9-A

DESIGN DESIGNATION

		Miles Road to Harvard Road
CURRENT ADT (1993)	=	11,916
ADT (2013)	=	9,530
DHV (2013)	=	1,300
D (2013)	=	51%
T	=	2%
V (DESIGN)	=	40 M.P.H.
V (POSTED)	=	35 M.P.H.
FUNCTIONAL CLASSIFICATION	=	URBAN ARTERIAL
DESIGN EXCEPTIONS	=	NONE

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
CUY-175-2.68
CUY-271-6.29

CITY OF WARRENSVILLE HEIGHTS AND VILLAGE OF HIGHLAND HILLS CUYAHOGA COUNTY

FHWA REGION	STATE	PROJECT	
5	OHIO		

1/110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

ALL REFERENCES TO STP-271-6(84) APPEARING THROUGHOUT THESE PLANS SHALL BE CONSIDERED TO READ SURFACE TRANSPORTATION PROGRAM.

NH-271-6(84)

SURFACE TRANSPORTATION PROGRAM

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 require the closing to traffic of the highway and that detours will be provided as indicated on the plans.

LIMITED ACCESS

This improvement is especially designed for through traffic and has been declared a limited access highway or freeway by action of the Director in accordance with the provisions of Section 5511.02 of the Revised Code of Ohio.

CONVENTIONAL SIGNS

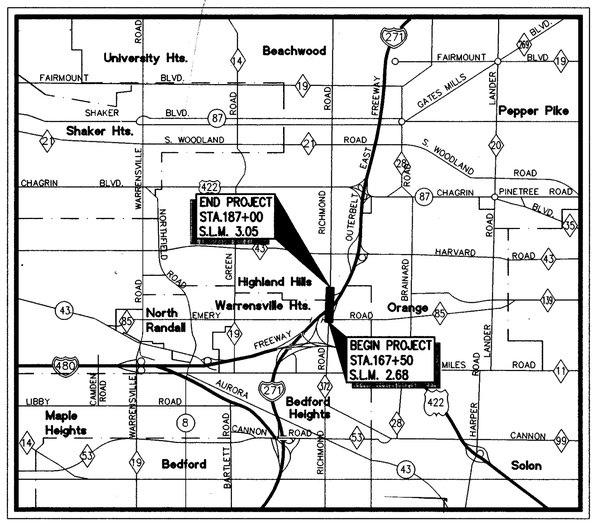
County Line
Township Line
Section Line
Corporation Line or
Fence Line (existing) (proposed)
Centerline 210 211 212 213 214
Trees , Stumps (to be removed)
Utility Poles: Telephone , Power , Light , General

Slope Easement T
Limit Acess (in existing fence)
Proposed Right of Way RW
Existing Right of Way RW
Property Line PL (in existing fence) PL
Guardrail (existing) (proposed)

INDEX OF SHEETS

LINE DATA

LENGTH OF PROJECT	
RICHMOND ROAD STA. 167+50 TO STA.187+00	= 1950 LIN.FT.
LENGTH OF PROJECT	= 1950 LIN.FT. OR 0.369 MILES
ADD FOR LENGTH OF WORK	
RICHMOND ROAD STA. 162+70 TO STA. 167+50 AND STA.187+00 TO STA. 190+20	= 800 LIN. FT.
EMERY ROAD STA. 118+65 TO STA. 120+87.35	= 222.35 LIN. FT.
AND STA. 121+49.35 TO STA. 127+14.90	= 565.55 LIN. FT.
LENGTH OF WORK	= 1587.90 LIN. FT. OR .301 MILES
TOTAL LENGTH OF WORK	= 3537.90 LIN. FT. OR .670 MILES



LOCATION MAP

SCALE IN MILES
1 0 1 2 3

Portion to be improved
Interstate-U.S.,State & County
Other Roads

SCALES

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

UNDERGROUND UTILITIES

TWO WORKING DAYS
BEFORE YOU DIG
CALL 800-362-2764 (Toll Free)
OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS MUST BE CALLED DIRECTLY

SUPPLEMENTAL SPECIFICATIONS

✓802	4-13-90
✓931	3-18-92
✓944	3-18-92
✓942	3-18-92
✓940	6-10-87
✓910	5-20-91
✓820	3-18-92
✓849	12-24-85
✓949	9-26-86

APPROVED: Bryan J. Hoolin
DATE: 7-6-93 DISTRICT DEPUTY DIRECTOR OF TRANSPORTATION

APPROVED: B.D. Hawbaker/wje
DATE: 10/5/93 ENGINEER, BUREAU OF BRIDGES AND STRUCTURAL DESIGN

APPROVED: Christopher L. Runyan
DATE: 12-28-93 DEPUTY DIRECTOR OF DESIGN

APPROVED: Jerry Wray
DATE: 12-28-93 DIRECTOR, DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS

BP-1.1	✓ 2-21-92	MH-3	✓ 12-18-84	TC-16.20	✓ 1-20-84	TC-81.20	✓ 1-20-84	MC-1	✓ 6-13-69	TC-32.10	✓ 9-1-92	HL-10.12	✓ 5-1-87	CB-8	✓ 11-10-83
BP-1.2	✓ 2-21-92	MC-4	✓ 7-26-76	TC-21.20	✓ 9-1-92	TC-82.10	✓ 8-29-84	I-1	✓ 12-18-84	TC-51.10	✓ 1-20-84	MT-97.11	✓ 10-4-89		
BP-2.1	✓ 2-21-92	F-1	✓ 11-10-83	TC-35.10	✓ 8-29-84	TC-83.10	✓ 3-18-92	MC-9.2	✓ 5-6-91	CB-2-2A&B	✓ 5-1-79	CB-458A	✓ 5-1-79		
BP-2.2	✓ 2-21-92	F-3	✓ 5-1-76	TC-41.10	✓ 8-29-84	TC-83.20	✓ 1-20-84	MH-1	✓ 12-18-84						
BP-2.3	✓ 2-21-92	HW-4B	✓ 4-1-80	TC-41.20	✓ 3-26-79	TC-85.10	✓ 1-20-84	MC-11	✓ 8-1-78						
BP-2.5	✓ 2-21-92	GR-1.1	✓ 5-6-91	TC-41.40	✓ 6-18-79	TC-85.20	✓ 1-20-84	CB-6	✓ 5-1-79						
BP-3.1	✓ 2-21-92	GR-1.2	✓ 10-30-92	TC-41.50	✓ 3-26-79	MT-95.30	✓ 10-10-88	MC-6	✓ 1-30-84						
BP-4.1	✓ 2-21-92	MH-2	✓ 6-12-75	TC-42.10	✓ 8-19-77	MT-99.10	✓ 11-14-86	HL-50.21	✓ 5-1-87						
BP-5.1	✓ 2-21-92	GR-2.1	✓ 5-6-91	TC-42.20	✓ 3-26-79	MT-101.60	✓ 7-1-92	HL-20.14	✓ 5-1-87						
BP-7.1	✓ 10-30-92	GR-4.1	✓ 5-6-91	TC-51.11	✓ 1-20-84	MT-105.10	✓ 7-1-92	TC-12.30	1-20-84						
CB-3	✓ 5-1-79	GR-6	✓ 2-5-82	TC-52.10	✓ 4-3-79	MT-105.11	✓ 7-1-92	TC-22.10	✓ 9-1-92						
CB-3A	✓ 5-1-79	HL-30.11	✓ 5-1-87	TC-52.20	✓ 4-3-79	GR-3.2	✓ 5-6-91	TC-22.20	✓ 9-1-92						
I-2A	✓ 12-18-84	HL-30.22	✓ 5-1-87	TC-71.10	✓ 9-10-91	AS-1-81	✓ 11-27-81	TC-31.21	✓ 9-1-92						

I-2	✓ 12-18-84	VPF-1-90	✓ 2-1-92		
F-5	✓ 5-1-76	EXJ-2-81	✓ 4-2-84		
		SD-1-69	✓ 6-12-69		

Plans Prepared By:
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

1287
Ralph E. Robison
Ralph E. Robison

STATE OF OHIO * RALPH E. ROBISON 29717 * REGISTERED PROFESSIONAL ENGINEER
SEAL

Project: CUY 175/271-2.68/6.29 PID: 11036
Date of Letting 19__, Contract No. ____

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED: ____
DIVISION ADMINISTRATOR DATE

LD0300 Rev. 11-21-73

FHWA REGION	STATE	PROJECT	
5	OHIO		

1A / 110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

NOTE:
THIS SHEET IS FOR

INFORMATION ONLY

PID: 11040 I.D.
CRS: CUY-480-23.45
CUY-480N-0.00
SALE DATE: 4/95
CNSLTNT: BURGESS&NIPLE
SECTION NO: 9B

PID: 11039 I.D.
CRS: CUY-271-5.26
CUY-480N-1.29
SALE DATE: 8/95
CNSLTNT: ADACHE
SECTION NO: 9A

PID: 11037 I.D.
CRS: CUY-271-5.34
CUY-422A-13.65NE
CUY-422A-15.64L
CUY-422N-1.50
SALE DATE: 5/94
CNSLTNT: H.N.T.B.
SECTION NO: 6

PID: 9233
CRS: CUY-271-6.46
SALE DATE: 11/93
CNSLTNT: BURGESS&NIPLE
SECTION NO: 1A

PID: 11035
CRS: CUY-175-3.14
SALE DATE: 4/95
CNSLTNT: POLYTECH
SECTION NO: 5A

PID: 11041
CRS: CUY-175-3.66
SALE DATE: 4/95
CNSLTNT: GPD
SECTION NO: 10

PID: 10869
CRS: CUY-271-7.61
SALE DATE: 7/94
CNSLTNT: BURGESS&NIPLE
SECTION NO: 2

PID: 9234
CRS: CUY-271-10.21
SALE DATE: 1/94
CNSLTNT: EUTHENICS
SECTION NO: 3

PID: 11042
CRS: CUY-175-2.05
SALE DATE: 4/95
CNSLTNT: RICHLAND
SECTION NO: 11

PID: 11036 I.D.
CRS: CUY-271-6.29
CUY-175-2.68
SALE DATE: 6/94
CNSLTNT: H.N.T.B.
SECTION NO: 5B

PID: 10868
CRS: CUY-271-7.20 L&R
SALE DATE: 11/10/92
CNSLTNT: BURGESS&NIPLE
SECTION NO: 1B

PID: 5600
CRS: CUY-271-6.10
SALE DATE:
CNSLTNT: J.D. JONES
BRIDGE PROGRAM

PID: 9300
CRS: CUY-271-6.53
SALE DATE: 4/95
CNSLTNT: URS
SECTION NO: 7

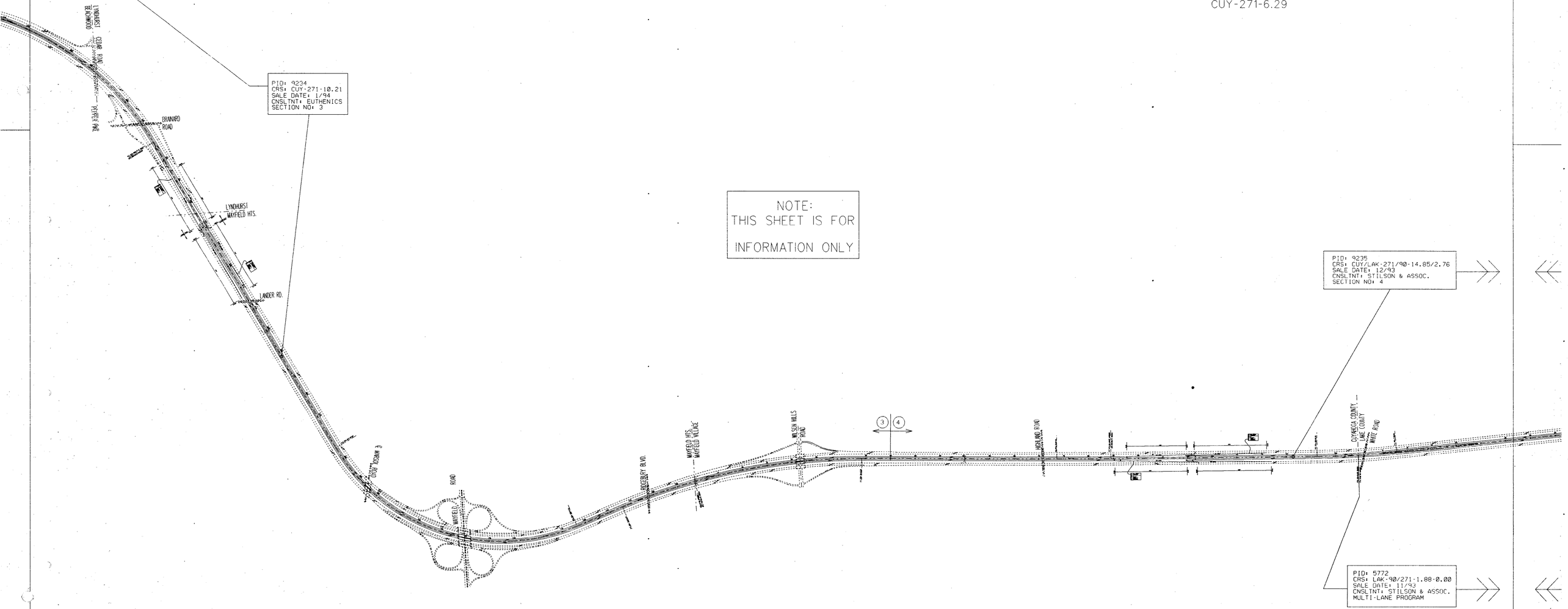
PID: 11038
CRS: CUY-HARVARD RD.
SALE DATE: 8/95
CNSLTNT: WARNER
SECTION NO: 8

LOCATION MAP

FHWA REGION	STATE	PROJECT	
5	OHIO		

1B
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29



NOTE:
THIS SHEET IS FOR

INFORMATION ONLY

LOCATION MAP

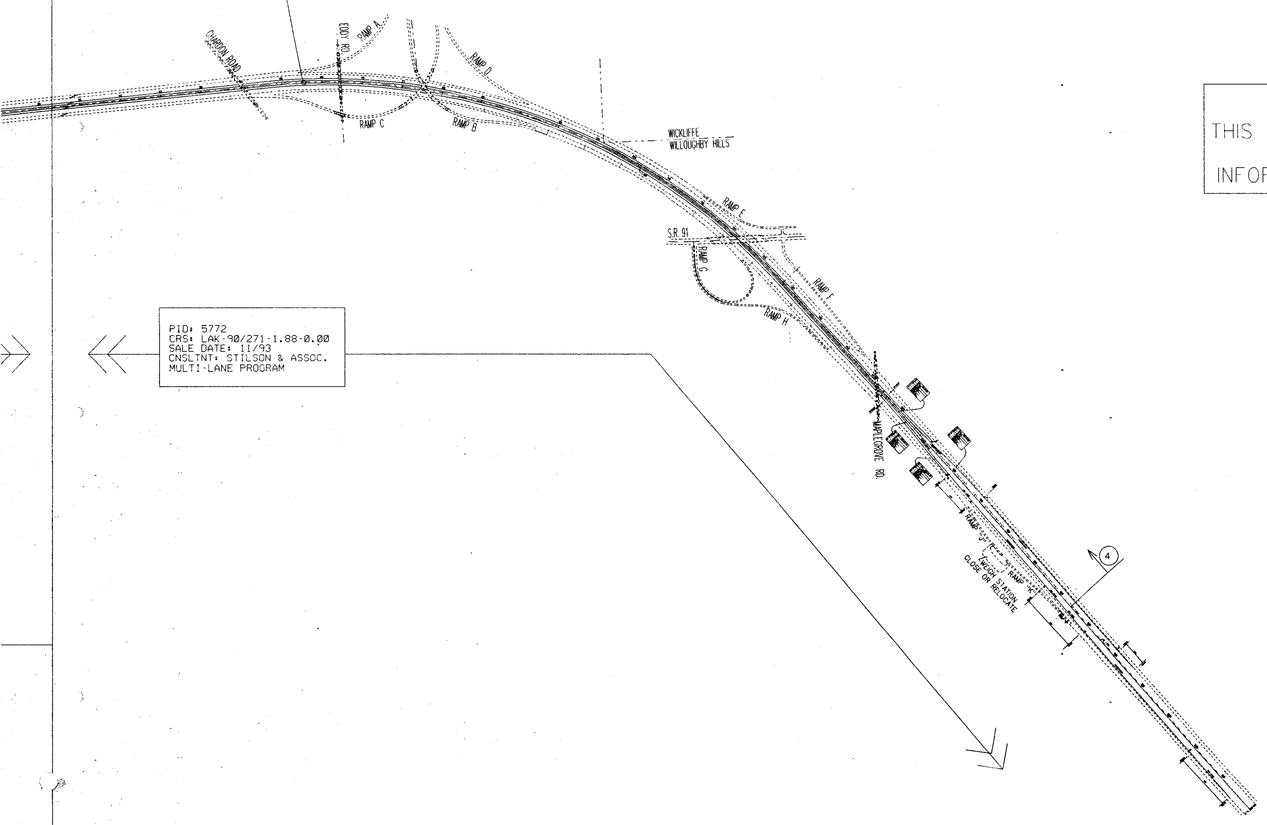
FHWA REGION	STATE	PROJECT	
5	OHIO		

1C
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

PID: 9235
CRS: CUY/LAK-271/90-14.85/2.76
SALE DATE: 12/93
CNSLTNT: STILSON & ASSOC.
SECTION NO: 4

PID: 5772
CRS: LAK-90/271-1.88-0.00
SALE DATE: 11/93
CNSLTNT: STILSON & ASSOC.
MULTI-LANE PROGRAM



NOTE:
THIS SHEET IS FOR

INFORMATION ONLY

LOCATION MAP

SCHEMATIC PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

2/110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)

N

BEGIN WORK
STA. 162+70

STP-271-6(84)
BEGIN PROJECT
STA. 167+50
S.L.M. 2.68

STP-271-6(84) NH-271-6(84)

NH-271-6(84) STP-271-6(84)

STP-271-6(84) END PROJECT
STA. 187+00
S.L.M. 3.05

END WORK
STA. 190+20

BEGIN WORK
STA. 167+50

STRUCTURE NO.
CUY-271-0629

℄ EMERY RD.
120
S89°25'39"W

Sta. 168+34.42 ℄ Richmond Road
Sta. 121+18.35 ℄ Emery Road

℄ RICHMOND RD

160+00 165+00 N00°13'59"W 170+00 N00°28'13"W 175+00 180+00 185+00 N00°32'42"W

Lane W-N and Lane E-N
I-271 NB
I-271 SB
℄ I-271 350+00
PCC = 351+69.67
355+00

CITY OF WARRENSVILLE HTS.
VILLAGE OF HIGHLAND HILLS

Angle Break
Sta. 183+38.24

VILLAGE OF HIGHLAND HILLS
CITY OF WARRENSVILLE HTS.

180°14'14"
180°04'29"
N59°32'28"E

℄ Ramp G-1
℄ Ramp G-2

P.C. 0+00
PC Sta. 0+00
A
B
1+64.62 Back
Sta. 1+95.97 Ahead
= Sta. 1+00.00
1+00 2+00 3+00

P.C. STA. 58+95.56
60+00
C

N00°28'13"W Taylor Lane

Sta. 123+33.82
= Sta. 10+00.00

125
N89°37'37"E

END WORK
STA. 127+14.90

Ramp G-2
CURVE DATA A
Δ= 21°23'41"
R = 358.10'
T = 67.65'
L = 133.72'
C = 133.94'
E = 6.33'
M = 6.22'
D_c = 16°00'0"

Relocated Ramp G-2
CURVE DATA B
Δ= 21°23'41"
R = 440.74'
T = 83.26'
L = 164.58'
C = 163.63'
E = 7.80'
M = 7.66'
D_c = 13°00'0"

CURVE DATA C
Δ= 21°58'50"
R = 954.93'
T = 185.45'
L = 366.34'
C = 364.10'
E = 17.84'
M = 17.51'
D_c = 6°00'00"

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: LML DATE: NOV. '92
DRAWN BY: LML DATE: NOV. '92
CHECKED BY: PF DATE: DEC. '92
SCALE: 1"= 100'
SCHEM.DWG

FHWA REGION	STATE	PROJECT	
5	OHIO		

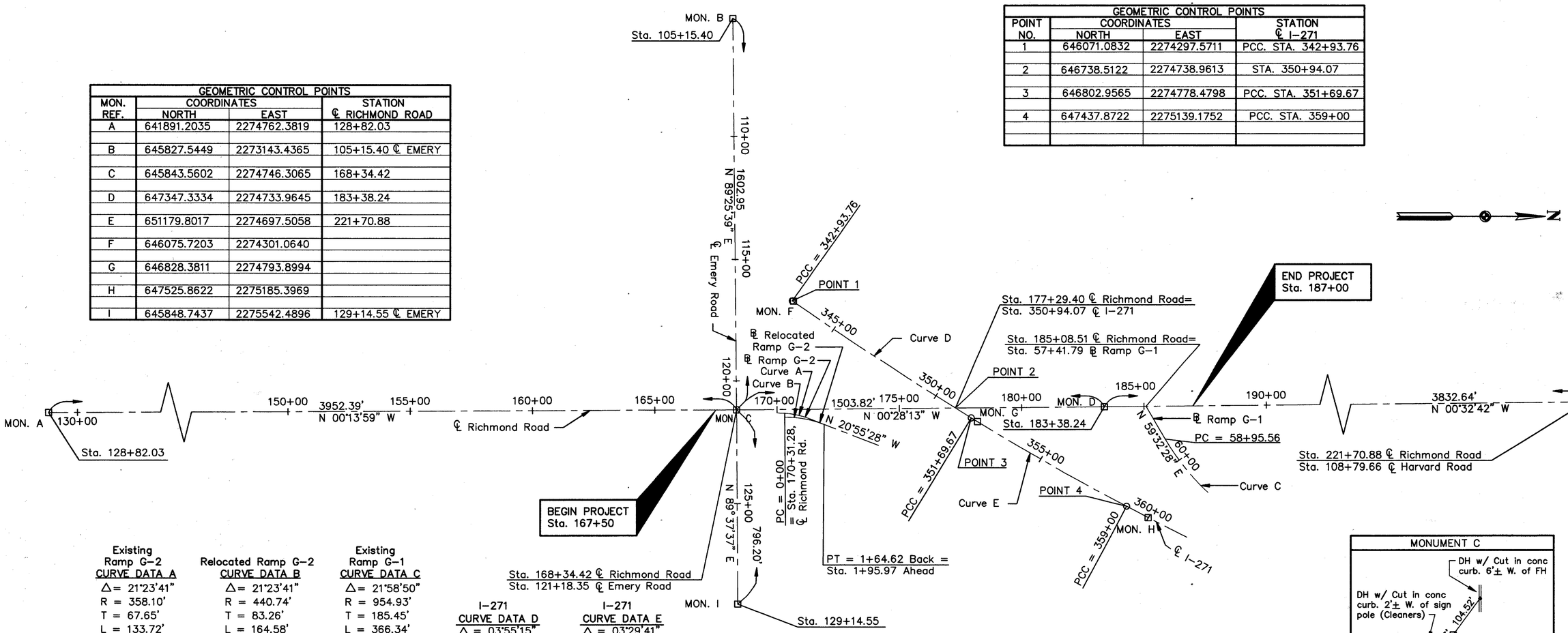
2A / 110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

GEOMETRIC PLAN

GEOMETRIC CONTROL POINTS			
MON. REF.	COORDINATES NORTH	EAST	STATION ℄ RICHMOND ROAD
A	641891.2035	2274762.3819	128+82.03
B	645827.5449	2273143.4365	105+15.40 ℄ EMERY
C	645843.5602	2274746.3065	168+34.42
D	647347.3334	2274733.9645	183+38.24
E	651179.8017	2274697.5058	221+70.88
F	646075.7203	2274301.0640	
G	646828.3811	2274793.8994	
H	647525.8622	2275185.3969	
I	645848.7437	2275542.4896	129+14.55 ℄ EMERY

GEOMETRIC CONTROL POINTS			
POINT NO.	COORDINATES NORTH	EAST	STATION ℄ I-271
1	646071.0832	2274297.5711	PCC. STA. 342+93.76
2	646738.5122	2274738.9613	STA. 350+94.07
3	646802.9565	2274778.4798	PCC. STA. 351+69.67
4	647437.8722	2275139.1752	PCC. STA. 359+00



Existing Ramp G-2 CURVE DATA A	Relocated Ramp G-2 CURVE DATA B	Existing Ramp G-1 CURVE DATA C
Δ = 21°23'41"	Δ = 21°23'41"	Δ = 21°58'50"
R = 358.10'	R = 440.74'	R = 954.93'
T = 67.65'	T = 83.26'	T = 185.45'
L = 133.72'	L = 164.58'	L = 366.34'
C = 133.94'	C = 163.63'	C = 364.10'
E = 6.33'	E = 7.80'	E = 17.84'
M = 6.22'	M = 7.66'	M = 17.51'
D_c = 16°00'0"	D_c = 13°00'0"	D_c = 6°00'00"

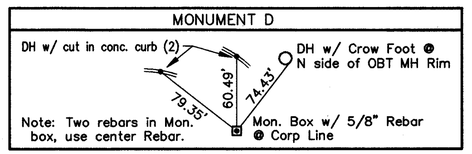
I-271 CURVE DATA D	I-271 CURVE DATA E
Δ = 03°55'15"	Δ = 03°29'41"
R = 12800.00'	R = 11973.77'
T = 438.12'	T = 365.28'
L = 875.91'	L = 730.33'
Dc = 00°26'51"	Dc = 00°28'43"
C = 875.73'	C = 730.22'

GRAPHIC SCALE

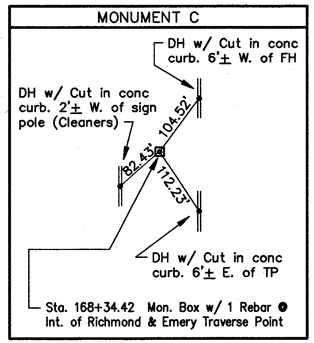
200 0 100 200 400 800

(IN FEET)

MONUMENT D



MONUMENT C



HOWARD NEEDLES TAMMEN & BERGENDOFF HNTB
ARCHITECTS ENGINEERS PLANNERS

MADE BY: PF DATE: 4/93
DRAWN BY: DJF DATE: 4/93
CHECKED BY: ZSS DATE: 4/93
SCALE: 1"=200'
GEOM

TYPICAL SECTIONS

TYPE 451

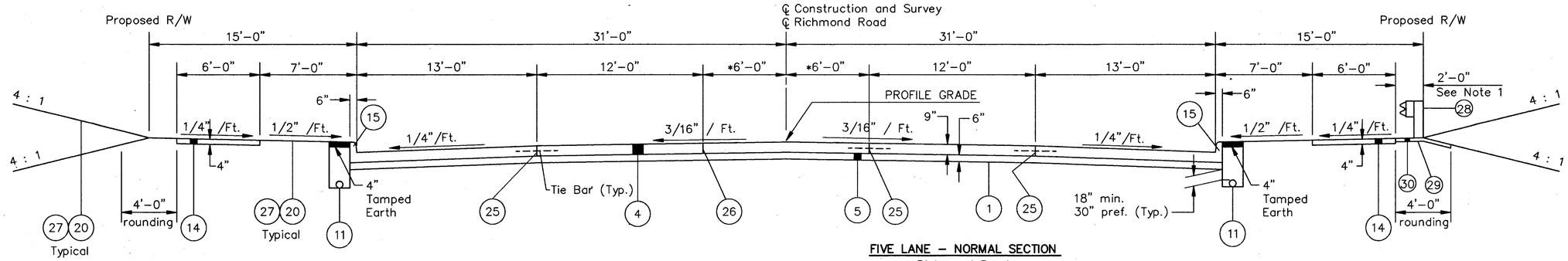
FHWA REGION	STATE	PROJECT	
5	OHIO		

3/110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

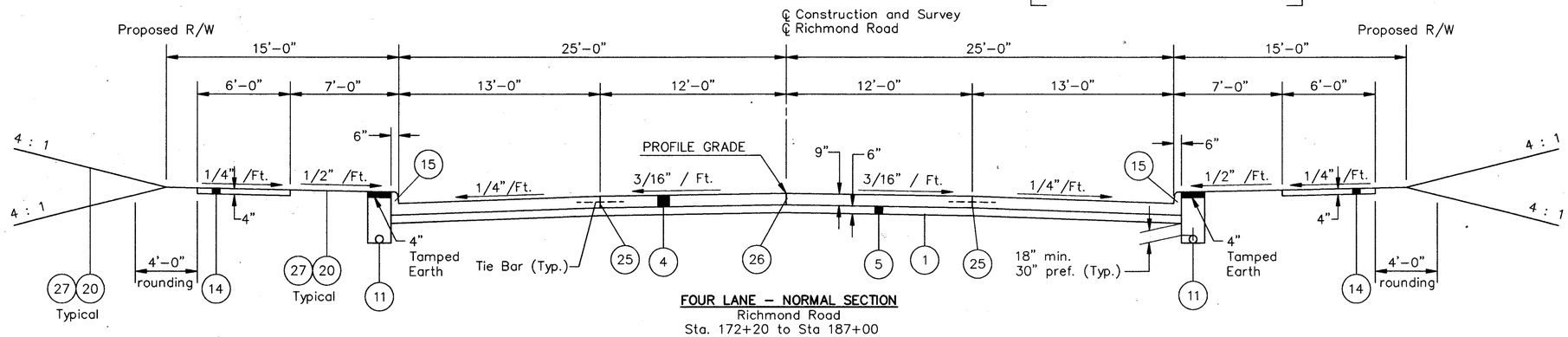
4 0 4 8 16

SCALE IN FEET

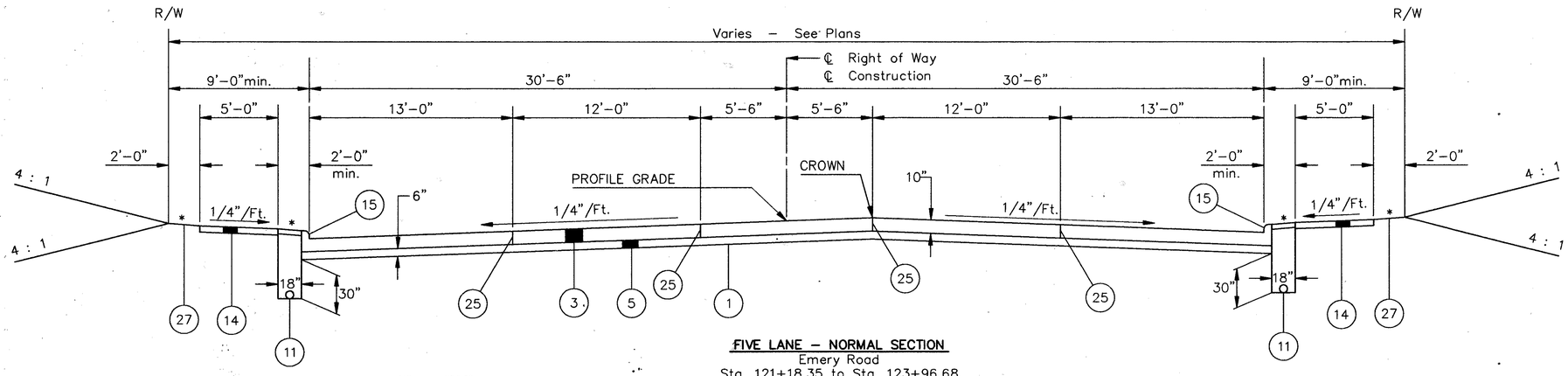


FIVE LANE – NORMAL SECTION
Richmond Road
Sta. 167+50 to Sta. 172+20

***Varies 6'-0" Min. to 0'-0" Max.**
Sta. 170+60.00 to Sta. 172+20.00



FOUR LANE – NORMAL SECTION
Richmond Road
Sta. 172+20 to Sta 187+00
Structure Limits – Sta. 172+89.21 to Sta 181+21.01



FIVE LANE – NORMAL SECTION
Emery Road
Sta. 121+18.35 to Sta. 123+96.68

* Varies 1/8"/Ft. to 1"/Ft. Max.

LEGEND

(1)	ITEM 203 – SUBGRADE COMPACTION
(3)	ITEM 451 – 10" REINFORCED CONCRETE PAVEMENT
(4)	ITEM 451 – 9" REINFORCED CONCRETE PAVEMENT
(5)	ITEM 304 – AGGREGATE BASE GRADING A (SEE PROPOSAL NOTES)
(6)	ITEM 407 – TACK COAT
(8)	ITEM 446 – 1 1/4" ASPHALT CONCRETE SURFACE COARSE AC-20
(9)	ITEM 446 – 1 3/4" ASPHALT CONCRETE INTERMEDIATE COARSE AC-20
(11)	ITEM 605 – 6" SHALLOW PIPE UNDERDRAIN
(14)	ITEM 608 – 4" CONCRETE WALK
(15)	ITEM 609 – CURB, TYPE 2A
(20)	ITEM 659 – SEEDING AND MULCHING
(25)	LONGITUDINAL JOINT AS PER STANDARD CONSTRUCTION DRAWING BP 2.1
(26)	LONGITUDINAL JOINT WITHOUT TIE BARS
(27)	ITEM 660 – SODDING (IN RESIDENTIAL AREAS)
(28)	ITEM 606 – GUARDRAIL, TYPE 5
(29)	ITEM 203 - LINEAR GRADING
(30)	ITEM 448 – 3" ASPHALT CONCRETE INTERMEDIATE COARSE, TYPE 1 (UNDERGUARD RAIL), AS PER PLAN
(31)	ITEM 611 – 17" REINFORCED CONCRETE APPROACH SLAB

NOTES:

1. FOR LOCATIONS OF GUARDRAIL, SEE PLAN AND PROFILE SHEETS 24 – 31.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: LML DATE: OCT 92
DRAWN BY: LML DATE: OCT 92
CHECKED BY: PE DATE: OCT 92
SCALE: no scale
TYPSEC

TYPICAL SECTIONS

TYPE 451

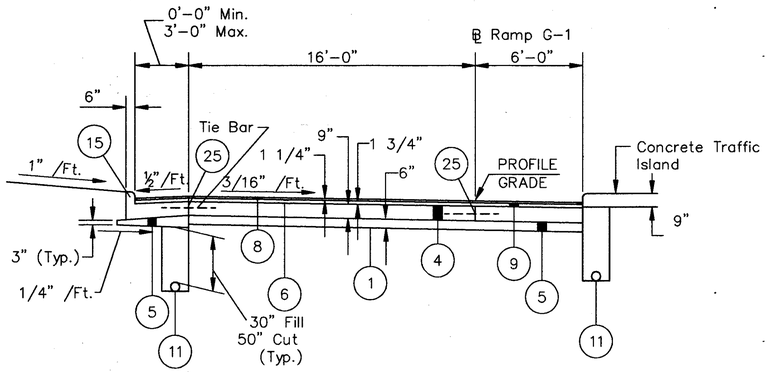
FHWA REGION	STATE	PROJECT	
5	OHIO		

4
110

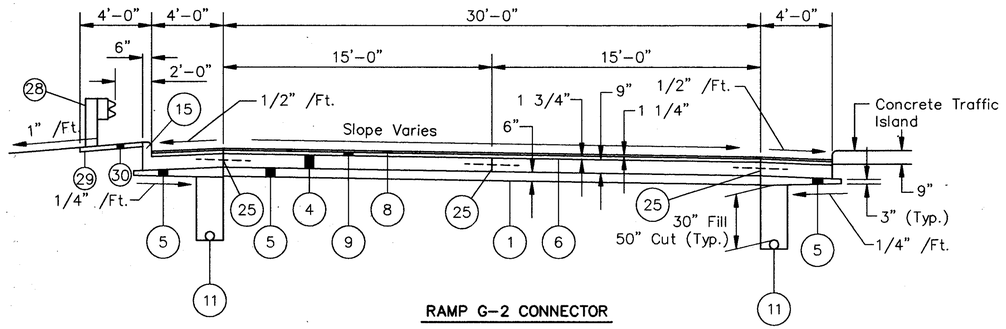
CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

4 0 4 8 16

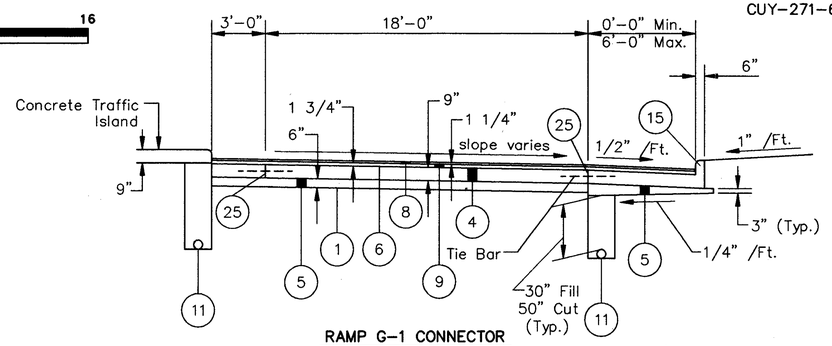
SCALE IN FEET



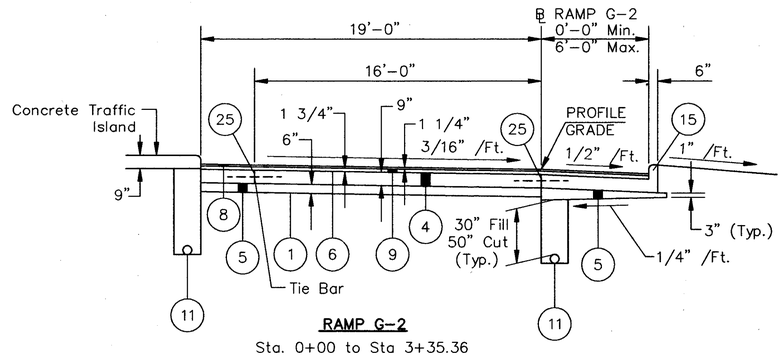
RAMP G-1
Sta. 57+41.79 to Sta. 58+57.08



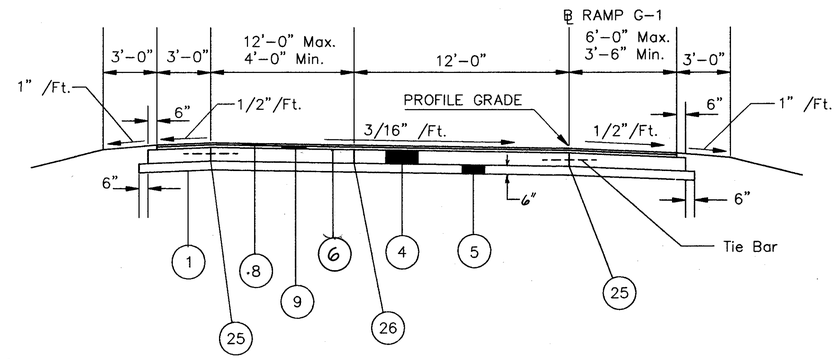
RAMP G-2 CONNECTOR



RAMP G-1 CONNECTOR

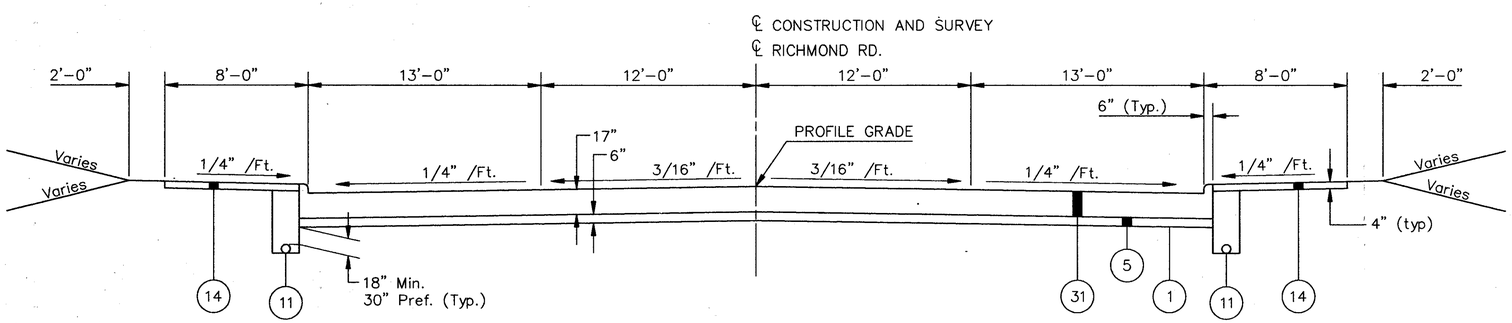


RAMP G-2
Sta. 0+00 to Sta 3+35.36
Sta. 1+64.62 Back = Sta. 1+95.97 Ahead



Ramp G-1

Sta.58+57.08 to Sta.59+75



APPROACH SLAB
Sta. 172+59.21 to Sta. 172+89.21
Sta. 181+21.01 to Sta. 181+51.01

Note: For legend see sheet 3.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: LML DATE: OCT 92
DRAWN BY: LML DATE: OCT 92
CHECKED BY: PF DATE: OCT 92
SCALE: no scale
TYPSEC

EXISTING TYPICAL SECTIONS

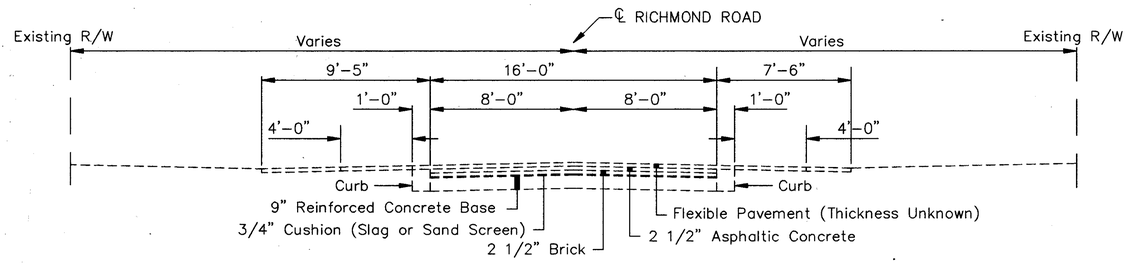
FHWA REGION	STATE	PROJECT	
5	OHIO		

5/110

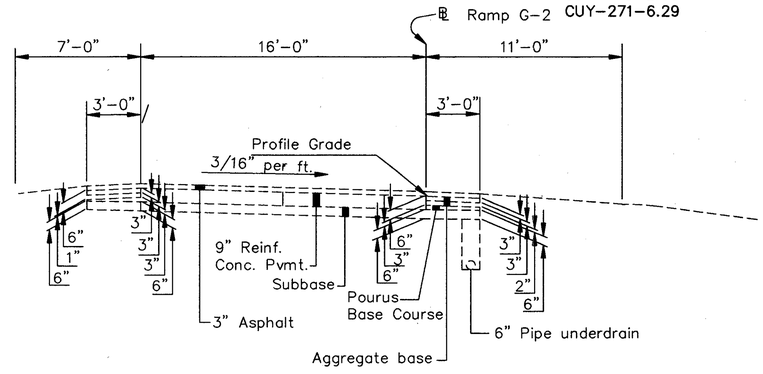
CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

4 0 4 8 16

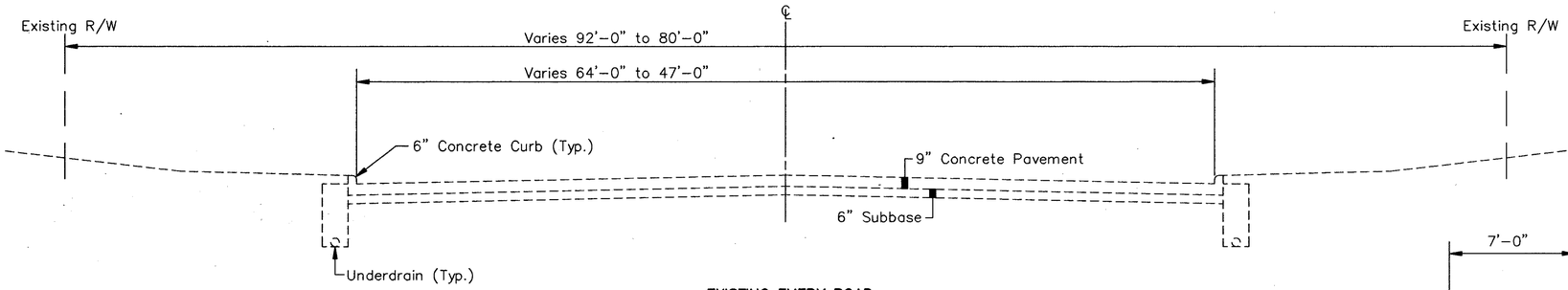
SCALE IN FEET



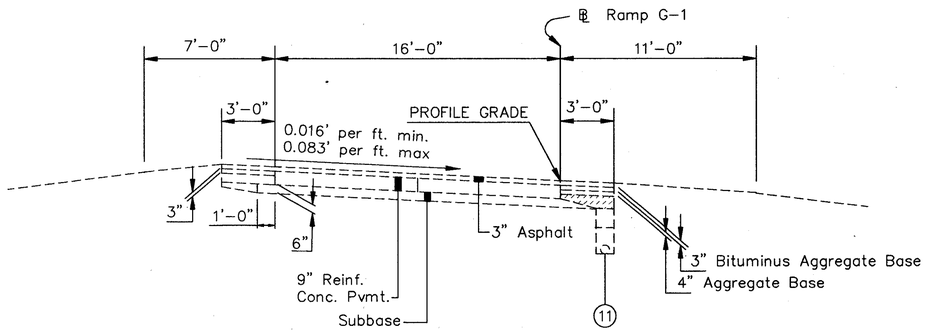
EXISTING RICHMOND ROAD
(two lane sections)
(No Scale)



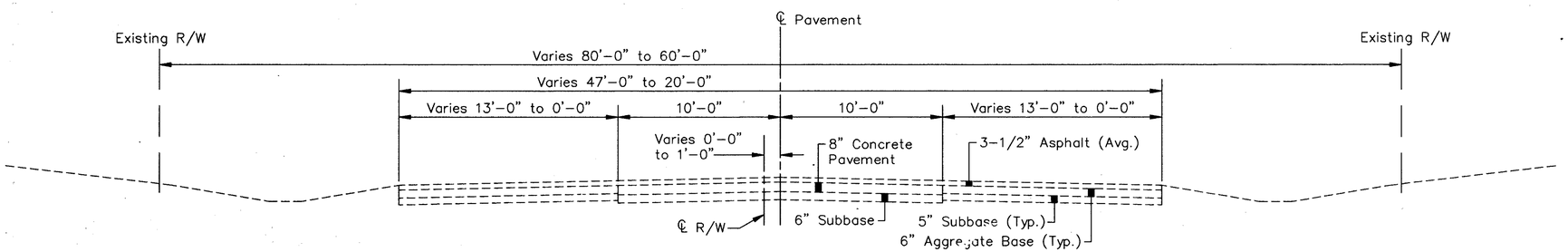
RAMP G-2



EXISTING EMERY ROAD
STA. 121+82.53 TO STA. 122+48.53
(No Scale)



RAMP G-1



EXISTING EMERY ROAD
STA. 122+48.53 TO STA. 135+41.11
(No Scale)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: LML DATE: OCT 92
DRAWN BY: LML DATE: OCT 92
CHECKED BY: PF DATE: OCT 92
SCALE: no scale
TYPSEC

FHWA REGION	STATE	PROJECT	
5	OHIO		

6
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

CONSTRUCTION SEQUENCE

GENERAL CONSTRUCTION REQUIREMENTS

1. ALL RESIDENTIAL AND COMMERCIAL DRIVES SHALL BE MAINTAINED AS DESCRIBED IN "ABUTTING PROPERTIES" OF THE GENERAL NOTES THROUGHOUT ALL PHASES OF CONSTRUCTION. THE DRIVE FURTHEST SOUTH ON THE NORTH SIDE OF THE BRIDGE, ACCESSING A COMMUNICATIONS TOWER, WILL SERVE AS A TURNAROUND FOR WAYWARD MOTORISTS.
2. ADVANCE CONSTRUCTION WARNING SIGNS SHALL BE POSTED AS REQUIRED PRIOR TO EACH PHASE.
3. ALL EXISTING OVERHEAD LANE USE CONTROL SIGNS SHALL BE BAGGED IF IN CONFLICT WITH THE MODIFIED CONSTRUCTION LANE USAGE DURING A PARTICULAR PHASE. SIGNS SHALL BE REMOVED ONCE THEY INTERFERE WITH NEW CONSTRUCTION.
4. SIGNAL HEADS ON THE TEMPORARY SIGNAL SPAN WIRE AT THE RICHMOND/ EMERY INTERSECTION WILL BE REPOSITIONED AT THE START OF EACH PHASE AS DETAILED ON SHEETS 13 – 14C.
5. AT LEAST ONE LANE WILL REMAIN OPEN IN EACH DIRECTION ON EMERY ROAD THROUGH EACH PHASE. THE SOUTH LEG OF THE RICHMOND/EMERY INTERSECTION WILL ALSO MAINTAIN A MINIMUM OF 1–LANE IN EACH DIRECTION.
6. ACCESS TO I–271 VIA RAMP G–2 WILL REMAIN THROUGHOUT CONSTRUCTION.
7. TRAFFIC WILL BE PERMITTED TO EXIT I–271 AT ALL TIMES ON RAMP G–1 BY FOLLOWING THE DETOUR ROUTE SHOWN ON SHEET 12.
8. ALL UTILITIES SHALL BE CONSTRUCTED WHILE THE PHASE IN WHICH THEY ARE LOCATED IS BEING CONSTRUCTED.

PHASE I – STAGE 1

A. WORK REQUIRED

1. BEGIN CONSTRUCTION ON THE BRIDGE. THIS WILL CONTINUE THROUGH ALL SUBSEQUENT PHASES. BEGIN INCENTIVE–DISINCENTIVE ON THE BRIDGE.
2. REMOVE THE CURBED EARTH ISLAND ON RAMP G–2 AND INSTALL TEMPORARY PAVEMENT FOR FUTURE PHASES AS SHOWN ON SHEET 13.
3. CONSTRUCT TEMPORARY PAVEMENT ALONG WEST EDGE OF RAMP G–2. FOR DETAILS SEE SHEET 13.
4. CONSTRUCT TEMPORARY PAVEMENT ALONG WEST EDGE OF RICHMOND ROAD NORTH OF THE BRIDGE TO BE UTILIZED IN LATER PHASES. FOR DETAILS, SEE SHEETS 13.
5. INSTALL TEMPORARY PAVEMENT ALONG EMERY AND TAYLOR ROADS FOR FUTURE PHASES AS SHOWN ON SHEET 13.

B. REQUIREMENTS

1. A TEMPORARY SIGNAL SHALL BE ERECTED AND MAINTAINED AT THE RICHMOND/EMERY INTERSECTION AND THE SIGNAL HEADS SHALL BE BAGGED. POSITION SIGNAL HEADS FOR PHASE I, STAGE 2. SEE SHEET 14 FOR POSITIONING DETAILS.
2. EXISTING SIGNAL AT THE RICHMOND/RAMP G–1 INTERSECTION SHALL BE MADE INOPERABLE. SEE SIGNALS NOTE ON SHEET 7.
3. CLOSE RICHMOND ROAD AT THE BRIDGE AND SET UP DETOUR ROUTE AS SHOWN ON SHEET 12. MAINTAIN EXISTING TRAFFIC SOUTH OF THE BRIDGE AND SHIFT THE TRAFFIC NORTH OF THE BRIDGE AS SHOWN ON SHEET 13.

PHASE I – STAGE 2

A. WORK REQUIRED

1. PERFORM PAVEMENT CONSTRUCTION ON THE NORTHEAST PORTION OF THE RICHMOND/EMERY INTERSECTION THROUGH THE EAST EDGE OF RAMP G–2 AND THROUGH THE TAYLOR LANE INTERSECTION ON EMERY AS SHOWN ON SHEET 14.
2. CONSTRUCT THE SOUTH HALF OF RAMP G–1 AND THE EASTERN LANES OF RICHMOND, SOUTH OF THE RAMP. SEE DETAIL ON SHEET 14.

B. REQUIREMENTS

1. EXISTING SIGNAL AT THE RICHMOND/EMERY INTERSECTION SHALL BE MADE INOPERABLE. SEE SIGNALS NOTE ON SHEET 7. ACTIVATE TEMPORARY SIGNALS PER SHEET 13 SIGNAL DETAILS.

C. SPECIAL CONDITIONS

1.) STAGE 2A

IN ORDER TO MAINTAIN TRAFFIC THROUGH THE INTERSECTION AT ALL TIMES, A 20' X 12' SQUARE OF PAVEMENT IN THE CENTER OF THE INTERSECTION WILL BE OMITTED FROM THE REST OF THE PAVEMENT CONSTRUCTION. IT WILL BE COMPLETED IMMEDIATELY AFTERWARDS USING 499 CONCRETE CLASS MODERATE–SETTING. TURNING TRAFFIC WILL THEN BE DETOURED AROUND THIS SEGMENT AS SHOWN IN THE STAGE 2A DETAIL, SHEET 14. APPROPRIATE SIGNING WILL BE ADDED FOR THIS DETAIL AS SHOWN. SEE NOTE "SHORT TERM RESTRICTIONS" IN THE MAINTENANCE OF TRAFFIC NOTES.

2.) STAGE 2B

IN ORDER TO MAINTAIN TAYLOR LANE TRAFFIC AND ACCESS TO THE FIRE STATION AT ALL TIMES, THE INTERSECTION OF EMERY ROAD AND TAYLOR LANE WILL BE CONSTRUCTED IN TWO STAGES USING 499 CONCRETE CLASS MODERATE–SETTING AS SHOWN ON SHEET 14. SEE NOTE ON "SHORT TERM RESTRICTIONS."

PHASE II

A. WORK REQUIRED

1. PERFORM PAVEMENT CONSTRUCTION ON THE NORTHWEST PORTION OF THE RICHMOND/EMERY INTERSECTION THROUGH TO THE SOUTH EDGE OF THE BRIDGE WORK. ALSO REMOVE THE TEMPORARY PAVEMENT ALONG RAMP G–2 AND CONSTRUCT THE WEST EDGE AND ISLAND AT RAMP G–2. SEE SHEET 14A.
2. CONSTRUCT THE NORTH HALF OF RAMP G–1 WITH ITS TAPERS AND ISLAND AND THE EASTERN LANES OF RICHMOND ROAD NORTH OF RAMP G–1 AS SHOWN ON SHEET 14A.
3. INSTALL TEMPORARY PAVEMENT FOR FUTURE PHASES AS SHOWN ON SHEET 14A.

PHASE III

A. WORK REQUIRED

1. PERFORM PAVEMENT CONSTRUCTION ON THE SOUTHEAST LEG OF THE RICHMOND/EMERY INTERSECTION AS SHOWN ON SHEET 14B.
2. REMOVE THE TEMPORARY PAVEMENT AND COMPLETE CONSTRUCTION ON THE ENTIRE WEST HALF OF RICHMOND ROAD NORTH OF THE BRIDGE AS DETAILED ON SHEET 14B.
3. INSTALL TEMPORARY PAVEMENT FOR PHASE IV AS SHOWN ON SHEET 14B.

B. SPECIAL CONDITIONS

1.) STAGE A

A 20' X 12' SQUARE IN THE NORTHWEST CORNER OF THE WORK AREA, AS CALLED OUT ON SHEET 16, WILL NOT BE CONSTRUCTED WITH THE REST OF THE WORK AREA. USING 499 MODERATE–SETTING CONCRETE, THAT SQUARE WILL BE CONSTRUCTED WHILE TRAFFIC IS ROUTED AROUND IT ON THE NEWLY COMPLETED PAVEMENT AS SHOWN IN THE DETAIL OF PHASE III, STAGE A, ON SHEET 14B. SEE NOTE "SHORT TERM RESTRICTIONS" IN THE MAINTENANCE OF TRAFFIC NOTES.

PHASE IV

A. WORK REQUIRED

1. PERFORM PAVEMENT CONSTRUCTION ON THE SOUTHWEST CORNER OF THE RICHMOND/EMERY INTERSECTION SHOWN ON SHEET 14C.
2. CONSTRUCT THE ASPHALT OVERLAY PORTIONS AT THE EAST END OF EMERY ROAD AND THE NORTH END OF TAYLOR LANE AS SHOWN ON SHEET 14C.

B. SPECIAL CONSIDERATION

1.) STAGE A

A 20' X 12' SQUARE IN THE CENTER OF THE INTERSECTION WILL BE COMPLETED IMMEDIATELY FOLLOWING THE REST OF THE WORK USING 499 MODERATE–SETTING CONCRETE. AS CONSTRUCTION IS BEING COMPLETED ON THIS PORTION, TRAFFIC WILL BE DETOURED ONTO THE NEWLY COMPLETED PAVEMENT AS SHOWN IN THE PHASE IV, STAGE A DETAIL ON SHEET 14C. SEE NOTE "SHORT TERM RESTRICTIONS" IN THE MAINTENANCE OF TRAFFIC NOTES.

2.) STAGE B

START TO CONSTRUCT THE ASPHALT OVERLAY IMMEDIATELY AFTER ALL OTHER WORK HAS BEEN COMPLETED AND THE INTERSECTION IS FULLY OPERATIONAL, BUT BEFORE THE BRIDGE IS OPENED. USE STANDARD DRAWING MT–97.11 TO MAINTAIN ONE LANE OF TRAFFIC DURING CONSTRUCTION.

CONSTRUCTION REQUIREMENTS ON THE FREEWAY

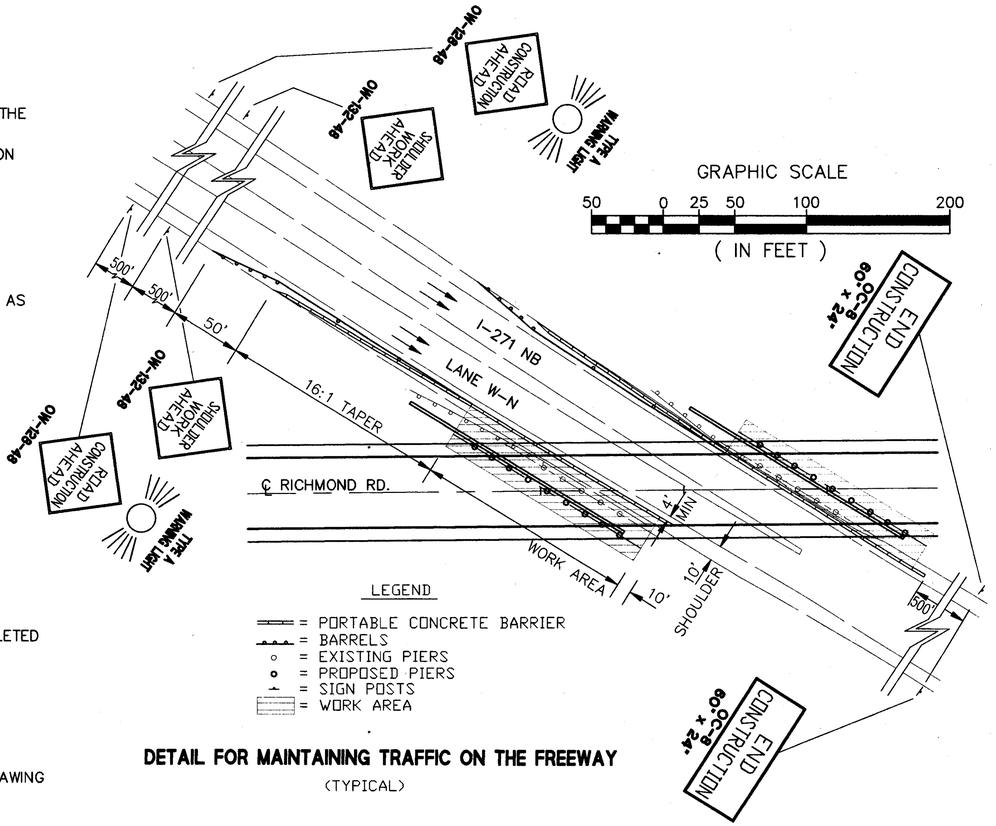
THIS WORK SHALL BE COMPLETED AT ANY POINT THROUGHOUT THE PREVIOUS PHASES AT THE CONVENIENCE OF THE CONTRACTOR, BUT WHILE THE BRIDGE IS STILL UNDER CONSTRUCTION.

A. WORK REQUIRED

1. REMOVE THE GUARDRAIL LOCATED ALONG I–271 UNDERNEATH THE RICHMOND ROAD BRIDGE. REPLACE IT WITH 622 PORTABLE CONCRETE BARRIER THEN REMOVE AND REPLACE BRIDGE PIERS.

B. REQUIREMENTS

1. IN ORDER TO REMOVE THE EXISTING PIERS, BOTH THE RIGHT AND LEFT SHOULDERS OF THE NORTHBOUND FREEWAY LANES AND THE RIGHT SHOULDER OF THE SOUTHBOUND LANES SHALL BE CLOSED USING PORTABLE CONCRETE BARRIER. THE BARRIER SHALL BE PLACED AT LEAST FOUR (4) FEET AWAY FROM THE EDGE OF PAVEMENT AND SHALL IN NO WAY AFFECT THE TRAVELED LANES ON THE FREEWAY. A "SHOULDER WORK AHEAD" SIGN (OW–132–48) SHALL BE PLACED 500' IN ADVANCE OF THE BARREL TAPER AS SHOWN IN THE DETAIL BELOW.
2. AFTER THE EXISTING PIERS HAVE BEEN REMOVED AND THE NEW PIERS ERECTED, THE PORTABLE CONCRETE BARRIER BECOMES THE PROPERTY OF ODOT TO BE REPOSITIONED AGAINST THE NEW PIERS WHERE IT WILL REMAIN UNTIL THE GUARDRAIL AND PERMANENT BARRIER ARE REPLACED UNDER ANOTHER CONTRACTUAL PHASE. ALL CONSTRUCTION SIGNS AND BARRELS CAN BE REMOVED ONCE THE EXISTING PIERS HAVE BEEN REMOVED AND THE BARRIER RELOCATED.



DETAIL FOR MAINTAINING TRAFFIC ON THE FREEWAY

(TYPICAL)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: FEB '93
SCALE: N/A
RMOT–CS.DWG

FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY
CUY-175-6.29
CUY-271-6.28

MAINTENANCE OF TRAFFIC NOTES

GENERAL

BEFORE WORK BEGINS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THE NAMES AND TELEPHONE NUMBERS OF AT LEAST TWO PERSONS WHO CAN BE CONTACTED 24 HOURS PER DAY BY THE OHIO DEPARTMENT OF TRANS-PORTATION, THE CUYAHOGA COUNTY ENGINEER, AND ALL INTERESTED POLICE AGENCIES. THESE PERSONS SHALL BE RESPONSIBLE FOR PLACING OR REPLACING NECESSARY TRAFFIC CONTROL DEVICES TO MAINTAIN THE TRAVELED PAVEMENT SAFELY.

TRAFFIC SHALL BE MAINTAINED WITHOUT INTERRUPTION ON I-271 DURING CONSTRUCTION OF THE WORK EXCEPT AS OTHERWISE APPROVED BY THE ENGINEER OR SPECIFIED IN THESE NOTES OR PLANS. THE CONTRACTOR SHALL SET UP AND OPERATE HIS EQUIPMENT IN SUCH A MANNER AS TO NOT ENCROACH UPON THE TRAVELED PAVEMENT.

NOTIFICATION

THE CONTRACTOR SHALL SUBMIT A SCHEDULE OF OPERATION, IN WRITING, TO THE PROJECT ENGINEER FOR HIS APPROVAL AT LEAST 14 DAYS PRIOR TO ANY TRAFFIC RESTRICTION. THE CONTRACTOR SHALL ALSO NOTIFY, IN WRITING, THE FOLLOWING AGENCIES 14 DAYS PRIOR TO ANY RESTRICTION:

CUYAHOGA COMMUNITY COLLEGE
THE CUYAHOGA COUNTY ENGINEER
THE GREATER CLEVELAND REGIONAL TRANSIT AUTHORITY
THE CUYAHOGA COUNTY BOARD OF MENTAL RETARDATION
THE WARRENSVILLE HEIGHTS BOARD OF EDUCATION, AND
THE WARRENSVILLE HEIGHTS AND HIGHLAND HILLS POLICE, FIRE, AND SERVICE DEPARTMENTS.

THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR PROVIDING AT LEAST 48 HOURS OF ADVANCED NOTICE TO THE PROJECT ENGINEER AND ALL OF THE ABOVE LISTED AGENCIES FOR ANY MINOR RESTRICTIONS INCLUDING, BUT NOT LIMITED TO, FLAGGER OPERATION AND/OR ANY TEMPORARY LANE CLOSURES PRIOR TO THE BRIDGE CLOSURE. ALL SUCH WORK SHALL BE PERFORMED DURING THE NON-RUSH HOUR PERIODS MENTIONED BELOW.

PHASING OF CONSTRUCTION

PHASING OF CONSTRUCTION AS APPEARS IN THESE MAINTENANCE OF TRAFFIC PLANS IS INTENDED TO PROVIDE FOR THE COMPLETION OF ALL WORK IN FOUR PHASES AS DETAILED UNDER "CONSTRUCTION SEQUENCE" ON SHEET 6.

THE CONTRACTOR SHALL COMPLETE ALL WORK, EXCLUSIVE OF PLACING THE FINAL PAVEMENT MARKINGS IN THE TRANSITION ZONE BETWEEN SECTIONS, IN A GIVEN CONSTRUCTION SECTION BEFORE BEGINNING ANY WORK IN A SUBSEQUENT SECTION, SUBJECT TO THE THE APPROVAL OF THE ENGINEER. NORMAL VEHICULAR TRAFFIC SHALL BE MAINTAINED AT ALL TIMES BEYOND THE WORK LIMITS OF THE SECTION CURRENTLY UNDER CONSTRUCTION.

LANE CLOSURES

LANE CLOSURES WILL ONLY BE PERMITTED ON I-271 AT THE FOLLOWING TIMES USING DRUMS, SIGNING, AND FLASHING ARROW BOARDS AS PER MT-95.30 AND THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, ALSO KNOWN AS THE "MANUAL."

1. WEEKDAYS
   A. 1 LANE CLOSURES

NORTH & SOUTHBOUND	9:00 AM TO 2:00 PM
NORTHBOUND	10:00 PM TO 6:00 AM
SOUTHBOUND	7:00 PM TO 6:00 AM

   B. 2 LANE CLOSURES

NORTH AND SOUTHBOUND	11:00 PM TO 6:00 AM

2. WEEKENDS
   A. 1 LANE CLOSURES

NORTHBOUND	10:00 PM FRIDAY TO 6:00 AM MONDAY
SOUTHBOUND	7:00 PM FRIDAY TO 6:00 AM MONDAY

   B. 2 LANE CLOSURES

NORTH AND SOUTHBOUND	12:00 AM SATURDAY TO 8:00 AM SATURDAY
	12:00 AM SUNDAY TO 10:00 AM SUNDAY

THERE SHALL BE NO LANE CLOSURES DURING HOLIDAYS OR SPECIAL EVENTS AND A LANE CLOSURE WILL ONLY BE PERMITTED AS LONG AS WORK RELATED TO THAT LANE CLOSURE IS BEING PERFORMED.

THE FOLLOWING DAYS SHALL BE DESIGNATED AS HOLIDAYS AND ANY OTHER HOLIDAYS OR SPECIAL EVENTS SHALL BE AS DIRECTED BY THE ENGINEER:

NEW YEARS	LABOR DAY
MEMORIAL DAY	THANKSGIVING
FOURTH OF JULY	CHRISTMAS

THE PERIOD OF TIME THAT THE LANES ARE TO BE OPEN DEPENDS ON THE DAY OF THE WEEK ON WHICH THE HOLIDAY OR SPECIAL EVENT FALLS. THE FOLLOWING SCHEDULE SHALL BE USED TO DETERMINE THE PERIOD.

DAY OF THE WEEK	TIME ALL LANES MUST BE OPEN TO TRAFFIC
SUNDAY	12:00N FRIDAY THROUGH 12:00N MONDAY
MONDAY	12:00N FRIDAY THROUGH 12:00N TUESDAY
TUESDAY	12:00N MONDAY THROUGH 12:00N WEDNESDAY
WEDNESDAY	12:00N TUESDAY THROUGH 12:00N THURSDAY
THURSDAY	12:00N WEDNESDAY THROUGH 12:00N MONDAY
FRIDAY	12:00N THURSDAY THROUGH 12:00N MONDAY
SATURDAY	12:00N FRIDAY THROUGH 12:00N MONDAY

NO EXTENSIONS OF TIME SHALL BE GRANTED FOR DELAYS IN MATERIAL DELIVERIES, UNLESS SUCH DELAYS ARE INDUSTRY-WIDE, OR FOR LABOR STRIKES, UNLESS SUCH STRIKES ARE AREA-WIDE.

SHOULD THE CONTRACTOR FAIL TO MEET ANY OF THESE REQUIREMENTS, THE CONTRACTOR SHALL BE ASSESSED LIQUIDATED DAMAGES IN THE AMOUNT OF $ 8,800 PER DAY.

TRAFFIC MAY ONLY BE STOPPED COMPLETELY ON I-271 DURING THE ABOVE MENTIONED PERIODS WHEN TWO LANE CLOSURES ARE PERMITTED. COMPLETE STOPPAGE OF TRAFFIC NEED ONLY OCCUR DURING THE REMOVAL AND REERECTION OF THE BRIDGE WHEN OVERSIZED BEAMS ARE BEING TRANSPORTED ACROSS HIGHWAY LANES, AND THEN ONLY FOR SHORT TIME INTERVALS TO BE OPENED AGAIN WHEN THE BEAMS ARE SECURED IN PLACE OR REMOVED. SEE "STOPPING TRAFFIC ON THE FREEWAY" DETAIL ON SHEET 9.

MAINTAINING VEHICULAR TRAFFIC

GENERAL PROVISIONS

1. ALL TRAFFIC CONTROL DEVICES SHALL BE IN ACCORDANCE WITH THE MANUAL.
2. EXISTING SIGNS LOCATED WITHIN THE ROAD WORK AREAS WHICH ARE NECESSARY FOR INTERIM OR PERMANENT TRAFFIC CONTROL SHALL BE REMOVED AND REERECTED IN LOCATIONS AS APPROVED BY THE ENGINEER.
3. THE CONTRACTOR SHALL FURNISH, ERECT, MAINTAIN AND REMOVE ALL TRAFFIC CONTROL DEVICES AND DETOUR SIGNING NECESSARY FOR MAINTAINING TRAFFIC. THE CONTRACTOR SHALL DETERMINE WHAT SIGNS ARE NEEDED AND ADVISE THE ENGINEER 2 WEEKS IN ADVANCE OF HIS DETAILED PLANS.
4. TRAFFIC CONTROL DEVICES SHALL BE SET UP PRIOR TO THE START OF CONSTRUCTION, AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH SPECIAL CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS THEY ARE NEEDED AND SHALL BE IMMEDI-ATELY REMOVED THEREAFTER. WHERE OPERATIONS ARE PERFORMED IN STAGES, THERE SHALL BE IN PLACE ONLY THOSE DEVICES THAT APPLY TO THE CONDITION PRESENT DURING THE STAGE IN PROGRESS. ALL SIGNS WITH MESSAGES WHICH DO NOT APPLY DURING A CERTAIN PERIOD SHALL BE COVERED OR SET ASIDE OUT OF THE VIEW OF TRAFFIC.

UTILITIES

EXISTING UNDERGROUND UTILITIES ARE SHOWN ON ROADWAY PLAN SHEETS. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING TYPE AND LOCATION OF OVERHEAD AND UNDERGROUND UTILITIES AND, AS NECESSARY, ADJUST LOCATION OF TEMPORARY TRAFFIC SIGNAL OR SIGN INSTALLATIONS, AS APPROVED BY ENGINEER, TO AVOID INTERFERENCE OR DAMAGE THERETO.

SHORT TERM RESTRICTIONS

CERTAIN RESTRICTIONS DETAILED IN THESE MAINTENANCE OF TRAFFIC PLANS SHALL BE KEPT TO AN ABSOLUTE MINIMUM. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL THE TIME SCHEDULE FOR THESE CLOSURES OR RESTRICTIONS. THE CONTRACTOR SHALL USE MODERATE-SETTING CONCRETE, AS SPECIFIED IN THE PLANS, IN ACCORDANCE WITH ITEM MS 499 TO MINIMIZE THE CONSTRUCTION TIME.

ABUTTING PROPERTIES

THE CONTRACTOR SHALL MAINTAIN SAFE AND SATISFACTORY ACCESS TO ALL ABUTTING PROPERTIES. RESIDENTIAL DRIVES MAY BE CLOSED FOR A PERIOD NOT TO EXCEED 14 CONSECUTIVE CALENDAR DAYS. LIQUIDATED DAMAGES SHALL BE ASSESSED IN THE AMOUNT OF $100 PER DAY PER DRIVE FOR EACH CALENDAR DAY THE DRIVE REMAINS CLOSED BEYOND THE SPECIFIED LIMIT. DURING THE PERIOD THE DRIVEWAY IS CLOSED, RESIDENTS MUST BE ABLE TO PARK ON THE PAVEMENT WITHIN THE CONSTRUCTION ZONE. COMMERCIAL DRIVES MAY ONLY BE CLOSED IF OTHER ACCESS DRIVES ARE AVAILABLE. THE CONTRACTOR MUST NOTIFY ALL PROPERTY OWNERS OF ACCESS RESTRICTIONS ONE WEEK IN ADVANCE. ALL RESTRICTIONS AND CLOSURES SHALL BE PROPERLY SIGNED AND/OR BARRICADED.

EQUIPMENT AND MATERIAL STORAGE

IN ORDER TO PROVIDE FOR THE SAFETY OF THE TRAVELING PUBLIC THE CONTRACTORS ATTENTION IS DIRECTED TO 614.03. IN ADDITION THE FOLLOWING PROVISIONS SHALL APPLY:

1. STORED OR PARKED VEHICLES, MATERIALS AND EQUIPMENT SHALL BE LOCATED BEHIND THE DRUM LINE WITHIN THE WORK AREA ON RICHMOND ROAD OR 30' OFF THE TRAVELED WAY ON I-271.
2. ANY REMOVED ITEMS SHALL NOT BE STORED ON THE RIGHT OF WAY FOR MORE THAN 30 DAYS.
3. ALL DISTURBED AREAS SHALL BE RETURNED TO THEIR ORIGINAL CONDITION AT NO EXPENSE TO THE STATE.
4. ALL CONSTRUCTION TRAFFIC SHALL USE ACCEPTABLE TRUCK ROUTES TO ACCESS THE CONSTRUCTION AREA. USE OF LOCAL RESIDENTIAL STREETS IS STRICTLY PROHIBITED UNLESS ALLOWED IN WRITING BY THE LOCAL ENFORCEMENT AGENCY.

TRAFFIC CONTROL MATERIALS

A. SIGNS
SIGN DIMENSIONS AND SPECIFICATIONS, INCLUDING LETTER SIZES, SHALL BE AS PROVIDED IN THE "MANUAL", OR IN SIGN DESIGN DRAWINGS PROVIDED BY THE DEPARTMENT OF TRANSPORTATION. THE SIGNS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER PRIOR TO THE START OF THE PROJECT. ADVANCE WARNING SIGNS ARE TO BE PROVIDED AS OUTLINED ON SHEETS 12 – 14C.

B. SIGN SUPPORTS
SUPPORTS SHALL BE ADEQUATE IN MASS AND STABILITY TO PREVENT THE SIGNS FROM BEING BLOWN OVER BY WIND OR VEHICULAR GENERATED AIR TURBULENCE IN ACCORDANCE WITH STANDARD DRAWINGS MT-105.10 AND MT-105.11.

C. DRUMS
DRUMS SHALL BE IN ACCORDANCE WITH PERTINENT SECTIONS OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES. ALL PERMANENT LANE CLOSURES SHALL BE DELINEATED WITH DRUMS SPACED AT 25' CENTER TO CENTER ON STRAIGHT-AWAYS AND 10' CENTER TO CENTER AT INTERSECTIONS AND AROUND CURVES. ALL COSTS FOR INSTALLING, MAINTAINING AND SUBSEQUENT REMOVAL OF SAID DRUMS SHALL BE INCLUDED IN THE LUMP SUM BID PRICE FOR ITEM 614 – MAINTAINING TRAFFIC.

D. BARRICADES
BARRICADES SHALL BE IN ACCORDANCE WITH PERTINENT SECTIONS OF THE OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND STANDARD DRAWING MT-101.60.

E. FLASHING ARROW PANEL
WHENEVER ANY PART OF THE TRAVELED SURFACE IS CLOSED, THE MOTORIST SHALL BE WARNED AND DIVERTED BY THE CONTRACTOR THROUGH THE USE OF ONE FLASHING ARROW PANEL FOR EACH LANE CLOSED. THE CONTRACTOR SHALL REFER TO STANDARD DRAWING TC-35.10 AND THE PROVISION SET FORTH IN OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS FOR ALL INFORMATION REGARDING FURNISHING, MAINTAINING AND USE OF FLASHING ARROW PANEL. PAYMENT FOR THE ABOVE SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM 614 – MAINTAINING TRAFFIC.

HOWARD NEEDLES TAMMEN & BERGENDOFF HNTB
ARCHITECTS ENGINEERS PLANNERS

MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: FEB '93
SCALE: N/A
RMOT-GN

MAINTENANCE OF TRAFFIC NOTES

F. SIGNALS

A TEMPORARY SIGNAL SHALL BE PROVIDED AT THE RICHMOND/EMERY INTERSECTION AS DETAILED ON PLAN SHEET 13. ALSO SEE SHEET 13 FOR THE SIGNAL TIMING, DISPLAY, SEQUENCE, WIRING, AND HEAD DETAILS. THESE DETAILS SHALL BE APPLICABLE TO ALL PHASES OF CONSTRUCTION. ALL OTHER ITEMS SHALL BE AS REQUIRED UNDER ITEM 614 – MAINTAINING TRAFFIC WITH PAYMENT UNDER THE SAME.

THE SIGNAL LOCATED AT THE RICHMOND/RAMP G-1 INTERSECTION SHALL BE MADE INOPERABLE AT THE START OF CONSTRUCTION EITHER BY REMOVING THE SIGNAL INSTALLATION OR BAGGING THE SIGNAL HEADS AND REMOVING THEM AT A LATER, MORE CONVENIENT DATE.

PAYMENT

PAYMENT FOR THE ABOVE WORK INCLUDING PROVIDING, ERECTING, MAINTAINING, AND REMOVING ALL SIGNS, BARRICADES, DRUMS, REGULATORY SIGNS, AND OBLITERATION OF EXISTING PAVEMENT MARKINGS SHALL BE INCLUDED IN THE LUMP SUM BID FOR ITEM 614 – MAINTAINING TRAFFIC.

ITEM 614 – TEMPORARY PAVEMENT MARKINGS

ALL TEMPORARY PAVEMENT MARKINGS AND SIGNS REQUIRED FOR A PARTICULAR LANE CLOSURE OR TRAFFIC PATTERN SHALL BE INSTALLED ON A SINGLE WORK DAY, AND THE CORRESPONDING TRAFFIC PATTERN, AS DETAILED ON THE PLANS, SHALL BE IMPLEMENTED IMMEDIATELY.

TYPICAL LOCATIONS INCLUDE:

A. LANE CLOSURES
B. LANE SHIFTS

THE FOLLOWING ESTIMATED QUANTITIES AS SUMMARIZED ON SHEET 11 HAVE BEEN INCLUDED IN THE GENERAL SUMMARY TO BE USED AS OUTLINED ABOVE AND SHOWN IN THE TRAFFIC MAINTENANCE PLANS. THE AMOUNT AND LOCATION OF THESE ITEMS SHALL BE RECORDED WITH PAYMENT BASED ON FINAL MEASUREMENTS.

ITEM 614 – TEMPORARY EDGE LINES, WHITE, CLASS 1, 642 PAINT	0.57 MI.
ITEM 614 – TEMPORARY EDGE LINES, WHITE, CLASS 1, 740.05 TYPE C	1.18 MI.
ITEM 614 – TEMPORARY EDGE LINES, YELLOW, CLASS 1, 642 PAINT	0.26 MI.
ITEM 614 – TEMPORARY EDGE LINES, YELLOW, CLASS 1, 740.05 TYPE C	0.36 MI.
ITEM 614 – TEMPORARY CHANNELIZING LINES, CLASS 1, 642 PAINT	77 L.F.
ITEM 614 – TEMPORARY CHANNELIZING LINES, CLASS 1, 740.05 TYPE C	899 L.F.
ITEM 614 – TEMPORARY CENTER LINES, DOUBLE SOLID, CLASS 1, 642 PAINT	0.39 MI.
ITEM 614 – TEMPORARY CENTER LINES, DOUBLE SOLID, CLASS 1, 740.05 TYPE C	0.80 MI.
ITEM 614 – TEMPORARY DOTTED LINES, CLASS 1, 642 PAINT	62 L.F.
ITEM 614 – TEMPORARY LANE ARROW, CLASS 1, 642 PAINT	5 EA.
ITEM 614 – TEMPORARY LANE ARROW, CLASS 1, 740.05 TYPE C	7 EA.
ITEM 614 – TEMPORARY STOP LINE, CLASS 1, 642 PAINT	69 L.F.
ITEM 614 – TEMPORARY STOP LINE, CLASS 1, 740.05 TYPE C	134 L.F.
ITEM 614 – TEMPORARY LANE LINE, CLASS 1, 740.05 TYPE C	0.10 MI.

ITEM 614 – PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN

THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN AND REMOVE, WHEN NO LONGER NEEDED, A DIESEL OR SOLAR POWERED CHANGEABLE MESSAGE SIGN, ON SITE, FOR THE TIMES LISTED. EACH SIGN SHALL BE EITHER A WINK-O-MATIC GENERATION 3, 4, 6, 10 OR 12, AMERICAN SIGNAL CO. CMS – T300 OR AN ADDCO DIGI-DOT SIGN OR A TELE-SPOT SENTINAL SIGN PSI SOLAR/LED OR AN APPROVED EQUAL.

EACH SIGN SHALL BE TRAILER MOUNTED AND EQUIPPED WITH A FUNCTIONAL DIMMING MECHANISM TO DIM THE SIGN DURING DARKNESS AND A TAMPER AND VANDAL PROOF ENCLOSURE. EACH SIGN SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS TO ENABLE ON-SITE PERSONNEL TO OPERATE AND TROUBLESHOOT THE UNIT. THE SIGN SHALL ALSO BE CAPABLE OF BEING POWERED BY AN ELECTRICAL SERVICE DROP FROM A LOCAL UTILITY COMPANY.

THE PROBABLE LOCATIONS AND WORK LIMITS FOR THOSE LOCATIONS ARE SHOWN ON SHEET 12 OF THE PLAN OR AS DIRECTED BY THE ENGINEER. PLACEMENT, OPERATION, MAINTENANCE AND ALL ACTIVATION OF THE SIGNS BY THE CONTRACTOR SHALL BE AS DIRECTED BY THE ENGINEER. THE PCMS SHALL BE LOCATED IN A HIGHLY VISIBLE POSITION YET PROTECTED FROM TRAFFIC. THE CONTRACTOR SHALL, AT THE DIRECTION OF THE ENGINEER, RELOCATE THE PCMS TO IMPROVE VISIBILITY OR ACCOMMODATE CHANGED CONDITIONS. WHEN NOT IN USE, THE PCMS WILL BE OFF, FACING AWAY FROM ALL TRAFFIC AND SHALL DISPLAY ONE OR MORE HIGH INTENSITY YELLOW REFLECTIVE SHEETING SURFACES OF 9-INCH BY 15-INCH MINIMUM SIZE FACING TRAFFIC.

THE ENGINEER SHALL BE PROVIDED ACCESS TO EACH SIGN UNIT AND SHALL BE PROVIDED WITH APPROPRIATE TRAINING AND OPERATION INSTRUCTIONS TO ENABLE ODOT PERSONNEL TO OPERATE AND TROUBLESHOOT THE UNIT AND TO REVISE SIGN MESSAGES, IF NECESSARY.

ALL MESSAGES TO BE DISPLAYED ON THE SIGN WILL BE PROVIDED BY THE ENGINEER. A LIST OF ALL REQUIRED PREPROGRAMMED MESSAGES WILL BE GIVEN TO THE CONTRACTOR AT THE PROJECT PRECONSTRUCTION CONFERENCE.

THE SIGN SHALL HAVE TWO DIFFERENT MEMORIES (PROM AND RAM) AND CAPABILITY TO STORE UP TO 90 MESSAGES IN EACH MEMORY. SIGN MESSAGES SHALL BE LEGIBLE FROM 650 FT MINIMUM. THE SIGN LEGEND SHALL BE CAPABLE OF BEING CHANGED IN THE FIELD. IN ORDER TO CONVEY A MAXIMUM OF INFORMATION AT A SINGLE GLANCE, ONLY THREE-LINE PRESENTATION FORMATS WITH A MAXIMUM OF SIX MESSAGE PHASES WILL BE PERMITTED. NORMALLY, ONLY A MAXIMUM OF THREE MESSAGE PHASES SHOULD BE EMPLOYED. PCMS FORMAT SHALL PERMIT THE COMPLETE MESSAGE FOR EACH PHASE TO BE READ AT LEAST ONCE.

TWO (2) PCMS WILL BE NEEDED FOR ONE (1) WEEK FOR ADVANCE NOTICE OF RICHMOND ROAD CLOSING. TWO PCMS WILL BE NEEDED FOR EACH DIRECTION AND EACH TIME TRAFFIC IS TO BE COMPLETELY STOPPED ON I-271.

THE PCMS SHALL CONTAIN AN ACCURATE CLOCK AND PROGRAMMING LOGIC WHICH WILL ALLOW THE SIGN TO BE ACTIVATED, DEACTIVATED OR MESSAGES CHANGED AUTOMATICALLY AT DIFFERENT TIMES OF THE DAY FOR DIFFERENT DAYS OF THE WEEK.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR 24 HOURS PER DAY OPERATION AND MAINTENANCE OF THESE SIGNS ON THE PROJECT FOR THE DURATION OF THE PHASES WHEN THE PLAN REQUIRES THEIR USE.

THE REQUIREMENT TO FURNISH, INSTALL, MAINTAIN AND REMOVE A PCMS UNIT ON THIS PROJECT SHALL NOT IN ANY WAY RELIEVE THE CONTRACTOR OF HIS RESPONSIBILITIES AS OUTLINED IN 104.04.

PAYMENT FOR THE ABOVE DESCRIBED ITEM SHALL BE AT THE CONTRACT UNIT PRICE BID FOR EACH ITEM 614 PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN AND SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, FUELS, LUBRICATING OILS, SOFTWARE, HARDWARE AND INCIDENTALS TO PERFORM THE ABOVE DESCRIBED WORK.

ITEM 614 – PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN 2 EACH

ITEM 404 – BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC

IN ORDER TO PROVIDE FOR LOCAL ACCESS, LONGITUDINAL VERTICAL FACES ABUTTING DRIVES SHALL BE TEMPORARILY RAMPED. TRANSVERSE VERTICAL FACES SHALL BE TEMPORARILY RAMPED A MINIMUM OF TEN (10) FEET IN LENGTH, AND TRAFFIC SHALL BE WARNED WITH OW-62 "BUMP" SIGNS IN ADVANCE OF THE RAMPED AREAS.

ALL CASTINGS ENCOUNTERED SHALL BE SET TO GRADE AND PAID FOR UNDER VARIOUS ITEMS DESCRIBED ELSEWHERE IN THE GENERAL NOTES OR SPECIFICATIONS. THE CASTING ELEVATION DIFFERENTIAL SHALL NOT BE GREATER THAN ONE (1) INCH WHEN EXPOSED TO TRAFFIC.

TEMPORARY RAMPING SHALL BE USED IN AREAS WHERE IT IS NECESSARY FOR VEHICLES TO TRAVEL ON BOTH NEW AND EXISTING PAVEMENT DURING CONSTRUCTION TO MAINTAIN PHASING.

ALL TEMPORARY RAMPING SHALL BE INSTALLED AT THE DIRECTION OF THE ENGINEER USING ITEM 404 – BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC.

THE FOLLOWING QUANTITY IS ESTIMATED AND ARE INCLUDED FOR USE ONLY AND IN AMOUNTS AS DIRECTED BY THE ENGINEER. THE PROVISIONS OF SECTION 104.02 WILL APPLY TO THESE ITEMS. THE AMOUNT OF THESE ITEMS AND THE LOCATIONS WHERE USED SHALL BE RECORDED AS USED, AND PAYMENT WILL BE BASED ON FINAL MEASUREMENTS.

ITEM 404 – BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC 50 CU. YDS.

ITEM 615 – TEMPORARY ROAD AND PAVEMENT

THIS WORK SHALL INVOLVE UNEARTHING, REPAIRING, WIDENING, GRADING, AND RESURFACING THE EXISTING ROADWAY TO PROVIDE TEMPORARY ACCESS FOR TRAFFIC ON RICHMOND ROAD AND ON THE ENTRANCE AND EXIT RAMPS OF I-271. TEMPORARY PAVEMENT SHALL BE PLACED AT THE FOLLOWING LOCATIONS:

* WEST SIDE OF RICHMOND ROAD NORTH OF BRIDGE – STA. 183+00 TO STA. 189+80, PHASE I, STAGE 1.
* SOUTH SIDE OF EMERY ROAD EAST OF THE RICHMOND AND EMERY INTERSECTION – STA. 122+80 TO STA. 126+55, PHASE I, STAGE 1.
* EAST SIDE OF TAYLOR LANE – STA. 10+42 TO STA. 10+90, PHASE I, STAGE 1.
* EAST SIDE OF RICHMOND ROAD NORTH OF BRIDGE – STA. 187+00 TO STA. 189+35, PHASE II.
* EAST SIDE OF RICHMOND ROAD SOUTH OF RICHMOND/EMERY INTERSECTION – STA. 166+68 TO STA 167+50, PHASE III.
* WIDEN WEST EDGE OF RAMP G-2 – STA. 172+95 TO STA. 173+95. SEE PHASE I, STAGE 1. FILL IN AREA OF EXISTING TRAFFIC ISLAND.

THE FOLLOWING QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:
TEMPORARY PAVEMENT

PHASE I, STAGE 1	1215 S.Y.
PHASE II	60 S.Y.
PHASE III	11 S.Y.

ITEM 615 – TEMPORARY PAVEMENT, CLASS B	1286 S.Y.
ITEM 615 – TEMPORARY ROAD	LUMP SUM

ITEM 622 – PORTABLE CONCRETE BARRIER

PORTABLE CONCRETE BARRIER (PCB), 32-INCH, SHALL BE PLACED AT EACH END OF THE BRIDGE AS SHOWN ON SHEET 13 IN ORDER TO DETER VEHICLES FROM GETTING TOO CLOSE TO THE BRIDGE. IT SHALL ALSO BE PLACED ON THE SHOULDER OF I-271 WHILE THE PIERS ARE BEING REMOVED AS SHOWN IN THE DETAIL AND EXPLAINED ON SHEET 6.

THE FOLLOWING QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:
PORTABLE CONCRETE BARRIER

ALONG THE FREEWAY	
NORTHBOUND RIGHT	325 FT.
NORTHBOUND LEFT	325 FT.
SOUTHBOUND RIGHT	325 FT.
BLOCKING THE BRIDGE	
SOUTH OF BRIDGE	67 FT.
NORTH OF BRIDGE	28 FT.

ITEM 622 – PORTABLE CONCRETE BARRIER, 32" 1070 L.F.

HOWARD NEEDLES TAMMEN & BERGENDOFF HNTB
ARCHITECTS ENGINEERS PLANNERS

MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: FEB '93
SCALE: N/A
RMOT-GN.DWG

MAINTENANCE OF TRAFFIC NOTES

DELINEATION OF PORTABLE CONCRETE BARRIER

PORTABLE CONCRETE BARRIER SHALL BE DELINEATED WITH REFLECTORS, OBJECT MARKERS, AND REFLECTIVE SHEETING. STEADY BURN WARNING LIGHTS ARE NOT REQUIRED ON PCB.

1. REFLECTORS SHALL BE MOUNTED ON THE FACE OF THE PCB WITH THE TOP OF THE REFLECTOR APPROXIMATELY 26 INCHES ABOVE THE BASE AND AT A MAXIMUM SPACING OF 25 FEET. THE REFLECTOR SHALL BE: CUBE CORNER PRISM, REFLEXITE SHEETING, OR 3-M DIAMOND GRADE SHEETING. THE REFLECTOR SHALL HAVE A MINIMUM AREA OF 7.5 SQUARE INCHES WITH NO DIMENSION LESS THAN 2-INCHES. THEY SHALL BE YELLOW IF ON THE LEFT SIDE OF TRAFFIC AND WHITE ON THE RIGHT. WHEN ADJACENT TO A REVERSIBLE TRAFFIC DIRECTION LANE, YELLOW AND WHITE REFLECTORS SHALL BE PAIRED BACK-TO-BACK.
2. TOP MOUNTED OBJECT MARKERS (9" X 15") WITH ORANGE REFLECTIVE SHEETING, TYPE G (730.19) SHALL BE MOUNTED MIDWAY BETWEEN THE FACE MOUNTED REFLECTORS. WHEN ADJACENT TO A REVERSIBLE TRAFFIC DIRECTION LANE OR BETWEEN OPPOSING TRAFFIC FLOWS, THEY SHALL BE MOUNTED IN PAIRS FACING TRAFFIC FROM EACH DIRECTION.

THE FOLLOWING QUANTITIES HAVE BEEN CARRIED TO THE GENERAL SUMMARY:

BARRIER REFLECTOR

I-271 NORTHBOUND, RIGHT	13 EACH
I-271 NORTHBOUND, LEFT	13 EACH
I-271 SOUTHBOUND, RIGHT	13 EACH

ITEM 614 - BARRIER REFLECTOR, TYPE B 39 EACH
ITEM 614 - OBJECT MARKER 39 EACH

3. TAPERED END SECTIONS AND EXPOSED ENDS: OBJECT MARKERS (9" X 15") WITH ORANGE REFLECTIVE SHEETING, TYPE G, SHALL BE MOUNTED DIRECTLY ABOVE THE TOP SURFACE AT EACH END OF THE SECTION.

ITEM SPECIAL - REPLACEMENT SIGN

FLAT SHEET SIGNS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENT OF THE PLANS, SPECIFICATIONS, AND PROPOSAL WHICH BECAME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. REPLACEMENT SIGNS SHALL BE NEW. OTHER MATERIALS MAY BE USED BUT IN GOOD CONDITION SUBJECT TO APPROVAL BY THE ENGINEER.

PAYMENT FOR THE NEW SIGNS WILL BE MADE AT THE BID PRICE PER SQUARE FOOT FOR "ITEM SPECIAL - REPLACEMENT SIGN," AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF THE DAMAGED SIGNS, HARDWARE, AND SUPPORTS; AND PROVIDING THE NECESSARY REPLACEMENT HARDWARE, SUPPORTS, ETC.

AN ESTIMATED QUANTITY OF 100 SQUARE FEET HAS BEEN PROVIDED IN THE GENERAL SUMMARY.

ITEM SPECIAL - REPLACEMENT SIGN 100 S.F.

ITEM SPECIAL - REPLACEMENT DRUM

DRUMS FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENT OF THE PLANS, SPECIFICATIONS, AND PROPOSAL WHICH BECAME DAMAGED BY TRAFFIC FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR SHALL BE REPLACED IN KIND WHEN ORDERED BY THE ENGINEER. REPLACEMENT DRUMS SHALL BE NEW.

PAYMENT FOR THE NEW DRUMS SHALL BE MADE AT THE BID PRICE PER EACH FOR "ITEM SPECIAL - REPLACEMENT DRUM," AND SHALL INCLUDE THE COST OF REMOVING AND DISPOSING OF THE DAMAGED DRUM; AND PROVIDING AND MAINTAINING THE REPLACEMENT DRUM IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS FOR THE ORIGINAL DRUM.

AN ESTIMATED QUANTITY OF 100 EACH HAS BEEN PROVIDED IN THE GENERAL SUMMARY.

ITEM SPECIAL - REPLACEMENT DRUM 100 EACH

ITEM SPECIAL - LAW ENFORCEMENT OFFICER WITH PATROL CAR

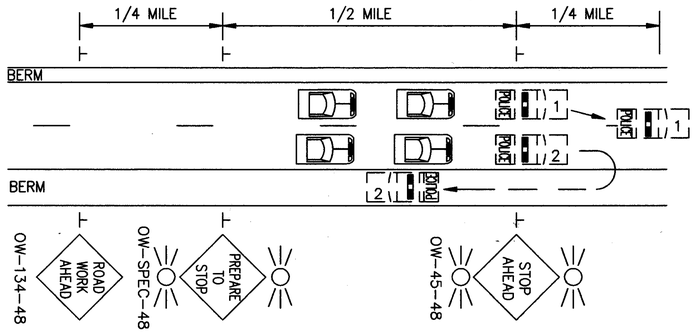
THE CONTRACTOR SHALL PROVIDE AND PAY ALL COST FOR THE SERVICES OF A LAW ENFORCEMENT OFFICER WITH PATROL CAR FOR THE EXCLUSIVE PURPOSE OF CONTROLLING TRAFFIC WHENEVER A CHANGE IN THE TRAFFIC PATTERN TAKES PLACE DUE TO LANE SHIFTS ON I-271. A LAW ENFORCEMENT OFFICER MUST ALSO BE PRESENT DURING THE SETTING UP AND TEARING DOWN OF ALL WORK ZONES. THE NEED FOR A LAW ENFORCEMENT OFFICER SHALL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. PAYMENT FOR THE ABOVE WILL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM SPECIAL - LAW ENFORCEMENT OFFICER WITH PATROL CAR.

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ARRANGE-MENTS FOR SCHEDULING AND PAYMENT OF THE LAW ENFORCEMENT OFFICER.

ITEM SPECIAL - LAW ENFORCEMENT OFFICER WITH PATROL CAR 200 HRS.

STOPPING TRAFFIC ON THE FREEWAY

REMOVAL OF THE EXISTING SPANS AND REERECTION OF THE NEW SPANS OF THE RICHMOND ROAD BRIDGE OVER I-271, WHICH SHALL REQUIRE COMPLETE TRAFFIC STOPPAGE ON ALL LANES IN ANY GIVEN TRAVELED DIRECTION, SHALL BE COMPLETED IN SUCH A WAY THAT NO DIRECTION IS CLOSED MORE THAN 10 MINUTES IN ANY ONE CONSECUTIVE 30 MINUTE PERIOD. A MINIMUM OF TWO (2) LAW ENFORCEMENT PATROL VEHICLES SHALL BE USED TO PACE MOTORISTS TO A STOP. AFTER TRAFFIC HAS BEEN SLOWED, ONE (1) PATROL VEHICLE SHALL TRAVEL ALONG THE ROADWAY SHOULDER 500 FEET BEHIND THE BACK OF STOPPED VEHICLES. WHERE STOPPAGE OCCURS IN THE VICINITY OF FREEWAY ENTRANCES, THE CONTRACTOR SHALL PLACE FLAGGERS ON THE RAMPS TO STOP TRAFFIC. HE SHALL ALSO ERECT AND MAINTAIN "ROADWORK AHEAD," "PREPARE TO STOP," AND "STOP AHEAD" SIGNS WITH FLASHING TWELVE (12) INCH TRAFFIC SIGNAL HEADS IN ACCORDANCE WITH 632.05. THESE SIGNS SHALL BE ILLUMINATED DURING NIGHT OPERATIONS. PATROL VEHICLES AND SIGNS SHALL BE LOCATED IN ACCORDANCE WITH THE FOLLOWING SKETCH.



MAINTENANCE OF TRAFFIC SUMMARY

FHWA REGION	STATE	PROJECT	
5	OHIO		

10
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

STP FUNDING

SHEET NUMBER 7	8	9	10	11	18	ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	AS PER PLAN REFERENCE SHT.#
										MAINTENANCE OF TRAFFIC	
	50					404	35000	50	CU YD	BITUMINOUS CONCRETE FOR MAINTAINING TRAFFIC	
		200				SPECIAL	61411100	200	HOUR	LAW ENFORCEMENT OFFICER WITH PATROL CAR	
		100				SPECIAL	61412500	100	SQ FT	REPLACEMENT SIGN	
		100				SPECIAL	61412600	100	EACH	REPLACEMENT DRUM	
		39				614	13300	39	EACH	BARRIER REFLECTOR, TYPE B	
		39				614	13350	39	EACH	OBJECT MARKER	
	2					614	18501	2	EACH	PORTABLE CHANGEABLE MESSAGE SIGN, AS PER PLAN	8
				0.10		614	20300	0.10	MILE	TEMPORARY LANE LINE, CLASS I, 740.05, TYPE C	
				0.39		614	21100	0.39	MILE	TEMPORARY CENTER LINE, CLASS I, 642 PAINT	
				0.80		614	21300	0.80	MILE	TEMPORARY CENTER LINE, CLASS I, 740.05, TYPE C	
				0.83		614	22100	0.83	MILE	TEMPORARY EDGE LINE, CLASS I, 642 PAINT	
				1.54		614	22300	1.54	MILE	TEMPORARY EDGE LINE, CLASS I, 740.05, TYPE C	
				77		614	23200	77	LIN FT	TEMPORARY CHANNELIZING LINE, CLASS I, 642 PAINT	
				899		614	23600	899	LIN FT	TEMPORARY CHANNELIZING LINE, CLASS I, 740.05, TYPE C	
				62		614	24200	62	LIN FT	TEMPORARY DOTTED LINE, CLASS I, 642 PAINT	
				69		614	26200	69	LIN FT	TEMPORARY STOP LINE, CLASS I, 642 PAINT	
				134		614	26600	134	LIN FT	TEMPORARY STOP LINE, CLASS I, 740.05, TYPE C	
				5		614	30200	5	EACH	TEMPORARY LANE ARROW, CLASS I, 642 PAINT	
				7		614	30600	7	EACH	TEMPORARY LANE ARROW, CLASS I, 740.05, TYPE C	
	LUMP					615	10000	LUMP		TEMPORARY ROAD	
	1286					615	25000	1286	SQ YD	TEMPORARY PAVEMENT, CLASS B	
	1070				450	622	40020	1520	LIN FT	PORTABLE CONCRETE BARRIER, 32"	

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: MAR '93
DRAWN BY: DAK DATE: MAR '93
CHECKED BY: TMA DATE: MAR '93
SCALE: N/A
R-MOTGEN.DWG

TEMPORARY PAVEMENT MARKING QUANTITIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

11/110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

ITEM 614 - TEMPORARY EDGE LINE, WHITE (PAINT)

PHASE	STATION FROM	STATION TO	SIDE	TOTAL (LIN FT)
PHASE I, STAGE 1	RICHMOND ROAD			
	183+00	190+00	LT.	700
PHASE I, STAGE 2	RICHMOND ROAD			
	168+26	168+66	RT.	40
	168+48	170+03	LT. & RT.	156
	183+10	185+75	LT.	265
	185+80	189+95	LT. & RT.	420
	EMERY ROAD			
	121+18	123+97	RT.	289
	121+18	121+81	RT.	63
	TAYLOR LANE			
	9+90	11+30	LT.	140
	10+10	10+90	RT.	80
	RAMP G-2			
	0+00	3+98	LT.	412
PHASE II	RICHMOND ROAD			
	185+15	186+15	LT.	100
	EMERY ROAD			
	120+37	121+27	RT.	90
PHASE III	EMERY ROAD			
	120+37	120+91	RT.	100
	123+97	125+47	RT.	150
			TABLE TOTAL:	3005

ITEM 614 - TEMPORARY EDGE LINE, WHITE (TAPE)

PHASE	STATION FROM	STATION TO	SIDE	TOTAL (LIN FT)
PHASE I, STAGE 2	RICHMOND ROAD			
	168+26	168+94	RT.	120
	EMERY ROAD			
	113+04	120+14	RT.	710
	118+44	120+37	LT. & RT.	205
	123+97	128+28	LT. & RT.	431
PHASE II	EMERY ROAD			
	121+50	124+98	LT.	410
	RAMP G-1			
	57+41	62+50	RT.	530
PHASE III	RICHMOND ROAD			
	162+70	168+30	RT.	570
	167+78	168+30	RT.	52
	167+55	168+30	RT.	115
	168+70	170+03	RT.	150
	183+10	190+70	LT. & RT.	760
	EMERY ROAD			
	118+20	120+37	RT.	217
	121+22	121+70	RT.	48
	121+40	123+48	RT.	215
	RAMP G-2			
	0+00	1+35	LT.	145
PHASE IV	RICHMOND ROAD			
	162+70	168+10	LT. & RT.	540
	167+50	168+30	LT.	125
	167+80	168+30	RT.	50
	EMERY ROAD			
	116+70	121+25	RT.	466
	120+65	121+27	RT.	62
	121+50	123+97	RT.	274
			TABLE TOTAL:	6195

ITEM 614 - TEMPORARY EDGE LINE, YELLOW (PAINT)

PHASE	STATION FROM	STATION TO	SIDE	TOTAL (LIN FT)
PHASE I, STAGE 1	RICHMOND ROAD			
	168+65	173+95	LT. & RT.	614
PHASE I, STAGE 2	RICHMOND ROAD			
	168+27	171+70	LT.	385
	RAMP G-1			
	57+75	59+75	LT. & RT.	245
	RAMP G-2			
	1+43	3+05	LT.	155
			TABLE TOTAL:	1399
			TOTAL EDGE LINE (PAINT):	0.83 MI.

ITEM 614 - TEMPORARY EDGE LINE, YELLOW (TAPE)

PHASE	STATION FROM	STATION TO	SIDE	TOTAL (LIN FT)
PHASE I, STAGE 2	EMERY ROAD			
	121+18	121+81	LT. & RT.	73
	RAMP G-1			
	59+75	62+50	LT.	280
PHASE II	RICHMOND ROAD			
	168+25	170+03	RT.	178
	RAMP G-1			
	57+20	57+75	RT.	55
	RAMP G-2			
	0+00	3+35	LT.	360
PHASE III	RICHMOND ROAD			
	167+78	168+30	RT.	70
	168+67	170+03	LT.	175
	RAMP G-1			
	58+20	59+75	RT.	160
	RAMP G-2			
	0+00	1+35	LT.	145
PHASE IV	RICHMOND ROAD			
	167+80	168+30	LT.	80
	169+15	170+03	RT.	88
	EMERY ROAD			
	120+37	121+33	LT.	127
	RAMP G-2			
	0+00	1+35	LT.	135
			TABLE TOTAL:	1926
			TOTAL EDGE LINE (TAPE):	1.54MI.

ITEM 614 - TEMPORARY CHANNELIZING LINE (PAINT)

PHASE	STATION FROM	STATION TO	SIDE	TOTAL (LIN FT)
PHASE II	EMERY ROAD			
	121+71	122+48	RT.	77
			TABLE TOTAL:	77

ITEM 614 - TEMPORARY CHANNELIZING LINE (TAPE)

PHASE	STATION FROM	STATION TO	SIDE	TOTAL (LIN FT)
PHASE III	EMERY ROAD			
	118+42	120+65	LT.	223
	118+42	120+65	RT.	223
	121+80	123+48	LT.	168
PHASE IV	EMERY ROAD			
	119+35	120+77	LT.	142
	121+80	123+23	LT.	143
			TABLE TOTAL:	899

ITEM 614 - TEMPORARY CENTERLINE, DOUBLE YELLOW (PAINT)

PHASE	STATION FROM	STATION TO	SIDE	TOTAL (LIN FT)
PHASE I, STAGE 1	RICHMOND ROAD			
	184+15	189+90	LT. & RT.	588
PHASE I, STAGE 2	RICHMOND ROAD			
	183+10	188+00	LT.	490
	EMERY ROAD			
	121+58	123+97	RT.	239
PHASE II	EMERY ROAD			
	122+48	125+48	RT.	610
PHASE III	EMERY ROAD			
	123+97	125+47	RT.	149
			TABLE TOTAL:	2076
			TOTAL CENTERLINE (PAINT):	0.39 MI.

ITEM 614 - TEMPORARY CENTERLINE, DOUBLE YELLOW (TAPE)

PHASE	STATION FROM	STATION TO	SIDE	TOTAL (LIN FT)
PHASE I, STAGE 2	RICHMOND ROAD			
	188+00	189+95	LT.	195
	EMERY ROAD			
	123+97	128+28	RT.	431
	118+19	120+45	RT.	226
PHASE II	EMERY ROAD			
	121+71	122+48	RT.	77
PHASE III	RICHMOND ROAD			
	183+10	188+25	RT.	515
	188+25	190+70	RT.	245
	EMERY ROAD			
	116+42	120+65	LT.	620
	121+80	123+97	LT.	217
PHASE IV	RICHMOND ROAD			
	163+00	167+70	RT.	870
	EMERY ROAD			
	116+20	119+35	LT.	630
	121+80	123+23	LT.	186
			TABLE TOTAL:	4212
			TOTAL CENTERLINE (TAPE):	0.80 MI.

ITEM 614 - TEMPORARY DOTTED LINE (PAINT)

PHASE	STATION FROM	STATION TO	SIDE	TOTAL (LIN FT)
PHASE II	RICHMOND ROAD			
	167+63	168+25	RT.	62
			TABLE TOTAL:	62

ITEM 614 - TEMPORARY LANE LINE (TAPE)

PHASE	STATION FROM	STATION TO	SIDE	TOTAL (LIN FT)
PHASE III	EMERY ROAD			
	116+92	118+20	RT.	128
PHASE IV	EMERY ROAD			
	116+70	119+35	RT.	265
	121+80	123+23	RT.	143
			TABLE TOTAL:	536
			TOTAL LANE LINE (TAPE):	0.10 MI.

ITEM 614 - TEMPORARY LANE ARROWS (PAINT)

PHASE	STATION FROM	STATION TO	SIDE	TOTAL (EACH)
PHASE I, STAGE 2	RICHMOND ROAD			
	167+10		RT.	1
	167+50		RT.	1
PHASE II	RICHMOND ROAD			
	167+10		LT.	1
	167+50		LT.	1
PHASE III	EMERY ROAD			
	120+15		RT.	1
			TABLE TOTAL:	5

ITEM 614 - TEMPORARY LANE ARROWS (TAPE)

PHASE	STATION FROM	STATION TO	SIDE	TOTAL (EACH)
PHASE II	EMERY ROAD			
	121+81		RT.	1
	122+21		RT.	1
PHASE III	EMERY ROAD			
	120+15		LT.	1
	120+55		RT.	1
	120+55		LT.	1
	121+90		LT.	1
	122+30		LT.	1
			TABLE TOTAL:	7

ITEM 614 - TEMPORARY STOP LINE (PAINT)

PHASE	STATION FROM	STATION TO	SIDE	TOTAL (LIN FT)
PHASE I, STAGE 2	RICHMOND ROAD			
	167+61	167+63	LT. & RT.	27
	EMERY ROAD			
	120+43	120+45	RT.	12
	121+58	121+60	RT.	13
PHASE III	RICHMOND ROAD			
	167+82	167+84	LT. & RT.	17
			TABLE TOTAL:	69

ITEM 614 - TEMPORARY STOP LINE (TAPE)

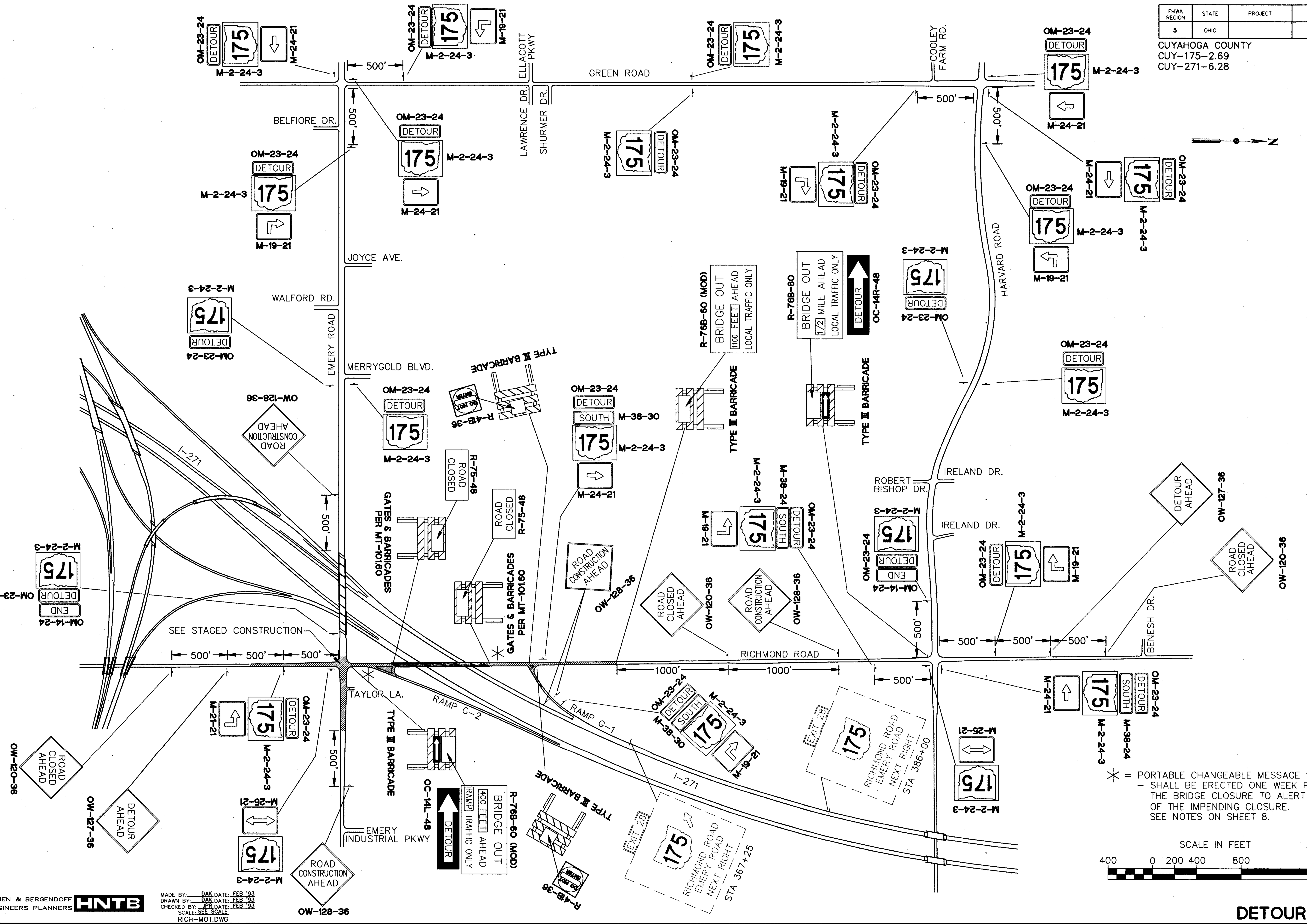
PHASE	STATION FROM	STATION TO	SIDE	TOTAL (LIN FT)
PHASE I, STAGE 2	TAYLOR LANE			
	11+31	11+33	RT.	10
	11+31	11+33	LT.	10
PHASE II	EMERY ROAD			
	121+71	121+73	RT.	23
PHASE III	EMERY ROAD			
	120+63	120+65	LT. & RT.	36
	121+80	121+82	LT.	24
PHASE IV	RICHMOND ROAD			
	167+68	167+70	RT.	10
	EMERY ROAD			
	120+75	120+77	LT. & RT.	21
			TABLE TOTAL:	134

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: APR '93
DRAWN BY: DAK DATE: APR '93
CHECKED BY: AMM DATE: APR '93
SCALE: N/A
R-MOTPM.DWG

FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY
CUY-175-2.69
CUY-271-6.28


GREEN ROAD
ELLACOTT PKWY.
LAWRENCE DR.
SHURMER DR.
COOLEY FARM RD.
BELFIORE DR.
JOYCE AVE.
WALFORD RD.
EMERY ROAD
MERRYGOLD BLVD.
HARVARD ROAD
ROBERT BISHOP DR.
IRELAND DR.
IRELAND DR.
BENESH DR.
RICHMOND ROAD
TAYLOR LA.
RAMP G-2
RAMP G-1
I-271
I-271
EMERY INDUSTRIAL PKWY
SEE STAGED CONSTRUCTION
TYPE III BARRICADE
GATES & BARRICADES PER MT-10160
ROAD CLOSED
R-75-48
BRIDGE OUT
1100 FEET AHEAD
LOCAL TRAFFIC ONLY
R-76B-60 (MOD)
BRIDGE OUT
1/2 MILE AHEAD
LOCAL TRAFFIC ONLY
R-76B-60
DETOUR
OC-14R-48
BRIDGE OUT
400 FEET AHEAD
RAMP TRAFFIC ONLY
OC-14L-48
R-41B-36
ROAD CONSTRUCTION AHEAD
OW-128-36
ROAD CLOSED AHEAD
OW-120-36
DETOUR AHEAD
OW-127-36
OM-23-24
DETOUR
175
M-2-24-3
SOUTH
M-38-30
M-24-21
M-19-21
M-25-21
END
OM-14-24
EXIT 28
RICHMOND ROAD
EMERY ROAD
NEXT RIGHT
STA 386+00
STA 367+25
500'
1000'

* = PORTABLE CHANGEABLE MESSAGE SIGN
- SHALL BE ERECTED ONE WEEK PRIOR TO THE BRIDGE CLOSURE TO ALERT TRAFFIC OF THE IMPENDING CLOSURE.
  SEE NOTES ON SHEET 8.

SCALE IN FEET
400 0 200 400 800 1600

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: FEB '93
SCALE: SEE SCALE
RICH-MOT.DWG

DETOUR PLAN

RICHMOND ROAD MAINTENANCE OF TRAFFIC PLAN

FHWA REGION	STATE	PROJECT		
5	OHIO			

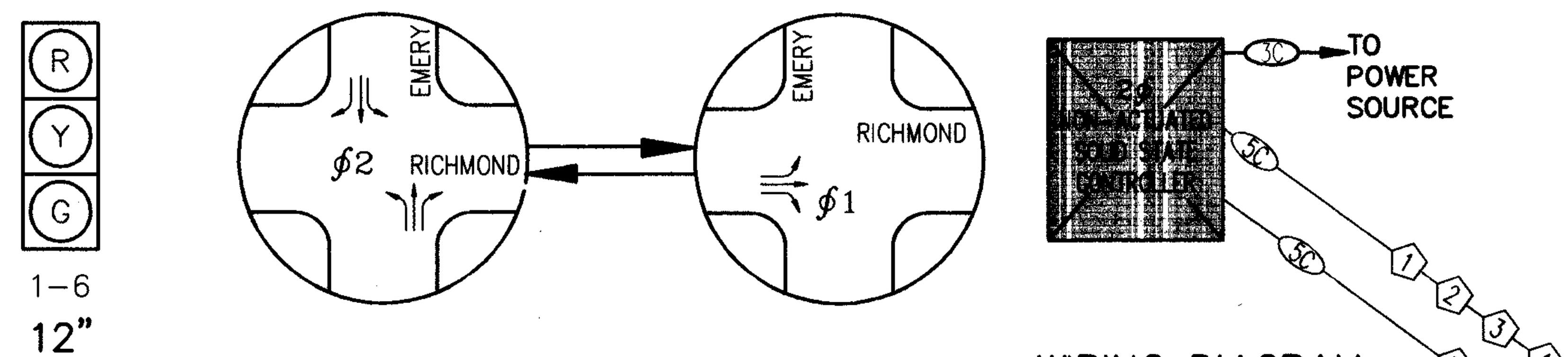
CUYAHOGA COUNTY
CUY-175-6.29
CUY-271-6.28

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)
N
END CONSTRUCTION
OC-8
60" x 24"
ROAD CONSTRUCTION AHEAD
OW-128-36
STA 107+35
STA 116+00
TEMPORARY SIGNAL SUPPORT STA 167+77 ℄ RICHMOND RD 58' LT. W/POLE MOUNTED CONTROLLER
STA 162+50
WORK LIMITS
R/W
℄ EMERY RD
120+00
122+00
124+00
126+00
170+00
℄ RICHMOND RD
℄ RICHMOND ROAD
STA 160+00
TEMPORARY SIGNAL SUPPORT STA 168+95 ℄ RICHMOND RD 57' RT.
SEE SIGNAL DETAILS FOR TIMING, DISPLAY, PHASING, AND WIRING FOR TEMPORARY SIGNAL
℄ TAYLOR LANE
TEMPORARY PAVEMENT TO ALLOW FOR ONE-WAY TRAFFIC ON TAYLOR LANE DURING PHASE I, STAGE 2
TEMPORARY PAVEMENT TO ALLOW FOR 2-WAY TRAFFIC IN PHASE I, STAGE 2
STA 128+50
STA 130+75
GATES & BARRICADES PER MT-101.60
R-75-48
ROAD CLOSED
PORTABLE CONCRETE BARRIER SEE MAINTENANCE OF TRAFFIC NOTES
L/A
℄ RAMP G-2
REMOVE CURB AND INSTALL TEMPORARY PAVEMENT FOR FUTURE TRAFFIC
DRUM LINE @ 10' C/C
TEMPORARY PAVEMENT TO ALLOW FOR ENTRANCE RAMP TRAFFIC IN PHASE I, STAGE 2
PORTABLE CONCRETE BARRIER. SEE MAINTENANCE OF TRAFFIC NOTES
MAINTAIN ACCESS TO DRIVE AT ALL TIMES, WILL SERVE AS TURN AROUND FOR TRAFFIC
BEGIN TEMPORARY PAVEMENT STA 183+00
STA 183+10
TEMPORARY PAVEMENT TO ALLOW FOR 2-WAY TRAFFIC IN PHASE I, STAGE 2
REMOVE EXISTING TRAFFIC SIGNAL. SEE MAINTENANCE OF TRAFFIC NOTES
DRUM LINE @ 25' C/C
185+00
BEGIN TAPER STA 188+25
END TAPER STA 189+80
155.00'
STA 193+00
STA 190+45
STA 186+10
STA 57+60
STA 57+65
STA 57+77
℄ RAMP G-1
60+00
STA 62+00
STOP
R-1-48

SIGNAL DETAILS

APPLICABLE FOR ALL PHASES OF CONSTRUCTION

TRAFFIC SIGNAL TIMING AND DISPLAY ACTUATED CONTROLLERS											
2 - ∅ SEMI - ACTUATED / RICHMOND & EMERY ROADS						START IN: FLASH ○ 8 SEC. ALL RED ●			FIRST PHASE: ∅ 2 GREEN ● YELLOW ○		
GREEN TIME						27			23		
YELLOW							3			3	
ALL RED								2			2
						INTERVAL COLORS					
						∅1			∅2		
STREET	DIRECTION	SIGNAL	LENS	EMERG-FLASH	PRE-EMPT	1	2	3	4	5	6
EMERY ROAD	EB WB	1,2 3,4	R			R	R	R			R
			Y	Y						Y	
			G						G		
RICHMOND ROAD	NB	5,6	R	R				R	R	R	R
			Y				Y				
			G			G					



SIGNAL HEAD DETAIL

PHASE SEQUENCE DIAGRAM

THE NUMBER OF LANES PER APPROACH VARIES PER PHASE

WIRING DIAGRAM

LEGEND

- ☐ = ITEM 615 – TEMPORARY PAVEMENT, CLASS B
- ▩ = WORK AREA – FULL DEPTH CONCRETE REPLACEMENT
- ▨ = WORK AREA – ASPHALT OVERLAY
- ▩ = WORK AREA W/499, CLASS MS CONCRETE
- = DRUM LINE
- = ITEM 622 – PORTABLE CONCRETE BARRIER
- = TRAFFIC DIRECTIONAL AREA
- = EXISTING LANE ARROW
- = EXISTING WORD "ONLY"
- = TEMPORARY LANE ARROW
- (X_n) = X = LETTER CORRESPONDING TO LEGEND BELOW; n = NUMBER CORRESPONDING TO PHASE IN WHICH QUANTITY IS PAID

X:
- A = TEMPORARY EDGE LINE, WHITE (PAINT)
- B = TEMPORARY EDGE LINE, WHITE (TAPE)
- C = TEMPORARY EDGE LINE, YELLOW (PAINT)
- D = TEMPORARY EDGE LINE, YELLOW (TAPE)
- E = TEMPORARY CENTERLINE, DOUBLE SOLID (PAINT)
- F = TEMPORARY CENTERLINE, DOUBLE SOLID (TAPE)
- G = TEMPORARY CHANNELIZING LINE (PAINT)
- H = TEMPORARY CHANNELIZING LINE (TAPE)
- J = TEMPORARY LANE LINE (TAPE)
- K = TEMPORARY STOP LINE (PAINT)
- L = TEMPORARY STOP LINE (TAPE)
- M = TEMPORARY LANE ARROW (PAINT)
- N = TEMPORARY LANE ARROW (TAPE)
- P = TEMPORARY DASHED LINE, YELLOW (PAINT)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: FEB '93
SCALE: SEE SCALE
RMOT-TMP.DWG

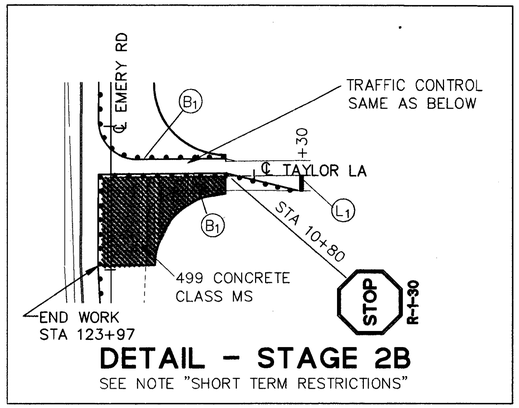
PHASE I, STAGE 1

RICHMOND ROAD MAINTENANCE OF TRAFFIC PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

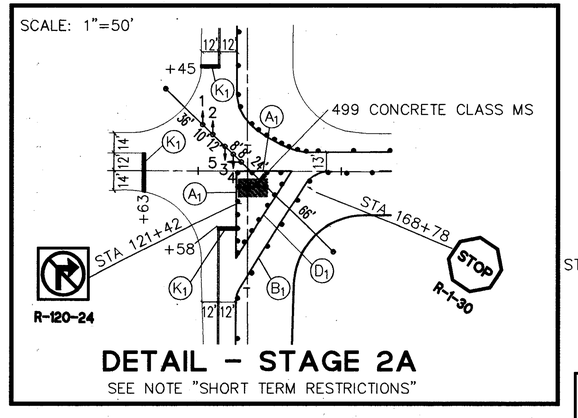
14/110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29



DETAIL - STAGE 2B

SEE NOTE "SHORT TERM RESTRICTIONS"



DETAIL - STAGE 2A

SEE NOTE "SHORT TERM RESTRICTIONS"

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: FEB 93
DRAWN BY: DAK DATE: FEB 93
CHECKED BY: PR DATE: FEB 93
SCALE: SEE SCALE
RMOT-PLDWG

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)

FOR LEGEND - SEE SHEET 13

PHASE I, STAGE 2

RICHMOND ROAD MAINTENANCE OF TRAFFIC PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

14A
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

OW-128-36 ROAD CONSTRUCTION AHEAD
OW-143-18 25 MPH
RIGHT LANE CLOSED AHEAD
OW-123-36 STA 108+85
STA 107+35
OW-138-30 STA 114+40
B – B
END TAPER STA 115+69
STA 116+00
END CONSTRUCTION
OC-8 60" x 24"
OW-138-30 STA 117+80
BEGIN TAPER STA 118+44
OW-60D-36 STA 110+55
BEGIN TAPER MATCH EXISTING STA 113+04
B – B
STA 113+20
FLASHING ARROW PANEL
M-24-21 STA 119+00
BEGIN TAPER STA 118+19
℄ EMERY RD.
25'
OW-138-30
271 M-5C-24-3
M-37-24
NORTH ONLY
M-8-SPECIAL
W-1-30
STA 120+70
170'
120+00
30'
END TAPER STA 120+14
WORK LIMITS
+45
STA 169+50
OC-8 60" x 24"
END CONSTRUCTION
STA 162+50
R/W
165+00
℄ RICHMOND ROAD
R/W
STA 165+50
STA 160+00
OW-128-36 ROAD CONSTRUCTION AHEAD
M-26-21
271 M-5C-24-3
NORTH ONLY M-37-24
M-8-SPECIAL
R-37R-24 KEEP RIGHT
+63
+71
STA 168+26
95'
R/W
WORK LIMITS
STA 121+80
R-31B-36 ONLY
BEGIN TAPER STA 122+48
STA 122+45
RIGHT LANE MUST TURN RIGHT
R-32R-30
STA 122+90
M-8-SPECIAL ONLY NORTH M-37-24
271 M-5C-24-3
M-24-21
250'
R/W
END TAPER MATCH EXISTING STA 124+98
STA 124+20
OW-138-30
OC-8 60" x 24"
END CONSTRUCTION
STA 125+20
50'
STA 128+50
ROAD CONSTRUCTION AHEAD
OW-128-36
STA 130+75
10' 10'
℄ RAMP G-2
L/A
STA 170+00
℄ RICHMOND RD.
R/W
WORK LIMITS
STA 185+00
STA 57+42
STA 57+48
STOP R-1-48
STOP R-1-48
TYPE III BARRICADE
℄ RAMP G-1
BEGIN TAPER STA 188+00
END TAPER MATCH EXISTING STA 189+95
TEMPORARY PAVEMENT FOR PHASE III
STA 188+00
STA 190+20
OW-138-30
ROAD CONSTRUCTION AHEAD
OW-128-36
STA 193+00
STA 190+70
END CONSTRUCTION
OC-8 60" x 24"
STA 58+80
OW-138-30
STA 59+75
BEGIN TAPER STA 59+75
OW-138-30
60+00
STA 60+85
OW-138-30
STA 62+00
END TAPER STA 62+50
STA 64+00
ROAD CONSTRUCTION AHEAD
OW-128-36
R-4B-36 ROAD WORK AHEAD

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: FEB '93
SCALE: SEE SCALE
RMOT-P2.DWG

FOR LEGEND – SEE SHEET 13.

PHASE II

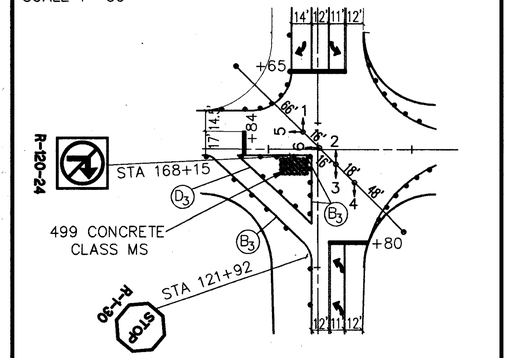
RICHMOND ROAD MAINTENANCE OF TRAFFIC PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

14B / 110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

SCALE 1"=50'



DETAIL - STAGE A
SEE NOTE "SHORT TERM RESTRICTIONS"

OW-128-36 ROAD CONSTRUCTION AHEAD
STA 107+35
STA 116+00
END CONSTRUCTION
OC-8
60" x 24"
13' 13' 13' 13'
50'
150'
120'
100'
BEGIN TAPER MATCH EXISTING STA 118+20
BEGIN TAPER MATCH EXISTING STA 116+92
℄ EMERY RD.
OW-138-30
STA 118+40
M-24-21
STA 119+10
271 M-5C-24-3
NORTH ONLY M-37-24
M-8-SPECIAL
R-31B-36
STA 119+70
STA 120+55
END TAPER STA 119+62
R/W
WORK LIMITS
SEE DETAIL PHASE III, STAGE A, THIS SHEET
STA 170+00
STA 171+00
OW-138-30
℄ RICHMOND ROAD
165+00
170+00
185+00
℄ RICHMOND RD
℄ RICHMOND ROAD
115'
END TAPER STA 167+00
TEMPORARY PAVEMENT FOR PHASE IV
STA 160+00
STA 162+50
STA 162+60
STA 165+00
STA 166+00
STA 166+50
OW-138-30
OW-128-36 ROAD CONSTRUCTION AHEAD
M-26-21
271 M-5C-24-3
NORTH ONLY M-37-24
M-8-SPECIAL
STA 121+80
ONLY
R-31A-36
STA 122+45
LEFT LANE MUST TURN LEFT
R-32L-30
OW-138-30
STA 123+95
STA 124+10
M-8-SPECIAL
ONLY
NORTH M-37-24
271 M-5C-24-3
M-24-21
BEGIN TAPER STA 123+97
END TAPER MATCH EXISTING STA 125+47
150'
STA 125+00
OW-138-30
19' 19'
C - C
STA 128+50
END CONSTRUCTION
OC-8
60" x 24"
10' 10'
STA 130+75
ROAD CONSTRUCTION AHEAD
OW-128-36
L/A
RAMP G-2
RAMP G-1
TYPE III BARRICADE
STA 58+16
STOP
R-1-48
STA 58+55
STA 59+60
60+00
STA 64+00
ROAD CONSTRUCTION AHEAD
OW-128-36
OW-138-30
R-41B-36
DO NOT ENTER
BEGIN TAPER STA 188+25
STA 188+35
OW-138-30
110'
MATCH LINE STA 189+15
OW-138-30
STA 189+25
STA 190+45
STA 193+00
ROAD CONSTRUCTION AHEAD
OW-128-36
50'
190+00
MATCH LINE STA 189+15
END TAPER STA 189+35
MATCH EXISTING STA 190+70
STA 190+70
END CONSTRUCTION
OC-8
60" x 24"

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)

FOR LEGEND - SEE SHEET 13.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: FEB '93
SCALE: SEE SCALE
RMOT-P3.DWG

PHASE III

RICHMOND ROAD MAINTENANCE OF TRAFFIC

FHWA REGION	STATE	PROJECT	
5	OHIO		

14C
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

SCALE: 1"=50'

DETAIL - STAGE A

SEE NOTE "SHORT TERM RESTRICTIONS"

R-1-30 STOP
R-20-24
STA 167+65
STA 121+09
499 CONCRETE CLASS MS

OW-128-36 ROAD CONSTRUCTION AHEAD
STA 107+35
STA 116+00
END CONSTRUCTION
OC-8 60" x 24"
OW-138-30
STA 117+00
BEGIN TAPER MATCH EXISTING STA 116+70
M-24-21
M-5C-24-3
M-37-24
M-8-SPECIAL NORTH ONLY
STA 118+20
STA 119+00
R-32L-30 LEFT LANE MUST TURN LEFT
R-31A-36 ONLY
STA 120+35
STA 121+00
265'
100'
END TAPER STA 119+35
SEE DETAIL PHASE IV, STAGE A
WORK LIMITS
℄ EMERY RD.
℄ RICHMOND ROAD
℄ RICHMOND RD
℄ RAMP G-2
℄ RAMP G-1
℄ TAYLOR LN
R/W
L/A
205'
75'
END CONSTRUCTION
OC-8 60" x 24"
BEGIN TAPER MATCH EXISTING STA 164+95
STA 162+50
STA 160+00
BEGIN TAPER STA 163+00
STA 163+40
STA 164+00
STA 165+00
STA 165+60
STA 166+00
STA 166+30
STA 166+40
STA 166+75
STA 166+80
END TAPER STA 167+00
M-26-21
M-8-SPECIAL NORTH ONLY M-37-24 M-5C-24-3
BEGIN TAPER STA 122+48
STA 122+20
STA 122+40
END TAPER MATCH EXISTING STA 123+23
END WORK STA 11+25
M-24-21
STA 124+00
LEFT LANE MUST TURN LEFT R-32L-30
STAGE B
SEE MT-97.11 FOR TRAFFIC CONTROL DURING ASPHALT RESURFACING.
MATCH LINE = STA 125+75
MATCH LINE = STA 125+75
127+00
END WORK STA 127+14.90
STA 128+50
END CONSTRUCTION OC-8 60" x 24"
STA 130+75
ROAD CONSTRUCTION AHEAD OW-128-36
OW-138-30
STA 170+40
STA 171+60
170+00
185+00
STA 57+80
STA 58+16
STOP R-1-30
STOP R-1-48
60+00
STA 64+00
ROAD CONSTRUCTION AHEAD OW-128-36
OW-128-36 ROAD CONSTRUCTION AHEAD
STA 190+70
END CONSTRUCTION OC-8 60" x 24"
M-8-SPECIAL ONLY NORTH M-37-24
M-5C-24-3
M-24-21
R-31A-36 ONLY

GRAPHIC SCALE
50 0 25 50 100 200
(IN FEET)

FOR LEGEND - SEE SHEET 13.

PHASE IV

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: FEB '93
SCALE: SEE SCALE
RIGHT-PLONG

RICHMOND ROAD MAINTENANCE OF TRAFFIC PLAN

GENERAL NOTES

FHWA REGION	STATE	PROJECT	
5	OHIO		

15
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

GENERAL

ROUNDING OF CORNERS SHOWN ON CROSS SECTIONS
THE ROUNDED CORNERS SHOWN ON TYPICAL SECTIONS APPLY TO ALL CROSS SECTION EVEN IF NOT SHOWN ON THESE PLANS.

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 OF THE OHIO REVISED CODE.

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

CLEVELAND ELECTRIC ILLUMINATING
55 PUBLIC SQUARE
P.O. BOX 5000
CLEVELAND, OH 44101
216-479-3452

OHIO BELL TELEPHONE
1020 BOLIVAR RD. RM.332
CLEVELAND, OH 44115
216-822-7136

EAST OHIO GAS CO.
1201 E. 55TH ST.
CLEVELAND, OH 44101-0759
216-432-6803

DEPARTMENT OF PUBLIC UTILITIES
1201 LAKESIDE AVE.
CLEVELAND, OH 44114
216-664-2378

CUYAHOGA COUNTY SANITARY ENGINEERING DEPT.
6100 W. CANAL RD.
VALLEY VIEW, OH 44125
216-443-8211

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.

EXISTING TYPICAL SECTION
EXISTING TYPICAL SECTIONS HAVE BEEN DEVELOPED FROM PAVEMENT CORES AND/OR RECORD PLANS AND ARE BELIEVED TO REPRESENT THE WIDTH AND COMPOSITION OF THE EXISTING PAVEMENT, BUT THE STATE OF OHIO DOES NOT GUARANTEE THE ACCURACY OF SAME.

ELEVATION DATUM
ELEVATIONS SHOWN ARE BASED ON CLEVELAND REGIONAL GEODETIC SURVEY DATA (C.R.G.S.).

COST PARTICIPATIONS
COST PARTICIPATIONS ARE AS FOLLOWS:
COST PARTICIPATION I - "STP" FUNDS
COST PARTICIPATION II - FEDERAL "NH" FUNDS
COST PARTICIPATION III - 100 % COUNTY FUNDS

ROADWAY

MONUMENTS ADJUSTED TO GRADE
MONUMENTS SHALL BE ADJUSTED TO GRADE IN ACCORDANCE WITH DETAILS SHOWN ON STANDARD CONSTRUCTION DRAWING MC-1.

SEEDING
QUANTITIES FOR SEEDING ARE CALCULATED FOR THE SOIL AREAS BETWEEN THE RIGHT-OF-WAY FENCE LINES, BETWEEN THE RIGHT-OF-WAY LINES IN UNFENCED AREAS, AND WITHIN THE WORK LIMITS FOR AREAS OUTSIDE THE RIGHT-OF-WAY LINES COVERED BY WORK AGREEMENT OR SLOPE EASEMENT.

WATERING PERMANENT SODDED AREAS
THE FOLLOWING ESTIMATED QUANTITIES ARE TO BE USED AS DIRECTED BY THE ENGINEER TO PROMOTE GROWTH AND CARE FOR PERMANENT SODDED AREAS. PAYMENT SHALL BE MADE ONLY FOR WATERING WHICH IS ORDERED BY THE ENGINEER AND IS IN ADDITION TO THAT REQUIRED UNDER 660.08 OF THE SPECIFICATIONS.

ITEM 659 - WATER	11 M GAL

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

ITEM 207 - TEMPORARY SEEDING AND MULCHING	580 SQ YDS
ITEM 207 - STRAW OR HAY BALES	144 EACH
ITEM 659 - MOWING	6.5 M SQ FT
ITEM 659 - REPAIR SEEDING AND MULCHING	145.6 SQ YDS
ITEM 659 - WATER	1 M. GALLON
ITEM 207 - FILTER FABRIC FENCE	200 LIN. FT.
ITEM 659 - COMMERCIAL FERTILIZER	0.10 TONS

NON-RIGID PAVEMENT REMOVAL
THE REMOVAL AND DISPOSAL OF NON-RIGID PAVEMENT, INCLUDING DRIVES, SHALL BE INCLUDED FOR PAYMENT IN ITEM 203 - EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION.

ITEM 202 - RAISED PAVEMENT MARKERS REMOVED FOR STORAGE
RAISED PAV'T MARKERS SHALL BE REMOVED IN A MANNER THAT PREVENTS DAMAGE TO THE CASTINGS. ALL DEPRESSIONS CAUSED BY REMOVAL OF THE MARKERS SHALL BE FILLED WITH 446 TO THE EXISTING ROAD SURFACE PRIOR TO RESURFACING. REMOVED MARKERS ARE TO BE STORED ON THE PROJECT SITE AS DIRECTED BY THE ENGINEER. ALL COSTS TO BE INCLUDED IN THE CONTRACT PRICE BID PER EACH FOR ITEM 202 - RAISED PVT. MARKERS REMOVED FOR STORAGE.

ITEM SPECIAL - MAILBOX SUPPORT

DESCRIPTION:
THIS WORK SHALL CONSIST OF FURNISHING AND ERECTING MAILBOX SUPPORTS AND ANY ASSOCIATED MOUNTING HARDWARE IN ACCORDANCE WITH PLAN DETAILS, AND ATTACHING AN OWNER-SUPPLIED MAILBOX, AT LOCATIONS SPECIFIED IN THE PLANS, OR AS OTHERWISE ESTABLISHED BY THE ENGINEER.

MATERIALS:
WOOD POSTS SHALL BE NOMINAL 4" x 4" OR 4-1/2" DIA. ROUND, AND SHALL CONFORM TO 710.14.

STEEL POSTS SHALL BE NOMINAL PIPE SIZE 2" I.D., AND SHALL CONFORM TO AASHTO M-181, AND SHALL BE FURNISHED WITH ANTI-TWIST PLATES.

ANY MATERIAL WITH BREAKAWAY CROSS SECTION CHARACTERISTICS EQUIVALENT TO THE ABOVE MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER.

HARDWARE (PLATES, SCREWS, BOLTS, ETC.) SHALL BE COMMERCIAL GRADE GALVANIZED STEEL.

SETTING POSTS:
POSTS SHALL BE SET IN ACCORDANCE WITH THE FIRST PARAGRAPH OF 606.03, AND SHALL IN NO INSTANCE BE ENCASED IN CONCRETE. DEPTH OF EMBEDMENT SHALL BE 19" MINIMUM (24" MAXIMUM FOR STEEL POST).
SEE DETAIL - SHEET 35A.

MOUNTING BOXES:
SUPPORT HARDWARE SHALL ACCOMODATE EITHER A SINGLE OR A DOUBLE MAILBOX INSTALLATION. IN NO CASE SHALL MORE THAN TWO BOXES BE MOUNTED ON A SINGLE POST. GROUP MAILBOX SUPPORTS SHOULD BE PLACED ON THREE FOOT (3') CENTERS.

THE MAILBOX SHALL BE SECURELY AND NEATLY ATTACHED BY THE CONTRACTOR TO THE NEW SUPPORT. THE CONTRACTOR SHALL FURNISH ALL NECESSARY ATTACHMENT HARDWARE (NUTS, BOLTS, PLATES, SPACERS, WASHERS, ETC.) AS NECESSARY TO ACCOMODATE THE COMPLETE INSTALLATION.

IN THE ABSENCE OF A NEW BOX SUPPLIED BY THE OWNER, THE CONTRACTOR SHALL SALVAGE THE EXISTING BOX AND PLACE IT ON THE NEW SUPPORT. DUE CARE SHALL BE EXERCISED IN SUCH AN OPERATION, AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING OR REPLACING ANY BOX DAMAGED BY IMPROPER HANDLING ON HIS PART, AS JUDGED AND DIRECTED BY THE ENGINEER.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE LOCAL POSTMASTER REGARDING THE TIMING OF THE MOVEMENT OF ANY MAILBOX TO A NEW LOCATION.

BASIS OF PAYMENT
PAYMENT UNDER THIS ITEM SHALL BE LIMITED TO FINAL PERMANENT INSTALLATIONS. TEMPORARY INSTALLATIONS SHALL BE IN ACCORDANCE WITH 107.12. HOWEVER, FOR TEMPORARY INSTALLATIONS, THE SAME MATERIAL AND SIZE LIMITATIONS AS FOR PERMANENT INSTALLATIONS SHALL APPLY.

MAILBOX SUPPORTS WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER EACH, FOR THE TYPE SPECIFIED, COMPLETE IN PLACE.

PAYMENT WILL BE MADE UNDER THE FOLLOWING ITEMS:

ITEM	UNIT	DESCRIPTION
SPECIAL	EACH	MAILBOX SUPPORT, SINGLE

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: PF DATE: 12/92
DRAWN BY: DJF DATE: 12/92
CHECKED BY: MFM DATE: 1/93
SCALE: N/A
GNOTES1

GENERAL NOTES

FHWA REGION	STATE	PROJECT	
5	OHIO		

16/110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

DRAINAGE

CONNECTION TO EXISTING PIPE
WHERE THE PLANS PROVIDE FOR PROPOSED CONDUIT TO BE CONNECTED TO, OR TO CROSS EITHER OVER OR UNDER AN EXISTING SEWER, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THE EXISTING PIPE BOTH AS TO LINE AND GRADE BEFORE HE STARTS TO LAY THE PROPOSED CONDUIT.

PAYMENT FOR ALL OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT 603 CONDUIT ITEMS.

EROSION CONTROL
ITEM 660 IS PROVIDED IN THE PLANS FOR EROSION CONTROL. TURF OF A STABLE NATURE WILL NOT BE REMOVED IN ORDER TO PLACE 660. THE ENGINEER SHALL CHECK AND NON-PERFORM QUANTITIES OR ADJUST LOCATIONS AND QUANTITIES FOR THESE ITEMS WHERE INDICATED BY FIELD CONDITIONS DURING CONSTRUCTION.

REVIEW OF DRAINAGE FACILITIES
BEFORE ANY WORK IS STARTED ON THIS PROJECT, AND AGAIN BEFORE FINAL ACCEPTANCE BY THE STATE, REPRESENTATIVES OF THE STATE AND THE CONTRACTOR, ALONG WITH LOCAL REPRESENTATIVES, SHALL MAKE AN INSPECTION OF THE EXISTING SEWERS WITHIN THE WORK LIMITS WHICH ARE TO REMAIN IN SERVICE AND WHICH MAY BE AFFECTED BY THE WORK. THE CONDITION OF THE EXISTING CONDUITS AND THEIR APPURTENANCES SHALL BE DETERMINED FROM FIELD OBSERVATIONS. RECORDS OF THE INSPECTIONS SHALL BE KEPT IN WRITING BY THE STATE.

ALL NEW CONDUITS, INLETS, CATCH BASINS AND MANHOLES CONSTRUCTED AS A PART OF THE PROJECT SHALL BE FREE OF ALL FOREIGN MATTER AND IN A CLEAN CONDITION BEFORE THE PROJECT WILL BE ACCEPTED BY THE STATE.

ALL EXISTING SEWERS INSPECTED BY THE ABOVE-MENTIONED PARTIES SHALL BE MAINTAINED AND LEFT IN A CONDITION REASONABLY COMPARABLE TO THAT DETERMINED BY THE ORIGINAL INSPECTION. ANY CHANGE IN THE CONDITION RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE CORRECTED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER.

PAYMENT FOR ALL OPERATIONS DESCRIBED ABOVE SHALL BE INCLUDED IN THE UNIT PRICES BID FOR THE PERTINENT 603 CONDUIT ITEMS OF THE CONTRACT.

HOUSE CONNECTIONS
EXISTING ROOF DRAINS, FOOTER DRAINS OR YARD DRAINS, DISTURBED BY THE PROPOSED WORK, SHALL BE PROVIDED WITH UNOBSTRUCTED OUTLETS BY CONNECTING TO A STORM SEWER, MANHOLE OR CATCH BASIN THROUGH THE CURB.

WHEN A HOUSE CONNECTION IS EXTENDED TO AN EXISTING HOUSE CONNECTION, IT SHALL INCLUDE A TEST TEE IN ACCORDANCE WITH THE DETAIL ON SHEET NO. 73. NO TEST TEE IS REQUIRED IF THE HOUSE CONNECTION IS MADE TO A CATCH BASIN OR MANHOLE, OR IF AN EXISTING FUNCTIONAL TEST TEE REMAINS IN SERVICE. THE LOCATION, TYPE, SIZE AND GRADE OF REQUIRED REPLACEMENT WILL BE DETERMINED BY THE ENGINEER DURING CONSTRUCTION. THE TEST TEE WILL BE PLACED DIRECTLY OUTSIDE THE PROPOSED RIGHT-OF-WAY. ANY EXISTING TEST TEES THAT ARE BEING REPLACED SHALL BE REMOVED AND NOT ABANDONED.

THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE WORK NOTED ABOVE:

ITEM 603 – 4" CONDUIT TYPE E, 707.19, PS. – 45 MIN	100 L.F.
ITEM 603 – 6" CONDUIT TYPE C, 706.01 OR 706.08	100 L.F.
ITEM 603 – 6" CONDUIT TYPE F, 707.17, NON PERFORATED	100 L.F.
ITEM 604 – DRAINAGE STRUCTURE, MISC.: TEST TEE	8 EACH

NECESSARY BENDS, BRANCHES, COLLARS, FITTINGS, ETC. SHALL BE INCLUDED FOR PAYMENT IN THE PERTINENT CONDUIT ITEM.

NONE OF THE ABOVE MATERIALS SHALL BE ORDERED BY THE CONTRACTOR UNTIL REQUESTED BY THE ENGINEER.

UNRECORDED SANITARY CONNECTIONS
ANY UNRECORDED ACTIVE CONNECTION TO A SANITARY SEWER ENCOUNTERED DURING CONSTRUCTION SHALL BE RECONNECTED TO THE EXISTING SEWER, AS DIRECTED BY THE ENGINEER. THE FOLLOWING ESTIMATED QUANTITIES HAVE BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE WORK NOTED ABOVE:

ITEM 603 – 6" CONDUIT, TYPE C, 706.08 E.S. WITH 706.12 JOINTS	100 L.F.
ITEM 603 – 6" CONDUIT, TYPE B, 706.08 E.S. WITH 706.12 JOINTS	100 L.F.
ITEM 604 – DRAINAGE STRUCTURE, MISC.: TEST TEE	4 EACH

NONE OF THE ABOVE MATERIALS SHALL BE ORDERED BY THE CONTRACTOR UNTIL AUTHORIZED BY THE ENGINEER.

MANHOLES, CATCH BASINS AND INLETS REMOVED OR ABANDONED
THE CASTINGS SHALL BE CAREFULLY REMOVED AND STORED WITHIN THE RIGHT-OF-WAY FOR SALVAGE BY THE CITY OF WARRENSVILLE HEIGHTS.

PAYMENT FOR ALL OF THE ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT 202 ITEM.

I-1 INLETS
THE FOLLOWING CONTINGENCY QUANTITIES FOR THE DRAINAGE OF UNFORESEEN SAG LOCATIONS CREATED BEYOND THE RIGHT-OF-WAY IN AREAS OF FILL HAVE BEEN INCLUDED IN THE GENERAL SUMMARY.

ITEM 603 – 12" CONDUIT, TYPE B, 706.02	200 LIN FT
ITEM 603 – 12" CONDUIT, TYPE C, 706.01, 706.02, OR 706.08 E.S.	200 LIN FT
ITEM 604 – INLET, NO 1	4 EACH

NONE OF THE ABOVE MATERIALS SHALL BE ORDERED BY THE CONTRACTOR UNTIL AUTHORIZED BY THE ENGINEER.

EXISTING UNDERDRAINS
NEW UNDERDRAINS ARE BEING CONSTRUCTED THROUGHOUT THE ENTIRE PROJECT LENGTH. THE EXISTING UNDERDRAINS SHALL BE REMOVED ACCORDING TO THE PROVISIONS OF ITEM 202 AS SET FORTH IN THE CONSTRUCTION AND MATERIAL SPECIFICATIONS.

THE FOLLOWING ESTIMATED QUANTITY HAS BEEN INCLUDED IN THE GENERAL SUMMARY FOR THE AFOREMENTIONED WORK:

ITEM 202 – PIPE REMOVED, UNDER 24"	1900 LIN FT

INLET AND CATCH BASIN BOX-OUTS
AT LOCATIONS WHERE CATCH BASIN OR INLET EXPANSION JOINTS AT THE EDGE OF THE BOX-OUT ARE LOCATED WITHIN FIVE (5) FEET OF THE NEAREST TRANSVERSE PAVEMENT JOINT, THE BOX-OUT EXPANSION JOINT SHALL BE ELIMINATED AND THE BOX-OUT EXTENDED TO THE ADJACENT TRANSVERSE PAVEMENT JOINT.

ITEMS 604 – INLETS VARIOUS, AS PER PLAN
ALL REINFORCING STEEL LISTED IN THE STEEL LIST ON THE STANDARD CONSTRUCTION DRAWINGS (FOR AS MODIFIED) SHALL BE EPOXY-COATED IN ACCORDANCE WITH 509.10 OF THE CMS.

ALL COSTS OF THEIS COATING SHALL BE INCLUDED IN THE COSTS OF THESE ITEMS.

ITEM 604 – MANHOLES ADJUSTED TO GRADE, AS PER PLAN
604.03 CONSTRUCTION METHODS: MANHOLES SHALL BE ADJUSTED TO GRADE BY THE METHOD OF ADJUSTING HEIGHT OF SUPPORTING WALLS AS NECESSARY AND RESETTING THE EXISTING FRAME IN A BED OF MORTAR OR CONCRETE. NO ADJUSTING RINGS ARE PERMITTED.

ITEM SPECIAL – MISCELLANEOUS METAL
EXISTING CASTINGS MAY PROVE TO BE UNSUITABLE FOR REUSE, AS DETERMINED BY THE ENGINEER, DURING THE CONSTRUCTION OF THIS PROJECT. TO PROVIDE FOR THIS CONTINGENCY, AN ESTIMATED QUANTITY OF ITEM SPECIAL – MISCELLANEOUS METAL HAS BEEN INCLUDED IN THE GENERAL SUMMARY TO BE USED AS DIRECTED BY THE ENGINEER. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE THE CASTINGS OF THE REQUIRED TYPE, SIZE, AND STRENGTH (HEAVY DUTY) FOR THE PARTICULAR STRUCTURE IN QUESTION. ALL CASTING MATERIALS SHALL CONFORM TO ITEM 604 SPECIFICATIONS AND HAVE THE PRIOR APPROVAL OF THE ENGINEER. WHERE IT IS NECESSARY TO COMPLETELY REPLACE UNSUITABLE STORM SEWER MANHOLE CASTINGS, THEY SHALL BE REPLACED USING CUYAHOGA COUNTY NO. 9 FRAMES AND NO. 28 COVERS AS DETAILED ON CONSTRUCTION DRAWING MH-10C. EXISTING MONUMENT BOXES CONFORMING TO CONSTRUCTION DRAWING MB-1C, WHICH ARE TO BE ADJUSTED TO GRADE BUT ARE FOUND UNSUITABLE FOR REUSE SHALL BE REPLACED WITH NEW CUYAHOGA COUNTY MONUMENT BOXES (AS DETAILED ON CONSTRUCTION DRAWING MB-1C), SET TO GRADE. DETAILS OF THESE STANDARDS ARE ON SHEETS 35C AND 35D.
THE FOLLOWING ESTIMATED QUANTITY HAS BEEN CARRIED TO THE GENERAL SUMMARY FOR USE AS DIRECTED BY THE ENGINEER:

ITEM SPECIAL – MISCELLANEOUS METAL	1200 LBS.

THE CONTRACTOR IS CAUTIONED TO USE EXTREME CARE IN THE REMOVAL, STORAGE AND REPLACEMENT OF ALL EXISTING CASTINGS. CASTINGS DAMAGED BY THE NEGLIGENCE OF THE CONTRACTOR, AS DETERMINED BY THE ENGINEER, SHALL BE REPLACED WITH THE PROPER NEW CASTING BY THE CONTRACTOR, AT NO EXPENSE TO THE STATE. THE CONTRACTOR SHALL NOT ORDER ANY OF THE ABOVE CASTINGS UNTIL DIRECTED BY THE ENGINEER, AND IN THE EVENT NO REPLACEMENT CASTINGS ARE REQUIRED, THE ITEM SHALL BE NONPERFORMED.

PAVEMENT

CONTRACTION AND EXPANSION JOINTS
ALTHOUGH SPECIFIC LOCATIONS OF CERTAIN EXPANSION AND CONTRACTION JOINTS HAVE BEEN DETAILED ON THIS PLAN, NO WAIVER OF THE SPECIFICATIONS IS INTENDED. PROVISION OF EXPANSION JOINTS AT ALL MAJOR STRUCTURES AND THE MAXIMUM SPACING BETWEEN CONTRACTION JOINTS SHALL, IN ALL CASES, BE IN ACCORDANCE WITH STANDARD CONSTRUCTION DRAWINGS AND THE SPECIFICATIONS.

TACK COAT
THE TACK COAT OPERATION SHALL BE DETERMINED AS PER SPEC. 407.05. PLAN QUANTITIES INDICATE AVERAGE APPLICATION RATES OF 0.075 GALLONS PER SQUARE YARD FOR ESTIMATING PURPOSES ONLY.

DOWEL BASKET ASSEMBLIES
WHERE DOWEL BASKET ASSEMBLIES ARE USED BY THE CONTRACTOR, ALL SPACER WIRES (SHIPPING WIRES) SHALL BE REMOVED FROM THE BASKET ASSEMBLIES PRIOR TO PAVING. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSURE THE DOWEL BASKET ASSEMBLIES ARE STABLE AND HELD FIRMLY IN PLACE.

JOINT SEALERS
ALL REFERENCES TO 705.01 OR 705.02, APPEARING ON STANDARD DRAWINGS OR ON THE PLANS, SHALL BE CONSIDERED TO READ 705.04.

GENERAL NOTES

ROADWAY (CONT'D)

PAVING UNDER GUARDRAIL

THIS OPERATION SHALL INCLUDE PREPARATION OF THE GRADED SHOULDER USING 203, LINEAR GRADING, AND PAVING UNDER THE GUARDRAIL USING 448, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1 (UNDER GUARDRAIL), AS PER PLAN.

ITEM 203, LINEAR GRADING, SHALL CONSIST OF EXCAVATING TOPSOIL, PLACING GRANULAR MATERIAL AND APPLYING HERBICIDE AS SPECIFIED IN THE PLANS AND IN ACCORDANCE WITH THE FOLLOWING:

ALL COLLECTED DEBRIS AND TOPSOIL, INCLUDING RHIZOMES, ROOTS AND OTHER VEGETATIVE PLANT MATERIAL SHALL BE REMOVED AND DISPOSED OF AS SPECIFIED IN 203.05.

THE REMOVED MATERIAL SHALL BE REPLACED WITH COMPACTABLE GRANULAR MATERIAL CONFORMING TO 203.02 PLACE TO GRADE AS DETAILED ON THE TYPICAL SECTION OR AS APPROVED BY THE ENGINEER.

HERBICIDE SHALL BE TREFLAN E. C., SPIKE OR AN APPROVED EQUAL AND SHALL BE APPLIED TO THE PREPARED AREA AFTER FINAL LEVELING AND GRADING HAS BEEN COMPLETED. THE APPLICATION SHALL BE JUST PRIOR TO PAVING AND SHALL STRICTLY ADHERE TO THE MANUFACTURER'S INSTRUCTIONS.

ONLY PROPERLY LICENSED PERSONNEL SHALL APPLY HERBICIDES AS REQUIRED BY THE OHIO REVISED CODE.

ALL EQUIPMENT, MATERIALS AND LABOR REQUIRED TO PERFORM THE WORK OUTLINED ABOVE SHALL BE INCLUDED FOR PAYMENT UNDER ITEM 203, LINEAR GRADING.

PAVING UNDER GUARDRAIL SHALL CONSIST OF PLACING ITEM 448 TO THE DEPTH SPECIFIED USING ONE OF THE FOLLOWING METHODS:

METHOD A: 1) SET GUARDRAIL POSTS

2) PLACE ITEM 448

METHOD B: 1) PLACE ITEM 448

2) BORE ASPHALT AT POST LOCATIONS (MAY BE OMITTED IF STEEL POSTS ARE USED)

3) SET GUARDRAIL POSTS

4) PATCH AROUND POSTS. THE MATERIALS USED FOR PATCHING SHALL BE A BITUMINOUS CONCRETE APPROVED BY THE ENGINEER. PATCHED AREAS SHALL BE COMPACTED USING EITHER HAND OR MECHANICAL METHODS. FINISHED SURFACES SHALL BE SMOOTH AND SLOPED TO DRAIN AWAY FROM THE POSTS.

ALL EQUIPMENT, MATERIALS AND LABOR REQUIRED TO PERFORM THE WORK OUTLINED ABOVE, WITH THE EXCEPTION OF SETTING GUARDRAIL POSTS, SHALL BE INCLUDED FOR PAYMENT UNDER ITEM 448, ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1 (UNDER GUARDRAIL) AS PER PLAN.

GENERAL NOTES

FHWA REGION	STATE	PROJECT	
5	OHIO		

17
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

WATER WORKS

ITEM SPECIAL- EXTEND AND ADJUST HYDRANT TO GRADE.

WORK INCLUDED

[redacted]

THE WORK INCLUDED UNDER THIS ITEM SHALL CONSIST OF EXTENDING AND ADJUSTING EXISTING HYDRANTS TO GRADE FROM THE VALVE TO THE HY-DRANT AS DETAILED ON THIS SHEET AND AT THE LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER, INCLUDING EXCAVATING, REMOVING AND RESETTING OF HYDRANT, EXTENDING OF BRANCH PIPE, VALVE BOX ADJUSTMENT, SHEETING AND BRACING, BACKFILL, LABOR, MATERIALS, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY TO MAKE THIS A COMPLETE ITEM OF WORK.

SETTING

(A) GENERAL LOCATION : THE HYDRANT SHALL BE LOCATED IN A MANNER TO PROVIDE COMPLETE ACCESSIBILITY, AND IN SUCH A MANNER THAT THE POSSIBILITY OF DAMAGE FROM VEHICLES OR INJURY TO PEDESTRIANS WILL BE MINIMIZED.

(B) LOCATION REGARDING CURB LINES : WHEN PLACED BEHIND CURB THE HYDRANT SHALL BE SET SO THAT THERE IS A MINIMUM OF TWO (2) FEET OF CLEARANCE FROM THE FACE OF CURB TO THE CLOSEST PORTION OF THE HYDRANT.

(C) LOCATION REGARDING SIDEWALK : WHEN SET IN THE LAWN SPACE BETWEEN THE CURB AND THE SIDEWALK OR BETWEEN THE SIDEWALK AND THE PROPERTY LINE, NO PORTION OF THE HYDRANT OR NOZZLE CAP SHALL BE WITHIN 6 INCHES OF THE SIDEWALK.

(D) POSITION OF NOZZLE : THE HYDRANT SHALL STAND PLUMB WITH THE NOZZLES POINTING TOWARD THE ROAD AT AN ANGLE OF FORTY-FIVE (45) DEGREES THEREFROM. WHERE THE HYDRANT BRANCH PIPING IS PARALLEL WITH OR NOT AT RIGHT ANGLES TO THE CURB, THE CONTRACTOR SHALL RELEASE SWIVEL HEAD BOLTS AND ADJUST THE HYDRANT NOZZLES TO FACE THE ROAD AT THE PROPER ANGLE. A HYDRANT WITHOUT SWIVEL HEADS WILL BE ADJUSTED BY THE CITY OF CLEVELAND WHERE NECESSARY TO CORRECT THE ANGLE OF THE NOZZLES. THE ELEVATION SHALL CONFORM TO THE ESTABLISHED GRADE WITH TOPS OF FROST CASING AT LEAST FOUR INCHES ABOVE GRADE.

(E) DRAINAGE AT HYDRANT : DRAINAGE SHALL BE PROVIDED AT THE BASE OF THE HYDRANT BY FILLING AROUND THE ELBOW WITH COARSE GRAVEL OR CRUSHED STONE TO AT LEAST 6 INCHES ABOVE THE WASTE OPENING. WHEREVER A HYDRANT IS SET IN ROCK, CLAY OR OTHER IMPERVIOUS SOIL, THE TRENCH SHALL BE WIDENED AND DEEPENED ON EACH SIDE OF THE HYDRANT BASE AND THE SPACE SHALL BE FILLED COMPACTLY WITH COARSE GRAVEL OR BROKEN STONE MIXED WITH COARSE SAND OF SUFFICIENT QUANTITY TO ABSORB ALL WATER TO BE DRAINED FROM THE HYDRANT WHEN THE VALVE IS CLOSED.

(F) ANCHORAGE FOR HYDRANT : THE HYDRANT SHALL BE SET ON A STONE SLAB OR SIMILAR FOUNDATION AND THE BASE OF THE HYDRANT AND THE HYDRANT TEE SHALL BE WELL BRACED AGAINST UNEXCAVATED EARTH AT THE END OF THE TRENCH WITH CONCRETE BACKING, OR IT SHALL BE TIED TO THE PIPE WITH SUITABLE RODS OR CLAMPS AS DIRECTED BY THE EN-GINEER.

(G) CLEANING : THE HYDRANT SHALL BE THOROUGHLY CLEANED OF DIRT AND FOREIGN MATTER BEFORE SETTING.

PAYMENT

THE UNIT PRICE STIPULATED FOR "ITEM SPECIAL – EXTEND AND ADJUST HYDRANT TO GRADE, [redacted] SHALL INCLUDE ALL EXCAVATION, SHEETING, REMOVING AND RESETTING HYDRANT, EXTENDING OR REPLACING BRANCH PIPE, ADJUSTMENT OR REPLACEMENT OF VALVE AND VALVE BOX, TESTING, PAINTING, BACKFILLING AND FURNISHING ALL LABOR, TOOLS, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN PLACE AS STATED ABOVE.

ITEM SPECIAL- 6" HYDRANT RELOCATED

WORK INCLUDED

THE WORK INCLUDED UNDER THIS ITEM SHALL CONSIST OF REMOVING AND RELOCATING AN EXISTING HYDRANT AT THE LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER, INCLUDING EXCAVATING, REMOVING AND RELOCATING OF EXISTING HYDRANT, NEW VALVE AND VALVE BOX, SHEETING AND BRACING, NEW BRANCH PIPE AND FITTINGS, TAPPING, BACKFILL, LABOR, MATERIALS, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY TO MAKE THIS A COMPLETE ITEM OF WORK.

MATERIALS

ALL HYDRANTS TO BE RELOCATED MUST BE IN GOOD CONDITION. ALL OTHER MATERIALS AND APPURTENANCES NECESSARY FOR THE PROPER COMPLETION OF THIS ITEM SHALL BE OF THE KIND AND GRADE CALLED FOR IN THE PLANS FOR THE PARTICULAR KIND OF CONSTRUCTION IN WHICH THE MATERIALS ARE USED.

SETTING

(A) GENERAL LOCATION: THE HYDRANT SHALL BE LOCATED IN A MANNER TO PROVIDE COMPLETE ACCESSIBILITY, AND IN SUCH A MANNER THAT THE POSSIBILITY OF DAMAGE FROM VEHICLES OR INJURY TO PEDESTRIANS WILL BE MINIMIZED.

(B) LOCATION REGARDING CURB LINES: WHEN PLACED BEHIND CURB THE HYDRANT SHALL BE SET SO THAT THERE IS MINIMUM OF TWO (2) FEET OF CLEARANCE FROM THE FACE OF THE CURB TO THE CLOSEST PORTION OF THE HYDRANT.

(C) LOCATION REGARDING SIDEWALK: WHEN SET IN THE LAWN SPACE BETWEEN THE CURB AND THE SIDEWALK OR BETWEEN THE SIDEWALK AND THE PROPERTY LINE, NO PORTION OF THE HYDRANT OR NOZZLE CAP SHALL BE WITHIN 6 INCHES OF THE SIDEWALK.

(D) POSITION OF NOZZLE: THE HYDRANT SHALL STAND PLUMB WITH THE NOZZLES POINTING TOWARD THE ROAD AT AN ANGLE OF FORTY-FIVE (45) DEGREES THEREFROM. WHERE THE HYDRANT BRANCH PIPING IS PARALLEL WITH OR NOT AT RIGHT ANGLES TO THE CURB, THE CONTRACTOR SHALL RELEASE SWIVEL HEAD BOLTS AND ADJUST THE HYDRANT NOZZLES TO FACE THE ROAD AT THE PROPER ANGLE. A HYDRANT WITHOUT SWIVEL HEADS WILL BE ADJUSTED BY THE CITY OF CLEVELAND WHERE NECESSARY TO CORRECT THE ANGLE OF THE NOZZLES. THE ELEVATION SHALL CONFORM TO THE ESTABLISHED GRADE WITH TOPS OF FROST CASING AT LEAST FOUR INCHES ABOVE GRADE.

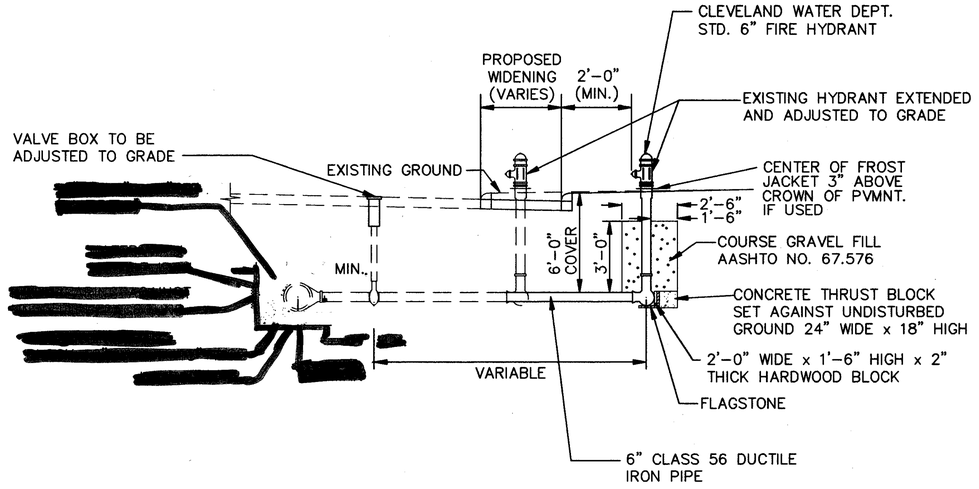
(E) DRAINAGE AT HYDRANT: DRAINAGE SHALL BE PROVIDED AT THE BASE OF THE HYDRANT BY FILLING AROUND THE ELBOW WITH COARSE GRAVEL OR CRUSHED STONE TO AT LEAST 6 INCHES ABOVE THE WASTE OPENING. WHEREVER A HYDRANT IS SET IN ROCK, CLAY OR OTHER IMPERVIOUS SOIL, THE TRENCH SHALL BE WIDENED AND DEPPENED ON EACH SIDE OF THE HYDRANT BASE AND THE SPACE SHALL BE FILLED COMPACTLY WITH COARSE GRAVEL OR BROKEN STONE MIXED WITH COARSE SAND OF SUFFICIENT QUANTITY TO ABSORB ALL WATER TO BE DRAINED FROM THE HYDRANT WHEN THE VALVE IS CLOSED.

(F) ANCHORAGE FOR HYDRANT: THE HYDRANT SHALL BE SET ON A STONE SLAB OR SIMILAR FOUNDATION AND THE BASE OF THE HYDRANT AND THE HYDRANT TEE SHALL BE WELL BRACED AGAINST UNEXCAVATED EARTH AT THE END OF THE TRENCH WITH CONCRETE BACKING, OR IT SHALL BE TIED TO THE PIPE WITH SUITABLE RODS OR CLAMPS AS DIRECTED BY THE ENGINEER.

(G) CLEANING: THE HYDRANT SHALL BE THOROUGHLY CLEANED OF DIRT AND FOREIGN MATTER BEFORE SETTING.

PAYMENT

THE UNIT PRICE STIPULATED FOR EACH "ITEM SPECIAL – 6" HYDRANT RELOCATED", SHALL INCLUDE ALL EXCAVATION, SHEETING, REMOVING AND RELOCATING HYDRANT, NEW BRANCH PIPE AND FITTINGS, NEW VALVE AND VALVE BOX, TAPPING, TESTING, PAINTING, BACKFILLING AND FURNISHING ALL LABOR, TOOLS, MATERIALS, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN PLACE.



EXTEND AND ADJUST HYDRANT TO GRADE
NOT TO SCALE

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: PF DATE: 12/92
DRAWN BY: DJF DATE: 12/92
CHECKED BY: MFM DATE: 1/93
SCALE: N/A
GNOTES1

CALCULATIONS AND SUB SUMMARIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

18
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

AGGREGATE BASE AND SUBGRADE COMPACTION

COST PARTICIPATION I

STATION FROM	STATION TO	SIDE	LENGTH LIN FT	WIDTH LIN FT	AREA SQ FT	304 AGGREGATE BASE GRADING A CU YDS	203 SUBGRADE COMPACTION SQ YDS	REMARKS
167+50	169+16.56	Lt & Rt			10010.28	185.4	1112.3	Intersection of Richmond and Emery Roads to L/A Line
169+16.56	170+03.55	Rt	86.99	31.5	2740.18	50.7	304.5	To L/A Line
181+14.56	181+51.01	Lt	36.45	2.5, 25.5	510.3	9.5	56.7	
181+51.01	186+63.79	Lt	512.78	25.5	13075.89	242.2	1452.9	To End of L/A Line
186+63.79	187+00	Lt & Rt	36.21	51	1846.71	34.2	205.2	End Full Depth Pavement Replacement
168+34.42	169+16.27	Lt			4728.70	87.6	525.4	Intersection of Richmond and Emery Rd.
169+16.27	170+03.55	Lt	87.28	31.5	2749.32	50.9	305.5	
170+03.55	170+31.28	Lt & Rt	27.73	63	1746.99	32.4	194.1	Ramp G-2
170+31.28	172+20	Lt & Rt			10906.86	202.0	1211.9	Irregular Area (Taper)
172+20	172+22.48	Lt & Rt	2.48	51	126.48	2.3	14.1	
172+22.48	172+95.94	Lt & Rt	73.46	48.5, 2	1859.60	34.4	206.6	Irregular Area
181+51.01	181+87.73	Rt	36.72	0, 23	422.28	7.8	46.9	
181+87.73	184+66.28	Rt	278.55	25.5	7103.03	131.5	789.2	
184+66.28	186+09.34	Rt	143.06		3623.63	67.1	403.6	Irregular Area
186+09.34	186+63.79	Rt	54.45	25.5	1388.47	25.7	154.3	
Ramp G-2								
0+38.02	3+35.36	Lt & Rt			8066.29	149.4	896.3	Ramp G-2 & G-2 Connector
Ramp G-1								
57+70.63	58+57.08	Lt & Rt			4197.06	77.7	466.4	
EMERY RD.								
121+49.35	123+96.68	Lt & Rt			19019.28	352.2	2113.3	
					TOTALS	1743.0	10459.2	

ASPHALT CONCRETE CURB

STATION FROM	STATION TO	SIDE	ITEM 609 ASPHALT CONCRETE CURB LIN FT	REMARKS
164+01	164+80	Rt	79	
165+02	166+22	Rt	128	
166+61	167+50	Rt	92	
163+70	165+74	Lt	206	
166+09	167+50	Lt	142	
167+10	167+60	Lt	50	Restaurant parking
187+00	187+10	Lt	10	
58+57	58+67	Lt	10	Ramp G-1
123+96.68	124+72	Lt	76	Emery Rd.
123+96.68	124+51	Rt	55	Emery Rd.
10+80.61	10+90	Lt	10	Taylor Ln.
		TOTAL	858	

PORTABLE CONCRETE BARRIER

COST PARTICIPATION I

REF#	STATION FROM	STATION TO	ITEM 622 PORTABLE CONCRETE BARRIER LIN FT	REMARKS
B-1	347+40	348+90	150	I-271 STATIONING
B-2	352+80	354+30	150	I-271 STATIONING
B-3	349+00	350+50	150	I-271 STATIONING
	TOTAL		450	

HEADWALL

REF#	STATION	OFFSET	SIDE	LENGTH LIN FT	WIDTH LIN FT	AREA SQ FT	ITEM 601 RIPRAP SQ YDS	ITEM 601 ROCK CHANNEL PROTECTION TYPE C WITH FILTER CU YDS	ITEM 602 CONCRETE MASONRY CU YDS	REMARKS
HW-1	186+78	59'	Rt						0.43	(from std. cons. dwg.)
HW-1	186+77	62'	Rt	5	4	20	2.2			
HW-1	186+76	68'	Rt	8	4	32		1.8		
						TOTALS	2.2	1.8	0.43	

SODDING, SEEDING AND MULCHING

STATION FROM	STATION TO	SIDE	ITEM 660 SODDING SQ YDS	ITEM 659 SEEDING AND MULCHING SQ YDS	REMARKS
180+74	184+00	Lt	942.4		
184+00	187+00	Lt	375.1		
186+64	187+00	Rt	967.0		
167+50	168+00	Lt		247.0	
167+50	168+03	Rt		213.7	
168+65	170+00	Rt		86.8	
170+00	170+68	Rt		42.8	
181+47	184+00	Rt		405.4	
180+00	180+74	Lt		67.4	
181+47	184+00	Rt		405.4	
184+00	186+64	Rt		553.8	
168+65	170+00	Lt		208.2	
170+03	3+35.36	Rt		379.8	
173+00	174+45	Rt		161.8	
170+00	172+67	Lt		319.3	
Emery Rd.					
122+90	123+20	Lt		36.6	
123+40	127+14.90	Lt		219.3	
123+25	127+14.90	Rt		228.7	
		TOTALS	2284.5	3576.0	

CURB, TYPE 2A

COST PARTICIPATION I

STATION FROM	STATION TO	SIDE	ITEM 609 CURB TYPE 2A LIN FT	REMARKS
167+50	168+05	Rt	142	Curb Return (Emery Rd SE)
168+65	170+04	Rt	220	Curb Return (Emery Rd NE) to L/A Line
167+50	168+02	Lt	82	Curb Return (Emery Rd SW)
181+15	184+00	Lt	285	
184+00	187+00	Lt	300	
186+64	187+00	Rt	36	
168+66	170+00	Lt	163	Curb Return (Emery Rd NW) to Sta. 170+00
170+04	173+19.69	Rt	331	Ramp G-2
173+07	173+29	Rt	81	Curb Return, Ramp G-2
170+00	172+22	Lt	222	
181+88	184+00	Rt	212	
184+00	185+07	Rt	117	Curb Return, Ramp G-2
185+71	186+64	Rt	154	Curb Return, to L/A Line
183+10	183+45	Lt	161	Curb for Driveway
Emery Rd.				
122+60	123+96.68	Rt	136	
122+60	123+96.68	Lt	168	
		TOTAL	2810	

MONUMENT BOXES AND MAILBOXES

STATION	OFFSET	SIDE	ITEM 604 MONUMENT BOX ADJUSTED TO GRADE EACH	SPECIAL MAILBOX SUPPORT SYSTEM SINGLE EACH	REMARKS
168+34.42		CL	1		
185+67	16'	Lt		1	
186+38	16'	Lt		1	
183+20	72'	Lt		1	
183+24	70'	Lt		1	
183+38.34		CL	1		
123+70	28'	Lt		1	EMERY RD.
		TOTAL	2	5	

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: TMA DATE: 3/93
DRAWN BY: LML DATE: 3/93
CHECKED BY: PF DATE: 3/93
SCALE: NO SCALE
CALC-2

CALCULATIONS AND SUB SUMMARIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

19/110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

PAVEMENT QUANTITIES

COST PARTICIPATION I

STATION FROM	STATION TO	SIDE	LENGTH LIN FT	WIDTH LIN FT	AREA SQ FT	451 9" REINFORCED CONCRETE PAVEMENT SQ YDS	451 10" REINFORCED CONCRETE PAVEMENT SQ YDS	407 TACK COAT GAL	446 ASPH CONC SURF COURSE TYPE I CU YDS	446 ASPH CONC INTER COURSE TYPE II CU YDS	REMARKS
167+50	169+16.56	Lt & Rt			9954.53	1106.1					Richmond Road At Emery Road
169+16.56	170+03.55	Rt	86.99	31	2696.69	299.6					To L/A Line
181+14.56	181+15.01	Lt	36.45	2, 25	492.08	54.7					
181+51.01	186+63.79	Lt	512.78	25	12819.50	1424.4					To End of L/A Line
186+63.79	187+00	Lt & Rt	36.21	50	1810.50	201.2					End Full Depth Pavement Replacement
168+34.42	169+16.27	LT			4689.14	521					Intersection of Richmond & Emery Rds. by Planimeter
169+16.27	170+03.55	LT	87.28	31	2705.68	300.6					
170+03.55	170+31.28	Lt & Rt	27.73	62	1719.26	191					To PC of Ramp G-2
170+31.28	172+20	Lt & Rt	188.72	62, 50	10771.47	1196.8					Area by Planimeter
172+20	172+22.48	Lt & Rt	2.48	62	153.76	17.1					
172+22.48	172+95.94	Lt & Rt	73.46	48, 2	1836.50	204.1					
181+51.01	181+87.73	RT	36.72	0, 23	422.28	46.9					
181+87.73	184+66.28	RT	278.55	25	6999.25	777.7					
184+66.28	186+09.34	RT	143.06	25	3606.80	400.8					
186+09.34	186+63.79	RT	54.45	25	1361.25	151.3					
Ramp G-2											
0+38.02	3+35.36	Lt & Rt			7842.58	871.4		65.4	30.3	42.4	By Planimeter
Ramp G-1											
57+70.63	58+57.08	Lt & Rt			4079.81	453.3		34.0	15.7	22.0	By Planimeter
58+57.08	59+75	Lt & Rt	117.87	33,23.5	3331.24	370.1		27.8	12.8	18.0	
Emery Rd.											
121+49.35	123+96.68	Lt & Rt			18741.60		2082.4				
					TOTALS	8588.1	2082.4	127.2	58.8	82.4	

CONCRETE SIDEWALK

STATION FROM	STATION TO	SIDE	LENGTH LIN FT	WIDTH LIN FT	ITEM 608 4" CONCRETE WALK SQ FT	REMARKS
167+50	167+92	Rt	67	6	402	
167+50	167+95	Lt	66	6	396	
168+84	169+05	Rt	21	6	126	
180+76	180+91	Lt	14		91	Irregular Walk Area
180+91	183+10	Lt	219	6	1314	
183+42	184+00	Lt	58	6	348	
184+00	185+66	Lt	166	6	996	
185+93	186+05	Lt	12	6	72	
186+30	187+00	Lt	70	6	420	
186+64	187+00	Rt	36	6	216	
185+45	185+49	Lt	3	5	15	
168+74	170+00	Lt	146	6	876	
170+04	170+97	Rt	93	6	558	
170+00	172+07	Lt	207	6	1242	
172+07	172+27	Lt	22	7	154	Sidewalk Transition from 6' to 8'
172+27	172+44	Lt	17	8	136	End Sidewalk Transition (Begin Sidewalk over Bridge)
173+15.14	173+36	Rt	21	8	168	Begin Sidewalk over Bridge
180+70	180+76	Lt	6		45	Irregular area
181+68	181+90	Rt	22	7	154	
181+90	182+10	Rt	20	6.5	130	
182+10	184+00	Rt	190	6	1140	
184+00	184+86	Rt	86	6	516	
185+89	186+64	Rt	77	6	462	
Emery Rd.						
122+00	122+50	Rt	50	5.5	275	
122+50	122+60	Rt	10	6	60	
123+25	123+96.68	Rt	71	5	355	
122+13	122+50	Lt	37	5.5	204	
123+75	123+96.68	Lt	21	5	105	
				TOTAL	10976.	

PAVEMENT REMOVED

COST PARTICIPATION I

STATION FROM	STATION TO	SIDE	LENGTH LIN FT	WIDTH LIN FT	AREA SQ FT	ITEM 202 PAVEMENT REMOVED SQ YDS	REMARKS
167+50	169+24.21	Lt & Rt			15556.0	1728.4	Richmond/Emery Rd. By Planimeter
169+24.21	170+03.55	Rt	79.34	13,14	1071.09	119.0	To L/A Line
181+28.13	181+51.01	Lt	22.88	0,14.5	165.88	18.4	
181+51.01	185+04.64	Lt	353.63	14.5,11.5	4597.19	510.8	
185+04.64	186+63.79	Lt	159.15	11.5	1830.23	203.4	To L/A Line
186+63.79	187+00	Lt & Rt	36.21	25,24.4	894.39	99.4	
168+34.42	169+17.56	Lt			4489.04	498.8	By Planimeter
169+17.56	170+03.55	Lt	85.99	26.5,25.7	2244.34	249.4	To L/A Line
170+03.55	Beginning of Approach Slab	Lt & Rt			15728.96	1747.7	By Planimeter (including Ramp G-2)
181+51.01	181+73.25	Rt	22.24	0,14	155.68	17.3	
181+73.25	184+94.92	Rt	321.67	14	4503.38	500.4	
184+94.92	186+02.54	Rt			4528.38	503.2	By Planimeter (including Ramp G-1)
186+02.54	186+63.79	Rt	61.25	14,13.4	839.13	93.2	
Emery Rd.							
122+60	123+96.68	Lt & Rt			8750	972.2	Emery Rd/Taylor Ln Intersect. By Planimeter
					TOTAL	7261.6	

GUARDRAIL & BARRIER

COST PARTICIPATION I

REF#	STATION FROM	STATION TO	SIDE	ITEM 606 GUARDRAIL TYPE 5 LIN FT	ITEM 606 BRIDGE TERM. ASS. TYPE 2 EACH	ITEM 606 ANCHOR ASSEMBLY TYPE A EACH	ITEM 202 GUARDRAIL REMOVED LIN FT	ITEM 448 3" ASPH. INTERMED. COURSE, TYPE I A,P,P. CU YDS	ITEM 203 LINEAR GRADING STATION	ITEM 202 CONCRETE BARRIER REMOVED LIN. FT.	REMARKS
G-6	180+85	182+10	Lt	125	1	1	-	4.7	1.25		
G-7	181+01	182+26	Lt				125				
G-7A	181+88	183+13	Rt	125	1	1		4.7	1.25		
G-1	3+35.36	173+25.86	Rt	90	1			3.3	0.90		
G-2	3+35.36	173+21	Rt				100				
G-3	171+48	172+61	Lt				112.5				
G-4*	347+60	348+97.5	Rt				137.5				I-271 STATIONING
G-5*	352+60	354+10	Lt				150				I-271 STATIONING
BR-1	349+20	350+10	RT.							90	I-271 STATIONING
G-8	181+61	182+74	Rt				112.5				
			TOTALS	340	3	2	738	13	3.4	90	

*GUARDRAIL TO BE REMOVED UNDER THE BRIDGE TO ALLOW WORK ON THE PIERS.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: TMA DATE: 3/93
DRAWN BY: LML DATE: 3/93
CHECKED BY: PF DATE: 3/93
SCALE: NO SCALE
CALC-2

CALCULATIONS AND SUB SUMMARIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

20
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

CURB RAMPS

REF#	STATION	SIDE	ITEM 608 CURB RAMP TYPE I EACH	ITEM 608 CURB RAMP TYPE II EACH	REMARKS
CR-1	167+80	Lt	1		
CR-2	167+80	Rt	1		
CR-4	168+88	Rt	1		
CR-14	185+47	Lt		1	
CR-3	168+88	Lt	1		
CR-5	171+02	Rt		1	
CR-6	172+03	Rt	1		
CR-7	172+62	Rt	1		
CR-8	173+06	Rt		1	
CR-9	184+91	Rt		1	
CR-10	185+30	Rt	1		
CR-11	185+47	Rt	1		
CR-12	185+49	Rt	1		
CR-13	185+82	Rt		1	
Emery Rd					
CR-14	122+10	Lt			NOT USED
CR-15	123+80	Lt		1	
		TOTALS	9	6	

WALK REMOVED

COST PARTICIPATION 1

STATION FROM	STATION TO	SIDE	ITEM 202 WALK REMOVED SQ FT	REMARKS
167+51.15	120+49.05	Rt & Lt	330.7	By Planimeter
(Richmond Rd)	(Emery Rd)			
		TOTAL	330.7	

FENCE

COST PARTICIPATION 1

REF#	STATION FROM	STATION TO	SIDE	ITEM 202 FENCE REMOVED LIN FT	ITEM 607 FENCE TYPE CLT LIN FT	REMARKS
F-7	186+64	187+00	Rt		36	
F-1	170+40	171+32	Rt	93		
F-2	172+17	172+90	Lt	77		
F-3	180+54	180+69	Lt	40		
F-4	181+29	182+10	Rt	90		
F-5	183+40	184+60	Rt	120		
F-6	186+57	186+64	Rt	45		
F-8	170+40	170+40	Rt	8		
F-9	172+17	172+21	Lt		10	
F-10	181+89	182+10	Rt		30	
F-11	186+62	186+64	Rt	10		
F-12	170+40	171+32	Rt		93	
F-13	180+55	180+84	Lt		34	
F-14	183+40	184+60	Rt		120	
F-15	186+57	186+64	Rt		45	
		TOTALS		483	368	

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: TMA DATE 12/30/92
DRAWN BY: LML DATE: 3/19/93
CHECKED BY: PF DATE: 2/9/93
SCALE: NO SCALE
CALC-2

REMOVALS

REF#	STATION FROM	STATION TO	SIDE	LENGTH LIN.FT	WIDTH LIN.FT	AREA SQ FT	ITEM 202 STRUCTURES REMOVED LUMP SUM	ITEM 202 APPROACH SLAB REMOVED SQ YDS	ITEM 202 INLET REMOVED EA.	ITEM 202 PIPE REMOVED 24" & UNDER LIN.FT	ITEM 202 CURB REMOVED LIN.FT	REMARKS
	162+70	167+50	Lt								480	
	163+50	167+50	Rt								400	
	167+50	168+00	Lt								85	Curb Return
	167+50	168+06	Rt								159	Curb Return
	168+67	170+04	Rt								240	Curb Return to L/A Line
	181+03	183+15	Lt								251	Curb Return to L/A Line
	183+10	183+45	Lt								161	Curb at Driveway
	183+35	183+75	Lt								65	Curb Return to L/A Line
	168+67	170+00	Lt								167	Curb Return
	170+00	172+65	Lt								265	
	170+04	171+33	Rt								134	
	171+36	172+74	Rt								340	Perimeter of Ramp Island
	172+96	173+12	Rt								28	
	181+43	184+00	Rt								257	
	180+97	181+03	Lt								6	
	184+00	185+08	Rt								117	Curb Return
	185+20	185+56	Rt								111	Perimeter of Ramp Island
R-1		169+09							1			
R-2		169+10							1			
R-3	169+09	169+10								40		
R-4	169+09	171+49								240		
R-5		171+49							1			
R-6	171+49	172+13								66		
R-7		172+13							1			
R-7A		183+74							1			
R-8	183+74	183+73								28		
R-9		183+73							1			
R-10		184+96							1			
R-11	184+96	185+54								58		
R-12		185+54							1			
R-13	185+54	186+83								130		
	173+03	173+28		25	28	700		77.8				
	180+97	181+22		25	28	700		77.8				
		186+87	Rt (30')				LUMP					
	122+60	124+46	Rt								186	Emery Rd.
	123+55	124+39	Lt								84	Emery Rd.
						TOTALS	LUMP	155.6	8	562	3536	

WATER WORKS

REF#	STATION	OFFSET	SIDE	SPECIAL EXTEND AND ADJUST HYDRANT TO GRADE TYPE A EACH	ITEM 638 VALVE BOX ADJUSTED TO GRADE EACH	ITEM 638 SERVICE BOX ADJUSTED TO GRADE EACH	SPECIAL 6" HYDRANT RELOCATED EACH	REMARKS
W-1	166+94	36'	Lt	1				
W-3	183+52	28'	Lt	1				
W-4	167+01	32'	Rt		1			
W-7	183+01	31'	Lt			1		
W-8	183+56	19'	Lt		1			
W-9	183+66	20'	Lt		1			
W-2	170+79	34'	Lt	1				
W-5	168+38	27'	Lt			1		
W-6	168+61	21'	Lt			1		
W-10	123+62	29'	Lt				1	Emery Rd.
W-11	123+57	18'	Lt		1			Emery Rd.
			TOTALS	3	4	3	1	

CONCRETE TRAFFIC ISLAND

COST PARTICIPATION 1

STATION FROM	STATION TO	SIDE	AREA SQ FT	ITEM 612 CONCRETE TRAFFIC ISLAND SQ YDS	REMARKS
171+75	172+64	Rt	2048	227.5	By Planimeter
185+24	185+56	Rt	484	53.8	By Planimeter
			TOTAL	281	

CALCULATIONS AND SUB SUMMARIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

20A / 110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

ADJUSTED TO GRADE

REF#	STATION	OFFSET	SIDE	ITEM 604 MANHOLE ADJUSTED TO GRADE AS PER PLAN EACH	REMARKS
A1	163+02	22'	Lt	1	
A2	162+98	20'	Rt	1	
A3	163+45	17'	Rt	1	
A4	164+00	18'	Rt	1	
A5	165+21	18'	Rt	1	
A6	165+53	20'	Rt	1	
A7	166+23	22'	Rt	1	
A8	168+23	22'	Rt	1	
A9	168+20	75'	Rt	1	
A10	169+36	21'	Rt	1	
A11	183+33	18'	Rt	1	
			TOTAL	11	

RESURFACING AND PAVEMENT WIDENING (DETAILS ON SH. 35)

STATION FROM	STATION TO	SIDE	LENGTH LIN FT	WIDTH LIN FT	AREA SQ FT	ITEM 254 PAVEMENT PLANING BITUMINOUS SQ YDS	ITEM 203 SUBGRADE COMPACTION SQ YDS	ITEM 301 BITUMINOUS AGGREGRATE BASE CU YDS	ITEM 304 6" AGGREGATE BASE CU YDS	ITEM 446 ASPH CONC SURF COURSE TYPE I CU YDS	ITEM 446 ASPH CONC INTER COURSE TYPE II CU YDS	ITEM 407 TACK COAT GAL
162+70	163+10	Lt & Rt	40	26	1040	115.6				4.0	5.6	8.7
		Lt	40	0,2.5	50		12.2 **	1.9 *	2.0 ≠	0.2	0.3	0.4
		Rt	40	0,1	20		8.9 **	1.3 *	1.5 ≠	0.1	0.1	0.2
163+10	166+15	Lt & Rt	305	26,38	9760	1084.4				37.6	52.7	81.3
		Lt	305	2.5	762.5		135.6 **	23.1 *	22.6 ≠	2.9	4.1	6.4
		Rt	305	1,12	1982.5		271.1 **	49.4 *	45.2 ≠	7.7	10.7	16.5
166+15	167+00	Lt & Rt	85	38,40	3315	368.3				12.8	17.9	27.6
		Lt	85	2.5,4	276.25		44.9 **	7.8 *	7.5 ≠	1.1	1.5	2.3
		Rt	85	12,16	1190		146.4 **	27.5 *	24.4 ≠	4.6	6.4	9.9
167+00	167+50	Lt & Rt	50	40	2000	222.2				7.7	—	16.7
		Lt	50	4,5	225		33.3 **	5.9 *	5.6 ≠	0.9	1.2	1.9
		Rt	50	16,18	850		102.8 **	19.4 *	17.1 ≠	3.3	4.6	7.1
187+00	188+25	Lt & Rt	125	24	3000	333.3				11.6	16.2	25.0
		Lt	125	15,9	1500		194.4***	36.5 **	32.4 ≠	5.8	8.1	12.5
		Rt	125	12,7	1187.5		159.7***	29.7 **	26.6 ≠	4.6	6.4	9.9
188+25	190+20	Lt & Rt	195	24	4680	520.0				18.1	25.3	39.0
		Lt	195	9,0	877.5		140.8***	25.3 **	23.5 ≠	3.4	4.7	7.3
		Rt	195	7,0	682.5		119.2***	19.9 **	19.9 ≠	2.6	3.7	5.7
					TOTALS	2643.8	1369.3	247.7	228.3	129.0	169.5	278.4

* Area to include an additional 1'-0" times its length.
** Area to include an additional 1'-6" times its length.
*** Area to include an additional 2'-0" times its length.
≠ Area taken from Item 203.

RESURFACING AND PAVEMENT WIDENING

STATION FROM	STATION TO	SIDE	LENGTH LIN FT	WIDTH LIN FT	AREA SQ FT	ITEM 254 PAVEMENT PLANING BITUMINOUS SQ YD.	ITEM 203 SUBGRADE COMPACTION SQ YD.	ITEM 301 BITUMINOUS AGGREGRATE BASE CU YD.	ITEM 304 6" AGGREGATE BASE CU YD.	ITEM 446 ASPH CONC SURF COURSE TYPE I CU YD.	ITEM 446 ASPH CONC INTER COURSE TYPE II CU YD.	ITEM 407 TACK COAT GAL
EMERY RD.												
123+96.68	124+73.00	LT	76.32	7.5,5.5	515.16		57.2		9.5			
124+73.00	127+14.90	LT	241.90	5,2	846.65		94.1		15.7			
123+96.68	124+50.00	RT	53.32	8.5	453.22		50.4		8.4			
124+50.00	127+14.90	RT	264.90	8,2	1324.5		147.17		24.5			
TAYLOR LN.												
10+80.39	11+25.00	LT	44.61	5,2	156.14		17.3		2.9			
10+80.39	11+25.00	RT	44.61	5,2	156.14		17.3		2.9			
EMERY RD.												
123+96.68	124+51.00	RT	54.32	8	434.56			9.4				
123+96.68	124+72.00	LT	75.32	7,5	451.92			9.8				
124+51.00	127+14.90	RT	263.90	7.5,1.5	1187.55			25.7				
124+72.00	127+14.90	LT	242.90	4.5,1.5	728.70			15.7				
123+96.68	127+14.90	LT & RT	318.22	51,32	13206.13	1467.3						
TAYLOR LN.												
10+80.39	11+25.00	RT	44.61	4.5,1.5	133.83			2.9				
10+80.39	11+25.00	LT	44.61	4.5,1.5	133.83			2.9				
10+80.39	11+25.00	LT & RT	44.61	20	892.2	99.1						
EMERY RD.												
123+96.68	127+14.90	LT & RT	318.22	62,32	14956.34					57.7	80.8	124.6
TAYLOR LN.												
10+80.39	11+25.00	LT & RT	44.61	26,20	1026.03					4.0	5.6	8.6
					TOTALS	1566.4	383.7	66.4	63.9	61.7	86.4	133.2

PRESSURE RELIEF JOINT

STATION	ITEM SPECIAL. PRESSURE RELIEF JOINT TYPE A LIN.FT	REMARKS
172+00	54	
182+05	51	
TOTAL	105	

APPROACH SLAB

REF#	STATION FROM	STATION TO	LENGTH LIN FT	WIDTH LIN FT	AREA SQ FT	ITEM 611. 17" REINF. CONCRETE APPROACH SLAB SQ YDS	203 SUBGRADE COMPACTION SQ.YD.	304 AGG. BASE GRADING A CU.YD.
AS-1	172+59.21	172+89.21	30	51	1530	170 (a)	170	28.5
AS-2	181+21.01	181+51.01	30	51	1530	170	170	28.5
					TOTAL	340	340	57

(a) AS PER PLAN (SEE SHT. 35A)

HOWARD NEEDLES TAMMEN & BERGENDOFF ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: TMA DATE 12/30/92
DRAWN BY: LML DATE: 3/19/93
CHECKED BY: PF DATE: 2/9/93
SCALE: NO SCALE
CALC-2

FHWA REGION	STATE	PROJECT
5	OHIO	

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

GENERAL SUMMARY

SHEET NUMBER 15	16	18	19	20	20A	25	26	28	29	31	31A	34	44	45	46	46A	COST PARTICIPATION STP	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	AS PER PLAN REFERENCE SHT.#
																	-					ROADWAY	
				LUMP													LUMP	202	11000	LUMP	LUMP	STRUCTURE REMOVED	
				156													156	202	22900	156	SQ YD	APPROACH SLAB REMOVED	
			7262									1173					8435	202	23000	8435	SQ YD	PAVEMENT REMOVED	
				331													331	202	30000	331	SQ FT	WALK REMOVED	
				3536													3536	202	32000	3536	LIN FT	CURB REMOVED	
			90														90	202	30700	90	LIN. FT.	CONCRETE BARRIER REMOVED	
	1900			562													2462	202	35100	2462	LIN FT	PIPE REMOVED, 24" AND UNDER	
			738														738	202	38000	738	LIN FT	GUARDRAIL REMOVED	
				8													8	202	58200	8	EACH	INLET REMOVED	
				483													483	202	75000	483	LIN FT	FENCE REMOVED	
						249	167	292	683	315	141	134	18	899	2122	141	5161	203	12000	5161	CU YD	EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION	
						470	211	1063	577	4	77	7	144	4		77	2634	203	20000	2634	CU YD	EMBANKMENT	
		10459			2093												12552	203	50000	12552	SQ YD	SUBGRADE COMPACTION	
			3.4														3.4	203	60000	3.4	STATION	LINEAR GRADING	
		2															2	604	39500	2	EACH	MONUMENT BOX ADJUSTED TO GRADE	
			340														340	606	13000	340	LIN FT	GUARDRAIL, TYPE 5	
			2														2	606	25000	2	EACH	ANCHOR ASSEMBLY, TYPE A	
			3														3	606	35100	3	EACH	BRIDGE TERMINAL ASSEMBLY, TYPE 2	
				368													368	607	23000	368	LIN FT	FENCE, TYPE CLT	
			10976														10976	608	10000	10976	SQ FT	4" CONCRETE WALK	
				9													9	608	50000	9	EACH	CURB RAMP, TYPE 1	
				6													6	608	51000	6	EACH	CURB RAMP, TYPE 2	
		5															5	SPECIAL	69050100	5	EACH	MAILBOX SUPPORT SYSTEM, SINGLE	15
																						EROSION CONTROL	
580																	580	207	10000	580	SQ YD	TEMPORARY SEEDING AND MULCHING	
200																	200	207	30000	200	LIN FT	FILTER FABRIC FENCE	
144																	144	207	70000	144	EACH	STRAW OR HAY BALES	
		2.2															2.2	601	11000	2.2	SQ YD	RIPRAP USING 6" REINFORCED CONCRETE SLAB	
		1.8															1.8	601	32200	1.8	CU YD	ROCK CHANNEL PROTECTION, TYPE C WITH FILTER	
0.1																	0.1	659	20000	0.1	TON	COMMERCIAL FERTILIZER	
		3576															3576	659	10000	3576	SQ YD	SEEDING AND MULCHING	
146																	146	659	14000	146	SQ YD	REPAIR SEEDING AND MULCHING	
12																	12	659	35000	12	M GAL	WATER	
7																	7	659	40000	7	M SQ FT	MOWING	
		2285															2285	660	30000	2285	SQ YD	SODDING	

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: TMA DATE: 3/93
DRAWN BY: TMA DATE: 3/93
CHECKED BY: PF DATE: 3/93
SCALE: AS SHOWN
GENSUM

GENERAL SUMMARY

FHWA REGION	STATE	PROJECT	
5	OHIO		

22
110

CUYAHAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

I=STP FUNDS

SHEET NUMBER 16	18	19	20	20A	24	25	26	28	29	31A	34	COST PARTICIPATION I	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	AS PER PLAN REFERENCE SHT.#
																	DRAINAGE	
	0.43											0.43	602	20000	0.43	CU YD	CONCRETE MASONRY	
100												100	603	00400	100	LIN FT	4" CONDUIT, TYPE E, 707.19, PS.- 45 MIN.	
100												100	603	00900	100	LIN FT	6" CONDUIT, TYPE B, 706.08 E.S. WITH 706.12 JOINTS	
							24			28		52	603	00900	52	LIN FT	6" CONDUIT, TYPE B	
100												100	603	01100	100	LIN FT	6" CONDUIT, TYPE C, 706.08 E.S. WITH 706.12 JOINTS	
100												100	603	01100	100	LIN FT	6" CONDUIT, TYPE C, 706.01 OR 706.08	
100						40	44	32	108	61		385	603	01500	385	LIN FT	6" CONDUIT, TYPE F, 707.17, NON PERFORATED ASTM	
																	3034, SDR35 OR SS931 OR ‸55 944	
					48	160	242		112	178		740	603	04400	740	LIN FT	12" CONDUIT, TYPE B	
200												200	603	04400	200	LIN FT	12" CONDUIT, TYPE B, 706.02	
					79	35	34	540	543			1231	603	04600	1231	LIN FT	12" CONDUIT, TYPE C	
200												200	603	04600	200	LIN FT	12" CONDUIT, TYPE C, 706.01, 706.02, OR, 706.08 E.S.	
							155		29			184	603	06100	184	LIN FT	15" CONDUIT, TYPE C	
									8			8	603	07400	8	LIN FT	18" CONDUIT, TYPE B	
						309	40		5			354	603	07600	354	LIN FT	18" CONDUIT, TYPE C	
								96				96	603	09100	96	LIN FT	21" CONDUIT, TYPE C	
									30			30	603	10600	30	LIN FT	24" CONDUIT, TYPE C	
								31				31	603	16600	31	LIN FT	36" CONDUIT, TYPE C	
									2			2	604	00500	2	EACH	CATCH BASIN, NO. 3, WITH "V" GRATE	
					2	3	1	3	3	2		14	604	00700	14	EACH	CATCH BASIN, NO. 3A, WITH "V" GRATE	
									1			1	604	02000	1	EACH	CATCH BASIN, NO. 6	
						1		1				2	604	04500	2	EACH	CATCH BASIN, NO. 2-2B	
4												4	604	10100	4	EACH	INLET, NO. 1	
							2					2	604	17501	2	EACH	INLET, NO. 2-A-6, AS PER PLAN	16
						1	1		1			3	604	17901	3	EACH	INLET, NO. 2-A-8, AS PER PLAN	16
							1		1			2	604	18301	2	EACH	INLET, NO. 2-A-10, AS PER PLAN	16
								1				1	604	02800	1	EACH	CATCH BASIN, NO. 8	
								1				1	604	02906	1	EACH	CATCH BASIN, NO. 8A	
						2	3	5	8	2		20	604	31500	20	EACH	MANHOLE, NO. 3	
				11								11	604	34501	11	EACH	MANHOLE ADJUSTED TO GRADE, AS PER PLAN	16
12												12	604	98000	12	EACH	DRAINAGE STRUCTURE, MISC.: TEST TEE	76
1200												1200	SPECIAL	60450000	1200	POUND	MISCELLANEOUS METAL	
						320	619	510	277	305		2031	605	11100	2031	LIN FT	6" SHALLOW PIPE UNDERDRAIN, 707.01 OR 707.21	
						241	75		244			560	605	13300	560	LIN FT	6" UNCLASSIFIED PIPE UNDERDRAIN	
																	PAVEMENT	
				4210								4210	254	01000	4210	SQ YD	PAVEMENT PLANING, BITUMINOUS	
				314								314	301	10002	314	CU YD	BITUMINOUS AGGREGATE BASE, AC-20	
	1743			349							102	2137	304	20000	2194	CU YD	AGGREGATE BASE, GRADING A (SEE PROPOSAL NOTE)	
		127		412								539	407	10000	539	GALLON	TACK COAT	
		82		256							21	359	446	01200	359	CU YD	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 2, AC-20	
		59		191							9	259	446	01400	259	CU YD	ASPHALT CONCRETE SURFACE COURSE, TYPE 1, AC-20	
		13										13	448	14101	13	CU YD	ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 1,(UNDER GUARDRAIL),A.P.P.	16A
											508	508	451	13000	508	SQ YD	8" REINFORCED CONCRETE PAVEMENT	
		8588										8588	451	14000	8588	SQ YD	9" REINFORCED CONCRETE PAVEMENT	
		2082										2082	451	15000	2082	SQ YD	10" REINFORCED CONCRETE PAVEMENT	
				105								105	SPECIAL	45130000	105	LIN FT	PRESSURE RELIEF JOINT TYPE A	
											106	106	452	10000	106	SQ YD	6" PLAIN CONCRETE PAVEMENT	
	858											858	609	10000	858	LIN FT	ASPHALT CONCRETE CURB, AC-20, TYPE-1	
	2810											2810	609	14000	2810	LIN FT	CURB, TYPE 2-A	
				170								170	611	30000	170	SQ YD	REINFORCED CONCRETE APPROACH SLAB (T=17")	
				170								170	611	30001	170	SQ YD	REINFORCED CONC. APPROACH SLAB (T=17"), AS PER PLAN	20A,35A
			281									281	612	18000	281	SQ YD	9" CONCRETE TRAFFIC ISLAND	

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS **HNTB**

MADE BY: TMA DATE: 3/93
DRAWN BY: TMA DATE: 3/93
CHECKED BY: PF DATE: 3/93
SCALE: AS SHOWN
GENSUM

GENERAL SUMMARY

I = STP FUNDS
* 100% COUNTY

FHWA REGION	STATE	PROJECT	
5	OHIO		

23/110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

SHEET NUMBER	COST PARTICIPATION I	COST PARTICIPATION III *	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	AS PER PLAN REFERENCE SHT.#
20 74								
							WATER WORK	
4	4		638	10800	4	EACH	VALVE BOX ADJUSTED TO GRADE	
3	3		638	10900	3	EACH	SERVICE BOX ADJUSTED TO GRADE	
3	3		SPECIAL	63824700	3	EACH	EXTEND AND ADJUST HYDRANT TO GRADE, [redacted]	
1	1		SPECIAL	63824800	1	EACH	6" HYDRANT RELOCATED	
							SANITARY SEWER: (SEE SHEET 74)	
1		1	202	58700	1	EACH	MANHOLE ABANDONED	
94		94	603	01401	94	LIN FT	6" CONDUIT TYPE E, AS PER PLAN	75
14		14	603	01801	14	LIN FT	8" CONDUIT TYPE B, AS PER PLAN	75
50		50	603	05901	50	LIN FT	15" CONDUIT TYPE B, AS PER PLAN	75
617		617	603	07401	617	LIN FT	18" CONDUIT TYPE B, AS PER PLAN	75
16		16	603	10401	16	LIN FT	24" CONDUIT TYPE B, AS PER PLAN	75
2		2	604	30901	2	EACH	MANHOLE, NO. 2, AS PER PLAN	74,75
4		4	604	31501	4	EACH	MANHOLE, NO. 3, AS PER PLAN	74,75
2	2		604	98000	2	EACH	DRAINAGE STRUCTURE, MISC.: TEST TEE	76
							MAINTENANCE OF TRAFFIC (SEE SHEET 10)	
							LIGHTING (SEE SHEET 69)	
							TRAFFIC CONTROL (SEE SHEET 48-48A)	
							STRUCTURES (SEE SHEET 79)	
			614	11000	LUMP	LUMP	MAINTAINING TRAFFIC	
			619	15020	LUMP	LUMP	FIELD OFFICE, TYPE C	
			623	10000	LUMP	LUMP	CONSTRUCTION LAYOUT STAKES	
			624	10000	LUMP	LUMP	MOBILIZATION	

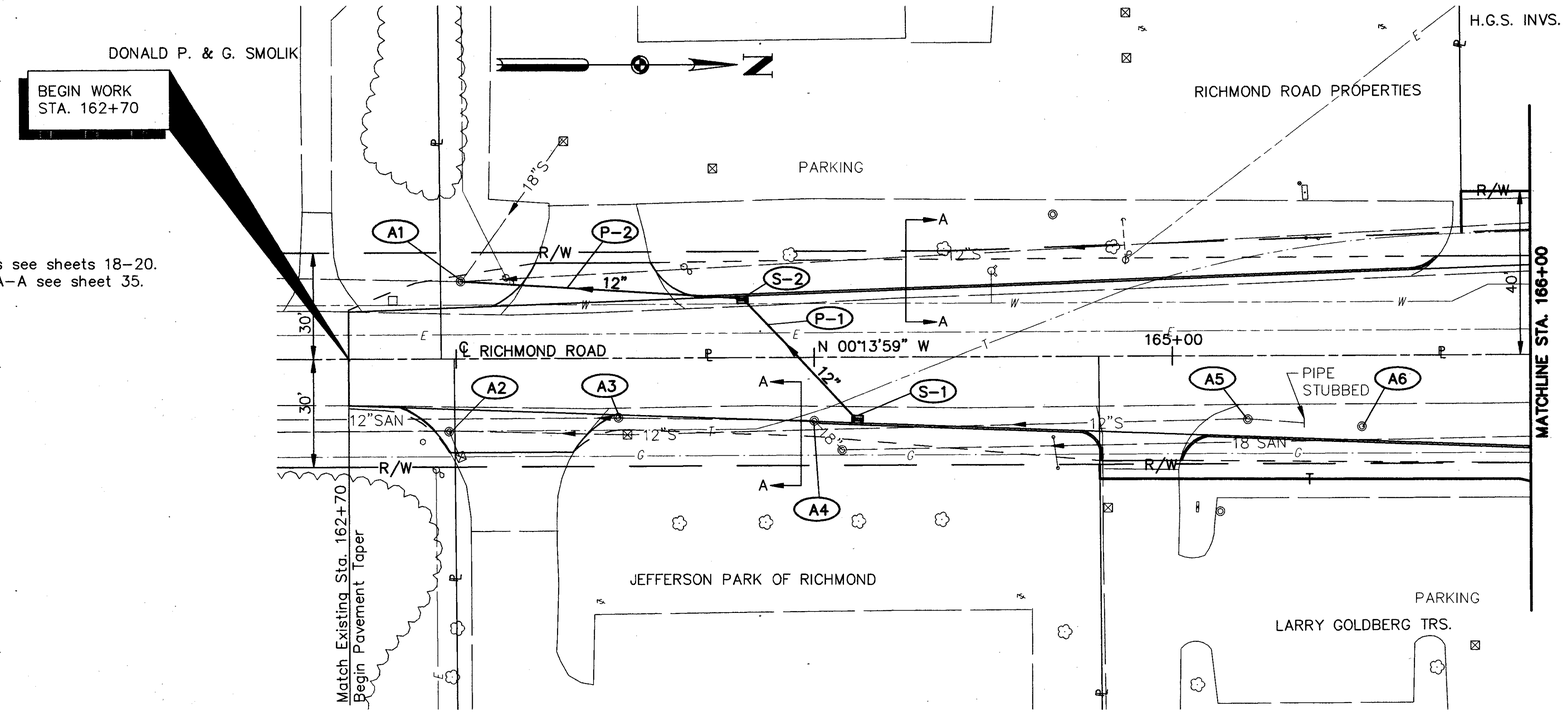
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: TMA DATE: 3/93
DRAWN BY: MTQ DATE: 6/93
CHECKED BY: PF DATE: 3/93
SCALE: AS SHOWN
GENSUM

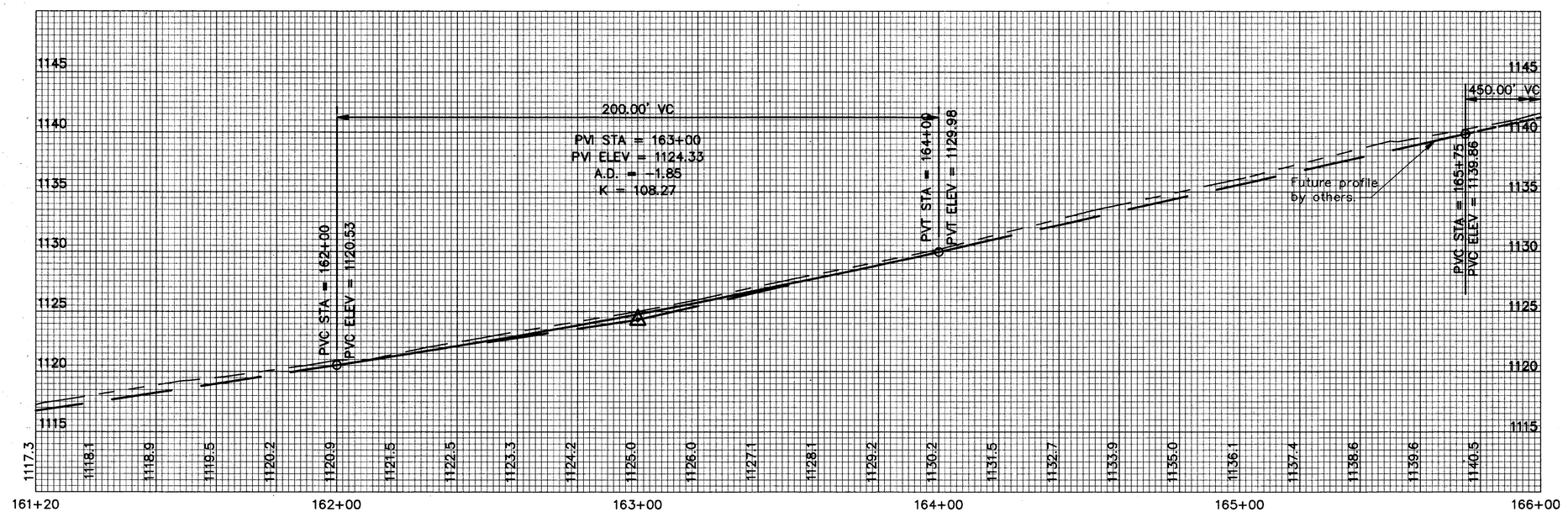
FHWA REGION	STATE	PROJECT	
5	OHIO		

24
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29



NOTES:
1. For Quantities see sheets 18–20.
2. For Section A–A see sheet 35.



ESTIMATED QUANTITIES

REF. NO.	STATION TO STATION	SIDE	603 12" CONDUIT TYPE B LIN.FT.	603 12" CONDUIT TYPE C LIN.FT.	604 CATCH BASIN NO.3-A * EACH
S-1	164+12				1
	163+80				
S-2	163+80				1
	164+12				
P-1	164+12		48		
	163+80				
P-2	163+80			79	
	163+01				
TOTALS			48	79	2

UNDERDRAINS

REF. NO.	FROM	TO	603 6" CONDUIT, TYPE F LIN. FT.	605 6" SHALLOW PIPE U.D. A.P.P. LIN. FT.	UPPER ELEV.	LOWER ELEV.

* with "V" Grate

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: PF DATE: 11/92
DRAWN BY: PF DATE: 11/92
CHECKED BY: DAK DATE: 11/92
SCALE: 1"=20'
PLAN1.DWG

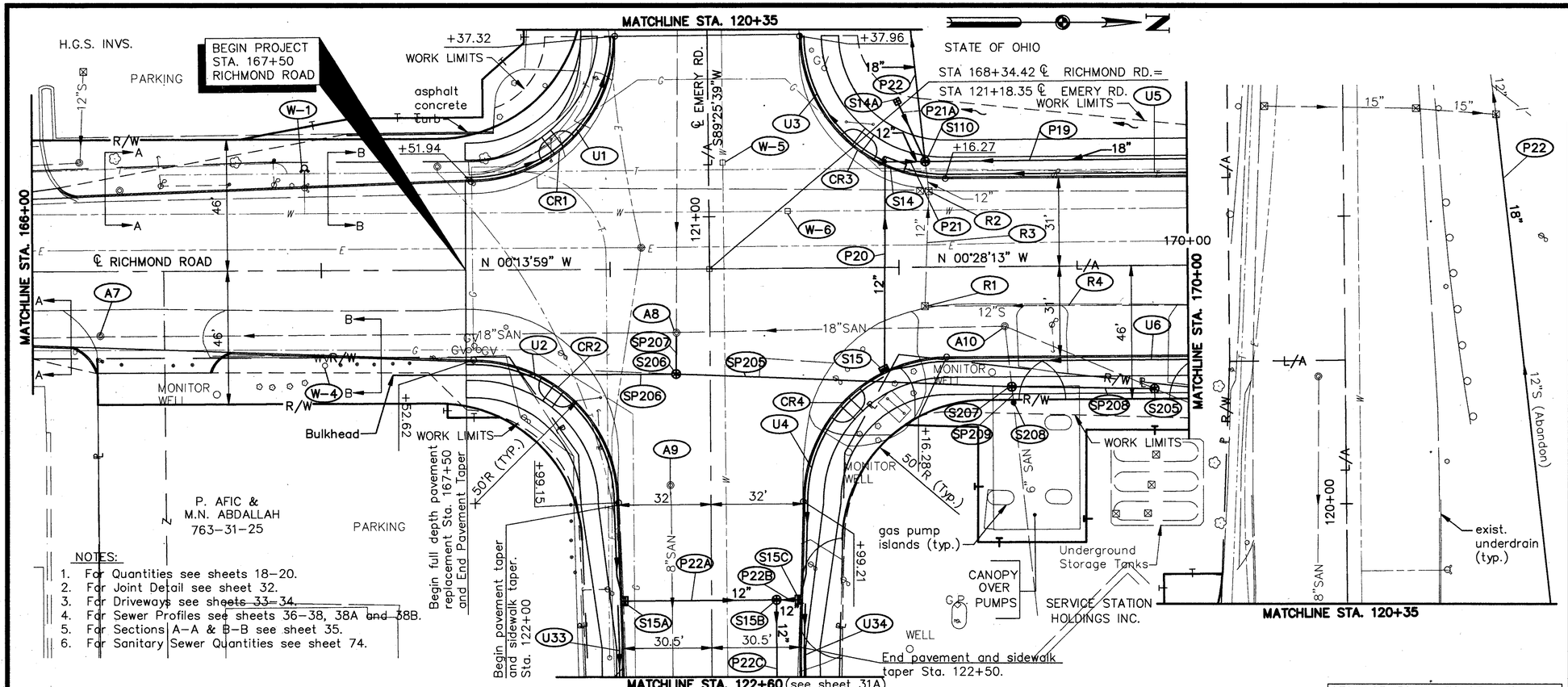
RICHMOND ROAD PLAN AND PROFILE STA. 162+00 TO STA. 166+00

FHWA REGION	STATE	PROJECT	
5	OHIO		

25
110

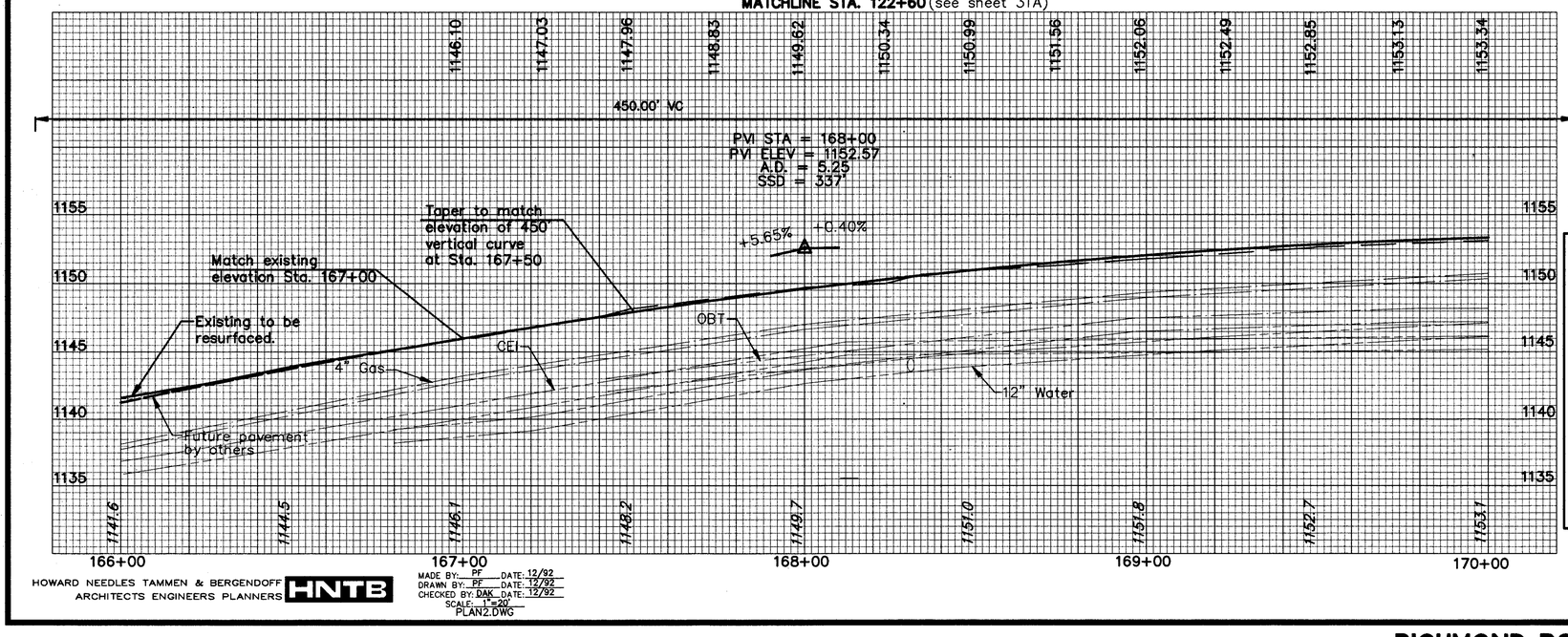
CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

* MATCH EXISTING UNDERDRAIN ELEVATION



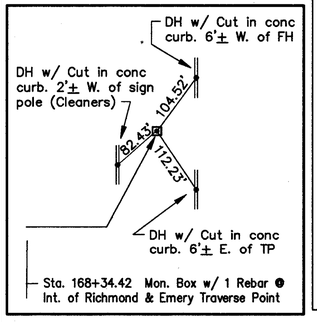
NOTES:

1. For Quantities see sheets 18–20.
2. For Joint Detail see sheet 32.
3. For Driveways see sheets 33–34.
4. For Sewer Profiles see sheets 36–38, 38A and 38B.
5. For Sections A–A & B–B see sheet 35.
6. For Sanitary Sewer Quantities see sheet 74.



STA. 167+50.	TO STA. 170+00.	
EXCAVATION	249	CU YDS
EMBANKMENT	470	CU YDS

BENCH MARK
NW Corner of Concrete Light Pole Base at BP Oil Station Elevation = 1153.33



ESTIMATED QUANTITIES

REF. NO.	STATION TO STATION	SIDE	603 12" COND. TYPE B LIN. FT.	603 12" COND. TYPE C LIN. FT.	603 18" COND. TYPE C LIN. FT.	604 CATCH BASIN NO. 3A ** EACH	604 INLET NO. 2A–8, AS PER PLAN EACH	604 MANHOLE NO. 3 EACH	604 CATCH BASIN NO.2–2B EACH
S15	168+95	RT.							1
P20	168+95	RT.	72						
S14A	168+96	LT.							
P21A	169+00	LT.		22					
S14	169+00	LT.					1		
P21	168+98	LT.		13					
S110	169+09	LT.						1	
P22	169+09	LT.			218				
P19	169+00	LT.			91	1			
S15A	170+00	RT.	53						
P22A	122+33.50	RT.				1			
S15B	122+60	LT.	27						
P22C	122+33.50	LT.							
S15C	122+33.50	LT.	8			1			1
P22B	122+33.50	RT.	160	35	309	3	1	1	2
		TOTALS							

COST PARTICIPATION I

	REF. NO.	FROM	TO	603 6" CONDUIT, TYPE F *** LIN. FT.	605 6" SHALLOW PIPE U.D. 707.01 OR 707.21 LIN. FT.	605 6" UNCLASSIFIED PIPE U.D. LIN. FT.	UPPER ELEV.	LOWER ELEV.
UNDERDRAINS	U1	167+50	120+37.32 (EMERY)			81	1144.16	*
	U2	167+50	122+33.50 (EMERY)	10		103	1144.16	1144.91
	U4	168+93.65	122+33.50 (EMERY)	10	82		1147.47	1145.16
	U6	170+00	168+95 (EMERY)	10	96		1149.54	1147.96
	U3	169+01.25	120+37.32 (EMERY)			57	1147.82	*
	U5	170+00	169+03 (EMERY)	10	88		1149.54	1147.82
	U33	122+33.50	122+60		27		1144.68	1144.58
	U34	122+33.50	122+60		27		1144.82	1144.35
	TOTALS			40	320	241		

** with "V" Grate

*** 707.17 non–perforated ASTM 3034, SDR35 or SS931 or 944.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

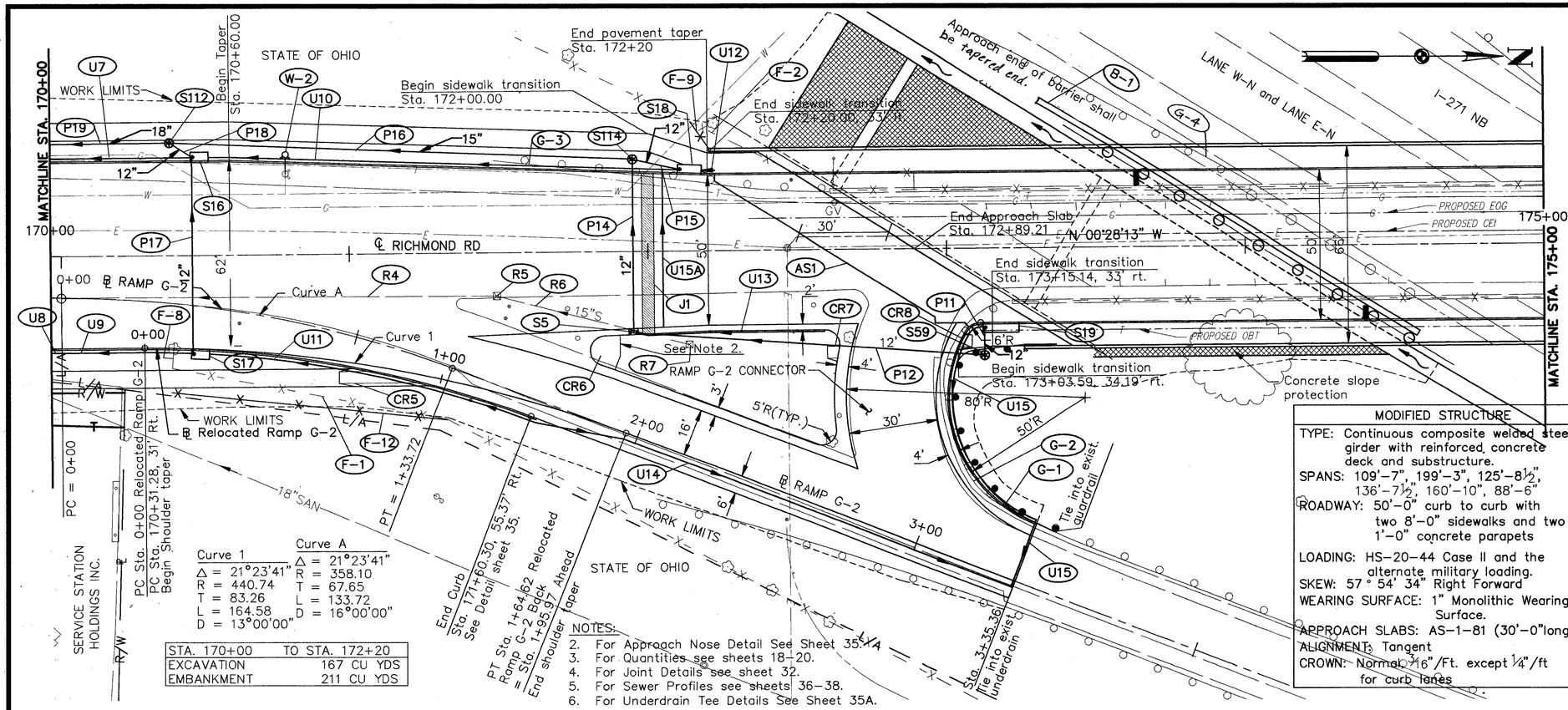
MADE BY: PF DATE: 12/92
DRAWN BY: PF DATE: 12/92
CHECKED BY: DAK DATE: 12/92
SCALE: 1"=20'
PLAN2.DWG

RICHMOND ROAD PLAN AND PROFILE STA. 166+00 TO STA. 170+00

FHWA REGION	STATE	PROJECT	
5	OHIO		

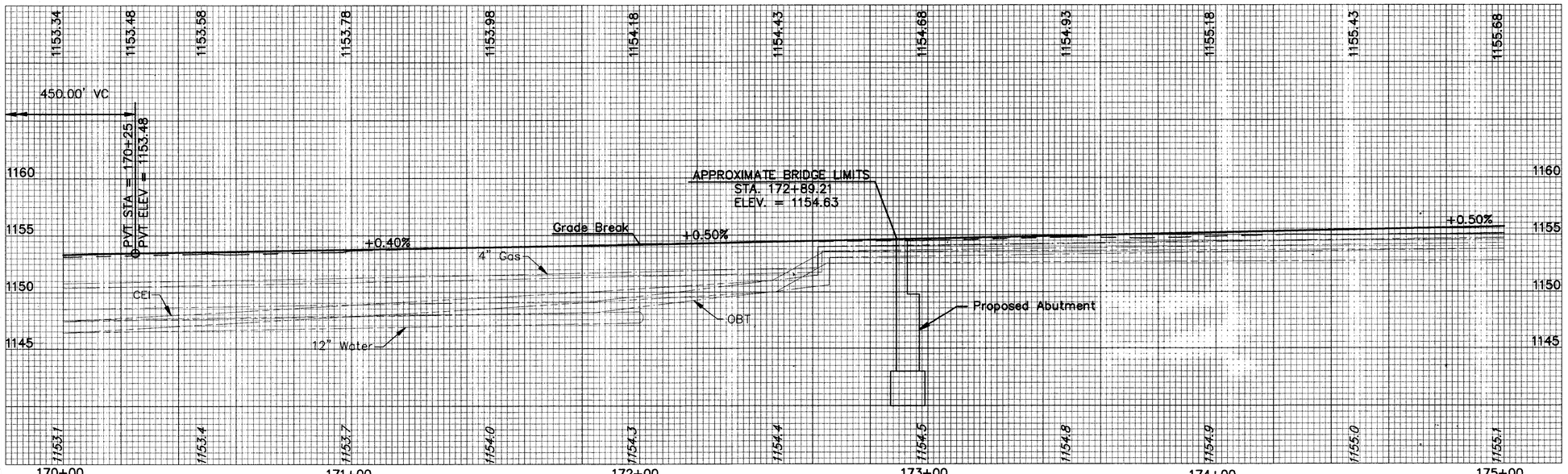
26
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29



STA. 170+00	TO STA. 172+20
EXCAVATION	167 CU YDS
EMBANKMENT	211 CU YDS

NOTES:
2. For Approach Nose Detail See Sheet 35A.
3. For Quantities see sheets 18-20.
4. For Joint Details see sheet 32.
5. For Sewer Profiles see sheets 36-38.
6. For Underdrain Tee Details See Sheet 35A.



MODIFIED STRUCTURE

TYPE: Continuous composite welded steel girder with reinforced concrete deck and substructure.
SPANS: 109'-7", 199'-3", 125'-8½", 136'-7½", 160'-10", 88'-6"
ROADWAY: 50'-0" curb to curb with two 8'-0" sidewalks and two 1'-0" concrete parapets
LOADING: HS-20-44 Case II and the alternate military loading.
SKEW: 57° 54' 34" Right Forward
WEARING SURFACE: 1" Monolithic Wearing Surface.
APPROACH SLABS: AS-1-81 (30'-0"long)
ALIGNMENT: Tangent
CROWN: Normal 3/16"/Ft. except ¼"/ft for curb lanes

* Match existing underdrain elevation
** 707.17 non-perforated ASTM 3034, SDR35 or SS9.31 or 944.
*** with "V" Grate

ESTIMATED QUANTITIES

REF. NO.	REF. NO.	STATION TO STATION	SIDE	603 12" COND. TYPE B LIN. FT.	603 12" COND. TYPE C LIN. FT.	603 15" COND. TYPE C LIN. FT.	603 18" COND. TYPE C LIN. FT.	604 CATCH BASIN NO. 3A*** EACH	604 INLET NO. 2A-6 APP EACH	604 INLET NO. 2A-8 APP EACH	604 INLET NO. 2A-10 APP EACH	604 MANHOLE NO.3 EACH
		COST PARTICIPATION ℄		118	10							
P12		173+12.5 TO 171+95	RT.									
P11		173+12.5 TO 173+12.5	RT.									
S12	P19	170+40 TO 170+00	LT.				40					1
S16		170+50 TO 170+53	RT.									
S17		170+50 TO 171+53	RT.									
S14		171+95 TO 172+18	LT.									
S18		172+14 TO 172+93	LT.									
S5	P14	171+95 TO 171+95	RT.	58				1				
S19		173+18 TO 173+12.5	RT.									1
S59												
P17		170+47.5 TO 170+47.5	RT.	66					1			
P18		170+47.5 TO 170+40	LT.		8					1		
P16		171+95 TO 170+40	LT.			155						
P15		172+10.5 TO 171+95	LT.		16	155						
TOTALS				242	34	155	40	1	2	1		3

REF. NO.	REF. NO.	FROM	TO	603 6" CONDUIT, TYPE B LIN. FT.	603 6" CONDUIT, TYPE F ** LIN. FT.	605 6" SHALLOW UNCLASSIFIED U.D. (NOT IN ODOT) LIN. FT.	605 6" UNCLASSIFIED U.D. LIN. FT.	UPPER ELEV.	LOWER ELEV.
		COST PARTICIPATION ℄		3.5			53	1151.03	1150.50
U8		170+03.5	170+00				47	1149.78	1149.54
U15A		171+95	171+95				43.5	1149.78	1149.57
U7		170+47	170+00				47	1149.78	1149.54
U9		170+47	170+03.5				43.5	1149.78	1149.57
U10		172+10.5	170+53		10		102	1150.52	1149.78
U11		171+63	170+53		10		147	1150.38	1149.78
U12		172+62	172+18		4		54	1150.38	1150.54
U13		173+95	172+93		10		169	1150.78	1150.52
U14		173+61.5	3+35.36	24	10		75	1151.06	*
U15		173+12	3+35.36						*
TOTALS				27.5 (RAMP G-2)	24	44	619	75	

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

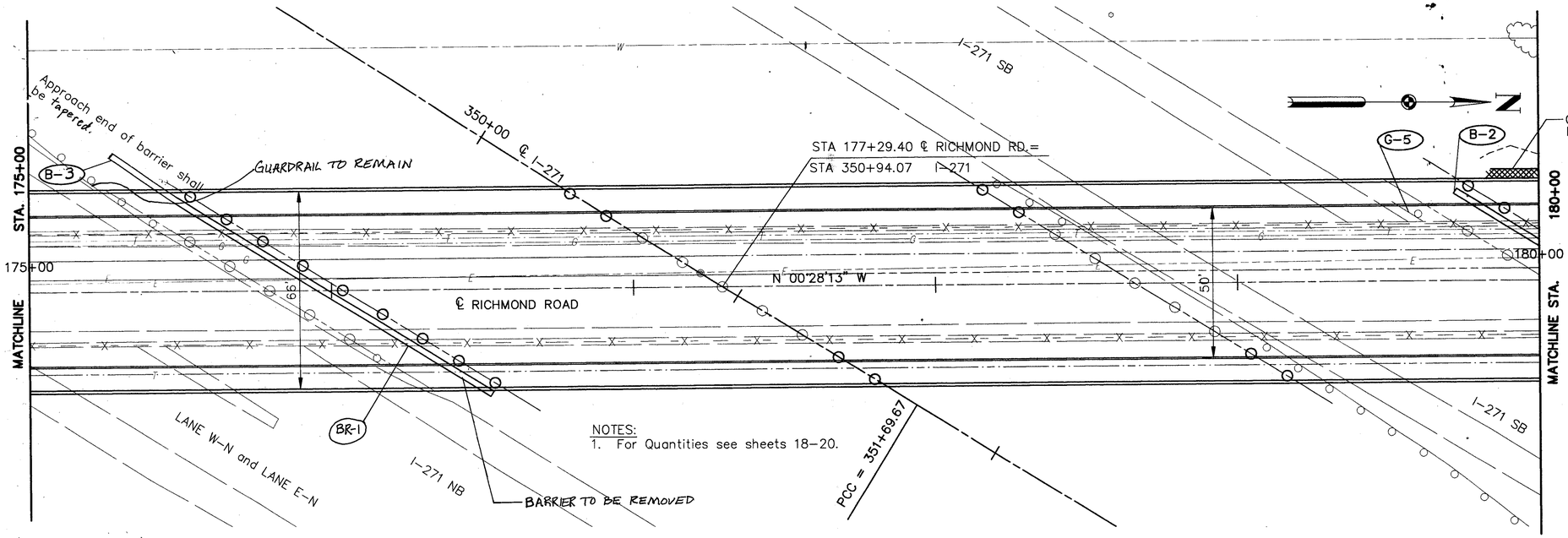
MADE BY: PF DATE: 12/92
DRAWN BY: PF DATE: 12/92
CHECKED BY: DAK DATE: 12/92
SCALE: 1"=20'
PLAN3.DWG

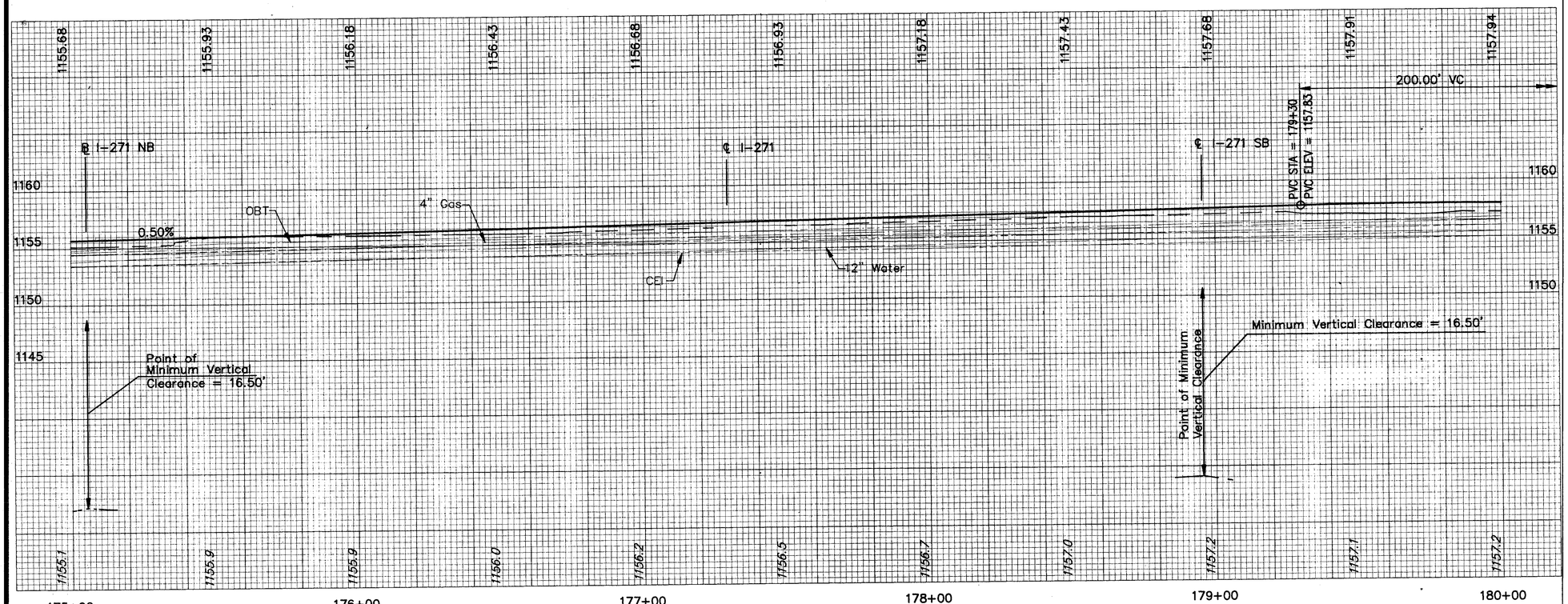
RICHMOND ROAD PLAN AND PROFILE STA. 170+00 TO STA. 175+00

FHWA REGION	STATE	PROJECT	
5	OHIO		

27
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29





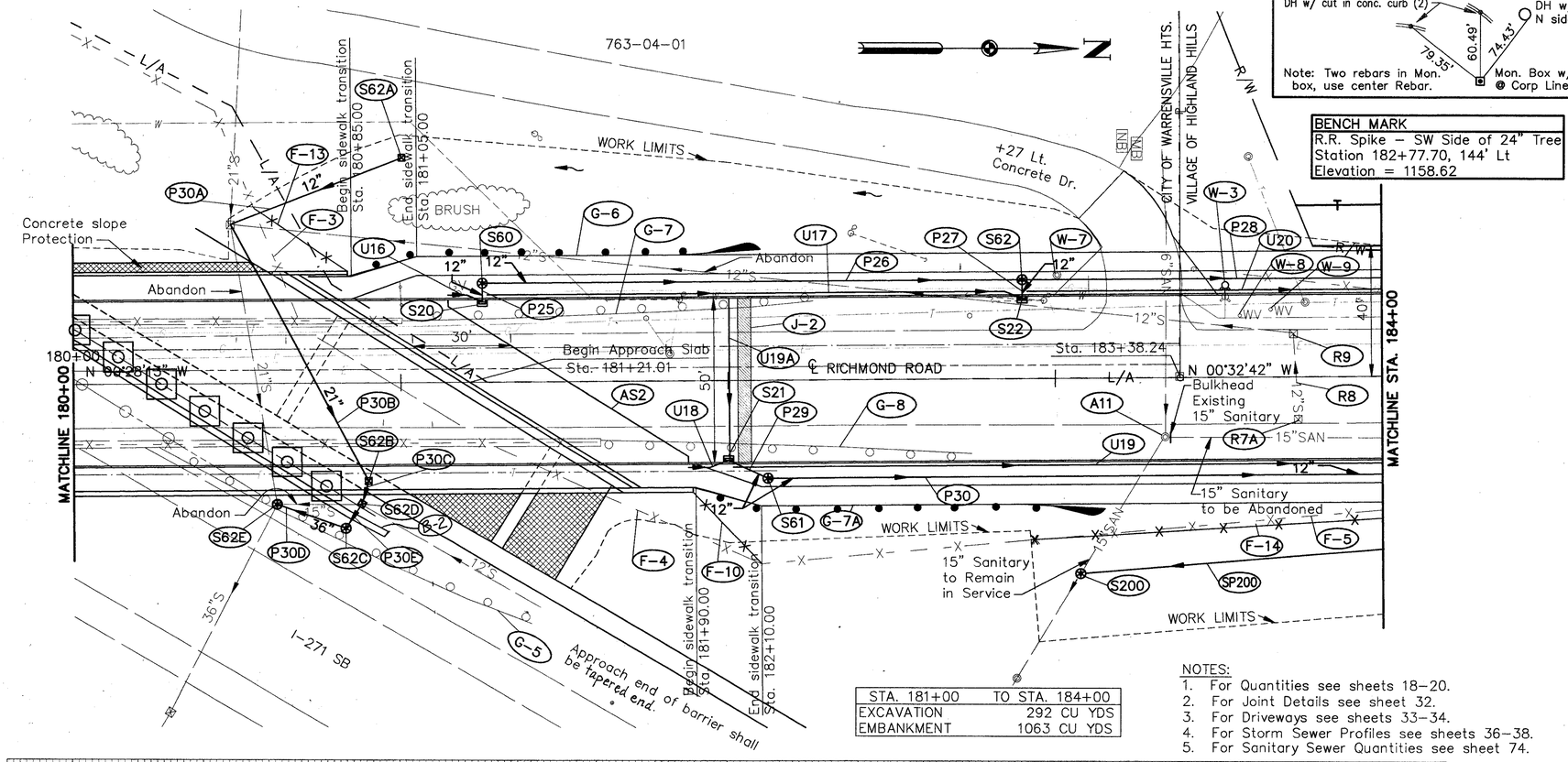
ESTIMATED QUANTITIES

REF. NO.	STATION TO STATION	SIDE EMBANKMENT 203 CU YDS	UNDERDRAINS FROM	UNDERDRAINS TO	603 6" CONDUIT, TYPE F LIN. FT.	605 6" SHALLOW PIPE U.D. A.P.P. LIN. FT.	UPPER ELEV.	LOWER ELEV.
	TOTALS							

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

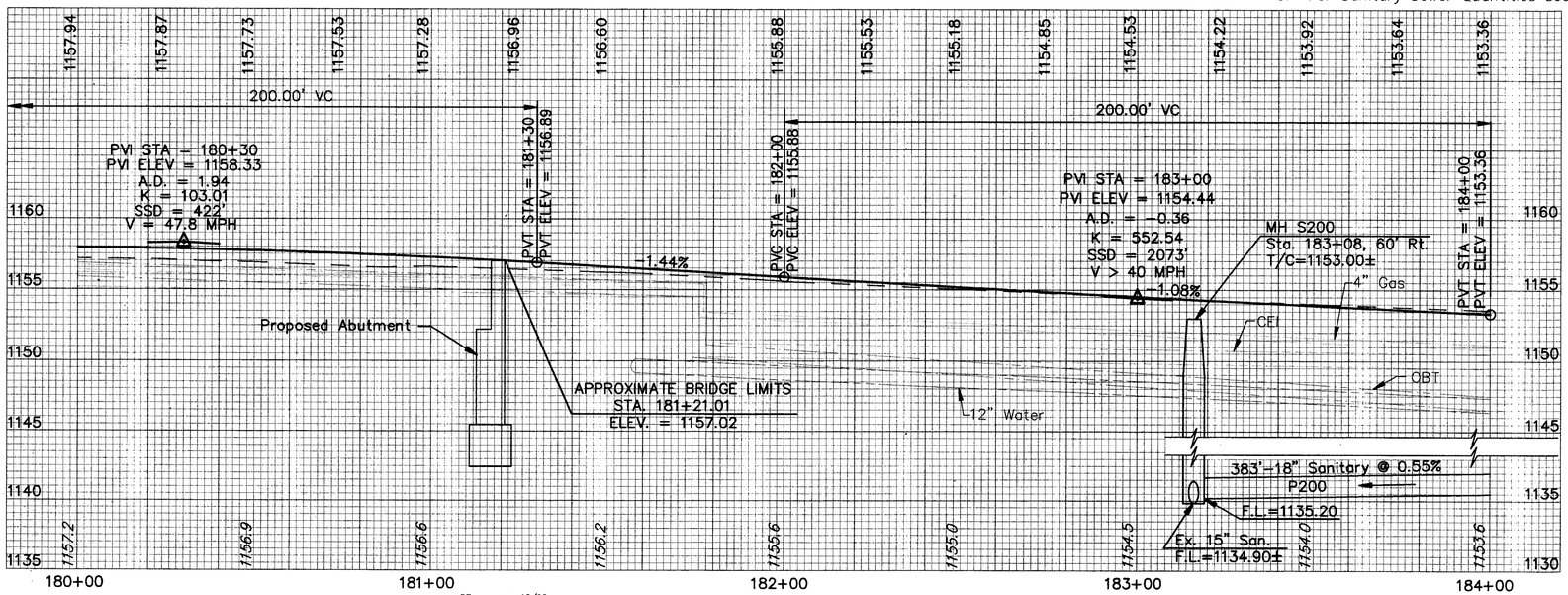
MADE BY: PF DATE: 12/92
DRAWN BY: PF DATE: 12/92
CHECKED BY: DAK DATE: 12/92
SCALE: 1"=20'

RICHMOND ROAD PLAN AND PROFILE STA. 175+00 TO STA. 180+00



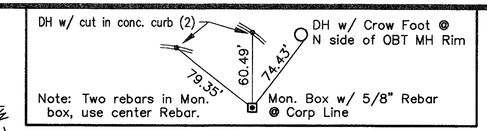
STA. 181+00	TO STA. 184+00
EXCAVATION	292 CU YDS
EMBANKMENT	1063 CU YDS

NOTES:
1. For Quantities see sheets 18–20.
2. For Joint Details see sheet 32.
3. For Driveways see sheets 33–34.
4. For Storm Sewer Profiles see sheets 36–38.
5. For Sanitary Sewer Quantities see sheet 74.



HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS **HNTB**

MADE BY: PF DATE: 12/92
DRAWN BY: PF DATE: 12/92
CHECKED BY: DAK DATE: 12/92
SCALE: 1"=20'
PLANS.DWG



BENCH MARK
R.R. Spike – SW Side of 24" Tree
Station 182+77.70, 144' Lt
Elevation = 1158.62

FHWA REGION	STATE	PROJECT	
5	OHIO		

28
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

ESTIMATED QUANTITIES

COST PARTICIPATION I

REF. NO.	STATION TO STATION	SIDE	604 CATCH BASIN NO. 8-A EACH	603 12" COND. TYPE C LIN. FT.	604 CATCH BASIN NO. 3A W/ V GRATE EACH	604 MANHOLE NO. 3 EACH	604 CATCH BASIN NO. 2-2B EACH	603 21" COND. TYPE C LIN.FT.	603 36" COND. TYPE C LIN.FT.	604 CATCH BASIN NO. 8 EACH
S20	181+25	LT.			1					
	181+25	LT.								
S60	181+25	LT.				1				
P25	181+25	LT.		5						
P26	181+25	LT.		165						
P27	182+90	LT.		5						
P28	182+90	LT.		110						
S62	182+90	LT.				1				
S22	182+90	LT.			1					
S62A	181+00	LT.					1			
S62D P30E	180+83	RT.	1							
P30A	181+00	LT.		54						
S21	182+00	RT.			1					
P29	182+00	RT.			13					
S61	182+12	RT.				1				
P30	182+12	RT.		188						
P30B	184+00	RT.								
	180+48	LT+RT						89		
S62B P30C	180+90	RT.						7		
S62C P30D	180+88	RT.								
S62E	180+83	RT.				1			22	
TOTALS	180+62		1	540	3	5	1	96	31	1

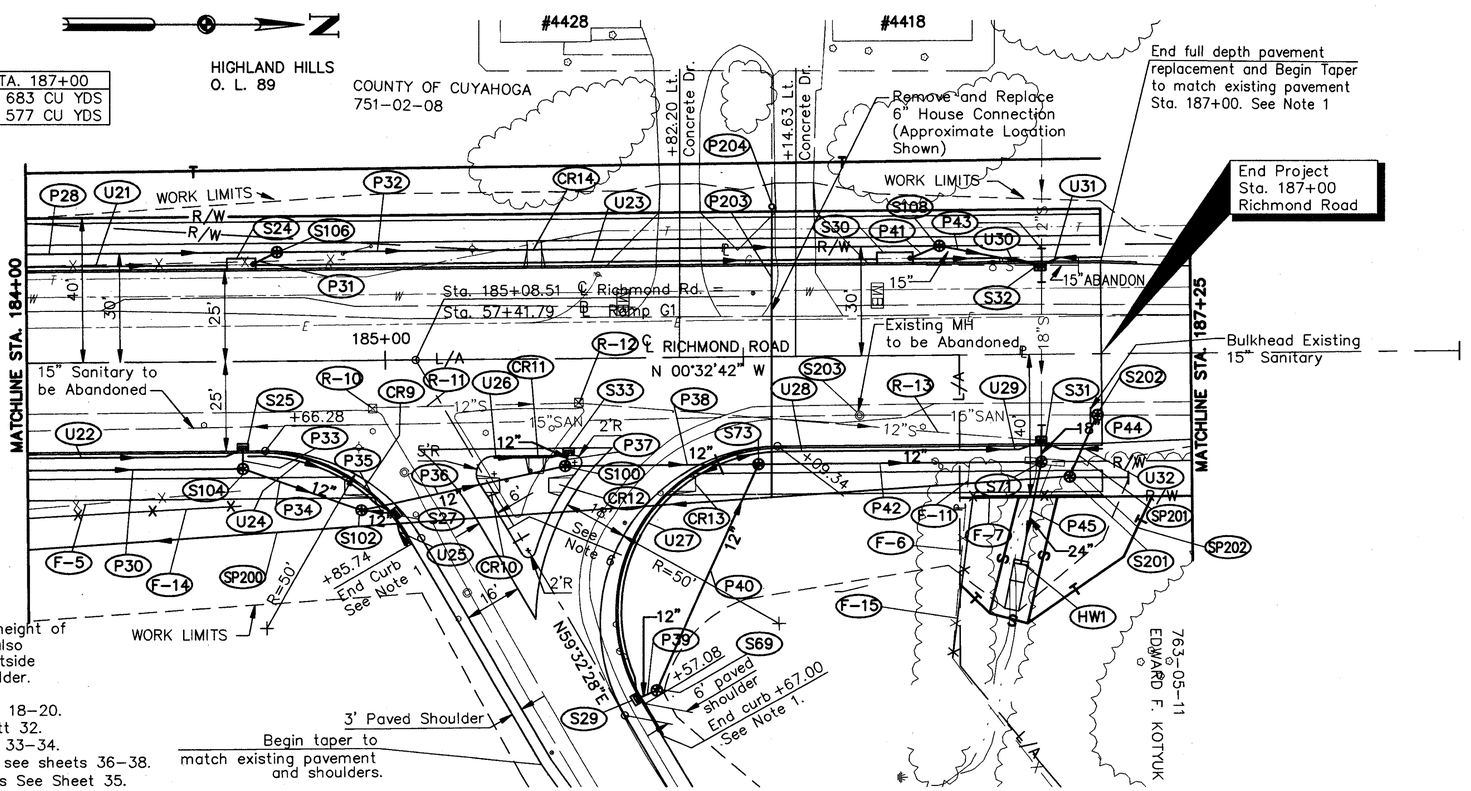
UNDERDRAINS

REF. NO.	FROM	TO	603 6" CONDUIT, TYPE F * LIN. FT.	605 6" SHALLOW PIPE U.D. 707.01 or 707.21 LIN. FT.	UPPER ELEV.	LOWER ELEV.
U16	181+15	181+25	10		1153.39	1153.25
U17	181+27	182+90	10	153	1153.22	1150.94
U20	182+92	184+00		108	1150.92	1149.65
U19A	182+05	182+05		49	1152.66	1152.17
U18	181+88	182+00	12		1152.34	1152.17
U19	182+02	184+00		200	1152.15	1149.65
TOTALS			32	510		

* 707.17 non-perforated ASTM 3034, SDR35 or SS931 or 944.

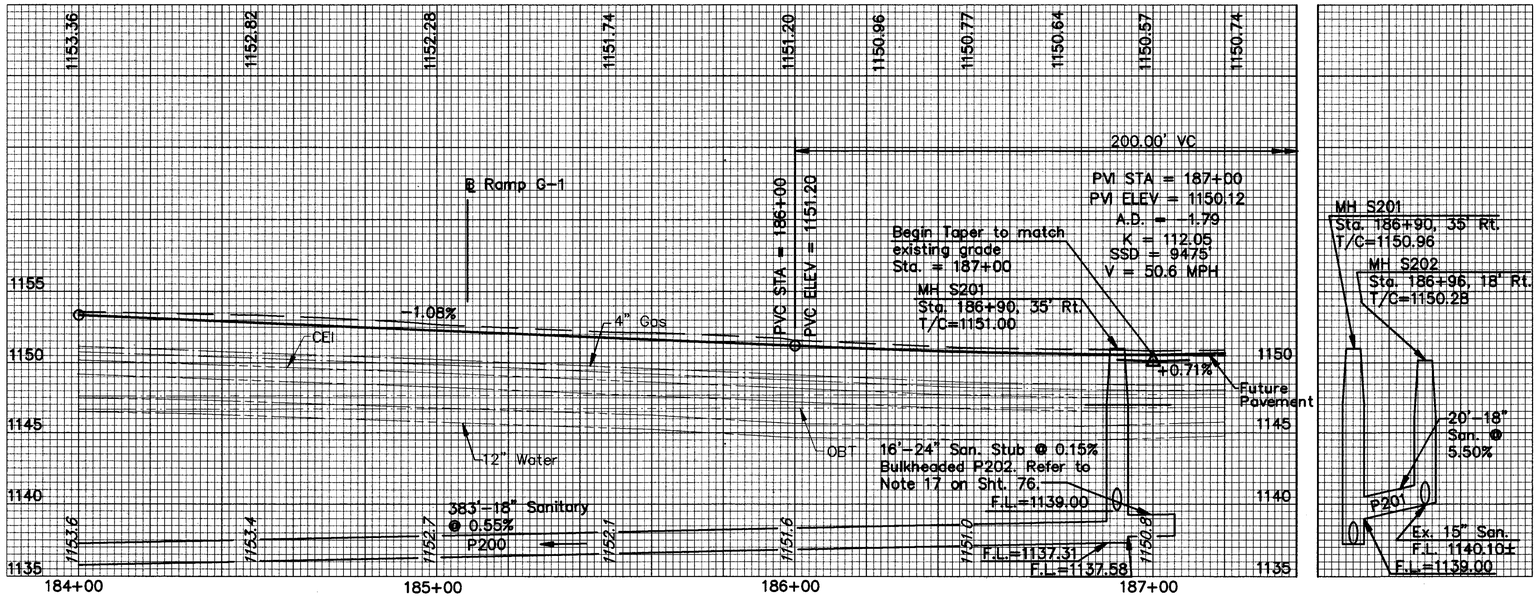
RICHMOND ROAD PLAN AND PROFILE STA. 180+00 TO STA. 184+00

STA. 184+00	TO STA. 187+00
EXCAVATION	683 CU YDS
EMBANKMENT	577 CU YDS



NOTES:

1. The curb tapers from a height of 6" to 0" in ten feet. It also tapers laterally to the outside edge of the treated shoulder. See Detail sheet 35.
2. For Quantities see sheets 18–20.
3. For Joint Details see shett 32.
4. For Driveways see sheets 33–34.
5. For Storm Sewer Profiles see sheets 36–38.
6. For Nose Approach Details See Sheet 35.
7. For Sanitary Sewer Quantities See Sheet 74.



ESTIMATED QUANTITIES

REF. NO.	REF. NO.	STATION TO STATION	SIDE	603 12" COND. TYPE B LIN. FT.	603 12" COND. TYPE C LIN. FT.	603 15" COND. TYPE C LIN. FT.	603 18" COND. TYPE C LIN. FT.	604 CATCH BASIN NO. 3 W/V GRATE EACH	604 CATCH BASIN NO. 3A W/V GRATE EACH	604 CATCH BASIN NO. 6 EACH	604 INLET NO. 2A-8 APP EACH
COST PARTICIPATION I											
P28		184+00 184+70	LT.		70						
S106	P32	184+70 186+55	LT.		185						
S108	P43	186+55 186+83	LT.		4	29					
S31		186+83	RT.					1			
S71		186+83	RT.								
S24	P31	184+60 184+70	LT.		8						1
P45		186+83 186+75	RT.								
P44		186+83 186+83	RT.				5				
S30	P41	186+42 186+55	LT.		9						1
S32		186+83	LT.					1			
S104	P34	184+60 184+93	RT.		34						
S102	P36	184+93 185+50	RT.	58							
S73	P42	186+04 186+83	RT.		79						
S27	P35	185+02 184+93	RT.		10				1		
S33	P37	185+51 185+50	RT.		4						
S100	P38	185+50 186+04	RT.	54						1	
S29	P39	185+70 185+75	RT.		5				1		
S69	P40	185+75 186+04	RT.		70						
S25	P33	184+60 184+60	RT.		5				1		
P30		184+00 184+60	RT.		60						
TOTALS				112	543	29	5	2	3	1	1

REF. NO.	REF. NO.	STATION TO STATION	SIDE	603 24" COND. TYPE C LIN. FT.	604 MANHOLE NO. 3 EACH	604 INLET NO. 2A-10 APP EACH	604 INLET NO. 2A-8 APP EACH
P28		184+00 184+70	LT.				
S106	P32	184+70 186+55	LT.		1		
S108	P43	186+55 186+83	LT.		1		
S31		186+83	RT.				
S71		186+83	RT.		1		
S24	P31	184+60 184+70	LT.	30			
P45		186+83 186+75	RT.				
P44		186+83 186+83	RT.		4	1	
S30	P41	186+42 186+55	LT.				
S32		186+83	LT.				
S104	P34	184+60 184+93	RT.				
S102	P36	184+93 185+50	RT.				
S73	P42	186+04 186+83	RT.				
S27	P35	185+02 184+93	RT.				
S33	P37	185+51 185+50	RT.				
S100	P38	185+50 186+04	RT.		1		
S29	P39	185+70 185+75	RT.				
S69	P40	185+75 186+04	RT.		1		
S25	P33	184+60 184+60	RT.				
P30		184+00 184+60	RT.				
TOTALS				30	8	1	1

UNDERDRAINS

REF. NO.	FROM	TO	603 6" CONDUIT TYPE F * LIN. FT.	605 6" SHALLOW UNCLASSIFIED PIPE U.D. 707.01 OR 707.21 LIN. FT.	605 6" UNCLASSIFIED PIPE U.D. LIN. FT.	UPPER ELEV.	LOWER ELEV.
COST PARTICIPATION I							
U21	184+00	184+60	10	50		1149.65	1149.00
U23	184+63	186+42	10		169	1148.97	1147.58
U29	186+64	186+83	10	9		1146.97	1146.90
U30	186+42	186+83	10	26		1147.09	1146.90
U31	187+00	186+83	10		7	1146.97	1146.90
U32	187+00	186+83	10	7		1146.86	1146.78
U22	184+00	184+60	10	50		1149.65	1149.00
U24	184+62	185+02	10	34		1148.98	1147.94
U25	185+07	185+02	8			1147.98	1147.94
U26	185+29	185+50	10	11		1148.26	1147.98
U27	185+93	185+70	10		68	1147.52	1145.57
U28	185+93	186+64		90		1147.52	1146.97
TOTALS			108	277	244		

* 707.17 non-perforated ASTM 3034, SDR35 or SS931 or 944

FHWA REGION	STATE	PROJECT	
5	OHIO		

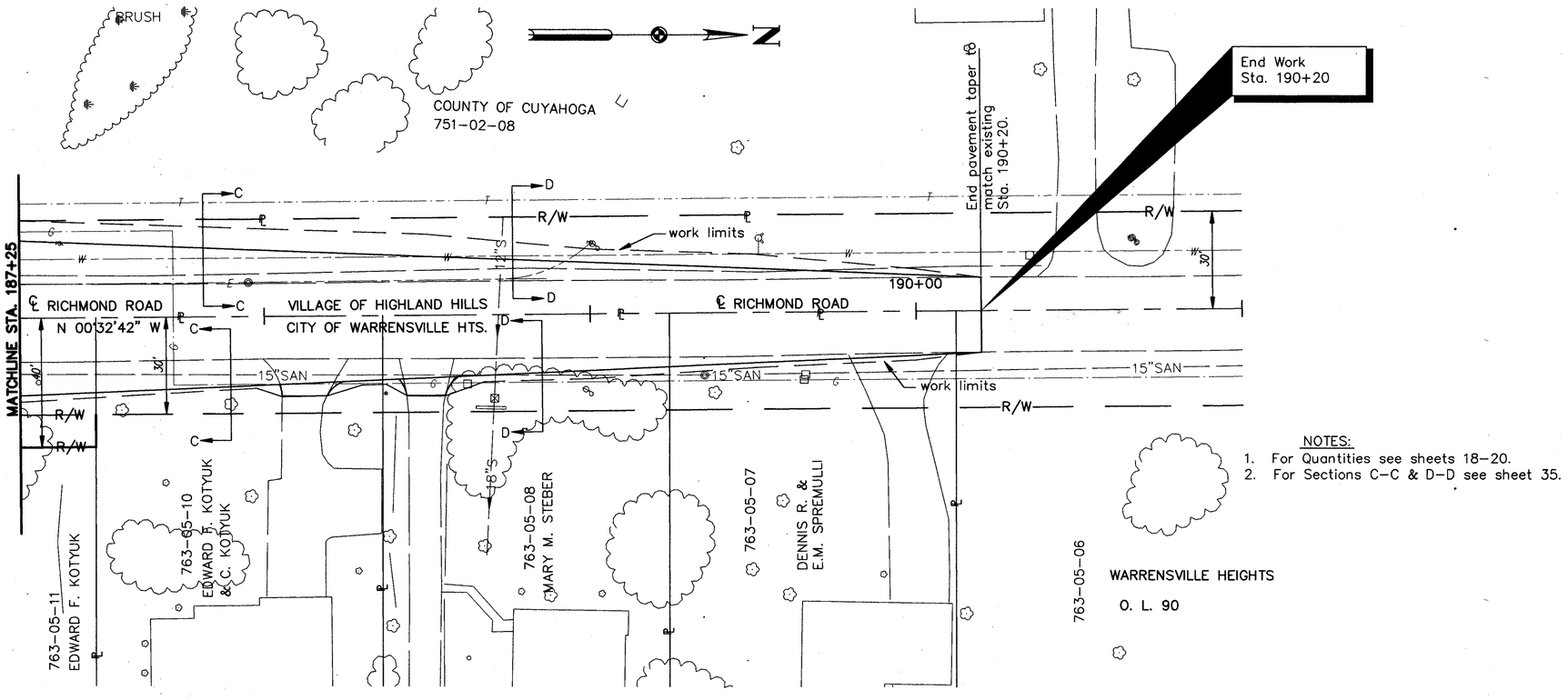
29
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

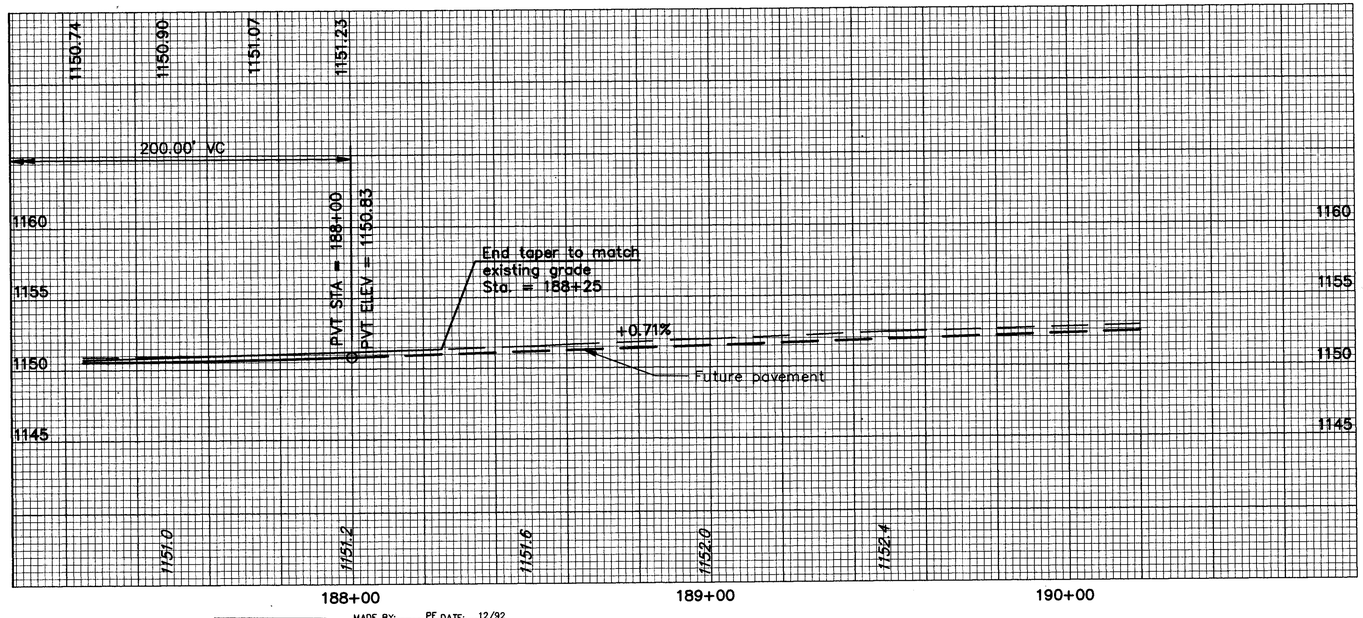
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: PF DATE: 12/92
DRAWN BY: PF DATE: 12/92
CHECKED BY: DAK DATE: 12/92
SCALE: 1"=20'
PLAN6.DWG

RICHMOND ROAD PLAN AND PROFILE STA. 184+00 TO STA. 187+25



NOTES:
1. For Quantities see sheets 18–20.
2. For Sections C–C & D–D see sheet 35.



HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: PF DATE: 12/92
DRAWN BY: PF DATE: 12/92
CHECKED BY: DAK DATE: 12/92
SCALE: 1"=20'
PLAN7

FHWA REGION	STATE	PROJECT	
5	OHIO		

30
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

ESTIMATED QUANTITIES

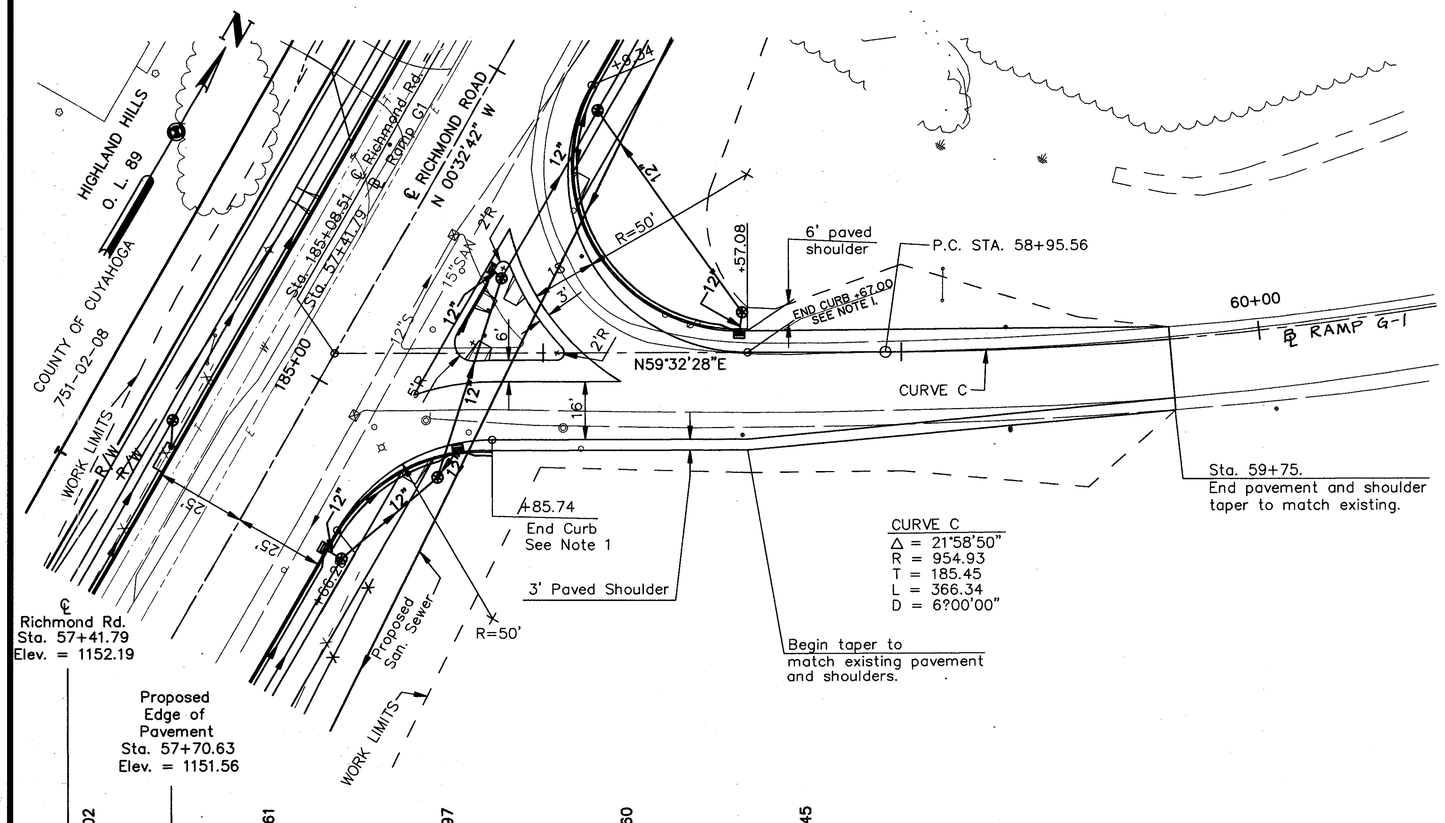
REF. NO.	STATION TO STATION	SIDE EMBANKMENT 203 CU YDS	UNDERDRAINS: FROM	UNDERDRAINS: TO	603 6" CONDUIT, TYPE F LIN. FT.	605 6" SHALLOW PIPE U.D. A.P.P. LIN. FT.	UPPER ELEV.	LOWER ELEV.
	TOTALS							

RICHMOND ROAD PLAN AND PROFILE STA. 187+25 TO STA. 191+00

FHWA REGION	STATE	PROJECT	
5	OHIO		

31
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29



NOTES:

1. The curb tapers from a height of 6" to 0" in ten feet. It also tapers laterally to the outside edge of the treated shoulder.
2. For Quantities see sheets 18-20.
3. For Joint Details see sheet 32.
4. For Sewer Profiles see sheets 36-38.

CURVE C
Δ = 21°58'50"
R = 954.93
T = 185.45
L = 366.34
D = 6°00'00"

STA. 58+00	TO STA. 59+75
EXCAVATION	315 CU YDS
EMBANKMENT	4 CU YDS

ESTIMATED QUANTITIES

REF. NO.	STATION TO STATION	SIDE EMBANKMENT 203 CU YDS	UNDERDRAINS: 603 6" CONDUIT, TYPE F LIN. FT.	605 6" SHALLOW PIPE U.D. A.P.P. LIN. FT.	UPPER ELEV.	LOWER ELEV.
	TOTALS					

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

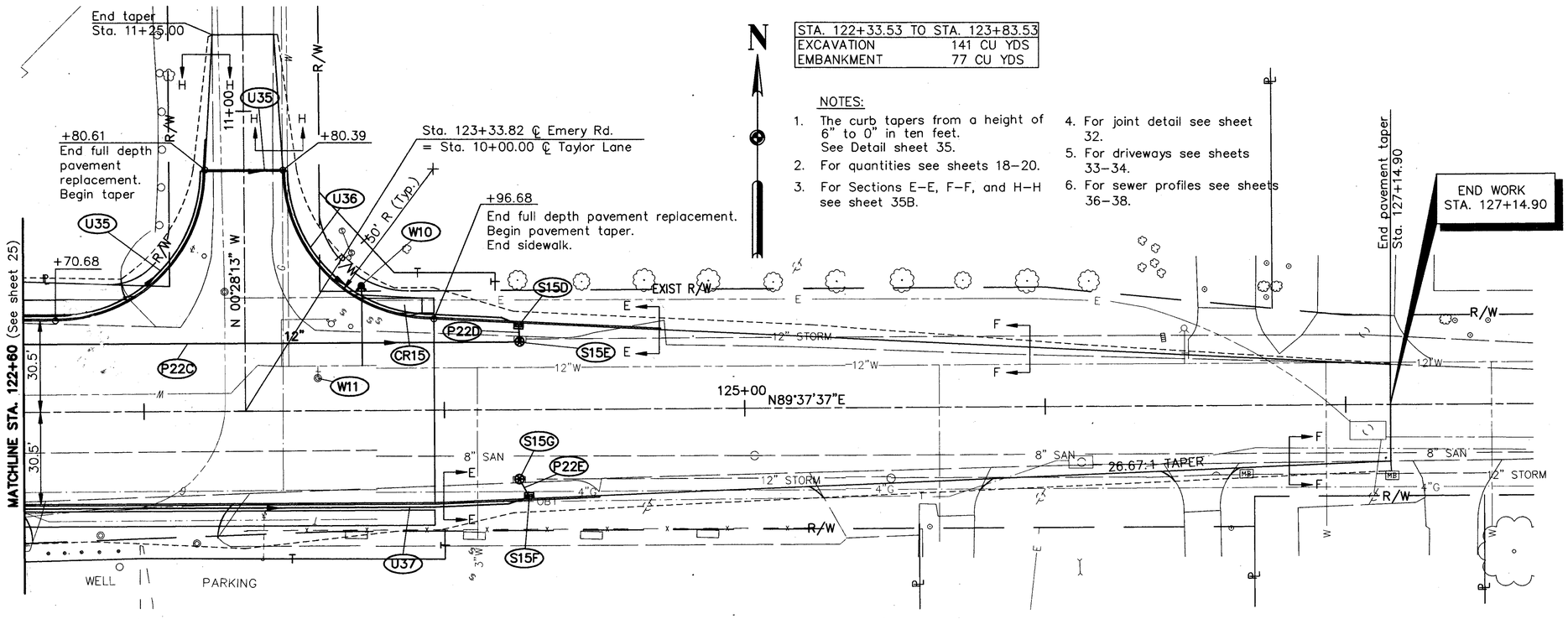
MADE BY: PF DATE: 1/93
DRAWN BY: PF DATE: 1/93
CHECKED BY: DAK DATE: 1/93
SCALE: 1"=20'

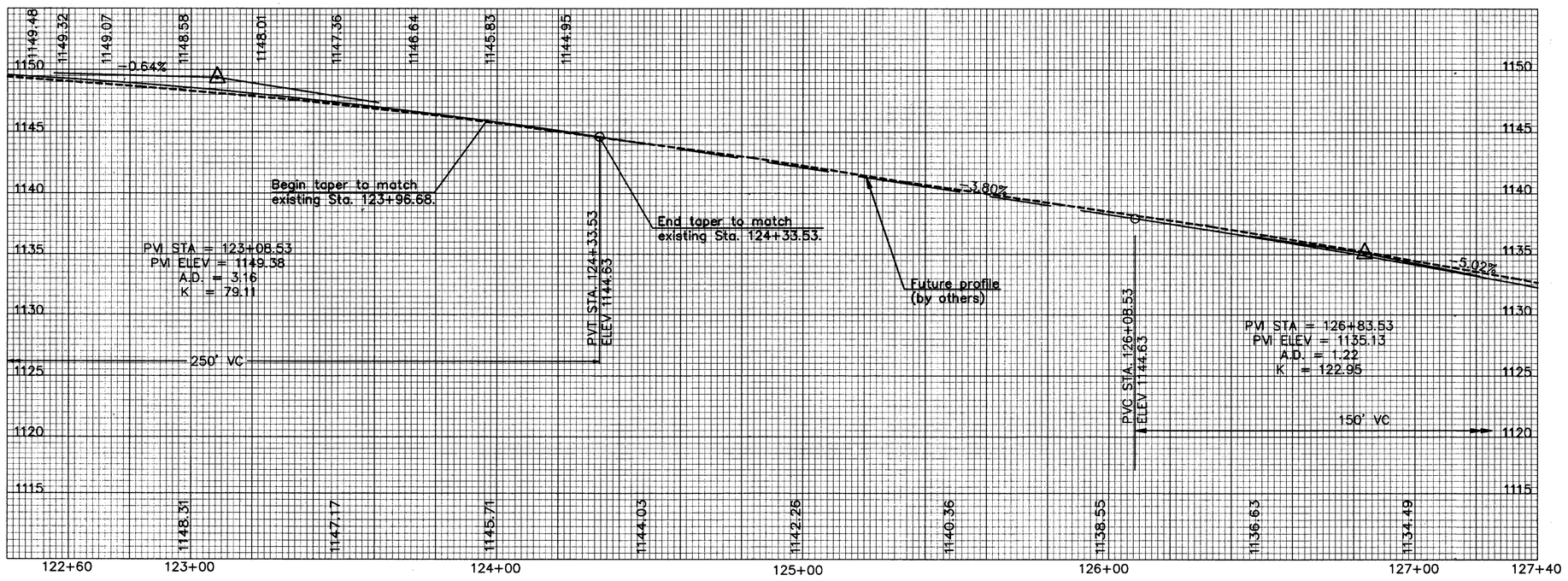
RAMP G-1 PLAN AND PROFILE STA. 57+41.79 TO STA. 59+75

STA. 122+33.53 TO STA. 123+83.53	
EXCAVATION	141 CU YDS
EMBANKMENT	77 CU YDS

NOTES:

1. The curb tapers from a height of 6" to 0" in ten feet. See Detail sheet 35.
2. For quantities see sheets 18–20.
3. For Sections E–E, F–F, and H–H see sheet 35B.
4. For joint detail see sheet 32.
5. For driveways see sheets 33–34.
6. For sewer profiles see sheets 36–38.





FHWA REGION	STATE	PROJECT	
5	OHIO		

31A / 110

CUYAHOGA COUNTY
CUY–175–2.68
CUY–271–6.29

* with "V" Grate
** 707.17, Non–Perforated ASTM 3034, SDR35 or SS931 or 944

ESTIMATED QUANTITIES

UNDERDRAINS

COST PARTICIPATION I

REF. NO.	FROM	TO	603 6" CONDUIT TYPE F ** LIN. FT.	605 6" SHALLOW PIPE U.D. 707.01 OR 707.21 LIN. FT.	603 6" CONDUIT, TYPE B LIN. FT.	UPPER ELEV.	LOWER ELEV.
U35	122+60 (Emery)	10+80.61 (Taylor)		89	28	1144.35	1142.20
U36	10+80.39 (Taylor)	124+25 (Emery)	28	79		1142.20	1140.02
U37	122+60 (Emery)	124+28 (Emery)	33	137		1144.58	1140.10
TOTALS			61	305	28		

REF. NO.	STATION TO STATION	SIDE	603 12" COND. TYPE B LIN. FT.	604 CATCH BASIN NO. 3A * EACH	604 MANHOLE NO. 3 EACH
P22C	122+60	124+25 Lt.	165		
S15D	124+25	Lt.		1	1
S15E	124+25	Lt.			
P22D	124+25	Lt.	6		
S15F	124+28	Rt.		1	
P22E	124+28	124+25 Rt.	7		
S15G	124+25	Rt.			1
TOTALS			178	2	2

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: PF DATE: 5/93
DRAWN BY: PF DATE: 5/93
CHECKED BY: AMM DATE: 5/93
SCALE: 1"=20'
PLAN9.DWG

EMERY ROAD PLAN AND PROFILE STA. 122+60 TO 127+50

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

NOTES:

1. Add 1100' to each elevation
2. For joint types (C), (L1), (L2) and (T): see standard construction drawings BP-2.1, BP-2.2, and BP-2.5.
3. For nose approach detail see sheet 35.

LEGEND

- (C) – CONTRACTION JOINT
- (L1) – STANDARD LONGITUDINAL JOINT
- (L2) – LONGITUDINAL JOINT WITHOUT TIE BARS
- (T) – TYPE T CONTRACTION JOINT
- (P) – PAVEMENT RELIEF JOINT TYPE A

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: PF DATE: DEC 92
DRAWN BY: PF DATE: DEC 92
CHECKED BY: TBS DATE: JAN 93
SCALE: 1"=20'

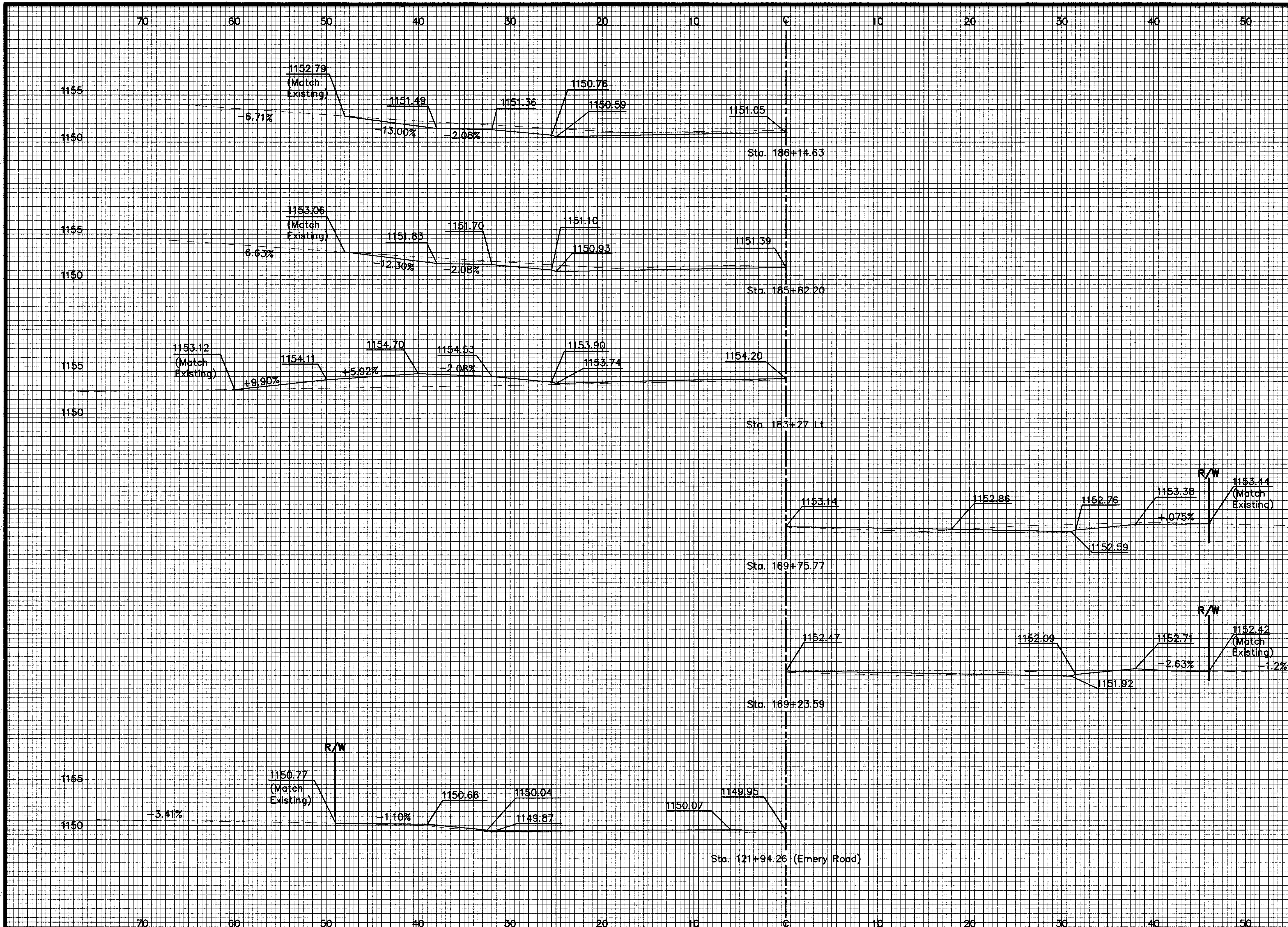
F:\PROJECTS\HIGHWAY\14472\RICHMOND\JOINT
1.99302050908167 4E+007

INTERSECTION DETAILS

FHWA REGION	STATE	PROJECT	
5	OHIO		

33
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29



HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: TBS/MA DATE: 12/92
DRAWN BY: JCAML DATE: 12/92
CHECKED BY: PP DATE: 1/93
SCALE: 1"=5'
DRVPROFS

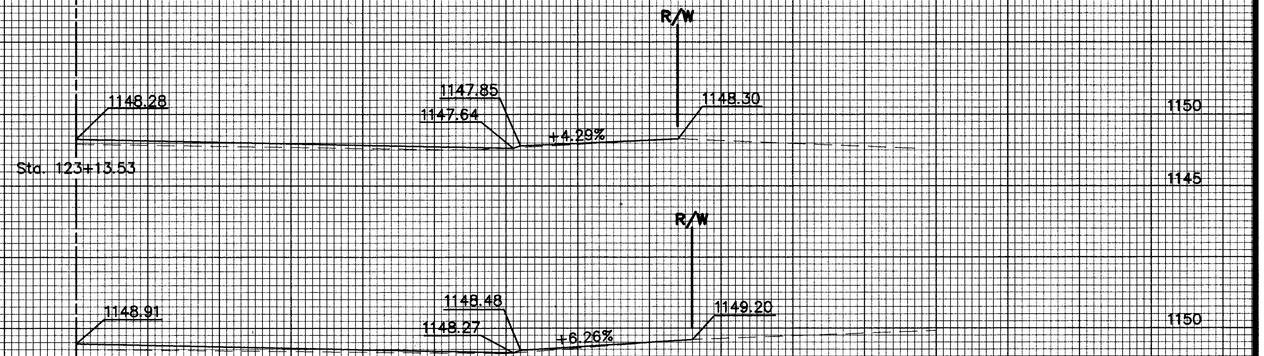
DRIVEWAY PROFILES

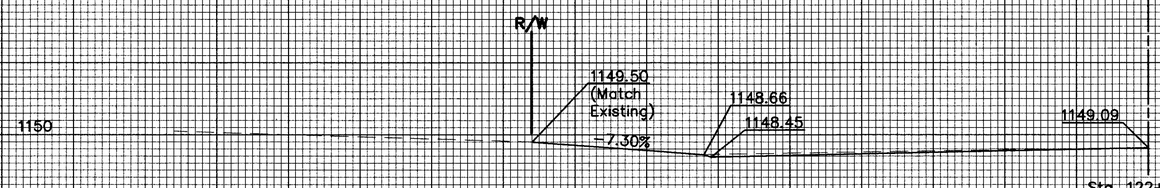
FHWA REGION	STATE	PROJECT	
5	OHIO		

33A
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

70 60 50 40 30 20 10 ℄ 10 20 30 40 50





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

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: SUB DATE: 5/93
DRAWN BY: BJF DATE: 6/93
CHECKED BY: RP DATE: 6/93
SCALE: 1"=5'
DRYPROFS

EMERY ROAD DRIVEWAY PROFILES

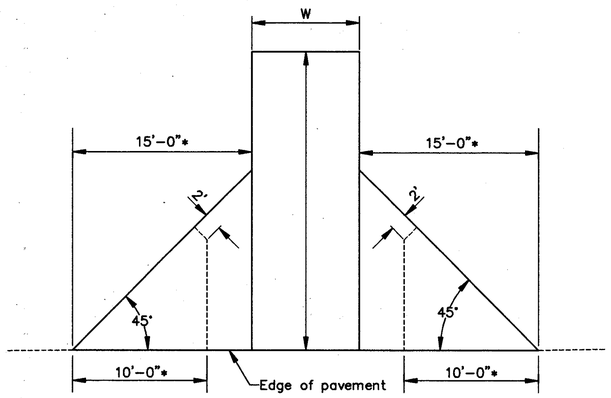
FHWA REGION	STATE	PROJECT	
5	OHIO		

34
110

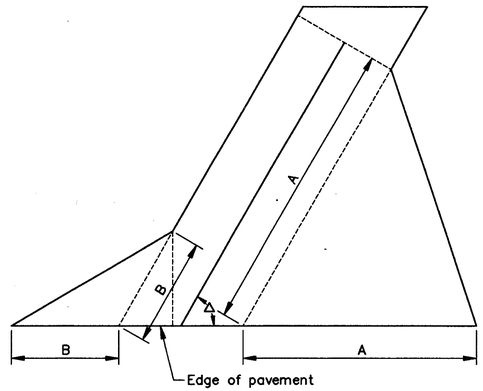
CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

C = Impressed joint without tie bars for portland cement concrete

* Unless otherwise shown in plans.



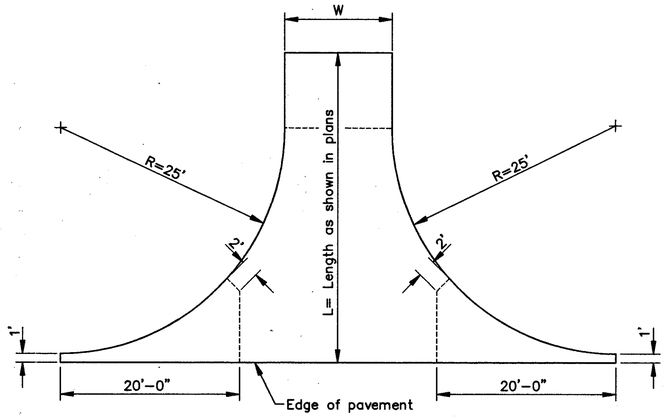
TYPE 2 DRIVEWAY



TYPE 2 SKEWED DRIVEWAY

C = Impressed joint without tie bars for portland cement concrete

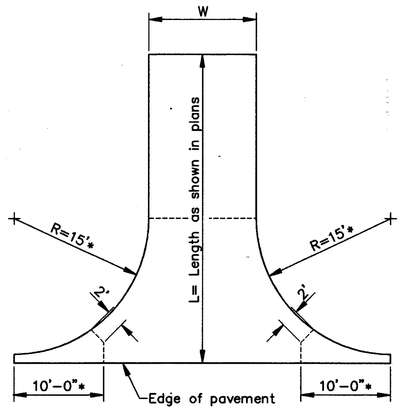
* Unless otherwise shown in plans.



TYPE – 1A DRIVEWAY

C = Impressed joint without tie bars for portland cement concrete

* Unless otherwise shown in plans.



TYPE – 1B DRIVEWAY

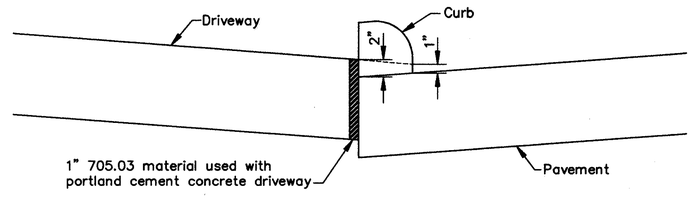
DRIVEWAY DIMENSIONS

STATION	SIDE	PAVE-MENT TYPE	DRIVE USE	DRIVE TYPE	W LF	R1 LF	R2 LF	△ DEGREE	L LF	A LF	B LF
Sta. 121+94.26 (Emery Rd.)	Lt	Conc.	C	1-B	35	15	15	90	17		
169+23.59	Rt	Conc.	C	1-B	36	15	15	90	15.5		
169+75.77	Rt	Conc.	C	1-B	36	15	15	90	15		
183+27	Lt	Conc.	C	2	25	–	–	90	35		
185+82.20	Lt	Conc.	R	2	11	–	–	90	23		
186+14.63	Lt	Conc.	R	2	11.5	–	–	90	23		

DRIVEWAY QUANTITIES (COST PARTICIPATION 1)

STATION	SIDE	AREA	202 PAVEMENT REMOVED	203 EXCAVATION NOT INCLUDING EMBANKMENT CONSTRUCTION	203 EMBANKMENT		304 AGGREGATE BASE, GRADING A	451 8" REIN-FORCED CONCRETE PAVEMENT	452 6" PLAIN CONCRETE PAVEMENT	446 1 1/4" SURFACE COURSE AC-20	446 3" AVG. INTERMED. COURSE, AC-20
		SQ. FT.	SQ. YD.	CU. YD.	CU. YD.		CU. YD.	SQ. YD.	SQ. YD.	CU.YD.	CU. YD.
Sta. 121+94.26 (Emery Rd.)	Lt	694	78	13.5	–		12.8	77	–		
Sta. 122+74 (Emery Rd.)	Lt	520	70	20.7	–		9.6	58			
Sta. 122+83 (Emery Rd.)	Rt	520	51	18.2	–		9.6	58			
Sta. 123+14 (Emery Rd.)	Rt	520	61	6.6	–		9.6	58			
Sta. 125+58 (Emery Rd.)	Rt	236	52							0.9	2.2
Sta. 126+52 (Emery Rd.)	Rt	88	14							0.3	0.8
Sta. 126+59 (Emery Rd.)	Lt	30	7							0.1	0.3
Sta. 127+03 (Emery Rd.)	Lt	22	4							0.1	0.2
169+23.59	Rt	659	131	17.5	–		12.2	73	–		
169+75.77	Rt	630	129	18.8	–		11.7	70	–		
183+27	Lt	1027	117	–	6.9		19.0	114	–		
185+82.20	Lt	482	57	18.5	–		9.0	–	54		
186+14.63	Lt	468	51	19.9	–		8.7	–	52		
163+15	Rt	497	63							1.9	4.6
163+37	Lt	536	64							2.1	5.0
164+92	Rt	218	50							0.8	2.0
165+90	Lt	114	22							0.4	1.1
166+42	Rt	368	105							1.4	3.4
188+12	Rt	78	28							0.3	0.7
188+50	Rt	66	19							0.3	0.6
TOTALS			1173	133.7	6.9		102.2	508	106	8.6	20.9

Note:
Transition from standard curb section to drop curb section to be made in 18' distance from driveway.



DROP CURB DETAIL AT DRIVEWAYS

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: TMA DATE: 3/93
DRAWN BY: PJK DATE: 3/93
CHECKED BY: PF DATE: 3/93
SCALE: NONE
DRIVES

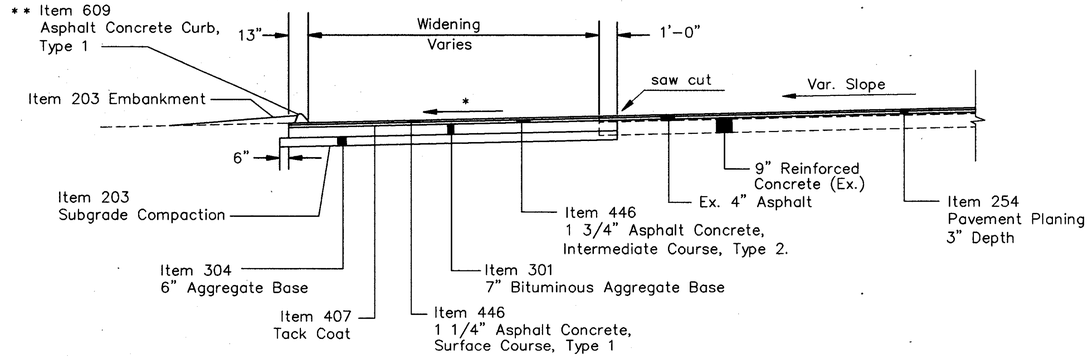
DRIVE DETAILS DIMENSIONS AND QUANTITIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

35
110

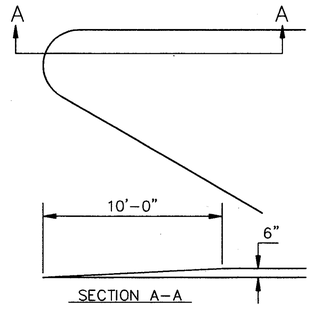
CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

** For locations of curb see plan sheets.



SECTION A – A

From Sta. 162+70 to Sta. 167+00

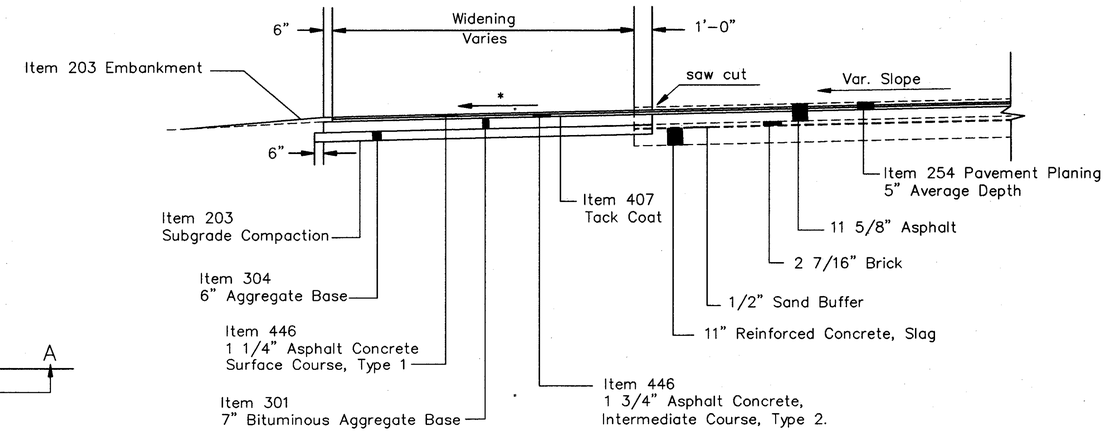


SECTION A–A

NOSE DOWN AT APPROACH END OF MEDIAN

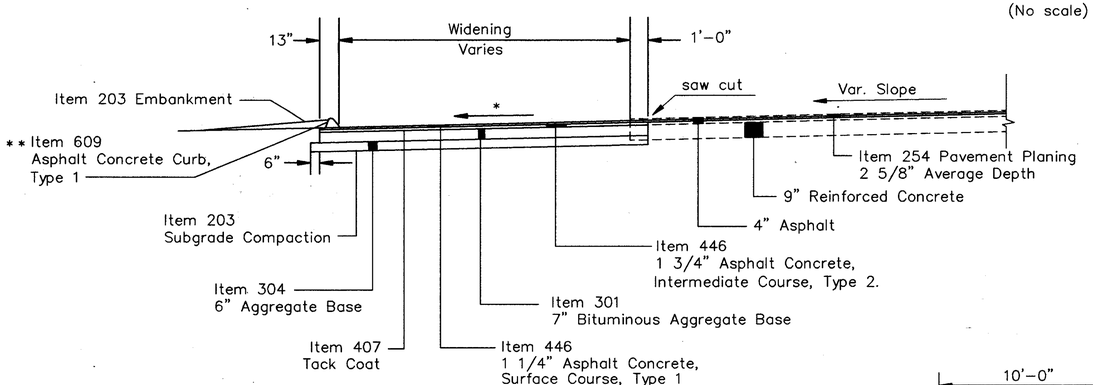
(No scale)

* Cross-Slope to Match Existing



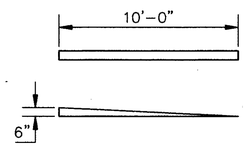
SECTION C – C

From Sta. 187+00 to Sta. 188+25



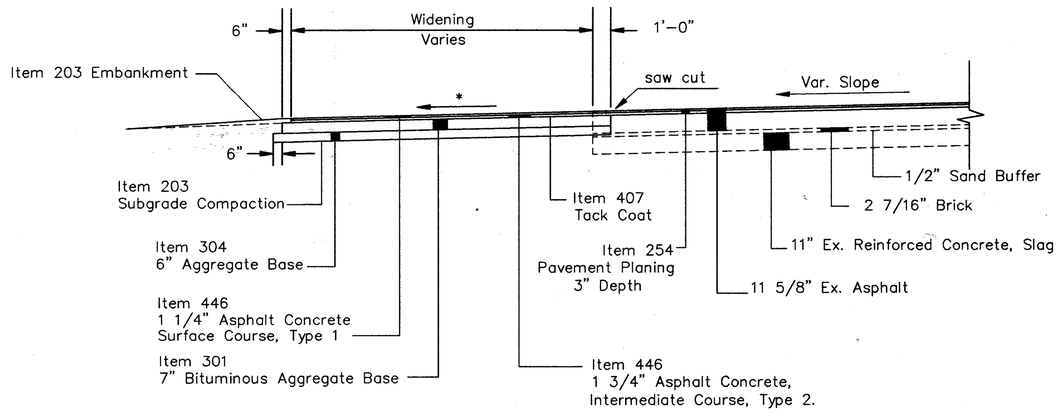
SECTION B – B

From Sta.167+00 to Sta.167+50



CURB TRANSITION DETAIL

(No scale)



SECTION D – D

From Sta. 188+25 to Sta. 190+20

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

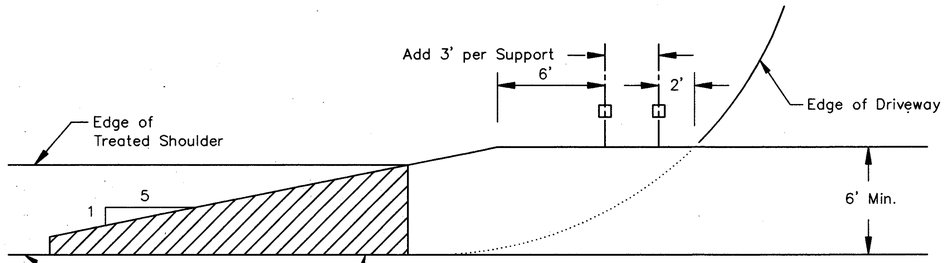
MADE BY: TMA DATE: 2/92
DRAWN BY: TMA DATE: 2/92
CHECKED BY: PF DATE: 3/92
SCALE: 1/4"=1'
TMADET

MISCELLANEOUS DETAILS

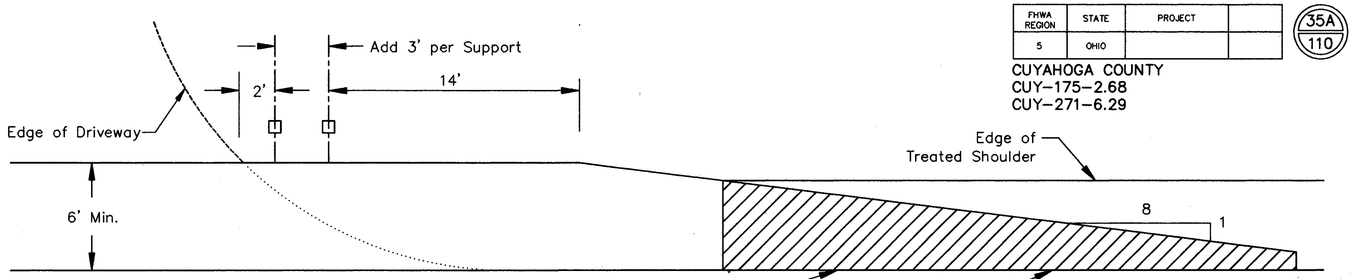
FHWA REGION	STATE	PROJECT	
5	OHIO		

35A
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

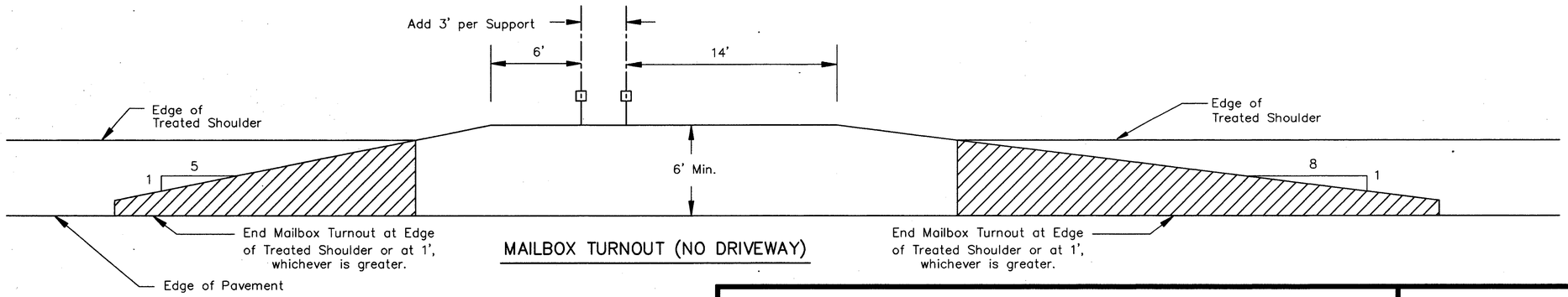


MAILBOX ON FAR SIDE OF DRIVE

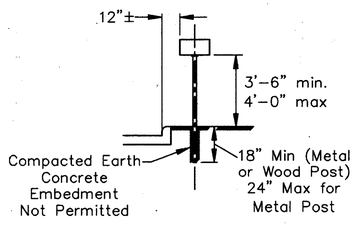


MAILBOX ON NEAR SIDE OF DRIVE

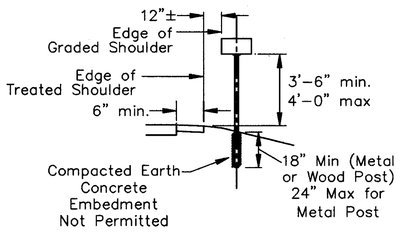
MAILBOX TURNOUTS AT DRIVEWAYS



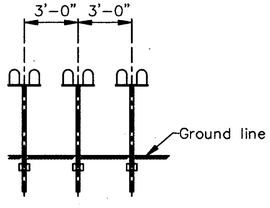
MAILBOX TURNOUT (NO DRIVEWAY)



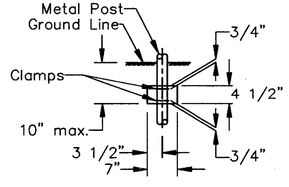
MAILBOX INSTALLATION DETAIL
CURBED PAVEMENT



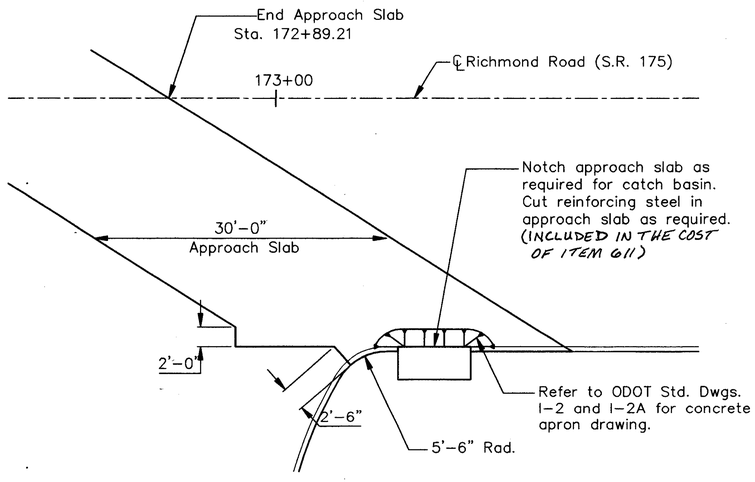
MAILBOX INSTALLATION DETAIL
PAVED SHOULDER



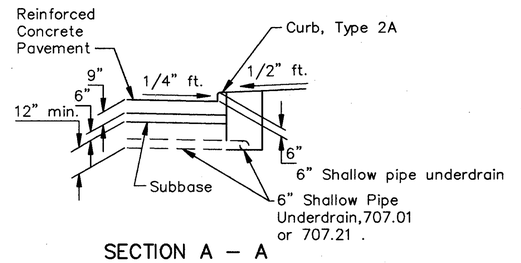
GROUP MAILBOX INSTALLATION



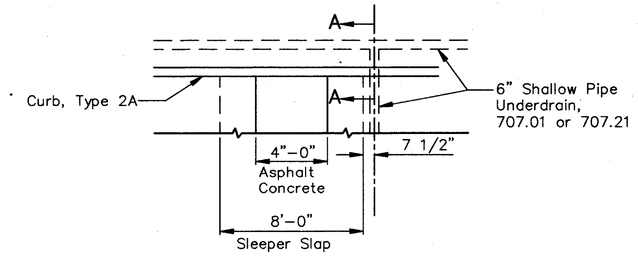
ANTI-TWIST PLATE
NOT TO SCALE



MODIFIED APPROACH SLAB AT REAR ABUTMENT (SOUTH SIDE)



SECTION A – A



UNDERDRAIN TEE DETAIL
AT PAVEMENT RELIEF JOINTS.
(SEE STANDARD CONSTRUCTION DRAWING BP-2.3)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

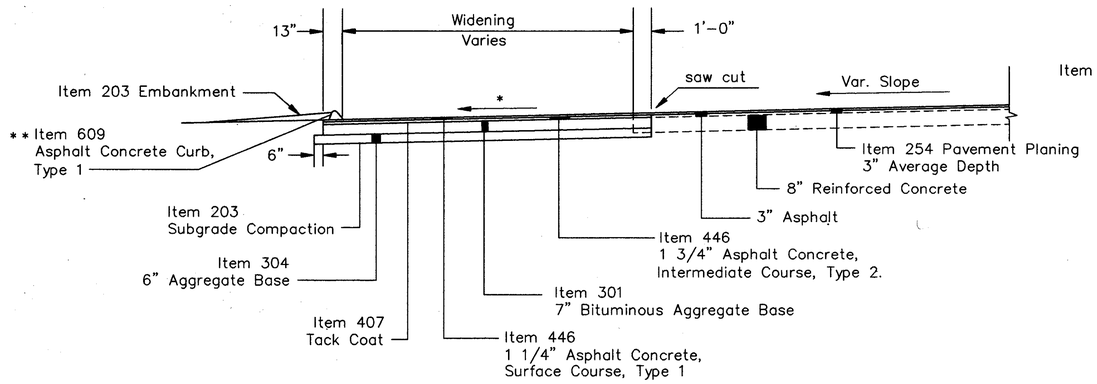
MADE BY: AMM DATE: 5/93
DRAWN BY: TMA DATE: 5/93
CHECKED BY: PF DATE: 5/93
SCALE: 1/4" = 1'
UD.DWG

MISCELLANEOUS DETAILS

FHWA REGION	STATE	PROJECT	
5	OHIO		

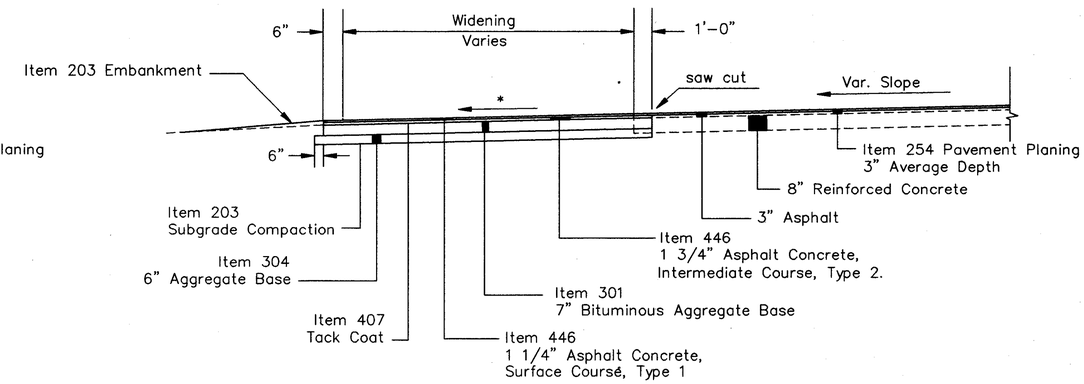
35B
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29



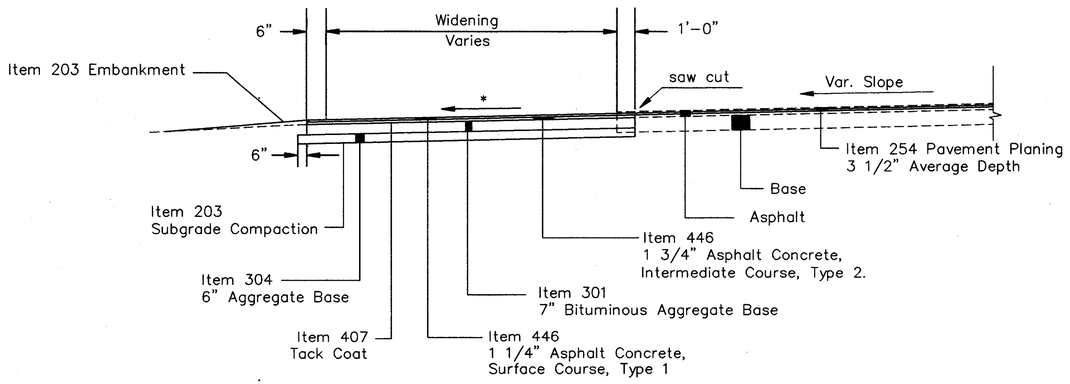
SECTION E – E

Emery Rd. From Sta.123+96.68 to Sta.124+73



SECTION F – F

Emery Rd. From Sta.124+73 to Sta.127+14.90



SECTION H – H

Taylor Ln. From Sta.10+80.01 to Sta.11+25

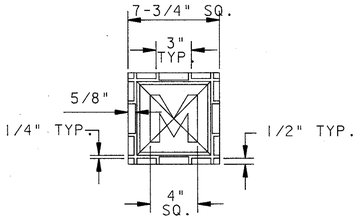
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: AMM DATE: 5/93
DRAWN BY: AMM DATE: 5/93
CHECKED BY: PF DATE: 5/93
SCALE: 1/4"=1'
TMADET

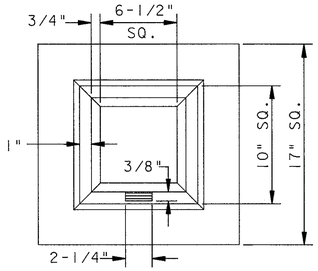
MISCELLANEOUS DETAILS

CALC. BY ____ DATE ____	CUYAHOGA COUNTY	OHIO
CHK'D BY ____ DATE ____	CUY-175-2.68 CUY-271-6.29	FHWA REGION 5

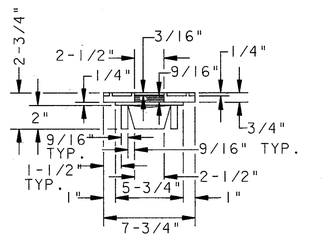
35C
110



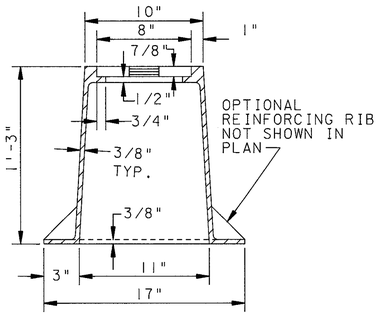
PLAN OF COVER



PLAN OF FRAME

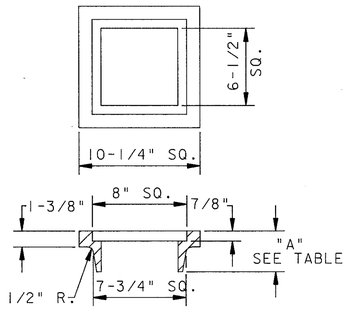


SIDE VIEW OF COVER



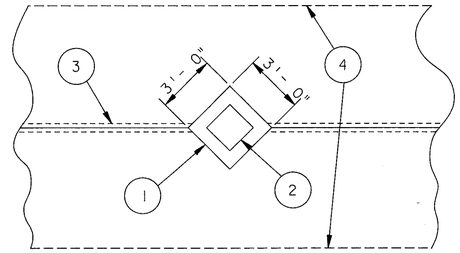
SECTION OF FRAME

MONUMENT BOX



ADJUSTING RING

ADJUSTMENT HEIGHT	DIMENSION "A"	MINIMUM WEIGHTS
1-1/2"	2-3/8"	20-LBS.
2-1/2"	3-3/8"	27-LBS.
3"	3-7/8"	30-LBS.
3-1/2"	4-3/8"	32-LBS.



1. MONUMENT ASSEMBLY BLOCK OUT (CONSTRUCTION JOINT PER BP-2.2)
2. MONUMENT BOX
3. TYPICAL LONGITUDINAL JOINT
4. 451 CONC. PAVEMENTS, A.P.P.

DETAIL "A"

TYPICAL BLOCK OUT IN RIGID PAVEMENT. (OMIT FOR FULL DEPTH FLEXIBLE PAVEMENT)

NOTES

CASTINGS SHALL MINIMALLY MEET THE REQUIREMENTS OF 604.02-711.12, A.S.T.M. A 48, CLASS 35 GRAY IRON OR 711.13 DUCTILE IRON.
THE ASSEMBLY SHALL BE ESSENTIALLY THE SAME AND EQUALLY AS STRONG AS THOSE HEREON.

MINIMUM WEIGHTS:
FRAME_____94 LBS.
COVER_____16 LBS.
PROVIDED THEY COMPLY WITH THE SPECIFICATIONS, DETAILS, DIMENSIONS AND MINIMUM WEIGHTS,
NEENAH_____NO.NF- 0000T04,
EAST JORDAN__NO.8365
OR APPROVED EQUAL CASTINGS ARE ACCEPTABLE.

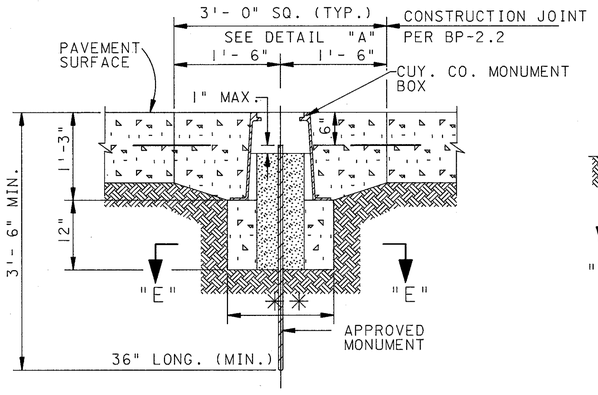
BEARING AREAS SHALL BE FINISHED AS TO PROVIDE A FIRM AND EVEN SEAT. NO PROJECTION SHALL EXIST ON THE BEARING AREAS AND THE COVER SHALL SEAT IN ITS FRAME WITHOUT ROCKING.

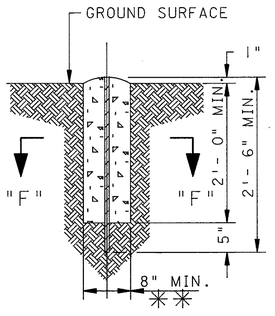
PRIOR TO CONSTRUCTION OF PAVEMENT, THE FRAME SHALL BE SET TO GRADE IN SUCH A MANNER THAT WILL PREVENT ANY PAVEMENT MATERIAL FROM ENTERING THE CASTING.

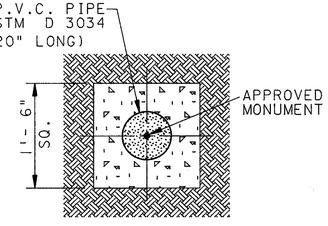
MONUMENT CAPS WILL BE FURNISHED BY THE CLEVELAND REGIONAL GEODETIC SURVEY (C.R.G.S.) OFFICE. CONTACT CUYAHOGA COUNTY ENGINEER'S SURVEY OFFICE AT 348-3846 TWO (2) WORKING DAYS BEFORE CONSTRUCTING.

ALL MONUMENTS ARE TO BE SET UNDER THE DIRECTION OF A REGISTERED SURVEYOR. (REF. O.A.C. 4733-37-03)

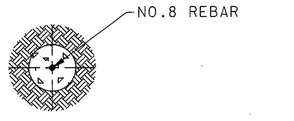
PAY ITEMS:
ITEM 604- CUYAHOGA COUNTY MONUMENT BOX
ITEM 604- CUYAHOGA COUNTY ROADWAY MONUMENT ASSEMBLY
ITEM 604- CUYAHOGA COUNTY RIGHT OF WAY MONUMENT
ITEM 604- CLEVELAND REGIONAL GEODETIC SURVEY MONUMENT ASSEMBLY, TYPE I OR TYPE II.
ITEM 604- CUYAHOGA COUNTY MONUMENT BOX ADJUSTED TO GRADE. (ONLY WHEN EXISTING MONUMENT BOX CONFORMS TO MB-1 AND IS SUITABLE FOR REUSE)
ITEM 202- MONUMENT ASSEMBLY ABANDONED, C.R.G.S. MONUMENT



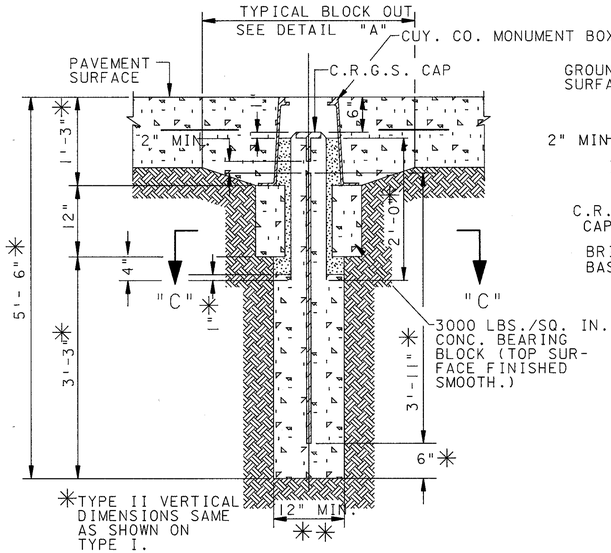




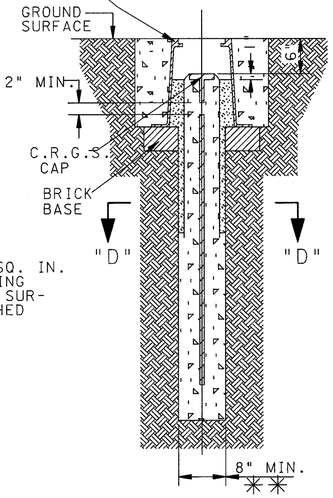
SECTION "E- E"
ROADWAY MONUMENT ASSEMBLY



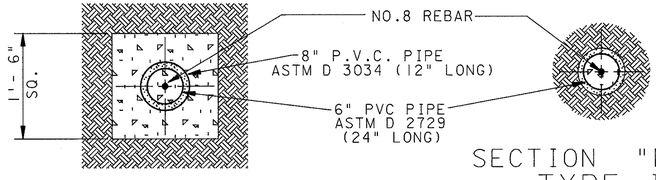
SECTION "F- F"
RIGHT OF WAY MONUMENT



SECTION "C- C"
TYPE I



SECTION "D- D"
TYPE II
IN SOIL



CLEVELAND REGIONAL GEODETIC SURVEY MONUMENT ASSEMBLY

LEGEND

ITEM 499- CONCRETE, CLASS "C"

SAND, ITEM 703.02- COMPACTED AS REQUIRED

**UNDISTURBED BEARING AND/OR SUITABLY FIRM FOUNDATION PROVIDED IN ACCORDANCE WITH 604.04 AND TO THE SATISFACTION OF THE ENGINEER.

CUYAHOGA COUNTY ENGINEER

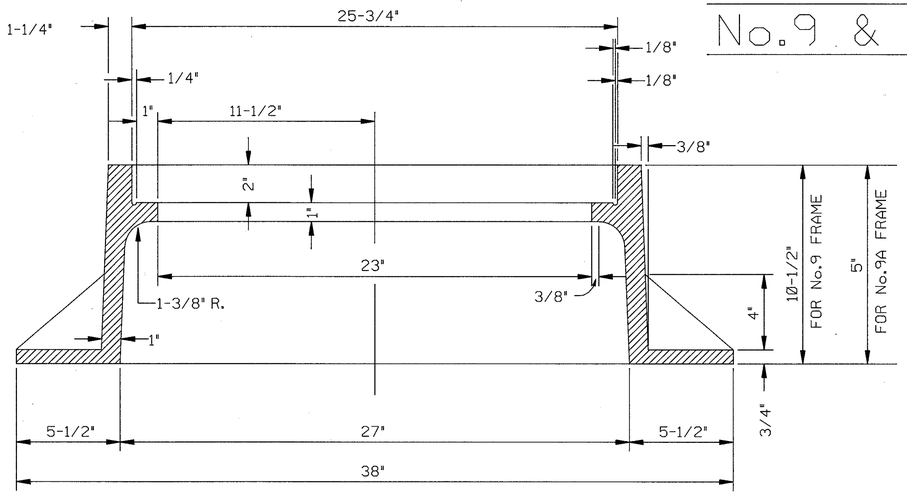
MONUMENT BOX & ASSEMBLIES

DATE
6-1-81
2-8-88
3-27-89
3-9-92

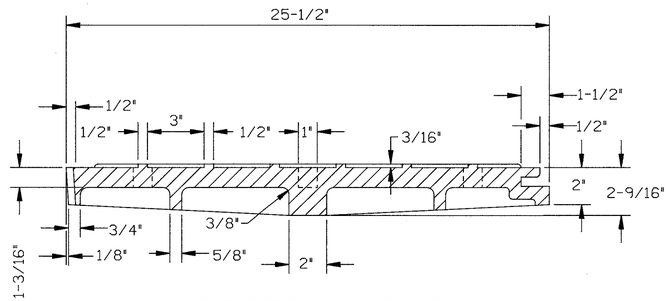
CONSTRUCTION DRAWING MB-1C

CUYAHOGA COUNTY MANHOLE CASTINGS,
No.9 & No.9A FRAMES & No.28 COVER

CALC. BY ____ DATE ____	CUYAHOGA COUNTY	OHIO	35D 110
CHK'D BY ____ DATE ____	CUY-175-2.68 CUY-271-6.29	FHWA REGION 5	



SECTION "A-A"



SECTION "B-B"

NOTES:

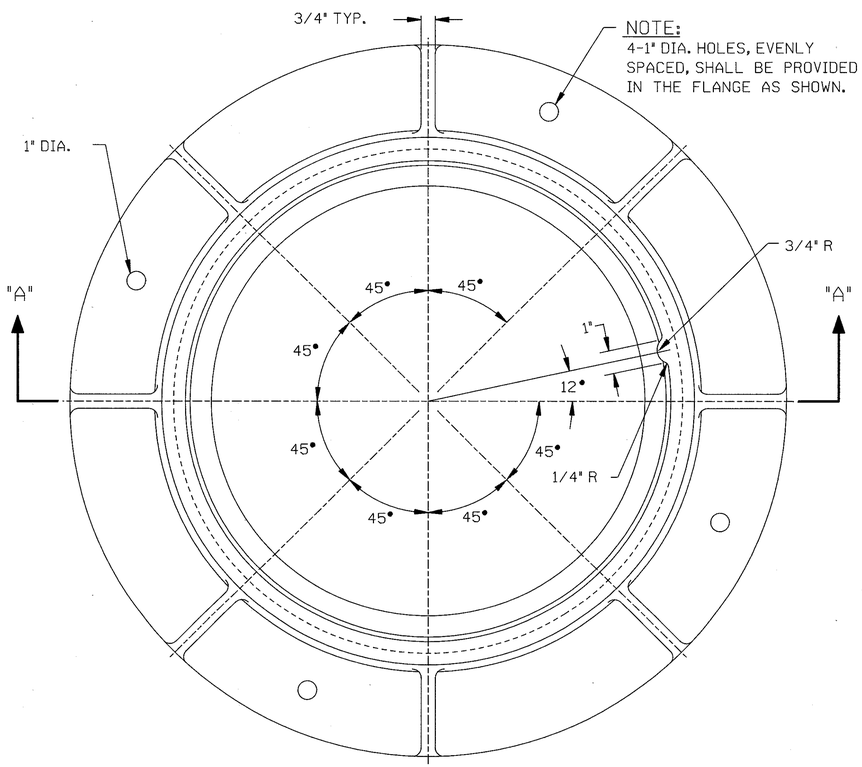
CASTINGS SHALL MINIMALLY MEET THE REQUIREMENTS OF ITEM 604-711.12, ASTM A 48, CLASS 35 GRAY ~~IRON~~ OR 711.13 DUCTILE IRON. THE DESIGN SHALL BE ESSENTIALLY THE SAME AND EQUALLY AS STRONG AS THOSE SHOWN HEREON.

TOTAL MINIMUM WEIGHT = 600 LBS.

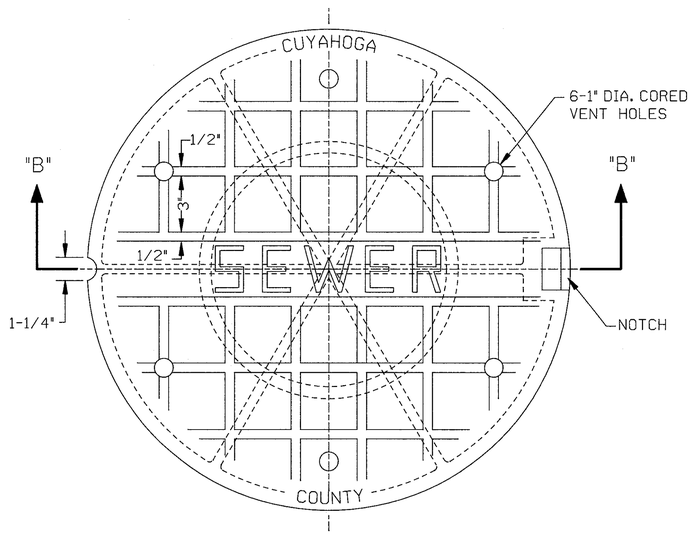
BEARING AREAS OF FRAME AND COVER SHALL BE SO FITTED AND FINISHED AS TO PROVIDE A FIRM AND EVEN SEAT FOR ALL PORTIONS OF THE COVER IN THE FRAME. NO PROJECTIONS SHALL EXIST ON BEARING AREAS OF EITHER CASTING AND THE COVER SHALL SEAT IN ITS FRAME WITHOUT ROCKING. EACH FRAME AND COVER SHALL BE FITTED, MATCHED AND MARKED BEFORE DELIVERY TO THE PROJECT.

LUG: THE LUG ON THE FRAME IS TO BE BETWEEN THE TOP OF THE FRAME AND THE TOP OF THE COVER SEAT ONLY AND SHALL BE CAST WITHOUT BATTER. THE LUG MAY BE UNDERCUT TO PERMIT PROPER MACHINING OF THE COVER SEAT.
PROVIDED THEY COMPLY WITH THE SPECIFICATIONS, DETAILS, DIMENSIONS AND MINIMUM WEIGHTS, ACCEPTABLE CASTING ASSEMBLIES ARE NEENAH No. R-1729, EAST JORDAN No. 1700 OR EQUAL WHEN USING No. 9 FRAME AND NEENAH No. R-1729-1, EAST JORDAN No. 1703 OR EQUAL WHEN USING No. 9A FRAME. No. 9A FRAMES MAY BE USED OUTSIDE PAVED AREAS WHEN COVER REQUIREMENTS SO WARRANT THEIR USE.

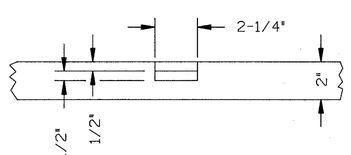
SANITARY COVERS: WHERE (IF) THIS CASTING ASSEMBLY IS SPECIFIED OR OTHERWISE USED FOR SANITARY SEWER MANHOLES, THE COVER SHALL BE CAST WITHOUT THE VENT HOLES AND THE PICK "NOTCH" SHOWN HEREON AND SHALL INCLUDE A SEALING GASKET AFFIXED TO THE BEARING SURFACE. BOLT-DOWN COVERS SHALL NOT BE REQUIRED OR USED UNLESS SPECIFIED IN THE PLANS.



PLAN DETAIL FOR No.9 & No.9A FRAMES



PLAN No.28 COVER



NOTCH DETAIL

CUYAHOGA COUNTY ENGINEER

CUYAHOGA COUNTY MANHOLE CASTINGS

CONSTRUCTION DRAWING MH-10C

DATE
6-19-81
5-5-87
2-8-88
3-9-92
1-12-93

9-C

FHWA REGION	STATE	PROJECT	
5	OHIO		

36
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

Existing Manhole
Sta. 118+65, 53' Lt.
CL Emery Rd.
T/C 1150.00
1144.63 (EX.)
1144.63
Ex. 12"

Existing Ground
218.0'-18" Conduit @ 0.72%
Type C
(P22)

(S110)
Manhole No. 3
Sta. 169+09, 37' Lt.
T/C 1152.41
Proposed grade
(P21)
(P19)
1146.53
1146.63
1146.13
Existing 12" Storm

(S114)
Manhole No. 3
Sta. 171+95, 30' Lt.
T/C 1154.36
(P15)
1150.38
(P16)
1149.17
1149.44
Ex. OBT
Ex. Ground
4" Ex. Gas
℄ Richmond Rd. Sta. 171+95, 28' Rt
Prop. Grade
Ex. CEI
58'-12" Conduit @ 1.0%
Type B
(P14)

(S5)
Catch Basin No. 3
Sta. 171+95, 28' Rt.
N/G 1153.62
(P12)
1150.02

(S14)
Inlet 2A-8
Sta. 168+98, 35' Lt.
N/G 1151.47
(P21)
Ex. OBT
1146.76
Existing Ground
4" Ex. Gas
Ex. CEI
12" Ex. Water

℄ Richmond Rd.
(S15)
Catch Basin No. 3A
Sta. 168+95, 36' Rt.
N/G 1151.21
℄ San
Proposed Grade
1147.46
70.0'-12" Conduit @ 1.0%
Type B
(P20)

(S110)
Manhole No. 3
Sta. 169+09, 37' Lt.
T/C 1152.41
(S14)
Inlet 2A-8
Sta. 168+98, 35' Lt.
N/G 1151.47
(P20)
Proposed Grade
Existing Ground
(P19)
(P22)
1146.13
1146.63
1146.76
13.0'-12" Conduit @ 1.0%
Type C
(P21)

(S14A)
Catch Basin 2-2B
Sta. 169+00, 58' Lt.
T/C 1151.22
(S110)
Manhole No.3
Sta. 169+09, 37' Lt.
T/C 1152.41
Prop. Grade
Ex. Ground
(P19)
(P21)
(P22)
1148.72
1146.63
1146.53
1146.13
22'-12"@1.0%
Type C
(P21A)

(S110)
Manhole No.3
Sta. 169+09, 37' Lt.
T/C 1152.41
(P21)
1146.63
1146.13
1146.53
(P22)

(S112)
Manhole No. 3
Sta. 170+40, 37.5' Lt.
T/C 1153.74
Existing Ground
Proposed Grade
(P18)
(P16)
1147.32
1147.57
1148.81
131' - 18" Conduit @ 0.6%
Type C
(P19)

(S5)
Catch Basin No. 3
Sta. 171+95, 28' Rt.
N/G 1153.62
(P14)
Prop. Grade
Ex. Ground
1150.02
Ex. CEI
118.0'-12" Conduit @ 1.0%
Type B
(P12)

(S59)
Manhole No. 3
Sta. 173+12.50, 36' Rt.
T/C 1155.16
(P11)
1151.20

(S112)
Manhole No. 3
Sta. 170+40, 37.5' Lt.
T/C 1153.74
(P19)
(P18)
1148.81
1147.57
1147.32
155' - 15" Conduit @ 1.0%
Type C
(P16)

(S112)
Manhole No. 3
Sta. 170+40, 37.5' Lt.
T/C 1153.74
Ex. Ground
(P16)
(P19)
1147.57
1147.32
1148.81

(S16)
Inlet 2A-6
Sta. 170+50, 31' Lt.
N/G 1153.03
℄ Richmond Rd.
Prop. Grade
4" Ex. Gas
Ex. OBT
1148.89
Ex. CEI
12" Ex. Water
8.0'-12" Conduit @ 1.0%
Type C
(P18)

(S17)
Inlet 2A-6
Sta. 170+50, 31' Rt.
N/G 1153.03
84.0'-12" Conduit @ 1.0%
Type B
(P17)
1149.53

(S19)
Inlet 2A-12
Sta. 173+18, 25' Rt.
N/G 1154.31
(S59)
Manhole No. 3
Sta. 173+12.50, 36' Rt.
T/C 1155.16
(P12)
1151.30
1151.20
Prop. OBT
10.0'-12" Conduit @ 1.0%
Type C
(P11)

(S114)
Manhole No.3
Sta. 171+95, 30' Lt.
T/C 1154.36
(S18)
Inlet 2A-8
Sta. 172+14, 25' Lt.
N/G 1153.79
(P14)
1150.54
1149.12
1150.38
Ex. Water
16.0' - 12" Conduit @ 1.0%
Type C
(P15)

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: TMA DATE: 2/93
DRAWN BY: PJS DATE: 1/93
CHECKED BY: MJE DATE: 2/93
SCALE: 1"=10'
SPROF123

P11, P12, P14, P15, P16, P17, P18, P19, P20, P21, P21A, P22

STORM SEWER PROFILES

FHWA REGION	STATE	PROJECT	
5	OHIO		

37
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

(S25) Catch Basin 3A
Sta. 184+60, 25' Rt.
N/G 1152.25
Prop. Grade
(P30)
Ex. Ground
1150
1148.00
(P34)
1147.95
1140
5.0'-12" Conduit @ 1.0%
Type C
(P33)

(S104) Manhole No. 3
Sta. 184+60, 30' Rt.
T/C 1152.96
1150
1140

(S104) Manhole No. 3
Sta. 184+60, 30' Rt.
T/C 1152.96
1160
1150
(P30)
1148.89
Prop. Grade
(P33)
1147.95
(P36)
1147.61
1146.62
34.0'-12" Conduit
@ 1.0% Type C
(P34)

(S102) Manhole No. 3
Sta. 184+93, 42' Rt.
T/C 1152.45
1150
Ex. Ground
1146.92
10.0'-12" Conduit @ 3.0%
Type C
(P35)

(S27) Catch Basin 3A
Sta. 185+02, 43' Rt.
N/G 1151.44
1160
1150

(S106) Manhole No. 3
Sta. 184+70, 30' Lt.
T/C 1152.85
(P31)
1150
(P28)
1148.62
1148.42
1140
Prop. Grade
185'-12" Conduit @ 0.75%
Type C
(P32)

(S108) Manhole No. 3
Sta. 186+55, 30' Lt.
T/C 1150.99
(P41)
1147.03
1146.99
1146.74
1146.61

(S32) Catch Basin 3
Sta. 186+83, 25' Lt.
N/G 1150.15
Ex. 12"
Ex. 18"
1150
1146.48
1146.36
1140
29'-15" Conduit @ 0.45%
Type C
(P43)

(S33) Catch Basin 3A
Sta. 185+51, 27' Rt.
N/G 1151.23
Ex. Ground
Prop. Grade
1150
(P36) & (P38)
1146.93
1146.27
1148.73
1140
4.0'-12" Conduit @ 5.0%
Type C
(P37)

(S100) Manhole No. 3
Sta. 185+50, 30' Rt.
T/C 1151.72

(S61) Manhole No. 3
Sta. 182+12, 30' Rt.
T/C 1155.95
1160
1150
1150.87
(P29)
Prop. Grade
Ex. Ground
248.0'-12" Conduit @ 0.8%
Type C
(P30)

(S104) Manhole No. 3
Sta. 184+60, 30' Rt.
T/C 1152.96
1160
(P33)
1150
1148.89
(P34)
1147.95

(S21) Catch Basin 3A
Sta. 182+00, 25' Rt.
N/G 1155.42
1160
Prop. Grade
Ex. Ground
1150
1151.50
1151.37
Prop. OBT
13.0'-12" Conduit @ 1.0%
Type C
(P29)

(S106) Manhole No. 3
Sta. 184+70, 30' Lt.
T/C 1152.85
(S24) Inlet 2A-8
Sta. 184+60, 25' Lt.
T/C 1152.25
1160
(P28)
Prop. Grade
(P32)
1148.42
1148.50
1150
1140
8'-12" Conduit @ 1.0%
Type C
(P31)

(S102) Manhole No. 3
Sta. 184+93, 42' Rt.
T/C 1152.45
1160
℄ Ramp G-1
(P34)
Prop. Grade
Ex. Ground
(P35)
1146.62
58.0'-12" Conduit @ 0.6%
Type B
(P36)
1146.27
1150
1140

(S100) Manhole No. 3
Sta. 185+50, 30' Rt.
T/C 1151.72
1160
(P37)
1150
(P38)
1146.73

(S62) Manhole No. 3
Sta. 182+90, 30' Lt.
T/C 1154.90
1160
1150
(P26)
(P28)
1149.77
4" Ex. Gas
Ex. OBT
12" Ex. Water
1149.82
1140
5.0'-12" Conduit
@ 1.0% Type C
(P27)

(S62) Manhole No. 3
Sta. 182+90, 30' Lt.
T/C 1154.90
1150
(P26)
(P27)
1150.21
1149.77
1140
℄ Sanitary
Prop. Grade
Ex. OBT to be Lowered
180'-12" Conduit @ 0.64%
Type C
(P28)

(S106) Manhole No. 3
Sta. 184+70, 30' Lt.
T/C 1152.85
(P31)
1150
1148.62
(P32)
1148.42
1140

(S60) Manhole No. 3
Sta. 181+25, 30' Lt.
T/C 1157.21
(S20) Catch Basin 3A
Sta. 181+25, 25' Lt.
N/G 1156.50
1160
Prop. Grade
(P26)
Ex. Ground
1150
1152.19
1152.25
5.0'-12" Conduit @ 1.2%
Type C
(P25)

(S60) Manhole No. 3
Sta. 181+25, 30' Lt.
T/C 1157.21
1160
Prop. Grade
Ex. Ground
(P25)
1152.19
1150
12" Ex. Water

(S62) Manhole No. 3
Sta. 182+90, 30' Lt.
T/C 1154.90
1160
(P27)
(P27)
1150.21
1149.77
1150
165.0'-12" Conduit @ 1.2%
Type C
(P26)

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: TMA DATE: 2/03
DRAWN BY: RJK DATE: 3/03
CHECKED BY: MOE DATE: 3/03
SCALE: 1"=10'
SHEET 23

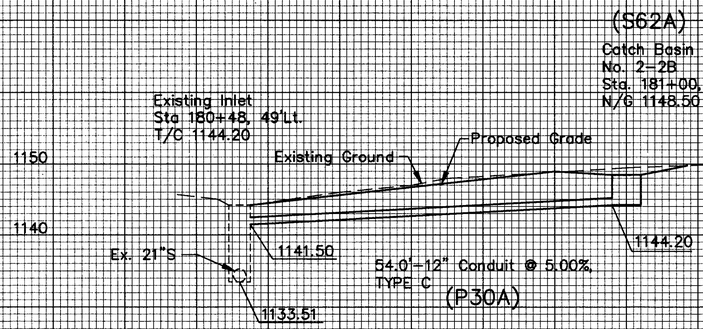
P25, P26, P27, P28, P29, P30, P31, P32, P33, P34, P35, P36, P37, P43

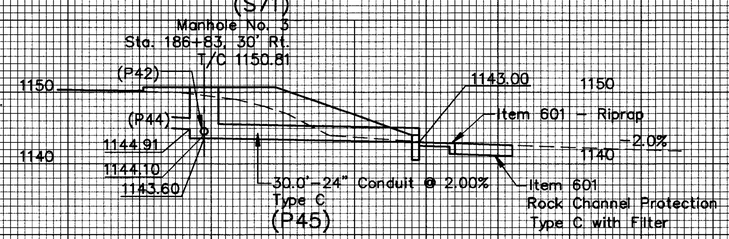
STORM SEWER PROFILES

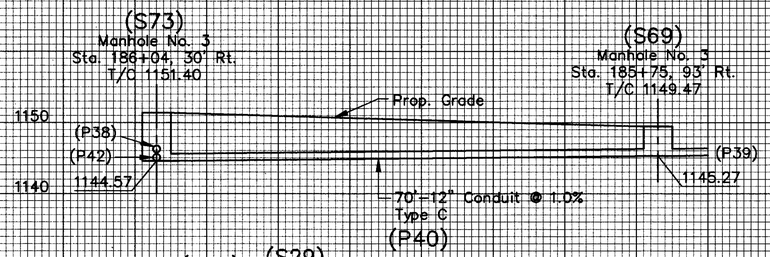
FHWA REGION	STATE	PROJECT	
5	OHIO		

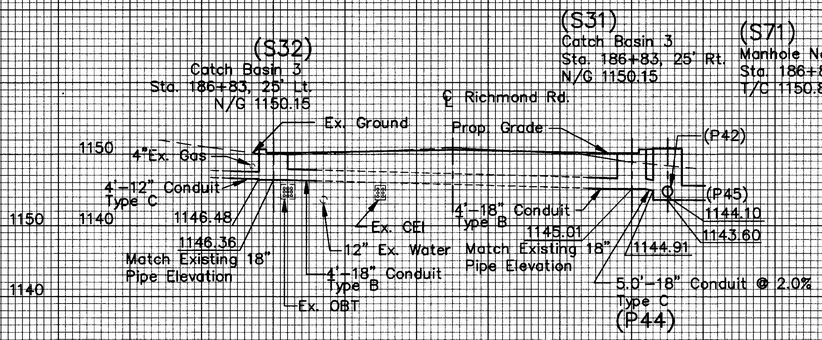
38
110

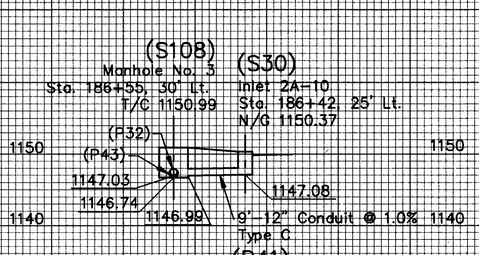
CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

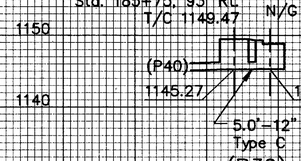


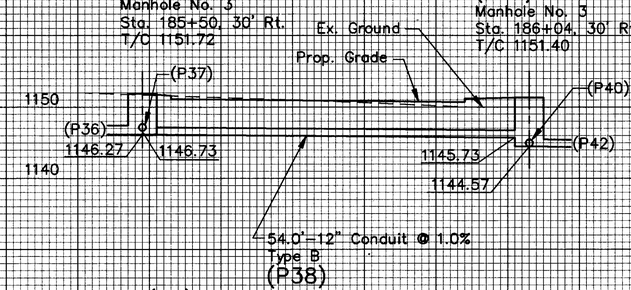


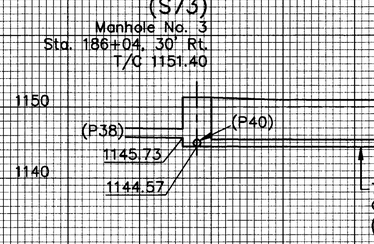


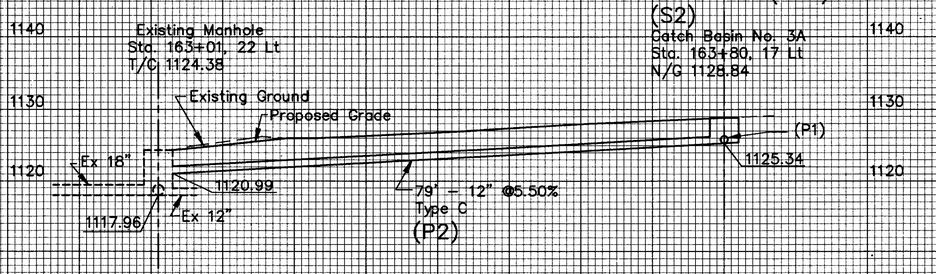


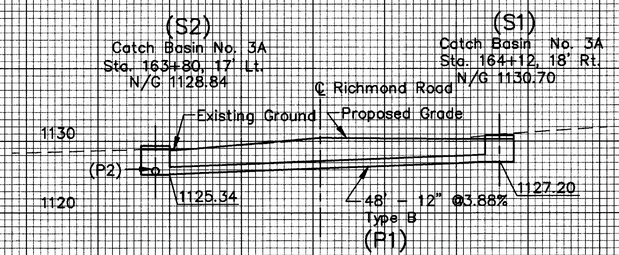












GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: TMA DATE: 1/93
DRAWN BY: PJK DATE: 2/93
CHECKED BY: MDE DATE: 2/93
SCALE: 1"=10'
SPRDF123

P1, P2, P30A, P38, P39, P40, P41, P42, P44, P45

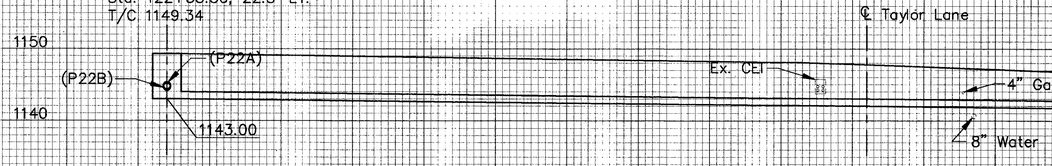
STORM SEWER PROFILES

FHWA REGION	STATE	PROJECT	
5	OHIO		

38A
110

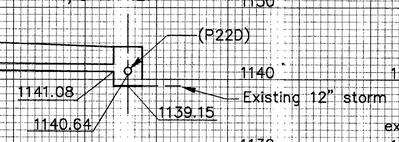
CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

(S15B)
Manhole No. 3
Sta. 122+33.50, 22.5' LT.
T/C 1149.34



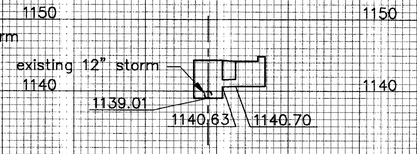
(P22C)

(S15E)
Manhole No. 3
Sta. 124+25, 23' LT.
T/C 1144.27



(S15G)
Manhole No. 3
Sta. 125+25, 23' RT.
T/C 1144.36

(S15F)
Catch Basin No. 3A
Sta. 125+28, 30' RT.
N/G 1144.20

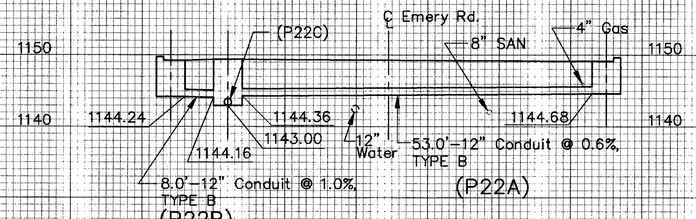


(P22E)

(S15C)
Catch Basin No. 3A
Sta. 122+33.50, 31' LT.
N/G 1149.15

(S15B)
Manhole No. 3
Sta. 122+33.50, 22.5' LT.
T/C 1149.34

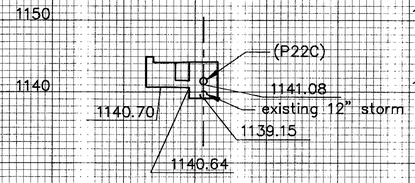
(S15A)
Catch Basin No. 3A
Sta. 122+33.50, 31' RT.
N/G 1148.92



(P22B) (P22A)

(S15D)
Catch Basin No. 3A
Sta. 125+25, 29' LT.
N/G 1144.20

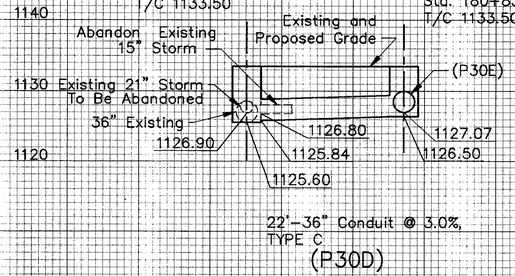
(S15E)
Manhole No. 3
Sta. 125+28, 23' LT.
T/C 1144.27



(P22D)

(S62E)
Manhole No. 3
Sta. 180+62, 37'Rt.
T/C 1133.50

(S62C)
Manhole No. 3
Sta. 180+83, 44.5' Rt.
T/C 1133.50



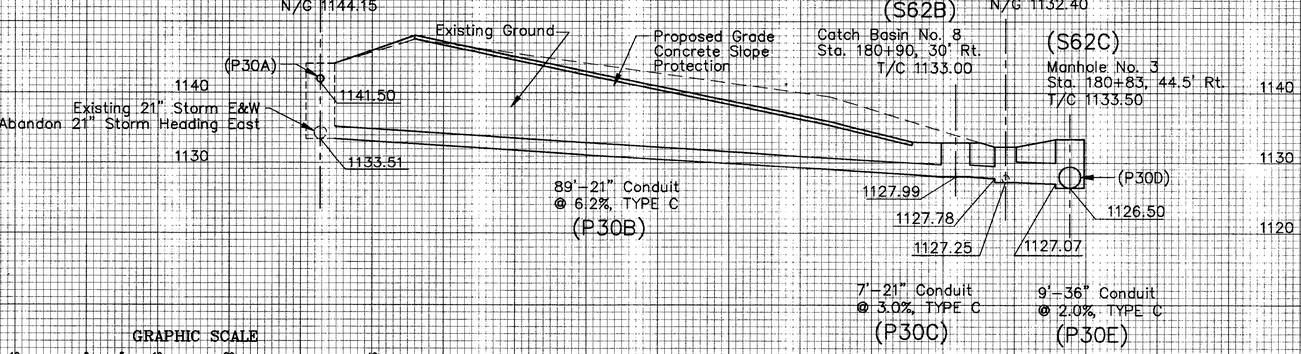
(P30D)

Existing Inlet
Sta. 180+48, 49'Lt.
N/G 1144.15

(S62B)
Catch Basin No. 8
Sta. 180+90, 30' Rt.
T/C 1133.00

(S62D)
Catch Basin No. 8A
Sta. 180+88, 37' Rt.
N/G 1132.40

(S62C)
Manhole No. 3
Sta. 180+83, 44.5' Rt.
T/C 1133.50



(P30B) (P30C) (P30E)

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: TMA DATE: 1/93
DRAWN BY: PJK DATE: 2/93
CHECKED BY: MDS DATE: 2/93
SCALE: 1"=10'
SPROF123

P22A, P22B, P22C, P22D, P22E, P30B, P30C, P30D, P30E

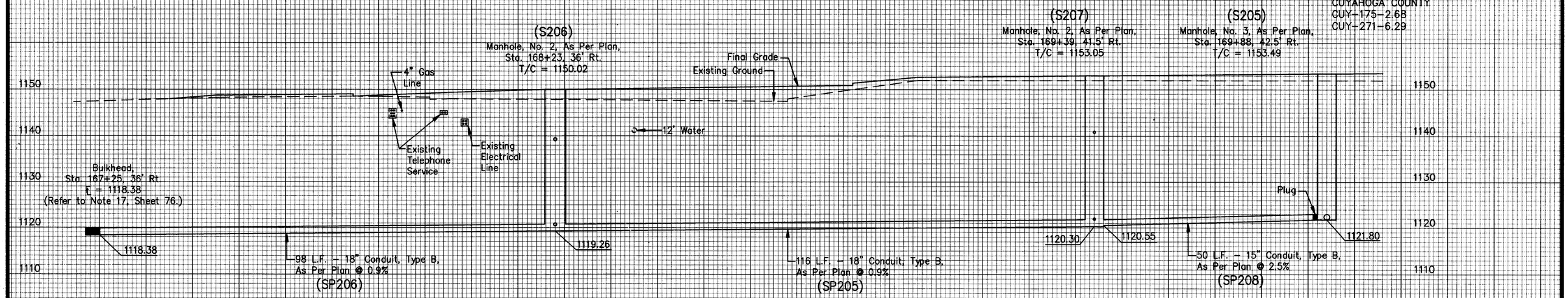
STORM SEWER PROFILES

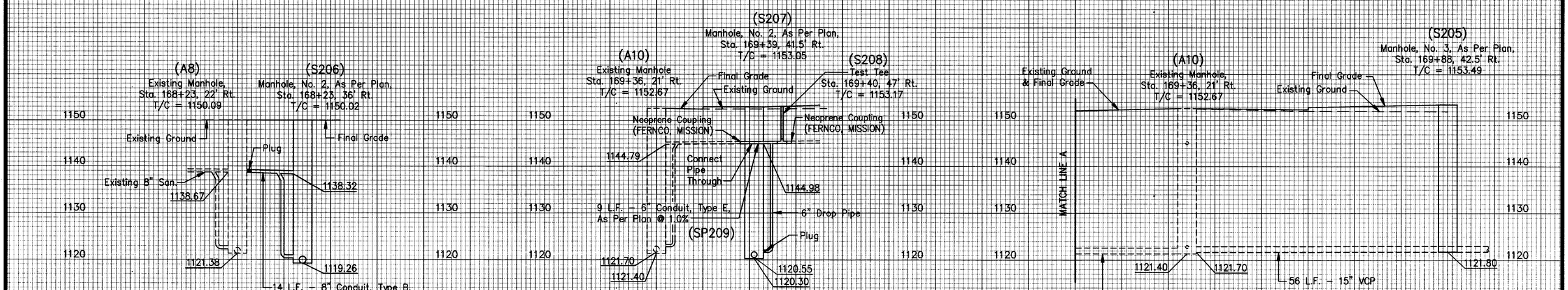
SANITARY SEWER PROFILES

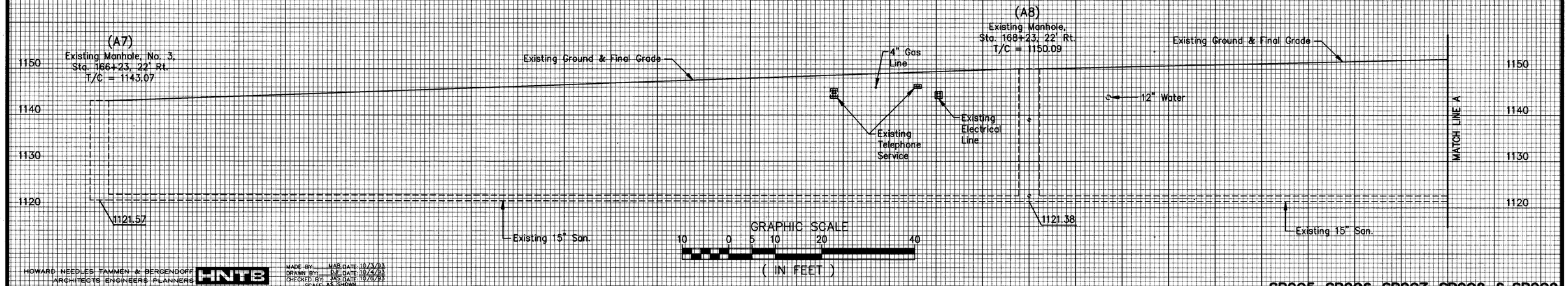
FHWA REGION	STATE	PROJECT	
5	OHIO		

388
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29







HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: MAB DATE: 10/23/95
DRAWN BY: DJF DATE: 10/6/95
CHECKED BY: JAS DATE: 10/6/95
SCALE: AS SHOWN
SANPROFS.DWG

SP205, SP206, SP207, SP208, & SP209

SANITARY SEWER PROFILES

FHWA REGION	STATE	PROJECT	
5	OHIO		

39
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

60 55 50 45 40 35 30 25 20 15 10 5 ℄ 5 10 15 20 25 30 35 40 45 50 55 60

1155
1150
1145

4:1 4:1
4" Gas
Electric
Telephone
12" Water
1153.62
170+60
1153.4

4:1 4:1
4" Gas
Telephone
12" Water
Electric
1153.34
170+00
1153.1

Catch Basin No. 2-2B
Sta. 169+00.58' LT.

4:1 4:1
4" Gas
Telephone
Electric
1152.06
169+00
1151.8
12" Water
MATCH LINE A
MATCH LINE B

4" Gas
Telephone
12" Water
Electric
1149.62
168+00
1149.7

2:1
Asphalt Concrete Curb
Telephone
Telephone
Electric
1147.96
167+50
1148.2
12" Water
4" Gas

SODDING		EARTHWORK END AREA		EARTHWORK VOLUME	
		EXC.	EMB.	EXC.	EMB.
L.F.	S.Y.	S.F.	S.F.	C.Y.	C.Y.
		18	24		
				43	81
		21	49		
				91	193
		28	55		
				100	204
		26	55		
				58	73
		37	24		
SHEET TOTALS:				292	551

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

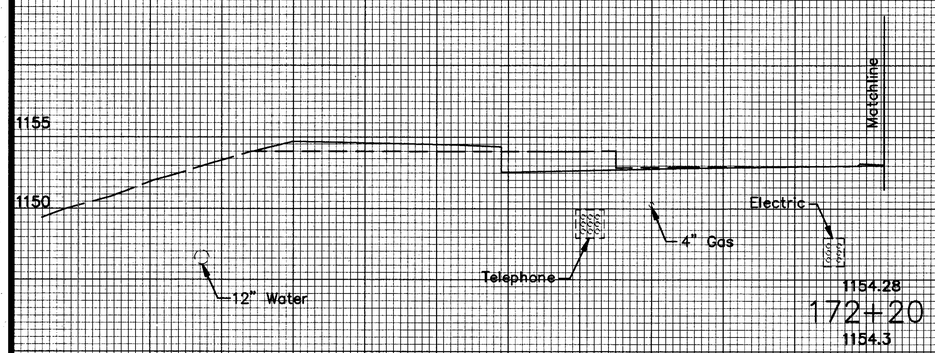
MADE BY: E.K. DATE 12/92
DRAWN BY: E.K. DATE 12/92
CHECKED BY: P.F. DATE 12/92
SCALE: AS SHOWN
XS-SHT4

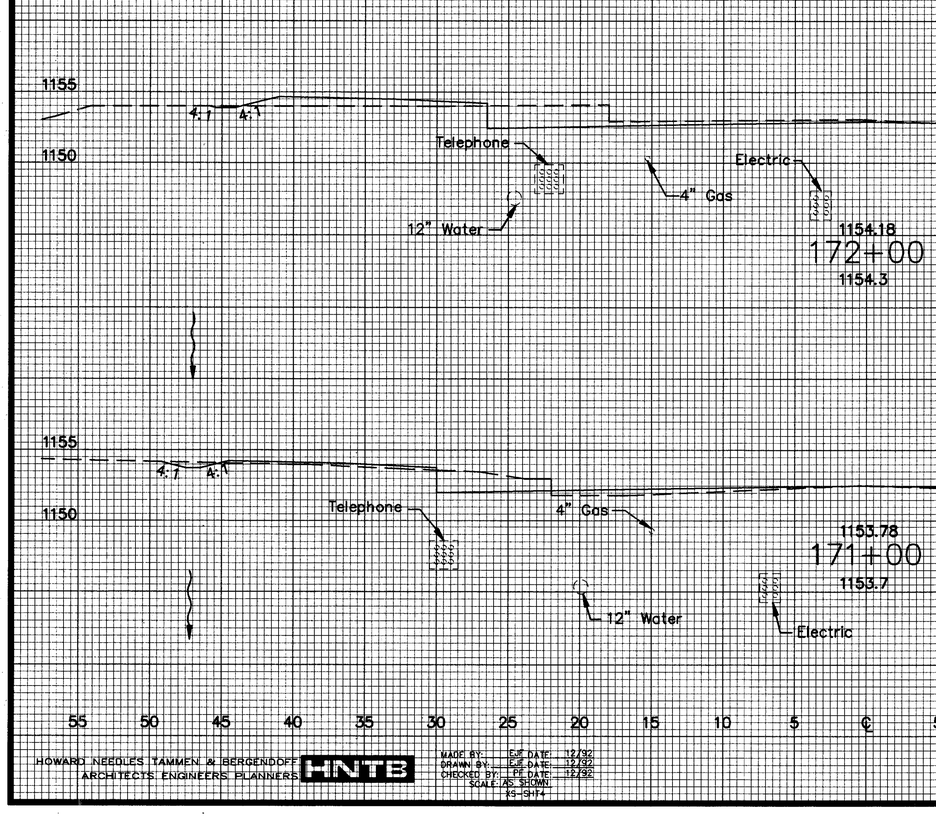
CROSS SECTION STA. 167+50 TO STA. 170+60

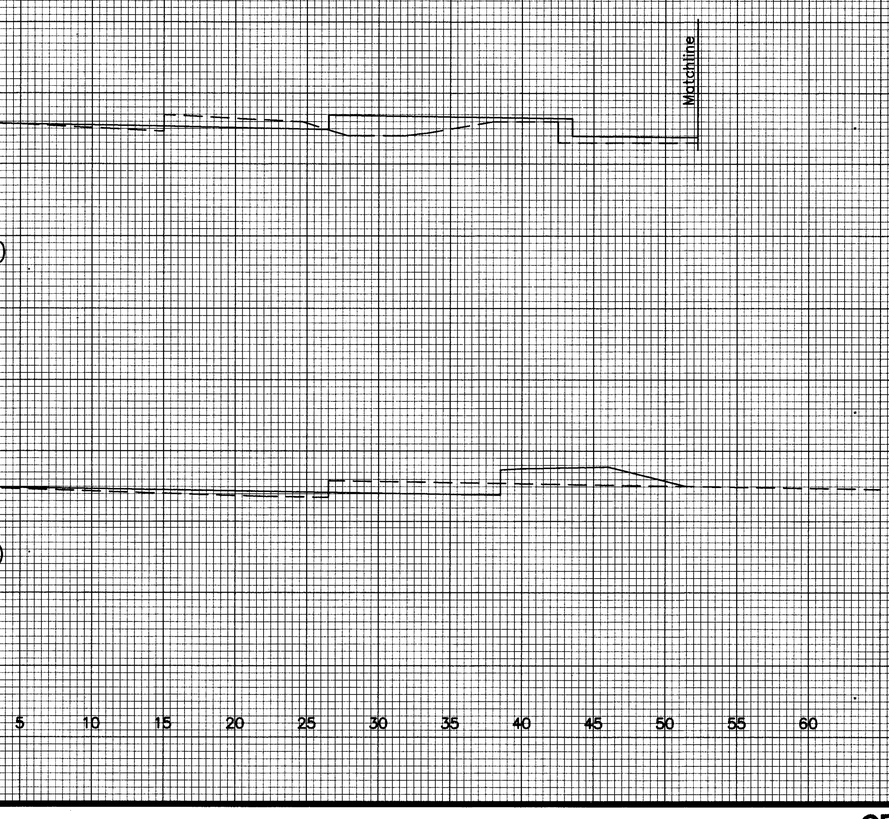
FHWA REGION	STATE	PROJECT	
5	OHIO		

40
110

CUYAHOGA COUNTY
CUY-175-2.58
CUY-271-6.29







SODDING		EARTHWORK			
		END AREA		VOLUME	
		EXC.	EMB.	EXC.	EMB.
L.F.	S.Y.	S.F.	S.F.	C.Y.	C.Y.
			12	19	
				14	18
		25	28		
				83	94
		20	23		
				28	35
SHEET TOTALS:				124	130

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: EJF DATE: 12/92
DRAWN BY: EJF DATE: 12/92
CHECKED BY: DF DATE: 12/92
SCALE: AS SHOWN
XS-SHT4

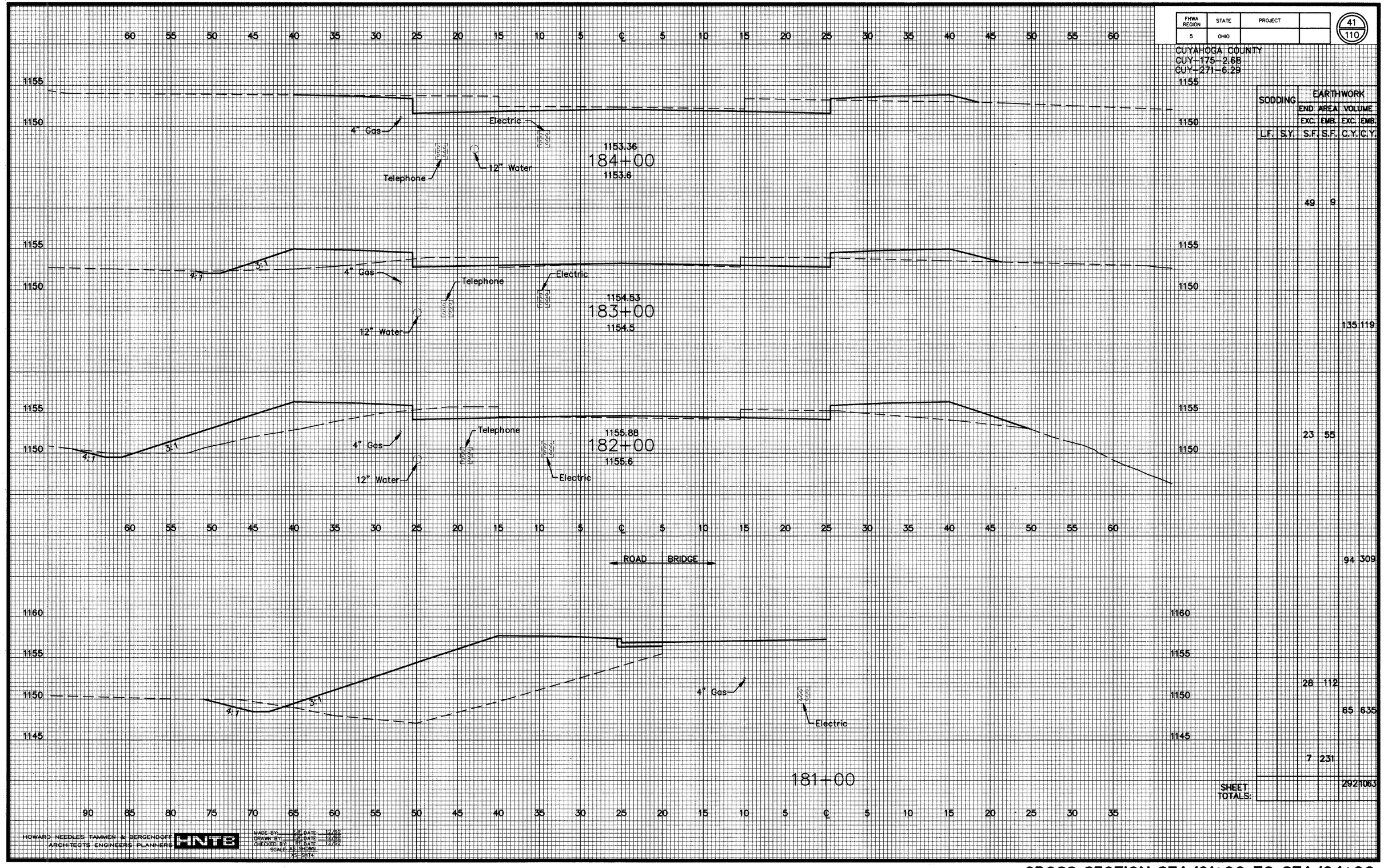
CROSS SECTION STA.171+00 TO STA. 172+20

FHWA REGION	STATE	PROJECT	
5	OHIO		

41
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

SODDING		EARTHWORK			
		END AREA		VOLUME	
		EXC.	EMB.	EXC.	EMB.
L.F.	S.Y.	S.F.	S.F.	C.Y.	C.Y.
		49	9		
				135	119
		23	55		
		28	112		
				65	635
		7	231		
SHEET TOTALS:				292	1063



HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: EJT DATE: 12/92
DRAWN BY: EJT DATE: 12/92
CHECKED BY: PT DATE: 12/92
SCALE: AS SHOWN
QC DATE:

CROSS SECTION STA.181+00 TO STA.184+00

FHWA REGION	STATE	PROJECT	
5	OHIO		

42
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

60 55 50 45 40 35 30 25 20 15 10 5 ℄ 5 10 15 20 25 30 35 40 45 50 55 60

1155
1150
1145
1140

4" Gas
Telephone
Electric
12" Water

1150.57
187+00
1150.8

1151.20
186+00
1151.6

1152.28
185+00
1152.7

SODDING		EARTHWORK			
		END AREA		VOLUME	
		EXC.	EMB.	EXC.	EMB.
L.F.	S.Y.	S.F.	S.F.	C.Y.	C.Y.
			28	61	
					163 307
			60	105	
					270 224
			86	16	
					250 46
SHEET TOTALS:					683 577

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

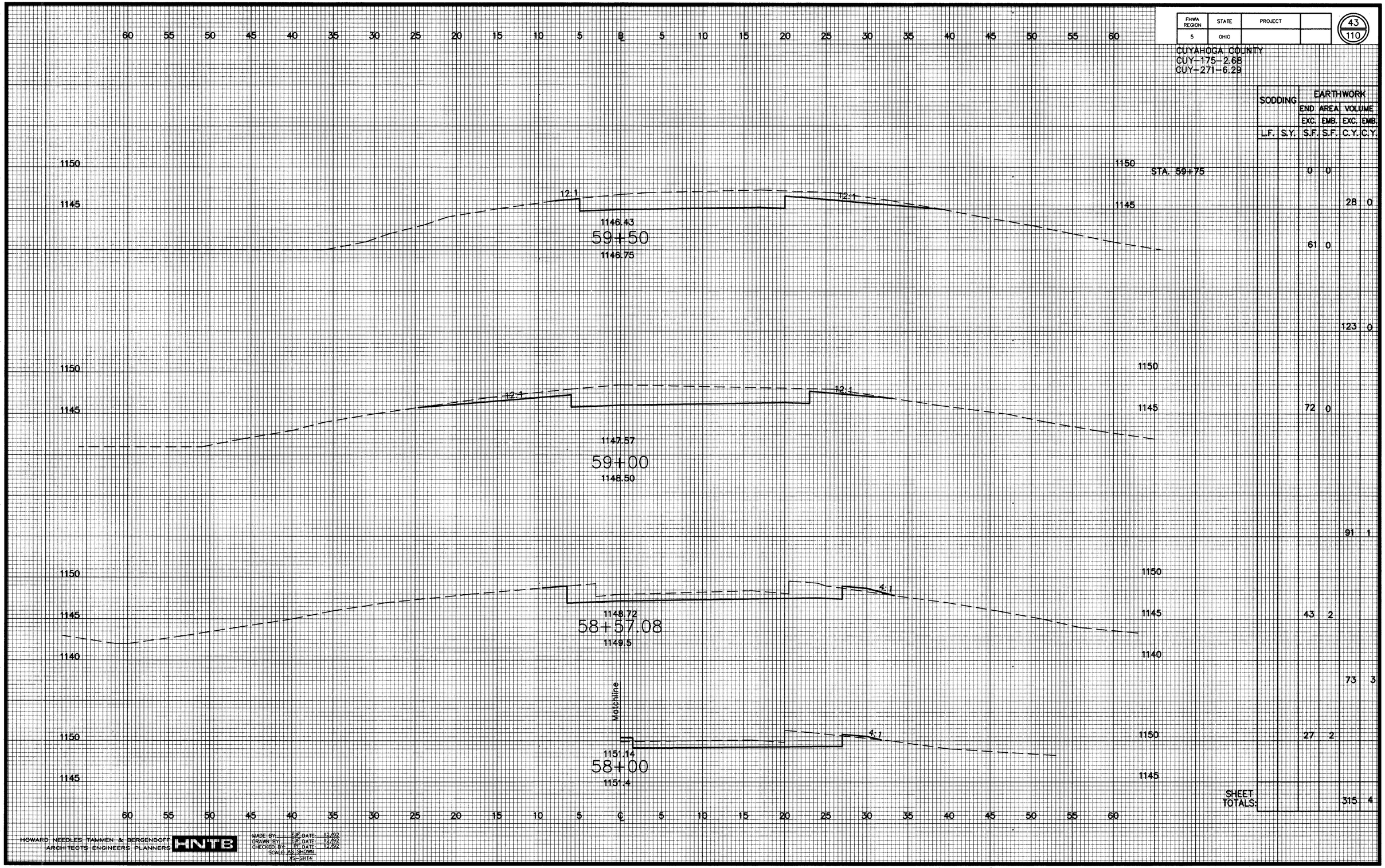
MADE BY: EJE DATE: 12/92
DRAWN BY: EJE DATE: 12/92
CHECKED BY: PE DATE: 12/92
SCALE: AS SHOWN
XS-SHT4

CROSS SECTION STA. 185+00 TO STA. 187+00

FHWA REGION	STATE	PROJECT	
5	OHIO		

43
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29



SODDING		EARTHWORK			
		END AREA		VOLUME	
		EXC.	EMB.	EXC.	EMB.
L.F.	S.Y.	S.F.	S.F.	C.Y.	C.Y.
		0	0		
				28	0
		61	0		
				123	0
		72	0		
				91	1
		43	2		
				73	3
		27	2		
SHEET TOTALS:				315	4

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

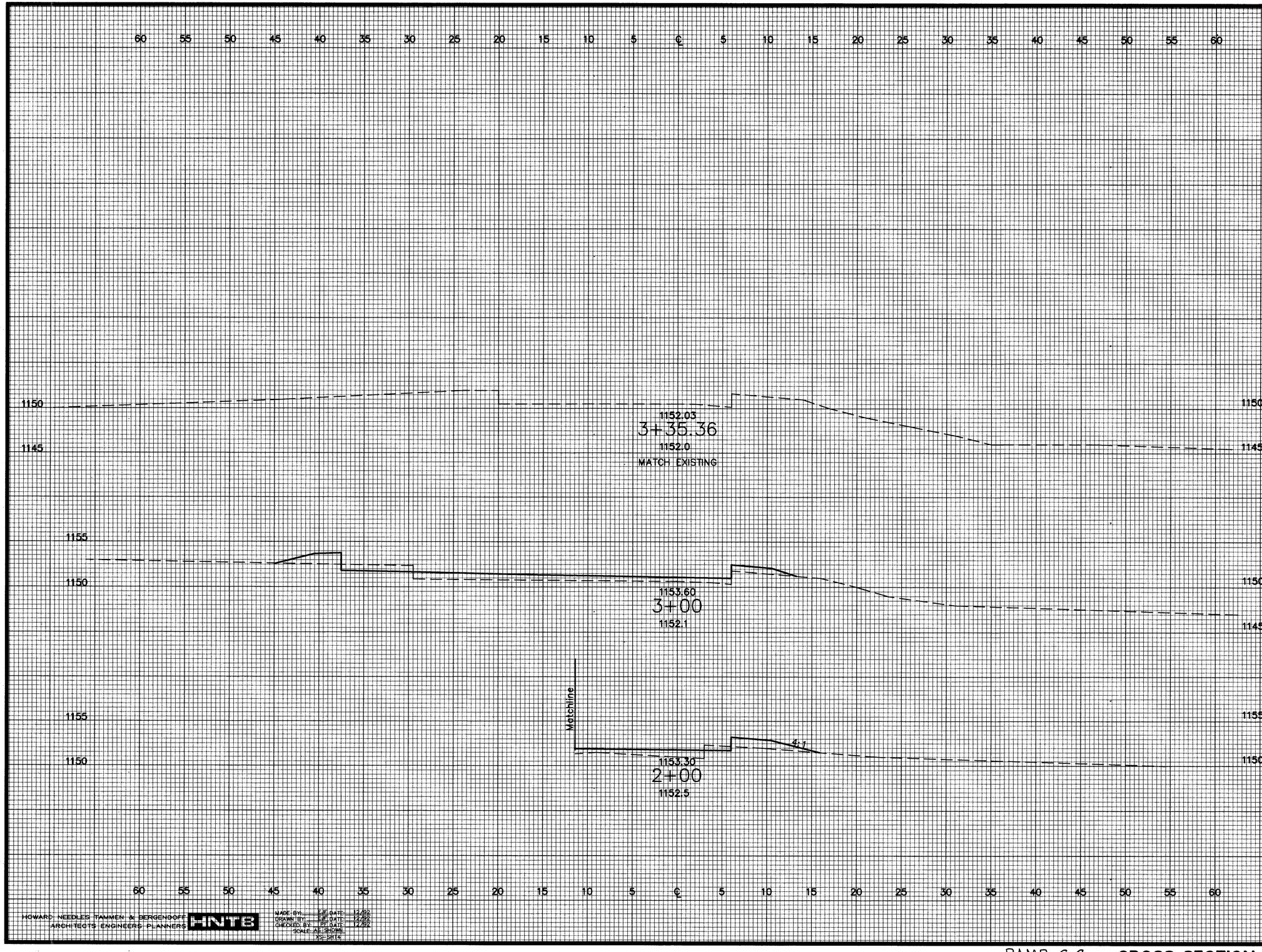
MADE BY: E.F. DATE: 12/92
DRAWN BY: E.F. DATE: 12/92
CHECKED BY: J.P.L. DATE: 12/92
SCALE: AS SHOWN
XS-SR14

CROSS SECTION RAMP G-1 STA. 58+00 TO STA. 59+50

FHWA REGION	STATE	PROJECT	
5	OHIO		

44
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29



SODDING		EARTHWORK			
		END AREA		VOLUME	
		EXC.	EMB.	EXC.	EMB.
L.F.	S.Y.	S.F.	S.F.	C.Y.	C.Y.
		0	0		
				4	27
		6	41		
				14	117
		2	22		
SHEET TOTALS:				18	144

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: EJF DATE: 12/92
DRAWN BY: EJF DATE: 12/92
CHECKED BY: PF DATE: 12/92
SCALE: AS SHOWN
XS-SHT4

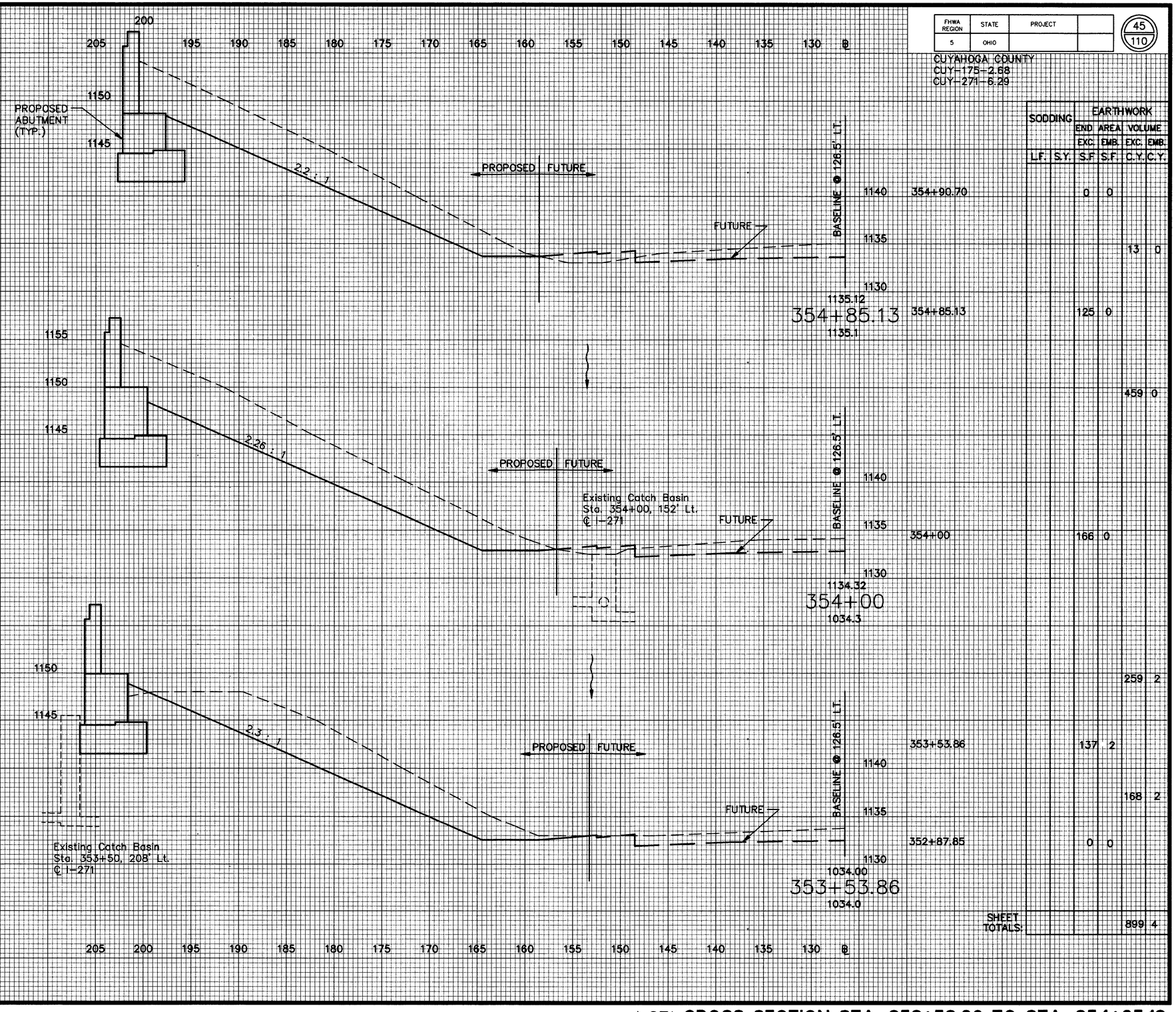
RAMP G-2

CROSS SECTION STA. 2+00 TO STA.3+35.36

FHWA REGION	STATE	PROJECT	
5	OHIO		

45
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29



SODDING		EARTHWORK			
		END AREA		VOLUME	
		EXC.	EMB.	EXC.	EMB.
L.F.	S.Y.	S.F.	S.F.	C.Y.	C.Y.
		0	0		
				13	0
		125	0		
				459	0
		166	0		
				259	2
		137	2		
				168	2
		0	0		
SHEET TOTALS:				899	4

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

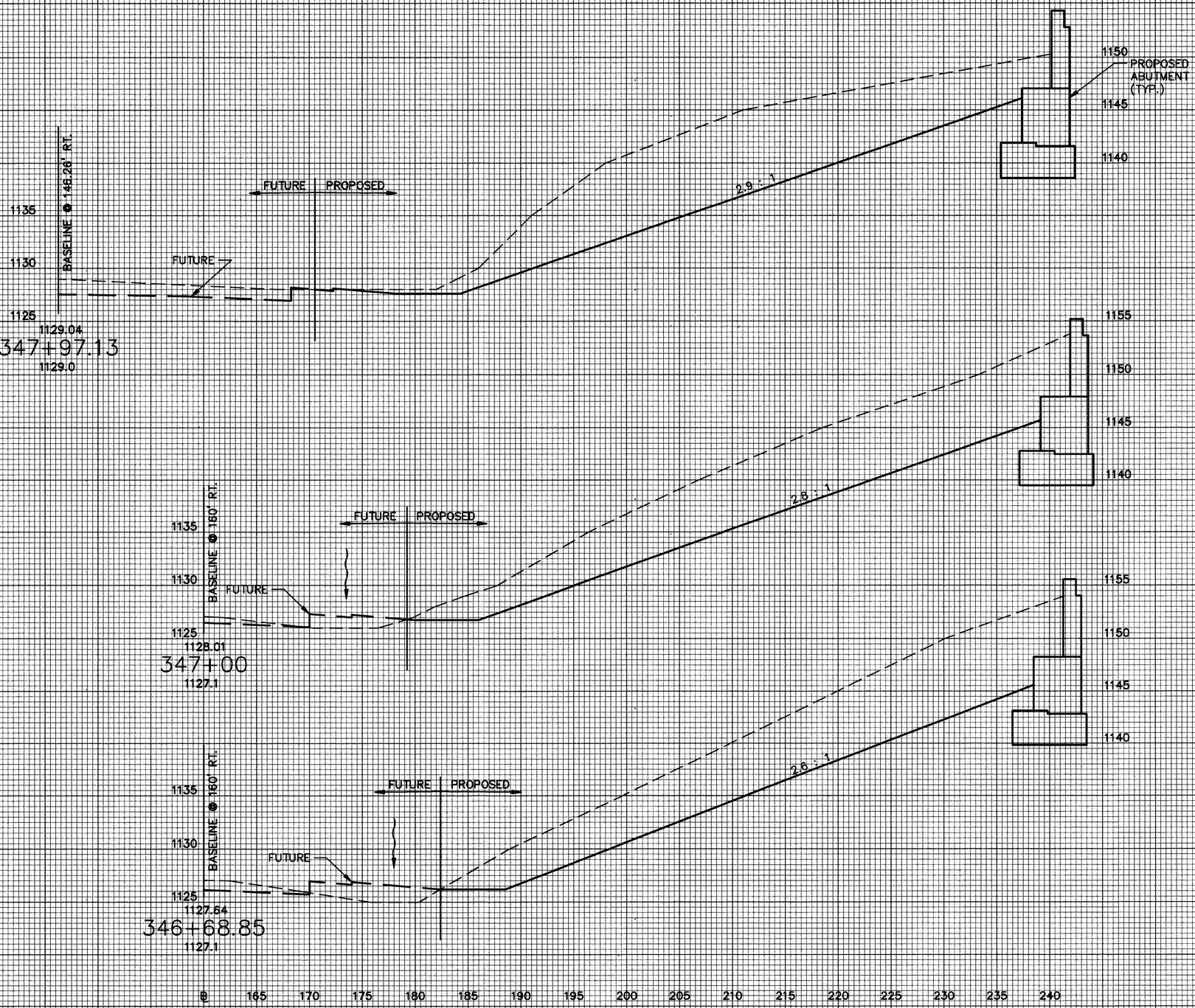
MADE BY: MTM DATE: 5/93
DRAWN BY: MJG DATE: 5/93
CHECKED BY: PF DATE: 5/93
SCALE: AS SHOWN, XS-SHTS

I-271 **CROSS SECTION STA. 353+53.86 TO STA. 354+85.13**

FHWA REGION	STATE	PROJECT	
5	OHIO		

46
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29



SODDING		EARTHWORK				
		END AREA		VOLUME		
		EXC.	EMB.	EXC.	EMB.	
L.F.	S.Y.	S.F.	S.F.	C.Y.	C.Y.	
		0	0			348+93.75
				583	0	
		326	0			347+97.13
				1144	0	
		310	0			347+00
				354	0	
		304	0			346+68.85
				41	0	
		0	0			346+61.49
				2122	0	SHEET TOTALS:

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

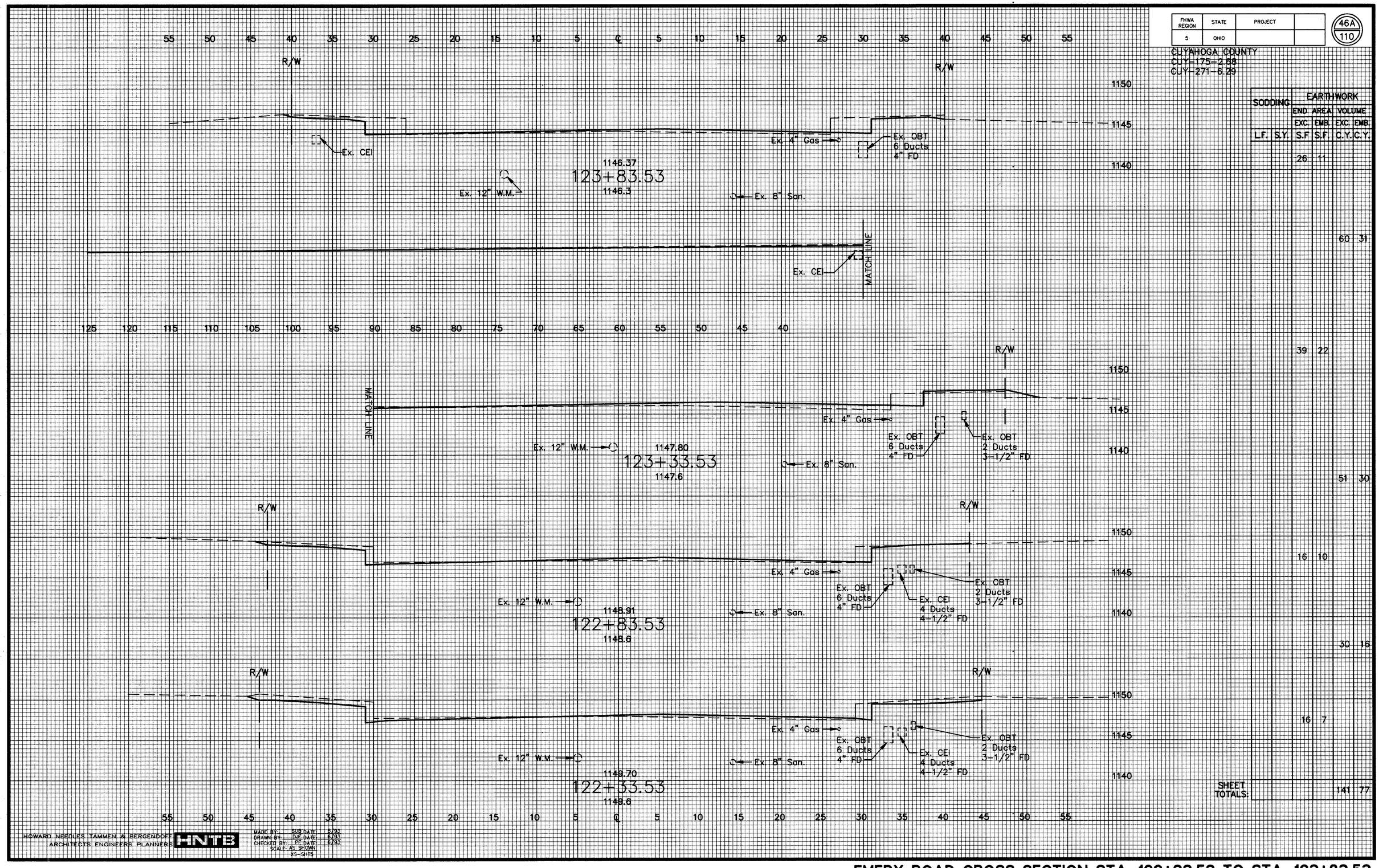
MADE BY: MTM DATE: 3/93
DRAWN BY: DJE DATE: 3/93
CHECKED BY: EF DATE: 3/93
SCALE: AS SHOWN
XS-SHTS

CROSS SECTION STA. 346+68.85 TO STA. 347+97.13

FHWA REGION	STATE	PROJECT	
5	OHIO		

46A / 110

CUYAHOGA COUNTY
CUY-175-2.88
CUY-271-6.29



SODDING		EARTHWORK			
		END AREA		VOLUME	
		EXC.	EMB.	EXC.	EMB.
L.F.	S.Y.	S.F.	S.F.	C.Y.	C.Y.
		26	11		
				60	31
		39	22		
				51	30
		16	10		
				30	16
		16	7		
SHEET TOTALS:				141	77

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: SUB DATE 6/93
DRAWN BY: DE DATE 6/93
CHECKED BY: EF DATE 6/93
SCALE: AS SHOWN
XS-SHTS

EMERY ROAD CROSS SECTION STA. 122+33.53 TO STA. 123+83.53

FHWA REGION	STATE	PROJECT	
5	OHIO		

47
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

TRAFFIC CONTROL NOTES

GENERAL:

GUARANTEE

THE CONTRACTOR SHALL GUARANTEE THAT THE TRAFFIC CONTROL SYSTEM INSTALLED AS PART OF THIS CONTRACT SHALL OPERATE SATISFACTORILY FOR A PERIOD OF 90 DAYS FOLLOWING COMPLETION OF THE 10-DAY PERFORMANCE TEST. IN THE EVENT OF UNSATISFACTORY OPERATION, THE CONTRACTOR SHALL CORRECT FAULTY INSTALLATIONS, MAKE REPAIRS AND REPLACE DEFECTIVE PARTS WITH NEW PARTS OF EQUAL OR BETTER QUALITY, EQUIPMENT, MATERIAL AND LABOR COSTS INCURRED IN CORRECTING AN UNSATISFACTORY OPERATIONS SHALL BE BORNE BY THE CONTRACTOR.

THE GUARANTEE SHALL COVER THE FOLLOWING ITEMS OF THE TRAFFIC CONTROL SYSTEM: CONTROLLERS AND ASSOCIATED EQUIPMENT, DETECTOR UNITS, INTERCONNECTION ITEMS AND MASTER CONTROL EQUIPMENT.

CUSTOMARY MANUFACTURER'S GUARANTEES FOR THE FOREGOING ITEMS SHALL BE TURNED OVER TO THE STATE OR THE MAINTAINING AGENCY FOLLOWING ACCEPTANCE OF THE EQUIPMENT.

THE COST OF GUARANTEEING THE TRAFFIC CONTROL SYSTEM WILL BE INCIDENTAL TO AND INCLUDED IN THE CONTRACT UNIT PRICE OF THE VARIOUS ITEMS MAKING UP THE SYSTEM.

TRAFFIC CONTROL STANDARD CONSTRUCTION DRAWINGS

REFERENCES TO SUPPLEMENTAL SPECIFICATIONS 857, 858, 861, 957, 958 AND 961 ON THE TRAFFIC CONTROL STANDARD CONSTRUCTION DRAWINGS IN THESE PLANS SHALL BE CONSIDERED TO READ AS RESPECTIVE REFERENCES TO ITEMS 630, 631, 633, 730, 731, AND 733.

REFERENCES TO ITEM 608, 4" CONCRETE WALK ON THE TRAFFIC CONTROL STANDARD CONSTRUCTION DRAWINGS IN THESE PLANS SHALL BE CONSIDERED TO READ ITEM 633, CONTROLLER WORK PAD. REFERENCES TO STANDARD CONSTRUCTION DRAWING HL-2 SHALL BE CONSIDERED TO READ AS REFERENCES TO STANDARD CONSTRUCTION DRAWING HL-10.12.

SIGNS:

ITEM 630 - SIGNS ERECTED, FLAT SHEET

SIGNS ERECTED UNDER THIS ITEM WILLL BE SUPPLIED BY THE CUYAHOGA COUNTY ENGINEER. TWO WEEKS ADVANCE NOTICE MUST BE GIVEN TO THE COUNTY SIGN SHOP, 4000 BROOKPARK ROAD, CLEVELAND, OHIO 44134 (216-741-3019), PRIOR TO THE PICKUP OF THE SIGNS BY THE CONTRACTOR, AT THE ABOVE ADDRESS.

REMOVAL OF STORED SIGNS

ALL SIGNS REMOVED FOR STORAGE SHALL BE DELIVERED TO THE WARRENSVILLE HEIGHTS MAINTENANCE YARD FOR PICKUP BY THE CITY OF WARRENSVILLE HEIGHTS OR THE OHIO DEPARTMENT OF TRANSPORTATION.

SIGNALS:

ITEM 632 - POWER SUPPLY FOR TRAFFIC SIGNALS

ELECTRIC POWER SHALL BE OBTAINED FROM THE CLEVELAND ELECTRIC ILLUMINATING COMPANY AT THE LOCATION INDICATED ON THE PLANS. POWER SUPPLIED SHALL BE 120 VOLTS.

ITEM 632 - VEHICULAR SIGNAL HEADS, 3-SECTION, 12 INCH LENS, 1-WAY, AND 5-SECTION, 12 INCH LENS, 1-WAY

SIGNAL HEADS SHALL BE RIGID MOUNTED

ITEM 632 LOOP DETECTOR UNITS, BY TYPE, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF 632 AND 732.07 OR 732.08, LOOP DETECTOR UNITS SHALL HAVE THE FOLLOWING REQUIREMENTS OR FEATURES:

THE OUTPUT DEVICE SHALL BE A RELAY, AND ALL CONTACTS SHALL BE INCLUDED IN THE WIRING HARNESS.

THE UNIT SHALL BE SELF TUNING.

THE UNIT'S ELECTRICAL CONNECTION PLUGS OR WIRING HARNESS SHALL ALLOW READY REPLACEMENT WITH SINGLE CHANNEL AMPLIFIERS AS DESCRIBED IN THE FINAL PARAGRAPH OF 732.07.

ITEM 632 - REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN

TRAFFIC SIGNAL INSTALLATIONS, INCLUDING SIGNAL HEADS, CABLE, MESSENGER WIRE, STRAIN POLES, CABINET, CONTROLLERS, ETC., SHALL BE REMOVED IN ACCORDANCE WITH 632.25 AND AS INDICATED ON THE PLANS. REMOVED ITEMS SHALL BE DELIVERED TO THE WARRENSVILLE HEIGHTS MAINTENANCE YARD. THE SIGNAL AT RICHMOND AND EMERY ROADS IS TO BE SALVAGED BY THE CITY OF WARRENSVILLE HEIGHTS AND THE SIGNAL AT RICHMOND AND RAMP G-1 WILL BE RECOVERED BY ODOT.

IN THE EVENT THE ITEMS STORED ON THE PROJECT FOR SALVAGE BY THE LOCAL AGENCY ARE NOT REMOVED; THE CONTRACTOR SHALL, WHEN DIRECTED BY THE ENGINEER IN WRITING, REMOVE AND DISPOSE OF THE ITEMS AT NO ADDITIONAL COST TO THE PROJECT.

ITEM 633 CONTROLLER, ACTUATED, 2-PHASE, SOLID STATE DIGITAL, MICROPROCESSOR, AS PER PLAN

THE OVERLAP PROGRAMMING SHALL BE BY USE OF AN INTERCHANGEABLE PLUG-IN PRINTED CIRCUIT BOARD ASSEMBLY AS DESCRIBED IN PART 14 OF NEMA TS-1. IN ADDITION TO NEMA REQUIREMENTS, THE CONFLICT MONITOR SHALL ALSO HAVE EXTENDED MONITORING (IN ACCORDANCE WITH 722.04 PART 3b). THE MONITOR SHALL ALSO HAVE THE CAPABILITY OF MONITORING EACH LOAD SWITCH SEPARATELY, AS SHOWN IN THE LOAD SWITCH HOOK-UP DIAGRAMS IN THE SIGNAL PLANS. THE CONTROLLER CABINET SHALL BE KEYED TO THE STATE MASTER.

PRINTED CIRCUIT BOARD TYPE BACK PANELS OF THE CONTROLLER CABINET WILL NOT BE ACCEPTABLE. SOLDERED CONNECTIONS WILL BE PERMITTED FOR WIRING ON THE BACK SIDE OF THE BACK PANEL. ALL CONTROLLER MEMORIES SHALL BE NON-VOLATILE AND SHALL NOT REQUIRE BATTERIES OR OTHER SOURCES OF ENERGY TO RETAIN DATA WHILE POWER IS REMOVED FROM THE CONTROLLER. PAYMENT FOR ITEM 633 CONTROLLER, ACTUATED, 2-PHASE, SOLID STATE DIGITAL, MICROPROCESSOR, AS PER PLAN WILL BE THE CONTACT BID PRICE PER EACH, COMPLETE AND IN PLACE INCLUDING ALL CONNECTIONS, TESTED AND ACCEPTED.

APPROACH MONITORING

APPROACH MONITORING IS TO BE UTILIZED IN THE SIGNAL HEAD AND CABINET WIRING OF THE TRAFFIC SIGNAL INSTALLATION AT THE RICHMOND/RAMP G-1 INTERSECTION. APPROACH MONITORING IS EMPLOYED TO ALLEVIATE THE POSSIBILITY OF THREE RED LAMPS BURNING OUT (IN A TYPICAL 2-PHASE FOUR-LEGGED INTERSECTION) WITHOUT ANY ACTION BY THE SIGNAL MONITOR. THERE IS A POSSIBILITY THAT THE SIGNAL CAN BE FULLY OPERATIONAL AND HAVE ONE APPROACH WITH NO RED INDICATION DISPLAYED. APPROACH MONITORING PROVIDES FOR THE FAILURE OF TWO RED LAMPS ON ANY APPROACH BY MAKING THE SIGNAL GO TO A "FLASH" CONDITION.

IN ORDER TO EMPLOY APPROACH MONITORING, A SEPARATE SIGNAL CABLE MUST BE ADDED TO THE SIGNAL FACES OF EACH APPROACH. ADDITIONAL LOAD SWITCHES ARE ALSO REQUIRED TO ACCOMODATE EACH APPROACH AND A NEMA "PLUS" TYPE OF MONITOR UNIT IS NECESSARY. ADDITIONAL CHANNELS IN THE MONITOR UNIT ARE NEEDED.

CONDUIT INSTALLATION

ALL TRENCHING AND CONDUIT INSTALLATIONS IN PAVED AREAS SHALL BE COMPLETED CONCURRENT WITH OR PRIOR TO PAVEMENT REPAIR OPERATIONS.

IF THE CONDUIT IS NOT INSTALLED UNDER THE PAVEMENT PRIOR TO THE PAVEMENT REPAIR OPERATIONS, THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL TRENCHING UNDER THE PAVEMENT NECESSARY TO INSTALL THE CONDUIT AT NO ADDITIONAL CHARGE TO THE STATE.

UNDERDRAINS FOR PULL BOXES

REFERENCE IS MADE TO STANDARD DRAWING HL30.11 FOR DETAILS OF DRAINING PULL BOXES. UNDERDRAINS FOR PULL BOXES SHALL BE USED AS DIRECTED BY THE ENGINEER AND SHALL BE PROVIDED WHERE THE LENGTH REQUIRED FOR A SATISFACTORY OUTLET DOES NOT EXCEED APPROXIMATELY 20 FEET. AN ESTIMATED QUANTITY OF "120 LINEAR FEET OF ITEM 603.4" CONDUIT TYPE E" IS INCLUDED IN THE TRAFFIC CONTROL GENERAL SUMMARY FOR THIS PURPOSE.

MAINTENANCE OF TRAFFIC SIGNAL INSTALLATIONS

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING TRAFFIC SIGNAL INSTALLATIONS WITHIN THE PROJECT UNDER THE FOLLOWING CONDITIONS:

A) EXISTING SIGNAL INSTALLATIONS WHICH THE PLANS REQUIRE THE CONTRACTOR TO ADJUST, MODIFY, ADD ONTO OR REMOVE, OR WHICH THE CONTRACTOR ACTUALLY ADJUSTS, MODIFIES OR OTHERWISE DISTURBS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ENTIRE INSTALLATION (AT AN INTERSECTION) FROM THE TIME HIS OPERATIONS FIRST DISTURB THE INSTALLATION UNTIL THE INSTALLATION HAS BEEN SUBSEQUENTLY REMOVED OR MODIFIED AND THE WORK IS ACCEPTED.

B) NEW OR REUSED SIGNAL INSTALLATIONS OR DEVICES, INSTALLED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF THESE FROM THE TIME OF INSTALLATION UNTIL THE WORK IS ACCEPTED.

THE CONTRACTOR SHALL CORRECT AS QUICKLY AS POSSIBLE ALL OUTAGES OR MALFUNCTIONS. HE SHALL PROVIDE THE CITY OF WARRENSVILLE HEIGHTS, THE DISTRICT 12 TRAFFIC DEPARTMENT, AND THE ENGINEER SUCH ADDRESSES AND PHONE NUMBERS WHERE HIS MAINTENANCE FORCES CAN BE CONTACTED. THE CONTRACTOR SHALL PROVIDE ONE OR MORE PERSONS TO RECEIVE ALL CALLS AND DISPATCH THE NECESSARY MAINTENANCE FORCES TO CORRECT OUTAGES. SUCH A PERSON OR PERSONS MAY BE USED TO PERFORM OTHER DUTIES AS LONG AS PROMPT ATTENTION IS GIVEN TO THESE CALLS AND A PERSON IS READILY AVAILABLE CONTINUOUSLY 24 HOURS A DAY, 7 DAYS A WEEK. ALL LAMP OUTAGES, CABLE OUTAGES, ELECTRICAL FAILURES, EQUIPMENT MALFUNCTIONS AND MISALIGNED SIGNAL HEADS SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER WITH THE SIGNAL BACK TO SERVICE WITHIN FOUR HOURS AFTER THE CONTRACTOR HAS BEEN NOTIFIED OF THE OUTAGE.

IN THE EVENT NEW SIGNALS ARE DAMAGED PRIOR TO ACCEPTANCE, ALL DAMAGED EQUIPMENT EXCEPT POLES AND CONTROL EQUIPMENT SHALL BE REPLACED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER WITH THE SIGNAL BACK IN SERVICE WITHIN 8 HOURS AFTER THE CONTRACTOR'S NOTIFICATION OF THE OUTAGE.

IF POLES AND/OR CONTROL EQUIPMENT ARE DAMAGED AND MUST BE REPLACED, THE CONTRACTOR SHALL MAKE TEMPORARY REPAIRS AS NECESSARY TO BRING THE SIGNAL BACK INTO FULL OPERATION WITHIN THE ALLOWED EIGHT-HOUR PERIOD, AND SHALL MAKE PERMANENT REPAIRS OR REPLACEMENT AS SOON THEREAFTER AS POSSIBLE.

NONE OF THE ABOVE SHALL BE CONSTRUED AS COLLECTIVE OR CONSECUTIVE OUTAGE TIME PERIODS AT ANY ONE LOCATION. THIS IS, WHERE MORE THAN ONE OUTAGE OCCURS AT ANY ONE LOCATION, THEN THE ALLOTTED TIME LIMIT SHALL BE FOR THE WORST SINGLE OUTAGE.

WHERE OUTAGES ARE THE DIRECT RESULT OF A VEHICLE ACCIDENT, THE RESPONSE OF THE CONTRACTOR SHALL BE AS OUTLINED ABOVE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COLLECTION OF ANY COMPENSATION FOR THIS WORK FROM THOSE PARTIES RESPONSIBLE FOR THE DAMAGE.

WHERE THE CONTRACTOR HAS FAILED TO OR CANNOT RESPOND TO AN OUTAGE OR SIGNAL EQUIPMENT MALFUNCTION, AT THESE LOCATIONS WITHIN HIS RESPONSIBILITY, WITHIN PERIODS AS SPECIFIED ABOVE, THE ENGINEER MAY INVOKE THE PROVISIONS OF SECTION 105.15 AND ANY SUBSEQUENT BILLINGS TO THE STATE OR THE CITY OF WARRENSVILLE HEIGHTS FOR POLICE SERVICES AND MAINTENANCE SERVICES BY CITY FORCES SHALL BE DEDUCTED FROM MONIES DUE OR TO BECOME DUE THE CONTRACTOR IN ACCORDANCE WITH PROVISIONS OF SECTION 105.15.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: TMA DATE: FEB '93
DRAWN BY: DAK DATE: MAR '93
CHECKED BY: DAK DATE: MAR '93
SCALE: N/A
R-TSGN.DWG

FHWA REGION	STATE	PROJECT	
5	OHIO		

47A
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

TRAFFIC CONTROL NOTES

THE CONTRACTOR SHALL PROVIDE THE MAINTENANCE SERVICE ENTIRELY WITH HIS FORCES OR HE MAY CHOOSE TO ENTER INTO A COOPERATIVE UNDERSTANDING WITH THE LOCAL MAINTAINING AGENCY TO PROVIDE THE MAINTENANCE. THE CONTRACTOR SHALL INFORM THE ENGINEER, IN WRITING, OF THE MAINTENANCE METHOD SELECTED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO ANY TRAFFIC SIGNAL COMPONENTS REQUIRED TO BE HANDLED DURING THE RELOCATION OF POLES AND REVISIONS TO THE SIGNAL SYSTEM.

WHEN A TRAFFIC SIGNAL MUST BE TAKEN OUT OF SERVICE BY THE CONTRACTOR, DUE TO CONSTRUCTION PROCEDURES, THIS OUTAGE SHALL NOT EXCEED 6 HOURS AND SHALL NOT INCLUDE THE HOURS OF 7:00 A.M. TO 9:00 A.M. AND 4:00 P.M. TO 6:00 P.M. ANY SIGNALIZED INTERSECTION, WHERE THE SIGNAL IS OUT OF SERVICE DUE TO CONSTRUCTION PROCEDURES, OR DUE TO AN OUTAGE OR MALFUNCTION OF EQUIPMENT AS DESCRIBED ABOVE, SHALL BE PROTECTED BY OFF-DUTY CITY OF WARRENSVILLE HEIGHTS POLICE, HIRED BY THE CONTRACTOR.

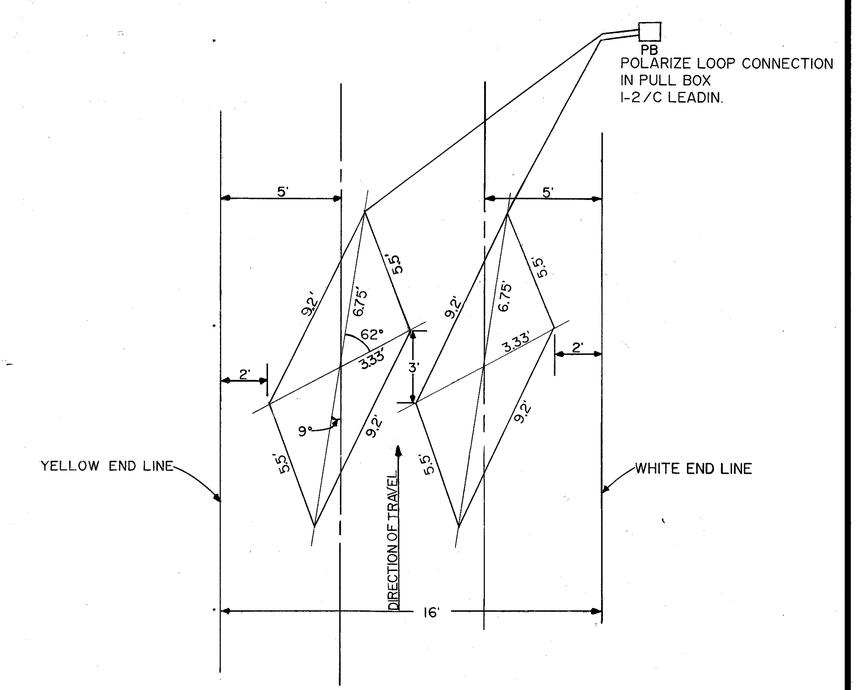
ANY VEHICULAR TRAFFIC SIGNAL HEAD, EITHER NEW OR EXISTING WHICH WILL BE OUT OF OPERATION SHALL BE COVERED IN THE MANNER DESCRIBED IN 632.24.

ALL COSTS RESULTING FROM THE ABOVE REQUIREMENTS SHALL BE CONSIDERED TO BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 614, MAINTAINING TRAFFIC.

LAYOUT OF RAMP G-I LOOP DETECTORS

THE CONTRACTOR SHALL NOTIFY THE DISTRICT 12 TRAFFIC ENGINEER (581-2333, EXT. 290) A MINIMUM OF ONE WEEK PRIOR TO LAYING OUT THE PROPOSED LOOP DETECTORS LOCATED ON RAMP G-I. THE CONTRACTOR SHALL NOT PERFORM ANY LOOP DETECTOR PAVEMENT CUTTING ON RAMP G-I UNTIL THE PROPOSED LOCATIONS OF THE LOOP DETECTORS HAVE BEEN APPROVED BY THE DISTRICT 12 TRAFFIC ENGINEER. THE DISTRICT 12 TRAFFIC ENGINEER WILL ASSIST THE CONTRACTOR WITH THE LAYOUT OF THE LOOP DETECTORS, IF NECESSARY, PROVIDED THE TRAFFIC DEPARTMENT IS GIVEN ONE WEEK NOTICE. SEE THIS SHEET FOR LOOP DETECTOR DETAILS.

LOOP DETECTOR DETAIL, RAMP G-I



HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: TMA DATE: FEB '93
DRAWN BY: DAK DATE: MAR '93
CHECKED BY: DAK DATE: MAR '93
SCALE: N/A
R-TSGN.DWG

TRAFFIC CONTROL SUMMARY

FHWA REGION	STATE	PROJECT	
5	OHIO		

48
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

STP FUNDING

SHEET NUMBER							ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	AS PER PLAN REFERENCE SHT.#
49	50	51	52	52A	53	63						
											TRAFFIC CONTROL	
						728	625	25400	728	LIN FT	CONDUIT, 2", 713.04	
						437	625	25500	437	LIN FT	CONDUIT, 3", 713.04	
						1165	625	29000	1165	LIN FT	TRENCH	
						12	625	30700	12	EACH	PULL BOX, 713.08, 18"	
						4	625	30706	4	EACH	PULL BOX, 713.08, 24"	
					6	9	625	32000	15	EACH	GROUND ROD	
					14.8		630	00000	14.8	CU YD	CONCRETE FOR ANCHOR BASE FOUNDATION	
0.54	0	1.2					630	00100	1.7	CU YD	CONCRETE FOR EMBEDDED FOUNDATION	
84	12	97	48	48			630	02100	289	LIN FT	GROUND MOUNTED SUPPORT, NO. 2 POST	
102	135	63	40	13			630	03100	353	LIN FT	GROUND MOUNTED SUPPORT, NO. 3 POST	
126	64	27	89				630	04100	306	LIN FT	GROUND MOUNTED SUPPORT, NO. 4 POST	
39		39					630	06400	78	LIN FT	GROUND MOUNTED SUPPORT, S4X7.7 BEAM	
		33					630	06500	33	LIN FT	GROUND MOUNTED SUPPORT, W6X9 BEAM	
		29	32				630	08100	61	LIN FT	ONE WAY SUPPORT, NO. 4 POST	
2		4					630	09000	6	EACH	BREAKAWAY BEAM CONNECTION	
			1				630	08500	1	EACH	STREET NAME SIGN SUPPORT	
					2		630	10300	2	EACH	OVERHEAD SIGN SUPPORT, TYPE TC-16.20, DESIGN 3, 35' ARM	
					1		630	10400	1	EACH	OVERHEAD SIGN SUPPORT, TYPE TC-16.20, DESIGN 4, 41' ARM	
					1		630	20300	1	EACH	OVERHEAD SIGN SUPPORT, TYPE TC-12.30, DESIGN 3, 16' ARM	
					2		630	20400	2	EACH	OVERHEAD SIGN SUPPORT, TYPE TC-12.30, DESIGN 4, 20' ARM	
1	5						630	79500	6	EACH	SIGN SUPPORT ASSEMBLY, POLE MOUNTED	
51	52	19	54	11			630	80100	187	SQ FT	SIGN, FLAT SHEET	
5	16	47	58		68		630	80102	194	SQ FT	SIGNS FLAT SHEET, TYPE G	
88	35	81			216		630	80204	420	SQ FT	SIGN, EXTRUSHEET, TYPE G	
2	2		2				630	80500	6	EACH	SIGN, DOUBLE FACED, STREET NAME	
8		8					630	81100	16	SQ FT	SIGN ERECTED, FLAT SHEET	
13	16	16	20	4			630	85000	69	EACH	REMOVAL OF GROUND MOUNTED SIGN AND STORAGE	
11	12	13	12	4			630	86002	52	EACH	REMOVAL OF GROUND MOUNTED POST SUPPORT AND DISPOSAL	
					3		630	88800	3	EACH	REMOVAL OF OVERHEAD SIGN SUPPORT AND STORAGE	
					7		630	87000	7	EACH	REMOVAL OF OVERHEAD MOUNTED SIGN AND STORAGE	
					3		631	84000	3	EACH	SIGN SERVICE	
					3		631	84300	3	EACH	SIGN WIRED	
					3		631	85100	3	EACH	DISCONNECT SWITCH WITH ENCLOSURE, TYPE X	
					3		631	87202	3	EACH	BALLAST, TYPE CMRI-175-480, INTEGRAL	
					3		631	89200	3	EACH	MERCURY VAPOR LUMINAIRE, TYPE TC-31.21 WITH 175 WATT LAMP	
						10	632	00300	10	EACH	VEHICULAR SIGNAL HEAD, 3 SECTION, 12" LENS, 1-WAY	
						4	632	00500	4	EACH	VEHICULAR SIGNAL HEAD, 5 SECTION, 12" LENS, 1 WAY	
						12	632	20600	12	EACH	PEDESTRIAN SIGNAL HEAD, TYPE D2	
						10	632	26000	10	EACH	PEDESTRIAN PUSHBUTTON	
						9	632	27005	9	EACH	LOOP DETECTOR UNIT, AS PER PLAN	47
						8	632	27009	8	EACH	LOOP DETECTOR UNIT, DELAY AND EXTENSION TYPE, AS PER PLAN	47
						1217	632	27500	1217	LIN FT	LOOP DETECTOR PAVEMENT CUTTING	
						652	632	40500	652	LIN FT	SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG	
						1720	632	40700	1720	LIN FT	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG	
						753	632	40900	753	LIN FT	SIGNAL CABLE, 9 CONDUCTOR, NO. 14 AWG	
						2550	632	64900	2250	LIN FT	LOOP DETECTOR WIRE, TYPE E	
						3178	632	65200	3178	LIN FT	LOOP DETECTOR LEAD-IN CABLE	
						151	632	68300	151	LIN FT	POWER CABLE, 3 CONDUCTOR, NO. 6 AWG	
						2	632	70000	2	EACH	POWER SERVICE	
						15.0	632	72000	15.0	CU YD	CONCRETE FOR ANCHOR BASE FOUNDATION	
						1	632	80100	1	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 1, 22' ARM	
						1	632	80400	1	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 4, 32' ARM	
						1	632	80400	1	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 4, 36' ARM	
						2	632	80500	2	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 11, 43' ARM	

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: MAR '93
DRAWN BY: DAK DATE: MAR '93
CHECKED BY: TMA DATE: MAR '93
SCALE: N/A
R-TGEN.DWG

TRAFFIC CONTROL SUMMARY

FHWA REGION	STATE	PROJECT	
5	OHIO		

48A / 110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

SHEET NUMBER 54	SHEET NUMBER 63	ITEM	ITEM EXT.	TOTAL	UNIT	DESCRIPTION	AS PER PLAN REFERENCE SHT.#
						TRAFFIC CONTROL	
	1	632	80600	1	EACH	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 12, 48' ARM	
	2	632	89900	2	EACH	PEDESTAL, 8', TRANSFORMER BASE	
	2	632	90101	2	EACH	REMOVAL OF TRAFFIC SIGNAL INSTALLATION, AS PER PLAN	47
	14	632	25000	14	EACH	COVERING OF VEHICULAR SIGNAL HEADS	
	1	633	32005	1	EACH	CONTROLLER, ACTUATED, 2 PHASE, SOLID STATE DIGITAL MICROPROCESSOR, AS PER PLAN	47
	1	633	38000	1	EACH	CONTROLLER, ACTUATED, 8 PHASE, SOLID STATE DIGITAL MICROPROCESSOR	47
	10.4	633	70500	10.4	SQ FT	CONTROLLER WORK PAD	
0.31		642	00102	0.31	MILE	EDGE LINE, TYPE 2	
0.98		642	00202	0.98	MILE	LANE LINE, TYPE 2	
0.75		642	00302	0.75	MILE	CENTER LINE, TYPE 2	
962		642	00402	962	LIN FT	CHANNELIZING LINE, TYPE 2	
259		642	00502	259	LIN FT	STOP LINE, TYPE 2	
1337		642	00602	1,337	LIN FT	CROSSWALK LINE, TYPE 2	
461		642	00702	461	LIN FT	TRANSVERSE LINE, TYPE 2	
10		642	01302	10	EACH	LANE ARROW, TYPE 2	
4		642	01402	4	EACH	WORD ON PAVEMENT, 72", TYPE 2	
48		642	00902	48	SQ FT	ISLAND MARKING, TYPE 2	

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: MAR '93
DRAWN BY: DAK DATE: MAR '93
CHECKED BY: TMA DATE: MAR '93
SCALE: N/A
R-TGEN2.DWG

TRAFFIC CONTROL QUANTITIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

49
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

630 - GROUND MOUNTED SIGNS

REF. NO.	STATION	SIDE	CODE	SIZE	SIGNS					GROUND MOUNTED SIGN SUPPORTS										
					FLAT SHEET	FLAT SHEET TYPE G	EXTRU SHEET TYPE G	DOUBLE FACED (STREET NAME)	SIGNS ERECTED FLAT SHEET	NO. 2 POST	NO. 3 POST	NO. 4 POST	S4 x 7.7 BEAM		BREAKAWAY BEAM CONNECTION	ONE-WAY SUPPORT NO. 4 POST	SIGN SUPPORT ASSEMBLY POLE MOUNTED	REMOVAL OF GRD. MTD. SIGN AND STORAGE	REMOVAL OF GRD. MTD. POST SUPPORT AND DISPOSAL	CONCRETE FOR EMBEDDED FOUNDATIONS	
					SQ. FT.	SQ. FT.	SQ. FT.	EACH	SQ. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.		EACH	LIN. FT.	EACH	EACH	EACH	CU. YD.	
1	RICHMOND 162+70	RT.	R-55-12	12 x 18	1.5					12										
2	162+90	RT.																1	1	
3	162+90	RT.																1	1	
4	163+00	RT.	CUY-D500	36 x 30					7.5		13/13									
5	164+50	RT.	M-45-42	42 x 66			19.25					16/16								
6	163+55	RT.																1	2	
7	164+75	RT.	R-55-12	12 x 18	1.5					12										
8	163+00	LT.	R-55-12	12 x 18	1.5					12										
9	164+75	LT.	R-10-24	24 x 30	5						13									
10	165+00	LT.	R-55-12	12 x 18	1.5					12										
11	166+10	LT.	R-55-12	12 x 18	1.5					12										
12	166+84	LT.																3		
13	166+85	LT.	M-38-24	24 x 12	2							14.5								
			M-2-24-3	30 x 24	5															
14	167+35	LT.	W-60C-36	36 x 36	9							15								
15	167+65	LT.																1	2	
16	167+65	LT.	M-45-SPECIAL	42 x 114			33.25						19.5/19.5		2					0.54
17	167+80	LT.																1	2	
18	167+72	LT.	D-14	VAR. x 8				1									1			
			D-14	VAR. x 8				1												
19	EMERY 120+70	RT.	M-45-42	42 x 60			17.5					16/16								
20	RICHMOND 167+82	LT.	D-11A	72 x 18	9						12/12									
21	EMERY 120+50	RT.																1	1	
22	120+50	RT.	R-55-12	12 x 18	1.5					12										
23	120+13	RT.																1	1	
25	RICHMOND 166+50	RT.	R-55-12	12 x 18	1.5					12										
26	166+80	RT.	N-29-24	24 x 24		4					13									
			N-15-24	24 x 6		1														
27	166+84	RT.																2		
28	167+62	RT.																1	1	
29	167+65	RT.	R-31C-48	48 x 30	10						13/13									
30	167+70	RT.	M-45-42	42 x 60			17.5					16/16								
TOTALS:					50.5	5	87.5	2	7.5	84	102	125.5	39		2	0	1	13	11	0.54

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: TMA DATE: FEB '93
DRAWN BY: DAK DATE: MAR '93
CHECKED BY: DAK DATE: MAR '93
SCALE: N/A
R-GMSQ1.DWG

GROUND MOUNTED SIGN QUANTITIES

TRAFFIC CONTROL QUANTITIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

50/110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

630 - GROUND MOUNTED SIGNS

REF. NO.	STATION	SIDE	CODE	SIZE	SIGNS					GROUND MOUNTED SIGN SUPPORTS										
					FLAT SHEET	FLAT SHEET TYPE G	EXTRU SHEET TYPE G	DOUBLE FACED (STREET NAME)	SIGNS ERECTED FLAT SHEET	NO. 2 POST	NO. 3 POST	NO. 4 POST	W4 x 7.7 BEAM	W6 x 9 BEAM	BREAKAWAY BEAM CONNECTION	ONE-WAY SUPPORT NO. 4 POST	SIGN SUPPORT ASSEMBLY POLE MOUNTED	REMOVAL OF GRD. MTD. SIGN AND STORAGE	REMOVAL OF GRD. MTD. POST SUPPORT AND DISPOSAL	CONCRETE FOR EMBEDDED FOUNDATIONS
					SQ. FT.	SQ. FT.	SQ. FT.	EACH	SQ. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	LIN. FT.	EACH	EACH	EACH	CU. YD.
31	RICHMOND 167+86	RT.	M-2-24-3	30 x 24	5												1			
			M-25-21	21 x 15	2.2												1			
32	EMERY 121+62	RT.																1	2	
33	122+30	RT.																1	1	
34	119+85	LT.																1	1	
35	119+85	LT.	R-10-24	24 x 30	5						14									
37	RICHMOND 168+83	LT.	M-2-24-3	30 x 24	5												1			
			M-25-21	21 x 15	2.2												1			
38	EMERY 120+70	LT.																1	2	
39	RICHMOND 169+00	LT.	M-45-42	42 x 60			17.5					16/16								
40	169+10	LT.	R-31C-48	48 x 30	10						13/13									
41	169+53	LT.	N-29-24	24 x 24		4					13									
			N-15-24	24 x 6		1														
42	169+53	LT.																2		
45	EMERY 122+21	LT.																1		
46	121+75	LT.	R-31C-48	48 x 30	10						13/13									
47	121+56	LT.																1		
48	121+53	LT.																1	2	
49	121+60	LT.	D-14	VAR x 8				1									1			
			D-14	VAR x 8				1												
50	121+48	LT.																2	1	
51	121+55	LT.	M-45-42	42 x 60			17.5					16/16								
52	RICHMOND 169+50	RT.	M-2-24-3	30 x 24	5						13.5									
			M-37-24	24 x 12	2															
53	169+53	RT.																3		
55	170+40	RT.	R-55-12	12 x 18	1.5					12										
56	RAMP G-2 1+75	RT.	R-15B-30	30 x 18	3.75						12									
57	RICHMOND 171+72	RT.																1	2	
59	172+60	RT.	R-2-60	60 x 60 x 60		10.8					15/15									
60	172+60	RT.																1	1	
	TOTALS:				51.6	15.8	35	2	0	12	134.5	64	0	0	0	0	5	16	12	0

REF. NOS. 36, 54, & 58 ARE NOT USED

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: TMA DATE: FEB '93
DRAWN BY: DAK DATE: MAR '93
CHECKED BY: DAK DATE: MAR '93
SCALE: N/A
R-GMSQ2.DWG

GROUND MOUNTED SIGN QUANTITIES

TRAFFIC CONTROL QUANTITIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

51
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

630 - GROUND MOUNTED SIGNS

REF. NO.	STATION	SIDE	CODE	SIZE	SIGNS					GROUND MOUNTED SIGN SUPPORTS										
					FLAT SHEET	FLAT SHEET TYPE G	EXTRU SHEET TYPE G	DOUBLE FACED (STREET NAME)	SIGNS ERECTED FLAT SHEET	NO. 2 POST	NO. 3 POST	NO. 4 POST	S4 x 7.7 BEAM	W6 x 9 BEAM	BREAKAWAY BEAM CONNECTION	ONE-WAY SUPPORT 'NO. 4 POST	SIGN SUPPORT ASSEMBLY POLE MOUNTED	REMOVAL OF GRD. MTD. SIGN AND STORAGE	REMOVAL OF GRD. MTD. POST SUPPORT AND DISPOSAL	CONCRETE FOR EMBEDDED FOUNDATIONS
					SQ. FT.	SQ. FT.	SQ. FT.	EACH	SQ. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	LIN. FT.	EACH	EACH	EACH	CU. YD.
61	RICHMOND 172+40	RT.	R-55-12	12 x 18	1.5					12										
62	173+03	RT.	R-15B-30	30 x 18	3.75						12									
63	172+44	RT.																2	2	
64	170+05	LT.	R-55-12	12 x 18	1.5					12										
65	172+00	LT.	M-45-SPECIAL	42 x 114			33.25						19.5/19.5		2					0.54
66	172+62	LT.																1	2	
67	181+00	LT.																1	2	
69	181+75	LT.	CUY-D500	36 x 30					7.5		13/13									
70	181+75	LT.																1	1	
71	182+75	LT.	R-55-12	12 x 18	1.5					12										
72	182+75	LT.																2	1	
73	183+40	LT.	N-1-40	40 x 20	5.6					12.5/12.5										
74	182+75	RT.	R-55-12	12 x 18	1.5					12										
75	184+25	RT.	R-55-12	12 x 18	1.5					12										
76	184+50	RT.																1	1	
77	184+97	RT.																3	1	
78	185+28	RT.																3	1	
79	RAMP G-1 57+70	RT.	R-41B-36	36 x 36		9						13.5				14.5				
			R-43R-36	36 x 12		3						13.5								
			R-43L-36	36 x 12		3														
80	57+70	LT.	R-41B-36	36 x 36		9										14.5				
			R-43R-36	36 x 12		3														
			R-43L-36	36 x 12		3														
81	RICHMOND 185+10	RT.																1	1	
82	RAMP G-1 58+15	RT.																1	1	
83	60+20	RT.	R-41A-36	36 x 24		6					12.5									
84	60+20	LT.	R-41A-36	36 x 24		6					12.5									
85	60+20	RT.	N-29-24	24 x 24		4														
			N-15-24	24 x 6		1														
86	RICHMOND 184+25	LT.	R-55-12	12 x 18	1.5					12										
87	RAMP G-1 62+20	LT.	D-4B-48	144 x 48			48							16.0/16.5	2					0.66
TOTALS:					18.4	47	81.2	0	7.5	97	63	27	39	32.5	4	29	0	16	13	1.20

REF. NO. 68 IS NOT USED

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: TMA DATE: FEB '93
DRAWN BY: DAK DATE: MAR '93
CHECKED BY: DAK DATE: MAR '93
SCALE: N/A
R-GMSQ3.DWG

GROUND MOUNTED SIGN QUANTITIES

TRAFFIC CONTROL QUANTITIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

52
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

630 - GROUND MOUNTED SIGNS

REF. NO.	STATION	SIDE	CODE	SIZE	SIGNS					GROUND MOUNTED SIGN SUPPORTS										
					FLAT SHEET	FLAT SHEET, TYPE G	EXTRU SHEET, TYPE G	DOUBLE FACED (STREET NAME)	SIGNS ERECTED FLAT SHEET	NO. 2 POST	NO. 3 POST	NO. 4 POST	S4 x 7.7 BEAM	W6 x 9 BEAM	BREAKAWAY BEAM CONNECTION	ONE-WAY SUPPORT, NO. 4 POST	STREET NAME SIGN SUPPORT	REMOVAL OF GRD. MTD. SIGN AND STORAGE	REMOVAL OF GRD. MTD. POST SUPPORT AND DISPOSAL	CONCRETE FOR EMBEDDED FOUNDATIONS
					SQ. FT.	SQ. FT.	SQ. FT.	EACH	SQ. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	LIN. FT.	EACH	EACH	EACH	CU. YD.
88	RICHMOND 184+95	LT.																5	2	
89	186+05	LT.																1	1	
90	186+25	LT.	R-55-12	12 x 18	1.5					12										
91	186+60	LT.	M-17-24	24 x 12	2							14.5								
			M-40-24	24 x 12	2															
			M-1-24-3	30 x 24	5															
92	186+60	LT.	IM-17-24	24 x 12	2							14.5								
			IM-37-24	24 x 12	2															
			M-5-24-3	30 x 24	5															
93	RAMP G-1 59+15	LT.																1	2	
94	58+35	LT.																1	1	
95	57+90	LT.	R-41B-36	36 x 36		9						15				16				
			R-43L-36	36 x 12		3														
			R-43R-36	36 x 12		3														
			R-2-60	60 x 60 x 60		10.8														
96	RICHMOND 185+45	RT.																4	1	
97	RAMP G-1 58+15	LT.	R-41B-36	36 x 36		9						15				16				
			R-43L-36	36 x 12		3														
			R-43R-36	36 x 12		3														
			R-2-60	60 x 60 x 60		10.8														
98	58+10	LT.																2	1	
99	RICHMOND 186+30	RT.	W-60C-36	36 x 36	9							15								
100	186+53	RT.	R-55-12	12 x 18	1.5					12										
101	186+50	RT.																2	1	
102	186+80	RT.	M-2-24-3	30 x 24	5						13.5									
			M-37-24	24 x 12	2															
103	187+30	RT.	R-10-24	24 x 30	5						13									
104	187+30	RT.																1	1	
105	188+35	RT.	R-55-12	12 x 18	1.5					12										
106	188+25	LT.	R-55-12	12 x 18	1.5					12										
107	TAYLOR 10+55	LT.	R-1-30	30 x 30		6.25					13									
108	10+52	LT.																1	1	
109	EMERY 123+62	LT.	D-14	VAR x 8				1									1			
			D-14	VAR x 8				1												
110	123+60	LT.																2	1	
111	123+00	RT.	W-60C-36	36 x 36	9							15								
TOTALS:					54	57.8	0	2	0	48	39.5	89	0	0	0	32	1	20	12	0

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: TMA DATE: FEB '93
DRAWN BY: DAK DATE: MAR '93
CHECKED BY: DAK DATE: MAR '93
SCALE: N/A
R-GMSQ4.DWG

GROUND MOUNTED SIGN QUANTITIES

TRAFFIC CONTROL QUANTITIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

52A/110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

630 - GROUND MOUNTED SIGNS

REF. NO.	STATION	SIDE	CODE	SIZE	SIGNS					GROUND MOUNTED SIGN SUPPORTS											
					FLAT SHEET	FLAT SHEET, TYPE G	EXTRU SHEET, TYPE G	DOUBLE FACED (STREET NAME)	SIGNS ERECTED FLAT SHEET	NO. 2 POST	NO. 3 POST	NO. 4 POST	S4 x 7.7 BEAM	W6 x 9 BEAM	BREAKAWAY BEAM CONNECTION	ONE-WAY SUPPORT, NO. 4 POST	SIGN SUPPORT ASSEMBLY POLE MOUNTED	REMOVAL OF GRD. MTD. SIGN AND STORAGE	REMOVAL OF GRD. MTD. POST SUPPORT AND DISPOSAL	CONCRETE FOR EMBEDDED FOUNDATIONS	
					SQ. FT.	SQ. FT.	SQ. FT.	EACH	SQ. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	LIN. FT.	EACH	EACH	EACH	CU. YD.	
113	EMERY 123+95	LT.	R-88-24	24 x 30	5						13										
114	123+78	LT.																1	1		
115	125+00	LT.	R-55-12	12 x 18	1.5					12											
116	125+22	LT.																1	1		
117	125+90	LT.																1	1		
118	126+00	LT.	R-55-12	12 x 18	1.5					12											
119	124+75	RT.	R-55-12	12 x 18	1.5					12											
120	125+98	RT.																1	1		
121	126+75	RT.	R-55-12	12 x 18	1.5					12											
TOTALS:					11	0	0	0	0	48	13	0	0	0	0	0	0	4	4	0	

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: TMA DATE: FEB '93
DRAWN BY: DAK DATE: MAR '93
CHECKED BY: DAK DATE: MAR '93
SCALE: N/A
R-GMSQ5.DWG

GROUND MOUNTED SIGN QUANTITIES

TRAFFIC CONTROL QUANTITIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

53
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

OVERHEAD SIGN SUB-SUMMARY

REF. NO.	ROADWAY	SIDE	STATION	CODE	SIZE	625	630										631				
						GROUND ROD	SIGNS FLAT SHEET TYPE G	SIGNS EXTRU SHEET TYPE G	CONCRETE FOR ANCHOR BASE FOUNDATION		OVERHEAD SIGN SUPPORT TYPE TC-16.20 DESIGN 3 35'-0" ARM	OVERHEAD SIGN SUPPORT TYPE TC-16.20 DESIGN 4 41'-0" ARM	OVERHEAD SIGN SUPPORT TYPE TC-12.30 DESIGN 4 20'-0" ARM	OVERHEAD SIGN SUPPORT TYPE TC-12.30 DESIGN 3 16'-0" ARM	REMOVAL OF OVERHEAD SIGN SUPPORT AND STORAGE	REMOVAL OF OVERHEAD MOUNTED SIGN	SIGN SERVICE	SIGNS WIRED	DISCONNECT SWITCH WITH ENCLOSURE TYPE X	BALLAST INTEGRAL TYPE CMRI-175-480	MERCURY VAPOR LUMINAIRE TYPE TC-31.21 WITH 175-WATT LAMP
						EACH	SQ. FT.	SQ. FT.	CU. YD.		EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
24	RICHMOND	RT	166+84												1	2					
S-2	EMERY	RT	120+10	R-26A-30	30" x 36"	1	7.5		1.67		1										
				R-29A-30	30" x 36"		7.5														
				R-30A-30	30" x 36"		7.5														
44		RT	122+25												1	3					
S-1		LT	122+80	R-29A-30	30" x 36"	1	7.5		2.66			1									
				R-26A-30	30" x 36"		7.5														
				R-30A-30	30" x 36"		7.5														
43	RICHMOND	LT	169+53												1	2					
S-3		LT	170+40	R-26A-30	30" x 36"	1	7.5		1.67		1										
				R-29A-30	30" x 36"		7.5														
				R-30A-30	30" x 36"		7.5														
S-4		RT	171+30	GH	11' x 6'-6"	1		71.5	2.92				1				1	1	1	1	1
S-5		RT	173+10	GH	9' x 8'	1		72	2.92				1				1	1	1	1	1
S-6		LT	181+05	GH	9' x 8'	1		72	2.92					1			1	1	1	1	1
					TOTALS:	6	67.5	216	14.76	0	2	1	2	1	3	7	3	3	3	3	3

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: MAR 93
DRAWN BY: DAK DATE: MAR 93
CHECKED BY: JPR DATE: JUN 93
SCALE: N/A
R-OHSQ.DWG

PAVEMENT MARKING QUANTITIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

54
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

REF. A		ITEM 642 – EDGE LINE, WHITE		
STATION FROM	STATION TO	SIDE	CALCULATIONS/REMARKS	TOTAL (LIN. FT.)
RICHMOND				
162+70	163+70	LT.		100
162+70	164+01	RT.		131
187+00	190+20	RT.		320
187+10	190+20	LT.		310
RAMP G-2				
0+00	3+35	RT.		335
RAMP G-1				
59+75	58+05	RT.		170
			TOTALS:	1366
				0.26 MI.

REF. B		ITEM 642 – EDGE LINE, YELLOW		
STATION FROM	STATION TO	SIDE	CALCULATIONS/REMARKS	TOTAL (LIN. FT.)
RAMP G-2				
2+85	3+35	RT.		75
RAMP G-1				
59+75	57+88	LT.		187
			TOTALS:	262
				0.05 MI.
			TOTAL EDGE LINE:	0.31 MI.

REF. C		ITEM 642 – LANE LINE		
STATION FROM	STATION TO	SIDE	CALCULATIONS/REMARKS	TOTAL (LIN. FT.)
RICHMOND ROAD				
166+80	170+03	RT.		323
166+80	168+35	LT.		155
168+35	181+00	LT.		1265
170+03	186+64	RT.		1661
181+00	187+10	LT.		610
186+64	187+10	RT.		46
EMERY ROAD				
119+50	125+16	RT.		566
121+18	125+16	LT.		398
119+50	121+18	LT.		168
			TOTALS:	5192
				0.98 MI.

REF. D		ITEM 642 – CENTER LINE, SOLID, DOUBLE		
STATION FROM	STATION TO	SIDE	CALCULATIONS/REMARKS	TOTAL (LIN. FT.)
RICHMOND ROAD				
162+70	168+34	LT.		564
168+34	170+03	RT.		169
162+70	165+58	RT.		290
170+03	172+20	RT.		217
172+20	181+25	LT. & RT.		905
181+25	186+64	LT. & RT.		540
186+64	190+20	LT. & RT.		356
170+64	172+20	LT.		158
EMERY ROAD				
119+50	120+65	LT.		115
121+72	123+00	RT.		128
123+97	127+15			458
			TOTALS:	3900
				0.74 MI.

REF. E		ITEM 642 – CHANNELIZING LINE		
STATION FROM	STATION TO	SIDE	CALCULATIONS/REMARKS	TOTAL (LIN. FT.)
RICHMOND ROAD				
165+80	167+72	RT.		192
168+97	170+40	LT.		143
EMERY ROAD				
119+50	120+67	RT.		117
121+70	123+00	LT.		130
RAMP G-1				
58+22	57+89	RT.		33
58+22	58+00	LT.		31
RAMP G-2				
1+35	2+73	LT.		138
1+35	2+55	LT.		178
			TOTALS:	962

REF. F		ITEM 642 – STOP LINE		
STATION FROM	STATION TO	SIDE	CALCULATIONS/REMARKS	TOTAL (LIN. FT.)
RICHMOND ROAD				
167+70	167+72	RT.		41
168+97	168+99	RT.		7
168+97	168+99	LT.		34
185+90	185+92	LT.		25
EMERY ROAD				
120+67	120+65	RT.		41
120+67	120+65	LT.		6
121+70	121+72	LT.		48
RAMP G-1				
57+87	57+89	RT.		25
TAYLOR LANE				
10+44				32
			TOTALS:	259

REF. G		ITEM 642 – CROSSWALK LINES		
STATION FROM	STATION TO	SIDE	CALCULATIONS/REMARKS	TOTAL (LIN. FT.)
RICHMOND ROAD				
167+76	167+82	LT. & RT.		156
168+86	168+92	LT. & RT.		157
172+63	173+04	RT.		156
184+94	185+26	RT.		64
185+44	185+50	LT. & RT.		100
171+15	171+93	RT.		81
185+51	185+81	RT.		61
EMERY ROAD				
120+71	120+77	LT. & RT.		195
121+59	121+65	LT. & RT.		192
122+85	123+80	LT.		175
			TOTALS:	1,337

REF. H		ITEM 642 – TRANSVERSE LINES, WHITE		
STATION FROM	STATION TO	SIDE	CALCULATIONS/REMARKS	TOTAL (LIN. FT.)
RICHMOND ROAD				
171+40	172+70	RT.		125
RAMP G-1				
58+22	57+90	LT.		70
			TOTALS:	195

REF. I		ITEM 642 – TRANSVERSE LINES, YELLOW		
STATION FROM	STATION TO	SIDE	CALCULATIONS/REMARKS	TOTAL (LIN. FT.)
RICHMOND ROAD				
162+90	165+60	LT. & RT.		123
170+60	172+20	LT. & RT.		43
123+97	125+20	LT. & RT.		100
			TOTALS:	266
			TOTAL TRANSVERSE LINES:	461

		ITEM 642 – LANE ARROWS		
STATION FROM	STATION TO	SIDE	CALCULATIONS/REMARKS	TOTAL (EACH)
RICHMOND ROAD				
166+60		LT. & RT.		1
167+45		LT. & RT.		1
169+25		LT. & RT.		1
170+10		LT. & RT.		1
EMERY ROAD				
119+60		LT. & RT.		1
120+40		LT. & RT.		1
121+97		LT. & RT.		1
122+82		LT. & RT.		1
RAMP G-1				
58+15		RT.		1
58+15		LT. & RT.		1
			TOTALS:	10

		ITEM 642 – WORD ON PAVEMENT		
STATION FROM	STATION TO	SIDE	CALCULATIONS/REMARKS	TOTAL (EACH)
RICHMOND ROAD				
166+95		LT. & RT.		1
169+70		LT. & RT.		1
EMERY ROAD				
119+95		LT. & RT.		1
122+47		LT. & RT.		1
			TOTALS:	4

ITEM 642 - ISLAND MARKING

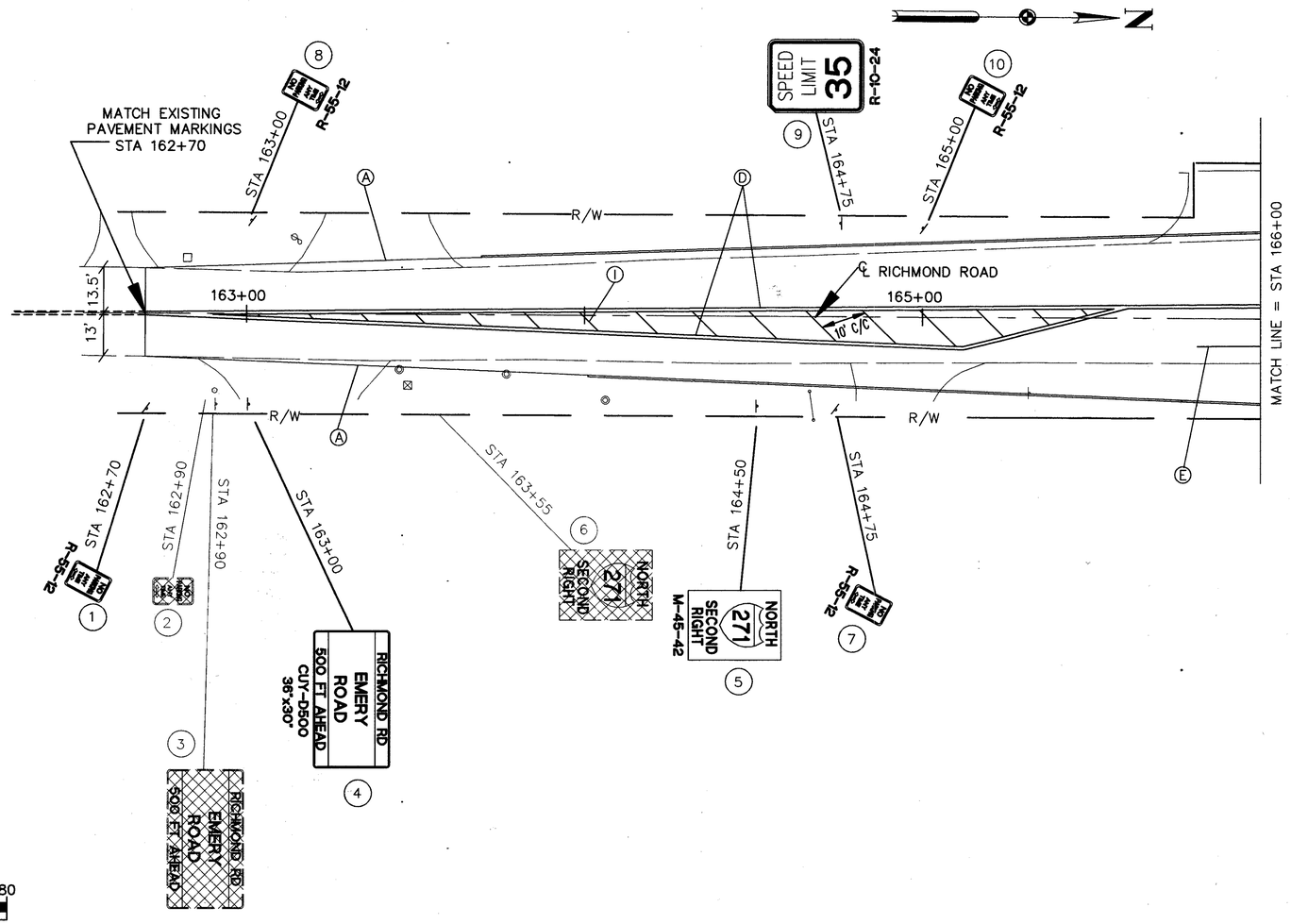
STA. 123+91 TO 123+97 : 48 SQ.FT.
(EMERY ROAD)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: TMA DATE: FEB '93
DRAWN BY: DAK DATE: MAR '93
CHECKED BY: DAK DATE: MAR '93
SCALE: N/A
R-PVMRK1.DWG

FHWA REGION	STATE	PROJECT	
5	OHIO		

55
110



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

LEGEND

- SIGN SUPPORT
- NEW SIGN & SUPPORT
- EXISTING SIGN & SUPPORT TO BE REMOVED
- (A) EDGE LINE WHITE
- (B) EDGE LINE YELLOW
- (C) LANE LINE
- (D) CENTERLINE, SOLID, DOUBLE
- (E) CHANNELIZING LINE
- (F) STOP LINE
- (G) CROSSWALK LINE
- (H) TRANSVERSE LINE, WHITE SEE DETAIL
- (I) TRANSVERSE LINE, YELLOW
- (J) ISLAND MARKING, YELLOW

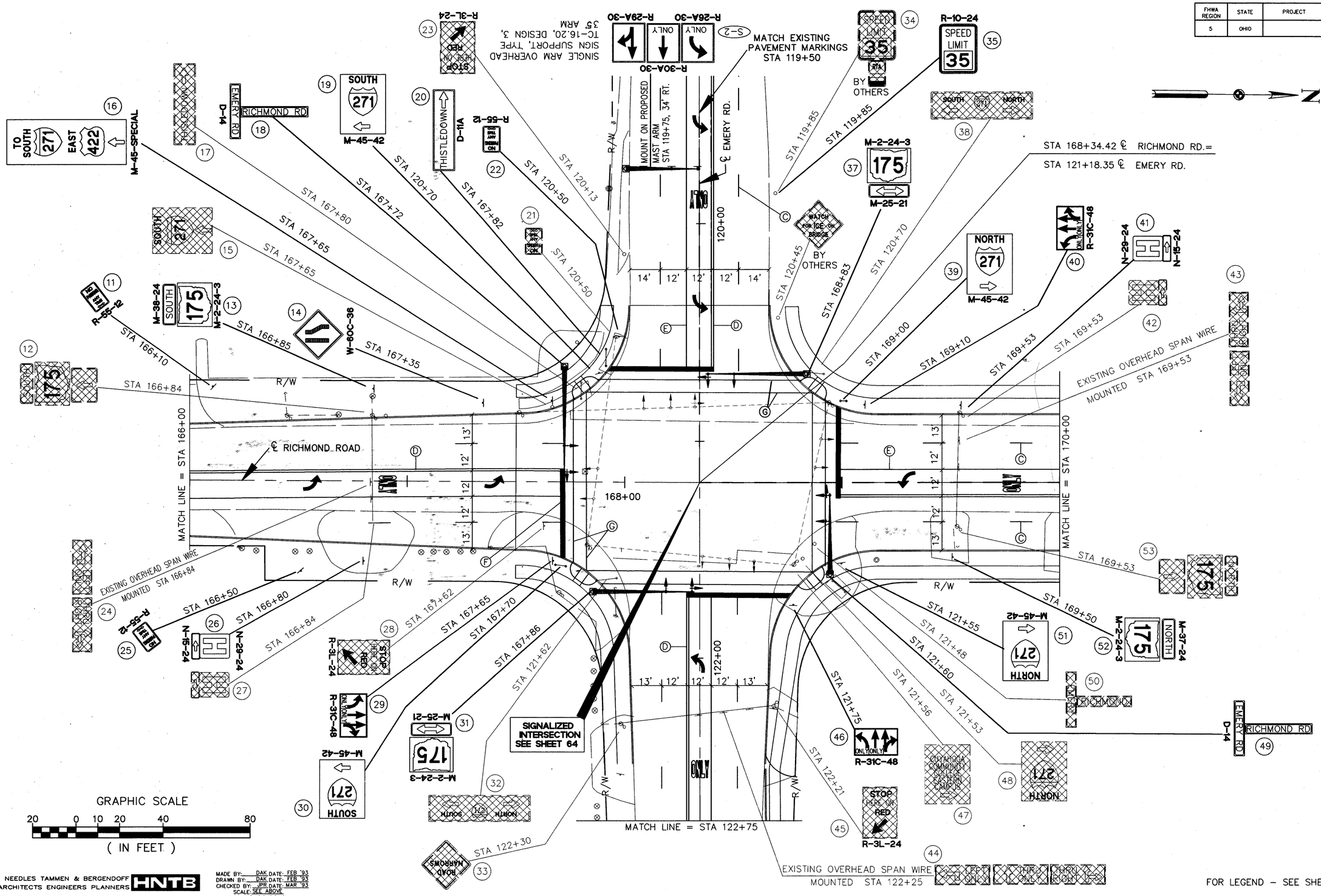
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: MAR '93
SCALE: SEE ABOVE
R-SIGN1.DWG

SIGNING AND PAVEMENT MARKING PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

56
110



HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS **HNTB**

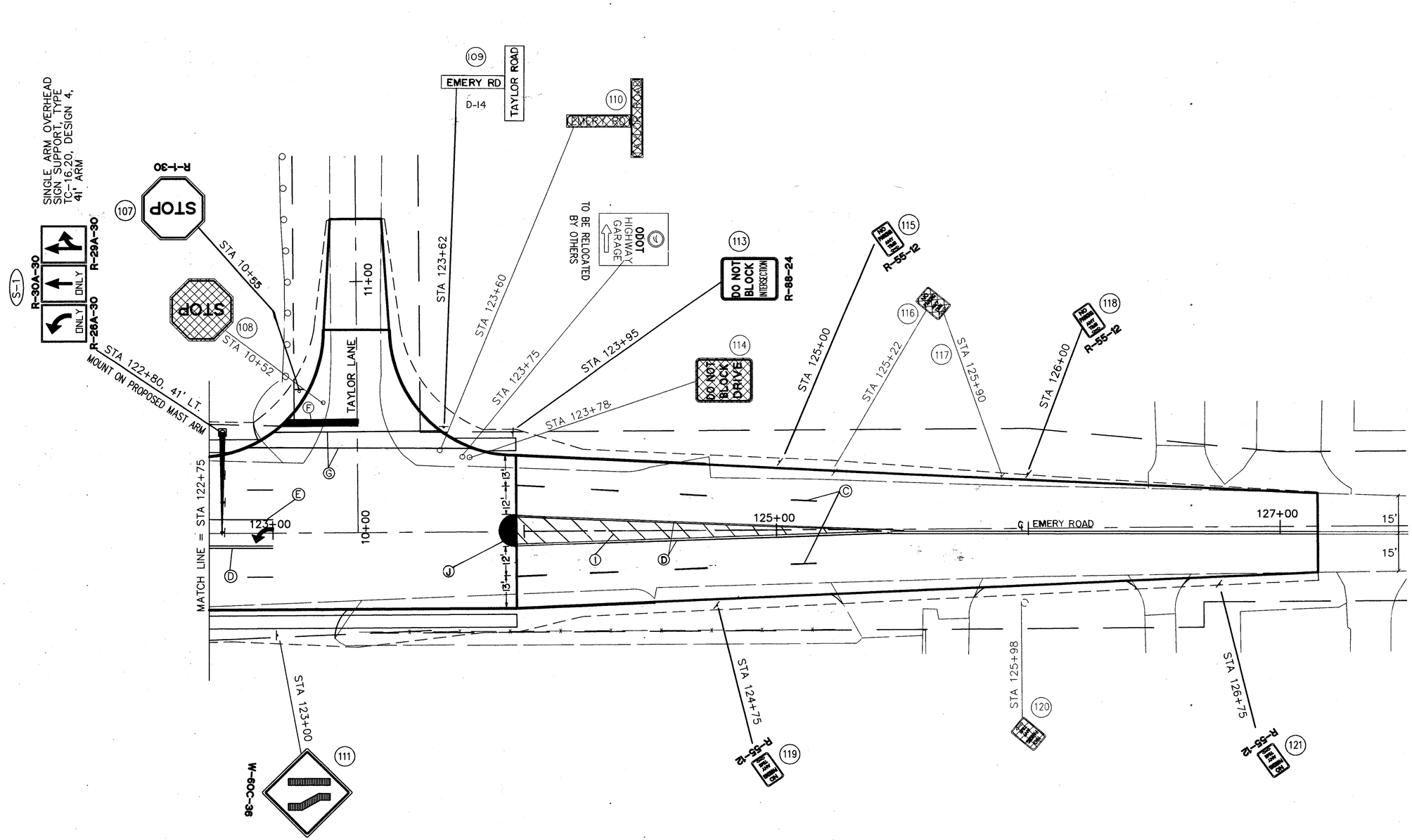
MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: MAR '93
SCALE: SEE ABOVE
R-SIGN2.DWG

FOR LEGEND – SEE SHEET 55

SIGNING AND PAVEMENT MARKING PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

56A / 110



GRAPHIC SCALE

20 0 10 20 40 80

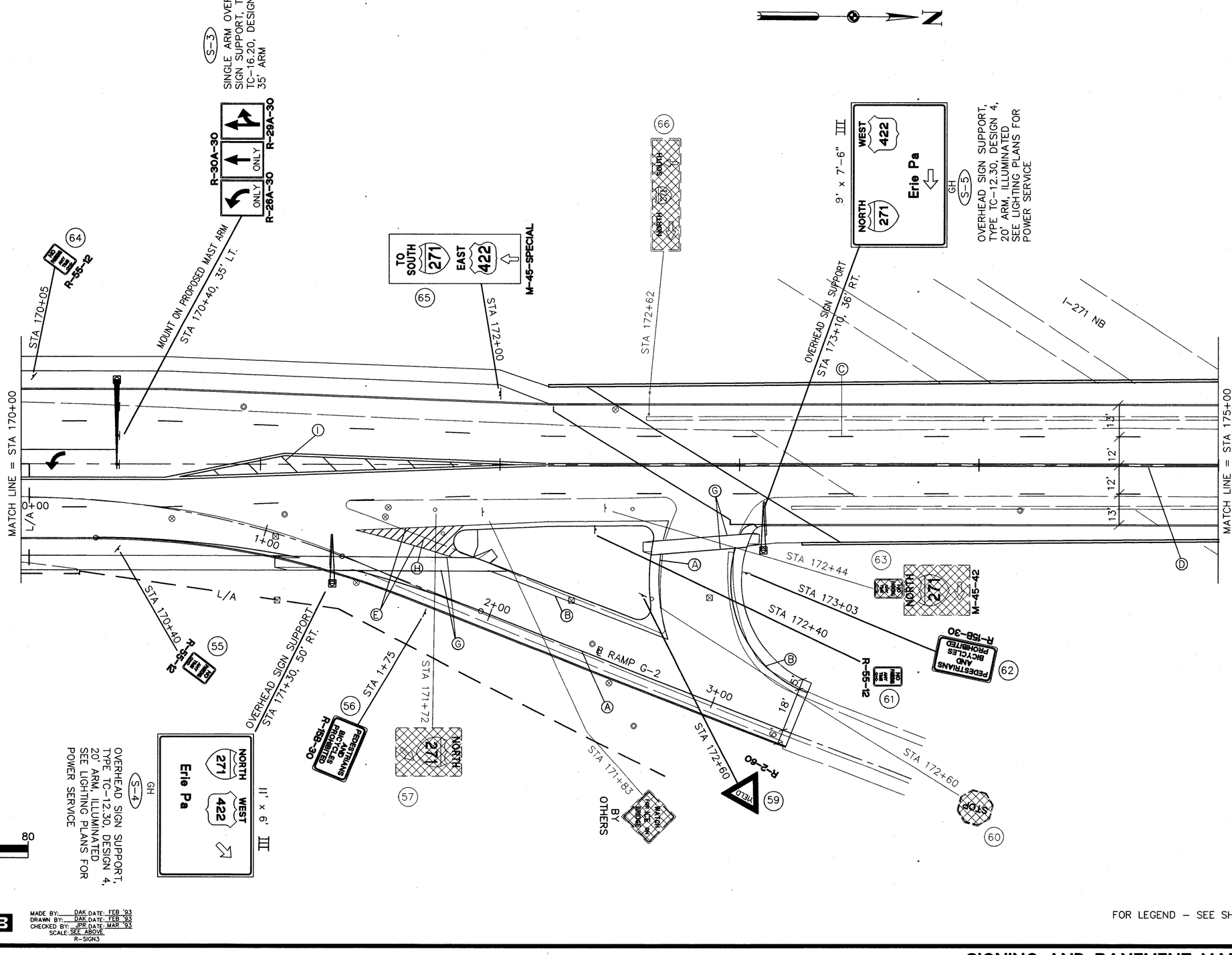
(IN FEET)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: JUN 93
DRAWN BY: DAK DATE: JUN 93
CHECKED BY: JPR DATE: JUN 93
SCALE: SEE SCALE
R-SIGN2A

SIGNING AND PAVEMENT MARKING PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

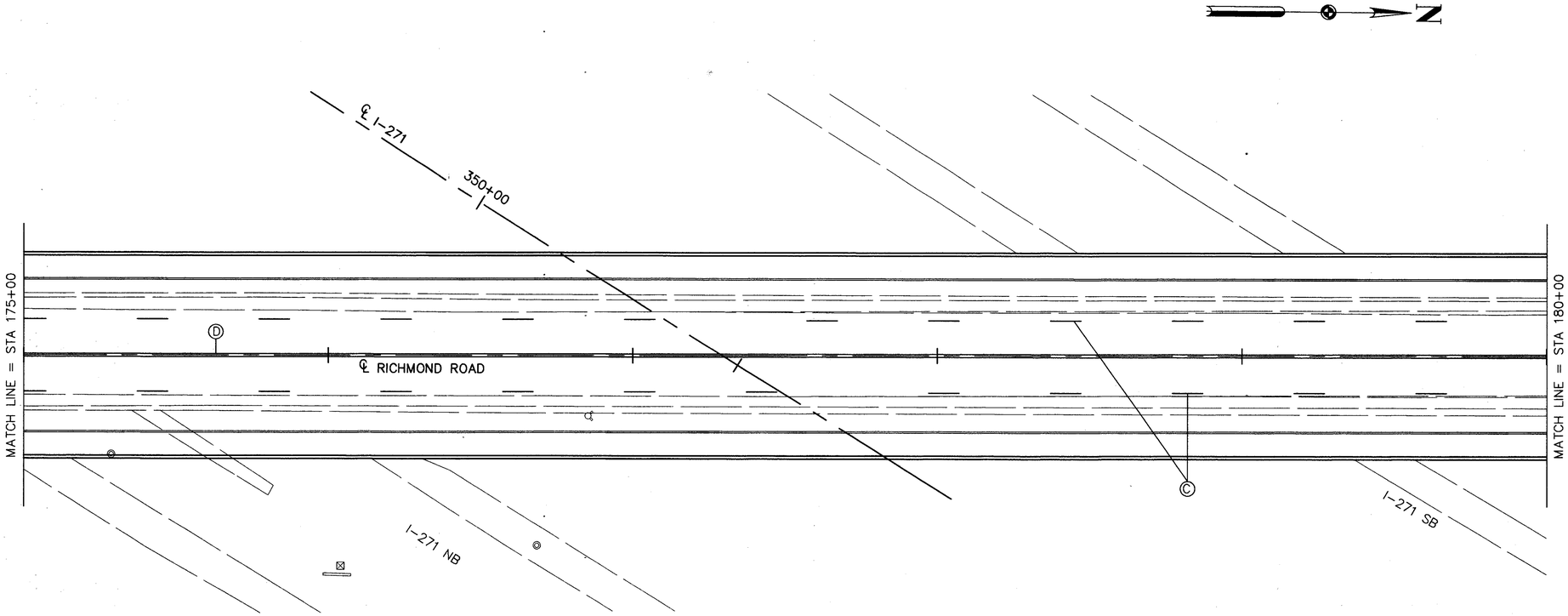
MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: MAR '93
SCALE: SEE ABOVE
R-SIGN3

FOR LEGEND – SEE SHEET 55

SIGNING AND PAVEMENT MARKING PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

58
110



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: MAR '93
SCALE: SEE ABOVE
R-SIGN4.DWG

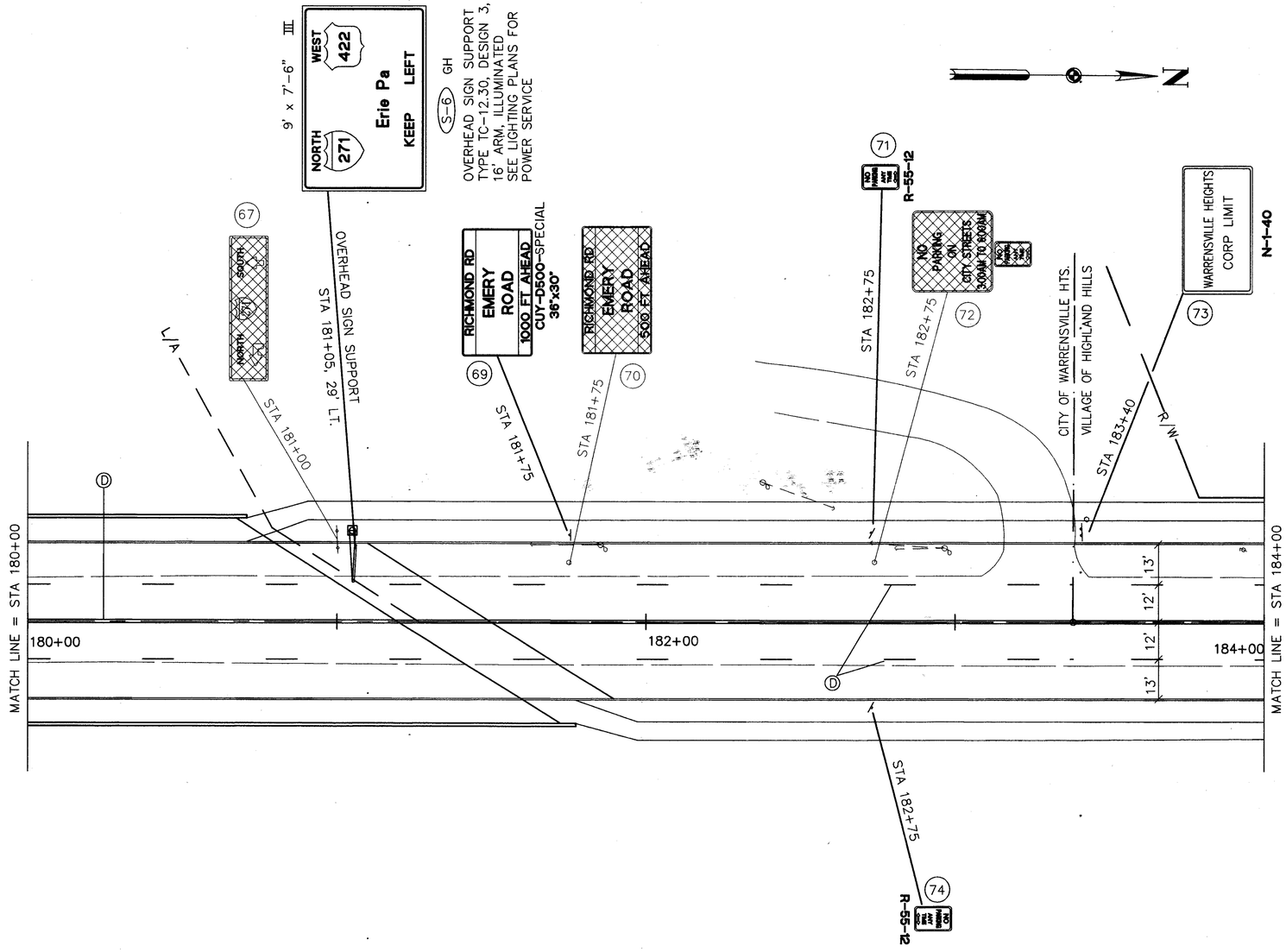
FOR LEGEND – SEE SHEET 55

SIGNING AND PAVEMENT MARKING PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

59
110

CUYAHOGA COUNTY
CUY-175-2.69
CUY-271-6.28



GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: MAR '93
SCALE: SEE ABOVE
R-SIGN5

FOR LEGEND – SEE SHEET 55

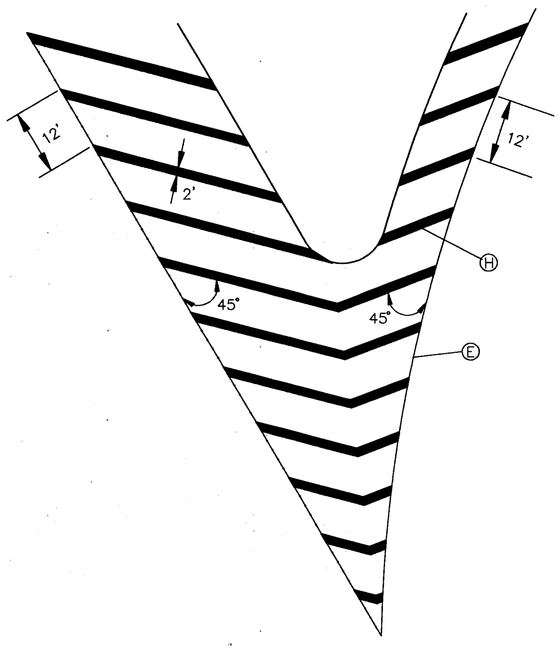
SIGNING AND PAVEMENT MARKING PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

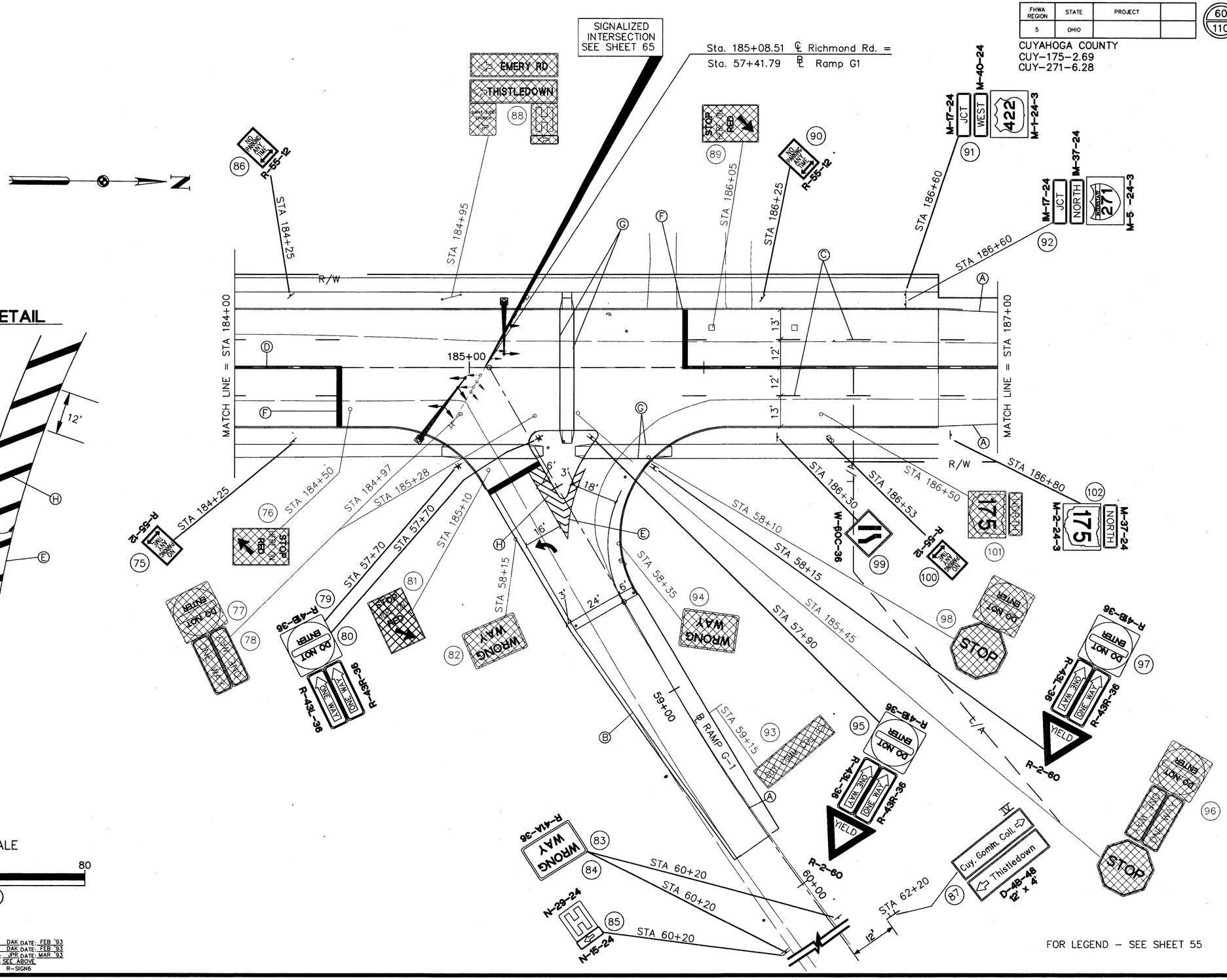
60
110

CUYAHOGA COUNTY
CUY-175-2.69
CUY-271-6.28

TRANSVERSE LINE DETAIL



GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)



FOR LEGEND – SEE SHEET 55

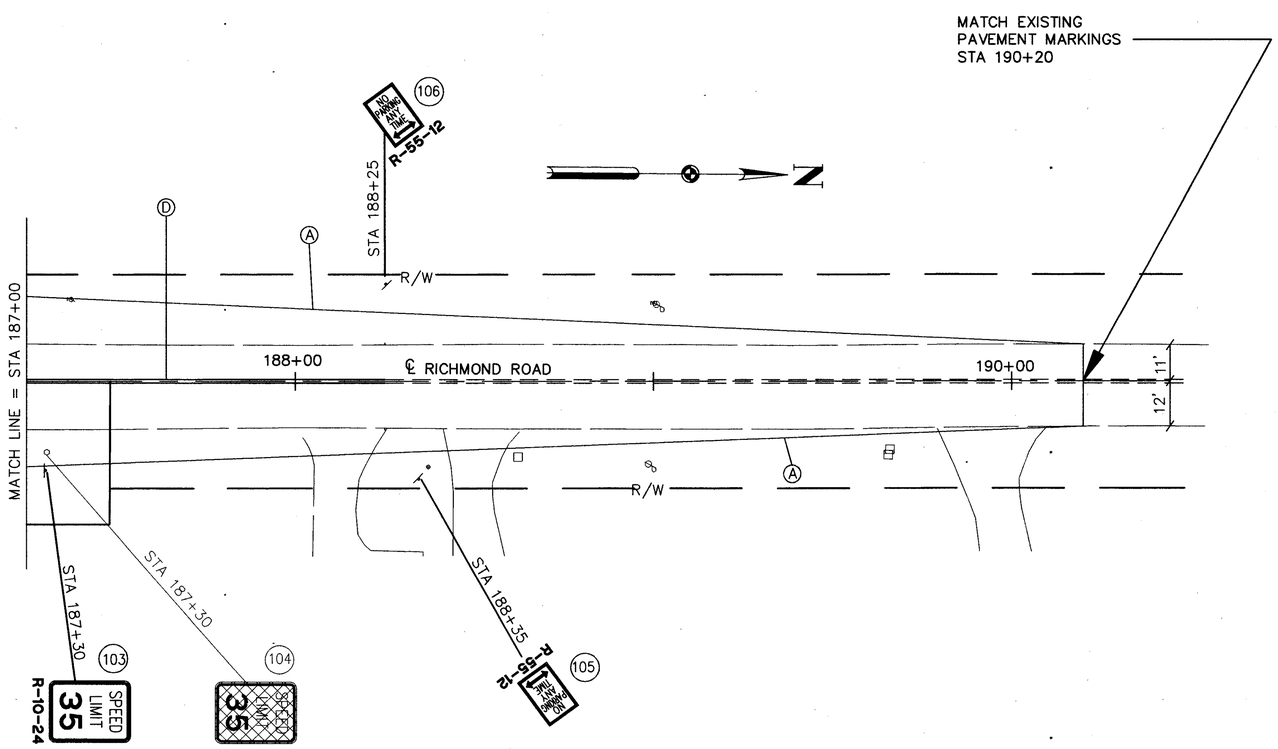
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: MAR '93
SCALE: SEE ABOVE
R-SIGN6

SIGNING AND PAVEMENT MARKING PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

61
110



GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

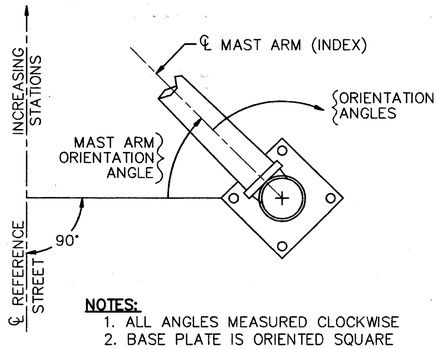
MADE BY: DAK DATE: FEB '93
DRAWN BY: DAK DATE: FEB '93
CHECKED BY: JPR DATE: MAR '93
SCALE: SEE ABOVE
R-SIGN7.DWG

FOR LEGEND – SEE SHEET 55

SIGNING AND PAVEMENT MARKING PLAN

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

OVERHEAD SIGN SUPPORT DETAILS

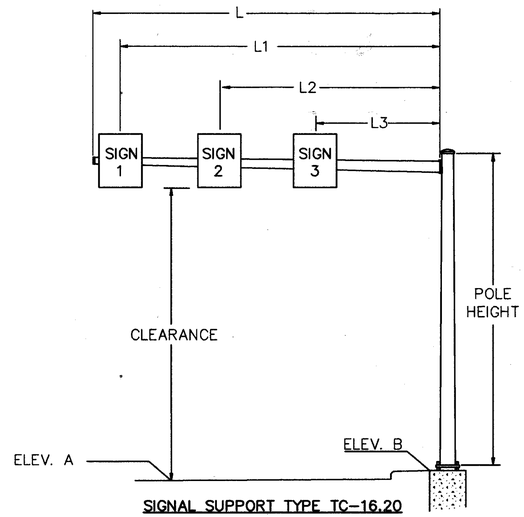


NOTES:
1. ALL ANGLES MEASURED CLOCKWISE
2. BASE PLATE IS ORIENTED SQUARE TO MAST ARM.
3. EACH FOUNDATION SHALL CONTAIN ONE 2" CAPPED CONDUIT ELL, IF SIGNS ARE UNLIGHTED.

MAST ARM ANGLE DETAIL
NO SCALE

OVERHEAD SIGN SUPPORT TYPE TC-16.20

FROM SHEET	REFERENCE STREET	STATION	SUPPORT NO.	POLE DESIGN NO.	POLE HEIGHT (FT)	L (FT)	L1 (FT)	A1 (S.F.)	L2 (FT)	A2 (S.F.)	L3 (FT)	A3 (S.F.)	CLEARANCE	ELEVATION A	ELEVATION B	MAST ARM ANGLE (DEG)	HAND HOLE (ORIENTATION ANGLE FROM MAST ARM)
56A	EMERY	122+80	S1	4	21	41	40	7.5	28	7.5	16	7.5	18.5	1149.75	1149.81	0°	180°
56	EMERY	119+75	S2	3	21	35	34	7.5	22	7.5	11	7.5	18.7	1149.40	1149.60	0°	180°
57	RICHMOND	170+40	S3	3	21	35	34	7.5	22	7.5	11	7.5	18.6	1153.53	1153.65	0°	180°



SIGNAL SUPPORT TYPE TC-16.20
NO SCALE
– SEE PLAN SHEETS FOR SIGN CONFIGURATIONS

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

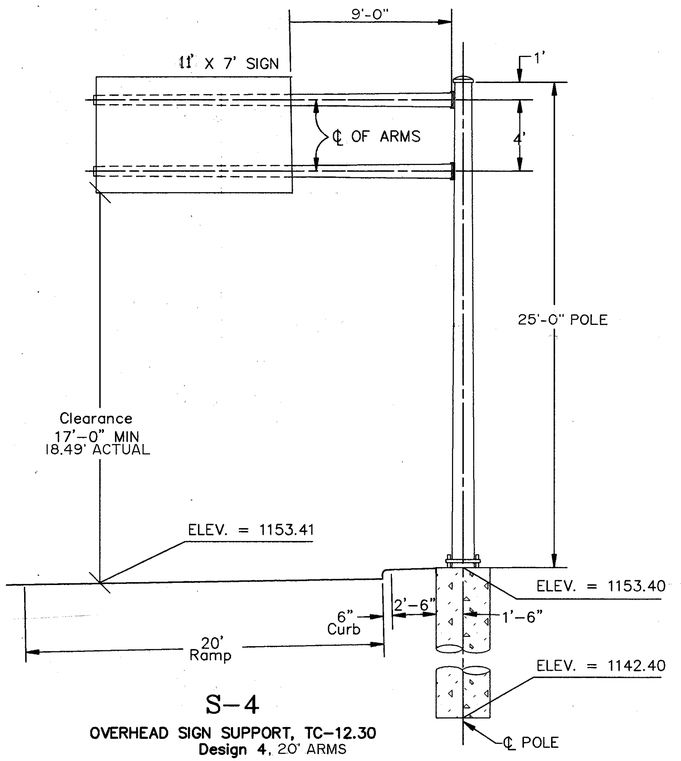
MADE BY: DAK DATE: MAR 93
DRAWN BY: DAK DATE: MAR 93
CHECKED BY: JPR DATE: JUN 93
SCALE: N/A
R-OHSSC.DWG

FHWA REGION	STATE	PROJECT	
5	OHIO		

62A
110

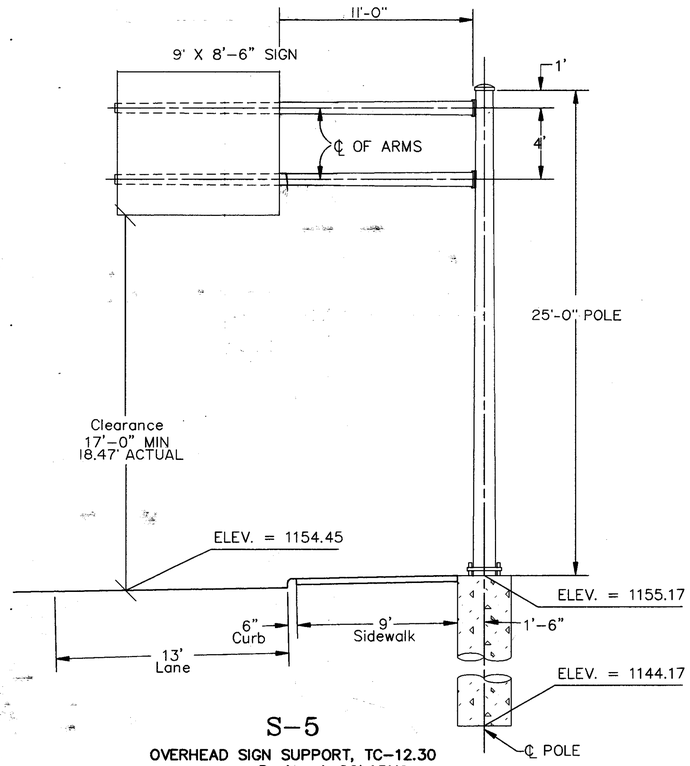
CUYAHOGA COUNTY
CUY-175-2.69
CUY-271-6.28

OVERHEAD SIGN SUPPORT DETAILS



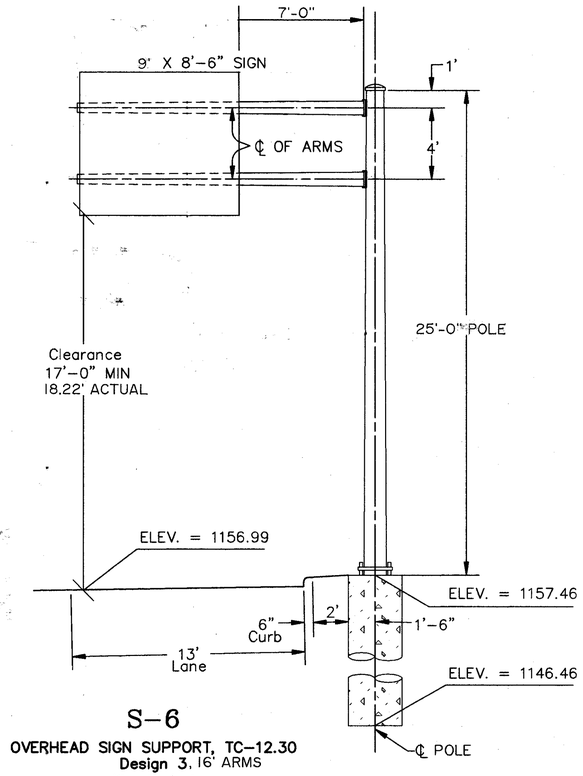
S-4

OVERHEAD SIGN SUPPORT, TC-12.30
Design 4, 20' ARMS
Illuminated
STA. 171+30, 50' RT.
℄ RICHMOND ROAD



S-5

OVERHEAD SIGN SUPPORT, TC-12.30
Design 4, 20' ARMS
Illuminated
STA. 173+10, 36' RT.
℄ RICHMOND ROAD



S-6

OVERHEAD SIGN SUPPORT, TC-12.30
Design 3, 16' ARMS
Illuminated
STA. 181+05, 29' LT.
℄ RICHMOND ROAD

GRAPHIC SCALE

4 0 2 4 8 16

(IN FEET)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE DAK DATE MAY '93
TRACED DAK DATE MAY '93
CHECKED JPR DATE JUN '93
SCALE SEE ABOVE
OVERHEAD.DWG

FHWA REGION	STATE	PROJECT	
5	OHIO		

63
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

TRAFFIC SIGNAL SUB-SUMMARY

SHEET NO.	INTERSECTION (WITH RICHMOND ROAD)	625						632										
		GROUND ROD	PULL BOX, 713.08, 18 IN.	PULL BOX, 713.08, 24 IN.	TRENCH	CONDUIT, 2 IN., 713.04	CONDUIT, 3 IN., 713.04			VEHICULAR SIGNAL HEAD, 3 SECTION, 12" LENS, 1-WAY	VEHICULAR SIGNAL HEAD, 5 SECTION, 12" LENS, 1-WAY	PEDESTRIAN SIGNAL HEAD, TYPE D2	PEDESTRIAN PUSHBUTTON	PEDESTAL, 8 FEET, TRANSFORMER BASE	LOOP DETECTOR UNIT, AS PER PLAN	LOOP DETECTOR UNIT, DELAY AND EXTENSION TYPE, AS PER PLAN	LOOP DETECTOR WIRE, TYPE E	LOOP DETECTOR LEAD-IN CABLE
		EACH	EACH	EACH	L.F.	L.F.	L.F.			EACH	EACH	EACH	EACH	EACH	EACH	EACH	L.F.	L.F.
*	EMERY ROAD	5	9	3	936	650	286			4	4	8	8	–	8	8	2338	3060
*	RAMP G-1	4	3	1	229	78	151			6	–	4	2	2	1	–	212	118
	TOTALS:	9	12	4	1165	728	437			10	4	12	10	2	9	8	2550	3178

SHEET NO.	INTERSECTION (WITH RICHMOND ROAD)	632														633		
		LOOP DETECTOR PAVEMENT CUTTING	CONCRETE FOR ANCHOR BASE FOUNDATIONS	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 12, 48' ARM	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 11, 45' ARM	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 4, 36' ARM	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 4, 32' ARM	SIGNAL SUPPORT, TYPE TC-81.20, DESIGN 1, 22' ARM	SIGNAL CABLE, 5 CONDUCTOR, NO. 14 AWG	SIGNAL CABLE, 7 CONDUCTOR, NO. 14 AWG	SIGNAL CABLE, 9 CONDUCTOR, NO. 14 AWG	POWER CABLE, 3 CONDUCTOR, NO. 6 AWG	POWER SERVICE	COVERING OF VEHICULAR SIGNAL HEADS	REMOVAL OF TRAFFIC SIGNAL INSTALLATION AS PER PLAN	CONTROLLER, ACTUATED, 8-PHASE, SOLID STATE DIGITAL MICROPROCESSOR,	CONTROLLER, SEMI-ACTUATED, 2-PHASE, SOLID STATE DIGITAL MICROPROCESSOR, AS PER PLAN	CONTROLLER WORK PAD
		L.F.	C.Y.	EACH	EACH	EACH	EACH	EACH	L.F.	L.F.	L.F.	L.F.	EACH	EACH	EACH	EACH	EACH	S.F.
*	EMERY ROAD	1123	10.90	1	2	1	–	–	–	1720	641	86	1	8	1	1	–	10.4
*	RAMP G-1	94	4.14	–	–	–	1	1	652	–	112	65	1	6	1	–	1	–
	TOTALS:	1217	15.04	1	2	1	1	1	652	1720	753	151	2	14	2	1	1	10.4

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: TMA DATE: FEB '93
DRAWN BY: DAK DATE: MAR '93
CHECKED BY: DAK DATE: MAR '93
SCALE: N/A
R-TSQ1.DWG

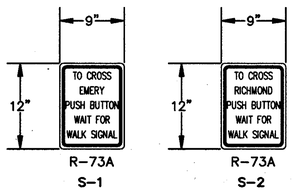
FHWA REGION	STATE	PROJECT	
5	OHIO		

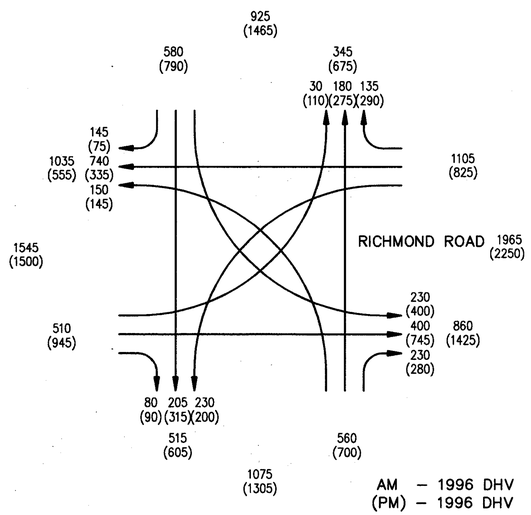
64/110

CUYAHOGA COUNTY
CUY-175-6.29
CUY-271-2.68

LEGEND	
	PROPOSED SIGNAL
	EXISTING SIGNAL
	MAST ARM
	PEDESTRIAN SIGNAL ON PEDESTAL W/ PUSHBUTTON
	CONDUIT
	SIGN
	CURB RAMP
	PULL BOX

PEDESTRIAN PUSH BUTTON SIGN DETAILS





AM - 1996 DHV
(PM) - 1996 DHV

TRAFFIC VOLUMES

SS-1
SIGNAL SUPPORT, TC-81.20, DESIGN 12, 48' ARM W/ PEDESTRIAN SIGNALS "A" & "H" AND PUSHBUTTONS "PB" & "PG" AND SIGNS S1 & S2 (SEE DETAIL) STA 167+72, 53' LT. (℄ RICHMOND RD.)

PULL BOX, 18" CONCRETE STA 167+90, 53' LT. (℄ RICHMOND RD.)

PULL BOX, 18" CONCRETE STA 120+46, 35' RT. (℄ EMERY RD.)

PULL BOX, 18" CONCRETE STA 119+36, 34' RT. (℄ EMERY RD.)

PULL BOX, 24" CONCRETE STA 168+79, 53' LT. (℄ RICHMOND RD.)

SS-2
SIGNAL SUPPORT, TC-81.20, DESIGN 11, 43' ARM W/ PEDESTRIAN SIGNALS "B" & "C" AND PUSHBUTTON "PA" & "PD" AND SIGNS S1 & S2 (SEE DETAIL) STA 168+83, 50' LT. (℄ RICHMOND RD.)

GROUND MOUNTED CONTROLLER STA 168+94, 55' LT. (℄ RICHMOND RD.)

CONTROLLER WORK PAD, TC-83.20, TYPE 2, STA 168+95, 56' LT. (℄ RICHMOND RD.)

PULL BOX, 24" CONCRETE STA 168+98, 52' LT. (℄ RICHMOND RD.)

PULL BOX, 18" CONCRETE STA 169+23, 34' LT. (℄ RICHMOND RD.)

PULL BOX, 18" CONCRETE STA 170+24, 34' LT. (℄ RICHMOND RD.)

POWER SOURCE W/POWER SERVICE ON RELOCATED CEI POWER POLE

PULL BOX, 18" CONCRETE STA 166+45, 34' RT. (℄ RICHMOND RD.)

PULL BOX, 18" CONCRETE STA 167+48, 34' RT. (℄ RICHMOND RD.)

SS-4
SIGNAL SUPPORT, TC-81.20, DESIGN 11, 43' ARM W/ PEDESTRIAN SIGNALS "F" & "G" AND PUSHBUTTON "PE" & "PH" AND SIGNS S1 & S2 (SEE DETAIL) STA 167+86, 50' RT. (℄ RICHMOND RD.)

PULL BOX, 18" CONCRETE STA 167+87, 54' RT. (℄ RICHMOND RD.)

SS-3
SIGNAL SUPPORT, TC-81.20, DESIGN 4, 36' ARM W/ PEDESTRIAN SIGNALS "D" & "E" AND PUSHBUTTON "PC" & "PF" AND SIGNS S1 & S2 (SEE DETAIL) STA 168+94, 42' RT. (℄ RICHMOND RD.)

PULL BOX, 24" CONCRETE STA 168+81, 49' RT. (℄ RICHMOND RD.)

PULL BOX, 18" CONCRETE STA 123+00, 33' LT. (℄ EMERY RD.)

FOR: WIRING DIAGRAM
PHASE SEQUENCE DIAGRAM
LOOP DETECTOR CHART
SIGNAL HEAD DETAIL AND
TRAFFIC SIGNAL TIMING
& DISPLAY CHARTS

SEE SHEET 64A

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: NOV '92
DRAWN BY: DAK DATE: DEC '92
CHECKED BY: JPR DATE: JAN '93
SCALE: SEE SCALE
EMER-SIG.DWG

RICHMOND ROAD & EMERY ROAD SIGNAL PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

64A / 110

CUYAHOGA COUNTY
CUY-175-2.69
CUY-271-6.28

TRAFFIC SIGNAL TIMING AND DISPLAY
ACTUATED CONTROLLERS

8 - ϕ FULL - ACTUATED

RICHMOND & EMERY

START IN: FLASH ○ 8 SEC.
ALL RED ●

FIRST PHASE: ϕ 2 & 6
GREEN ●
YELLOW ○

CYCLE LENGTH = 95 SEC.

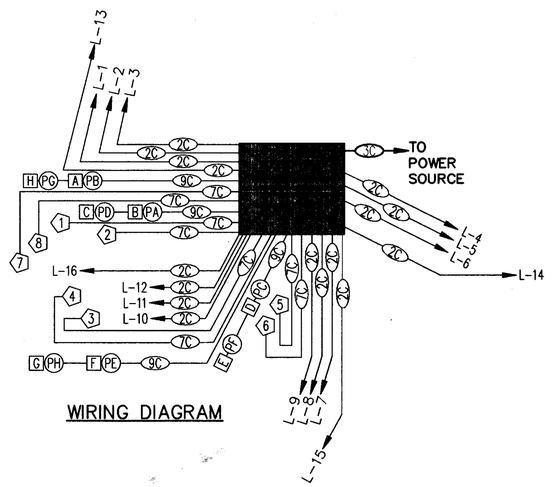
PHASE		ϕ1	ϕ5	ϕ2	ϕ6	ϕ3	ϕ7	ϕ4	ϕ8
INITIAL (MINIMUM)	AM	6	6	10	10	6	6	12	12
	OFF	6	6	10	10	6	6	12	12
	PM	6	6	10	10	6	6	12	12
WALK	AM			6	6			6	6
	OFF			6 → MINIMUM	6			6	6
	PM			6	6			6	6
EXTENSION (PRESET & MINIMUM)		2	2	2.5	2.5	2	2	2.5	2.5
PEDESTRIAN CLEARANCE (FDW)				17	17			20	20
MAXIMUM	AM	13	11	25	25	6	9	30	30
	OFF	13	11	25	25	6	9	30	30
	PM	19	11	23	23	9	9	26	26
YELLOW		3	3	3	3	3	3	3	3
ALL RED		1	1	2	2	1	1	2	2

INTERVAL COLORS

STREET	DIRECTION	SIGNAL	LANES	TIMING PHASE PRESET	ϕ1 & ϕ5	ϕ1 & ϕ6	ϕ2 & ϕ5	ϕ2 & ϕ6	ϕ3 & ϕ7	ϕ3 & ϕ8	ϕ4 & ϕ7	ϕ4 & ϕ8
EMERY ROAD	WB	1	R R		R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R
			Y					Y				
			G				G G G G	G G				
			Y									
			⊖		⊖ ⊖ 1 1	⊖ ⊖						
	WB	2	R R		R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R	R R R R
			Y					Y				
			G				G G G G	G G				
			R R		R R R R		R R R R	R R R R	R R R R	R R R R	R R R R	R R R R
		3	Y					Y				
			G			G G G G		G G				
	EB		Y									
			⊖		⊖ ⊖ 2 2	⊖ ⊖						
		4	R R		R R R R		R R R R	R R R R	R R R R	R R R R	R R R R	R R R R
			Y					Y				
			G			G G G G		G G				
NORTH CROSSWALK	WB	C	DW		DW DW DW DW	DW DW DW DW	DW DW DW DW	FDW DW DW DW	DW DW DW DW	DW DW DW DW	DW DW DW DW	DW DW DW DW
	EB	D	W				W W W W	W				
SOUTH CROSSWALK	WB	H	DW		DW DW DW DW		DW DW DW DW	FDW DW DW DW	DW DW DW DW	DW DW DW DW	DW DW DW DW	DW DW DW DW
	EB	G	W			W W W W		W				
RICHMOND ROAD	NB	5	R		R R R R	R R R R	R R R R	R R R R	R R R R		R R R R	R
			Y Y									Y
			G						G G G G		G G	
			Y									
			⊖						3 3	⊖ ⊖		
		6	R		R R R R	R R R R	R R R R	R R R R	R R R R		R R R R	R
			Y Y									Y
			G						G G G G		G G	
	SB	7	R		R R R R	R R R R	R R R R	R R R R	R R R R			R
			Y Y									Y
			G						G G G G		G G	
			Y									
			⊖						4 4	⊖ ⊖		
		8	R		R R R R	R R R R	R R R R	R R R R	R R R R	R R R R		R
			Y Y									Y
			G						G G G G	G G		
WEST CROSSWALK	SB	A	DW		DW DW DW DW	DW DW DW DW	DW DW DW DW	DW DW DW DW	DW DW DW DW	DW DW DW DW		FDW DW DW
	NB	B	W								W W W W	W
EAST CROSSWALK	SB	F	DW		DW DW DW DW	DW DW DW DW	DW DW DW DW	DW DW DW DW	DW DW DW DW		DW DW DW DW	FDW DW DW
	NB	E	W						W W W W			W

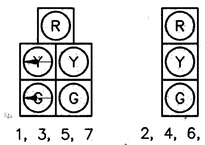
	RECALL	ϕ1	ϕ5	ϕ2	ϕ6	ϕ3	ϕ7	ϕ4	ϕ8
	VEH/MEM/OFF	■	■	■	■	■	■	□	□
	VEH/MEM/ON	□	□	□	□	□	□	□	□
	VEH/MIN	□	□	□	□	□	□	■	■
	VEH/MAX	□	□	□	□	□	□	□	□
	PED/RECALL	□	□	□	□	□	□	□	□
	NON-ACT	□	□	□	□	□	□	□	□

NOTES:
1- REMAINS ⊖ IF ϕ2 & ϕ5 ARE NEXT
2- REMAINS ⊖ IF ϕ1 & ϕ6 ARE NEXT
3- REMAINS ⊖ IF ϕ3 & ϕ8 ARE NEXT
4- REMAINS ⊖ IF ϕ4 & ϕ7 ARE NEXT



WIRING DIAGRAM

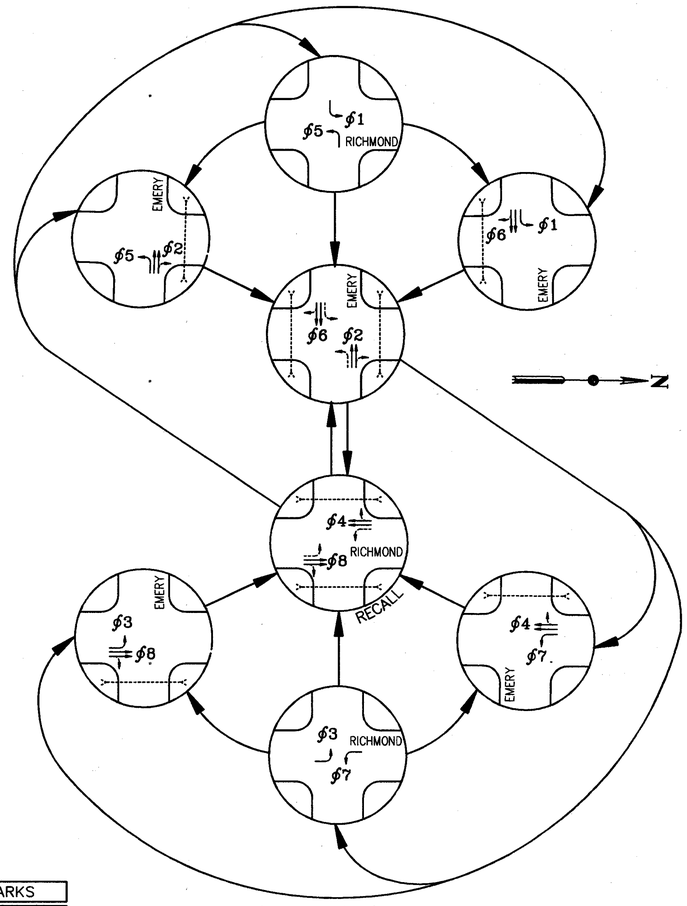
(12" LENSES)



SIGNAL HEAD DETAIL
RIGID MOUNTED

PEDESTRIAN SIGNAL

A-H
TYPE D-2



PHASE SEQUENCE DIAGRAM

LOOP	# TURNS	STATION	℄ OF	SIZE	HOOK-UP	CALL/DELAY/EXTEND	TYPE	REMARKS
L-1	2	120+73	EMERY	25'x6'	ϕ6	CALL/8 SEC DELAY/EXTEND	PRESENCE	NON-LOCK
L-2	2	120+65	EMERY	20'x6'	ϕ6	CALL/EXTEND	PRESENCE	NON-LOCK
L-3	2	120+65	EMERY	20'x6'	ϕ1	CALL/2 SEC DELAY/EXTEND	PRESENCE	NON-LOCK
L-4	2	168+88	RICHMOND	25'x6'	ϕ4	CALL/8 SEC DELAY/EXTEND	PRESENCE	NON-LOCK
L-5	2	169+01	RICHMOND	20'x6'	ϕ4	CALL/EXTEND	PRESENCE	NON-LOCK
L-6	2	169+01	RICHMOND	20'x6'	ϕ7	CALL/2 SEC DELAY/EXTEND	PRESENCE	NON-LOCK
L-7	2	121+65	EMERY	25'x6'	ϕ2	CALL/8 SEC DELAY/EXTEND	PRESENCE	NON-LOCK
L-8	2	121+73	EMERY	20'x6'	ϕ2	CALL/EXTEND	PRESENCE	NON-LOCK
L-9	2	121+73	EMERY	20'x6'	ϕ5	CALL/2 SEC DELAY/EXTEND	PRESENCE	NON-LOCK
L-10	2	167+81	RICHMOND	25'x6'	ϕ8	CALL/8 SEC DELAY/EXTEND	PRESENCE	NON-LOCK
L-11	2	167+70	RICHMOND	20'x6'	ϕ8	CALL/EXTEND	PRESENCE	NON-LOCK
L-12	2	167+70	RICHMOND	20'x6'	ϕ3	CALL/2 SEC DELAY/EXTEND	PRESENCE	NON-LOCK
L-13	2	119+34	EMERY	20'x6'	ϕ6	EXTEND	PRESENCE	NON-LOCK
L-14	2	170+31	RICHMOND	20'x6'	ϕ4	EXTEND	PRESENCE	NON-LOCK
L-15	2	123+03	EMERY	20'x6'	ϕ2	EXTEND	PRESENCE	NON-LOCK
L-16	2	166+40	RICHMOND	15'x6'	ϕ8	EXTEND	PRESENCE	NON-LOCK

LOOP DETECTOR CHART

FOR PLAN AND TRAFFIC VOLUMES
SEE SHEET 64

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: DAK DATE: NOV '92
DRAWN BY: DAK DATE: DEC '92
CHECKED BY: JPR DATE: JAN '93
SCALE: SEE ABOVE
EMER-DET.DWG

RICHMOND ROAD & EMERY ROAD SIGNAL PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY
CUY-175-2.69
CUY-271-6.28

SIGNAL PLAN

TRAFFIC SIGNAL TIMING AND DISPLAY ACTUATED CONTROLLERS

2 - ϕ SEMI - ACTUATED RICHMOND & I-271 RAMP G1	FIRST PHASE: ϕ 1 GREEN ● YELLOW ○	START IN: FLASH ● ALL RED ○ 10 SEC.

		1	2	3	4	5	6	7	8
INITIAL (MINIMUM)	AM					8			
	AVG					8			
	PM					8			
WALK	AM	14				10			
	AVG	14	MINIMUM			10			
	PM	14				10			
PASSAGE TIME							5.0		
PEDESTRIAN CLEARANCE (FDW)			7				11		
MAXIMUM	AM		21				29		
	AVG		25				25		
	PM		25				25		
YELLOW				3				3	
ALL RED					2				2

INTERVAL COLORS

STREET	DIRECTION	SIGNAL	LENS	EMERG-FLASH	PRE-EMPT	ϕ1 1	2	3	4	ϕ2 5	6	7	8
RICHMOND ROAD	SB NB	1,2 3,6	R						R	R	R	R	R
			Y	Y				Y					
			G			G	G						
EAST CROSSWALK	SB	C	DW				FDW	DW	DW	DW	DW	DW	DW
	NB	D	W			W							
I-271 RAMP G1	WB	4,5	R	R		R	R	R	R				R
			¥									¥	
			Ǥ							Ǥ	Ǥ		
NORTH CROSSWALK	WB	A	DW			DW	DW	DW	DW		FDW	DW	DW
	EB	B	W							W			

NOTES:
- ϕ1 REST IN VEHICLE "GREEN" AND PEDESTRIAN "WALK" UNTIL ϕ2 IS ACTUATED
- ϕ2 INTERVALS 1 & 2 REMAIN "DON'T WALK" UNLESS PEDESTRIAN ACTUATED

RECALL	ϕ1	ϕ2
VEH/MEM/OFF	☐	■
VEH/MEM/ON	☐	☐
VEH/MIN	☐	☐
VEH/MAX	■	☐
PED/RECALL	■	☐
NON-ACT	■	☐

WIRING DIAGRAM

LOAD SWITCH HOOK-UP
APPROACH MONITORING

PEDESTRIAN PUSH BUTTON SIGN DETAIL

R-73A

SS-5

SIGNAL SUPPORT TC-81.20,
DESIGN 1, 22' ARM,
STA 185+15, 28' LT. (℄ RICHMOND RD.)

PULL BOX, 24" CONCRETE,
STA 185+30, 28' LT. (℄ RICHMOND RD.)

P-1

PEDESTRIAN SIGNAL "A" W/ PUSHBUTTON "PB"
& SIGN (SEE DETAIL) MOUNTED ON AN 8'
PEDESTAL W/TRANSFORMER BASE (TC-83.20)
STA 185+37, 28' LT. (℄ RICHMOND RD.)

POWER SOURCE W/POWER SERVICE
ON RELOCATED WOOD CEI POLE

SS-6

SIGNAL SUPPORT TC-81.20, DESIGN 4,
32' ARM, W/PEDESTRIAN SIGNAL "C"
STA 184+79, 30' RT. (℄ RICHMOND RD.)
PULL BOX, 18" CONCRETE, STA. 184+83, 31' RT.
PULL BOX, 18" CONCRETE,
STA 185+30, 30' RT. (℄ RICHMOND RD.)

P-2

PEDESTRIAN SIGNALS "B" & "D" W/ PUSHBUTTON
"PA" & SIGN (SEE DETAIL) MOUNTED ON AN 8'
PEDESTAL W/TRANSFORMER BASE (TC-83.20)
STA 185+37, 32' RT. (℄ RICHMOND RD.)

LOOP	# TURNS	STATION	SIZE	HOOK-UP	LOOP TYPE	MODE	REMARKS
L-1	3	58+05	9.2 5.5	ϕ2	ADD LOOP(SEE DETAIL)	PULSE	LOCK
L-2	3	58+05	9.2x5.5	ϕ2	ADD LOOP(SEE DETAIL)	PULSE	LOCK

LOOP DETECTOR CHART

SEE SHEET 47A FOR LOOP DETECTOR DETAIL

12" LENSES
TUNNEL VISORS

SIGNAL HEAD DETAIL
RIGID MOUNTED

PEDESTRIAN SIGNAL

A–D
TYPE D-2

LEGEND

←	PROPOSED SIGNAL
⇠	EXISTING SIGNAL
◁	MAST ARM
■	PEDESTRIAN SIGNAL ON PEDESTAL W/ PUSHBUTTON
—	CONDUIT
▲	SIGN
☐	CURB RAMP
■	PULL BOX

PHASE SEQUENCE DIAGRAM

TRAFFIC VOLUMES

AM – 1996 DHV
(PM) – 1996 DHV

GRAPHIC SCALE

(IN FEET)

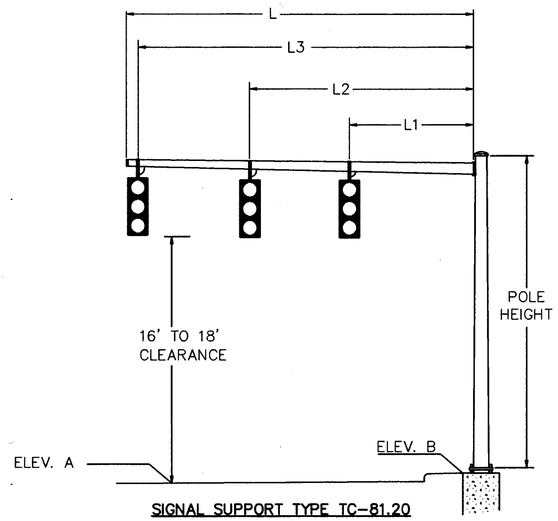
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: DAK DATE: NOV '92
DRAWN BY: DAK DATE: DEC '92
CHECKED BY: JPR DATE: DEC '92
SCALE: SEE SCALE
RAMP-SIG.DWG

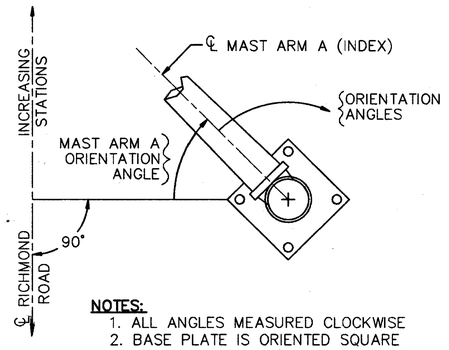
RICHMOND ROAD & RAMP G-1 SIGNAL PLAN

SIGNAL SUPPORT CHARTS

SIGNAL SUPPORT TYPE TC-81.20																		
													ORIENTATION ANGLE (DEG) FROM MAST ARM A					
FROM SHEET	REFERENCE STREET	SUPPORT NO.	POLE DESIGN NO.	POLE HEIGHT (FT)	L (FT)	L1 (FT)	L2 (FT)	L3 (FT)	L4 (FT)	ELEVATION A	ELEVATION B	MAST ARM A ANGLE (DEG)	PEDESTRIAN SIGNAL 1	PEDESTRIAN SIGNAL 2	PUSHBUTTON 1 & SIGN	PUSHBUTTON 2 & SIGN	CONTOLLER	HAND HOLE
64	RICHMOND	SS1	12	21	48	35	47	–	–	1148.72	1149.26	0°	270°	0°	270°	0°	–	150°
64	RICHMOND	SS2	11	21	45	32	44	–	–	1150.18	1151.61	90°	270°	0°	350°	260°	–	90°
64	RICHMOND	SS3	4	21	36	23	35	–	–	1151.80	1151.65	0°	270°	180°	130°	185°	–	90°
64	RICHMOND	SS4	11	21	45	32	44	–	–	1150.08	1149.53	90°	270°	0°	0°	270°	–	90°
65	RICHMOND	SS5	1	21	22	9	21	–	–	1152.02	1152.21	0°	–	–	–	–	180°	90°
65	RICHMOND	SS6	4	21	32	16	19	29	31	1152.22	1152.34	37°	180°	–	–	–	–	90°



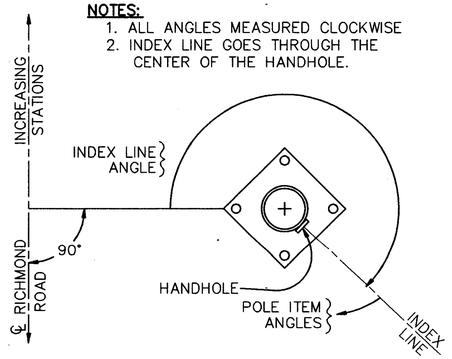
SIGNAL SUPPORT TYPE TC-81.20
NO SCALE
– SEE PLAN SHEETS FOR SIGNAL HEAD CONFIGURATIONS
– SIGNALS ARE RIGID MOUNTED



NOTES:
1. ALL ANGLES MEASURED CLOCKWISE
2. BASE PLATE IS ORIENTED SQUARE TO MAST ARM A (LARGEST ARM) EVEN IF SUPPORT HAS TWO MAST ARMS.

MAST ARM ANGLE DETAIL
NO SCALE

NOTES:
1. ALL ANGLES MEASURED CLOCKWISE
2. INDEX LINE GOES THROUGH THE CENTER OF THE HANDHOLE.



PEDESTRIAN ORIENTATION ANGLES
NO SCALE

PEDESTAL WITH TRANSFORMER BASE TYPE TC-83.20													
		LOCATION						ORIENTATION ANGLE (DEG) FROM INDEX ARM					
FROM SHEET	REFERENCE STREET	STATION	OFFSET	SUPPORT NO.	HEIGHT (FT)	FOUNDATION ELEVATION	INDEX LINE ANGLE (DEG)	PEDESTRIAN SIGNAL 1	PEDESTRIAN SIGNAL 2	PUSHBUTTON W/SIGN	CONTROLLER	POWER SERVICE	CABLE ENTRANCE
65	RICHMOND	185+42	28'LT	P1	8	1152.00	180°	355°	–	260°	–	–	90°
65	RICHMOND	185+42	32'RT	P2	8	1151.69	180°	180°	0°	90°	–	–	280°

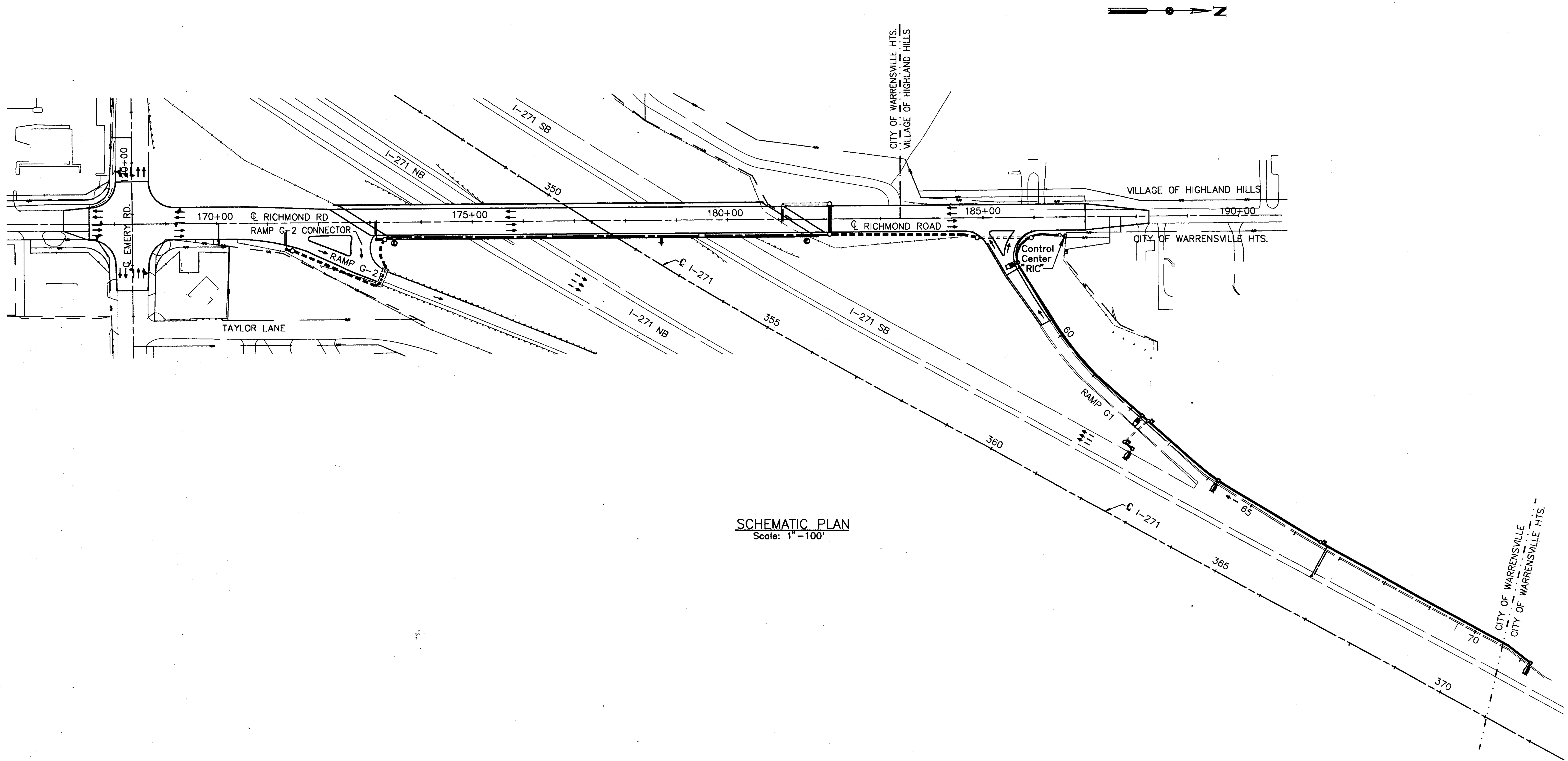
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: DAK DATE: MAR 93
DRAWN BY: DAK DATE: MAR 93
CHECKED BY: JPR DATE: JUN 93
SCALE: SEE SCALE
R-SSC.DWG

FHWA REGION	STATE	PROJECT	
5	OHIO		

67
110

CUYAHOGA COUNTY
CUY-175-2.69
CUY-271-6.29



SCHEMATIC PLAN
Scale: 1"-100'

See Legend on Sheet 71.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: FEG DATE: 1/6/93
DRAWN BY: PJK DATE: 1/8/93
CHECKED BY: PF DATE: 6/11/93
SCALE: 1"=100'

14472/LTSKEM 1=1200

SCHEMATIC PLAN

SCHEMATIC PLAN

LIGHTING NOTES

ITEM 202. LIGHT POLE REMOVED FOR STORAGE, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF REMOVING AN EXISTING LIGHT POLE INCLUDING THE BRACKET ARM, TRANSFORMER BASE, IF ANY, AND THE POLE AND BRACKET CABLES, AND STORING THIS ASSEMBLY ON THE PROJECT SITE UNTIL REERECTED.

REMOVAL OF LUMINAIRES FOR STORAGE IS A SEPARATE BID ITEM.

PAYMENT WILL BE MADE AT THE UNIT PRICE THAT HAS BEEN BID FOR EACH "ITEM 202. LIGHT POLE REMOVED FOR STORAGE, AS PER PLAN" WHICH SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, AND INCIDENTALS REQUIRED FOR SATISFACTORY PERFORMANCE OF THIS WORK.

ITEM 202.LUMINAIRE REMOVED FOR STORAGE, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF REMOVING AN EXISTING LUMINAIRE AND STORING IT ON THE PROJECT SITE FOR REERECTION.

PAYMENT WILL BE MADE FOR EACH ITEM 202 "LUMINAIRE REMOVED FOR STORAGE, AS PER PLAN" AND SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, AND INCIDENTALS REQUIRED TO COMPLETE THE WORK SATISFACTORILY.

ITEM 202. LIGHT POLE FOUNDATION REMOVED, AS PER PLAN

THIS ITEM OF WORK SHALL CONSIST OF REMOVING A LIGHT POLE FOUNDATION EITHER COMPLETELY OR TO A MINIMUM OF ONE FOOT BELOW FINISHED GRADE.

THE RESULTANT DEPRESSION SHALL BE BACKFILLED WITH COMPACTED SOIL AND THE DISTURBED AREA SHALL BE RESTORED TO NORMAL CONDITIONS TO THE SATISFACTION OF THE ENGINEER.

PAYMENT WILL BE MADE AT THE UNIT PRICE THAT HAS BEEN BID FOR EACH "ITEM 202. LIGHT POLE FOUNDATION REMOVED AS PER PLAN" WHICH SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, AND INCIDENTALS REQUIRED TO COMPLETE THE REMOVAL OF THE FOUNDATION SATISFACTORILY.

REERECT EXISTING LUMINAIRE
THIS WORK SHALL CONSIST OF CLEANING THE EXISTING LUMINAIRE AND LENS, REPLACING LAMP, VERIFYING LUMINAIRE IS IN OPERATING CONDITION, REPAIRING IF REQUIRED, AND REERECTING. OR, AT THE OPTION OF THE CONTRACTOR, A NEW LUMINAIRE MAY BE PROVIDED IN LIEU OF ABOVE.

ITEM SPECIAL-DISCONNECT EXISTING CIRCUIT
THIS ITEM OF WORK SHALL CONSIST OF THE DISCONNECTION OF AN EXISTING LIGHTING CIRCUIT AT A PULL BOX OR JUNCTION BOX.

DISCONNECTION AT A LIGHT POLE SHALL INVOLVE THE REMOVAL OF THAT PART OF CABLE THAT IS TO BE ABANDONED FROM THE POLE. WHEN NEW KITS ARE NOT BEING INSTALLED, THE ENDS OF THE CONNECTOR KITS FROM WHICH THE ABANDONED CABLE IS REMOVED SHALL BE STUBBED AND TAPED. WHEN NEW KITS ARE BEING INSTALLED, THE EXISTING KITS SHALL BE REMOVED.

DISCONNECTION AT A PULL BOX SHALL INVOLVE CUTTING THE EXISTING LIGHTING CIRCUIT AND REMOVING ALL SPLICE KITS. ANY CABLE THAT IS TO BE ABANDONED SHALL BE TERMINATED IN A MANNER SUCH THAT NO CABLE IS LEFT IN THE PULL BOX. ALL EXISTING CABLE DISCONNECTED BY CUTTING SHALL BE CUT IN A MANNER SO THAT THERE IS SUFFICIENT LENGTH OF CABLE LEFT FOR RECONNECTION.

PAYMENT SHALL BE MADE AT THE UNIT BID PRICE FOR EACH ITEM SPECIAL "DISCONNECT EXISTING CIRCUIT" AND SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS, AND INCIDENTALS REQUIRED TO COMPLETE THE DISCONNECTION IN A SATISFACTORY MANNER. CABLE SPLICE KITS AND CONNECTOR KITS WILL BE PAID RESPECTIVELY UNDER EACH ITEM 625.

DRAINS FOR PULL BOXES
REFERENCE IS MADE TO STANDARD DRAWING HL-30.11 FOR DETAILS OF DRAINING PULL BOXES. DRAINS FOR PULL BOXES SHALL BE USED AS DIRECTED BY THE ENGINEER AND SHALL BE PROVIDED WHERE THE LENGTH REQUIRED FOR A SATISFACTORY OUTLET DOES NOT EXCEED APPROXIMATELY 20 FT. AN ESTIMATED QUANTITY OF 160 LINEAR FEET OF ITEM 603, 4" CONDUIT TYPE E, IS INCLUDED IN THE GENERAL SUMMARY FOR THIS PURPOSE.

CONDUIT ON STRUCTURES
EXPANSION FITTINGS FOR CONDUIT ON STRUCTURES SHALL BE OZ TYPE AX-8, CROUSE HINDS TYPE XJ-8, APPLETON TYPE XJ-8 OR EQUAL APPROVED BY THE ENGINEER, FOR BRIDGE CUY-271-6.29. EACH EXPANSION FITTING SHALL HAVE A COPPER EXTERNAL BONDING JUMPER.

FHWA REGION	STATE	PROJECT	
5	OHIO		

69
110

CUYAHOGA COUNTY
CUY-175-2.69
CUY-271-6.29

LIGHTING QUANTITIES GENERAL SUMMARY

LINE NUMBER	SHEET NO. 68	SHEET NO. 70	COST PARTICIPATION NH	ITEM	ITEM EXT.	GRAND TOTAL	UNIT	DESCRIPTION	LINE NUMBER
1									1
2	160		160	603	00400	160	L.F.	4" CONDUIT, TYPE E	2
3		2	2	625	00500	2	EA.	CONNECTOR KIT, TYPE II	3
4		2	2	625	00600	2	EA.	CONNECTOR KIT, TYPE III	4
5		14	14	625	01500	14	EA.	CABLE SPLICING KIT	5
6									6
7									7
8		1	1	625	14100	1	EA.	LIGHT POLE FOUNDATION 24"X 8' DEEP	8
9		2140	2140	625	23200	2140	L.F.	NO. 4 AWG 5000 VOLT DISTRIBUTION CABLE	9
10		1130	1130	625	24100	1130	L.F.	1 1/2" DUCT CABLE WITH TWO NO. 4 AWG 5000V CABLES	10
11		1240	1240	625	29002	1240	L.F.	TRENCH 24" DEEP	11
12									12
13									13
14		880	880	625	25400	880	L.F.	CONDUIT 2", 713.04	14
15		200	200	625	25500	200	L.F.	CONDUIT 3", 713.04	15
16		4	4	625	29900	4	EA.	JUNCTION BOX, TYPE II, 713.10	16
17		6	6	625	30700	6	EA.	PULL BOX, 713.08, 18"	17
18									18
19									19
20		1	1	625	32000	1	EA.	GROUND ROD	20
21		1	1	625	33000	1	EA.	STRUCTURE GROUNDING SYSTEM	21
22		1	1	625	35000	1	EA.	REERECT EXISTING LIGHT POLE	22
23		1	1	202	75403	1	EA.	LIGHT POLE REMOVED FOR STORAGE, AS PER PLAN (SEE SHT. 68)	23
24									24
25									25
26		1	1	202	75505	1	EA.	LUMINAIRE REMOVED FOR STORAGE, AS PER PLAN (SEE SHT. 68)	26
27		1	1	625	35100	1	EA.	REERECT EXISTING LUMINAIRE	27
28		1	1	202	75501	1	EA.	LIGHT POLE FOUNDATION REMOVED, AS PER PLAN (SEE SHT. 68)	28
29									29
30									30
31									31
32		2	2	SPECIAL	62540020	2	EA.	DISCONNECT EXISTING CIRCUIT (SEE SHT. 68)	32
33									33
34									34
35									35
36									36
37									37
38									38
39									39
40									40
41									41
42									42
43									43
44									44
45									45
46									46
47									47
48									48
49									49
50									50
51									51
52									52
53									53
54									54
55									55
56									56
57									57
58									58
59									59
60									60

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: FEG DATE: 1/8/93
DRAWN BY: FJK DATE: 1/27/93
CHECKED BY: PF DATE: 8/11/93
SCALE: None

14472/12DESIGN 1=1

LIGHTING QUANTITIES GENERAL SUMMARY

LIGHTING QUANTITIES GENERAL SUMMARY

LIGHTING QUANTITIES SUB-SUMMARY

FHWA REGION	STATE	PROJECT	
5	OHIO		

70
110

CUYAHOGA COUNTY
CUY-175-2.69
CUY-271-6.29

LINE NUMBER	STATION	STATION	SIDE	625																				SPECIAL	625					LINE NUMBER
					LIGHT POLE FOUNDATION REMOVED, A.P.P.	LIGHT POLE REMOVED FOR STORAGE, AS PER PLAN	LUMINAIRE REMOVED FOR STORAGE, AS PER PLAN	CONDUIT 2", 713.04	CONDUIT 3", 713.04	TRENCH 24" DEEP	GROUND ROD 713.16	1 1/2" DUCT CABLE W/2 #4 AWG 5000V CABLES	NO. 4 AWG 5000 VOLT DISTRIBUTION CABLE		LIGHT POLE FOUNDATION 24" X 8'	RE-ERECT EXISTING LIGHT POLE	RE-ERECT EXISTING LUMINAIRE	PULL BOX 18", 713.08	JUNCTION BOX TYPE II, 713.10	CONNECTOR KIT, TYPE II	CONNECTOR KIT, TYPE III	CABLE SPLICING KIT				DISCONNECT EXISTING CIRCUIT				STRUCTURE GROUNDING SYSTEM		
					EACH	EACH	EACH	L.F.	L.F.	L.F.	EACH	L.F.	L.F.		EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH				EACH				EACH		
1	SHEET 71																														1
2	186+44±	185+94	RT./RT.							50		60										2									2
3	185+94± RICHMOND	58+40, ℄ G1	RT./LT.							60		70						1				2				1					3
4	58+40, ℄ G1		LT.		1	1	1				1				1	1	1			1	1									4
5	58+40, ℄ G1	62+25, ℄ G1	LT.							385		395								1	1					1					5
6																															6
7																															7
8																															8
9	185+94℄ RICHMOND	184+90℄ RICHMOND	RT.						110	110			240																		9
10	184+90℄ RICHMOND	184+00℄ RICHMOND	RT.							90		95						1				2									10
11	SHEET 71	TOTAL			1	1	1		110	695	1	620	240		1	1	1	2		2	2	6			2						11
12																															12
13	SHEET 71A																														13
14																															14
15	171+40℄ RICHMOND		RT.															1				2									15
16	171+40℄ RICHMOND	173+20, ℄ RICHMOND	RT.						40	295		305																			16
17	173+20, ℄ RICHMOND		RT.															1				2									17
18																															18
19	173+20, ℄ RICHMOND	182+00, ℄ RICHMOND	RT.					880					1780					1	4			2							1		19
20																															20
21	182+00, ℄ RICHMOND	182+00, ℄ RICHMOND	RT./LT.						50	50			120																		21
22	182+00, ℄ RICHMOND		LT.															1				2									22
23			LT.																												23
24																															24
25	182+00, ℄ RICHMOND	184+00, ℄ RICHMOND	LT.							200		205																			25
26																															26
27	SHEET 71A	TOTAL						880	90	545		510	1900					4	4			8							1		27
28																															28
29																															29
30																															30
31																															31
32																															32
33																															33
34																															34
35																															35
36																															36
37																															37
38																															38
39																															39
40																															40
41																															41
42																															42
43																															43
44																															44
45																															45
46																															46
47																															47
48																															48
49																															49
50																															50
51																															51
52																															52
53																															53
54																															54
55	GRAND	TOTAL			1	1	1	880	200	1240	1	1130	2140		1	1	1	6	4	2	2	14			2				1		55

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: FEG DATE: 1/8/93
DRAWN BY: PJK DATE: 1/7/93
CHECKED BY: PF DATE: 6/11/93
SCALE: None

14472\TSUBSUM 1=1

LIGHTING QUANTITIES SUB-SUMMARY

LIGHTING QUANTITIES SUB-SUMMARY

9-1

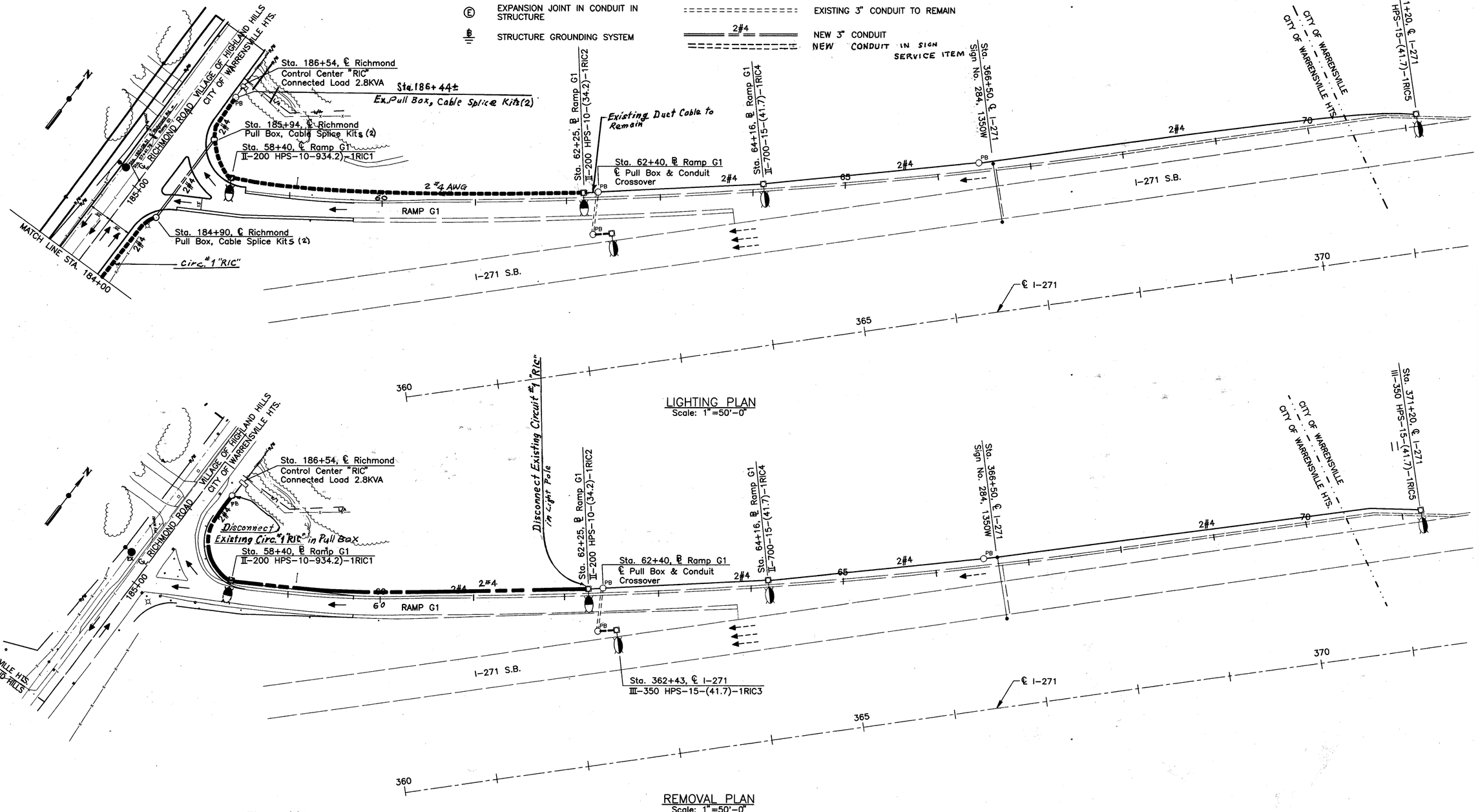
LEGEND

- RELOCATED LIGHTING UNIT; 200W HPS LUMINAIRE ON NEW FOUNDATION
- EXISTING LIGHTING UNIT TO BE REMOVED FOR STORAGE, REFURBISHMENT, AND REUSE
- EXISTING LIGHTING UNIT; 200W HPS TO REMAIN
- EXISTING LIGHTING UNIT; 310W HPS TO REMAIN
- EXISTING CEI UTILITY POLE W/250W HPS LUMINAIRE ON 12' BRACKET ARM
- RELOCATED CEI UTILITY POLE W/250W HPS LUMINAIRE ON 12' BRACKET ARM
- CONTROL CENTER "RIC" TO REMAIN
- EXISTING PULL BOX TO REMAIN
- NEW CANTILEVER ILLUMINATED SIGN
- NEW PULL BOX-18" DIAMETER
- TYPE II JUNCTION BOX IN STRUCTURE
- EXPANSION JOINT IN CONDUIT IN STRUCTURE
- STRUCTURE GROUNDING SYSTEM
- EXISTING DUCT-CABLE TO BE ABANDONED
- NEW 1 1/2" DUCT-CABLE 713.03 IN 24" DEEP TRENCH. AWG AS PER PLAN
- NEW 2" CONDUIT ON STRUCTURE
- EXISTING DUCT-CABLE TO REMAIN
- EXISTING 3" CONDUIT TO REMAIN
- NEW 3" CONDUIT
- NEW CONDUIT IN SIGN SERVICE ITEM

FHWA REGION	STATE	PROJECT	
5	OHIO		

71/110

CUYAHOGA COUNTY
CUY-175-2.69
CUY-271-6.29



LIGHTING PLAN
Scale: 1"=50'-0"

REMOVAL PLAN
Scale: 1"=50'-0"

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: FEG DATE: 1/6/93
DRAWN BY: PJK DATE: 1/7/93
CHECKED BY: PF DATE: 5/11/93
SCALE: 1"=50'-0"

14472/RICRLT 1-400

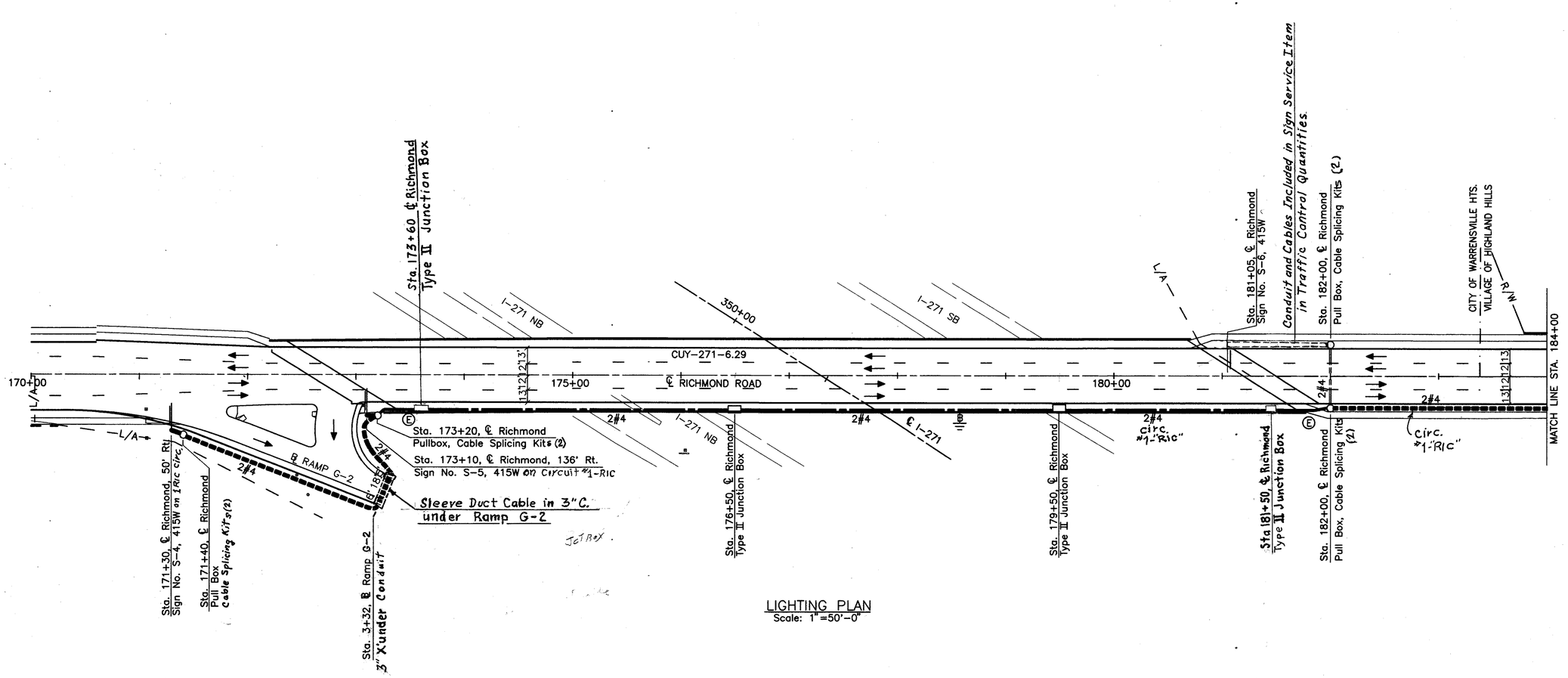
LIGHTING AND REMOVAL PLAN

LIGHTING AND REMOVAL PLAN

FHWA REGION	STATE	PROJECT	
5	OHIO		

71A / 110

CUYAHOGA COUNTY
CUY-175-2.69
CUY-271-6.29



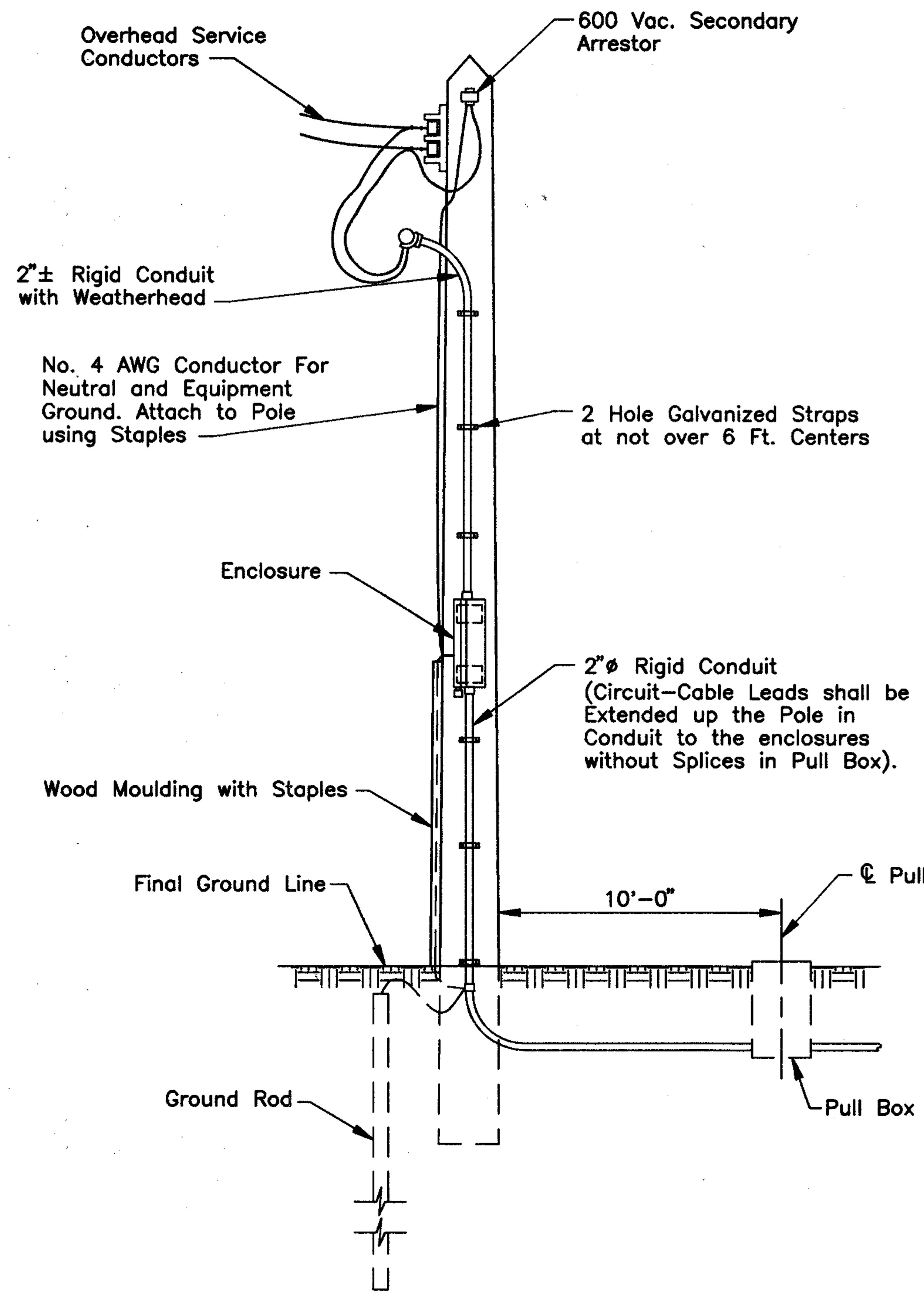
LIGHTING PLAN
Scale: 1" =50'-0"

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: FEG DATE: 6/8/93
DRAWN BY: PJK DATE: 6/9/93
CHECKED BY: PF DATE: 6/11/93
SCALE: 1"=50'-0"

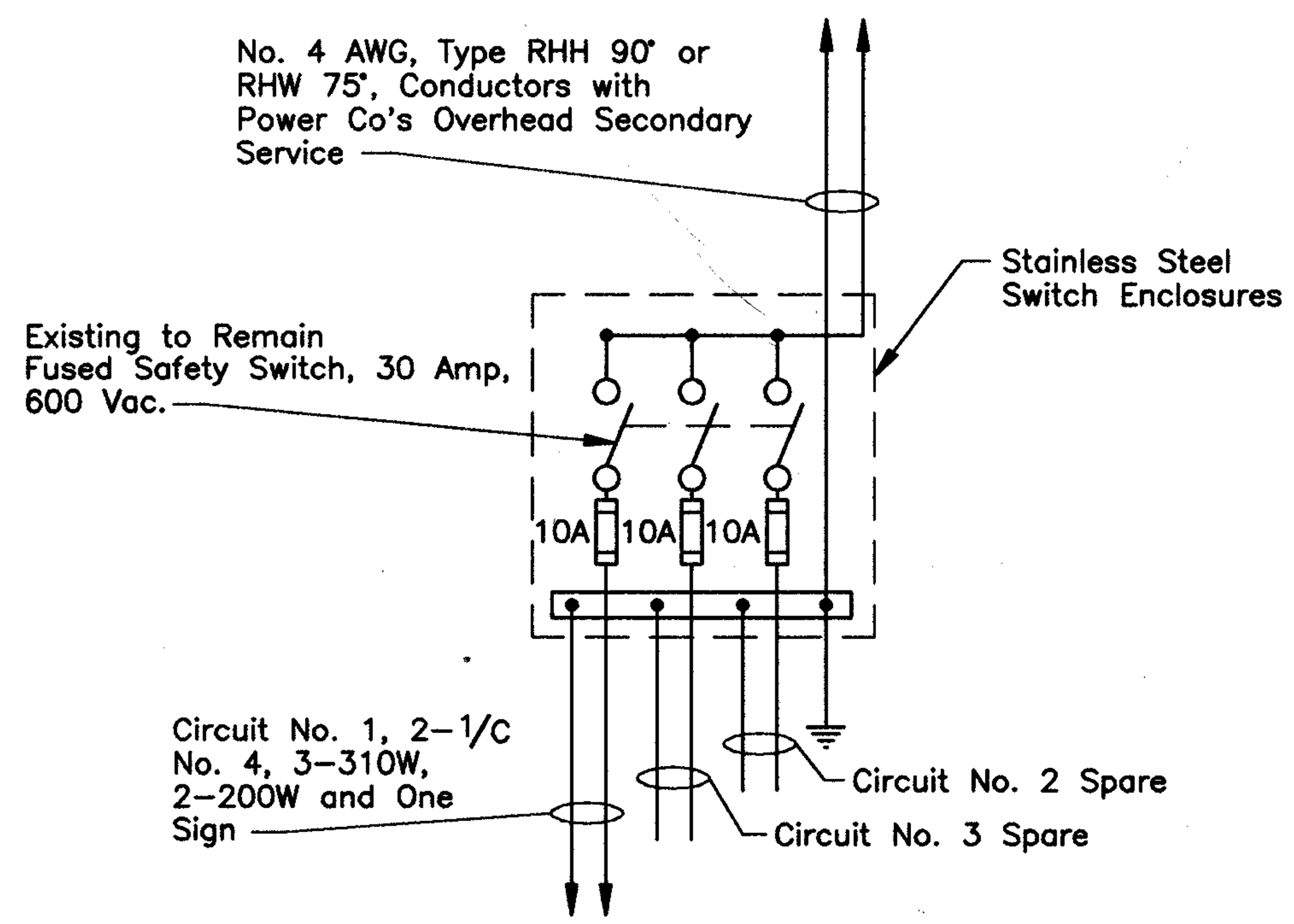
14472/ROAD7 1=400

LIGHTING PLAN



Note:
All items in this detail are existing and shall remain unless noted otherwise.

EXISTING CONTROL CENTER DETAIL
Not to Scale



WIRING DIAGRAM
(Connected Load is 2.8KVA)
Not to Scale

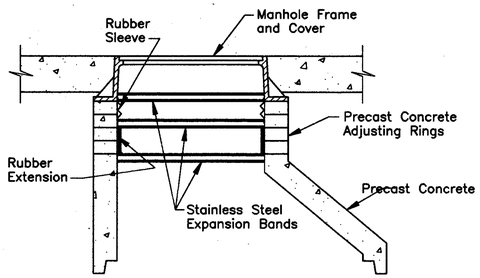
POWER SERVICE DATA AND DETAILS

FHWA REGION	STATE	PROJECT	
5	OHIO		

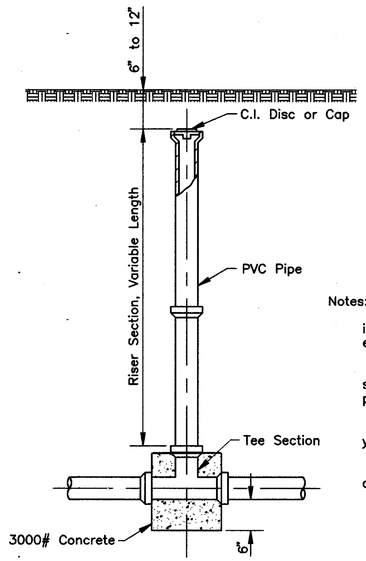
73
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

TO SPAN CHIMNEY HEIGHTS OF:	
0-4 1/2"	- Chimney Seal Only
4 1/2" - 9"	- Seal + 7" Extension
9" - 12"	- Seal + 10" Extension
Over 12"	- Seal + Multiple Extensions



MANHOLE NO. 3, AS PER PLAN
MANHOLE CHIMNEY SEAL
Not to Scale



Notes:

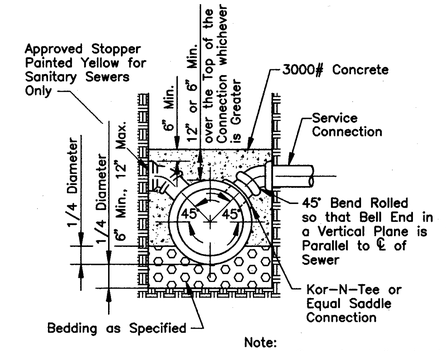
The test riser section shall be installed when the connection is extended to the building.

Risers shall be furnished with stoppers upon which shall be placed a cast iron disc.

Cast iron disc shall be painted yellow on sanitary sewer.

Set test tee one (1) foot outside of the right-of-way line.

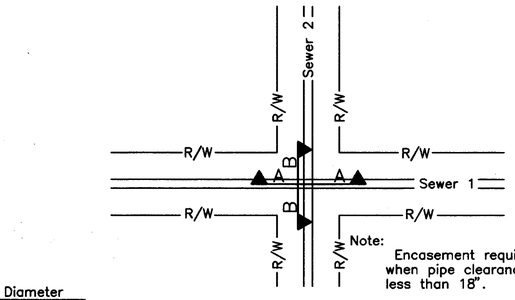
DRAINAGE STRUCTURE, MISC.: TEST TEE
Not to Scale



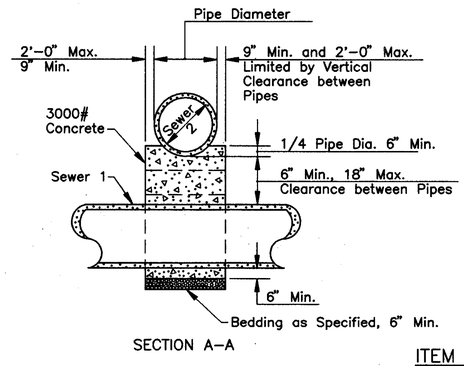
Note:

Concrete shall extend along sewer trenches 24" each way from service connections.

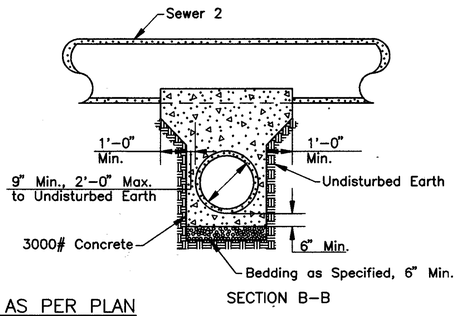
ITEM 603 - AS PER PLAN
TYPICAL SLANT DETAIL
Not to Scale



PLAN VIEW

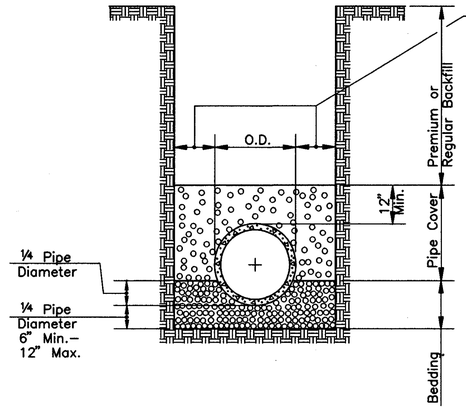


SECTION A-A



SECTION B-B

ITEM 603, AS PER PLAN
STANDARD CONCRETE ENCASEMENT
(MONOLITHIC CRADLING OF UPPER PIPE)
Not to Scale



Notes:

Premium backfill shall consist of coarse interlocking aggregate No. 6, 67, 68, 7, 78, 8, or limestone screenings.

Pipe cover shall consist of coarse interlocking aggregate No. 6, 67, 68, 7, 78, 8.

Bedding shall consist of coarse interlocking aggregate No. 6, 67, 68, 7, 78, or 8 for 60" or smaller diameter pipe, for 66" or larger diameter pipe No. 4 aggregate may also be used.

Slag or recycled concrete will not be permitted.

Lateral connections to have a minimum bedding depth of 3" coarse aggregate.

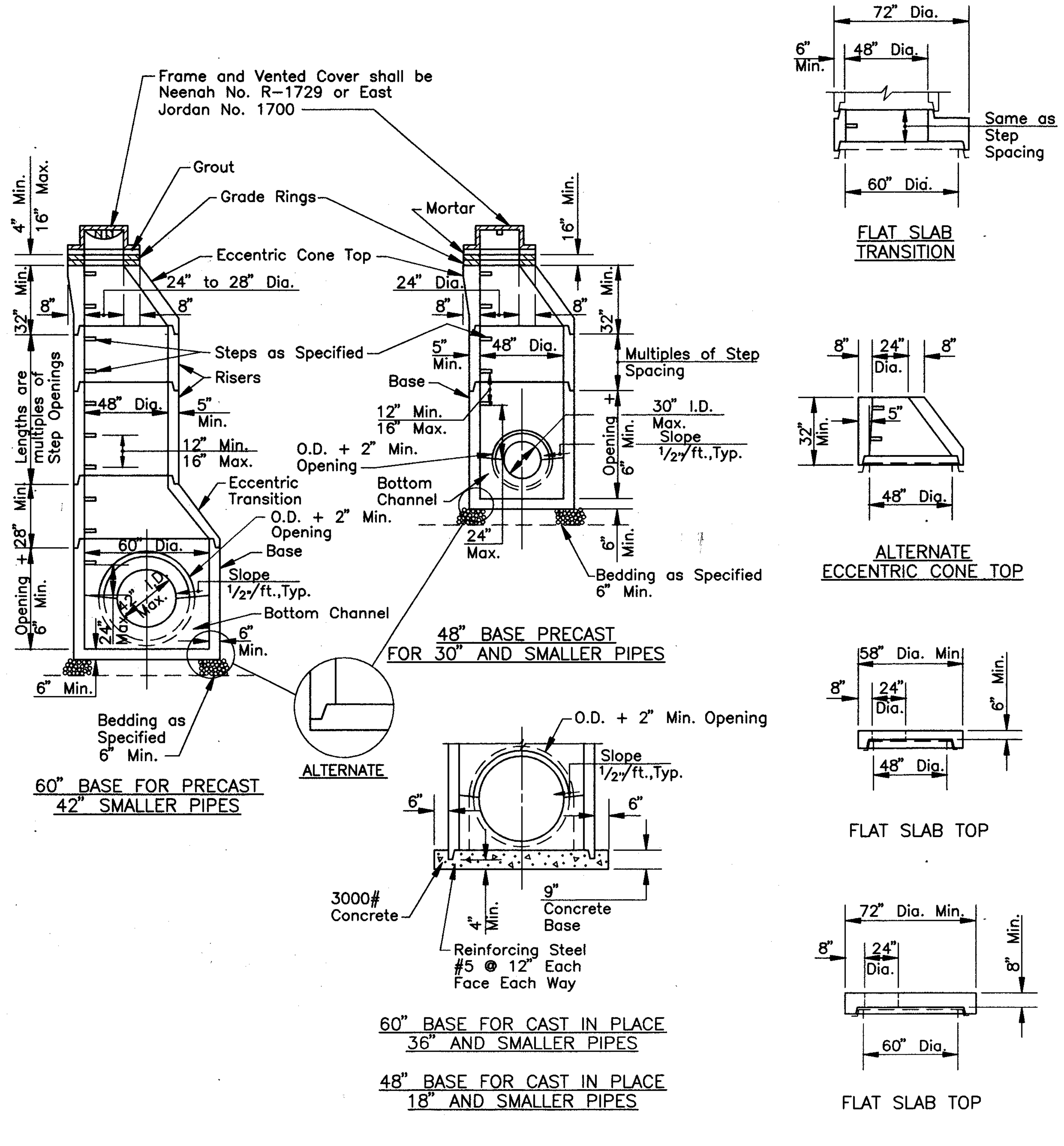
ITEM 603, AS PER PLAN
TYPICAL TRENCH DETAIL
Not to Scale

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: E.D.S. DATE: 5/11/93
DRAWN BY: P.J.K. DATE: 5/12/93
CHECKED BY: M.D.E. DATE: 5/28/93
SCALE: As Shown

20757/DETAIL 1of1

SANITARY SEWER DETAILS



MANHOLE NO. 3, AS PER PLAN
Not to Scale

Notes:

Sections of the precast manhole shall be cast and assembled with either all tongue or all groove ends up. Lift holes may be provided in each section for handling.

Top and transition (or reducer) sections may be either eccentric cone, concentric cone or flat slab.

Bases for manholes are shown with monolithic floor and riser which may be cast in one or two operations. A permissable alternate is to cast and ship the floor and barrel separately. Openings for inlet and outlet pipes shall be provided, either when unit is cast or later to meet project requirements. Bottom channels may be formed of concrete precast in the base or by field construction. Bases may also be poured in place.

Openings in riser and base sections for pipes shall be prefabricated. Flexible connections shall be provided for sanitary sewers.

Joint seal between precast manhole sections on sewers shall be resilient and flexible gasket joints per A.S.T.M. C443 or latest edition.

Materials for bases and other precast sections including reinforcement not specified hereon, shall comply with specifications.

Precast manhole shall conform to the requirements of A.S.T.M. C 478.

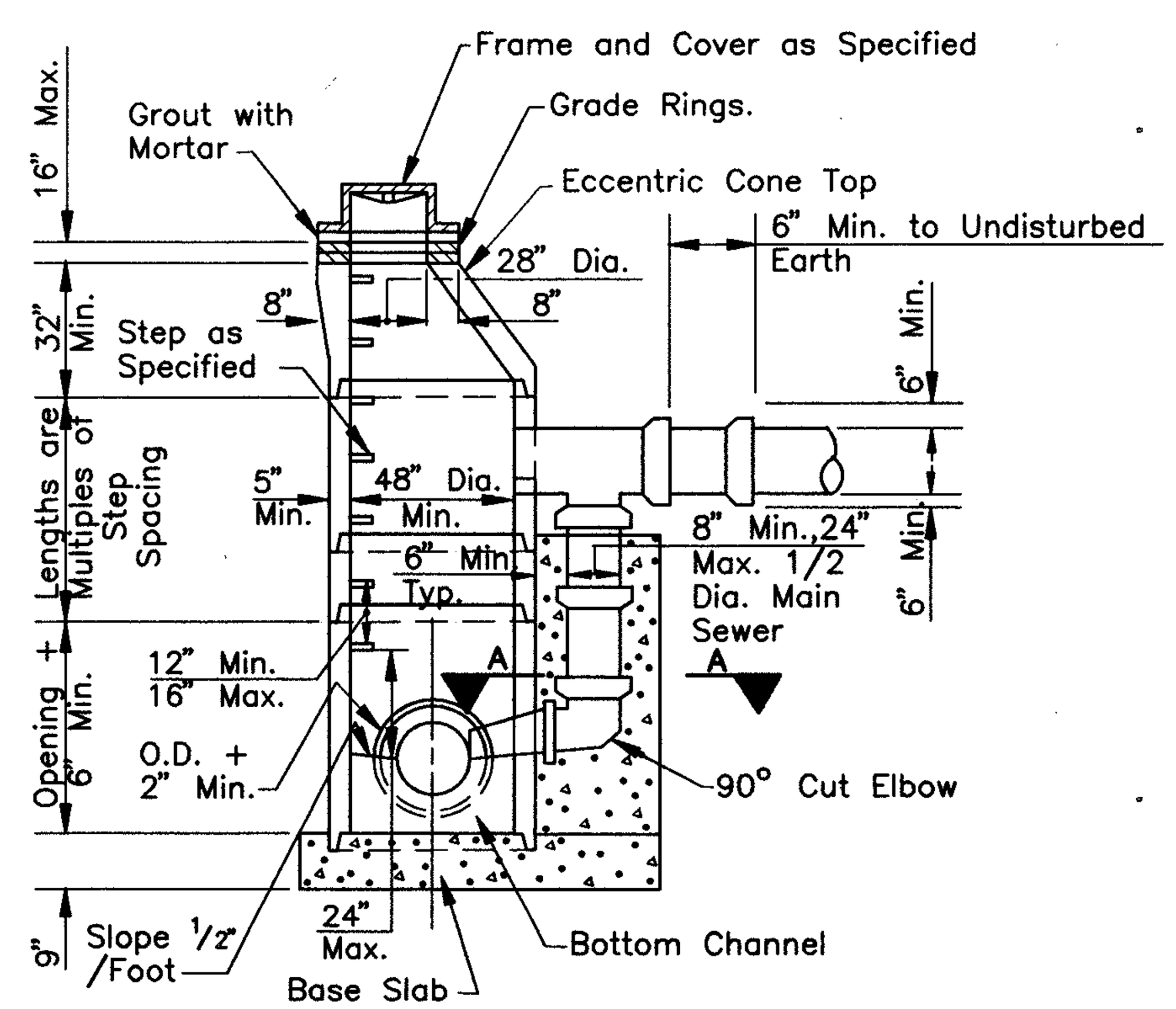
Seal lift holes with approved concrete plugs and bituminous material.

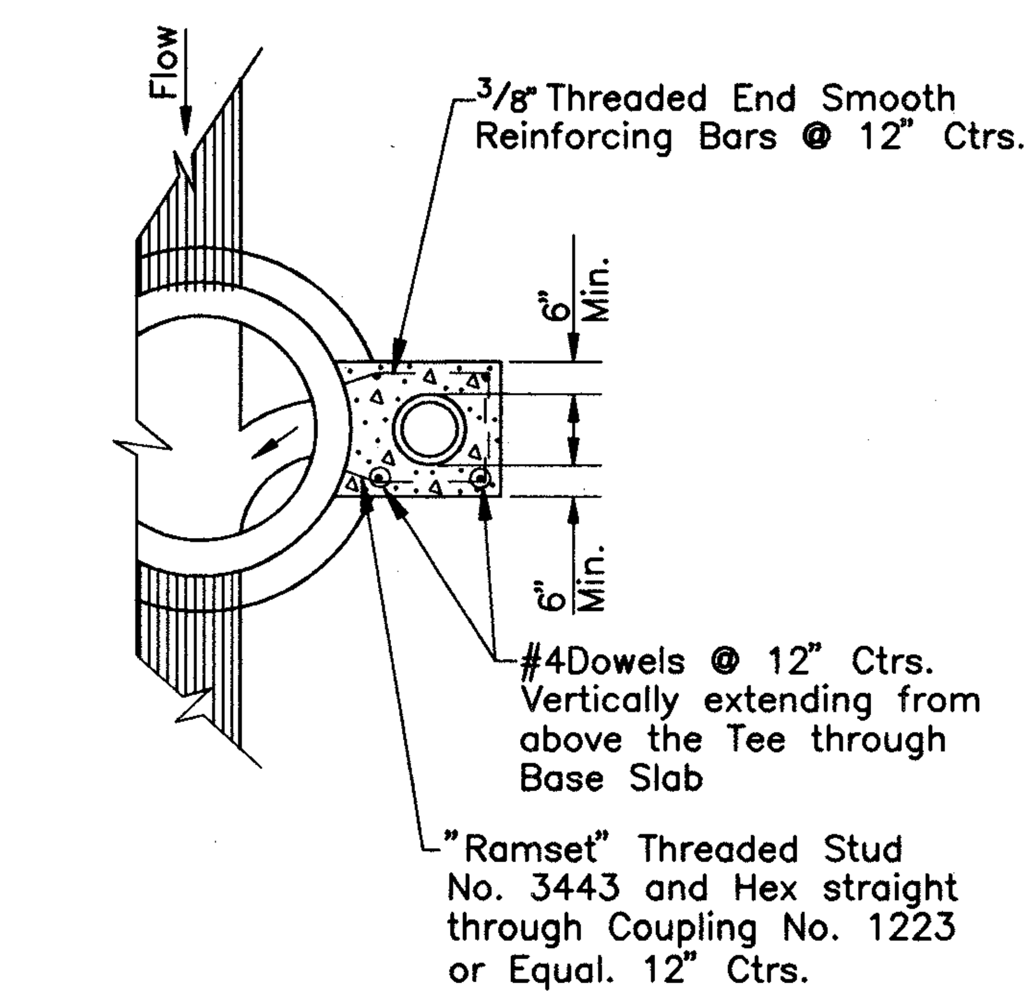
All manholes shall have chimney seals, see detail Sheet 73.

SANITARY SEWER ESTIMATED QUANTITIES

REF. NO.		STATION TO STATION		SIDE	202 MANHOLE ABANDONED	603 6" CONDUIT, TYPE E, AS PER PLAN	603 8" CONDUIT, TYPE B, AS PER PLAN	603 15" CONDUIT, TYPE B, AS PER PLAN	603 18" CONDUIT, TYPE B, AS PER PLAN	603 24" CONDUIT, TYPE B, AS PER PLAN	604 MANHOLE, NO. 2, AS PER PLAN	604 MANHOLE, NO. 3, AS PER PLAN	604 DRAINAGE STRUCTURE, MISC.: TEST TEE
					EACH	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	EACH
COST PARTICIPATION III (COUNTY PAID)													*
SP200		183+08	186+90	RT.					383				
SP201		186+90	186+96	RT.					20				
SP202		186+90	187+06	RT.						16			
S200		183+08	–	RT.								1	
S201		186+90	–	RT.								1	
S202		186+96	–	RT.								1	
S203		186+32	–	RT.	1								
SP203		186+09	–	–		85							
SP204		186+09	–	LT.									1
S205		169+88	–	RT.								1	
S206		168+23	–	RT.							1		
SP205		169+39	168+23	RT.					116				
SP206		168+23	167+25	RT.					98				
SP207		168+23	–	RT.			14						
S207		169+39	–	RT.							1		
S208		169+40	–	RT.									1
SP208		169+88	169+39	RT.				50					
SP209		169+39	169+40	RT.		9							
TOTALS					1	94	14	50	617	16	2	4	2

* COST PARTICIPATION I





SECTION A–A

Notes:

A drop manhole shall be constructed in sewers wherever the distance between the inverts is 2.5ft. or greater.

The following notes on the precast concrete manholes shall pertain to the manhole: top of transition, openings in riser sections, joint seal materials and landing platforms and chimney seals.

Poured in place concrete shall be 3000# concrete.

MANHOLE NO. 2, AS PER PLAN
Not to Scale

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: E.D.S. DATE: 5/11/93
DRAWN BY: P.J.K. DATE: 5/12/93
CHECKED BY: M.O.E. DATE: 5/28/93
SCALE: As Shown

SANITARY SEWER DETAILS AND QUANTITIES

FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

SANITARY SEWER NOTES

1. CONSTRUCTION OF PAVEMENTS AND SIDEWALKS AND SEEDING AND MULCHING OF LAWN AREAS SHALL NOT BE INCLUDED IN THE SANITARY SEWER WORK.

2. ALL SANITARY SEWER WORK SHALL CONFORM TO THE CONTRACT DRAWINGS, "UNIFORMED STANDARDS FOR SEWERAGE IMPROVEMENTS", "UNIFORM STANDARD SEWER DETAILS", AND THE LATEST OHIO DEPARTMENT OF TRANSPORTATION CONSTRUCTION AND MATERIAL SPECIFICATIONS.

3. ALL WORK ON THE SANITARY SEWERS AND APPURTENANCES SHALL BE SUBJECT TO THE FULL TIME INSPECTION BY THE CUYAHOGA COUNTY SANITARY ENGINEER.

   THE CONTRACTOR SHALL NOTIFY THE SANITARY ENGINEER 24 HOURS IN ADVANCE OF OPERATIONS REQUIRING FIELD INSPECTION.

   THE COUNTY WILL PAY THE COST OF INSPECTION. NO CLAIMS SHALL BE MADE BY THE CONTRACTOR FOR LOSS OF TIME, FOR INCONVENIENCE OR FOR ANY EXPENSE FOR TEMPORARILY DISCONTINUING THE WORK FOR THE PURPOSE OF INSPECTION.

4. THE CONTRACTOR SHALL UNCOVER THE EXISTING PIPES AND VERIFY THE LOCATION AND ELEVATIONS AT STATION 183+08, 60' RT., AT STATION 186+96, 18' RT. AND STATION 169+39, 41.5' RT. PRIOR TO STARTING WORK. IN CASE OF DISCREPANCY, THE SANITARY ENGINEER MAY ADJUST THE FLOW LINES AS REQUIRED. THE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT ITEM 603.

5. LINES, GRADES, AND CONSTRUCTION STAKING

   THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STAKING OF THE SANITARY SEWER LINE. ALL LAYOUT WORK, CONSTRUCTION STAKING, AND VERTICAL CONTROL SHALL BE PERFORMED BY A REGISTERED SURVEYOR LICENSED BY THE STATE OF OHIO.

   THE CONTRACTOR SHALL INSURE THAT THE FINISHED WORK CONFORMS TO THE LINE, GRADE, ELEVATION, AND DIMENSION OF THE PLANS. THERE SHALL BE NO SPECIAL COMPENSATION TO THE CONTRACTOR FOR THE COST OF ANY WORK OR DELAY OCCASIONED BY GIVEN LINES, GRADES, ELEVATIONS, OTHER NECESSARY MEASUREMENTS, OR BY INSPECTION.

   UPON COMPLETION OF THE SANITARY SEWER CONSTRUCTION THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER ONE SET OF PLANS (SHTS. 28 & 29) SHOWING THE "RECORD MEASUREMENTS" AND ELEVATIONS. THE INFORMATION SUBMITTED SHALL REFLECT ACTUAL FIELD LOCATIONS INCLUDING STATION, OFFSET, AND ELEVATIONS (RIM AND FLOW LINE) OF MANHOLES, TEST TEES AND SERVICE LATERAL CONNECTIONS. THIS SET OF PLANS SHALL BEAR THE SEAL AND SIGNATURE OF THE REGISTERED SURVEYOR CERTIFYING THE ACCURACY OF RECORD MEASUREMENTS AND ELEVATIONS.

   THE WORK UNDER THIS ITEM SHALL BE PAID FOR UNDER THE UNIT PRICES BID FOR THE PERTINENT ITEM 603.

   TOLERANCES

   ALL SEWERS AND APPURTENANCES SHALL BE CONSTRUCTED WITHIN THE FOLLOWING LIMITS:

LINE	+ 0.04 FT.
ELEVATION	+ 0.02 FT.

6. EXISTING STORM HOUSE AND INDUSTRIAL SERVICE CONNECTIONS

   ALL STORM SEWER LATERAL CONNECTIONS WITHIN THE SANITARY SEWER TRENCH SHALL BE SUPPORTED ACROSS THE TRENCH ON A HARDWOOD BOARD 1" BY 10" BENCHED INTO THE SIDE OF THE TRENCH. THE PIPE SHALL BE STRAPPED TO THE BOARD USING GALVANIZED STEEL OR ALUMINUM STRAPS TO PREVENT MOVEMENT DURING BACKFILLING.

   IF THESE CONNECTIONS ARE DAMAGED THEY SHALL BE REPLACED IN KIND. THE COST FOR SUPPORTING OR REPLACING THE STORM SEWER LATERALS WITHIN THE SANITARY SEWER RELOCATION WORK LIMITS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT ITEM 603. SEE NOTE 12 REGARDING SANITARY SERVICE CONNECTIONS.

7. USE OF SEWERS AND CONDUITS

   THE STATE SHALL HAVE THE RIGHT TO CONNECT ANY SEWER, CONDUIT, OR PIPE LINE WITH THE SEWERS AND THEIR APPURTENANCES, HEREIN DESCRIBED, OR TO GRANT PERMITS TO MAKE CONNECTIONS THERETO, AT ANY TIME BEFORE THE WORK IS FINALLY ACCEPTED. THE SAID CONTRACTOR SHALL NOT INTERFERE WITH THE MAKING OF SUCH CONNECTIONS, AND NO EXTRA ALLOWANCES SHALL BE MADE TO SAID CONTRACTOR ON ACCOUNT THEREOF.

8. MAINTAINING SEWAGE FLOW

   THE CONTRACTOR SHALL BE REQUIRED TO BY-PASS AND MAINTAIN THE FLOW IN ALL EXISTING LIVE SANITARY AND STORM SEWERS DURING CONSTRUCTION AT THE EXISTING LEVEL OF SERVICE. THE METHOD EMPLOYED SHALL BE APPROVED BY THE ENGINEER. IF THE EXISTING SANITARY SEWER IS DAMAGED, SEWAGE SHALL BE PUMPED TO THE NEXT DOWNSTREAM MANHOLE WHILE REPAIRS ARE BEING MADE. NO STORM WATER RUNOFF WILL BE PERMITTED TO BE DIVERTED TO ANY SANITARY SEWER. THE FULL COST OF BY-PASSING AND MAINTAINING SEWAGE FLOW SHALL BE INCLUDED IN THE PRICES BID FOR THE PERTINENT ITEM 603.

9. REMOVING WATER

   THE CONTRACTOR SHALL AT ALL TIMES DURING CONSTRUCTION PROVIDE AND MAINTAIN AMPLE MEANS AND DEVICES WITH WHICH TO PROMPTLY REMOVE AND PROPERLY DISPOSE OF ALL WATER ENTERING THE JACKING PITS, TRENCHES OR OTHER PARTS OF THE WORK, AND KEEP SAID EXCAVATIONS AS DRY AS POSSIBLE UNTIL THE STRUCTURES TO BE INSTALLED THEREIN ARE COMPLETED. ALL WATER PUMPED OR DRAINED FROM THE WORK SHALL BE DISPOSED OF IN A SUITABLE MANNER WITHOUT DAMAGE TO ADJACENT PROPERTY, OR TO SEWERS, PAVEMENTS ELECTRICAL CONDUITS, OR OTHER WORK OR PROPERTY. NO WATER MAY BE PUMPED INTO ANY EXISTING OR PROPOSED SANITARY SEWER. THE FULL COST OF REMOVING ALL WATER SHALL BE INCLUDED AS INCIDENTAL IN THE UNIT PRICE BID FOR THE PERTINENT ITEM 603.

10. ITEM 603, AS PER PLAN

    SANITARY SEWER PIPE SHALL BE REINFORCED CONCRETE PIPE, ITEM 603, TYPE B, CLASS V WITH ASTM C-361 JOINTS.

    PVC PIPE CONFORMING TO ITEM 603, TYPE E, ASTM D-3034 (SDR 35) OR ABS COMPOSITE WALL PIPE ASTM D-2680 SHALL BE USED FOR PIPES 12" DIA. AND SMALLER.

    PVC PIPE CONFORMING TO ITEM 603, TYPE E, ASTM D-3034 (SDR 26) SHALL BE BE USED FOR 15" DIA. PIPES.

    REFER TO NOTES 11, 12, 13, 14, AND 18.

11. EXCAVATION AND PREPARATION OF TRENCH

    UNLESS OTHERWISE PROVIDED, ALL EXCAVATION SHALL BE UNCLASSIFIED AND SHALL INCLUDE THE REMOVAL AND DISPOSAL OF ALL MATERIAL ENCOUNTERED IN EXCAVATION, INCLUDING PAVEMENT SURFACE, PAVEMENT BASE, AND OTHER MATERIALS. IT SHALL ALSO INCLUDE THE PLACING AND REMOVAL OF THE SHEETING AND BRACING, AND REMOVING WATER ENCOUNTERED. ALL EXCAVATED MATERIALS SHALL BE STORED IN CONVENIENT PILES NEAR THE CONSTRUCTION SITES AND REMOVED FROM THE SITE OF THE WORK UNLESS OTHERWISE SPECIFIED.

    THE MAXIMUM WIDTH OF UNSHEETED TRENCH SHALL NOT EXCEED 12 INCHES ON EACH SIDE OF THE PIPE FOR PIPE DIAMETERS OR SPANS OF 24 INCHES OR LESS, AND NOT EXCEED 15 INCHES ON EACH SIDE OF THE PIPE FOR DIAMETERS OR SPANS GREATER THAN 24 INCHES AND LESS THAN 72 INCHES. THE MINIMUM WIDTH OF UNSHEETED TRENCH SHALL BE AT LEAST NINE (9) INCHES WIDER ON EACH SIDE THAN THE OUTSIDE DIAMETER OF PIPE AT THE SPRING LINE.

12. SHEETING AND BRACING FOR TRENCH EXCAVATION

    THE CONTRACTOR SHALL FURNISH AND INSTALL TIMBER AND OTHER SHEETING AND BRACING, AND SHALL TAKE ALL PRECAUTIONS REQUIRED TO PREVENT ANY CAVING OR SETTLING OF EXCAVATION OR TRENCH WALLS WHICH COULD IN ANY WAY ENDANGER THE SAFETY OF ANY PERSON ENGAGED IN THE WORK OR IN ANY WAY DAMAGE THE PIPE OR ADJACENT PROPERTY, DIMINISH THE WIDTH NECESSARY FOR THE PROPER CONSTRUCTION OR DRAINAGE OR OTHERWISE INJURE OR DELAY THE WORK. THE TYPE AND AMOUNT OF SUCH PROTECTION SHALL BE CONSISTENT WITH THE MAGNITUDE OF THE WORK AND THE CHARACTER OF THE MATERIAL IN WHICH THE EXCAVATION IS MADE, AND SHALL BE IN ACCORDANCE WITH THE LATEST OSHA REGULATIONS.

    WHEN SHEET PILING IS USED, IT SHALL BE HELD IN PLACE BY LONGITUDINAL BEAMS AND CROSS BRACES OR STRUTS AS REQUIRED TO RESTRAIN THE TOP OF THE SHEETING. IF TIMBER SHEETING AND BRACING IS USED IT MUST BE A GOOD QUALITY AND OF HARDWOOD CONSTRUCTION.

    THE ENTIRE COST OF SUCH WORK SHALL BE INCLUDED IN THE UNIT PRICES BID FOR THE PERTINENT ITEM 603 AND NO ADDITIONAL COMPENSATION SHALL BE PROVIDED THEREFORE.

    WHEN THE BACKFILL IS HIGH ENOUGH TO REMOVE THE SHEETING AND BRACING WITH SAFETY, AND WHERE NO WRITTEN ORDER FROM THE ENGINEER HAS BEEN GIVEN TO LEAVE THE SAME IN PLACE, THE SHEETING AND BRACING SHALL BE REMOVED IN SUCH A MANNER AS TO PREVENT DAMAGE BY CAVING OF THE TRENCH WALLS OR UNDERMINING THE SEWER PIPE BEDDING.

    WHENEVER TIMBER OR OTHER SHEETING IS DRIVEN TO A DEPTH BELOW THE ELEVATION OF THE BOTTOM OF THE PIPE, THAT PORTION OF THE SHEETING BELOW THE ELEVATION OF THE TOP OF THE PIPE SHALL NOT BE DISTURBED OR REMOVED. PAYMENT FOR THE PORTION OF THE SHEETING BELOW THE ELEVATION OF THE TOP OF THE PIPE WHICH CANNOT BE REMOVED OR DISTURBED SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT ITEM 603.

13. PIPE BEDDING AND BACKFILLING

    PIPE BEDDING AND BACKFILL SHALL BE AS PER DETAIL SHOWN ON DRAWING 73 AND PER UNIFORM STANDARD SEWER DETAILS.

    PREMIUM BACKFILL

    ALL BACKFILLING OF THE SEWER TRENCH BELOW PAVEMENT, SIDEWALKS, AND DRIVEWAYS SHALL BE MADE WITH LIMESTONE SCREENINGS OR COARSE INTERLOCKING AGGREGATE #6, 67, 68, 7, 78, OR 8. PREMIUM BACKFILL SHALL ALSO BE USED WHENEVER THE SIDES OF THE TRENCH EXCAVATION ARE WITHIN 4 FEET OF ANY STRUCTURE, PAVEMENT OR SIDEWALK.

    EXCAVATED MATERIAL SHALL BE REMOVED FROM THE SITE AND PREMIUM MATERIAL SHALL BE USED FOR BACKFILLING. SLAG OR RECYCLED CONCRETE WILL NOT BE ALLOWED. THIS BACKFILL SHALL BE THOROUGHLY COMPACTED TO A MINIMUM OF 95% COMPACTION BY TAMPING IN LAYERS OF NOT MORE THAN TWELVE (12") INCHES.

    THE COST OF ALL LABOR AND MATERIALS AS DESCRIBED ABOVE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT ITEM 603.

    REMOVAL OF EXCAVATED MATERIAL

    ALL MATERIAL IN EXCESS OF THAT REQUIRED FOR BACKFILL AND ALL MATERIAL NOT SUITABLE OR NOT APPROVED BY THE ENGINEER FOR BACKFILL MUST BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF AT OTHER LOCATIONS BY THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING PERMISSION (AND PERMITS, IF NEEDED) FOR SUCH DISPOSAL. THE COST OF REMOVING ALL EXCAVATED MATERIAL, INCLUDING EARTH, OLD PIPE, PAVING MATERIALS, CONCRETE, AND OTHER DEBRIS CREATED IN THE COURSE OF THE WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE PERTINENT ITEM 603.

14. ITEM 603 - 6" CONDUIT, TYPE E, AS PER PLAN

    ALL LIVE SANITARY SERVICE CONNECTIONS SHALL BE REPLACED AS SHOWN ON THE PLANS. SERVICE CONNECTIONS SHALL BE REMOVED FROM THE EXISTING RIGHT-OF-WAY LINE TO THE EXISTING SANITARY SEWER MAIN. ALL LATERAL CONNECTIONS WILL REQUIRE CORING OF THE MAIN SEWER AND INSTALLATION OF A "KOR-N-TEE" OR EQUAL INSERT SLEEVE. THE CORED PLUG MUST BE REMOVED FROM THE SEWER BEFORE INSTALLATION OF THE SLEEVE.

    THE CONNECTIONS SHALL BE INSTALLED AS PER THE DETAIL ON SHEET 73. SANITARY SERVICE CONNECTIONS SHALL BE PAID AT THE CONTRACT UNIT PRICE FOR "ITEM 603 - 6" CONDUIT, TYPE E, AS PER PLAN". THE PRICE BID SHALL INCLUDE LOCATING AND REMOVING THE EXISTING SERVICE CONNECTION AND TEST TEE, FURNISHING, LAYING AND CONNECTING THE PIPE, BENDS, TRANSITION COUPLINGS, INSERT SLEEVES, CONCRETE ENCASEMENT, AND ANY OTHER WORK AND MATERIAL NECESSARY TO COMPLETE THIS ITEM. THE PRICE SHALL INCLUDE REMOVING EXISTING SANITARY SERVICE HOUSE LATERALS FROM THE EXISTING RIGHT-OF-WAY LINE TO THE EXISTING SANITARY SEWER MAIN. THE PRICE SHALL INCLUDE PREMIUM BACKFILL. SEE NOTE 13 REGARDING THE REQUIREMENTS FOR PREMIUM BACKFILL.

15. MANHOLE, NO. 3, AS PER PLAN AND MANHOLE NO. 2, AS PER PLAN

    ALL MANHOLES SHALL BE BUILT IN ACCORDANCE WITH THE PLANS.

    MANHOLE FRAME-CHIMNEY SEAL - AN INTERNAL RUBBER SEAL SHALL BE INSTALLED ON ALL SANITARY MANHOLES ON THIS PROJECT. A RUBBER SEAL EXTENSION, TO COVER ANY ADDITIONAL HEIGHTS OF CHIMNEY NOT COVERED BY THE SEAL ITSELF, SHALL BE USED AS DIRECTED. THE INTERNAL RUBBER SEAL AND SEAL EXTENSIONS SHALL BE AS MANUFACTURED BY CRETEX SPECIALTY PRODUCTS OR EQUAL.

    THE SLEEVES AND EXTENSIONS SHALL HAVE A MINIMUM THICKNESS OF 3/16 INCHES AND SHALL BE EXTRUDED FROM A HIGH GRADE RUBBER COMPOUND CONFORMING TO THE APPLICABLE REQUIREMENTS OF ASTM C923. THE BANDS USED FOR COMPRESSING THE SLEEVE AND EXTENSION AGAINST THE MANHOLE SHALL BE FABRICATED FROM 16 GAUGE STEEL CONFORMING TO ASTM A240, TYPE 304. ANY SCREWS, BOLTS OR NUTS USED ON THIS BAND SHALL BE STAINLESS STEEL CONFORMING TO ASTM F593 AND 594, TYPE 304.

    CEMENT MORTAR SHALL BE USED IN THE JOINT BETWEEN THE MANHOLE FRAME AND CHIMNEY OR CONE.

    ANY SEALANT USED BETWEEN THE ADJUSTMENT OR GRADE RINGS OF THE CHIMNEY SHALL NOT BE USED IN THIS JOINT. DETAILED INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

    IN AN INTERNAL SEAL THE SLEEVE SHALL BE DOUBLE PLEATED WITH A MINIMUM UNEXPANDED VERTICAL HEIGHT OF 8 INCHES AND BE CAPABLE OF VERTICAL EXPANSION OF NOT LESS THAN 2 INCHES WHEN INSTALLED.

    ALL COSTS FOR THE FURNISHING AND INSTALLATION OF THE INTERNAL RUBBER SEAL AND EXTENSION SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "ITEM 604 - MANHOLE, NO. 3, AS PER PLAN". "ITEM 604 - MANHOLE, NO. 2, AS PER PLAN".

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: E.D.S. DATE: 5/24/93
DRAWN BY: P.J.K. DATE: 5/25/93
CHECKED BY: M.O.E. DATE: 5/28/93
SCALE: None

20752/PAH-NOTE 1 of 1

SANITARY SEWER NOTES

16. MANHOLES ABANDONED

SANITARY MANHOLES TO BE ABANDONED SHALL BE AS PER ODOT ITEM 202.09. ALL INLET AND OUTLET PIPES SHALL BE PLUGGED IN ACCORDANCE WITH ODOT ITEM 202.09. WORK SHALL BE PAID FOR AT THE CONTRACT BID PRICE FOR "ITEM 202 – MANHOLE ABANDONED".

17. BULKHEADS

THE CONTRACTOR SHALL CONSTRUCT MASONRY BULKHEADS AT ALL LOCATIONS SHOWN ON THE PLANS AND AT ALL OTHER LOCATIONS WHERE SO DIRECTED BY THE SANITARY ENGINEER. THEY SHALL BE BUILT NINE INCHES (9") THICK, UNLESS OTHERWISE SPECIFIED, AND WITH A ONE-HALF INCH (1/2") COATING OF 1 TO 2 CEMENT MORTAR.

THE CONTRACTOR SHALL INSTALL AN ADDITIONAL 3' PIECE OF 24" PIPE AT THE END OF 24" STUB. THIS ENTIRE 3' PIECE SHALL BE FILLED WITH MASONRY AND WEIGHTED WITH 1 TO 2 CEMENT MORTAR. THE COST OF CONSTRUCTING THE PROPOSED BULKHEADS SHALL BE INCLUDED IN THE CONTRACT PRICE BID FOR THE PERTINENT ITEM 603.

18. A. LINE ACCEPTANCE TEST FOR SEWERS

THE NEW SANITARY SEWER SHALL BE TESTED AS FOLLOWS:

A. LOW PRESSURE AIR TEST
B. PHOTOGRAPHIC TEST

AS SOON AFTER A REASONABLE SECTION OF SEWER AND THE MANHOLES HAVE BEEN COMPLETED, THE CONTRACTOR SHALL FURNISH ALL EQUIPMENT, MATERIAL, AND PERSONNEL TO CONDUCT A "LINE ACCEPTANCE" TEST USING LOW PRESSURE AIR. THE EQUIPMENT TO BE USED SHALL HAVE PRIOR APPROVAL AND THE TEST SHALL BE CONDUCTED UNDER THE SUPERVISION OF THE ENGINEER. THE LINE ACCEPTANCE TEST SHALL BE CONDUCTED AFTER BACKFILLING HAS BEEN COMPLETED.

ALL SLANTS, TEES, OR END OF LATERAL STUBS SHALL BE SUITABLY CAPPED TO WITHSTAND THE INTERNAL TEST PRESSURES. SUCH CAPS SHALL BE A TYPE WHICH IS EASILY REMOVABLE FOR FUTURE LATERAL CONNECTIONS OR EXTENSIONS.

AFTER A MANHOLE-TO-MANHOLE SECTION OF THE LINE HAS BEEN CLEANED, IT SHALL BE PLUGGED AT EACH MANHOLE WITH PNEUMATIC PLUGS INFLATED TO 35 PSIG INTERNAL PRESSURE. THE DESIGN OF THE PLUGS SHALL BE SUCH THAT THEY WILL HOLD AGAINST THE LINE TEST PRESSURE WITHOUT REQUIRING EXTERNAL BLOCKING OR BRACING. EACH PNEUMATIC PLUG SHALL HAVE A SEALING LENGTH EQUAL TO OR GREATER THAN THE DIAMETER OF THE PIPE IN WHICH IT IS TO BE USED SO THAT EFFECTIVE SEALING WILL ALWAYS TAKE PLACE AROUND ANY NODULE OR LUMP THAT MAY BE ON THE INNER SURFACE OF THE PIPE. BEFORE ACTUAL LINE TESTING STARTS, THE PNEUMATIC PLUGS SHALL PASS THE FOLLOWING QUALIFYING TEST IN THE PRESENCE OF THE ENGINEER: ONE LENGTH OF PIPE SHALL BE LAID ON THE GROUND AND SEALED AT BOTH ENDS WITH THE PNEUMATIC PLUGS TO BE CHECKED; AIR SHALL BE INTRODUCED INTO THE PIPE UNTIL THE PIPE PRESSURE REACHES 15 PSIG. THE PNEUMATIC PLUGS BEING CHECKED SHALL HOLD AGAINST THIS PRESSURE WITHOUT BRACING BEING NEEDED, AND WITHOUT MOVEMENT OF THE PLUGS OUT OF THE PIPE. ALL PNEUMATIC PLUGS SHALL PASS THE AFOREMENTIONED QUALIFICATIONS BEFORE BEING USED TO TEST THE ACTUAL INSTALLATION.

ONE PNEUMATIC PLUG USED IN THIS TESTING PROCEDURE SHALL HAVE TWO FACTORY EQUIPPED HOSE CONNECTIONS IN ADDITION TO THAT HOSE CONNECTION USED ONLY FOR THE INFLATION OF THE PNEUMATIC PLUG. ONE OF THE ADDITIONAL HOSE CONNECTIONS SHALL BE USED FOR CONTINUOUSLY READING THE AIR PRESSURE RISE IN THE SEALED LINE. THE SECOND ADDITIONAL HOSE CONNECTION SHALL BE USED ONLY FOR INTRODUCING LOW PRESSURE AIR INTO THE SEALED LINE.

THERE SHALL BE A MINIMUM THREE INCH (3") DIAMETER, 0-30 PSIG GAUGE SUPPLIED FOR READING THE INTERNAL PRESSURE OF THE LINE BEING TESTED.

CALIBRATIONS FROM THE 0-10 PSIG RANGE SHALL BE IN TENTHS OF POUNDS (NOT OUNCES) AND THIS 0-10 PORTION SHALL COVER 90% OF THE COMPLETE DIAL RANGE.

LOW PRESSURE AIR SHALL BE INTRODUCED INTO THE SEALED LINE UNTIL THE INTERNAL PRESSURE REACHES 4.0 PSIG GREATER THAN THE AVERAGE BACK PRESSURE OF ANY GROUND WATER PRESSURE THAT MAY BE OVER THE PIPE. AT LEAST TWO (2) MINUTES SHALL BE ALLOWED FOR THE AIR PRESSURE TO STABILIZE. AFTER THE STABILIZATION PERIOD, THE HOSE FOR INTRODUCING LOW PRESSURE AIR INTO THE SEALED LINE SHALL BE DISCONNECTED FROM THE AIR SOURCE IN SUCH A MANNER AS TO RETAIN THE PRESSURE IN THE SEALED LINE.

THE PORTION OF THE LINE BEING TESTED SHALL BE ACCEPTED IF THE PORTION UNDER TEST DOES NOT LOSE AIR AT A RATE GREATER THAN 0.003 CFM PER SQUARE FOOT OF INTERNAL PIPE SURFACE WHEN TESTED AT AN AVERAGE PRESSURE OF 3.0 PSIG GREATER THAN ANY PRESSURE EXERTED BY GROUND WATER THAT MAY BE OVER THE PIPE AT THE TIME OF THE TEST.

THE ABOVE REQUIREMENT SHALL BE ACCOMPLISHED BY PERFORMING THE TEST AS FOLLOWS: THE TIME REQUIRED IN MINUTES FOR THE PRESSURE TO DECREASE FROM 3.5 TO 2.5 PSIG GREATER THAN THE AVERAGE BACK PRESSURE OF ANY GROUND WATER THAT MAY BE OVER THE PIPE SHALL NOT BE LESS THAN THE TIME SHOWN FOR THE GIVEN DIAMETER IN THE FOLLOWING TABLE:

PIPE DIAMETER IN INCHES	MINUTES
8	4.0
10	5.0
12	5.5
15	7.5
18	8.5
21	10.0
24	12.5
27	15.0
30	18.0
33	21.0

WHERE HIGH GROUND WATER IS KNOWN TO EXIST, THE HEIGHT IN FEET OF GROUND WATER ABOVE THE INVERT OF THE SEWER SHALL BE DIVIDED BY 2.3 TO ESTABLISH THE POUNDS OF PRESSURE THAT WILL BE ADDED TO THE INTERNAL AIR PRESSURE USED FOR THE LINE ACCEPTANCE TEST IN DETERMINING THE TIME IN MINUTES FOR THE AIR PRESSURE TO DECREASE 1.0 PSIG.

THE ABOVE REQUIRED TEST SHALL BE PERFORMED CONTINUOUSLY THROUGHOUT THE CONSTRUCTION AND AT NO TIME SHALL THERE BE MORE THAN FOUR SECTIONS OF SEWER BETWEEN MANHOLES NOT TESTED.

PERSONNEL FOR READING THE MEASURING DEVICES WILL BE FURNISHED BY THE SANITARY ENGINEER, BUT ALL OTHER LABOR, EQUIPMENT, MATERIAL AND WATER, INCLUDING GAUGES AND METERS, WILL BE FURNISHED BY THE CONTRACTOR. ALL COSTS TO THE CONTRACTOR REQUIRED BY THESE TESTS ARE TO BE INCLUDED IN THE UNIT PRICES BID FOR THE PERTINENT ITEM 603.

IF THE INSTALLATION FAILS TO MEET THE REQUIREMENTS OF THIS TEST, THE CONTRACTOR SHALL DETERMINE AT HIS OWN EXPENSE THE SOURCE OF LEAKAGE. THE CONTRACTOR SHALL REPAIR OR REPLACE ALL DEFECTIVE MATERIALS AND/OR WORKMANSHIP WITH THE METHOD APPROVED BY THE SANITARY ENGINEER, AND THEN RE-TEST THE INSTALLATION FOR COMPLIANCE WITH THESE SPECIFICATIONS.

B. PHOTOGRAPHIC TESTS

ALL SANITARY SEWERS CONSTRUCTED UNDER THIS CONTRACT SHALL BE SUBJECT TO VISUAL INSPECTION AND SHALL HAVE A FINAL INSPECTION BY TELEVISED METHODS. THE CONTRACTOR SHALL CLEAN THE SEWER AND SHALL ENGAGE THE SERVICES OF A COMPETENT NON-AFFILIATED FIRM TO TELEVISE THE SEWER.

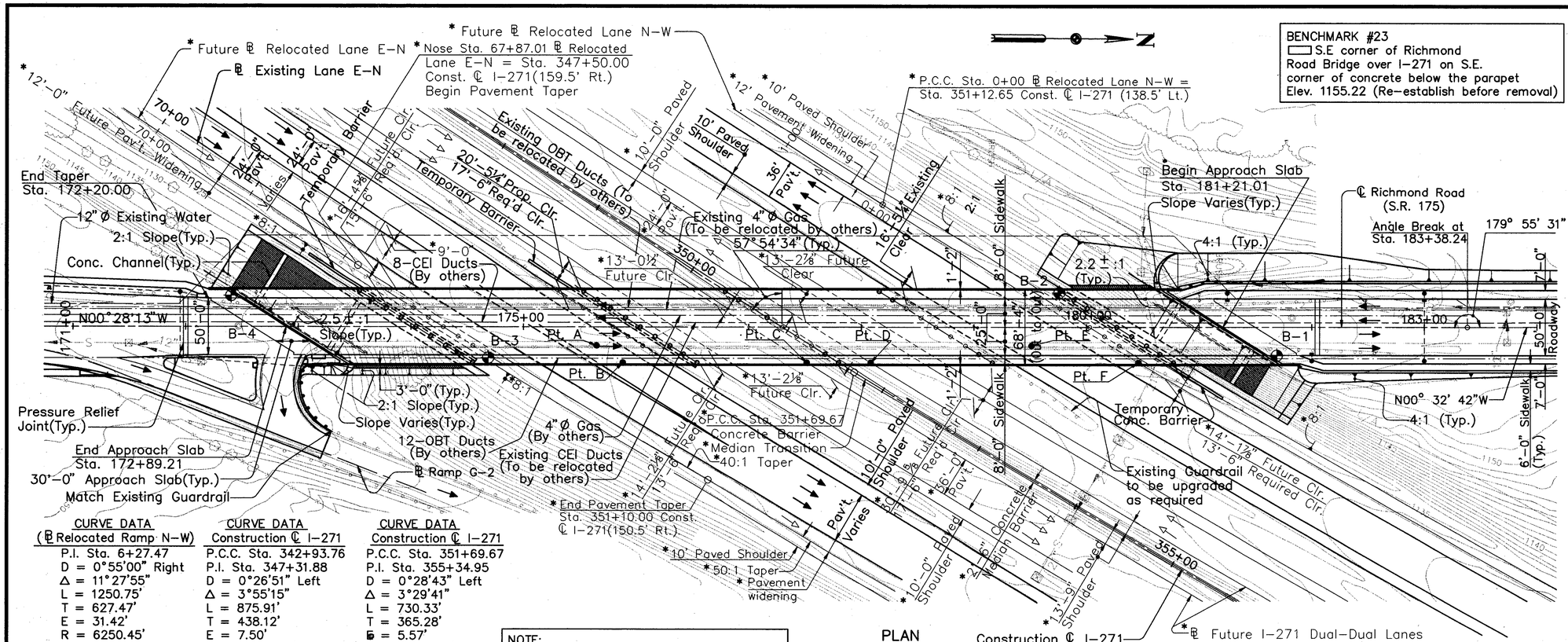
THE SEWER SHALL BE TELEVISED AND RECORDED ON STD. C-120 VHS VIDEO CASSETTES. THE TAPE ALONG WITH AN AUDIO COMMENTARY AND A WRITTEN REPORT AS TO THE CONDITION OF THE SEWER SHALL BE SUBMITTED TO THE ENGINEER.

BEFORE ACCEPTANCE OF THE SEWER BY THE ENGINEER, THE CONTRACTOR SHALL REPAIR ANY DEFECTS WHICH ARE FOUND WITH METHOD APPROVED BY THE ENGINEER, AND THE REPAIRED SEWER SHALL THEN BE REINSPECTED BY THE METHOD PREVIOUSLY SPECIFIED HEREIN.

THE COST OF CLEANING AND TELEVISING THE SANITARY SEWER SHALL BE INCLUDED IN THE PRICE BID FOR THE PERTINENT ITEM 603. THIS COST SHALL INCLUDE ANY RECLEANING NEEDED DUE TO REPAIR OF ANY DEFECTS.

19. ITEM 604 – DRAINAGE STRUCTURE, MISC.: TEST TEE

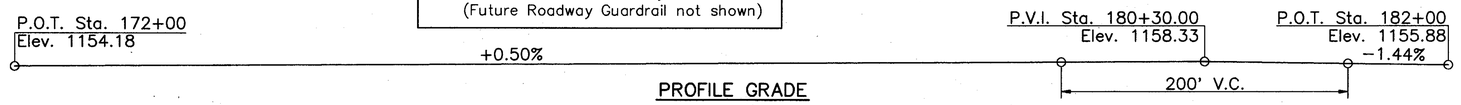
SANITARY TEST TEES SHALL BE INSTALLED AS SHOWN ON THE PLANS. JOINT CONNECTION BETWEEN PVC AND THE EXISTING CLAY PIPE SHALL BE MADE USING CLAY TO PVC ELASTOMERIC COUPLING SIMILAR TO FERNCO SERIES 1002. THE UNIT PRICE BID FOR "ITEM 604 – DRAINAGE STRUCTURE, MISC.: TEST TEE" SHALL INCLUDE ALL ITEMS NECESSARY TO PERFORM THIS WORK INCLUDING THE COST OF THE ELASTOMERIC COUPLING.



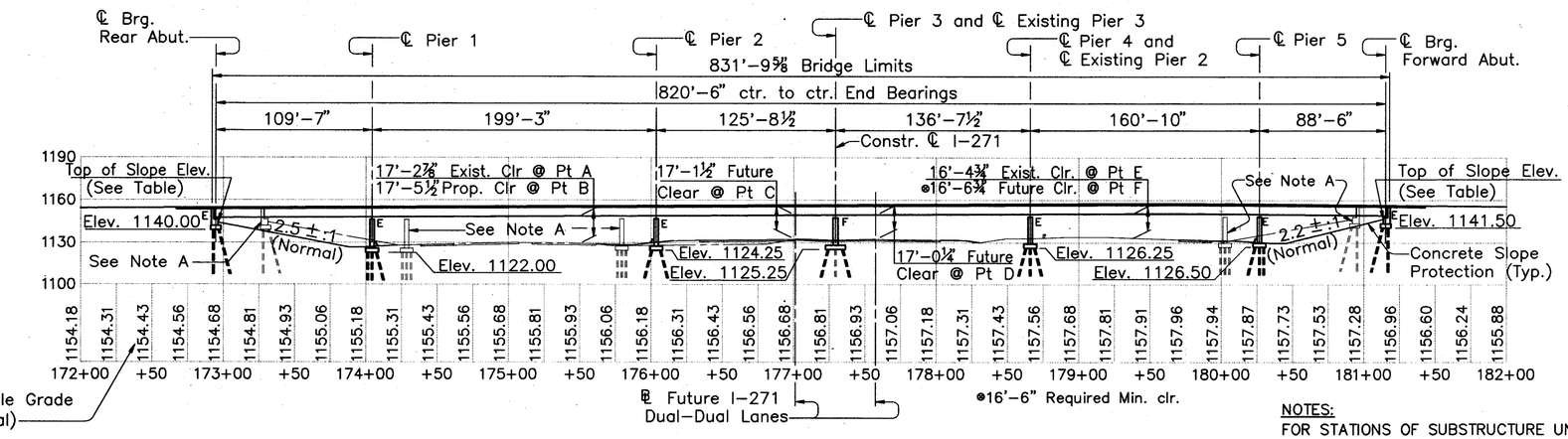
CURVE DATA (℄ Relocated Ramp N–W)	CURVE DATA Construction ℄ I–271	CURVE DATA Construction ℄ I–271
P.I. Sta. 6+27.47	P.C.C. Sta. 342+93.76	P.C.C. Sta. 351+69.67
D = 0°55'00" Right	P.I. Sta. 347+31.88	P.I. Sta. 355+34.95
Δ = 11°27'55"	D = 0°26'51" Left	D = 0°28'43" Left
L = 1250.75'	Δ = 3°55'15"	Δ = 3°29'41"
T = 627.47'	L = 875.91'	L = 730.33'
E = 31.42'	T = 438.12'	T = 365.28'
R = 6250.45'	E = 7.50'	E = 5.57'
	R = 12800.00'	R = 11973.77'

NOTE:
* – Indicates Future Roadway Construction (Future Roadway Guardrail not shown)

PLAN



PROFILE GRADE



ELEVATION ALONG ℄ RICHMOND ROAD

TOP OF SLOPE ELEVATION	
Location	Elevation
Northwest Corner	1148.9
Southwest Corner	1145.6
Northeast Corner	1147.6
Southeast Corner	1146.1

NOTES:
FOR STATIONS OF SUBSTRUCTURE UNITS, SEE GENERAL PLAN AND ELEVATION, SHEET 2 OF 28.
EARTHWORK LIMITS SHOWN ARE APPROXIMATE. ACTUAL SLOPES SHALL CONFORM TO PLAN CROSS–SECTIONS.
NOTE A: REMOVE EXISTING SUBSTRUCTURE AS PER ITEM 202.

FHWA REGION	STATE	PROJECT	
5	OHIO		

77/110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29

MODIFIED STRUCTURE

TYPE: Continuous composite welded steel girder with reinforced concrete deck and substructure.
SPANS: 109'–7", 199'–3", 125'–8½", 136'–7½", 160'–10", 88'–6"
ROADWAY: 50'–0" curb to curb with two 8'–0" sidewalks and two 1'–0" concrete parapets
LOADING: HS–20–44 Case II and the alternate military loading.
SKEW: 57° 54' 34" Right Forward
WEARING SURFACE: 1" Monolithic Wearing Surface.
APPROACH SLABS: AS–1–81 (30'–0"long)
ALIGNMENT: Tangent
CROWN: Normal, 1/16"/Ft. except ¼"/ft for curb lanes

EXISTING STRUCTURE

TYPE: Continuous welded steel girder with reinforced concrete deck and substructure.
SPANS: 98'–9", 150'–10½", 149'–10½", 136'–7½", 136'–7½", 90'–11"
ROADWAY: 28'–0" curb to curb with two 4'–2" walks
LOAD FREQUENCY: CF400(57)
SKEW: 57° 54' 34" Right Forward
WEARING SURFACE: Concrete
APPROACH SLABS: AS–1–54 (25'–0"long)
ALIGNMENT: Tangent
YEAR BUILT: 1965
STRUCTURE FILE NO. 1811169

FOUNDATION DATA
(NEW SUBSTRUCTURE)
ALL PILES SHALL BE HP 10X42 STEEL PILES AND HAVE A MINIMUM BEARING CAPACITY OF 35 TONS PER PILE AT ABUTMENTS AND 50 TONS PER PILE AT PIERS. ALL PILING SHALL BE DRIVEN TO REFUSAL ON BEDROCK.
THE ESTIMATED AVERAGE PAY LENGTHS OF THE PILES ARE AS FOLLOWS:

REAR ABUT.	45 FT.	PIER 4	30 FT.
PIER 1	35 FT.	PIER 5	30 FT.
PIER 2	35 FT.	FORWARD ABUT.	25 FT.
PIER 3	35 FT.		

THE PILES AT THE FORWARD ABUTMENT SHALL BE PREDRILLED TO A MINIMUM ELEVATION OF 1131.50.

TRAFFIC DATA (Year 2010)	ADT	ADTT
RICHMOND ROAD	9,530	190

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

SITE PLAN
BR. NO. CUY–271–0629
RICHMOND ROAD (S.R. 175) OVER I–271

STA. 172+89.21
TO STA. 181+21.01

CUYAHOGA COUNTY OHIO

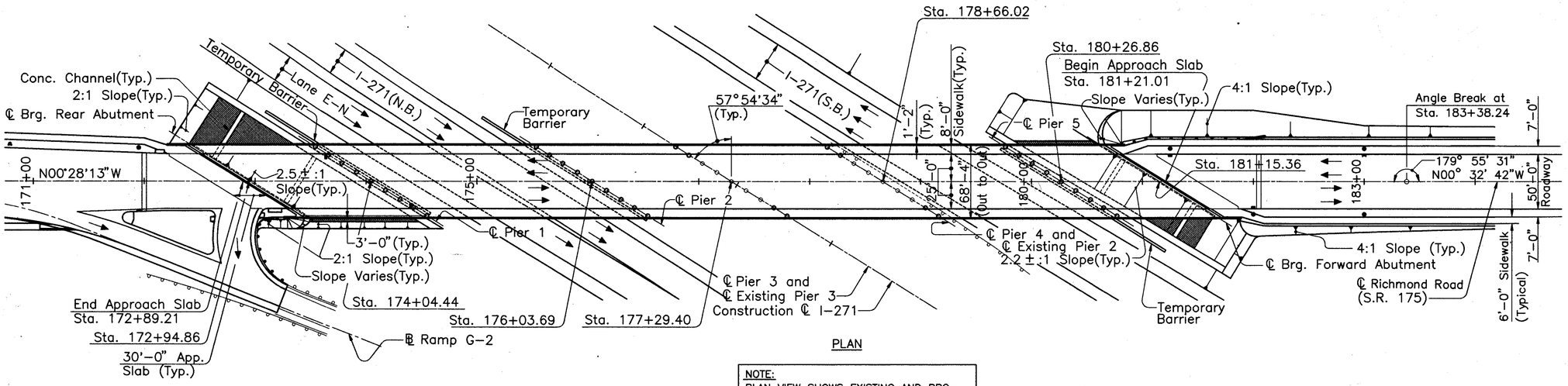
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
C.A.C.	C.A.C.	D.H.S./R.H.W.	F.S.J./C.A.B.	
DATE 1/13/92	DATE 1/13/92	DATE 2/19/93	DATE 2/25/93	SHEET 1/28

\14472\RICH\TSL1A

FHWA REGION	STATE	PROJECT	
5	OHIO		

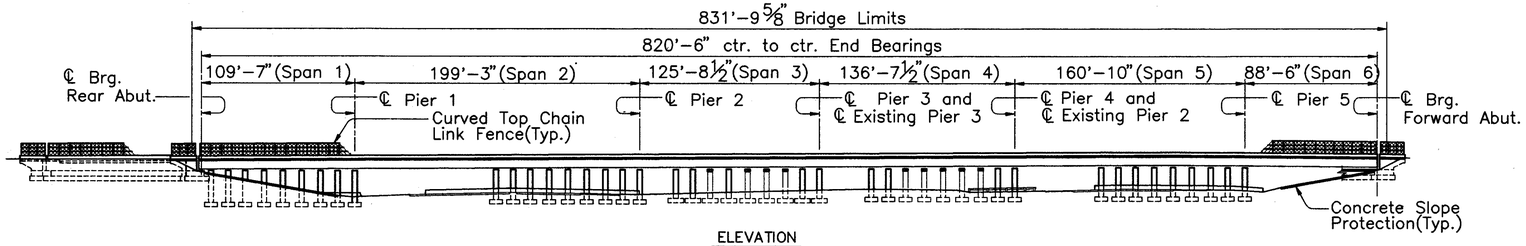
78
110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29



PLAN

NOTE:
PLAN VIEW SHOWS EXISTING AND PROPOSED ROADWAY WORK, AS COMPLETED. FOR FUTURE CONDITIONS, SEE SITE PLAN.



ELEVATION
(Piles not shown)

\14472\RICH\RICHGPE.DWG

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

GENERAL PLAN AND ELEVATION

BR. NO. CUY–271–0629
RICHMOND ROAD (S.R. 175) OVER I–271

STA. 172+89.21
TO STA. 181+21.01

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
J.L.V.	J.L.V.	R.H.W.	C.A.B.	
DATE 1/26/93	DATE 1/26/93	DATE 2/19/93	DATE 2/25/93	SHEET 2/28

MADE BY: J.L.V. | DATE: 2/15/93
CHECKED BY: R.H.W. | DATE: 2/22/93

ESTIMATED QUANTITIES

ITEM	ITEM EXT.	UNIT	DESCRIPTION	"NH" ABUTS.	PIERS	SUPER-STRUCTURE	GEN'L	TOTAL
202	11200	LUMP SUM	PORTIONS OF STRUCTURE REMOVED				L.S.	L.S.
503	21100	CU.YD.	UNCLASSIFIED EXCAVATION	823	1018			1841
505	11100	LUMP SUM	PILE DRIVING EQUIPMENT MOBILIZATION				L.S.	L.S.
507	12200	LIN.FT.	STEEL PILES, HP10 X 42	2793	6290			9083
507	92200	LIN.FT.	PREBORED HOLES	390				390
509	15840	LBS.	EPOXY COATED REINFORCING STEEL, GRADE 60	45,590	96,425	485,527		627,542
510	12200	LIN.FT.	DOWEL HOLES		72			72
SPECIAL	51148040	CU.YD.	HIGH PERFORMANCE CONCRETE, SUBSTRUCTURE, (ABUTMENT NOT INCLUDING FOOTING)*	350				350
SPECIAL	51148040	CU.YD.	HIGH PERFORMANCE CONCRETE, SUBSTRUCTURE, (PIER ABOVE FOOTINGS)*		283			283
SPECIAL	51148040	CU.YD.	HIGH PERFORMANCE CONCRETE, SUBSTRUCTURE, (FOOTINGS)*	224	323			547
SPECIAL	51148000	CU.YD.	HIGH PERFORMANCE CONCRETE, SUPERSTRUCTURE (DECK)*			2178		2178
SPECIAL	51148020	CU.YD.	HIGH PERFORMANCE CONCRETE, SUPERSTRUCTURE (PARAPET)*			143		143
SPECIAL	51149000	LUMP SUM	HIGH PERFORMANCE CONCRETE, TRIAL MIX*				L.S.	L.S.
SPECIAL	51267504	SQ.YD.	SEALING OF CONCRETE SURFACES (NON-EPOXY)*	86		3565		3651
SPECIAL	51267502	SQ.YD.	SEALING OF CONCRETE SURFACES (EPOXY)*	341	1120			1461
SPECIAL	51271500	SQ.YD.	URETHANE TOP COAT SEALER FOR CONCRETE SURFACE	341	1120			1461
513 #	12400	LBS.	STRUCTURAL STEEL (AISC CATEGORY III) (A572)			2,065,700		2,065,700
513	20000	EACH	WELDED STUD SHEAR CONNECTORS			10,962		10,962
514 #	00610	LB	FIELD PAINTING OF NEW STEEL, SYSTEM IZEU (SEE PROPOSAL NOTE)			2,065,700		2,065,700
SPECIAL	51645000	EACH	STEEL POT BEARINGS 0-200 KIPS (SEE PROPOSAL NOTE)			18		18
SPECIAL	51645000	EACH	STEEL POT BEARINGS 200-400 KIPS (SEE PROPOSAL NOTE)			18		18
SPECIAL	51645000	EACH	STEEL POT BEARINGS 400-600 KIPS (SEE PROPOSAL NOTE)			27		27
SPECIAL	51645300	EACH	ADDITIONAL BEARING TEST, STEEL POT BEARING (SEE PROPOSAL NOTE)			1		1
SPECIAL	51614600	LIN. FT.	STRUCTURAL JOINT OR JOINT SEALER, MISC.: NEOPRENE TROUGH			250		250
518	12301	EACH	SCUPPERS, INCLUDING SUPPORTS, AS PER PLAN			2		2
518	21200	CU.YD.	POROUS BACKFILL WITH FILTER FABRIC	192				192
SPECIAL	51862100	LIN.FT.	6" PERFORATED P.V.C. PIPE, 707.17	240				240
SPECIAL	51862100	LIN.FT.	6" NON-PERFORATED P.V.C. PIPE, 707.19	231				231
518	51200	LIN.FT.	PIPE DOWNSPOUT, INCLUDING SPECIALS 10"			53		53
SPECIAL	51911502	SQ. FT.	PATCHING CONCRETE WITH TROWELABLE MORTAR (SEE PROPOSAL NOTE) STRUCTURE		40			40
SPECIAL	53000800	SQ.YD.	SOLVENT-FREE EPOXY RESIN	87				87
601	20000	SQ.YD.	CRUSHED AGGREGATE SLOPE PROTECTION	8				8
601	21001	SQ.YD.	CONCRETE SLOPE PROTECTION, AS PER PLAN	1340		4		1344
SPECIAL	60798000	LIN. FT.	FENCE; MISC.: VANDAL PROTECTION FENCE-11 FT. CURVED, COATED FABRIC.	68		1650		1718

*SEE PROPOSAL NOTE

INCLUDES 7,566 POUNDS, FOR THE INSTALLATION OF UTILITY SUPPORTS, WHICH IS TO BE PAID FOR BY THE UTILITIES AS SHOWN BELOW:

EAST OHIO GAS	= 546 LBS.
OHIO BELL TELEPHONE	= 4,961 LBS.
CLEVELAND ELECTRIC ILLUMINATING	= 2,059 LBS.
	7,566 LBS.

1. DESIGN SPECIFICATIONS
THIS STRUCTURE CONFORMS TO THE "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS DATED 1992 AND THE OHIO "SUPPLEMENT" TO THESE SPECIFICATIONS. THE DESIGN LOADING IS HS20-44, CASE II AND THE ALTERNATE MILITARY LOADING.

THE CLASSES OF CONCRETE AND THE GRADES OF STRUCTURAL STEEL AND REINFORCING STEEL TOGETHER WITH THE STRENGTH FOR EACH ARE AS FOLLOWS:

CONCRETE CLASS S - COMPRESSIVE STRENGTH 4,500 PSI FOR SUPERSTRUCTURE
CONCRETE CLASS C - COMPRESSIVE STRENGTH 4,000 PSI FOR SUBSTRUCTURE
STRUCTURAL STEEL - ASTM A572, YIELD STRENGTH 50,000 PSI
REINFORCING STEEL - ASTM A615, A616, A617 - GRADE 60, (MINIMUM YIELD STRENGTH - 60,000 PSI)
SPIRAL REINFORCEMENT MAY BE PLAIN BARS, ASTM A82 OR A615.

2. REFERENCE DRAWINGS
REFERENCE SHALL BE MADE TO STANDARD DRAWINGS AS-1-81 DATED 11-27-81 (SHEETS 1, 2 AND 3 OF 3), VPF-1-90 REVISED 2-1-92, EXJ-2-81 REVISED 4-2-84 SHEET 1 OF 2, AND SD-1-69 DATED 6-12-69 (SHEET 1, 2 AND 3 OF 4).

3. DECK PROTECTION METHOD
EPOXY COATED REINFORCING STEEL (BOTH MATS). MONOLITHIC WEARING SURFACE IS ASSUMED, FOR DESIGN PURPOSES, TO BE 1" THICK.

4. PLANS OF EXISTING BRIDGE
CONSTRUCTION PLANS FOR THE EXISTING BRIDGE ARE ON FILE AT THE OHIO DEPARTMENT OF TRANSPORTATION, DISTRICT 12 OFFICE, 5500 TRANSPORTATION BOULEVARD, GARFIELD HEIGHTS, OHIO AND ARE AVAILABLE FOR REFERENCE.

5. UTILITIES
INFORMATION SHOWN IN THE PLANS CONCERNING TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO.

ANY EXISTING, PRIVATELY-OWNED UTILITY FACILITIES ENCOUNTERED AT THE SITE OF THE WORK WHICH WILL INTERFERE WITH PORTIONS OF THE FINISHED ROADWAYS OR STRUCTURES SHALL BE REMOVED OR RELOCATED BY THE OWNER. ALL EXPENSES INVOLVED IN RELOCATING THE AFFECTED UTILITY LINES SHALL BE BORNE BY THE OWNER. THE CONTRACTOR AND OWNER ARE REQUESTED TO COOPERATE BY ARRANGING THEIR WORK IN SCHEDULE A MANNER THAT INCONVENIENCE TO EITHER WOULD BE HELD TO A MINIMUM.

6. ALL REFERENCES TO ITEM 511-CLASS S CONCRETE OR ITEM 511-CLASS C CONCRETE SHALL BE CONSIDERED TO READ ITEM SPECIAL-HIGH PERFORMANCE CONCRETE, SUPERSTRUCTURE OR ITEM SPECIAL-HIGH PERFORMANCE CONCRETE, SUBSTRUCTURE, RESPECTIVELY. ALL PLACEMENT/LOCATION DESCRIPTIONS SHALL REMAIN THE SAME.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

ESTIMATED QUANTITIES & GENERAL NOTES
BR. NO. CUY-271-0629
RICHMOND ROAD (S.R. 175) OVER I-271
STA. 172+89.21
TO STA. 181+21.01
CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
R.H.W.	R.H.W.	J.L.V.	C.A.B.	
DATE 2/19/93	DATE 2/19/93	DATE 2/22/93	DATE 2/25/93	SHEET 3/28

FHWA REGION	STATE	PROJECT	
5	OHIO		

80/110

GENERAL NOTES - STRUCTURES OVER 20-FT SPAN

CUYAHOGA COUNTY
CUY - 175 - 2.68
CUY - 271 - 6.29

AT LEAST TWO WORKING DAYS PRIOR TO COMMENCING CONSTRUCTION OPERATIONS IN AN AREA WHICH MAY INVOLVE UNDERGROUND UTILITY FACILITIES, THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER, THE REGISTERED UTILITY PROTECTION SERVICE AND THE OWNERS OF EACH UNDERGROUND UTILITY FACILITY SHOWN IN THE PLANS (SEE ROADWAY PLANS).

THE BRIDGE CONTRACTOR AND THE CONTRACTORS INSTALLING THE OBT, CEI, AND EOG UTILITY LINES ARE REQUESTED TO COOPERATE BY ARRANGING THEIR WORK IN SUCH A MANNER THAT INCONVENIENCE TO EITHER WOULD BE HELD TO A MINIMUM.

6. MAINTENANCE OF TRAFFIC

RICHMOND ROAD AT THE PROJECT SITE SHALL BE CLOSED TO VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE CONSTRUCTION PERIOD. TRAFFIC WILL BE MAINTAINED ON I-271. FOR MAINTENANCE OF TRAFFIC NOTES, REFER TO THE ROADWAY PLANS.

7. REMOVAL OF EXISTING STRUCTURE

A. GENERAL

WHEN NO LONGER NEEDED TO MAINTAIN TRAFFIC, THE CONTRACTOR SHALL REMOVE THE EXISTING BRIDGE INCLUDING THE EXISTING TIMBER SUBDECK BE-TWEEN GIRDER WEBS IN THE ORDER NOTED ON AN APPROVED CONSTRUCTION SEQUENCE OR AS DIRECTED BY THE ENGINEER. THE REMOVAL SEQUENCE SHALL BE STAGED IN COORDINATION WITH THE MAINTENANCE OF TRAFFIC PLANS. NO REMOVALS SHALL OCCUR OVER ACTIVE PORTIONS OF INTERSTATE I-271. REMOVAL SHALL NOT INCLUDE THOSE PORTIONS OF EXISTING PIERS 3 AND 4 THAT ARE TO REMAIN AS NOTED IN THE PLANS. THE SUBSTRUCTURE SHALL BE REMOVED TO 1'-0" MINIMUM BELOW FINAL GROUND OR AS REQUIRED FOR CONSTRUCTION OF THE PROPOSED STRUCTURE AND MODIFIED I-271 ROADWAY. REMOVAL OF THE EXISTING BRIDGE SHALL BE BY METHODS OF THE CONTRACTOR'S SELECTION AS APPROVED BY THE ENGINEER.

SPECIAL CARE SHALL BE TAKEN BY THE CONTRACTOR TO PROTECT ALL EXISTING FACILITIES UNDER THE BRIDGE DURING DEMOLITION. DEBRIS SHALL NOT BE PERMITTED TO DROP TO THE GROUND. ALL DAMAGES TO ADJACENT FACILITIES OR TO ITEMS SCHEDULED TO REMAIN SHALL BE REPAIRED AND/OR RESTORED TO THEIR ORIGINAL CONDITION TO THE SATISFACTION OF THE ENGINEER AND AT THE EXPENSE OF THE CONTRACTOR.

B. DISPOSAL OF REMOVED MATERIAL

ALL STRUCTURAL STEEL, CONCRETE, REINFORCING STEEL, PIPES, ETC., REMOVED BY THE CONTRACTOR SHALL BECOME HIS PROPERTY AND SHALL BE REMOVED BY HIM FROM THE SITE. UNDER NO CIRCUMSTANCES SHALL THE MATERIAL BE PERMITTED TO REMAIN ON THE PREMISES, RIGHT-OF-WAY OR STREETS PENDING DISPOSAL OF SAME OR FOR ANY OTHER PURPOSES, UNLESS APPROVED BY THE ENGINEER.

8. TEMPORARY FALSEWORK AND PROTECTIVE STRUCTURES

A. GENERAL

THIS WORK SHALL CONSIST OF CONSTRUCTING AND REMOVING TEMPORARY CONSTRUCTIONS REQUIRED TO COMPLETE THE WORK IN ADDITION TO THE FORMWORK AND ITEMS WHICH ARE SPECIFICALLY INCLUDED ELSEWHERE. THE WORK INCLUDES TEMPORARY PLATFORMS OR OTHER MEANS TO PREVENT LOOSE MATERIALS FROM FALLING DURING THE CONSTRUCTION OF THE SUPERSTRUCTURE OVER ACTIVE PORTIONS OF INTERSTATE I-271.

B. REQUIREMENTS

IN ORDER TO PROTECT AGAINST DAMAGE FROM FALLING MATERIAL AND DEBRIS WHILE SUPERSTRUCTURE CONCRETE IS BEING PLACED OR WHILE WORK IS IN PROGRESS OVERHEAD, THE CONTRACTOR SHALL FURNISH AND ERECT TEMPORARY PROTECTIVE STRUCTURES. THE FLOORING AND SIDING OF THE STRUCTURES SHALL HAVE NO CRACKS OR OPENINGS THROUGH WHICH MATERIAL PARTICLES MAY FALL. AS A MINIMUM, ONE LAYER OF 3/4-INCH PLYWOOD WITH LAPPED JOINTS OR AN EQUIVALENT DESIGN SHALL BE PLACED BETWEEN THE LOWER FLANGES OF THE STRUCTURAL STEEL GIRDERS. THE PROTECTION SHALL COVER A MINIMUM OF 10' BEYOND THE SHOULDER LIMITS OF ROADWAYS. THE PROTECTION IN ALL CASES SHALL EXTEND BEYOND THE EXTERIOR STRUCTURAL GIRDERS AT A SUFFICIENT DISTANCE TO PROTECT UNDER THE BRIDGE RAILINGS.

AFTER THE TEMPORARY FALSEWORK AND PROTECTIVE STRUCTURES HAVE SERVED THEIR PURPOSE, AND WHEN SO DIRECTED BY THE ENGINEER, THEY SHALL BE REMOVED. ALL MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR AT HIS OWN EXPENSE.

DETAILS OF THE TEMPORARY FALSEWORK AND PROTECTIVE STRUCTURES, SHALL BE SUBMITTED TO THE DIRECTOR FOR APPROVAL.

C. PAYMENT

TEMPORARY FALSEWORK AND PROTECTIVE STRUCTURES WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED WITH THE UNIT BID FOR SUPER-STRUCTURE CONCRETE.

9. DIMENSIONS

DIMENSIONS ARE MEASURED HORIZONTALLY AND AT 60°F UNLESS OTHERWISE NOTED.

10. ITEM 507 - STEEL PILES HP 10 X 42

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 50 TONS PER PILE FOR THE PIER PILES. THE PILES AT THE FORWARD ABUTMENT SHALL BE PREBORED TO A PILE TIP ELEVATION OF 1131.50.

11. NEOPRENE DRAINAGE TROUGH

A. DESCRIPTION

THIS WORK SHALL INCLUDE FURNISHING AND INSTALLING AT ALL EXPANSION JOINTS THE NEOPRENE TROUGHS AND BITUMINOUS COATING AS DETAILED IN THE PLANS AND IN ACCORDANCE WITH THE SPECIFICATIONS.

B. MATERIALS

1) ELASTOMERIC TROUGH SHEETING SHALL BE SHOP FABRICATED AND VUL-CANIZED BONDED WITH HEAT AND PRESSURE FROM NYLON REINFORCED NEOPRENE SHEET (NRNS). THE SHEET MATERIAL SHALL BE 3/32" THICK GENERAL PURPOSE, HEAVY DUTY NEOPRENE SHEET WITH NYLON FABRIC REINFORCEMENT. THE NRNS SHALL BE "FAIRPRENE NUMBER NN-0003" AS MANUFACTURED BY E.I. DUPONT DE NEMOURS AND COMPANY, INCOR-PORATED, "WINGPRENE" AS MANUFACTURED BY THE GOODYEAR TIRE AND RUBBER COMPANY, OR AN APPROVED EQUAL. THE SHEET SHALL CONFORM TO THE FOLLOWING:

THE ONE-PLY MATERIAL SHALL CONFORM TO ASTM D751 AND THE FOLLOWING:

THICKNESS, INCHES	.094 ± .010"
BREAKING STRENGTH, GRAB, W X F, MINIMUM	700 X 700 LBS.
ADHESIVE, 1" STRIP, 2" MIN., MINIMUM	9 LBS.
BURST STRENGTH (MULLEN),MINIMUM	1,400 PSI
HEAT AGING, 70 HOURS @ 212°F	
180° BEND WITHOUT CRACKING, ASTM D2136	NO CRACKING OF COATING
LOW TEMPERATURE BRITTLENESS 1 HOUR AT -40°F, BEND AROUND 1/4" MANDREL, ASTM D2136	NO CRACKING OF COATING

2) CONNECTIONS - CONNECTIONS FOR ELASTOMERIC TROUGH INCLUDING ALL CLAMP BARS, SUPPORTS, BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED ACCORDING TO 711.02. ALL HOLES MADE IN THE FIELD SHALL BE DRILLED AND ALL CUTS MADE IN THE FIELD SHALL BE SAWN. ANY GALVANIZED COATING WHICH HAS BEEN CUT OR DAMAGED IN ANY WAY SUCH THAT NEW STEEL IS EXPOSED SHALL BE REPLACED WITH A COLD GALVANIZING COMPOUND SUCH AS THAT MANUFACTURED BY Z.R.C. PRODUCTS OF QUINCY, MASS., "GALVICON" BY KENCO DIV. OF SOUTHERN COATING, INC. OF SUMTER, S.C., OR AN APPROVED EQUAL, APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S REC-OMMENDATIONS.

3) BITUMINOUS COATING - THE COATING SHALL CONFORM TO THE LATEST EDITION OF FEDERAL SPECIFICATION WW-P-405B, COATING F.

C. FABRICATION

SHOP DRAWINGS FOR THE ELASTOMERIC TROUGHS SHALL BE PREPARED BY THE FABRICATOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL. FABRI-CATION SHALL NOT BEGIN BEFORE THE SHOP DRAWINGS ARE APPROVED.

TROUGHS SHALL BE PREFORMED IN THE SHOP TO CONFORM WITH THE TROUGH SHAPES AS SHOWN IN THE PLANS.

SHEETS SHALL BE FURNISHED IN ONE CONTINUOUS PIECE UNLESS A SHOP FABRICATED SPLICE, VULCANIZED (WITH HEAT AND PRESSURE) FIELD SPLICE OR FIELD BUTT JOINT IS INDICATED ON THE PLANS OR APPROVED BY THE DIRECTOR

ADHESIVE FOR FIELD BONDING SHALL BE SIKASTIX 323 BY THE SIKA CHEMICAL CORPORATION OF LYNDHURST, NEW JERSEY; FEL-POXY FP-101 BY THE FELT PRODUCTS MANUFACTURING COMPANY OF SKOKIE, ILLINOIS; MARK-184 BY POLY-CARB OF SOLON, OHIO; OR OTHER AS RECOMMENDED BY THE SHEETING MANUFACTURER.

HOLES IN THE TROUGHS SHALL BE LOCATED WITH THE AID OF A TEMPLATE FURNISHED BY THE STRUCTURAL STEEL FABRICATOR.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

GENERAL NOTES

BR. NO. CUY-271-0629

RICHMOND ROAD (S.R. 175) OVER I-271
STA. 172+89.21
TO STA. 181+21.01

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
R.H.W.	R.H.W.	J.L.V.	C.A.B	
DATE 2/19/93	DATE 2/19/93	DATE 2/19/93	DATE 2/25/93	SHEET 4 / 28

G:\14472\RICH\GN-1.DWG

GENERAL NOTES - STRUCTURES OVER 20-FT SPAN

CUYAHOGA COUNTY
CUY - 175 - 2.68
CUY - 271 - 6.29

D. PREPARATION FOR INSTALLATION - PRIOR TO INSTALLING THE NRNS SHEETING, ALL SURFACES WHICH ARE TO BE BONDED TOGETHER SHALL BE THOROUGHLY CLEANED AND KEPT DRY UNTIL THE ADHESIVE HAS BEEN APPLIED.

THE PREPARATION OF SURFACES SHALL BE ACCOMPLISHED NOT MORE THAN 24 HOURS PRIOR TO ADHESIVE BONDING. BARE STEEL SURFACES SHALL BE PREPARED TO GRADE SA 3, ASTM D 2200. CONCRETE SURFACES SHALL BE LIGHTLY SANDBLASTED. GALVANIZED STEEL SURFACES SHALL BE LIGHTLY SANDED. IMMEDIATELY AFTER MECHANICAL PREPARATION, THE FRESH SURFACES SHALL BE WIPED WITH METHYLETHYL KETONE, TOLUENE OR OTHER APPROVED SOLVENTS TO REMOVE CONTAMINANTS. CONTINUOUS AND CONSISTENT PRESSURE SHALL BE MAINTAINED ON THE BONDED COMPONENTS UNTIL THE ADHESIVE HAS ACHIEVED ENOUGH STRENGTH TO RESIST STRESS.

PRIOR TO USE, ALL EXTERIOR ELASTOMERIC SURFACES SHALL BE CLEANED WITH METHYLETHYL KETONE, TOLUENE OR OTHER APPROVED SOLVENT USING CLEAN DISPOSABLE CLOTHS. THEN, NOT MORE THAN SEVEN (7) DAYS PRIOR TO INSTALLATION, A THIN COATING OF APPROVED CYCLIZING PASTE SHALL BE APPLIED TO THE ELASTOMERIC BONDING SURFACES ONLY. AFTER FROM 25 TO 40 MINUTES, THE PASTE SHALL BE WASHED FROM THE SURFACES WITH CLEAN WATER.

E. INSTALLATION - SUBSTRATE SURFACES SHALL BE CLEAN, DRY AND MAINTAINED ABOVE 45F DURING INSTALLATION AND ADHESIVE CURING. SUPPLEMENTAL HEATING WILL BE PERMITTED. ADHESIVE SHALL BE APPLIED LIBERALLY TO BOTH THE STEEL/CONCRETE AND ELASTOMERIC BONDING SURFACES USING A SERRATED SPATULA IF NECESSARY TO ACHIEVE A COMPLETE AND RELATIVELY UNIFORM COATING.

F. SAMPLING AND TESTING - EACH LOT OF NRNS SHEETING SHALL BE TESTING BY AN INDEPENDENT LABORATORY TO ENSURE COMPLIANCE WITH THESE PROVISIONS. TWO CERTIFIED COPIES OF THE QUALIFICATION TEST DATA INDICATING THAT THE TESTED MATERIAL COMPLY WITH THESE PROVISIONS SHALL BE SUBMITTED TO THE ODOT TESTING LABORATORY. SAMPLING WHEN REQUESTED, SHALL BE IN ACCORDANCE WITH 106.3 EXCEPT THAT WHERE NRNS SHEETING IS TO BE FABRICATED ACCORDING TO PLAN REQUIREMENTS, SAMPLES SHALL BE MADE AVAILABLE PRIOR TO FABRICATION. THE SAMPLE FROM EACH LOT AND FOR EACH PROJECT SHALL BE ONE PIECE, THREE FEET (3') LONG.

MATERIAL ACCEPTANCE WILL BE BASED UPON ODOT TESTING LABORATORY EVALUATION OF CERTIFIED TEST DATA, LABORATORY TEST OF SAMPLED MATERIAL, OR THE EVALUATION OF BOTH CERTIFIED TEST DATA AND TESTED SAMPLES.

G. BITUMINOUS COATING APPLICATION
THE BITUMINOUS COATING SHALL BE BRUSH OR TROWEL APPLIED. PRIOR TO ITS APPLICATION SURFACES SHALL BE WIPED WITH A SUITABLE SOLVENT USING CLEAN DRY CLOTHS TO REMOVE CONTAMINANT TRACES. SURFACES SHALL BE DRY AND WARMER THAN 40°F DURING COATING APPLICATION. COATING THICKNESS SHALL BE NOT LESS THAN 1/16 OF AN INCH.

H. MEASUREMENT AND PAYMENT
NEOPRENE DRAINAGE TROUGH MEASUREMENT WILL BE BASED ON THE ACTUAL NUMBER OF LINEAL FEET OF DRAINAGE TROUGH (MEASURED ALONG THE TOP OF THE TROUGH) COMPLETE AND IN PLACE AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR ITEM SPECIAL, STRUCTURAL JOINT OR JOINT SEALER,MISC.:NEOPRENE TROUGH. THIS PRICE SHALL BE PAYMENT IN FULL FOR FURNISHING ALL MATERIALS, EQUIPMENT, LABOR, AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK. ALL STRUCTURAL STEEL ,PLATES, AND ANCHOR STUDS ARE INCLUDED WITH ITEM 513.

12. CONCRETE DECK
THE FINAL SURFACE OF THE ROADWAY SHALL CONFORM TO THE ELEVATIONS SHOWN ON THE PLANS.

13. STRUCTURAL STEEL
ALL STRUCTURAL STEEL SHALL BE ASTM-A572 GRADE 50, EXCEPT AS NOTED IN THE PLANS.

14. CONCRETE DECK POUR SEQUENCE
IN ORDER TO PREVENT UPLIFT DURING CONSTRUCTION, A SUGGESTED POUR SEQUENCE IS SHOWN ON SHEET 21 OF 28. THE COUNTERWEIGHTS OR TIE DOWNS CALLED FOR SHALL BE PROVIDED BY METHODS OF THE CONTRACTOR'S SELECTION AS APPROVED BY THE ENGINEER.

THE CONTRACTOR MAY PROPOSE AN ALTERNATE TO THE POUR SEQUENCE SPECIFIED. IF THE CONTRACTOR DESIRES AN ALTERNATE POUR SEQUENCE, DETAILS OF THE SEQUENCE SHALL BE SUBMITTED, IN TRIPLICATE, TO THE DIRECTOR FOR APPROVAL.

NO SEPARATE PAYMENT WILL BE MADE FOR THE COUNTERWEIGHTS OR TIE DOWNS REQUIRED BY THE POUR SEQUENCE. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE SUPERSTRUCTURE CONCRETE.

15. SEALING OF CONCRETE SURFACES
1. A NON-EPOXY SEALER MEETING THE REQUIREMENTS OF THE PROPOSAL NOTE SHALL BE APPLIED TO THE FOLLOWING EXPOSED CONCRETE SURFACES:

A. NINE-INCH (9") GUTTERS, SIDEWALKS, ENTIRE PERIMETERS OF THE PARAPETS, EDGES OF SLAB AND THE UNDERSIDES OF THE DECK OUTSIDE THE EXTERIOR GIRDERS (SEE SHEET 22/28 FOR DETAILS);

B. EXPOSED FACE OF THE WINGWALLS, AND ENTIRE PERIMETERS OF THE PARAPETS AT THE ABUTMENTS;

C. ENTIRE SURFACE OF ALL PIERS ABOVE THE GROUNDLINE EXCEPT THE TOPS OF THE COLUMNS.

D. FRONT FACE OF ABUTMENT BACKWALLS FROM TOP TO BRIDGE SEAT, BRIDGE SEAT, AND BREASTWALL DOWN TO THE GROUNDLINE. SEE SHEET 10/28 FOR DETAILS.

PAYMENT FOR THIS WORK SHALL BE INCLUDED WITH ITEM SPECIAL, SEALING OF CONCRETE SURFACES (NON-EPOXY).

2. AN EPOXY SEALER MEETING THE REQUIREMENTS OF THE PROPOSAL NOTE SHALL BE APPLIED TO THE FOLLOWING EXPOSED CONCRETE SURFACES:

A. 4'-0" WIDE CONCRETE CHANNELS

PAYMENT FOR THIS WORK SHALL BE INCLUDED WITH ITEM SPECIAL, SEALING OF CONCRETE SURFACES, EPOXY.

16. ITEM SPECIAL - URETHANE TOP COAT SEALER FOR CONCRETE SURFACES
THIS ITEM SHALL CONSIST OF THE APPLICATION OF A URETHANE TOP COAT SEALER OVER CONCRETE AREAS COATED WITH EPOXY SEALER AND/OR SOLVENT-FREE EPOXY RESIN. THE COLOR SHALL BE FEDERAL COLOR STANDARD NO. 595A-16187.

THE URETHANE TOP COAT SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS AT THE MINIMUM APPLICATION RATE OF 150 SQ.FT. PER GALLON AFTER THE EPOXY HAS BECOME DRY TACKY AND 1 1/2 TO 6 HOURS HAVE ELAPSED SINCE THE EPOXY WAS APPLIED. THE SURFACE SHALL BE CLEAN WHEN THE URETHANE IS APPLIED. APPLICATION SHALL BE AIRLESS SPRAY, BRUSH OR ROLLER AS DIRECTED BY THE ENGINEER.

THE URETHANE TOP COAT SHALL BE ONE OF THE FOLLOWING PRODUCTS:

1) AMERON AMERCOAT 450 H.S.
2) POLY-CARB MARK 73
3) TNEMAC SERIES 70 ENDURA SHIELD
4) DURAL AQUATHANE
5) SPRAY CURE POLYTHANE CRU

THE COST OF ALL LABOR, EQUIPMENT, AND MATERIAL NECESSARY TO ACCOMPLISH THIS ITEM OF WORK SHALL BE PAID FOR UNDER:

ITEM	UNIT	DESCRIPTION
SPECIAL	SQ. YD.	URETHANE TOP COAT SEALER FOR CONCRETE SURFACE

17. ITEM SPECIAL - SOLVENT-FREE EPOXY RESIN
A. DESCRIPTION
THIS ITEM SHALL CONSIST OF THE APPLICATION OF A SOLVENT-FREE EPOXY RESIN OVER THE FOLLOWING CONCRETE AREAS:

1. THE DRAINAGE CHANNELS AT THE ABUTMENTS (SIX-INCHES PAST THE EDGES OF THE CHANNELS ON ALL SIDES) (SEE SHEET 10/28 FOR DETAILS);

B. MATERIALS
THE MATERIAL SHALL BE A TWO PART SOLVENT-FREE EPOXY RESIN COATING. THE MATERIAL SHALL BE ONE OF THE FOLLOWING PRODUCTS:

1) SIKAGARD 62
2) EUCLID CHEMICAL EPOXY 452LV
3) POLY-CARB MARK-65
4) THERMAL-CHEM PRODUCT NO. 901
5) DURALKOTE

C. APPLICATION
THE EPOXY SHALL BE APPLIED TO THE CONCRETE SURFACES UNDER CONDITIONS AND IN THE MANNER SPECIFIED BY THE ENGINEER. TWO COATS SHALL BE APPLIED AT A MAXIMUM COVERAGE RATE OF 150 SQ. FT. PER GALLON FOR EACH COAT.

D. PAYMENT
THE COST OF ALL LABOR, EQUIPMENT, AND MATERIAL NECESSARY TO ACCOMPLISH THIS ITEM OF WORK SHALL BE PAID FOR UNDER:

ITEM	UNIT	DESCRIPTION
SPECIAL	SQ. YD.	SOLVENT-FREE EPOXY RESIN

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

GENERAL NOTES

BR. NO. CUY-271-0629

RICHMOND ROAD (S.R. 175) OVER I-271
STA. 172+89.21
TO STA. 181+21.01

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
R.H.W	R.H.W	J.L.V.	C.A.B.	
DATE 2/19/93	DATE 2/19/93	DATE 2/22/93	DATE 2/25/93	SHEET 5/28

G:\14472\RICH\GN-2.DWG

GENERAL NOTES - STRUCTURES OVER 20-FT SPAN

CUYAHOGA COUNTY
CUY - 175 - 2.68
CUY - 271 - 6.29

18. ITEM 518 - SCUPPERS, INCLUDING SUPPORTS, AS PER PLAN
STRUCTURAL STEEL UNDER THIS ITEM WILL NOT REQUIRE SHOP DRAWINGS PRIOR TO FABRICATION. THE ENGINEER SHALL HAVE AUTHORITY AND RESPONSIBILITY FOR ENSURING THAT THE FABRICATED STEEL IS ACCEPTABLE. TECHNICAL ASSISTANCE WILL BE PROVIDED ON REQUEST BY THE BUREAU OF BRIDGES. MILL TEST REPORTS AND SHIPPING DOCUMENTS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO INCORPORATING STEEL ITEMS INTO THE WORK, AS REQUIRED BY 501.07. AFTER FABRICATION, THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR REVIEW AND APPROVAL TO VERIFY THAT THE DRAWINGS DEPICT THE STEEL AS ACTUALLY INCORPORATED INTO THE WORK. THE ENGINEER WILL THEN SEND ONE APPROVED SET TO THE BUREAU OF BRIDGES FOR INFORMATION. THE FABRICATOR SHALL FURNISH A 35 MILLIMETER MICROFILM COPY OF EACH SHOP DRAWING, WHICH SHALL BE MOUNTED ON AN APERTURE CARD AS SPECIFIED IN 501.05.

19. ITEM SPECIAL - P.V.C. PIPE

A. GENERAL
ALL APPLICABLE PROVISIONS OF SECTION 518 SHALL APPLY. THESE ITEMS SHALL INCLUDE ALL WORK NECESSARY TO FURNISH AND INSTALL THE P.V.C. PIPE IN ACCORDANCE WITH PLAN DETAILS AND TO THE SATISFACTION OF THE ENGINEER.

B. BASIS OF PAYMENT
PAYMENT WILL BE MADE AT THE CONTRACT UNIT PRICE BID FOR:

ITEM	UNIT	DESCRIPTION
SPECIAL	LIN. FT.	6" NON-PERFORATED P.V.C. PIPE, 707.19
SPECIAL	LIN. FT.	6" PERFORATED P.V.C. PIPE, 707.17

20. ITEMS NOT INCLUDED IN BRIDGE PLANS
THE FOLLOWING ITEMS ARE NOT INCLUDED IN THE BRIDGE PLANS, SEE ROADWAY PLANS FOR DETAILS:

(1) GRADING, APPROACH PAVEMENTS SIDEWALKS AND APPROACH SLABS.
(2) REMOVAL OF EXISTING PAVEMENTS, ETC.
(3) MAINTENANCE OF TRAFFIC PLANS FOR INTERSTATE I-271.

G:\14472\RICH\GN-3.DWG

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

GENERAL NOTES
BR. NO. CUY-271-0629
RICHMOND ROAD (S.R. 175) OVER I-271
STA. 172+89.21
TO STA. 181+21.01
CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
R.H.W.	R.H.W.	J.L.V.	C.A.B	
DATE 2/19/93	DATE 2/19/93	DATE 2/22/93	DATE 2/25/93	SHEET 6/28

FHWA REGION	STATE	PROJECT	
5	OHIO		

83
110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29

REQUIRED LAP LENGTHS	
NO. 5 BAR (VERTICAL)	= 1'–7" MINIMUM
NO. 5 BAR (HORZ.)	= 2'–2" MINIMUM
NO. 6 BAR	= 2'–5" MINIMUM
NO. 801 BAR	= 5'–7" MINIMUM
NO. 802 AND 806 BAR	= 3'–1" MINIMUM

NOTES:
ALL REINFORCING BAR MARKS SHALL BE PREFIXED ERA EXCEPT FOR BAR NO. 808 WHICH SHALL BE PREFIXED EDRA.
ALL PILES ARE HP 10 X 42.
PILE LAYOUT DIMENSIONS ARE MEASURED ALONG THE BOTTOM OF FOOTING.
ALL BATTERED PILES SHALL BE INCLINED 3 IN 12 IN THE DIRECTION SHOWN.
FOR SECTION A–A, AND SECTION B–B, SEE SHEET 10 OF 28.
FOR REINFORCEMENT SCHEDULE, SEE SHEET 27 AND 28 OF 28.
THE FOLLOWING ABBREVIATIONS ARE USED:
N.F. = NEAR FACE T = TOP
F.F. = FAR FACE B = BOTTOM
E.F. = EACH FACE

ELEVATION
(Piles not shown)

* Field cut reinforcing as required to clear the channel
** Field cut reinforcing as required to clear the utility openings

FOOTING PLAN

NOTE:
FOR ADDITIONAL DETAILS AT UTILITY OPENINGS, SEE SHEET 10 of 28.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

REAR ABUTMENT

BR. NO. CUY–271–0629
RICHMOND ROAD (S.R. 175) OVER I–271

STA. 172+89.21
TO STA. 181+21.01

CUYAHOGA COUNTY OHIO

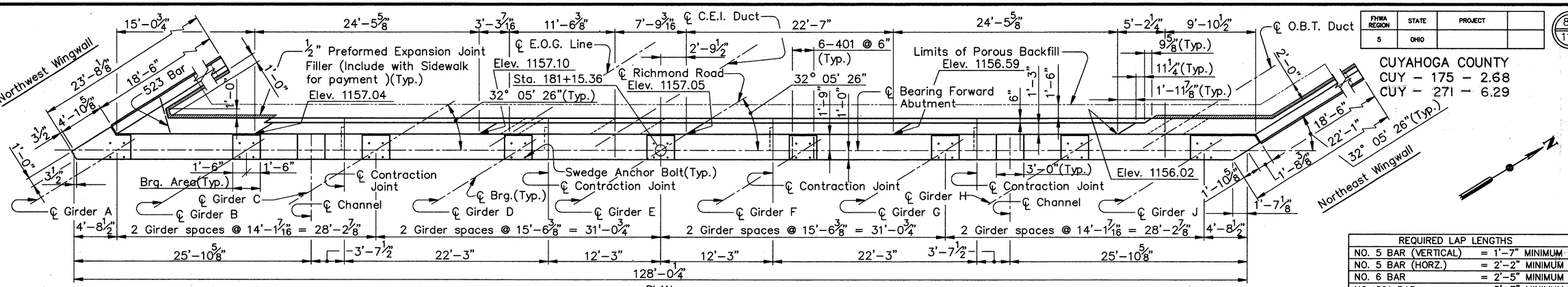
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
J.L.V.	J.L.V.	W.D.D.	C.A.B.	
DATE 1/08/93	DATE 1/08/93	DATE 1/27/93	DATE 2/25/93	SHEET 7/28

\14472\RICH\RA1.DWG

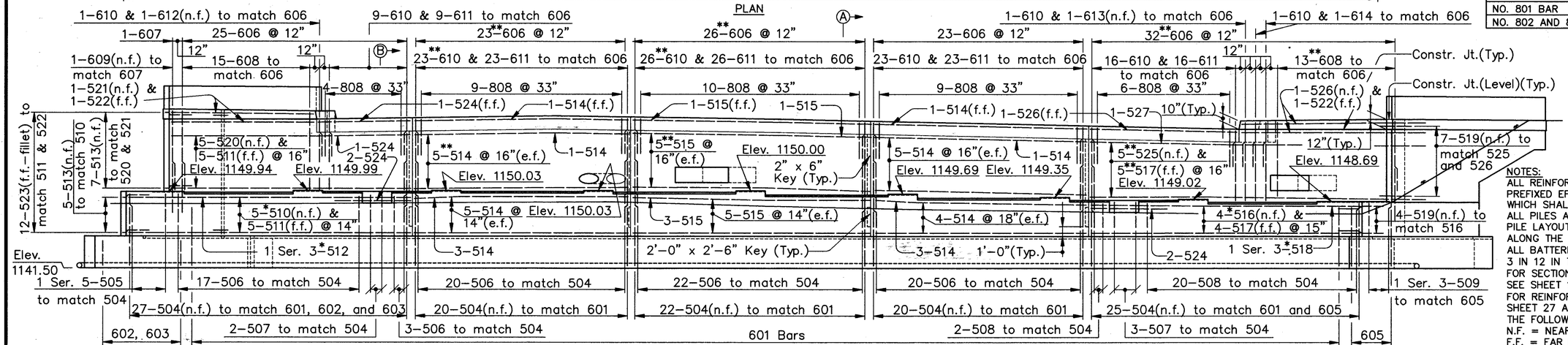
FHWA REGION	STATE	PROJECT	
5	OHIO		

84/110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29



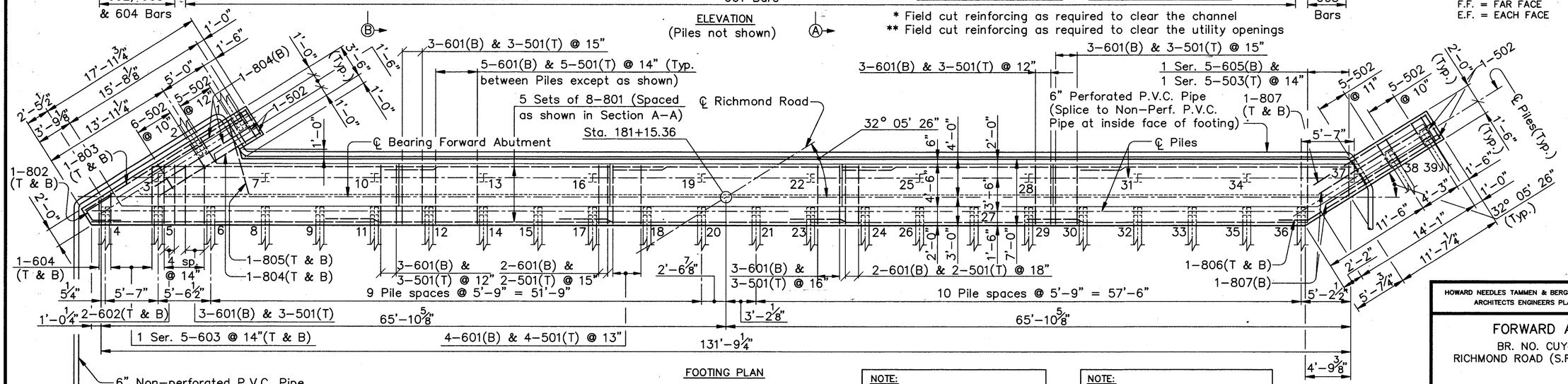
REQUIRED LAP LENGTHS	
NO. 5 BAR (VERTICAL)	= 1'-7" MINIMUM
NO. 5 BAR (HORZ.)	= 2'-2" MINIMUM
NO. 6 BAR	= 2'-5" MINIMUM
NO. 801 BAR	= 5'-7" MINIMUM
NO. 802 AND 806 BAR	= 3'-1" MINIMUM



NOTES:
ALL REINFORCING BAR MARKS SHALL BE PREFIXED EFA EXCEPT FOR BAR NO. 808 WHICH SHALL BE PREFIXED EDFA.
ALL PILES ARE HP 10 X 42.
PILE LAYOUT DIMENSIONS ARE MEASURED ALONG THE BOTTOM OF FOOTING.
ALL BATTERED PILES SHALL BE INCLINED 3 IN 12 IN THE DIRECTION SHOWN.
FOR SECTION A-A, AND SECTION B-B, SEE SHEET 10 OF 28.
FOR REINFORCEMENT SCHEDULE, SEE SHEET 27 AND 28 OF 28.
THE FOLLOWING ABBREVIATIONS ARE USED:
N.F. = NEAR FACE T = TOP
F.F. = FAR FACE B = BOTTOM
E.F. = EACH FACE

ELEVATION
(Piles not shown)

* Field cut reinforcing as required to clear the channel
** Field cut reinforcing as required to clear the utility openings



FOOTING PLAN

NOTE:
PILES SHALL BE PREDRILLED TO A MINIMUM ELEVATION OF 1131.50.

NOTE:
FOR ADDITIONAL DETAILS AT UTILITY OPENINGS, SEE SHEET 10 OF 28.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

FORWARD ABUTMENT

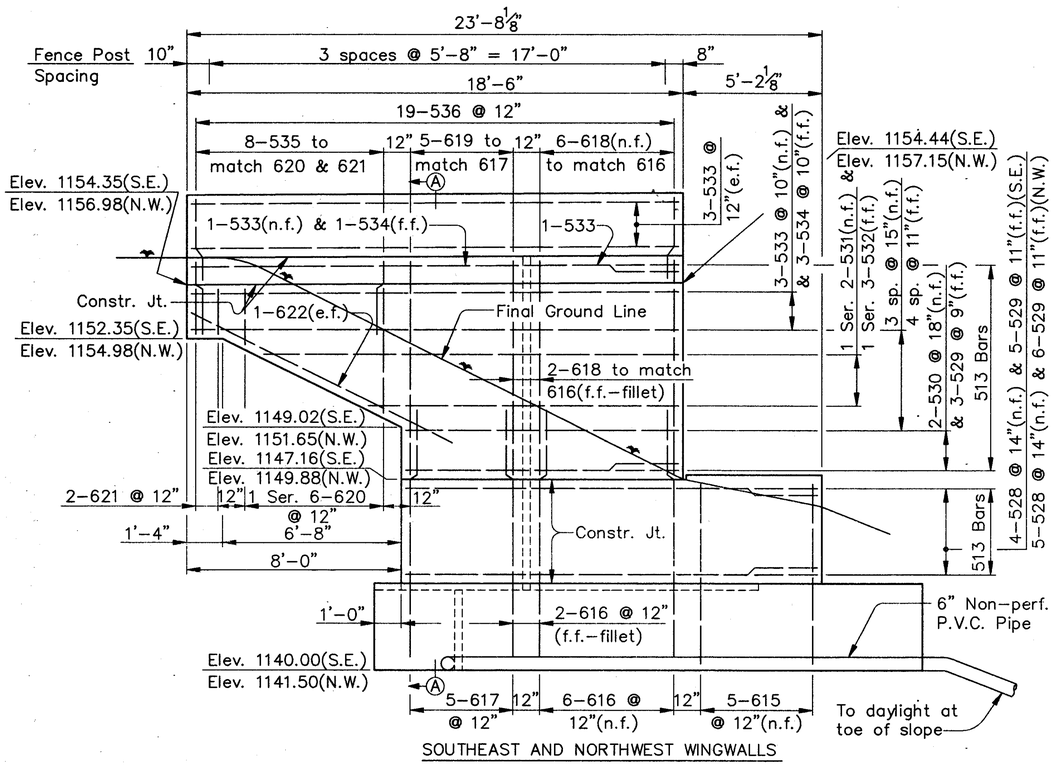
BR. NO. CUY-271-0629
RICHMOND ROAD (S.R. 175) OVER I-271

STA. 172+89.21
TO STA. 181+21.01

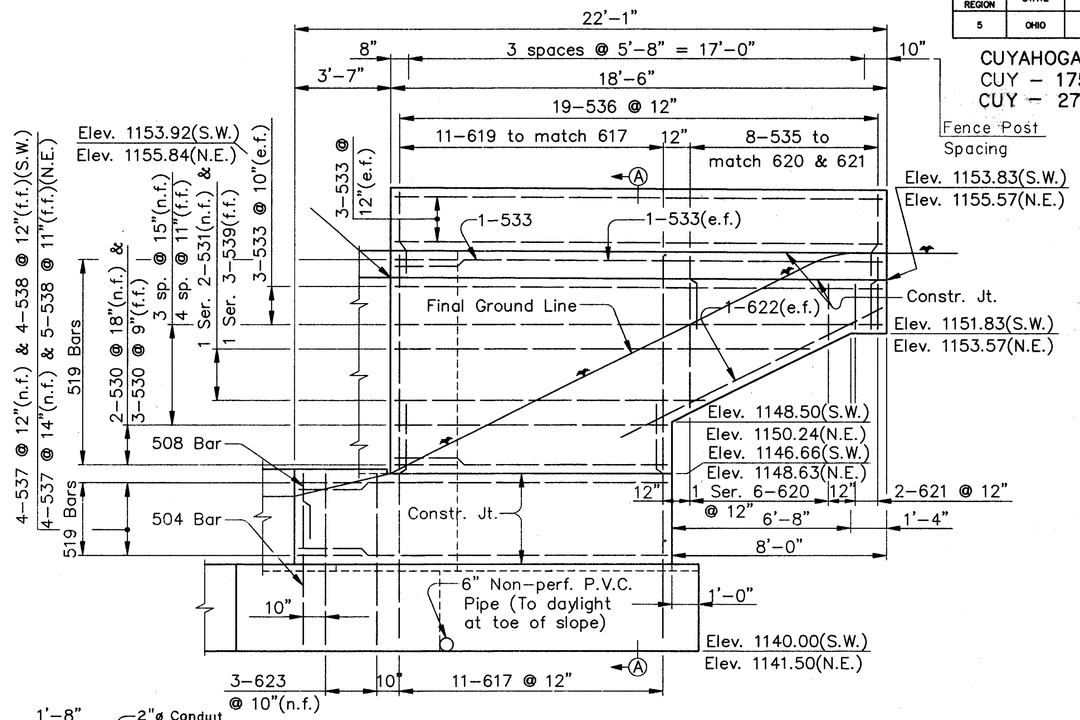
CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
J.L.V.	J.L.V.	W.D.D.	C.A.B.	
DATE 1/12/93	DATE 1/12/93	DATE 1/27/93	DATE 2/25/93	SHEET 8/28

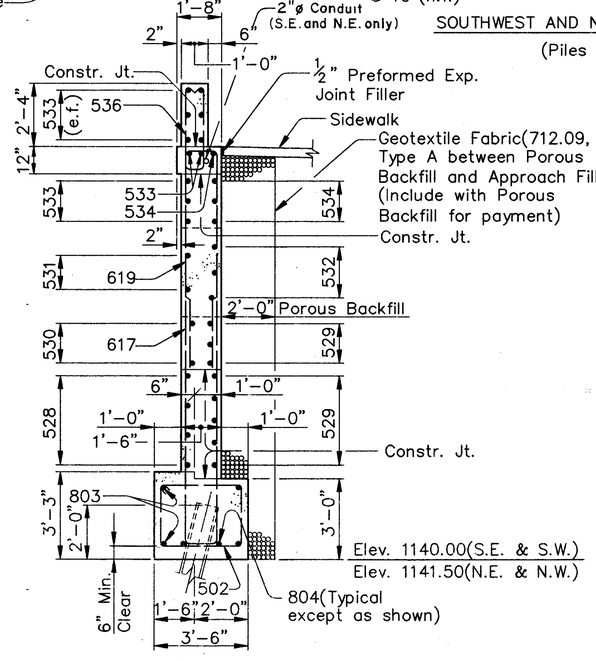
\\14472\RICH\FA1.DWG



SOUTHEAST AND NORTHWEST WINGWALLS
(Piles not shown)



SOUTHWEST AND NORTHEAST WINGWALLS
(Piles not shown)



SECTION A-A
(S.E. shown, all others similar)
(Fencing not shown)

REQUIRED LAP LENGTHS	
NO. 5 BAR (VERTICAL)	= 1'-7" MINIMUM
NO. 5 BAR (HORZ.)	= 2'-2" MINIMUM
NO. 6 BAR	= 2'-5" MINIMUM

NOTES:

ALL REINFORCING BAR MARKS FOR THE SOUTHEAST AND SOUTHWEST WINGWALLS SHALL BE PREFIXED ERA.
ALL REINFORCING BAR MARKS FOR THE NORTHEAST AND NORTHWEST WINGWALLS SHALL BE PREFIXED EFA.
FOR FENCING DETAILS, SEE SHEET 24 OF 28.
FOR REINFORCEMENT SCHEDULE, SEE SHEET 27 AND 28 OF 28.
THE FOLLOWING ABBREVIATIONS ARE USED:
S.E. = SOUTHEAST WINGWALL
S.W. = SOUTHWEST WINGWALL
N.E. = NORTHEAST WINGWALL
N.W. = NORTHWEST WINGWALL
E.F. = EACH FACE N.F. = NEAR FACE
F.F. = FAR FACE

FHWA REGION	STATE	PROJECT	
5	OHIO		

85/110

CUYAHOGA COUNTY
CUY - 175 - 2.68
CUY - 271 - 6.29

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

WINGWALL DETAILS

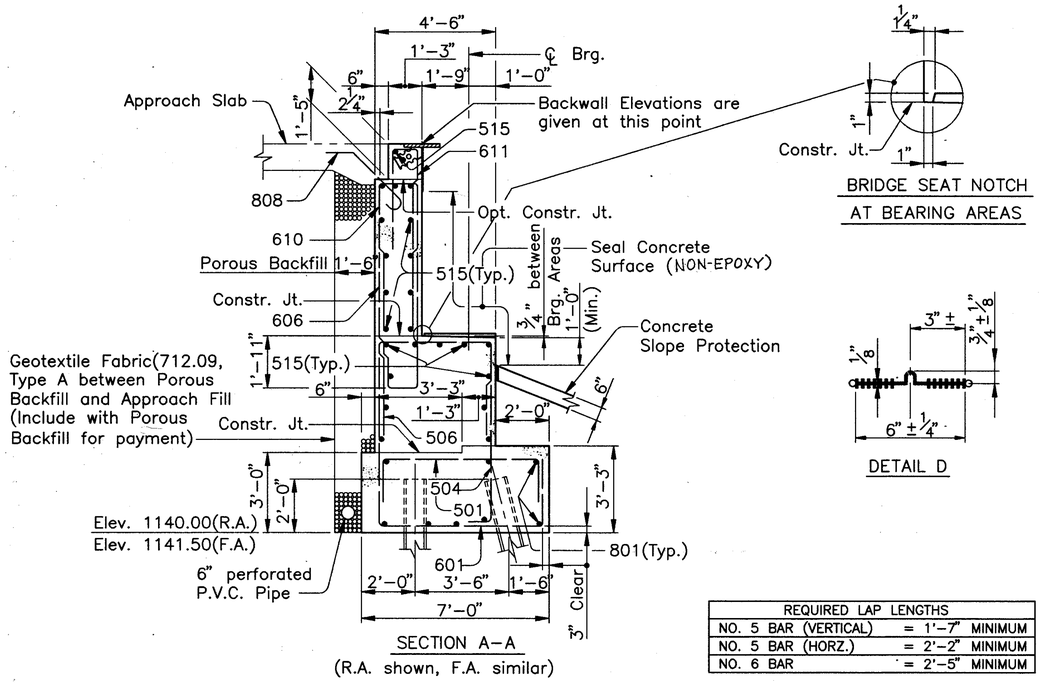
BR. NO. CUY-271-0629
RICHMOND ROAD (S.R. 175) OVER I-271

STA. 172+89.21
TO STA. 181+21.01

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
J.L.V.	J.L.V.	W.D.D.	C.A.B.	
DATE 1/18/93	DATE 1/18/93	DATE 1/27/93	DATE 2/25/93	SHEET 9/28

\14472\RICH\ABDET2.DWG

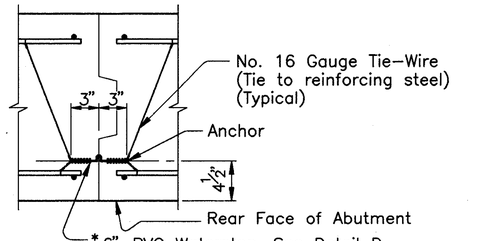


SECTION A–A
(R.A. shown, F.A. similar)

BRIDGE SEAT NOTCH AT BEARING AREAS

DETAIL D

REQUIRED LAP LENGTHS	
NO. 5 BAR (VERTICAL)	= 1'-7" MINIMUM
NO. 5 BAR (HORZ.)	= 2'-2" MINIMUM
NO. 6 BAR	= 2'-5" MINIMUM

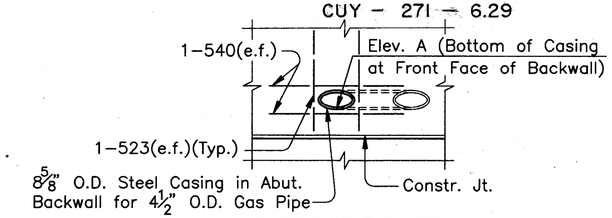


WATERSTOP DETAIL

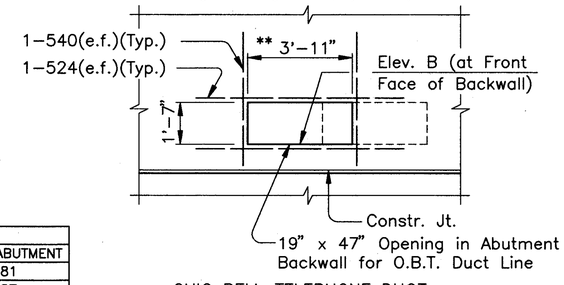
* For the first pour, the waterstop shall be held securely in place by the use of split forms and tie–wires. For the second pour, secure the free end of waterstop in proper position with tie–wires. Alternate methods, as approved by the Engineer may be used to ensure the correct pos–itioning of the waterstop.

TABLE OF ELEVATIONS		
	REAR ABUTMENT	FORWARD ABUTMENT
ELEV. A	1148.17	1150.81
ELEV. B	1148.20	1149.87
ELEV. C	1148.36	1150.77

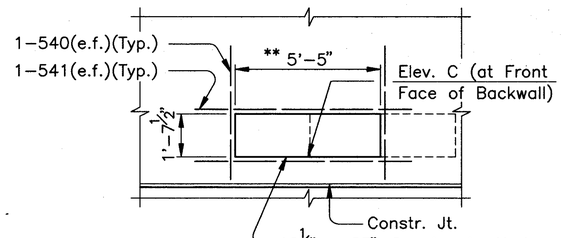
CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29



EAST OHIO GAS LINE
(The 8⅝" O.D. Steel Casing shall be supplied by The East Ohio Gas Company and installed by the Contractor. Include cost of installation with Item 511, Class C Concrete Abutments, not including Footing, for payment.)

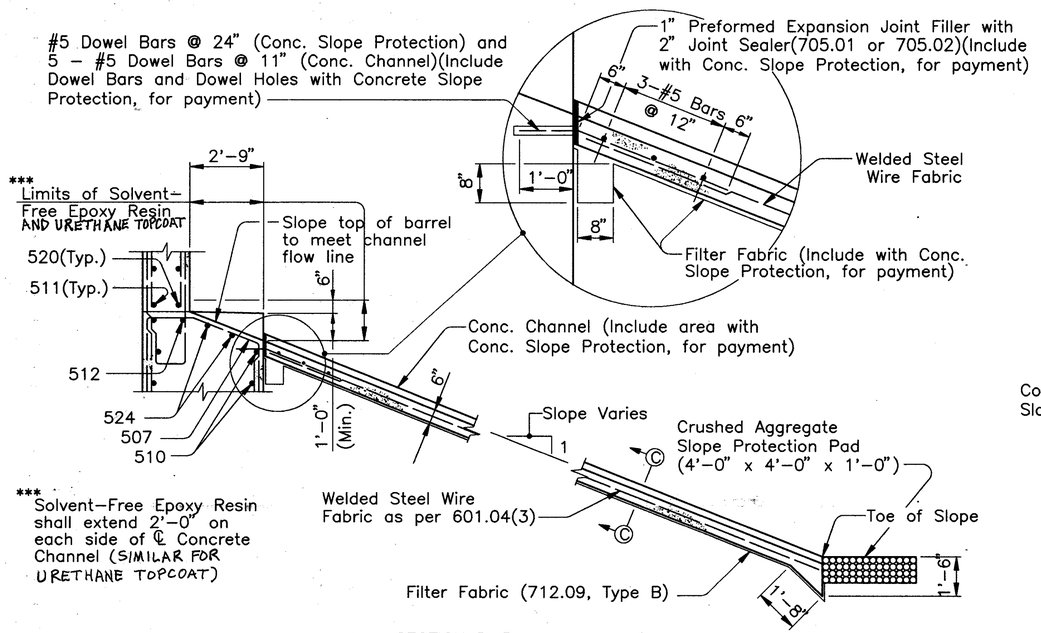


OHIO BELL TELEPHONE DUCT

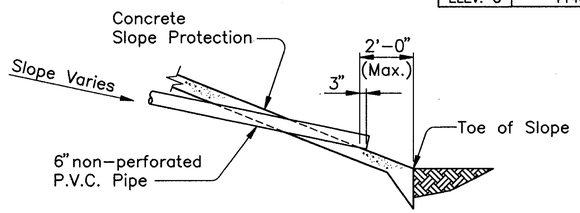


CLEVELAND ELECTRIC ILLUMINATING DUCT
** (Measured along Front Face of Backwall)

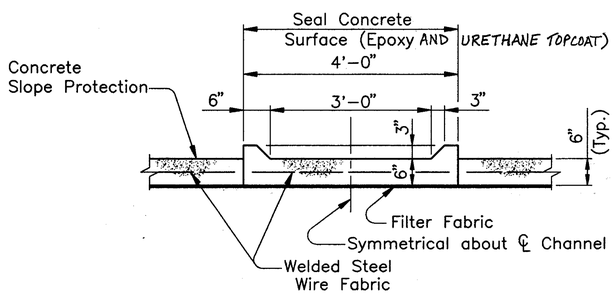
UTILITY OPENING DETAILS



SECTION B–B
(Section thru Concrete Channel shown, Section thru Concrete Slope Protection similar)



TERMINATION OF 6" P.V.C. PIPE
AT TOE OF SLOPE



SECTION C–C

NOTES:
ALL REINFORCING BAR MARKS FOR THE REAR ABUTMENT SHALL BE PREFIXED ERA EXCEPT FOR BAR NO. 808 WHICH SHALL BE PREFIXED EDRA.

ALL REINFORCING BAR MARKS FOR THE FORWARD ABUTMENT SHALL BE PREFIXED EFA EXCEPT FOR BAR NO. 808 WHICH SHALL BE PREFIXED EDFA.

FOR LOCATION OF SECTION A–A AND B–B, SEE SHEET 7 AND 8 OF 28.

FOR LOCATION OF UTILITY OPENINGS, SEE SHEET 7 AND 8 OF 28.

FOR REINFORCEMENT SCHEDULE, SEE SHEET 27 AND 28 OF 28.

THE FOLLOWING ABBREVIATIONS ARE USED:
R.A. = REAR ABUTMENT
F.A. = FORWARD ABUTMENT
E.F. = EACH FACE

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

ABUTMENT DETAILS

BR. NO. CUY–271–0629
RICHMOND ROAD (S.R. 175) OVER I–271

STA. 172+89.21
TO STA. 181+21.01

CUYAHOGA COUNTY OHIO

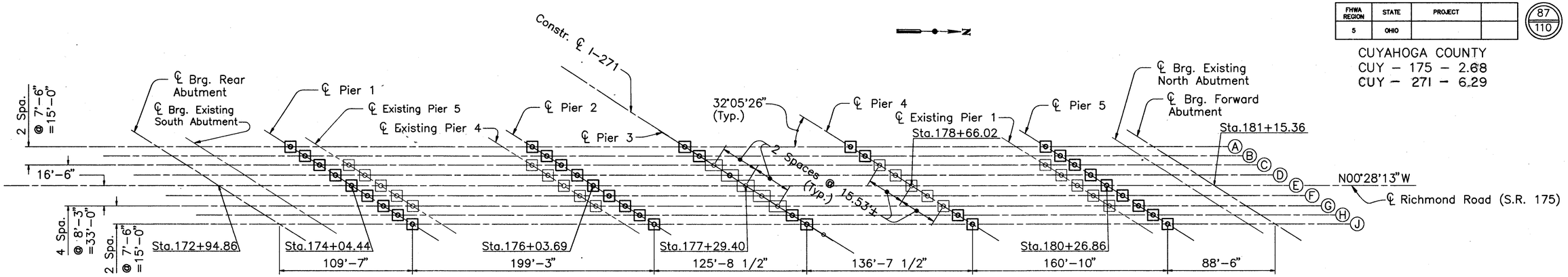
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
J.L.V.	J.L.V.	W.D.D.	C.A.B.	
DATE 1/18/93	DATE 1/18/93	DATE 2/15/93	DATE 2/25/93	SHEET 10/28

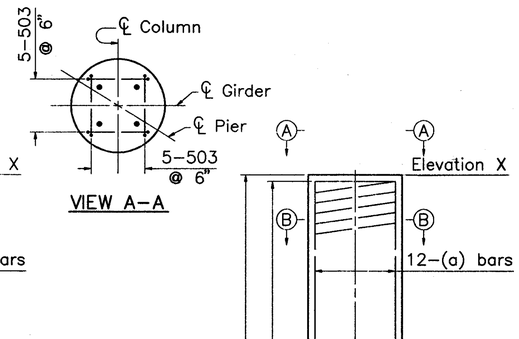
\14472\RICH\ABDET1.DWG

FHWA REGION	STATE	PROJECT	
5	OHIO		

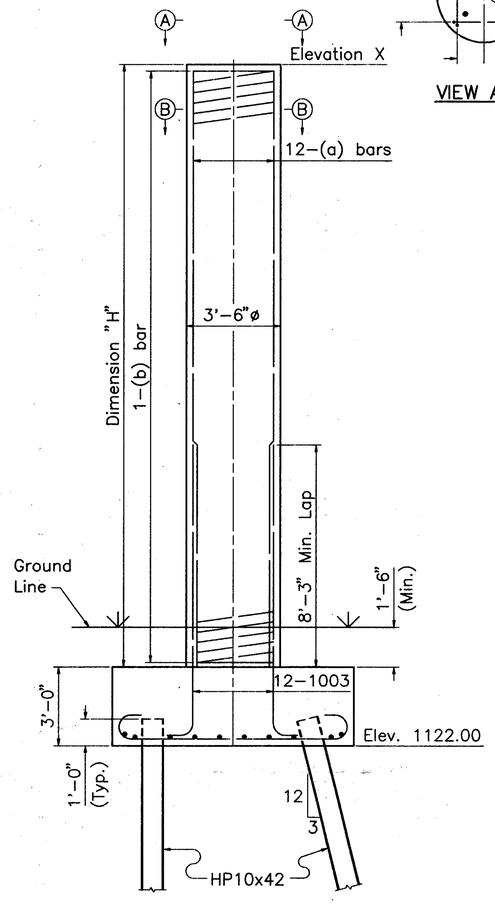
87
110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29

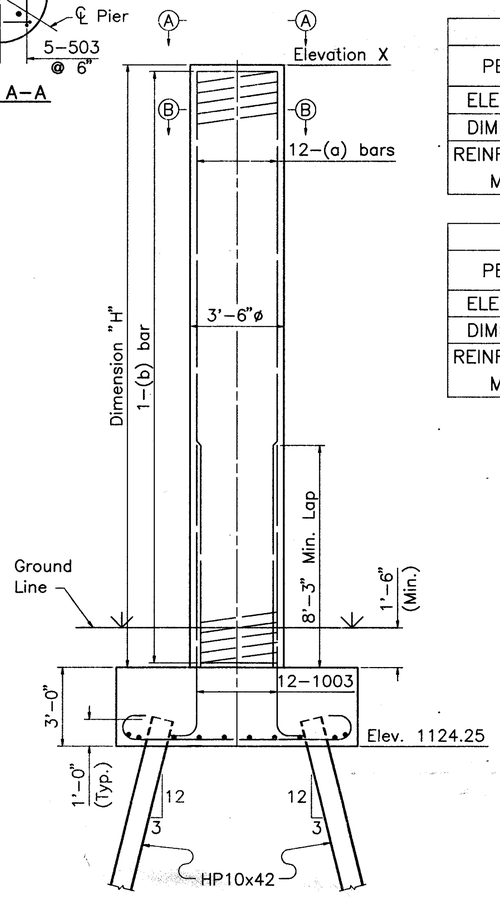




VIEW A-A



PIER 1

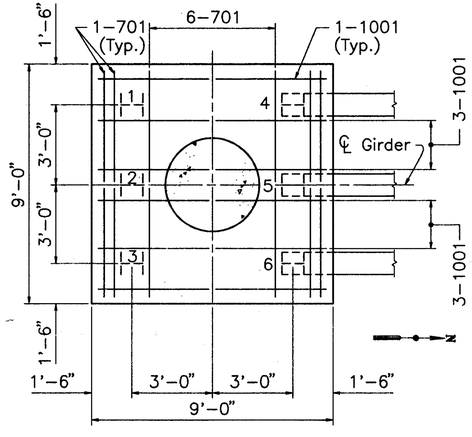


PIER 2

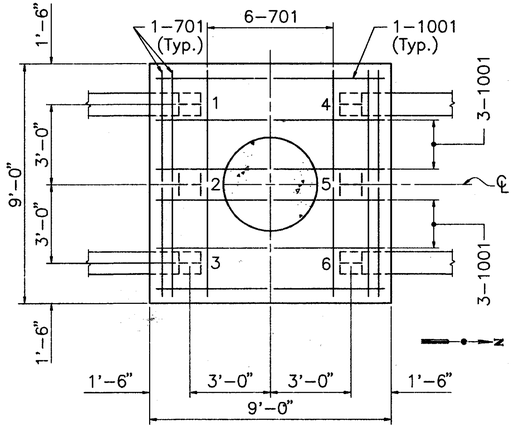
PIER LAYOUT DIAGRAM

TABULATION OF PIER 1 PEDESTAL DATA										
PEDESTAL		1A	1B	1C	1D	1E	1F	1G	1H	1J
ELEVATION	X	1147.11	1147.32	1147.52	1147.74	1147.93	1147.87	1147.78	1147.71	1147.61
DIMENSION	H	22'-1 3/8"	22'-3 7/8"	22'-6 1/4"	22'-8 7/8"	22'-11 1/8"	22'-10 1/2"	22'-9 3/8"	22'-8 1/2"	22'-7 3/8"
REINF. STEEL	(a)	1011	1012	1013	1014	1015	1014	1014	1014	1013
MARK	(b)	418	419	420	422	425	424	423	422	421

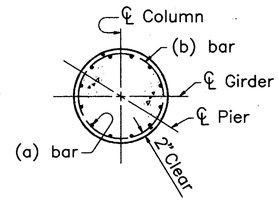
TABULATION OF PIER 2 PEDESTAL DATA										
PEDESTAL		2A	2B	2C	2D	2E	2F	2G	2H	2J
ELEVATION	X	1148.10	1148.32	1148.52	1148.73	1148.93	1148.87	1148.78	1148.70	1148.61
DIMENSION	H	20'-10 1/4"	21'-0 7/8"	21'-3 1/4"	21'-5 3/4"	21'-8 1/8"	21'-7 1/2"	21'-6 3/8"	21'-5 5/8"	21'-4 3/8"
REINF. STEEL	(a)	1006	1007	1008	1009	1010	1009	1009	1009	1008
MARK	(b)	407	409	412	414	417	416	415	414	413



PIER 1 FOOTING



PIER 2 FOOTING



SECTION B-B

NOTES:

ALL PILES ARE HP 10 x 42 WITH A DESIGN PILE LOAD OF 50 TONS PER PILE.

PILE LAYOUT DIMENSIONS ARE MEASURED ALONG THE BOTTOM OF FOOTING.

ALL BATTERED PILES SHALL BE INCLINED 3 IN 12 IN THE DIRECTION SHOWN. THE ESTIMATED AVERAGE PAY LENGTH OF THE PILES IS 35 FT. FOR PIERS 1 AND 2.

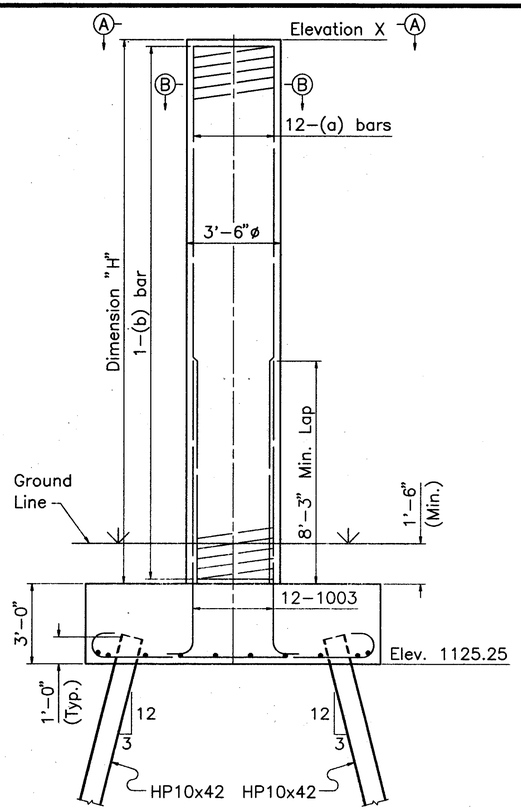
ALL REINFORCING BAR MARKS SHALL BE PREFIXED EP.
FOR REINFORCEMENT SCHEDULE, SEE SHEET 28/28.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

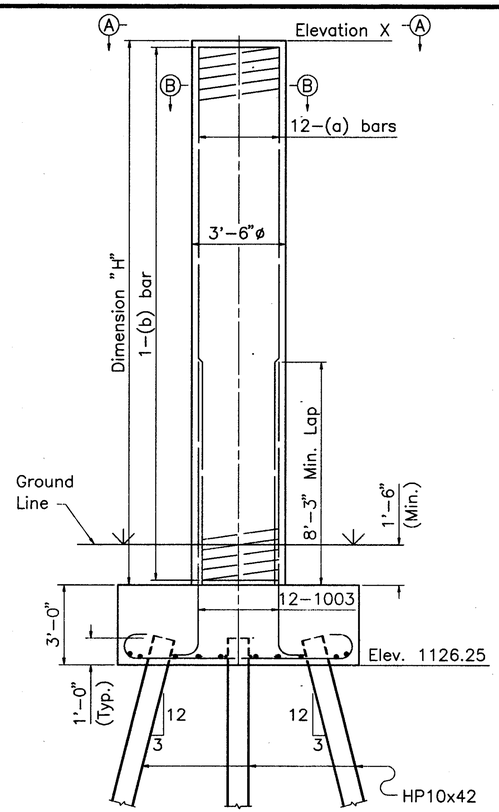
PIER LAYOUT DIAGRAM
AND PIERS 1 & 2
BR. NO. CUY-271-0629
RICHMOND ROAD (S.R. 175) OVER I-271
STA. 172+89.21
TO STA. 181+21.01
CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
MJP	MJP	RSY	CAB	
DATE 1-6-93	DATE 1-6-93	DATE 1-22-93	DATE 2-25-93	SHEET 11/28

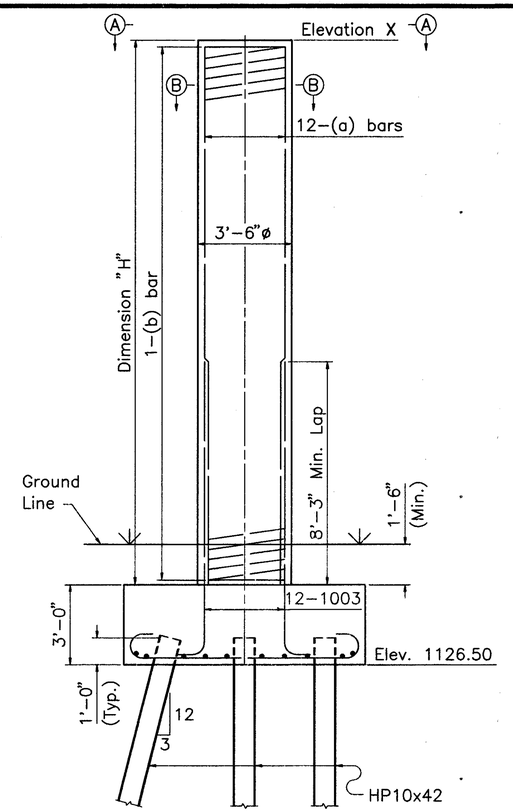
F:\PROJECTS\BRIDGE\14472\RICH\PIERS
1.9930223172927928E+007



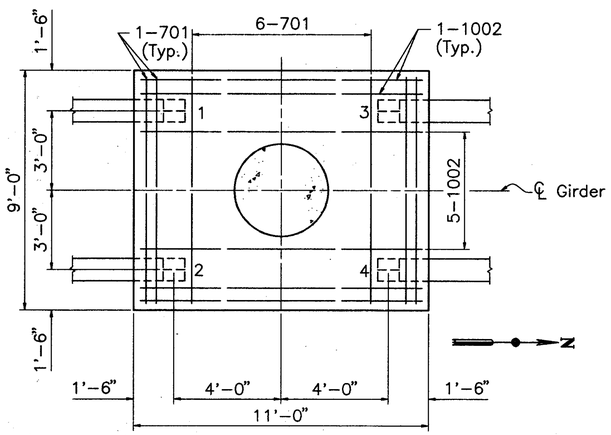
PIER 3



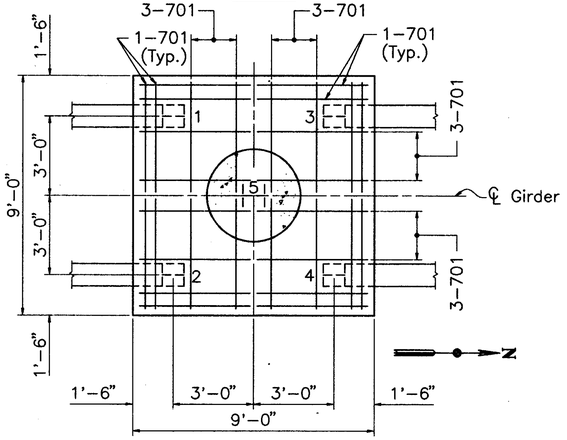
PIER 4



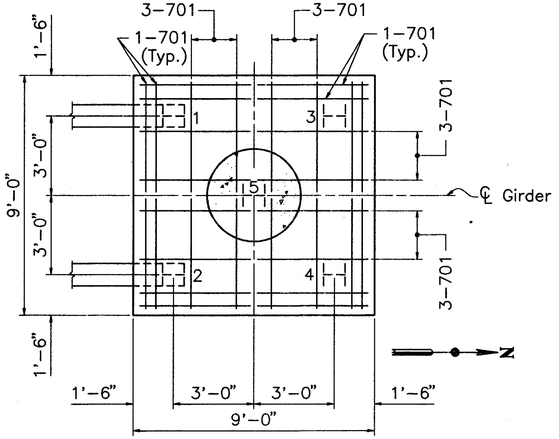
PIER 5



PIER 3 FOOTING



PIER 4 FOOTING



PIER 5 FOOTING

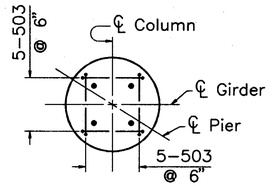
TABULATION OF PEDESTAL DATA

PEDESTAL		3A	3B	3H	3J	4A	4B	4H	4J	5A	5B	5C	5D	5E	5F	5G	5H	5J
ELEVATION	X	1148.97	1149.19	1149.57	1149.48	1149.47	1149.68	1150.07	1149.97	1150.21	1150.36	1150.49	1150.61	1150.69	1150.49	1150.26	1150.02	1149.76
DIMENSION	H	20'–8 5/8"	20'–11 1/4"	21'–3 7/8"	21'–2 3/4"	20'–2 5/8"	20'–5 1/8"	20'–9 7/8"	20'–8 5/8"	20'–8 1/2"	20'–10 3/8"	20'–11 7/8"	21'–1 3/8"	21'–2 1/4"	20'–11 7/8"	20'–9 1/8"	20'–6 1/4"	20'–3 1/8"
REINF. STEEL	(a)	1006	1007	1008	1008	1004	1005	1006	1006	1006	1006	1007	1007	1008	1007	1006	1005	1004
MARK	(b)	405	408	412	411	401	403	406	405	405	407	408	410	411	408	406	404	402

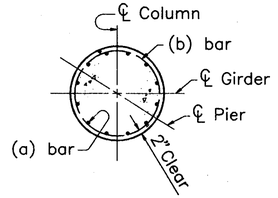
FHWA REGION	STATE	PROJECT	
5	OHIO		

88/110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29



VIEW A–A



SECTION B–B

NOTES:

ALL PILES ARE HP 10 x 42 WITH A DESIGN PILE LOAD OF 50 TONS PER PILE.

PILE LAYOUT DIMENSIONS ARE MEASURED ALONG THE BOTTOM OF FOOTING.

ALL BATTERED PILES SHALL BE INCLINED 3 IN 12 IN THE DIRECTION SHOWN.

THE ESTIMATED AVERAGE PAY LENGTH OF THE PILES IS 35 FT. FOR PIER 3 AND 30 FT. FOR PIERS 4 AND 5.

ALL REINFORCING BAR MARKS SHALL BE PREFIXED EP.
FOR REINFORCEMENT SCHEDULE, SEE SHEET 28/28.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

PROPOSED PIERS 3, 4 AND 5

BR. NO. CUY–271–0629

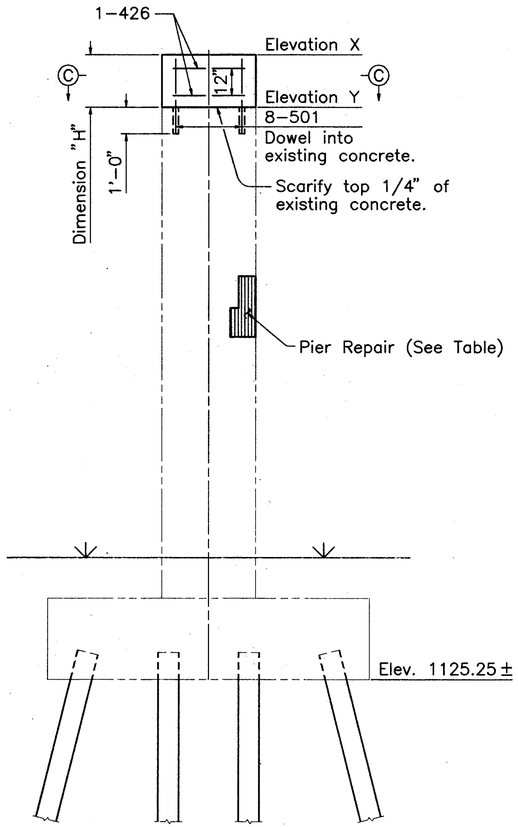
RICHMOND ROAD (S.R. 175) OVER I–271
STA. 172+89.21
TO STA. 181+21.01

CUYAHOGA COUNTY OHIO

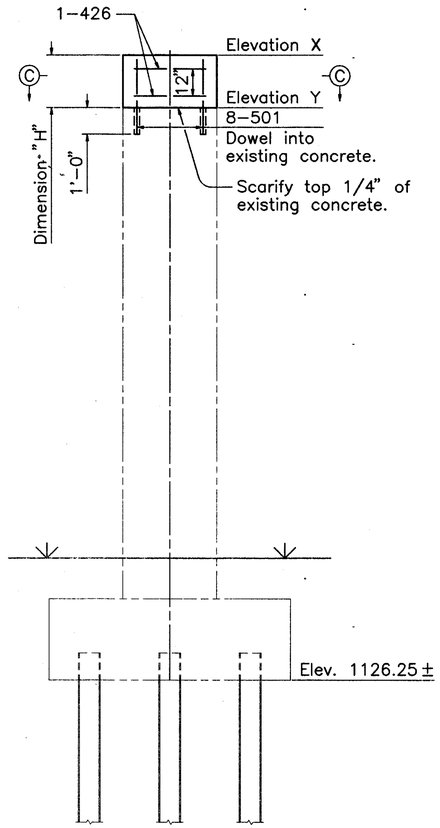
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
MJP	MJP	RSY	CAB	
DATE 1–6–93	DATE 1–6–93	DATE 1–22–93	DATE 2–25–93	SHEET 12/28

F:\PROJECTS\BRIDGE\14472\RICH\PIERS
1:99301270921273 9E+007

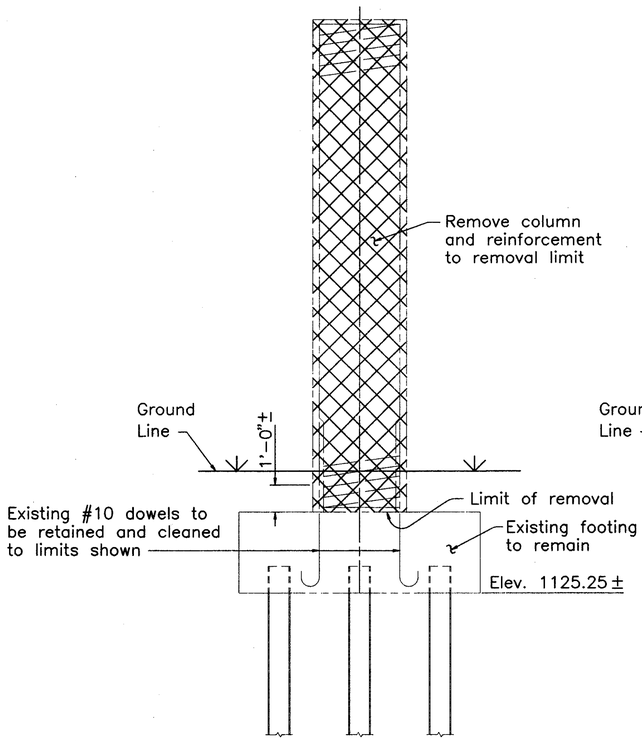
CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29



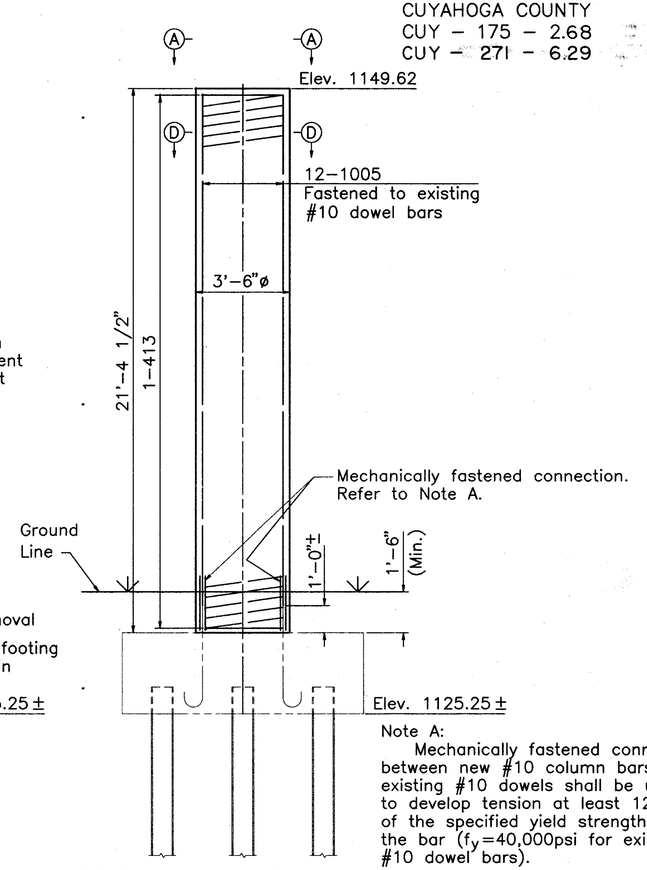
EXISTING PIER 3 PEDESTALS
(Excluding Pedestal 3D)



EXISTING PIER 4 PEDESTALS



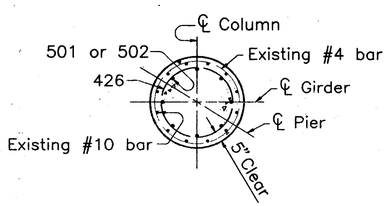
PEDESTAL 3D COLUMN REMOVAL



PEDESTAL 3D COLUMN REPLACEMENT

Note A:
Mechanically fastened connection between new #10 column bars and existing #10 dowels shall be used to develop tension at least 125% of the specified yield strength of the bar (f_y=40,000psi for existing #10 dowel bars).

TABULATION OF PEDESTAL DATA										
PEDESTAL		3C	3E	3F	3G	4C	4D	4E	4F	4G
ELEVATION	X	1149.41	1149.82	1149.75	1149.67	1149.89	1150.11	1150.30	1150.24	1150.15
	Y	1147.33±	1147.72±	1147.65±	1147.59±	1148.03±	1148.23±	1148.42±	1148.35±	1148.29±
DIMENSION	H	2'–1"±	2'–1¼"±	2'–1¼"±	2'–1"±	1'–10⅜"±	1'–10½"±	1'–10½"±	1'–10⅝"±	1'–10⅜"±



SECTION C–C

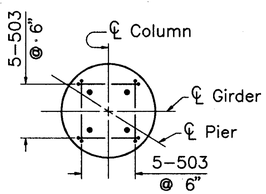
SUMMARY OF PIER REPAIR QUANTITIES				
MEASURED QUANTITY			MEASURED QUANTITY (M.Q.) (Date: 2/11/93)	ESTIMATED QUANTITY (1.2 x M.Q.)
PEDESTAL	UNIT			
3C	S.F.		0	0
3E	S.F.		6	7
3F	S.F.		0	0
3G	S.F.		0	0
4C	S.F.		0	0
4D	S.F.		11	13
4E	S.F.		0	0
4F	S.F.		11	13
4G	S.F.		6	7
			Total =	40

NOTES:

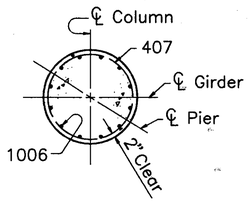
THE EXTENSION OF EXISTING PIERS 3 AND 4 AND THE REPLACEMENT OF PIER COLUMN 3D SHALL BE PAID FOR UNDER "ITEM 511 CLASS C CONCRETE, PIER ABOVE FOOTINGS".

THERE SHALL BE NO SEPARATE PAYMENT FOR THE MECHANICAL SPLICE CONNECTORS AT PIER 3D. ALL COSTS SHALL BE INCLUDED WITH ITEM 509.

ALL REINFORCING BAR MARKS SHALL BE PREFIXED EP. FOR REINFORCEMENT SCHEDULE, SEE SHEET 28/28.



VIEW A–A



SECTION D–D

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

EXISTING PIER MODIFICATIONS AND REPAIRS

BR. NO. CUY–271–0629
RICHMOND ROAD (S.R. 175) OVER I–271
STA. 172+89.21
TO STA. 181+21.01
CUYAHOGA COUNTY OHIO

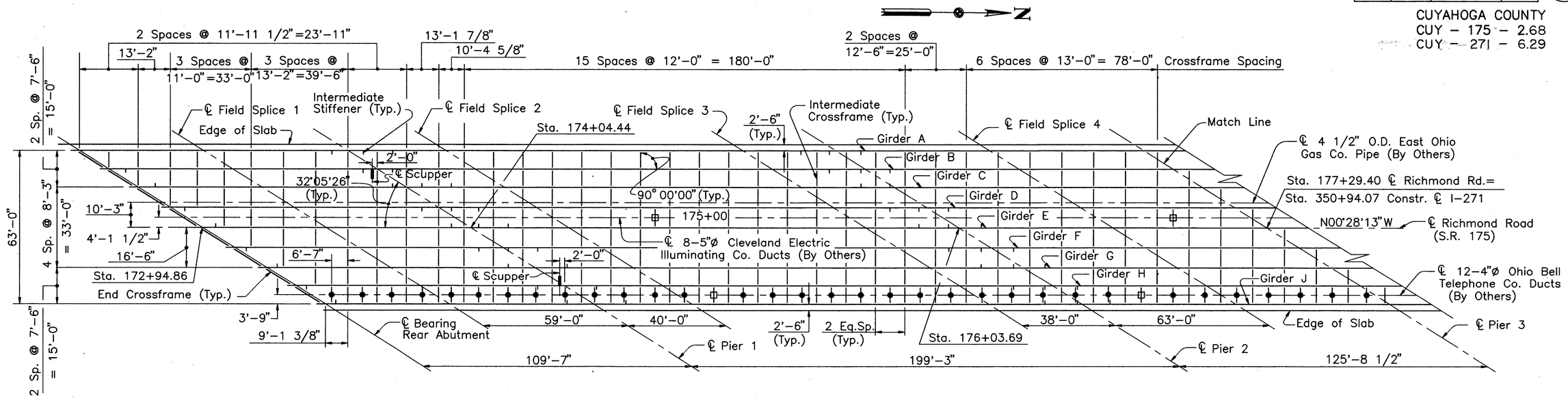
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
MJP	MJP	RSY	CAB	
DATE 1-6-93	DATE 1-6-93	DATE 1-22-93	DATE 2-25-93	SHEET 13/28

F:\PROJECTS\BRIDGE\14472\RICH\PIERS
1.99301270922501?E+007

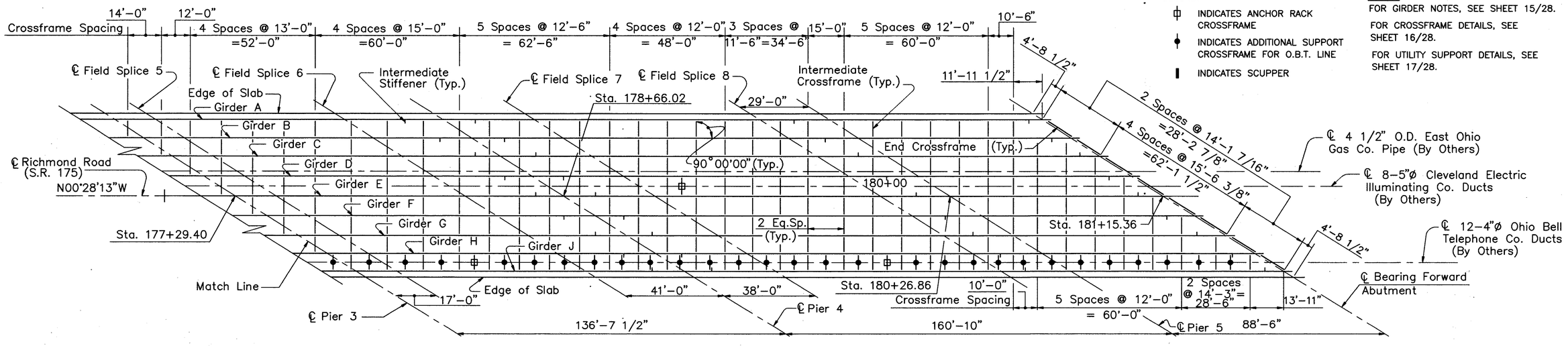
FHWA REGION	STATE	PROJECT	
5	OHIO		

90/110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29



PART FRAMING PLAN



LEGEND:
- ⊕ INDICATES ANCHOR RACK CROSSFRAME
- ♦ INDICATES ADDITIONAL SUPPORT CROSSFRAME FOR O.B.T. LINE
- ▌ INDICATES SCUPPER

NOTES:
FOR GIRDER NOTES, SEE SHEET 15/28.
FOR CROSSFRAME DETAILS, SEE SHEET 16/28.
FOR UTILITY SUPPORT DETAILS, SEE SHEET 17/28.

PART FRAMING PLAN

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

FRAMING PLAN

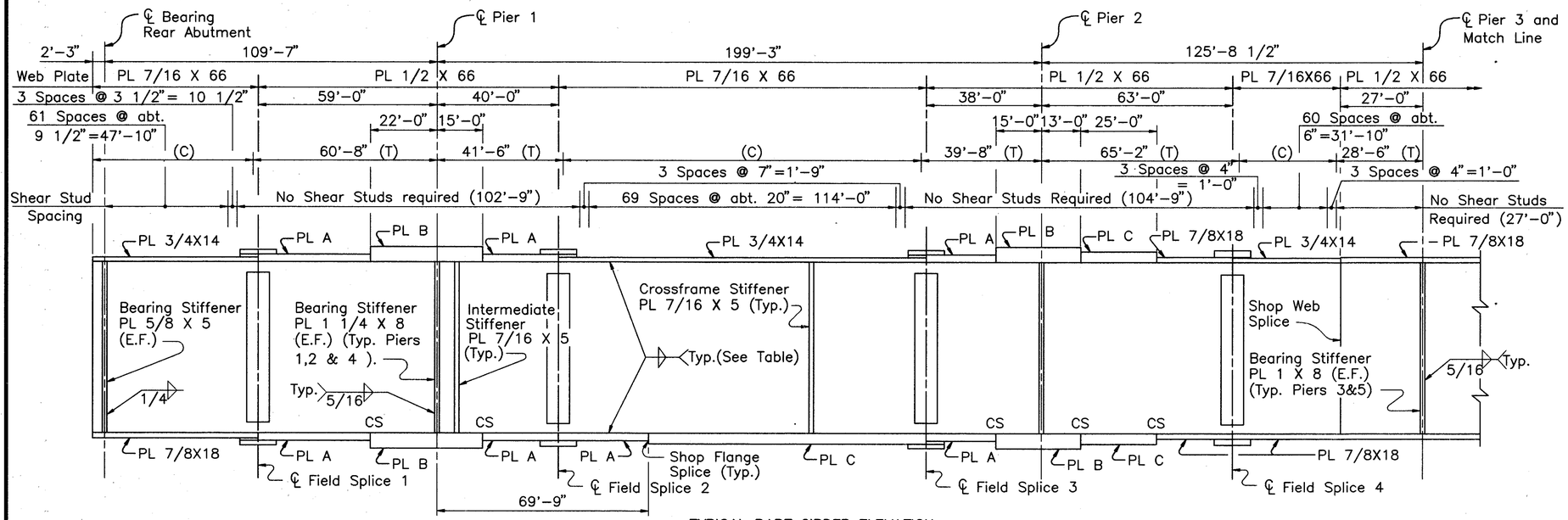
BR. NO. CUY-271-0629

RICHMOND ROAD (S.R. 175) OVER I-271
STA. 172+89.21
TO STA. 181+21.01

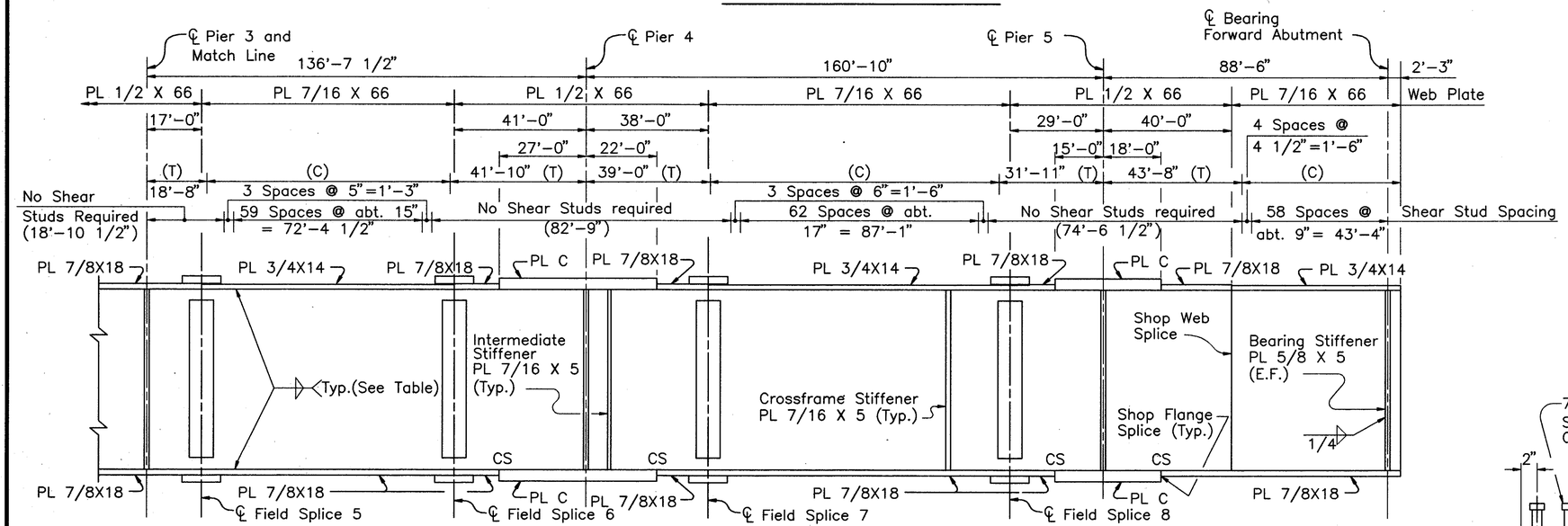
CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
NF	NF	RHW/RSY	CAB	
DATE 11/23/92	DATE 11/23/92	DATE 1/15/93	DATE 2/25/93	SHEET 14/28

F:\PROJECTS\BRIDGE\14472\RICH\FRAMING



TYPICAL PART GIRDER ELEVATION



TYPICAL PART GIRDER ELEVATION

LEGEND:

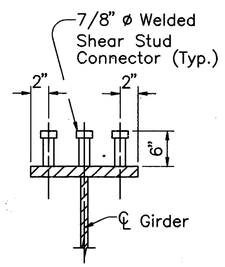
(T) DENOTES AREA OF TENSION IN THE TOP FLANGE. THE BOTTOM FLANGE IN THESE AREAS IS IN COMPRESSION.

(C) DENOTES AREA OF COMPRESSION IN THE TOP FLANGE. THE BOTTOM FLANGE IN THESE AREAS IS IN TENSION.

"CS" INDICATES BUTT WELD SUBJECT TO COMPRESSIVE STRESSES ONLY.

TABLE OF FLANGE PLATES		
PLATE	GIRDERS A,B,H & J	GIRDERS C THRU G
A	1 1/8 X 18	1 1/4 X 18
B	2 1/4 X 18	2 1/2 X 18
C	1 5/8 X 18	1 3/4 X 18

WELD SIZE–WEB TO FLANGE	
FLANGE PLATE THICKNESS	FILLET WELD SIZE
3/4"	1/4
7/8" Thru 1–1/2"	5/16
1–5/8" Thru 2–1/2"	3/8



SHEAR STUD DETAIL

Note: Stud Placement on Flange Splice Plates is not Permitted. Adjust spacings as required to avoid interference with Splice Plates and Connections Bolts.

FHWA REGION	STATE	PROJECT	
5	OHIO		

91 / 110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29

GIRDER NOTES:

THE WEB PLATES MAY BE SHOP SPLICED AS REQUIRED BY AVAILABLE PLATE LENGTH. THE LOCATION OF WEB SHOP SPLICES SHALL BE SUBMITTED TO THE DIRECTOR FOR APPROVAL PRIOR TO ORDERING OF MATERIAL.

ALL FLANGE AND WEB PLATES SHALL BE DESIGNATED "CVN" WITH THE MATERIAL MEETING SPECIFIED MINIMUM NOTCH TOUGHNESS REQUIREMENTS IN ACCORDANCE WITH 711.01. THE FABRICATOR SHALL SUBMIT TO THE DIRECTOR A PROCEDURE DESIGNED FOR POSITIVE IDENTIFICATION OF MATERIAL THROUGH ALL PHASES OF FABRICATION. NO MATERIAL SHALL BE FABRICATED UNTIL THE DIRECTOR HAS APPROVED THE PROCEDURE.

ALL GIRDER FIELD SPLICES SHALL BE MADE WITH 1" DIA. ASTM A325, TYPE I HIGH–STRENGTH STEEL BOLTS.

BEARING STIFFENERS SHALL BE PLACED IN PAIRS ON ALL GIRDERS AND SHALL BE SET VERTICAL WITH FULL BEARING ON THE BOTTOM FLANGE AND A TIGHT FIT AT THE TOP FLANGE.

INTERMEDIATE STIFFENERS SHALL BE PLACED SINGLY, EXCEPT AT CROSSFRAMES OF INTERIOR GIRDERS WHERE THE STIFFENERS SHALL BE PLACED IN PAIRS. ALL INTERMEDIATE STIFFENERS SHALL BE WELDED TO THE GIRDER WEB WITH A 1/4" CONTINUOUS FILLET WELD ON BOTH SIDES OF THE STIFFENERS AND SINGLY PLACED STIFFENERS SHALL BE WELDED TO THE COMPRESSION FLANGE. CROSSFRAME STIFFENERS SHALL BE WELDED TO THE TOP AND BOTTOM GIRDER FLANGES WITH A 5/16" FILLET WELD ON BOTH SIDES OF THE STIFFENERS. THE INTERMEDIATE STIFFENERS SHALL BE PLACED NORMAL TO THE GIRDER FLANGE AS SHOWN ON THE FRAMING PLAN, EQUALLY SPACED BETWEEN CROSSFRAMES OR CROSSFRAMES AND BEARING STIFFENERS OR CROSSFRAMES AND SPLICES.

WELDED ATTACHEMENT OF SUPPORTS FOR CONCRETE DECK FINISHING MACHINE MAY BE MADE TO AREAS OF THE FASCIA GIRDER FLANGES DESIGNATED "COMPRESSION (C)". ATTACHMENTS SHALL NOT BE MADE TO AREAS DESIGNATED "TENSION (T)". FILLET WELDS TO COMPRESSION FLANGES SHALL NOT BE CLOSER THAN 1" FROM EDGE OF FLANGE, BE NOT MORE THAN 2" LONG, AND BE NOT SMALLER THAN THE MINIMUM SIZE REQUIRED BY AASHTO.

BUTT WELDS AT SHOP SPLICES SHALL BE COMPLETE PENETRATION WELDS (CJP).

NOTES:

FOR FIELD SPLICE DETAILS, SEE SHEET 16 OF 28.
FOR POT BEARING DETAILS, SEE SHEET 25 OF 28.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

GIRDER ELEVATION

BR. NO. CUY–271–0629

RICHMOND ROAD (S.R. 175) OVER I–271
STA. 172+89.21
STA. 181+21.01

CUYAHOGA COUNTY OHIO

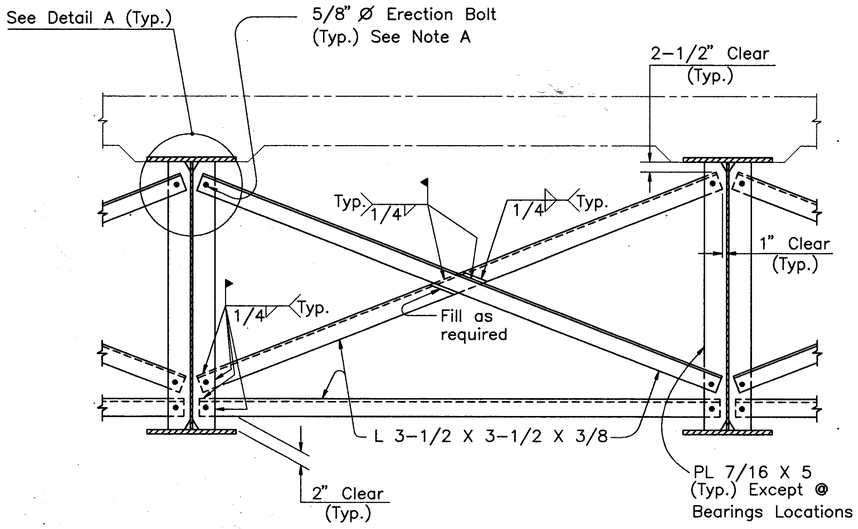
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
NF	NF	RSY	CAB	
DATE 1/4/93	DATE 1/4/93	DATE 1/18/93	DATE 2/25/93	SHEET 15/28

F:\PROJECTS\BRIDGE\1447\2\MCH\GIRDER

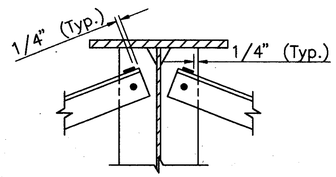
FHWA REGION	STATE	PROJECT	
5	OHIO		

92
110

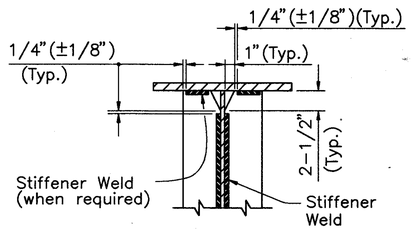
CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29



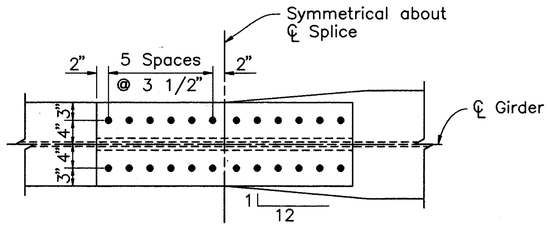
INTERMEDIATE CROSSFRAME



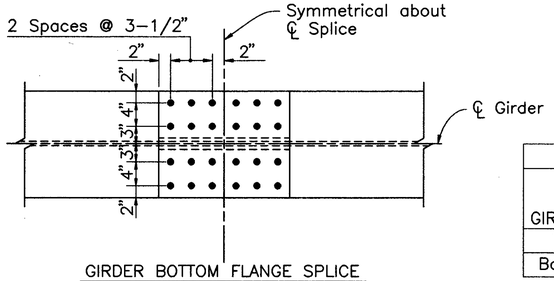
DETAIL A



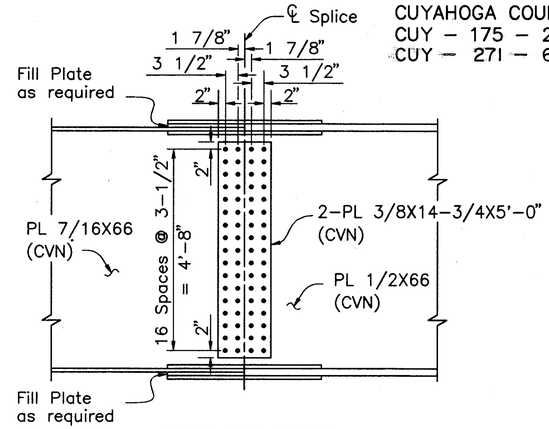
STIFFENER CLIP DETAIL



GIRDER TOP FLANGE SPLICE
(1 Outside and 2 Inside Plates Required)



GIRDER BOTTOM FLANGE SPLICE
(1 Outside and 2 Inside Plates Required)



GIRDER WEB SPLICE

GIRDER FLANGE SPLICES			
	FLANGE SPLICE PLATES (CVN)		
GIRDER FLANGES	OUTSIDE (1)	INSIDE (2)	FLANGE BOLTS NUMBER
Top Flange	1/2 X 14 X 3'–7"	1/2 X 6 X 3'–7"	24
Bottom Flange	1/2 X 18 X 1'–10"	1/2 X 8 X 1'–10"	24

FIELD SPLICE DETAILS

NOTE A:

HOLE DIAMETER IN THE CROSSFRAMES AND GIRDER STIFFENERS SHALL BE RESPECTIVELY 1/16" AND 1/4" LARGER THAN THE DIAMETER OF THE ERECTION BOLTS. SEE THE OHIO CONSTRUCTION AND MATERIAL SPECIFICATIONS SECTION 513.22, FOR FURTHER INFORMATION. BOLTS SHALL BE FURNISHED AS PART OF ITEM 513.

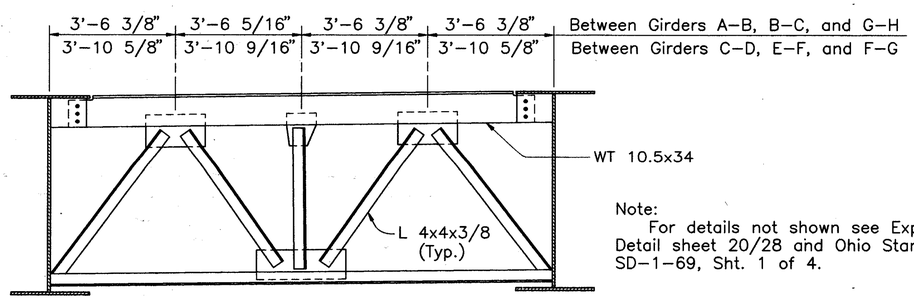
NOTES:

FOR CROSSFRAME LOCATIONS SEE SHEET 14/28.

FOR GIRDER NOTES, SEE SHEET 15/28.

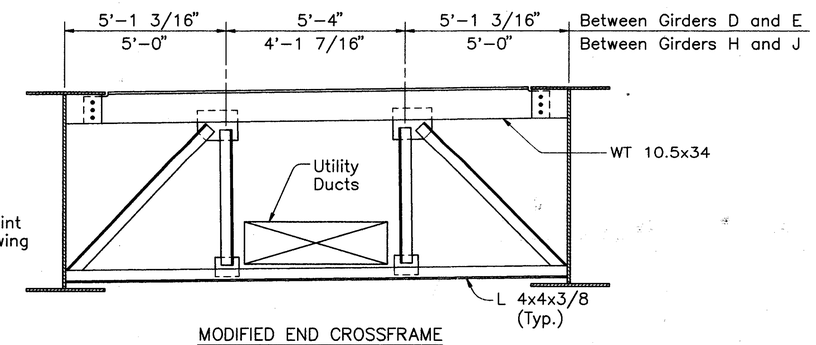
WHERE A SHAPE OR PLATE IS LABELED "CVN", THE MATERIAL SHALL MEET THE MINIMUM NOTCH TOUGHNESS REQUIREMENTS IN ACCORDANCE WITH 711.01.

INTERMEDIATE CROSSFRAME DETAILS



END CROSSFRAME

Note:
For details not shown see Expansion Joint Detail sheet 20/28 and Ohio Standard Drawing SD–1–69, Sht. 1 of 4.



MODIFIED END CROSSFRAME
(BETWEEN GIRDERS D AND E AND GIRDERS H AND J)

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

SUPERSTRUCTURE DETAILS

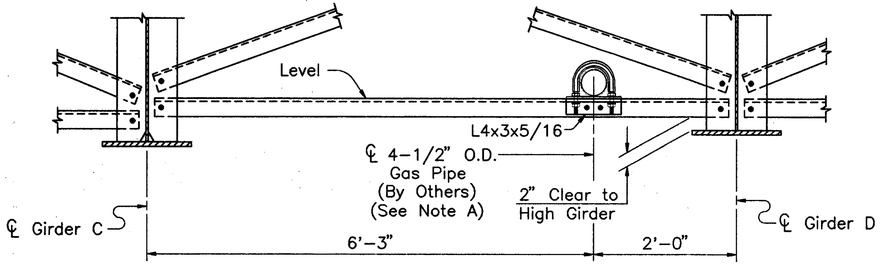
BR. NO. CUY–271–0629
RICHMOND ROAD (S.R. 175) OVER I–271
STA. 172+89.21
STA. 181+21.01
CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
NF	NF	RSY	CAB	
DATE 1/13/93	DATE 1/15/93	DATE 1/19/93	DATE 2/25/93	SHEET 16/28

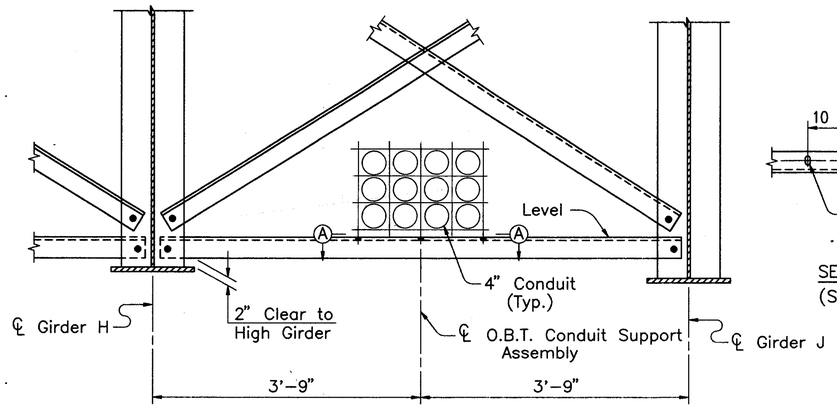
F:\PROJECTS\BRIDGE\14472\KRCA\SUPERDTL

FHWA REGION	STATE	PROJECT	
5	OHIO		

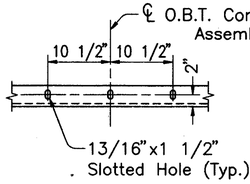
CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29



INTERMEDIATE CROSSFRAME BETWEEN GIRDERS C AND D

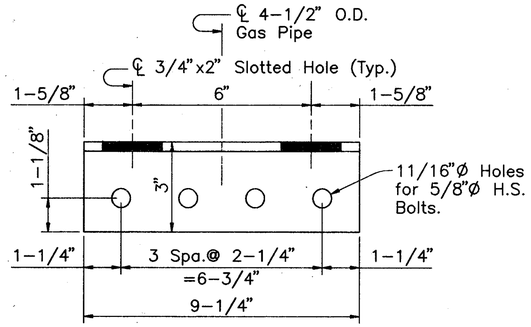


INTERMEDIATE CROSSFRAME BETWEEN GIRDERS H AND J



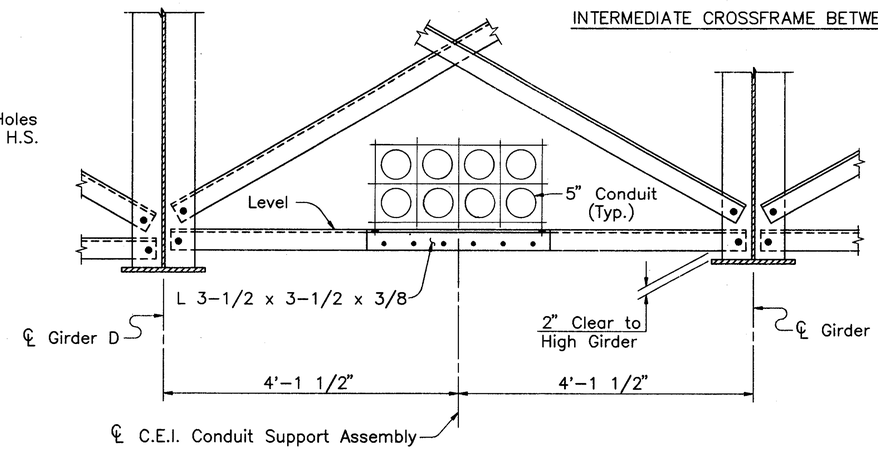
SECTION A–A
(See Note C)

Note C:
The twelve – 4" Ohio Bell Telephone Company ducts including conduit support assemblies will be furnished and installed by others. The slotted holes in the crossframe angles for the conduit support assemblies shall be furnished by the bridge contractor.

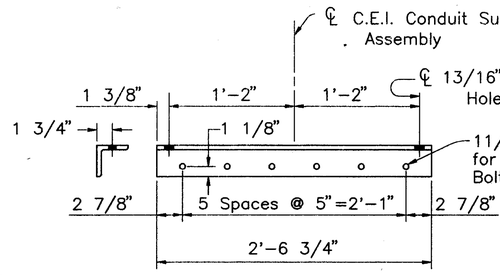


GAS PIPE SUPPORT ANGLE

Note A:
Gas pipe, 5/8"Ø U–bolts, washers, nuts, vinyl tubing and polypropylene pads to be furnished and installed by The East Ohio Gas Company.

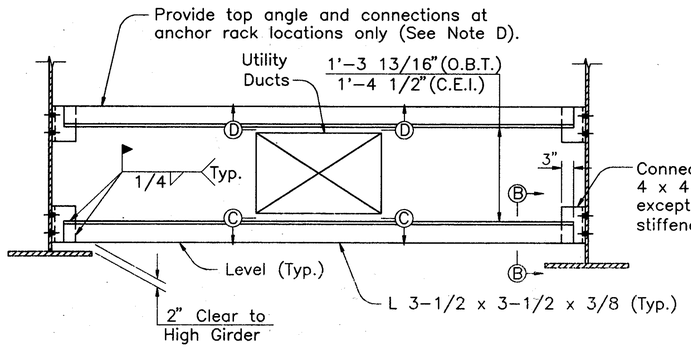


INTERMEDIATE CROSSFRAME BETWEEN GIRDERS D AND E

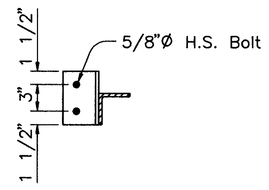


CONDUIT SUPPORT ANGLE
(See Note B)

Note B:
The eight – 5" Cleveland Electric Illuminating Co. ducts including conduit support assemblies will be furnished and installed by others. The conduit support angles shall be furnished and installed by the bridge contractor and paid for by the Cleveland Electric Illuminating Company.

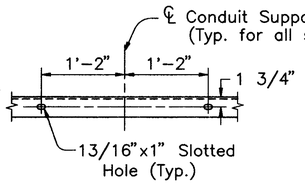


ANCHOR RACK BETWEEN GIRDERS D AND E
ADDITIONAL SUPPORT CROSSFRAME AND
ANCHOR RACK BETWEEN GIRDERS H AND J

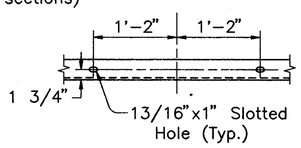


SECTION B–B

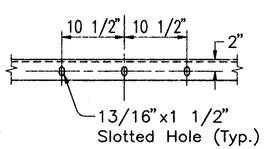
Note D:
The utility ducts including conduit support assemblies will be furnished and installed by others. The anchor rack conduit support angles and connection angles shall be furnished and installed by the bridge contractor and paid for by the Cleveland Electric Illuminating Company or the Ohio Bell Telephone Company.
At intermediate stiffener locations the support angle shall be welded to the stiffener.



BETWEEN GIRDERS D AND E

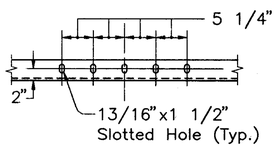


BETWEEN GIRDERS D AND E



BETWEEN GIRDERS H AND J

SECTION C–C



BETWEEN GIRDERS H AND J

SECTION D–D

NOTES:

THE TOPS OF ALL SUPPORT ANGLES SHALL BE SET TO ALIGN WITH THE TOPS OF THE CROSSFRAME ANGLES.

FOR CROSSFRAME AND UTILITY LOCATIONS, SEE SHEET 14/48.

FOR CROSSFRAME DETAILS, SEE SHEET 16/28.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

UTILITY SUPPORT DETAILS

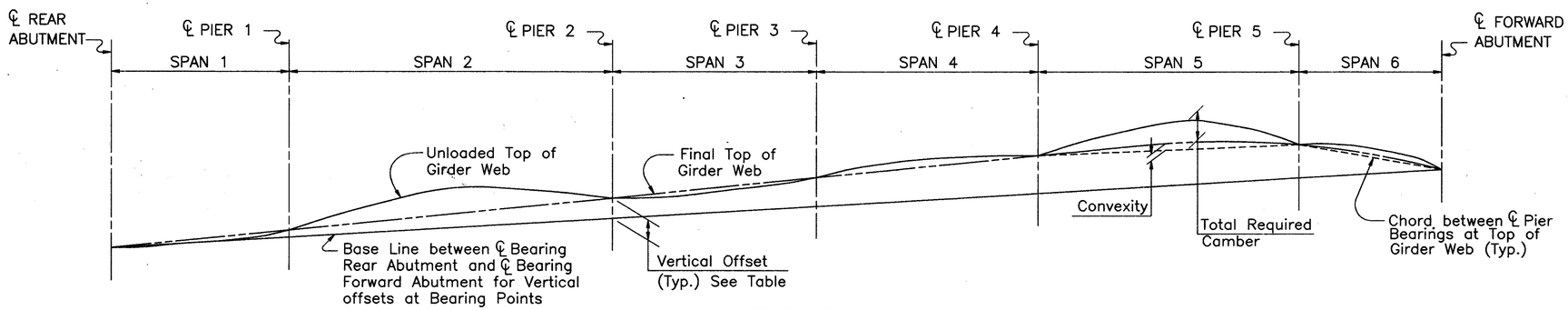
BR. NO. CUY–271–0629

RICHMOND ROAD (S.R. 175) OVER I–271
STA. 172+89.21
TO STA. 181+21.01

CUYAHOGA COUNTY OHIO

DRAWN JOL/MJP	TRACED JOL/MJP	CHECKED RHW/JOL	REVIEWED CAB	REVISED
DATE 1/28/93	DATE 1/28/93	DATE 1/29/93	DATE 2-25-93	SHEET 17/28

F:\PROJECTS\BRIDGE\14472\ROH\UTILITY



CAMBER DIAGRAM

FHWA REGION	STATE	PROJECT	
5	OHIO		

94/110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29

VERTICAL OFFSETS AT BEARING POINTS

BEARING POINT	GIRDER								
	A	B	C	D	E	F	G	H	J
R. ABUT	0	0	0	0	0	0	0	0	0
PIER 1	1 1/2"	1 9/16"	2 1/16"	2 5/16"	2 5/8"	3 1/8"	3 3/8"	3 7/8"	4 3/16"
PIER 2	4"	4 11/16"	5 5/8"	6 1/2"	7 9/16"	8 3/4"	9 3/4"	10 13/16"	1'–0"
PIER 3	5 9/16"	6 5/8"	7 13/16"	9 1/8"	10 11/16"	1'–0 1/8"	1'–1 13/16"	1'–3 1/4"	1'–4 13/16"
PIER 4	7 7/16"	8 3/4"	10 5/16"	1'–0 1/8"	1'–1 15/16"	1'–4 1/8"	1'–6 1/8"	1'–8 3/16"	1'–10 1/8"
PIER 5	8 5/16"	9 1/4"	10 3/16"	11 7/16"	1'–0 3/8"	1'–1 7/16"	1'–2 7/16"	1'–3"	1'–3 5/8"
F. ABUT	0	0	0	0	0	0	0	0	0

DEAD LOAD DEFLECTIONS AND CAMBER — SPAN 1

GIRDER	0.1 STL	0.1 REM DL	0.1 CON	0.1 TOTAL	0.2 STL	0.2 REM DL	0.2 CON	0.2 TOTAL	0.3 STL	0.3 REM DL	0.3 CON	0.3 TOTAL	0.4 STL	0.4 REM DL	0.4 CON	0.4 TOTAL	FS 1 STL	FS 1 REM DL	FS 1 CON	FS 1 TOTAL	0.6 STL	0.6 REM DL	0.6 CON	0.6 TOTAL	0.7 STL	0.7 REM DL	0.7 CON	0.7 TOTAL	0.8 STL	0.8 REM DL	0.8 CON	0.8 TOTAL	0.9 STL	0.9 REM DL	0.9 CON	0.9 TOTAL
A & J	0	0	0	0	0	0	0	0	0	–1/8	0	–1/8	–1/16	–1/4	0	–5/16	–1/16	–5/16	0	–3/8	–1/8	–9/16	0	–11/16	–3/16	–5/8	0	–13/16	–1/8	–9/16	0	–11/16	–1/16	–3/8	0	–7/16
B & H	0	0	0	0	0	0	0	0	0	–1/8	0	–1/8	–1/16	–1/4	0	–5/16	–1/16	–3/8	0	–7/16	–1/8	–9/16	0	–11/16	–3/16	–11/16	0	–7/8	–1/8	–5/8	0	–3/4	–1/16	–7/16	0	–1/2
C & G	0	0	0	0	0	0	0	0	0	–1/8	0	–1/8	–1/16	–1/4	0	–5/16	–1/16	–3/8	0	–7/16	–1/8	–9/16	0	–11/16	–1/8	–11/16	0	–13/16	–1/8	–5/8	0	–3/4	–1/16	–3/8	0	–7/16
D,E &F	0	0	0	0	0	0	0	0	0	–1/8	0	–1/8	–1/16	–1/4	0	–5/16	–1/16	–3/8	0	–7/16	–1/8	–5/8	0	–3/4	–1/8	–11/16	0	–13/16	–1/8	–5/8	0	–3/4	–1/16	–7/16	0	–1/2

DEAD LOAD DEFLECTIONS AND CAMBER — SPAN 2

GIRDER	0.1 STL	0.1 REM DL	0.1 CON	0.1 TOTAL	FS 2 STL	FS 2 REM DL	FS 2 CON	FS 2 TOTAL	0.3 STL	0.3 REM DL	0.3 CON	0.3 TOTAL	0.4 STL	0.4 REM DL	0.4 CON	0.4 TOTAL	0.5 STL	0.5 REM DL	0.5 CON	0.5 TOTAL	0.6 STL	0.6 REM DL	0.6 CON	0.6 TOTAL
A & J	5/16	1 3/16	0	1 1/2	13/16	2 7/8	0	3 11/16	1 5/16	4 1/2	0	5 13/16	1 5/8	5 5/8	0	7 1/4	1 3/4	6 1/16	0	7 13/16	1 5/8	5 5/8	0	7 1/4
B & H	5/16	1 1/4	0	1 9/16	13/16	3 1/16	0	3 7/8	1 5/16	4 13/16	0	6 1/8	1 5/8	6	0	7 5/8	1 3/4	6 7/16	0	8 3/16	1'5/8	6	0	7 5/8
C & G	5/16	1 3/16	0	1 1/2	3/4	2 15/16	0	3 11/16	1 1/4	4 5/8	0	5 7/8	1 9/16	5 13/16	0	7 3/8	1 11/16	6 1/4	0	7 15/16	1 9/16	5 7/8	0	7 7/16
D,E &F	5/16	1 1/4	0	1 9/16	13/16	3 1/16	0	3 7/8	1 1/4	4 13/16	0	6 1/16	1 9/16	6 1/16	0	7 5/8	1 11/16	6 1/2	0	8 3/16	1 9/16	6 1/16	0	7 5/8

DEAD LOAD DEFLECTIONS AND CAMBER — SPAN 2

GIRDER	0.7 STL	0.7 REM DL	0.7 CON	0.7 TOTAL	FS 3 STL	FS 3 REM DL	FS 3 CON	FS 3 TOTAL	0.9 STL	0.9 REM DL	0.9 CON	0.9 TOTAL
A & J	1 5/16	4 1/2	0	5 13/16	3/4	2 3/4	0	3 1/2	3/8	1 1/4	0	1 5/8
B & H	1 5/16	4 13/16	0	6 1/8	13/16	2 15/16	0	3 3/4	3/8	1 5/16	0	1 11/16
C & G	1 1/4	4 11/16	0	5 15/16	3/4	2 13/16	0	3 9/16	5/16	1 1/4	0	1 9/16
D,E &F	1 1/4	4 13/16	0	6 1/16	3/4	2 15/16	0	3 11/16	5/16	1 5/16	0	1 5/8

NOTES:

NEGATIVE VALUES FOR DEFLECTIONS INDICATE DEFLECTIONS ABOVE CHORD LINE. NEGATIVE VALUES OF CONVEXITY AND TOTAL REQUIRED CAMBER INDICATE VALUES BELOW CHORD LINE.

DEFLECTIONS AND CONVEXITIES ARE GIVEN TO THE NEAREST 1/16 INCH.

THE FOLLOWING ABBREVIATIONS ARE USED:

STL. = DEAD LOAD DEFLECTION DUE TO THE WEIGHT OF STEEL
REM. D.L. = REMAINING DEAD LOAD DEFLECTION
CON. = CONVEXITY
TOT. = TOTAL REQUIRED CAMBER

NO CONVEXITY IS REQUIRED IN THE SPANS IN WHICH THE CHORD BETWEEN CENTERLINE PIER BEARINGS DOES NOT APPEAR.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

CAMBER DIAGRAM

BR. NO. CUY–271–0629

RICHMOND ROAD (S.R. 175) OVER I–271
STA. 172+89.21
STA. 181+21.01

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
NF	NF	WDD	CAB	
DATE 1/8/93	DATE 1/8/93	DATE 2/1/93	DATE 2/25/93	SHEET 18/28

F:\PROJECTS\BRIDGE\14472\RICH\CAMBER

FHWA REGION	STATE	PROJECT	
5	OHIO		

95
110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29

DEAD LOAD DEFLECTIONS AND CAMBER

SPAN 3

GIRDER	0.1 STL	0.1 REM DL	0.1 CON	0.1 TOTAL	0.2 STL	0.2 REM DL	0.2 CON	0.2 TOTAL	0.3 STL	0.3 REM DL	0.3 CON	0.3 TOTAL	0.4 STL	0.4 REM DL	0.4 CON	0.4 TOTAL	FS 4 STL	FS 4 REM DL	FS 4 CON	FS 4 TOTAL	0.6 STL	0.6 REM DL	0.6 CON	0.6 TOTAL	0.7 STL	0.7 REM DL	0.7 CON	0.7 TOTAL	0.8 STL	0.8 REM DL	0.8 CON	0.8 TOTAL	0.9 STL	0.9 REM DL	0.9 CON	0.9 TOTAL
A & J	-1/8	-7/16	0	-9/16	-3/16	-11/16	0	-7/8	-3/16	-3/4	0	-15/16	-3/16	-5/8	0	-13/16	-1/8	-1/2	0	-5/8	-1/8	-3/8	0	-1/2	-1/16	-5/16	0	-3/8	-1/16	-1/4	0	-5/16	-1/16	-3/16	0	-1/4
B & H	-1/8	-1/2	0	-5/8	-3/16	-3/4	0	-15/16	-3/16	-3/4	0	-15/16	-3/16	-11/16	0	-7/8	-1/8	-9/16	0	-11/16	-1/8	-7/16	0	-9/16	-1/16	-5/16	0	-3/8	-1/16	-1/4	0	-5/16	-1/16	-3/16	0	-1/4
C & G	-1/8	-1/2	0	-5/8	-3/16	-3/4	0	-15/16	-3/16	-13/16	0	-1	-3/16	-3/4	0	-15/16	-1/8	-9/16	0	-11/16	-1/8	-7/16	0	-9/16	-1/16	-5/16	0	-3/8	-1/16	-1/4	0	-5/16	-1/16	-3/16	0	-1/4
D,E &F	-1/8	-1/2	0	-5/8	-3/16	-3/4	0	-15/16	-3/16	-13/16	0	-1	-3/16	-3/4	0	-15/16	-1/8	-5/8	0	-3/4	-1/8	-7/16	0	-9/16	-1/16	-3/8	0	-7/16	-1/16	-5/16	0	-3/8	-1/16	-3/16	0	-1/4

DEAD LOAD DEFLECTIONS AND CAMBER

SPAN 4

GIRDER	FS 5 STL	FS 5 REM DL	FS 5 CON	FS 5 TOTAL	0.2 STL	0.2 REM DL	0.2 CON	0.2 TOTAL	0.3 STL	0.3 REM DL	0.3 CON	0.3 TOTAL	0.4 STL	0.4 REM DL	0.4 CON	0.4 TOTAL	0.5 STL	0.5 REM DL	0.5 CON	0.5 TOTAL	0.6 STL	0.6 REM DL	0.6 CON	0.6 TOTAL	FS 6 STL	FS 6 REM DL	FS 6 CON	FS 6 TOTAL	0.8 STL	0.8 REM DL	0.8 CON	0.8 TOTAL	0.9 STL	0.9 REM DL	0.9 CON	0.9 TOTAL
A & J	1/8	7/16	0	9/16	3/16	3/4	0	15/16	1/4	1 1/16	0	1 5/16	5/16	1 3/16	0	1 1/2	5/16	1 3/16	0	1 1/2	1/4	15/16	0	1 3/16	1/8	9/16	0	11/16	1/16	1/4	0	5/16	0	0	0	0
B & H	1/8	1/2	0	5/8	3/16	13/16	0	1	1/4	1 1/8	0	1 3/8	5/16	1 5/16	0	1 5/8	5/16	1 1/4	0	1 9/16	1/4	1	0	1 1/4	1/8	5/8	0	3/4	1/16	1/4	0	5/16	0	0	0	0
C & G	1/8	1/2	0	5/8	3/16	13/16	0	1	1/4	1 1/8	0	1 3/8	5/16	1 5/16	0	1 5/8	1/4	1 1/4	0	1 1/2	1/4	1	0	1 1/4	1/8	5/8	0	3/4	1/16	1/4	0	5/16	0	0	0	0
D,E &F	1/8	1/2	0	5/8	3/16	13/16	0	1	1/4	1 3/16	0	1 7/16	5/16	1 3/8	0	1 11/16	1/4	1 5/16	0	1 9/16	1/4	1 1/16	0	1 5/16	1/8	5/8	0	3/4	1/16	1/4	0	5/16	0	0	0	0

DEAD LOAD DEFLECTIONS AND CAMBER

SPAN 5

GIRDER	0.1 STL	0.1 REM DL	0.1 CON	0.1 TOTAL	FS 7 STL	FS 7 REM DL	FS 7 CON	FS 7 TOTAL	0.3 STL	0.3 REM DL	0.3 CON	0.3 TOTAL	0.4 STL	0.4 REM DL	0.4 CON	0.4 TOTAL	0.5 STL	0.5 REM DL	0.5 CON	0.5 TOTAL	0.6 STL	0.6 REM DL	0.6 CON	0.6 TOTAL	0.7 STL	0.7 REM DL	0.7 CON	0.7 TOTAL
A	1/16	3/8	1/8	9/16	5/16	1 3/8	1/4	1 15/16	7/16	1 13/16	3/8	2 5/8	9/16	2 7/16	1/2	3 1/2	5/8	2 11/16	5/8	3 15/16	5/8	2 9/16	3/4	3 15/16	1/2	2 1/16	7/8	3 7/16
B	1/16	7/16	3/16	11/16	5/16	1 7/16	3/8	2 1/8	7/16	1 15/16	9/16	2 15/16	9/16	2 9/16	13/16	3 15/16	5/8	2 7/8	1	4 1/2	5/8	2 3/4	1 3/16	4 9/16	1/2	2 3/16	1 5/16	4
C	1/16	7/16	5/16	13/16	5/16	1 7/16	9/16	2 5/16	7/16	1 15/16	7/8	3 1/4	9/16	2 9/16	1 1/8	4 1/4	5/8	2 7/8	1 7/16	4 15/16	9/16	2 11/16	1 11/16	4 15/16	1/2	2 3/16	1 3/4	4 7/16
D	1/16	7/16	7/16	15/16	5/16	1 7/16	13/16	2 9/16	7/16	2	1 1/4	3 11/16	9/16	2 5/8	1 5/8	4 13/16	5/8	2 15/16	2	5 9/16	9/16	2 13/16	2 1/4	5 5/8	1/2	2 1/4	2 1/8	4 7/8
E	1/16	7/16	9/16	1 1/16	5/16	1 7/16	1 1/16	2 13/16	7/16	2	1 5/8	4 1/16	9/16	2 5/8	2 3/16	5 3/8	5/8	2 15/16	2 9/16	6 1/8	9/16	2 13/16	2 5/8	6	1/2	2 1/4	2 7/16	5 3/16
F	1/16	7/16	11/16	1 3/16	5/16	1 7/16	1 3/8	3 1/8	7/16	2	2 1/8	4 9/16	9/16	2 5/8	2 11/16	5 7/8	5/8	2 15/16	3	6 9/16	9/16	2 13/16	3	6 3/8	1/2	2 1/4	2 11/16	5 7/16
G	1/16	7/16	7/8	1 3/8	5/16	1 7/16	1 3/4	3 1/2	7/16	1 15/16	2 9/16	4 15/16	9/16	2 9/16	3 1/8	6 1/4	5/8	2 7/8	3 3/8	6 7/8	9/16	2 11/16	3 1/4	6 1/2	1/2	2 3/16	2 7/8	5 9/16
H	1/16	7/16	1 1/16	1 9/16	5/16	1 7/16	2 1/8	3 7/8	7/16	1 15/16	2 7/8	5 1/4	9/16	2 9/16	3 3/8	6 1/2	5/8	2 7/8	3 9/16	7 1/16	5/8	2 3/4	3 7/16	6 13/16	1/2	2 3/16	3 1/16	5 3/4
J	1/16	3/8	1 1/4	1 11/16	5/16	1 3/8	2 5/16	4	7/16	1 13/16	3 1/16	5 5/16	9/16	2 7/16	3 9/16	6 9/16	5/8	2 11/16	3 11/16	7	5/8	2-9/16	3 9/16	6 3/4	1/2	2 1/16	3 1/8	5 11/16

DEAD LOAD DEFLECTIONS AND CAMBER

SPAN 5

GIRDER	FS 8 STL	FS 8 REM DL	FS 8 CON	FS 8 TOTAL	0.9 STL	0.9 REM DL	0.9 CON	0.9 TOTAL
A	1/4	1 3/16	7/8	2 5/16	1/8	9/16	9/16	1 1/4
B	1/4	1 1/4	1 3/16	2 11/16	1/8	9/16	3/4	1 7/16
C	1/4	1 1/4	1 7/16	2 15/16	1/8	9/16	7/8	1 9/16
D	1/4	1 1/4	1 11/16	3 3/16	1/8	5/8	1	1 3/4
E	1/4	1 1/4	1 15/16	3 7/16	1/8	5/8	1 1/8	1 7/8
F	1/4	1 1/4	2 1/8	3 5/8	1/8	5/8	1 3/16	1 15/16
G	1/4	1 1/4	2 1/4	3 3/4	1/8	9/16	1 1/4	1 15/16
H	1/4	1 1/4	2 5/16	3 13/16	1/8	9/16	1 5/16	2
J	1/4	1 3/16	2 3/8	3 13/16	1/8	9/16	1 3/8	2 1/16

DEAD LOAD DEFLECTIONS AND CAMBER

SPAN 6

GIRDER	0.1 STL	0.1 REM DL	0.1 CON	0.1 TOTAL	0.2 STL	0.2 REM DL	0.2 CON	0.2 TOTAL	0.3 STL	0.3 REM DL	0.3 CON	0.3 TOTAL	0.4 STL	0.4 REM DL	0.4 CON	0.4 TOTAL
A,B&C	-1/16	-3/16	7/16	3/16	-1/16	-1/4	3/4	7/16	-1/16	-1/4	15/16	5/8	-1/16	-3/16	1 1/16	13/16
D,E&F	-1/16	-3/16	7/16	3/16	-1/16	-1/4	3/4	7/16	-1/16	-1/4	15/16	5/8	-1/16	-3/16	1 1/16	13/16
G	-1/16	-3/16	3/8	1/8	-1/16	-1/4	11/16	3/8	-1/16	-1/4	15/16	5/8	-1/16	-3/16	1 1/16	13/16
H	-1/16	-3/16	3/8	1/8	-1/16	-1/4	11/16	3/8	-1/16	-1/4	7/8	9/16	-1/16	-3/16	15/16	11/16
J	-1/16	-3/16	5/16	1/16	-1/16	-1/4	9/16	1/4	-1/16	-1/4	3/4	7/16	-1/16	-3/16	13/16	9/16

FOR CAMBER NOTES, SEE SHEET 18 OF 28.

DEAD LOAD DEFLECTIONS AND CAMBER

SPAN 6

GIRDER	0.5 STL	0.5 REM DL	0.5 CON	0.5 TOTAL	0.6 STL	0.6 REM DL	0.6 CON	0.6 TOTAL	0.7 STL	0.7 REM DL	0.7 CON	0.7 TOTAL	0.8 STL	0.8 REM DL	0.8 CON	0.8 TOTAL	0.9 STL	0.9 REM DL	0.9 CON	0.9 TOTAL
A,B&C	0	-1/8	1 1/8	1	0	-1/16	1 1/16	1	0	0	15/16	15/16	0	1/16	3/4	13/16	0	0	7/16	7/16
D,E&F	0	-1/8	1 1/8	1	0	-1/16	1 1/16	1	0	0	15/16	15/16	0	1/16	3/4	13/16	0	0	7/16	7/16
G	0	-1/8	1 1/16	15/16	0	-1/16	1 1/16	1	0	0	7/8	7/8	0	1/16	11/16	3/4	0	0	5/16	5/16
H	0	-1/8	1	7/8	0	-1/16	7/8	13/16	0	0	3/4	3/4	0	1/16	1/2	9/16	0	0	1/4	1/4
J	0	-1/8	3/4	5/8	0	-1/16	5/8	9/16	0	0	1/2	1/2	0	1/16	5/16	3/8	0	0	3/16	3/16

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

CAMBER DIAGRAM

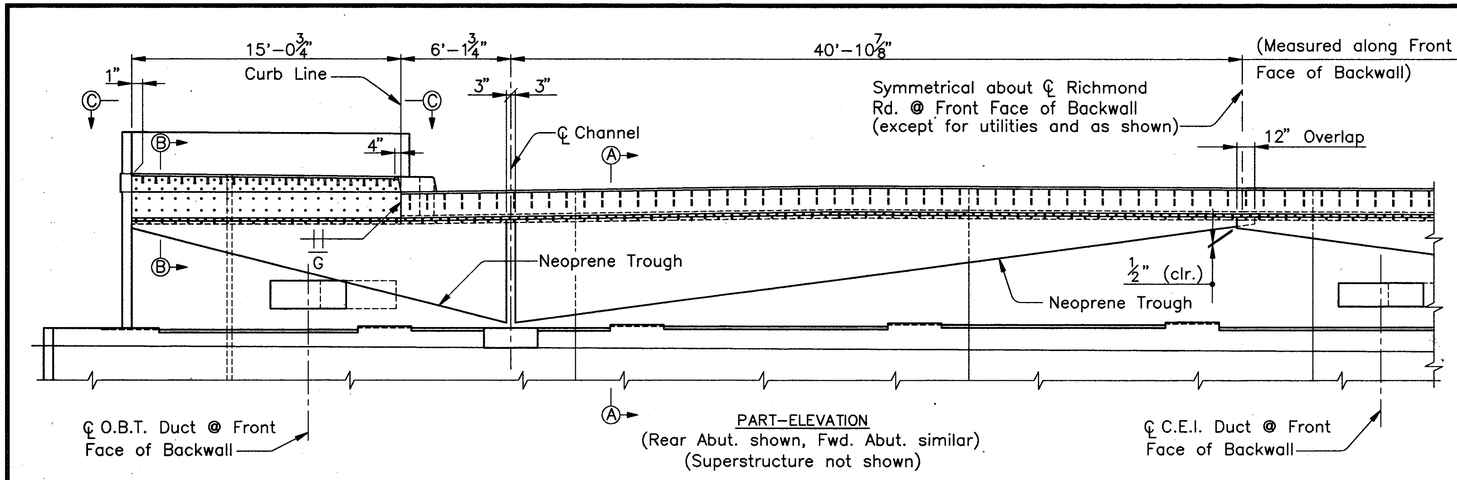
BR. NO. CUY-271-0629

RICHMOND ROAD (S.R. 175) OVER I-271
STA. 172+89.21
STA. 181+21.01

CUYAHOGA COUNTY OHIO

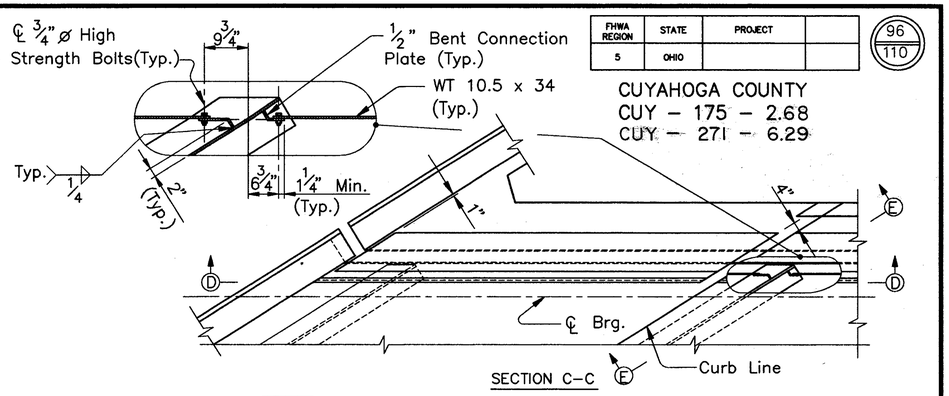
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
NF	NF	WDD	CAB	
DATE 1/11/93	DATE 1/11/93	DATE 2/1/93	DATE 2/25/93	SHEET 19/28

F:\PROJECTS\14472\RICH\CAMBER

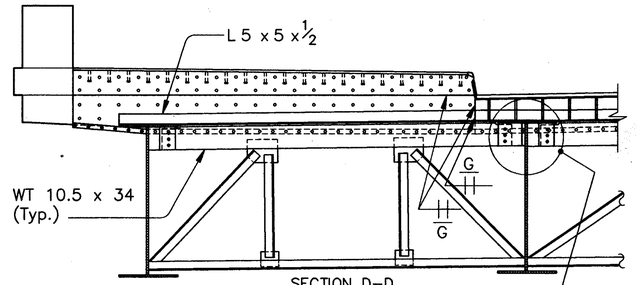


PART–ELEVATION
(Rear Abut. shown, Fwd. Abut. similar)
(Superstructure not shown)

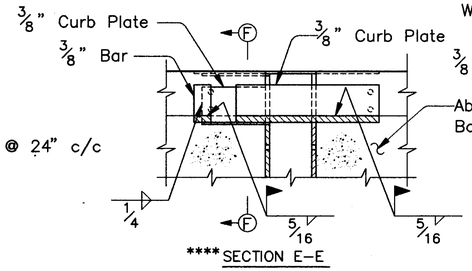
TEMPERATURE ADJUSTMENT TABLE (BASED ON A TEMPERATURE RANGE OF –30°F TO 120°F)									
	30°F	40°F	50°F	60°F	70°F	80°F	90°F	MIN.	MAX.
REAR ABUTMENT	5.54"	5.36"	5.18"	5"	4.82"	4.64"	4.46"	3.92"	6.62"
FORWARD ABUTMENT	5.48"	5.32"	5.16"	5"	4.84"	4.68"	4.52"	4.04"	6.44"



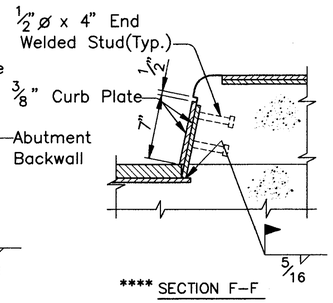
SECTION C–C



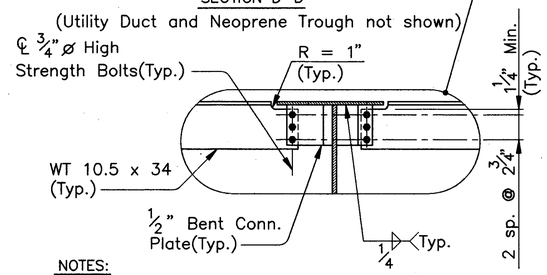
SECTION D–D
(Utility Duct and Neoprene Trough not shown)



**** SECTION E–E



**** SECTION F–F



NOTES:

* DIMENSION MEASURED NORMAL TO EXP. JT. @ 60°F. SEE TEMPERATURE ADJUSTMENT TABLE.

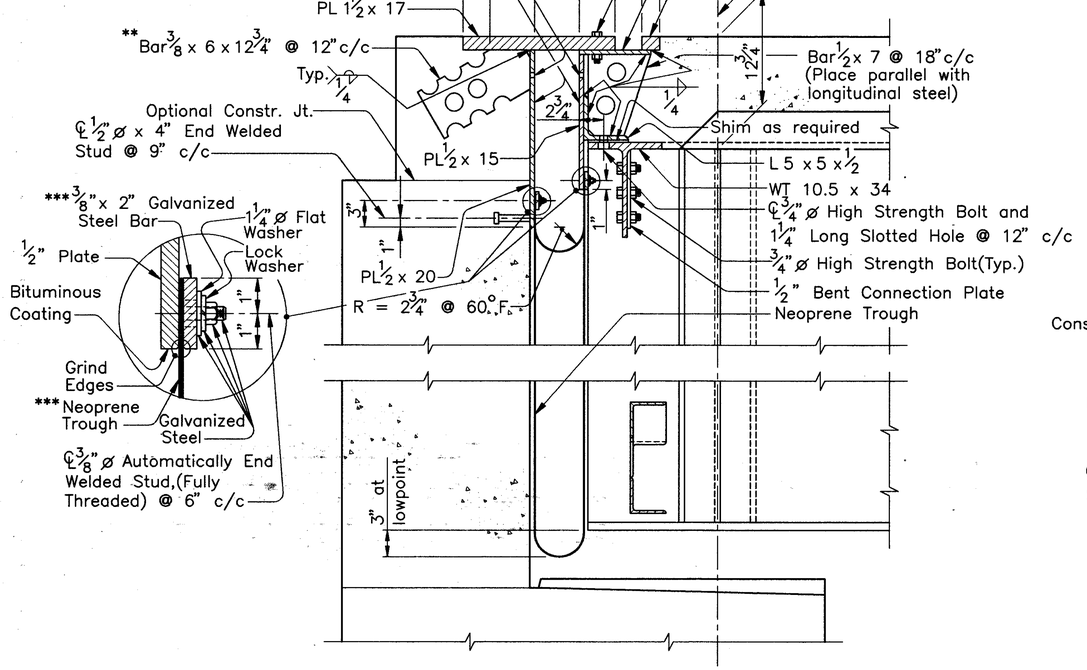
** FOR ADDITIONAL DETAILS, SEE O.D.O.T. STD. DWG. EXJ–2–81, REV. 4–2–84, SHEET 1 of 2.

*** PROVIDE 3/4" ø HOLES IN BAR 3/8 X 2 AND NEOPRENE TROUGH.

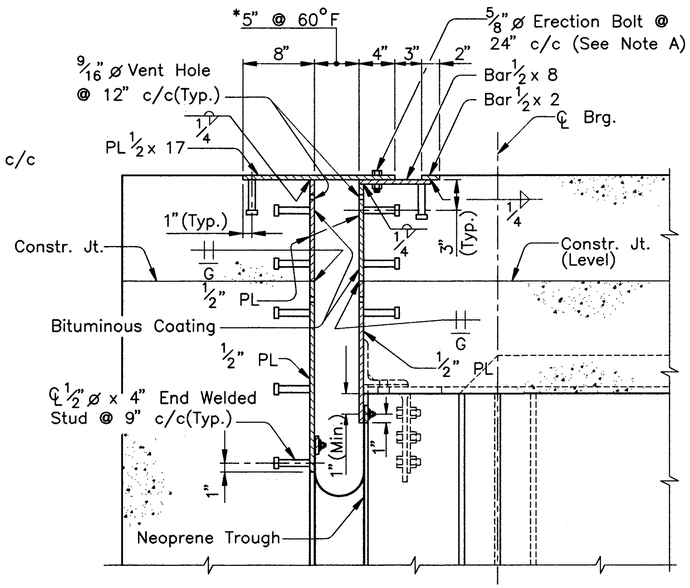
**** FOR ADDITIONAL DETAILS, SEE O.D.O.T. STD. DWG. SD–1–69, SHEET 2 of 4.

NOTE A:

5/8 " ø BOLTS @ 24" CENTERS WITH CAP NUTS TACK WELDED TO UNDER SIDE PLATE. CENTER 5/8" ø BOLTS IN 1–1/16" ø HOLES IN THE TOP PLATE. APPLY FLAKE GRAPHITE BETWEEN WASHERS AND PLATE. TURN BOLTS TIGHT AND RELEASE ONE HALF TURN. REMOVE BOLTS AS SOON AS CONCRETE HAS SET, PREFERABLY WITHIN TWO HOURS AFTER PLACING. FILL HOLES WITH BITUMINOUS MATERIAL.



SECTION A–A



SECTION B–B

FHWA REGION	STATE	PROJECT	
5	OHIO		

96/110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

EXPANSION JOINT DETAILS

BR. NO. CUY–271–0629
RICHMOND ROAD (S.R. 175) OVER I–271

STA. 172+89.21
TO STA. 181+21.01

CUYAHOGA COUNTY OHIO

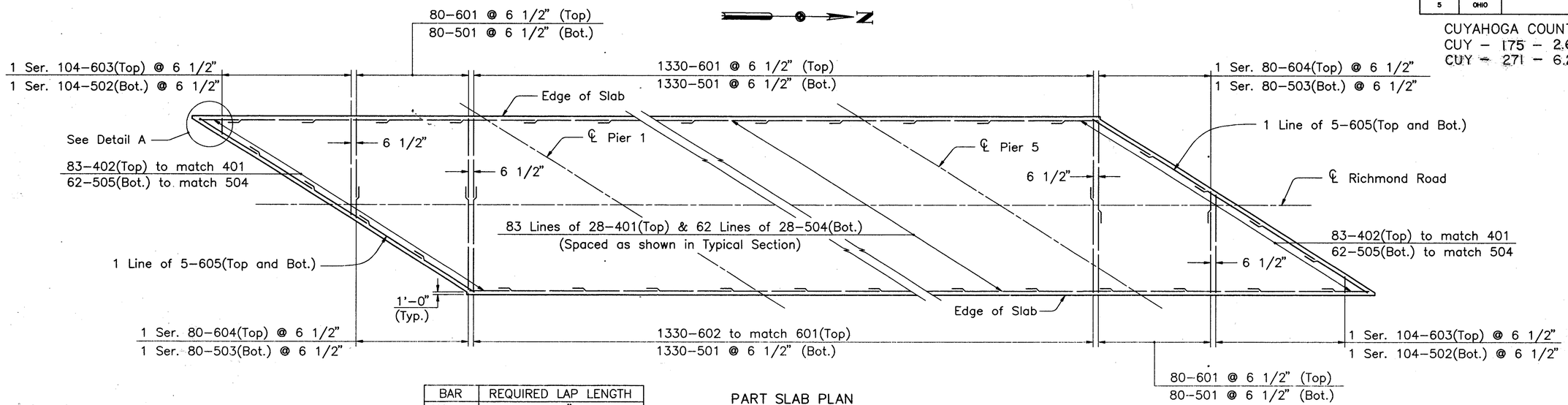
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
J.L.V.	J.L.V.	R.H.W.	C.A.B.	
DATE 2/04/93	DATE 2/04/93	DATE 2/09/93	DATE 2/25/93	SHEET 20/28

\14472\RICH\EXPJT1.DWG

FHWA REGION	STATE	PROJECT	
5	OHIO		

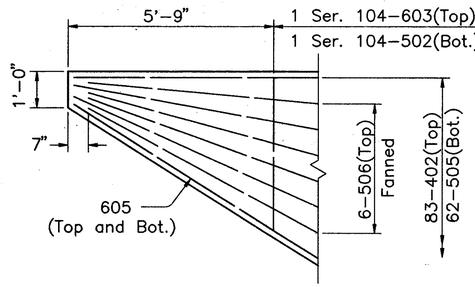
97/110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29



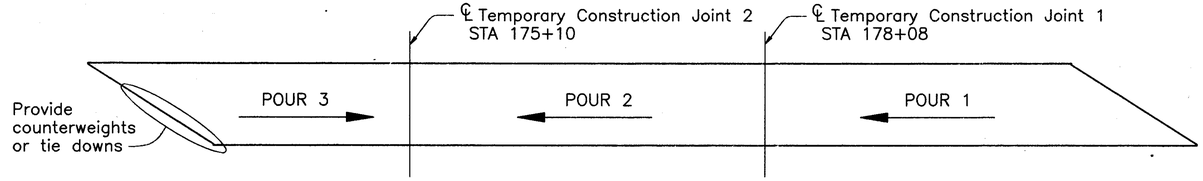
PART SLAB PLAN

BAR	REQUIRED LAP LENGTH
NO. 4	1'–8"
NO. 5	2'–0"
NO. 6	2'–5"



DETAIL A

(Opposite corner similar.)



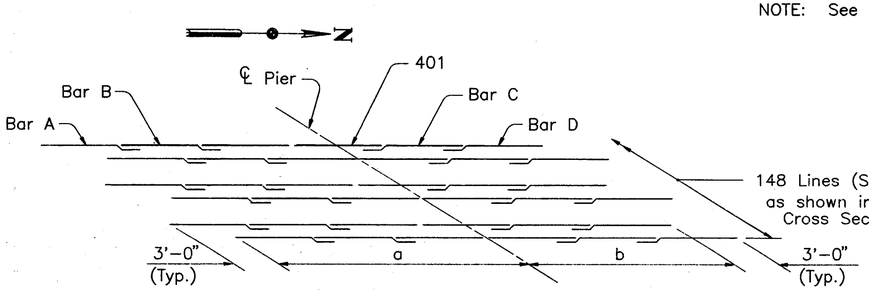
Pouring of the concrete deck shall proceed as follows:

1. Start POUR 1 at the forward abutment and proceed to ℄ Joint 1.
2. Provide counterweights or tie downs of girders D thru J at rear abutment to prevent uplift of the girders (See table).
3. Start POUR 2 at ℄ Joint 1 and proceed to ℄ Joint 2.
4. Start POUR 3 at rear abutment and proceed to ℄ Joint 2.
5. Remove counterweights or tie downs.

NOTE: See General Note # 14 on Sheet 5/28.

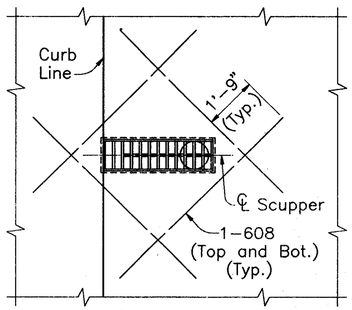
GIRDER	COUNTERWEIGHT
D	1.0 TON
E	2.0 TON
F	2.5 TON
G	3.0 TON
H	3.5 TON
J	4.0 TON

SUGGESTED POURING SEQUENCE



ADDITIONAL REINFORCEMENT OVER PIERS

ADDITIONAL REINFORCEMENT OVER PIERS						
PIER	a	b	Bar A	Bar B	Bar C	Bar D
1	64'–0"	44'–0"	403	401	401	——
2	42'–6"	68'–6"	——	401	401	401
3	32'–6"	27'–6"	——	404	405	——
4	44'–6"	41'–6"	——	406	401	——
5	34'–0"	45'–6"	——	403	401	——



DETAIL AT SCUPPER

NOTES:

DECK SLAB REINFORCEMENT SHALL BE FIELD CUT AS REQUIRED TO PLACE THE SCUPPERS. THE COST OF FIELD CUTTING REINFORCING SHALL BE INCLUDED WITH ITEM 509 FOR PAYMENT.

ALL REINFORCING BARS SHALL BE PREFIXED ES.

FOR TYPICAL CROSS SECTION, SEE SHEET 22/28.

FOR FENCE POST AND PARAPET JOINT SPACING AND FOR LONGITUDINAL REINFORCEMENT IN THE PARAPETS, SEE SHEET 23/28.

FOR SIDEWALK REINFORCEMENT, SEE TYPICAL CROSS SECTION AND SHEET 23/28.

FOR FENCE DETAILS, SEE SHEET 24/28.

FOR SCUPPER DETAILS, SEE SHEET 26/28.

FOR REINFORCEMENT SCHEDULE, SEE SHEET 28/28.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

DECK SLAB

BR. NO. CUY–271–0629
RICHMOND ROAD (S.R. 175) OVER I–271

STA. 172+89.21
STA. 181+21.01

CUYAHOGA COUNTY OHIO

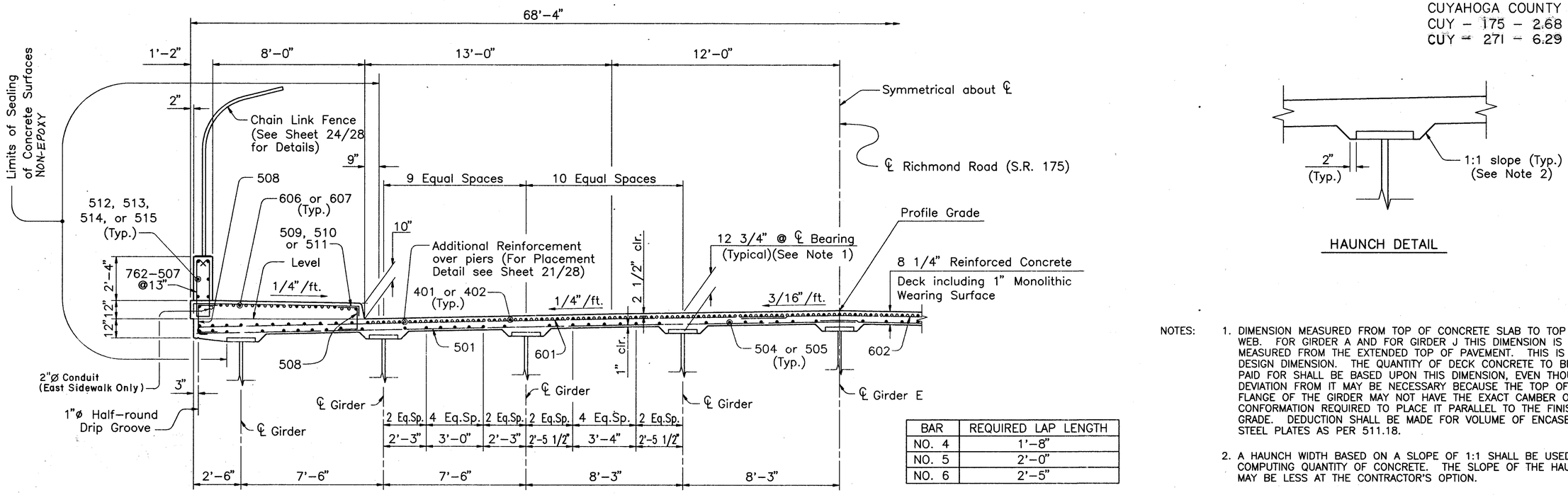
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
JOL	JOL	WDD	CAB	
DATE 1/5/93	DATE 1/7/93	DATE 2/3/93	DATE 2/25/93	SHEET 21/28

F:\PROJECTS\BRIDGE\114272\RICH\SLAB1

FHWA REGION	STATE	PROJECT	
5	OHIO		

98/110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29



TYPICAL CROSS SECTION

BAR	REQUIRED LAP LENGTH
NO. 4	1'–8"
NO. 5	2'–0"
NO. 6	2'–5"

HAUNCH DETAIL

NOTES:

1. DIMENSION MEASURED FROM TOP OF CONCRETE SLAB TO TOP OF WEB. FOR GIRDER A AND FOR GIRDER J THIS DIMENSION IS MEASURED FROM THE EXTENDED TOP OF PAVEMENT. THIS IS THE DESIGN DIMENSION. THE QUANTITY OF DECK CONCRETE TO BE PAID FOR SHALL BE BASED UPON THIS DIMENSION, EVEN THOUGH DEVIATION FROM IT MAY BE NECESSARY BECAUSE THE TOP OF FLANGE OF THE GIRDER MAY NOT HAVE THE EXACT CAMBER OR CONFORMATION REQUIRED TO PLACE IT PARALLEL TO THE FINISHED GRADE. DEDUCTION SHALL BE MADE FOR VOLUME OF ENCASED STEEL PLATES AS PER 511.18.
2. A HAUNCH WIDTH BASED ON A SLOPE OF 1:1 SHALL BE USED FOR COMPUTING QUANTITY OF CONCRETE. THE SLOPE OF THE HAUNCH MAY BE LESS AT THE CONTRACTOR'S OPTION.
3. ALL REINFORCING BARS SHALL BE PREFIXED ES.
4. FOR ADDITIONAL NOTES, SEE SHEET 21/28.

SCREED ELEVATIONS																								
	℄ BRG. REAR ABUT.	SPAN 1				℄ PIER 1	SPAN 2									℄ PIER 2	SPAN 3									℄ PIER 3
		0.2	0.4	0.6	0.8		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	
W. GUTTER LINE	1154.00	1154.11	1154.20	1154.28	1154.38	1154.55	1154.75	1155.00	1155.25	1155.44	1155.58	1155.64	1155.64	1155.59	1155.55	1155.54	1155.56	1155.60	1155.67	1155.74	1155.81	1155.88	1155.96	1156.02	1156.09	1156.17
PROFILE GRADE	1154.65	1154.76	1154.85	1154.93	1155.04	1155.20	1155.41	1155.66	1155.90	1156.11	1156.24	1156.31	1156.30	1156.24	1156.21	1156.20	1156.22	1156.26	1156.32	1156.39	1156.46	1156.54	1156.61	1156.67	1156.75	1156.83
E. GUTTER LINE	1154.40	1154.51	1154.59	1154.68	1154.78	1154.94	1155.15	1155.40	1155.64	1155.84	1155.98	1156.04	1156.04	1155.99	1155.95	1155.94	1155.96	1156.00	1156.07	1156.13	1156.21	1156.28	1156.35	1156.42	1156.49	1156.57

SCREED ELEVATIONS																					
	SPAN 4									℄ PIER 4	SPAN 5									℄ PIER 5
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9		0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	
W. GUTTER LINE	1156.28	1156.37	1156.47	1156.55	1156.62	1156.66	1156.70	1156.74	1156.79	1156.85	1156.97	1157.13	1157.26	1157.39	1157.49	1157.57	1157.59	1157.57	1157.54	1157.50
PROFILE GRADE	1156.94	1157.03	1157.13	1157.21	1157.28	1157.33	1157.36	1157.39	1157.44	1157.51	1157.63	1157.79	1157.92	1158.05	1158.14	1158.18	1158.15	1158.05	1157.97	1157.86
E. GUTTER LINE	1156.68	1156.77	1156.87	1156.95	1157.01	1157.06	1157.10	1157.14	1157.18	1157.25	1157.37	1157.53	1157.63	1157.71	1157.74	1157.71	1157.62	1157.47	1157.32	1157.15

SCREED ELEVATIONS					
	SPAN 6				℄ BRG. FWD. ABUT.
	0.2	0.4	0.6	0.8	
W. GUTTER LINE	1157.45	1157.40	1157.33	1157.22	1157.07
PROFILE GRADE	1157.75	1157.63	1157.48	1157.31	1157.09
E. GUTTER LINE	1156.97	1156.78	1156.57	1156.33	1156.07

NOTE:
THE SCREED ELEVATIONS HAVE BEEN ADJUSTED FOR DEAD LOAD DEFLECTIONS DUE TO THE WEIGHT OF DECK CONCRETE AND ARE THE TOP OF DECK ELEVATIONS REQUIRED BEFORE THE CONCRETE DECK IS PLACED.

F:\PROJECTS\BRIDGE\14472\RICH\SLAB2

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

DECK SLAB DETAILS

BR. NO. CUY–271–0629
RICHMOND (S.R. 175) ROAD OVER I–271

STA. 172+89.21
STA. 181+21.01

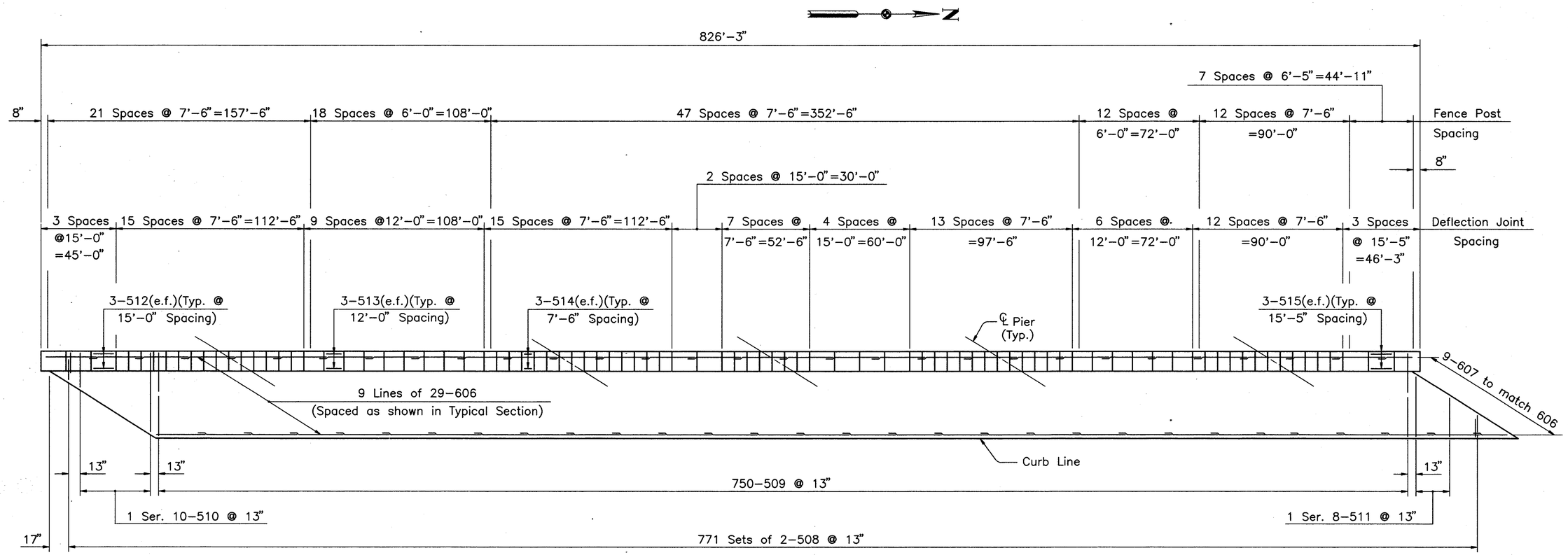
CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
JOL	JOL	WDD	CAB	
DATE 1/12/93	DATE 1/13/93	DATE 2/3/93	DATE 2/25/93	SHEET 22/28

FHWA REGION	STATE	PROJECT	
5	OHIO		

99
110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29



WEST PARAPET AND SIDEWALK PLAN

(East parapet and sidewalk similar)

BAR	REQUIRED LAP LENGTH
NO. 4	1'–8"
NO. 5	2'–0"
NO. 6	2'–5"

NOTES:

CONCRETE PARAPETS SHALL BE PLACED IN ALTERNATE SECTIONS BY THE USE OF BULKHEADS. CLOSING SECTIONS SHALL BE PLACED AFTER REMOVAL OF BULKHEADS AND AFTER PLACEMENT OF SPONGE FILLER. FILLER SHALL BE FLUSH WITH SURFACE OF CONCRETE AND EXPOSED EDGES SHALL BE FREE OF MORTAR.

PREFORMED EXPANSION JOINT FILLER IN THE PARAPET DEFLECTION JOINTS MAY BE EITHER 1/4" GRAY SPONGE RUBBER OR 1/4" GRAY CELLULAR POLYVINYL CHLORIDE (PVC) SPONGE. EITHER MATERIAL SHALL MEET THE REQUIREMENTS OF AASHTO M–153, TYPE 1, EXCEPT THE DENSITY OF PVC SPONGE SHALL BE NOT LESS THAN 20 LBS. PER CU.FT.

INCLUDE WITH ITEM 511, SUPERSTRUCTURE CONCRETE, FOR PAYMENT.

ALL REINFORCING BARS SHALL BE PREFIXED ES.

FOR FENCE DETAILS, SEE SHEET 24/28.

FOR ADDITIONAL NOTES, SEE SHEET 21/28.

THE FOLLOWING ABBREVIATIONS ARE USED:
e.f. = each face

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

PARAPET AND SIDEWALK DETAILS
BR. NO. CUY–271–0629
RICHMOND ROAD (S.R. 175) OVER I–271

STA. 172+89.21
STA. 181+21.01

CUYAHOGA COUNTY OHIO

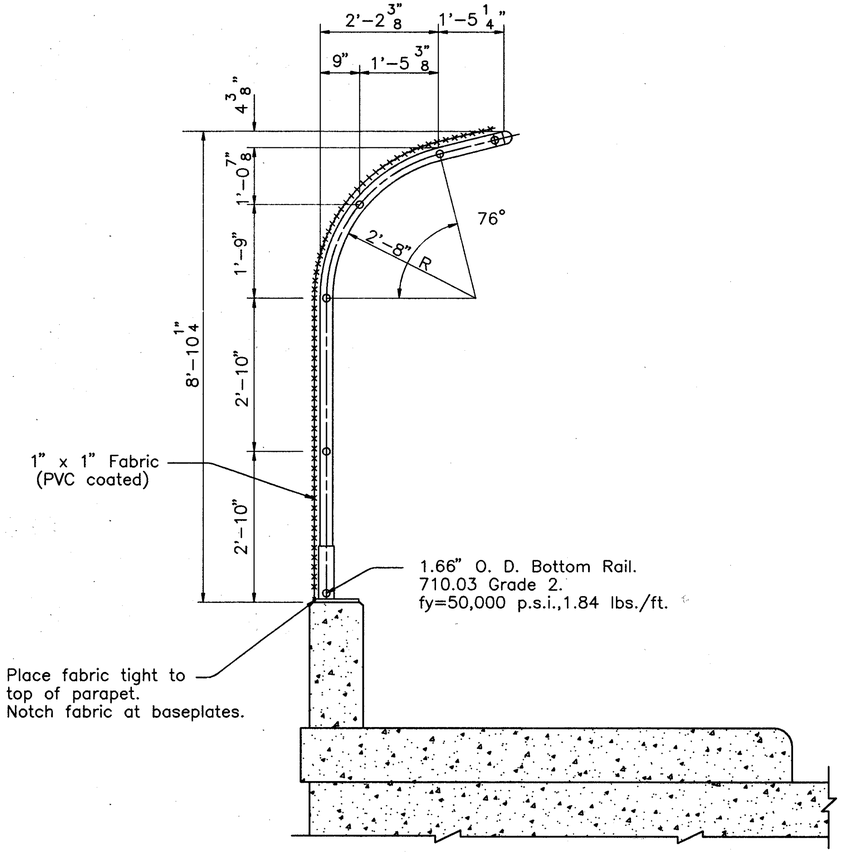
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
JOL	JOL	WDD	CAB	
DATE 1/15/93	DATE 1/18/93	DATE 2/3/93	DATE 2/23/93	SHEET 23/28

F:\PROJECTS\BRIDGE\14472\ROA\SL483

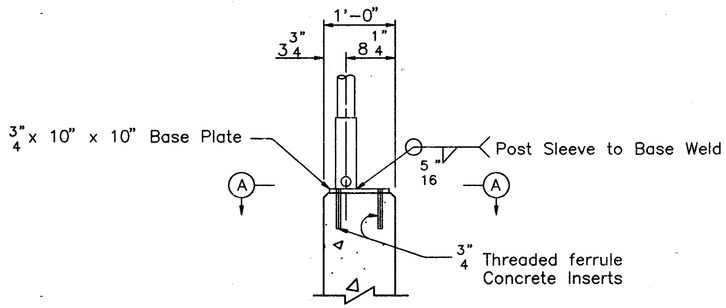
FHWA REGION	STATE	PROJECT	
5	OHIO		

100
110

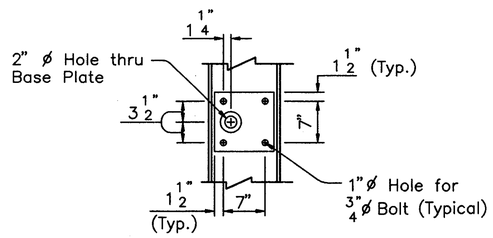
CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29



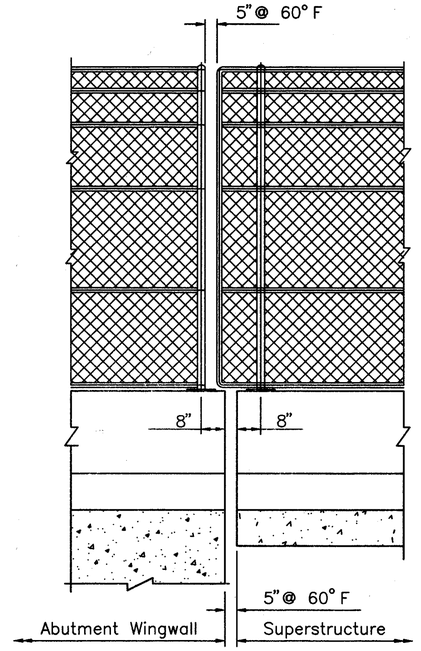
TYPICAL SECTION



PARAPET SECTION



SECTION A–A



FENCE ELEVATION AT ABUTMENTS

NOTES: FOR ADDITIONAL FENCE DETAILS SEE STANDARD DRAWING VPF–1–90 DATED 2–1–92. FENCE DETAILS SHALL CONFORM TO THE STANDARD DRAWINGS EXCEPT AS SHOWN AND AS NOTED BELOW:

1. STEEL FABRIC SHALL BE 11 GAGE CORE WIRE WITH CLASS 2B PVC COATING.
2. 3/4" DIAMETER HIGH STRENGTH ANCHORS SHALL BE CAST–IN–PLACE THREADED FERRULE CONCRETE INSERTS AS APPROVED BY THE DIRECTOR.
3. PAYMENT WILL BE MADE UNDER: "VANDAL PROTECTION FENCE, 11 FT. CURVED,COATED FABRIC"

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

FENCE DETAILS

BR. NO. CUY–271–0629

RICHMOND ROAD (S.R. 175) OVER I–271
STA. 172+89.21
TO STA. 181+21.01

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
RHW	RHW	VLV	CAB	
DATE 1/20/93	DATE 1/20/93	DATE 2/22/93	DATE 2/25/93	SHEET 24/28

g:\1447\Fence

FHWA REGION	STATE	PROJECT	
5	OHIO		

101
110

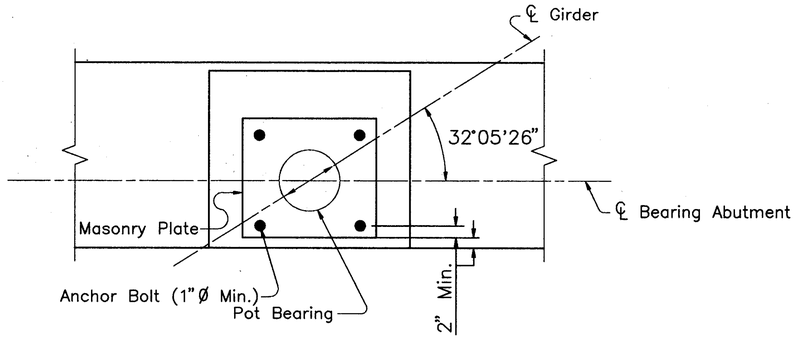
CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29

BEARING REQUIREMENTS

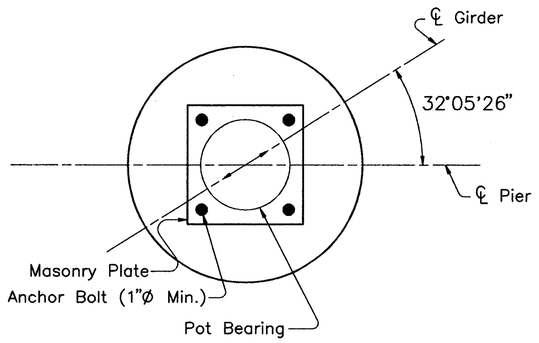
LOCATION	TYPE	VERTICAL DEAD LOAD (KIPS)	VERTICAL LIVE LOAD (KIPS)	VERTICAL LOAD TOTAL (KIPS)	MIN. AREA OF MASONRY PLATE (SQ. IN.)	MAX. DESIGN ROTATION (DEGREES)	DESIGN MOVEMENT (INCHES)	10° TEMP. MOVEMENT (INCHES)	BEARING HEIGHT (SEE NOTE A) (INCHES)	MIN. LATERAL CAPACITY (KIPS)
REAR ABUTMENT	GUIDED EXPANSION	44	64	108	90	0.16	6	3/8	5 1/2	11
PIER 1	GUIDED EXPANSION	326	134	460	383	0.22	4 1/2	1/4	6	46
PIER 2	GUIDED EXPANSION	317	134	451	376	0.24	1 3/4	1/8	6	45
PIER 3	FIXED	174	112	286	238	0.19	0	0	4 1/2	29
PIER 4	GUIDED EXPANSION	283	126	409	341	0.20	2	1/8	6	41
PIER 5	GUIDED EXPANSION	245	114	359	299	0.17	4 1/4	1/4	5 1/2	36
FORWARD ABUTMENT	GUIDED EXPANSION	39	64	103	86	0.11	5 1/2	1/4	5 1/2	10

Note A:
The bearing height specified is the distance from the top of masonry to the bottom flange of the girder.

LOCATION		SLOPE AT CL BEARING (PERCENT)
REAR ABUTMENT		+0.50%
PIER 1		+0.50%
PIER 2		+0.50%
PIER 3		+0.50%
PIER 4		+0.50%
PIER 5	GIRDER A	+0.06%
	GIRDER B	−0.05%
	GIRDER C	−0.17%
	GIRDER D	−0.30%
	GIRDER E	−0.42%
	GIRDER F	−0.55%
	GIRDER G	−0.68%
	GIRDER H	−0.80%
	GIRDER J	−0.91%
FORWARD ABUTMENT	GIRDER A	−0.77%
	GIRDER B	−0.88%
	GIRDER C	−0.99%
	GIRDER D	−1.13%
	GIRDER E	−1.27%
	GIRDER F	−1.39%
	GIRDER G	−1.44%
	GIRDER H	−1.44%
	GIRDER J	−1.44%



TYPICAL POT BEARING DETAIL AT ABUTMENT



TYPICAL POT BEARING DETAIL AT PIER

LEGEND
⟷ Direction of allowed movement for guided expansion bearings.

NOTE: FOR ADDITIONAL POT BEARING REQUIREMENTS SEE PROPOSAL NOTE.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

BEARING DETAILS
BR. NO. CUY–271–0629
RICHMOND ROAD (S.R. 175) OVER I–271
STA. 172+89.21
TO STA. 181+21.01
CUYAHOGA COUNTY OHIO

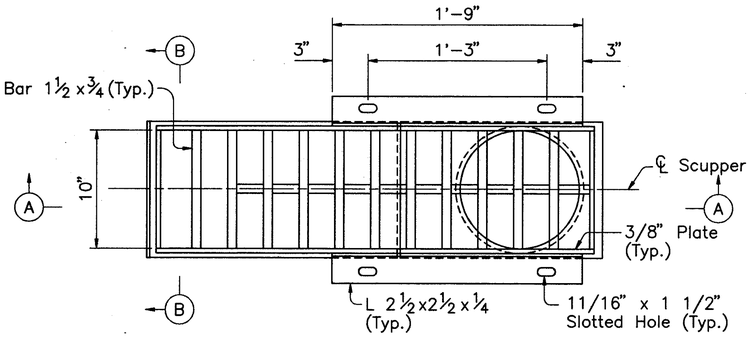
DRAWN	TRACED	CHECKED	REVIEWED	REVISED
MJP	MJP	RHW	CAB	
DATE 1-14-93	DATE 1-14-93	DATE 2-6-93	DATE 2/25/93	SHEET 25/28

F:\PROJECTS\BRIDGE\14472\RICH\POTBRGS
1.99302011037502?E+007

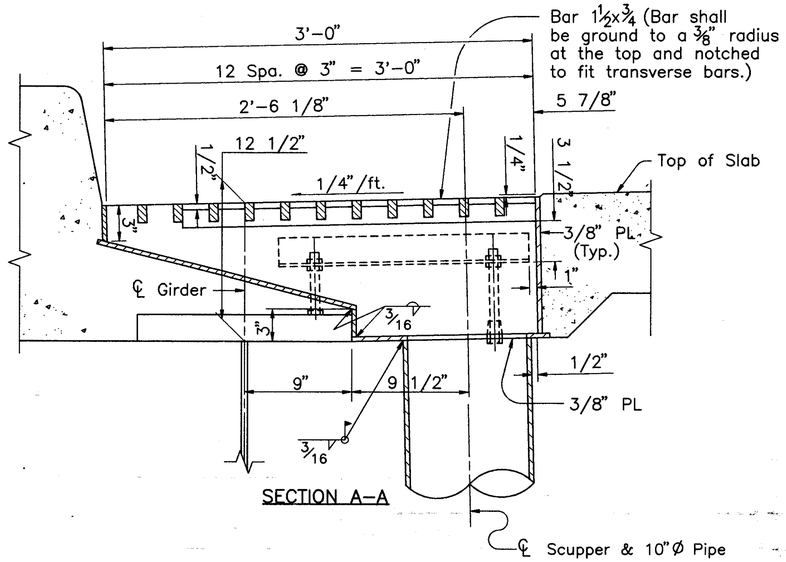
FHWA REGION	STATE	PROJECT	
5	OHIO		

102
110

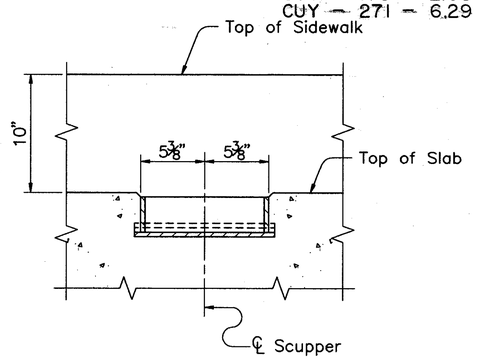
CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29



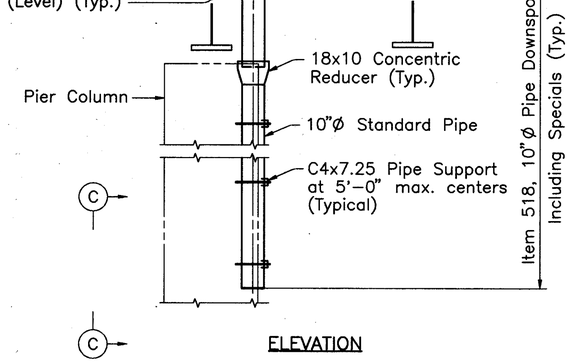
PLAN



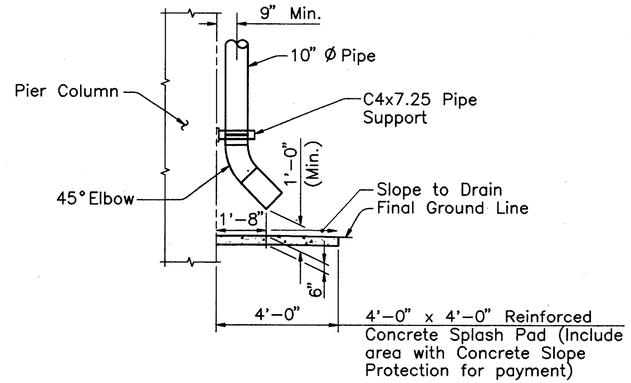
SECTION A–A



SECTION B–B

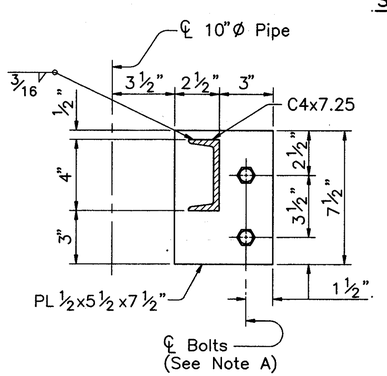


ELEVATION

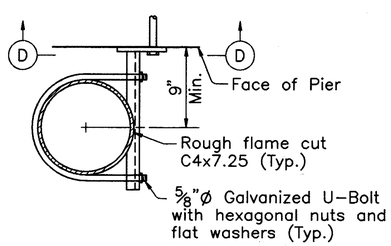


SECTION C–C

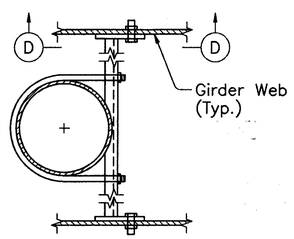
SCUPPER DETAILS



SECTION D–D



PLAN AT PIER



PLAN AT GIRDER

PIPE SUPPORT DETAIL ON STRUCTURE

NOTES:
THE SCUPPERS AND SCUPPER SUPPORTS SHALL BE HOT–DIPPED GALVANIZED LOW OR MILD CARBON STEEL AVAILABLE COMMERCIALLY.

ALL PIPES SHALL BE 10"Ø STANDARD HOT–DIPPED GALVANIZED STEEL PIPE. JOINTS SHALL BE MADE BY WELDING OR BY USE OF CLAMP–TYPE COUPLINGS HAVING A RING GASKET. ALL WELDING SHALL BE DONE BEFORE GALVANIZING. SUPPORT MATERIAL FOR ATTACHING PIPES SHALL BE ASTM A36 AND SHALL BE GALVANIZED AFTER FABRICATION. THE BOLTS SHALL BE GALVANIZED AS SPECIFIED IN ASTM A153.

THE SCUPPER SUPPORT ANGLES AND ACCESSORIES ARE INCLUDED WITH ITEM 518, SCUPPERS, INCLUDING SUPPORTS, AS PER PLAN, FOR PAYMENT.

THE 10"Ø PIPE INCLUDING FITTINGS, SUPPORTS AND ACCESSORIES SHALL BE PAID FOR AT THE UNIT PRICE BID FOR ITEM 518, 10"Ø PIPE DOWNSPOUT INCLUDING SPECIALS.

FOR SCUPPER LOCATIONS, SEE SHEET 14/28.

FOR ADDITIONAL SCUPPER DETAILS, SEE OHIO STANDARD DRAWING SD–1–69, SHEET 3 OF 4.

NOTE A:
FOR ATTACHMENT TO PIERS, BOLTS SHALL BE 3/4"Ø EXPANSION BOLT ANCHORS DRILLED–IN–PLACE AND CAPABLE OF DEVELOPING A PULLOUT RESISTANCE OF NOT LESS THAN 12,000 POUNDS.

FOR ATTACHMENT TO GIRDERS, BOLTS SHALL BE 7/8"Ø ASTM A325 HIGH STRENGTH STEEL BOLTS.

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

DRAINAGE DETAILS
BR. NO. CUY–271–0629
RICHMOND ROAD (S.R. 175) OVER I–271
STA. 172+89.21
TO STA. 181+21.01
CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
WDD	MJP	RHW	CAB	
DATE 1–5–93	DATE 1–21–93	DATE 1–13–93	DATE 2/25/93	SHEET 26/28

F:\PROJECTS\BRIDGE\14472\ROH\SCUPPERS

BAR SCHEDULE

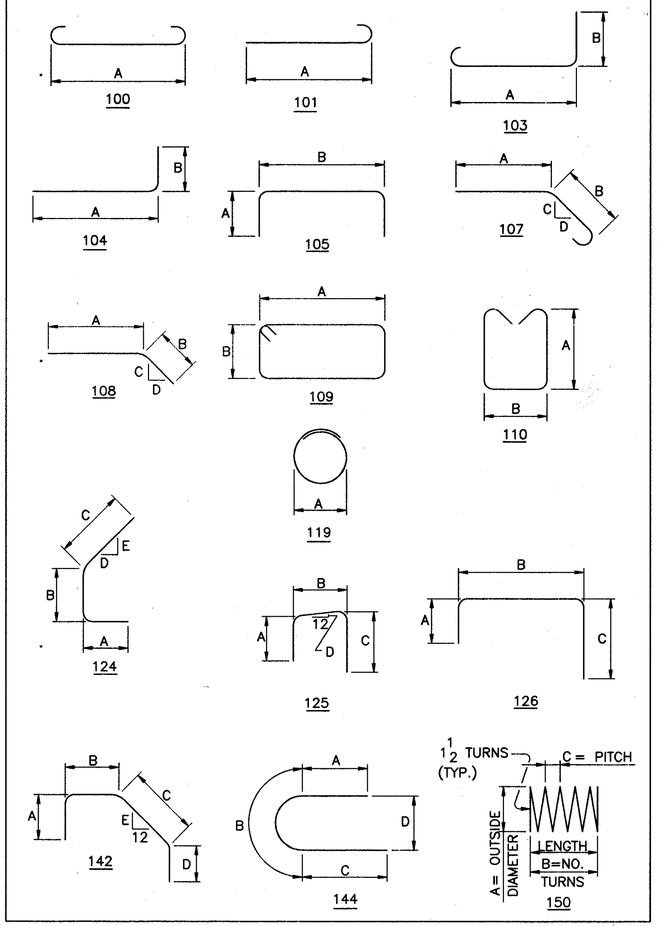
MARK	NUMBER REQ'D	LENGTH FT.	LENGTH IN.	TYPE	A FT.	A IN.	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	SER. INCR. FT.	SER. INCR. IN.	WEIGHT (LBS.)
REAR ABUTMENT – EPOXY COATED BARS																	
ERA 401	54	4	5	105	1	0	2	7									159
ERA 501	106	9	0	105	1	7	6	1									995
ERA502	25	11	1	109	2	3	3	0									289
ERA503	1 SER 5	10	8	105	2	6	5	11								8 1/4	48
		7	11				3	2									
ERA504	114	6	0	104	5	3	0	10									713
ERA505	1 SER 5	8	11	105	3	1	3	0								6	41
		6	11				1	0									
ERA506	82	10	9	105	3	5	4	2									919
ERA507	5	8	4	142	2	2	1	7	2	10	2	0	4 3/4				43
ERA508	22	9	1	105	2	7	4	2									208
ERA509	1 SER 3	9	5	105	3	0	3	6								8	27
		8	1				2	2									
ERA510	4	29	0	STR													121
ERA 511	9	23	9	STR													223
ERA512	1 SER 3	28	9	STR											1	6	85
		25	9														
ERA513	11	5	2	124	2	4	0	9	2	4	12		7 1/2				59
ERA514	23	21	9	STR													522
ERA515	23	19	0	STR													456
ERA516	4	27	9	STR													116
ERA517	9	34	3	STR													322
ERA518	1 SER 3	32	3	STR											1	6	96
		29	3														
ERA519	11	4	8	108	2	4	2	4	7 1/2		12						54
ERA520	5	24	6	STR													128
ERA 521	2	15	0	STR													31
ERA522	4	15	6	STR													65
ERA523	15	3	9	STR													59
ERA524	10	7	9	STR													81
ERA525	5	32	3	STR													168
ERA526	3	16	6	STR													52
ERA527	1	18	3	STR													19
ERA528	4	15	3	STR													64
ERA529	8	6	3	STR													52
ERA530	7	10	0	STR													73
ERA 531	2 SER 2	14	6	STR											2	6	55
		12	0														
ERA532	1 SER 3	11	0	STR											1	10 1/2	29
		7	3														
ERA533	26	18	0	STR													488
ERA534	4	14	0	STR													58
ERA535	16	6	1	105	2	7	1	2									102
ERA536	38	7	4	110	3	0	0	8									291
ERA537	4	13	9	STR													57
ERA538	4	11	9	STR													49
ERA539	1 SER 3	14	6	STR											1	3	41
		12	0														
ERA540	12	5	0	STR													63
ERA 541	4	8	6	STR													35
ERA542	23	27	6	STR													660
ERA 601	106	14	6	126	2	6	6	1	6	3							2309
ERA602	4	10	9	105	2	6	6	1									65
ERA603	2 SER 5	10	6	105	2	6	5	10								8 1/4	137
		7	9				3	1									
ERA604	2	7	0	105	2	6	2	4									21
ERA605	1 SER 5	14	4	126	2	6	5	11	6	3						8 1/4	97
		11	7				3	2									
ERA606	129	11	1	105	5	0	1	5									2147
ERA607	1	6	7	126	1	0	0	11	5	0							10
ERA608	28	16	3	105	7	7	1	5									683
ERA 609	1	7	6	STR													11
ERA610	101	11	11	105	5	5	1	5									1808
ERA 611	97	8	3	105	3	10	0	11									1202
ERA612	1	3	9	STR													6
ERA613	1	4	9	STR													7
ERA614	2	9	9	105	4	7	0	11									29
ERA615	5	7	8	104	6	10	1	0									58
ERA616	8	10	1	104	9	3	1	0									121
ERA617	16	19	4	105	9	3	1	2									465

BAR SCHEDULE

MARK	NUMBER REQ'D	LENGTH FT.	LENGTH IN.	TYPE	A FT.	A IN.	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	SER. INCR. FT.	SER. INCR. IN.	WEIGHT (LBS.)
REAR ABUTMENT – EPOXY COATED BARS (CONTINUED)																	
ERA618	8	8	0	STR													96
ERA619	16	16	8	105	7	11	1	2									401
ERA620	2 Ser 6	9	10	105	4	6	1	2							1	0	132
		4	10		2	0											
ERA 621	4	4	0	105	1	7	1	2									24
ERA622	4	11	0	STR													66
ERA623	3	7	2	104	6	4	1	0									32
ERA 801	40	31	0	STR													3311
ERA802	2	7	7	124	3	3	1	6	3	3	12		7 1/2				40
ERA803	2	19	9	STR													105
ERA804	4	12	9	STR													136
ERA805	2	8	0	STR													43
ERA806	2	19	10	108	16	9	3	1	7 1/2		12						106
ERA807	4	13	6	STR													144
EDRA808	38	5	0	107	1	5	2	10	12		12						507
																TOTAL WEIGHT =	22,535
FORWARD ABUTMENT – EPOXY COATED BARS																	
EFA 401	54	4	5	105	1	0	2	7									159
EFA 501	106	9	0	105	1	7	6	1									995
EFA502	25	11	1	109	2	3	3	0									289
EFA503	1 SER 5	10	8	105	2	6	5	11								8 1/4	48
		7	11				3	2									
EFA504	114	6	8	104	5	11	0	10									793
EFA505	1 SER 5	10	1	105	3	8	3	0								6	47
		8	1				1	0									
EFA506	82	11	5	105	3	9	4	2									976
EFA507	5	9	7	142	2	11	1	7	2	10	2	6	4 3/4				50
EFA508	22	9	5	105	2	9	4	2									216
EFA509	1 SER 3	9	5	105	3	0	3	6								8	27
		8	1				2	2									
EFA510	5	29	0	STR													151
EFA 511	10	23	9	STR													248
EFA512	1 SER 3	28	9	STR											1	6	85
		25	9														
EFA513	12	5	2	124	2	4	0	9	2	4	12		7 1/2				65
EFA514	48	22	0	STR													1101
EFA515	25	24	3	STR													632
EFA516	4	27	9	STR													116
EFA517	9	34	3	STR													322
EFA518	1 SER 3	32	3	STR											1	6	96
		29	3														
EFA519	11	4	8	108	2	4	2	4	7 1/2		12						54
EFA520	5	24	6	STR													128
EFA 521	2	15	0	STR													31
EFA522	4	15	6	STR													65
EFA523	16	3	9	STR													63
EFA524	10	7	9	STR													81
EFA525	5	32	3	STR													168
EFA526	3	16	6	STR													52
EFA527	1	18	3	STR													19
EFA528	5	15	3	STR													80
EFA529	9	6	3	STR													59
EFA530	7	10	0	STR													73
EFA 531	2 SER 2	14	6	STR											2	6	55
		12	0														
EFA532	1 SER 3	11	0	STR											1	10 1/2	29
		7	3														
EFA533	26	18	0	STR													488
EFA534	4	14	0	STR													58
EFA535	16	6	1	105	2	7	1	2									102
EFA536	38	7	4	110	3	0	0	8									291
EFA537	4	13	9	STR													57
EFA538	5	11	9	STR													61
EFA539	1 SER 3	14	6	STR											1	3	41
		12	0														
EFA540	12	5	0	STR													63
EFA 541	4	8	6	STR													35

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29

BAR BENDING DIAGRAMS



SPIRAL REINFORCEMENT NOTE

FOUR STEEL CHANNELS, TEE OR ANGLE SPACERS, WEIGHING APPROXIMATELY 0.80 LBS. PER FOOT OF SPACER, SHALL BE PROVIDED FOR EACH SPIRAL UNIT. THEY SHALL BE EQUALLY SPACED ALONG THE PERIPHERY OF THE COIL. THE NUMBER OF POUNDS OF THESE SPACERS BASED ON 0.80 LBS. PER FOOT WILL BE PAID FOR AS REINFORCING STEEL AND IS INCLUDED IN THE TABULATED QUANTITY OF SPIRAL BARS. SPACER BARS SHALL BE EPOXY COATED.

SPIRAL REINFORCEMENT MAY BE PLAIN BARS, BUT SHALL, IN OTHER RESPECTS, CONFORM TO ITEM 509.

REINFORCING STEEL SAMPLES

REFER TO CMS SECTIONS 106.03, 700, 709.00, AND 709.01. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING.
RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

REINFORCEMENT SCHEDULE

BR. NO. CUY–271–0629
RICHMOND ROAD (S.R. 175) OVER I–271

STA. 172+89.21
TO STA. 181+21.01

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
J.L.V.	J.L.V.	W.D.D.	C.A.B	
DATE 2/11/93	DATE 2/11/93	DATE 2/17/93	DATE 2/25/93	SHEET 27/28

F:\14472\RICH\RS-1.DWG

BAR SCHEDULE

MARK	NUMBER REQ'D	LENGTH FT.	LENGTH IN.	TYPE	A FT.	A IN.	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	SER. INCR. FT.	SER. INCR. IN.	WEIGHT (LBS.)
FORWARD ABUTMENT – EPOXY COATED BARS CONTINUED																	
EFA 601	106	15	0	126	2	6	6	1	6	9							2388
EFA602	4	10	9	105	2	6	6	1									65
EFA603	2 SER 5	10	6	105	2	6	5	10								8¼	137
		7	9				3	1									
EFA604	2	7	0	105	2	6	2	4									21
EFA605	1 SER 5	14	10	126	2	6	5	11	6	9						8¼	101
		12	1				3	2									
EFA606	129	11	1	105	5	0	1	5									2147
EFA607	1	6	7	126	1	0	0	11	5	0							10
EFA608	28	16	3	105	7	7	1	5									683
EFA609	1	7	6	STR													11
EFA610	101	11	11	105	5	5	1	5									1808
EFA 611	97	8	3	105	3	10	0	11									1202
EFA612	1	3	9	STR													6
EFA613	1	4	9	STR													7
EFA614	2	9	9	105	4	7	0	11									29
EFA615	5	8	10	104	8	0	1	0									66
EFA616	8	11	6	104	10	8	1	0									138
EFA617	16	22	2	105	10	8	1	2									533
EFA618	8	7	9	STR													93
EFA619	16	16	4	105	7	9	1	2									393
EFA620	2 Ser 6	9	10	105	4	6	1	2							1	0	132
		4	10		2	0											
EFA 621	4	4	0	105	1	7	1	2									24
EFA622	4	11	0	STR													66
EFA623	3	7	7	104	6	9	1	0									34
EFA 801	40	31	0	STR													3311
EFA802	2	7	7	124	3	3	1	6	3	3	12		7½				40
EFA803	2	19	9	STR													105
EFA804	4	12	9	STR													136
EFA805	2	8	0	STR													43
EFA806	2	19	10	108	16	9	3	1	7½		12						106
EFA807	4	13	6	STR													144
EDFA808	38	5	0	107	1	5	2	10	12		12						507
																TOTAL WEIGHT =	23,055
PIERS – EPOXY COATED BARS																	
EP 401	1	19	10	150	3	2	56	4½									368
EP402	1	19	11	150	3	2	56	4½									368
EP403	1	20	1	150	3	2	57	4½									374
EP404	1	20	2	150	3	2	57	4½									374
EP405	3	20	4	150	3	2	57	4½									1122
EP406	2	20	5	150	3	2	57	4½									748
EP407	2	20	6	150	3	2	58	4½									762
EP408	3	20	7	150	3	2	58	4½									1143
EP409	1	20	8	150	3	2	58	4½									381
EP410	1	20	9	150	3	2	58	4½									381
EP 411	2	20	10	150	3	2	59	4½									774
EP412	2	20	11	150	3	2	59	4½									774
EP413	2	21	0	150	3	2	59	4½									774
EP414	2	21	1	150	3	2	59	4½									774
EP415	1	21	2	150	3	2	59	4½									387
EP416	1	21	3	150	3	2	60	4½									394
EP417	1	21	4	150	3	2	60	4½									394
EP418	1	21	9	150	3	2	61	4½									400
EP419	1	21	11	150	3	2	61	4½									400
EP420	1	22	2	150	3	2	62	4½									407
EP 421	1	22	3	150	3	2	62	4½									407
EP422	2	22	4	150	3	2	63	4½									826
EP423	1	22	5	150	3	2	63	4½									413
EP424	1	22	6	150	3	2	63	4½									413
EP425	1	22	7	150	3	2	63	4½									413
EP426	18	10	1	119	2	8											121
EP 501	40	3	0	STR													125
EP502	32	2	9	STR													92
EP503	360	3	7	105	0	10	2	2									1345

BAR SCHEDULE

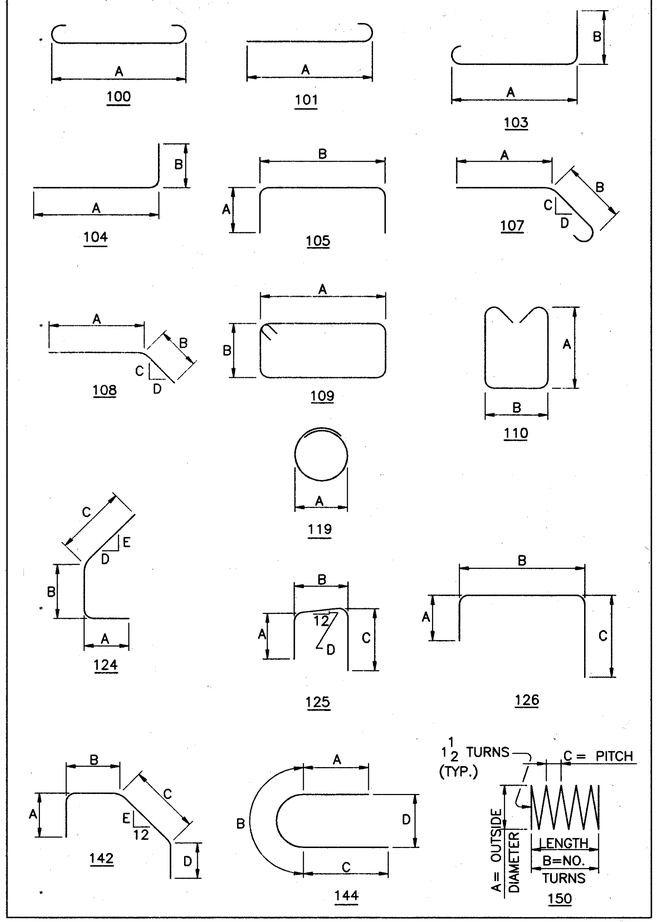
MARK	NUMBER REQ'D	LENGTH FT.	LENGTH IN.	TYPE	A FT.	A IN.	B FT.	B IN.	C FT.	C IN.	D FT.	D IN.	E FT.	E IN.	SER. INCR. FT.	SER. INCR. IN.	WEIGHT (LBS.)
PIERS – EPOXY COATED BARS CONTINUED																	
EP 701	480	10	2	100	8	6											9975
EP 1001	144	11	4	100	8	6											7022
EP 1002	36	13	4	100	10	6											2065
EP 1003	420	12	5	104	11	0	1	9									22,440
EP 1004	24	20	0	STR													2065
EP 1005	36	20	3	STR													3137
EP 1006	84	20	6	STR													7410
EP 1007	60	20	9	STR													5357
EP 1008	60	21	0	STR													5422
EP 1009	48	21	3	STR													4389
EP 1010	12	21	6	STR													1110
EP 1011	12	21	9	STR													1123
EP 1012	12	22	0	STR													1136
EP 1013	24	22	3	STR													2298
EP 1014	48	22	6	STR													4647
EP 1015	12	22	9	STR													1175
																TOTAL WEIGHT =	96,425
DECK SLAB – EPOXY COATED BARS																	
ES 401	4100	30	0	STR													82,164
ES402	166	17	0	STR													1885
ES403	296	26	0	STR													5141
ES404	148	21	0	STR													2076
ES405	148	16	0	STR													1582
ES406	148	32	4	STR													3197
ES 501	2820	34	10	STR													102,444
ES502	2 Ser 104	39	0	STR												4 1/16	4664
		4	0														
ES503	2 Ser 80	33	6	STR												4 1/16	3345
		6	7														
ES504	1736	30	0	STR													54,319
ES505	124	22	0	STR													2845
ES506	12	15	0	STR													188
ES507	1524	7	4	110	3	0		8									11,657
ES508	3084	3	0	105	1	0	1	3									9650
ES509	1500	9	3	105			6	8	6								14,472
ES510	2 Ser 10	8	11	105			6	8	2							8 1/8	123
		2	10				6	2	1								
ES 511	2 Ser 8	8	0	105			6	7	3							8 1/8	94
		3	3				6	2	6								
ES512	108	14	6	STR													1633
ES513	180	11	6	STR													2159
ES514	744	7	0	STR													5432
ES515	36	14	11	STR													560
ES 601	1490	31	8	101	31	0											70,869
ES602	1330	39	8	101	39	0											79,240
ES603	2 Ser 104	39	8	101	39	0										4 1/16	6925
		4	8		4	0											
ES604	2 Ser 80	37	1	STR												4 1/16	5758
		10	10														
ES605	20	27	4	STR													821
ES606	261	30	0	STR													11,761
ES607	9	26	0	STR													351
ES608	16	7	2	STR													172
																TOTAL WEIGHT =	485,527

FHWA REGION	STATE	PROJECT	
5	OHIO		

104/110

CUYAHOGA COUNTY
CUY – 175 – 2.68
CUY – 271 – 6.29

BAR BENDING DIAGRAMS



SPIRAL REINFORCEMENT NOTE

FOUR STEEL CHANNELS, TEE OR ANGLE SPACERS, WEIGHING APPROXIMATELY 0.80 LBS. PER FOOT OF SPACER, SHALL BE PROVIDED FOR EACH SPIRAL UNIT. THEY SHALL BE EQUALLY SPACED ALONG THE PERIPHERY OF THE COIL. THE NUMBER OF POUNDS OF THESE SPACERS BASED ON 0.80 LBS. PER FOOT WILL BE PAID FOR AS REINFORCING STEEL AND IS INCLUDED IN THE TABULATED QUANTITY OF SPIRAL BARS. SPACER BARS SHALL BE EPOXY COATED.
SPIRAL REINFORCEMENT MAY BE PLAIN BARS, BUT SHALL, IN OTHER RESPECTS, CONFORM TO ITEM 509.

REINFORCING STEEL SAMPLES

REFER TO CMS SECTIONS 106.03, 700, 709.00, AND 709.01. SUFFICIENT ADDITIONAL REINFORCING STEEL SHALL BE PROVIDED FOR SAMPLING.
RANDOM SAMPLES SHALL BE REPLACED IN THE STRUCTURES BY THE ADDITIONAL STEEL, SPLICED IN ACCORDANCE WITH 509.08

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

REINFORCEMENT SCHEDULE

BR. NO. CUY–271–0629
RICHMOND ROAD (S.R. 175) OVER I–271

STA. 172+89.21
TO STA. 181+21.01

CUYAHOGA COUNTY OHIO

DRAWN	TRACED	CHECKED	REVIEWED	REVISED
MJP/JOL/JLV	JVL	JOL/MJP	CAB	
DATE 2/17/93	DATE 2/17/93	DATE 2/17/93	DATE 2/25/93	SHEET 28/28

F:\14472\RICH\RS-2.DWG

TOTAL NUMBER OF
8 OWNERSHIPS
0 TOTAL TAKES
0 OWNERSHIPS WITH STRUCTURES INVOLVED
0 OWNERSHIPS WITH "P" ITEMS

FHWA REGION	STATE	PROJECT	
5	OHIO		

106
110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

2
6

SUMMARY OF ADDITIONAL RIGHT OF WAY REQUIRED

AUD. NO.	PARCEL	OWNER	SHEET NO.	OWNERS RECORD BOOK	OWNERS RECORD PAGE	RECORD AREA	TOTAL P.R.O.	GROSS TAKE	P.R.O. IN TAKE	NET TAKE	STRUCTURE	NET RESIDUE LEFT	NET RESIDUE RIGHT	TYPE FUND	REMARKS AND PERSONALTY	AS ACQUIRED BOOK	AS ACQUIRED PAGE
763-31-002	1-T	Larry Goldberg, Trustee	3	90-3011	54	0.61 Ac	—	744.44 SF	—	744.44 SF	—	—	—		DRIVE AND GRADING		
				90-6393	22												
763-27-002	2-WD	H.G.S. Investments	3	86-8624	43	0.71 Ac	—	2,054.57 SF	—	2054.57 SF	—	0.66 Ac	—			95-02480	57
	2-T						—	1,289.03 SF	—	1289.03 SF	—	—	—		DRIVE AND GRADING		
763-31-025	3-WD	Rafic Abdallah & Mary N. Abdallah	3	90-3761	33-36	0.56 Ac	—	2,756.64 SF	—	2756.64 SF	—	—	0.50 Ac			94-03692	29-32
	3-T						—	864.91 SF	—	864.91 SF	—	—	—		DRIVE AND GRADING		
763-07-003	4-WD	Service Station Holding, Inc	4	89-6152	41	0.51 Ac	—	1,537.51 SF	—	1537.51 SF	—	—	0.47 Ac			94-10447	7-17
	4-WD-1		4				—	93.72 SF	—	93.72 SF	—	—	—				
	4-T						—	3,552.97 SF	—	3552.97 SF	—	—	—		DRIVES, GRADING AND CANOPY REMOVAL		
751-02-008	5-WD	County of Cuyahoga	4 & 5	5475	113	106.61 Ac	—	2,460.46 SF	—	2460.46 SF	—	106.55 Ac	—			94-09829	46-49
	5-T						—	3466.31 SF	—	3466.31 SF	—	—	—		DRIVES AND GRADING		
763-05-011	6-WD	Edward F. Kotyuk	5	12530	157	0.22 Ac	5280.00 SF	352000 SF	264000SF	880.00 SF	—	—	0.20 Ac			94-04352	53-56
	6-T-1						—	370.34 SF	—	370.34 SF	—	—	—		GRADING		
	6-T-2						—	625.83 SF	—	625.83 SF	—	—	—		GRADING		
	6-S						—	377.80 SF	—	377.80 SF	—	—	—		24" SEWER PIPE AND HEADWALL, RIPRAP		
763-31-001	7-T	Michael K. Topalian & Shirley J. Topalian	6	12793	361-364	1.55 Ac	—	851.63 SF	—	851.63 SF	—	—	—		DRIVE AND GRADING		
							—										
763-07-011A	8-WD	Emery Development Company	6	247	5	1.61 Ac	—	181.65 SF	—	181.65 SF	—	—	1.60 Ac			94-05520	55
	8-T						—	502.02 SF	—	502.02 SF	—	—	—		GRADING		

NOTE:
ALL TEMPORARY PARCELS
TO BE OF 15 MONTH DURATION.

NO.	DATE	DESCRIPTION	BY

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: LML DATE: APRIL 93
DRAWN BY: LML DATE: APRIL 93
CHECKED BY: PF DATE: APRIL 93
SCALE: NO SCALE
RW-SUM

FHWA REGION	STATE	PROJECT	
5	OHIO		

107
110

3
6

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

N

DONALD P. & G. SMOLIK

Richmond Road Properties
147,357.49 Sq. Ft.
3.38 Ac.
Vol 86-8624 Pg 60
Vol 90-3761 Pg 33
Vol 14291 Pg 505
763-27-013

PARKING

H.G.S. Investments
31,215.46 Sq. Ft.
0.71 Ac.
Vol 86-8624 Pg 43
763-27-002

BEGIN WORK
STATION 162+70.00

BEGIN PROJECT
STATION 167+50.00

BEGIN R/W ACQUISITION
STATION 164+79.69

JEFFERSON PARK OF RICHMOND

Curve Data for A1
R = 50.00'
L = 76.66'
C = 69.37'
N44°09'21"W

Curve Data for A2
R = 38.00'
L = 58.26'
C = 52.71'
S44°08'57"E

Curve Data for A3
R = 50.00'
L = 76.76'
C = 69.44'
S43°44'39"W

Curve Data for A4
R = 36.18'
L = 49.04'
C = 45.37'
S41°39'56"W

Larry Goldberg, Trustee
26,932.89 Sq. Ft.
0.61 Ac.
Vol 90-3011 Pg 54
Vol 90-6393 Pg 22
763-31-002

Rafic Abdallah & Mary N. Abdallah
24,685.56 Sq. Ft.
0.56 Ac.
Vol 90-3761 Pg 33-36
763-31-025

Sewer Easement
3,000.00 Sq. Ft.
0.06 Ac.
Vol 12793 Pg 364

2,054.57 Sq. Ft. (2-WD)
1,289.03 Sq. Ft. (2-T)
744.44 Sq. Ft. (1-T)
2,756.64 Sq. Ft. (3-WD)
864.91 Sq. Ft. (3-T)

MATCH LINE STA. 168+34.42

STA 168+34.42 ℄ RICHMOND RD. =
STA 121+18.35 ℄ EMERY RD.

MATCH LINE STA. 122+98.33 (℄ EMERY ROAD)

NO.	DATE	DESCRIPTION	BY

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: LML DATE: MAR 93
DRAWN BY: LML DATE: MAR 93
CHECKED BY: WJS DATE: APRIL 93
SCALE: 1"=20'
RW-SHT1

RIGHT-OF-WAY PLANS

FHWA REGION	STATE	PROJECT	
5	OHIO		

108
110

4
6

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

N

CITY OF WARRENSVILLE HTS.
VILLAGE OF HIGHLAND HILLS

County of Cuyahoga
4,643,939.48 Sq. Ft.
106.61 Ac.
Vol. 5475 Pg. 113
751-02-008

HIGHLAND HILLS

O. L. 89

3,466.31 Sq Ft
0.08 Ac

2,460.46 Sq. Ft.
0.06 Ac.

5-T

5-WD

FLAG POLE (TO BE REMOVED)

183+75.95
47.42 L

183+78.92
40.00 L

EXIST R/W

S 67°39'13" W
7.99'

N01°42'59"W
324.14'

185+28.97
30.00 L

N 00°32'42" W
321.10'

R/W

S03°16'09"W 150.33'

EXIST R/W

S00°32'42"E 171.04'

EXIST R/W

MATCH LINE STA. 187+00.00

N89°27'18"E
30.00'

187+00.00
54.04 L

187+00.00
40.00 L

MATCH LINE STA. 168+34.42 L/A

STATE OF OHIO

STA 168+34.42 ℄ RICHMOND RD.=
STA 121+18.35 ℄ EMERY RD.

℄ RICHMOND ROAD 170+00

N 00°28'13" W
169.13'

169+10.65
55.21 R

Curve Data for A5
R = 50.00'
L = 76.64'
C = 69.35'
S44°22'55"E

168+99.71
30.00 R

12"S

12"SAN

N 06°22'59" E
104.59'

EXIST R/W

L/A

21.10

N 89°31'47" E
42.48'

170+03.55
42.48 R

170+24.42
45.00 R

N 89°25'39" E
1.00

170+24.34
46.00 R

N 89°25'39" E
11.19'

170+24.32
57.18 R

R/W

S00°28'13"E
94.98

N00°04'57"E
60.01'

N00°00'00"W
16.39'

169+29.52
46.00 R

CANOPY
OVER
PUMPS

169+64.51
56.61 R

S90°00'00"W
39.43'

4-WD

1,537.51 Sq. Ft.

Underground
Storage
Tanks

N 61°19'38" W
39.04'

WELL

169+27.04
55.34 R

168+80.70
64.10 R

N 88°17'37" W
30.02'

A5

A6

N90°00'00"E
40.38'

N00°00'00"E
37.48'

169+64.19
96.03 R

169+26.71
95.73 R

168+79.56
94.10 R

12"

12"

℄ EMERY RD.

4-T

3,552.97 Sq. Ft.

Service Station Holding, Inc.
22,016.22 Sq Ft
0.51 Ac
Vol. 89-6152 Pg. 41
763-07-003

4-WD-1

93.72 Sq. Ft.

A8

N 88°18'00" W
75.66'

N89°34'58"W
79.79'

Curve Data for A6
R = 45.00'
L = 49.72'
C = 47.23'
N57°06'05"W

Curve Data for A8
R = 20.00'
L = 32.17'
C = 28.82'
S45°36'56"W

S88°18'00"E
20.77'

168+76.70
169.71 R

168+75.92
190.47 R

168+83.44
174.43 R

N00°28'13"W
20.77'

S45°25'02"W
22.33'

168+96.69
190.47 R

N00°28'13"W
1.84'

168+98.99
190.47 R

MATCH LINE STA. 123+08.35 (℄ EMERY ROAD)

STATE OF OHIO

EXIST R/W

N 00°32'42" W
322.10'
190.72'

185+00

S89°27'18"W
30.00'

℄ RICHMOND ROAD

Sta. 185+08.51 ℄ Richmond Rd. =
Sta. 57+41.79 ℄ Ramp G1

N 00°32'42" W

Sta. 183+38.24

12"S

15"SAN

12"

12"

12"

N59°32'28"E

MATCH LINE STA. 186+25.00

STATE OF OHIO

DATE	DESCRIPTION	BY
DATE OF COMPLETION:		

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

MADE BY: LML DATE: MAR 93
DRAWN BY: LML DATE: MAR 93
CHECKED BY: WJS DATE: APRIL 93
SCALE: 1"=20'
RW-SHT2

RIGHT-OF-WAY PLANS

FHWA REGION	STATE	PROJECT	
5	OHIO		

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

109
110

5
6

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

N

MATCH LINE STA. 187+00.00

MATCH LINE STA. 186+25.00

END WORK
STATION 190+20.00

END R/W ACQUISITION
STATION 187+58.58

END PROJECT
STATION 187+00.00

187+00.00
54.04 L

5T

187+23.54
34.90 L

187+58.58
30.00 L

N39°43'31"E
30.85'

N06°07'42"E
35.28'

S00°32'42"E
58.58'

322.10

℄ RICHMOND ROAD

L/A

186+76.56
40.00 R

186+87.38
40.00 R

186+60.09
40.00 R

88.00'

N 00°32'42" W

S 00°32'42" E 88.00'

88.00 S00°32'42"E

187+13.84
40.00 R

187+48.15
30.00 R

187+48.09
40.00 R

40.00'

24.47'
S89°48'14"W

S89°48'14"W

16.47'

10.82'

26.46'

60.71'

S65°08'24"E
18.99'

187+05.69
57.15 R

33.75'
N78°08'39"E

36.55'
S76°56'55"E

S34°57'58"E
32.58'

6-T-1
370.34 Sq Ft
0.01 Ac
186+59.94
64.47 R
S44°24'28"W
11.62'
186+68.17
72.68 R
S14°27'08"W
11.00'

6-WD
3520 Sq Ft
0.08 Ac

186+78.79
75.53 R

6-S
377.80 Sq Ft
0.01 Ac

6-T-2
625.83 Sq Ft
0.01 Ac

Edward F. Kotyuk
9,687.23 Sq. Ft.
0.22 Ac.
Vol. 12530 Pg. 157
763-05-011

N89°48'14"E

VILLAGE OF HIGHLAND HILLS
CITY OF WARRENSVILLE HTS.

℄ RICHMOND ROAD

190+00

EXIST R/W

15"SAN

Edward F. Kotyuk
17,033.34 Sq. Ft.
0.39 Ac.
763-05-010
Vol 12530 - Pg 155

Mary M. Steber
30,321.11 Sq. Ft.
0.70 Ac.
763-05-008

Dennis R. & E.M. Spermulli
35,185.46 Sq. Ft.
0.81 Ac.
763-05-007

71,283.55 Sq. Ft.
1.64 Ac.
763-05-006

County of Cuyahoga
4,643,939.48 Sq. Ft.
106.61 Ac.
Vol. 5475 Pg. 113
751-02-008

N 89°49'15" E
2629.58'

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: LML DATE: MAR 93
DRAWN BY: LML DATE: MAR 93
CHECKED BY: MJS DATE: APR 93
SCALE: 1"=20
RW-SHT3

DATE	DESCRIPTION	BY
DATE OF COMPLETION:		

RIGHT-OF-WAY PLANS

FHWA REGION	STATE	PROJECT	
5	OHIO		

110
110

6
6

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)

N

Emery Developement Co.
70,097.05 Sq. Ft.
1.61 Ac.
Torrens #147121 & #147122
763-07-011A

Curve Data for A7
R = 30.00'
L = 42.16'
C = 38.77'
N50°07'04"W

MATCH LINE STA. 123+08.82

℄ TAYLOR LANE
N 00°28'13" W

WOOD POST (TO BE REMOVED)
SIGN (TO REMAIN)

123+58.70
72.99 L
N00°28'13"W
7.93'
8-T
502.02 SQ FT
S42°59'36"E
36.67'
8-WD
181.65 SQ FT
124+17.14
45.78 L
S00°00'00"E
5.78'
123+83.53
46.00 L
124+17.10
40.00 L
A7
123+58.71
65.05 L
N00°28'13"W
25.05'
N90°00'00"E
33.61'
Ø R/W
SAVE
EXIST R/W
S89°37'37"W
28.80'
123+58.75
40.00 L
12"
S89°37'37"W
29.55'
123+88.30
40.00 L
269.95'
281.65'
N00°22'23"W
40.00'
298.75'
N00°22'23"W
40.00'
℄ EMERY ROAD
N89°37'37"E
123+62.53
40.00 R
N89°37'37"E
37.47'
N87°43'18"E
64.40'
8" SAN
N00°09'20"W
7.19'
S90°00'00"W
101.86'
124+00.00
40.00 R
BRICK COLUMNS (TO REMAIN)
122+98.17
42.14 R
PARKING
S00°22'23"E
9.37'
124+00.00
49.37 R
122+98.15
48.71 R
7-T
851.63 SQ FT
MATCH LINE STA. 122+98.33

12" STORM
12"W
8" SAN
4"G
E
W
℄
O.L. 101
O.L. 102

Michael K. Topalian & Shirley J. Topalian
67,351.21 Sq. Ft.
1.55 Ac.
Vol 12793 Pg. 361-364
763-31-001

DATE	DESCRIPTION	BY
DATE OF COMPLETION:		

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: LML DATE: JUNE 93
DRAWN BY: LML DATE: JUNE 93
CHECKED BY: PF DATE: JUNE 93
SCALE: 1"=20'
RW-SHT4

RIGHT-OF-WAY PLANS (EMERY ROAD)

FHWA REGION	STATE	PROJECT	
5	OHIO		

1 / 110

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
CUY-175-2.68
CUY-271-6.29

CITY OF WARRENSVILLE HEIGHTS AND VILLAGE OF HIGHLAND HILLS CUYAHOGA COUNTY

NH-271-6(84)

SURFACE TRANSPORTATION PROGRAM

DESIGN DESIGNATION

		Miles Road to Harvard Road
CURRENT ADT (1993)	=	11,916
ADT (2013)	=	9,530
DHV (2013)	=	1,300
D (2013)	=	51%
T	=	2%
V (DESIGN)	=	40 M.P.H.
V (POSTED)	=	35 M.P.H.
FUNCTIONAL CLASSIFICATION	=	URBAN ARTERIAL
DESIGN EXCEPTIONS	=	NONE

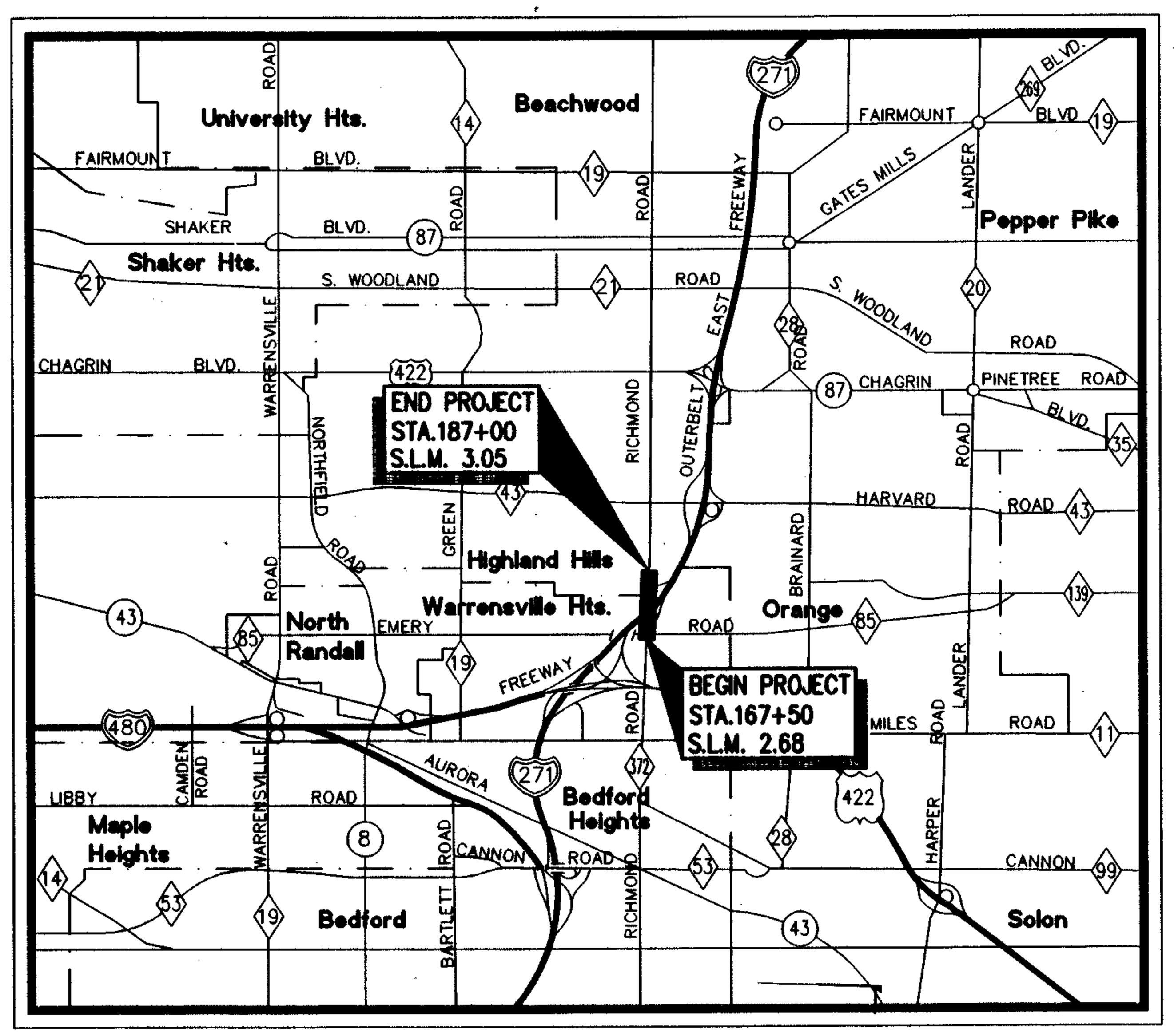
CONVENTIONAL SIGNS

County Line
Township Line
Section Line
Corporation Line —— or
Fence Line (existing) —— (proposed)
Centerline
Trees, Stumps (to be removed)
Utility Poles: Telephone, Power, Light, General
Slope Easement —— T ——
Limit Acess —— (in existing fence)
Proposed Right of Way —— RW ——
Existing Right of Way —— RW ——
Property Line —— (in existing fence)
Guardrail (existing) —— (proposed)

INDEX OF SHEETS

LINE DATA

LENGTH OF PROJECT	
RICHMOND ROAD	
STA. 167+50 TO STA.187+00	= 1950 LIN.FT.
LENGTH OF PROJECT	= 1950 LIN.FT. OR 0.369 MILES
ADD FOR LENGTH OF WORK	
RICHMOND ROAD	
STA. 162+70 TO STA. 167+50 AND STA.187+00 TO STA. 190+20	= 800 LIN. FT.
EMERY ROAD	
STA. 118+65 TO STA. 120+87.35	= 222.35 LIN. FT.
AND STA. 121+49.35 TO STA. 127+14.90	= 565.55 LIN. FT.
LENGTH OF WORK	= 1587.90 LIN. FT. OR .301 MILES
TOTAL LENGTH OF WORK	= 3537.90 LIN. FT. OR .670 MILES



LOCATION MAP

SCALE IN MILES
1 0 1 2 3

Portion to be improved
Interstate-U.S.,State & County
Other Roads

SCALES

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

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 require the closing to traffic of the highway and that detours will be provided as indicated on the plans.

UNDERGROUND UTILITIES
TWO WORKING DAYS
BEFORE YOU DIG
CALL 800-362-2764 (Toll Free) OHIO UTILITIES PROTECTION SERVICE
NON-MEMBERS MUST BE CALLED DIRECTLY

SUPPLEMENTAL SPECIFICATIONS	
802	4-13-90
931	3-18-92
944	3-18-92
817	12-7-84

APPROVED: [signature]
DATE: 7-6-93 DISTRICT DEPUTY DIRECTOR OF TRANSPORTATION

APPROVED:
DATE:____ ENGINEER, BUREAU OF BRIDGES AND STRUCTURAL DESIGN

APPROVED:
DATE:____ DEPUTY DIRECTOR OF DESIGN

APPROVED:
DATE:____ DIRECTOR, DEPARTMENT OF TRANSPORTATION

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS											
BP-1.1	2-21-92	MH-3	12-18-84	TC-16.20	1-20-84	TC-81.20	1-20-84	MC-1	6-13-69	TC-32.10	9-1-92
BP-1.2	2-21-92	MC-4	7-26-76	TC-21.20	9-1-92	TC-82.10	8-29-84	I-1	12-18-84	TC-51.10	1-20-84
BP-2.1	2-21-92	F-1	11-10-83	TC-35.10	8-29-84	TC-83.10	3-18-92	MC-9.2	5-6-91	CB-2-2B	5-1-79
BP-2.2	2-21-92	F-3	5-1-76	TC-41.10	8-29-84	TC-83.20	1-20-84	MH-1	12-18-84		
BP-2.3	2-21-92	HW-4B	4-1-80	TC-41.20	3-26-79	TC-85.10	1-20-84	MC-11	8-1-78		
BP-2.5	2-21-92	GR-1.1	5-6-91	TC-41.40	6-18-79	TC-85.20	1-20-84	CB-6	5-1-79		
BP-3.1	2-21-92	GR-1.2	10-30-92	TC-41.50	3-26-79	MT-95.30	10-10-88	MC-6	1-30-84		
BP-4.1	2-21-92	GR-1.3	2-21-92	TC-42.10	8-19-77	MT-99.10	11-14-86	HL-50.21	5-1-87		
BP-5.1	2-21-92	GR-2.1	5-6-91	TC-42.20	3-26-79	MT-101.60	7-1-92	HL-20.14	5-1-87		
BP-7.1	10-30-92	GR-4.1	5-6-91	TC-51.11	1-20-84	MT-105.10	7-1-92	TC-12.30	1-20-84		
CB-3	5-1-79	GR-6	2-5-82	TC-52.10	4-3-79	MT-105.11	7-1-92	TC-22.10	9-1-92		
CB-3A	5-1-79	HL-30.11	5-1-87	TC-52.20	4-3-79	GR-3.2	5-6-91	TC-22.20	9-1-92		
I-2A	12-18-84	HL-30.22	5-1-87	TC-71.10	9-10-91	AS-1-81	11-27-81	TC-31.21	9-1-92		

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

Plans Prepared By:
HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS
HNTB

STATE OF OHIO
RALPH E. ROBISON
29717
REGISTERED PROFESSIONAL ENGINEER
SEAL

[signature]
Ralph E. Robison

Project: CUY 175/271-2.68/6.29 PID: 11036
Date of Letting________ 19__, Contract No. ____

LD0300 Rev. 11-21-73

CALC. BY: _____ DATE: _____

CHK. BY: _____ DATE: _____

FHWA REGION	STATE	PROJECT	
5	OHIO		

1/4

INTRODUCTION

This report presents the results of a soil investigation conducted at the site of the proposed I-271 under Richmond Road in Cuyahoga County, Ohio.

The subsurface investigation was performed to determine the subsurface conditions and structural characteristics of the subsurface soil and its suitability for support of the proposed structure.

FIELD INVESTIGATION

Four (4) soil borings with sampling and rock coring were conducted at the proposed site between July 25 and 31, 1991, to determine the subsurface conditions.

1. SPLIT SPOON SAMPLING

Samplings was conducted as outlined below, in accordance with ASTM D-1586.

a. Using approved split barrel equipment, four (4) split barrel samples were taken in the first ten (10) feet, and one (1) sample every five (5) feet thereafter to the bottom of abutment elevation. Samples were taken at minimum two and one-half (2.5) foot intervals to a depth of twenty (20) feet below the abutment after which samples were again taken at minimum five (5) foot intervals.

b. Hammer blows per six (6) inch penetration intervals (0-6"; 6-12"; 12-18") were logged with a 140 pound hammer at 30 inch free fall. Standard Penetration Test results were entered in a drillers log and identified by boring number and depth.

c. Groundwater level was measured and recorded upon encounter and at completion of each test boring.

d. All samples were visually classified immediately upon removal from the sampler, identified in the drillers log by boring number and depth, placed in sealed glass sampling containers which were individually identified as per the drillers logs, and collected for removal to our soil mechanics laboratory in accordance with ASTM D-4220.

2. ROCK CORINGS

Rock coring was performed as outlined below, in accordance with ASTM D-2113.

a. Casing was seated in bedrock to prevent cave-in of the overburden into the test hole during coring operations,

b. Using an approved, NX size, double-tube, swivel-type core barrel, rock was cored in runs up to five (5) feet in length.

c. The rock samples were removed from the core barrel and placed in approved core boxes.

d. The length recovered was measured and the rock was visually classified. The above information was entered in the drillers logs by boring number and depth.

e. The core boxes were identified as per the drillers logs, labeled for stratigraphic sequence and collected for removal to our soil laboratory in accordance with ASTM D-4220.

All soil samples were subjected to laboratory visual-manual soil classification in accordance with ASTM D-2488 utilizing the nomenclature of the Unified soil Classification System, ASTM D-2487. All rock samples were classified in accordance with ASTM C-294.

The rock quality designation (RQD) of the rock cores was determined. The RQD is determined by first summing the length of pieces of the core which are four (4) inches or longer, then dividing this sum by the length of the coring run.

LABORATORY TESTING

Moisture content testing was performed in accordance with ASTM D-2216 on all split barrel samples to determine the in-place moisture content of the existing soils.

Representative, selected samples of the rock cores from test borings B-2 and B-3 were subjected to unconfined compressive strength tests, in accordance with ASTM D-2938, to determine the in-situ strength of the bedrock.

Representative, selected samples were subjected to laboratory soil particle size analysis testing, in accordance with ASTM D-422. Procedures included sieve and hydrometer sedimentation determinations.

Representative, selected samples were subjected to plasticity index testing, including liquid and plastic limits, in accordance with ASTM D-4318.

LEGEND

TEST BORING LOCATION - PLAN VIEW

X-Y-Z — TEST BORING PLOTTED TO VERTICAL SCALE ONLY - PROFILE

FIGURES BESIDE THE BORING LOG IN PROFILE INDICATE THE NUMBER OF BLOWS OF 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

TR — Top of rock

W — WATER ON ENCOUNTER

▼ — WATER ON COMPLETION

X — FIGURE BESIDE THE BORING LOG IN PROFILE INDICATES THE MOISTURE CONTENT

CLASSIFICATION OF SOILS*

SYMBOL	DESCRIPTION	Classification AASHTO	Classification OHIO	% Pass #10	% Pass #40	% Pass #200	Liquid Limit (LL)	Plasticity Index (PI)	Group Index Max.	REMARKS
	Gravel and / or Stone Fragments	A-1-a		50 Max.	30 Max.	15 Max.		6 Max.	0	
	Gravel and / or Stone Fragments with Sand	A-1-b			50 Max.	25 Max.		6 Max.	0	
	Fine Sand	A-3			51 Min.	10 Max.	NON-PLASTIC		0	
	Coarse and Fine Sand	—	A-3a			35 Max.		6 Max.	0	Min. of 50% combined coarse and fine sand sizes
	Gravel and/or Stone Fragments with Sand and Silt	A-2-4				35 Max.	40 Max.	10 Max.	0	
		A-2-5					41 Min.			
	Gravel and/or Stone Fragments with Sand, Silt and Clay	A-2-6				35 Max.	40 Max.	11 Min.	4	
		A-2-7					41 Min.			
	Sandy Silt	A-4	A-4a			36 Min.	40 Max.	10 Max.	8	Less than 50% silt sizes
	Silt	A-4	A-4b			50 Min.	40 Max.	10 Max.	8	50% or more silt sizes
	Elastic Silt and Clay	A-5				36 Min.	41 Min.	10 Max.	12	
	Silt and Clay	A-6	A-6a			36 Min.	40 Max.	11-15	10	
	Silty Clay	A-6	A-6b			36 Min.	40 Max.	16 Min.	16	
	Elastic Clay	A-7-5				36 Min.	41 Min.	LL-30	20	
	Clay	A-7-6				36 Min.	41 Min.	LL-30	20	

* The classification of a soil is found by the process of elimination. Using the required test data, proceed from the top of the chart. The first classification the test data fits is the correct classification.

MATERIAL CLASSIFIED BY VISUAL INSPECTION

Sod and/or Topsoil; Berm Material; Peat - S-Sedimentary W-Woody F-Fibrous L-Loamy M-Marly Etc.; Random Fill; Boulder Zone; Fire Clay or Underclay; Coal; Coal Blossom; Claystone; Mudstone; Weathered Mudstone; Shale; Weathered Shale; Sandstone; Weathered Sandstone; Siltstone; Limestone; Leached Limestone; Dolomite; Leached Dolomite; Various Other Materials

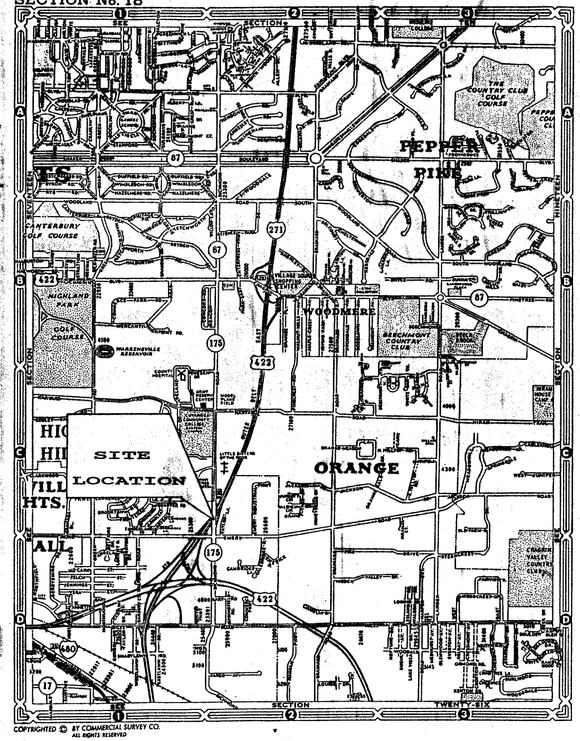
SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS	GRAVELS	CLEAN GRAVELS	GW	Well-graded gravels and gravel sand mixtures, little or no fines
			GP	Poorly-graded gravels and gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES	GM	Silty gravels, gravel sand-silt mixtures
			GC	Clayey gravels, gravel-sand clay mixtures
	SANDS	CLEAN SAND	SW	Well-graded sands and gravelly sands, little or no fines
			SP	Poorly-graded sands and gravelly sands, little or no fines
		SAND WITH FINES	SM	Silty sands, and-silt mixtures
			SC	Clayey sand, sand-clay mixtures
FINE GRAINED SOILS	SILTS AND CLAYS LL < 50		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sand clays, silty clays, leans clays
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS LL > 50		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
HIGHLY ORGANIC SOILS			PT	Peat, muck and other highly organic soils

COMPONENT		SIZE
BOULDERS		Larger than 8"
COBBLES		8" to 3"
GRAVEL	COARSE	3" to 3/4"
	FINE	3/4" to 2.0 MM (3/4" to #10 sieve)
SAND	COARSE	2.0 MM to 0.42 MM (#10 to #40 sieve)
	FINE	0.42 MM to 0.074 MM (#40 to #200 sieve)
SILT		0.074 MM to 0.005 (#200 to .005 MM)
CLAY		Smaller than .005 MM

TERMS	RANGE
Trace	0 - 10%
Little	10 - 20%
Some	20 - 35%
And	35 - 50%

SECTION No. 18



SOLAR TESTING LABORATORIES, INC.

SUBSURFACE INVESTIGATION

I-271 UNDER

RICHMOND ROAD (S.R. 175)

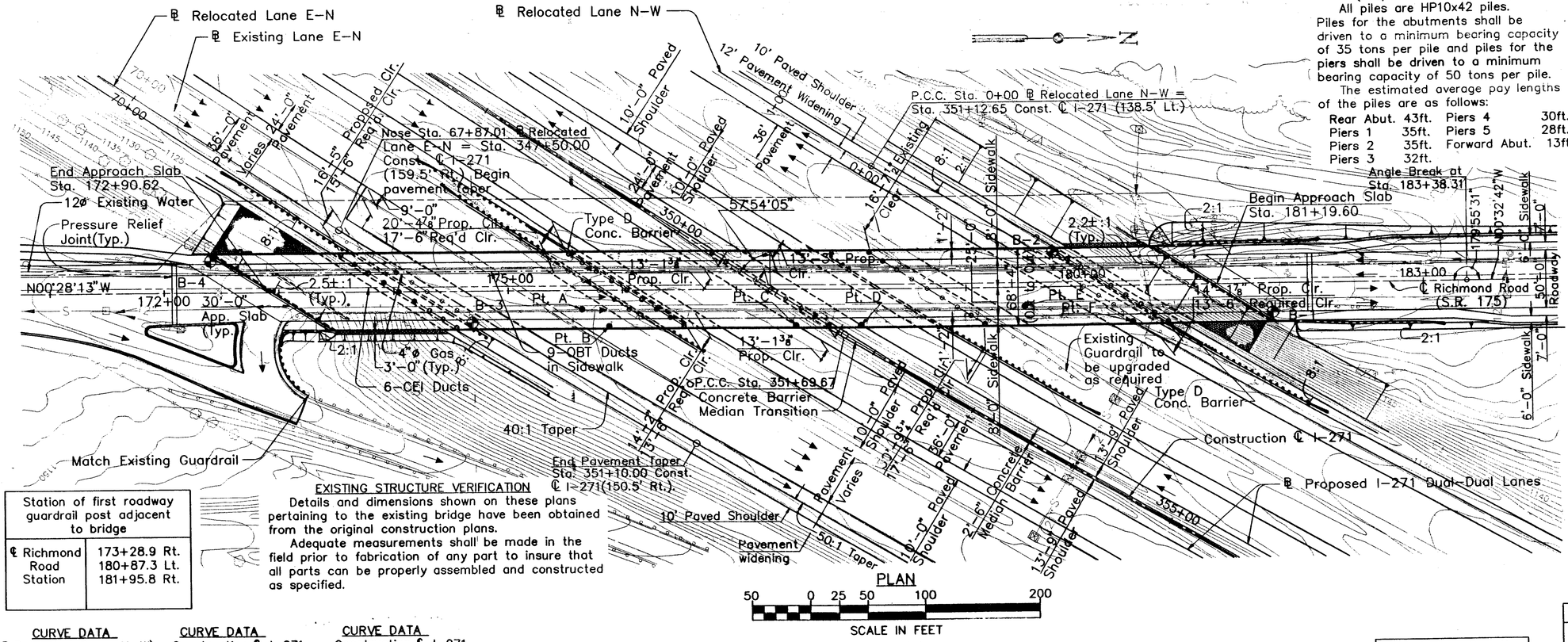
WARRENSVILLE HEIGHTS, CUYAHOGA COUNTY, OHIO

DRAWN BY EPZ	CHECKED BY AMA	STL PROJECT NO.
SCALE	DATE 10-15-91	#A91608.10

FHWA REGION	STATE	PROJECT	
5	OHIO		

2/4

CUYAHOGA COUNTY
CUY – 175 – 2.01



FOUNDATION DATA
(Proposed Substructures)

All piles are HP10x42 piles.
Piles for the abutments shall be driven to a minimum bearing capacity of 35 tons per pile and piles for the piers shall be driven to a minimum bearing capacity of 50 tons per pile.
The estimated average pay lengths of the piles are as follows:

Rear Abut.	43ft.	Piers 4	30ft.
Piers 1	35ft.	Piers 5	28ft.
Piers 2	35ft.	Forward Abut.	13ft.
Piers 3	32ft.		

Angle Break at Sta. 183+38.31

MODIFIED STRUCTURE

TYPE: Continuous composite welded steel girder with reinforced concrete deck and substructure.
SPANS: 109'–7", 199'–3", 125'–8½", 136'–7½", 160'–10", 88'–6"
ROADWAY: 50'–0" curb to curb with two 8'–0" sidewalks and two 1'–0" concrete parapets
LOADIING: HS–20–44 Case II and the alternate military loading.
SKEW: 57° 54' 05.0" Right Forward
WEARING SURFACE: 1" Monolithic Wearing Surface.
APPROACH SLABS: AS–1–81 (30'–0"long)
ALIGNMENT: Tangent

EXISTING STRUCTURE

TYPE: Continuous welded steel girder with reinforced concrete deck and substructure.
SPANS: 98'–9", 150'–10½", 149'–10½", 136'–7½", 136'–7½", 90'–11"
ROADWAY: 28'–0" curb to curb with two 4'–2" walks
LOAD FREQUENCY: CF400(57)
SKEW: 57° 54' 05.0" Right Forward
WEARING SURFACE: Concrete
APPROACH SLABS: AS–1–54 (25'–0"long)
ALIGNMENT: Tangent
YEAR BUILT: 1965
STRUCTURE FILE NO. 1811169

Station of first roadway guardrail post adjacent to bridge	
℄ Richmond Road Station	173+28.9 Rt. 180+87.3 Lt. 181+95.8 Rt.

EXISTING STRUCTURE VERIFICATION

Details and dimensions shown on these plans pertaining to the existing bridge have been obtained from the original construction plans.
Adequate measurements shall be made in the field prior to fabrication of any part to insure that all parts can be properly assembled and constructed as specified.

CURVE DATA
(℄ Relocated Ramp N–W)
P.I. Sta. 6+27.47
D = 0°55'00" Right
Δ = 11°27'55"
L = 1250.75'
T = 627.47'
E = 31.42'
R = 6250.45'

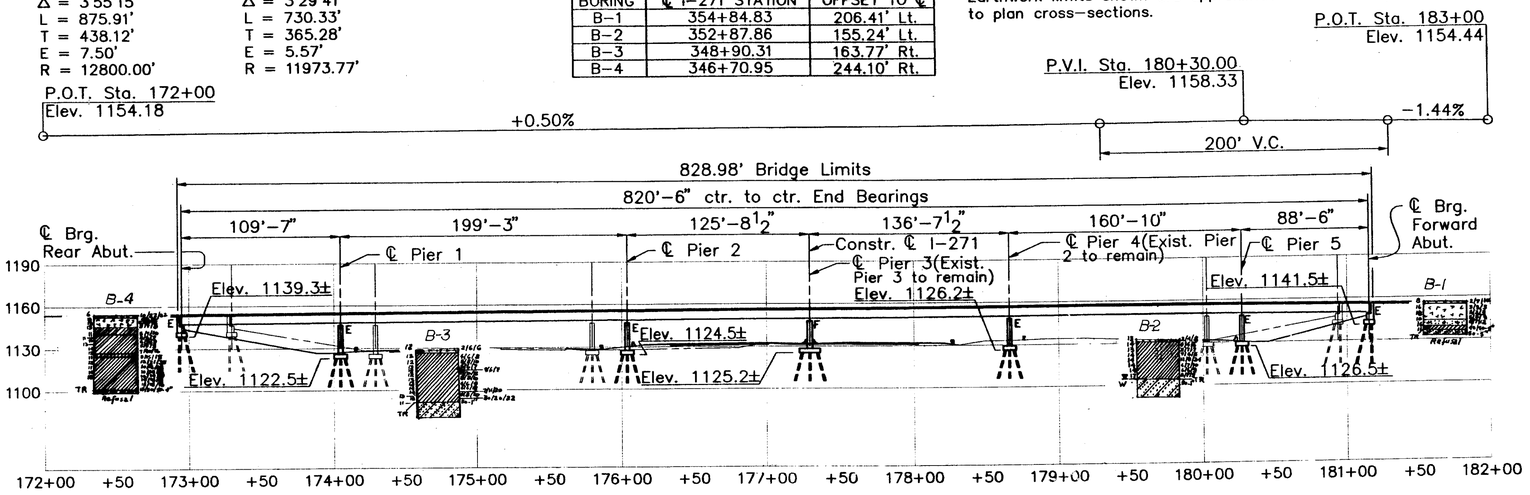
CURVE DATA
Construction ℄ I–271
P.C.C. Sta. 342+93.76
P.I. Sta. 347+31.88
D = 0°26'51" Left
Δ = 3°55'15"
L = 875.91'
T = 438.12'
E = 7.50'
R = 12800.00'

CURVE DATA
Construction ℄ I–271
P.C.C. Sta. 351+69.67
P.I. Sta. 355+34.95
D = 0°28'43" Left
Δ = 3°29'41"
L = 730.33'
T = 365.28'
E = 5.57'
R = 11973.77'

BORING LOCATIONS		
BORING	℄ I–271 STATION	OFFSET TO ℄
B–1	354+84.83	206.41' Lt.
B–2	352+87.86	155.24' Lt.
B–3	348+90.31	163.77' Rt.
B–4	346+70.95	244.10' Rt.

Notes:
The proposed profile grade is only within bridge limits. See Roadway Plans for pavement elevations beyond bridge limits.
Earthwork limits shown are approximate. Actual slopes shall conform to plan cross–sections.

Top of Slope Elevation	
Location	Elevation
Northwest Corner	1148.8
Southwest Corner	1145.8
Northeast Corner	1147.4
Southeast Corner	1146.2



ELEVATION ALONG ℄ RICHMOND ROAD

STRUCTURE DEPTH (Modified Structure)

Slab (Including wearing surface)	0'–8¼"
Haunch (Bottom of slab to top of flange)	0'–2"
Girder depth (66" web)	5'–10"
Top of wearing surface to bottom of girder flange	6'–8¼"

BENCHMARK #23
S.E corner of Richmond Road Bridge over I–271 on S.E. corner of concrete below the parapet
Elev. 1155.22 (Re–establish before removal)

TRAFFIC DATA (Year 2010)

	ADT	ADTT
Richmond Road	9,530	190

SOLAR TESTING LABORATORIES, INC.

SUBSURFACE INVESTIGATION
I–271 UNDER
RICHMOND ROAD (S.R. 175)
WARRENSVILLE HTS., CUYAHOGA COUNTY, OHIO

DRAWN BY EFZ SCALE	CHECKED BY GWA DATE 03–31–92	STL PROJECT NO. #A91608x10

\14472\RICH\RICHSOIL

CALC. BY: _____ DATE: _____
CHK. BY: _____ DATE: _____

FHWA REGION	STATE	PROJECT	
5	OHIO		

3/4

SOLAR TESTING LABORATORIES, INC. — LOG OF TEST BORING

PROJECT I-271 Bridge under Richmond Rd.(S.R.175) CLIENT HOWARD NEEDLES TAMMEN & BERGENDOFF BORING B-1
LOCATION Warrensville Hts., Cuyahoga County, OH DATE STARTED 7-25-91 DATE COMPLETED 7-25-91
DRILLING METHOD HOLLOW STEM
SURFACE ELEVATION 1155.70'
WATER ENCOUNTER NONE
ELEV. ON COMPLETION NONE

DEPTH	SAMPLE	TYPE	SYMBOL	SOIL DESCRIPTION	SPLIT BARREL PENETRATION blows / 6 in.	PHYSICAL CHARACTERISTICS: AGG. %	COARSE SAND %	FINE SAND %	SILT %	CLAY %	LIQUID LIMIT %	PLASTICITY INDEX %	MOISTURE CONTENT %	UNCONF. COMP. STRENGTH tsf	DRY UNIT WEIGHT (pcf)	SOIL CLASSIFICATION
	1	SB		TOPSOIL	2-7-10								7.9			
	1R															
5	2	SB			2-3-7								15.9			
	3	SB		Brown with little gray SILT and CLAY, little sand, few rock and sandstone fragments, trace gravel. (FILL) (MOIST)	2-2-3								17.8			
10	4	SB			5-8-8								10.4			
	5	SB		Medium dense brown SILTY SAND, little gravel. (SM) (MOIST)	6-7-12	8.6	12.9	25.5	53.0				16.6			A-4
15				Hard gray SILT and CLAY, little sand, gravel, trace sandstone fragments. (CL-ML) (MOIST)												
	6	SB			40-50/5"								11.3			
20		TR		Highly weathered gray SANDSTONE.	50/5"											
	7	SB		AUGER REFUSAL	50/0"											
	8	SB														
25																
30																
35																
40																
45																
50																

SOLAR TESTING LABORATORIES, INC. — LOG OF TEST BORING

PROJECT I-271 Bridge under Richmond Rd.(S.R.175) CLIENT HOWARD NEEDLES TAMMEN & BERGENDOFF BORING B-2
LOCATION Warrensville Hts., Cuyahoga County, OH DATE STARTED 7-29-91 DATE COMPLETED 7-29-91
DRILLING METHOD HOLLOW STEM
SURFACE ELEVATION 1132.04
WATER ENCOUNTER 1103.54
ELEV. ON COMPLETION 1103.54

DEPTH	SAMPLE	TYPE	SYMBOL	SOIL DESCRIPTION	SPLIT BARREL PENETRATION blows / 6 in.	PHYSICAL CHARACTERISTICS: AGG. %	COARSE SAND %	FINE SAND %	SILT %	CLAY %	LIQUID LIMIT %	PLASTICITY INDEX %	MOISTURE CONTENT %	UNCONF. COMP. STRENGTH tsf	DRY. UNIT WEIGHT (pcf)	SOIL CLASSIFICATION
	1	SB		TOPSOIL	2-4-8								12.6			
5	2	SB			9-4-5								13.0			
	3	SB			3-5-7								12.9			
10	4	SB			7-6-5								14.3			
	5	SB		Stiff to hard gray SILT and CLAY, little sand, gravel, trace sandstone fragments. (CL-ML) (POSSIBLE FILL) (MOIST)	11-8-24								13.5			
15	6	SB			6-7-10	13.6	10.0	11.2	34.2	31.0	27	10	13.6			A-4
	7	SB			6-6-9	7.8	11.1	11.9	31.7	37.5	27	10	14.1			A-4
20	8	SB			9-7-9								16.7			
	9	TR		Highly to moderatley weathered gray SANDSTONE, few angular fractures.	50/1"											
25					RUN 30' -35'											
30	10	NX			REC'D = 68% LONGEST PIECE = 13" SHORTEST PIECE = frags RQD = 53%									813		
	11	NX			RUN 35'-40' REC'D = 67% LONGEST PIECE = 5" SHORTEST PIECE = frags RQD = 26%									799		
40																
45																
50																

SOLAR TESTING LABORATORIES, INC.

SUBSURFACE INVESTIGATION
I-271 UNDER
RICHMOND ROAD (S.R. 175)
WARRENSVILLE HEIGHTS, CUYAHOGA COUNTY, OHIO

DRAWN BY EPZ	CHECKED BY AMA	STL PROJECT NO.
SCALE	DATE 10-15-91	#A91608x10

CALC. BY:_____ DATE:_____
CHK. BY:_____ DATE:_____

FHWA REGION	STATE	PROJECT	
5	OHIO		

4/4

SOLAR TESTING LABORATORIES, INC. — LOG OF TEST BORING

PROJECT I-271 Bridge under Richmond Rd.(S.R.175) CLIENT HOWARD NEEDLES TAMMEN & BERGENDOFF BORING B-3

LOCATION Warrensville Hts., Cuyahoga County,OH DATE STARTED 7-27-91 DATE COMPLETED 7-31-91

DRILLING METHOD HOLLOW STEM

SURFACE ELEVATION 1126.11'

WATER ENCOUNTER NONE

ELEV. ON COMPLETION NONE

DEPTH	SAMPLE	TYPE	SYMBOL	SOIL DESCRIPTION	SPLIT BARREL PENETRATION blows / 6 in.	AGG. %	COARSE SAND %	FINE SAND %	SILT %	CLAY %	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT %	UNCONF. COMPR. STRENGTH tsf	DRY UNIT WEIGHT (pcf)	SOIL CLASSIFICATION
	1	SB		Brownish-gray SILT and CLAY, some sand, gravel, trace organics. (FILL) (MOIST)	(2)-3-4								11.7			
5	2	SB			4-6-6								11.9			
	3	SB			8-8-10								12.1			
	4	SB			6-6-7								12.8			
	5	SB			5-6-7								14.7			
15	6	SB			5-8-10								11.6			
	7	SB		Stiff to hard gray SILT and CLAY, little sand, little gravel, trace sandstone fragments. (CL-ML) (MOIST)	15-10-12	15.2	10.7	12.6	31.0	30.5	29	8	12.5			A-4
20	8	SB			8-8-10								13.2			
	9	SB			4-6-9	4.4	12.6	12.4	30.3	40.3	26	9	13.8			A-4
	10	SB			6-6-15								13.9			
25	11	SB			7-11-20	5.6	12.1	13.4	33.8	34.8	26	9	13.3			A-4
30	12	SB			6-8-10								14.5			
	13	SB			30-20-22								10.5			
35	14	SB	TR		50/1"											
40	15	NX			RUN 35'-40' REC'D 78% LONGEST PIECE 3" SHORTEST PIECE frags RQD 0%											
	16	NX		Highly weathered gray SANDSTONE, some SHALE interlayers.	RUN 40'-43' REC'D 37% LONGEST PIECE 3" SHORTEST PIECE frags RQD 0%											
45	17	NX			RUN 43'-48' REC'D 100% LONGEST PIECE 10½" SHORTEST PIECE frags RQD 44%										92%	
50																

SOLAR TESTING LABORATORIES, INC. — LOG OF TEST BORING

PROJECT I-271 Bridge under Richmond Rd.(S.R.175) CLIENT HOWARD NEEDLES TAMMEN & BERGENDOFF BORING B-4

LOCATION Warrensville Hts., Cuyahoga County,OH DATE STARTED 7-25-91 DATE COMPLETED 7-26-91

DRILLING METHOD HOLLOW STEM

SURFACE ELEVATION 1154.50'

WATER ENCOUNTER NONE

ELEV. ON COMPLETION NONE

DEPTH	SAMPLE	TYPE	SYMBOL	SOIL DESCRIPTION	SPLIT- BARREL PENETRATION blows / 6 in.	AGG. %	COARSE SAND %	FINE SAND %	SILT %	CLAY %	LIQUID LIMIT	PLASTICITY INDEX	MOISTURE CONTENT %	UNCONF. COMPR. STRENGTH tsf	DRY UNIT WEIGHT (pcf)	SOIL CLASSIFICATION
1	1	SB		TOPSOIL	10-22-22								5.6			
5	2	SB		Brown with little gray SILT and CLAY, little sand, trace gravel, shale fragments, organics. (FILL) (SLIGHTLY MOIST)	6-6-6								13.3			
	3	SB			6-9-13								13.3			
10	4	SB		Stiff gray SILT and CLAY, little sand, gravel, few sand lenses. (CL-ML) (MOIST)	9-7-8	3.1	17.8	16.7	32.1	30.3	24	7	12.5			A-4
15	5	SB			5-7-10	10.0	16.5	16.0	32.5	25.0	22	6	11.4			A-4
	6	SB		Stiff to very stiff gray SILT and CLAY, some sand, little gravel, trace shale fragments, few sand seams. (CL-ML) (MOIST)	5-6-7								10.9			
20	7	SB			6-8-9	6.8	18.1	18.2	35.2	21.5	21	6	10.9			A-4
	8	SB			8-9-9								12.9			
25	9	SB		Very stiff brownish-gray SILT and CLAY, little sand, gravel, trace sandstone fragments. (CL-ML) (MOIST)	7-10-16	6.8	12.2	12.0	34.1	34.9	28	8	14.0			A-4
30	10	SB			9-15-15	5.2	12.5	12.6	34.8	34.9	26	8	11.7			A-4
	11	SB			12-31-37								11.3			
35	12	SB			10-12-18	6.8	12.8	11.6	38.8	30.0	26	8	12.1			A-4
	13				10-14-16								11.4			
40	14	SB		Very stiff to hard gray SILT and CLAY, little sand, gravel, trace shale fragments, sandstone fragments. (CL-ML) (MOIST)	10-14-17								13.5			
45	15				14-15-15	6.8	13.1	12.5	31.6	35.9	27	9	13.1			A-4
	16				15-15-[illegible]											
50																
55	17	SB		Highly weathered gray SANDSTONE. Auger Refusal	15-36-50/4"											

SOLAR TESTING LABORATORIES, INC.

SUBSURFACE INVESTIGATION

I-271 UNDER

RICHMOND ROAD (S.R. 175)

WARRENSVILLE HEIGHTS, CUYAHOGA COUNTY, OHIO

DRAWN BY EPZ	CHECKED BY AMA	STL PROJECT NO.
SCALE	DATE 10-15-91	9A91608.16

CALC. BY:_____ DATE:_____

CHK. BY: _____ DATE:_____

FHWA REGION	STATE	PROJECT	
5	OHIO		

1/3

CUYAHOGA
RICHMOND ROAD, S.R. 175

INTRODUCTION

This report presents the results of a soil investigation conducted at the site of the proposed reconstruction of Richmond Road in the Village of Highland Hills and the City of Warrensville Heights, Cuyahoga County, Ohio.

The subsurface investigation was performed to determine the subsurface conditions and structural characteristics of the subsurface soil and its suitability for support of the proposed pavement.

FIELD INVESTIGATION

Four (4) soil borings with sampling were conducted at the proposed site on *December 24, 1992*, to determine the subsurface conditions. Pavement cores were also performed at these locations to determine the existing pavement components. Test boring locations were selected and field located by *Howard Needles Tammen & Bergendoff.*

Sampling was conducted as outlined below, in accordance with ASTM D-1586.

1. Using approved split barrel equipments, four (4) split barrel samples were taken in the upper ten (10) feet.
2. Hammer blows per six 6 inch penetration intervals (0-6"; 6-12"; 12-18") were logged with a 140 pound hammer at 30 inch free fall. Standard Penetration Test results were entered in a driller's log and identified by boring number and depth.
3. When encountered, groundwater water level was measured and recorded upon encounter and at completion of each test boring .
4. All samples were visually classified immediately upon removal from the sampler, identified in the driller's log by boring number and depth, placed in sealed glass sampling containers which were individually identified as per the driller's logs, and collected for removal to our soil mechanics laboratory in accordance with ASTM D-4220.

All soil samples were subjected to laboratory visual-manual soil classification in accordance with ASTM D-2488 utilizing the nomenclature of the Unified Soil Classification System, ASTM D-2487.

Two (2) bulk samples were obtained from borings B-1 and B-2 and borings B-3 and B-4.

LABORATORY TESTING

Moisture content testing was performed in accordance with ASTM D-2216 on all split barrel samples to determine the in-place moisture content of the existing soils.

California Bearing Ratio (CBR) tests were performed on the bulk samples in accordance with ASTM D-1883. Maximum dry and wet weights and corresponding optimum moisture content were determined.

Representative, selected samples were subjected to laboratory soil particle size analysis testing, in accordance with ASTM D-422. Procedures included sieve and hydrometer sedimentation determinations, where applicable.

Representative, selected samples were subjected to plasticity index testing, including liquid and plastic limits, in accordance with ASTM D-4318.

GEOLOGY

The test borings were overlain with approximately one (1) to two (2) feet of asphalt and concrete. Previously placed fill consisting of a combination of brown and gray sand, silt, clay, and gravel was encountered in boring B-3 extending to a depth of approximately five (5) feet below the surface. It should be noted that nature and extent of fill could vary with location, since borings only cover a finite area.

The naturally deposited soils consisted of stiff to hard brown and gray sandy silt (A-4a) and silt and clay (A-6a), containing fractions of gravel, sandstone and shale fragments.

No water was encountered in any of the borings. However, all soil samples were moist and fluctuations in water levels are common with seasonal changes.

LEGEND

X-Y-Z — TEST BORING LOCATION - PLAN VIEW

TEST BORING PLOTTED TO VERTICAL SCALE ONLY - PROFILE

FIGURES BESIDE THE BORING LOG IN PROFILE INDICATE THE NUMBER OF BLOWS OF 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

TR — Top of rock

W — WATER ON ENCOUNTER

▼ — WATER ON COMPLETION

X — FIGURE BESIDE THE BORING LOG IN PROFILE INDICATES THE MOISTURE CONTENT

CLASSIFICATION OF SOILS

SYMBOL	DESCRIPTION	Classification AASHTO	Classification OHIO	% Pass #10	% Pass #40	% Pass #200	Liquid Limit (LL)	Plasticity Index (PI)	Group Index Max.	REMARKS
	Gravel and /or Stone Fragments	A-1-a		50 Max.	30 Max.	15 Max.		6 Max.	0	
	Gravel and /or Stone Fragments with Sand	A-1-b			50 Max.	25 Max.		6 Max.	0	
	Fine Sand	A-3			51 Min.	10 Max.	NON-PLASTIC		0	
	Coarse and Fine Sand	—	A-3a			35 Max.		6 Max.	0	Min. of 50% combined coarse and fine sand sizes
	Gravel and/or Stone Fragments with Sand and Silt	A-2-4				35 Max.	40 Max.	10 Max.	0	
		A-2-5					41 Min.			
	Gravel and/or Stone Fragments with Sand, Silt and Clay	A-2-6				35 Max.	40 Max.	11 Min.	4	
		A-2-7					41 Min.			
	Sandy Silt	A-4	A-4a			36 Min.	40 Max.	10 Max.	8	Less than 50% silt sizes
	Silt	A-4	A-4b			50 Min.	40 Max.	10 Max.	8	50% or more silt sizes
	Elastic Silt and Clay	A-5				36 Min.	41 Min.	10 Max.	12	
	Silt and Clay	A-6	A-6a			36 Min.	40 Max.	11-15	10	
	Silty Clay	A-6	A-6b			36 Min.	40 Max.	16 Min.	16	
	Elastic Clay	A-7-5				36 Min.	41 Min.	‡ LL-30	20	
	Clay	A-7-6				36 Min.	41 Min.	>LL-30	20	

‡ The classification of a soil is found by the process of elimination. Using the required test data, proceed from the top of the chart. The first classification the test data fits is the correct classification.

MATERIAL CLASSIFIED BY VISUAL INSPECTION

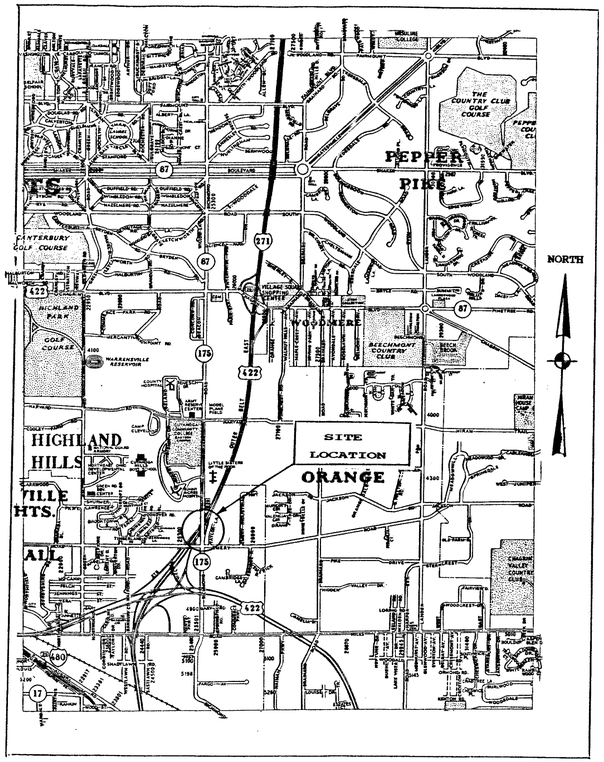
- Sod and/or Topsoil
- Berm Material
- Peat - S-Sedimentary W-Woody F-Fibrous L-Loamy M-Murky &etc.
- Random Fill
- Bouldery Zone
- Fire Clay or Underclay
- Coal
- Coal Blossom
- Claystone
- Mudstone
- Weathered Mudstone
- Shale
- Weathered Shale
- Sandstone
- Weathered Sandstone
- Siltstone
- Limestone
- Leached Limestone
- Dolomite
- Leached Dolomite
- Various Other Materials

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS	GRAVELS	CLEAN GRAVELS	GW	Well-graded gravels and gravel sand mixtures, little or no fines
			GP	Poorly-graded gravels and gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES	GM	Silty gravels, gravel sand-silt mixtures
			GC	Clayey gravels, gravel-sand clay mixtures
	SANDS	CLEAN SAND	SW	Well-graded sands and gravelly sands, little or no fines
			SP	Poorly-graded sands and gravelly sands, little or no fines
		SAND WITH FINES	SM	Silty sands, and-silt mixtures
			SC	Clayey sand, sand-clay mixtures
FINE GRAINED SOILS	SILTS AND CLAYS LL < 50		ML	Inorganic silts very fine sands, rock flour, silty or clayey fine sands
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sand clays, silty clays, leans clays
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS LL > 50		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
HIGHLY ORGANIC SOILS			PT	Peat, muck and other highly organic soils

COMPONENT		SIZE
BOULDERS		Larger than 8"
COBBLES		8" to 3"
GRAVEL	COARSE	3" to 3/4"
	FINE	3/4" to 2.0 MM (3/4" to #10 sieve)
SAND	COARSE	2.0 MM to 0.42 MM (#10 to #40 sieve)
	FINE	0.42 MM to 0.074 MM (#40 to #200 sieve)
SILT		0.074 MM to 0.005 (#200 to .005 MM)
CLAY		Smaller than .005 MM

TERMS	RANGE
Trace	0 - 10%
Little	10 - 20%
Some	20 - 35%
And	35 - 50%



LABORATORY TEST RESULTS

BORING NO.	SAMPLE DEPTH(ft)	MOISTURE CONTENT(%)	COARSE (%)	SAND(%)	SILT(%)	CLAY(%)	LL	PL	PI	ODOT CLASSIFICATION
B-1	1.0 - 2.5	14.7	10.8	20.6	34.5	34.1	27	18	9	A-4a
	2.5 - 4.0	14.0								
	5.0 - 6.5	14.1	7.6	23.3	36.8	32.3				A-4a
	8.5 - 10.0	13.3								
B-2	1.0 - 2.5	13.4	15.6	22.1	32.0	30.3	27	18	9	A-4a
	2.5 - 4.0	14.3								
	5.0 - 6.5	15.0								
	8.5 - 10.0	12.7								
B-3	1.0 - 2.5	14.8								
	2.5 - 4.0	14.3	41.6	14.0	24.8	19.6				
	5.0 - 6.5	14.4								
	8.5 - 10.0	13.7								
B-4	2.0 - 3.5	16.5	9.5	22.8	38.2	29.5	31	20	11	A-6a
	3.5 - 5.0	16.9								
	5.0 - 6.5	16.9	26.5	14.6	36.9	22.0	28	22	6	A-4a
	8.5 - 10.0	14.5								

SOLAR TESTING LABORATORIES, INC.

RICHMOND ROAD CONSTRUCTION

SECTION 5B

CUYAHOGA COUNTY, OHIO

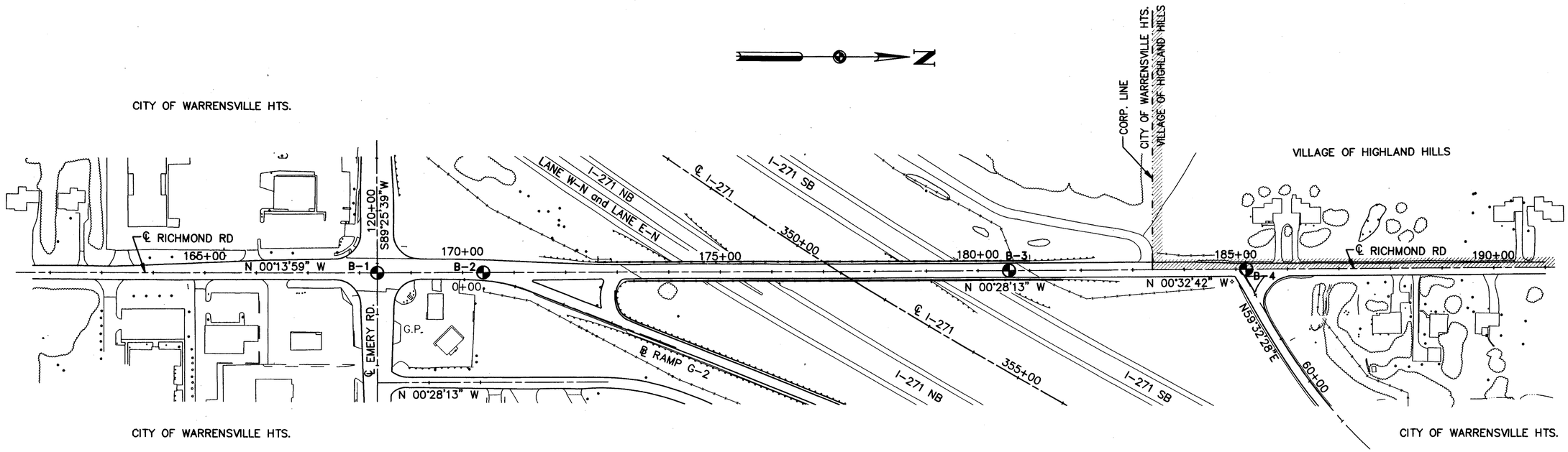
DRAWN BY HND SCALE	CHECKED BY AMA DATE 02-16-93	STL PROJECT NO. A92991x10

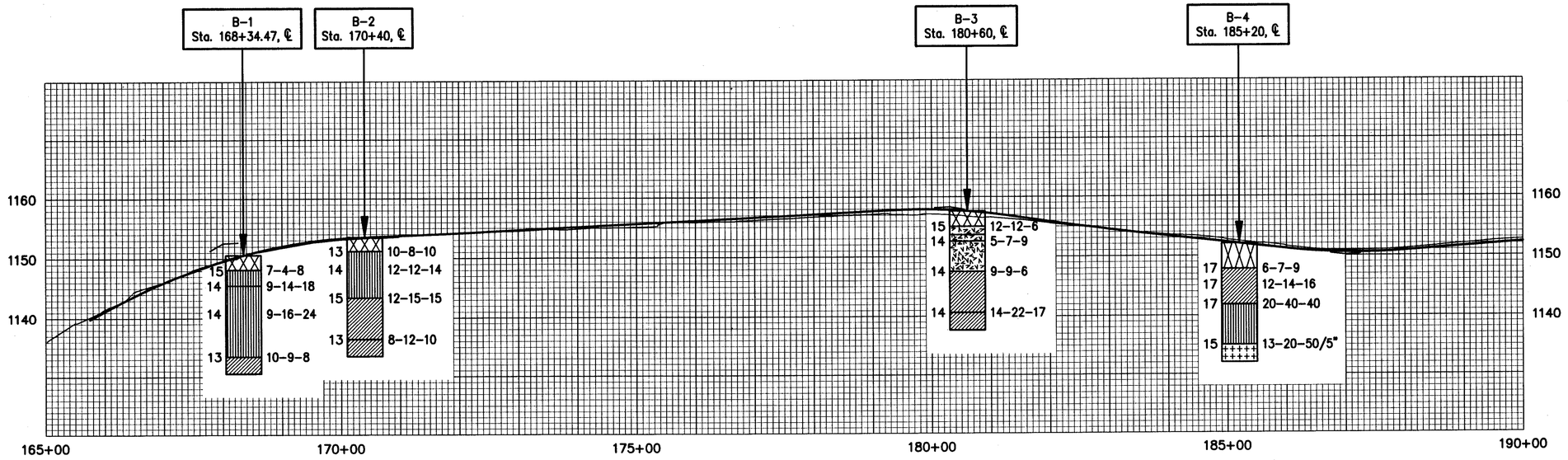
SOIL BORINGS

FHWA REGION	STATE	PROJECT	
5	OHIO		

2/3

CUYAHOGA COUNTY
CUY-175-2.68
CUY-271-6.29





HORIZONTAL 100 0 100 200 400
VERTICAL 10 0 10 20 40
SCALE IN FEET

HOWARD NEEDLES TAMMEN & BERGENDOFF
ARCHITECTS ENGINEERS PLANNERS HNTB

MADE BY: SUBCON. DATE: 2/93
DRAWN BY: HND DATE: 2/93
CHECKED BY: AMA DATE: 2/16/93
SCALE: AS SHOWN
DJFSOIL.DWG

SOLAR TESTING LABORATORIES, INC.
RICHMOND ROAD CONSTRUCTION
SECTION 5B
CUYAHOGA COUNTY, OHIO

SOIL BORINGS

CALC. BY:_____ DATE:_____

CHK. BY:_____ DATE:_____

FHWA REGION	STATE	PROJECT	
5	OHIO		

3/3

CUYAHOGA
RICHMOND ROAD, S.R. 175

SOLAR TESTING LABORATORIES, INC. — LOG OF TEST BORING

PROJECT: RICHMOND ROAD CONSTRUCTION/SECTION 5B — CLIENT: HOWARD NEEDLES TAMMEN & BERGENDOFF — BORING B-1

LOCATION: CUY. CNTY, OH STA. 168+34.47, CENTERLINE — DATE STARTED 12/24/92 — DATE COMPLETED 12/24/92

DRILLING METHOD: SOLID STEM
SURFACE ELEVATION: 1150.7'
WATER ENCOUNTER: NONE
ELEV. ON COMPLETION: NONE

DEPTH	SAMPLE	TYPE	SYMBOL	SOIL DESCRIPTION	SPLIT-BARREL PENETRATION blows / 6 in.	PHYSICAL CHARACTERISTICS: AGG. %	COARSE SAND %	FINE SAND %	SILT %	CLAY %	LIQUID LIMIT %	PLASTICITY INDEX %	MOISTURE CONTENT %	UNCONF. COMP. STRENGTH (psf)	DRY UNIT WEIGHT (pcf)	SOIL CLASSIFICATION
				4" ASPHALT, 8 3/4" CONCRETE												
	1	SS		Stiff brown with little gray SANDY SILT, little clay, gravel. (ML) (MOIST)	7-4-8	10.8	8.2	12.4	34.5	34.1	27	9	14.7			A-4a
	2	SS			9-14-18								14.0			
5'	3	SS		Hard brown SANDY SILT, little clay, gravel, few shale fragments. (ML) (MOIST)	9-16-24	7.6	9.2	14.1	36.8	32.3			14.1			A-4a
	4	SS		Very stiff gray SILT and CLAY, little sand, gravel, trace shale fragments. (CL-ML) (MOIST)	10-9-8								13.3			
10'																
15'																

SOLAR TESTING LABORATORIES, INC. — LOG OF TEST BORING

PROJECT: RICHMOND ROAD CONSTRUCTION/SECTION 5B — CLIENT: HOWARD NEEDLES TAMMEN & BERGENDOFF — BORING B-3

LOCATION: CUY. CNTY, OH STA. 180+60, CENTERLINE — DATE STARTED 12/24/92 — DATE COMPLETED 12/24/92

DRILLING METHOD: SOLID STEM
SURFACE ELEVATION: 1157.6'
WATER ENCOUNTER: NONE
ELEV. ON COMPLETION: NONE

DEPTH	SAMPLE	TYPE	SYMBOL	SOIL DESCRIPTION	SPLIT-BARREL PENETRATION blows / 6 in.	PHYSICAL CHARACTERISTICS: AGG. %	COARSE SAND %	FINE SAND %	SILT %	CLAY %	LIQUID LIMIT %	PLASTICITY INDEX %	MOISTURE CONTENT %	UNCONF. COMP. STRENGTH (psf)	DRY UNIT WEIGHT (pcf)	SOIL CLASSIFICATION
				5 1/8" ASPHALT, 9 3/8" CONCRETE												
	1	SS		Brown SILTY SAND and GRAVEL. (FILL) (HOIST)	12-12-6								14.8			
	2	SS		Brown SILT and CLAY, * Brownish-gray SILT and CLAY, few sandstone fragments, little sand, trace slag. (FILL) (HOIST)	5-7-9	41.6	4.7	9.3	24.8	19.6			14.3			
5'	3	SS		Stiff brown SILT and CLAY, little sand, gravel. (CL-ML) (MOIST)	9-9-6								14.4			
	4	SS		Hard mottled brown and gray SILT and CLAY, some sandstone fragments, little sand. (CL-ML)(MOIST)	14-22-17								13.7			
10'				* little sand, gravel. (FILL) (MOIST)												
15'																

SOLAR TESTING LABORATORIES, INC. — LOG OF TEST BORING

PROJECT: RICHMOND ROAD CONSTRUCTION/SECTION 5B — CLIENT: HOWARD NEEDLES TAMMEN & BERGENDOFF — BORING B-2

LOCATION: CUY. CNTY, OH STA. 170+40, CENTERLINE — DATE STARTED 12/24/92 — DATE COMPLETED 12/24/92

DRILLING METHOD: SOLID STEM
SURFACE ELEVATION: 1153.5'
WATER ENCOUNTER: NONE
ELEV. ON COMPLETION: NONE

DEPTH	SAMPLE	TYPE	SYMBOL	SOIL DESCRIPTION	SPLIT-BARREL PENETRATION blows / 6 in.	PHYSICAL CHARACTERISTICS: AGG. %	COARSE SAND %	FINE SAND %	SILT %	CLAY %	LIQUID LIMIT %	PLASTICITY INDEX %	MOISTURE CONTENT %	UNCONF. COMP. STRENGTH (psf)	DRY UNIT WEIGHT (pcf)	SOIL CLASSIFICATION
				4 3/4" ASPHALT, 9 1/4" CONCRETE												
	1	SS		Very stiff brown with trace gray SANDY SILT, little clay, gravel, few silty sand pockets. (POSSIBLE FILL) (ML) (MOIST)	10-8-10	15.6	8.9	13.2	32.0	30.3	27	9	13.4			A-4a
	2	SS			12-12-14								14.3			
5'	3	SS		Very stiff brown SILT and CLAY, little sand, gravel, few shale fragments. (CL-ML) (MOIST)	12-15-15								15.0			
	4	SS		Very stiff gray SILT and CLAY, little sand, gravel, trace shale fragments. (CL-ML) (MOIST)	8-12-10								12.7			
10'																
15'																

SOLAR TESTING LABORATORIES, INC. — LOG OF TEST BORING

PROJECT: RICHMOND ROAD CONSTRUCTION/SECTION 5B — CLIENT: HOWARD NEEDLES TAMMEN & BERGENDOFF — BORING B-4

LOCATION: CUY. CNTY, OH STA. 185+20, CENTERLINE — DATE STARTED 12/24/92 — DATE COMPLETED 12/24/92

DRILLING METHOD: SOLID STEM
SURFACE ELEVATION: 1152.0'
WATER ENCOUNTER: NONE
ELEV. ON COMPLETION: NONE

DEPTH	SAMPLE	TYPE	SYMBOL	SOIL DESCRIPTION	SPLIT-BARREL PENETRATION blows / 6 in.	PHYSICAL CHARACTERISTICS: AGG. %	COARSE SAND %	FINE SAND %	SILT %	CLAY %	LIQUID LIMIT %	PLASTICITY INDEX %	MOISTURE CONTENT %	UNCONF. COMP. STRENGTH (psf)	DRY UNIT WEIGHT (pcf)	SOIL CLASSIFICATION
				11 5/8" ASPHALT, 2 7/16" BRICK, 1/2" SAND BUFFER, 11" CONCRETE												
	1	SS		Very stiff mottled brown and gray SILT and CLAY, little sand, trace gravel. (CL-ML) (HOIST)	6-7-9	9.5	7.4	15.4	38.2	29.5	31	11	16.5			A-6a
	2	SS			12-14-16								16.9			
5'	3	SS		Very dense brown with little gray SANDY SILT, little clay, interlayers of brown SILT and CLAY, some sandstone fragments, gravel. (CL-ML) (MOIST)	20-40-40	26.5	6.3	8.3	36.9	22.0	28	6	16.9			A-4a
	4	SS		Hard brownish-gray CLAYEY SILT, little sand, gravel. (ML) (MOIST)	13-20-50/5"								14.5			
10'																
15'																

SOLAR TESTING LABORATORIES, INC.

RICHMOND ROAD CONSTRUCTION

SECTION 5B

CUYAHOGA COUNTY, OHIO

DRAWN BY HND	CHECKED BY AMA	STL PROJECT NO.
SCALE	DATE 02-16-93	A92991x10