30 Change 1-27

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

BUT-4-14.79R
LEMON TOWNSHIP
BUTLER COUNTY

SJN# 080910
PRJ#

BUT-4-14.79R	OHIO
	FHWA REGION 5
BRF-8(75)	FEDERAL PROJECT

1/27

BRF-8(75)

DESIGN DESIGNATION

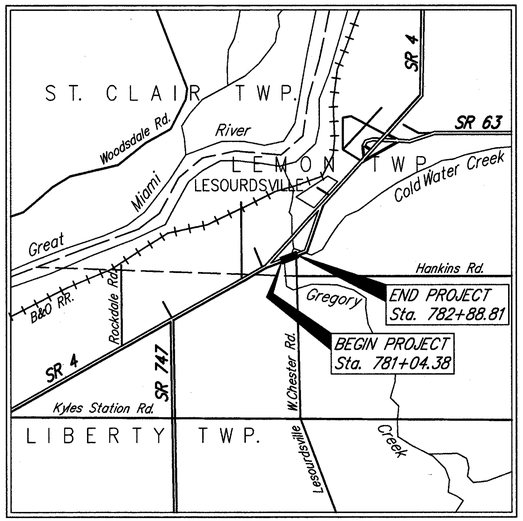
Current A.D.T. (1993)	=	22,030
Design Year A.D.T. (2013)	=	28,540
D.H.V.	=	2854
D	=	55%
T	=	5%
Design Speed	=	55 mph
Legal Speed	=	55 mph
Functional Classification	=	Rural Arterial
Design Exception	=	Bridge Width
Approval Date	=	5-04-92

CONVENTIONAL SIGNS

State Line
County Line
Township Line
Section Line
Corporation Line
Fence Line (existing) —x—x—, (proposed)
Center Line
Trees , Stumps , (to be removed)
Utility Poles: Telephone , Power , Light
Drain or Sewer Pipe (existing) (proposed)
Underdrain (existing) (proposed)
Catch Basin (existing) (adjust to grade) (proposed)
Manholes (existing) (adjust to grade) (proposed)
Water Valve Chamber (existing) (adjust to grade) (proposed)

Limited Access (only) —LA—
Right of Way (existing) (proposed) —R/W—
Limited Access & Right of Way —LA R/W—
Property Line (in existing fence) —x—℄—x—
Railroad or
Guardrail (existing) , (proposed)
Telephone, Gas & Electric Chamber or
Power —P— —P—
Gas —G— —G—
Water —W— —W—
Telephone —T— —T—
Cable —C— —C—

INDEX OF SHEETS



LOCATION MAP
SCALE IN MILES
0 1 2

Portion to be improved
State and Federal Routes
Other Roads

LINE DATA

Begin Project	Sta. 781+04.38	
End Project	Sta. 782+88.81	
LENGTH OF PROJECT	184.43	Lin. Ft.
	0.035	Mile
Add for Approaches		
Sta. 780+25.00 – 781+04.38	79.38	Lin. Ft.
Sta. 782+88.81 – 784+00.00	111.19	Lin. Ft.
Sta. 362+70.00 – 436+32.00	7362.00	Lin. Ft.
LENGTH OF WORK	7737.00	Lin. Ft.
	1.465	Mile

STRUCTURE PLANS REVIEWED BY:
Burgess & Niple, Limited
Engineers and Architects

UNDERGROUND UTILITIES

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

SCALES

Plan 0 20 40
Profile: Horizontal 0 20 40, Vertical 0 5 10
Cross Section: Horizontal 0 5 10, Vertical 0 5 10

26 AUG 1993
719TS

719–01

Plans Prepared By
HAZELET + ERDAL, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

PROJECT
DATE OF LETTING , 19
CONTRACT NO.

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS

BP-3.1	2-21-92	MC-1	6-13-69	MT-95.30	10-10-88	TC-35.10	8-29-84	AS-1-81	11-27-81
		MC-9.1	10-30-92	MT-95.40	10-01-92	TC-41.10	8-29-84	DBR-2-73	4-10-73
		MC-9.2	5-06-91	MT-95.70	2-23-90	TC-41.20	3-26-79	PSBD-1-81	6-20-89
GR-1.1	5-06-91	MC-9A	1-11-85	MT-95.81	2-23-90	TC-52.10	4-03-79		
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GR-1.3	2-21-92			MT-99.20	4-29-88	TC-65.10	2-01-90		
GR-2.1	5-06-91			MT-100.00	2-23-90	TC-65.11	2-01-90		
GR-3.4	5-06-91			MT-101.60	7-01-92	TC-82.10	8-29-84		
GR-4.1	5-06-91			MT-105.10	7-01-92	TC-83.10	3-18-92		
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GR-8	10-25-90	MT-96.25	9-9-88			TC-85.20	1-20-84		

SUPPLEMENTAL SPECIFICATIONS

802	4-13-90	
820	3-18-92	
862	12-16-88	
924	12-14-88	
942	3-18-92	
962	1-23-90	
903	1-1-69	

1993 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, except as noted on Sheets 5–8, and that provisions for the maintenance and safety of traffic will be as set forth on the plans and estimates.

Approved Date 9-9-93 District Deputy Director of Transportation

B & N REV. Approved Date 11-22-93 Engineer, Bureau of Bridges and Structural Design

Approved Date 1-24-94 Deputy Director, Division of Design

Approved Date 1-24-94 Director, Department of Transportation

REVISED 3-28-94

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

301 Change 1-27

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION

BUT-4-14.79R
LEMON TOWNSHIP
BUTLER COUNTY

SJN# 080910
PRJ# 300-94

BUT-4-14.79R	OHIO
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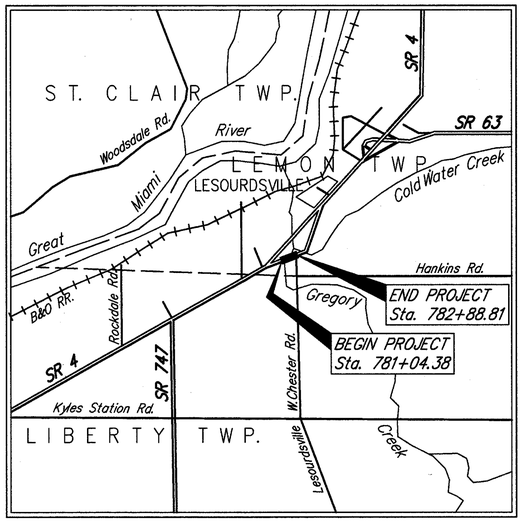
INDEX OF SHEETS



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DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

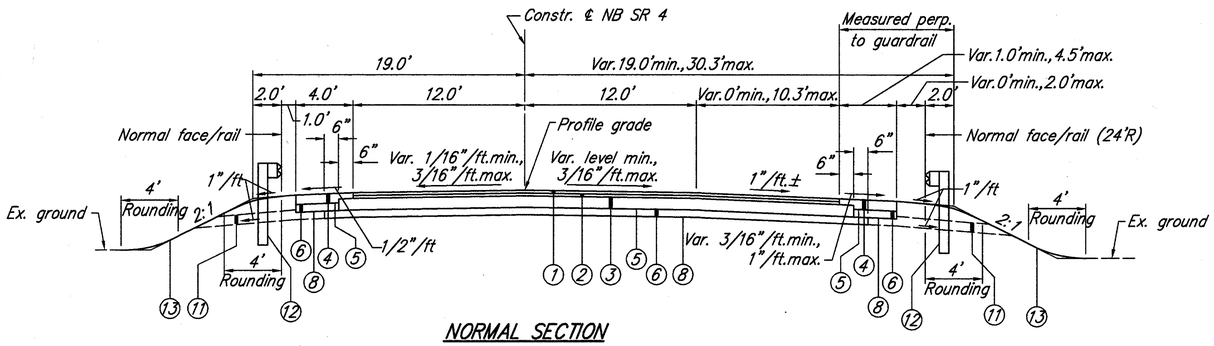
APPROVED:

DIVISION ADMINISTRATOR DATE

CALC. BY DATE	BUT-4-14.79R	OHIO	2 / 27
CHKD. BY DATE		FHWA REGION 5	

TYPICAL SECTIONS

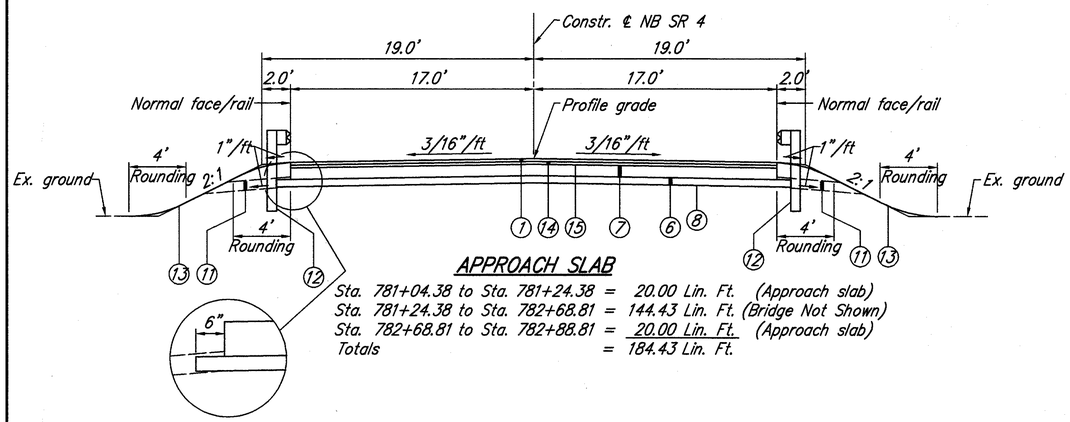
TYPE 404 ON 301



NORMAL SECTION

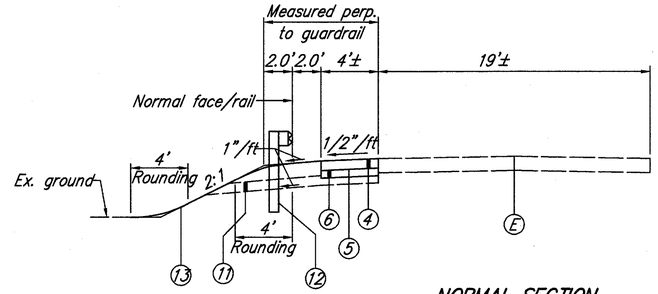
Sta. 782+88.81 to Sta. 783+25.00 = 36.19 Lin. Ft.

LEGEND		
NO.	ITEM	DESCRIPTION
1	404	1 1/4" Asphalt concrete, AC-20
2	403	1 3/4" Asphalt concrete, AC-20
3	301	9" Bituminous aggregate base: AC-20
4	301	6" Bituminous aggregate base: AC-20
5	408	Bituminous prime coat @ 0.40 gal./s.y.
6	304	6" Aggregate base (See Proposal Note)
7	611	Reinforced concrete approach slab (T= 13")
8	203	Subgrade compaction
9		Not Used
10		Not Used
11	605	Aggregate drains (see General Notes)
12	606	Guardrail, Type 5
13	659	Seeding and mulching
14	403	1 1/4" Asphalt concrete, AC-20
15	407	Tack Coat using SS 924
A		Existing 6"± asphalt concrete overlay
B		Existing 3" brick course
C		Existing 6"± concrete base
D		Existing 7"± flexible pavement widening
E		Existing asphalt surface



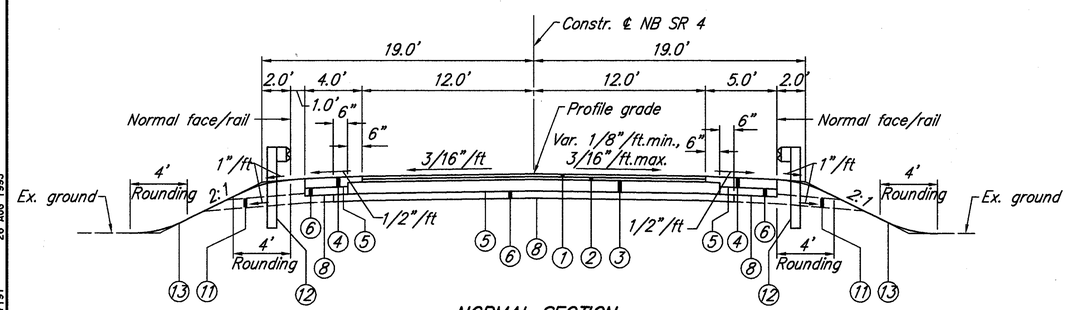
APPROACH SLAB

Sta. 781+04.38 to Sta. 781+24.38 = 20.00 Lin. Ft. (Approach slab)
Sta. 781+24.38 to Sta. 782+68.81 = 144.43 Lin. Ft. (Bridge Not Shown)
Sta. 782+68.81 to Sta. 782+88.81 = 20.00 Lin. Ft. (Approach slab)
Totals = 184.43 Lin. Ft.



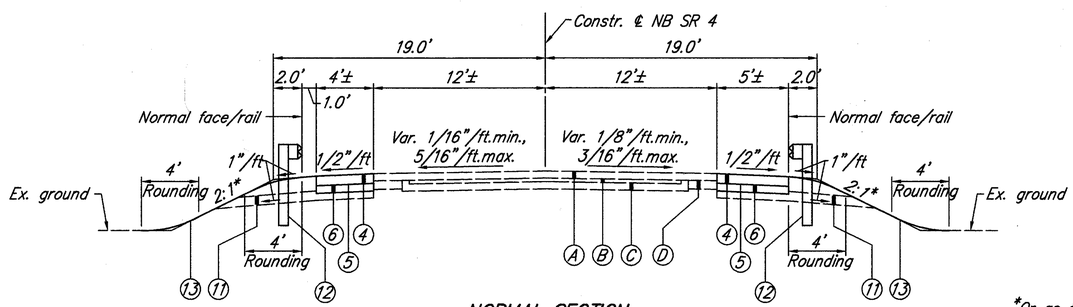
NORMAL SECTION

Lesourdsville W.Chester Road
(Looking North. See Plan)



NORMAL SECTION

Sta. 780+75.00 to Sta. 781+04.38 = 29.38 Lin. Ft.



NORMAL SECTION

Sta. 780+25.00 to Sta. 780+75.00 = 50.00 Lin. Ft. (Both sides)
Sta. 783+25.00 to Sta. 784+00.00 = 75.00 Lin. Ft. (Left side only)
Totals = 125.00 Lin. Ft.

*Or as shown on cross sections.

TYPICAL SECTIONS

26 AUG 1993

719T

GENERAL NOTES

GENERAL

ELEVATION DATUM

All elevations are based on U.S.C. & G.S. datum.

UTILITIES SHOWN IN CROSS SECTIONS

Although an attempt has been made to accurately represent utilities in cross sections, the depth shown is approximate only.

UNDERGROUND UTILITIES

The locations of the underground utilities shown on the plans are as obtained from the owners of the utility as required by Section 153.64 ORC.

UTILITY OWNERSHIP

The following utilities and owners are located within the work limits of this project:

POWER
Cincinnati Gas & Electric Company
P.O. Box 960, Room M 50 M
Cincinnati, Ohio 45202
513-287-2522 (1-800-262-3000 Ext:2522)

WATER & SEWER
Butler County Water and Sewer District
130 High Street
Hamilton, Ohio 45011
513-887-3000

TELEPHONE
Cincinnati Bell Telephone Company
201 East Fourth Street (102-280)
Cincinnati, Ohio 45202
513-397-9900

CONTINGENCY QUANTITIES

The Contractor shall not order materials or perform work listed in the General Summary for items designated by plan note 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.

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.

WORK LIMITS

The work limits shown on these plans are for physical construction only. The installation and operation of all temporary traffic control and temporary traffic control devices required by these plans shall be provided by the Contractor whether inside or outside these work limits.

ROADWAY

CLEARING AND GRUBBING

Although there are no trees and/or stumps specifically marked for removal within the limits of this project, a lump sum quantity has been included in the General Summary for Item 201, Clearing and grubbing. All provisions as set forth in the specifications under this item shall be included in the lump sum price bid for Item 201, Clearing and grubbing.

RAILING REPLACEMENT

No hazard shall be left unprotected except for the actual time necessary to remove, grade, and reinstall railing in an efficient manner. The removal of all guardrail shall at all times be as directed by the Engineer. No guardrail shall be removed until the replacement material is on the site, ready for installation. Failure to comply with this requirement shall be deemed sufficient cause to order work suspended on this project until such time that the Engineer is assured of said compliance.

CONNECTIONS BETWEEN EXISTING AND PROPOSED GUARDRAIL

When it is necessary to splice proposed guardrail to existing guardrail, only the existing guardrail shall be cut, drilled, or punched. The connection shall be made using a "beam rail splice" as shown on Standard Drawing GR-1.1. Payment shall be included in the unit price bid for the respective guardrail runs.

EROSION CONTROL

TEMPORARY SOIL EROSION AND SEDIMENT CONTROL

The following estimated quantity is to be used as directed by the Engineer, for temporary erosion and sediment control measures:

Item 207, Straw or hay bales	138 Each
Item 207, Filter fabric fence	550 Lin. Ft.

ITEM 207, FILTER FABRIC FENCE

Materials. Filter fabric shall meet the requirements of Item 207.02.

Construction. The bottom of the fence shall be buried 6" below the ground. The fence shall be high enough to retain sediment laden water and adequately supported to prevent collapse or bursting. The ground elevation of the fence shall be held constant except that the end elevations shall be raised to prevent flow around the end of the fence.

Maintenance. The filter fabric fence shall be maintained to be functional. This shall include removal of trapped sediment and required cleaning, repair, and/or replacement of the filter fabric.

Payment. The cost of all materials, construction, maintenance and removal required shall be paid for under:

ITEM	UNIT	DESCRIPTION
207	Lin.Ft.	Filter fabric fence

ITEM 659, SEEDING AND MULCHING

Seeding and mulching shall be applied to all areas of exposed soil within the construction limits. Quantity calculations for item 659, Seeding and mulching, are based on these limits.

WATERING AND MOWING PERMANENT SEEDED AREAS

The following estimated quantities are to be used as directed by the Engineer to promote growth and to care for permanent seeded areas per 659.09:

659, Water	1 M. Gal. (see Sheet 9)

EROSION CONTROL

Item 601 is provided in the plans for erosion control. Rock of a stable nature shall not be removed in order to place this item. The Engineer shall check and non-perform quantities or adjust locations and quantities of this item where indicated by field conditions during construction. In addition, this item shall meet the requirements of 108.04.

DRAINAGE

ITEM 605, AGGREGATE DRAINS

Aggregate drains shall be constructed as follows:

STATION	LENGTH LEFT SIDE	LENGTH RIGHT SIDE
780+30	9'	9'
780+70		
780+80	7'	
781+10		3'
781+27	3'	
782+95	8'	13'
782+98		13' (Lesourdsville)
783+45	9'	
783+95	10'	
Totals to Gen. Sum.	93'	

PAVEMENT

ITEM 407, TACK COAT

The rate of application of the 407 Tack coat shall be subject to adjustment as directed by the Engineer. Plan quantities indicate an average application rate of 0.075 Gallons per square yard of tack coat for estimating purposes only.

MAINTENANCE OF TRAFFIC

ITEM 622, PORTABLE CONCRETE BARRIER

Sections of Portable concrete barrier shall be connected using pin connections. Tongue and groove connections will not be allowed.

ITEM 622, PORTABLE CONCRETE BARRIER, 50", AS PER PLAN

This work shall consist of furnishing, installing, maintaining, and subsequently removing a 50-inch Portable concrete barrier at the locations shown on the plans. For details, see Standard Construction Drawing MC-9.1.

Portable concrete barrier, 32 inches high with an 18-inch minimum height glare screen may be used at the option of the Contractor. The glare screen shall be constructed using one of the following systems or an approved equal:

Carsonite Modular Glare Screen
Carsonite International
2900 Lockheed Way, Carson City, Nevada 89701
702-883-5104 or 800-648-7974

Forward Glare Screen
Proven Products, Inc.
7560 SW LaView Drive, Portland, Oregon 97219
503-244-9185

Syro Glarefoil
Syro Steel Company
1170 N. State St., Girard, Ohio 44420
216-545-4373

Paddle or intermittent type glare screens shall be designed using a 20 degree cut-off angle based on tangent alignment. That spacing shall be used throughout the barrier length without regard to barrier curvature.

The glare screen system shall be securely fastened to the 32-inch Portable concrete barrier using the hardware and procedures specified by the Manufacturer.

Payment shall include all labor, material, and equipment necessary to perform the work and shall be paid for at the contract price per linear foot for Item 622, Portable concrete barrier, 50", as per plan.

ITEM 410, TRAFFIC COMPACTED SURFACE, AS PER PLAN

All standard provisions of Item 410, Traffic compacted surface shall apply except that material shall be as indicated in Item 304.02.

Basis of Payment. Payment will be made under:

ITEM	UNIT	DESCRIPTION
410	Ton	Traffic compacted surface, as per plan

MAINTAINING TRAFFIC

The stationing used for Maintenance of Traffic is taken from the alignment shown in previous construction plans.

The Contractor will be required to provide, erect, maintain (in proper position, clean, legible and good working condition) and remove all lights, signs, barricades and all other traffic control devices necessary for the maintenance of traffic, including regulatory signs and pavement markings. All signs that are to convey their message during the hours of darkness shall be reflectorized or illuminated. All signs shall be post mounted, unless otherwise directed by the Engineer.

Before work begins, the Contractor shall submit to the Engineer the names and telephone numbers of persons who can be contacted 24 hours a day by the Ohio Department of Transportation and all interested police agencies. These persons shall be responsible for placing or replacing necessary traffic control devices to maintain the traveled pavement safely.

To assure maintenance of adequate traffic control at all times, no signs are to be installed or removed without the approval of the Engineer.

PAYMENT

The following estimated quantities have been included in the General Summary to be used as directed by the Engineer for the maintenance of traffic.

Item 404, Bituminous concrete for maintaining traffic	10 Cu. Yd.
Item 410, Traffic compacted surface, as per plan	85 Ton
Item 614, Temporary lane line, Class II	3.20 Mile
Item 614, Temporary channelizing line, Class I	300 Lin. Ft.
Item 614, Temporary stop line, Class I	50 Lin. Ft.
Item 616, Water	50 M. Gal.
Item 616, Calcium chloride	5 Ton
Item 615, Temporary Roads	Lump Sum

Separate payment shall be made for items listed above; items listed on Sheet 13 subsummary; Item 614, Temporary crossover lighting, as per plan; Item Special, Temporary traffic signal; Item Special, Temporary impact attenuator; and Item 615, Temporary roads. All other work required for traffic maintenance (including providing, erecting, maintaining, and removing all lights, signs, barricades, drums and all other traffic control devices), shall be included with payment for Item 614, Maintaining Traffic.

ITEM 614, TEMPORARY CROSSOVER LIGHTING, AS PER PLAN

Temporary crossover lighting shall be used on this project, except that the area to be illuminated shall be enlarged as follows: in addition to the illumination of the two crossovers, the intersection with Parkwood Drive, and the travelled portion of SR 4 between the southern crossover and the intersection shall be illuminated.

The installation shall be in accordance with Standard Drawing MT-100.00 and with the details on the Maintenance of Traffic plans. All work, including materials, equipment, labor, and removal shall be included in the price bid for Item 614, Temporary crossover lighting, as per plan - 1 each.

719RN1 27 AUG 1993

GENERAL NOTES

CALC. BY RS DATE 6-93	BUT-4-14.79R	OHIO	4
CHKD. BY DHM DATE 6-93		FHWA REGION 5	27

MAINTENANCE OF TRAFFIC (CONT'D)

COVERING OF SIGNS

Where the plans call for a permanent sign to be covered, the Contractor shall do so in such a manner so as to avoid damaging the permanent sign when the cover is removed. The cover shall be totally opaque. The use of adhesive tape applied directly to a sign face is strictly prohibited.

ITEM 614, BARRIER REFLECTORS

These reflectors and their mountings shall conform to Supplemental Specification 802 except that spacing shall conform to Proposal Note.

ITEM SPECIAL, TEMPORARY TRAFFIC SIGNAL

A temporary traffic signal shall be provided according to the plans, standard drawings, and specifications.

An estimated quantity is included in the General Summary for:

Item Special, Temporary Traffic Signal 1 Each

ITEM SPECIAL, TEMPORARY IMPACT ATTENUATOR, G.R.E.A.T. TYPE

This work shall consist of furnishing temporary impact attenuators as required in the plans. This item shall include all related hardware, not separately specified, as required by the manufacturer to construct complete and functional G.R.E.A.T. impact attenuator systems. The attenuators shall be placed in accordance with the Manufacturer's specifications and at the locations shown on the plans. The impact attenuator shall be manufactured by the Energy Absorption Systems, Inc., One East Walker Drive, Chicago, Illinois 60601; Telephone (312) 467-6750.

The backup system shall be designed per the Manufacturer's instructions; the Manufacturer shall provide the details for this shape and transition. The costs for this work necessary for completion of this item shall be considered incidental. [redacted]

The nose cover of the attenuator shall be marked with three evenly spaced four-inch wide horizontal stripes of white reflective material meeting the requirements of the CMS 730.19 for a permanent installation. For a temporary installation, the nose cover shall meet the requirements of Standard Drawing MT-95.81.

The Contractor shall be responsible for inspection, repairing, and otherwise restoring the impact attenuator in accordance with the Manufacturer's maintenance instructions while it is in use on the project. Such repairs shall be performed within 12 hours of the incident which caused damage to the project. In addition to any extra units supplied for this project, the Contractor shall be responsible for supplying all necessary materials, labor and equipment required to perform the above described restoration of the attenuator.

For locations of temporary impact attenuators see sheet 6.

Payment for the above work shall be made at the unit price bid and shall be considered full payment for furnishing, installing at the specified locations, restoration after each vehicle impact, including all labor, tools, equipment and miscellaneous hardware and materials necessary to complete these items of work. An estimated quantity is included in the General Summary for:

Item Special, Temporary impact attenuator (G.R.E.A.T. Type), Model No. 200200NF6GCZ, bidirectional – 2 each

719SHR2 27 AUG 1993

ITEM 614, TEMPORARY RAISED PAVEMENT MARKERS

This item of work shall consist of furnishing, installing, maintaining, and subsequently removing Temporary Raised Pavement Markers (TRPM'S). The TRPM'S shall be yellow or white, as described in the plan.

MATERIAL
All units shall be of sufficient strength and properly shaped so as not to be dislodged or broken, or the reflector dislodged or broken, or the reflector dislodged or damaged by impacts from vehicles tires, including those of high pressure truck tires loaded to 4500 pounds.

Retro-reflectors shall be provided in one or two directions on each unit as required by the usage and shall return white or yellow light as is appropriated for the application.

The reflector shall have an effective area of 0.35 square inch for Type A or 3.0 square inch for Type B. Its brightness or specific intensity (when tested at 0.2 degree angle of observation and the following angles of incidence) shall meet or exceed the following:

SPECIFIC INTENSITY
TYPE A

INCIDENCE ANGLE (DEGREES)	WHITE	YELLOW
0	1.0	0.6
20	0.4	0.24
45	–	–

TYPE B

	WHITE	YELLOW
0	3.0	1.8
20	1.2	0.72
45	0.3	0.2

ANGLE OF INCIDENCE formed by a ray from light source to the marker and the normal to the leading edge of the marker face (also horizontal entrance angle).

ANGLE OF OBSERVATION formed by a ray from light source to the marker and the returned ray from the marker to the measuring receptor.

SPECIFIC INTENSITY is the mean candlepower of the reflected light (at given incidence and divergence angles) for each foot-candle at the reflector (on a plane perpendicular to the incident light).

TYPE A units are intended to provide high visibility both at night and during daylight. Their day time visibility shall be assured by size, shape and color as follows:

1) The units shall be a high visibility yellow or white color which will not degrade substantially due to traffic wear and which will match the color of the reflector.

2) When viewed from above, the units shall have a visible area of not less than 14 square inches.

3) When viewed from the front, parallel to the pavement, as from approaching traffic, the unit shall have a width of approximately 4 inches and a visible area of not less than 1.5 square inches.

TYPE B units are intended to provide high visibility at night by retroreflecting automotive headlight back to the driver.

INSTALLATION: They shall be attached to clean, dry pavement by a butyl adhesive pad, a bituminous adhesive or other construction grade adhesives (such as franklin panel and metal adhesive) suitable to anchor the unit under the above conditions. When it is necessary to attach units to new concrete with curing compound remaining, the curing compound membrane shall be removed by sandblasting or other mechanical cleaning method. They shall be installed in accordance with the manufacturer's recommendations.

The contractor shall immediately replace, at his cost, any units which fail (broken housing, housing worn to the extent that daytime visibility is significantly diminished or of an unacceptable color, detached or broken reflector, housing detached from adhesive).

TRPM'S are likely to be removed by snow plowing operations, thus they are not considered suitable for use during the period from October 15 until April 30. The Contractor is advised to schedule his work and/or the use of these devices to avoid this period. Should the Contractor choose to use TRPM'S during this period and they are subsequently removed or destroyed by snow and ice control activities, the Contractor shall immediately, at his cost, provide a substitute traffic guidance system effective during light and dark and which is acceptable to the Engineer.

The units shall be placed accurately to depict straight or uniformly curving lines. When used to supplement temporary pavement markings, they may be placed on or immediately adjacent to the pavement marking. Locations shall be adjusted up to one foot longitudinally or six inches laterally to avoid placement on joints, cracked or deteriorated pavement. They shall not be placed directly on pavement markings if this will detract from their ability to remain attached to the pavement.

APPLICATION
1) When required to supplement pavement marking; they shall be placed as follows:

LINE	TYPE	SPACING
Edge Line	A or B	20' c/c
Lane Line	A or B	40' c/c*
Center Line (single/broken)	A or B	40' c/c*
Center Line (double/solid)	A or B	2 units side by side 4 inches apart 20' c/c
Channelizing Line (includes exit gore nose)	A or B	10' c/c

* centered in gap

2) When used to simulate (replace) pavement marking they shall be placed as follows:

LINE	TYPE	SPACING
Edge Line	A	5' c/c
Lane Line	A	4 @ 3.33' c/c 30' gap (40' cycle)
Center Line (double/solid)	A	2 units side by side 5' c/c
Center Line (single/broken)	A	4 @ 3.33' c/c 30' gap (40' cycle)
Channelizing Line (includes exit gore nose)	A	5' c/c
Edge Line (Two color) (white/yellow)	A	Back to Back 5'c/c

Yellow TRPM'S used to separate opposite flows of traffic (Center Lines) shall include reflections for both directions. All other yellow TRPM'S and white TRPM'S shall provide retro-reflectivity for one direction.

REMOVAL
Removal shall be accomplished in a manner that little or none of the adhesive remains on the pavement and permanent pavement surfaces shall not be scarred, broken or roughened significantly.

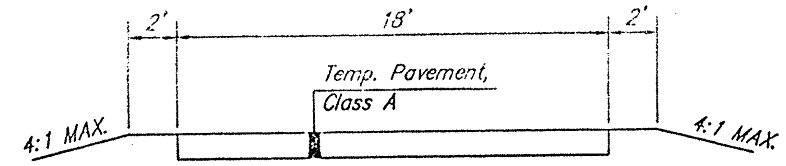
PAYMENT
Basis of payment shall be at the contract unit price per each TRPM and shall include all labor, equipment, hardware and incidentals required to perform the work. It shall also include replacement at no additional cost of all TRPM'S which, in the judgment of the Engineer, fail for any reason, except due to failure of the pavement to which they are attached.

ITEM	UNIT	DESCRIPTION
614	Each	Temporary Raised Pavement Markers

STATIONING (From-To) (Side)	SPACING	TYPE B W	TYPE B Y	REMARKS (Line Type)
10+00 – 16+36 Lt.	20		32	Edge Line
11+00 – 17+12 Rt.	20	31		Edge Line
21+06 – 28+87 Lt.	20		39	Edge Line
20+00 – 28+00 Rt.	20	40		Edge Line
TOTALS		71	71	
		142		

ODNR COMPLIANCE

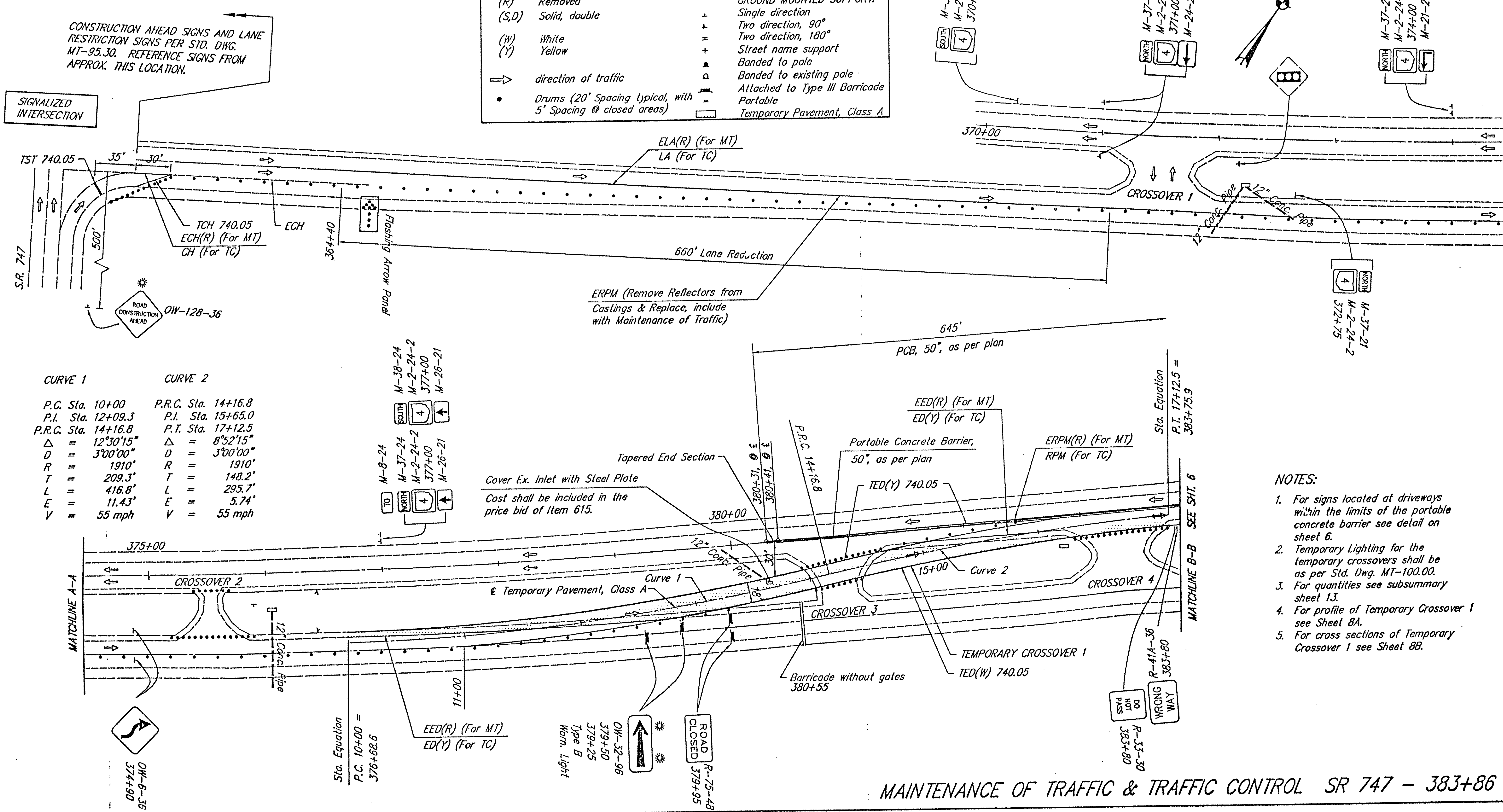
Erosion and sediment control measures specified in this plan are minimum requirements and shall be implemented and strictly adhered to by the Contractor. Disturbance of the stream bottom shall be held to a minimum, subject to normal construction procedures. The stream channel shall be returned to original contour and substrate composition upon completion of the project.



TEMPORARY CROSSOVER TYPICAL SECTION
Sta. 10+00 to Sta. 17+12.5

TRAFFIC LEGEND

ED	4" Edge line		Vehicle signal (Temporary)
LA	4" Lane line		Luminaire (Temporary)
CE	4" Center line		Pole (Existing)
CH	8" Channelizing line		Pole (Proposed)
ST	Stop line		Controller cabinet (Existing)
TR	24" Transverse line		Pull box, junction box
			Pull box, junction box
E__	Existing markings		Portable concrete barrier
T__	Temporary markings		Barricade warning light, Type A
(R)	Removed		GROUND MOUNTED SUPPORT:
(S,D)	Solid, double		Single direction
			Two direction, 90°
(W)	White		Two direction, 180°
(Y)	Yellow		Street name support
			Banded to pole
	direction of traffic		Banded to existing pole
			Attached to Type III Barricade
	Drums (20' Spacing typical, with 5' Spacing @ closed areas)		Portable
			Temporary Pavement, Class A


CONSTRUCTION AHEAD SIGNS AND LANE RESTRICTION SIGNS PER STD. DWG. MT-95.30. REFERENCE SIGNS FROM APPROX. THIS LOCATION.
SIGNALIZED INTERSECTION
TST 740.05
35'
30'
TCH 740.05
ECH(R) (For MT)
CH (For TC)
ECH
500'
S.R. 747
ROAD CONSTRUCTION AHEAD
OW-128-36
364+40
Flashing Arrow Panel
ELA(R) (For MT)
LA (For TC)
660' Lane Reduction
ERPM (Remove Reflectors from Castings & Replace, include with Maintenance of Traffic)
370+00
M-38-21
M-2-24-2
370+25
SOUTH
M-37-21
M-2-24-2
371+00
M-24-21
NORTH
CROSSOVER 1
12" Conc. Pipe
12" Conc. Pipe
M-38-21
M-2-24-2
374+00
M-26-21
M-37-21
M-2-24-2
374+00
M-21-21
M-37-21
M-2-24-2
372+75
MATCHLINE A-A
645'
PCB, 50", as per plan
M-38-24
M-2-24-2
377+00
M-26-21
M-8-24
M-37-24
M-2-24-2
377+00
M-26-21
TO
Tapered End Section
380+31. @ ℄
380+41. @ ℄
P.R.C. 14+16.8
Portable Concrete Barrier, 50", as per plan
TED(Y) 740.05
EED(R) (For MT)
ED(Y) (For TC)
ERPM(R) (For MT)
RPM (For TC)
Sta. Equation
P.T. 17+12.5 =
383+75.9
SEE SHT. 6
Cover Ex. Inlet with Steel Plate
Cost shall be included in the price bid of Item 615.
380+00
375+00
12" Conc. Pipe
32'
18'
CROSSOVER 2
Curve 1
℄ Temporary Pavement, Class A
15+00
Curve 2
CROSSOVER 3
CROSSOVER 4
MATCHLINE B-B
MATCHLINE A-A
12" Conc. Pipe
11+00
TEMPORARY CROSSOVER 1
TED(W) 740.05
Barricade without gates
380+55
R-41A-36
383+80
DO NOT PASS
WRONG WAY
R-33-30
383+80
OW-6-36
374+90
Sta. Equation
P.C. 10+00 =
376+68.6
EED(R) (For MT)
ED(Y) (For TC)
OW-32-96
379+50
379+25
Type B
Warn. Light
ROAD CLOSED
R-75-48
379+95

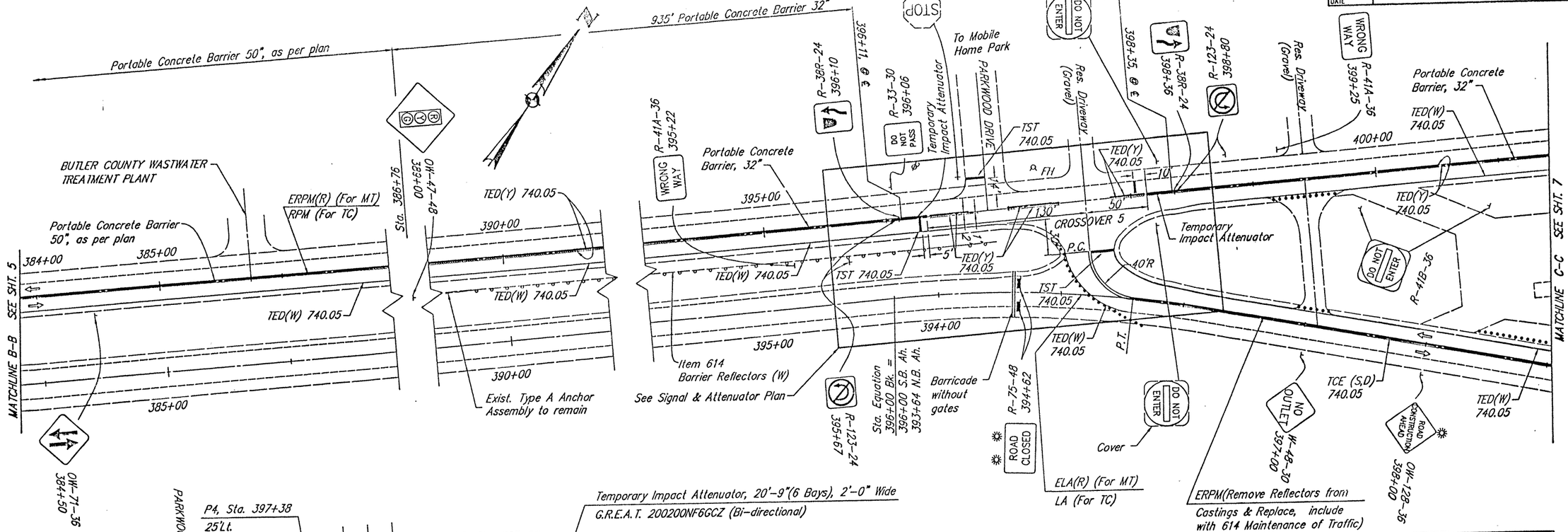
CURVE 1		CURVE 2	
P.C. Sta.	10+00	P.R.C. Sta.	14+16.8
P.I. Sta.	12+09.3	P.I. Sta.	15+65.0
P.R.C. Sta.	14+16.8	P.T. Sta.	17+12.5
Δ =	12°30'15"	Δ =	8°52'15"
D =	3°00'00"	D =	3°00'00"
R =	1910'	R =	1910'
T =	209.3'	T =	148.2'
L =	416.8'	L =	295.7'
E =	11.43'	E =	5.74'
V =	55 mph	V =	55 mph

NOTES:

1. For signs located at driveways within the limits of the portable concrete barrier see detail on sheet 6.
2. Temporary Lighting for the temporary crossovers shall be as per Std. Dwg. MT-100.00.
3. For quantities see subsummary sheet 13.
4. For profile of Temporary Crossover 1 see Sheet 8A.
5. For cross sections of Temporary Crossover 1 see Sheet 8B.

MAINTENANCE OF TRAFFIC & TRAFFIC CONTROL SR 747 - 383+86

719MT1 31 AUG 1993



SEMI-ACTUATED 75-SECOND CYCLE								
Interval	1	2	3	4	5	6	7	8
Movement	N/S G	N/S Y	ALL R	EB G	EB Y	ALL R	WB G	WB Y
Seconds	40	3	3	10	3	3	10	3
Flash	Y			R			R	

TRAFFIC SIGNAL DETECTORS							
Loop Designation	Size	No. of Turns	Shape	Pulse or Presence	Calling Relay	Connect to Detector Unit No.	Associated Controller Phase
D1	12' X 20'	2-4-2	Fig. 8	Presence	No	1	4
D2	8' X 35'	2-4-2	Fig. 8	Presence	No	1	7

NOTES:

1. For Legend see sheet 5.
2. For signs located at driveways within the limits of the portable concrete barrier see detail this sheet.
3. Per Standard Drawing MT-95.40, General Notes Nos. 1-3, 5-10, and 12-15 are applicable.
4. Per Standard Drawing MT-96.11, General Notes Nos. 1-3 and 8 are applicable.
5. Standard Drawing MT-96.25 shall be modified to indicate 3 phases instead of 2.
6. For quantities see Subsummary sheet 13.

MAINTENANCE OF TRAFFIC & TRAFFIC CONTROL 383+86 - 402+41

719MT2 27 JAN 1993

CALC. BY DATE	BUT-4-14.79R	OHIO	7 / 27
CHKD. BY DATE		FHWA REGION 5	

2,336' Portable Concrete Barrier 32"

OW-47-36 405+50

405+00

410+00

Sta. 421+71

SEE SHT. 8

ERPM(R) (For MT)
RPM (For TC)

TED(Y) 740.05

Item 614
Barrier Reflectors (W)

OW-71-48 412+70

OW-71-48 418+50

Remove existing Type T Anchor Assembly. Replace with Type A Anchor Assembly. Type A Assembly may remain upon completion of project.

Portable Concrete Barrier, 32"

TED(W) 740.05

R-41B-36 408+30

DO NOT ENTER

RIGHT TURN ONLY R-25A-24 409+05

RIGHT TURN ONLY R-25A-24 402+70

DO NOT PASS R-33-30 403+50

MATCHLINE C-C SEE SHT. 6

ERPM(Remove Reflectors from Castings & Replace, include with 614 Maintenance of Traffic)

TED(W) 740.05

TCE(S,D) 740.05

Comm. Building

Conc.

Conc.

Conc. Loading Ramp

GREGORY CREEK

300 FEET ROAD CLOSED AHEAD OW-1-45B-36 400+00

OW-120-36 400+00

100 FEET ROAD CLOSED AHEAD OW-1-45B-36 402+00

OW-120-36 402+00

ROAD CLOSED R-75-48 404+00

Barricade with Gates

Sta. Equation 405+70NB (BK) = 779+00 (AH)

781+00

DO NOT ENTER

ROAD CLOSED R-75-48 783+52

ED(Y)

Barricade with Gates See MT-101.60

784+00 14.3'

ED(W)

LA

ERPM(R)

RPM

SEE SHT. 8

FH

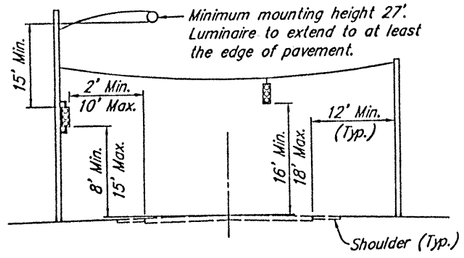
STOP R-121-36 783+55

LESOURDSVILLE WEST CHESTER RD.

500'

ROAD CONSTRUCTION AHEAD OW-128-36

Drums, 20' Spacing Drums continue N.B. For continuation see sheet 8.



TEMPORARY SIGNAL DETAIL
(For Crossover 5)

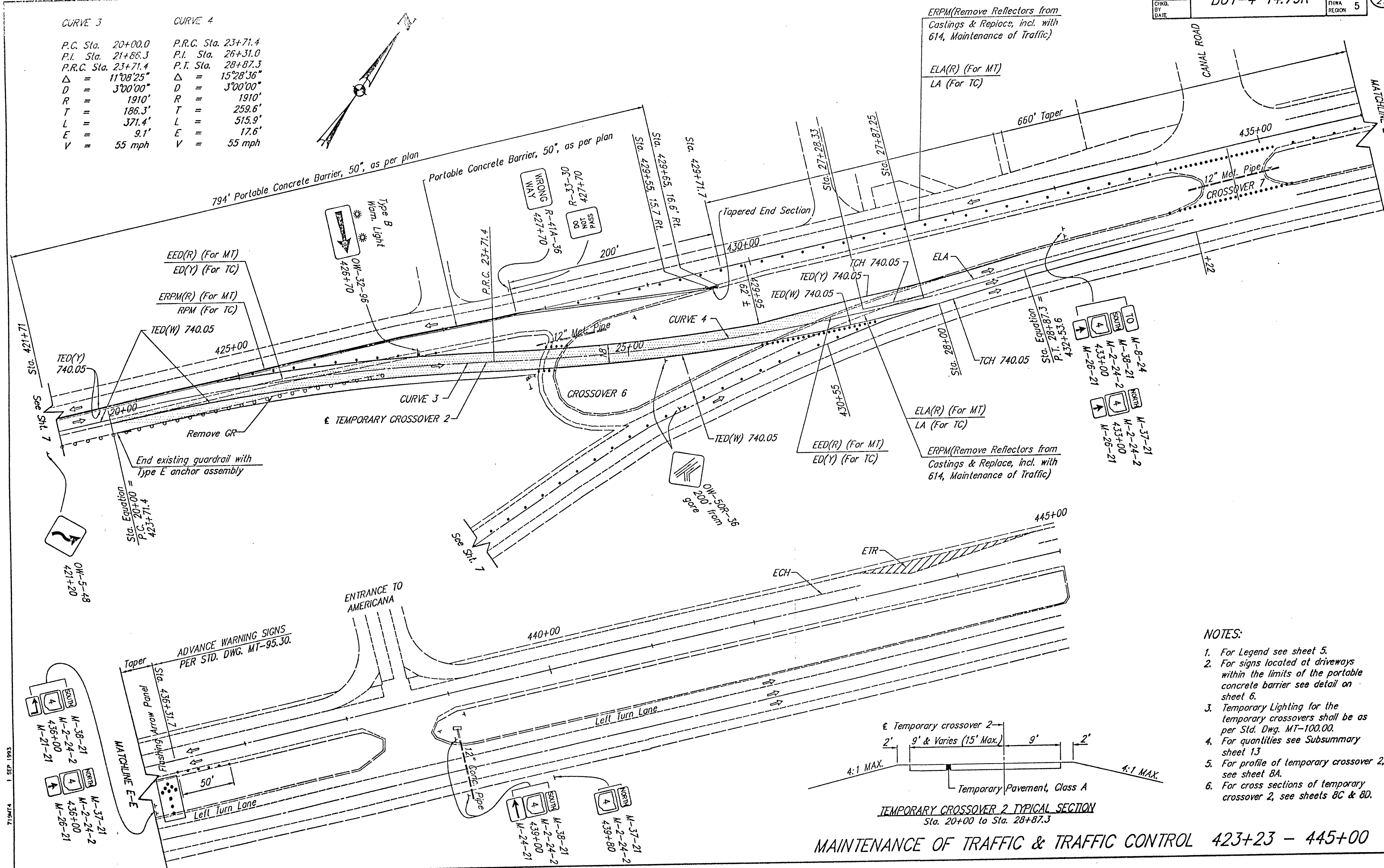
NOTES:

1. For Legend see sheet 5.
2. For signs located at driveways within the limits of the portable concrete barrier see detail on sheet 6.
3. For quantities see Subsummary sheet 13.

MAINTENANCE OF TRAFFIC & TRAFFIC CONTROL 402+41 – 414+00

719MT3 27 AUG 1993

CURVE 3		CURVE 4	
P.C. Sta.	20+00.0	P.R.C. Sta.	23+71.4
P.I. Sta.	21+86.3	P.I. Sta.	26+31.0
P.R.C. Sta.	23+71.4	P.T. Sta.	28+87.3
Δ =	11°08'25"	Δ =	15°28'36"
D =	3°00'00"	D =	3°00'00"
R =	1910'	R =	1910'
T =	186.3'	T =	259.6'
L =	371.4'	L =	515.9'
E =	9.1'	E =	17.6'
V =	55 mph	V =	55 mph


794' Portable Concrete Barrier, 50", as per plan
Portable Concrete Barrier, 50", as per plan
Type B Warn. Light
OW-32-96 426+70
WRONG WAY R-41A-36 427+70
DO NOT PASS R-33-30 427+70
200'
Sta. 429+65, 16.6' Rt.
Sta. 429+55, 15.7 Rt.
Sta. 429+71.7
Tapered End Section
Sta. 27+28.33
Sta. 27+87.25
ERPM(Remove Reflectors from Castings & Replace, incl. with 614, Maintenance of Traffic)
ELA(R) (For MT)
LA (For TC)
CANAL ROAD
660' Taper
435+00
12" Met. Pipe
CROSSOVER 7
MATCHLINE E-E
EED(R) (For MT)
ED(Y) (For TC)
ERPM(R) (For MT)
RPM (For TC)
TED(W) 740.05
TED(Y) 740.05
Sta. 421+71
425+00
P.R.C. 23+71.4
430+00
62' ±
429+95
TCH 740.05
TED(Y) 740.05
TED(W) 740.05
ELA
CURVE 4
12" Met. Pipe
25+00
8'
CROSSOVER 6
CURVE 3
℄ TEMPORARY CROSSOVER 2
Remove GR
20+00
See Sht. 7
End existing guardrail with Type E anchor assembly
Sta. Equation P.C. 20+00 = 423+71.4
OW-5-48 421+20
OW-50R-36 200' from gore
TED(W) 740.05
430+55
EED(R) (For MT)
ED(Y) (For TC)
ELA(R) (For MT)
LA (For TC)
ERPM(Remove Reflectors from Castings & Replace, incl. with 614, Maintenance of Traffic)
Sta. 28+00
TCH 740.05
Sta. Equation P.T. 28+87.3 = 432+53.6
TO SOUTH 4 M-8-24 M-38-21 M-2-24-2 433+00 M-26-21
NORTH 4 M-37-21 M-2-24-2 433+00 M-26-21
+22
See Sht. 7
445+00
ETR
ECH
ENTRANCE TO AMERICANA
440+00
ADVANCE WARNING SIGNS PER STD. DWG. MT-95.30.
Taper
Sta. 436+31.7
Flashing Arrow Panel
50'
Left Turn Lane
Left Turn Lane
12" Corr. Pipe
SOUTH 4 M-38-21 M-2-24-2 436+00 M-21-21
NORTH 4 M-37-21 M-2-24-2 436+00 M-26-21
SOUTH 4 M-38-21 M-2-24-2 439+00 M-24-21
NORTH 4 M-37-21 M-2-24-2 439+80
℄ Temporary crossover 2
2'
9' & Varies (15' Max.)
9'
2'
4:1 MAX.
4:1 MAX.
Temporary Pavement, Class A
TEMPORARY CROSSOVER 2 TYPICAL SECTION
Sta. 20+00 to Sta. 28+87.3
7194T4 1 SEP 1993

NOTES:

1. For Legend see sheet 5.
2. For signs located at driveways within the limits of the portable concrete barrier see detail on sheet 6.
3. Temporary Lighting for the temporary crossovers shall be as per Std. Dwg. MT-100.00.
4. For quantities see Subsummary sheet 13
5. For profile of temporary crossover 2, see sheet 8A.
6. For cross sections of temporary crossover 2, see sheets 8C & 8D.

MAINTENANCE OF TRAFFIC & TRAFFIC CONTROL 423+23 - 445+00

CALC. BY DATE
CHKD. BY DATE

BUT-4-14.79R

OHIO
FHWA REGION 5

8A
27

728.52 728.82 729.04 728.77 728.42 728.07 727.72 727.32 726.66 725.72 724.52 723.27 722.02 720.77 719.52

50' L.V.C.

160' L.V.C.

P.V.I. 11+00
729.12

P.V.I. 14+00
727.02

Station Equation
Sta. 10+00 = 376+68.6

Station Equation
Sta. 17+12.50 = 983+75.9

-0.6%

-0.7%

2.5%

Proposed Grade

Existing Ground

730

720

728.52 728.50 729.01 728.60 728.13 727.1 726.2 726.3 726.4 725.2 723.6 722.47 721.77 720.11 719.52

10+00 12+00 14+00 16+00

TEMPORARY CROSSOVER 1

634.87 635.12 635.37 635.62 635.87 636.12 636.37 636.62 636.87 637.12 637.37 637.62 637.87 638.12 638.37 638.62 638.87 639.12 639.31

Station Equation
Sta. 204+00 = 423+71.4

+0.5%

Proposed Grade

Existing Ground

Station Equation
Sta. 284+87.30 = 432+53.6

640

630

634.87 634.70 635.06 635.1 634.9 634.7 634.5 634.7 634.8 636.1 636.4 636.7 636.0 636.3 637.04 637.50 637.99 639.01 639.31

20+00 22+00 24+00 26+00 28+00

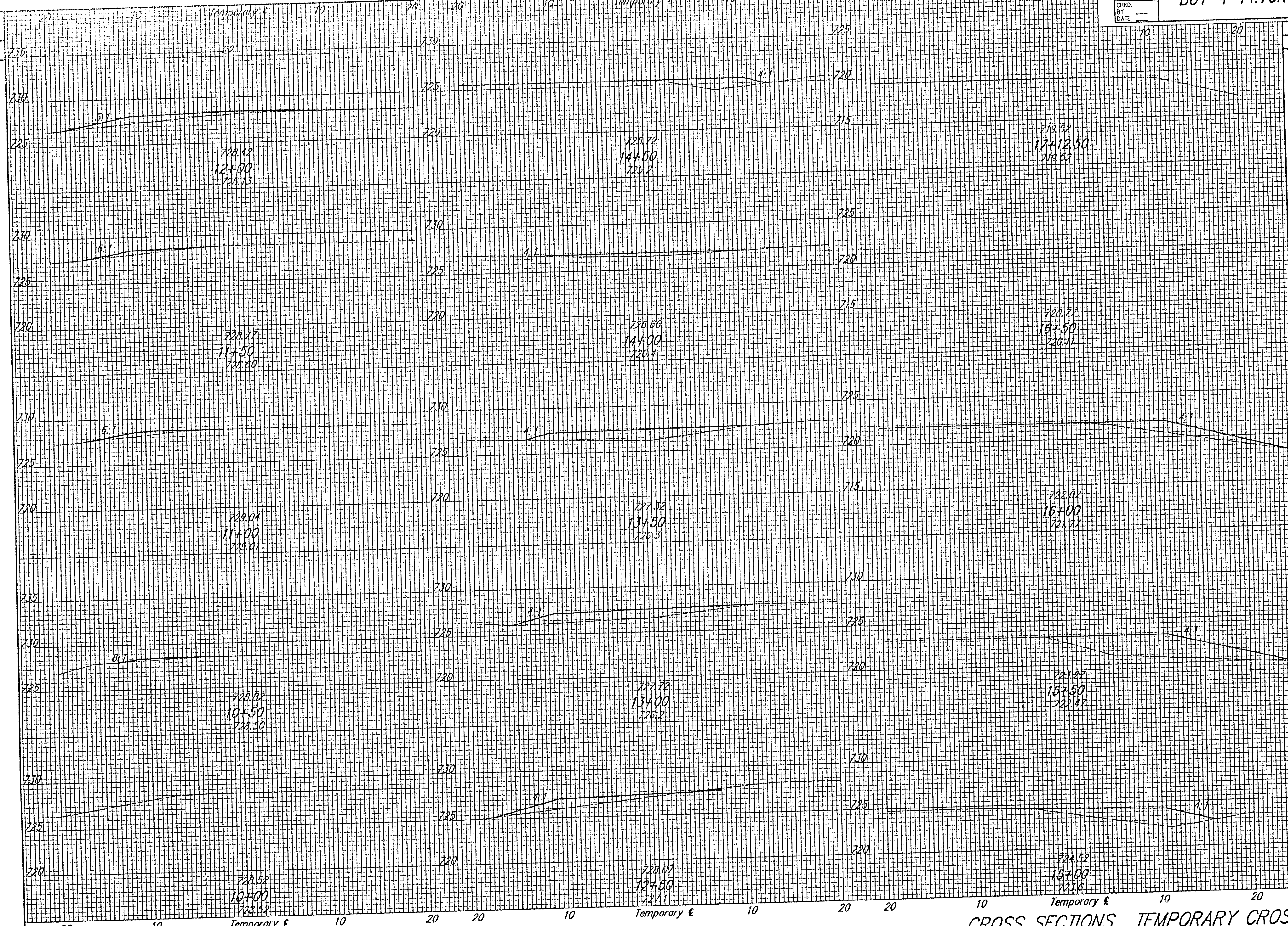
TEMPORARY CROSSOVER 2

PROFILE TEMPORARY CROSSOVERS 1 & 2

71SMITPF 31 AUG 1993

CALC. BY — DATE —	BUT-4-14.79R	OHIO	88/27
CHKD. BY — DATE —		FHWA REGION 5	

SEEDING and/or SODDING	
END WIDTH	SQ. YDS.



END AREA		VOLUME	
CUT	FILL	CUT	FILL

CROSS SECTIONS TEMPORARY CROSSOVER 1

719WTC1 31 AUG 1993

CALC. BY	
DATE	
CHKD. BY	
DATE	

BUT-4-14.79R

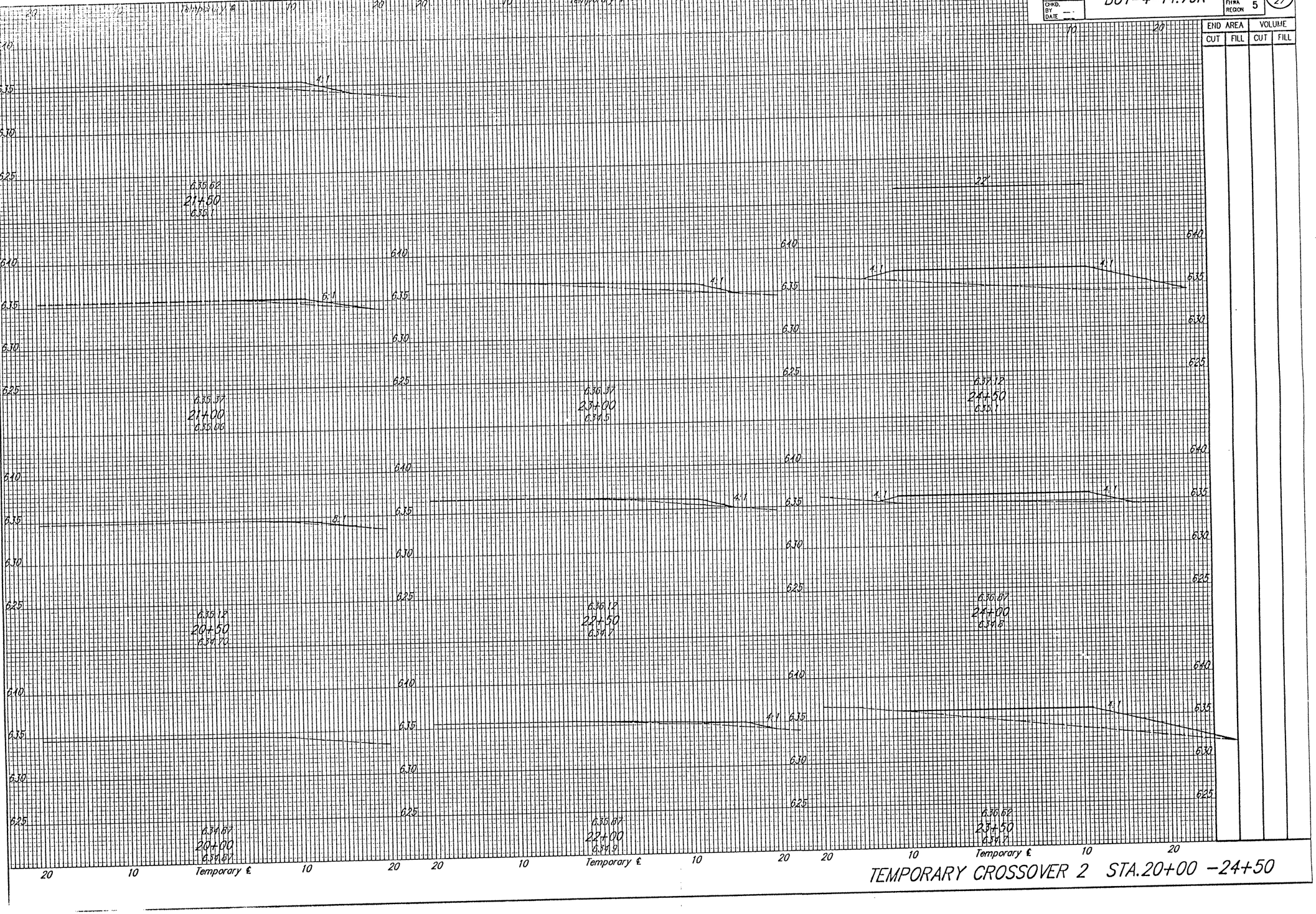
OHIO

FHWA REGION 5

8C
27

SEEDING and/or SODDING	
END MOTH	SQ. YDS.

END AREA		VOLUME	
CUT	FILL	CUT	FILL



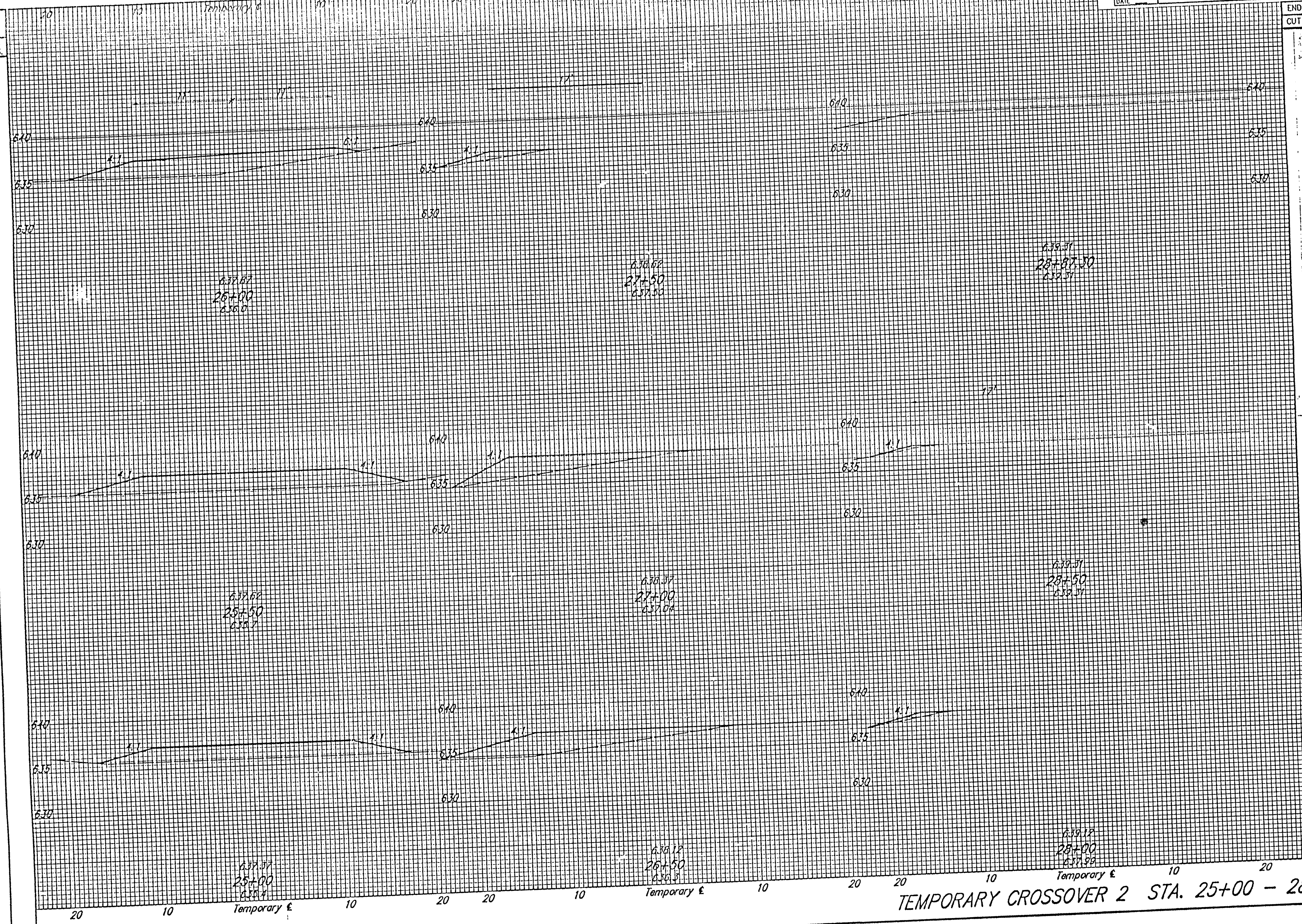
TEMPORARY CROSSOVER 2 STA.20+00 -24+50

7194RC2 31 AUG 1993

CALC. BY DATE	CHKD. BY DATE	BUT-4-14.79R	OHIO	FHWA REGION 5	80/27

SEEDING and/or SODDING	
END WIDTH	SQ. YDS.

END AREA		VOLUME	
CUT	FILL	CUT	FILL



TEMPORARY CROSSOVER 2 STA. 25+00 - 28+87.30

7194TC3 31 AUG 1993

QUANTITY COMPUTATIONS

CALC. BY CAC DATE 6-93	BUT-4-14.79R	OHIO	9
CHKD. BY RS DATE 8-93		FHWA REGION 5	27

Item 404, Asphalt Concrete, AC-20

780+75 – 781+04
(29)(24) = 696 S.F.

782+89 – 783+25
(36)(29.15) = 1049 S.F.

781+04 – 781+24
(20)(34) = 680 S.F.

782+69 – 782+89
(20)(34) = 680 S.F.
3105 S.F.

(3105 S.F.)(0.104 Ft.)/(27 C.F./C.Y.) = 12 C.Y.

Item 403, Asphalt Concrete, AC-20

780+75 – 781+04
(29)(24) = 696 S.F.

782+89 – 783+25
(36)(29.15) = 1049 S.F.
1745 S.F.

(1745 S.F.)(0.146 Ft.)/(27 C.F./C.Y.) = 9 C.Y.

781+04 – 781+24
(20)(34) = 680 S.F.

782+69 – 782+89
(20)(34) = 680 S.F.
1360 S.F.

(1360 S.F.)(0.104 Ft.)/(27 C.F./C.Y.) = 5 C.Y.

TOTAL = 9 C.Y. + 5 C.Y. = 14 C.Y.

Item 301, Bituminous Aggregate Base, AC-20

780+75 – 781+04
(29)(25) = 725 S.F.

782+89 – 783+25
(36)(30.15) = 1085 S.F.
1810 S.F.

(1810 S.F.)(0.75 Ft.)/(27 C.F./C.Y.) = 50 C.Y.

780+75 – 781+04 (Lt.-Rt.)
(29)(8.5) = 247 S.F.

782+89 – 783+25 (Lt.-Rt.)
(36)(6.25) = 225 S.F.

780+25 – 780+75 (Lt.-Rt.)
(50)(9) = 450 S.F.

783+25 – 784+00 (Lt.)
(75)(4) = 300 S.F.

Lesourdsville W. Chester Road (West)
(86)(4) = 344 S.F.
1566 S.F.

(1566 S.F.)(0.5 S.F.)/(27 C.F./C.Y.) = 29 C.Y.

TOTAL = 50 C.Y. + 29 C.Y. = 79 C.Y.

Item 408, Bituminous Prime Coat

780+75 – 781+04
(29)(34) = 986 S.F.

782+89 – 783+25
(36)(36.9) = 1328 S.F.

780+25 – 780+75 (Lt.-Rt.)
(50)(9) = 450 S.F.

783+25 – 784+00 (Lt.)
(75)(4) = 300 S.F.

Lesourdsville W. Chester Road (West)
(86)(4) = 344 S.F.
3408 S.F.

((3408 S.F.)/(9 S.F./S.Y.))
(0.40 Gal./S.Y.) = 151 Gal.

Item 304, Aggregate Base

781+04 – 781+24 (Lt.-Rt.)
(20)(35) = 700 S.F.

782+69 – 782+89 (Lt.-Rt.)
(20)(35) = 700 S.F.

780+25 – 780+75 (Lt.-Rt.)
(50)(9) = 450 S.F.

780+75 – 781+04 (Lt.-Rt.)
(29)(34) = 986 S.F.

782+89 – 783+25 (Lt.-Rt.)
(36)(36.9) = 1328 S.F.

783+25 – 784+00 (Lt.)
(75)(4) = 300 S.F.

Lesourdsville W. Chester Road (West)
(86)(4) = 344 S.F.
4808 S.F.

(4808 S.F.)(0.5 Ft.)/(27 C.F./C.Y.) = 89 C.Y.

Item 203, Subgrade Compaction

780+75 – 781+04
(29)(34) = 986 S.F.

782+89 – 783+25
(36)(36.9) = 1328 S.F.

781+04 – 781+24
(20)(34) = 680 S.F.

782+69 – 782+89
(20)(34) = 680 S.F.
3674 S.F.

(3674 S.F.)/(9 S.F./S.Y.) = 408 S.Y.

Item 407, Tack Coat Using SS 924

781+04 – 781+24
(20)(34) = 680 S.F.

782+69 – 782+89
(20)(34) = 680 S.F.
1360 S.F.

(1360 S.F.)/(9 S.F./S.Y.)
(0.075 Gal./S.Y.) = 11 Gal.

Item 611, Reinforced Concrete Approach Slab (T=13")

781+04 – 781+24
(20)(34) = 680 S.F.

782+69 – 782+89
(20)(34) = 680 S.F.

(1360 S.F.)/(9 S.F./S.Y.) = 151 S.Y.

Item 659, Commercial Fertilizer

Seeding and Mulching from General Summary 667 S.Y.

(667 S.Y.)(9 S.F./S.Y.)
(20 Lb./1000 S.F.)/(2000 Lb./Ton) = 0.06 Ton

Item 659, Water

Seeding and Mulching from General Summary 667 S.Y.

(667 S.Y.)(9 S.F./S.Y.)
(120 Gal./1000 S.F.) = 720 Gal.

720 gal./1000 = 1 Mgal.

71910C 27 AUG 1993

GENERAL SUMMARY

SHEET NUMBER				PARTICIPATION	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
3	9	12	13						
									ROADWAY
Lump					201	11000	Lump		Clearing and grubbing
			133		202	22900	133	SqYd	Approach slab removed
			256		202	23000	256	SqYd	Pavement removed
			975		202	38000	975	LinFt	Guardrail removed
			74		202	54100	74	Each	Raised pavement marker removed for storage
		114			203	12000	114	CuYd	Excavation not including embankment construction
		244			203	20000	244	CuYd	Embankment
	408				203	50000	408	SqYd	Subgrade compaction
			4		604	40500	4	Each	Reference Monument
			362.5		606	13000	362.5	LinFt	Guardrail, Type 5
			3		606	25000	3	Each	Anchor Assembly, Type A
			1		606	26100	1	Each	Anchor Assembly, Type E
			1		606	26500	1	Each	Anchor Assembly, Type T
			4		606	35140	4	Each	Bridge Terminal Assembly, Type 4
									EROSION CONTROL
550					207	30000	550	LinFt	Filter fabric fence
138					207	70000	138	Each	Straw or Hay bales
			467		601	34200	467	CuYd	Rock channel protection, Type C, without filter
		667			659	10000	667	SqYd	Seeding and mulching
	0.06				659	20000	0.06	Ton	Commercial fertilizer
	1				659	35000	1	MGal	Water
									DRAINAGE
93					605	31100	93	LinFt	Aggregate drain
									PAVEMENT
	79				301	10002	79	CuYd	Bituminous aggregate base: AC-20
	89				304	20000	89	CuYd	Aggregate base (See Proposal Note)
	14				403	20000	14	CuYd	Asphalt concrete, AC-20
	12				404	20000	12	CuYd	Asphalt concrete, AC-20
	11				407	13900	11	Gallon	Tack coat using SS924
	151				408	10000	151	Gallon	Bituminous prime coat
	151				611	15000	151	SqYd	Reinforced concrete approach slab (T= 13")
									TRAFFIC CONTROL
			1.08		642	00102	1.08	Mile	Edge line, Type 2
			1.47		642	00202	1.47	Mile	Lane line, Type 2
			30		642	00402	30	LinFt	Channelizing line, Type 2
			11		802	00100	11	Each	Barrier Reflector, Type A
			74		862	00100	74	Each	Raised pavement marker

7190S1 1 SEP 1993

GENERAL SUMMARY

CALC. BY CAC DATE 6-93
CHKD. BY RS DATE 8-93

BUT-4-14.79R

OHIO
FHWA REGION 5

11/27

GENERAL SUMMARY

SHEET NUMBER 3	SHEET NUMBER 4	SHEET NUMBER 13	PARTICIPATION	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION
								MAINTENANCE OF TRAFFIC
10				404	35000	10	CuYd	Bituminous concrete for maintaning traffic
85				410	24001	85	Ton	Traffic compacted surface, as per plan (Sh. 3)
	1			SPECIAL	61411300	1	Each	Temporary traffic signal (Sh. 4)
1				614	12751	1	Each	Temporary crossover lighting, as per plan (Sh. 3)
	142			614	12800	142	Each	Temporary raised pavement marker
		62		614	13200	62	Each	Barrier reflector, Type A
		500		614	13300	500	Each	Barrier reflector, Type B
		268		614	13350	268	Each	Object marker
3.20				614	20400	3.20	Mile	Temporary lane line, class II
		0.19		614	21300	0.19	Mile	Temporary center line, class I, 740.05, Type C
		3.07		614	22300	3.07	Mile	Temporary edge line, class I, 740.05, Type C
300				614	23000	300	LinFt	Temporary channelizing line, class I
		401		614	23600	401	LinFt	Temporary channelizing line, class I, 740.05, Type C
50				614	26000	50	LinFt	Temporary stop line, class I
		68		614	26600	68	LinFt	Temporary stop line, class I, 740.05, Type C
Lump				615	10000	Lump		Temporary road
		2540		615	20000	2540	SqYd	Temporary pavement, class A
50				616	10000	50	M.Gal	Water
5				616	20000	5	Ton	Calcium chloride
		3270		622	40020	3270	LinFt	Portable concrete barrier, 32"
		1440		622	40031	1440	LinFt	Portable concrete barrier, 50", as per plan (Sh. 3)
	2			SPECIAL	69010300	2	Each	Temporary impact attenuator (G.R.E.A.T. Type), Model No. 200200NF6GCZ, bidirectional (Sh. 4)
								For Structure Estimate of Quantities see sheet 19
				614	11000	Lump		Maintaining traffic
Lump				619	15000	Lump		Field office, Type A
				623	10000	Lump		Construction layout stakes
				624	10000	Lump		Mobilization

GENERAL SUMMARY

719052 1 SEP 1993

CALC. BY SCC DATE 8-93
CHKD. BY RS DATE 8-93

BUT-4-14.79R

OHIO | FHWA REGION 5 | 12/27

PROPOSED STRUCTURE

TYPE: Three span continuous, noncomposite prestressed box beams with capped pile piers and abutments.
SPANS: 43'-3", 53'-6", 43'-3" (c/c bearings).
ROADWAY: 34'-0" face to face of guard rail
LIVE LOADING: HS 20-44, Case II, and the Alternate Military Loading

WEARING SURFACE: 2 1/2" Minimum Asphalt Concrete
APPROACH SLABS: AS-1-81 (20' long), with asphalt overlay
ALIGNMENT: Tangent
CROWN: 3/16" per foot
SKEW: 20° L.F.

BENCH MARK

Square cut on top of wingwall at the S.W. Corner of Bridge over Coldwater Creek.
3.58'Lt. of Constr. ℄ Sta. 785+98.2
B.M. Elev. 633.71

Rock Channel Protection, Type C, without filter 39'x90'x2'-0"

Rock Channel Protection, Type C, without filter 30'x93'x2'-0"

END PROJECT
Sta. 782+88.81
S.L.M. 14.83
BRF-8(75)

BEGIN PROJECT
Sta. 781+04.38
S.L.M. 14.79
BRF-8(75)

16" Wingwall

GREGORY CREEK

Conc.

Gate

Conc. Loading Ramp

Ex. R/W

Sta. Equation
405+70NB (BK)=
779+00 (AH)

12.5' Trans.*

Sta. 781+27.78
Bridge terminal assembly, Type 4

Work Limits

Sta. 782+77.78
Bridge terminal assembly, Type 4

Edge/shdr. PC +40.00, 16.00 Lt.

Radius 1892.86'

Anchor assembly, Type T

Edge/shdr. End +00.00, 16.95 Lt.

25' Trans.*

42" San. Sewer

+75, Meet existing w/ Butt end joint

Sta. 780+50
15' Lt. & Rt.

Sta. 784+00
15' Lt. & Rt.

+25, Meet existing w/ Butt end joint

SR 4 (Northbound)

Constr. ℄ NB SR 4
N65°42'05"E

779 780 781 782 783 784

12.0'Rt. 14.8'Rt. 22.3'Rt.

Sta. 781+15.41
Bridge terminal assembly, Type 4

Sta. 782+65.41
Bridge terminal assembly, Type 4

Attach proposed guardrail to existing per General Notes on sheet 3.

30"

F.H.

Edge/shdr. 25'Radius +79.41, 41.00 Rt.

Edge/shdr. PT +00.76, 55.84 Rt.

Anchor assembly, Type A

Edge/shdr. End +82.78, 81.71 Rt.

10" Water

16" Wingwall

Lesourdsville West Chester Rd.

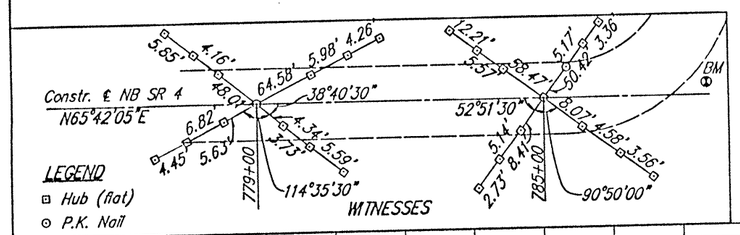
Anchor assembly, Type A

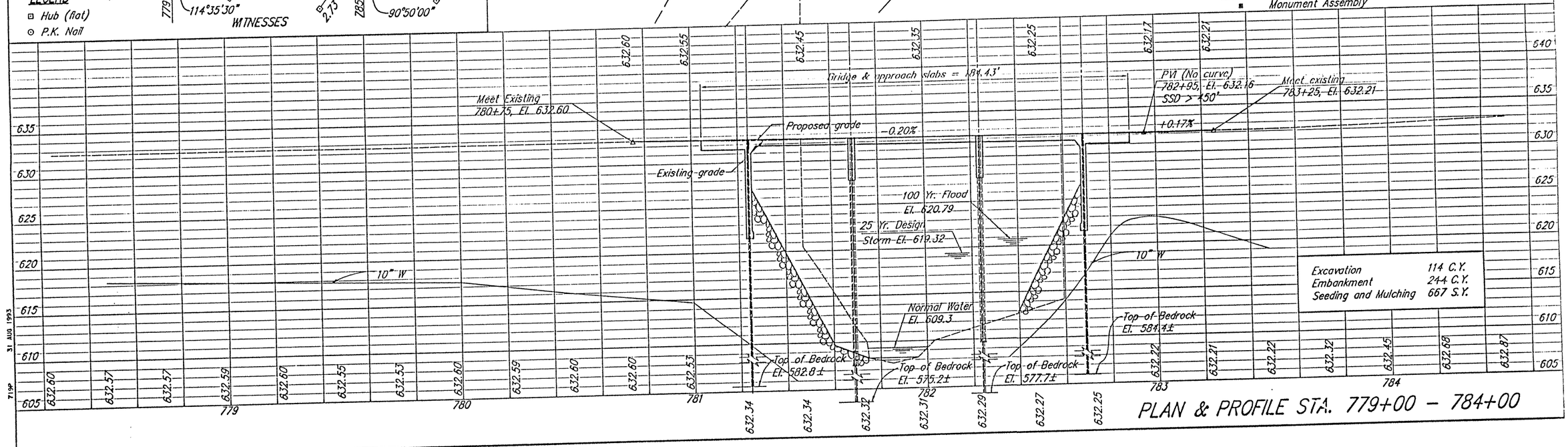
Ex. R/W

EXISTING STRUCTURE

TYPE: Simple span, steel truss bridge (Warren riveted) with reinforced concrete deck and substructure
SPANS: 115'-0" (c/c bearings)
ROADWAY: 29'-6" face to face of guard rail
LOADING: S15
SKEW: None
CONDITION: Fair
APPROACH SLABS: 21'-0" long
ALIGNMENT: Tangent
DATE OF CONSTRUCTION: 1930

NOTE:
* Transition shoulder and side slopes to meet existing.
Pavement Removal
Monument Assembly





PLAN & PROFILE STA. 779+00 - 784+00

SUBSUMMARY

CALC. BY CAG DATE 6-93 | CHKD. BY RS DATE 6-93 | BUT-4-14.79R | OHIO DIVISION 5 REGION | 13 / 27

Stations are relative to Project ℄ unless otherwise noted

REFERENCE NO.	STATION	STATION	SIDE	SHEET NO.		Approach slab removed	Pavement removed	Guardrail removed	Raised pavement marker removed for storage		Rock channel protection, Type C, without filter		Reference Monument	Guardrail, Type 5	Anchor assembly, Type A	Anchor assembly, Type E	Anchor assembly, Type T	Bridge terminal assembly, Type 4			Barrier Reflector, Type A (W)	Barrier Reflector, Type B (Y)	Object marker	Temporary center line(S.D.), class I, 740.05, type C	Temporary edge line(W), class I, 740.05, type C	Temporary edge line (Y), class I, 740.05, Type C	Temporary channelizing line, class I, 740.05, Type C	Temporary stop line, class I, 740.05, Type C		Temporary pavement, class A		Portable concrete barrier, 32"	Portable concrete barrier, 50", as per plan			Edge line, Type 2 (W)	Edge line, Type 2 (Y)	Lane line, Type 2	Channelizing line, Type 2		Barrier reflector, Type A (W)	Barrier reflector, Type A (Y)		Raised pavement marker, two-way (white/red)	REMARKS
ITEM						202	202	202	202		601		604	606	606	606	606	606			614	614	614	614	614	614	614	614		615		622	622			642	642	642	642		802	802		862	
UNIT						SqYd	SqYd	LinFt	Each		CuYd		Each	LinFt	Each	Each	Each	Each			Each	Each	Each	LinFt	LinFt	LinFt	LinFt	LinFt		SqYd		LinFt	LinFt			LinFt	LinFt	LinFt	LinFt		Each	Each		Each	
E1	781+07	781+92	Lt-Rt	12							260																																	
E2	782+31	782+84	Lt-Rt	12							207																																	
G1	780+23	781+48	Lt	12				125																																				
G2	780+28	781+28	Lt	12										100				1																								5		Sta. 780+28 to Sta. 783+91
G3	780+23	781+48	Rt	12				125																																	6		Sta. 780+21 to Sta. 783+00
G4	780+21	781+15	Rt	12										93.75				1																									
G5	782+60	783+98	Lt	12				137.5																																			
G6	782+78	783+91	Lt	12										100				1	1																								
G7	782+60	783+00	Rt	12				100																																			
G8	782+65	783+00	Rt	12										68.75	1				1																								
G9	783+28		Rt	12											1																												
R1	780+75	781+22	Lt-Rt	12			125																																				
R2	782+85	783+25	Lt-Rt	12			131																																				
R3	781+22	781+43	Lt-Rt	12		65																																				
R4	782+64	782+85	Lt-Rt	12		68																																				
R5	780+50		Lt-Rt	12									2																													
R6	784+00		Lt-Rt	12									2																													
S.R. 4 Maintenance of Traffic & Traffic Control																																										
NB S.R. 4 @	S.R. 747	Rt	5																																							
364+40 NB	371+00 NB	℄	5																																							
10+00 CO1	17+13 CO1	Lt-Rt	5																																							
380+31 SB	427+70 SB	Lt-Rt	5-8						59																																	
380+31 SB	396+11 SB	℄	5-6																																							
396+11 SB	398+35 SB	Lt-Rt	6																																							
395+00 NB	403+80 NB	Lt-Rt	6-7																																							
398+35 SB	429+65 SB	℄	6-8																																							
20+00 CO2	28+87 CO2	Rt-Lt	8						2																																	
429+65 SB	436+32 SB	℄	8						9																																	
383+76 SB	423+71 SB	Rt	5-8					225.5							1																											
430+55 NB	434+22 NB	℄	8																																							
423+71 SB	426+34 SB	Rt.	8					262.5								1																											
780+25	784+00	Lt-Rt	7						4																																	
TOTAL TO GENERAL SUMMARY						133	256	975	74		467		4	362.5	3	1	1	4			62	500	268	980	5548	10683	401	68		2540		3271	1439			350	5340	7766	30		6	5		74	
																							Mile	0.19	3.07										Mile	1.08	1.47			11			

SUBSUMMARY

31 AUG 1993

71451

CALC. BY SCN DATE 7-92	BUT-4-14.79R	OHIO	14/27
CHKD. BY KEW DATE 7-92		FHWA REGION 5	

SEEDING END WIDTH	SEEDING SQ. YDS.	END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
		0	0		
	109			14	70
53		18	88		
	294			24	125
53		8	47		
	147	0	0	7	44

Prop. Bridge Not Shown

632.46
781+43
632.50

632.56
781+00
632.53

000.0
780+50
632.60

000.0
780+00
632.60

2:1

10' W

Sta. 780+25 to Sta. 780+50

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

CROSS SECTIONS STA. 780+00 – 781+43

71961 25 AUG 1993

CALC. BY SGM DATE 7-92
CHKD. BY KEW DATE 7-92

BUT-4-14.79R

OHIO | FHWA REGION 5 | 15/27

SEEDING

END WIDTH	SQ. YDS.
	667
6	
	36
7	
	19
	25
	9
	37
	0

TOTAL Sta. 780+25 to Sta. 784+00

Sta. 783+25 to Sta. 783+50
Sta. 783+00 to Sta. 783+25

Angle Pt.

Radial

Prop. Bridge Not Shown

END AREA CUT	END AREA FILL	VOLUME CUT	VOLUME FILL
		114	222
4	1		
		7	2
4	1		
		4	1
		33	1
36	1		
		25	1
0	0		

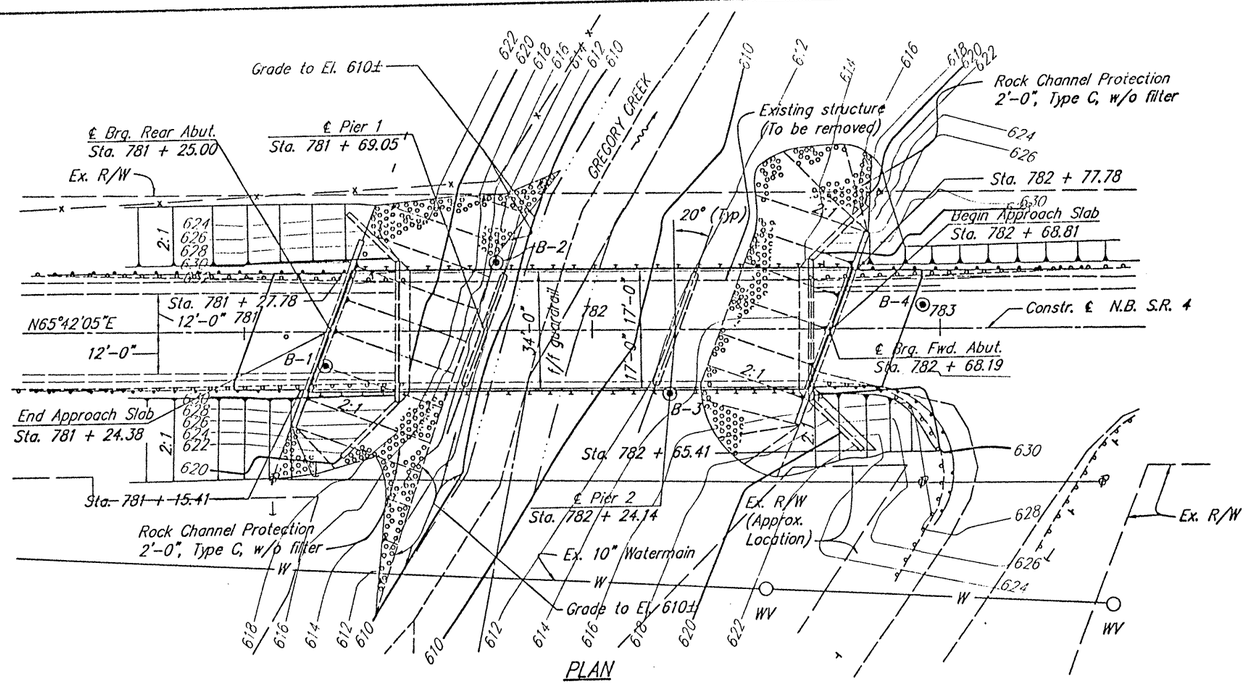
71962 1 SEP 1993

CROSS SECTIONS STA. 782+63 – 784+00

FEDERAL REGION	STATE	PROJECT	FISCAL YEAR
5	OHIO		

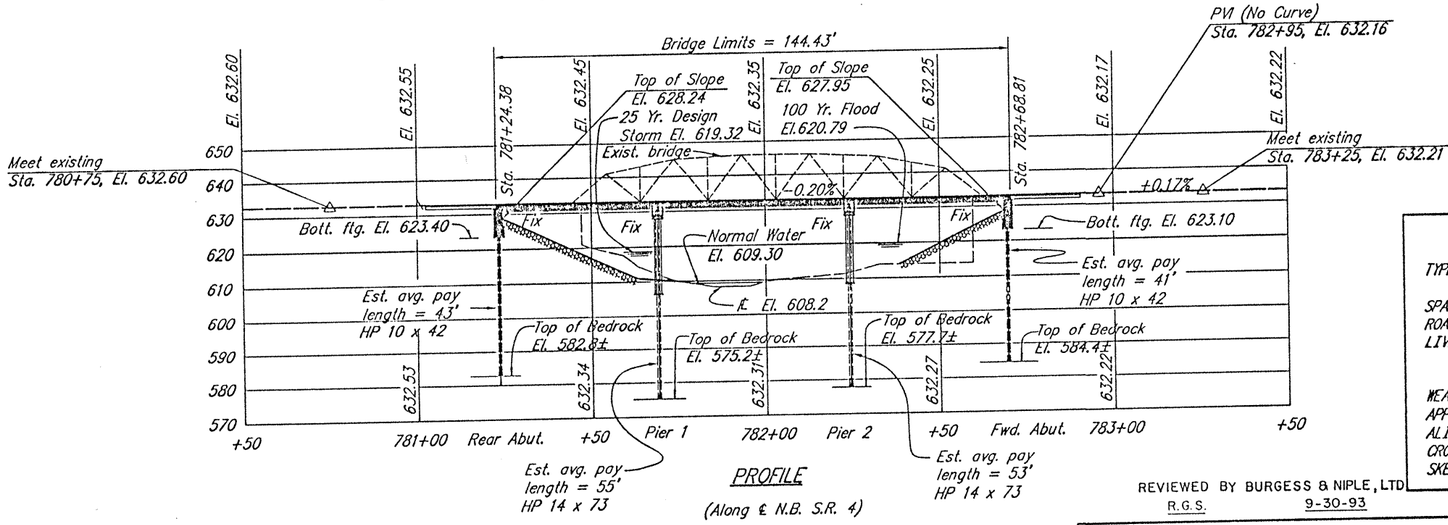
16
27

BUTLER COUNTY
BUT-4-14.79R



PLAN

⊙—Indicates Soil Boring Location



PROFILE
(Along ℄ N.B. S.R. 4)

NOTES:

EARTHWORK limits are approximate. Actual slopes shall conform to plan cross-sections.

Rock Channel Protection, Type C is included with Roadway Plans for payment.

** As reported in the Flood Insurance Study

DRAINAGE

25 Year Storm elevation = 619.32
Discharge = 5,192 cfs
Max. Velocity = 7.13 ft./sec.

100 Year Storm elevation = 620.79 (626.00**)
Discharge = 6,800 cfs (8,170**)
Max. Velocity = 7.46 ft./sec

Low Water Elevation: 609.30 (July, 1991)
Drainage Area: 23.6 sq. miles

Waterway Opening = 1847 s.f. (existing)
Waterway Opening = 2069 s.f. (proposed)

EXISTING STRUCTURE

STRUCTURE FILE NO: 0900125
TYPE: Simple span, steel truss bridge (Warren riveted) with reinforced concrete deck and pile supported substructure
SPANS: 115'-0" (c/c bearings)
ROADWAY: 29'-6" face to face of guard rail
LOADING: S15
SKEW: None
CONDITION: Fair
APPROACH SLABS: 21'-0" long
ALIGNMENT: Tangent
DATE OF CONSTRUCTION: 1930

PROPOSED STRUCTURE

TYPE: Three span continuous, noncomposite prestressed box beams with capped pile piers and abutments.
SPANS: 43'-3", 53'-6", 43'-3" (c/c bearings).
ROADWAY: 34'-0" face to face of guard rail
LIVE LOADING: HS 20-44, Case II, and the Alternate Military Loading

WEARING SURFACE: 2 1/2" Minimum Asphalt Concrete
APPROACH SLABS: AS-1-81 (20' long)
ALIGNMENT: Tangent
CROWN: 3/16" per foot
SKEW: 20° L.F.

REVIEWED BY BURGESS & NIPLE, LTD
R.G.S. 9-30-93

ADT (2010)
Cars: 24,790
Trucks: 2,210

BENCH MARK

Square cut on top of wingwall at the S.W. Corner of Bridge over Coldwater Creek.
3.58' Lt. of ℄ Sta. 785+98.2
B.M. Elev. 633.71

EXISTING UTILITIES

Telephone: Overhead cables on south side

Electric: Power transmission lines on south side

Watermain: 10" at 75'± south of ℄

HAZELET + ERDAL, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

1/12

SITE PLAN

BRIDGE NO. BUT-4-1480R
OVER GREGORY CREEK
BUTLER COUNTY STA. 781 + 24.38 TO STA. 782 + 68.81

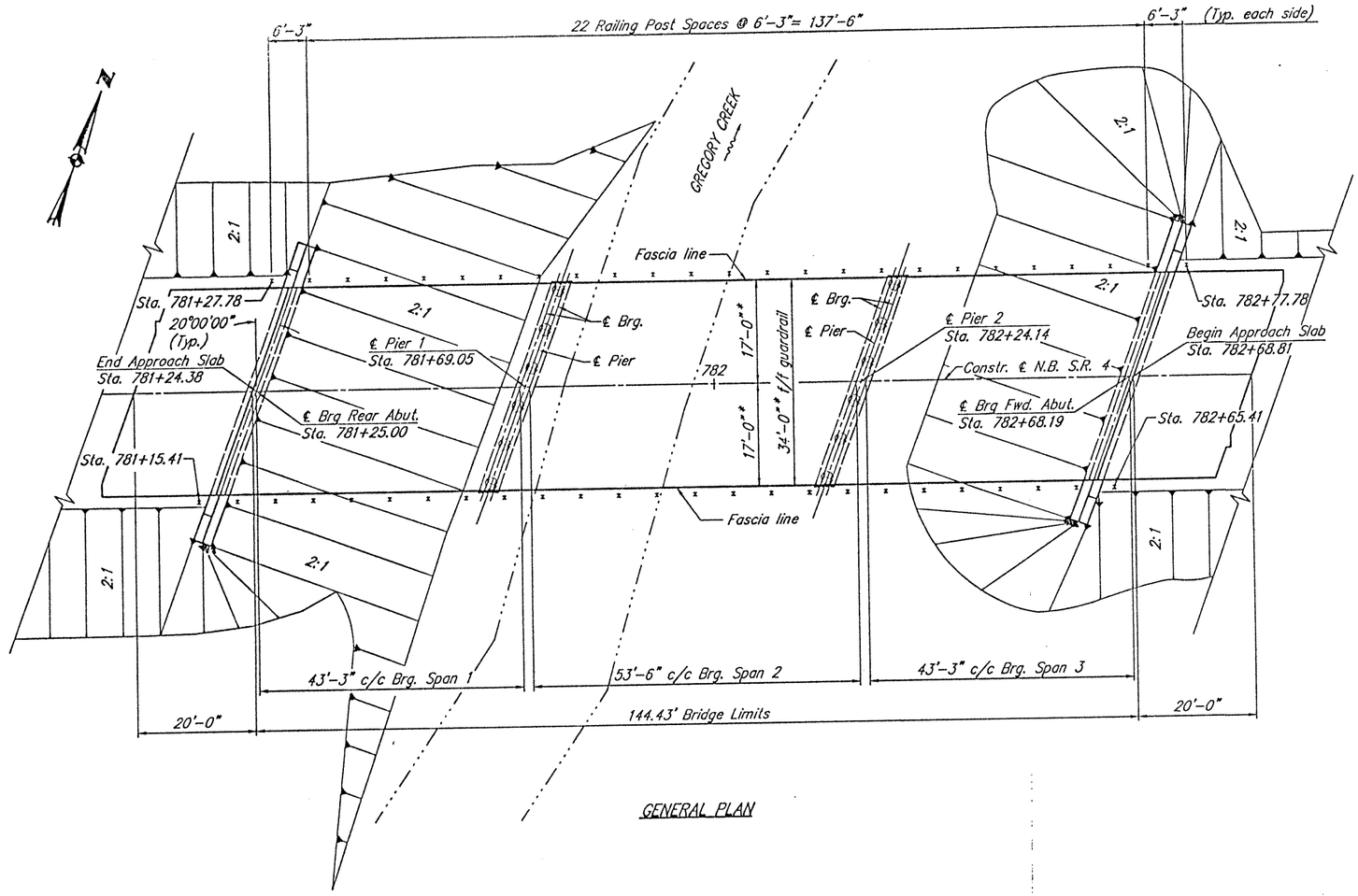
PRESENT GEOGRAPHY		DRAWN W/K			
SURVEYED	DRAWN	DESIGNED	DRAWN	CHECKED	REVIEWED
J.M	CADD	DER	WAW	HLL	JJO

7191SP1 1 SEP 1993

FEDERAL REGION	STATE	PROJECT	FISCAL YEAR
5	OHIO		

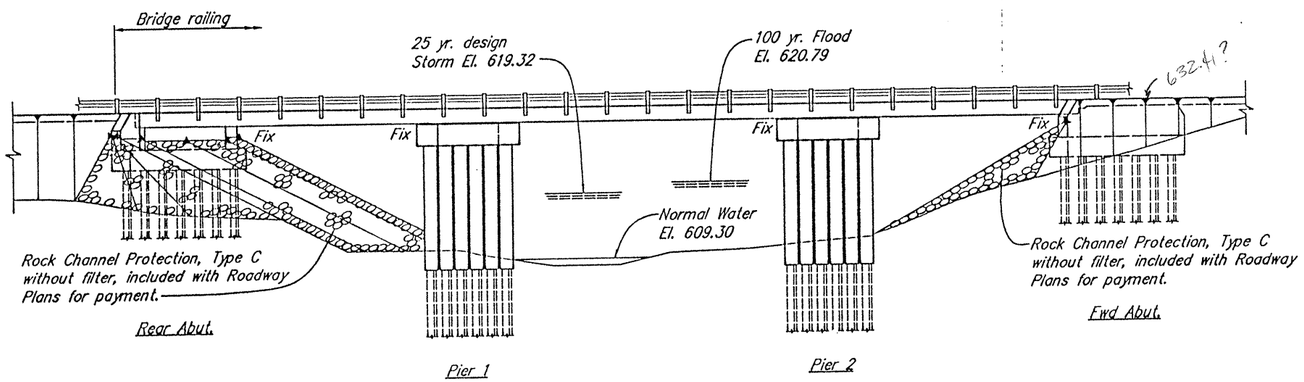
11/27

BUT-4-14.79R



GENERAL PLAN

* Plus Fit-up



ELEVATION

HAZELET + ERDAL, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

2/12

GENERAL PLAN AND ELEVATION

BRIDGE NO. BUT-4-1480R
OVER GREGORY CREEK

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
HLL	DJS	DJS	JSB	JJH	9/1/93	

7191OPE 1 SEP 1993

FEDERAL REGION	STATE	PROJECT	FISCAL YEAR
5	OHIO		

18
27

BUT-4-14.79R

GENERAL NOTES

REFERENCE shall be made to Standard Drawings:

AS-1-81	Sheets 1, 2, & 3	dated 11-27-81
DBR-2-73		dated 4-10-73
PSBD-1-81	Sheets 1, 2, 3, & 4	revised 6-20-89

and to Supplemental Specifications:

820	dated	03-18-92
942	dated	3-18-92

DESIGN SPECIFICATIONS: This structure conforms to "Standard Specifications for Highway Bridges" adopted by the American Association of State Highway and Transportation Officials, 1989 including the 1990 and 1991 Interim Specifications, and the Ohio "Supplement" to these specifications.

DESIGN LOADING: HS20-44 and the Alternate Military Loading.

DESIGN STRESSES:

Concrete Class C - unit stress 1333 p.s.i. (substructure).
Concrete Class S - unit stress 1500 p.s.i. (superstructure).

Reinforcing Steel - ASTM A615, A616 or A617.
- Grade 60 - unit stress 24,000 p.s.i.
- Grade 40 - unit stress 20,000 p.s.i. allowed in box beams only.

Concrete for prestressed beams - unit stress 2200 p.s.i. compression
- unit stress 444 p.s.i. tension

Prestressing strand ASTM A416 - f's = 270,000 p.s.i.
- Initial stress = 0.70 f's

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

DECK PROTECTION METHOD: Membrane waterproofing, asphalt concrete overlay, steel drip strip, and sealing of concrete surfaces.

REMOVAL OF EXISTING STRUCTURE: When no longer needed to maintain traffic the existing structure shall be removed. Suitable waste masonry may be placed as bank protection as directed by the Engineer.

EMBANKMENT CONSTRUCTION: The embankments shall be constructed to the level of the subgrade. Excavation may then be made for the abutments and piles driven.

PILES shall be driven to refusal on bedrock. Refusal shall be considered as attained by penetrating soft bedrock with a minimum resistance of 20 blows per inch, or refusal shall be considered as attained after the pile has contacted hard bedrock and the pile has then received at least 20 blows.

THE DESIGN LOAD is 35 tons per pile for the abutment piles and 55 tons per pile for the pier piles.

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

ITEM SPECIAL, SEALING OF CONCRETE SURFACES: A concrete sealer shall be applied to those surfaces indicated on sheets [5/12], [6/12], [7/12], [8/12], and [9/12]. See the proposal note for surface preparation requirements, application rates, materials requirements, and application procedure.

LAMINATED ELASTOMERIC BEARINGS

MATERIALS

Elastomer shall be 50 durometer neoprene; internal laminates shall be ASTM A36.

DESIGN LOADING:

Bearings are designed for the following loads:
Dead Load 13.7 kips
Live Load 10.6 kips
Total Load 24.3 kips

BASIS OF PAYMENT

Payment will be made at Contract price for:

ITEM	UNIT	DESCRIPTION
516	Each	1 1/4" x 6" x 8" Elastomeric bearing with internal laminates only (neoprene)

The unit bid price shall include all materials, labor, and incidentals necessary to furnish and install laminated elastomeric bearings either fixed or expansion.

ITEM 507, STEEL POINTS

Steel pile points shall be used to protect the tips of the proposed piling. The steel points shall be furnished by Associated Pile and Fitting Corporation, 262 Rutherford Boulevard, Clifton, New Jersey 07014; International Construction Equipment, Inc., 301 Warehouse Drive, Matthews, North Carolina 28015; Dougherty Foundation Products, Inc., P.O. Box 688, Franklin Lakes, New Jersey 07417; Versa Steel, Inc., 3601 N.W. Yeon Avenue, P.O. Box 10559, Portland, Oregon 97210 or by a manufacturer that can furnish a steel point that is acceptable to the Director.

ITEM SPECIAL - PILE ENCASEMENT

All piles for the capped pile piers shall be encased in Class S concrete (499.03) and shall be in accordance with 511, except as modified and supplemented herein. The required slump is to be not less than 6 (six) inches. The required slump shall be achieved by the addition of a chemical admixture meeting the requirements of 705.12 Type F or G. The concrete shall be placed within a form that consists of polyethylene pipe (707.16), or PVC pipe (SS 942). The encasement shall extend from 3 feet below the finished ground surface up to the concrete pier cap and shall be positioned so that at least 3 inches of concrete cover is provided around the exterior of the pile.

The length of pile encasement shall be measured in feet along the length of the pile. This item includes all work and materials necessary to furnish the required encasement.

BASIS OF PAYMENT

Payment will be made at Contract price for:

ITEM	UNIT	DESCRIPTION
Special	Linear foot	Pile Encasement

HAZELET + ERDAL, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

3/12

GENERAL NOTES

BRIDGE NO. BUT-4-1480R
OVER GREGORY CREEK

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JSB	JSB		MSL	JHO	9/1/93	

7191SN1 1 SEP 1993

FEDERAL REGION	STATE	PROJECT	FISCAL YEAR
5	OHIO		

19/27

BUT-4-14.79R

ESTIMATED QUANTITIES

Calculated by DJS Date 6-19-92
Checked by MSL Date 6-23-92

ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	SUPERSTRUCTURE	REAR ABUT.	FORWARD ABUT.	PIER 1	PIER 2	GENERAL	AS BUILT
202	11002	Lump	Lump sum	Structure removed, over 20 foot span						Lump	
403	20000	35	Cu. yd.	Asphalt concrete (AC-20)	35						
404	20000	19	Cu. yd.	Asphalt concrete (AC-20)	19						
503	11100	Lump	Lump sum	Cofferdams, cribs and sheeting						Lump	
503	21100	157	Cu. yd.	Unclassified excavation		77	80				
505	11100	Lump	Lump sum	Pile driving equipment mobilization						Lump	
507	11100	588	Lin. ft.	Steel piles HP 10x42		301	287				
507	15500	648	Lin. ft.	Steel piles HP 14x73				330	318		
Special	50771200	216	Lin. ft.	Pile encasement				114	102		
507	93300	26	Each	Steel point (or shoe)		7	7	6	6		
509	1582A	12022	Lb.	Epoxy coated reinforcing steel, grade 60	928	7057		4037			
511	34002	6	Cu. yd.	Class S concrete, high early strength	6						
511	42500	30	Cu. yd.	Class C concrete, Pier cap				15	15		
511	43500	68	Cu. yd.	Class C concrete, Abutment including footing		34	34				
512	55800	561	Sq. yd.	Type D waterproofing	561						
Special	51267500	110	Sq. yd.	Sealing of concrete surfaces (see Proposal Note)	88			11	11		
Special	51267502	52	Sq. yd.	Sealing of concrete surfaces (epoxy) (see Proposal Note)		26	26				
515	50700	4	Each	Prestressed concrete box beam, (40-50' Length) B27-36 (See Propsal Note)	4						
515	50900	2	Each	Prestressed concrete box beam, (50-62' Length) B27-36 (See Propsal Note)	2						
515	53900	14	Each	Prestressed concrete box beam, (40-52' Length) B27-48 (See Propsal Note)	14						
515	54100	7	Each	Prestressed concrete box beam, (52-62' Length) B27-48 (See Propsal Note)	7						
516	13600	168	Sq. ft.	1" Preformed expansion joint filler		84	84				
SPECIAL	51631300	74	Lin. ft.	Polymer Modified Asphalt expansion Joint System (3" THICK)		37	37				
516	43100	108	Each	1 1/4" x 6" x 8" Elastomeric bearing with internal laminates only (neoprene) (See proposal note)	108						
516	41100	54	Each	1/8" Preformed bearing pad, 711.21	54						
517	72300	300	Lin. ft.	Railing (deep beam rail with steel tubular backup and Type 2 steel posts and anchor bolts)(See proposal note)	300						
518	21200	26	Cu. yd	Porous backfill with filter fabric	240	13	13				
Special	51822200	240	Sq. ft.	Steel drip strip		53	53				
518	41100	106	Lin. ft.	6" Perforated helical corrugated steel pipe, 707.01		6	6				
518	41200	12	Lin. ft.	6" Non-perforated helical corrugated steel pipe, including specials, 707.01							

HAZELET + ERDAL, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

4/12

ESTIMATED QUANTITIES

BRIDGE NO. BUT-4-1480R
OVER GREGORY CREEK

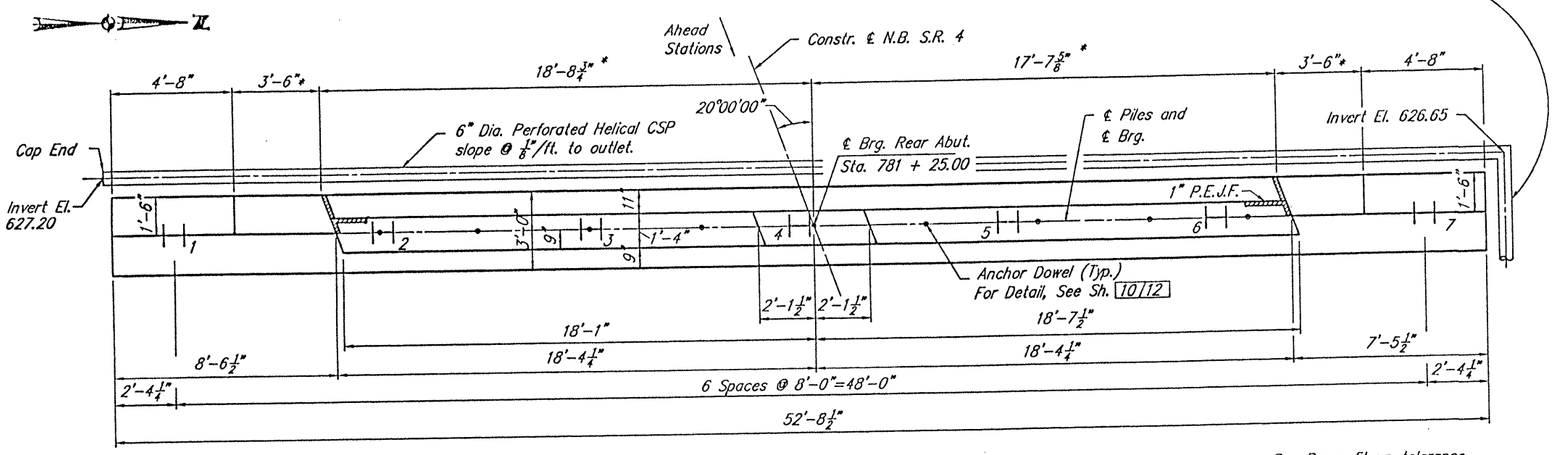
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
DJS	DJS		MSL	JHO	7/1/93	

719E01 1 SEP 1993

FEDERAL REGION	STATE	PROJECT	FISCAL YEAR
5	OHIO		

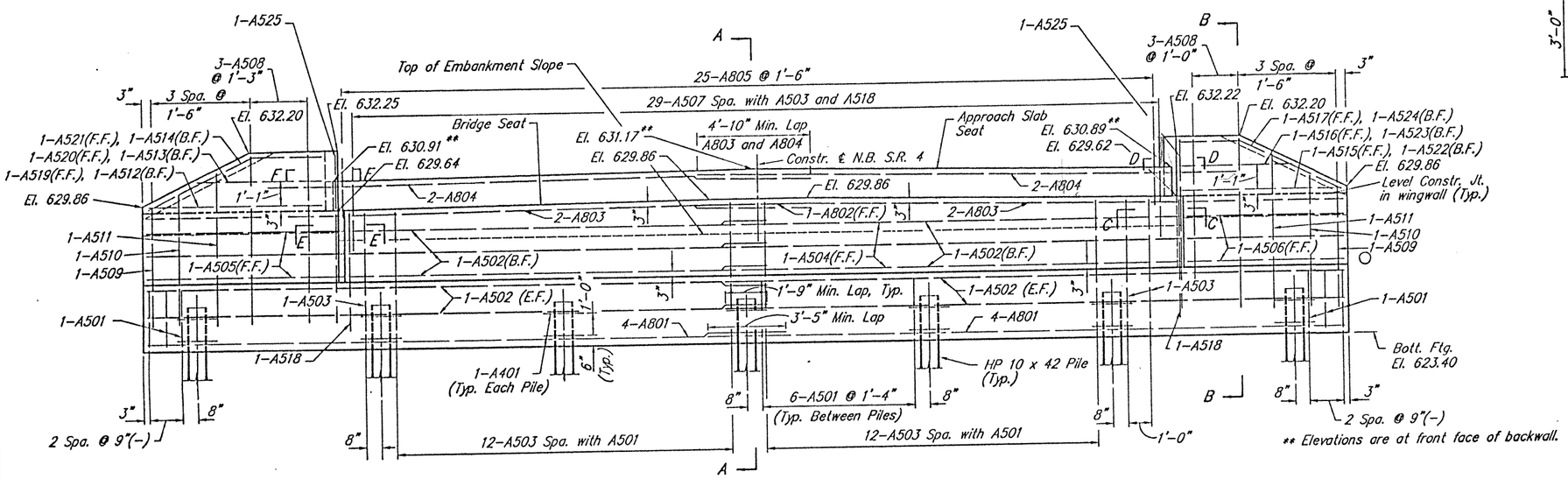
20
21

BUT-4-14.79R



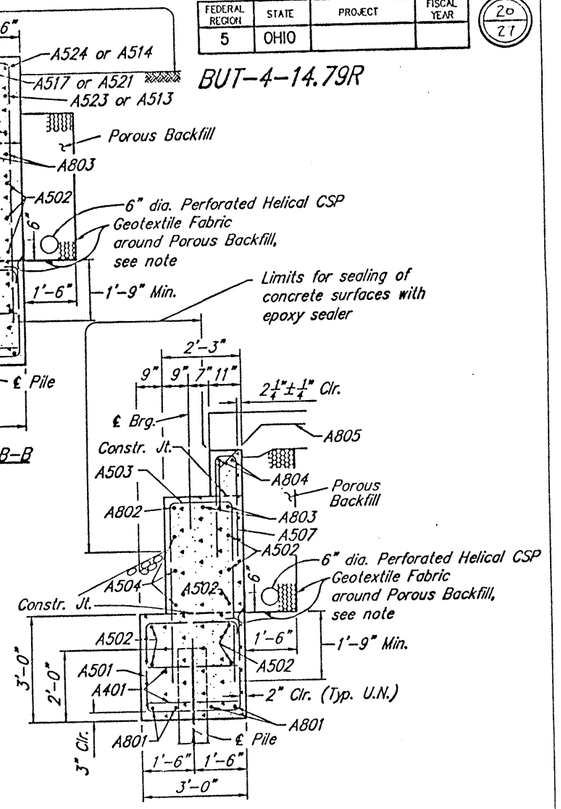
PLAN

* Box Beam fit up tolerance must be added to or subtracted from dimension shown.



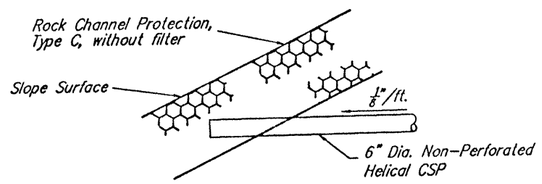
** Elevations are at front face of backwall.

ELEVATION

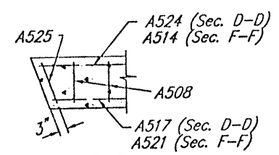


SECTION B-B

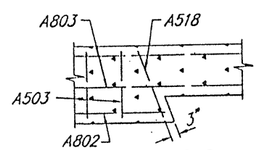
SECTION A-A



OUTLET DETAIL



SECTION D-D
(SECTION F-F SIMILAR)



SECTION C-C
(SECTION E-E SIMILAR)

NOTES

B.F. denotes Back Face.
F.F. denotes Front Face.
E.F. denotes Each Face.
Porous Backfill, 1.5 ft. thick, shall extend up to the plane of the subgrade and laterally to the ends of the wingwalls.
Geotextile Fabric shall conform to Item 712.09, Type A, and shall be included with Porous Backfill for payment.
All concrete shall be Class C.
P.E.J.F. denotes Preformed Expansion Joint Filler.
Concrete above bridge seat level shall not be cast until after beams are erected.
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.

HAZELET + ERDAL, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

5/12

REAR ABUTMENT

BRIDGE NO. BUT-4-1480R
OVER GREGORY CREEK

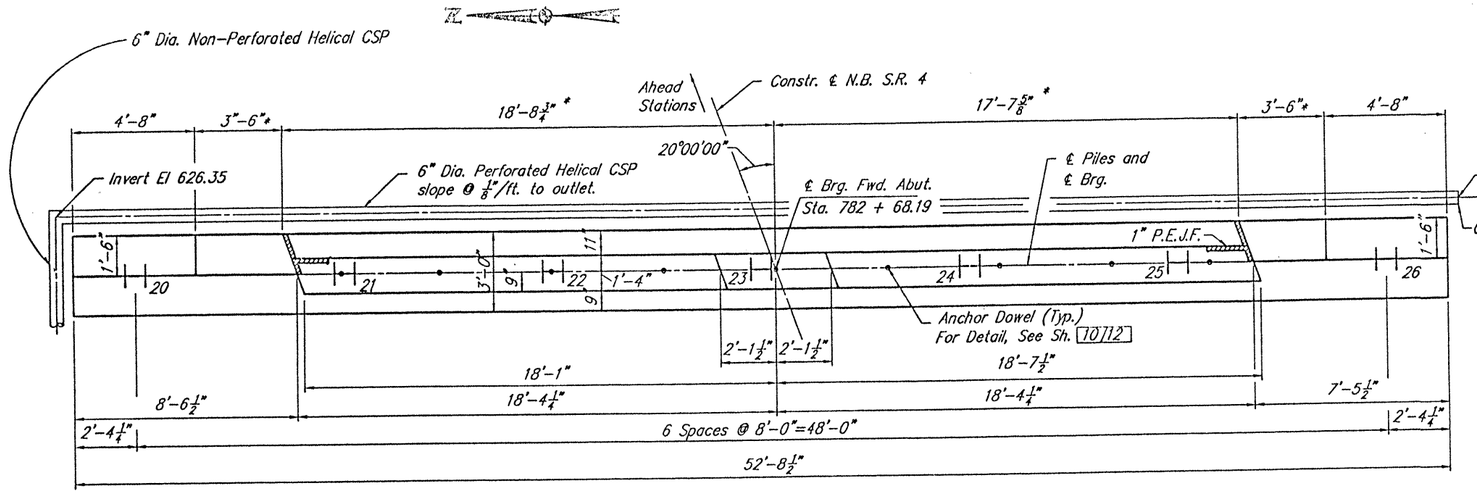
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
MSL	MSL		TOM	JHO	9/1/93	

7191RA 2 NOV 1992

FEDERAL REGION	STATE	PROJECT	FISCAL YEAR
5	OHIO		

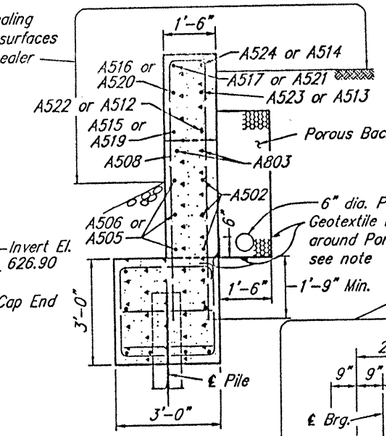
21
21

BUT-4-14.79R

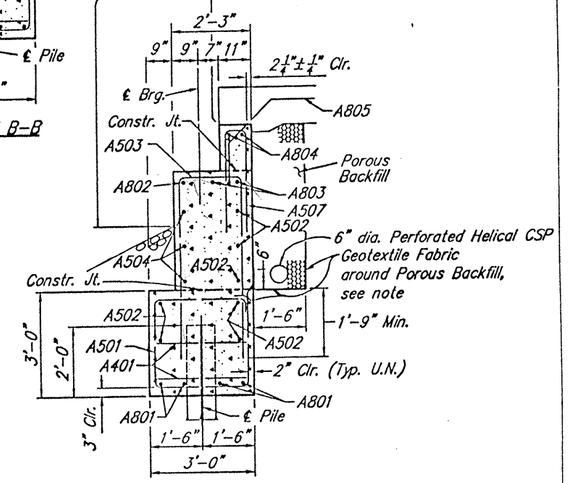


PLAN

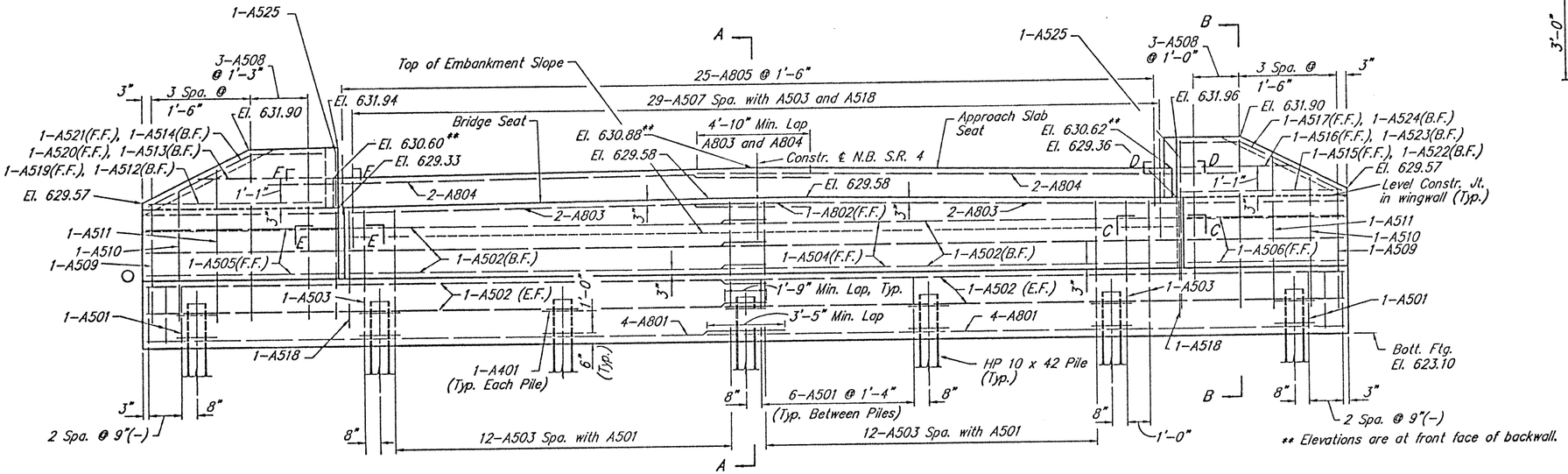
* Box Beam fit up tolerance must be added to or subtracted from dimension shown.



SECTION B-B

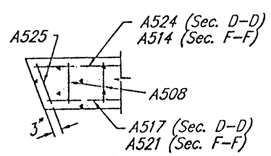


SECTION A-A

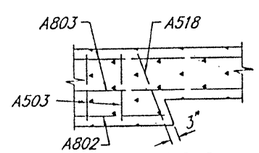


ELEVATION

** Elevations are at front face of backwall.



SECTION D-D
(SECTION F-F SIMILAR)



SECTION C-C
(SECTION E-E SIMILAR)

NOTES

B.F. denotes Back Face.
F.F. denotes Front Face.
E.F. denotes Each Face.
Porous Backfill, 1.5 ft. thick, shall extend up to the plane of the subgrade and laterally to the ends of the wingwalls.
Geotextile Fabric shall conform to Item 712.09, Type A, and shall be included with Porous Backfill for payment.
All concrete shall be Class C.
P.E.J.F. denotes Preformed Expansion Joint Filler.
Concrete above bridge seat level shall not be cast until after beams are erected.
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.
For outlet detail see Sh. 5 / 12 .

HAZELET + ERDAL, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

6 / 12

FORWARD ABUTMENT

BRIDGE NO. BUT-4-1480R
OVER GREGORY CREEK

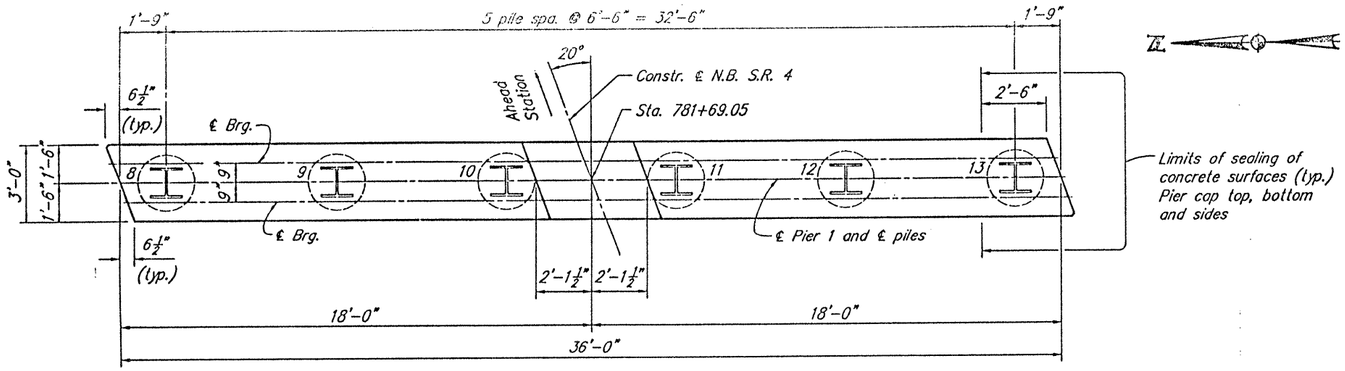
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
MSL	MSL		TOM	JHO	9/1/93	

7191FA 2 NOV 1992

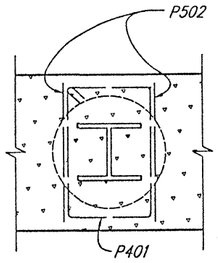
FEDERAL REGION	STATE	PROJECT	FISCAL YEAR
5	OHIO		

22
27

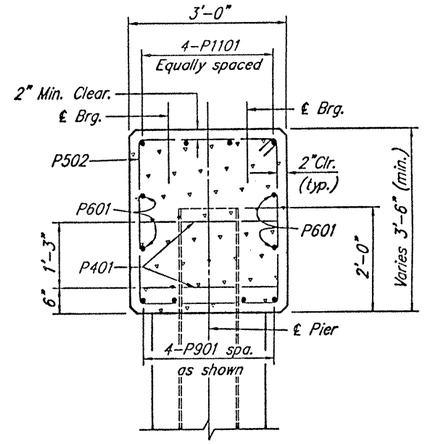
BUT-4-14.79R



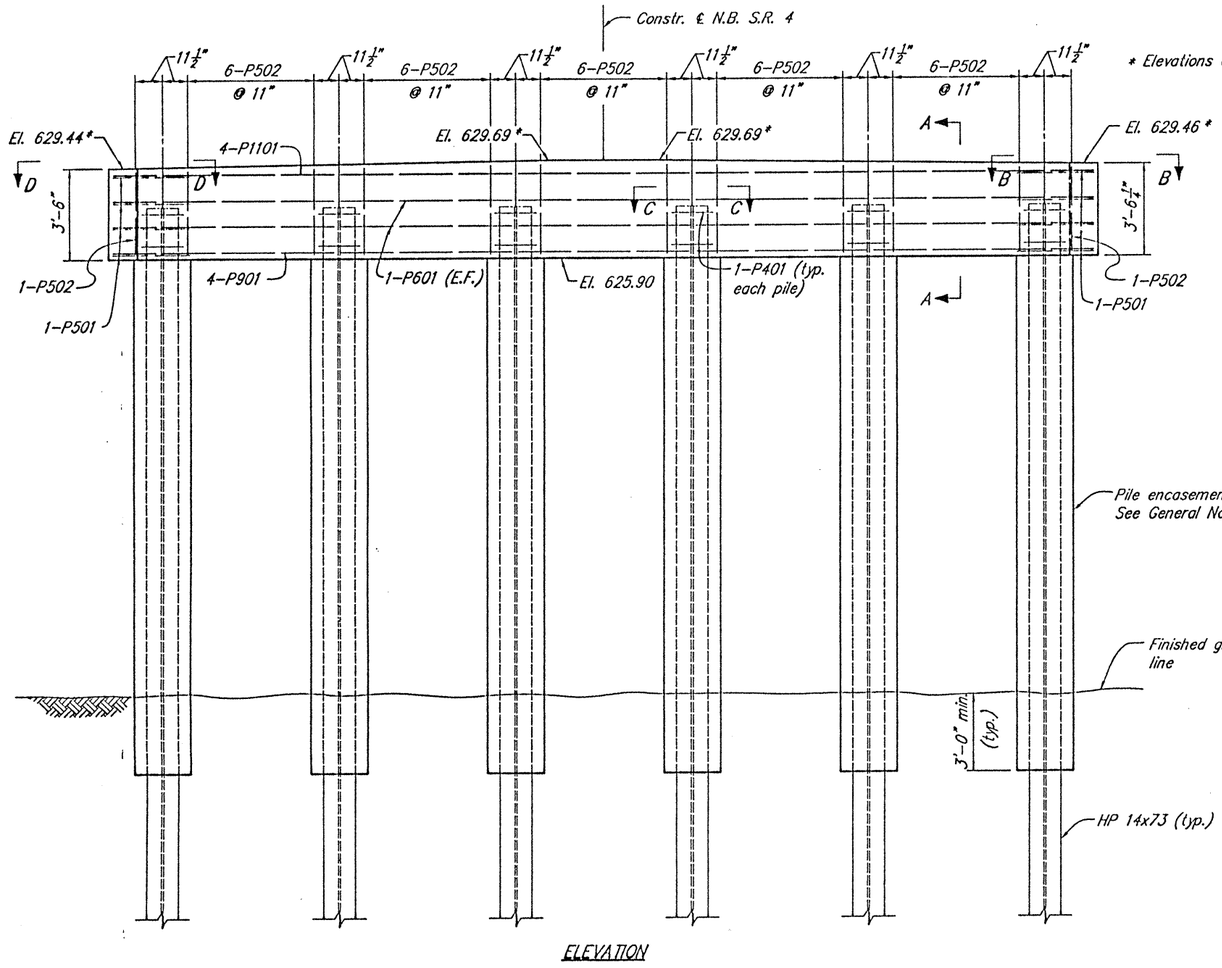
PLAN



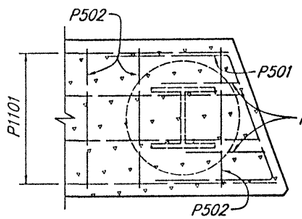
SECTION C-C



SECTION A-A



ELEVATION



SECTION B-B
(Section D-D similar)
(P401 not shown)

NOTES

E.F. denotes each face

HAZELET + ERDAL, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

7 12

PIER 1

BRIDGE NO. BUT-4-1480R
OVER GREGORY CREEK

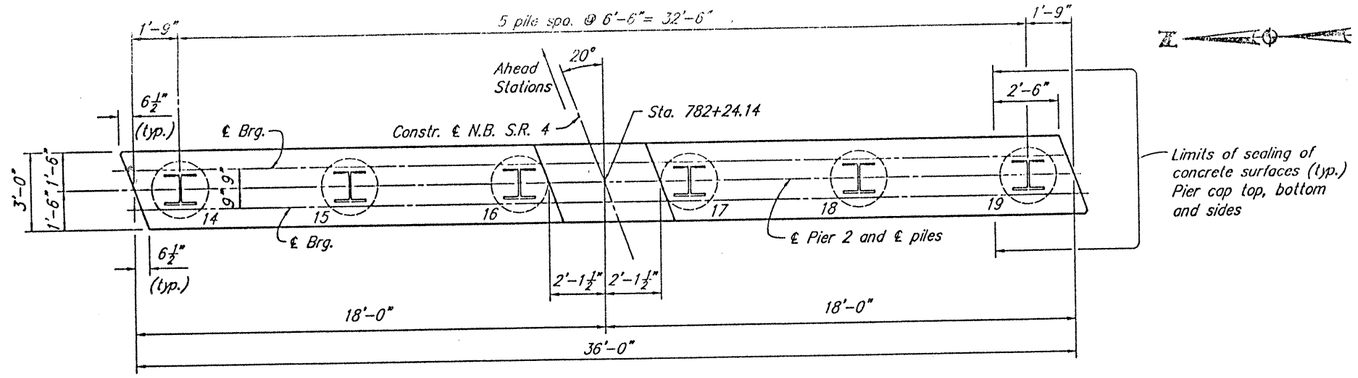
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JSB	JSB		TOM	JHO	9/1/93	

7191PR1 1 SEP 1993

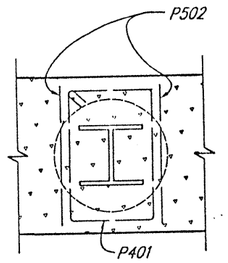
FEDERAL REGION	STATE	PROJECT	FISCAL YEAR
5	OHIO		

23
21

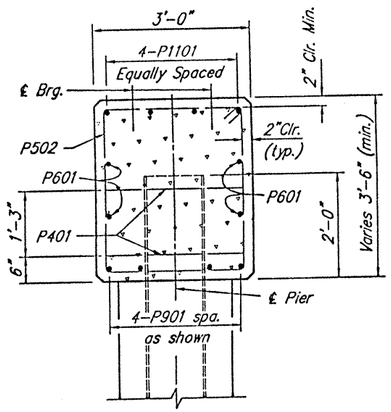
BUT-4-14.79R



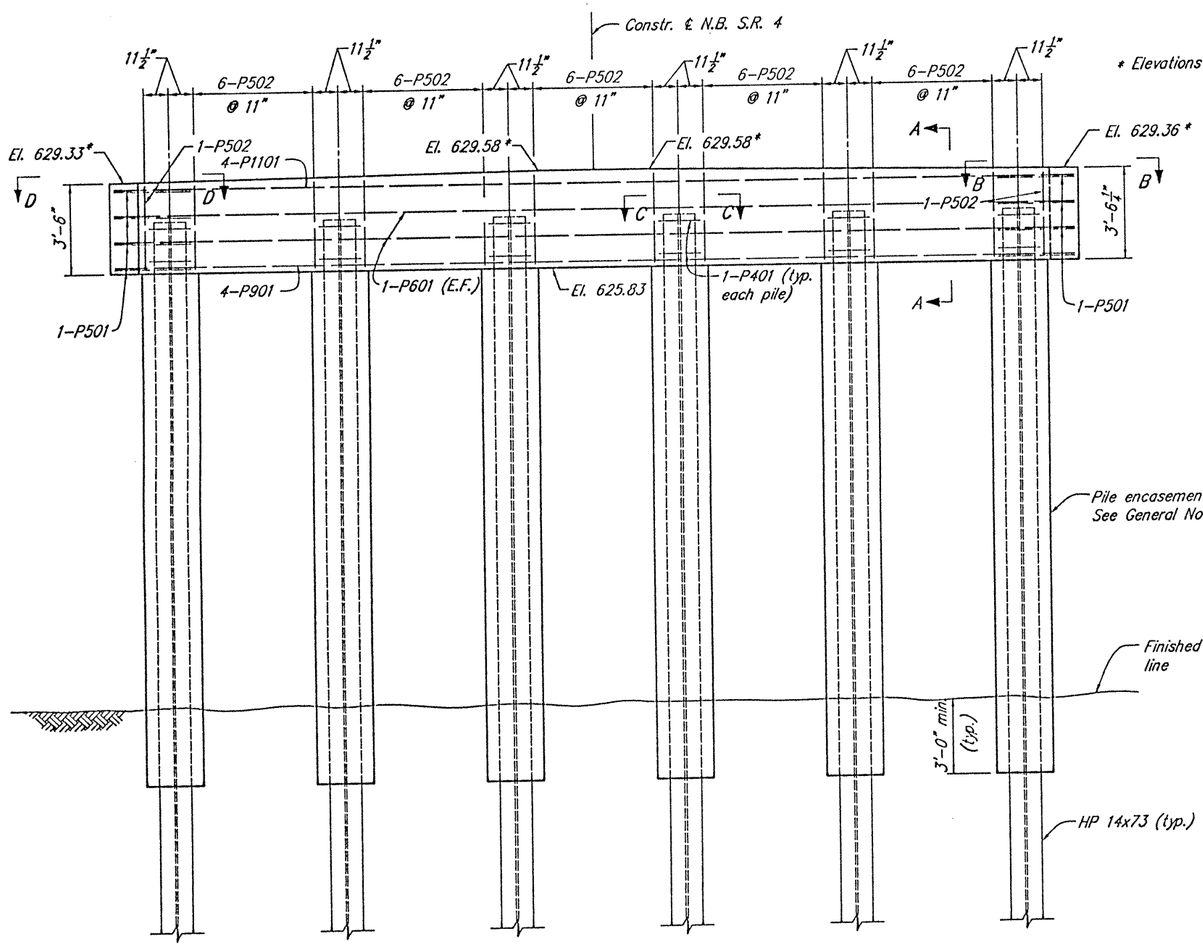
PLAN



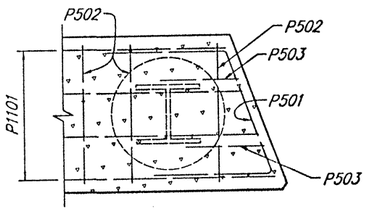
SECTION C-C



SECTION A-A



ELEVATION



SECTION B-B
(Section D-D similar)
(P401 Not Shown)

NOTES

E.F. denotes each face

HAZELET + ERDAL, INC. CONSULTING ENGINEERS CINCINNATI, OHIO	8/12

PIER 2

BRIDGE NO. BUT-4-1480R
OVER GREGORY CREEK

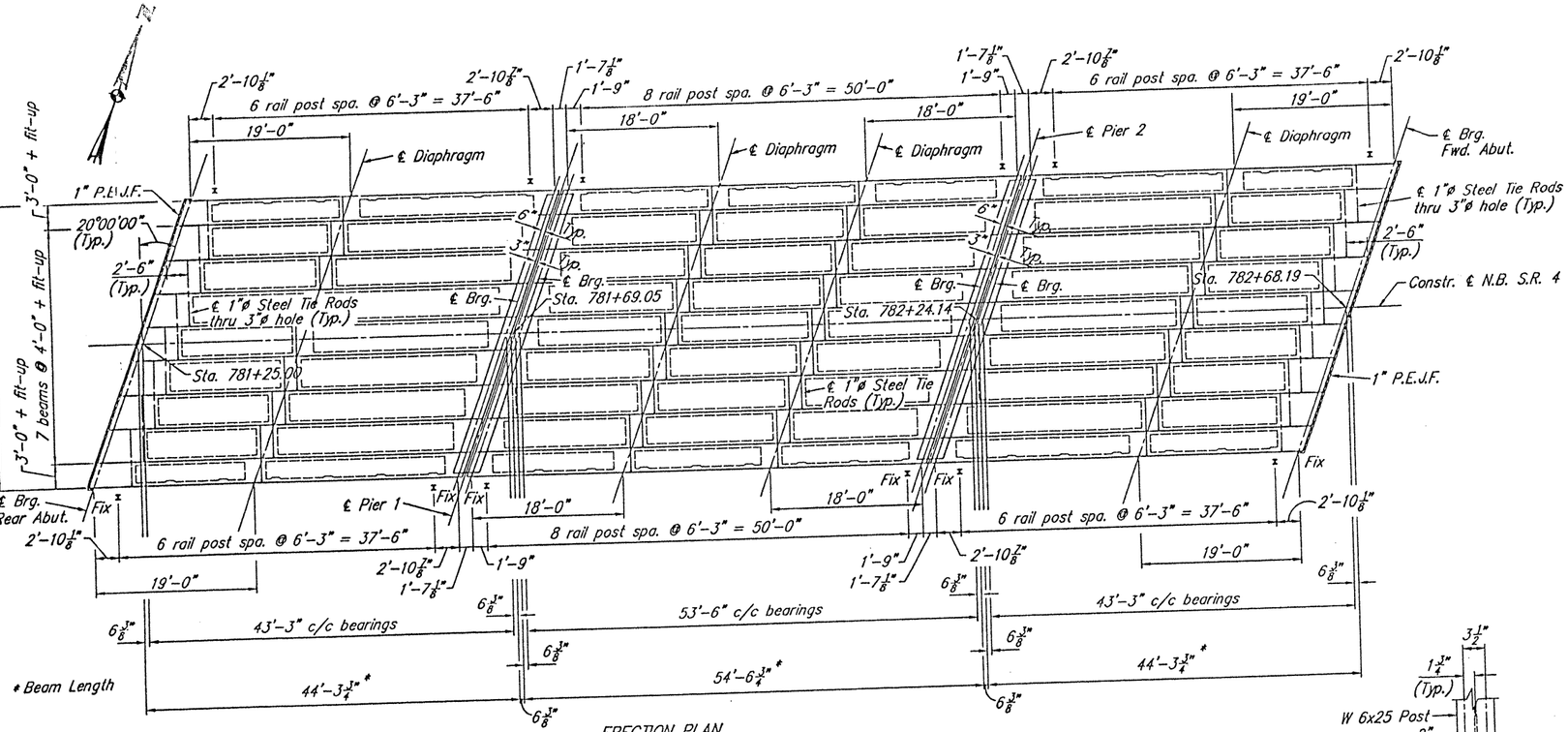
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JSB	MSL		TOM	JHo	9/1/93	

7191P02 1 SEP 1993

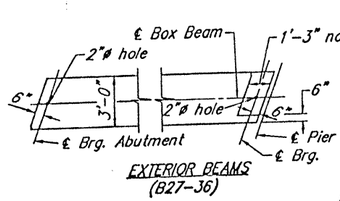
FEDERAL REGION	STATE	PROJECT	FISCAL YEAR
5	OHIO		

24
27

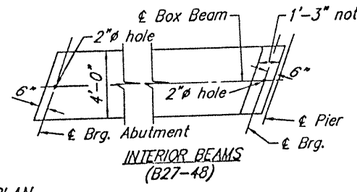
BUT-4-14.79R



ERECTION PLAN

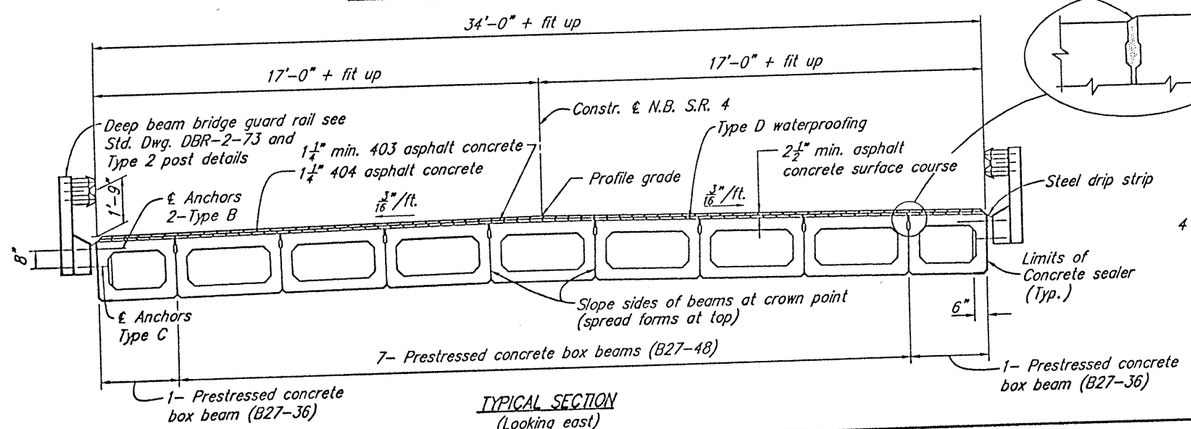


EXTERIOR BEAMS (B27-36)



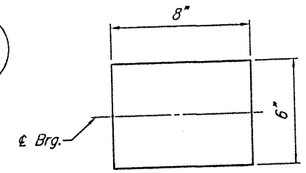
INTERIOR BEAMS (B27-48)

BOX BEAM PLAN

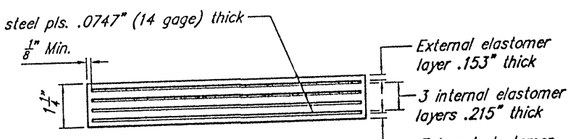


TYPICAL SECTION (Looking east)

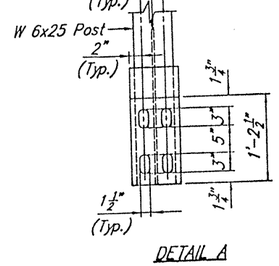
Shear keys shall be mortared on a finished plane between the top edges of the adjacent beams where vertical offset (within tolerance) occurs.



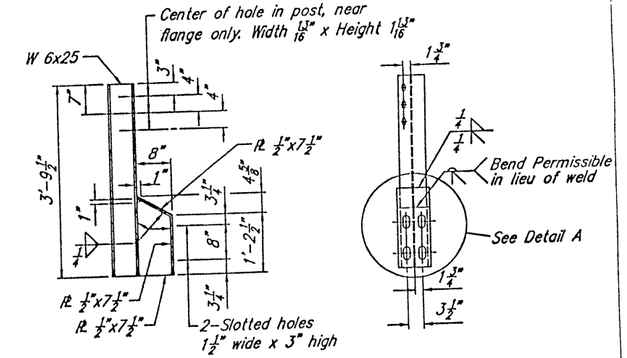
PLAN



ELEVATION
LAMINATED ELASTOMERIC BEARING



DETAIL A



TYPE 2 POST DETAILS

NOTES

FABRICATOR'S SHOP DRAWINGS shall show complete details of the box beams and reinforcing steel.

CONCRETE: Min. compressive strength at 28 days = 5,500 psi. Min. compressive strength at initial prestress = 4,000 psi.

PRESTRESSING STEEL: ASTM A416 Grade 270, 1/2" diameter, seven-wire, uncoated, stress-relieved strand.

Area of strand = 0.153 sq. in.
Initial prestress force per strand = 28,900 lbs.

REINFORCING STEEL for prestressed beams shall be ASTM A615, A616, or A617, grade 40 or 60.

TRANSVERSE TIE RODS, TIE ROD ANCHORAGE, BEAM TOLERANCES, DIAPHRAGMS, AND DRAIN HOLES: see Standard drawing PSBD-1-81, sheets 1 and 2.

DRIP STRIP: Prior to applying Type "D" Waterproofing, a bent drip strip (8" x 0.105") shall be installed along the edges of the deck for the full length of the asphalt overlay. The strip shall be fastened a 1'-6" c/c (max.) with 1 1/4" x 5/32" x 1/4" (length x shank dia. x head dia.) flat head drive pins and washers or #10 galvanized screws and expansion anchors, subject to approval of the engineer. Where splices are required, a 3" (min.) lap shall be used with a fastener through the lap. Steel for galvanized strips shall meet the requirements of ASTM A568. Galvanizing shall be in accordance with 711.02. Stainless steel shall be 20 gauge ASTM A 167, Type 304, mill finish.
The pay quantity for drip strips shall be for the actual overall installation length of drip strip plus the length of strips at posts and over piers. Payment shall be at the contract price bid for item Special, Lin. Ft., Steel drip strip, which shall include all materials, labor, tools and incidentals necessary to complete an acceptable installation.

P.E.J.F. denotes Preformed Expansion Joint Filler.

For elastomeric bearings notes, see General Notes Sh. 3/12.

HAZELET + ERDAL, INC. CONSULTING ENGINEERS CINCINNATI, OHIO — 9/12

SUPERSTRUCTURE

BRIDGE NO. BUT-4-1480R OVER GREGORY CREEK

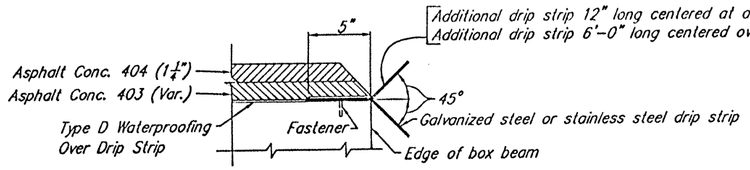
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JSB	MSL		TOM	JHO	9/1/93	

7/9151 2 NOV 1992

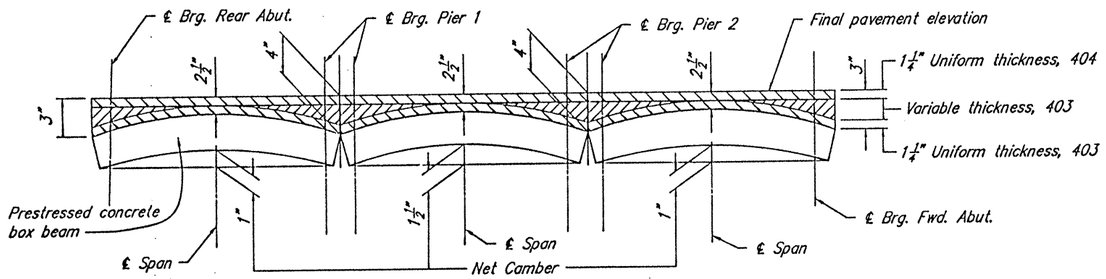
FEDERAL REGION	STATE	PROJECT	FISCAL YEAR
5	OHIO		

25
27

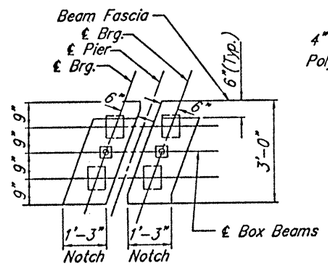
BUT-4-14.79R



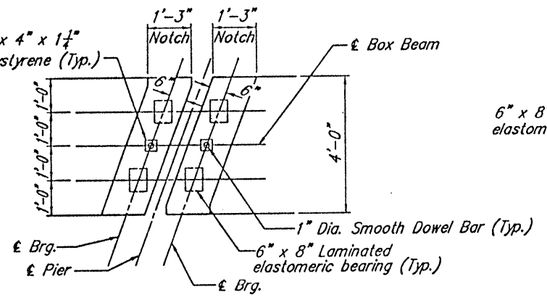
DRIP STRIP DETAIL



ASPHALT CONCRETE SURFACE COURSE THICKNESS DIAGRAM

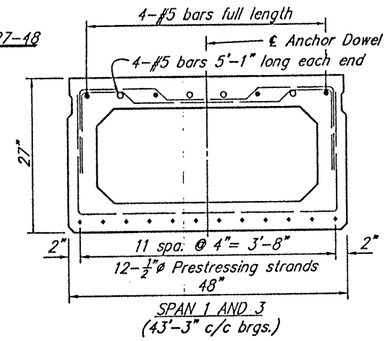


EXTERIOR BEAMS (B27-36)

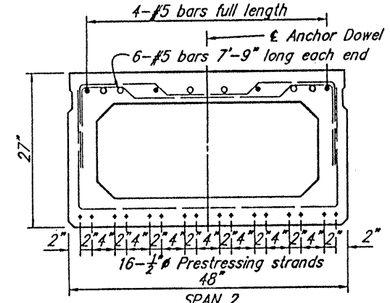


INTERIOR BEAMS (B27-48)

B27-48

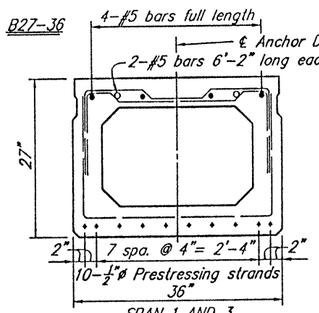


SPAN 1 AND 3 (43'-3" c/c brgs.)

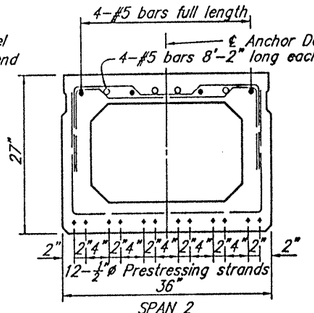


SPAN 2 (53'-6" c/c brgs.)

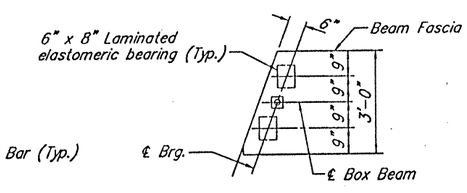
B27-36



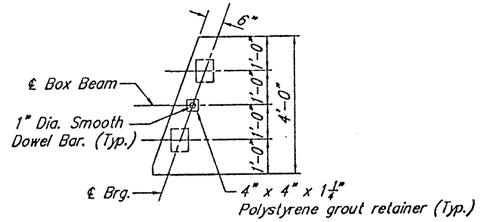
SPAN 1 AND 3 (43'-3" c/c brgs.)



SPAN 2 (53'-6" c/c brgs.)

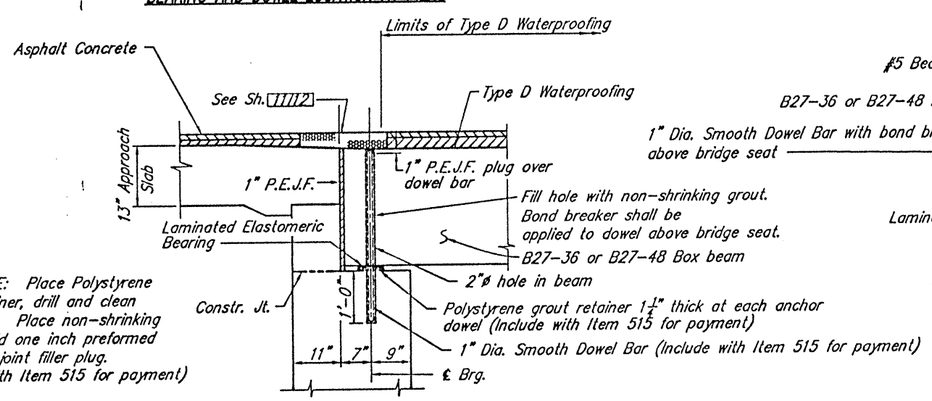


EXTERIOR BEAMS (B27-36)



INTERIOR BEAMS (B27-48)

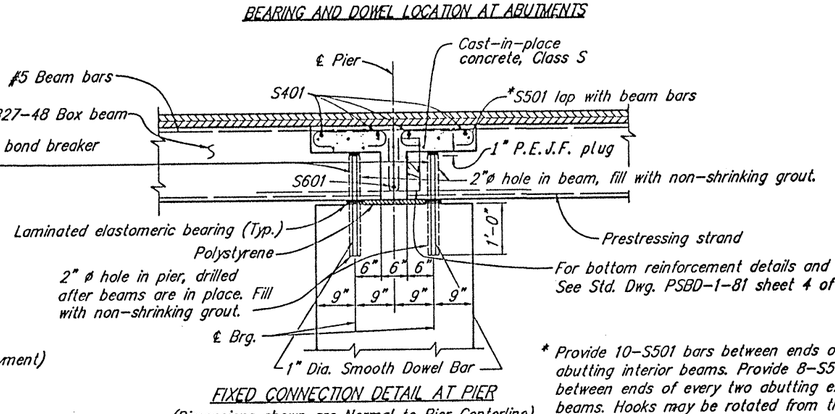
BEARING AND DOWEL LOCATION AT PIERS



PROCEDURE: Place Polystyrene grout retainer, drill and clean dowel hole. Place non-shrinking grout. Add one inch preformed expansion joint filler plug. (Include with Item 515 for payment)

FIXED CONNECTION DETAIL AT ABUTMENT
(Dimensions shown are normal to abutment bearing centerline)

BEARING AND DOWEL LOCATION AT ABUTMENTS



FIXED CONNECTION DETAIL AT PIER
(Dimensions shown are Normal to Pier Centerline)

* Provide 10-S501 bars between ends of every two abutting interior beams. Provide 8-S501 bars between ends of every two abutting exterior beams. Hooks may be rotated from the vertical position to provide the required clearance.

NOTES

BEAM LIFTING INSERTS, ANCHOR DOWELS, DETAILS AND REINFORCEMENT OF BEAM ENDS, AND SUPERSTRUCTURE NOTES see Standard Drawing PSBD-1-81, sheet 1 and 2.

Var. denotes variable

P.E.J.F. denotes preformed expansion joint filler.

Calculated camber at time of paving, including allowance for camber growth due to creep, is $1\frac{1}{16}$" for Span 1, $1\frac{3}{8}$" for Span 2, and $1\frac{1}{16}$" for Span 3.

Calculated deflection due to weight of surface course and railing is $\frac{1}{16}$" for Span 1, $\frac{1}{8}$" for Span 2, and $\frac{1}{16}$" for Span 3.

Span 1 and Span 3 net final camber of beams is 1". This is 1" in excess of the amount required to place the top of the beam parallel to profile grade and $\frac{1}{4}$" less than required in Span 2. To have the same bridge seat elevation at the pier, the 403 leveling course shall be $1\frac{1}{4}$" at center of span, $2\frac{3}{4}$" at the pier end of span, and $1\frac{1}{4}$" at abutment end of span.

Span 2 net final camber of beams is $1\frac{1}{2}$". This is $1\frac{1}{2}$" in excess of the amount required to place the top of the beam parallel to profile grade. This excess amount shall be compensated for by thickening the 403 leveling course from $1\frac{1}{4}$" at center of spans to $2\frac{3}{4}$" at ends of spans.

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

HAZELET + ERDAL, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

10/12

SUPERSTRUCTURE DETAILS

BRIDGE NO. BUT-4-1480R
OVER GREGORY CREEK

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JSB	MSL		TOM	JHo	9/1/93	

719152 1 SEP 1993

BUT-4-14.79K

GENERAL NOTES AND DETAILS FOR POLYMER MODIFIED ASPHALT EXPANSION JOINT SYSTEM

ITEM SPECIAL - POLYMER-MODIFIED ASPHALT EXPANSION JOINT SYSTEM

THIS ITEM WILL BE USED TO SEAL THE EXPANSION/CONTRACTION JOINTS AS PER THESE DETAILS AND THE MANUFACTURER'S REQUIREMENTS USING A POLYMER-MODIFIED ASPHALT SYSTEM. THE PRIME CONTRACTOR WILL OBTAIN THE SERVICES OF ONE OF THE FOLLOWING LICENSED APPLICATORS WHO WILL FURNISH AND INSTALL THE NEW BRIDGE EXPANSION JOINT SYSTEM AFTER ALL PAVING ON THE AFFECTED BRIDGE(S) HAS BEEN COMPLETED.

PAVETECH ENGINEERED SYSTEMS INC.
2575 US. RT. 22 & 3, OFFICE 1
MAINEVILLE, OH 45039
TEL: 1-800-258-0162

LINEAR DYNAMICS, INC.
400 LAWIDEX PLAZA
PARSIPPANY, NJ 07054
TEL: (201) 884-0300

MATERIALS:

BRIDGING PLATE:

MILD STEEL OR ALUMINUM 1/8" OR 1/4" THICK PLATE, 8" WIDE

BINDER:

TYPE:	POLYMER MODIFIED ASPHALT
SOFTENING POINT:	180 DEGREES F. MIN.
FLOW:	3 MM. MAX. AT 140 DEGREES F.
PENETRATION:	9 MM. MAX. AT 77 DEGREES F. 1 MM. MAX AT 0 DEGREES F. ASTM D 3407
DUCTILITY:	40 CM. MIN. ASTM D 113
RESILIENCE:	60% MIN. AT 77 DEGREES F.
TENSILE ADHESION:	700% MIN.
SPECIFIC GRAVITY:	1.10 ± 0.05
POURING TEMP:	350 - 390 DEGREES F.

AGGREGATE:

TYPE:	CRUSHED, DOUBLE WASHED, AND DRIED GRANITE OR BASALT
GRADATION	THE GRADATION OF THE AGGREGATE VARIES BY MANUFACTURER AND WILL BE AS PER THE MANUFACTURER'S RECOMMENDATIONS FOR THE SYSTEM BEING USED ON THIS PROJECT.

BACKER ROD:

PROPERTY	NOMINAL VALUE	TEST METHOD
DENSITY	2.0 LBS/CU FT	ASTM D 1622
TENSILE STRENGTH	25 PSI	ASTM D 1623
WATER ABSORPTION BY VOLUME	0.5%	ASTM C 509
COMPRESSION DEFLECTION AT 8 PSI	25%	ASTM D 1621
TEMPERATURE RESISTANCE	-45 TO +450 DEGREES F	

INSTALLATION PROCEDURES:

SAWING AND SURFACE PREPARATION:

AFTER ALL PAVING OPERATIONS ARE COMPLETE, THE OVERLAY IS TO BE TRANSVERSELY SAW CUT FULL DEPTH NO LESS THAN TWO INCHES DEEP (20" CENTERED OVER JOINT OPENING, UNLESS OTHERWISE NOTED). REMOVE ALL MATERIAL, INCLUDING WATER-PROOFING MATERIAL, BETWEEN SAW CUTS. THOROUGHLY CLEAN AND DRY EXPOSED CONCRETE, STEEL, AND CUT SURFACES USING COMPRESSED AIR AND A HOT COMPRESSED AIR (HCA) LANCE. THE LANCE MUST PRODUCE A FLAME RETARDED AIR STREAM TEMPERATURE OF 3000 DEGREES F. AT A VELOCITY OF 3,000 FEET PER SECOND WITH 15 PSIG CHAMBER PRESSURE. IF THERE IS AN INTERRUPTION DUE TO WEATHER OR OTHER CAUSES, THE OPERATION WILL BE REPEATED WITH THE HCA LANCE IMMEDIATELY BEFORE THE TANKING OPERATION. ALSO, 6 INCHES OF THE ROAD SURFACE ON EITHER SIDE OF THE JOINT WILL BE DRIED SO THAT A SUITABLE SURFACE FOR BITUMEN ADHESION IS OBTAINED.

SEALING OF EXPANSION JOINT: (PRE-STRESSED BOX OR CONCRETE SLAB)

THE EXPANSION JOINT GAP IS TO BE SEALED AND A BRIDGING PLATE CENTERED ALONG IT. A VERY NARROW GAP WILL BE SEALED BY POURING HOT BINDER INTO THE GAP. GAPS OF 1/8" OR MORE WILL FIRST BE FILLED WITH AN APPROPRIATELY SIZED BACKER ROD. THE BACKER ROD WILL BE INSTALLED SO THAT IT IS BETWEEN 1/8" AND 1-1/8" BELOW THE TOP OF THE EXISTING GAP. THE GAP WILL THEN BE FILLED WITH BINDER. ADDITIONAL BINDER WILL BE SPREAD OVER THE SURFACE AREA WHERE THE METAL PLATE WILL BE PLACED.

BOND BREAKER:

CENTER THE BRIDGING PLATE OVER THE EXISTING JOINT AND BED INTO THE HOT BINDER. BUTT JOINT THE BRIDGING PLATES TO ACCOMODATE THE ENTIRE JOINT LENGTH. SPIKE HOLES WILL BE DRILLED AT 1 FOOT INTERVALS ALONG THE LONGITUDINAL CENTERLINE OF THE PLATES. SECURE BRIDGING PLATE WITH NAILS OR SPIKES. SEAL BUTT JOINTS WITH HOT BINDER AND ALLOW TO COOL BEFORE TANKING THE JOINT.

TANKING:

SEAL ALL PREPARED, EXPOSED SURFACES OF THE JOINT WITH BINDER. POUR THE HOT BINDER OVER THE FLOOR AREA OF THE JOINT AND SPREAD TO COAT ALL EXPOSED SURFACES. THE BINDER WILL BE A MINIMUM OF 1/32" THICK ON THE BOTTOM OF THE JOINT CAVITY, WITH POOLS OF GREATER THICKNESS WHERE SURFACE IRREGULARITIES EXIST. THE BINDER APPLICATION TEMPERATURE WILL BE BETWEEN 350 350 AND 390 DEGREES F. THE BINDER WILL NOT BE ALLOWED TO BE HEATED ABOVE 410 DEGREES F. NOR ALLOWED TO EXCEED 390 DEGREES F. FOR MORE THAN 1 HOUR.

BUILD-UP OF JOINT LAYERS:

AGGREGATE PREPARATION:

HEAT THE AGGREGATE TO A TEMPERATURE OF 275 TO 325 DEGREES F., WITH A SUITABLE ROTATING DRUM WITH ATTACHED HEAT SOURCE OR A HOT COMPRESSED AIR LANCE, TO REMOVE ALL DUST AND MOISTURE.

AGGREGATE PROPORTION AND LAYER THICKNESS:

MIX THE AGGREGATE WITH THE BINDER SUCH THAT THE MINIMUM AGGREGATE CONTENT BY WEIGHT WILL BE 68%. THE HEATED AGGREGATE AND BINDER WILL BE COMBINED IN LAYERS NOT LESS THAN 3/4 OF AN INCH NOR NOR EXCEEDING 2 INCHES. THE THICKNESS OF EACH LAYER CAN BE VARRIED, WITHIN THESE LIMITS, TO ACHIEVE THE REQUIRED JOINT THICKNESS. THE OBJECTIVE IS TO COAT EACH STONE AND FILL THE VOIDS WHILE AVOIDING AN EXCESS OF BINDER. THIS WILL ACHIEVE THE MAXIMUM CONTENT OF STONE CONSISTENT WITH ALL STONES BEING COATED WITH BINDER AND A MAXIMUM VOID CONTENT OF 2%. RAKE THE MIXTURE TO MIX AND LEVEL.

AGGREGATE PREPARATION:

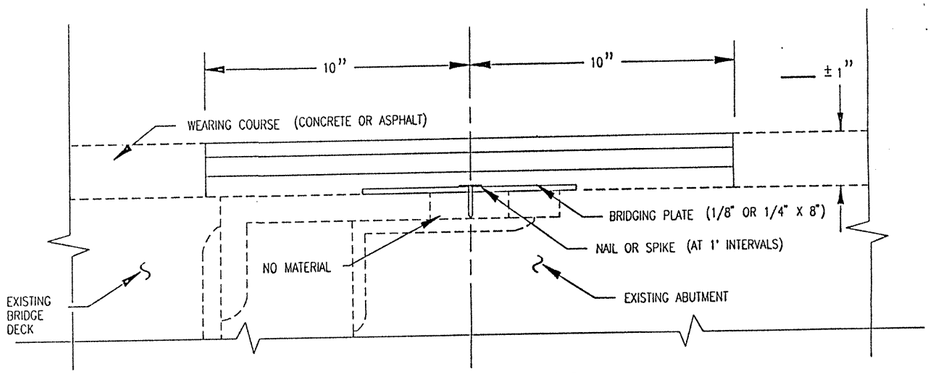
THE TOP LAYER THICKNESS WILL VARY BETWEEN 1/2 INCH AND ONE (1) INCH. IN PREPARING THE TOP LAYER, THE RATIO OF AGGREGATE TO BINDER WILL BE APPROXIMATELY 6:1 BY WEIGHT. THIS RATIO IS NOT ABSOLUTELY VITAL SINCE ADDITIONAL BINDER WILL INFILTRATE THE TOP LAYER FROM BOTH BELOW AND ABOVE. OVERFILL THE TOP LAYER AND COMPACT TO THE LEVEL OF THE ADJACENT SURFACES USING A ROLLER OR VIBRATORY PLATE COMPACTOR. IMMEDIATELY AFTER COMPLETION OF THE COMPACTION, POUR SUFFICIENT BINDER OVER THE JOINT TO FILL THE SURFACE VOIDS AND COAT THE SURFACE STONE. DUST THE FINISHED JOINT WITH A FINE, DRY AGGREGATE TO PREVENT TACKINESS.

MAINTENANCE OF TRAFFIC:

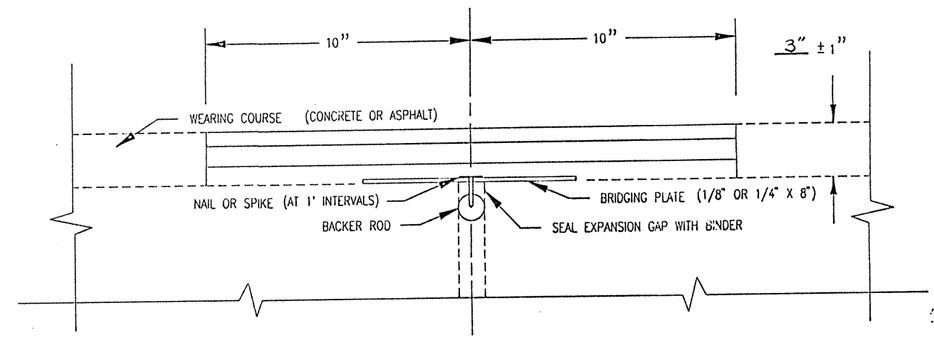
IF NECESSARY TO FACILITATE TRAFFIC MAINTENANCE, THE JOINT WILL BE INSTALLED IN TWO (2) HALF-WIDTH PHASES. DURING PHASE 1 APPROXIMATELY HALF OF THE TOTAL JOINT WILL BE INSTALLED. DURING PHASE 2, A MINIMUM OF TWO (2) INCHES OF THE PHASE 1 JOINT WILL BE REMOVED, AT OR NEAR THE CENTERLINE, WITH THE REMAINDER OF THE JOINT INSTALLED. IN ALL CASES, OPERATIONS WILL BE SCHEDULED SO THAT ALL LANES CAN BE OPEN TO TRAFFIC DURING ALL NON-WORKING HOURS.

PAYMENT:

PAYMENT FOR ALL THE ABOVE WILL BE AT THE UNIT PRICE BID PER LINEAR FOOT OF SEALED JOINT IN PLACE FOR ITEM SPECIAL 516 31300, POLYMER MODIFIED ASPHALT EXPANSION JOINT SYSTEM (3 INCHES THICK). THIS WILL INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE ABOVE WORK.



TYPICAL STEEL BEAM EXPANSION JOINT



TYPICAL PRESTRESSED BOX BEAM
OR
CONCRETE SLAB JOINT

CALCULATED | CHECKED
DATE REVISED 10-25-93
DESIGNED M.A.M. | DRAWN M.A.M.

POLYMER MODIFIED ASPHALT EXPANSION JOINT SYSTEM

11/12

FEDERAL REGION	STATE	PROJECT	FISCAL YEAR
5	OHIO		

21
27

BUT-4-14.79R

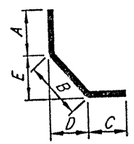
REINFORCING STEEL LIST

MARK	TOTAL NO.	LENGTH	WEIGHT	TYPE	DIMENSIONS A	B	C	D	E	NUMBER FWD ABUT	REAR ABUT		INCR
ABUTMENTS													
A401	28	8'-11"	167	60	4 1/2"	1'-9"	2'-6 1/2"			14	14		
A501	84	10'-11"	956	60	6"	2'-8"	2'-7"			42	42		
A502	28	27'-1"	791	Str.						14	14		
A503	54	11'-8"	657	1	5'-0"	1'-11"				27	27		
A504	6	36'-5"	228	Str.						3	3		
A505	6	10'-2"	64	Str.						3	3		
A506	6	9'-1"	57	Str.						3	3		
A507	58	6'-2"	373	1	2'-11"	7"				29	29		
A508	12	15'-9"	197	1	7'-5"	1'-2"				6	6		
A509	4	11'-3"	47	1	5'-2"	1'-2"				2	2		
A510	4	12'-9"	53	1	5'-11"	1'-2"				2	2		
A511	4	14'-3"	59	1	6'-8"	1'-2"				2	2		
A512	2	7'-7"	16	Str.						1	1		
A513	2	5'-5"	11	Str.						1	1		
A514	2	8'-1"	17	4	4'-11"	3'-2"	2'-3"	4'-5"		1	1		
A515	2	7'-1"	15	Str.						1	1		
A516	2	4'-11"	10	Str.						1	1		
A517	2	7'-7"	16	4	4'-11"	2'-8"	2'-3"	4'-5"		2	2		
A518	4	11'-10"	49	1	5'-0"	2'-1"				1	1		
A519	2	8'-0"	17	Str.						1	1		
A520	2	5'-10"	12	Str.						1	1		
A521	2	8'-6"	18	4	4'-11"	3'-7"	2'-3"	4'-5"		1	1		
A522	2	7'-6"	16	Str.						1	1		
A523	2	5'-4"	11	Str.						1	1		
A524	2	7'-11"	17	4	4'-11"	3'-0"	2'-3"	4'-5"		2	2		
A525	4	15'-10"	66	1	7'-5"	1'-3"							
										8	8		
A801	16	27'-11"	1,193	Str.						1	1		
A802	2	36'-5"	194	Str.						4	4		
A803	8	28'-8"	612	Str.						4	4		
A804	8	23'-8"	506	Str.									
A805	50	4'-7"	612	18	1'-5"	1'-9"	1'-5"	1'-3"	1'-3"	25	25		

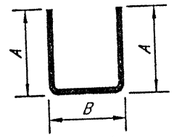
Total Weight, Epoxy Coated Reinforcing Steel, Grade 60, Abutments = 7057 lbs

BAR BENDING DIAGRAM

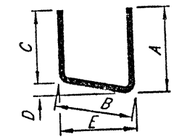
All dimensions are out to out of bars.



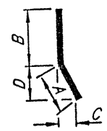
Type 18



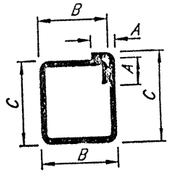
Type 1



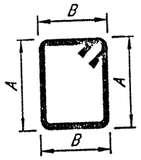
Type 13



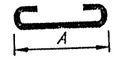
Type 4



Type 60



Type 70



Type 52

REINFORCING STEEL LIST

MARK	TOTAL NO.	LENGTH	WEIGHT	TYPE	DIMENSIONS A	B	C	D	E	NUMBER PIER 1	PIER 2		INCR
PIERS													
P401	24	9'-4"	150	70	2'-8"	1'-9"				12	12		
P501	16	6'-9"	113	13	2'-2"	2'-8"	2'-2"	11"	2'-6"	8	8		
P502	64	12'-3"	818	70	3'-2"	2'-8"				32	32		
P503	8	5'-9"	48	1	1'-6"	3'-0"				4	4		
										4	4		
P601	8	35'-7"	428	Str.									
										4	4		
P901	8	35'-7"	968	Str.									
										4	4		
P1101	8	35'-7"	1512	Str.									

Total Weight, Epoxy Coated Reinforcing Steel, Grade 60, Piers = 4037 lbs

REINFORCING STEEL LIST

MARK	TOTAL NO.	LENGTH	WEIGHT	TYPE	DIMENSIONS A	B	C	D	E	NUMBER			INCR
SUPERSTRUCTURE													
S401	8	32'-5"	173	Str.									
S501	172	3'-8"	658	52	2'-8"								
S601	2	32'-5"	97	Str.									

Total Weight, Epoxy Coated Reinforcing Steel, Grade 60, Superstructure = 928 lbs

HAZELET + ERDAL, INC.
CONSULTING ENGINEERS
CINCINNATI, OHIO

12/12

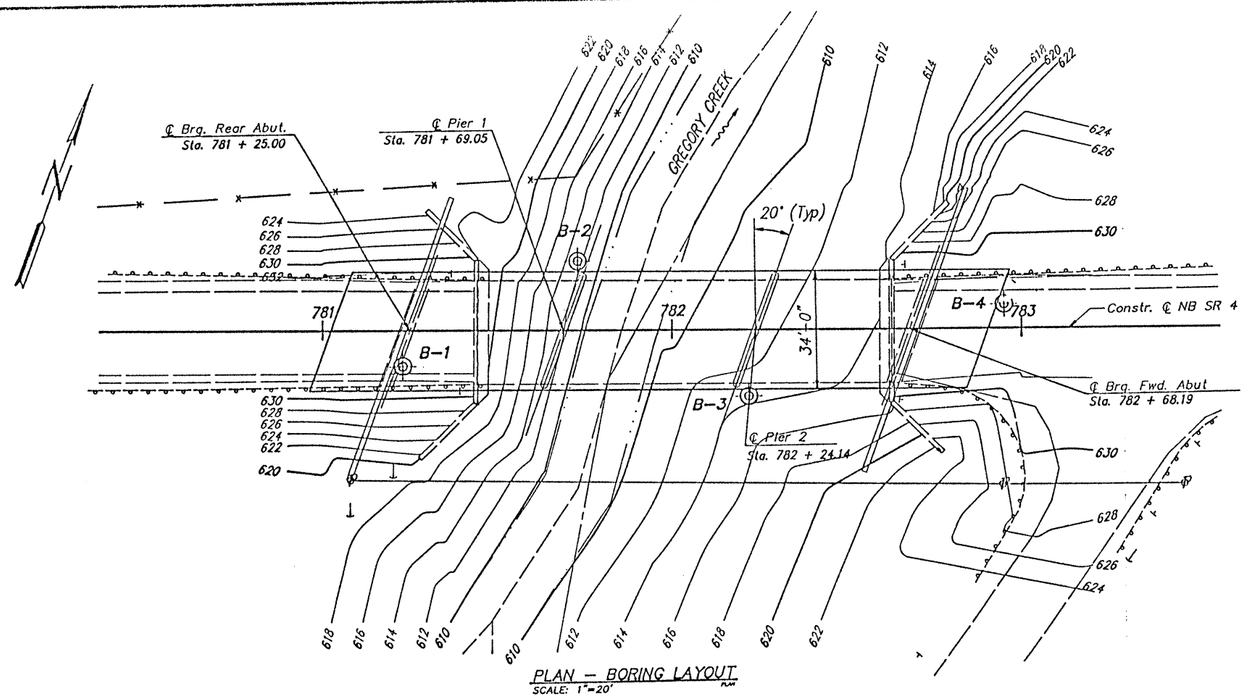
REINFORCING STEEL LIST

BRIDGE NO. BUT-4-1480R
OVER GREGORY CREEK

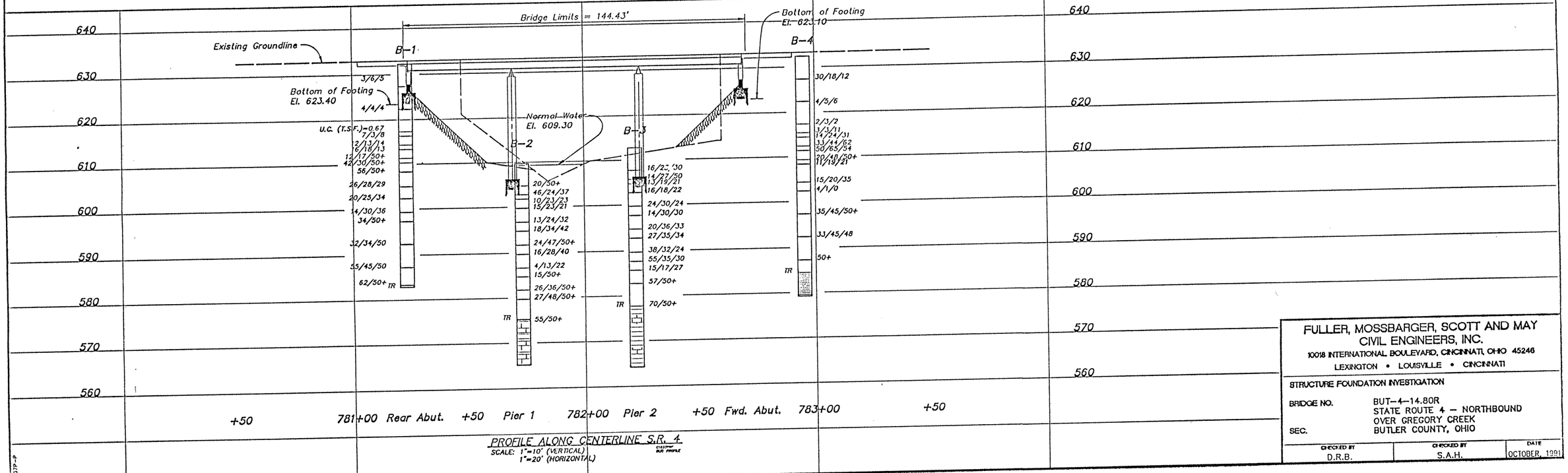
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
JSB	DJS		MSL	JHO	9/1/93	

7191RS1 31 AUG 1993

BUT-4-14.79R
BRF-8(75)



PLAN – BORING LAYOUT
SCALE: 1"=20'



PROFILE ALONG CENTERLINE S.R. 4
SCALE: 1"=10' (VERTICAL)
1"=20' (HORIZONTAL)

FULLER, MOSSBARGER, SCOTT AND MAY
CIVIL ENGINEERS, INC.
10018 INTERNATIONAL BOULEVARD, CINCINNATI, OHIO 45246
LEXINGTON • LOUISVILLE • CINCINNATI

STRUCTURE FOUNDATION INVESTIGATION

BRIDGE NO. BUT-4-14.80R
STATE ROUTE 4 – NORTHBOUND
OVER GREGORY CREEK
SEC. BUTLER COUNTY, OHIO

CHECKED BY	CHECKED BY	DATE
D.R.B.	S.A.H.	OCTOBER, 1991

BUT-4-14.79R

GENERAL INFORMATION

PROJECT DESCRIPTION

THE PROJECT SITE IS LOCATED IN LEMON TOWNSHIP, BUTLER COUNTY, OHIO, APPROXIMATELY 85 FEET WEST OF THE INTERSECTION OF NORTHBOUND STATE ROUTE 4 WITH LESOURDSVILLE–WEST CHESTER ROAD. THE PROPOSED STRUCTURE WILL REPLACE AN EXISTING 115 FOOT LONG (C/C BEARING), SINGLE SPAN STEEL TRUSS BRIDGE WHICH CURRENTLY CARRIES NORTHBOUND STATE ROUTE 4 OVER GREGORY CREEK, A TRIBUTARY OF THE GREAT MIAMI RIVER. THE PROPOSED STRUCTURE IS A THREE SPAN CONTINUOUS BRIDGE WITH NONCOMPOSITE PRESTRESSED BOX BEAMS WITH CAPPED PILE PIERS AND ABUTMENTS. SPANS FOR THE PROPOSED BRIDGE WILL BE 43'–3", 53'–6" AND 43'–3".

EXPLORATION

FOUR BORINGS WERE DRILLED AT THE SITE ON AUGUST 20–22, 1991 USING 6 INCH DIAMETER FLIGHT AUGERS AND 8 INCH DIAMETER HOLLOW–STEM AUGERS POWERED BY A TRUCK–MOUNTED DRILL RIG. STANDARD PENETRATION TEST (SPT) WERE PERFORMED IN THE BORINGS IN ACCORDANCE WITH AASHTO T206.

ALL SOIL SAMPLES WERE RETURNED TO OUR TESTING LABORATORY. EACH SAMPLE WAS VISUALLY CLASSIFIED AND TESTED FOR NATURAL MOISTURE CONTENT. UNCONFINED COMPRESSION TESTS WERE PERFORMED ON THIN–WALLED TUBE SAMPLES IN ACCORDANCE WITH AASHTO T208. SPT SAMPLES HAVING SIMILAR CHARACTERISTICS WERE COMBINED AND SUBJECTED TO PARTICLE SIZE ANALYSIS AND ATTERBERG LIMITS DETERMINATION IN ACCORDANCE WITH THE SPECIFICATIONS FOR SUBSURFACE EXPLORATION, PUBLISHED BY THE OHIO DEPARTMENT OF TRANSPORTATION, FEBRUARY, 1984 EDITION.

TOPOGRAPHY AND GEOLOGY

THE PROJECT IS LOCATED IN THE FLOODPLAIN OF GREGORY CREEK APPROXIMATELY 3300 FEET UPSTREAM OF THE MIAMI RIVER. THE REGION HAS BEEN COVERED BY WISCONSIN–AGE GLACIERS RESULTING IN GLACIAL TILL DEPOSITS FORMED AROUND AND UNDERNEATH THE RECENT ALLUVIAL DEPOSITS. THESE DEPOSITS ARE UNDERLAIN BY INTERBEDDED SHALE AND LIMESTONE OF THE MAYSVILLE FORMATION WHICH REPRESENTS THE ORDOVICIAN GEOLOGIC PERIOD. BEDROCK TYPICALLY CONSISTS OF APPROXIMATELY 60 PERCENT GRAY CALCAREOUS SHALE WITH INTERBEDDED THIN LAYERS OF HARD FOSSILIFEROUS LIMESTONE. BEDROCK IS NEARLY LEVEL SINCE THE SITE OVERLIES THE CREST OF THE CINCINNATI ARCH.

INVESTIGATIONAL FINDINGS AND OBSERVATIONS

THE BORINGS INVESTIGATING THE ABUTMENTS AND PIERS TYPICALLY ENCOUNTERED MATERIAL CONSISTING PRIMARILY OF GRAVEL AND/OR STONE FRAGMENTS WITH VARYING AMOUNTS OF SAND, SILT AND CLAY. SANDY SILT LAYERS WITH MINOR AMOUNTS OF GRAVEL AND CLAY WERE ALSO ENCOUNTERED. THE SOIL RANGED FROM MEDIUM DENSE TO VERY DENSE AND STIFF TO VERY STIFF WITH THE COHESIVE COMPONENTS OF LOW PLASTICITY.

TOP OF BEDROCK, INDICATED BY BORING B–1 THRU B–4, VARIED FROM 575.2 FEET (B–2) TO 584.4 FEET (B–4). THE ROCK CORE OBTAINED IN BORINGS B–2 AND B–3 CONSISTED OF GRAY SHALE, WHICH WAS LAMINATED, WEATHERED AND MODERATELY HARD, WITH INTERBEDDED LIGHT GRAY LIMESTONE WHICH WAS FOSSILIFEROUS, VERY HARD AND THIN TO MEDIUM BEDDED. THE ROCK CORE OBTAINED IN BORING B–4 CONSISTED OF GRAY SHALE, LAMINATED, WEATHERED AND SOFT TO MODERATELY HARD.

GROUNDWATER ELEVATIONS RANGED FROM 604.2 FEET (B–2) TO 610.2 FEET (B–4).

LEGEND

- Auger Boring Location – Plan View
- Press and / or Drive Sample and / or Core Boring Location – Plan View
- TR — Top of Rock
- Capped Pile
- Footing
- Footing on Pile
- 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.
- W — Indicates Free Water Elevation.
- Indicates Static Water Elevation.

SYMBOLS OF ROCK TYPES

- Weathered Mudstone
- Mudstone
- Weathered Shale
- Shale
- Claystone
- Siltstone
- Weathered Sandstone
- Sandstone
- Leached Dolimite
- Dolimite
- Leached Limestone
- Limestone
- Boulders or Cobbles

Partical Size Definitions

Boulders	Cobbles	Gravel	Coarse Sand	Fine Sand	Silt	Clay
12"	3"	2.0 mm	0.42 mm	0.074 mm	0.0005 mm	
		No. 10 sieve	No. 40 sieve	No. 200 sieve		

DRIVE SAMPLE/PRESS SAMPLE/CORE BORINGS

DRIVE SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY–POWERED ROTARY–TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1–3/8" I.D. SPLIT SPOON SAMPLING DEVICE, 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 SAMPLING DEVICE 18 INCHES IS CONSIDERED THE STANDARD PENETRATION TEST.

DRIVE/PRESS SAMPLE BORINGS ARE MADE BY MEANS OF A MECHANICALLY–POWERED ROTARY–TYPE DRILLING MACHINE, EMPLOYING A 2" O.D., 1–3/8" I.D. SPLIT SPOON SAMPLING DEVICE, AND 3" O.D. THIN WALL PRESS SAMPLING DEVICE. THE PRESS SAMPLER IS ADVANCED BY CONTINUOUS UNIFORM PRESSURE, APPLIED BY THE DRILLING MACHINE.

CORE BORINGS ARE MADE BY MEANS OF A MECHANICALLY–POWERED ROTARY–TYPE DRILLING MACHINE, EMPLOYING A NMX CORE BARREL WITH INDUSTRIAL DIAMOND CUTTING HEAD.

THE BORING LOG SHEETS DISPLAY A GRAPHIC PLOT OF THE INFORMATION OBTAINED, INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, TYPE OF SAMPLE, THE STANDARD PENETRATION TEST READINGS IN THREE 6–INCH INCREMENTS, DEPTH AND ELEVAITON OF PRESS SAMPLES, FIELD NUMBER ASSIGNED TO SAMPLE, SAMPLE DESCRIPTION – BASED ON LABORATORY TEST UTILIZING THE CASAGRANDE AC CLASSIFICATION SYSTEM – AND GRADATION, PLASTICITY AND MOISTURE CONTENT DETERMINATIONS. RESULTS OF STRENGTH AND CONSOLIDATION TESTING, IF PERFORMED ON UNDISTURBED SAMPLES, WILL APPEAR GRAPHICALLY ON SEPARATE ENCLOSURES. ROCK SAMPLES ARE DISPLAYED ON THE LOG SHEETS INCLUDING DEPTH AND ELEVATION OF THE SAMPLE, AMOUNT OF RECOVERY AND A VISUAL CLASSIFICATION BASED ON TYPE, COLOR, DEGREE OF HARDNESS, GRAIN SIZE, DETERIORATION, BEDDING, ACID REACTION AND OTHER QUALIFYING FACTORS.

AT DEPTHS WHERE MATERIALS ARE BOULDERY OR GRAVELLY TO THE EXTENT THAT THE SAMPLER CAN NOT BE UTILIZED, A WASH SAMPLE IS PROCURED AND VISUALLY CLASSIFIED, IN ORDER TO DETERMINE THE GENERAL CHARACTERISTICS OF THE MATERIAL. THESE SAMPLES ARE NOT CONSIDERED SUFFICIENTLY REPRESENTATIVE TO WARRANT LABORATORY TESTING.

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 part of the plans governing construction of the project.

FULLER, MOSSBARGER, SCOTT AND MAY
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LEXINGTON • LOUISVILLE • CINCINNATI

STRUCTURE FOUNDATION INVESTIGATION

BRIDGE NO. BUT–4–14.80R
STATE ROUTE 4 – NORTHBOUND
OVER GREGORY CREEK
SEC. BUTLER COUNTY, OHIO

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BUT-4-14.79R

3/4

LOG OF BORING

Date Started 8/20/91
Date Completed 8/20/91
Boring No. B-1

Sampler Type SS/ST Dia. 1-3/8"/3"
Coring: Length — Dia. —
Station & Offset 781+23, 10' Rt.

Water Elev. 608.3'
Surface Elev. 632.3'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Core ft.	Description	Sample No.	Physical Characteristics: % Agg	% C.S.	% F.S.	% Silt	% Clay	LL	PI	WC	SHTL Class
632.3	0				Asphaltic Concrete										
631.8					Fill consisting of gravel, red brick fragments and brown clay										
631.0					Concrete										
630.5	2														
	4				Sandy silt with a little gravel and clay, gray, moist, medium stiff	1	20	13	23	29	15	24	8	20	A-4a
		3/8/5													
	6														
	8														
	10	4/4/4				2								13	
	12														
		Uncon. Comp. Str. (T.S.F.) = 0.67				3								13	
618.3	16	7/3/8			Gravel and/or stone fragments with sand and a little silt and a trace of clay, gray and brown, moist, medium dense to very dense	4	47	18	17	12	6	NP	NP	16	A-1-b
	18	12/13/14				5								8	
		16/18/13				6								7	
612.3	20														
		12/17/50+			Gravel and/or stone fragments with sand and silt and a little clay, glacial till, gray, moist, very dense	7	33	13	20	20	14	NP	NP	9	A-2-4
	22	42/30/50+				8								12	
608.3	24	36/50+			Gravel and/or stone fragments with sand, a little silt and a trace of clay, gray and brown, wet, very dense	9	47	18	17	12	6	NP	NP	7	A-1-b
	26														
605.0		26/28/28			Sandy silt, gray, wet, very stiff	10								14	VISUAL
	28														
602.3	30	20/25/34			Gravel and/or stone fragments with sand and silt and a little clay, glacial till, gray, moist, very dense	11	33	13	20	20	14	NP	NP	9	A-2-4
	32														
		14/30/36				12								8	
	34														
		34/50+				13								8	
	36														
	38														
	40	32/34/50				14								9	
	42														
	44														
		55/45/50				15								10	
	46														
	48														
582.8		82/50+			Top of Rock — Refusal Bottom of Boring	16								12	

LOG OF BORING

Date Started 8/20/91
Date Completed 8/20/91
Boring No. B-2

Sampler Type SS Dia. 1-3/8"
Coring: Length 10.0' Dia. NX
Station & Offset 781+73, 20' LT.

Water Elev. 604.2'
Surface Elev. 609.7'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Core ft.	Description	Sample No.	Physical Characteristics: % Agg	% C.S.	% F.S.	% Silt	% Clay	LL	PI	WC	SHTL Class
609.7	0				Gravel and/or stone fragments with sand, gray, moist, very dense										
	2														
	4					1								7	Visual
		20/50+													
	6					2	18	11	21	25	25	23	10	8	A-4a
		46/24/37													
602.2	8	10/23/23				3								8	
					Sandy silt with some clay and a little gravel, gray, moist, very stiff										
	10	15/23/21				4								11	
	12														
		13/24/32				5								8	
	14														
		18/34/42				6								12	
	16														
591.7	18	24/47/50+				7								17	Visual
					Sand, fine to medium grain, gray, wet, very dense										
589.7	20	18/28/40				8	18	11	21	25	25	23	10	8	A-4a
					Sandy silt with some clay and a little gravel, gray, moist, very stiff										
	22														
		4/13/22				9								16	
	24														
		15/50+				10								5	
	26														
	28	26/36/50+				11								13	
	30	27/48/50+				12								5	
	32														
	34				Top of Rock										
575.2		35/50+			Shale, gray (augered)	13								8	
	36														
	38				Begin Core										
570.7					Shale (60%), gray, laminated, weathered, moderately hard with interbedded Limestone (40%), light gray, fossiliferous, very hard, thin to medium bedded										
	40														
	42														
	44														
563.0			5.5	0.2	Bottom of Boring										

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BRF-8(75)

LOG OF BORING

Date Started 8/21/91
Date Completed 8/21/91
Boring No. B-3

Sampler Type SS Dia. 1-3/8"
Coring: Length 10.0' Dia. NX
Station & Offset 782+22, 19' RT.

Water Elev. --
Surface Elev. 612.7'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	% Agg	% C.S.	% F.S.	% Silt	% Clay	LL	PI	WC	SHTL Class
612.7	0														
	2				Sandy silt with some clay and a little gravel, gray, moist, very stiff										
	4														
		16/23/30				1	12	10	25	33	20	17	4	14	A-4a
	6														
		14/27/50				2								13	
	8	13/19/21				3								14	
602.7	10	18/18/22				4	52	26	12	8	4	NP	NP	7	A-1-a
	12				Gravel and/or stone fragments and sand with a trace of silt clay, gray, wet, dense to very dense										
		24/30/24				5								18	
	14														
		14/30/30				6								10	
	16														
	18	20/36/33				7								12	
	20	27/35/34				8								9	
	22														
		38/32/24				9								11	
	24														
		55/35/30				10								10	
	26														
		15/17/27				11								17	
	28														
582.2	30	57/50+				12								10	Visual
	32				Gravel and/or stone fragments with sand and silt and a little clay, glacial till, gray, moist, very dense										
	34														
577.7		20/50+			Top of Rock	13								9	
	36				Shale, gray (augered)										
	38														
574.2					Begin Core										
	40				Shale (80%), gray, laminated, weathered, moderately hard with interbedded Limestone (20%), light gray, fossilferous, very hard, thin to medium bedded											
570.7	42		1.8	1.7											
	44														
	46														
	48														
564.1			6.6	0.0	Bottom of Boring										

LOG OF BORING

Date Started 8/22/91
Date Completed 8/22/91
Boring No. B-4

Sampler Type SS Dia. 1-3/8"
Coring: Length 10.0' Dia. NX
Station & Offset 782+95, 7' LT.

Water Elev. 610.2'
Surface Elev. 632.2'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	% Agg	% C.S.	% F.S.	% Silt	% Clay	LL	PI	WC	SHTL Class
632.2	0														
631.1					Asphaltic Concrete										
630.9	2				Red brick and gravel										
	4				Fill consisting of silty sand with clay and gravel, brown, moist, medium dense to dense										
		30/18/12				1								14	Visual
	6														
	8														
621.7	10	4/5/6				2	7	13	34	28	18	27	9	18	A-4a
	12				Sandy silt with a little clay and a trace of gravel, gray and brown, moist, medium stiff to very stiff										
	14														
		2/3/2				3								25	
	16														
		3/3/11				4								28	
	18	14/24/31				5								8	
613.2															
	20	33/44/62			Gravel and/or stone fragments with sand, a little silt and a trace of clay, brown and gray, moist to wet, dense to very dense	6	40	25	17	12	6	NP	NP	7	A-1-b
		50/65/54				7								8	
	22														
		20/48/50+				8								14	
607.7	24	11/19/21				9	8	8	11	44	28	22	8	11	A-4a
	26				Sandy silt with some clay and a trace of gravel, glacial till, moist, stiff to very stiff Note: A 6 inch void was encountered from a depth of 31.0 to 31.5 feet											
	28	15/20/35				10								18	
	30	4/1/0				11								15	
600.2	32														
	34				Gravel and/or stone fragments with sand and a trace of silt and clay, gray, moist, very dense										
		35/45/50+				12	45	23	18	10	4	NP	NP	11	A-1-b
	36														
	38														
	40	33/45/46				13								9	
	42														
	44														
		50+				14	No Recovery								
	46														
584.4	48				Top of Rock										
583.7					Shale, gray (augered)										
	50				Begin Core										
	52				Shale, gray, laminated, weathered, soft to moderately hard										
579.1			4.6	0.4	Bottom of Boring										

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