APPENDIX
MR-2019

RECORD DRAWINGS

RMTA SYSTEM MAP AND PIER LOCATION EXHIBIT

RMTA BRIDGES Boulevard, 11,63,64, 65, 66, 67 & 68

(NOTE: Additional As-built Plans are Available upon Request to the Engineer)

RMTA

System Map


RICHMOND EXPRESSWAY SYSTEM
Scale:
0 1000 2000 3000ft.
48 - Bridge Number
RMTA Facilities Shown in Red
RMTA
RICHMOND METROPOLITAN TRANSPORTATION AUTHORITY
RICHMOND
JOSEPH BRYAN PARK
Toll Booths
BRYAN PARK INTERCHANGE
LABURNUM AVE.
WESTWOOD AVE.
BROOKLAND PARK BLVD.
OVERBROOK RD.
NORTH AVE.
BROOK RD.
CHAMBERLAYNE AVE.
UNIVERSITY OF RICHMOND
THREE CHOPT RD.
LIBBIE AVE.
BROAD ST.
MONUMENT AVE.
PATTERSON AVE.
GROVE AVE.
CARY STREET ROAD
COMMONWEALTH AVE.
MALVERN AVE.
HAMILTON ST.
KENT RD.
THOMPSON ST.
Visitor Information Center
The Diamond
Science Museum Of Virginia
VIRGINIA UNION UNIVERSITY
HERMITAGE RD.
RICHMOND PETERSBURG TURNPIKE
BROOK RD.
SEABOARD COAST LINE
MECHANICSVILLE
HUGUENOT BRIDGE
HUGUENOT ROAD
RIVERSIDE DR.
Williams Island
DOVER RD.
(C. & O. RY.)
JAMES
Section Two Connection To I-195
PORTLAND PL.
Toll Booths
STADIUM INTERCHANGE
CITY STADIUM
IDLEWOOD AVE.
MAPLEWOOD AVE.
GRANT RD.
DOUGLASDALE RD.
R. F. & P. R.R.
Water Works
WILLOW OAKS
COUNTRY CLUB
Section One
POWHITE BRIDGE OVER THE JAMES RIVER
FOREST HILL AVE.
Toll Booths
FOREST HILL AVE. INTERCHANGE
Powhite Parkway State Rte 76
Toll Plaza (SB)
Toll Plaza (NB)
(SOUTHERN RAILWAY)
PARKWAY
CHIPPENHAM
CHIPPENHAM PARKWAY INTERCHANGE
Powhite Parkway Extension (VDOT Toll Road)
BLILELY RD.
JAHNKE RD.
SEABOARD COAST LINE
CSX RAILWAY
NANSEMOND ST.
I-195
Virginia Museum Of Fine Arts
SHEPPARD ST.
THE BOULEVARD
ROBINSON ST.
Downtown Expressway Extension
ELWOOD AVE.
FLOYD AVE.
MAIN ST.
CARY ST.
PARKWOOD AVE.
BOULEVARD INTERCHANGE
PATTERSON AVE.
MONUMENT AVE.
PARK AVE.
GROVE AVE.
BROAD ST.
LOMBARDY
Connection to Downtown Expressway
WILLIAM BYRD PARK
Section Three
MAYMONT PARK
Toll Plaza
BOULEVARD BRIDGE 7500# Limit
WESTOVER HILLS BLVD.
MEADOW ST.
ALLEN AVE.
IDLEWOOD AVE.
LAKEVIEW AVE.
RANDOLPH ST.
HARRISON ST.
COLORADO AVE.
MT. CALVARY CEMETERY
RIVERVIEW CEMETERY
HOLLYWOOD CEMETERY
Section Four Downtown Expressway
Toll Plaza
GRAYLAND AVE.
Downtown Expressway State Rte. 195
Virginia Commonwealth University
Monroe Park
The Mosque
CHERRY ST.
LAUREL ST.
BELVIDERE
CLAY ST.
MARSHALL ST.
LEIGH ST.
FRANKLIN ST.
ADAMS ST.
Public Library
COLISEUM
State Penitentiary
Chamber of Commerce
CANAL ST.
BYRD ST.
Toll Booths
City Hall
Med. Col. Of Va. (VCU)
STATE CAPITOL
Shockoe Slip Historic District
MAIN ST. STATION
DOWNTOWN I-95 INTERCHANGE
Toll Booths
17th ST.
18th ST.
MOSBY ST.
FAIRFIELD AVE.
CARRINGTON ST.
NINE MILE RD.
25th ST.
MARSHALL ST.
BROAD ST.
CLAY ST.
21st ST.
ROBERT E. LEE BRIDGE
MANCHESTER BRIDGE
MAYOS BRIDGE
JAMES RIVER BRIDGE
RIVER
(C & O RY.)
NORFOLK SOUTHERN
(SOUTHERN RAILWAY)
FOREST HILL PARK
SEMMES AVE.
FOREST HILL AVE.
HULL ST.
COMMERCE RD.
MAURY ST.
Chimborazo Park
SOUTHERN RAILWAY
64
95
195
250
33
6
147
197
161
146
76
150
360
301
60
5
1
4
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9
10
11
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13
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65
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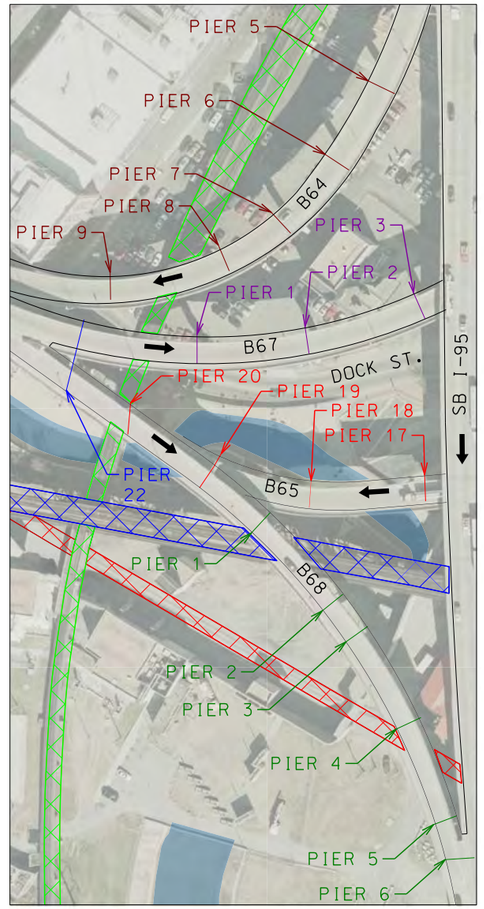
67
68

RMTA DTE, I-95 Ramps Pier Location Exhibit

INSERT 1



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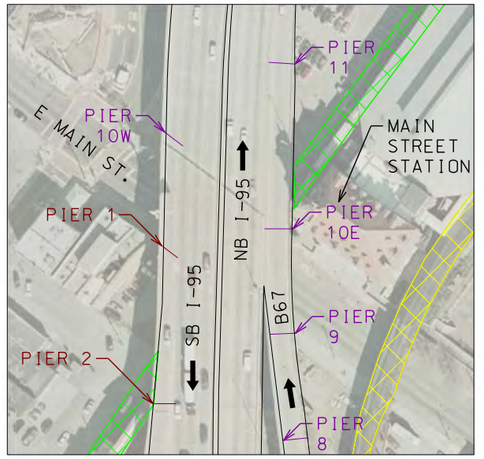

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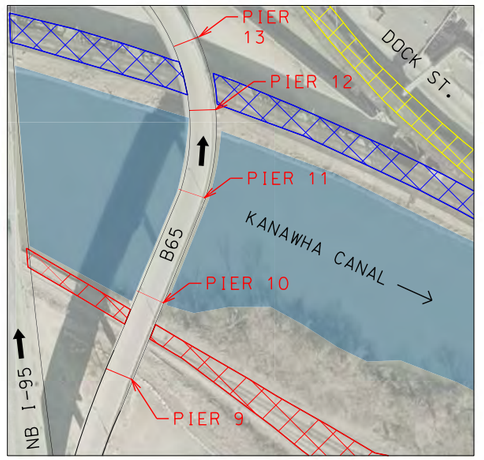


LEGEND:
- BRIDGE 63
- BRIDGE 64
- BRIDGE 65
- BRIDGE 66
- BRIDGE 67
- BRIDGE 68
- N&S RAILROAD
- CSX RAILROAD
- CSX RAILROAD
- CSX RAILROAD

NOTES:
1) PIER NUMBERS BASED ON AS-BUILT DRAWINGS FROM CONTRACTS C-10 AND C-11.
2) RAILROAD LIMITS AND PIER LOCATIONS BASED ON AERIAL PHOTOGRAPHY.
3) THIS EXHIBIT IS FOR REFERENCE ONLY. REFER TO AS-BUILT DRAWINGS FOR EXACT PIER LOCATIONS.
4) BRIDGE 63 IS ON BOTTOM, BRIDGE 66 IS ON TOP.

RICHMOND METROPOLITAN TRANSPORTATION AUTHORITY

HNTB
2900 S. QUINCY STREET, SUITE 200
ARLINGTON, VIRGINIA
(703) 824-5100

I-95 RAMPS PIER LOCATION EXHIBIT

Scale:	Date:	Contract No.:	Sheet:
N.T.S.	MAY 2015	MR-2015	1 OF 1

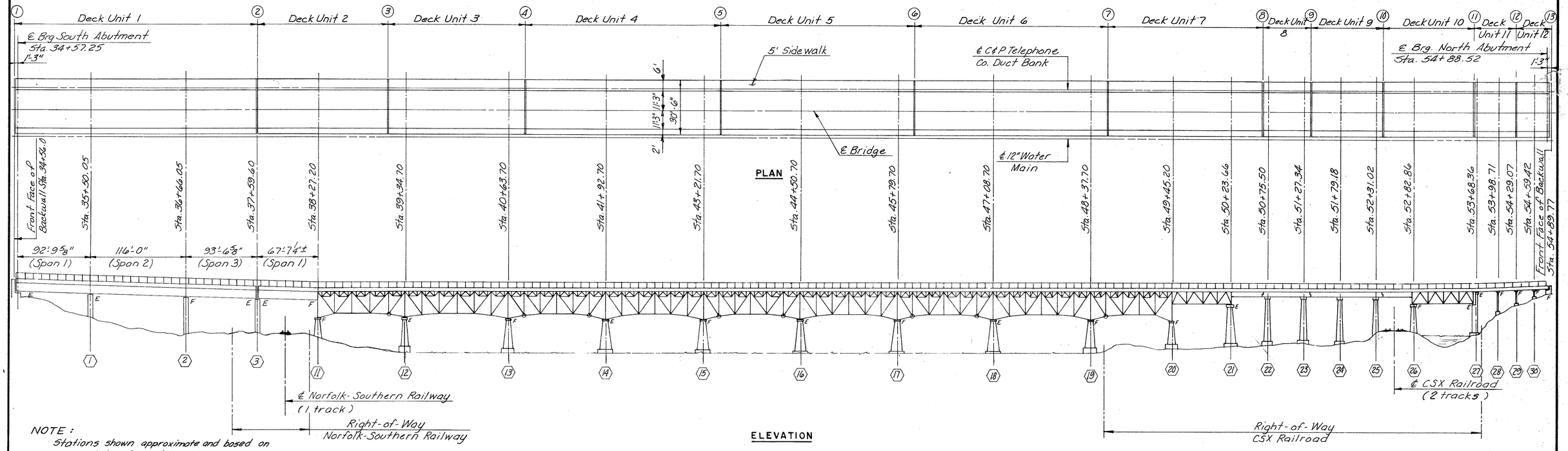
Pier Map-DR2016.dgn
3/4/2016

Boulevard Bridge

(VA State Rte. 161 – Westover Hills Blvd.)

Record Set Plans

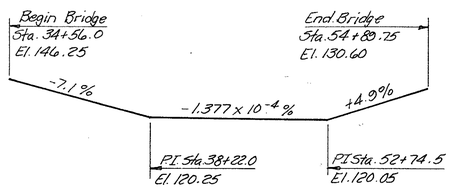
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
C-17B	Boulevard Bridge Rehab	35(1)	



PLAN

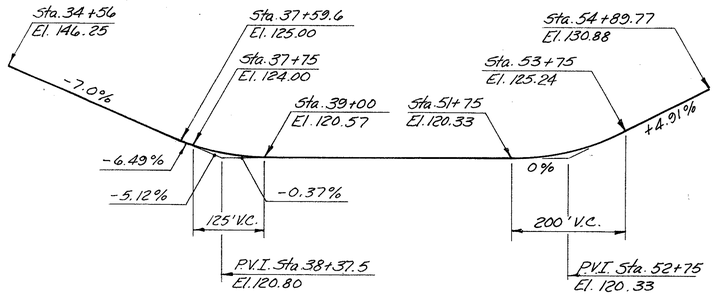
ELEVATION

NOTE :
Stations shown approximate and based on surveyed deck joint station. The Contractor is to verify all pertinent dimensions and elevations prior to the fabrication of any structural steel.



APPROXIMATE EXISTING PROFILE GRADE

Profile grade shown is based on surveyed elevation along the ℄ of the existing bridge.
The contractor is to verify all elevations prior to construction.



PROPOSED PROFILE GRADE

INDEX

LEGEND:
(1) Joint Number
⟨1⟩ Pier Number

NOTE:

LOAD RESTRICTIONS ARE CURRENTLY IN EFFECT ON THE EXISTING BRIDGE. CONSTRUCTION EQUIPMENT WEIGHING IN EXCESS OF 8 TONS SHOULD NOT BE PERMITTED ON THE BRIDGE.

	BY	DATE	NO.	REVISION	BY	DATE
MADE	H.H.	2-92				
CHECKED	T.E.M	3-92				
IN CHARGE						

RECORD DRAWING

RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM

BOULEVARD BRIDGE REHABILITATION
DECK REPLACEMENT
GENERAL PLAN, ELEVATIONS AND INDEX

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
General Consultants

SCALE: No. Scale
CONTRACT NO.: C-17B
SHEET NO. 1 OF 38

Bridge 11

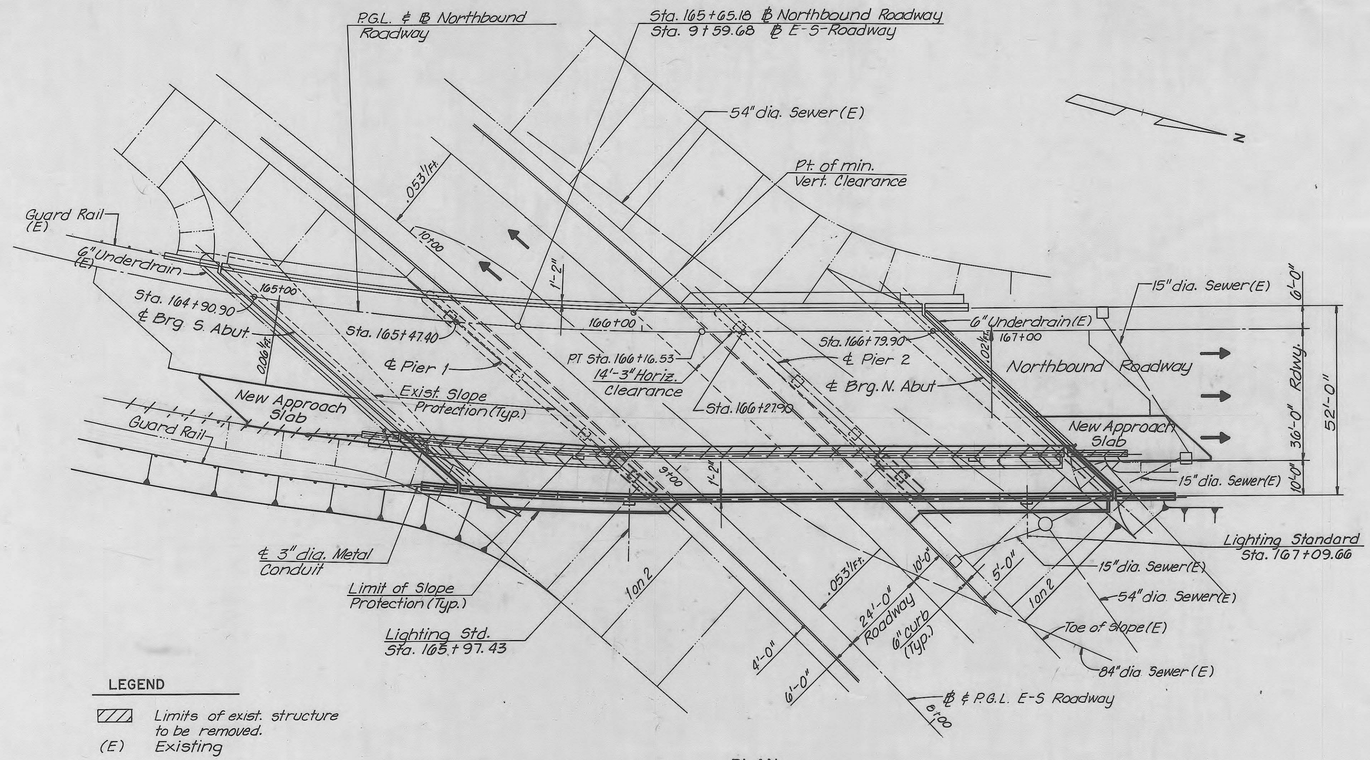
Northbound 76 over Westbound DTE Connector 146

Record Set Plans

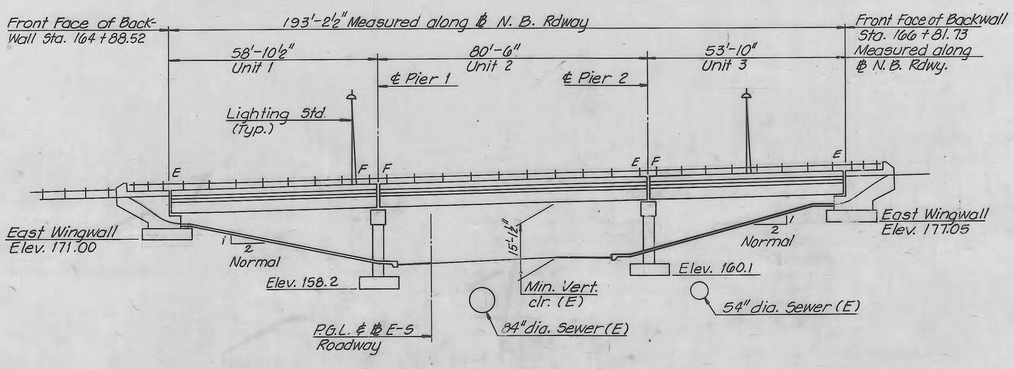
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
14	1990-1991 IMPROVEMENTS	16(1)	

NOTE TO CONTRACTOR

The contractors attention is directed to the approximate locations of utilities as shown on the General Plan and Elevation. The contractor shall submit to the engineer for approval, drawings for protection and maintenance of service of utilities, located in the areas adjacent to new footing to be constructed.



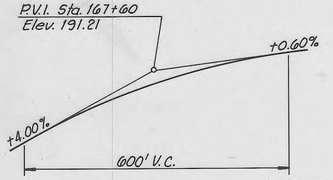
PLAN
1" = 20'-0"



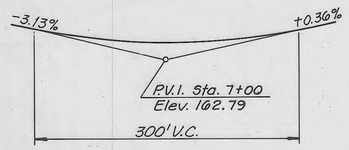
ELEVATION
1" = 20'-0"

LEGEND

- ▨ Limits of exist. structure to be removed.
- (E) Existing



℄ NORTHBOUND ROADWAY



E-S ROADWAY

PROFILE GRADE DATA
(Existing)

HORIZONTAL CURVE DATA

℄ NORTHBOUND RDWY.	℄ E-S RDWY.
P.I. = Sta. 164+19.74	P.I. = Sta. 6+43.88
Δ = 30°-14'-26"	Δ = 37°-15'-41"
D = 7°-30'-00"	D = 3°-00'-00"
T = 200.42'	T = 643.88'
L = 403.21'	L = 1242.04'
R = 763.94'	R = 1909.86'

INDEX

	BY	DATE
MADE	BTG	4/87
CHECKED	KSH	5/87
IN CHARGE	J.R.	

NO.	REVISION	BY	DATE

RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM
DOWNTOWN EXPRESSWAY

BRIDGE NO. 11 WIDENING
NORTHBOUND ROADWAY OVER
EAST-SOUTH ROADWAY

GENERAL PLAN & ELEVATION

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
consulting engineers
Alexandria, Virginia

SCALE: AS NOTED
CONTRACT NO.: C-14
SHEET NO. 1 OF 17

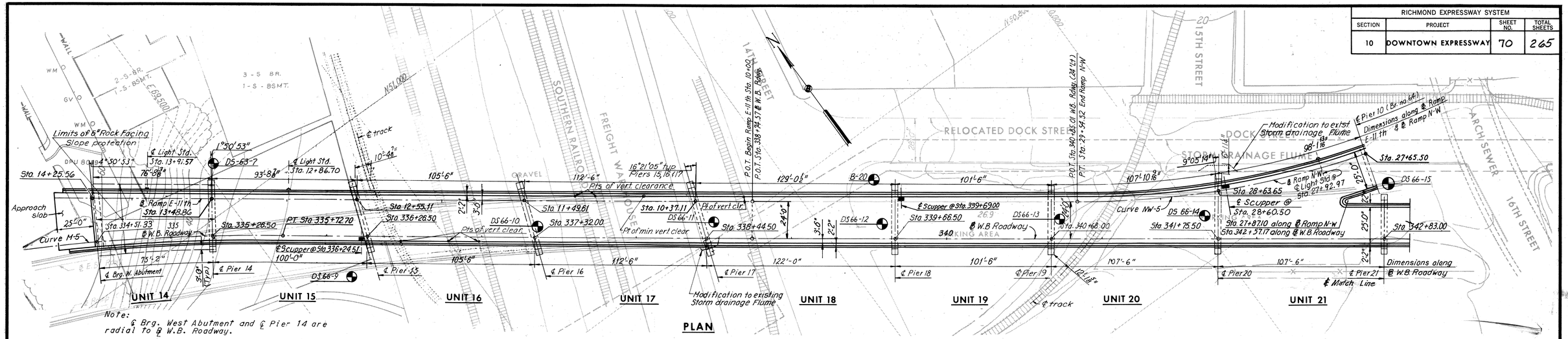
C-14

Bridge 63

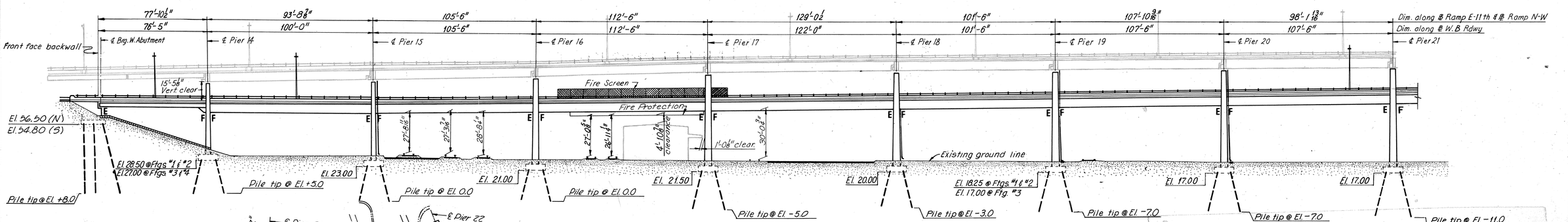
(Westbound Downtown Expressway “Rte. 195” over Virginia Street and South 14th Street “US Rte. 360”)

Record Set Plans

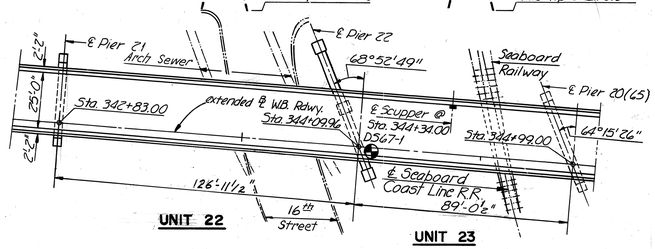
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
10	DOWNTOWN EXPRESSWAY	70	265



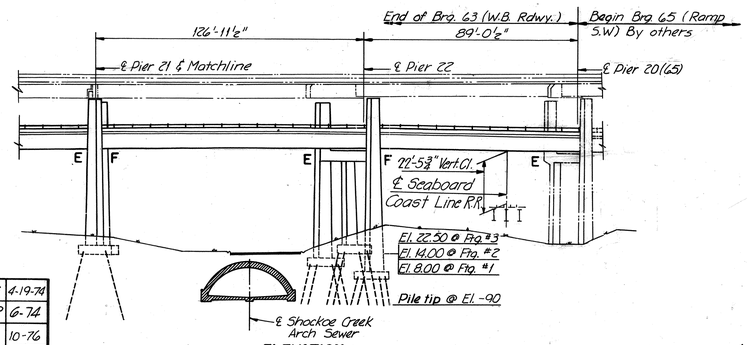
PLAN



ELEVATION



PLAN



ELEVATION

	BY	DATE
MADE	Y.C.P	1-9-69
CHECKED	J.D.	3-13-69
IN CHARGE	FKD	

NO.	REVISION	BY	DATE
1	Joint Type & Rail-Road Name Added	PRMC	4-19-74
2	Seaboard & Coast Line Added To Elev.	K.D.P	6-74
3	As Built	TEM	10-76

℄ W.B. Roadway

Curve: M-5

P.I. = Sta. 334+26.15
Δ = 11°45'56"
D = 4°00'
T = 147.59'
L = 294.14'
R = 1432.40'

℄ Ramp N-W

Curve NW-5

P.I. = Sta. 28+25.38
Δ = 26°18'00"
D = 10°00'
T = 133.86'
L = 263.00'
R = 572.96'

HORIZONTAL CURVE DATA

Notes:
For Estimated quantities and General Notes see Sheet 2.
For Boring Logs see Sheets 26 thru 29.
For Layout of Pier 10(64) see Bridge No. 64 (Ramp N-W) Sheet 3.
◓ Indicates boring location.
Footing numbers (1,2, etc.) on each pier go from North to South.
For Profile Grade Data see Sheet 2.

INDEX

AS BUILT

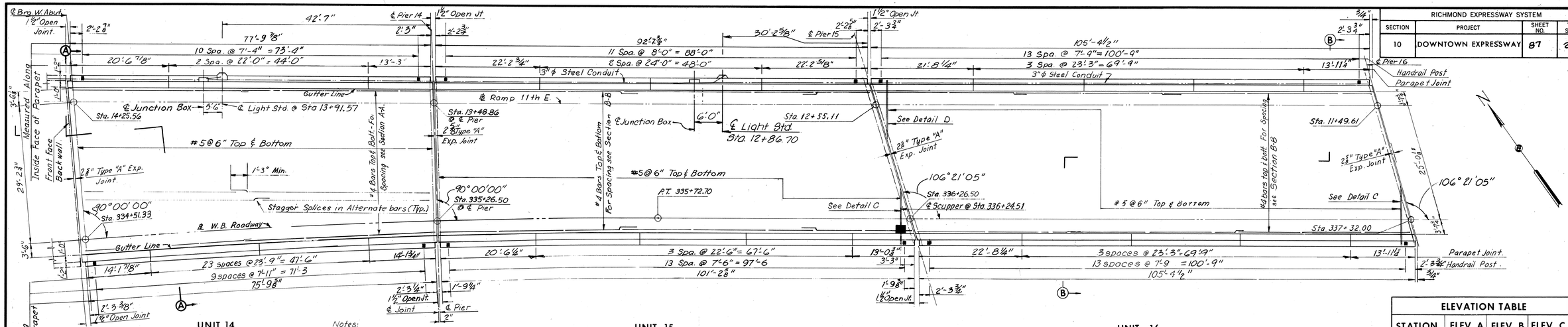
RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM
DOWNTOWN EXPRESSWAY

BRIDGE NO. 63
WESTBOUND ROADWAY OVER 12TH ST. - R.R. TRACKS AND 16TH ST.
GENERAL PLAN AND ELEVATION

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
consulting engineers
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: 1" = 30'
CONTRACT NO.: 10
SHEET NO. 1 OF 29

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
10	DOWNTOWN EXPRESSWAY	87	265



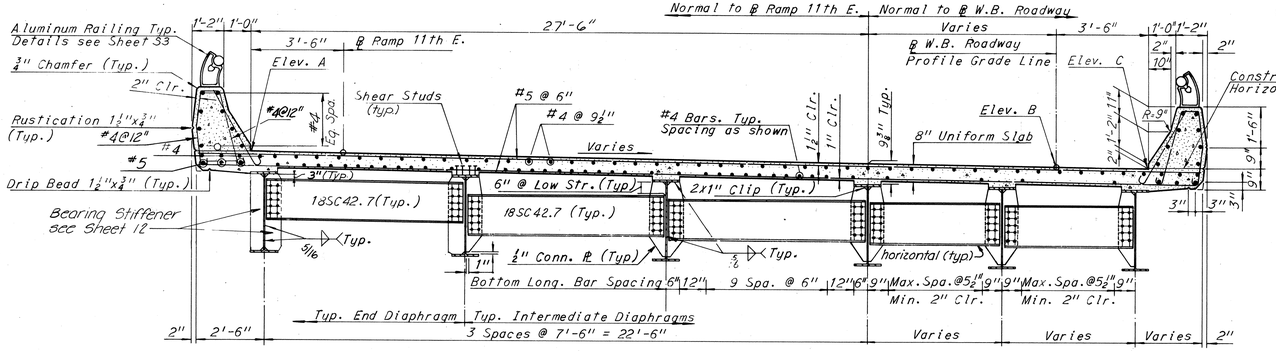
UNIT 14

UNIT 15

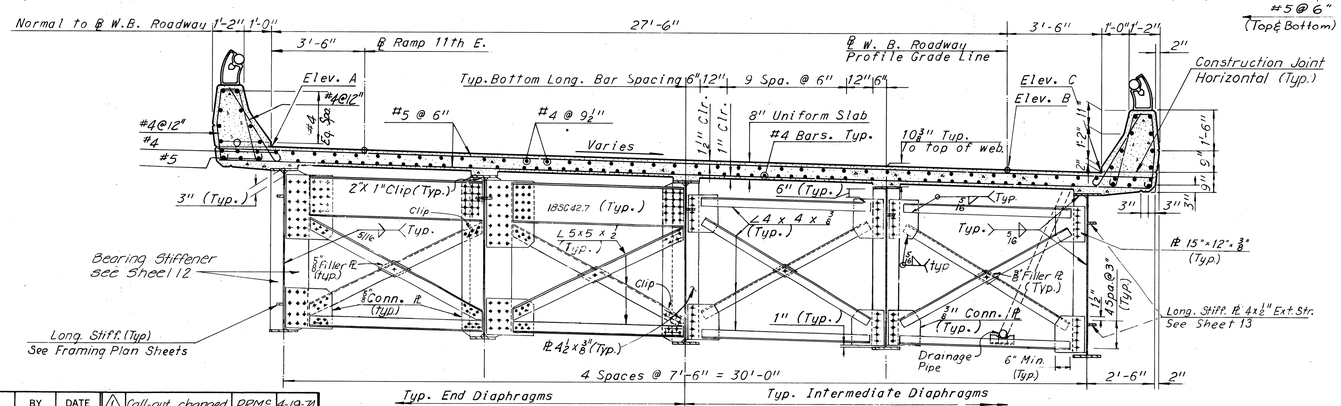
UNIT 16

Notes:
For End Diaphragms at Abutment, see Section A-A this Sheet.
For End Diaphragms at Pier 14, Units 14 & 15, see Section A-A Sheet 19.
For End Diaphragms at Pier 15, Units 15 & 16, see Section B-B this Sheet.
For End Diaphragms at Pier 16, Unit 16, see Section B-B this Sheet.

DECK PLAN
Scale: 1" = 10'-0"



SECTION A-A
Scale: ⅜" = 1'-0"



SECTION B-B
Scale: ⅜" = 1'-0"

DETAIL C
Scale: 1" = 2'-0"

DETAIL D
Scale: 1" = 2'-0"

ELEVATION TABLE			
STATION	ELEV. A	ELEV. B	ELEV. C
334+50.00	68.13	66.16	65.95
+51.50	68.10	66.13	65.92
+60.00	67.89	65.97	65.76
+70.00	67.65	65.78	65.57
+80.00	67.42	65.58	65.37
+90.00	67.17	65.39	65.18
335+00.00	66.92	65.20	64.99
+10.00	66.67	65.02	64.81
+20.00	66.43	64.85	64.65
+26.50	66.28	64.74	64.55
+30.00	66.20	64.69	64.50
+40.00	65.99	64.55	64.37
+50.00	65.78	64.43	64.26
+60.00	65.61	64.32	64.16
+70.00	65.46	64.23	64.07
+80.00	65.32	64.15	64.00
+90.00	65.20	64.09	63.95
336+00.00	65.09	64.04	63.91
+10.00	65.00	64.01	63.88
+18.58	64.93	---	---
+20.00	64.92	63.99	63.87
+26.50	---	63.99	---
+27.38	---	---	63.87
+30.00	64.86	63.99	63.87
+40.00	64.81	64.00	63.90
+50.00	64.78	64.03	63.94
+60.00	64.76	64.07	63.99
+70.00	64.76	64.13	64.05
+80.00	64.79	64.21	64.13
+90.00	64.81	64.30	64.23
337+00.00	64.85	64.40	64.34
+10.00	64.91	64.51	64.46
+20.00	64.97	64.62	64.58
+24.08	64.96	---	---
+30.00	65.00	64.74	64.71
+32.00	---	64.76	---
+32.88	---	---	64.74
+40.00	65.05	64.85	64.83

Notes:
For Superstructure quantities, see Sheet 2.
For Framing plan, see Sheet 13.
For Joint details, see Sheet 24.
For Railing details, see Sheet 53.
For Standard Drainage Details, see Support Type 2 Sheet S5 & S6

	BY	DATE				
MADE	SHS	8-2-68	2	As Built	TEM	10-76
CHECKED	R.C.	10-23-68				
IN CHARGE			NO.	REVISION	BY	DATE

AS BUILT

RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM
DOWNTOWN EXPRESSWAY

BRIDGE NO. 63
WESTBOUND ROADWAY OVER
12TH ST. - R.R. TRACKS AND 16TH ST.
DECK PLAN - UNITS 14, 15, AND 16

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
consulting engineers
NEW YORK ALEXANDRIA KANSAS CITY

SCALE:
CONTRACT NO.: 10
SHEET NO. 18 OF 29

Bridge 64

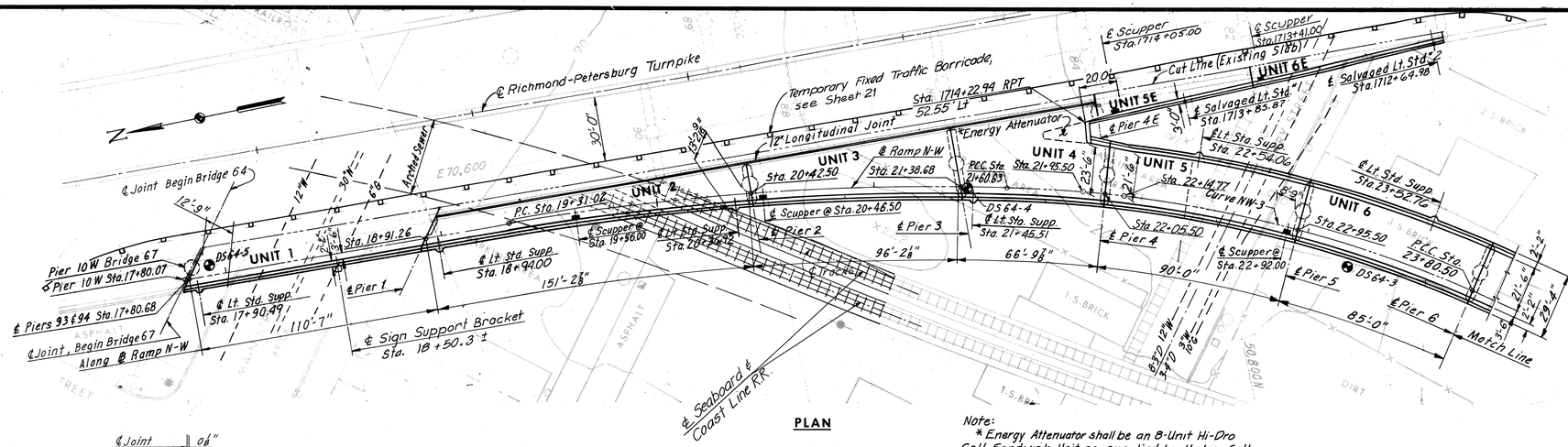
(Ramp from Southbound I-95 to Westbound Downtown Expressway “Rte. 195” over East Cary Street, Dock Street and CSX RR)

Record Set Plans

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
10	DOWNTOWN EXPRESSWAY	99	265

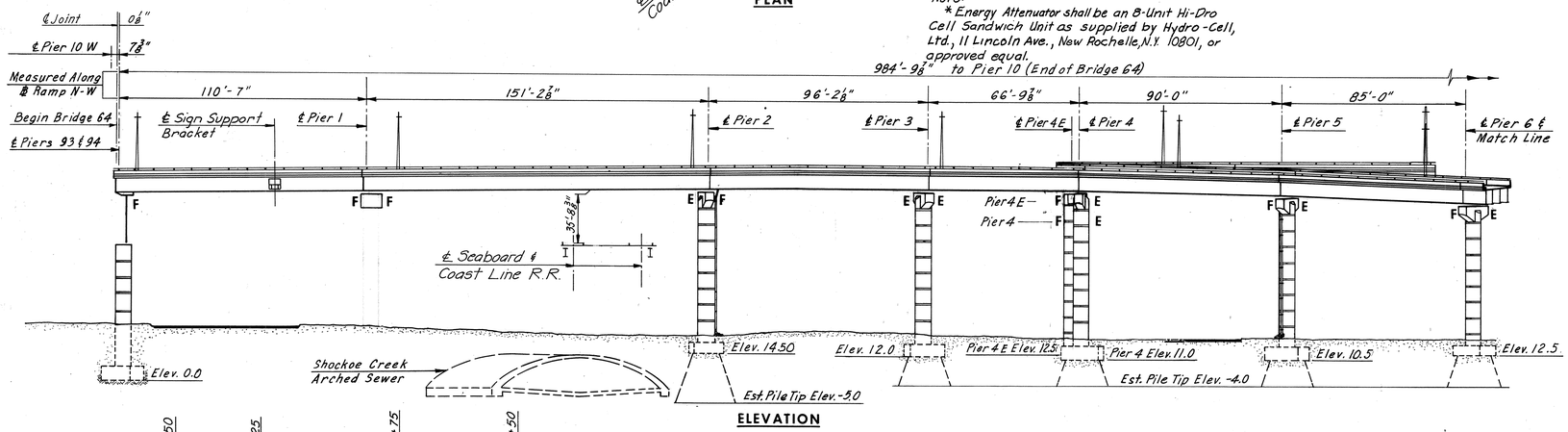
INDEX

Note:
For General Notes, see Sheet 2.
For Quantity Table, see Sheet 2.

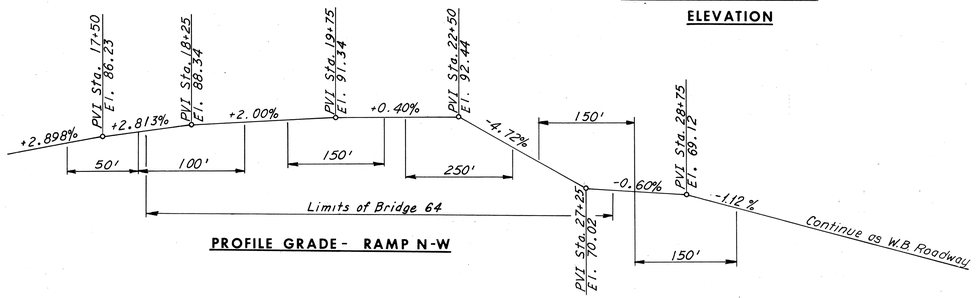


PLAN

Note:
* Energy Attenuator shall be an 8-Unit Hi-Dro Cell Sandwich Unit as supplied by Hydro-Cell, Ltd., 11 Lincoln Ave., New Rochelle, N.Y. 10801, or approved equal.



ELEVATION



PROFILE GRADE - RAMP N-W

HORIZONTAL CURVE DATA

℄ R. P. Turnpike

Curve: R.P.T.-1
P.I. = Sta. 1704+68.83
Δ = 15° 03' 56.2"
D = 1° 00' 00"
T = 757.65'
L = 1,506.56'
R = 5,729.58

Curve: R.P.T.-2
P.I. = Sta. 1723+07.01
Δ = 33° 27' 06.8"
D = 4° 00' 00"
T = 430.45'
L = 836.30'
R = 1,432.39'

℄ Ramp N-W

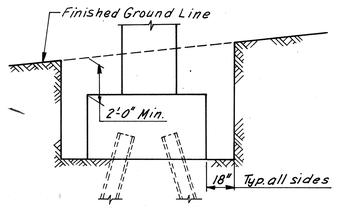
Curve: NW-1
P.I. = Sta. 13+42.50
Δ = 32° 01' 34"
D = 3° 51' 35.6"
T = 426.01'
L = 829.72'
R = 1,484.39

Curve: NW-2
P.I. = Sta. 20+46.21
Δ = 11° 28' 49.9"
D = 5° 00'
T = 115.19'
L = 229.61'
R = 1,145.92'

Curve: NW-3
P.I. = Sta 22+71.93
Δ = 21° 59' 14.9"
D = 10° 00' 00"
T = 111.31'
L = 219.88'
R = 572.96'

Curve: NW-4
P.I. = 25+55.02
Δ = 64° 43' 04"
D = 20° 50' 05.4"
T = 174.52'
L = 311.02'
R = 275.00'

Curve: NW-5
P.I. = Sta. 28+25.38
Δ = 26° 18' 00"
D = 10° 00' 00"
T = 133.86'
L = 263.00'
R = 572.96'



LIMITS OF STRUCTURE EXCAVATION
No Scale

	BY	DATE
MADE	AMH	1-6-69
CHECKED	G.C.C.	4/26/69
IN CHARGE		

NO.	REVISION	BY	DATE
4	As Built	TEM	6-77
3	℄ Seaboard & Coast Line Add To Plant El.	K.D.P.	6-74
2	Sign Support Bracket & Sheet 12a added	L.B.P.	8-74
1	Added Sta.	REG	1-13-75

AS BUILT

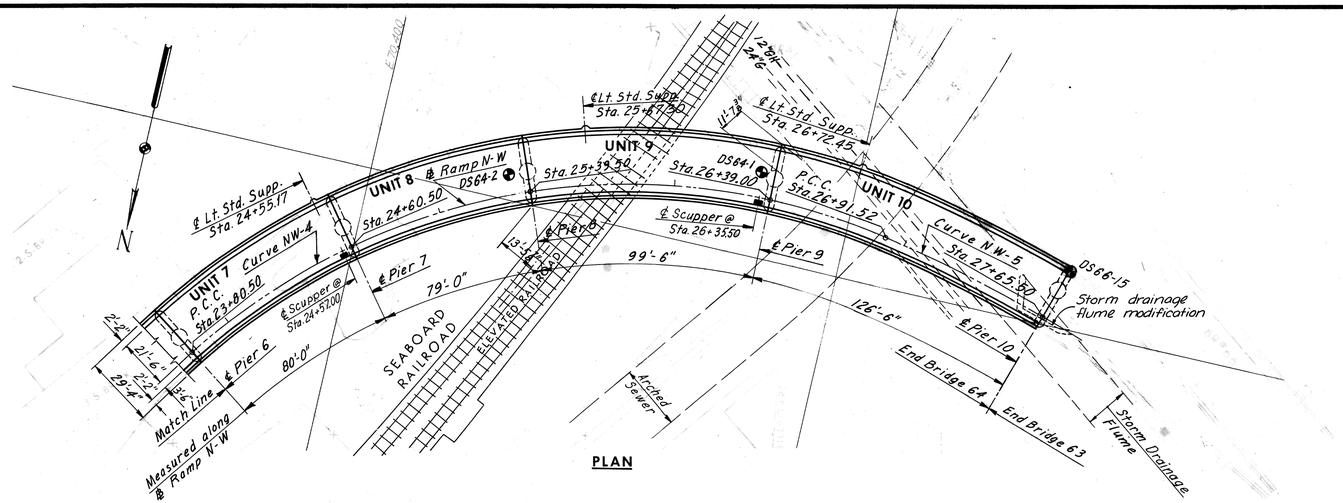
RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM
DOWNTOWN EXPRESSWAY

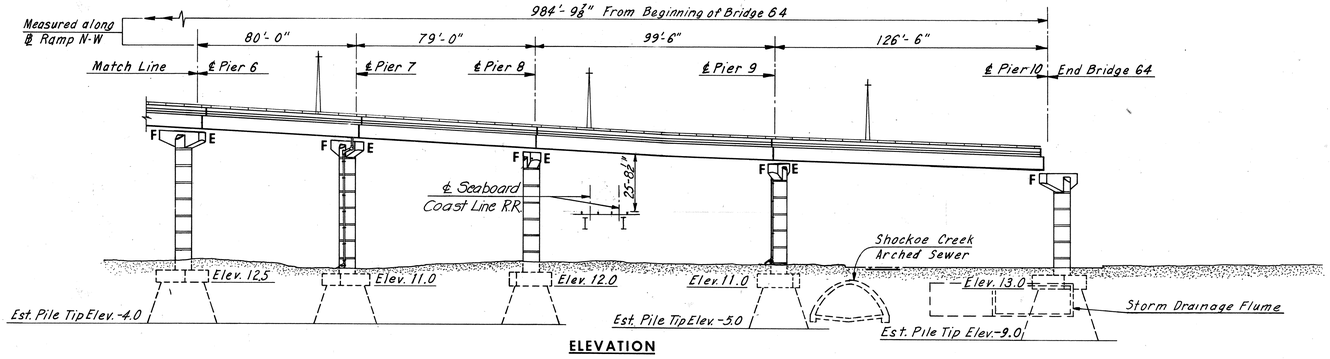
BRIDGE NO. 64
RAMP N-W CONNECTION FROM RICHMOND-PETERSBURG TURNPIKE
GENERAL PLAN AND ELEVATION

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
consulting engineers
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: 1" = 30'-0"
CONTRACT NO.: 10
SHEET NO. 1 OF 28

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
10	DOWNTOWN EXPRESSWAY	100	265





ESTIMATED QUANTITIES

	Structure Excavation Cu. Yds.	Concrete (‡) Cu. Yds.	Reinforcing Steel Lbs.	Str. Steel Mild Carbon Lbs.	Str. Steel High Strength Lbs.	Aluminum Railing (T-Rail) Lin. Ft.	Steel Piles 10BP42 Lin. Ft.
Superstructure	--	1,023.8	213,790	768,100	413,900	1,600	---
Substructure	1,125	1,484.1	236,580	2,000	---	---	145
Total	1,125	2,507.9	450,370	770,100	413,900	1,600	145

	Steel Piles 12BP53 Lin. Ft.	Sheet Piling Lump Sum	Metal Conduit Lin. Ft.	Energy Attenuator 8-Unit Each	Bridge Drainage Metal Work Lbs.	Modifications to R.P. Turnpike Bridge Lump Sum	Modifications To Storm Drainage Flume Cu. Yds.
Superstructure	---	--	1,075	1	13,030	1	--
Substructure	3,035	1	--	--	--	-	116
Total	3,035	1	1,075	1	13,030	1	116

‡ All Concrete for Sucerstructure shall be Class A4 and for Substructure Class A3.

	BY	DATE	NO.	REVISION	BY	DATE
MADE	AMH	1-13-69	1	Seaboard Coast Line Adj. To Plantel	K.D.P.	6-74
CHECKED	GCC	4-28-69	2	Str. Steel Quantity	R.B.H.	9-74
IN CHARGE			3	As Built	TEM	6-77

GENERAL NOTES:

ROADWAY: One variable width roadway transitioning from a widening of Southbound roadway of Richmond-Petersburg turnpike to a ramp with 25'-0" clear roadway connecting with W.B. Roadway (Br. 63).

CAPACITY: Dead load includes 15 lbs. per sq. ft. for future wearing surface. Live load. HS 20-44 loading and alternate military loading.

SPECIFICATIONS:
GENERAL: Virginia Department of Highway Road and Bridge Specifications 1970.
DESIGN: A.A.S.H.O. Standard Specifications for Highway Bridges 1973, modified by Special Design provisions.
WELDING: 1972 Standard Specifications for Welded Highway and Railway Bridges of the American Welding Society.
CONTRACT SPECIAL PROVISIONS
Specifications and Contract Special Provisions referred to above are necessary to make these plans complete.

DATUM: City of Richmond

TEMPERATURE: The normal temperature referred to in the plans is 60°F. The temperature range for movement is 0° F. to 120° F.

DIMENSIONS: All dimensions are measured horizontally and vertically unless otherwise noted.

EXCAVATION: Excavation below subgrade and cut slope template shall be classified as Structure Excavation. All excavation above these limits shall be classified as Regular Excavation and is not included in the Structural Quantities.

FOUNDATIONS: Footings shall rest on firm material. Foundation material shall be dry and special attention is called to Section 401.05 of Standard Specifications and to the Contract Special Provisions, concerning preparation of foundations for footings.

CONCRETE NOTES: Concrete in superstructure shall be Class A 4. All other concrete shall be Class A 3. All exposed edges and corners shall have a ¾" chamfer or fillet unless otherwise noted. Care in the method of vibration, the use of low-slump concrete, and orother means shall be employed to prevent downgrade movement of newly placed slab concrete. Finishing Concrete Surfaces: See Standard Architectural Detail Sheets and the Contract Special Provisions for types and details. All reinforcing bar dimensions on the detailed drawings are to centers of bars unless otherwise noted. Clear distance between reinforcing steel and face to concrete shall be as noted on the plans. All bar laps shall be 30 diameters of the smaller diameter bar unless otherwise noted. All reinforcing steel shall conform to ASTM A615 Grade 40.

STEEL NOTES: Structural steel shall conform to A.S.T.M. Designations A36, A572 - Grade 50 and A588 as noted. See Special Provisions.
All field connections shall be made with high strength bolts. High strength bolts shall be ⅞" diameter unless otherwise noted and shall conform to A.S.T.M. Specification A-325.

Note: For Curve Data and Profile Grade, see Sheet 1.
For Layout Plan, see Sheet 3.

AS BUILT

RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM
DOWNTOWN EXPRESSWAY

BRIDGE NO. 64
RAMP N-W CONNECTION FROM RICHMOND-PETERSBURG TURNPIKE
GENERAL PLAN AND ELEVATION

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
consulting engineers
NEW YORK ALEXANDRIA KANSAS CITY

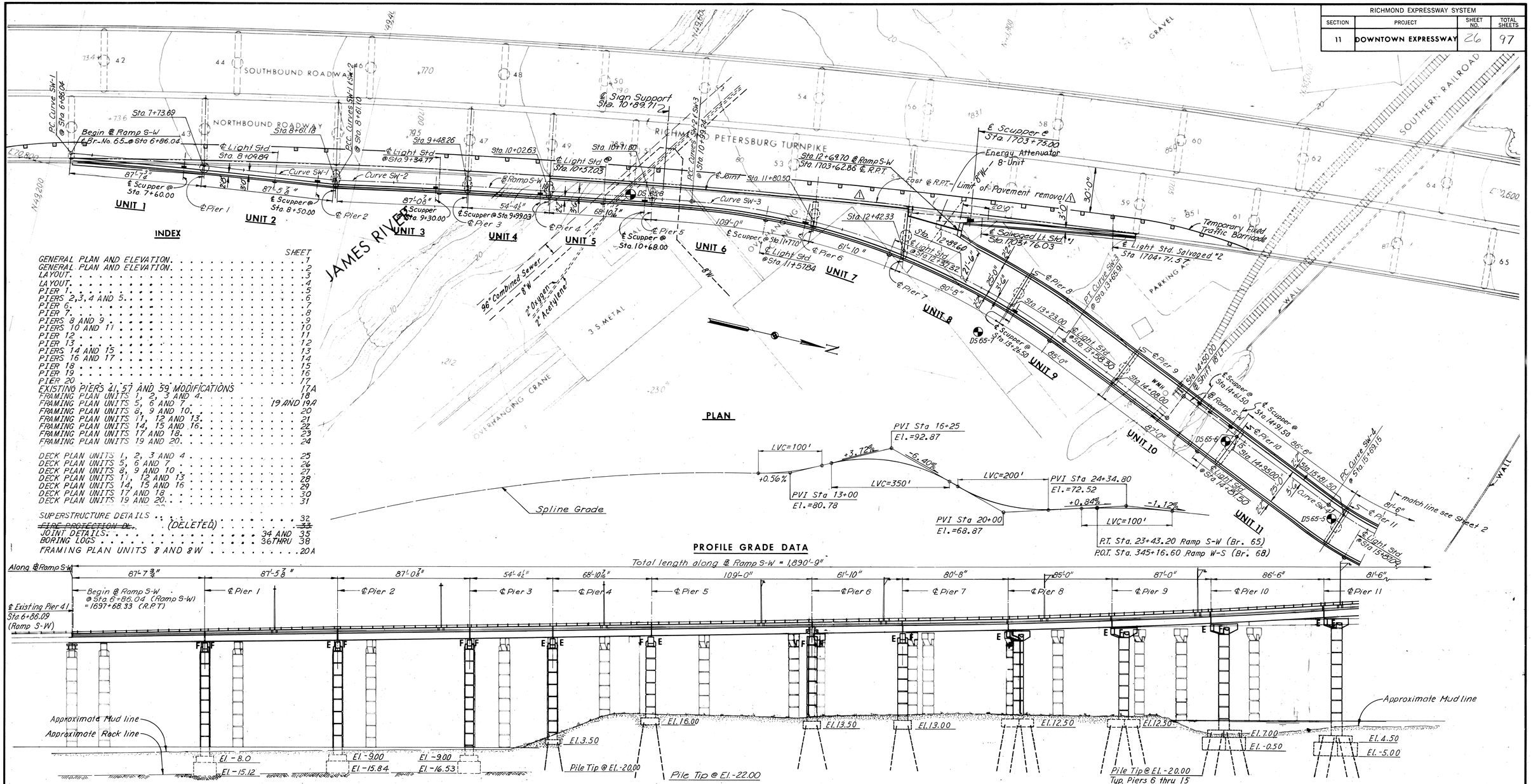
SCALE: 1" = 30'-0"
CONTRACT NO. 10
SHEET NO. 2 OF 28

Bridge 65

(Ramp from Northbound I-95 to Westbound Downtown Expressway “Rte. 195” over NS RR and CSX RR)

Record Set Plans

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
11	DOWNTOWN EXPRESSWAY	26	97



INDEX

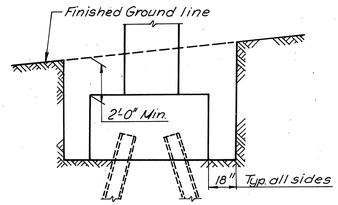
PROFILE GRADE DATA

Total length along ℄ Ramp S-W = 1,890'-9"

ELEVATION

Notes:
For General Plan and Elevation Units 12 thru 20 see Sheet 2.
For Layout of Ramp S-W, see Sheets 3 and 4.
For Estimated Quantities, see Sheet 4.
For Boring Logs, see Sheets 36 thru 38.
For General Notes, see Sheet 4.

Substructure Note: Footings for Piers 1, 2 and 3 shall be founded on concrete seals socketed 1'-0" into solid rock.



LIMITS OF STRUCTURE EXCAVATION

no scale

NO.	REVISION	BY	DATE
2	Sheet 20a Added	TEM	9-9-75
1	Profile Ramp W-S	TEM	9-8-75
	Limit of pavement removal & Sheet 17A added	G.B.P.	8-25-75

	BY	DATE
MADE	J.V. JLK	4-28-69 6-25-75
CHECKED	V.C.P. D.W.B	5-28-69 7-7-75
IN CHARGE		

AS BUILT

RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM
DOWNTOWN EXPRESSWAY

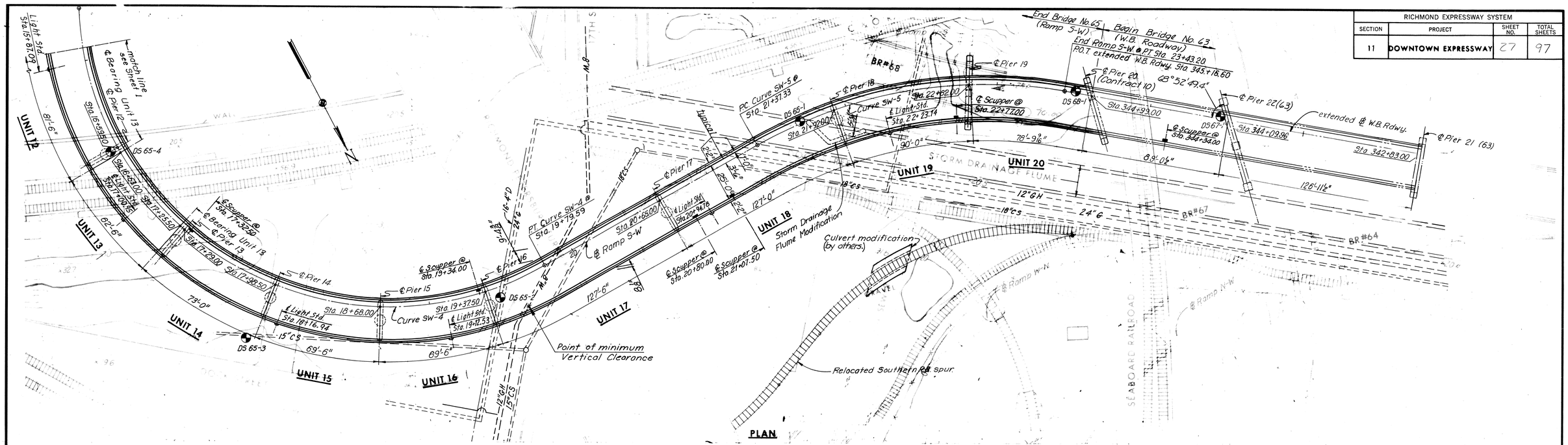
BRIDGE NO. 65
RAMP S-W CONNECTION FROM RICHMOND-PETERSBURG TURNPIKE
GENERAL PLAN AND ELEVATION

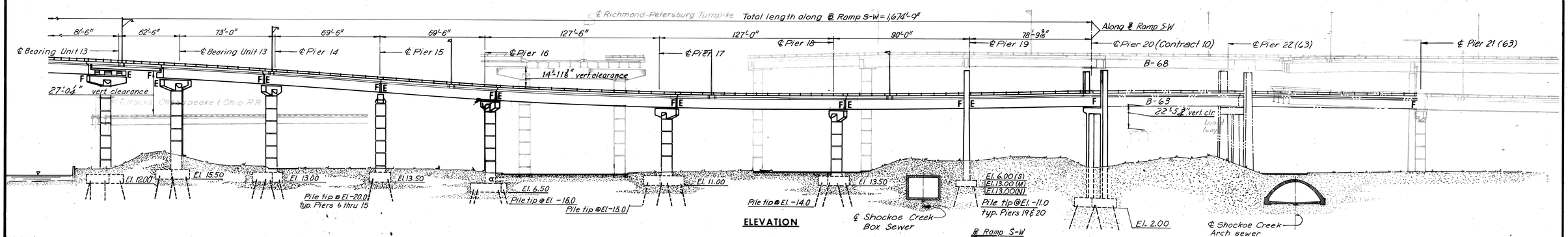
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
consulting engineers
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: 1"=30'-0"
CONTRACT NO. 11
SHEET NO. 1 OF 38

26

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
11	DOWNTOWN EXPRESSWAY	27	97





ELEVATION

HORIZONTAL CURVE DATA

℄ Ramp S-W

Curve: SW-1
P.I. = Sta. 7+73.58
Δ = 1°45'02"
D = 1°00'
T = 87.53'
L = 175.05'
R = 5,729.58'

Curve: SW-2
P.I. = Sta. 9+80.19
Δ = 2°24'12"
D = 1°00'33"
T = 119.09'
L = 238.14'
R = 5,677.58'

Curve: SW-3
P.I. = Sta. 12+36.15
Δ = 32°00'00"
D = 12°00'
T = 136'91'
L = 266.67'
R = 477.47'

Curve: SW-4
P.I. = Sta. 18+95.05
Δ = 116°25'03"
D = 28°27'51"
T = 325.90'
L = 410.44'
R = 202.00'

Curve: SW-5
P.I. = Sta. 22+44.51
Δ = 39°19'04"
D = 19°05'55"
T = 107.17'
L = 205.87'
R = 300.00'

℄ Richmond-Petersburg Turnpike

Curve: R.P.T.-1
P.I. = Sta. 1704+68.83
Δ = 15°03'56"
D = 1°00'
T = 757.65'
L = 1,506.56'
R = 5,729.58

Curve: R.P.T.-2
P.I. = Sta. 1723+07.01
Δ = 33°27'07"
D = 4°00'
T = 430.45'
L = 836.30'
R = 1,432.39'

Notes:
For General Plan and Elevation Units 1 thru 11, see Sheet 1.
For Layout of Ramp S-W, see Sheets 3 and 4.
For Estimated Quantities, see Sheet 4.
For Boring Logs, see Sheets 34 thru 38.
For General Notes, see Sheet 4.

	BY	DATE	NO.	REVISION	BY	DATE
MADE	J.V.	4-2-69				
CHECKED	Y.C.P.	5-28-69				
IN CHARGE						

AS BUILT

RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM
DOWNTOWN EXPRESSWAY

BRIDGE NO. 65
RAMP S-W CONNECTION FROM RICHMOND-PETERSBURG TURNPIKE

GENERAL PLAN AND ELEVATION

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
consulting engineers
NEW YORK ALEXANDRIA KANSAS CITY

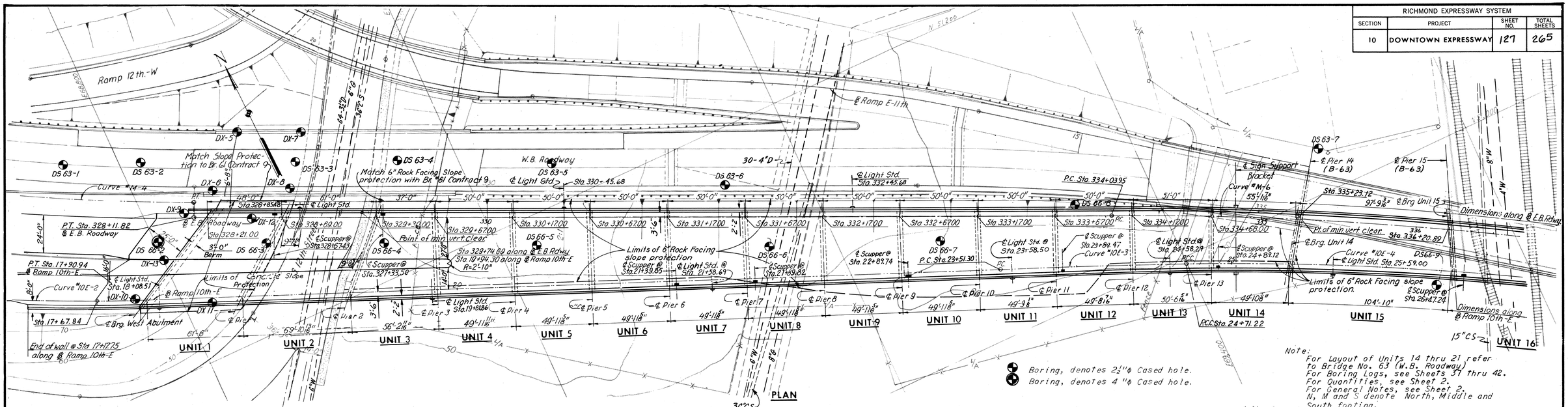
SCALE: 1"=30'-0"
CONTRACT NO. 11
SHEET NO. 2 OF 38

Bridge 66

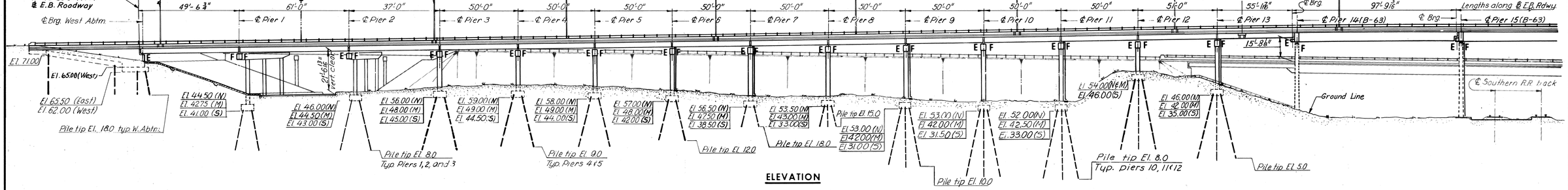
(Eastbound Downtown Expressway “Rte. 195” over Virginia Street and South 14th Street)

Record Set Plans

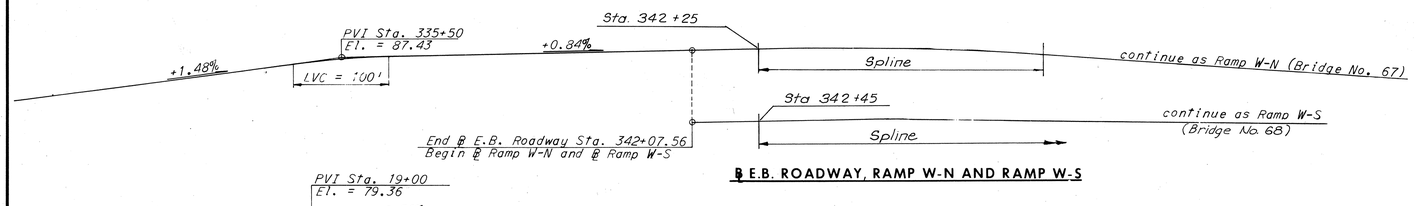
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
10	DOWNTOWN EXPRESSWAY	127	265



Note:
For Layout of Units 14 thru 21 refer to Bridge No. 63 (W.B. Roadway)
For Boring Logs, see Sheets 37 thru 42.
For Quantities, see Sheet 2.
For General Notes, see Sheet 2.
N, M and S denote North, Middle and South footing.



ELEVATION



℄ E.B. ROADWAY, RAMP W-N AND RAMP W-S

℄ RAMP 10TH-E.

PROFILE GRADE DATA

℄ Downtown Expressway Curve M-4		℄ E.B. Roadway Curve M-6		℄ Ramp W-N Curve WN-1	
P.I.	= 326+57.21	P.I.	= 336+40.09	P.I.	= 345+25.47
Δ	= 12°25'03"	Δ	= 11°45'56"	Δ	= 64°53'49"
D	= 4°00'	D	= 2°30'	D	= 11°27'33"
T	= 155.83'	T	= 236.14'	T	= 317.90'
L	= 310.44'	L	= 470.62'	L	= 566.33'
R	= 1,432.40'	R	= 2,291.83'	R	= 500.00'

Curve: 10E-2		℄ Ramp 10th-E Curve: 10E-3		Curve: 10E-4	
P.I.	= 17+36.87	P.I.	= 24+11.27	P.I.	= 26+80.64
Δ	= 6°29'42"	Δ	= 1°11'57"	Δ	= 12°30'55"
D	= 6°00'	D	= 1°00'	D	= 3°00'
T	= 54.18'	T	= 59.97'	T	= 209.42'
L	= 108.25	L	= 119.93'	L	= 417.18'
R	= 954.93'	R	= 5,729.58'	R	= 1,909.86'

HORIZONTAL CURVE DATA

	BY	DATE
MADE	J.V.	9-12-68
CHECKED	G.C.C.	5-26-69
IN CHARGE		

NO.	REVISION	BY	DATE
3	As Built	TEM	8-76
2	Sign Support Bracket & Sh. 16A & 20A added	R.B.H.	9-74
1	Footing elev. & piles, Piers 8, 9, 10, 11, 12 & 13	R.B.H.	8-74

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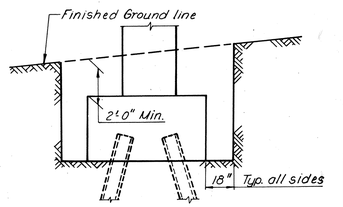


LIMITS OF STRUCTURE EXCAVATION
no scale

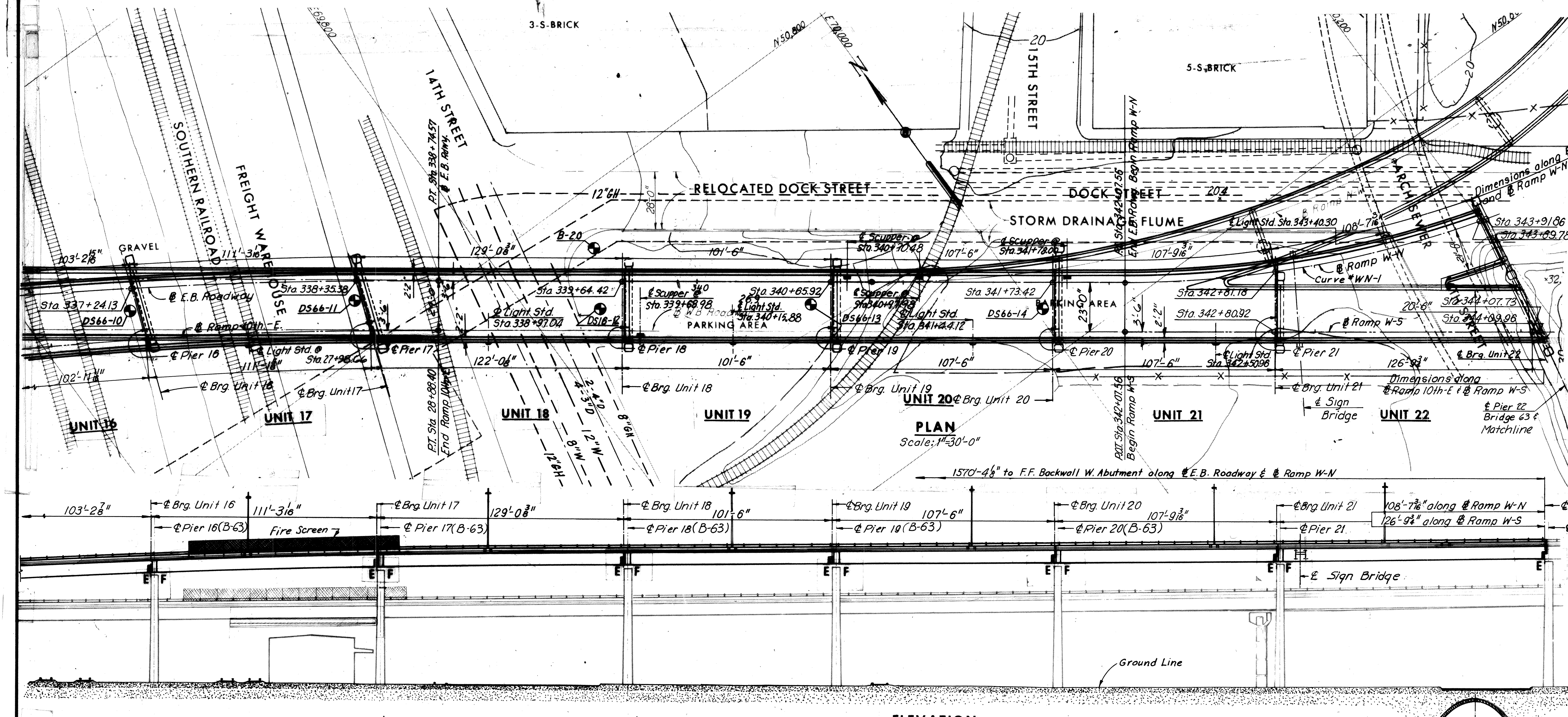
AS BUILT

RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM
DOWNTOWN EXPRESSWAY

BRIDGE NO. 66
EASTBOUND ROADWAY OVER 12TH ST. - R.R. TRACKS AND 16TH ST.
GENERAL PLAN AND ELEVATION

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
consulting engineers
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: 1"=30'
CONTRACT NO.: 10
SHEET NO. 1 OF 46



PLAN
Scale: 1"=30'-0"

ELEVATION
Scale: 1"=30'-0"

Notes:
For Vertical and Horizontal Curve Data see Sheet 1.
For Layout of Units 14 thru 22 refer to Bridge No. 63 (Westbound Roadway).

ESTIMATED QUANTITIES

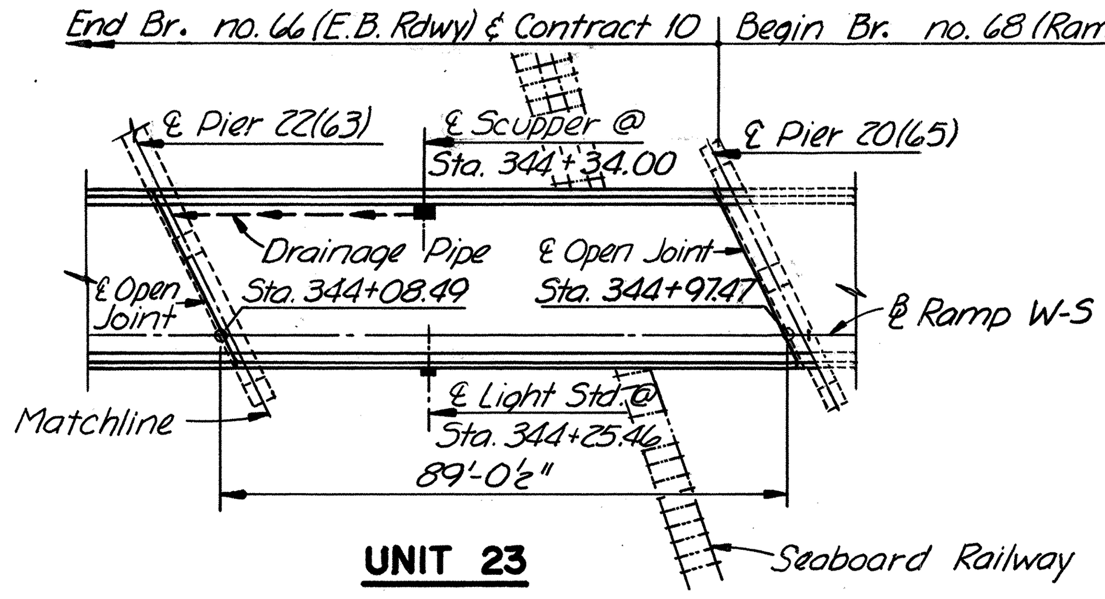
	Structure Excavation Cu. Yds.	Concrete (‡) Cu. Yds.	Reinforcing Steel Lbs.	Str. Steel Mild Carbon Lbs.	Str. Steel High Strength Lbs.	Aluminum Railing (1-Rail) Lin. Ft.	Porous Backfill Cu. Yds.	Underdrain 6"Dia. Pipe Lin. Ft.	Steel Piles 10BP42 Lin. Ft.
Superstructure	--	2,237.6	530,860	1,564,700	567,800	3,241	--	--	---
Substructure	1,835	1,256.6	155,030	---	----	84	34	150	9,410
Total	1,835	3,494.2 ‡	685,890	1,564,700	567,800	3,325	34	150	9,410

	Asphalt Damp-proofing Sq. Yds.	Approach Slab Concrete (‡) Cu. Yds.	Fire Screen Lin. Ft.	Approach Slab Reinforcing Steel (Lbs.)	Metal Conduit Lin. Ft.	Concrete Slope Protection Sq. Yds.	Bridge Drainage Metal Work Lbs.	Rock Facing Slope Prot. Sq. Yds.	Energy Attenuator 8-Unit Each
Superstructure	--	--	210	---	2,214	--	11,870	--	1
Substructure	105	91.5	---	23,870	92	559	--	3,320	---
Total	105	91.5 ‡	210	23,870	2,306	559	11,870	3,320	1

‡ All Concrete for Superstructure shall be Class A4 and for Substructure Class A3.

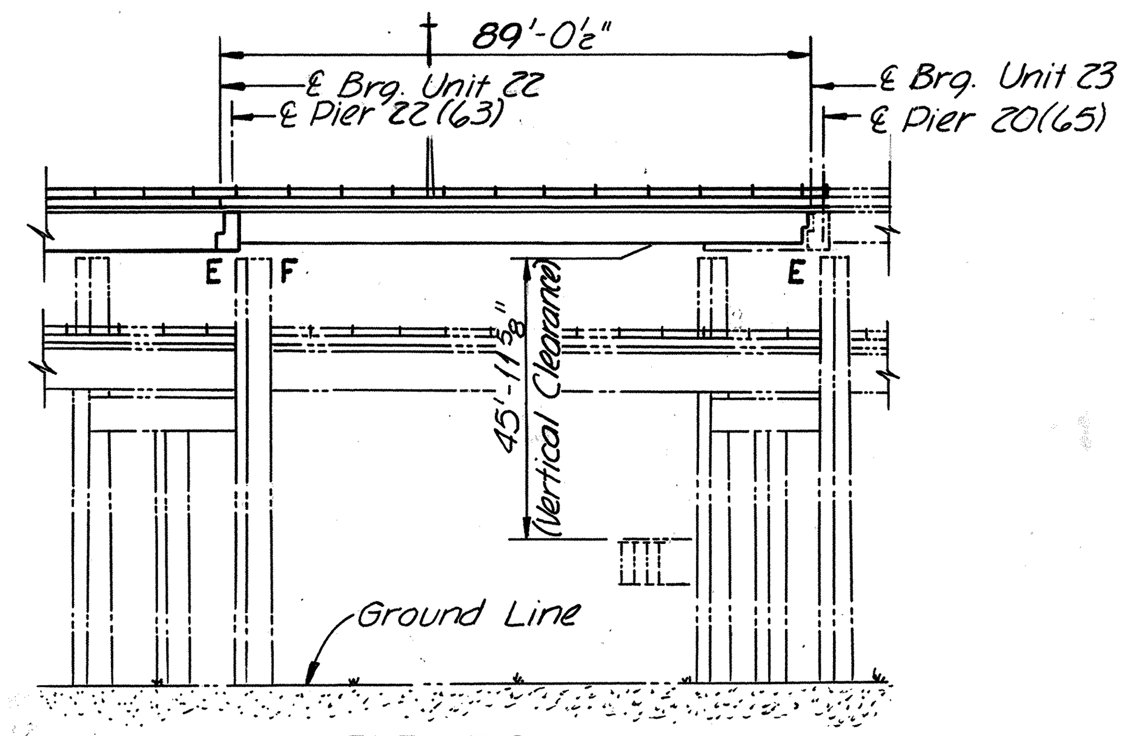
℄ Shockoe Creek Sewer

End Br. no. 66 (E.B. Rdwy) & Contract 10 | Begin Br. no. 68 (Ramp W-S) by others



UNIT 23

PLAN



ELEVATION

GENERAL NOTES:

ROADWAY: One variable width roadway transitioning from E.B. Roadway Downtown Expressway and Ramp 10th-E into Ramps W-N and W-S (Bridges No. 67 and 68)

CAPACITY: Dead load includes 15 Lbs. per sq. ft. for future wearing surface. Live load. HS 20-44 loading and alternate military loading.

SPECIFICATIONS:
GENERAL: Virginia Department of Highway Road and Bridge Specifications 1970
DESIGN: A.A.S.H.O. Standard Specifications for Highway Bridges 1973 modified by Special Design provisions.
WELDING: 1972 Structural Welding Code of the American Welding Society.

CONTRACT SPECIAL PROVISIONS
Specifications and Contract Special Provisions referred to above are necessary to make these plans complete

DATUM: City of Richmond

TEMPERATURE: The normal temperature referred to in the plans is 60°F. The temperature range for movement is 0°F to 120°F.

DIMENSIONS: All dimensions are measured horizontally and vertically unless otherwise noted.

EXCAVATION: Excavation below subgrade and cut slope template shall be classified as Structure Excavation. All excavation above these limits shall be classified as Regular Excavation and is not included in the Structural Quantities.

FOUNDATIONS: Footings shall rest on firm material. Foundation material shall be dry and special attention is called to Section 401.05 of General Specifications and to the Contract Special Provisions, concerning preparation of foundations for footings.

CONCRETE NOTES: Concrete in superstructure shall be Class A-4. All other concrete shall be Class A-3. All exposed edges and corners shall have a ¾" chamfer or fillet unless otherwise noted. Care in the method of vibration, the use of low-slump concrete, and or other means shall be employed to prevent downgrade movement of newly placed slab concrete. Finishing Concrete Surfaces: See Standard Architectural Detail Sheets and the Contract Special Provisions for types and details. All reinforcing steel shall be deformed bars conforming to ASTM A615 Grade 40. All reinforcing bar dimensions on the detailed drawings are to centers of bars unless otherwise noted. Clear distance between reinforcing steel and face of concrete shall be as noted on the plans. All bar laps shall be 30 diameters of the smaller diameter bar unless otherwise noted.

STEEL NOTES: Structural steel shall conform to A.S.T.M. Designations A36, A572 - Grade 50 and A588 as noted. See Special Provisions.
All field connections shall be made with high strength bolts. High strength bolts shall be ⅞" diameter unless otherwise noted and shall conform to A.S.T.M. Specification A-325.

	BY	DATE	NO.	REVISION	BY	DATE
MADE	J.V.	1-9-69	1	Span Fixities & R.R. name added	PRMS	4-19-74
CHECKED	G.C.C.	5-26-69	2	Sign Bridge added & Struct. St'l Qty.	R.B.H.	9-74
IN CHARGE			3	As Built	TEM	8-76

AS BUILT

RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM
DOWNTOWN EXPRESSWAY

BRIDGE NO. 66
EASTBOUND ROADWAY OVER
12TH ST. - R.R. TRACKS AND 16TH ST.
GENERAL PLAN AND ELEVATION

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
consulting engineers
NEW YORK ALEXANDRIA KANSAS CITY

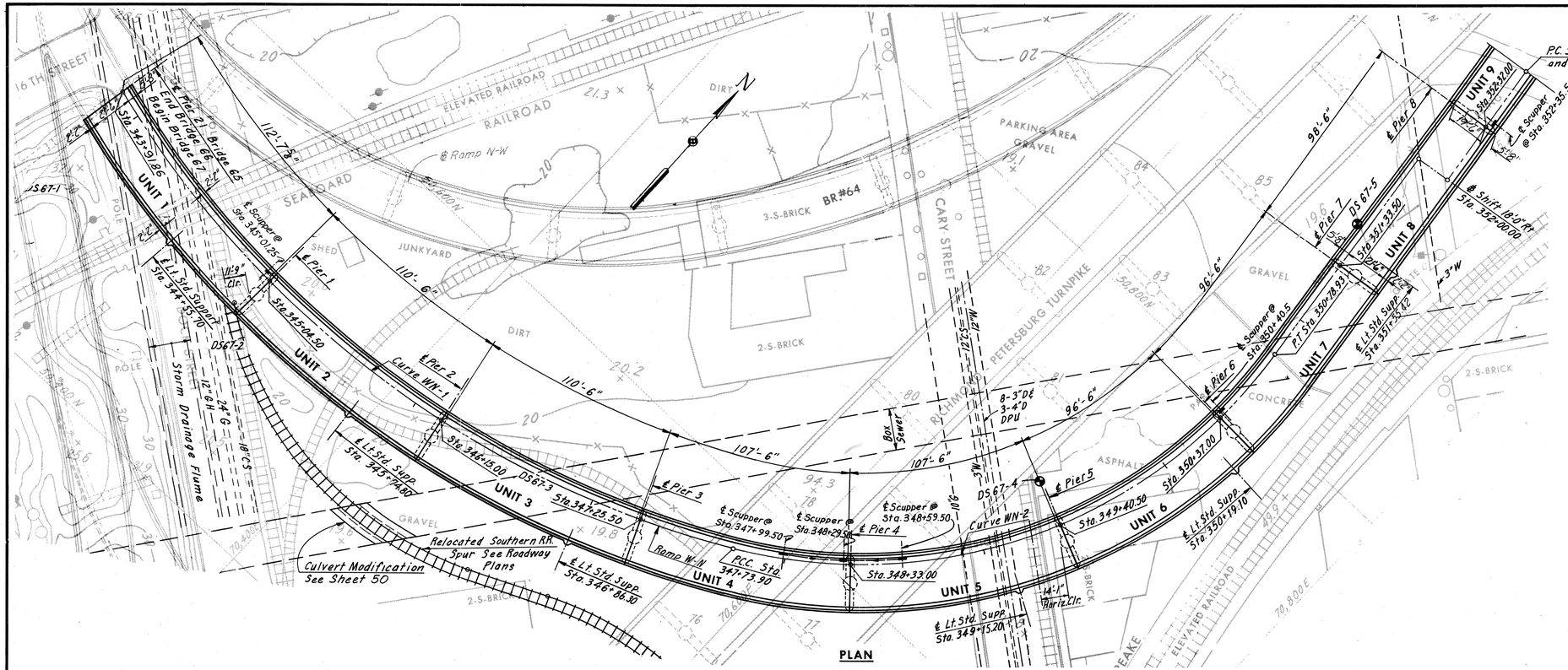
SCALE: As Noted
CONTRACT NO.: 10
SHEET NO. 2 OF 46

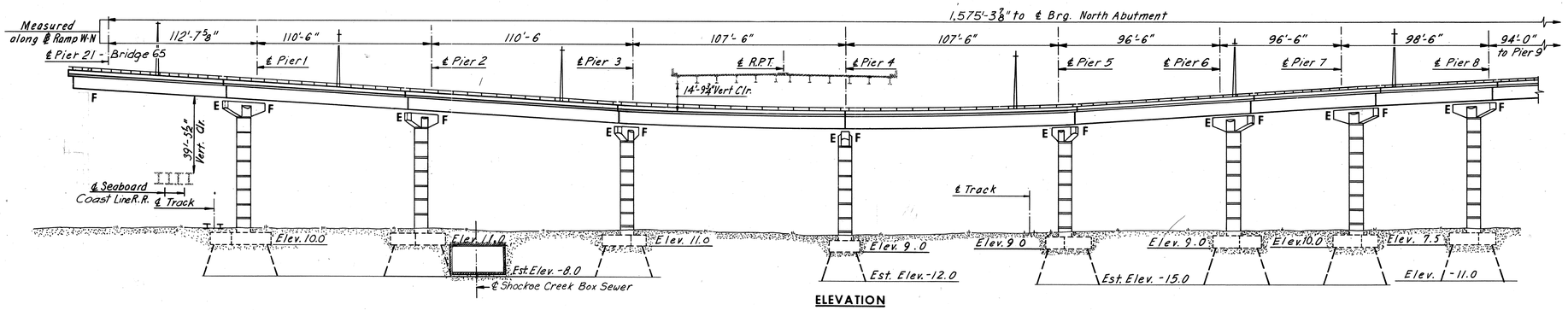
Bridge 67

(Ramp from Eastbound Downtown Expressway “Rte. 195” to Northbound I-95 over Dock Street, East Cary Street, East Main Street “Rte. 60” and CSX RR)

Record Set Plans

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
10	DOWNTOWN EXPRESSWAY	173	265





ELEVATION

CURVE DATA

℄ R.P.T.

Curve: R.P.T.-1
P.I. = Sta. 1704+68.83
Δ = 15°03'56"
D = 1°00'
T = 757.65'
L = 1,506.56'
R = 5,729.58

Curve: R.P.T.-2
P.I. = Sta. 1723+07.01
Δ = 33°27'07"
D = 4°00'
T = 430.45'
L = 836.30'
R = 1,432.39'

℄ Ramp W-N

Curve: WN-1
P.I. = Sta. 345+25.47
Δ = 64°53'49"
D = 11°27'33"
T = 317.90'
L = 566.33'
R = 500.00

Curve: WN-2
P.I. = Sta. 349+47.64
Δ = 68°32'15"
D = 22°28'08"
T = 173.75'
L = 305.03'
R = 255.00'

Curve: WN-3
P.I. = Sta. 353+19.15
Δ = 6°23'54"
D = 6°00'
T = 53.38'
L = 106.64'
R = 954.93'

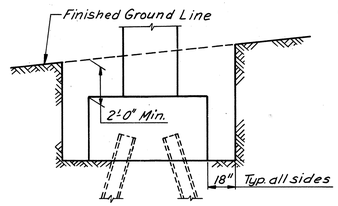
Curve: WN-4
P.I. = Sta 355+39.85
Δ = 5°01'11"
D = 1°30'
T = 167.43'
L = 334.65'
R = 3,819.72'

Curve: WN-5
P.I. = Sta. 358+17.39
Δ = 13°10'51"
D = 6°00'
T = 110.33'
L = 219.68'
R = 954.93'

Curve: WN-6
P.I. = Sta. 361+67.68
Δ = 19° 35' 06"
D = 4° 09' 03"
T = 238.25'
L = 471.85'
R = 1,380.39'

℄ Ramp N-W

Curve: NW-1
P.I. = Sta. 13+42.50
Δ = 32° 01' 34"
D = 3° 51' 36"
T = 426.01'
L = 829.72'
R = 1,484.39



LIMITS OF STRUCTURE EXCAVATION
No Scale

INDEX

Note:
For General Notes, see Sheet 4.
For Quantity Table, see Sheet 3

	BY	DATE	NO.	REVISION	BY	DATE
MADE	AMH	3-5-69	3	As Built	TEM	6-77
CHECKED	KCT	5-12-69	2	Light Sta. Location Unit 8	JLK	6-6-75
IN CHARGE			1	Sheets 42 & 45 added	LBP	3-5-75

AS BUILT

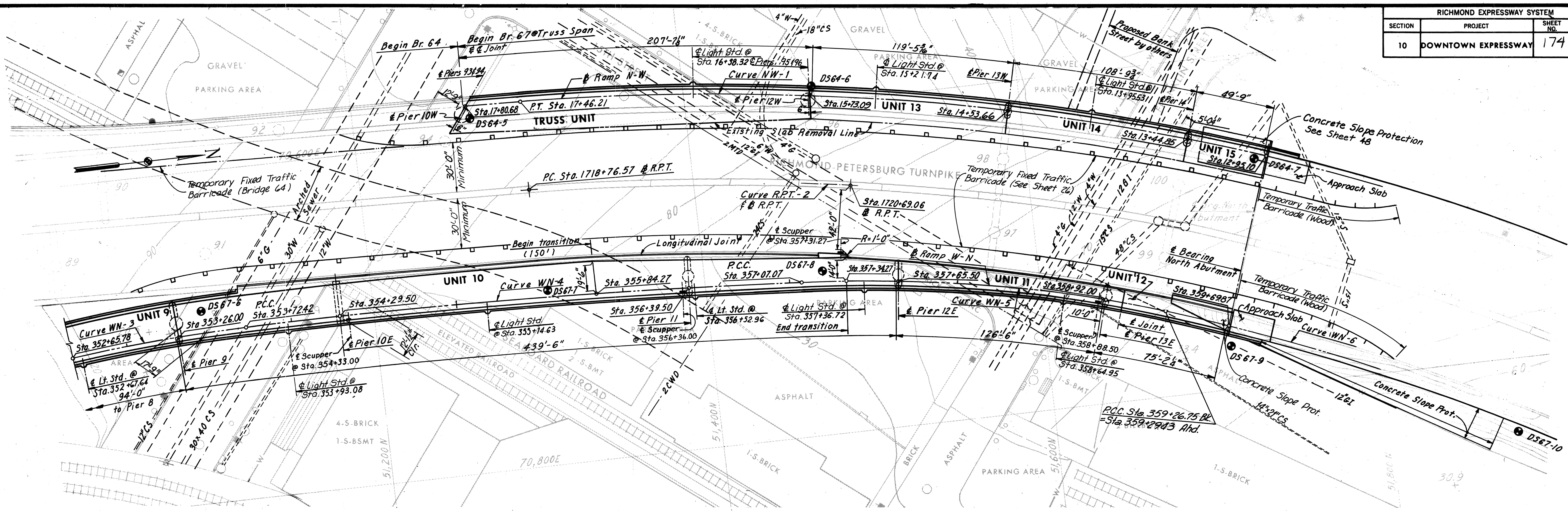
RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM
DOWNTOWN EXPRESSWAY

BRIDGE NO. 67
RAMP W-N CONNECTION TO
RICHMOND-PETERSBURG TURNPIKE
GENERAL PLAN AND ELEVATION

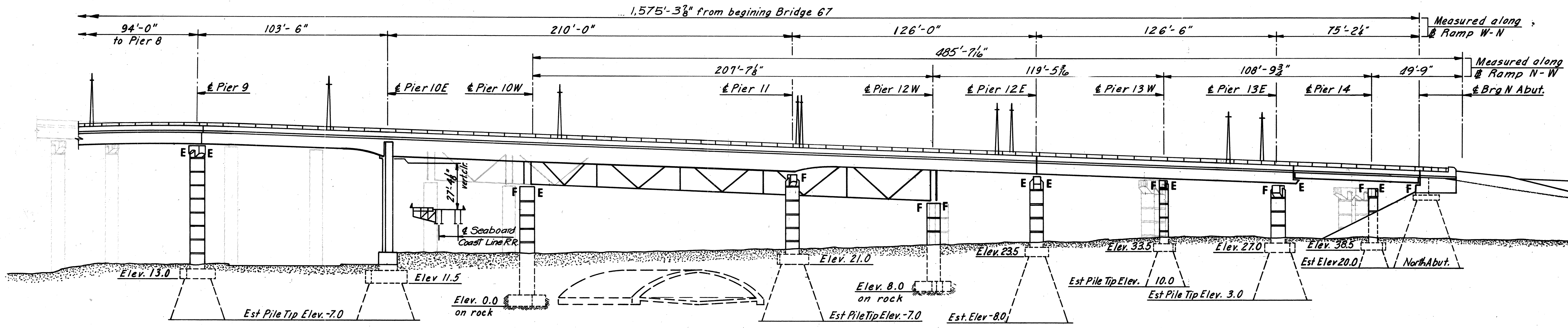
HOWARD, NEEDLES, TAMMEN & BERGENDOFF
consulting engineers
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: 1" = 30'-0"
CONTRACT NO.: 10
SHEET NO. 1 OF 54

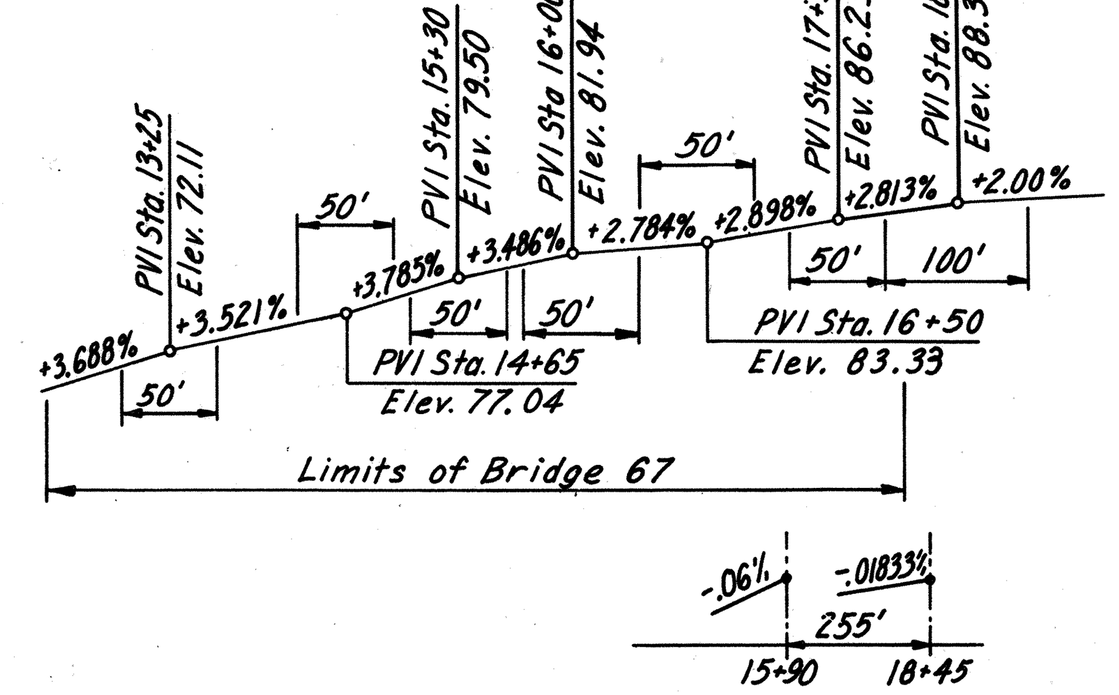
RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
10	DOWNTOWN EXPRESSWAY	174	265



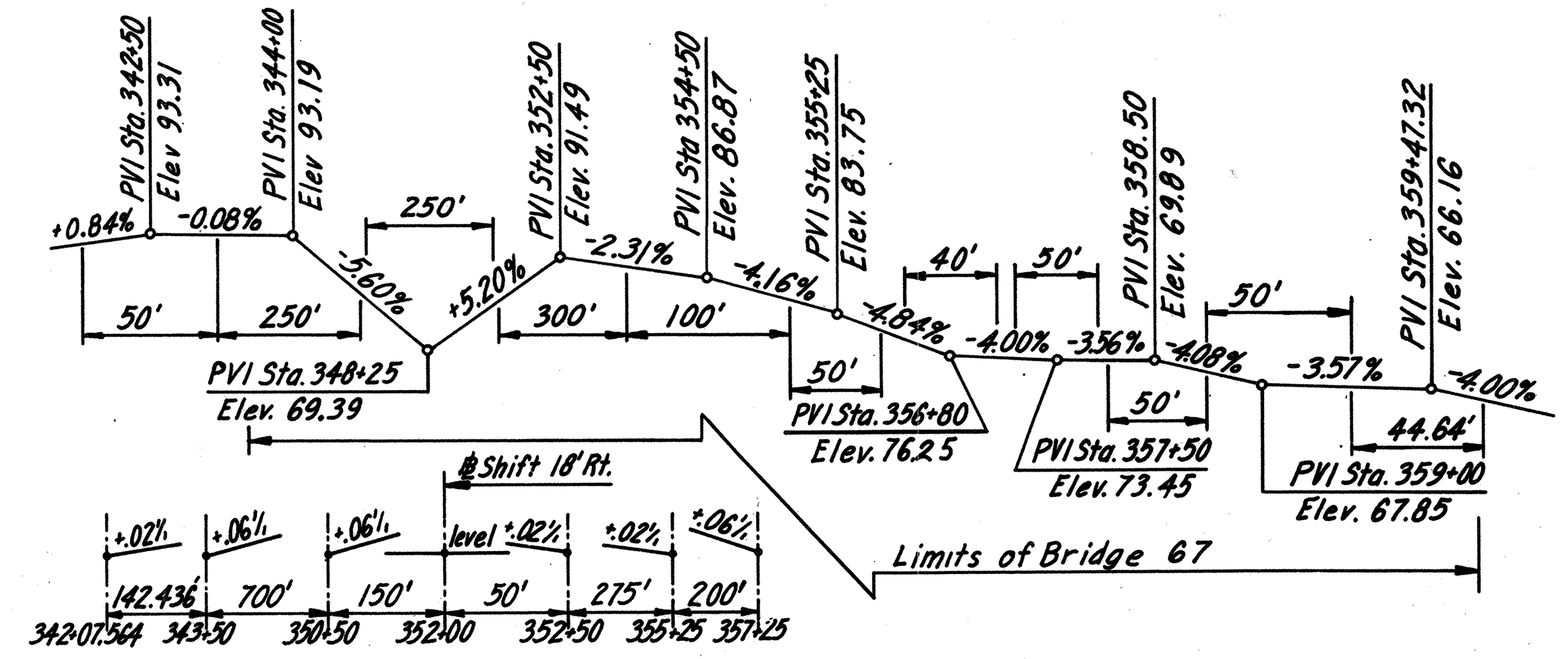
PLAN
Scale: 1" = 30'-0"



ELEVATION
Scale: 1" = 30'-0"



PROFILE GRADE CROSS SLOPE - RAMP N-W



PROFILE GRADE AND CROSS SLOPE - RAM W-N

AS BUILT

	BY	DATE	NO.	REVISION	BY	DATE
MADE	AMH	12-30-68	2	'As Built	TEM	6-77
CHECKED	KCT	5-12-69	△	Revised Piers & Abut Sta. & Span Length	DWB	1-24-75
IN CHARGE						

RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM
DOWNTOWN EXPRESSWAY

BRIDGE NO. 67
RAMP W-N CONNECTION TO RICHMOND-PETERSBURG TURNPIKE
GENERAL PLAN AND ELEVATION

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
consulting engineers
NEW YORK ALEXANDRIA KANSAS CITY

SCALE: As Noted
CONTRACT NO.: 10
SHEET NO. 2 OF 54

Bridge 68

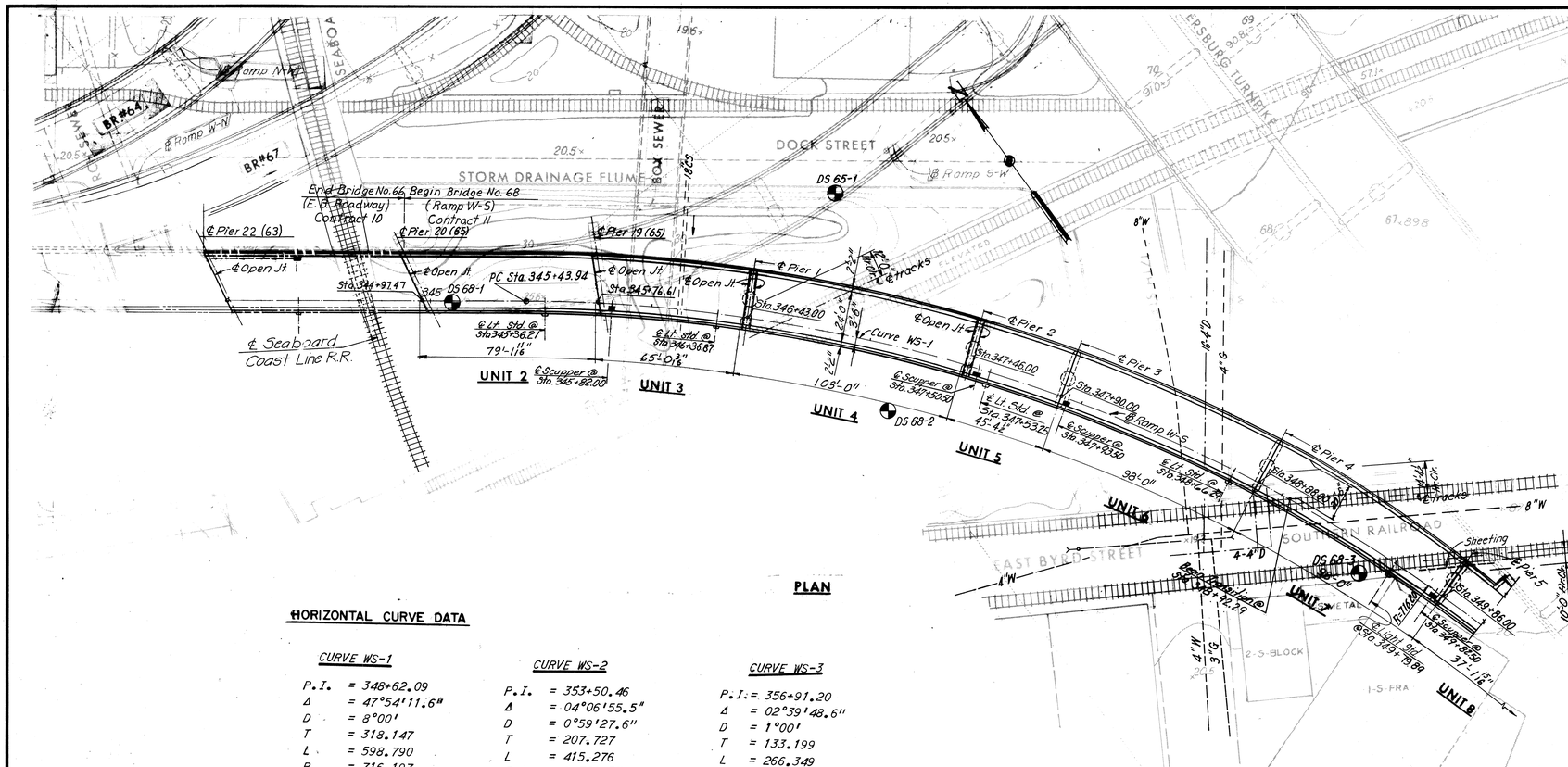
(Ramp from Eastbound Downtown Expressway “Rte. 195” to Southbound I-95 over East Byrd Street, NS RR and CSX RR)

Record Set Plans

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
11	DOWNTOWN EXPRESSWAY	64	97

INDEX

PLAN



HORIZONTAL CURVE DATA

CURVE WS-1

P.I.	= 348+62.09
Δ	= 47°54'11.6"
D	= 8°00'
T	= 318.147
L	= 598.790
R	= 716.197

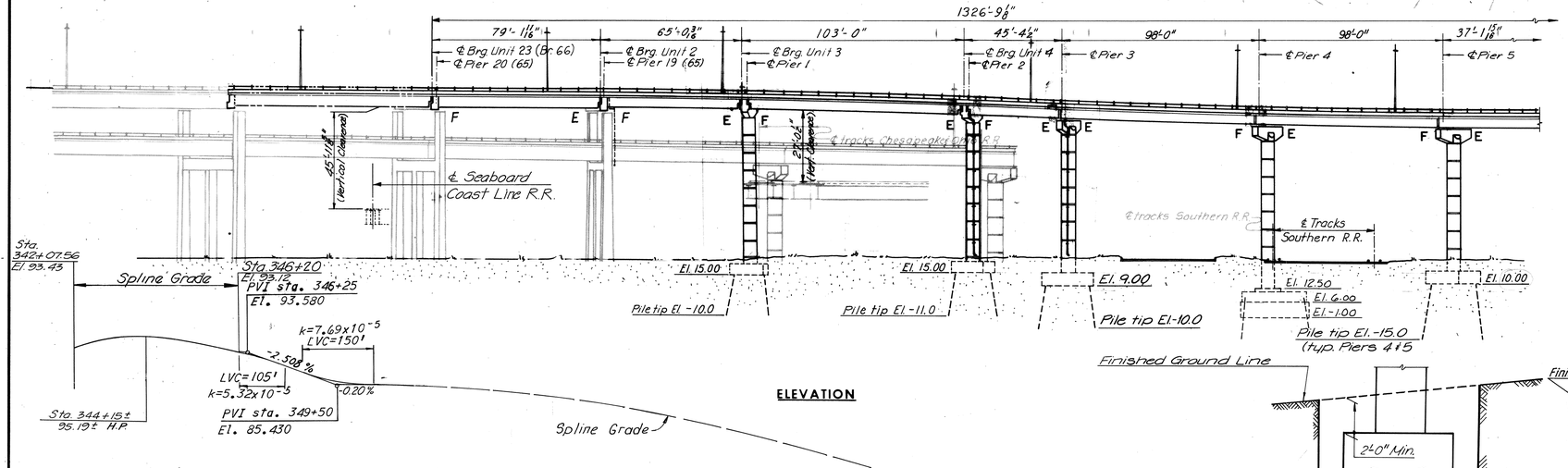
CURVE WS-2

P.I.	= 353+50.46
Δ	= 04°06'55.5"
D	= 0°59'27.6"
T	= 207.727
L	= 415.276
R	= 5,781.578

CURVE WS-3

P.I.	= 356+91.20
Δ	= 02°39'48.6"
D	= 1°00'
T	= 133.199
L	= 266.349
R	= 5,729.578

ELEVATION



GENERAL NOTES

ROADWAY: One 24'-0" clear roadway transitioning into a 13'-6" widening of existing Richmond-Petersburg Turnpike.

CAPACITY: Dead load includes 15lbs. per sq.ft. for future wearing surface. Live load HS 20-44 loading and alternate military loading.

SPECIFICATIONS:

- GENERAL: Virginia Department of Highway Road and Bridge Specifications 1970.
- DESIGN: A.A.S.H.O. Standard Specifications for Highway Bridges 1973, modified by Special Design provisions.
- WELDING: 1972 Structural Welding Code of the American Welding Society.

CONTRACT SPECIAL PROVISIONS
Specifications and Contract Special Provisions referred to above are necessary to make these plans complete.

DATUM: City of Richmond

TEMPERATURE: The normal temperature referred to in the plans is 60°F. The temperature range for movement is 0°F to 120°F.

DIMENSIONS: All dimensions are measured horizontally and vertically unless otherwise noted.

EXCAVATION: Excavation below subgrade and cut slope template shall be classified as Regular Excavation. All excavation above these limits shall be classified as Regular Excavation and is not included in the Structural Quantities.

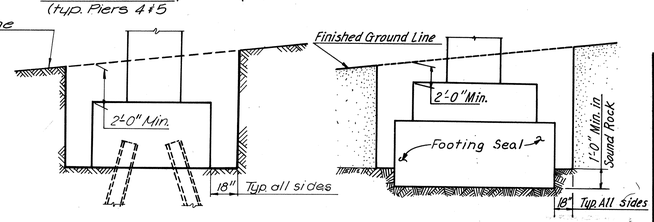
FOUNDATIONS: Footings shall rest on firm material. Foundation material shall be dry and special attention is called to Section 401.05 of General Specifications and to the Contract Special Provisions, concerning preparation of foundations for footings.

CONCRETE NOTES: Concrete in superstructure shall be Class A-4. All other concrete shall be Class A-3. All exposed edges and corners shall have a ¾" chamfer or fillet unless otherwise noted. Care in the method of vibration, the use of low-slump concrete, and or other means shall be employed to prevent downgrade movement of newly placed slab concrete. Finishing Concrete Surfaces: See Standard Architectural Detail Sheets and the Contract Special Provisions for types and details. All reinforcing steel shall be deformed bars conforming to ASTM A615 Grade 40. All reinforcing bar dimensions on the detailed drawings are to centers of bars unless otherwise noted. Clear distance between reinforcing steel and face of concrete shall be as noted on the plans. All bar laps shall be 30 diameters of the smaller diameter bar unless otherwise noted.

STEEL NOTES: Structural steel shall conform to A.S.T.M. Designations A36, A572-Grade 50 and A588 as noted. See Special Provisions. All field connections shall be made with high strength bolts. High strength bolts shall be ¾" diameter unless otherwise noted and shall conform to A.S.T.M. Specification A-325.

LIMITS OF STRUCTURE EXCAVATION

No Scale



	BY	DATE
MADE	J.V.	4-2-69
CHECKED	G.S.H.	7-16-69
IN CHARGE		

NO.	REVISION	BY	DATE
3	Rev. Profile Grade & Ramp W-S	SSS	12-75
2	Profile Grade W-S, Index	TEM	8-26-75
1	Seaboard Coast Line Added	TEM	6-74

△2 PROFILE GRADE ℄ RAMP W-S

AS BUILT

RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM
DOWNTOWN EXPRESSWAY

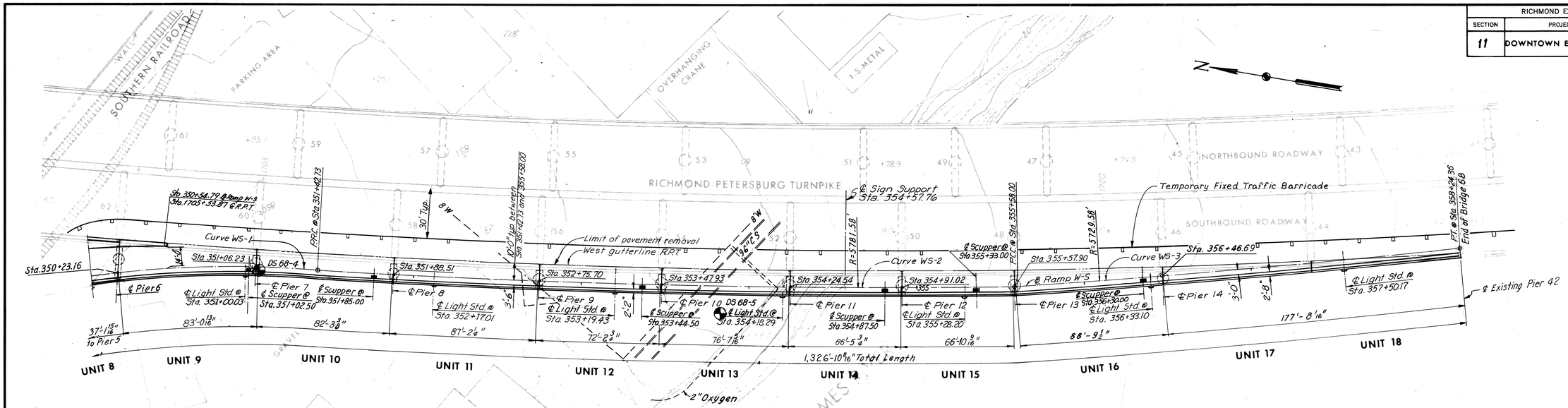
BRIDGE NO. 68
RAMP W-S CONNECTION TO RICHMOND-PETERSBURG TURNPIKE
GENERAL PLAN AND ELEVATION

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
consulting engineers
NEW YORK ALEXANDRIA KANSAS CITY

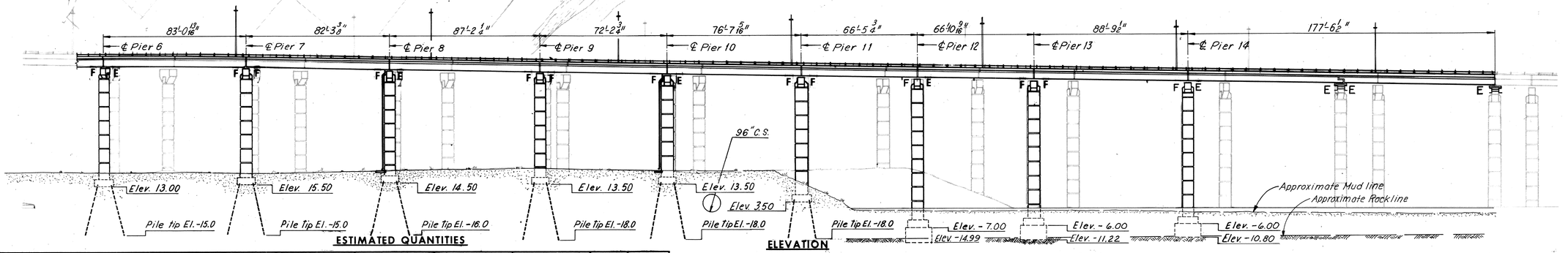
SCALE: 1"=30'
CONTRACT NO.: 11
SHEET NO. 1 OF 28

64

RICHMOND EXPRESSWAY SYSTEM			
SECTION	PROJECT	SHEET NO.	TOTAL SHEETS
11	DOWNTOWN EXPRESSWAY	65	97



PLAN



ELEVATION

ESTIMATED QUANTITIES

	Structure Excavation Cu. Yds.	Concrete (†) Cu. Yds.	Reinforcing Steel Lbs.	Str. Steel Mild carbon Lbs.	Str. Steel High Strength Lbs.	Aluminum Railing (1-rail) Lin. Ft.	Steel Piles 10BP42 Lin. Ft.
Superstructure	----	888.7	215,200	600,400	255,600	1,849	-----
Substructure	1,415*	1,751.0	245,300	31,600	8,400	---	2,630
Total	1,415*	2,639.7	460,500	632,000	264,000	1,849	2,630

	Steel Piles 12BP53 Lin. Ft.	Tremie Concrete Class T3 Cu. Yds	Sheeting Pier 5 Lump Sum	Metal Conduit Lin. Ft.	Bridge Drainage Metal work Lbs.	Modifications to R.P. Turnpike Bridge Lump Sum	Modifications to Existing Retaining Wall Cu. Yds.	Temporary Barricade Lin. Ft.
Superstructure	---	---		1310	11,450	1	50	
Substructure	1,412	173.3	1	---	---	-	-	
Total	1,412	173.3	1	1,310	11,450	1	50	990

	BY	DATE
MADE	J.V	4-3-69
CHECKED	G.S.H.	7-16-69
IN CHARGE		

NO.	REVISION	BY	DATE
1	At Pier 44 & 42 Struc. Steel Quan	T.E.M.	8-26-75

* Including 365 Cu. Yds. of " Underwater " Excavation for Piers 12, 13 and 14.

† All concrete for Superstructure shall be Class A4 and for Substructure Class A3. Concrete for Footing Seals shall be Tremie Concrete, Class T3 and is listed separately.

AS BUILT

RICHMOND METROPOLITAN AUTHORITY
RICHMOND EXPRESSWAY SYSTEM
DOWNTOWN EXPRESSWAY

BRIDGE NO. 68
RAMP W-S CONNECTION TO RICHMOND-PETERSBURG TURNPIKE
GENERAL PLAN AND ELEVATION

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SCALE: 1"=30'
CONTRACT NO. 11
SHEET NO. 2 OF 28