	2	4	13'-5"	2	6'-3"	1'-2"	6'-3"			56
A514	2	2	4	7'-3"	2	3'-2"	1'-2"	3'-2"			30
A515	2	2	4	5'-7"	2	2'-4"	1'-2"	2'-4"			23
A801	8	8	16	27'-11"	STR.						1193
D802	27	27	54	4'-5"	5	1'-0"	1'-9"	1'-9"	2'-4"		637
								TOTAL WEIGHT			4112

EPOXY COATED REINFORCING BENDING SCHEDULE

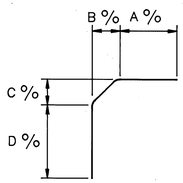
MARK	REAR	FWD	NO.	LENGTH	TYPE	A	B	C	D		WEIGHT
EA503	4	4	8	39'-0"	STR.						325
EA505	27	27	54	9'-10"	2	4'-1"	1'-11"	4'-1"			554
EA507	2	2	4	39'-8"	STR.						166
EA601	29	29	58	4'-11"	2	2'-4"	7"	2'-4"			428
EA1001	4	4	8	39'-0"	STR.						1343
								TOTAL WEIGHT			2816



TYPE 2



TYPE 4



TYPE 5

ESTIMATED QUANTITIES

CALC. BY. CDW CHK'D BY EAD

ITEM	TOTAL	UNIT	DESCRIPTION	SUPER.	ABUTS.	GEN'L		
202	Lump	Sum	Portions of structure removed			LUMP		
403	15	Cu.Yd.	Asphalt concrete (AC-20)	15				
404	9	Cu.Yd.	Asphalt concrete (AC-20)	9				
502	Lump	Sum	Temporary structure, as per plan			LUMP		
503	99	Cu.Yd.	Unclassified excavation		99			
505	Lump	Sum	Pile Driving Equipment Mobilization			LUMP		
507	900	Lin.Ft.	12" Cast-in-place reinforced concrete piles, as per plan		900			
509	4112	Lbs.	Reinforcing steel, Grade 60		4112			
511	66	Cu.Yd.	Class C concrete, abutment, as per plan, (See Proposal Note).		66			
512	290	Sq.Yd.	Type D waterproofing	290				
515	10	Each	Prestressed concrete bridge members, (See Proposal Note).	10				
516	191	Sq.Ft.	1" Preformed expansion joint filler		191			
516	40	Each	1" x8" x16" Elastometric bearing pads (60 Durometer)	40				
516	80	Lin.Ft.	2" Deep joint sealer, as per plan		80			
517	137.5	Lin.Ft.	Railing (deep beam w\stl. tubular backup, type 2 stl. posts & bolts)	137.5				
518	27	Cu.Yd.	Porous backfill, as per plan		27			
518	112	Lin.Ft.	6" Perforated, helical corrugated steel pipe, 707.01		112			
518	24	Lin.Ft.	6" Non-perforated, helical corr.stl.pipe, including specials,707.01		24			
523	3	Hour	Dynamic load test		3			
824	2816	Lbs.	Epoxy coated reinforcing steel, Grade 60		2816			
Special	93	Sq.Ft.	Steel drip strip	93				
Special	42	Sq.Yd.	Sealing concrete surfaces, (See Proposal Note)	37	25			
Special	80	Lin.Ft.	Sawing and sealing Bituminous concrete joint	80				

NOTES:

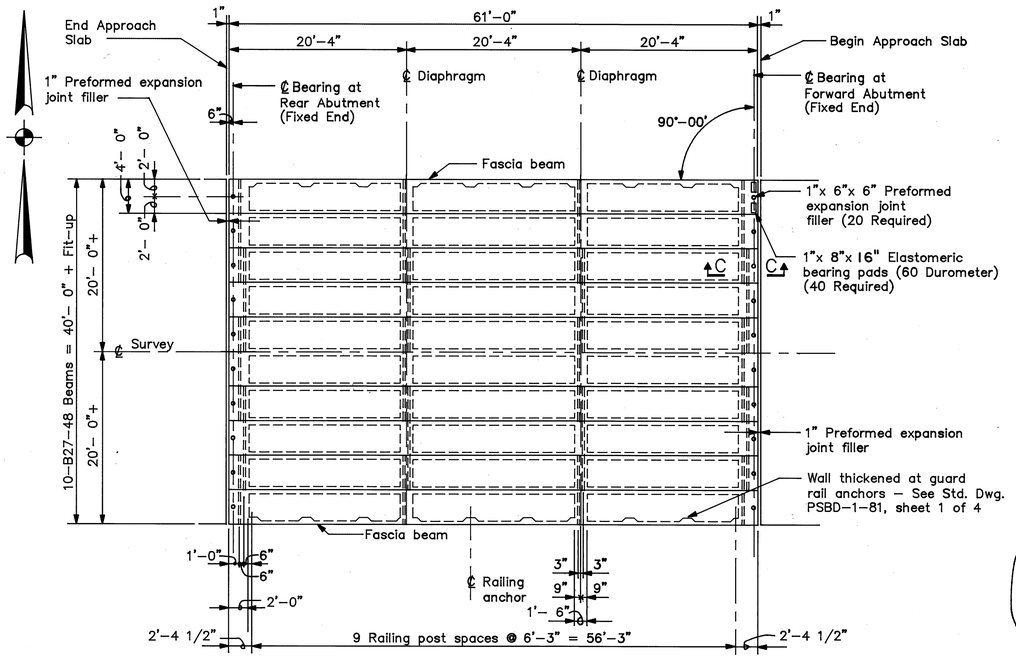
REINFORCING STEEL SAMPLES: Refer to CMS Sections 106.03, 700, 709.01 through 709.05. Sufficient additional reinforcing steel shall be provided for sampling. Random samples shall be replaced in the structures by the additional steel. spliced in accordance with 509.08.

REINFORCING SPLICE LENGTHS shall be 1'-8" for #5 bars and 3'-3" for #8 bars.

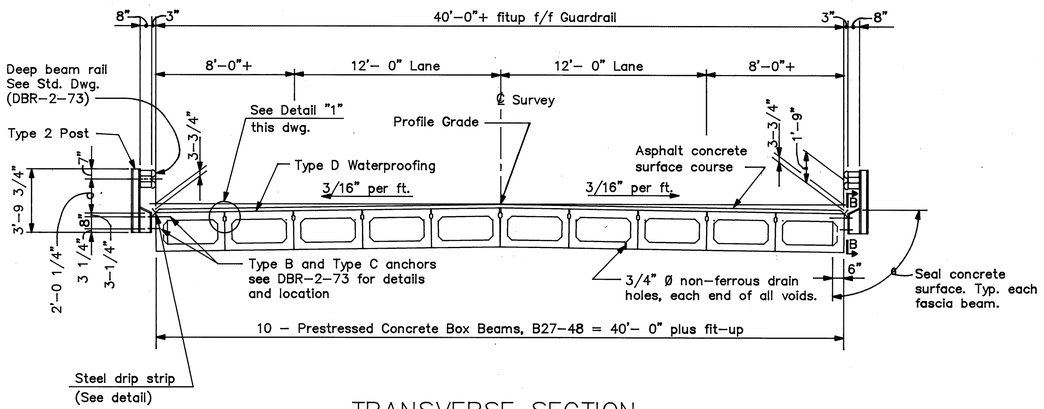
R.E.WARNER & ASSOCIATES 5/7
CONSULTING ENGINEERS
WESTLAKE OHIO

ABUTMENT REINFORCING STEEL SCHEDULES AND ESTIMATED QUANTITIES BRIDGE NO. LOR-20-0217 OVER EAST FORK OF VERMILION RIVER

DESIGN	DRAWN	TRACED	CHECKED	REVIEW	DATE	REVISED
CDW	VMB		EAD	JDOB	5-21-87	

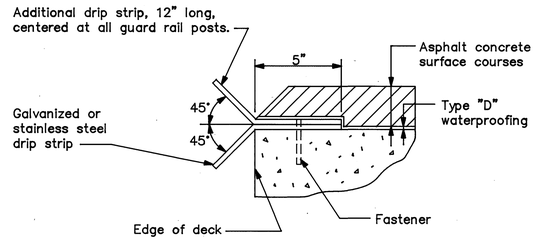


PLAN

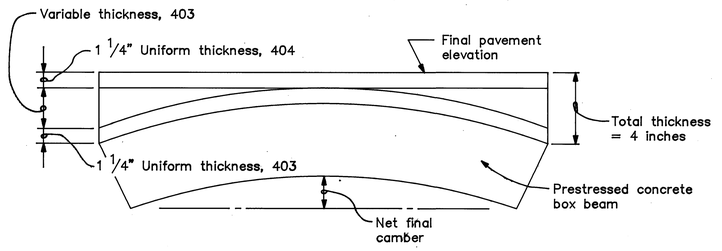


TRANSVERSE SECTION

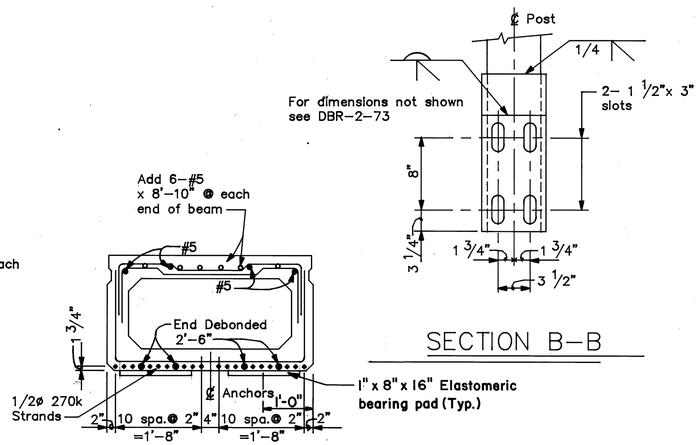
DRIP STRIP Prior to applying Type "D" waterproofing, a bent drip strip shall be installed along the edges of the deck as shown. The strips shall be fastened at 1'- 6" c/c maximum with 1-1/4" x 5/32" x 1/4" flat head drive pin and washer (Length x Shank Dia x Head Dia) or #10 galvanized screws and expansion anchors, subject to the approval of the Engineer. The strips shall be placed the full length of the deck, ending at the face of the abutment wingwall. Where splices are required a 3" (Min.) lap shall be used with a fastener through the lap. Steel for galvanized strips shall be 8"x 0.105" and shall meet the requirements of ASTM A568. Galvanizing shall be in accordance with 711.02. Stainless steel shall be 20 gauge ASTM A167, Type 304, mill finish. Payment shall be at the contract price bid for Item Special, Sq. Ft., Steel Drip Strip, which shall include all materials, labor, tools and incidentals necessary to complete the item.



DRIP STRIP



ASPHALT THICKNESS DIAGRAM



TYPICAL BOX BEAM B27-48

SECTION B-B

Shear keys shall be mortared on a finished plane between the top edges of the adjacent beams where vertical offset (within tolerance) occurs.

DETAIL "1"

NOTES

ASPHALT CONCRETE SURFACE COURSE shall consist of a variable thickness of 403 and a 1-1/4" thickness of 404. The 403 shall be placed in two operations. The first course shall be of 1-1/4" uniform thickness. The second course shall be feathered to place the surface parallel to and 1-1/4" below final pavement surface elevation.

CAMBER Calculated camber at time of paving, including allowance for camber growth due to creep, is 1 3/4". Calculated deflection due to weight of surface course and railing is 1/4". This is 1 1/2" in excess of the amount required to place the top of beam parallel to profile grade. This excess amount shall be compensated for by thickening the 403 leveling course from 1 1/4" at center of span to 2 3/4" at ends of spans.

RAILING See Standard Drawing DBR-2-73

SECTION C-C See Sheet 4/7

FASCIA BEAMS: To avoid interference with the anchors for the bridge railing posts, the longitudinal reinforcing bars near the fascia shall be shifted as necessary. Fabricator's shop drawings shall show complete details of the beam reinforcement. The keyway on exterior side of the fascia beams shall be omitted.

GUARDRAIL POST: Slots shall be provided in all guardrail posts, so that vertical adjustments may be made after placement to provide a straight-smooth guardrail line across the structure. See Section B-B this drawing.

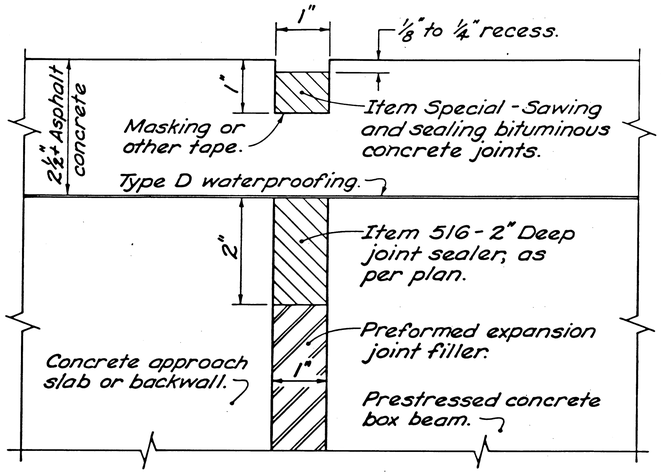
NON-SHRINKING MORTAR Mortar or grout for keyways between prestressed concrete box beams, for tie rod recesses and for anchor dowel holes shall be a non-shrinking non-metallic mortar having a minimum compressive strength at 28 days of 5000 p.s.i. according to the Corps of Engineers Specification CRD-C621-83 when prepared to a moderate fluidity (124-145% flow table flow). The mortar or grout shall also meet all other requirements of Specification CRD-C621-83. The mortar shall be prepared, placed and cured in accordance with the manufacturers recommendations, against surfaces as specified below.

PREPARATION OF CONCRETE SURFACES IN CONTACT WITH NON-SHRINKING MORTAR The keyway surfaces shall be given a medium sandblast at the plant within four days before the beams leave the plant. Before mortaring, the keyways shall be thoroughly clean of all dirt, dust and other foreign matter. The keyway surfaces shall be wetted, but no free water shall be allowed to remain in the keyways.

R.E.WARNER & ASSOCIATES CONSULTING ENGINEERS WESTLAKE OHIO 6/7

SUPERSTRUCTURE
BRIDGE NO. LOR-20-0217
OVER EAST FORK
OF VERMILION RIVER

DESIGN	DRAWN	TRACED	CHECKED	REVIEW	DATE	REVISED
CDW	VMB		EAD	JDOB	5-21-87	



SEALING OF JOINTS AT ABUTMENTS

ITEM SPECIAL - SAWING AND SEALING BITUMINOUS CONCRETE JOINTS

1) Description:

This work shall consist of cutting and sealing transverse joints on the new bituminous concrete overlay of box beam bridges. Bituminous concrete joints shall be constructed directly over, and in line with, the existing underlying transverse abutment joint of the box beams.

2) Materials:

The joint sealant shall meet the requirements of ASTM Specification D3405, Joint sealants, Hot-poured, for Concrete and Asphalt Pavements. Acceptable alternate materials are: nitrile rubber, as distributed by W. J. Ruscoe Company, 483 Kenmore Blvd., Akron, Ohio 44301 (Don Kalin, 216-253-8148); Roof-Flex 176, polyurethane, as produced by the Carboline Company, 350 Hanley Industrial Court, St. Louis, Missouri 63144 (Roger Zubal, 614-877-3406); or a silicone sealant meeting Federal Specifications TT-S-001543A Class A (one-part silicone sealants) and TT-S-00230C Class A (one-component sealants), such as those manufactured by General Electric, Silicone Products Division, 6155 Rockside Rd., Rockside Square I, Independence, Ohio 44131 (John Fromholtz, 216-447-1750) or Dow Corning, 3737 Park East, Beachwood, Ohio 44122 (Robert Ruppel, 216-464-2330). Sealant will be accepted on the basis of the manufacturer's certification that it conforms to the requirements of these specifications.

3) Construction Details:

A) General: The contractor shall conduct his operation so that cutting, cleaning and sealing of transverse joints is a continuous operation that will be performed as soon as practical after the paving, but no later than four (4) days after placement of the asphalt concrete surface course. Traffic shall not be allowed to knead together or damage the joint cut prior to sealing.

B) Cutting of Transverse Joints: The contractor shall saw or rout transverse joints to the dimensions shown in the details on this sheet. The cut joints shall lie directly above each box beam abutment joint. The joint location shall be marked on the new asphalt surface with a chalk line, or by some other acceptable method, before cutting. Details of the method for locating and accurately marking the proposed cuts shall be subject to the approval of the engineer prior to starting any surfacing or paving operations.

The blade or blades shall be of such size that the full width and depth of the cut can be made with one pass. Dry or wet cutting will be allowed. Joints shall extend the full width of the bridge.

C) Cleaning Joints: Dry sawed joints shall be thoroughly cleaned with a sufficient amount of compressed air to remove any dirt, dust, or deleterious matter. Wet sawed joints shall be washed clean of all cuttings by flushing with a jet of water and with other tools as necessary. After flushing, the joint shall be blown out with compressed air. When the surfaces are thoroughly clean and dry, and just prior to placing the joint sealer, compressed air having a pressure of at least 90 p.s.i. shall be used to blow out the joint and remove all traces of dust.

In the event freshly cut joints become contaminated before they are sealed, they shall be recleaned of all foreign material by high pressure water jet.

D) Sealing Joints: The joint shall be thoroughly dried before the sealant is placed. After cleaning and drying, a bond-breaker (tape) shall be applied to the bottom of the groove.

Hot-poured joint sealant material shall be heated in a kettle or melter constructed as a double boiler, with the space between the inner and outer shells filled with oil or other heat transfer medium. Positive temperature control and mechanical agitation shall be provided. Heating must be in strict accordance with the manufacturer's recommendation. Joint sealer material shall never be kept heated at the pouring temperature for more than four (4) hours and shall never be reheated. Sealer left in the applicator at the end of a day's work shall be removed and discarded.

Hot-poured sealant shall be applied immediately through a nozzle, which must project into the sawed joint, filling from the bottom up. The seal shall completely fill the joint in such a manner that, after cooling, the level of the sealer will not be higher than 1/8" below the pavement surface. Any depression in the cooled seal greater than 3/16" shall be brought up to the specified limit by further addition of hot-poured sealant. Care shall be taken in the sealing of the joints so that the final appearance will present a neat fine line.

The cold applied sealant materials (nitrile rubber, polyurethane and silicone) shall be installed as per manufacturers' recommendations, or as directed by the engineer. The sealant shall be installed when the ambient temperature is 40° F or higher. Traffic shall not be allowed on the joint for one hour after application of the sealant.

4) Method of Measurement:

The quantity to be paid for under this item will be the number of linear feet of joints sawed and sealed as per the above requirements.

5) Basis of Payment:

The unit price per linear foot for Item Special - "Sawing and sealing bituminous concrete joints" shall include the cost of all labor, materials, and equipment necessary to complete the work, including the furnishing and placing of the joint sealer material.

ITEM 516 - 2" DEEP JOINT SEALER, AS PER PLAN

This item shall meet the materials (para. 2) and sealing (para.3D) specifications of Item Special - Sawing and sealing bituminous concrete joints.

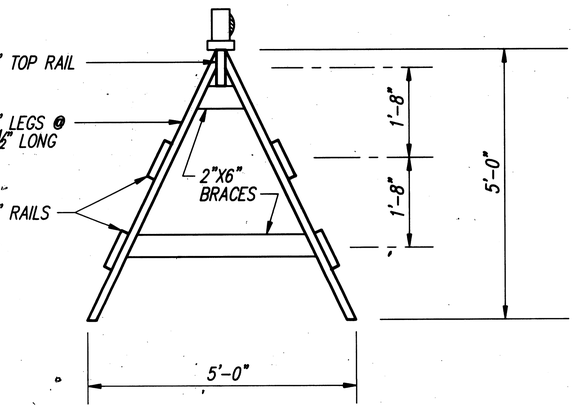
STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
BUREAU OF BRIDGES AND STRUCTURAL DESIGN

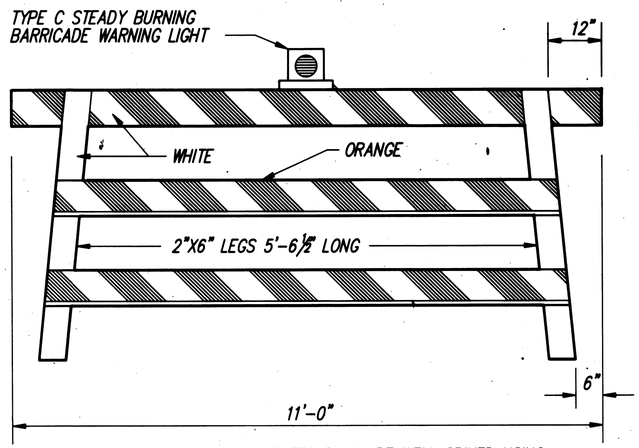
7/7

ABUTMENT JOINTS IN BITUMINOUS CONCRETE, BOX BEAM BRIDGES
BRIDGE NO. LOR-20-0217

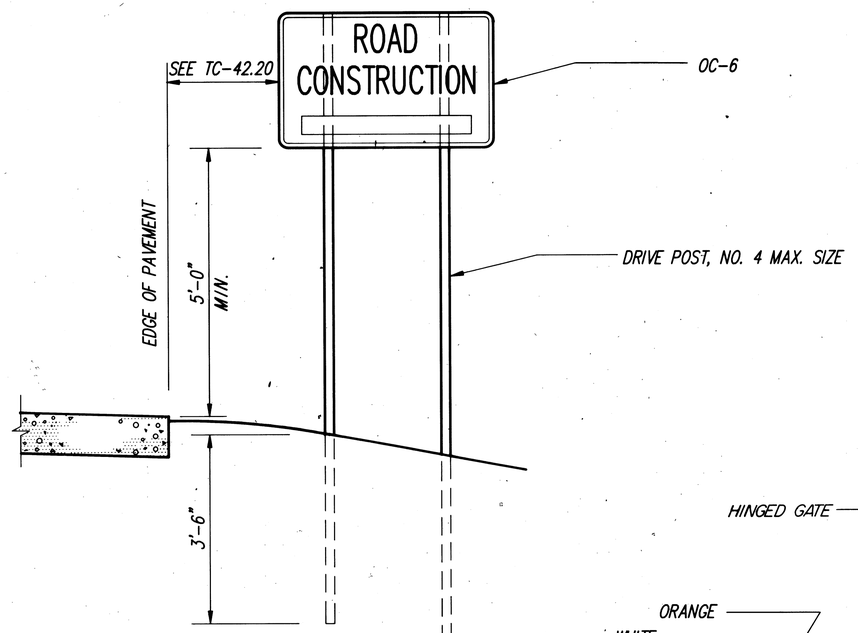
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JEB	MJB				2-2-84	2/9/84

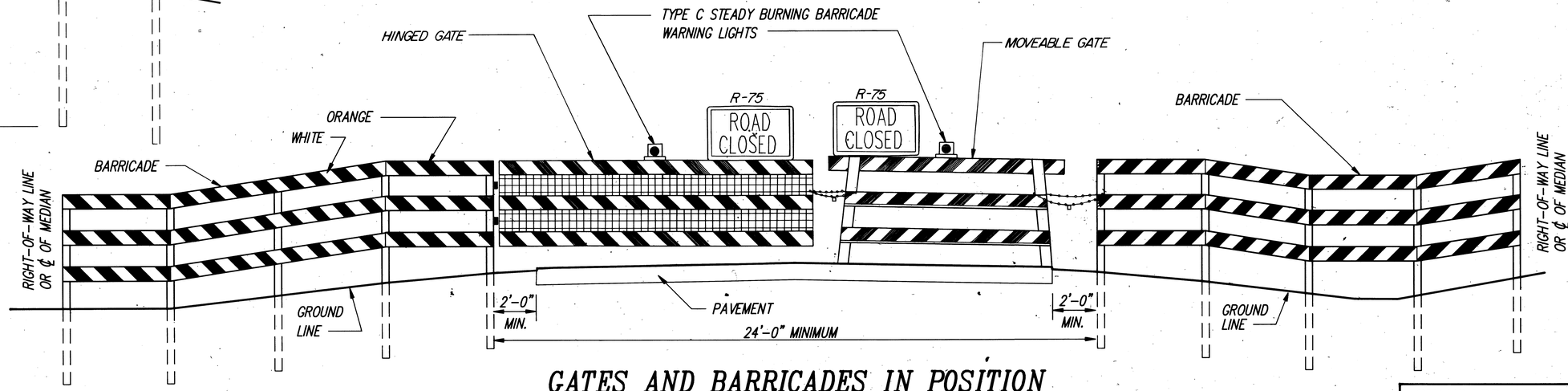
MOVABLE GATE





GATES SHALL BE WELL SPIKED USING SPIKES LONG ENOUGH TO CLINCH.





GATES AND BARRICADES IN POSITION

-NOTES-

① **BARRICADES:** BARRICADES SHALL BE CONSTRUCTED ACCORDING TO DETAILS SHOWN. WHEN THE ROAD IS CLOSED TO TRAFFIC, BARRICADES AND GATES SHALL BE USED TO EFFECTIVELY CLOSE THE ENTIRE ROADWAY INCLUDING THE MEDIAN OF DIVIDED HIGHWAYS. IN URBAN AREAS AND AT LOCATIONS WHERE IT IS IMPRACTICAL TO EXTEND THE BARRICADE TO THE RIGHT-OF-WAY LINE BECAUSE OF A SIDEWALK OR OTHER OBSTRUCTION, THE ENDS OF THE BARRICADE SHALL BE LOCATED AS DIRECTED BY THE ENGINEER TO EFFECT THE DESIRED CLOSING OF THE HIGHWAY.

② **PAINTING AND REFLECTORIZATION:** ALL RAILS OF THE BARRICADES AND GATES SHALL BE REFLECTORIZED WITH ORANGE AND WHITE REFLECTORIZED SHEETING* IN 6" WIDE ALTERNATE STRIPES WHICH SLOPE DOWNWARD TOWARD THE CENTER LINE OF THE ROAD AT AN ANGLE OF 45°. ALL THREE RAILS OF THE ROAD CLOSED BARRICADE SHALL BE STRIPED ON THE SIDE FACING TRAFFIC. ALL GATE RAILS SHALL BE STRIPED ON BOTH SIDES. ALL POSTS, BRACES, GATE LEGS, AND ANY UNSTRIPED RAILS SHALL BE PAINTED WHITE.

* TYPE G

③ **GATES:** ONE GATE SHALL BE ERECTED FOR EACH TRAFFIC LANE. GATES SHALL BE CHAINED AND PADLOCKED TO ONE ANOTHER AND TO ADJACENT POSTS OF THE BARRICADES. CHAINS SHALL BE 1/4" STOCK OR LARGER WITH WELDED LINKS.

A HINGED GATE MAY BE USED AND SHALL BE AN APPROVED 12'x4' STEEL FRAME FARM TYPE, OR A TYPE APPROVED BY THE ENGINEER. THE GATE SHALL BE HUNG ON HINGE SCREW HOOKS, OR AS OTHERWISE APPROVED. STRIPING SIMILAR TO THAT USED ON THE MOVEABLE GATE SHALL BE ACCOMPLISHED WITH 1"x8" LUMBER OR WITH METAL STRIPS FASTENED TO THE GATE. THE GATE SHALL BE SUPPORTED AT THE CENTER IN AN APPROVED MANNER.

④ **TYPE C STEADY BURNING BARRICADE WARNING LIGHTS:** EACH GATE SHALL BE EQUIPPED WITH A TYPE C STEADY BURNING BARRICADE WARNING LIGHT, CONSPICUOUSLY VISABLE AT ALL DISTANCES UP TO 1000' UNDER NORMAL ATMOSPHERIC CONDITIONS. THE LIGHT SHALL BE IN OPERATION AT ALL TIMES BETWEEN SUNSET AND SUNRISE DURING THE PERIOD THE HIGHWAY IS CLOSED.

⑤ **SIGNS:** WHERE THE ROAD IS CLOSED TO TRAFFIC BY THE ERECTION OF GATES AND BARRICADES, ROAD CLOSED SIGNS (R-75) SHALL BE MOUNTED ON THE GATES AS SHOWN.

WHERE TRAFFIC IS MAINTAINED, A ROAD CONSTRUCTION AHEAD SIGN (OW-128) SHALL BE USED ON THE RIGHT SHOULDER ON THE APPROACHES APPROXIMATELY 500 FEET IN ADVANCE OF THE PROJECT. A ROAD CONSTRUCTION NEXT __ MILES SIGN (OC-6) SHALL BE USED ON THE RIGHT SHOULDER ON THE APPROACHES TO ANY MAJOR CONSTRUCTION OR MAINTENANCE JOB OF TWO (2) MILES OR MORE IN LENGTH. AN END CONSTRUCTION SIGN (OC-8) SHALL BE ERECTED FACING TRAFFIC LEAVING THE CONSTRUCTION SECTION. THE SIGNS SHALL BE ERECTED AS DETAILED HEREON. DUAL MOUNTED SIGNS ARE REQUIRED FOR A FOUR LANE FACILITY.

⑥ **LUMBER:** LUMBER USED IN THE CONSTRUCTION OF THE GATES AND BARRICADES SHALL BE NO. 1 COMMON YELLOW PINE OR NO. 1 COMMON DOUGLAS FIR, SURFACED ON FOUR SIDES STANDARD, OR OTHER MATERIALS APPROVED BY THE ENGINEER. ALL SIZES ARE NOMINAL.

⑦ **POSTS:** POSTS SHALL BE SOUND 4"x4" SAWED OR 4 ½" ROUND. RAILS OF THE BARRICADE SHALL BE BOLTED TO THE POSTS WITH 5/8" BOLTS.

STANDARD D3-01 12-18-86

ORIGINAL

DETAILS FOR POSITIONING GATES AND BARRICADES

GEOLOGY OF THE SITE

THE PROPOSED STRUCTURE SITE IS LOCATED IN THE DISSECTED GLACIATED PORTION OF THE MISSISSIPPI VALLEY PLAIN REGION, IN AN AREA WHERE DEEP GLACIAL-DERIVED MATERIAL AND ALLUVIAL DEPOSITS OVERLIE BEDROCK, OF MISSISSIPPIAN AGE.

EXPLORATION

THE EXPLORATION CONSISTED OF TWO DRIVE SAMPLE BORINGS MADE BY MEANS OF A MECHANICALLY-POWERED HOLLOW STEM ROTARY AUGER MOUNTED ON A MOBILE PLATFORM, PERFORMED ON MAY 8, 1985.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

THE BORINGS ENCOUNTERED INTERVALS OF EXTREMELY LOOSE TO EXTREMELY DENSE UNSTRATIFIED BASIC SILTS, CLAYS AND SAND MODIFIED WITH GRAVEL AND VARYING PERCENTAGES OF EACH OTHER THAT GRADUALLY INCREASE (ERRATIC AT TIMES) IN DENSITY WITH INCREASE IN DEPTH. BORING B-1 (IN THE GENERAL VICINITY OF THE REAR ABUTMENT) PENETRATED TO A DEPTH OF 41.5 FEET, ELEVATION 794.8 FEET AND WAS TERMINATED AFTER PENETRATING IN EXCESS OF 24.0 FEET OF MATERIAL REQUIRING IN EXCESS OF 30 BLOWS PER FOOT IN THE STANDARD PENETRATION TEST. BORING B-2 (IN THE GENERAL VICINITY OF THE FORWARD ABUTMENT) PENETRATED TO A DEPTH OF 41.5 FEET, ELEVATION 794.8 FEET AND WAS TERMINATED AFTER PENETRATING IN EXCESS OF 16.5 FEET OF MATERIAL REQUIRING IN EXCESS OF 30 BLOWS PER FOOT IN THE STANDARD PENETRATION TEST.

BEDROCK SURFACE WAS NOT ENCOUNTERED IN EITHER OF THE TEST BORINGS PERFORMED.

FREE WATER WAS OBSERVED AND MEASURED IN BORING B-1 AT 12.5-FOOT DEPTH, ELEVATION 823.8 FEET AND IN BORING B-2 AT 12.5-FOOT DEPTH, ELEVATION 823.8 FEET.

LEGEND

Auger Boring Location – Plan View.

Press and / or Drive Sample and / or Core Boring Location – Plan View.

Drive Rod Penetration Resistance Sounding Location – Plan View.

Capped Pile

Footing

Footing on Pile

TR Top of Rock

H Horizontal Bar on Boring Log Indicates the Depth the Sample Was Taken.

X/Y/Z Figures Beside the Boring Log in Profile Indicate the Number of Blows for Standard Penetration Test.
- X = Number of Blows for First 6 inches.
- Y = Number of Blows for Second 6 inches.
- Z = Number of Blows for Third 6 inches.

Drive Rod Penetration Resistance Sounding Log – Profile

Casing

Resistance "R" < 10,000 lbs.

Resistance "R" > 10,000 lbs.

Z Indicates Final Measurement of Penetration, in Inches.

W— Indicates Free Water Elevation.

Indicates Static Water Elevation.

SYMBOLS OF ROCK TYPES

Coal

Weathered Mudstone or Claystone

Mudstone or Claystone

Weathered Shale

Shale

Weathered Siltstone

Siltstone

Weathered Sandstone

Sandstone

Leached Dolomite

Dolomite

Leached Limestone

Limestone

Boulders or Cobbles

GENERAL INFORMATION

Drive Rod Penetration Sounding Tests

Drive rod penetration resistance tests constitute driving a 1.315-inch diameter steel rod, with a 45° cone point, into the ground, using a 122-pound drop-hammer with a free fall of five feet. At one or two-foot depth intervals, a measurement is taken to determine the amount of penetration achieved in three hammer drops. This reading is converted to an empirical value for capacity "R", in thousands of pounds (which is a measure of both the point resistance and frictional resistance on the rod), by using charts prepared by the Ohio Department of Highways, Bureau of Bridges, on the basis of correlation study of rod penetration with past performance of pile driving. For interpretation, a graph is prepared by plotting the value "R" against the depth at which the reading was taken, and connecting the plotted points. The curve so obtained reflects the density of subsurface materials in a manner that can be readily compared with data from similar tests at other locations on the structure site. From this comparison, the overall uniformity of subsurface condition may be evaluated.

Drive Sample Borings – Drive-Press Sample Borings

Drive sample borings are made by means of a rotary-type drill rig, employing a 2" O.D., 1-3/8" I.D. sampler, at 2-1/2 and / or 5-foot depth intervals, driven by means of a 140 - pound drop-hammer with a free fall of 30 inches. The number of blows required to drive the sampler 18 inches is considered the standard penetration test.

Drive-press sample borings are made by means of a rotary-type drill rig, employing a 2" O.D., 1-3/8" I.D. drive sampler, and 3" O.D. thin-wall press sampler. The press sampler is advanced by continuous uniform pressure, applied by the drill rig.

The boring log sheets show a graphic plot of the information obtained, including depth and elevation of the sample, number of blows for the standard penetration tests in three 6-inch increments, depth of press samples, field sample number, sample description - based on laboratory tests and the Casagrande AC classification system-and gradation, plasticity, and moisture content determinations. Results of strength and consolidation testing, if performed, appear on separate enclosures.

At depths where materials are bouldery or gravelly to the extent that the sampler can not be driven, a wash sample is procured for visual classification, in order to determine the general character of the material. These samples are not considered sufficiently representative to warrant laboratory testing.

Particle Size Definitions

Boulders | 12" | Cobbles | 3" | Gravel | 2.0mm (No. 10 sieve) | Coarse Sand | 0.42mm (No. 40 sieve) | Fine Sand | 0.074mm (No. 200 sieve) | Silt | 0.005mm | Clay

LOG OF BORING

Date Started 5/8/85 Sampler Type SS Dia 1 3/8" Water Elev. 823.8'
Date Completed 5/8/85 Casing: Length Dia.
Boring No. B-1 Station & Offset 15+85 15' RT. (REAR ABUTMENT) Surface Elev 836.3'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
836.3	0														
833.8	2														
831.3	4	3/4/5			BROWN SILT	1	4	6	17	32	41	27	10	18	A-4a
828.8	6	2/4/7			BROWN CLAY	2	6	6	17	35	36	27	11	19	A-6a
826.3	8 / 10	4/6/9			GRAY GRAVELLY SANDY SILT	3	16	8	32	30	14	NP	NP	14	A-4a
823.8	12	1/1/2			GRAY SILTY GRAVELLY SAND WITH DECAYED WOOD	4	19	8	35	25	13	NP	NP	20	A-4a
821.3	14	8/11/10			GRAY SANDY SILT	5	8	1	31	50	10	NP	NP	17	A-4b
818.8	16 / 18	5/8/11			GRAY SILTY SAND	6	9	6	58	18	9	NP	NP	14	A-3a
816.3	20	6/17/26			GRAY SANDY SILT	7	2	0	58	33	7	NP	NP	19	A-4a
	22 / 24	8/21/30			GRAY SANDY SILT	8	0	0	39	52	9	NP	NP	22	A-4b
811.3	26 / 28	17/33			GRAY SANDY SILT	9	5	1	24	59	11	NP	NP	16	A-4b
806.3	30														
	32 / 34	7/11/21			GRAY SANDY SILT	10	6	4	12	30	48	26	9	15	A-4a
801.3	36 / 38	9/12/21			GRAY CLAYEY SILT	11	7	2	9	30	52	26	8	17	A-4a
796.3	40														
794.8		6/12/19			GRAY SILT AND CLAY	12	0	0	1	13	86	34	14	21	A-6a

BOTTOM OF BORING

LOG OF BORING

Date Started 5/8/85 Sampler Type SS Dia 1 3/8" Water Elev. 823.8'
Date Completed 5/8/85 Casing: Length Dia.
Boring No. B-2 Station & Offset 16+90 15' RT. (FORWARD ABUTMENT) Surface Elev 836.3'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
836.3	0														
833.8	2														
831.3	4	1/4/4			BROWN SANDY CLAY	13	7	4	20	35	34	33	16	16	A-6b
828.8	6	1/1/6			BROWN SANDY CLAY	14	8	5	16	36	35	30	12	17	A-6a
826.3	8 / 10	1/4/4			BROWN-GRAY SANDY CLAY	15	3	4	16	35	42	30	12	20	A-6a
823.8	12	1/2/4			GRAY SANDY SILT	16	2	2	41	34	21	NP	NP	23	A-4a
821.3	14	1/1/1			NO RECOVERY - SAMPLE WASHED OUT	-	-	-	-	-	-	-	-	-	-
818.8	16 / 18	3/6/6			GRAY SANDY SILT	17	13	5	27	41	14	NP	NP	26	A-4a
816.3	20	1/5/8			GRAY SANDY SILT	18	9	9	43	26	13	NP	NP	13	A-4a
	22 / 24	3/6/10			GRAY SANDY SILT	19	13	8	36	29	14	NP	NP	10	A-4a
811.3	26 / 28	4/20/30 (0.3')			GRAY SILTY SAND	20	9	3	56	24	8	NP	NP	12	A-3a
806.3	30														
	32 / 34	4/17/26			GRAY SANDY SILT	21	9	4	22	30	35	22	7	17	A-4a
801.3	36 / 38	12/20/26			GRAY SANDY SILT	22	5	3	13	30	49	22	7	16	A-4a
796.3	40														
794.8		6/14/19			GRAY CLAYEY SILT	23	0	2	7	32	59	28	8	17	A-4a

BOTTOM OF BORING

NOTE – ALL AVAILABLE SOIL AND BEDROCK INFORMATION WHICH CAN BE CONVENIENTLY SHOWN ON THE STRUCTURE FOUNDATION INVESTIGATION SHEETS HAS BEEN SO REPORTED. ADDITIONAL SUBSURFACE INVESTIGATIONS MAY HAVE BEEN MADE TO STUDY SOME SPECIAL ASPECT OF THE PROJECT. COPIES OF THIS DATA, IF ANY, MAY BE INSPECTED IN THE DISTRICT DEPUTY DIRECTOR'S OFFICE, THE BUREAU OF TESTS AT 1600 WEST BROAD STREET, THE PAVEMENT AND SOILS SECTION OF THE BUREAU OF LOCATION AND DESIGN OR IN THE BRIDGE BUREAU AT 25 SOUTH FRONT STREET.

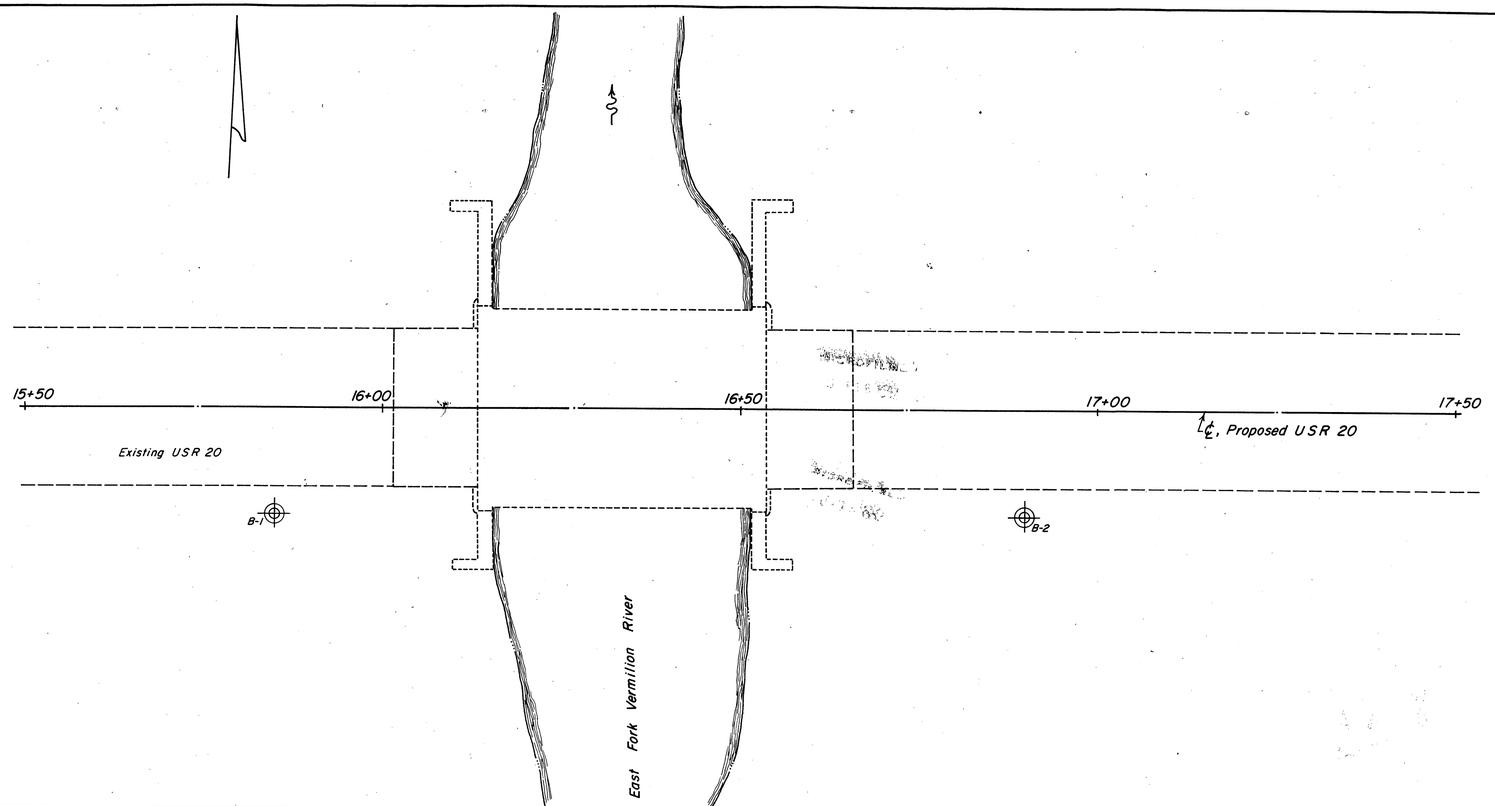
NOTE: Information shown by this subsurface investigation was obtained solely for the use in establishing design controls for the project. The State of Ohio does not guarantee the accuracy of this data and it is not to be construed as a part of the plans governing construction of the project.

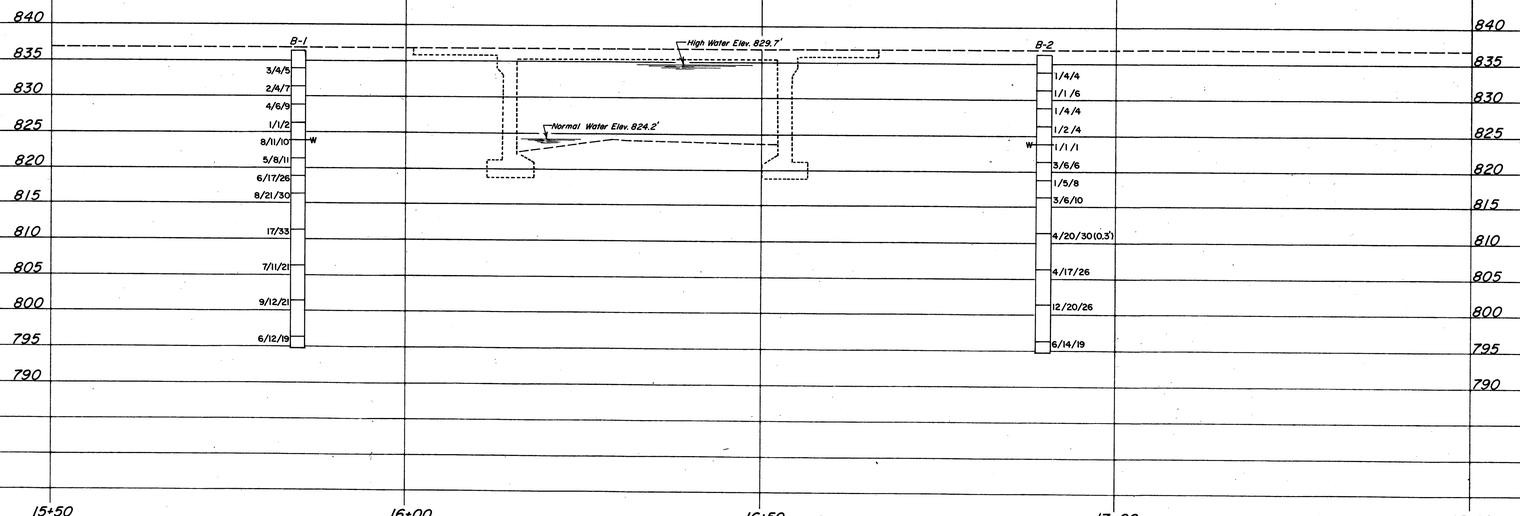
OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS — TESTING LABORATORY
1600 WEST BROAD STREET, COLUMBUS, OHIO 43223

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. LOR-20-0217
OVER EAST FORK VERMILION RIVER
SEC. LOR-20-2.16

CHECKED BY	REVIEWED BY	DATE
L. N. L.	R. D. R.	5/30/85

LOR-20-2.16 (2/2)





SCALE: 1" = 10'

OHIO DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS - TESTING LABORATORY
1600 WEST BROAD STREET COLUMBUS, OHIO 43223

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. LOR-20-0217
OVER EAST FORK VERMILION RIVER
SEC. LOR-20-2.16

PLAN AND PROFILE

DRAWN BY	CHECKED BY	REVIEWED BY	DATE
L.N.L.	L.N.L.	R.D.R.	5/30/85