Appendix A4

Bridge Inspection Reports and Work History Summaries

NY33 BRIDGE CONDITION VERIFICATION 2023
KENSINGSTON EXPRESSWAY PROJECT
PIN 5512.52
CITY OF BUFFALO, ERIE COUNTY
BIN 1022609

Prepared By:

John J Picard, PE (NYSPE 067412)
Inspection Team Leader | Sr. Structural Engineer
Date: 5/30/2023

Reviewed By:

Stephen L. Gauthier, PE (NYSPE 0075775)
Quality Control Engineer | Sr. Structural Engineer
Date: 6/16/2023

LaBella
Powered by partnership.
300 State Street
Rochester, New York 14614
ph: 585-454-6110
www.labellapc.com

NY33 BRIDGE CONDITION VERIFICATION 2023
KENSINGSTON EXPRESSWAY PROJECT
PIN 5512.52
CITY OF BUFFALO, ERIE COUNTY
BIN 1022609

STRUCTURE:	BIN 1022609 - Best Street on NY33 Kensington Expressway
STRUCTURE TYPE:	Four (4) span Steel, Multi-Stringer (12 beams) structure with concrete abutments founded on piles and 3-six column piers with spread footings. Year Built: 1959
CURRENT INSPECTION:	05/01/23 – 5/09/23 (LaBella Verification Inspections)
LAST BIENNIAL INSPECTION:	10/17/22
GEN. REC.	4
INSPECTION SCOPE:	An element-specific inspection of the subject structure to verify field conditions and obtain and confirm steel measurements found in the field latest biennial inspection in order to complete a Level 1 load rating.

GENERAL INSPECTION OBSERVATIONS & CONDITIONS:

- **Superstructure Beam End Section Loss** – Beam end corrosion was reviewed and verified in the field and found to be in reasonable conformance with the to the latest 2022 biennial bridge inspection reports and additional measurements were taken to represent existing conditions. Measurements were taken at the critical sections to confirm conditions and extent. The critical beam end locations identified in the field were in Span1, G10 (end), in Span 2, G8 (begin) and G11 (begin), in Span3, G1 (end), and in Span4, G8 (begin) & G9 (begin).

    - The maximum section loss was typically found at the base of the web which was expected based on past inspection reports. Several beam ends showed some pitting along the base of the web. This pitting has been painted over and was observed to be primarily located behind the connection plate and not extend into the span. The connection plate had no apparent section loss. Photos of conditions found in the field can be found in Photo Log section of this report.
    - Generally, the maximum steel section loss was found primarily in the web behind the connection plate and directly over the bearing location within 5-8 inches
    - To determine loss of bearing area, the average of the 2-3 thickness measurements at the base of the web on either side of the bearing line were compared to the original web thickness. As expected, these losses were typically higher than the average, full height loss. In most cases, the losses found in the field during this inspection were found to be slightly higher than those from the recent 2022 inspection report to varying degrees. See Section Loss Table below for additional details.
    - The bearing area loss ranged from 23% to 61%. The maximum loss was observed in Span 1 at G6 (end) at 44%, in Span 2 at G8 (begin) and G11 (begin) at 48% and 47% respectively, in Span 3 at G1 (begin) , G12 (begin) and G7 (end) at 61%, 45% and 41%, respectively, and in Span 4 at G8 (begin) and G9 (begin) at 38% each.
    - The average full height web section loss, excluding the bearing area, was found to range from 13% - 53%. The maximum full height web section loss was determined to be in Span 1 at G6 and G10 locations with 44% and 53% losses, respectively.

- 21 of 72 (29%) of the beam end locations at the pier already have temporary supports consisting of 3”x 5“ tubes sections in place, with a number of them recently installed since the last biennial inspection in October 2022.

- Several expansion bearings had pack rust noted between plates causing the sliding bronze plates to bow upwards in the center and likely cause the bearing to not function as originally designed. In the 2022 inspection report, this condition was reported as Poor (CS3) for <u>all</u> 48 expansion bearings.

- Numerous expansion bearings were found to be overextended at Piers 1 & 3.
  In some cases, the ends of the girders between Spans 1&2, including G5, G8, G11 and between Spans 3 & 4, including G5, G7, G8 are in contact with each other, and no acting as originally designed.

- At a number of the end diaphragm locations, those with heavy deck leakage, diaphragms showed significant section loss which was observed in the web and bottom flange of the end diaphragm especially between G7 and G8 in Span 4 at Pier 3.

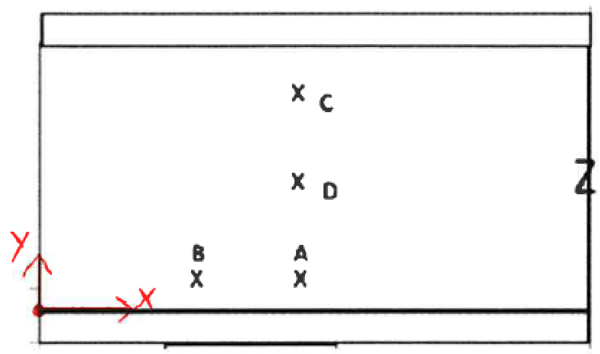
BEST STREET BRIDGE - GIRDER END SECTION LOSS TABLE								
SPAN 1								
GIRDER	LOCATI ON	READIN G	X (IN.)	Y (IN.)	ORIG. WEB THICKNESS (IN.)	MEASURED THICKNESS (IN.)	AVG. MEASURED THICKNESS (IN.)	AVG. % SECTION LOSS
G1	PIER 1	A	6	3	0.58	0.413	0.383	34%
		B	3			0.353		
G5	PIER 1	A	8	3	0.615	0.422	0.415	33%
		B	4			0.408		
G6	PIER 1	A	8	3	0.545	0.233	0.306	44%
		C	8	28		0.243		
		D	8	13		0.443		
G10	PIER 1	A	8	3	0.615	0.169	0.292	53%
		C	8	28		0.151		
		D	8	13		0.555		

BEST STREET BRIDGE - GIRDER END SECTION LOSS TABLE								
SPAN 2								
GIRDER	**LOCATION**	**READING**	**X (IN.)**	**Y (IN.)**	**ORIG. WEB THICKNESS (IN.)**	**MEASURED THICKNESS (IN.)**	**AVG. MEASURED THICKNESS (IN.)**	**AVG. % SECTION LOSS**
G1	PIER 1	A	6	3	0.58	0.443	0.448	23%
		B	3			0.453		
G5	PIER 1	A	8	3	0.58	0.374	0.397	32%
		B	4			0.419		
		A	8	3	0.58	0.374	0.414	29%
		C		28		0.402		
		D		17		0.467		
	PIER 2	A	8	3	0.58	0.449	0.402	31%
		B	4			0.354		
G6	PIER 1	A	8	3	0.58	0.352	0.324	44%
		B		3		0.296		
	PIER 2	A	8	6	0.58	0.395	0.502	13%
		C		29		0.561		
		D		17		0.551		
G8	PIER 1	A	8	3	0.58	0.208	0.301	48%
		B	4			0.393		
	PIER 2	A	SEE SKETCH BELOW	SEE SKETCH BELOW		0.448	0.384	34%
		B				0.319		
G11	PIER 1	A	8	3	0.58	0.294	0.305	47%
		B	4			0.316		

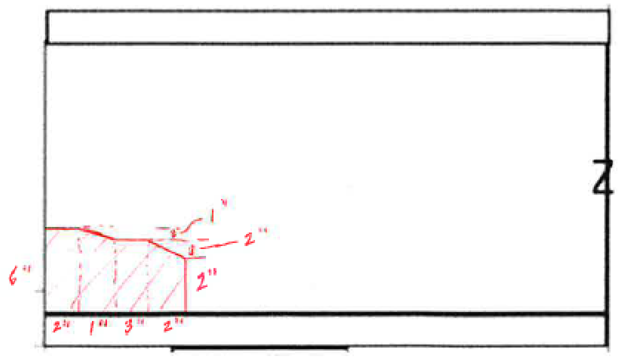
BEST STREET BRIDGE - GIRDER END SECTION LOSS TABLE								
SPAN 3								
GIRDER	LOCATION	READING	X (IN.)	Y (IN.)	ORIG. WEB THICKNESS (IN.)	MEASURED THICKNESS (IN.)	AVG. MEASURED THICKNESS (IN.)	AVG. % SECTION LOSS
G1*	PIER 2	A	4	2	0.58	0.183	0.225	61%
		B	2	2		0.266		
G2	PIER 3	A	8	3	0.58	0.368	0.349	40%
		B	4			0.329		
G5	PIER 2	A	8	3	0.58	0.445	0.432	26%
		B	4			0.419		
G6	PIER 2	A	8	3	0.58	0.356	0.482	17%
		B	4			0.568		
		C	8	28		0.521		
G6	PIER 3	A	8	3	0.58	0.394	0.351	40%
		B	4			0.307		
G7	PIER 3	A	8	3	0.58	0.321	0.342	41%
		B	4			0.362		
G9	PIER 2	A	8	3	0.58	0.453	0.405	30%
		B	4			0.356		
G10*	PIER 3	A	8	3	0.58	0.361	0.354	39%
		B	4			0.347		
G12	PIER 2	A	8	2	0.58	0.377	0.317	45%
		B	4			0.257		

* SEE SUPPLEMENTAL SKETCH BELOW

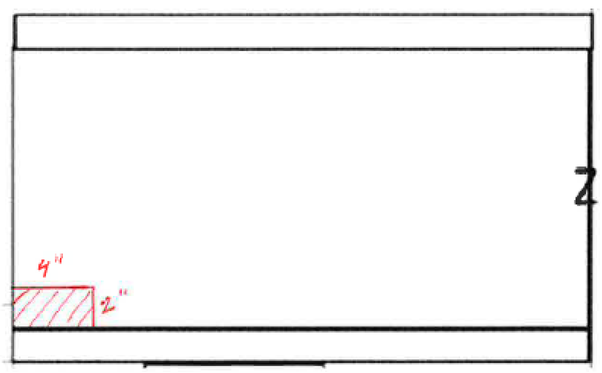
SPAN 4								
GIRDER	LOCATION	READING	X (IN.)	Y (IN.)	ORIG. WEB THICKNESS (IN.)	MEASURED THICKNESS (IN.)	AVG. MEASURED THICKNESS (IN.)	AVG. % SECTION LOSS
G8	PIER 3	A	6	3	0.518	0.352	0.322	38%
		B	3			0.291		
G9	PIER 3	A	6	3	0.518	0.333	0.321	38%
		B	3			0.309		
G10	PIER 3	A	6	3	0.518	0.366	0.361	30%
		B	3			0.356		



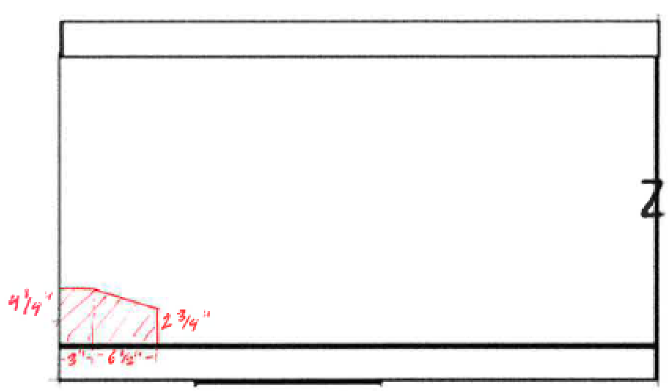
SKETCH 1: ORIGIN



SKETCH 2: G8 GIRDER END @ SPAN 2, PIER 2



SKETCH 3: G1 GIRDER END @ SPAN 3, PIER



SKETCH 4: G10 GIRDER END @ SPAN 3, PIER 3

- **Load Rating -** A Level 1 Load Rating evaluation was completed in conjunction with this inspection and has been attached to this report. A summary of the results is below:

Rating Load	Controlling Mode	Inventory Rating	Operating Rating
Load and Resistance Factor Rating HL-93	Span 3 Girder G1 Original 33WF130 Web Local Yielding	0.10	0.13
Load Factor Rating HS Truck or Lane	Span 1 Girder G10 Original 30WF132 Unstiffened Bearing Area	HS 11.6 20.8 Ton	HS 19.3 34.8 Ton
Load Factor Rating H Truck or Lane	Span 1 Girder G10 Original 30WF132 Unstiffened Bearing Area	H 15.8 15.8 Ton	H 26.4 26.4 Ton

Recommended Load Posting = 24 Ton

A fatigue analysis was also performed in conjunction with this inspection. The results showed that the existing structure has 0 years of remaining life.

- **Substructure Concrete** Condition -
    - Abutments – The abutment faces were observed and found to be in generally Good to Fair condition. There were no major changes in deterioration from the 2022 inspection report. A few locations of spalls to rebars and heavy cracks and delamination were evident throughout both backwalls as well as some of abutment pedestals on both ends of the structure.
    - Piers – The pier caps & columns and pedestals were observed, sounded, and found to be in Fair to Poor condition with significant distress noted. There are some additional notes in deterioration from the 2022 inspection report. Several locations of severe spalling to exposed rebar are evident across the faces of the columns, pier caps and girder pedestals. Numerous locations of hollow and heavily cracked and delaminated concrete are also evident throughout these locations. Refer completed field sheets attached to this report for additional details.

      Photos of general substructure conditions can be found in Photo Log section of this report.

- **Structural Deck Observations -** The structural deck was observed below deck and is considered indicative of the overall deck conditions above. This deck was constructed with removable forms so direct observation was permissible.

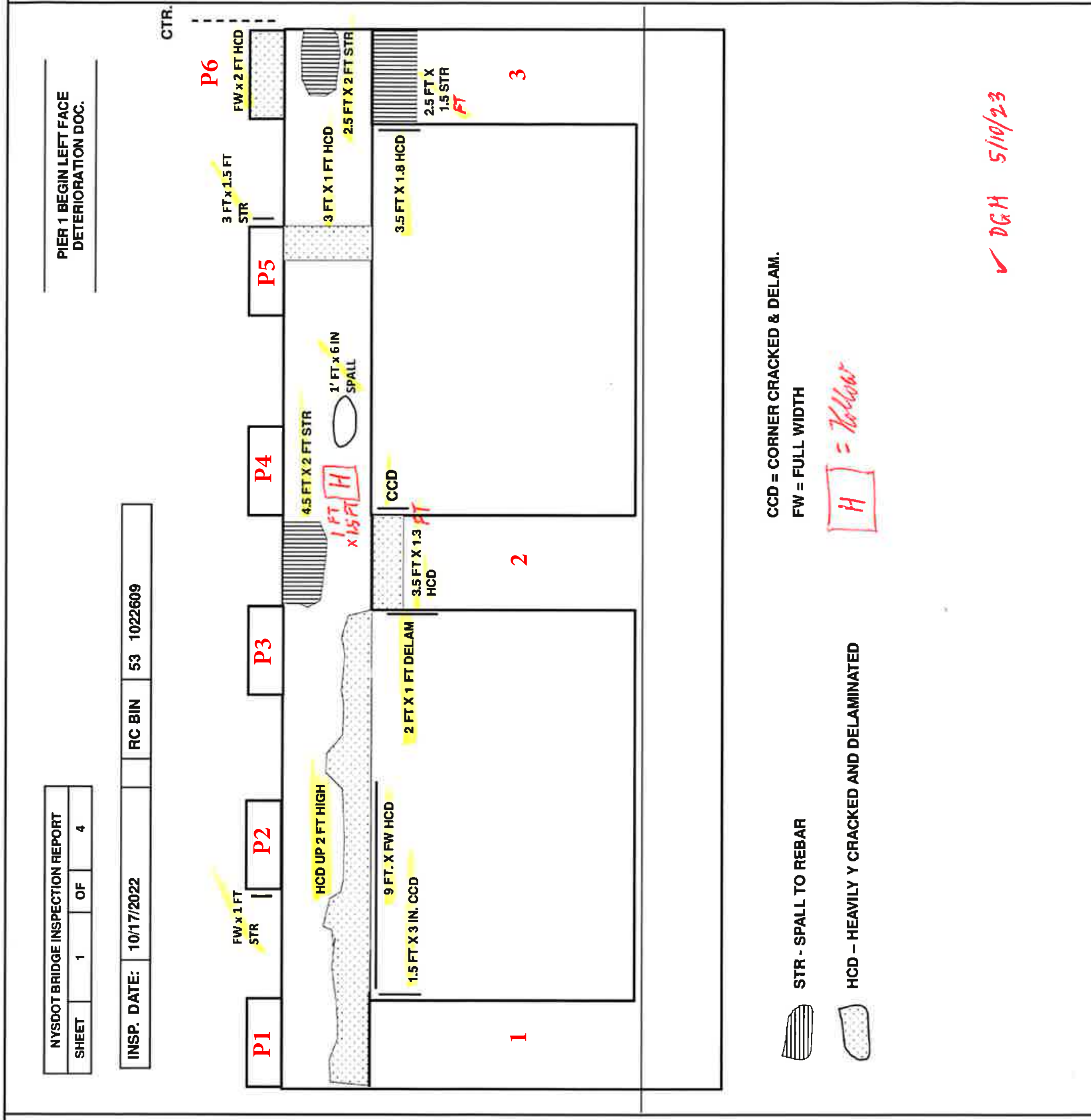
  The general condition of the structural deck was found to be as follows:

    - 1% of the structural deck in ADVANCED state of deterioration
    - 8% of the structural deck in FAIR state of deterioration
    - 91% of the structural deck in relatively GOOD condition

Photos of general deck conditions can be found in Photo Log section of this report.

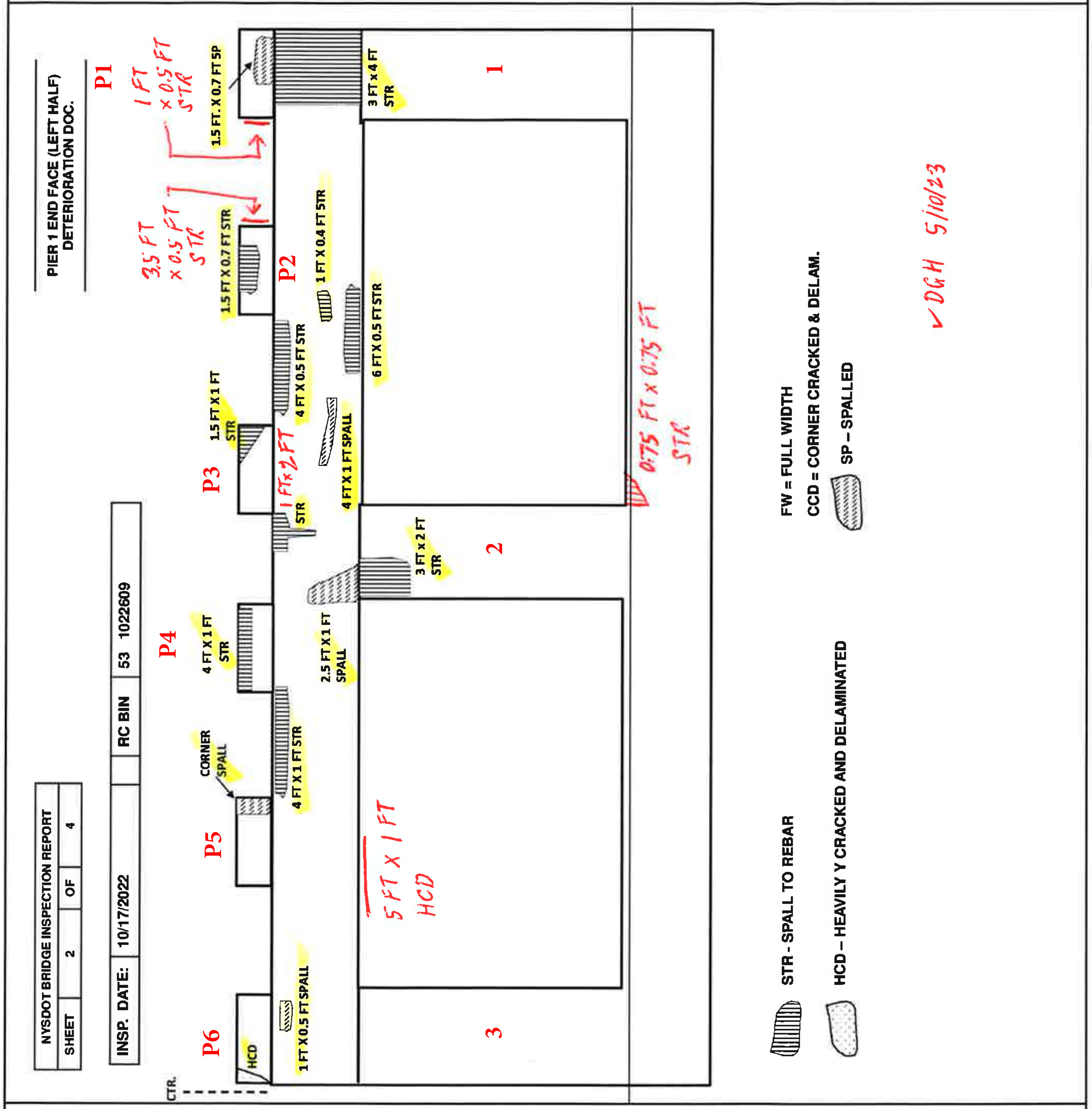
Abutment and Pier Sketches

Sketch Number: **6** Sketch Filename: **22-1022609-Pier_1_Deterioraton1.jpg**



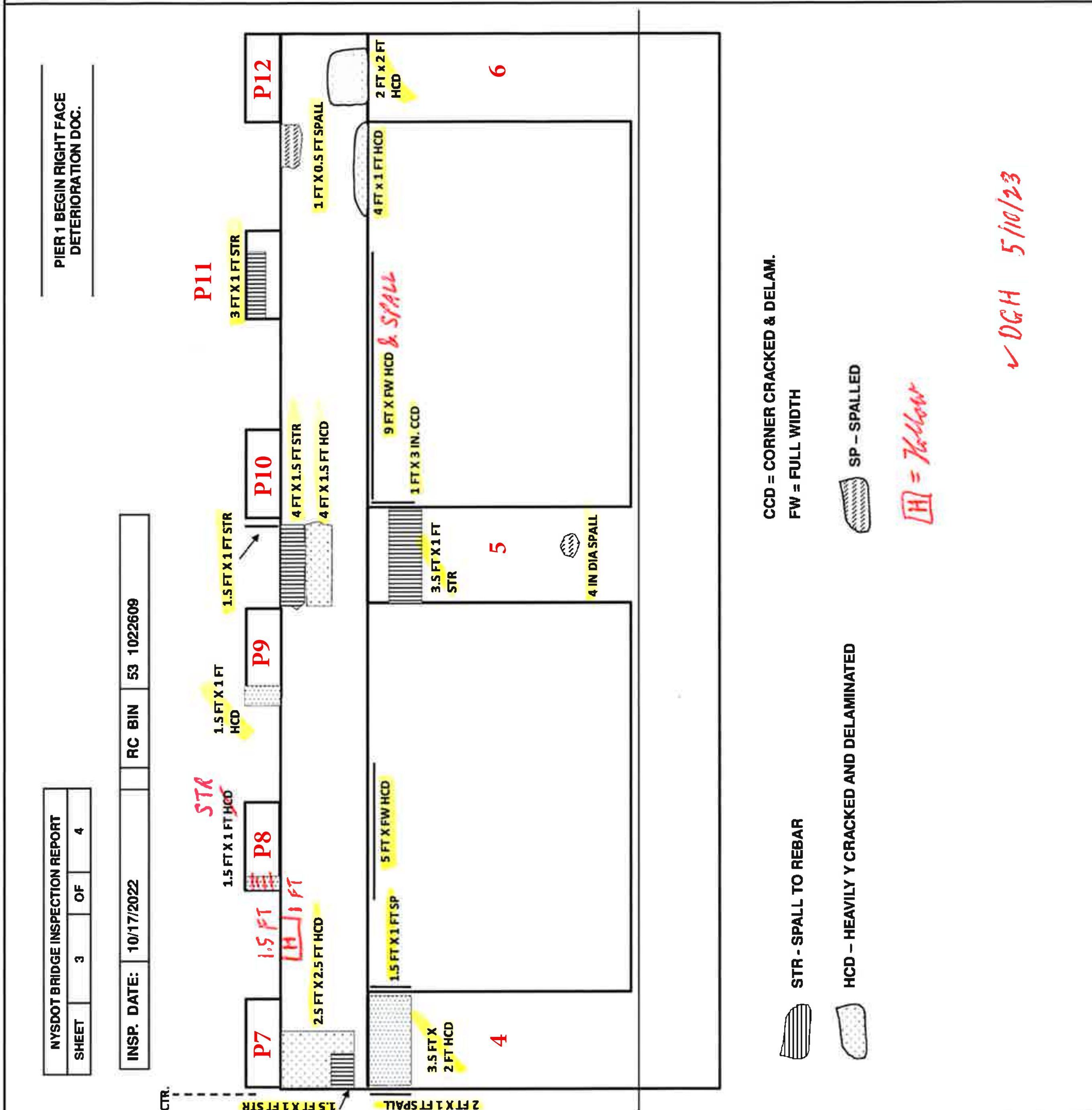
Sketch Description: Pier PR-1 Deterioraton - Begin Left Face

Sketch Number: **7** Sketch Filename: **22-1022609-Pier_1_Deterioraton2.jpg**



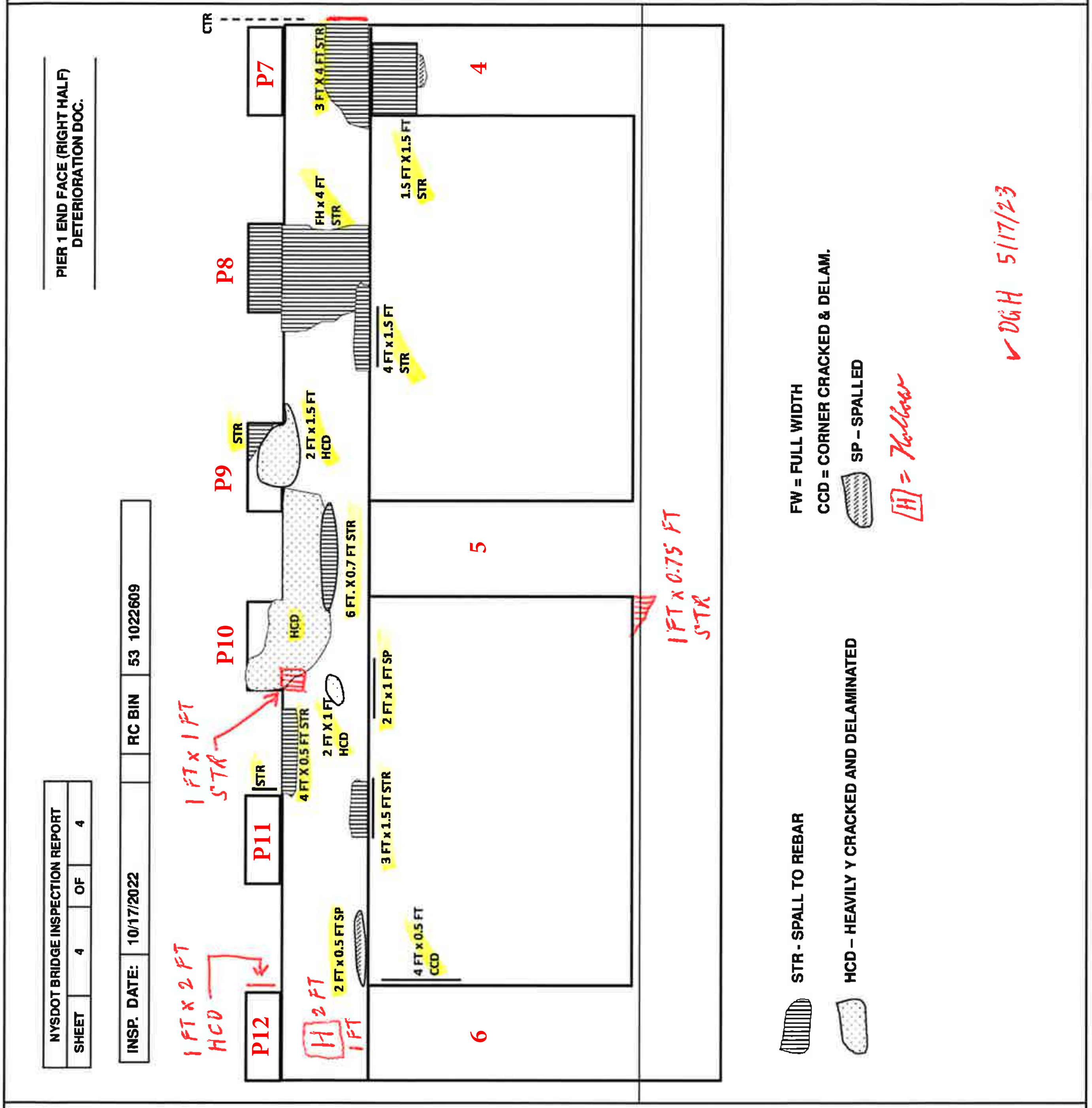
Sketch Description: Pier PR-1 Deterioraton - End Left Face

Sketch Number: **8** Sketch Filename: **22-1022609-Pier_1_Deterioraton3.jpg**



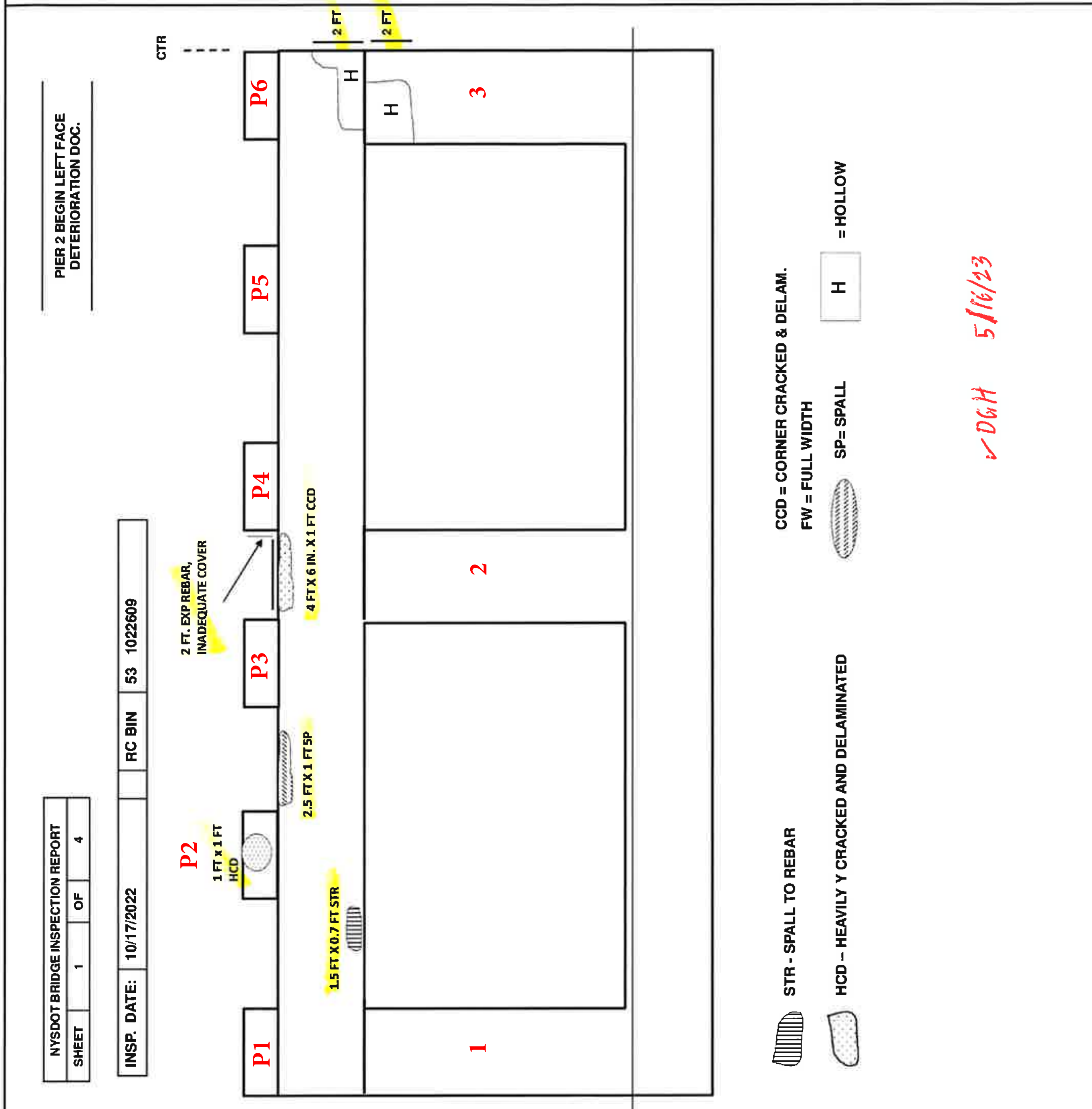
Sketch Description: Pier PR-1 Deterioraton - Begin Right Face

Sketch Number: **9** Sketch Filename: **22-1022609-Pier_1_Deterioraton4.jpg**



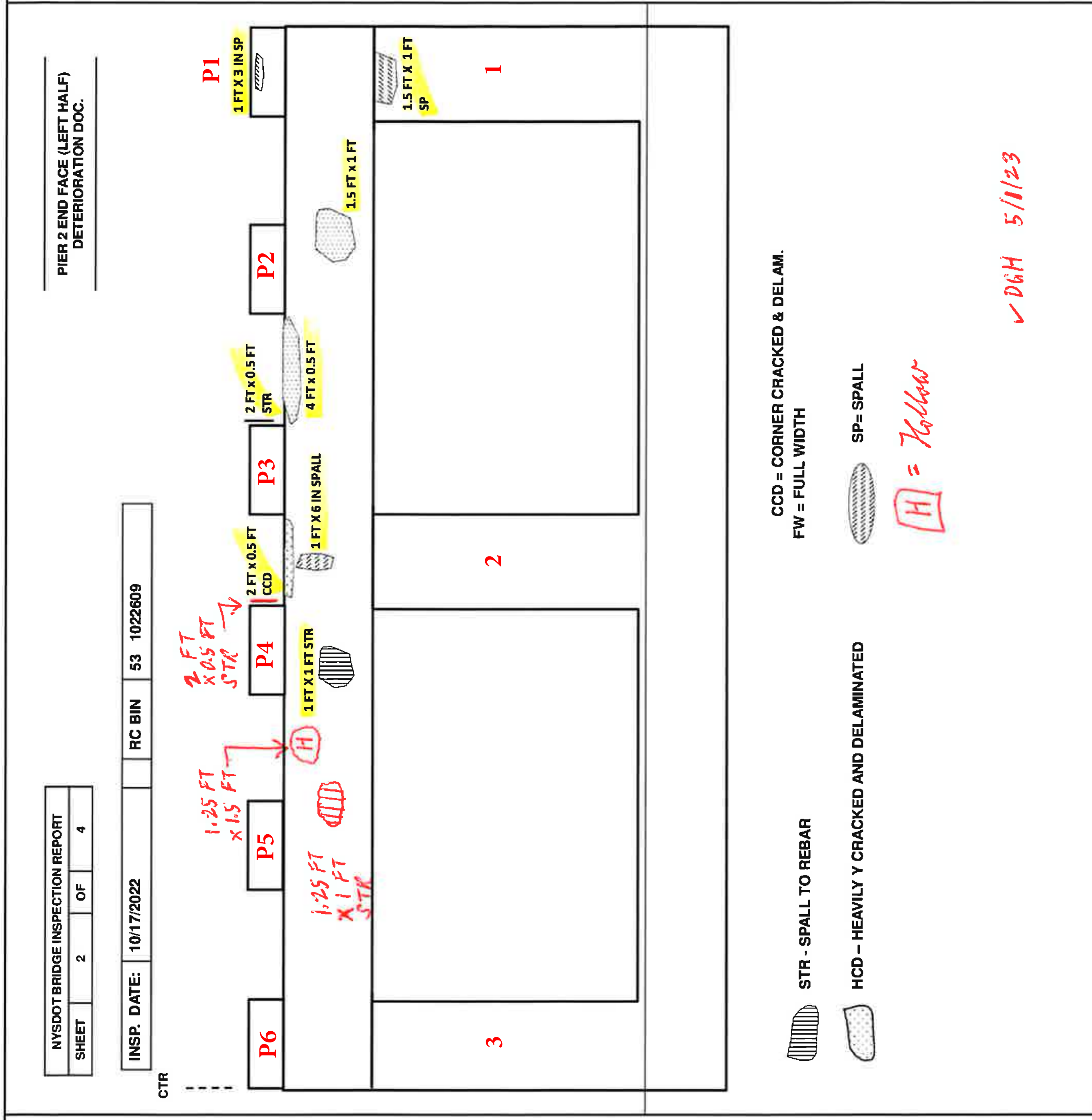
Sketch Description: Pier PR-1 Deterioraton - End Right Face

Sketch Number: **10** Sketch Filename: **22-1022609-Pier_2_Deterioraton1.jpg**



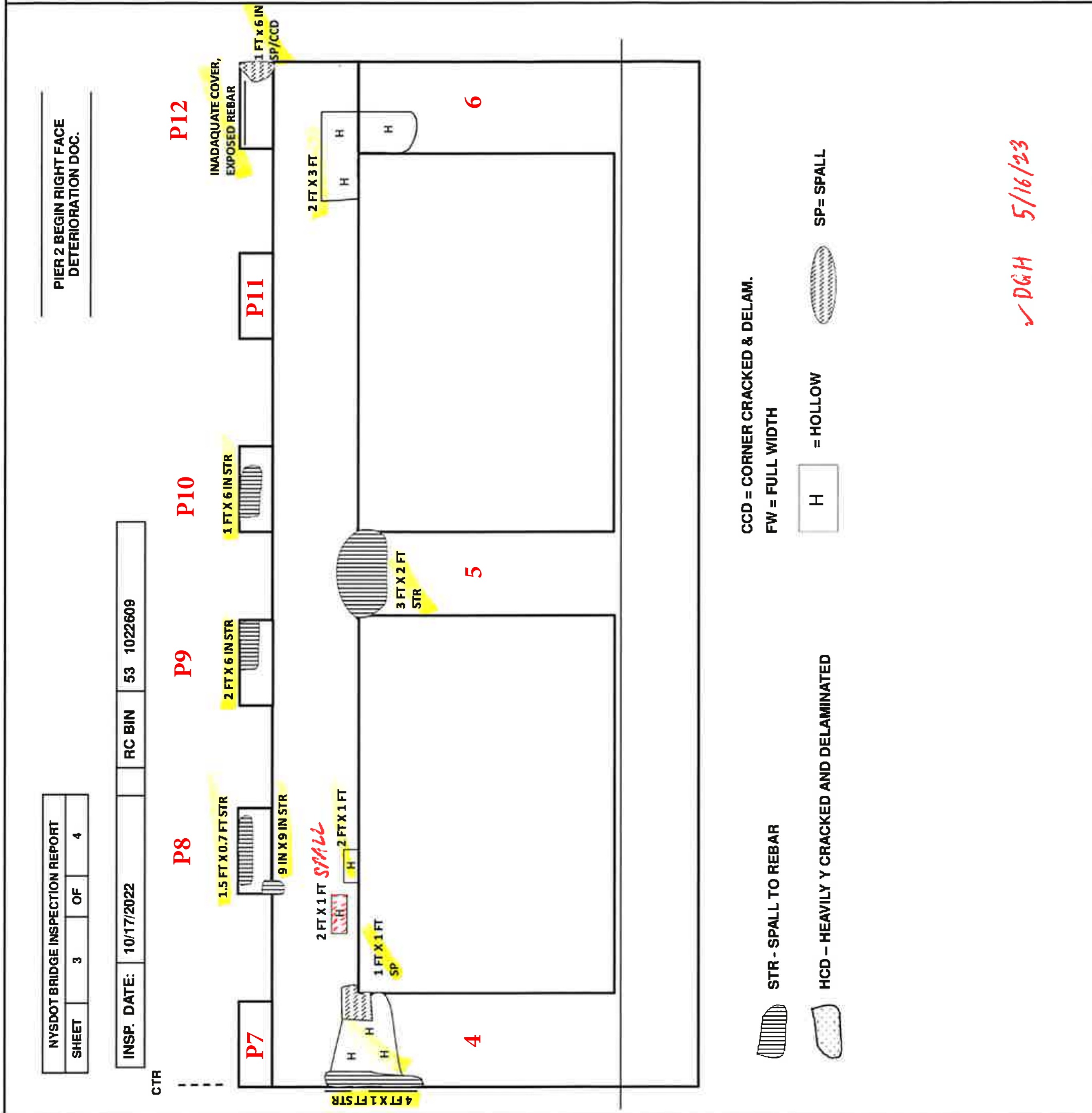
Sketch Description: Pier PR-2 Deterioraton - Begin Left Face

Sketch Number: **11** Sketch Filename: **22-1022609-Pier_2_Deterioraton2.jpg**



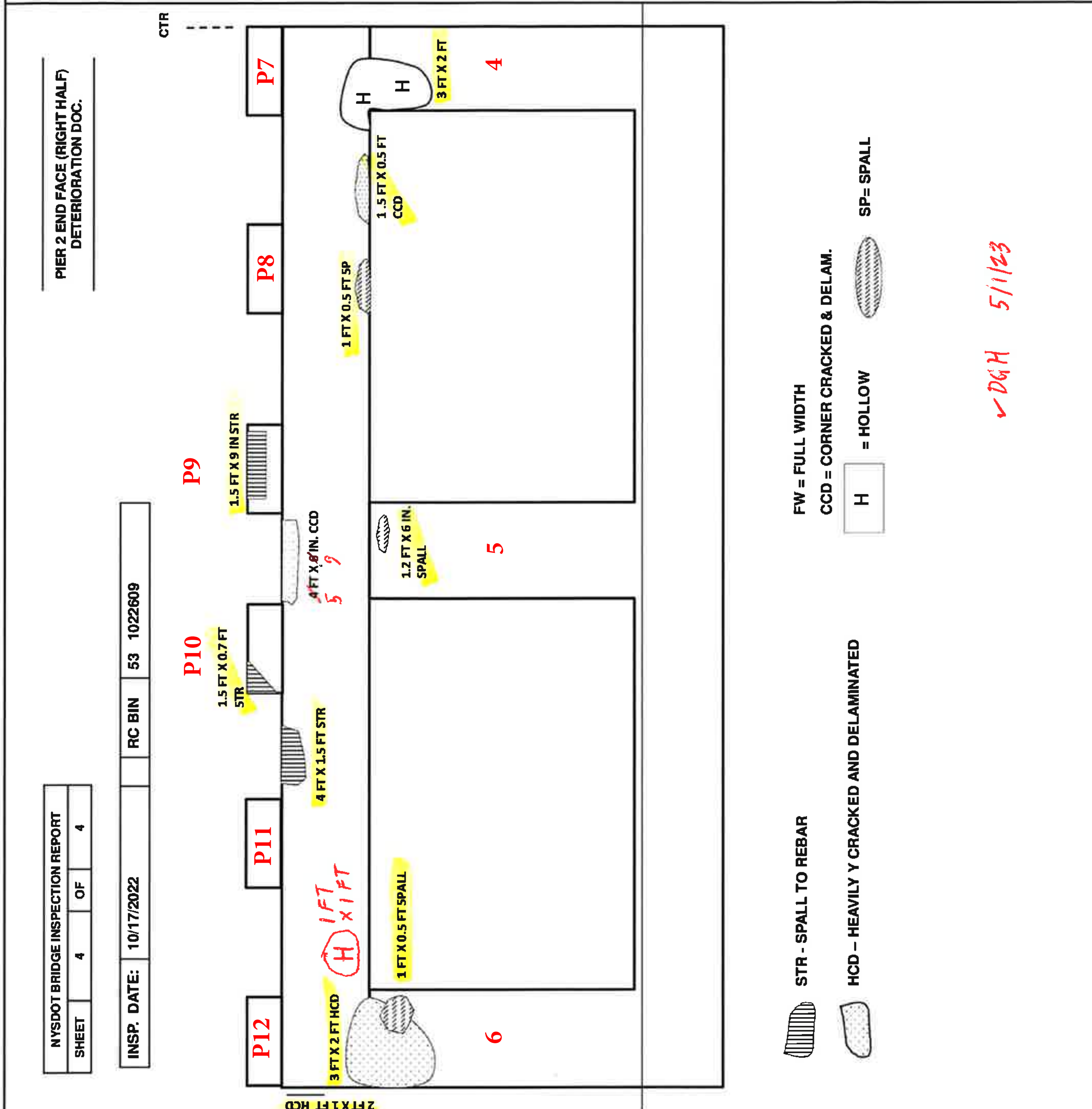
Sketch Description: Pier PR-2 Deterioraton - End Left Face

Sketch Number: **12** Sketch Filename: **22-1022609-Pier_2_Deterioraton3.jpg**



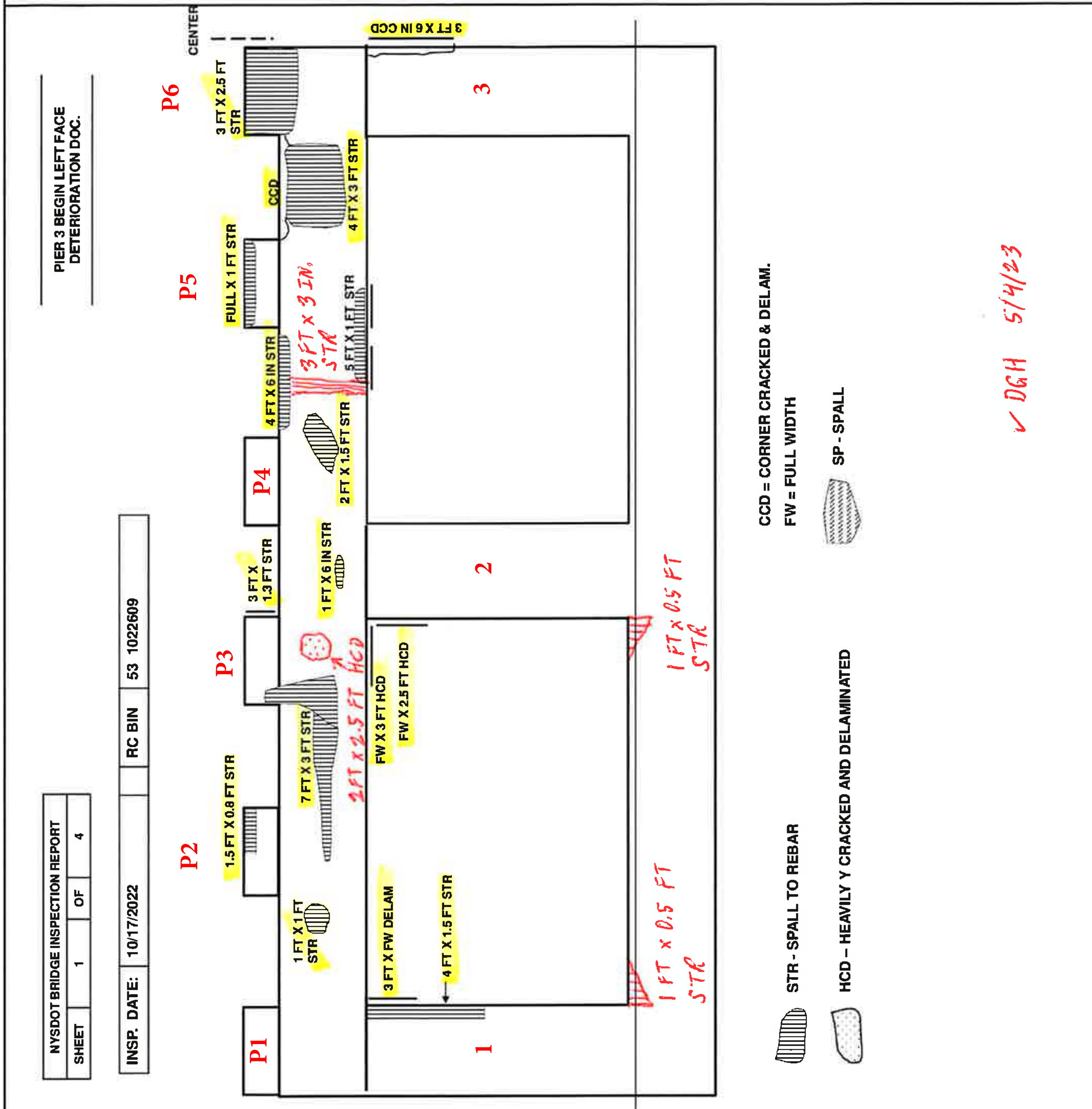
Sketch Description: Pier PR-2 Deterioraton - Begin Right Face

Sketch Number: **13** Sketch Filename: **22-1022609-Pier_2_Deterioraton4.jpg**



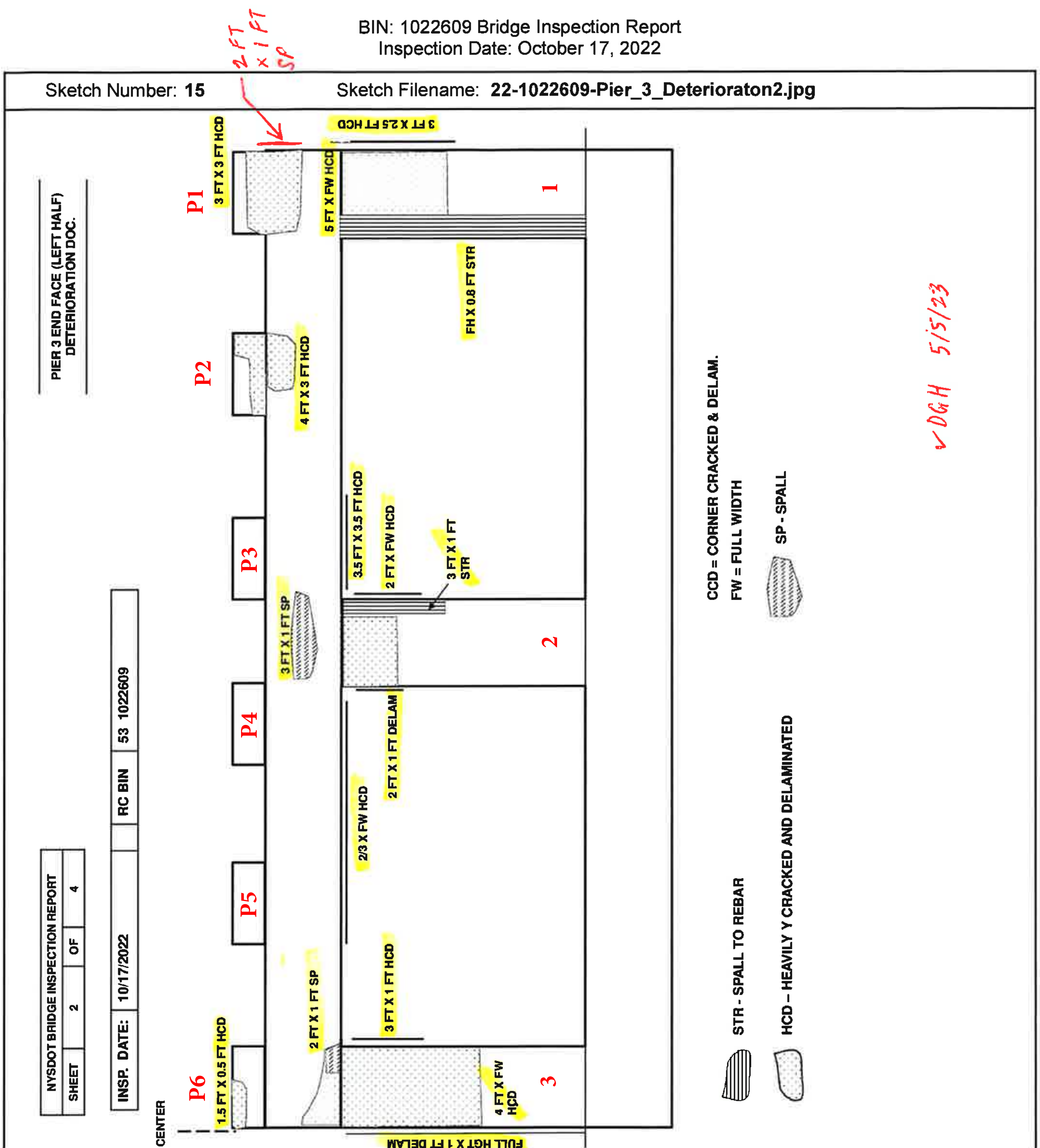
Sketch Description: Pier PR-2 Deterioraton - End Right Face

Sketch Number: **14** Sketch Filename: **22-1022609-Pier_3_Deterioraton1.jpg**



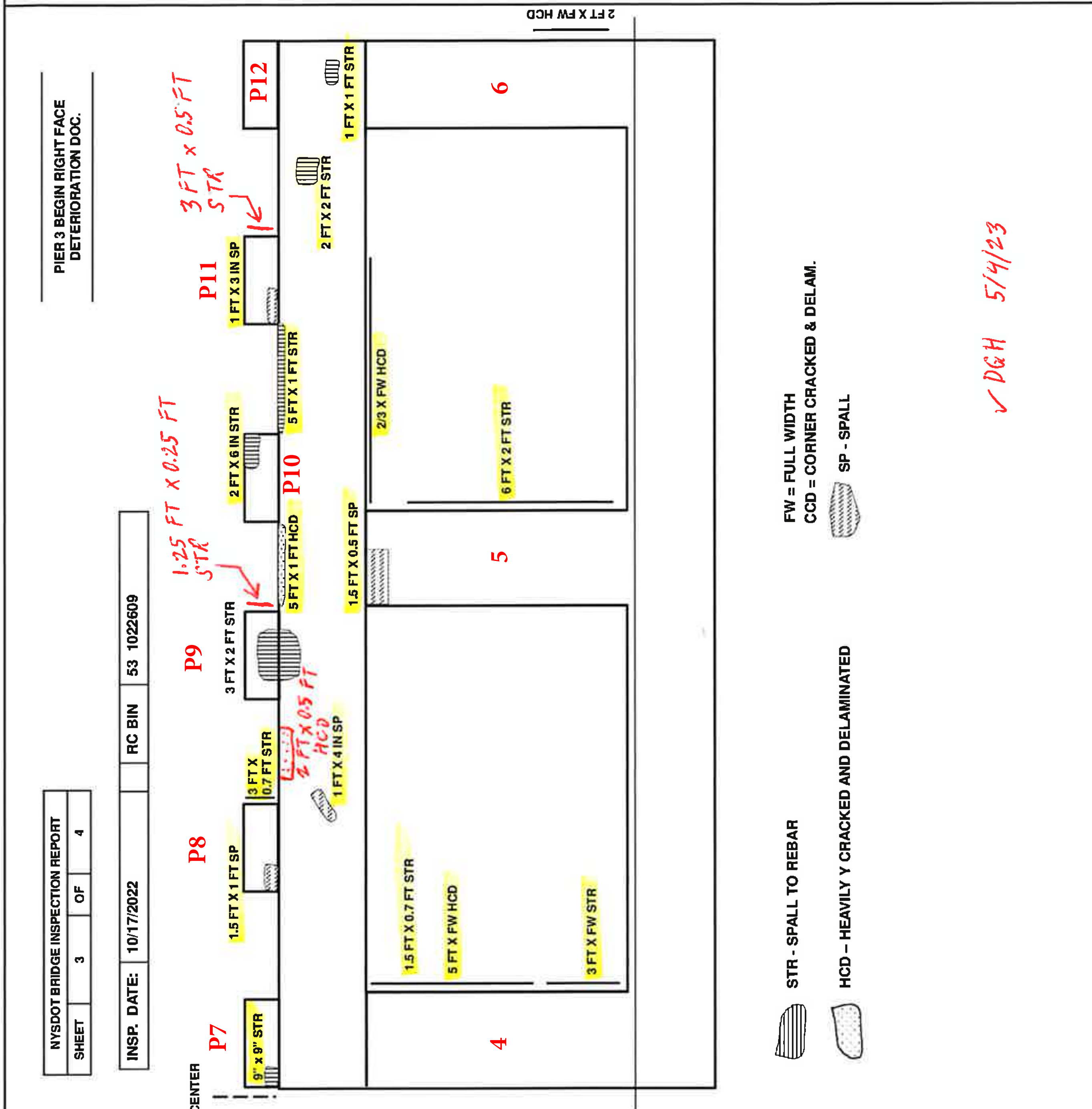
Sketch Description: Pier PR-3 Deterioraton - Begin Left Face

Sketch Number: **15** Sketch Filename: **22-1022609-Pier_3_Deterioraton2.jpg**



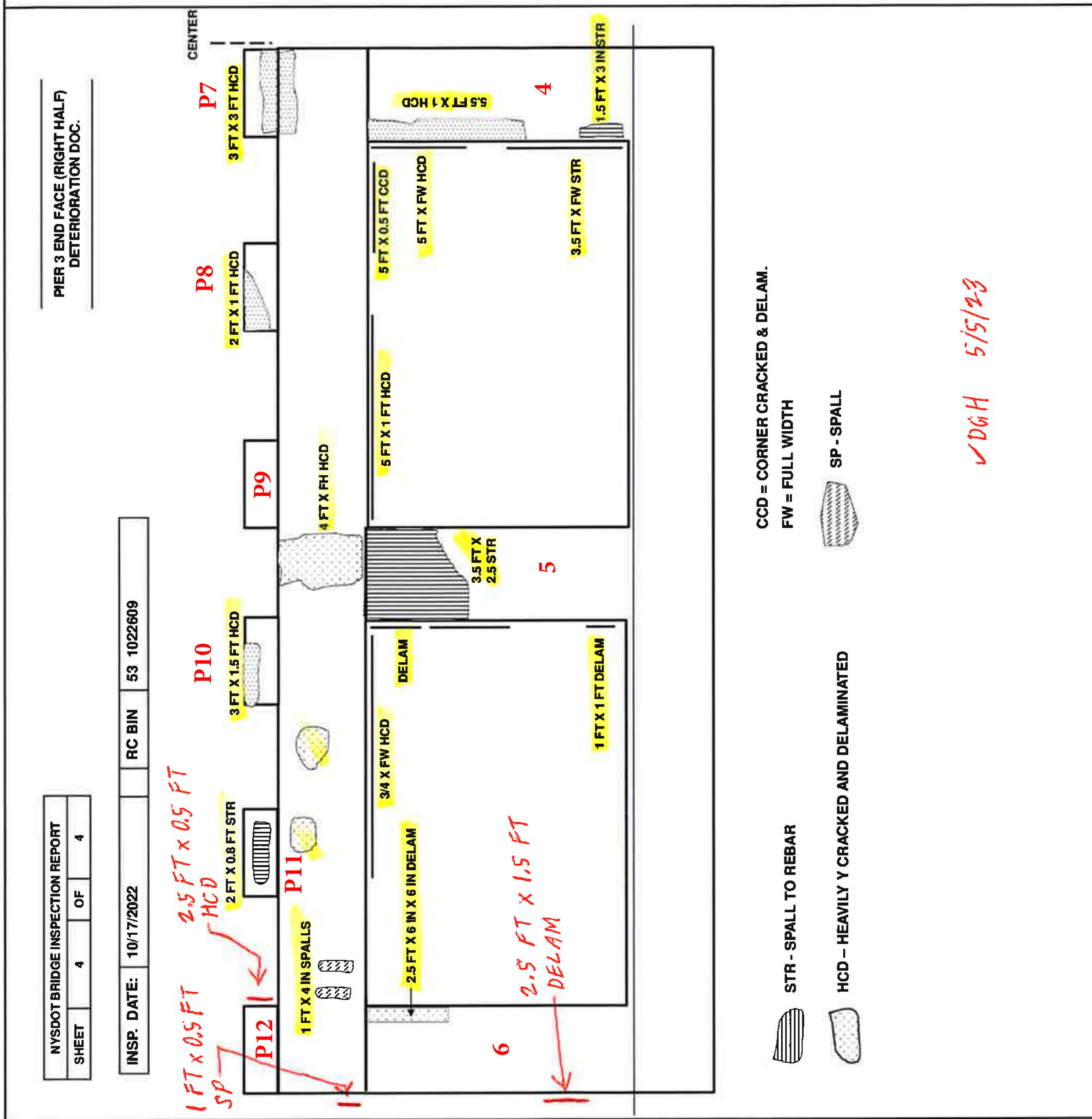
Sketch Description: Pier PR-3 Deterioraton - End Left Face

Sketch Number: **16** Sketch Filename: **22-1022609-Pier_3_Deterioraton3.jpg**



Sketch Description: Pier PR-3 Deterioraton - Begin Right Face

Sketch Number: **17** Sketch Filename: **22-1022609-Pier_3_Deterioraton4.jpg**



Sketch Description: Pier PR-3 Deterioraton - End Right Face

Photographs

PHOTO 1

LOCATION:
G1 IN SPANS 1 & 2 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 2

LOCATION:
G1 IN SPAN 2 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 3

LOCATION:
G1 IN SPAN 1 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 4

LOCATION:
G1 IN SPANS 1 & 2 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 5

LOCATION:
G5 IN SPANS 1 & 2 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 6

LOCATION:
G6 IN SPANS 1 & 2 AT PIER

DESCRIPTION:
FULL-HEIGHT SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 7

LOCATION:
G6 IN SPAN 2 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 8

LOCATION:
G8 IN SPANS 1 & 2 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 9

LOCATION:
G10 IN SPANS 1 & 2 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 10

LOCATION:
G11 IN SPANS 1 & 2 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 11

LOCATION:
G1 IN SPAN 3 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 12

LOCATION:
G2 IN SPANS 3 & 4 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 13

LOCATION:
G2 IN SPANS 3 & 4 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 14

LOCATION:
G5 IN SPANS 2 & 3 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 15

LOCATION:
G5 IN SPANS 3 & 4 AT PIER

DESCRIPTION:
BEARING CONDITIONS WITH PREVIOUSLY INSTALLED TUBE STIFFENER

PHOTO 16

LOCATION:
G5 IN SPANS 3 & 4 AT PIER

DESCRIPTION:
BEARING CONDITIONS WITH PREVIOUSLY INSTALLED TUBE STIFFENER

PHOTO 17

LOCATION:
G6 IN SPAN 3 AT PIER

DESCRIPTION:
HEAVILY RUSTED AND OVEREXTENDED EXPANSION BEARING

PHOTO 18

LOCATION:
G6 IN SPANS 3 & 4 AT PIER

DESCRIPTION:
HEAVILY RUSTED AND OVEREXTENDED EXPANSION BEARINGS

PHOTO 19

LOCATION:
G6 IN SPANS 2 & 3 AT PIER

DESCRIPTION:
WEB CRIPPLE ADJACENT TO TEMPORARY WEB SUPPORT

PHOTO 20

LOCATION:
G6 IN SPANS 2 & 3 AT PIER

DESCRIPTION:
TYPICAL 3" x 5" TUBE TEMPORARY WEB SUPPORT

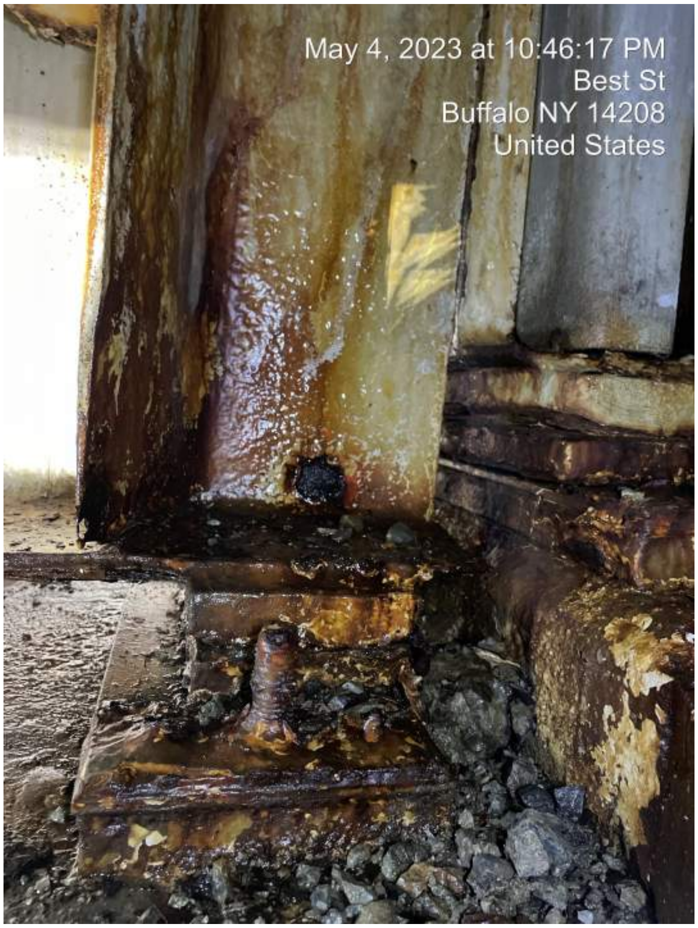


PHOTO 21

LOCATION:
G7 IN SPAN 3 AT PIER

DESCRIPTION:
HEAVILY RUSTED AND OVEREXTENDED EXPANSION BEARINGS

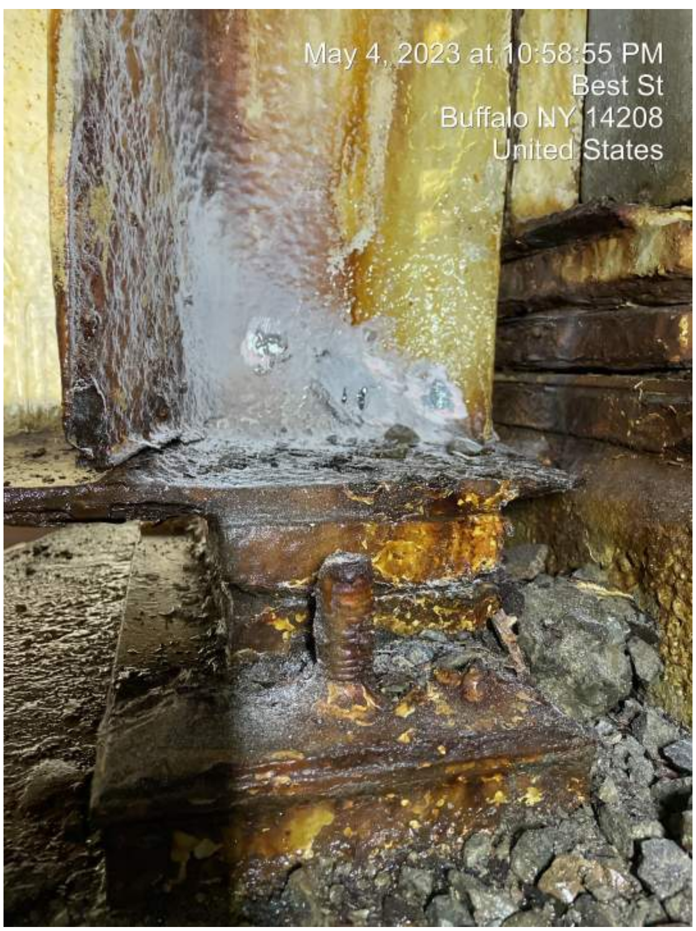


PHOTO 22

LOCATION:
G1 IN SPAN 3 AT PIER

DESCRIPTION:
GIRDER END CONDITION PHOTO (WORST CASE SECTION LOSS AREA)

<u>PHOTO 23</u>

LOCATION:
G7 IN SPANS 3 & 4 AT PIER

DESCRIPTION:
RUSTED AND OVEREXTENDED EXPANSION BEARINGS; END OF BEAM SPANS IN CONTACT

<u>PHOTO 24</u>

LOCATION:
G7 IN SPANS 3 & 4 AT PIER

DESCRIPTION:
END OF BEAM SPANS IN CONTACT; HEAVILY CORRODED END DIAPHRAGM

PHOTO 25

LOCATION:
G7 IN SPANS 3 & 4 AT PIER

DESCRIPTION:
RUSTED AND OVEREXTENDED EXPANSION BEARINGS; HEAVILY CORRODED END DIAPGRAGM

PHOTO 26

LOCATION:
G8 IN SPANS 3 & 4 AT PIER

DESCRIPTION:
OVEREXTENDED EXPANSION BEARINGS; END OF BEAM SPANS IN CONTACT

PHOTO 27

LOCATION:
G8 IN SPAN 4 AT PIER

DESCRIPTION:
OVEREXTENDED EXPANSION BEARINGS; END OF BEAM SPANS IN CONTACT

PHOTO 28

LOCATION:
G8 IN SPAN 4 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 29

LOCATION:
G6 IN SPAN 3 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 30

LOCATION:
G9 IN SPAN 3 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 31

LOCATION:
G9 IN SPAN 3 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 32

LOCATION:
G9 IN SPAN 4 AT PIER

DESCRIPTION:
BEARING CONDITIONS WITH PREVIOUSLY INSTALLED TUBE STIFFENER

PHOTO 33

LOCATION:
G10 IN SPANS 3 & 4 AT PIER

DESCRIPTION:
BEARING AREA SECTION LOSS MEASUREMENT LOCATIONS

PHOTO 34

LOCATION:
G12 IN SPAN 3 AT PIER

DESCRIPTION:
BEARING CONDITIONS WITH PREVIOUSLY INSTALLED TUBE STIFFENERS

PHOTO 35

LOCATION:
G12 IN SPAN 3 AT PIER

DESCRIPTION:
BEARING CONDITIONS WITH PREVIOUSLY INSTALLED TUBE STIFFENER

PHOTO 36

LOCATION:
PIER 3 BEGIN LEFT FACE LOOKING EAST

DESCRIPTION:
GENERAL SPALLING CONCRETE CONDITIONS; TYPICAL FOR ALL PIERS

PHOTO 37

LOCATION:
PIER 3 BEGIN LEFT FACE BETWEEN PEDESTALS P5 & P6

DESCRIPTION:
SPALLS TO CORRODED REBAR ON FACES OF PIER CAP; TYPICAL FOR ALL PIERS

PHOTO 38

LOCATION:
COLUMN 1 AT PIER 3 LOOKING NORTH

DESCRIPTION:
SPALLS TO REBAR AT THE INSIDE CORNERS OF THE COLUMN ALONG WITH HOLLOW CONCRETE AT THE INSIDE FACE

PHOTO 39

LOCATION:
PIER 1 END LEFT FACE LOOKING WEST

DESCRIPTION:
SPALLS TO CORRODED REBAR ON FACES OF PIER CAP; TYPICAL FOR ALL PIERS

PHOTO 40

LOCATION:
PIER PEDESTAL 2 ON PIER 1 LOOKING SOUTH

DESCRIPTION:
SPALLS TO CORRODED REBAR ON PEDESTAL

PHOTO 41

LOCATION:
UNDERSIDE OF DECK IN SPAN 3 LOOKING EAST

DESCRIPTION:
TYPICAL DECK CONDITION PHOTO NEAR NORTH END OF BRIDGE

PHOTO 42

LOCATION:
UNDERSIDE OF DECK IN SPAN 4 AND END ABUTMENT LOOKING WEST

DESCRIPTION:
TYPICAL DECK AND ABUTMENT CONDITIONS WITH 8" GAS LINE NEAR SOUTH END OF BRIDGE

Appendices

- Appendix A: 2022 Biennial Bridge Inspection Report
- Appendix B: Bridge Work History Summary
- Appendix C: Load Rating Summary

Appendix A

2022 Biennial Bridge Inspection Report

New York State Department of Transportation
General Bridge Inspection Report

Inspection Date: October 17, 2022

Structure Information

BIN: **1022609**	*Region:* 05 - BUFFALO
Feature Carried: BEST STREET	*County:* ERIE
Feature Crossed: 33 33 53011026	*Political Unit:* City of BUFFALO
Orientation: 3 - EAST	*Approximate Year Built:* 1963

Primary Owner: New York State Department of Transportation

Primary Maintenance Responsibility: New York State Department of Transportation

General Type Main Span: 3 - Steel, 02 - Stringer/Multi-Beam or Girder

This Bridge is not a Ramp

Number of Spans: 4

Postings

Posted Load Matches Inventory: Yes	*Posted Vertical Clearances Match Inventory:* Yes
Posted Load in field: Not Posted	*Inventory On:* Not Posted
	Inventory Under: Not Posted

Number of Flags Issued

Red PIA: 0

Red: 0

Yellow: 2

Safety PIA: 0

New York State Inspection Overview

General Recommendation: 4

Federal NBI Ratings

NBI Deck Condition:	5	*NBI Channel Condition:*	N
NBI Superstructure Condition:	4	*NBI Culvert Condition:*	N
NBI Substructure Condition:	4		

Action Items

Non-Structural Condition Observations noted: YES

Vulnerability Reviews Recommended: NO

Diving Inspection Requested: NO

Further Investigation Requested: NO

Inspector & Reviewer Signature Information

Inspection Signature:	Kevin M. Seely, P.E. 100192-1	*Date:* December 21, 2022
Review Signature:	Lawrence A. Mathews, P.E. 051173-1	*Date:* December 21, 2022
Processed by :	William F. Leblanc, P.E. 085471-1	*Date:* December 22, 2022

Report Printed: December 22, 2022 8:57:19 AM

Special Emphasis Inspection

Special Emphasis Detail	"Other" Special Emphasis Detail Description	Hands-On Insp Performed	Hands-On Inspection Note
AASHTO Category D, E, and E' welded details		Yes	100% hands-on Inspection performed on transverse weld at ends of bottom flange cover plates on all Girders in Spans 2 and 3, with no defects found. Kevin M Seely, PE; #100192; 10/17/2022
Steel Web Bearing Area		Yes	100% hands-on Inspection performed on all Girder ends with section loss 25% or greater in the Bearing area of the lower webs. See condition notes for Element 107 in all spans, as well as FBRs for YF #5B2267W023, YF #5B2267W029 for defects found. Kevin M Seely, PE; #100192; 10/17/2022

Additional Information

Overloads Observed

No overload vehicles observed during this inspection.

Notes to Next Inspector

2022 – The BIN plates are located on the End Left approach and the End Backwall in Bay 7.
Access for this structure is walking; Bucket truck with WZTC (Left shoulder and Right lane & shoulder closure with shadow vehicles on NY33 WB for Spans 1 & 2; Left shoulder and Right lane & shoulder closure with shadow vehicles on NY-33 EB for Spans 3 & 4).
Park within work zone for underside Inspection; Park in lawn of sidewalk at End Left approach for top side Inspection.

Improvements Observed

2022 – The Strip Seal Expansion joints over Piers PR-1 and PR-3 have been replaced with compression Joint Seals with new elastomeric concrete headers within the roadway.

Pedestrian Fence Height

6'

Snow Fence

None

Bin Plate Condition

OK

Scour Critical Rating

N - Bridge not over waterway.

Field Notes

Staff Present During Inspection		
Name	**Title**	**Organization**
Brandon Wilson	WZTC	TSI
Gary Lachina	ATL	Lu Engineers
Matt Chadwick	WZTC	TSI
Mike Cauwels	WZTC supervisor	TSI
Rick Vasciannie	WZTC	TSI
Rop Parks	WZTC	TSI
Walt Graves	WZTC	TSI

General Equipment Required for Inspection*
Access Type
13 - Walking
15 - Extension Ladder
19 - Up to 30 Foot Lift
29 - Lane Closure With Shadow Vehicle

*** For span specific equipment requirements refer to the Active Inventory's "Access Needs" tab in BDIS.**

Detailed Time & Weather Conditions				
Field Date	**Arrival**	**Departure**	**Temp (F)**	**Weather Conditions**
09/20/2022	08:10 AM	02:45 PM	77	mostly clear, sunny
10/17/2022	09:50 AM	03:00 PM	50	overcast with rain, heavy at times

Inspection Times (hours)	
Time required for travel, inspection and report preparation	30
Lane closure usage	12
Railroad flagging time	No

Element Quantities

Element Assessment Summary Table							
Element	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
12 - Reinforced Concrete Deck	16560	ft^2	11938	4140	482		0
107 - Steel Open Girder/Beam	2160	ft	2008	50	98	4	0
205 - Reinforced Concrete Column	18	each		1	17		0
220 - Reinforced Concrete Pile Cap/Footing	381	ft					381
225 - Steel Pile	66	each					66
234 - Reinforced Concrete Pier Cap	270	ft	54	96	120		0
300 - Strip Seal Expansion Joint	40	ft				40	0
302 - Compression Joint Seal	144	ft		144			0
311 - Movable Bearing	48	each			48		0
313 - Fixed Bearing	48	each	14	32	2		0
330 - Metal Bridge Railing	360	ft		360			0
510 - Wearing Surfaces	12960	ft^2	12960				0
515 - Steel Protective Coating	19470	ft^2	8336	9725	611	798	0
800 - Erosion or Scour	489	ft	469	20			0
810 - Sidewalk	3600	ft^2	2312	1224	64		0
811 - Curb	720	ft	540	180			0
830 - Secondary Members	4	each			4		0
831 - Steel Beam End	72	each		21	49	2	0
850 - Backwall	262	ft	172	80	10		0
851 - Abutment Pedestal	24	each		14	10		0
852 - Pier Pedestal	72	each		32	40		0

Element Assessment by Span							
Element**	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
Span Number : 1							
BA220 - Reinforced Concrete Pile Cap/Footing	135	ft					135
BA225 - Steel Pile	33	each					33
BA313 - Fixed Bearing	12	each	8	4			0
515 - Steel Protective Coating	12	ft^2		8	2	2	0
BA800 - Erosion or Scour	135	ft	135				0
BA850 - Backwall	131	ft	76	52	3		0
BA851 - Abutment Pedestal	12	each		8	4		0
PR205 - Reinforced Concrete Column	6	each		1	5		0

Element**	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
PR220 - Reinforced Concrete Pile Cap/Footing	37	ft					37
PR234 - Reinforced Concrete Pier Cap	90	ft		34	56		0
PR300 - Strip Seal Expansion Joint	20	ft				20	0
PR302 - Compression Joint Seal	72	ft		72			0
PR311 - Movable Bearing	24	each			24		0
515 - Steel Protective Coating	24	ft²		8	10	6	0
PR800 - Erosion or Scour	73	ft	73				0
PR831 - Steel Beam End	12	each		5	6	1	0
PR852 - Pier Pedestal	24	each		10	14		0
12 - Reinforced Concrete Deck	3312	ft²	2386	828	98		0
510 - Wearing Surfaces	2592	ft²	2592				0
107 - Steel Open Girder/Beam	432	ft	400	18	12	2	0
515 - Steel Protective Coating	1832	ft²	826	916	36	54	0
330 - Metal Bridge Railing	72	ft		72			0
515 - Steel Protective Coating	429	ft²	173	214	34	8	0
810 - Sidewalk	720	ft²	492	216	12		0
811 - Curb	144	ft	108	36			0
830 - Secondary Members	1	each			1		0
Span Number : 2							
PR205 - Reinforced Concrete Column	6	each			6		0
PR220 - Reinforced Concrete Pile Cap/Footing	37	ft					37
PR234 - Reinforced Concrete Pier Cap	90	ft	54	20	16		0
PR313 - Fixed Bearing	24	each		24			0
515 - Steel Protective Coating	24	ft²		12	8	4	0
PR800 - Erosion or Scour	73	ft	73				0
PR831 - Steel Beam End	24	each		7	17		0
PR852 - Pier Pedestal	24	each		14	10		0
12 - Reinforced Concrete Deck	5336	ft²	3846	1334	156		0
510 - Wearing Surfaces	4176	ft²	4176				0
107 - Steel Open Girder/Beam	696	ft	648	14	34		0
515 - Steel Protective Coating	6368	ft²	2803	3184	127	254	0
330 - Metal Bridge Railing	116	ft		116			0
515 - Steel Protective Coating	691	ft²	276	345	55	15	0
810 - Sidewalk	1160	ft²	800	348	12		0
811 - Curb	232	ft	174	58			0
830 - Secondary Members	1	each			1		0
Span Number : 3							

 Format Version 20221011

Element**	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
PR205 - Reinforced Concrete Column	6	each			6		0
PR220 - Reinforced Concrete Pile Cap/Footing	37	ft					37
PR234 - Reinforced Concrete Pier Cap	90	ft		42	48		0
PR300 - Strip Seal Expansion Joint	20	ft				20	0
PR302 - Compression Joint Seal	72	ft		72			0
PR311 - Movable Bearing	24	each			24		0
515 - Steel Protective Coating	24	ft^2		8	8	8	0
PR800 - Erosion or Scour	73	ft	73				0
PR831 - Steel Beam End	24	each		4	19	1	0
PR852 - Pier Pedestal	24	each		8	16		0
12 - Reinforced Concrete Deck	5336	ft^2	3850	1334	152		0
510 - Wearing Surfaces	4176	ft^2	4176				0
107 - Steel Open Girder/Beam	696	ft	648	8	38	2	0
515 - Steel Protective Coating	6368	ft^2	2650	3184	191	343	0
330 - Metal Bridge Railing	116	ft		116			0
515 - Steel Protective Coating	691	ft^2	276	345	55	15	0
810 - Sidewalk	1160	ft^2	672	464	24		0
811 - Curb	232	ft	174	58			0
830 - Secondary Members	1	each			1		0
Span Number : 4							
EA220 - Reinforced Concrete Pile Cap/Footing	135	ft					135
EA225 - Steel Pile	33	each					33
EA313 - Fixed Bearing	12	each	6	4	2		0
515 - Steel Protective Coating	12	ft^2		4	6	2	0
EA800 - Erosion or Scour	135	ft	115	20			0
EA850 - Backwall	131	ft	96	28	7		0
EA851 - Abutment Pedestal	12	each		6	6		0
PR831 - Steel Beam End	12	each		5	7		0
12 - Reinforced Concrete Deck	2576	ft^2	1856	644	76		0
510 - Wearing Surfaces	2016	ft^2	2016				0
107 - Steel Open Girder/Beam	336	ft	312	10	14		0
515 - Steel Protective Coating	2661	ft^2	1199	1330	53	79	0
330 - Metal Bridge Railing	56	ft		56			0
515 - Steel Protective Coating	334	ft^2	133	167	26	8	0
810 - Sidewalk	560	ft^2	348	196	16		0
811 - Curb	112	ft	84	28			0

Element**	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
830 - Secondary Members	1	each			1		0

** Elements with a prefix designate the locations of BA-Begin Abutment, BW-Begin Wingwall, EA-End Abutment, EW-End Wingwall, CO-Culvert Outlet, and PR-Pier. No prefix generally indicates the element is part of the superstructure.

Inspection Notes

General Notes

2022 – This Inspection Report and subsequent QC Review submissions have been completed greater than 60 days from the Inspection date. The Region requested the completion all field inspection activities on remaining assigned BINs by mid-November so as to avoid weather/snow-related delays and Inspection photos with significant snow cover. The emphasis on completion of the field inspection activities for other assigned BINs has resulted in a delay in submittal of the Inspection report.

New standard photos have been taken and updated within Inventory.

Element PR300 has been removed in Span 2 from the Inspection, since the Deck is continuous over the Pier PR-2. The quantity for the Element has been revised to 20 ft (from 92 ft) for Spans 1 and 3, and Element PR302-Compression Joint Seal has been added at both locations with a quantity of 72 ft.

Element Condition Notes

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 12 - Reinforced Concrete Deck	3312	2386	828	98	0	0
Span 2: 12 - Reinforced Concrete Deck	5336	3846	1334	156	0	0
Span 3: 12 - Reinforced Concrete Deck	5336	3850	1334	152	0	0
Span 4: 12 - Reinforced Concrete Deck	2576	1856	644	76	0	0

Condition State 3 Note

Referenced Photo(s): 1, 2, 3, 4, 5, 6, 7

Referenced Sketch(es): None

2022 – The top of the Deck is generally in good condition in all spans. All 4 spans show scattered deterioration with dampness, rust staining and spalling to corroded reinforcing bars scattered over the full length of the median joint in Bay 6 (Photos 1, 2), as well as intermittent spalling to rebar along the transverse joints over each Pier.

There is additional deterioration on the underside of the Deck as follows:
Span 1 - Left fascia above PR-1 has spalls with exposed reinforcement affecting 3 SF
Bay 7 has an isolated spall to rebar @ begin affecting 10 SF.
Bay 9 has an isolated spall to rebar @ begin affecting 4 SF (Photo 3).
Right fascia overhang has spalls to rebar @ PR-1 affecting a 10 ft. long x full width area.

Span 2 - Left fascia overhang has 10 SF of intermittent spalls to rebar near PR-2 (Photo 4).
Right fascia overhang has spalls to rebar affecting 10 SF.

Span 3 - Right fascia overhang has 6 SF of spalling to rebar near Begin, spalling to rebar near 1/3-Span for 18 SF (Photo 5) and spalling to rebar near End for 12 SF.

Span 4 - Left fascia overhang has a 1 SF spall to rebar @ at PR-3.
Bay 2 end deck haunch has a 2 ft. long x 2 “D spall to rebar above end backwall.
Bay 7 has 4 SF and 1 SF spalls to rebar near End Abutment (Photo 6).
Right fascia overhang has scattered spalling to rebar = 20 SF (Photo 7).

All exposed reinforcing generally appears to be bonded to the remining concrete.

A Deck Deterioration sketch is not warranted.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 107 - Steel Open Girder/Beam	432	400	18	12	2	0
Span 2: 107 - Steel Open Girder/Beam	696	648	14	34	0	0
Span 3: 107 - Steel Open Girder/Beam	696	648	8	38	2	0
Span 4: 107 - Steel Open Girder/Beam	336	312	10	14	0	0

Condition State 3 Note

Referenced Photo(s): 8, 9, 10, 11, 12

Referenced Sketch(es): 2, 3, 4, 5

2022 – Many of the Girder ends over the Piers exhibit painted over pitting, as well as active corrosion with section loss in the bearing area of the lower web within 2' of the ends. Remaining thickness measurements were obtained by D-meter to calculate section losses as follows:

Span 1
Girder G-1 @ End – Bearing area SL = 35% (32% in 2020)
Girder G-2 @ End – Bearing area SL = 20% (16% in 2020)
Girder G-3 @ End – Bearing area SL = 21% (23% in 2020)
Girder G-4 @ End – Bearing area SL = 22% (17% in 2020)
Girder G-5 @ End – Bearing area SL = 30% (35% in 2020)
Girder G-9 @ End – Bearing area SL = 7% (<5% in 2020)
Girder G-11 @ End – Bearing area SL = 48% (37% in 2020) (Photo 9)

Span 2
Girder G-1 @ Begin – Bearing area SL = 20% (30% in 2020)
Girder G-3 @ Begin – Bearing area SL = 15% (24% in 2020)
Girder G-4 @ Begin – Bearing area SL = 8% (9% in 2020)
Girder G-5 @ Begin – Bearing area SL = 30% (33% in 2020)
Girder G-6 @ Begin – Bearing area SL = 44% (40% in 2020)
Girder G-8 @ Begin – Bearing area SL = 36% (38% in 2020)
Girder G-9 @ Begin – Bearing area SL = 17% (<15% in 2020)
Girder G-10 @ Begin – Bearing area SL = 5% (<10% in 2020) (Photo 8)
Girder G-11 @ Begin – Bearing area SL = 49% (36% in 2020) (Photo 9)
Girder G-2 @ End – Bearing area SL = 22% (30% in 2020)
Girder G-3 @ End – Bearing area SL = 18% (4% in 2020)
Girder G-4 @ End – Bearing area SL = 18% (23% in 2020)
Girder G-5 @ End – Bearing area SL = 30% (30% in 2020)
Girder G-8 @ End – Bearing area SL = 27% (24% in 2020)
Girder G-9 @ End – Bearing area SL = 9% (3% in 2020)
Girder G-10 @ End – Bearing area SL = 8% (<10% in 2020)
Girder G-11 @ End – Bearing area SL = 9% (4% in 2020)

Span 3
Girder G-1 @ Begin – Bearing area SL = 41% (35% in 2020) (Photo 10)
Girder G-2 @ Begin – Bearing area SL = 22% (31% in 2020)
Girder G-3 @ Begin – Bearing area SL = 17% (4% in 2020)
Girder G-4 @ Begin – Bearing area SL = 13% (20% in 2020)
Girder G-5 @ Begin – Bearing area SL = 25% (19% in 2020) (Photo 11)
Girder G-8 @ Begin – Bearing area SL = 22% (22% in 2020)
Girder G-9 @ Begin – Bearing area SL = 27% (27% in 2020)
Girder G-10 @ Begin – Bearing area SL = 20% (28% in 2020)
Girder G-11 @ Begin – Bearing area SL = 4% (4% in 2020)
Girder G-1 @ End – Bearing area SL = 25% (34% in 2020)
Girder G-2 @ End – Bearing area SL = 40% (42% in 2020)
Girder G-3 @ End – Bearing area SL = 26% (28% in 2020)
Girder G-4 @ End – Bearing area SL = 18% (21% in 2020)
Girder G-5 @ End – Bearing area SL = 43% (30% in 2020) (Photo 11)
Girder G-6 @ End – Bearing area SL = 37% (39% in 2020)
Girder G-7 @ End – Bearing area SL = 41% (40% in 2020) (Photo 12)
Girder G-8 @ End – Bearing area SL = 33% (27% in 2020)
Girder G-10 @ End – Bearing area SL = 39% (32% in 2020)
Girder G-11 @ End – Bearing area SL = 20% (16% in 2020)

Span 4

Girder G-1 @ Begin – Bearing area SL = 27% (34% in 2020)
Girder G-3 @ Begin – Bearing area SL = 4% (<5% in 2020)
Girder G-4 @ Begin – Bearing area SL = 14% (12% in 2020)
Girder G-5 @ Begin – Bearing area SL = 9% (7% in 2020) (Photo 11)
Girder G-8 @ Begin – Bearing area SL = 37% (33% in 2020)
Girder G-9 @ Begin – Bearing area SL = 43% (33% in 2020)
Girder G-10 @ Begin – Bearing area SL = 30% (27% in 2020)

See Bearing Area Section Loss documentation.

There is no crippling, buckling, or any other deformation of the member due to the section loss apparent in the ends of the Girders.

Girder end locations not noted above either exhibit no apparent section loss or have previously been repaired with a box section installed between the flanges on each side of the web, above the bearing (Photos 10, 12).

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 107 - Steel Open Girder/Beam	432	400	18	12	2	0

Condition State 4 Note

Referenced Photo(s): 8

Referenced Sketch(es): 2

2022 – See FBR for YF #5B2267W029

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 107 - Steel Open Girder/Beam-515 - Steel Protective Coating	1832	826	916	36	54	0
Span 2: 107 - Steel Open Girder/Beam-515 - Steel Protective Coating	6368	2803	3184	127	254	0
Span 3: 107 - Steel Open Girder/Beam-515 - Steel Protective Coating	6368	2650	3184	191	343	0
Span 4: 107 - Steel Open Girder/Beam-515 - Steel Protective Coating	2661	1199	1330	53	79	0

Common

Referenced Photo(s): 8, 9, 10, 11, 12, 46

Referenced Sketch(es): None

2022 – In all 4 spans, the paint coating on the steel Girders exhibits scattered areas and varying levels of deterioration (Photos 8, 9, 10, 11, 12, 46) and is assessed as follows:
CS-2 (for fading and chalkiness)
CS-3 (for bubbling, peeling, rust staining and very limited effectiveness)
CS-4 (for failure with exposure and corrosion of the base metal)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR205 - Reinforced Concrete Column	6	0	1	5	0	0
Span 2: PR205 - Reinforced Concrete Column	6	0	0	6	0	0
Span 3: PR205 - Reinforced Concrete Column	6	0	0	6	0	0

Condition State 3 Note

Referenced Photo(s): 13, 14, 15, 16

Referenced Sketch(es): 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17

2022 – Pier Columns in all spans have areas of heavy delamination and spalled concrete as detailed below and in attached sketches:

Pier PR-1
Column C-1 – End face full height vertical crack up to 1/16"W with moderate to heavy efflorescence as well as tight map cracking
Column C-2 – End face 3'W x 2'H x 3"D spall to rebar on top.
Column C-4 – End face has a 6 SF area of cracked and heavily delaminated concrete with a 3"D spall to rebar on the End Right corner.
Column C-5 – End face has a 4 SF area of spalling to rebar near the bottom of the Cap beam
Column C-6 – End Left corner is cracked up to 1/4"W with rust staining for the upper 1/2 (Photo 13)

Pier PR-2
Column C-1 – Top of the column on the End Right face has a 2 SF x 2”D spall to rebar. The left face has a small area of cracked and heavily delaminated concrete.
Column C-2 –The left face has a 1 SF area of heavily cracked and delaminated concrete.
Column C-3 - Begin face has 2 SF of cracked and heavily delaminated concrete plus a 1 SF x 1”D spall @ the Begin Right. The right face has a 1 SF area of cracked and heavily delaminated concrete.
Column C-4 - Begin face has 2 SF of cracked and heavily delaminated concrete. The top Begin Left corner has a 2.5’H x 0.5’W x 3"D spall to rebar. The right face has 1 SF of cracked and heavily delaminated concrete.
Column C-5 – Begin face has 2 SF of cracked and heavily delaminated concrete (Photo 14). End face has a 1 SF x 1”D spall @ the top.
Column C-6 – Begin face has 12 SF of cracked and heavily delaminated concrete. End face has a 1 SF x 1.5”D spall at the top. Right face has a 1 SF area of cracked and hollow sounding concrete.

Pier PR-3
Column C-1 – The Right an End faces are hollow sounding for their full widths over the top 1/2 and the Begin Right corner is spalled up to 10” on the Begin face x up to 2’W on the Right face with exposed rebar (Photo 15)
Column C-2 –The Left side exhibits 7 SF of cracked and hollow sounding concrete with a spall that measures 1’W x 3’H x 3”D with exposed reinforcement. There is also a small spall on the End Left corner. The End face exhibits 7 SF of cracked and hollow sounding concrete. The Right side exhibits 1 SF of cracked and hollow sounding concrete.
Column C-3 – The End face has 16 SF of cracked and hollow sounding concrete with a 1 SF 1.5”D spall. The Right side exhibits <2 SF of cracked and hollow sounding concrete.
Column C-4 – The Right face has 14 SF of cracked and delaminated concrete with 5 SF of 2.5”D spalling with exposed reinforcement (Photo 16).
Column C-5 – The End face has 3 SF of cracked and hollow sounding concrete with 4 SF of 3”D spalling with exposed reinforcement. The Right face has 14 SF of cracked and hollow sounding concrete with 4 SF of 2”D spalling with exposed reinforcement (Photo 16). The Begin face has <1 SF of 1.5”D spalling.
Column C-6 – The Right face has 7 SF of cracked and hollow sounding concrete with several small 1”D spalls.

All reinforcing exposed by spalling shows up to 20% secion loss, but is generally still bonded to the remaining concrete.

See Pier Condition sketches.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR234 - Reinforced Concrete Pier Cap	90	0	34	56	0	0
Span 2: PR234 - Reinforced Concrete Pier Cap	90	54	20	16	0	0
Span 3: PR234 - Reinforced Concrete Pier Cap	90	0	42	48	0	0

Condition State 3 Note

Referenced Photo(s): 17, 18, 19, 20, 21, 22

Referenced Sketch(es): 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17

2022 – At PR-1, the Cap Beam has areas of cracked, hollow sounding and spalled concrete on the Begin and End faces (photos 17, 18) as well as the underside with some exposed rebar (Photo 19). The spalling depth varies between 1” and 4” deep. About 25% of the begin face and 35% of the end face are affected by spalling. The worst conditions on the begin face were found in Bays 3 and 9. The worst conditions on the End face were found in Bays 1 thru 4.

At PR-2, the Cap Beam has areas of cracked, hollow sounding and spalled concrete on the Begin and End faces (Photo 20). The spalling typically varies between 1” and 3” deep. Approximately 10% of each face is affected by spalling. The worst conditions were found in Bay 10 on the End face.

At PR-3, the Cap Beam has areas of cracked, hollow sounding and spalled concrete on the Begin (Photos 21, 22) and End faces as well as on the underside with exposed rebar. The spall depths vary between 1” and 4”. About 25% of the begin face and 5% of end face are affected by spalling. The worst conditions on the begin face were found in Bays 2, 4, and 12.

All reinforcing exposed by spalling shows up to 20% secion loss, but is generally still bonded to the remaining concrete. The concrete within the spalled areas crumbles easily when struck with a hammer.

See Pier Condition sketches.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR300 - Strip Seal Expansion Joint	20	0	0	0	20	0
Span 3: PR300 - Strip Seal Expansion Joint	20	0	0	0	20	0

Condition State 4 Note

Referenced Photo(s): 23, 24, 25

Referenced Sketch(es): None

2022 – At Piers PR-1 and PR-3, the strip seal joint has been replaced within the roadways with a Compression Joint Seal including new elastomeric concrete headers (Photo 23). The Strip Seal Expansion Joints through the Left (Photo 24) and Right sidewalks (Photo 25). and the raised median remain (Photo 23). There is dirt and gravel filling the entire length of the PR-1 and PR-3 joints through both sidewalks and the raised median. Below deck, there is active leakage in both fascia bays as well as Bays 5 to 7, below the median at both Piers (Photo 26).

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR302 - Compression Joint Seal	72	0	72	0	0	0
Span 3: PR302 - Compression Joint Seal	72	0	72	0	0	0

Condition State 2 Note

Referenced Photo(s): 23

Referenced Sketch(es): None

2022 – At Piers PR-1 and PR-3, the strip seal joint has been replaced within the roadways with a Compression Joint Seal including new elastomeric concrete headers (Photo 23). The new Joints and seals are in fair to good condition.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR311 - Movable Bearing	24	0	0	24	0	0
Span 3: PR311 - Movable Bearing	24	0	0	24	0	0

Condition State 3 Note

Referenced Photo(s): 27, 28

Referenced Sketch(es): None

2022 – At Piers PR-1 and PR-3, the sliding-type Movable Bearings exhibit minor to moderate surface corrosion as well as heavy pack-rust up to 3/8”thick (Photos 27, 28), potentially inhibiting thermal expansion of the Girders.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR311 - Movable Bearing-515 - Steel Protective Coating	24	0	8	10	6	0
Span 1: BA313 - Fixed Bearing-515 - Steel Protective Coating	12	0	8	2	2	0
Span 2: PR313 - Fixed Bearing-515 - Steel Protective Coating	24	0	12	8	4	0
Span 3: PR311 - Movable Bearing-515 - Steel Protective Coating	24	0	8	8	8	0
Span 4: EA313 - Fixed Bearing-515 - Steel Protective Coating	12	0	4	6	2	0

Common

Referenced Photo(s): 27, 28, 29

Referenced Sketch(es): None

2022 – At both Abutments and all 3 Piers, the paint coating on the Bearings exhibits scattered areas and varying levels of deterioration (Photos 27, 28, 29) and is assessed as follows:
CS-2 = (for fading and chalkiness)
CS-3 = (for bubbling, peeling, rust staining and very limited effectiveness)
CS-4 = (for failure with exposure and corrosion of the base metal)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 330 - Metal Bridge Railing-515 - Steel Protective Coating	429	173	214	34	8	0
Span 2: 330 - Metal Bridge Railing-515 - Steel Protective Coating	691	276	345	55	15	0
Span 3: 330 - Metal Bridge Railing-515 - Steel Protective Coating	691	276	345	55	15	0
Span 4: 330 - Metal Bridge Railing-515 - Steel Protective Coating	334	133	167	26	8	0

Common

Referenced Photo(s): 30

Referenced Sketch(es): None

2022 – In all 4 Spans, the paint coating on the Left and Right Railings exhibits scattered areas and varying levels of deterioration (Photo 30) and is assessed as follows in each span:
CS-1 = 40%

CS-2 = 50% (for fading and chalkiness)
CS-3 = 8% (for bubbling, peeling, rust staining and very limited effectiveness)
CS-4 = 2% (for failure with exposure and corrosion of the base metal)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 810 - Sidewalk	720	492	216	12	0	0
Span 2: 810 - Sidewalk	1160	800	348	12	0	0
Span 3: 810 - Sidewalk	1160	672	464	24	0	0
Span 4: 810 - Sidewalk	560	348	196	16	0	0

Condition State 3 Note

Referenced Photo(s): 24, 25

Referenced Sketch(es): None

2022 – Isolated sidewalk repairs the joints over Piers PR-1 and PR-3 are failing with wide cracking, spalling, and heaving (Photos 24, 25). Additionally, there are scattered narrow, shallow spalls in the Left and Right Sidewalks, as well as the raised median along the back of the Curbs.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 830 - Secondary Members	1	0	0	1	0	0
Span 2: 830 - Secondary Members	1	0	0	1	0	0
Span 3: 830 - Secondary Members	1	0	0	1	0	0
Span 4: 830 - Secondary Members	1	0	0	1	0	0

Condition State 3 Note

Referenced Photo(s): 31, 32

Referenced Sketch(es): None

2022 – In all spans, the end diaphragms of the Pier exhibit moderate to severe corrosion including rust thru perforations of the webs near the bottom flange, particularly in the fascia bays (Photos 31, 32).

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR831 - Steel Beam End	12	0	5	6	1	0
Span 2: PR831 - Steel Beam End	24	0	7	17	0	0
Span 3: PR831 - Steel Beam End	24	0	4	19	1	0
Span 4: PR831 - Steel Beam End	12	0	5	7	0	0

Common

Referenced Photo(s): 8, 9, 10, 11, 12, 46

Referenced Sketch(es): None

2022 – See condition notes for Element 107 in all spans.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA850 - Backwall	131	76	52	3	0	0
Span 4: EA850 - Backwall	131	96	28	7	0	0

Condition State 3 Note

Referenced Photo(s): 44, 45

Referenced Sketch(es): None

2022 – At the Begin Abutment, the Backwall exhibits a horizontal crack 1/8”W x 2’L with heavy rust staining, near the top of Bay 7 (Photo 44). Additionally, there is a full height vertical crack up to 3/16”W in Bay 10, adjacent to the Left face of the G-11 pedestal.

At the End Abutment, the Backwall is heavily cracked and delaminated 5’W x 6”H along the top edge of Bay 1, and Bay 3 exhibits horizontal cracking 1/8”W with moderate efflorescence, adjacent to the Right side of the G-3 pedestal (Photo 45).

There is no differential displacement across any of the cracks in the Backwalls at either Abutment.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA851 - Abutment Pedestal	12	0	8	4	0	0
Span 4: EA851 - Abutment Pedestal	12	0	6	6	0	0

Condition State 3 Note

Referenced Photo(s): 33, 34, 35

Referenced Sketch(es): None

2022 – At the Begin and End Abutments, the Pedestals exhibit deteriorations as follows:
At the Begin Abutment
Pedestal 1 – the top of the front Right corner is spalled up to 2'W x up to 1'H on each face with exposed and corroded reinforcing (Photo 33).
Pedestal 4 – the top corner of the front face is spalled 2'W x up to 1'H x up to 3"D with exposed and corroded reinforcing
Pedestal 7 – the Right face is spalled to 1"D with exposed and corroded reinforcing.
Pedestal 8 – the top corner of the Left face is spalled full width x up to 4'H x up to 2"D, but no reinforcing is exposed

At the End Abutment -
Pedestal 1 – the front and Right faces show horizontal cracking up to 1/2"W with rust staining.
Pedestal 2 – the top corner of the Left face is spalled 3'L x up to 6"H x up to 3"D with exposed and corroded reinforcing.
Pedestal 3 – the Right face shows 4 SF of map cracking up to 1/16"W with moderate to heavy efflorescence
Pedestal 6 – the top of the front Left corner is spalled up to 1.5'W x up to 1.5'H on the front face with exposed and corroded reinforcing and the Left face is cracked full length x up to 1/4" (Photo 34).
Pedestal 7 – the front face is spalled 3.5'W x up to 1.5"H x up to 2"D with exposed and corroded reinforcing
Pedestal 11 - the top of the front face is spalled full width x up to 1.5"H x up to 2"D with exposed and corroded reinforcing (Photo 35)

No spalling extends to, nor undermines any of the Bearing masonry plates, and some of the exposed reinforcing is partially debonded.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR852 - Pier Pedestal	24	0	10	14	0	0
Span 2: PR852 - Pier Pedestal	24	0	14	10	0	0
Span 3: PR852 - Pier Pedestal	24	0	8	16	0	0

Condition State 3 Note

Referenced Photo(s): 36, 37, 38, 39, 40, 41, 42, 43

Referenced Sketch(es): 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17

2022 – At all of the Piers, PR-1, PR-2, and PR-3 many of the Pedestals exhibit deterioration including cracking and spalling as follows:

At Pier PR-1
Pedestal 1 – there is a spall on the End face of the Pier cap that extends into the bottom of the pedestal, 1.6'W x 1.7'H x 3"D with exposed and corroded reinforcing
Pedestal 2 – the Left face is spalled full length x up to 2"D with exposed and corroded reinforcing; End face is spalled 1.7'W x up to 2"D with exposed and corroded reinforcing (Photo 36)
Pedestal 3 – the End Left corner is spalled 1.2'W x full height x up to 2"D with exposed and corroded reinforcing
Pedestal 4 – the End face is spalled 2.5'W x full height x up to 2.5"D with exposed and corroded reinforcing (Photo 37)
Pedestal 5 – the Right face is spalled near full length x up to 3.5"D with exposed and corroded reinforcing, and the End Left corner is spalled up to 2"D
Pedestal 8 – the End face is spalled full height x full width x up to 8"D with exposed and corroded reinforcing, and the Left face is spalled and delaminated full length x full height x up to 1.5"D with exposed and corroded reinforcing (Photo 38)
Pedestal 9 – the Left face is spalled full length x up to 6"H x up to 8"D with exposed and corroded reinforcing
Pedestal 11 – the Begin Left corner is spalled 1.5'W x 0.8'H x up to 2"D with exposed and corroded reinforcing. The concrete adjacent to the spall is cracked and hollow sounding.

At Pier PR-2 -
Pedestal 1 – the End face is spalled 1.5'W x up to 5"H x up to 2"D with exposed and corroded reinforcing
Pedestal 2 – the Begin and Left faces are cracked and delaminated
Pedestal 3 – the Left face is spalled 2'W x up to 1'H x up to 2.5"D with exposed and corroded reinforcing and the Right face is cracked and delaminated (Photo 39)
Pedestal 4 – the Right face is cracked and delaminated
Pedestal 5 – the Right face is cracked and delaminated
Pedestal 6 – the Left face is cracked and delaminated
Pedestal 9 – the End face is spalled 1.5'W x up to 10"H x up to 6"D with exposed and corroded reinforcing

Pedestal 10 – the Right face is spalled 3.5'L x up to 8"H x up to 5"D with exposed and corroded reinforcing (Photo 40)
Pedestal 12 – the Right face is cracked and delaminated with heavy rust staining

At Pier PR-3 -
Pedestal 1 – The Left face is spalled 3'W x up to 7"H x up to 1.5"D with exposed and corroded reinforcing
Pedestal 2 – the Begin faces of the Spans 3 and Span 4 pedestals are spalled up to full width x up to 9"H x up to 4"D with exposed and corroded reinforcing (Photo 41)
Pedestal 3 – the Right face is spalled full length x up to full height x up to 3"D with exposed and corroded reinforcing
Pedestal 4 – the Begin face is delaminated and spalled up to full height x up to 2"D with exposed and corroded reinforcing
Pedestal 5 – the Begin face is spalled full width x up to 1'H x up to 3"D with exposed and corroded reinforcing
Pedestal 6 – the Begin face is cracked and delaminated for nearly the entire face with 2 small shallow spalls exposing corroded reinforcing
Pedestal 7 – the top of the End Left corner is spalled 1'L x up to 8"H x up to 5"D with exposed and corroded reinforcing
Pedestal 8 – the Begin face is spalled 2'W x 1'H x 2"D and the Right face is spalled full length x up to 1'H x up to 5"D with exposed and corroded reinforcing (Photo 42)
Pedestal 9 – the Begin face is spalled 3'Wx up to 1.8'H x up to 3"D with exposed and corroded reinforcing; the spall extends into the Pier cap below
Pedestal 10 – the top corner of the Begin and Right faces is spalled 2.5'W on the Begin face x up to 2'L on the Right face x up to 1.2'H x up to 7"D with exposed and corroded reinforcing (Photo 43).
Pedestal 11 – the Right face is spalled 2'L x up to 6"H x up to 2"D with exposed and corroded reinforcing

No spalling extends to, nor undermines any of the Bearing masonry plates, and some of the exposed reinforcing is partially debonded.

See Pier Condition sketches.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 3: 107 - Steel Open Girder/Beam	696	648	8	38	2	0

Condition State 4 Note

Referenced Photo(s): 46

Referenced Sketch(es): 4

2022 – See FBR for YF #5B2267W023

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 4: EA313 - Fixed Bearing	12	6	4	2	0	0

Condition State 3 Note

Referenced Photo(s): 29

Referenced Sketch(es): None

2022 – At the End Abutment, there is a gap between the masonry and sole plates varying from contact on the Left side to 3/16" on the Right side, for the Fixed Bearing below the end of G-4, but the gap did not change under vehicular live load. Additionally, the Left anchor bolt for the G-12 Bearing is missing (Photo 29). There is no apparent displacement of the Bearing.

Non-Structural Condition Observations

Category: OTHER -Other – Expressway Lighting Quantity: 1 Unit: ea Referenced Element(s): NONE Referenced Photo(s): 47 Referenced Sketch(es): NONE
2022 – The light standard mounted on the median barrier of NY-33, nearest the Left fascia of the bridge has a cracked base (Photo 47).

Inspection Photographs

	Photo Number: **1** Photo Filename: **1-Typical spalling in underside of Deck along**
Attachment Description: Typical spalling in underside of Deck along median joint (Begin Span 1 shown looking toward Begin)	

	Photo Number: **2** Photo Filename: **2-Typical spalling in underside of Deck along**
Attachment Description: Typical spalling in underside of Deck along median joint (1/3-Span 4 shown looking toward Begin)	

Attachment Description: Spall in underside of Deck in Bay 9 at Begin Span 1 (Looking toward Begin)	Photo Number: **3**	Photo Filename: **3-Spall in underside of Deck in Bay 9 at Begin**

Attachment Description: Spalling in underside of Left fascia near End of Span 2 (Looking toward End)	Photo Number: **4**	Photo Filename: **4-Spalling in underside of Left fascia near**

Attachment Description: Bottom corner spall in Right fascia of Span 3 Deck near End (Looking Left)	Photo Number: **5** Photo Filename: **5-Bottom corner spall in Right fascia of Span** 
Attachment Description: Spall in underside of Deck in Bay 7 at End Span 4 (Looking toward End)	Photo Number: **6** Photo Filename: **6-Spall in underside of Deck in Bay 7 at End** 

Attachment Description: Spalling in underside of Right fascia near End of Span 4 (Looking toward Begin)	Photo Number: **7**	Photo Filename: **7-Spalling in underside of Right fascia near**

Attachment Description: Painted over pitting and active corrosion in lower webs of G-10 over PR-1 (Looking Right)	Photo Number: **8**	Photo Filename: **8-Painted over pitting and active corrosion in**

Attachment Description: Painted over pitting in lower webs of G-11 over PR-1 (Looking Right)	Photo Number: **9** Photo Filename: **9-Painted over pitting in lower webs of G-11**

Attachment Description: Tube repair and active corrosion in lower web of G-1 over PR-2 (Looking Right)	Photo Number: **10** Photo Filename: **10-Tube repair and active corrosion in lower**

Photo Number: **11** Photo Filename: **11-Active corrosion and painted over pitting**

Attachment Description:
Active corrosion and painted over pitting in lower web of G-5 over PR-3 (Looking Left)

Photo Number: **12** Photo Filename: **12-Tube repair and active corrosion in lower**

Attachment Description:
Tube repair and active corrosion in lower web of G-7 over PR-3 (Looking Right)

Attachment Description: Vertical cracking in End Left corner of Column C-6 at PR-1 (Looking toward Begin Right)	Photo Number: **13** Photo Filename: **13-Vertical cracking in End Left corner of C-6** 

Attachment Description: Spalling near top of Begin face of Column C-5 at PR-2 (Looking toward End)	Photo Number: **14** Photo Filename: **14-Spalling near top of Begin face of C-5 at** 

Photo Number: **15** Photo Filename: **15-End and Right faces of C-1 at PR-3**

Attachment Description:
End and Right faces of Column C-1 at PR-3 (Looking Left)

Photo Number: **16** Photo Filename: **16-Right faces of C-4 and C-5 at PR-3**

Attachment Description:
Right faces of Columns C-4 and C-5 at PR-3 (Looking toward End Left)

Attachment Description: End face of PR-1 below Bays 1-6 (Looking toward Begin)	Photo Number: **17**	Photo Filename: **17-End face of PR-1 below Bays 1-6 (Looking**

Attachment Description: End face of PR-1 below Bays 6-11 (Looking toward Begin)	Photo Number: **18**	Photo Filename: **18-End face of PR-1 below Bays 6-11 (Looking**

Attachment Description: Underside of PR-1 Cap beam in column Bay 2 (Looking Left)	Photo Number: **19** Photo Filename: **19-Underside of PR-1 Cap beam in column** 
Attachment Description: End face of PR-2 (Looking toward Begin Right)	Photo Number: **20** Photo Filename: **20-End face of PR-2 (Looking toward Begin** 

Attachment Description: Begin face of PR-3 below Bays 1-6 (Looking toward Begin Left)	Photo Number: **21** Photo Filename: **21-Begin face of PR-3 below Bays 1-6**

Attachment Description: Begin face of PR-3 below Bays 6-11 (Looking toward End Right)	Photo Number: **22** Photo Filename: **22-Begin face of PR-3 below Bays 6-11**

Attachment Description	Photo
Attachment Description: Typical new Joints and Headers over PR-1 and PR-3 (PR-1 shown looking Right)	Photo Number: **23** Photo Filename: **23-Typical new Joints and Headers over PR-1** 

Attachment Description	Photo
Attachment Description: Typical condition of Joints through sidewalks (Left side over PR-3 shown looking toward Begin)	Photo Number: **24** Photo Filename: **24-Typical condition of Joints through** 

Photo Number: **25** Photo Filename: **25-Typical condition of Joints through**

Attachment Description:
Typical condition of Joints through sidewalks (Right side over PR-1 shown looking toward Begin)

Photo Number: **26** Photo Filename: **26-Active leakage through joint above Bay 11**

Attachment Description:
Active leakage through joint above Bay 11 at PR-3 (Looking Right)

Photo Number: **27** Photo Filename: **27-Typical condition of sliding Bearings at**

Attachment Description:
Typical condition of sliding Bearings at PR-1 (G-4 Bearing at Beg Span 2 shown looking to Begin)

Photo Number: **28** Photo Filename: **28-Typical condition of sliding Bearings at**

Attachment Description:
Typical condition of sliding Bearings at PR-3 (G-10 Bearing at End Span 3 shown looking to End)

	Photo Number: **29** Photo Filename: **29-Typical paint condition on Fixed Bearings**
Attachment Description: Typical paint condition on Fixed Bearings and missing anchor at G-12 Brg at End Abutment (Looking toward End)	

	Photo Number: **30** Photo Filename: **30-Typical condition of paint coating onn**
Attachment Description: Typical condition of paint coating on Railings (Right side in Span 3 shown looking toward End Right)	

Photo Number: **31** Photo Filename: **31-Rust thru perforations in Bay 1 end**

Attachment Description:
Rust thru perforations in Bay 1 end diaphragm at End of Span 1 (Looking toward Begin)

Photo Number: **32** Photo Filename: **32-Rust thru perforations in Bay 11end**

Attachment Description:
Rust thru perforations in Bay 11 end diaphragm at Begin of Span 4 (Looking toward End)

	Photo Number: **33** Photo Filename: **33-G-1 Pedestal at Begin Abutment spalled**
Attachment Description: G-1 Pedestal at Begin Abutment spalled (Looking toward Begin)	

	Photo Number: **34** Photo Filename: **34-G-6 Pedestal at End Abutment spalled and**
Attachment Description: G-6 Pedestal at End Abutment spalled and cracked (Looking toward End Right)	

Photo Number: **35** Photo Filename: **35-G-11 Pedestal at End Abutment spalled**

Attachment Description:
G-11 Pedestal at End Abutment spalled (Looking toward End)

Photo Number: **36** Photo Filename: **36-G-2 Pedestal at PR-1 spalled (Looking**

Attachment Description:
G-2 Pedestal at PR-1 spalled (Looking toward Begin Right)

	Photo Number: **37** Photo Filename: **37-G-4 Pedestal at PR-1 spalled (Looking**
Attachment Description: G-4 Pedestal at PR-1 spalled (Looking toward Begin Right)	

	Photo Number: **38** Photo Filename: **38-G-8 Pedestal at PR-1 spalled (Looking**
Attachment Description: G-8 Pedestal at PR-1 spalled (Looking toward Begin Right)	

	Photo Number: **39**	Photo Filename: **39-Left face of G-3 Pedestal at PR-2 spalled**
Attachment Description: Left face of G-3 Pedestal at PR-2 spalled (Looking Right)		

	Photo Number: **40**	Photo Filename: **40-Right face of G-10 Pedestal at PR-2 spalled**
Attachment Description: Right face of G-10 Pedestal at PR-2 spalled (Looking toward Begin Left)		

Photo Number: **41** Photo Filename: **41-Begin faces of G-2 Pedestal at PR-3**

Attachment Description:
Begin faces of G-2 Pedestal at PR-3 spalled (Looking toward End Left)

Photo Number: **42** Photo Filename: **42-Right face of G-8 Pedestal at PR-3 spalled**

Attachment Description:
Right face of G-8 Pedestal at PR-3 spalled (Looking toward End Left)

Photo Number: **43** Photo Filename: **43-Begin Right corner of G-10 Pedestal at PR-**

Attachment Description:
Begin Right corner of G-10 Pedestal at PR-3 spalled (Looking toward End Left)

Photo Number: **44** Photo Filename: **44-Horizontal crack in Bay 7 of Begin**

Attachment Description:
Horizontal crack in Bay 7 of Begin Backwall (Looking toward Begin Right)

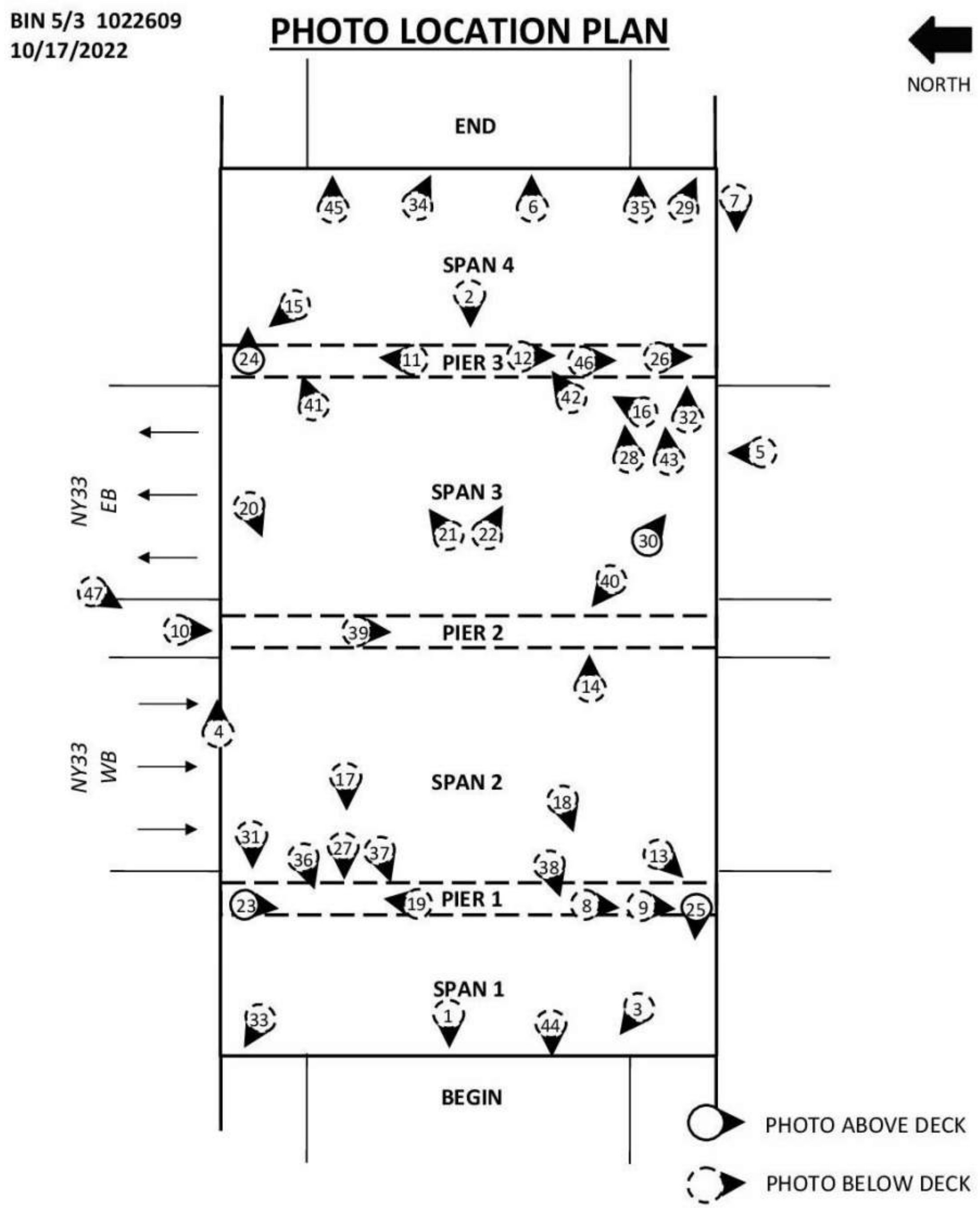
	Photo Number: **45** Photo Filename: **45-Cracking with efflorescence in Bay 3 of**
Attachment Description: Cracking with efflorescence in Bay 3 of End Backwall (Looking toward End)	

	Photo Number: **46** Photo Filename: **46-Painted over pitting in lower webs of G-9**
Attachment Description: Painted over pitting in lower webs of G-9 over PR-3 (Looking Right)	

Attachment Description: Cracked base on NY-33 median light standard Left of Bridge (Looking toward Begin Right)	Photo Number: **47** Photo Filename: **47-Cracked base on NY-33 median light** 

Inspection Sketches

Sketch Number: **1** Sketch Filename: **22-1022609-Photo Location Plan.jpg**



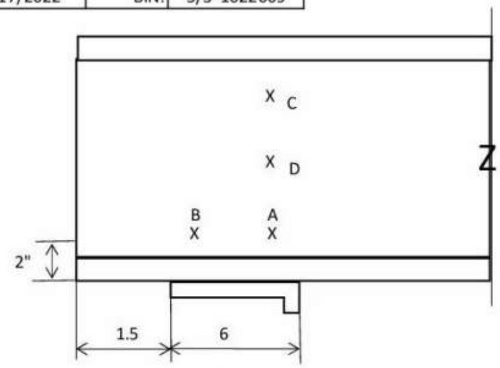
Sketch Description: Photo Location Plan

Sketch Number: **2** Sketch Filename: **22-1022609-Bearing Area SL-Span 1.jpg**

NYSDOT BRIDGE INSPECTION REPORT

Girder End Section Loss Documentation

INSP. DATE:	10/17/2022	BIN:	5/3 1022609



GIRDER ENDS in SPAN 1

Note: All dimensions in inches.

Original Beam		33 WF 130					Tw =	0.580	d =	33.10	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	Hole $_L$	Thk $_{BA}$	%S.L.	C	D	Hole $_H$	Thk $_{SH}$	%S.L.
KMS/TL	G-1 @ End	0.409	0.350	0.000	0.380	35%					
GL/ATL	G-12 @ End	Repaired with box section									

Original Beam		30 WF 116					Tw =	0.564	d =	30.00	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	Hole $_L$	Thk $_{BA}$	%S.L.	C	D	Hole $_H$	Thk $_{SH}$	%S.L.
KMS/TL	G-2 @ End	0.403	0.495	0.000	0.449	20%					
GL/ATL	G-11 @ End	0.301	0.287	0.000	0.294	48%					

Original Beam		30 WF 132					Tw =	0.615	d =	30.30	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	Hole $_L$	Thk $_{BA}$	%S.L.	C	D	Hole $_H$	Thk $_{SH}$	%S.L.
KMS/TL GL/ATL	G-3 @ End	0.502	0.467	0.000	0.485	21%					
	G-4 @ End	0.495	0.459	0.000	0.477	22%					
	G-5 @ End	0.415	0.443	0.000	0.429	30%					
	G-8 @ End	Repaired with box section									
	G-9 @ End	0.586	0.554	0.000	0.570	7%					
	G-10 @ End	0.254	0.170	0.000	0.212	66%					

Original Beam		30 WF 108					Tw =	0.548	d =	29.82	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	Hole $_L$	Thk $_{BA}$	%S.L.	C	D	Hole $_H$	Thk $_{SH}$	%S.L.
KMS/TL	G-6 @ End	Repaired with box section									
GL/ATL	G-7 @ End	Repaired with box section									

*2020 readings shown. These locations were spot checked with calipers in 2022.

$Hole_L$ - Length of hole in Bearing Area
Thk_{BA} - Thickness in Bearing Area

$Hole_H$ - Height of hole in Shear Area
Thk_{SH} - Thickness in Shear Area

$$\text{Thickness}_{BA} = [\frac{(\text{"A"}+\text{"B"})}{2}][\text{bearing size-hole}]/\text{bearing size}]$$

$$\text{Thickness}_{SH} = [\frac{(\text{"A"}+\text{"C"}+\text{"D"})}{3}][\text{"d"-hole}]/\text{"d"}$$

$$\text{Section Loss \%} = \frac{\text{Thickness}_{original} - \text{Thickness}_{readings}}{\text{Thickness}_{original}} \times 100$$

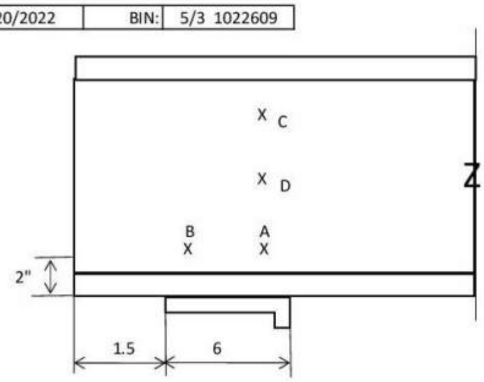
Sketch Description: Bearing Area Section Loss - Span 1

Sketch Number: **3** Sketch Filename: **22-1022609-Bearing Area SL-Span 2.jpg**

NYSDOT BRIDGE INSPECTION REPORT

Girder End Section Loss Documentation

INSP. DATE:	9/20/2022	BIN:	5/3 1022609



GIRDER ENDS in SPAN 2

Note: All dimensions in inches.

Original Beam		33 WF 130					Tw =	0.580	d =	33.10	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
	G-1 @ Begin	0.456	0.471	0.000	0.464	20%					
	G-2 @ Begin	Repaired with box section									
	G-3 @ Begin	0.544	0.441	0.000	0.493	15%					
	G-4 @ Begin	0.539	0.526	0.000	0.533	8%					
	G-5 @ Begin	0.371	0.441	0.000	0.406	30%					
	G-6 @ Begin	0.346	0.304	0.000	0.325	44%					
	G-7 @ Begin	Repaired with box section									
	G-8 @ Begin	0.370	0.367	0.000	0.369	36%					
	G-9 @ Begin	0.463	0.504	0.000	0.484	17%					
	G-10 @ Begin	0.559	0.542	0.000	0.551	5%					
	G-11 @ Begin	0.286	0.304	0.000	0.295	49%					
KMS/TL	G-12 @ Begin	Repaired with box section									
GL/ATL	G-1 @ End	Repaired with box section									
	G-2 @ End	0.477	0.424	0.000	0.451	22%					
	G-3 @ End	0.517	0.430	0.000	0.474	18%					
	G-4 @ End	0.508	0.449	0.000	0.479	18%					
	G-5 @ End	0.422	0.388	0.000	0.405	30%					
	G-6 @ End	Repaired with box section									
	G-7 @ End	Repaired with box section									
	G-8 @ End	0.481	0.361	0.000	0.421	27%					
	G-9 @ End	0.526	0.535	0.000	0.531	9%					
	G-10 @ End	0.540	0.526	0.000	0.533	8%					
	G-11 @ End	0.520	0.530	0.000	0.525	9%					
	G-12 @ End	Repaired with box section									

$Hole_L$ - Length of hole in Bearing Area
Thk_{BA} - Thickness in Bearing Area

$Hole_H$ - Height of hole in Shear Area
Thk_{SH} - Thickness in Shear Area

$$\text{Thickness}_{BA} = [\frac{(\text{"A"}+\text{"B"})}{2}][\text{bearing size-hole}]/\text{bearing size}]$$

$$\text{Thickness}_{SH} = [\frac{(\text{"A"}+\text{"C"}+\text{"D"})}{3}][\text{"d"-hole}]/\text{"d"}$$

$$\text{Section Loss \%} = \frac{\text{Thickness}_{original} - \text{Thickness}_{readings}}{\text{Thickness}_{original}} \times 100$$

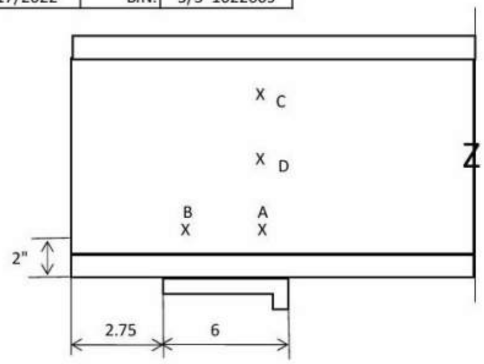
Sketch Description: Bearing Area Section Loss - Span 2

Sketch Number: **4** Sketch Filename: **22-1022609-Bearing Area SL-Span 3.jpg**

NYSDOT BRIDGE INSPECTION REPORT

Girder End Section Loss Documentation

INSP. DATE:	10/17/2022	BIN:	5/3 1022609



GIRDER ENDS in SPAN 3

Note: All dimensions in inches.

Original Beam		33 WF 130					Tw =	0.580	d =	33.10	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
	G-1 @ Begin	0.381	0.302	0.000	0.342	41%					
	G-2 @ Begin	0.500	0.403	0.000	0.452	22%					
	G-3 @ Begin	0.459	0.502	0.000	0.481	17%					
	G-4 @ Begin	0.540	0.464	0.000	0.502	13%					
	G-5 @ Begin	0.457	0.408	0.000	0.433	25%					
	G-6 @ Begin	Repaired with box section									
	G-7 @ Begin	Repaired with box section									
	G-8 @ Begin	0.455	0.445	0.000	0.450	22%					
	G-9 @ Begin	0.460	0.386	0.000	0.423	27%					
	G-10 @ Begin	0.482	0.446	0.000	0.464	20%					
	G-11 @ Begin	0.581	0.530	0.000	0.556	4%					
KMS/TL	G-12 @ Begin	Repaired with box section									
GL/ATL	G-1 @ End	0.488	0.379	0.000	0.434	25%					
	G-2 @ End	0.355	0.337	0.000	0.346	40%					
	G-3 @ End	0.450	0.408	0.000	0.429	26%					
	G-4 @ End	0.483	0.467	0.000	0.475	18%					
	G-5 @ End	0.398	0.265	0.000	0.332	43%					
	G-6 @ End	0.412	0.324	0.000	0.368	37%					
	G-7 @ End	0.360	0.330	0.000	0.345	41%					
	G-8 @ End	0.409	0.365	0.000	0.387	33%					
	G-9 @ End	0.258	0.309	0.000	0.284	51%					
	G-10 @ End	0.369	0.341	0.000	0.355	39%					
	G-11 @ End	0.459	0.471	0.000	0.465	20%					
	G-12 @ End	Repaired with box section									

$Hole_L$ - Length of hole in Bearing Area
Thk_{BA} - Thickness in Bearing Area

$Hole_H$ - Height of hole in Shear Area
Thk_{SH} - Thickness in Shear Area

$$\text{Thickness}_{BA} = [\frac{(\text{"A"}+\text{"B"})}{2}][\text{bearing size-hole}]/\text{bearing size}]$$

$$\text{Thickness}_{SH} = [\frac{(\text{"A"}+\text{"C"}+\text{"D"})}{3}][\text{"d"-hole}]/\text{"d"}$$

$$\text{Section Loss \%} = \frac{\text{Thickness}_{original} - \text{Thickness}_{readings}}{\text{Thickness}_{original}} \times 100$$

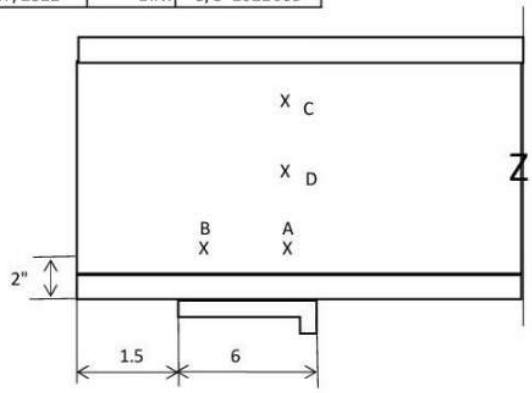
Sketch Description: Bearing Area Section Loss - Span 3

Sketch Number: **5** Sketch Filename: **22-1022609-Bearing Area SL-Span 4.jpg**

NYSDOT BRIDGE INSPECTION REPORT

Girder End Section Loss Documentation

INSP. DATE:	10/17/2022	BIN:	5/3 1022609



GIRDER ENDS in SPAN 4

Note: All dimensions in inches.

Original Beam		33 WF 130					Tw =	0.580	d =	33.09	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
KMS/TL	G-1 @ Begin	0.466	0.385	0.000	0.426	27%					
GL/ATL	G-12 @ Begin	Repaired with box section									

Original Beam		27 WF 94					Tw =	0.490	d =	26.91	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
	G-2 @ Begin	Repaired with box section									
KMS/TL	G-6 @ Begin	Repaired with box section									
GL/ATL	G-7 @ Begin	Repaired with box section									
	G-11 @ Begin	Repaired with box section									

Original Beam		27 WF 102					Tw =	0.518	d =	27.07	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
	G-3 @ Begin	0.500	0.492	0.000	0.496	4%					
	G-4 @ Begin	0.433	0.457	0.000	0.445	14%					
KMS/TL	G-5 @ Begin	0.486	0.453	0.000	0.470	9%					
GL/ATL	G-8 @ Begin	0.322	0.335	0.000	0.329	37%					
	G-9 @ Begin	0.344	0.246	0.000	0.295	43%					
	G-10 @ Begin	0.369	0.360	0.000	0.365	30%					

$Hole_L$ - Length of hole in Bearing Area
Thk_{BA} - Thickness in Bearing Area

$Hole_H$ - Height of hole in Shear Area
Thk_{SH} - Thickness in Shear Area

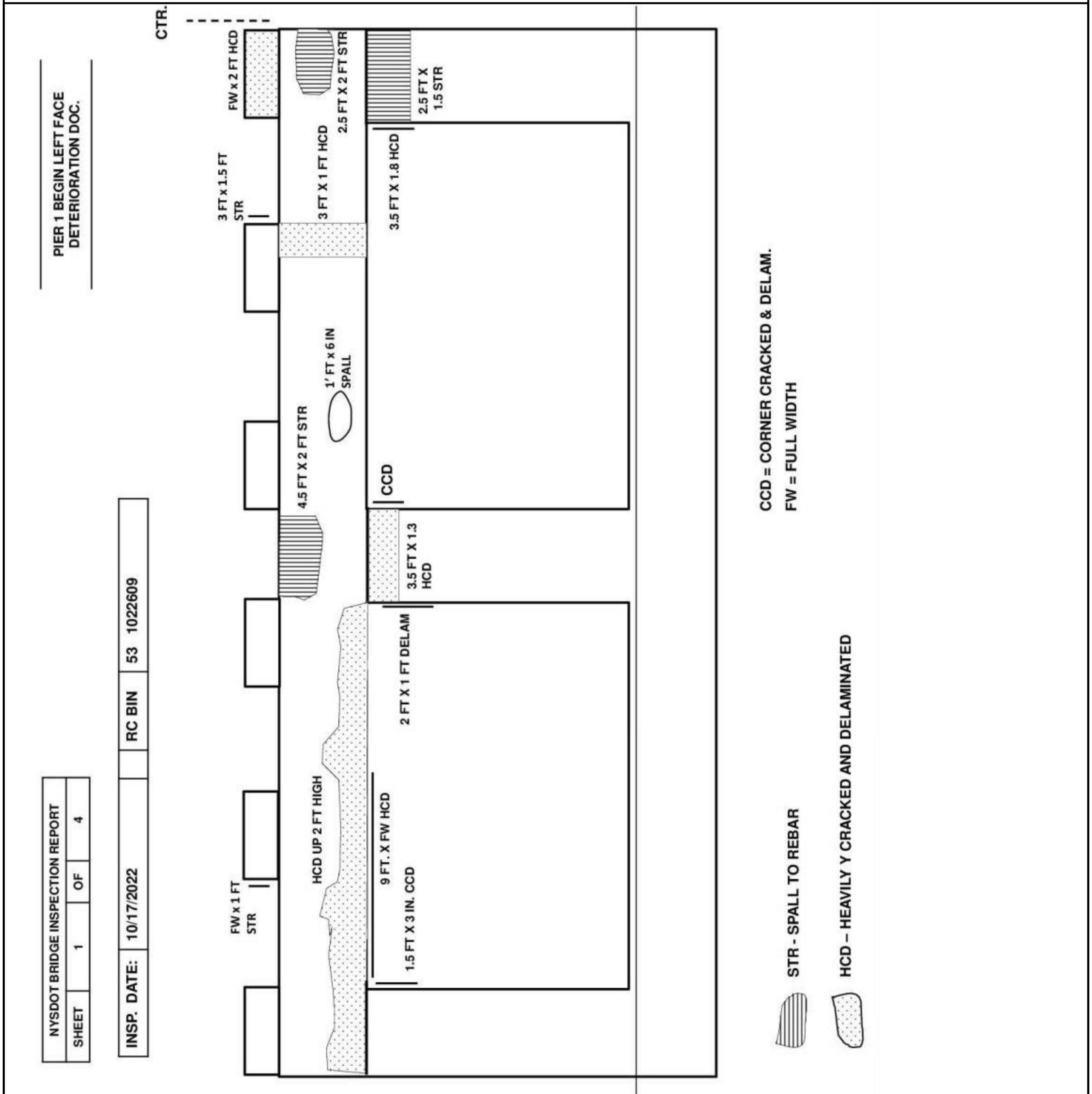
$$\text{Thickness}_{BA} = \left[\frac{(\text{"A"}+\text{"B"})}{2}\right][\text{bearing size-hole}]/\text{bearing size}]$$

$$\text{Thickness}_{SH} = \left[\frac{(\text{"A"}+\text{"C"}+\text{"D"})}{3}\right][\text{"d"-hole}]/\text{"d"}$$

$$\text{Section Loss \%} = \frac{\text{Thickness}_{original} - \text{Thickness}_{readings}}{\text{Thickness}_{original}} \times 100$$

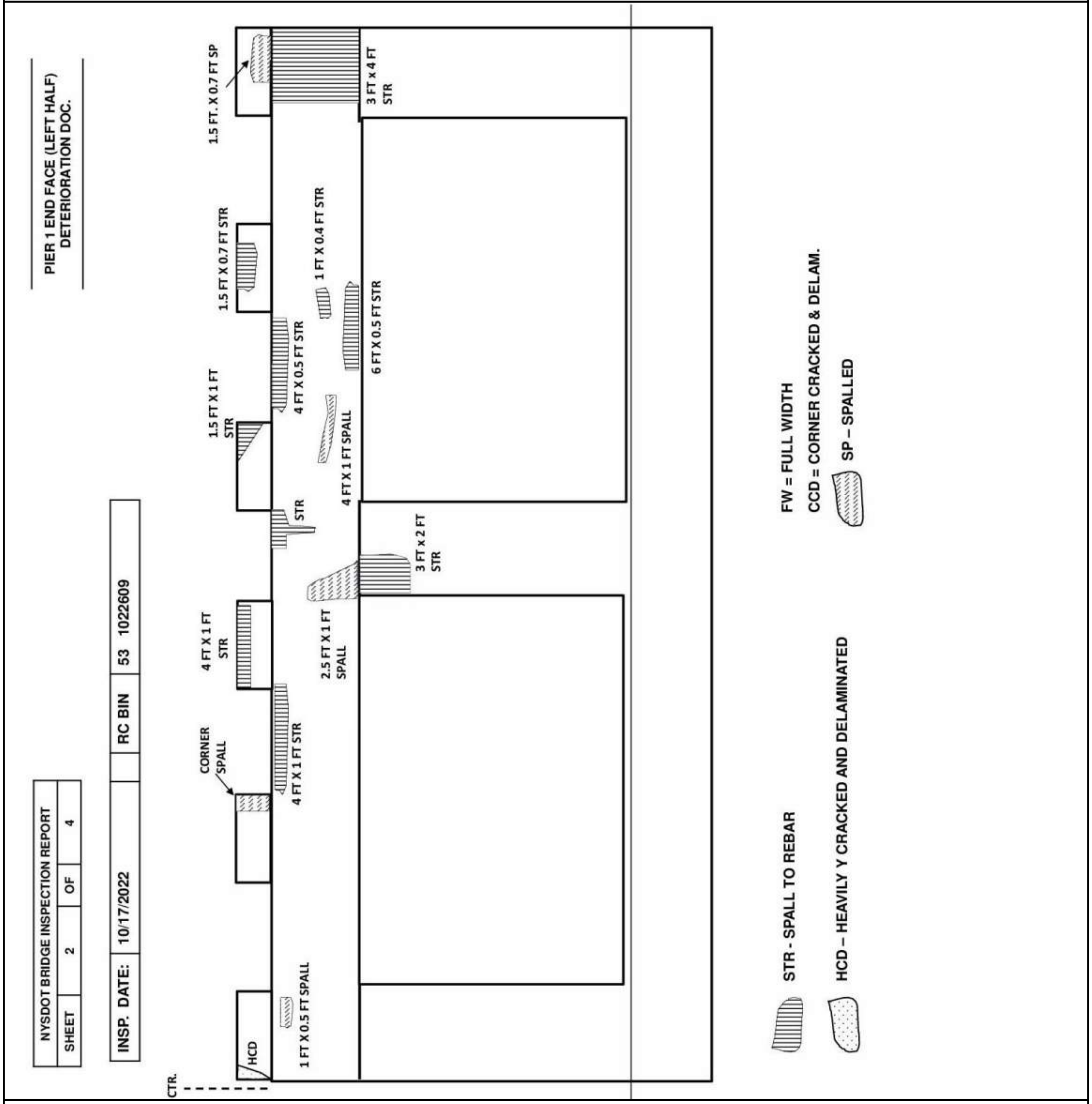
Sketch Description: Bearing Area Section Loss - Span 4

Sketch Number: **6** Sketch Filename: **22-1022609-Pier_1_Deterioraton1.jpg**



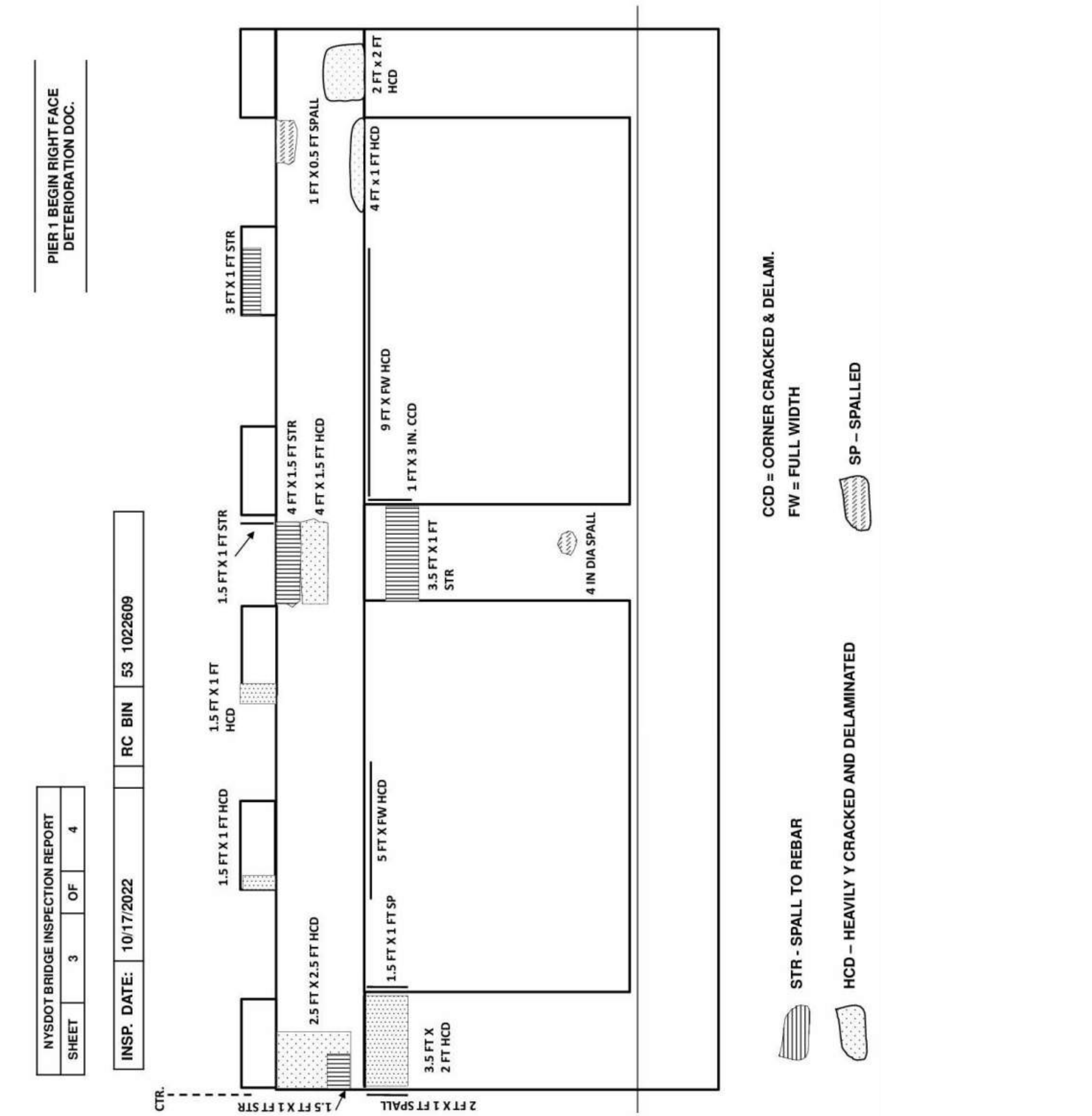
Sketch Description: Pier PR-1 Deterioraton - Begin Left Face

Sketch Number: **7**	Sketch Filename: **22-1022609-Pier_1_Deterioraton2.jpg**



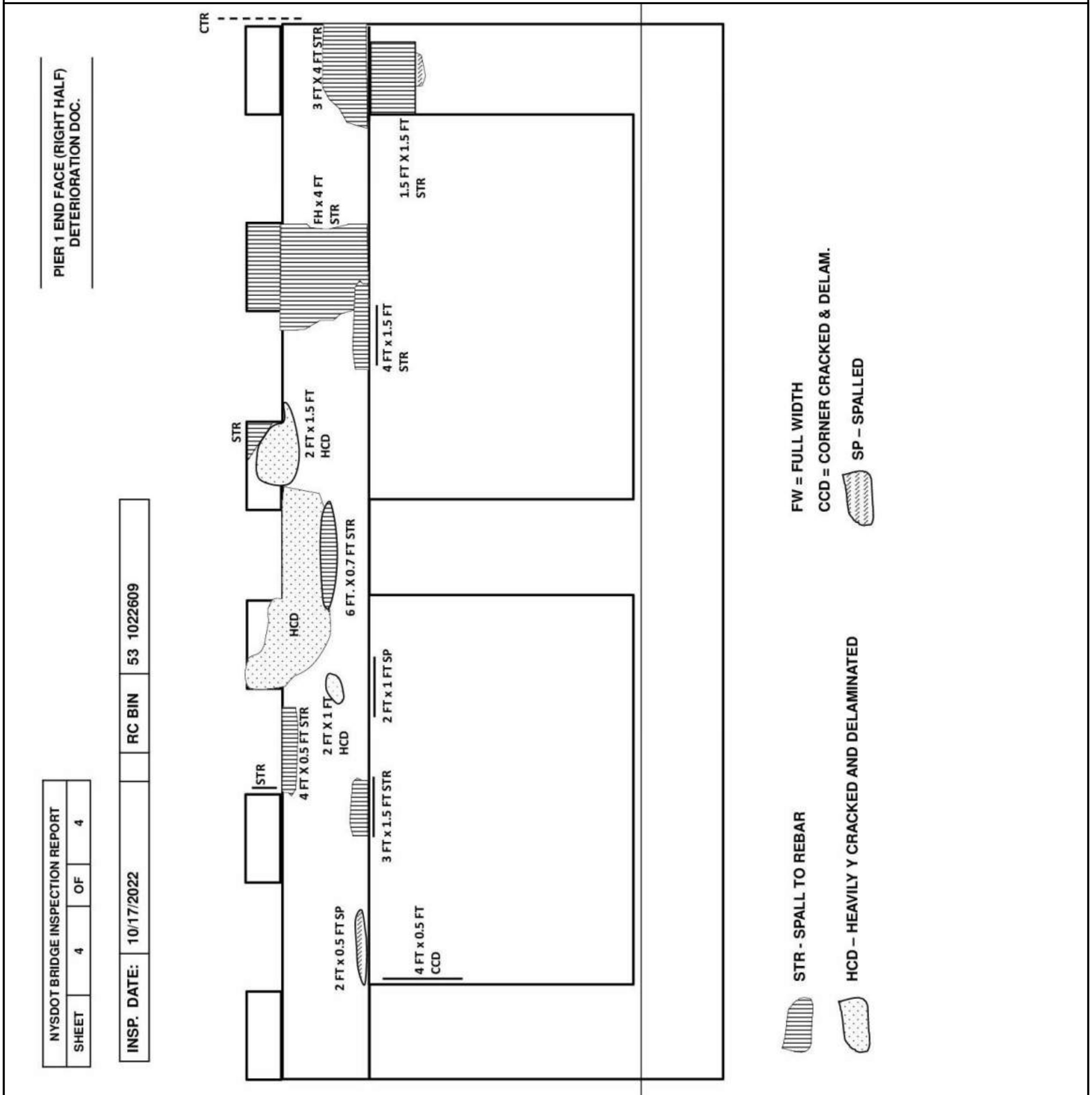
Sketch Description: Pier PR-1 Deterioraton - End Left Face

Sketch Number: **8** Sketch Filename: **22-1022609-Pier_1_Deterioraton3.jpg**



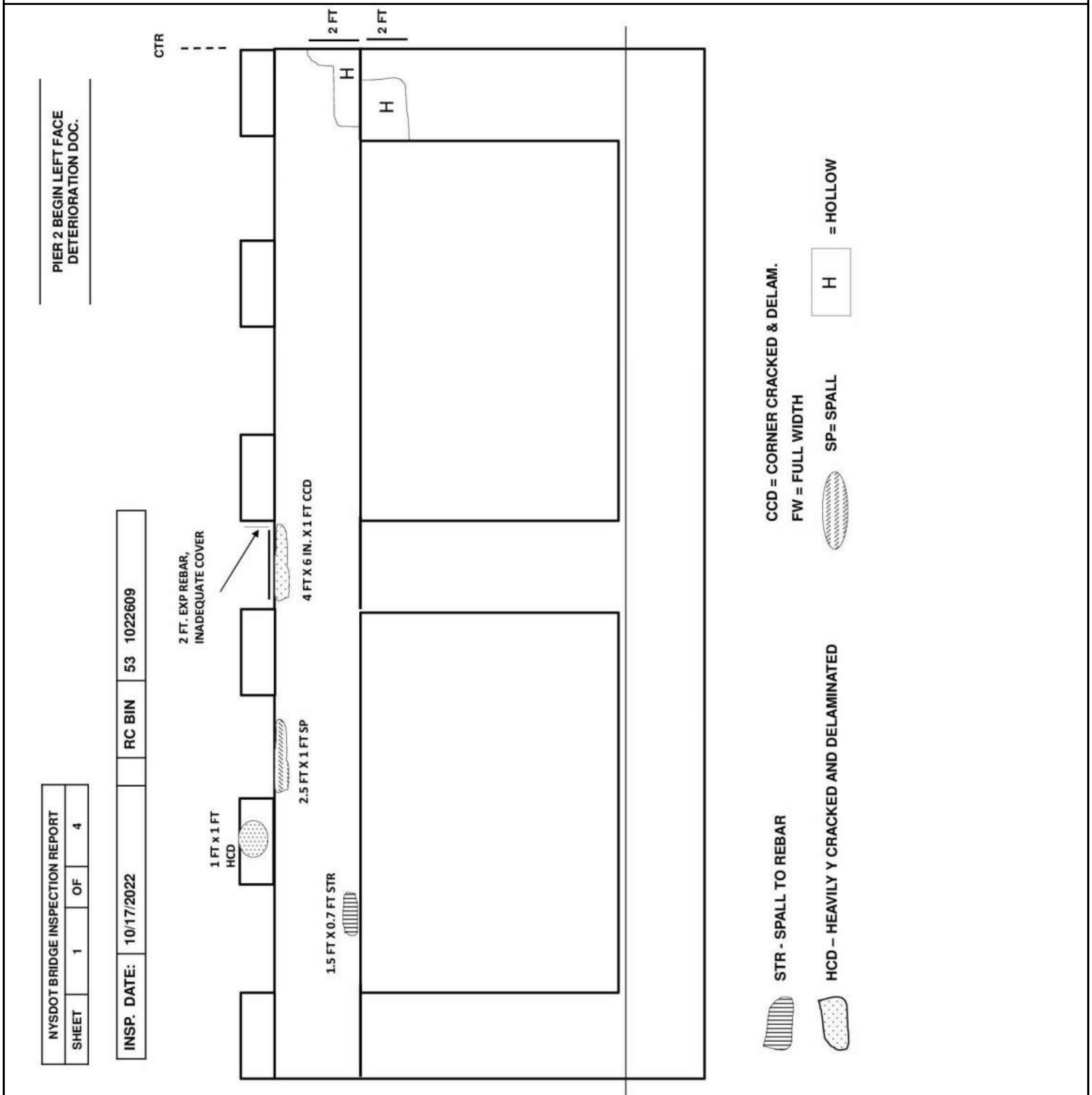
Sketch Description: Pier PR-1 Deterioraton - Begin Right Face

Sketch Number: **9** Sketch Filename: **22-1022609-Pier_1_Deterioraton4.jpg**



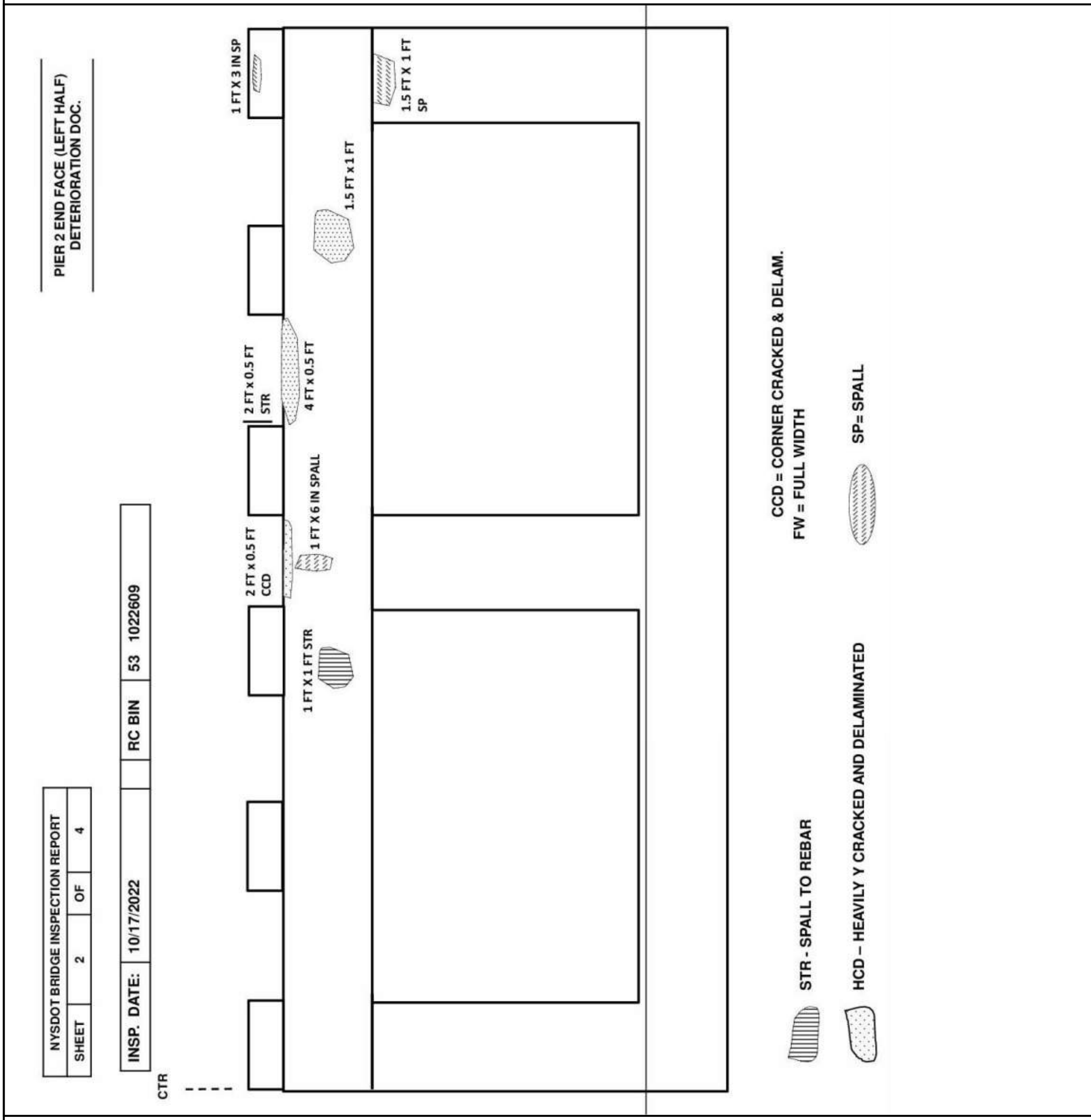
Sketch Description: Pier PR-1 Deterioraton - End Right Face

Sketch Number: **10** Sketch Filename: **22-1022609-Pier_2_Deterioraton1.jpg**



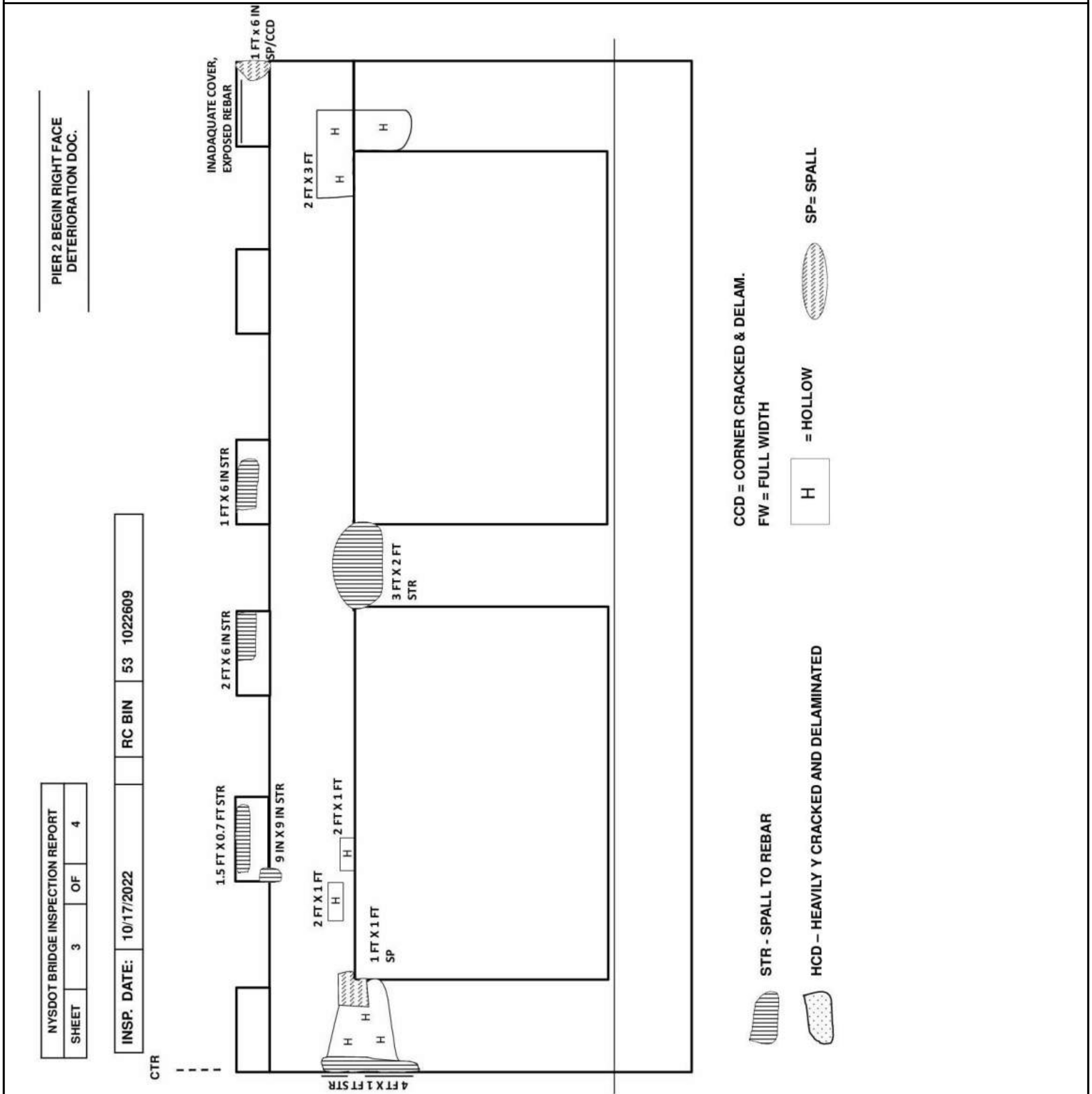
Sketch Description: Pier PR-2 Deterioraton - Begin Left Face

Sketch Number: **11** Sketch Filename: **22-1022609-Pier_2_Deterioraton2.jpg**



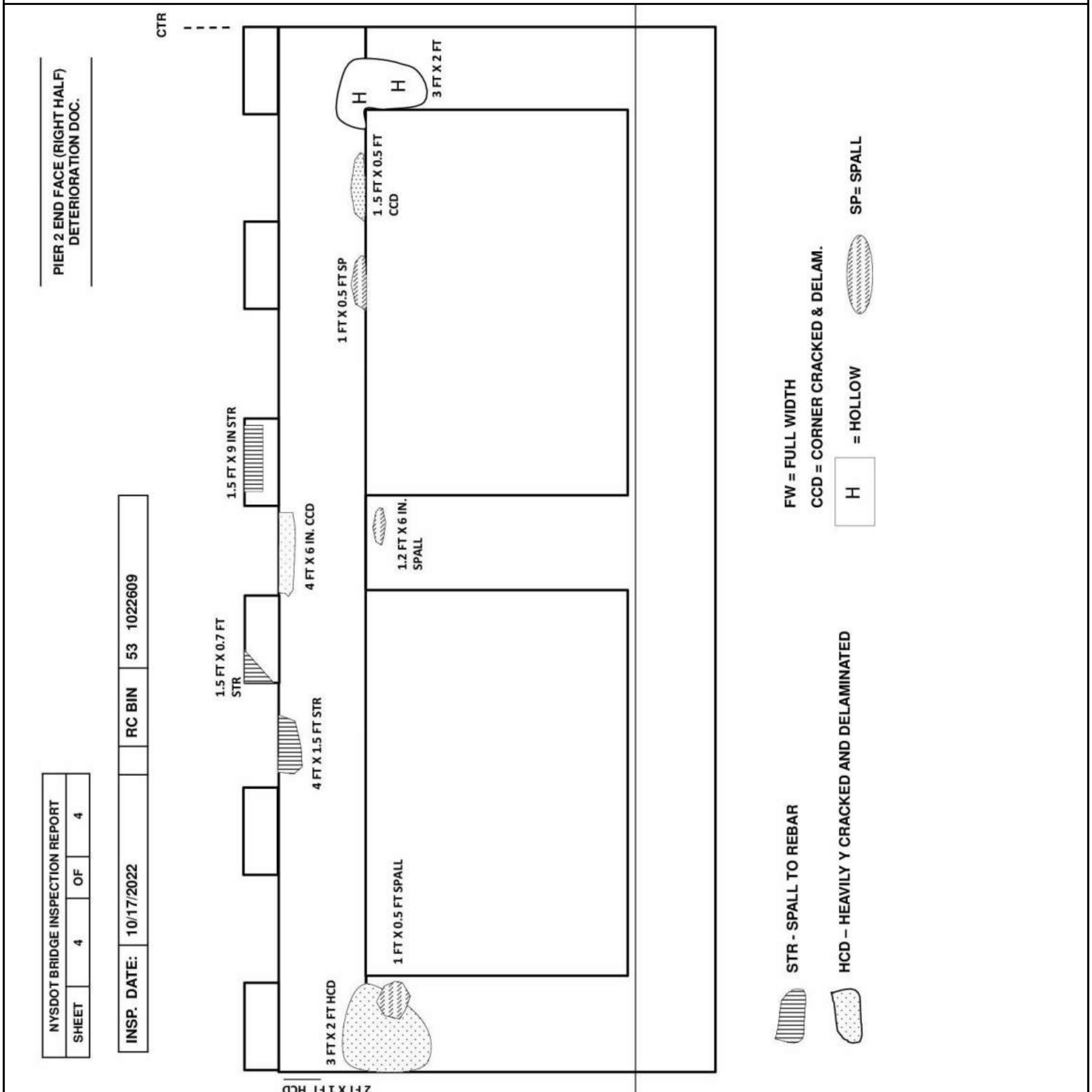
Sketch Description: Pier PR-2 Deterioraton - End Left Face

Sketch Number: **12** Sketch Filename: **22-1022609-Pier_2_Deterioraton3.jpg**



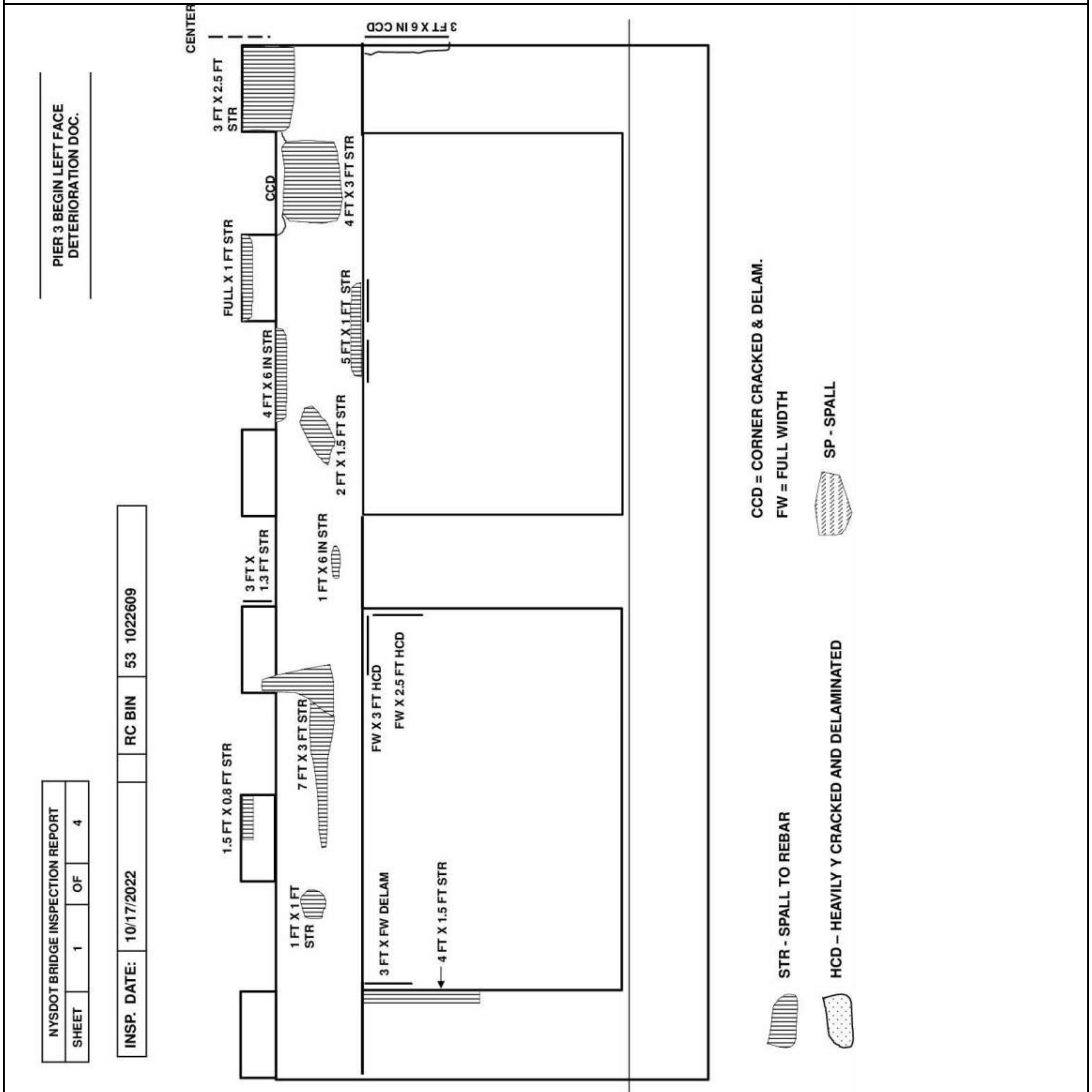
Sketch Description: Pier PR-2 Deterioraton - Begin Right Face

Sketch Number: **13** Sketch Filename: **22-1022609-Pier_2_Deterioraton4.jpg**



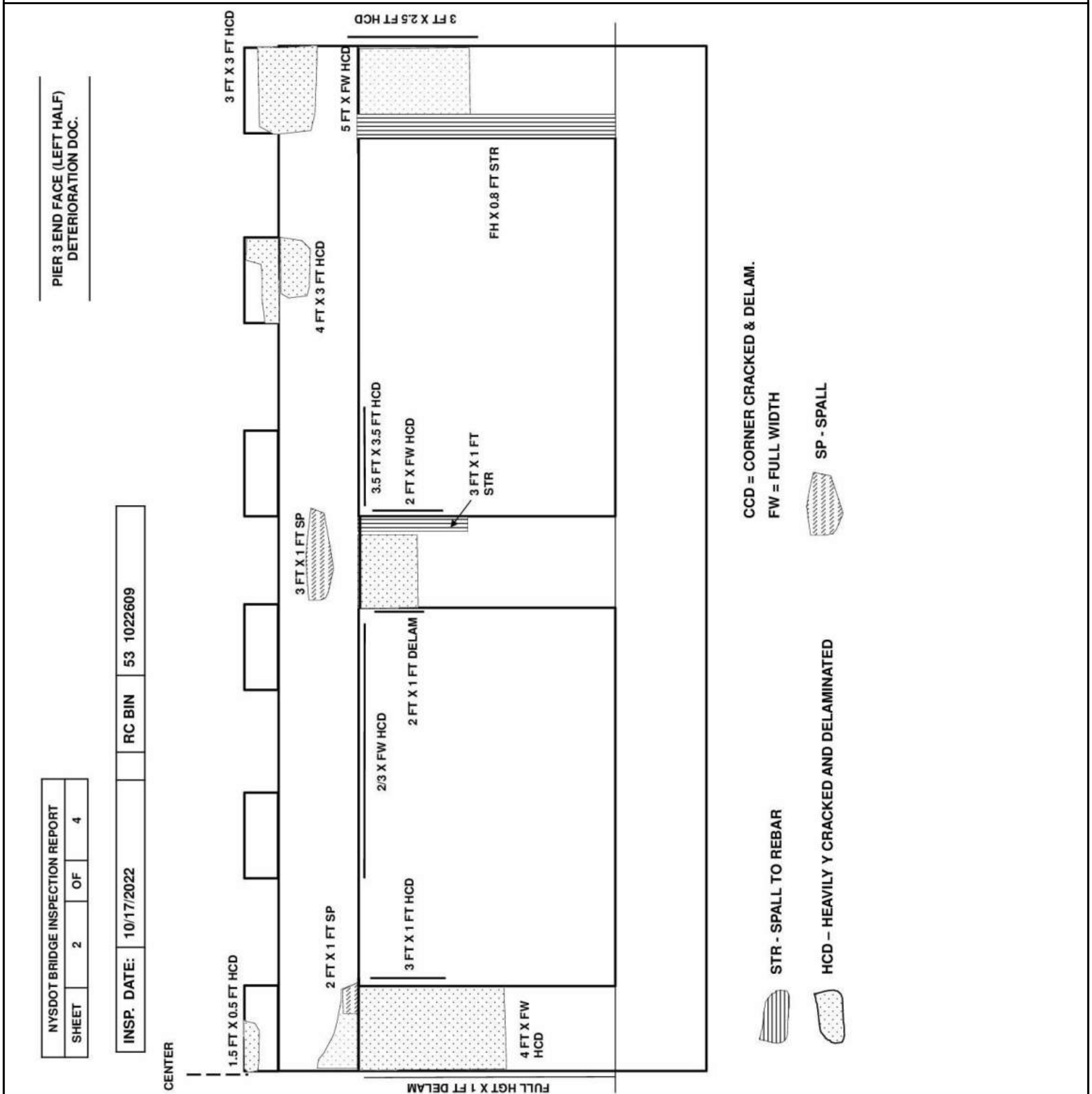
Sketch Description: Pier PR-2 Deterioraton - End Right Face

Sketch Number: **14** Sketch Filename: **22-1022609-Pier_3_Deterioraton1.jpg**



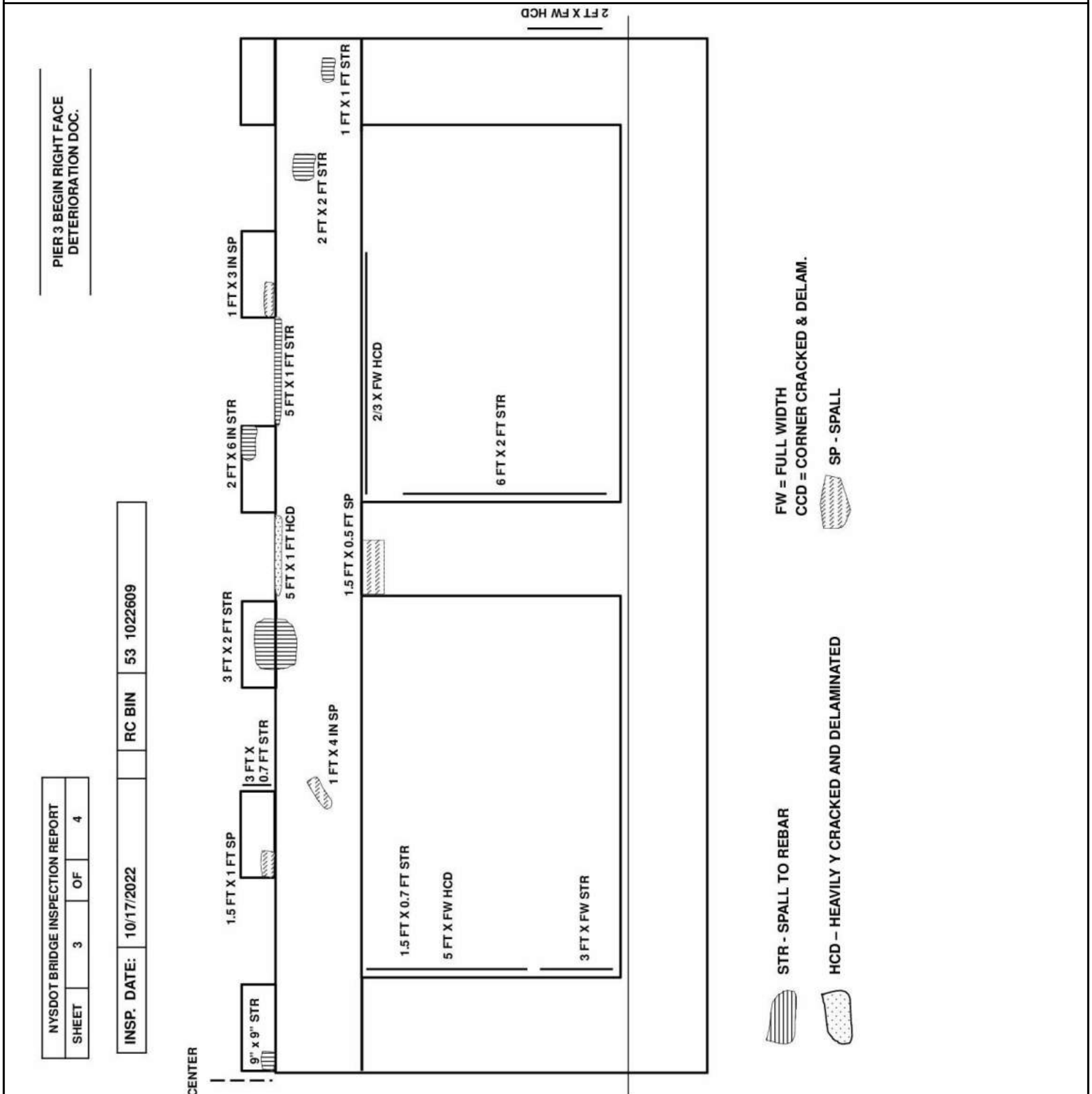
Sketch Description: Pier PR-3 Deterioraton - Begin Left Face

Sketch Number: **15** Sketch Filename: **22-1022609-Pier_3_Deterioraton2.jpg**



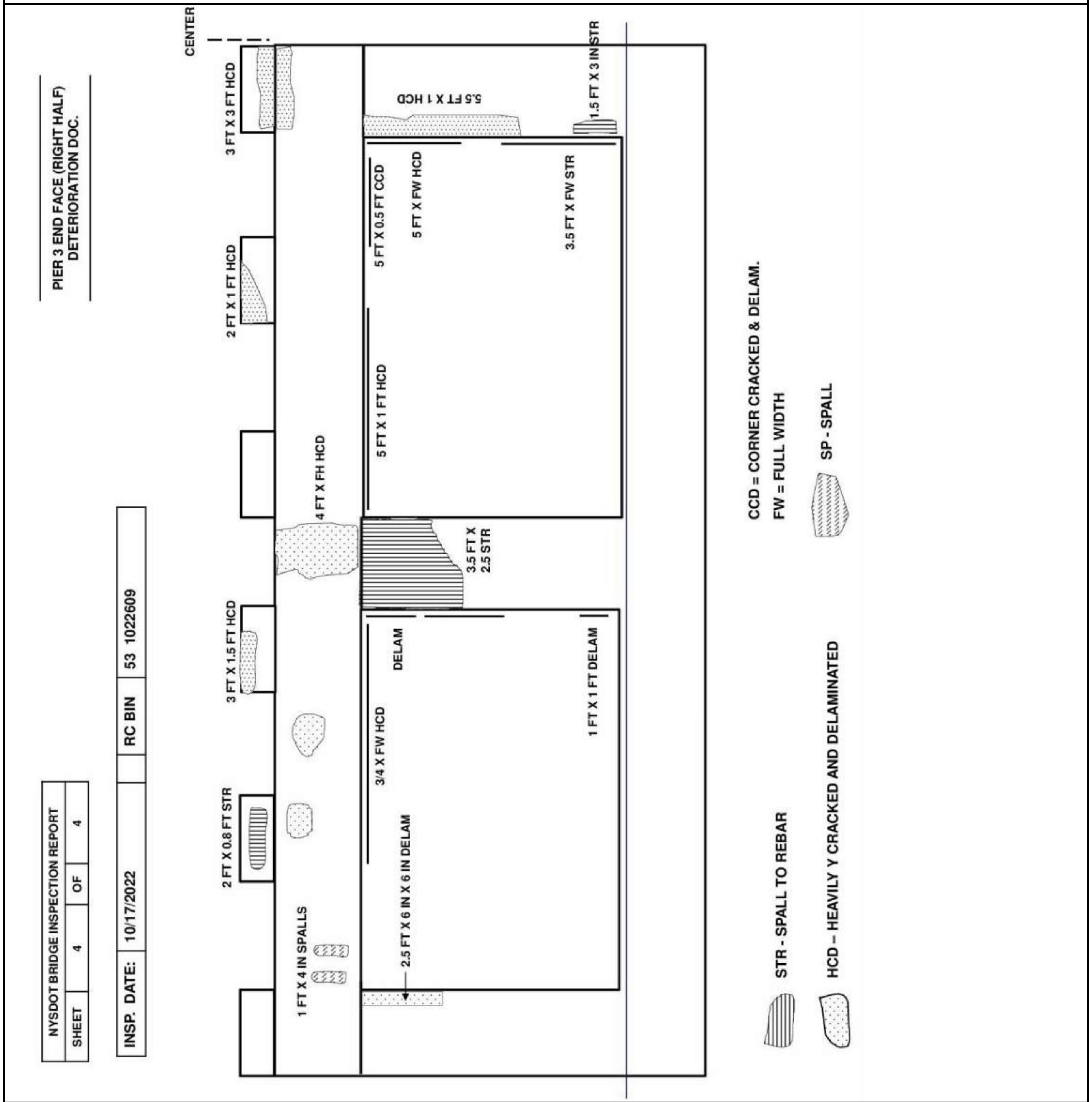
Sketch Description: Pier PR-3 Deterioraton - End Left Face

Sketch Number: **16**	Sketch Filename: **22-1022609-Pier_3_Deterioraton3.jpg**



Sketch Description: Pier PR-3 Deterioraton - Begin Right Face

Sketch Number: **17** Sketch Filename: **22-1022609-Pier_3_Deterioraton4.jpg**

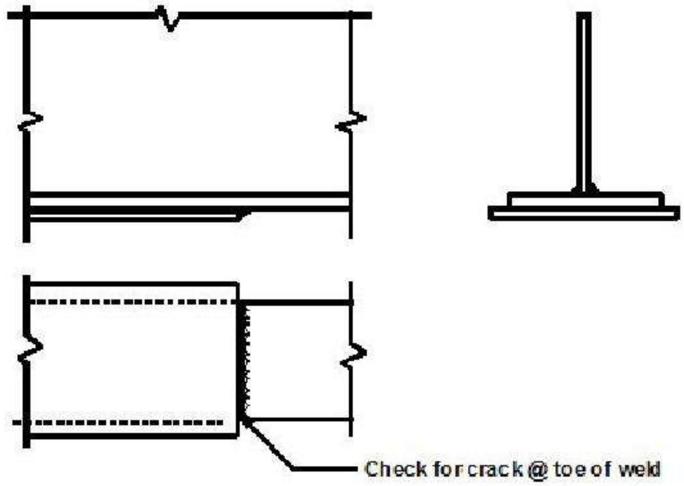


Sketch Description: Pier PR-3 Deterioraton - End Right Face

Sketch Number: **18** Sketch Filename: **22-1022609-SE Details1.jpg**

SPECIAL EMPHASIS DETAILS REQUIRING 100% HANDS-ON INSPECTION

RC 5/3 BIN 1022609



NOTES:
1) Category “E” welds are located at ends of cover plates on all girders in Spans 2 & 3.
2) All Category “E” welds shall receive 100% hands on inspection

Sketch Description: Special Emphasis Details - 1 of 3

Sketch Number: **19** Sketch Filename: **22-1022609-SE Details2.jpg**

SPECIAL EMPHASIS DETAILS REQUIRING 100% HANDS-ON INSPECTION

RC 5/3 **BIN** 1022609

Steel Web Bearing Area:

Primary member bearing areas, where combined web and bearing stiffeners (when present) loss meets or exceeds 25%, require 100% hands-on inspection.

The primary member bearing area is the web design strip length including bearing stiffeners (when present) for 8 inches above the bottom flange that is directly over the bearing. Bearing stiffeners are generally a minimum of ¾" thick and located on both sides of the web. The web design strip length, 18 times the web thickness (for example: 0.625 inches x 18 = 11.25 inches), is considered as effective with the bearing stiffeners in acting as a column to transmit the entire beam reaction load to the bearing.

Although all built up plate girders require bearing stiffeners, AASHTO only requires bearing stiffeners on rolled beams when the shear at the bearing exceeds 75% of the allowable shear of the web. The web over the bearing acts like a thin column by itself to support the beam reactions and to transfer the loads to the bearings. Therefore, the area of the beam directly over the bearing is susceptible to failure due to loss of section from corrosion, especially for rolled beams without bearing stiffeners.

Bridge inspectors should note that some of the bridges without bearing stiffeners have connection plates in or near the bearing area that might be confused with bearing stiffeners. Connection plates are of limited benefit in reducing the possibility of web distortions and should not be confused with bearing stiffeners.

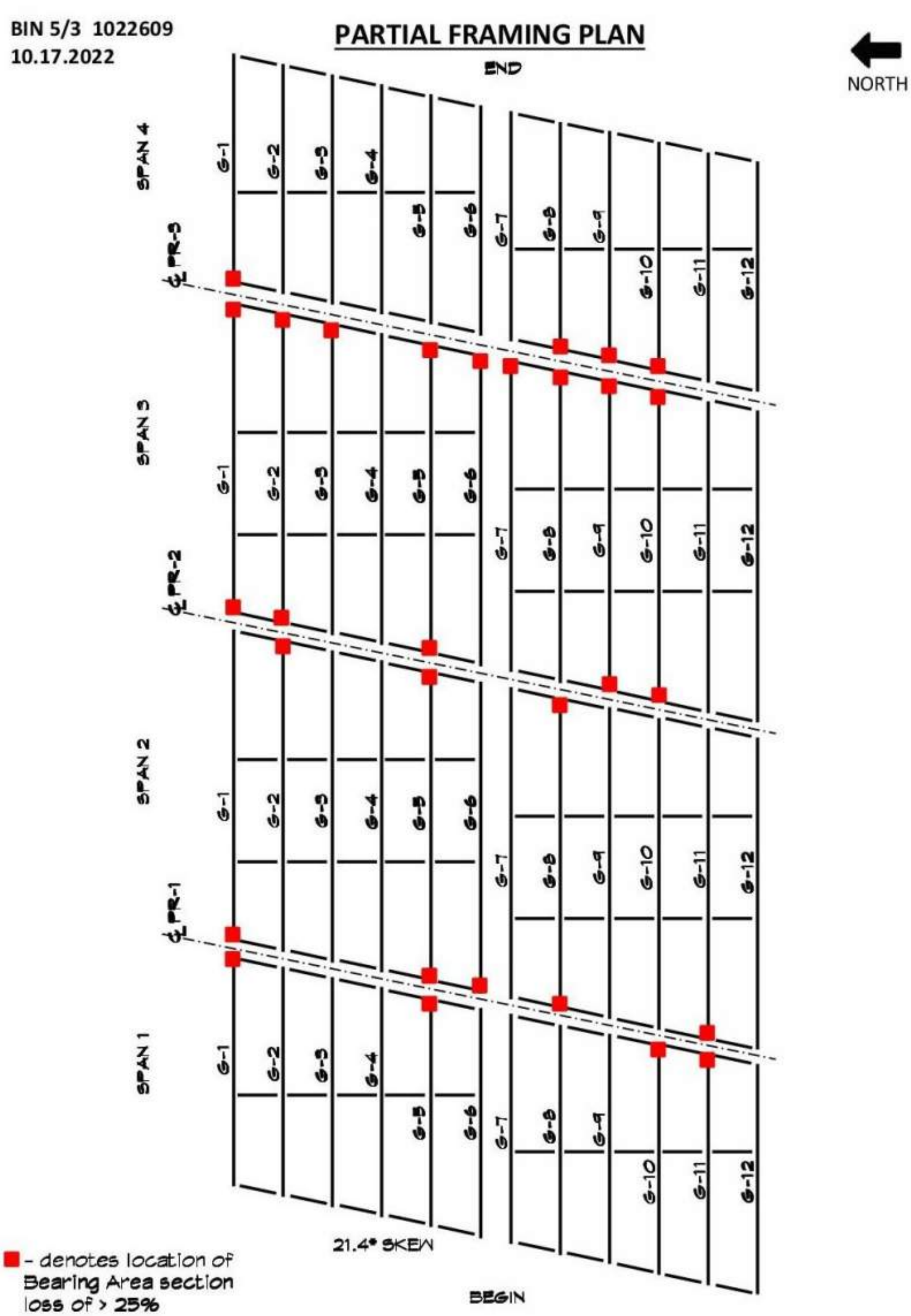
When corrosion is present, the inspector should measure and document the extent of that corrosion and section loss. Where loss of bearing area exceeds 25%, the corroded bearing area shall be well documented, preferably with a sketch.

For all cases, where there is more than 50% section loss to the bearing area, the inspector shall consider issuing a structural flag based on condition, redundancy, loading and engineering judgment for each circumstance.

(See Framing Plans on Sheets 4 and 5 for locations)

Sketch Description: Special Emphasis Details - 2 of 3

Sketch Number: **20**	Sketch Filename: **22-1022609-SE Details3.jpg**



Sketch Description: Special Emphasis Details - 3 of 3

Sketch Number: **21** Sketch Filename: **22-1022609-Load Rating Field Check1.jpg**

LOAD RATING FIELD CHECK FORM (1 of 2)

RC 53 BIN 1022609 Date: 10/17/2022

Dead load - Note changes in the dead load since the last inspection or state "NONE":

No changes.

Section Loss - note locations and amount of section loss on each girder or state "NONE":

Span 1
Girder G-1 @ End – Bearing area SL = 35% (32% in 2020)
Girder G-2 @ End – Bearing area SL = 20% (16% in 2020)
Girder G-3 @ End – Bearing area SL = 21% (23% in 2020)
Girder G-4 @ End – Bearing area SL = 22% (17% in 2020)
Girder G-5 @ End – Bearing area SL = 30% (35% in 2020)
Girder G-9 @ End – Bearing area SL = 7% (<5% in 2020)
Girder G-10 @ End – Bearing area SL = 66% (34% in 2020)
Girder G-11 @ End – Bearing area SL = 48% (37% in 2020)

Span 2
Girder G-1 @ Begin – Bearing area SL = 20% (30% in 2020)
Girder G-3 @ Begin – Bearing area SL = 15% (24% in 2020)
Girder G-4 @ Begin – Bearing area SL = 8% (9% in 2020)
Girder G-5 @ Begin – Bearing area SL = 30% (33% in 2020)
Girder G-6 @ Begin – Bearing area SL = 44% (40% in 2020)
Girder G-8 @ Begin – Bearing area SL = 36% (38% in 2020)
Girder G-9 @ Begin – Bearing area SL = 17% (<15% in 2020)
Girder G-10 @ Begin – Bearing area SL = 5% (<10% in 2020)
Girder G-11 @ Begin – Bearing area SL = 49% (36% in 2020)
Girder G-2 @ End – Bearing area SL = 22% (30% in 2020)
Girder G-3 @ End – Bearing area SL = 18% (4% in 2020)
Girder G-4 @ End – Bearing area SL = 18% (23% in 2020)
Girder G-5 @ End – Bearing area SL = 30% (30% in 2020)
Girder G-8 @ End – Bearing area SL = 27% (24% in 2020)
Girder G-9 @ End – Bearing area SL = 9% (3% in 2020)
Girder G-10 @ End – Bearing area SL = 8% (<10% in 2020)
Girder G-11 @ End – Bearing area SL = 9% (4% in 2020)

Range of all SL = 2' from End of Girder

Team Leader: Kevin M. Seely PE #: 100192

Sketch Description: Load Rating Field Check - Sht 1 of 2

Sketch Number: **22** Sketch Filename: **22-1022609-Load Rating Field Check2.jpg**

LOAD RATING FIELD CHECK FORM (2 of 2)

RC 53 **BIN** 1022609 **Date:** 10/17/2022

Dead load - Note changes in the dead load since the last inspection or state "NONE":

No changes.

Section Loss - note locations and amount of section loss on each girder or state "NONE":

Span 3
Girder G-1 @ Begin – Bearing area SL = 41% (35% in 2020)
Girder G-2 @ Begin – Bearing area SL = 22% (31% in 2020)
Girder G-3 @ Begin – Bearing area SL = 17% (4% in 2020)
Girder G-4 @ Begin – Bearing area SL = 13% (20% in 2020)
Girder G-5 @ Begin – Bearing area SL = 25% (19% in 2020)
Girder G-8 @ Begin – Bearing area SL = 22% (22% in 2020)
Girder G-9 @ Begin – Bearing area SL = 27% (27% in 2020)
Girder G-10 @ Begin – Bearing area SL = 20% (28% in 2020)
Girder G-11 @ Begin – Bearing area SL = 4% (4% in 2020)
Girder G-1 @ End – Bearing area SL = 25% (34% in 2020)
Girder G-2 @ End – Bearing area SL = 40% (42% in 2020)
Girder G-3 @ End – Bearing area SL = 26% (28% in 2020)
Girder G-4 @ End – Bearing area SL = 18% (21% in 2020)
Girder G-5 @ End – Bearing area SL = 43% (30% in 2020)
Girder G-6 @ End – Bearing area SL = 37% (39% in 2020)
Girder G-7 @ End – Bearing area SL = 41% (40% in 2020)
Girder G-8 @ End – Bearing area SL = 33% (27% in 2020)
Girder G-9 @ End – Bearing area SL = 51% (32% in 2020)
Girder G-10 @ End – Bearing area SL = 39% (32% in 2020)
Girder G-11 @ End – Bearing area SL = 20% (16% in 2020)

Span 4
Girder G-1 @ Begin – Bearing area SL = 27% (34% in 2020)
Girder G-3 @ Begin – Bearing area SL = 4% (<5% in 2020)
Girder G-4 @ Begin – Bearing area SL = 14% (12% in 2020)
Girder G-5 @ Begin – Bearing area SL = 9% (7% in 2020) (Photo 11)
Girder G-8 @ Begin – Bearing area SL = 37% (33% in 2020)
Girder G-9 @ Begin – Bearing area SL = 43% (33% in 2020)
Girder G-10 @ Begin – Bearing area SL = 30% (27% in 2020)

Range of all SL = 2' from End of Girder

Additional Notes:

None.

Attachments:

See FBR's for YF #5B2267W023 & YF #5B2267W029, Bearing Area Section Loss documentation.

Team Leader: **Kevin M. Seely** PE #: **100192**

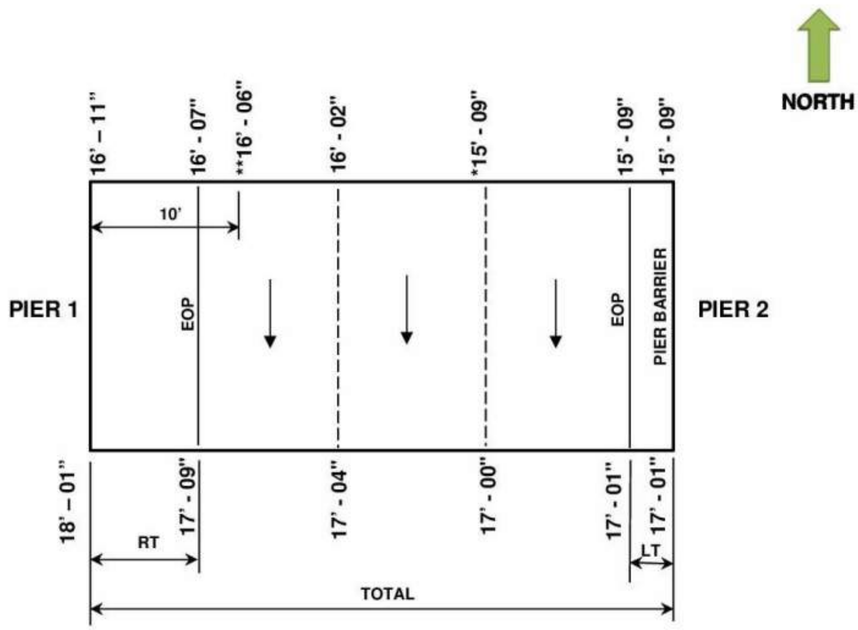
Sketch Description: Load Rating Field Check - Sht 2 of 2

Sketch Number: **23** Sketch Filename: **22-1022609-VC_Under1.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	2

SPAN 2 FEAT. 2 VERTICAL CLEARANCES RTE 33 WB (INBOUND) (FT.)

INSP. DATE:	10/17/2022		RC BIN	5/3 1022609



INBOUND

Date	DEF**	ACT*	TOT	LT	RT
2020	16' - 07"	15 - 08"	49.3'	3.5'	8.0'
10/17/2022	16' - 06"	15' - 09"	✓	3.0'	✓

✓ if no change

2022 – Rte 33 EB & WB has been milled and paved since the previous 2020 inspection.

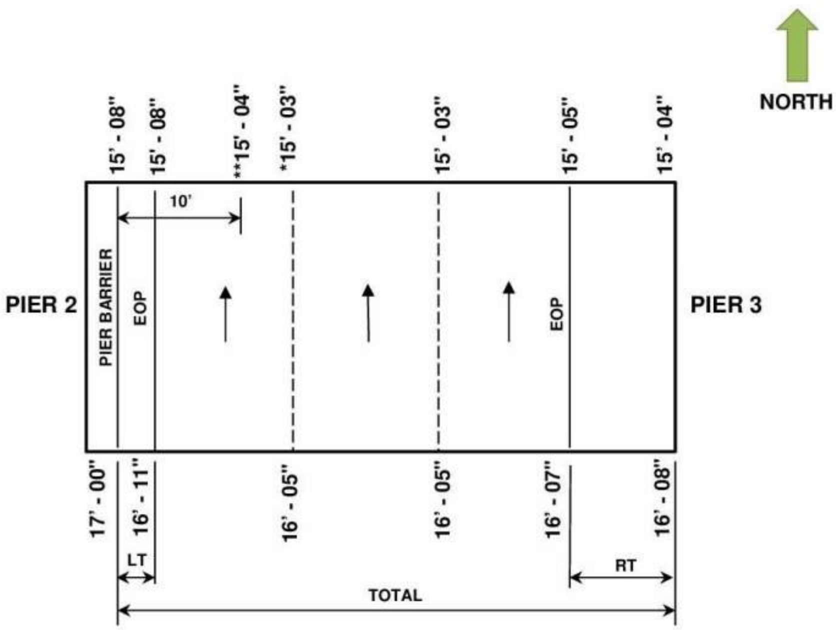
Sketch Description: Vertical Clearances - Under - Feature 2 - NY33 WB

Sketch Number: **24** Sketch Filename: **22-1022609-VC_Under2.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	2	OF	2

SPAN 3 FEAT. 3 VERTICAL CLEARANCES RTE. 33 EB (OUTBOUND) (FT.)

INSP. DATE:	10/17/2022		RC BIN	5/3 1022609



OUTBOUND

Date	DEF**	ACT*	TOT	LT	RT
2020	15' - 02"	15' - 02"	49.3'	3.5'	8.0'
10/17/2022	15' - 04"	15' - 03"	✓	3.2'	8.2'
✓ if no change					

2022 – Rte 33 EB & WB has been milled and paved since the previous 2020 inspection.

Sketch Description: Vertical Clearances - Under - Feature 3 - NY33 EB

Sketch Number: **25** Sketch Filename: **22-1022609-Electrical Hazard Survey.jpg**

NYSDOT BRIDGE INSPECTION REPORT
BD241

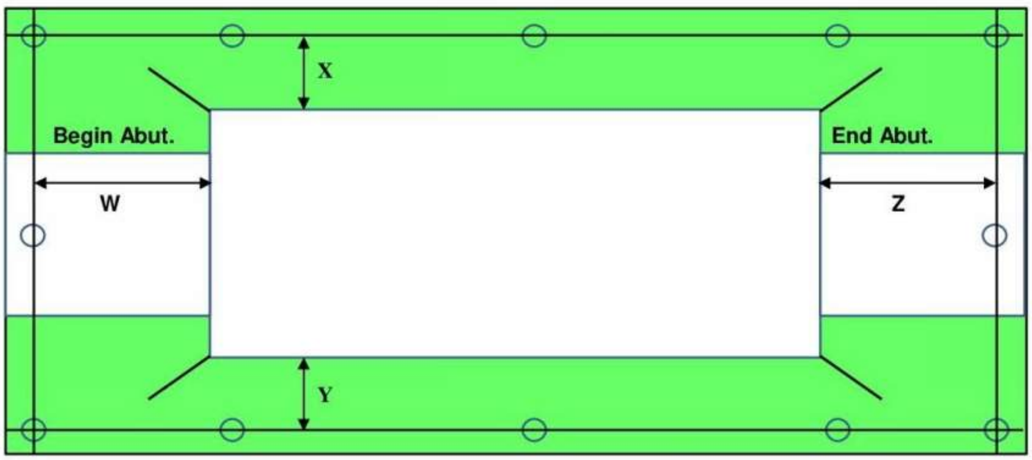
Electrical Hazard Survey

Carried:	BEST STREET	RC BIN:	53 1022609
Crossed:	NY 33 (33 33 53011026)	Insp. Date:	10/17/2022
ATL:	Gary Lachina	Inspector:	Kevin M Seely

Electrical Hazard Classification (Put an X in the appropriated box at the right)		Danger!
		Warning
	X	No Lines Present

Electrical Hazard Alignments (Put an X in the appropriated boxes at the right)		Parallel Alignment
		Perpendicular Alignment
		Diagonal Alignment

Utility Name	NA
System Voltage	NA



(For Clarity, You Must Specify English or Metric Units for Offsets)

Location (Put X where appropriate)	No Lines Present	Above the Deck	Below the Deck	Above and Below	Horizontal Offset	Vertical Offset
Before Begin Abutment (W)	X					
To Left of Bridge (X)	X					
To Right of Bridge (Y)	X					
After End Abutment (Z)	X					

Sketch Description: Electrical Hazard Survey

New York State Department of Transportation
Yellow Flag 5B2267W023

By: Kevin M. Seely
Flag Date: September 20, 2022

Superseding Information:
No Flags Superseded

Structure Information

BIN: **1022609**
Feature Carried: BEST STREET
Feature Crossed: 33 33 53011026
Orientation: 3 - EAST

Region: 05 - BUFFALO
County: ERIE
Political Unit: City of BUFFALO
Approximate Year Built: 1963

Posted Load Matches Inventory: Yes
Posted Load in field : Not Posted for Load

Primary Owner: New York State Department of Transportation
Primary Maintenance Responsibility: New York State Department of Transportation
Typical or Main Span Type: 3 - Steel, 02 - Stringer/Multi-Beam or Girder
This Bridge is not a Ramp
Number of Spans: 4

Verbal Notification Information

Person Notified: Not Contacted
Date:

Of:

Signature Information

Signature: Kevin M. Seely, P.E. 100192-1
Date: September 21, 2022

Reviewed By: Lawrence A. Mathews
Date: September 21, 2022

Attachments: 7

Yellow Flag 5B2267W023 BIN 1022609 Flag Date: September 20, 2022

Flagged Elements

Parent Element	Element	Total Quantity	Unit
Span Number : 3			
	107 - Steel Open Girder/Beam	696	ft

Flagged Condition Description

SUBJECT:
This flag is issued for section loss of 50% or greater in the bearing area of the lower web of an unstiffened rolled Girder.

BACKGROUND:
This structure is a four-span, steel multi-girder bridge, with a composite, cast-in-place reinforced concrete deck (Photo 1). There are 12 unstiffened, rolled steel Girders in all spans and they are simply supported (Photo 2). The Superstructure is founded on cast-in-place reinforced concrete Substructures.

The structure is oriented East. The NY-33 WB (Inbound) is below Span 2, NY-33 EB (Outbound) is below Span 3. The Begin approach is at the intersection with Linden Park.

2022 FLAG CONDITION:
Many of the Girders exhibit painted over pitting and section loss in the bearing area of the lower web within 2' of the ends. Remaining thickness measurements were obtained by D-meter to calculate section losses as follows:

Girder G-9 @ End of Span 3 – Bearing area SL = 51% (32% in 2020); Range = 2' (Photo 3)

See Bearing Area Section Loss Documentation included within this FBR.

There is no crippling, buckling, or any other deformation of the member due to the section loss apparent in the end of the Girder.

Remaining thickness was measured during the 2020 Inspection by caliper or D-meter at a single location on each girder, above the bearing. There is no new or active corrosion occurring on Girder G-9. Changes in Section Loss are most likely due to small differences in location of measurements as well as precision of D-meter vs Caliper.

ADDITIONAL INFORMATION NOT INCLUDED IN FLAG:
Additionally, several other Girders exhibit similar, but less severe painted over pitting and section loss above the bearings as follows:

Span 1 (have not yet been measured at the time of issuing this FBR)

Span 2 (the ends of the Girder at Begin Span 2 over Pier PR-1 have not yet been measured at the time of issuing this FBR)

Girder G-2 @ End – Bearing area SL = 22% (30% in 2020); Range = 2'
Girder G-3 @ End – Bearing area SL = 18% (4% in 2020); Range = 2'
Girder G-4 @ End – Bearing area SL = 18% (23% in 2020); Range = 2'
Girder G-5 @ End – Bearing area SL = 30% (30% in 2020); Range = 2'
Girder G-8 @ End – Bearing area SL = 27% (24% in 2020); Range = 2'
Girder G-9 @ End – Bearing area SL = 9% (3% in 2020); Range = 2'
Girder G-10 @ End – Bearing area SL = 8% (<10% in 2020); Range = 2'
Girder G-11 @ End – Bearing area SL = 9% (4% in 2020); Range = 2'

Span 3
Girder G-1 @ Begin – Bearing area SL = 41% (35% in 2020); Range = 2'
Girder G-2 @ Begin – Bearing area SL = 22% (31% in 2020); Range = 2'
Girder G-3 @ Begin – Bearing area SL = 17% (4% in 2020); Range = 2'
Girder G-4 @ Begin – Bearing area SL = 13% (20% in 2020); Range = 2'
Girder G-5 @ Begin – Bearing area SL = 25% (19% in 2020); Range = 2'

Girder G-8 @ Begin – Bearing area SL = 22% (22% in 2020); Range = 2’
Girder G-9 @ Begin – Bearing area SL = 27% (27% in 2020); Range = 2’
Girder G-10 @ Begin – Bearing area SL = 20% (28% in 2020); Range = 2’
Girder G-11 @ Begin – Bearing area SL = 4% (4% in 2020); Range = 2’
Girder G-1 @ End – Bearing area SL = 25% (34% in 2020); Range = 2’
Girder G-2 @ End – Bearing area SL = 40% (42% in 2020); Range = 2’
Girder G-3 @ End – Bearing area SL = 26% (28% in 2020); Range = 2’
Girder G-4 @ End – Bearing area SL = 18% (21% in 2020); Range = 2’
Girder G-5 @ End – Bearing area SL = 43% (30% in 2020); Range = 2’
Girder G-6 @ End – Bearing area SL = 37% (39% in 2020); Range = 2’
Girder G-7 @ End – Bearing area SL = 41% (40% in 2020); Range = 2’
Girder G-8 @ End – Bearing area SL = 33% (27% in 2020); Range = 2’
Girder G-10 @ End – Bearing area SL = 39% (32% in 2020); Range = 2’
Girder G-11 @ End – Bearing area SL = 20% (16% in 2020); Range = 2’

Span 4
Girder G-1 @ Begin – Bearing area SL = 27% (34% in 2020); Range = 2’
Girder G-3 @ Begin – Bearing area SL = 4% (<5% in 2020); Range = 2’
Girder G-4 @ Begin – Bearing area SL = 14% (12% in 2020); Range = 2’
Girder G-5 @ Begin – Bearing area SL = 9% (7% in 2020); Range = 2’
Girder G-8 @ Begin – Bearing area SL = 37% (33% in 2020); Range = 2’
Girder G-9 @ Begin – Bearing area SL = 43% (33% in 2020); Range = 2’
Girder G-10 @ Begin – Bearing area SL = 30% (27% in 2020); Range = 2’

Girder end locations not noted above either exhibit no apparent section loss or have previously been repaired with a box section installed between the flanges on each side of the web, above the bearing (Photo 4).

Yellow Flag 5B2267W023 | BIN 1022609 | Flag Date: September 20, 2022

Flag Photographs

Photo Number: **1** Photo Filename: **1-General Elevation view (Left side looking Right).jpg**

Attachment Description: **General Elevation view (Left side looking Right)**

Yellow Flag 5B2267W023 | BIN 1022609 | Flag Date: September 20, 2022

Photo Number: **2**	Photo Filename: **2-Span 3 framing (Looking toward Begin Right).jpg**

Attachment Description: **Span 3 framing (Looking toward Begin Right)**

Yellow Flag 5B2267W023 | BIN 1022609 | Flag Date: September 20, 2022

Photo Number: **3**	Photo Filename: **3-Painted over pitting in lower webs of G-9 over PR-3**

Attachment Description: **Painted over pitting in lower webs of G-9 over PR-3 (Looking Right)**

Yellow Flag 5B2267W023 | BIN 1022609 | Flag Date: September 20, 2022

Photo Number: **4**	Photo Filename: **4-Typical box section repair (Right side of G-12**

Attachment Description: **Typical box section repair (Right side of Girder G-12 shown over Pier PR-2 looking Left)**

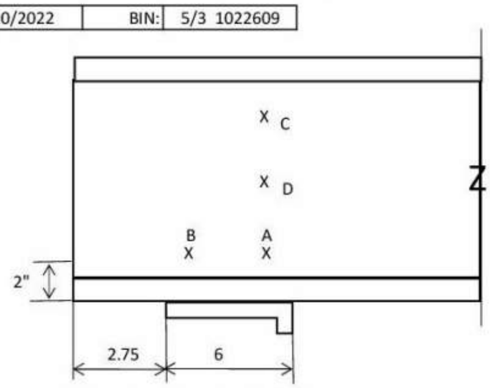
Yellow Flag 5B2267W023 | BIN 1022609 | Flag Date: September 20, 2022

Photo Number: **5** | Photo Filename: **22-1022609-Bearing Area SL-Span 3.jpg**

NYSDOT BRIDGE INSPECTION REPORT

Girder End Section Loss Documentation

INSP. DATE:	9/20/2022	BIN:	5/3 1022609



GIRDER ENDS in SPAN 3

Note: All dimensions in inches.

Original Beam		33 WF 130					Tw =	0.580	d =	33.10	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	Hole $_L$	Thk $_{BA}$	%S.L.	C	D	Hole $_H$	Thk $_{SH}$	%S.L.
	G-1 @ Begin	0.381	0.302	0.000	0.342	41%					
	G-2 @ Begin	0.500	0.403	0.000	0.452	22%					
	G-3 @ Begin	0.459	0.502	0.000	0.481	17%					
	G-4 @ Begin	0.540	0.464	0.000	0.502	13%					
	G-5 @ Begin	0.457	0.408	0.000	0.433	25%					
	G-6 @ Begin	Repaired with box section									
	G-7 @ Begin	Repaired with box section									
	G-8 @ Begin	0.455	0.445	0.000	0.450	22%					
	G-9 @ Begin	0.460	0.386	0.000	0.423	27%					
	G-10 @ Begin	0.482	0.446	0.000	0.464	20%					
	G-11 @ Begin	0.581	0.530	0.000	0.556	4%					
KMS/TL	G-12 @ Begin	Repaired with box section									
GL/ATL	G-1 @ End	0.488	0.379	0.000	0.434	25%					
	G-2 @ End	0.355	0.337	0.000	0.346	40%					
	G-3 @ End	0.450	0.408	0.000	0.429	26%					
	G-4 @ End	0.483	0.467	0.000	0.475	18%					
	G-5 @ End	0.398	0.265	0.000	0.332	43%					
	G-6 @ End	0.412	0.324	0.000	0.368	37%					
	G-7 @ End	0.360	0.330	0.000	0.345	41%					
	G-8 @ End	0.409	0.365	0.000	0.387	33%					
	G-9 @ End	0.258	0.309	0.000	0.284	51%					
	G-10 @ End	0.369	0.341	0.000	0.355	39%					
	G-11 @ End	0.459	0.471	0.000	0.465	20%					
	G-12 @ End	Repaired with box section									

$Hole_L$ - Length of hole in Bearing Area

Thk_{BA} - Thickness in Bearing Area

$Hole_H$ - Height of hole in Shear Area

Thk_{SH} - Thickness in Shear Area

$$\text{Thickness}_{BA} = \left[\frac{\text{"A"}+\text{"B"}}{2}\right][\text{bearing size-hole}]/\text{bearing size}]$$

$$\text{Thickness}_{SH} = \left[\frac{\text{"A"}+\text{"C"}+\text{"D"}}{3}\right][\text{"d"-hole}]/\text{"d"}$$

$$\text{Section Loss \%} = \frac{\text{Thickness}_{\text{original}} - \text{Thickness}_{\text{readings}}}{\text{Thickness}_{\text{original}}} \text{ X 100}$$

Attachment Description: **Bearing Area Section Loss - Span 3**

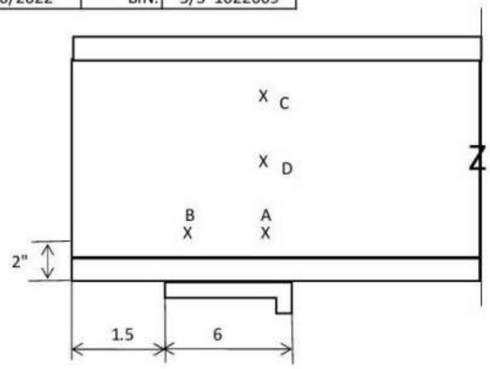
Yellow Flag 5B2267W023 BIN 1022609 Flag Date: September 20, 2022

Photo Number: **6** Photo Filename: **22-1022609-Bearing Area SL-Span 2.jpg**

NYSDOT BRIDGE INSPECTION REPORT

Girder End Section Loss Documentation

INSP. DATE:	9/20/2022	BIN:	5/3 1022609



GIRDER ENDS in SPAN 2

Note: All dimensions in inches.

Original Beam		33 WF 130					Tw =	0.580	d =	33.10	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
	G-1 @ Begin										
	G-2 @ Begin										
	G-3 @ Begin										
	G-4 @ Begin										
	G-5 @ Begin										
	G-6 @ Begin										
	G-7 @ Begin										
	G-8 @ Begin										
	G-9 @ Begin										
	G-10 @ Begin										
	G-11 @ Begin										
KMS/TL	G-12 @ Begin										
GL/ATL	G-1 @ End	Repaired with box section									
	G-2 @ End	0.477	0.424	0.000	0.451	22%					
	G-3 @ End	0.517	0.430	0.000	0.474	18%					
	G-4 @ End	0.508	0.449	0.000	0.479	18%					
	G-5 @ End	0.422	0.388	0.000	0.405	30%					
	G-6 @ End	Repaired with box section									
	G-7 @ End	Repaired with box section									
	G-8 @ End	0.481	0.361	0.000	0.421	27%					
	G-9 @ End	0.526	0.535	0.000	0.531	9%					
	G-10 @ End	0.540	0.526	0.000	0.533	8%					
	G-11 @ End	0.520	0.530	0.000	0.525	9%					
	G-12 @ End	Repaired with box section									

$Hole_L$ - Length of hole in Bearing Area
Thk_{BA} - Thickness in Bearing Area

$Hole_H$ - Height of hole in Shear Area
Thk_{SH} - Thickness in Shear Area

$$\text{Thickness}_{BA} = \left[\frac{\text{"A"}+\text{"B"}}{2}\right][\text{bearing size-hole}]/\text{bearing size}]$$

$$\text{Thickness}_{SH} = \left[\frac{\text{"A"}+\text{"C"}+\text{"D"}}{3}\right][\text{"d"-hole}]/\text{"d"}$$

$$\text{Section Loss \%} = \frac{\text{Thickness}_{original} - \text{Thickness}_{readings}}{\text{Thickness}_{original}} \times 100$$

Attachment Description: **Bearing Area Section Loss - Span 2**

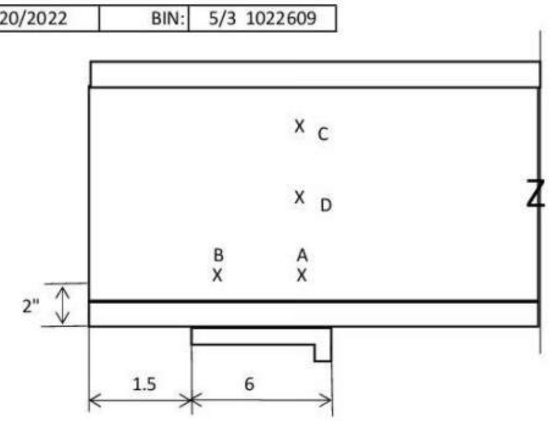
Yellow Flag 5B2267W023 | BIN 1022609 | Flag Date: September 20, 2022

Photo Number: **7** | Photo Filename: **22-1022609-Bearing Area SL-Span 4.jpg**

NYSDOT BRIDGE INSPECTION REPORT

Girder End Section Loss Documentation

INSP. DATE:	9/20/2022	BIN:	5/3 1022609



GIRDER ENDS in SPAN 4

Note: All dimensions in inches.

Original Beam		33 WF 130					Tw =	0.580	d =	33.09	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
KMS/TL	G-1 @ Begin	0.466	0.385	0.000	0.426	27%					
GL/ATL	G-12 @ Begin	Repaired with box section									

Original Beam		27 WF 94					Tw =	0.490	d =	26.91	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
KMS/TL GL/ATL	G-2 @ Begin	Repaired with box section									
	G-6 @ Begin	Repaired with box section									
	G-7 @ Begin	Repaired with box section									
	G-11 @ Begin	Repaired with box section									

Original Beam		27 WF 102					Tw =	0.518	d =	27.07	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
KMS/TL GL/ATL	G-3 @ Begin	0.500	0.492	0.000	0.496	4%					
	G-4 @ Begin	0.433	0.457	0.000	0.445	14%					
	G-5 @ Begin	0.486	0.453	0.000	0.470	9%					
	G-8 @ Begin	0.322	0.335	0.000	0.329	37%					
	G-9 @ Begin	0.344	0.246	0.000	0.295	43%					
	G-10 @ Begin	0.369	0.360	0.000	0.365	30%					

$Hole_L$ - Length of hole in Bearing Area
Thk_{BA} - Thickness in Bearing Area

$Hole_H$ - Height of hole in Shear Area
Thk_{SH} - Thickness in Shear Area

$$\text{Thickness}_{BA} = \left[\frac{(\text{"A"}+\text{"B"})}{2}\right][\text{bearing size-hole}]/\text{bearing size}]$$

$$\text{Thickness}_{SH} = \left[\frac{(\text{"A"}+\text{"C"}+\text{"D"})}{3}\right][\text{"d"-hole}]/\text{"d"}]$$

$$\text{Section Loss \%} = \frac{\text{Thickness}_{original} - \text{Thickness}_{readings}}{\text{Thickness}_{original}} \times 100$$

Attachment Description: **Bearing Area Section Loss - Span 4**

New York State Department of Transportation
Yellow Flag 5B2267W029

By: Kevin M. Seely
Flag Date: October 17, 2022

Superseding Information:
No Flags Superseded

Structure Information

BIN: **1022609**
Feature Carried: BEST STREET
Feature Crossed: 33 33 53011026
Orientation: 3 - EAST

Region: 05 - BUFFALO
County: ERIE
Political Unit: City of BUFFALO
Approximate Year Built: 1963

Posted Load Matches Inventory: Yes
Posted Load in field : Not Posted for Load

Primary Owner: New York State Department of Transportation
Primary Maintenance Responsibility: New York State Department of Transportation
Typical or Main Span Type: 3 - Steel, 02 - Stringer/Multi-Beam or Girder
This Bridge is not a Ramp
Number of Spans: 4

Verbal Notification Information

Person Notified: Not Contacted
Date:

Of:

Signature Information

Signature: Kevin M. Seely, P.E. 100192-1
Date: October 17, 2022

Reviewed By: Lawrence A. Mathews
Date: October 18, 2022

Attachments: 8

Yellow Flag 5B2267W029 BIN 1022609 Flag Date: October 17, 2022

Flagged Elements

Parent Element	Element	Total Quantity	Unit
	Span Number : 1		
	107 - Steel Open Girder/Beam	432	ft

Flagged Condition Description

SUBJECT:
This flag is issued for section loss of 50% or greater in the bearing area of the lower web of an unstiffened rolled Girder.

BACKGROUND:
This structure is a four-span, steel multi-girder bridge, with a composite, cast-in-place reinforced concrete deck (Photo 1). There are 12 unstiffened, rolled steel Girders in all spans and they are simply supported (Photo 2). The Superstructure is founded on cast-in-place reinforced concrete Substructures.

The structure is oriented East. The NY-33 WB (Inbound) is below Span 2, NY-33 EB (Outbound) is below Span 3. The Begin approach is at the intersection with Linden Park.

2022 FLAG CONDITION:
Many of the Girders exhibit painted over pitting and section loss in the bearing area of the lower web within 2’ of the ends. Remaining thickness measurements were obtained by D-meter to calculate section losses as follows:

Girder G-10 @ End of Span 1 – Bearing area SL = 66% (34% in 2020); Range = 2’ (Photo 3)

See Bearing Area Section Loss Documentation included within this FBR.

There is no crippling or any other deformation of the member apparent in the end of the Girder.

Remaining thickness was measured during the 2020 Inspection by caliper or D-meter at a single location on each girder, above the bearing. There is no new or active corrosion occurring on Girder G-10. Changes in Section Loss are most likely due to small differences in location of measurements as well as precision of D-meter vs Caliper.

ADDITIONAL INFORMATION NOT INCLUDED IN FLAG:
Additionally, several other Girders exhibit similar, but less severe painted over pitting and section loss above the bearings as follows:

Span 1
Girder G-1 @ Begin – Bearing area SL = 35% (32% in 2020); Range = 2’
Girder G-2 @ Begin – Bearing area SL = 20% (16% in 2020); Range = 2’
Girder G-3 @ Begin – Bearing area SL = 21% (23% in 2020); Range = 2’
Girder G-4 @ Begin – Bearing area SL = 22% (17% in 2020); Range = 2’
Girder G-5 @ Begin – Bearing area SL = 30% (35% in 2020); Range = 2’
Girder G-9 @ Begin – Bearing area SL = 7% (<5% in 2020); Range = 2’
Girder G-11 @ Begin – Bearing area SL = 48% (37% in 2020); Range = 2’

Span 2
Girder G-1 @ Begin – Bearing area SL = 20% (30% in 2020); Range = 2’
Girder G-3 @ Begin – Bearing area SL = 15% (24% in 2020); Range = 2’
Girder G-4 @ Begin – Bearing area SL = 8% (9% in 2020); Range = 2’
Girder G-5 @ Begin – Bearing area SL = 30% (33% in 2020); Range = 2’
Girder G-6 @ Begin – Bearing area SL = 44% (40% in 2020); Range = 2’
Girder G-8 @ Begin – Bearing area SL = 36% (38% in 2020); Range = 2’
Girder G-9 @ Begin – Bearing area SL = 17% (<15% in 2020); Range = 2’
Girder G-10 @ Begin – Bearing area SL = 5% (<10% in 2020); Range = 2’
Girder G-11 @ Begin – Bearing area SL = 49% (36% in 2020); Range = 2’

See FBR for Yellow Flag #5B2267W023, issued on 9/20/2022, for bearing area section loss greater than 50% at Girder

Yellow Flag 5B2267W029 BIN 1022609 Flag Date: October 17, 2022

G-9 at End of Span 3. Section loss for the remaining Girder ends at End of Span 2, Begin and End of Span 3, and Begin of Span 4 are included as Additional Information in YF #5B2267W023.. (Section loss documentation is included in this FBR for reference.)

Girder end locations not noted above either exhibit no apparent section loss or have previously been repaired with a box section installed between the flanges on each side of the web, above the bearing (Photo 4).

Yellow Flag 5B2267W029 | BIN 1022609 | Flag Date: October 17, 2022

Flag Photographs

Photo Number: **1** Photo Filename: **1-General Elevation view (Left side looking Right).jpg**

Attachment Description: **General Elevation view (Left side looking Right)**

Yellow Flag 5B2267W029 | BIN 1022609 | Flag Date: October 17, 2022

Photo Number: **2**	Photo Filename: **2-Span 3 framing (Looking toward Begin Right).jpg**

Attachment Description: **Span 3 framing (Looking toward Begin Right)**

Yellow Flag 5B2267W029 | BIN 1022609 | Flag Date: October 17, 2022

Photo Number: **3**	Photo Filename: **3-Painted over pitting in lower webs of G-10 over PR-**

Attachment Description: **Painted over pitting in lower webs of G-10 over PR-1 (Looking Right)**

Yellow Flag 5B2267W029 | BIN 1022609 | Flag Date: October 17, 2022

Photo Number: **4** Photo Filename: **4-Typical box section repair (Right side of G-12**

Attachment Description: **Typical box section repair (Right side of G-12 shown over PR-1)**

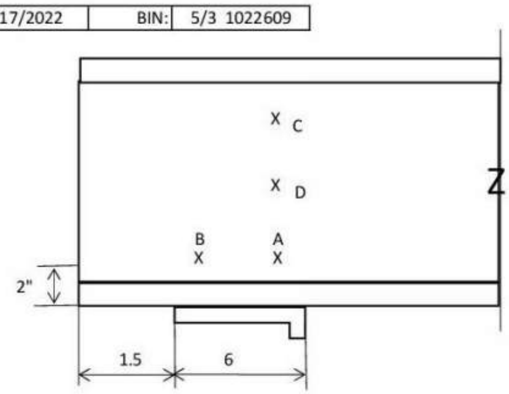
Yellow Flag 5B2267W029 BIN 1022609 Flag Date: October 17, 2022

Photo Number: **5** Photo Filename: **22-1022609-Bearing Area SL-Span 1.jpg**

NYSDOT BRIDGE INSPECTION REPORT

Girder End Section Loss Documentation

INSP. DATE:	10/17/2022	BIN:	5/3 1022609



GIRDER ENDS in SPAN 1

Note: All dimensions in inches.

Original Beam		33 WF 130					Tw =	0.580	d =		33.10
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
KMS/TL	G-1 @ End	0.409	0.350	0.000	0.380	35%					
GL/ATL	G-12 @ End	Repaired with box section									

Original Beam		30 WF 116					Tw =	0.564	d =		30.00
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
KMS/TL	G-2 @ End	0.403	0.495	0.000	0.449	20%					
GL/ATL	G-11 @ End	0.301	0.287	0.000	0.294	48%					

Original Beam		30 WF 132					Tw =	0.615	d =		30.30
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
	G-3 @ End	0.502	0.467	0.000	0.485	21%					
	G-4 @ End	0.495	0.459	0.000	0.477	22%					
KMS/TL	G-5 @ End	0.415	0.443	0.000	0.429	30%					
GL/ATL	G-8 @ End	Repaired with box section									
	G-9 @ End	0.586	0.554	0.000	0.570	7%					
	G-10 @ End	0.254	0.170	0.000	0.212	66%					

Original Beam		30 WF 108					Tw =	0.548	d =		29.82
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
KMS/TL	G-6 @ End	Repaired with box section									
GL/ATL	G-7 @ End	Repaired with box section									

*2020 readings shown. These locations were spot checked with calipers in 2022.

$Hole_L$ - Length of hole in Bearing Area
Thk_{BA} - Thickness in Bearing Area

$Hole_H$ - Height of hole in Shear Area
Thk_{SH} - Thickness in Shear Area

$$\text{Thickness}_{BA} = \left[\frac{(\text{"A"}+\text{"B"})}{2}\right][\text{bearing size-hole}]/\text{bearing size}]$$

$$\text{Thickness}_{SH} = \left[\frac{(\text{"A"}+\text{"C"}+\text{"D"})}{3}\right][\text{"d"-hole}]/\text{"d"}$$

$$\text{Section Loss \%} = \frac{\text{Thickness}_{original} - \text{Thickness}_{readings}}{\text{Thickness}_{original}} \times 100$$

Attachment Description: **Bearing Area Section Loss - Span 1**

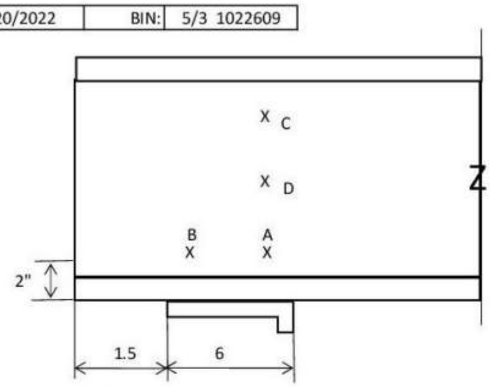
Yellow Flag 5B2267W029 BIN 1022609 Flag Date: October 17, 2022

Photo Number: **6** Photo Filename: **22-1022609-Bearing Area SL-Span 2.jpg**

NYSDOT BRIDGE INSPECTION REPORT

Girder End Section Loss Documentation

INSP. DATE:	9/20/2022	BIN:	5/3 1022609



GIRDER ENDS in SPAN 2

Note: All dimensions in inches.

Original Beam		33 WF 130					Tw =	0.580	d =	33.10	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
	G-1 @ Begin	0.456	0.471	0.000	0.464	20%					
	G-2 @ Begin	Repaired with box section									
	G-3 @ Begin	0.544	0.441	0.000	0.493	15%					
	G-4 @ Begin	0.539	0.526	0.000	0.533	8%					
	G-5 @ Begin	0.371	0.441	0.000	0.406	30%					
	G-6 @ Begin	0.346	0.304	0.000	0.325	44%					
	G-7 @ Begin	Repaired with box section									
	G-8 @ Begin	0.370	0.367	0.000	0.369	36%					
	G-9 @ Begin	0.463	0.504	0.000	0.484	17%					
	G-10 @ Begin	0.559	0.542	0.000	0.551	5%					
	G-11 @ Begin	0.286	0.304	0.000	0.295	49%					
KMS/TL	G-12 @ Begin	Repaired with box section									
GL/ATL	G-1 @ End	Repaired with box section									
	G-2 @ End	0.477	0.424	0.000	0.451	22%					
	G-3 @ End	0.517	0.430	0.000	0.474	18%					
	G-4 @ End	0.508	0.449	0.000	0.479	18%					
	G-5 @ End	0.422	0.388	0.000	0.405	30%					
	G-6 @ End	Repaired with box section									
	G-7 @ End	Repaired with box section									
	G-8 @ End	0.481	0.361	0.000	0.421	27%					
	G-9 @ End	0.526	0.535	0.000	0.531	9%					
	G-10 @ End	0.540	0.526	0.000	0.533	8%					
	G-11 @ End	0.520	0.530	0.000	0.525	9%					
	G-12 @ End	Repaired with box section									

$Hole_L$ - Length of hole in Bearing Area
Thk_{BA} - Thickness in Bearing Area
$Hole_H$ - Height of hole in Shear Area
Thk_{SH} - Thickness in Shear Area

$$\text{Thickness}_{BA} = \left[\frac{\text{"A"}+\text{"B"}}{2}\right][\text{bearing size-hole}]/\text{bearing size}]$$

$$\text{Thickness}_{SH} = \left[\frac{\text{"A"}+\text{"C"}+\text{"D"}}{3}\right][\text{"d"-hole}]/\text{"d"}$$

$$\text{Section Loss \%} = \frac{\text{Thickness}_{original} - \text{Thickness}_{readings}}{\text{Thickness}_{original}} \times 100$$

Attachment Description: **Bearing Area Section Loss - Span 2**

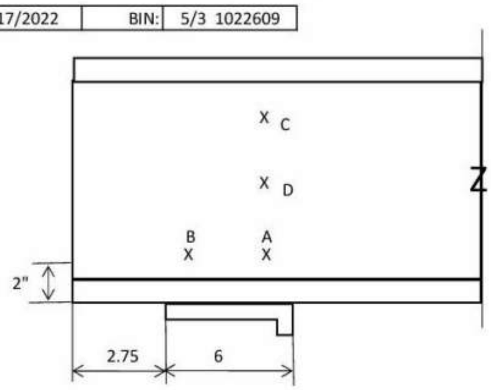
Yellow Flag 5B2267W029 BIN 1022609 Flag Date: October 17, 2022

Photo Number: **7** Photo Filename: **22-1022609-Bearing Area SL-Span 3.jpg**

NYSDOT BRIDGE INSPECTION REPORT

Girder End Section Loss Documentation

INSP. DATE:	10/17/2022	BIN:	5/3 1022609



GIRDER ENDS in SPAN 3

Note: All dimensions in inches.

Original Beam		33 WF 130					Tw =	0.580	d =	33.10	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
	G-1 @ Begin	0.381	0.302	0.000	0.342	41%					
	G-2 @ Begin	0.500	0.403	0.000	0.452	22%					
	G-3 @ Begin	0.459	0.502	0.000	0.481	17%					
	G-4 @ Begin	0.540	0.464	0.000	0.502	13%					
	G-5 @ Begin	0.457	0.408	0.000	0.433	25%					
	G-6 @ Begin	Repaired with box section									
	G-7 @ Begin	Repaired with box section									
	G-8 @ Begin	0.455	0.445	0.000	0.450	22%					
	G-9 @ Begin	0.460	0.386	0.000	0.423	27%					
	G-10 @ Begin	0.482	0.446	0.000	0.464	20%					
	G-11 @ Begin	0.581	0.530	0.000	0.556	4%					
KMS/TL	G-12 @ Begin	Repaired with box section									
GL/ATL	G-1 @ End	0.488	0.379	0.000	0.434	25%					
	G-2 @ End	0.355	0.337	0.000	0.346	40%					
	G-3 @ End	0.450	0.408	0.000	0.429	26%					
	G-4 @ End	0.483	0.467	0.000	0.475	18%					
	G-5 @ End	0.398	0.265	0.000	0.332	43%					
	G-6 @ End	0.412	0.324	0.000	0.368	37%					
	G-7 @ End	0.360	0.330	0.000	0.345	41%					
	G-8 @ End	0.409	0.365	0.000	0.387	33%					
	G-9 @ End	0.258	0.309	0.000	0.284	51%					
	G-10 @ End	0.369	0.341	0.000	0.355	39%					
	G-11 @ End	0.459	0.471	0.000	0.465	20%					
	G-12 @ End	Repaired with box section									

$Hole_L$ - Length of hole in Bearing Area
Thk_{BA} - Thickness in Bearing Area

$Hole_H$ - Height of hole in Shear Area
Thk_{SH} - Thickness in Shear Area

$$\text{Thickness}_{BA} = \left[\frac{(\text{"A"}+\text{"B"})}{2}\right][\text{bearing size-hole}]/\text{bearing size}$$

$$\text{Thickness}_{SH} = \left[\frac{(\text{"A"}+\text{"C"}+\text{"D"})}{3}\right][\text{"d"-hole}]/\text{"d"}$$

$$\text{Section Loss \%} = \frac{\text{Thickness}_{original} - \text{Thickness}_{readings}}{\text{Thickness}_{original}} \times 100$$

Attachment Description: **Bearing Area Section Loss - Span 3**

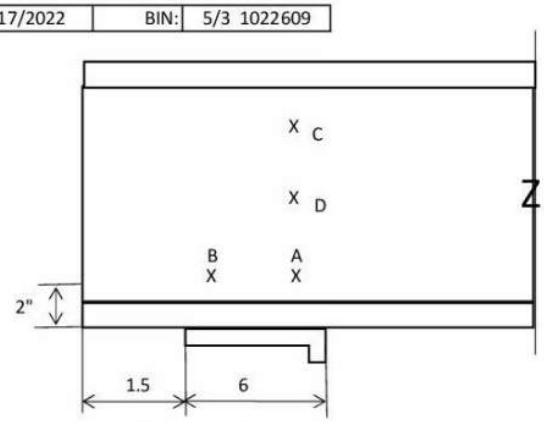
Yellow Flag 5B2267W029 BIN 1022609 Flag Date: October 17, 2022

Photo Number: **8** Photo Filename: **22-1022609-Bearing Area SL-Span 4.jpg**

NYSDOT BRIDGE INSPECTION REPORT

Girder End Section Loss Documentation

INSP. DATE:	10/17/2022	BIN:	5/3 1022609



GIRDER ENDS in SPAN 4

Note: All dimensions in inches.

Original Beam		33 WF 130					Tw =	0.580	d =	33.09	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
KMS/TL	G-1 @ Begin	0.466	0.385	0.000	0.426	27%					
GL/ATL	G-12 @ Begin	Repaired with box section									

Original Beam		27 WF 94					Tw =	0.490	d =	26.91	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
KMS/TL GL/ATL	G-2 @ Begin	Repaired with box section									
	G-6 @ Begin	Repaired with box section									
	G-7 @ Begin	Repaired with box section									
	G-11 @ Begin	Repaired with box section									

Original Beam		27 WF 102					Tw =	0.518	d =	27.07	
		Bearing Area (range of SL = 2')					Overall Shear Area				
By/Title	Location	A	B	$Hole_L$	Thk_{BA}	%S.L.	C	D	$Hole_H$	Thk_{SH}	%S.L.
KMS/TL GL/ATL	G-3 @ Begin	0.500	0.492	0.000	0.496	4%					
	G-4 @ Begin	0.433	0.457	0.000	0.445	14%					
	G-5 @ Begin	0.486	0.453	0.000	0.470	9%					
	G-8 @ Begin	0.322	0.335	0.000	0.329	37%					
	G-9 @ Begin	0.344	0.246	0.000	0.295	43%					
	G-10 @ Begin	0.369	0.360	0.000	0.365	30%					

$Hole_L$ - Length of hole in Bearing Area
Thk_{BA} - Thickness in Bearing Area

$Hole_H$ - Height of hole in Shear Area
Thk_{SH} - Thickness in Shear Area

$$\text{Thickness}_{BA} = \left[\frac{(\text{"A"}+\text{"B"})}{2}\right][\text{bearing size-hole}]/\text{bearing size}]$$

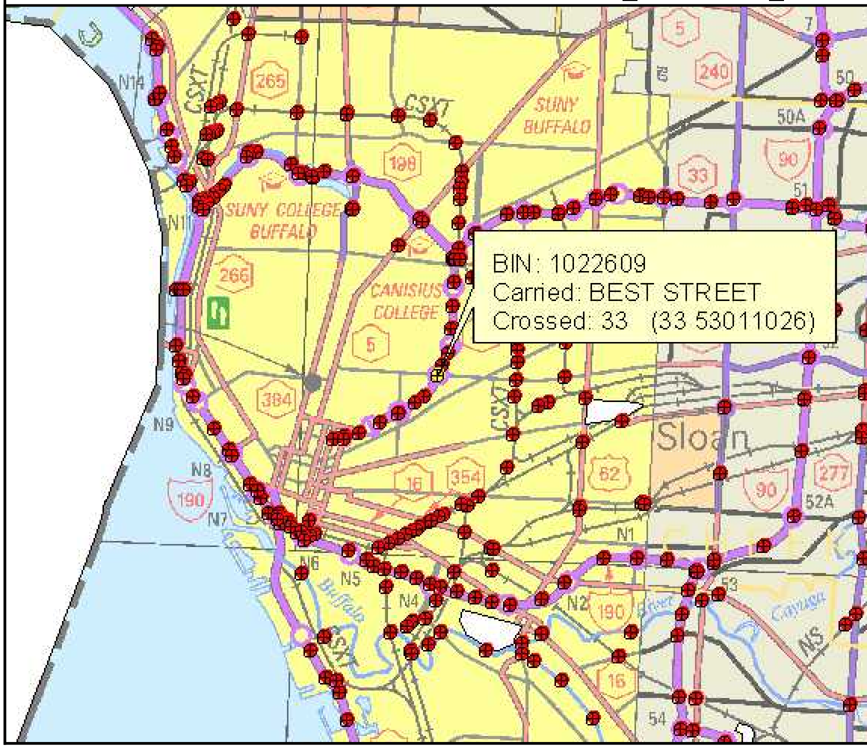
$$\text{Thickness}_{SH} = \left[\frac{(\text{"A"}+\text{"C"}+\text{"D"})}{3}\right][\text{"d"-hole}]/\text{"d"}$$

$$\text{Section Loss \%} = \frac{\text{Thickness}_{original} - \text{Thickness}_{readings}}{\text{Thickness}_{original}} \times 100$$

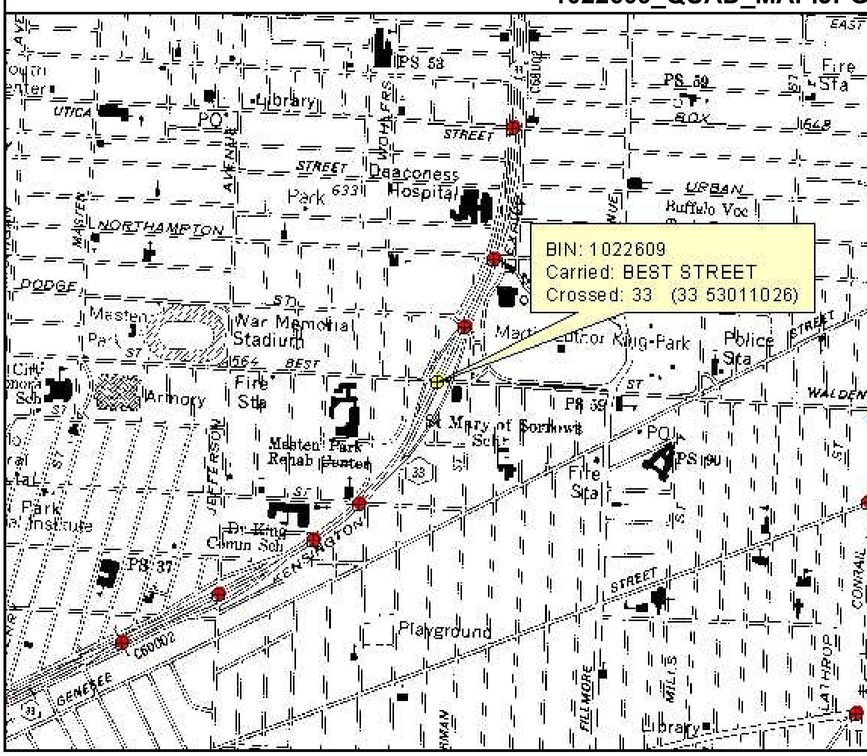
Attachment Description: **Bearing Area Section Loss - Span 4**

Standard Photographs

1022609_LOCATION_MAP.JPG



1022609_QUAD_MAP.JPG



AbutmentEnd.jpg

ApproachBegin.jpg

ApproachEnd.jpg

ElevationLeft.jpg

ElevationRight.jpg

Feature2CrossedLeft.jpg

Feature2CrossedRight.jpg

Feature3CrossedLeft.jpg

Feature3CrossedRight.jpg

FramingSpan3.jpg

Pier2.jpg

Wingwall.jpg

Appendix B

Bridge Work History Summary

Best St. Bridge (BIN 1022609) Work History

Year	Contract	Description of Work
2021	-	New Joint Headers & Seals Installed over Piers 1 and 3
2014	49341	General Bridge Repairs - Water line repairs in Bay 7
		Repair Damaged Railing Repair Railings
		Temp Supports Installed Below Water Pipe
		new asph wearing surface and appr pavement
		Repair Damaged Railing Repair Railings
		Replace sign structures
		Straighten, Repair or Replace Structural Members
2013	-	Straighten, Repair or Replace Structural Members
	-	New Lights on Lt. in Spans 1 & 3
2011	-	Repair Damaged Railing Repair Railings
2010	-	Waterproof Bridge Seats and Pier Caps
	-	Clean Pier Caps and Abutments
	-	Straighten, Repair or Replace Structural Members Install tube stiffeners on G6, Sp 3 & 4
	-	Repair Bearings (non-working bearings) Fix Welds Pier 2 - G5, G6, G8, Sp3
2009	D260954	Bridge Cleaning
2008	-	No Contract Provided - Clean, Free, and Repair Joint Mechanism In-house Maintenance
	D260644	Bridge Cleaning
2007	D260336	Bridge Cleaning
2006	D260013	Bridge Painting
2005	D259746	Bridge Cleaning Cleaning Bridge Superstructure & Substructure
2003	D259244	Waterproof Bridge Deck SEAL DECK
2001	D258747	Bridge Cleaning
2000	D258317	Bridge Cleaning
1999	D257936	Bridge Cleaning
		Waterproof Bridge Deck
1998	D257523	Bridge Cleaning
1997	D257087	Clean Superstructure
		Clean Pier Caps and Abutments
		Clean Bridge Deck
1996	D256740	Maintain and Repair Structural Bridge Deck - Clean Deck
		Clean Pier Caps and Abutments
		Clean Superstructure
1995	D256372	Clean Superstructure
		Cleaned Deck
		Clean Pier Caps and Abutments
1994	D254824	Clean Superstructure
		Clean Pier Caps and Abutments
		Clean Bridge Deck
1993	D254371	Clean Pier Caps and Abutments
		Clean Superstructure
		Cleaned Deck

Best St. Bridge (BIN 1022609) Work History

Year	Contract	Description of Work
1992	D254200	Clean and Paint Bridge Railing - Painted Fencing & Light Standards
		D254200 - Waterproof Bridge Seats and Pier Caps - Sealed Abutments
		D254200 - Clean and Paint Metal Surfaces - Epoxy Prime & Intermed. Urethane Finish Coat
	D254105	Clean Pier Caps and Abutments
		Clean Superstructure
		Clean Deck
1991	D253745	Replace Joint System
		Replace Wearing Surface (Asphalt Concrete)
1984	D250678	Clean and Paint Metal Surfaces - Bridge Painting Contract

Appendix C

Load Rating Summary

BIN 1022609
Best Street
over
Kensington Expressway

City of Buffalo
Erie County, New York

Level 1 Load Rating Calculations

November 2023

Prepared By: Chirag S Patel, PE
Checked By: Walter James Kaniecki, PE

Load Rating Summary

Rating Load	Controlling Mode	Inventory Rating	Operating Rating
Load and Resistance Factor Rating HL-93	Span 3 Girder G1 Original 33*WF*130 Web Local Yielding	0.10	0.13
Load Factor Rating HS Truck or Lane	Span 1 Girder G10 Original 30*WF*132 Unstiffened Bearing Area	HS 11.6 20.8 Tons	HS 19.3 34.8 Tons
Load Factor Rating H Truck or Lane	Span 1 Girder G10 Original 30*WF*132 Unstiffened Bearing Area	H 15.8 15.8 Tons	H 26.4 26.4 Tons

Recommended Load Posting 24 Tons

Approved By:
Walter James Kaniecki, PE
License Number 099619

STATE OF NEW YORK
WALTER JAMES KANIECKI
EXCELSIOR
099619
LICENSED PROFESSIONAL ENGINEER

LaBella
Powered by partnership.

Table of Contents

BIN 1022609
Level 1 Load Rating, November 2023

Load Rating Summary

Load and Resistance Factor Rating (LRFR), HL-93

Span 3 Girder G1 Begin
Original 33WF130 with measured Section Loss
Web Local Yielding, No Bearing Stiffeners
0.10 Inventory
0.13 Operating

Load Factor Rating (LFR), HS-Truck or Lane

Span 1 Girder G10 End
Original 30WF132 with measured Section Loss
Web End Shear, No Bearing Stiffeners
HS 11.6, 20.8 Tons Inventory
HS 19.3, 34.8 Tons Operating

Load Factor Rating (LFR), H-Truck or Lane

Span 1 Girder G10 End
Original 30WF132 with measured Section Loss
Web End Shear, No Bearing Stiffeners
H 15.8, 15.8 Tons Inventory
H 26.4, 26.4 Tons Operating

Load Posting Analysis per NYSDOT EI 20-026

Table 2 Redundancy Case 3, Condition Rating ≤ 3
→ Safe Load Capacity = 0.8 x H-Operating = 21 Tons
Table 1A Effective Length 34.5 ft → H-Equivalent 25 Tons
Table 3 Effective Load Posting 24 Tons

Fatigue Analysis (LRFR), HL-93

Spans 2 & 3 Girders G6 & G7, 12’-9” from Girder Ends
Original 33WF130 with End-Welded Cover Plate in Tension
Category E’ Detail
Estimated 14,539,045 cycles consumed out of 12,131,924 allowable, 0 years Remaining Life

Bridge Information

BIN	1022609
Date of Load Rating	November 2023
Political Unit	City of Buffalo
Feature Carried	Best Street
Feature Crossed	Kensington Expressway
Superstructure Type	Steel Multi-Girder
Number of Spans	4 Simple Spans 34’-6” & 57’-0” & 57’-0” & 27’-6”
Skew	21°-26’-07.5”
Total Length	183’-0”
Out-to-Out Width	92’-0”
Bridge Width Curb-to-Curb	72’-0”
Number of Actual Travel Lanes	6
Number of Lanes used in Rating	6
Type of Deck	Concrete
Type of Wearing Surface	Asphalt
Type of Sidewalks	Left Side: Concrete Right Side: Concrete
Barrier or Railing Type	Steel Railing
Year Built	1963
Rehabilitation Year(s)	
Design Live Load	HS 20-44
Existing Posted Load	Not Posted
Date of Most Recent Inspection	May 2023
List of Plans Included	Excerpts from: 1959 FAC 59-19 Original Plans

General Description

The Best Street Bridge over the Kensington Expressway was originally built in 1963. It is a multi-girder bridge with 4 consecutive simple spans. It is a twin structure with a longitudinal joint in the median, splitting the 12-girder structure into two 6-girder structures. Both halves together are classified as BIN 1022609. The girders are steel rolled shapes, some with welded bottom cover plates, and some made composite with the concrete deck. Each half carries a 36'-wide roadway with 3 lanes. Both the exterior side and the median have raised sidewalks with curb. The exterior sides have steel pedestrian railing and snow fence, and the median does not have railing.

The bridge orientation differs among the Record Plans, Inspection Reports, and the existing Level 2 Load Rating Model in AASHTOWare BrR.

Record Plans	Inspection Report & This Level 1 Load Rating	AASHTOWare BrR Level 2 Load Rating
West ← East	West → East	West → East

Analysis Description

This bridge was analyzed using both:

- Load and Resistance Factor Rating (LRFR)
- Load Factor Rating (LFR)

as described by the American Association of State Highway and Transportation Officials (AASHTO) and the New York State Department of Transportation (NYSDOT).

Three load definitions were evaluated:

- The HL-93 design load definition for LRFR
- The HS 20 truck or lane design load definition for LFR
- For specific ratings with LFR less than HS 20.0 Inventory, re-evaluate for the H 20 truck or lane load definition

This Level 1 Load Rating takes the existing Level 2 Load Rating Model built using AASHTOWare BrR. The input was verified and the most recent inspection information was incorporated into the model.
Due to specific concerns at the girder ends, select locations were manually checked for their capacity in the bearing region.

Modifications to the AASHTOWare BrR File

1. Traffic Information was missing. Added ADT, % Trucks, Directional Percent, and ADTT based on the Bridge Inventory Report.
   Total ADT 10889 w/ 6% Trucks.
   Let directionality be 55% [AASHTO LRFD C3.6.1.4.2] & 3 lanes available per direction.
   Assume current ADTT is reasonable for cycles over entire lifetime.

2. The bridge framing is split into structurally independent halves, eastbound and westbound. The model had only defined one half as a representative typical superstructure. The model was left with this definition style, and section loss was applied as the worse of the eastbound or corresponding westbound location.
   a. Span 1 G10 loss applied to Span 1 G3.
   b. Span 2 G8 & G11 loss applied to Span 2 G5 & G2 respectively.
   c. Span 3 G7, G9, G10, & G12 loss applied to Span 2 G6, G4, G3, & G1 respectively.

3. Updated section loss based on most recent LaBella Element-Specific Inspection.

4. The weight of utilities was not included in the model. Added uniform loads where appropriate.
   a. 8” Gas line – Standard 8” pipe with a unit weight of 28.580 lb/ft was used.
      For Members G1 & G2: 28.580 plf / 2 girders = 0.015 klf
   b. Members G5 & G6 had 0.05 k/ft of uniform load applied as DC1. That load was assumed to be load due to water line and was moved under DW.

5. Added Points of Interest for Cover Plate End fatigue detail.
   [AASHTO LRFD 6.6.1.2.3-1] Case 3.5, End Welded Cover Plates
   33 WF 130 t_f = 0.855” > 0.8” → Category E’

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway				
PROJECT NO.	2230860	SHEET		OF	
SUBJECT	BIN 1022609 Best				
		CALC. BY	WJK	DATE	11/16/2023
		CKD. BY	JJP	DATE	11/20/2023

<u>Modifications to the AASHTOWare BrR File</u>

- Application of Section Loss

Existing bearing area strengthening takes the form of tube-shapes inserted between flanges over the bearing.
This is not shear strengthening and web panel shear is still subject to the full-height section loss.
In both the 2022 General Inspection and the 2023 LaBella Element-Specific Inspection,
most locations only measured the bottom of the Web.
Let every location's full-height loss be based on 3 points,
every un-accounted for point treated as the original thickness (0% partial loss).

Not Measured	Bot. Measurement Only	
	tw = (A + D + C) / 3	Let C & D = tw original

— 2022 General Inspection

	Span 1		Span 2		Span 3		Span 4	
	Begin	End	Begin	End	Begin	End	Begin	End
G1		9.8%	7.1%		11.4%	5.3%	6.6%	
G2		9.5%		5.9%	4.6%	12.9%		
G3		6.1%	2.1%	3.6%	7.0%	7.5%	1.2%	
G4		6.5%	2.4%	4.1%	2.3%	5.6%	5.5%	
G5		10.8%	12.0%	9.1%	7.1%	10.5%	2.1%	
G6			13.4%			9.7%		
G7						12.6%		
G8			12.1%	5.7%	7.2%	9.8%	12.6%	
G9		1.6%	6.7%	3.1%	6.9%	18.5%	11.2%	
G10		19.6%	1.2%	2.3%	5.6%	12.1%	9.6%	
G11		15.5%	16.9%	3.4%	-0.1%	7.0%		
G12								

— 2023 Element-Specific Inspection

	Span 1		Span 2		Span 3		Span 4	
	Begin	End	Begin	End	Begin	End	Begin	End
G1		9.6%	7.9%		22.8%			
G2						12.2%		
G3								
G4								
G5		10.5%	28.6%	7.5%	7.8%			
G6		44.1%	13.1%	13.4%	19.7%	10.7%		
G7						14.9%		
G8			21.4%	7.6%			10.7%	
G9					7.3%		11.9%	
G10		52.6%				12.6%	9.8%	
G11			16.4%					
G12					11.7%			

— Symmetrical Reflected Application to AASHTOWare
Right-Side End reflected to Left-Side Begin to maintain acute/obtuse corner positioning

	Span 1		Span 2		Span 3		Span 4	
	Begin	End	Begin	End	Begin	End	Begin	End
G1	0.0%	9.8%	7.9%	0.0%	22.8%	11.7%	6.6%	0.0%
G2	15.5%	9.5%	3.4%	16.9%	7.0%	12.9%	0.0%	0.0%
G3	52.6%	6.1%	2.3%	3.6%	12.6%	7.5%	1.2%	9.8%
G4	1.6%	6.5%	3.1%	6.7%	18.5%	7.3%	5.5%	11.9%
G5	0.0%	10.8%	28.6%	21.4%	9.8%	10.5%	2.1%	12.6%
G6	0.0%	44.1%	13.4%	13.4%	19.7%	10.7%	0.0%	0.0%

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway				
PROJECT NO.	2230860	SHEET		OF	
SUBJECT	BIN 1022609 Best				
	CALC. BY	CSP	DATE	11/15/2023	
	CKD. BY	WJK	DATE	11/17/2023	

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W → E

AASHTOWare BrR Rating Output

- Load and Resistance Factor Rating, HL-93
  - Whole Structure

Structure	Member	Inventory rating factor	Operating rating factor	Inventory capacity (Ton)	Operating capacity (Ton)	Inventory location (ft)
Span 1	G1	1.554	2.014	55.929	72.501	17.25
Span 1	G2	0.883	1.144	31.777	41.192	17.25
Span 1	G3	0.726	0.941	26.134	33.878	0.00
Span 1	G4	1.067	1.383	38.412	49.793	17.25
Span 1	G5	1.052	1.364	37.889	49.115	17.25
Span 1	G6	0.862	1.117	31.029	40.222	17.25
Span 1	G7	Definition Linked to G6				
Span 1	G8	Definition Linked to G5				
Span 1	G9	Definition Linked to G4				
Span 1	G10	Definition Linked to G3				
Span 1	G11	Definition Linked to G2				
Span 1	G12	Definition Linked to G1				
Span 2	G1	1.521	1.977	54.750	71.175	28.50
Span 2	G2	1.319	1.715	47.480	61.724	28.50
Span 2	G3	1.424	1.846	51.261	66.449	28.50
Span 2	G4	1.424	1.846	51.261	66.449	28.50
Span 2	G5	1.336	1.732	48.108	62.362	0.00
Span 2	G6	1.262	1.641	45.436	59.066	28.50
Span 3	G1	1.521	1.977	54.750	71.175	28.50
Span 3	G2	1.319	1.715	47.480	61.724	28.50
Span 3	G3	1.424	1.846	51.261	66.449	28.50
Span 3	G4	1.424	1.846	51.261	66.449	28.50
Span 3	G5	1.405	1.822	50.590	65.579	28.50
Span 3	G6	1.262	1.641	45.436	59.066	28.50
Span 4	G1	2.284	2.960	82.206	106.564	13.75
Span 4	G2	0.906	1.174	32.600	42.259	13.75
Span 4	G3	1.018	1.320	36.664	47.528	13.75
Span 4	G4	1.018	1.320	36.664	47.527	13.75
Span 4	G5	1.007	1.305	36.242	46.980	13.75
Span 4	G6	1.027	1.331	36.957	47.908	13.75

  - Controlling Member, Corresponding Position Span 1 G10 End

Live Load Type	Inventory rating factor	Operating rating factor	Location (ft)	Location Span-(%)	Limit State
Truck + Lane	0.726	0.941	0.00	(0.0)	STRENGTH-I Steel Shear

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway				
PROJECT NO.	2230860	SHEET		OF	
SUBJECT	BIN 1022609 Best				
	CALC. BY	CSP	DATE	11/15/2023	
	CKD. BY	WJK	DATE	11/17/2023	

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model

AASHTOWare BrR Rating Output

- Load Factor Rating, HS20-44
  - Whole Structure

Structure	Member	Inventory rating factor	Operating rating factor	Inventory capacity (Ton)	Operating capacity (Ton)	Inventory location (ft)
Span 1	G1	6.057	10.116	218.068	364.173	13.80
Span 1	G2	0.934	1.560	33.624	56.152	13.80
Span 1	G3	0.679	1.134	24.448	40.827	0.00
Span 1	G4	1.138	1.900	40.964	68.409	20.70
Span 1	G5	1.126	1.880	40.520	67.669	20.70
Span 1	G6	1.970	3.289	70.904	118.409	20.70
Span 1	G7	Definition Linked to G6				
Span 1	G8	Definition Linked to G5				
Span 1	G9	Definition Linked to G4				
Span 1	G10	Definition Linked to G3				
Span 1	G11	Definition Linked to G2				
Span 1	G12	Definition Linked to G1				
Span 2	G1	5.277	8.812	189.965	317.241	28.50
Span 2	G2	1.323	2.209	47.628	79.539	28.50
Span 2	G3	1.468	2.452	52.847	88.255	28.50
Span 2	G4	1.468	2.452	52.847	88.255	28.50
Span 2	G5	1.449	2.420	52.163	87.113	28.50
Span 2	G6	2.532	4.229	91.164	152.244	28.50
Span 3	G1	5.277	8.812	189.965	317.241	28.50
Span 3	G2	1.323	2.209	47.628	79.539	28.50
Span 3	G3	1.468	2.452	52.847	88.255	28.50
Span 3	G4	1.468	2.452	52.847	88.255	28.50
Span 3	G5	1.449	2.420	52.163	87.113	28.50
Span 3	G6	2.532	4.229	91.164	152.244	28.50
Span 4	G1	9.526	15.909	342.944	572.716	11.00
Span 4	G2	1.054	1.759	37.928	63.340	11.00
Span 4	G3	1.192	1.990	42.906	71.653	11.00
Span 4	G4	1.192	1.990	42.907	71.654	16.50
Span 4	G5	1.181	1.972	42.506	70.986	16.50
Span 4	G6	2.507	4.186	90.239	150.698	16.50

  - Controlling Member, Corresponding Position Span 1 G10 End

Live Load Type	Inventory rating factor	Operating rating factor	Location (ft)	Location Span-(%)	Limit State
Axle Load	0.679	1.134	0.00	(0.0)	Design Shear - Steel

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway				
PROJECT NO.	2230860	SHEET		OF	
SUBJECT	BIN 1022609 Best				
		CALC. BY	CSP	DATE	11/15/2023
		CKD. BY	WJK	DATE	11/17/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model

AASHTOWare BrR Rating Output

- Load Factor Rating, H20-44
  - Whole Structure

Structure	Member	Inventory rating factor	Operating rating factor	Inventory capacity (Ton)	Operating capacity (Ton)	Inventory location (ft)
Span 1	G2	1.117	1.865	22.334	37.297	17.25
Span 1	G3	0.928	1.549	18.554	30.984	0.00

  - Controlling Member, Corresponding Position Span 1 G10 End

Live Load Type	Inventory rating factor	Operating rating factor	Location (ft)	Location Span-(%)	Limit State
Axle Load	0.928	1.549	0.00	(0.0)	Design Shear - Steel

- Fatigue Evaluation, HL-93 (Fatigue)
  - End Welded Cover Plates

		Infinite Life Check		Finite Life Analysis				
Member	Stress Range, Δf (ksi)	Infinite Life Range, Δf Max (ksi)	Threshold Stress, ΔF TH (ksi)	Finite Life Range, Δf eff (ksi)	Current Cycles, N1	Available Cycles, Nav	Remaining Life, Y REM (yrs)	Fatigue Serviceability Index, Q
2G1	2.83	4.93	2.60	2.25	14539045	44379707	125	0.55
2G2	3.41	5.94	2.60	2.71	14539045	25370291	45	0.35
2G3	3.43	5.98	2.60	2.73	14539045	24865300	43	0.34
2G6	4.36	7.59	2.60	3.47	14539045	12131924	0	0

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022609 Best		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	09/07/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W → E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 1

Begin

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	2.248		0.030	0.245	9.717	0.144	3.953		4.968	45.954	10.535	7.425
G2	2.007			0.465	12.264	0.144	3.953		4.968	71.349	49.431	34.735
G3	2.283			0.439	12.264	0.144	3.953		4.968	66.591	56.506	41.365
G4	2.283			0.414	12.264	0.144	3.953		4.968	66.591	56.506	41.365
G5	2.283			0.389	12.264	0.144	3.953		4.968	66.777	49.431	34.735
G6	1.861		0.045	0.182	10.660	0.144	3.953		4.968	50.763	21.524	15.181
G7	1.861	0.000	0.045	0.260	10.660	0.144	3.953	0.863	4.968	54.335	21.524	15.181
G8	2.283	0.000	0.000	0.494	12.264	0.144	3.953	0.863	4.968	71.130	49.431	34.735
G9	2.283	0.000	0.000	0.469	12.264	0.144	3.953		4.968	66.591	56.506	41.365
G10	2.283	0.000	0.000	0.444	12.264	0.144	3.953		4.968	66.591	56.506	41.365
G11	2.007	0.000	0.000	0.418	12.264	0.144	3.953	0.259	4.968	66.786	49.431	34.735
G12	2.248	0.000	0.030	0.196	9.717	0.144	3.953	0.259	4.968	43.259	10.535	7.425

End

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	2.248		0.030	0.196	9.717	0.144	3.953		4.968	43.259	10.535	7.425
G2	2.007			0.418	12.264	0.144	3.953		4.968	66.786	49.431	34.735
G3	2.283			0.444	12.264	0.144	3.953		4.968	66.591	56.506	41.365
G4	2.283			0.469	12.264	0.144	3.953		4.968	66.591	56.506	41.365
G5	2.283			0.494	12.264	0.144	3.953		4.968	71.130	49.431	34.735
G6	1.861		0.045	0.260	10.660	0.144	3.953		4.968	54.335	21.524	15.181
G7	1.861	0.000	0.045	0.182	10.660	0.144	3.953	0.863	4.968	50.763	21.524	15.181
G8	2.283	0.000	0.000	0.389	12.264	0.144	3.953	0.863	4.968	66.777	49.431	34.735
G9	2.283	0.000	0.000	0.414	12.264	0.144	3.953		4.968	66.591	56.506	41.365
G10	2.283	0.000	0.000	0.439	12.264	0.144	3.953		4.968	66.591	56.506	41.365
G11	2.007	0.000	0.000	0.465	12.264	0.144	3.953	0.259	4.968	71.349	49.431	34.735
G12	2.248	0.000	0.030	0.245	9.717	0.144	3.953	0.259	4.968	45.954	10.535	7.425

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022609 Best		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	09/07/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W → E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 2

Begin

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	4.036		0.050	0.333	16.054	0.238	6.531	[redacted]	8.208	55.106	11.849	8.703
G2	4.420			0.635	20.262	0.238	6.531	[redacted]	8.208	84.895	56.097	38.079
G3	4.562			0.605	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G4	4.562			0.574	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G5	4.562			0.543	20.262	0.238	6.531	[redacted]	8.208	81.017	56.097	40.629
G6	4.036		0.050	0.256	17.612	0.238	6.531	[redacted]	8.208	61.580	24.193	17.777
G7	4.036	0.000	0.050	0.333	17.612	0.238	6.531	1.425	8.208	64.644	24.193	17.777
G8	4.562	0.000	0.000	0.635	20.262	0.238	6.531	1.425	8.208	84.869	56.097	40.629
G9	4.562	0.000	0.000	0.604	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G10	4.562	0.000	0.000	0.573	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G11	4.420	0.000	0.000	0.543	20.262	0.238	6.531	0.428	8.208	81.019	56.097	38.079
G12	4.036	0.000	0.050	0.256	16.054	0.238	6.531	0.428	8.208	52.494	11.849	8.703

End

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	4.036		0.050	0.256	16.054	0.238	6.531	[redacted]	8.208	52.494	11.849	8.703
G2	4.420			0.543	20.262	0.238	6.531	[redacted]	8.208	81.019	56.097	38.079
G3	4.562			0.573	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G4	4.562			0.604	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G5	4.562			0.635	20.262	0.238	6.531	[redacted]	8.208	84.869	56.097	40.629
G6	4.036		0.050	0.333	17.612	0.238	6.531	[redacted]	8.208	64.644	24.193	17.777
G7	4.036	0.000	0.050	0.256	17.612	0.238	6.531	1.425	8.208	61.580	24.193	17.777
G8	4.562	0.000	0.000	0.543	20.262	0.238	6.531	1.425	8.208	81.017	56.097	40.629
G9	4.562	0.000	0.000	0.574	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G10	4.562	0.000	0.000	0.605	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G11	4.420	0.000	0.000	0.635	20.262	0.238	6.531	0.428	8.208	84.895	56.097	38.079
G12	4.036	0.000	0.050	0.333	16.054	0.238	6.531	0.428	8.208	55.106	11.849	8.703

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022609 Best		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	09/07/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W → E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 3

Begin

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	4.036		0.050	0.333	16.054	0.238	6.531	[redacted]	8.208	55.106	11.849	8.703
G2	4.420			0.635	20.262	0.238	6.531	[redacted]	8.208	84.895	56.097	38.079
G3	4.562			0.605	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G4	4.562			0.574	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G5	4.562			0.543	20.262	0.238	6.531	[redacted]	8.208	81.017	56.097	40.629
G6	4.036		0.050	0.256	17.612	0.238	6.531	[redacted]	8.208	61.580	24.193	17.777
G7	4.036	0.000	0.050	0.333	17.612	0.238	6.531	1.425	8.208	64.644	24.193	17.777
G8	4.562	0.000	0.000	0.635	20.262	0.238	6.531	1.425	8.208	84.869	56.097	40.629
G9	4.562	0.000	0.000	0.604	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G10	4.562	0.000	0.000	0.573	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G11	4.420	0.000	0.000	0.543	20.262	0.238	6.531	0.428	8.208	81.019	56.097	38.079
G12	4.036	0.000	0.050	0.256	16.054	0.238	6.531	0.428	8.208	52.494	11.849	8.703

End

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	4.036		0.050	0.256	16.054	0.238	6.531	[redacted]	8.208	52.494	11.849	8.703
G2	4.420			0.543	20.262	0.238	6.531	[redacted]	8.208	81.019	56.097	38.079
G3	4.562			0.573	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G4	4.562			0.604	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G5	4.562			0.635	20.262	0.238	6.531	[redacted]	8.208	84.869	56.097	40.629
G6	4.036		0.050	0.333	17.612	0.238	6.531	[redacted]	8.208	64.644	24.193	17.777
G7	4.036	0.000	0.050	0.256	17.612	0.238	6.531	1.425	8.208	61.580	24.193	17.777
G8	4.562	0.000	0.000	0.543	20.262	0.238	6.531	1.425	8.208	81.017	56.097	40.629
G9	4.562	0.000	0.000	0.574	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G10	4.562	0.000	0.000	0.605	20.262	0.238	6.531	[redacted]	8.208	80.936	62.646	46.493
G11	4.420	0.000	0.000	0.635	20.262	0.238	6.531	0.428	8.208	84.895	56.097	38.079
G12	4.036	0.000	0.050	0.333	16.054	0.238	6.531	0.428	8.208	55.106	11.849	8.703

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway				
PROJECT NO.	2230860	SHEET		OF	
SUBJECT	BIN 1022609 Best				
		CALC. BY	CSP	DATE	09/06/2023
		CKD. BY	WJK	DATE	09/07/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W → E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 4

Begin

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	1.792		0.024	0.266	7.745	0.115	3.151	[redacted]	3.960	40.859	9.565	7.191
G2	1.296			0.500	9.775	0.115	3.151	[redacted]	3.960	63.929	44.694	33.800
G3	1.404			0.468	9.775	0.115	3.151	[redacted]	3.960	59.478	51.884	40.571
G4	1.404			0.436	9.775	0.115	3.151	[redacted]	3.960	59.478	51.884	40.571
G5	1.404			0.404	9.775	0.115	3.151	[redacted]	3.960	59.645	44.694	33.800
G6	1.296		0.036	0.186	8.497	0.115	3.151	[redacted]	3.960	45.336	19.553	14.728
G7	1.296	0.000	0.036	0.256	8.497	0.115	3.151	0.688	3.960	48.587	19.553	14.728
G8	1.404	0.000	0.000	0.480	9.775	0.115	3.151	0.688	3.960	63.795	44.694	33.800
G9	1.404	0.000	0.000	0.448	9.775	0.115	3.151	[redacted]	3.960	59.478	51.884	40.571
G10	1.404	0.000	0.000	0.416	9.775	0.115	3.151	[redacted]	3.960	59.478	51.884	40.571
G11	1.296	0.000	0.000	0.384	9.775	0.115	3.151	0.206	3.960	59.651	44.694	33.800
G12	1.792	0.000	0.024	0.176	7.745	0.115	3.151	0.206	3.960	38.625	9.565	7.191

End

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	1.792		0.024	0.176	7.745	0.115	3.151	[redacted]	3.960	38.625	9.565	7.191
G2	1.296			0.384	9.775	0.115	3.151	[redacted]	3.960	59.651	44.694	33.800
G3	1.404			0.416	9.775	0.115	3.151	[redacted]	3.960	59.478	51.884	40.571
G4	1.404			0.448	9.775	0.115	3.151	[redacted]	3.960	59.478	51.884	40.571
G5	1.404			0.480	9.775	0.115	3.151	[redacted]	3.960	63.795	44.694	33.800
G6	1.296		0.036	0.256	8.497	0.115	3.151	[redacted]	3.960	48.587	19.553	14.728
G7	1.296	0.000	0.036	0.186	8.497	0.115	3.151	0.688	3.960	45.336	19.553	14.728
G8	1.404	0.000	0.000	0.404	9.775	0.115	3.151	0.688	3.960	59.645	44.694	33.800
G9	1.404	0.000	0.000	0.436	9.775	0.115	3.151	[redacted]	3.960	59.478	51.884	40.571
G10	1.404	0.000	0.000	0.468	9.775	0.115	3.151	[redacted]	3.960	59.478	51.884	40.571
G11	1.296	0.000	0.000	0.500	9.775	0.115	3.151	0.206	3.960	63.929	44.694	33.800
G12	1.792	0.000	0.024	0.266	7.745	0.115	3.151	0.206	3.960	40.859	9.565	7.191

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022609 Best		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	09/07/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W → E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 1

	Begin					End				
	DC	DW	HL-93	HS 20	H 20	DC	DW	HL-93	HS 20	H 20
G1	16.34	4.97	45.95	10.54	7.43	16.29	4.97	43.26	10.54	7.43
G2	18.83	4.97	71.35	49.43	34.74	18.79	4.97	66.79	49.43	34.74
G3	19.08	4.97	66.59	56.51	41.37	19.09	4.97	66.59	56.51	41.37
G4	19.06	4.97	66.59	56.51	41.37	19.11	4.97	66.59	56.51	41.37
G5	19.03	4.97	66.78	49.43	34.74	19.14	4.97	71.13	49.43	34.74
G6	16.85	4.97	50.76	21.52	15.18	16.92	4.97	54.34	21.52	15.18
G7	16.92	5.83	54.34	21.52	15.18	16.85	5.83	50.76	21.52	15.18
G8	19.14	5.83	71.13	49.43	34.74	19.03	5.83	66.78	49.43	34.74
G9	19.11	4.97	66.59	56.51	41.37	19.06	4.97	66.59	56.51	41.37
G10	19.09	4.97	66.59	56.51	41.37	19.08	4.97	66.59	56.51	41.37
G11	18.79	5.23	66.79	49.43	34.74	18.83	5.23	71.35	49.43	34.74
G12	16.29	5.23	43.26	10.54	7.43	16.34	5.23	45.95	10.54	7.43

  - Span 2

	Begin					End				
	DC	DW	HL-93	HS 20	H 20	DC	DW	HL-93	HS 20	H 20
G1	27.24	8.21	55.11	11.85	8.70	27.17	8.21	52.49	11.85	8.70
G2	32.09	8.21	84.90	56.10	38.08	31.99	8.21	81.02	56.10	38.08
G3	32.20	8.21	80.94	62.65	46.49	32.17	8.21	80.94	62.65	46.49
G4	32.17	8.21	80.94	62.65	46.49	32.20	8.21	80.94	62.65	46.49
G5	32.14	8.21	81.02	56.10	40.63	32.23	8.21	84.87	56.10	40.63
G6	28.72	8.21	61.58	24.19	17.78	28.80	8.21	64.64	24.19	17.78
G7	28.80	9.63	64.64	24.19	17.78	28.72	9.63	61.58	24.19	17.78
G8	32.23	9.63	84.87	56.10	40.63	32.14	9.63	81.02	56.10	40.63
G9	32.20	8.21	80.94	62.65	46.49	32.17	8.21	80.94	62.65	46.49
G10	32.17	8.21	80.94	62.65	46.49	32.20	8.21	80.94	62.65	46.49
G11	31.99	8.64	81.02	56.10	38.08	32.09	8.64	84.90	56.10	38.08
G12	27.17	8.64	52.49	11.85	8.70	27.24	8.64	55.11	11.85	8.70

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022609 Best		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	09/07/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W → E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 3

	Begin					End				
	DC	DW	HL-93	HS 20	H 20	DC	DW	HL-93	HS 20	H 20
G1	27.24	8.21	55.11	11.85	8.70	27.17	8.21	52.49	11.85	8.70
G2	32.09	8.21	84.90	56.10	38.08	31.99	8.21	81.02	56.10	38.08
G3	32.20	8.21	80.94	62.65	46.49	32.17	8.21	80.94	62.65	46.49
G4	32.17	8.21	80.94	62.65	46.49	32.20	8.21	80.94	62.65	46.49
G5	32.14	8.21	81.02	56.10	40.63	32.23	8.21	84.87	56.10	40.63
G6	28.72	8.21	61.58	24.19	17.78	28.80	8.21	64.64	24.19	17.78
G7	28.80	9.63	64.64	24.19	17.78	28.72	9.63	61.58	24.19	17.78
G8	32.23	9.63	84.87	56.10	40.63	32.14	9.63	81.02	56.10	40.63
G9	32.20	8.21	80.94	62.65	46.49	32.17	8.21	80.94	62.65	46.49
G10	32.17	8.21	80.94	62.65	46.49	32.20	8.21	80.94	62.65	46.49
G11	31.99	8.64	81.02	56.10	38.08	32.09	8.64	84.90	56.10	38.08
G12	27.17	8.64	52.49	11.85	8.70	27.24	8.64	55.11	11.85	8.70

  - Span 4

	Begin					End				
	DC	DW	HL-93	HS 20	H 20	DC	DW	HL-93	HS 20	H 20
G1	13.09	3.96	40.86	9.57	7.19	13.00	3.96	38.63	9.57	7.19
G2	14.84	3.96	63.93	44.69	33.80	14.72	3.96	59.65	44.69	33.80
G3	14.91	3.96	59.48	51.88	40.57	14.86	3.96	59.48	51.88	40.57
G4	14.88	3.96	59.48	51.88	40.57	14.89	3.96	59.48	51.88	40.57
G5	14.85	3.96	59.65	44.69	33.80	14.93	3.96	63.80	44.69	33.80
G6	13.28	3.96	45.34	19.55	14.73	13.35	3.96	48.59	19.55	14.73
G7	13.35	4.65	48.59	19.55	14.73	13.28	4.65	45.34	19.55	14.73
G8	14.93	4.65	63.80	44.69	33.80	14.85	4.65	59.65	44.69	33.80
G9	14.89	3.96	59.48	51.88	40.57	14.88	3.96	59.48	51.88	40.57
G10	14.86	3.96	59.48	51.88	40.57	14.91	3.96	59.48	51.88	40.57
G11	14.72	4.17	59.65	44.69	33.80	14.84	4.17	63.93	44.69	33.80
G12	13.00	4.17	38.63	9.57	7.19	13.09	4.17	40.86	9.57	7.19

PROJECT	Kensington Expressway	SHEET	OF
PROJECT NO.	2230860	CALC. BY CSP	DATE 09/06/23
SUBJECT	BIN 1022609 Best	SCALE	
CHECKED BY	WJK 11/06/23		

LaBella
Powered by partnership.

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G2 End
  -- Applied Load and LRFR Factors

Assumptions & Limitations of this Worksheet
Girder not Longitudinally Stiffened
Girder not Transversely Stiffened
No Bearing Stiffeners

Only one location with measured loss among all 30WF116's
Use 1G2 End

Applied End Shear $V_{DC} := 18.79\ \textbf{kip}$ $V_{DW} := 4.97\ \textbf{kip}$ $V_{HL} := 66.79\ \textbf{kip}$

Applied Reaction Force $R_{DC} := 18.79\ \textbf{kip}$ $R_{DW} := 4.97\ \textbf{kip}$ $R_{HL} := 66.79\ \textbf{kip}$

STRENGTH Load Factors $\gamma_{DC} := 1.25$ $\gamma_{DW} := 1.50$ $\gamma_{LL} := \begin{bmatrix} 1.75 \\ 1.35 \end{bmatrix}$

Condition Resistance Reduction Factor [AASHTO MBE 6A.4.2.3]
Smooth polynomial connecting (0%, 1.00), (5%, 0.98), & (20%, 0.90)
with tangent at minimum value of 0.90

$$\phi_c(Loss) := \text{if } Loss \le 0.2 \;\; \left\| \frac{190}{9} \cdot Loss^3 - \frac{107}{18} \cdot Loss^2 - \frac{7}{45} \cdot Loss + 1 \right. \;\; \text{else} \;\; \| 0.900$$

System Redundancy Resistance Reduction Factor [AASHTO MBE 6A.4.2.4]
Regular Multi-Girder System with > 3 Girders $\phi_s := 1$

Rating Check Resistance Reduction Factors
Shear $\phi_v := 1$ Yielding $\phi_b := 1$ Crippling $\phi_w := 0.8$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G2 End
  -- Girder Geometry

		Web	Flange
Steel Properties	$E := 29000\ ksi$	$F_{yw} := 33\ ksi$	$F_{yf} := 33\ ksi$

Web Thickness Measurements and "Weight"

t_{wm} (in)	t_{ww}
0.615	$1 \div 3$
0.615	$1 \div 3$
0.403	$1 \div 3$

Web Monolithic Steel Depth $d := 30.00\ in$
(Rolled Shape Section Depth, Plate Shape Web Depth)

Web Shear "Unbraced Depth" $D_v := 26.875\ in$
(Rolled Shape Web Flat Depth, Plate Shape Web Depth)

Bottom Flange + Fillet Height $k := 1.5625\ in$

Section Original Web Thickness $t_{wo} := 0.564\ in$

Weighted Average Web Thickness $t_w := t_{wm} \cdot t_{ww} = 0.544\ in$

Thickness at Bottom of Web $t_{wb} := t_{wm_2} = 0.403\ in$

Bottom Flange Thickness $t_{fb} := 0.850\ in$

Girder Extension Beyond Centerline of Bearing $ext := 5\ in$
(input zero for interior support)

Bearing Contact Length $N := 6\ in$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G2 End
  -- Web Panel Shear [AASHTO LRFD 6.10.9]

Shear-Buckling Coefficient (unstiffened) $k_v := 5$

Web Compactness

$$\lambda_v := \frac{D_v}{t_w} = 49.4 \qquad \lambda_{pv} := 1.12 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 74.2 \qquad \lambda_{rv} := 1.40 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 92.8$$

Shear-Buckling Ratio

$$C := \text{if } \lambda_v \le \lambda_{rv} \; \left\| \min\left(1, \frac{\lambda_{pv}}{\lambda_v}\right) \right. \; \text{else} \; \left\| 1.57 \cdot \frac{E \cdot k_v}{\lambda_v^{\ 2} \cdot F_{yw}} \right. = 1.000$$

Web Plastic Shear Strength

$$V_p := 0.58 \cdot F_{yw} \cdot d \cdot t_w = 312.6 \; \boldsymbol{kip}$$

Nominal Resistance

$$V_n := C \cdot V_p = 312.6 \; \boldsymbol{kip}$$

Section Loss based on Web Thickness

$$Loss_v := 1 - \frac{t_w}{t_{wo}} = 3.5\% \qquad \phi_{c.v} := \phi_c\left(Loss_v\right) = 0.988$$

$$V_r := \phi_{c.v} \cdot \phi_v \cdot V_n = 308.9 \; \boldsymbol{kip} \qquad RF_v := \frac{V_r - \gamma_{DC} \cdot V_{DC} - \gamma_{DW} \cdot V_{DW}}{\gamma_{LL} \cdot V_{HL}} = \begin{bmatrix} 2.38 \\ 3.08 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G2 End
  -- Web Local Yielding [AASHTO LRFD D6.5.2]

For Rating, Let Bearing Resistance be the sum of
Web Local Yielding and Stiffener Contact Stress

$$R_{ny} := \text{if } ext > d \vee ext = 0\ in \quad \begin{aligned} &\| (5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \\ &\text{else} \\ &\| (2.5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \end{aligned} = 131.7\ kip$$

Section Loss based on Thickness at Base of Web

$$Loss_b := 1 - \frac{t_{wb}}{t_{wo}} = 28.5\% \qquad \phi_{c.b} := \phi_c\left(Loss_b\right) = 0.900$$

$$R_{ry} := \phi_{c.b} \cdot \phi_s \cdot \phi_b \cdot R_{ny} = 118.6\ kip$$

$$RF_b := \frac{R_{ry} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.75 \\ 0.97 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G2 End
  -- Web Local Crippling [AASHTO LRFD D6.5.3]

$$R_{nw} := \text{if } ext > \frac{d}{2} \vee ext = 0\ in$$
$$\quad \left\| 0.8 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$
$$\text{else if } \frac{N}{d} \le 0.2$$
$$\quad \left\| 0.4 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$
$$\text{else}$$
$$\quad \left\| 0.4 \cdot t_w^{\ 2} \cdot \left(1 + \left(\frac{4\ N}{d} - 0.2\right) \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$
$$= 189.4\ kip$$

Section Loss based on Web Thickness

$$Loss_w := Loss_v = 3.5\% \qquad \phi_{c.w} := \phi_c\left(Loss_w\right) = 0.988$$

$$R_{rw} := \phi_{c.w} \cdot \phi_s \cdot \phi_w \cdot R_{nw} = 149.8\ kip$$

$$RF_w := \frac{R_{rw} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 1.02 \\ 1.32 \end{bmatrix}$$

Existing Girder End Section Resistance (LFR)

- Span 1 Girder G2 End
  -- Lack of Bearing Stiffeners on Rolled Shapes

[AASHTO 10.48.7] Redirects all Load Factor Design for Bearing Stiffeners back to the Allowable Stress part of the Code.
[10.33.2] Stiffeners only required where end shear exceeds 75% of allowable

Translate this to LFR by letting the Strength be 75% of the Web Panel Shear

-- Applied Load and LFR Factors

Applied End Shear $V_D := V_{DC} + V_{DW} = 23.76\ \textbf{kip}$ $V_{HS} := 49.43\ \textbf{kip}$

LFR Load Factors $A_1 := 1.3$ $A_2 := \begin{bmatrix} 2.17 \\ 1.3 \end{bmatrix}$

-- Web Panel Shear Strength

Math setup is the same as LRFR

$V_u := V_n = 312.6\ \textbf{kip}$ $75\% \cdot V_u = 234.4\ \textbf{kip}$

$$RF_{HS} := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_{HS}} = \begin{bmatrix} 1.90 \\ 3.17 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G5 End
  -- Applied Load and LRFR Factors

Assumptions & Limitations of this Worksheet
Girder not Longitudinally Stiffened
Girder not Transversely Stiffened
No Bearing Stiffeners

Test for Worst Combination of Loads & Loss among all 30WF132's
Use 1G5 End (2nd Greatest Loss)

Applied End Shear $V_{DC} := 19.14\ kip$ $V_{DW} := 4.97\ kip$ $V_{HL} := 71.13\ kip$

Applied Reaction Force $R_{DC} := 19.14\ kip$ $R_{DW} := 4.97\ kip$ $R_{HL} := 71.13\ kip$

STRENGTH Load Factors $\gamma_{DC} := 1.25$ $\gamma_{DW} := 1.50$ $\gamma_{LL} := \begin{bmatrix} 1.75 \\ 1.35 \end{bmatrix}$

Condition Resistance Reduction Factor [AASHTO MBE 6A.4.2.3]
Smooth polynomial connecting (0%, 1.00), (5%, 0.98), & (20%, 0.90)
with tangent at minimum value of 0.90

$$\phi_c(Loss) := \begin{cases} \dfrac{190}{9} \cdot Loss^3 - \dfrac{107}{18} \cdot Loss^2 - \dfrac{7}{45} \cdot Loss + 1 & \text{if } Loss \le 0.2 \\ 0.900 & \text{else} \end{cases}$$

System Redundancy Resistance Reduction Factor [AASHTO MBE 6A.4.2.4]
Regular Multi-Girder System with > 3 Girders $\phi_s := 1$

Rating Check Resistance Reduction Factors
Shear $\phi_v := 1$ Yielding $\phi_b := 1$ Crippling $\phi_w := 0.8$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G5 End
  -- Girder Geometry

Steel Properties $E:=29000\ ksi$ Web $F_{yw}:=33\ ksi$ Flange $F_{yf}:=33\ ksi$

Web Thickness Measurements and "Weight"

t_{wm} (in)	t_{ww}
0.615	$1 \div 3$
0.615	$1 \div 3$
0.408	$1 \div 3$

Web Monolithic Steel Depth $d:=30.30\ in$
(Rolled Shape Section Depth, Plate Shape Web Depth)

Web Shear "Unbraced Depth" $D_v:=26.875\ in$
(Rolled Shape Web Flat Depth, Plate Shape Web Depth)

Bottom Flange + Fillet Height $k:=1.6875\ in$

Section Original Web Thickness $t_{wo}:=0.615\ in$

Weighted Average Web Thickness $t_w:=t_{wm} \cdot t_{ww}=0.546\ in$

Thickness at Bottom of Web $t_{wb}:=t_{wm_2}=0.408\ in$

Bottom Flange Thickness $t_{fb}:=1.000\ in$

Girder Extension Beyond Centerline of Bearing $ext:=5\ in$
(input zero for interior support)

Bearing Contact Length $N:=6\ in$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G5 End
  -- Web Panel Shear [AASHTO LRFD 6.10.9]

Shear-Buckling Coefficient (unstiffened) $k_v := 5$

Web Compactness

$$\lambda_v := \frac{D_v}{t_w} = 49.2 \qquad \lambda_{pv} := 1.12 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 74.2 \qquad \lambda_{rv} := 1.40 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 92.8$$

Shear-Buckling Ratio

$$C := \begin{cases} \min\left(1, \dfrac{\lambda_{pv}}{\lambda_v}\right) & \text{if } \lambda_v \le \lambda_{rv} \\ 1.57 \cdot \dfrac{E \cdot k_v}{\lambda_v^{\ 2} \cdot F_{yw}} & \text{else} \end{cases} = 1.000$$

Web Plastic Shear Strength

$$V_p := 0.58 \cdot F_{yw} \cdot d \cdot t_w = 316.6 \ \textbf{kip}$$

Nominal Resistance

$$V_n := C \cdot V_p = 316.6 \ \textbf{kip}$$

Section Loss based on Web Thickness

$$Loss_v := 1 - \frac{t_w}{t_{wo}} = 11.2\% \qquad \phi_{c.v} := \phi_c\left(Loss_v\right) = 0.938$$

$$V_r := \phi_{c.v} \cdot \phi_v \cdot V_n = 296.9 \ \textbf{kip} \qquad RF_v := \frac{V_r - \gamma_{DC} \cdot V_{DC} - \gamma_{DW} \cdot V_{DW}}{\gamma_{LL} \cdot V_{HL}} = \begin{bmatrix} 2.13 \\ 2.76 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G5 End
  -- Web Local Yielding [AASHTO LRFD D6.5.2]

For Rating, Let Bearing Resistance be the sum of
Web Local Yielding and Stiffener Contact Stress

$$R_{ny} := \begin{array}{l} \text{if } ext > d \lor ext = 0 \; in \\ \quad \left\| (5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \right. \\ \text{else} \\ \quad \left\| (2.5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \right. \end{array} = 137.6 \; kip$$

Section Loss based on Thickness at Base of Web

$$Loss_b := 1 - \frac{t_{wb}}{t_{wo}} = 33.7\% \qquad \phi_{c.b} := \phi_c \left(Loss_b \right) = 0.900$$

$$R_{ry} := \phi_{c.b} \cdot \phi_s \cdot \phi_b \cdot R_{ny} = 123.8 \; kip$$

$$RF_b := \frac{R_{ry} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.74 \\ 0.96 \end{bmatrix}$$

PROJECT Kensington Expressway SHEET ____ OF ____

PROJECT NO. 2230860 CALC. BY CSP DATE 09/06/23

SUBJECT BIN 1022609 Best SCALE ____

CHECKED BY WJK 11/06/23

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G5 End
  -- Web Local Crippling [AASHTO LRFD D6.5.3]

$$R_{nw} := \text{if } ext > \frac{d}{2} \vee ext = 0\ in \quad \left\| 0.8 \cdot t_w^{\ 2}\left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$

$$\text{else if } \frac{N}{d} \le 0.2 \quad \left\| 0.4 \cdot t_w^{\ 2}\left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$

$$\text{else} \quad \left\| 0.4 \cdot t_w^{\ 2} \cdot \left(1 + \left(\frac{4\ N}{d} - 0.2\right) \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right. \quad = 195.7\ kip$$

Section Loss based on Web Thickness

$Loss_w := Loss_v = 11.2\%$ $\qquad \phi_{c.w} := \phi_c\left(Loss_w\right) = 0.938$

$$R_{rw} := \phi_{c.w} \cdot \phi_s \cdot \phi_w \cdot R_{nw} = 146.8\ kip$$

$$RF_w := \frac{R_{rw} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.93 \\ 1.20 \end{bmatrix}$$

Existing Girder End Section Resistance (LFR)

- Span 1 Girder G5 End
  -- Lack of Bearing Stiffeners on Rolled Shapes

[AASHTO 10.48.7] Redirects all Load Factor Design for Bearing Stiffeners back to the Allowable Stress part of the Code.
[10.33.2] Stiffeners only required where end shear exceeds 75% of allowable

Translate this to LFR by letting the Strength be 75% of the Web Panel Shear

-- Applied Load and LFR Factors

Applied End Shear $V_D := V_{DC} + V_{DW} = 24.11\ \mathbf{kip}$ $V_{HS} := 49.43\ \mathbf{kip}$

LFR Load Factors $A_1 := 1.3$ $A_2 := \begin{bmatrix} 2.17 \\ 1.3 \end{bmatrix}$

-- Web Panel Shear Strength

Math setup is the same as LRFR

$V_u := V_n = 316.6\ \mathbf{kip}$ $75\% \cdot V_u = 237.5\ \mathbf{kip}$

$$RF_{HS} := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_{HS}} = \begin{bmatrix} 1.92 \\ 3.21 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G10 End
  -- Applied Load and LRFR Factors

Assumptions & Limitations of this Worksheet
Girder not Longitudinally Stiffened
Girder not Transversely Stiffened
No Bearing Stiffeners

Test for Worst Combination of Loads & Loss among all 30WF132's
Use 1G10 End (Greatest Loss)

Applied End Shear $V_{DC} := 19.08\ kip$ $V_{DW} := 4.97\ kip$ $V_{HL} := 66.59\ kip$

Applied Reaction Force $R_{DC} := 19.08\ kip$ $R_{DW} := 4.97\ kip$ $R_{HL} := 66.59\ kip$

STRENGTH Load Factors $\gamma_{DC} := 1.25$ $\gamma_{DW} := 1.50$ $\gamma_{LL} := \begin{bmatrix} 1.75 \\ 1.35 \end{bmatrix}$

Condition Resistance Reduction Factor [AASHTO MBE 6A.4.2.3]
Smooth polynomial connecting (0%, 1.00), (5%, 0.98), & (20%, 0.90)
with tangent at minimum value of 0.90

$$\phi_c(Loss) := \text{if } Loss \le 0.2 \; \left\| \frac{190}{9} \cdot Loss^3 - \frac{107}{18} \cdot Loss^2 - \frac{7}{45} \cdot Loss + 1 \right. \; \text{else} \; \| \, 0.900$$

System Redundancy Resistance Reduction Factor [AASHTO MBE 6A.4.2.4]
Regular Multi-Girder System with > 3 Girders $\phi_s := 1$

Rating Check Resistance Reduction Factors
Shear $\phi_v := 1$ Yielding $\phi_b := 1$ Crippling $\phi_w := 0.8$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G10 End
  -- Girder Geometry

Steel Properties $E := 29000\ ksi$ Web $F_{yw} := 33\ ksi$ Flange $F_{yf} := 33\ ksi$

Web Thickness Measurements and "Weight"

t_{wm} (in)	t_{ww}
0.151	$1 \div 3$
0.555	$1 \div 3$
0.169	$1 \div 3$

Web Monolithic Steel Depth $d := 30.30\ in$
(Rolled Shape Section Depth, Plate Shape Web Depth)

Web Shear "Unbraced Depth" $D_v := 26.875\ in$
(Rolled Shape Web Flat Depth, Plate Shape Web Depth)

Bottom Flange + Fillet Height $k := 1.6875\ in$

Section Original Web Thickness $t_{wo} := 0.615\ in$

Weighted Average Web Thickness $t_w := t_{wm} \cdot t_{ww} = 0.292\ in$

Thickness at Bottom of Web $t_{wb} := t_{wm_2} = 0.169\ in$

Bottom Flange Thickness $t_{fb} := 1.000\ in$

Girder Extension Beyond Centerline of Bearing $ext := 5\ in$
(input zero for interior support)

Bearing Contact Length $N := 6\ in$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G10 End
  -- Web Panel Shear [AASHTO LRFD 6.10.9]

Shear-Buckling Coefficient (unstiffened) $k_v := 5$

Web Compactness

$$\lambda_v := \frac{D_v}{t_w} = 92.1 \qquad \lambda_{pv} := 1.12 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 74.2 \qquad \lambda_{rv} := 1.40 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 92.8$$

Shear-Buckling Ratio

$$C := \text{if } \lambda_v \le \lambda_{rv} \; \left\| \min\left(1, \frac{\lambda_{pv}}{\lambda_v}\right) \right. \text{ else } \left\| 1.57 \cdot \frac{E \cdot k_v}{\lambda_v^{\,2} \cdot F_{yw}} \right. = 0.806$$

Web Plastic Shear Strength

$$V_p := 0.58 \cdot F_{yw} \cdot d \cdot t_w = 169.1 \; \textbf{kip}$$

Nominal Resistance

$$V_n := C \cdot V_p = 136.3 \; \textbf{kip}$$

Section Loss based on Web Thickness

$$Loss_v := 1 - \frac{t_w}{t_{wo}} = 52.6\% \qquad \phi_{c.v} := \phi_c\left(Loss_v\right) = 0.900$$

$$V_r := \phi_{c.v} \cdot \phi_v \cdot V_n = 122.7 \; \textbf{kip} \qquad RF_v := \frac{V_r - \gamma_{DC} \cdot V_{DC} - \gamma_{DW} \cdot V_{DW}}{\gamma_{LL} \cdot V_{HL}} = \begin{bmatrix} 0.78 \\ 1.02 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G10 End
  -- Web Local Yielding [AASHTO LRFD D6.5.2]

For Rating, Let Bearing Resistance be the sum of
Web Local Yielding and Stiffener Contact Stress

$$R_{ny} := \text{if } ext > d \vee ext = 0\ in \; \left\| (5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \right. \; \text{else} \; \left\| (2.5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \right. = 57.0\ kip$$

Section Loss based on Thickness at Base of Web

$$Loss_b := 1 - \frac{t_{wb}}{t_{wo}} = 72.5\% \qquad \phi_{c.b} := \phi_c \left(Loss_b\right) = 0.900$$

$$R_{ry} := \phi_{c.b} \cdot \phi_s \cdot \phi_b \cdot R_{ny} = 51.3\ kip$$

$$RF_b := \frac{R_{ry} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.17 \\ 0.22 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G10 End
  -- Web Local Crippling [AASHTO LRFD D6.5.3]

$$R_{nw} := \text{if } ext > \frac{d}{2} \lor ext = 0\ in$$
$$\quad \left\| 0.8 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$
$$\text{else if } \frac{N}{d} \le 0.2$$
$$\quad \left\| 0.4 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$
$$\text{else}$$
$$\quad \left\| 0.4 \cdot t_w^{\ 2} \cdot \left(1 + \left(\frac{4\ N}{d} - 0.2\right) \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$
$$= 67.4\ kip$$

Section Loss based on Web Thickness

$$Loss_w := Loss_v = 52.6\% \qquad \phi_{c.w} := \phi_c\left(Loss_w\right) = 0.900$$

$$R_{rw} := \phi_{c.w} \cdot \phi_s \cdot \phi_w \cdot R_{nw} = 48.5\ kip$$

$$RF_w := \frac{R_{rw} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.15 \\ 0.19 \end{bmatrix}$$

PROJECT Kensington Expressway		SHEET ___	OF ___
PROJECT NO. 2230860	CALC. BY CSP	DATE 09/06/23	
SUBJECT BIN 1022609 Best		SCALE ___	
CHECKED BY WJK 11/06/23			

Existing Girder End Section Resistance (LFR)

- Span 1 Girder G10 End
  - -- Lack of Bearing Stiffeners on Rolled Shapes

[AASHTO 10.48.7] Redirects all Load Factor Design for Bearing Stiffeners back to the Allowable Stress part of the Code.
[10.33.2] Stiffeners only required where end shear exceeds 75% of allowable

Translate this to LFR by letting the Strength be 75% of the Web Panel Shear

-- Applied Load and LFR Factors

Applied End Shear $V_D := V_{DC} + V_{DW} = 24.05\ \textbf{kip}$ $V_{HS} := 56.51\ \textbf{kip}$

LFR Load Factors $A_1 := 1.3$ $A_2 := \begin{bmatrix} 2.17 \\ 1.3 \end{bmatrix}$

-- Web Panel Shear Strength

Math setup is the same as LRFR

$V_u := V_n = 136.3\ \textbf{kip}$ $75\% \cdot V_u = 102.2\ \textbf{kip}$

$$RF_{HS} := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_{HS}} = \begin{bmatrix} 0.58 \\ 0.97 \end{bmatrix}$$

For Inventory < HS 20, check H-Rating

$V_H := 41.37\ \textbf{kip}$

$$RF_H := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_H} = \begin{bmatrix} 0.79 \\ 1.32 \end{bmatrix}$$

[EI 20-026] For Regular Girders in Poor Condition $K := 0.8$

$SLC := K \cdot RF_{H_1} \cdot 20\ \textbf{ton} = 21\ \textbf{ton}$

For Length 34.5', Posting Threshold H25, Posting Required

Existing Girder End Section Resistance (LRFR)

- 33WF130 Mixed Properties
  - -- Applied Load and LRFR Factors

Assumptions & Limitations of this Worksheet
Girder not Longitudinally Stiffened
Girder not Transversely Stiffened
No Bearing Stiffeners

Mix Properties to envelope over worst potential rating:
Use Loads from 2G11 End, except 2G3/G4 for HS20 (Greatest Reaction)
Use Loss from 3G1 Begin (Greatest Loss)

Applied End Shear $V_{DC} := 32.09\ kip$ $V_{DW} := 8.64\ kip$ $V_{HL} := 84.90\ kip$

Applied Reaction Force $R_{DC} := 32.09\ kip$ $R_{DW} := 8.64\ kip$ $R_{HL} := 84.90\ kip$

STRENGTH Load Factors $\gamma_{DC} := 1.25$ $\gamma_{DW} := 1.50$ $\gamma_{LL} := \begin{bmatrix} 1.75 \\ 1.35 \end{bmatrix}$

Condition Resistance Reduction Factor [AASHTO MBE 6A.4.2.3]
Smooth polynomial connecting (0%, 1.00), (5%, 0.98), & (20%, 0.90)
with tangent at minimum value of 0.90

$$\phi_c(Loss) := \begin{cases} \dfrac{190}{9} \cdot Loss^3 - \dfrac{107}{18} \cdot Loss^2 - \dfrac{7}{45} \cdot Loss + 1 & \text{if } Loss \le 0.2 \\ 0.900 & \text{else} \end{cases}$$

System Redundancy Resistance Reduction Factor [AASHTO MBE 6A.4.2.4]
Regular Multi-Girder System with > 3 Girders $\phi_s := 1$

Rating Check Resistance Reduction Factors
Shear $\phi_v := 1$ Yielding $\phi_b := 1$ Crippling $\phi_w := 0.8$

PROJECT	Kensington Expressway	SHEET	OF
PROJECT NO.	2230860	CALC. BY CSP	DATE 09/06/23
SUBJECT	BIN 1022609 Best	SCALE	
CHECKED BY	WJK 11/06/23		

Existing Girder End Section Resistance (LRFR)

- 33WF130 Mixed Properties
  -- Girder Geometry

Steel Properties $E:=29000\ ksi$ Web $F_{yw}:=33\ ksi$ Flange $F_{yf}:=33\ ksi$

Web Thickness Measurements and "Weight"

t_{wm} (in)	t_{ww}
0.580	$1 \div 3$
0.580	$1 \div 3$
0.183	$1 \div 6$
0.266	$1 \div 6$

Web Monolithic Steel Depth $d:=33.10\ in$
(Rolled Shape Section Depth, Plate Shape Web Depth)

Web Shear "Unbraced Depth" $D_v:=29.75\ in$
(Rolled Shape Web Flat Depth, Plate Shape Web Depth)

Bottom Flange + Fillet Height $k:=1.6875\ in$

Section Original Web Thickness $t_{wo}:=0.580\ in$

Weighted Average Web Thickness $t_w:=t_{wm} \cdot t_{ww}=0.462\ in$

Thickness at Bottom of Web $t_{wb}:=\left(t_{wm_2}+t_{wm_3}\right) \div 2=0.225\ in$

Bottom Flange Thickness $t_{fb}:=0.855\ in$

Girder Extension Beyond Centerline of Bearing $ext:=5\ in$
(input zero for interior support)

Bearing Contact Length $N:=6\ in$

PROJECT Kensington Expressway SHEET ___ OF ___

PROJECT NO. 2230860 CALC. BY CSP DATE 09/06/23

SUBJECT BIN 1022609 Best SCALE ___

CHECKED BY WJK 11/06/23

Existing Girder End Section Resistance (LRFR)

- 33WF130 Mixed Properties
  - -- Web Panel Shear [AASHTO LRFD 6.10.9]

Shear-Buckling Coefficient (unstiffened) $k_v := 5$

Web Compactness

$$\lambda_v := \frac{D_v}{t_w} = 64.5 \qquad \lambda_{pv} := 1.12 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 74.2 \qquad \lambda_{rv} := 1.40 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 92.8$$

Shear-Buckling Ratio

$$C := \begin{cases} \min\left(1, \dfrac{\lambda_{pv}}{\lambda_v}\right) & \text{if } \lambda_v \le \lambda_{rv} \\ 1.57 \cdot \dfrac{E \cdot k_v}{\lambda_v^{\ 2} \cdot F_{yw}} & \text{else} \end{cases} = 1.000$$

Web Plastic Shear Strength

$$V_p := 0.58 \cdot F_{yw} \cdot d \cdot t_w = 292.4 \ \textit{kip}$$

Nominal Resistance

$$V_n := C \cdot V_p = 292.4 \ \textit{kip}$$

Section Loss based on Web Thickness

$$Loss_v := 1 - \frac{t_w}{t_{wo}} = 20.4\% \qquad \phi_{c.v} := \phi_c\left(Loss_v\right) = 0.900$$

$$V_r := \phi_{c.v} \cdot \phi_v \cdot V_n = 263.1 \ \textit{kip} \qquad RF_v := \frac{V_r - \gamma_{DC} \cdot V_{DC} - \gamma_{DW} \cdot V_{DW}}{\gamma_{LL} \cdot V_{HL}} = \begin{bmatrix} 1.41 \\ 1.83 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- 33WF130 Mixed Properties
  - -- Web Local Yielding [AASHTO LRFD D6.5.2]

For Rating, Let Bearing Resistance be the sum of
Web Local Yielding and Stiffener Contact Stress

$$R_{ny} := \text{if } ext > d \vee ext = 0\ in \;\; \| \left(5 \cdot k + N\right) \cdot F_{yw} \cdot t_{wb} \;\; \text{else} \;\; \| \left(2.5 \cdot k + N\right) \cdot F_{yw} \cdot t_{wb} = 75.7\ kip$$

Section Loss based on Thickness at Base of Web

$$Loss_b := 1 - \frac{t_{wb}}{t_{wo}} = 61.3\% \qquad \phi_{c.b} := \phi_c\left(Loss_b\right) = 0.900$$

$$R_{ry} := \phi_{c.b} \cdot \phi_s \cdot \phi_b \cdot R_{ny} = 68.1\ kip$$

$$RF_b := \frac{R_{ry} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.10 \\ 0.13 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- 33WF130 Mixed Properties
  -- Web Local Crippling [AASHTO LRFD D6.5.3]

$$R_{nw} := \text{if } ext > \frac{d}{2} \vee ext = 0 \; in = 137.9 \; kip$$

$$\quad 0.8 \cdot t_w^{\;2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$

$$\text{else if } \frac{N}{d} \le 0.2$$

$$\quad 0.4 \cdot t_w^{\;2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$

$$\text{else}$$

$$\quad 0.4 \cdot t_w^{\;2} \cdot \left(1 + \left(\frac{4\,N}{d} - 0.2\right) \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$

Section Loss based on Web Thickness

$$Loss_w := Loss_v = 20.4\% \qquad \phi_{c.w} := \phi_c\left(Loss_w\right) = 0.900$$

$$R_{rw} := \phi_{c.w} \cdot \phi_s \cdot \phi_w \cdot R_{nw} = 99.3 \; kip$$

$$RF_w := \frac{R_{rw} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.31 \\ 0.40 \end{bmatrix}$$

Existing Girder End Section Resistance (LFR)

- 33WF130 Mixed Properties
  - Lack of Bearing Stiffeners on Rolled Shapes

[AASHTO 10.48.7] Redirects all Load Factor Design for Bearing Stiffeners back to the Allowable Stress part of the Code.
[10.33.2] Stiffeners only required where end shear exceeds 75% of allowable

Translate this to LFR by letting the Strength be 75% of the Web Panel Shear

-- Applied Load and LFR Factors

Applied End Shear $V_D := V_{DC} + V_{DW} = 40.73\ \textbf{kip}$ $V_{HS} := 62.65\ \textbf{kip}$

LFR Load Factors $A_1 := 1.3$ $A_2 := \begin{bmatrix} 2.17 \\ 1.3 \end{bmatrix}$

-- Web Panel Shear Strength

Math setup is the same as LRFR

$V_u := V_n = 292.4\ \textbf{kip}$ $75\% \cdot V_u = 219.3\ \textbf{kip}$

$$RF_{HS} := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_{HS}} = \begin{bmatrix} 1.22 \\ 2.04 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 4 Girder G8 Begin
  - -- Applied Load and LRFR Factors

Assumptions & Limitations of this Worksheet
Girder not Longitudinally Stiffened
Girder not Transversely Stiffened
No Bearing Stiffeners

Choose Representative Values among all 27WF102's
Use Loads from 4G8 Begin (Greatest Reaction)
Use Loss from 4G8 Begin (Greatest Loss)

Applied End Shear $V_{DC} := 14.93\ kip$ $V_{DW} := 4.65\ kip$ $V_{HL} := 63.80\ kip$

Applied Reaction Force $R_{DC} := 14.93\ kip$ $R_{DW} := 4.65\ kip$ $R_{HL} := 63.80\ kip$

STRENGTH Load Factors $\gamma_{DC} := 1.25$ $\gamma_{DW} := 1.50$ $\gamma_{LL} := \begin{bmatrix} 1.75 \\ 1.35 \end{bmatrix}$

Condition Resistance Reduction Factor [AASHTO MBE 6A.4.2.3]
Smooth polynomial connecting (0%, 1.00), (5%, 0.98), & (20%, 0.90)
with tangent at minimum value of 0.90

$$\phi_c(Loss) := \text{if } Loss \le 0.2 \;\; \left\| \frac{190}{9} \cdot Loss^3 - \frac{107}{18} \cdot Loss^2 - \frac{7}{45} \cdot Loss + 1 \right. \;\; \text{else} \;\; \| 0.900$$

System Redundancy Resistance Reduction Factor [AASHTO MBE 6A.4.2.4]
Regular Multi-Girder System with > 3 Girders $\phi_s := 1$

Rating Check Resistance Reduction Factors
Shear $\phi_v := 1$ Yielding $\phi_b := 1$ Crippling $\phi_w := 0.8$

PROJECT	Kensington Expressway	SHEET		OF	
PROJECT NO.	2230860	CALC. BY	CSP	DATE	09/06/23
SUBJECT	BIN 1022609 Best	SCALE			
CHECKED BY	WJK 11/06/23				

LaBella
Powered by partnership.

Existing Girder End Section Resistance (LRFR)

- Span 4 Girder G8 Begin
  - -- Girder Geometry

Steel Properties $E := 29000\ ksi$ Web $F_{yw} := 33\ ksi$ Flange $F_{yf} := 33\ ksi$

Web Thickness Measurements and "Weight"

t_{wm} (in)	t_{ww}
0.518	$1 \div 3$
0.518	$1 \div 3$
0.291	$1 \div 3$

To get the worst combination,SL from G8 @ x=3 was used.

Web Monolithic Steel Depth $d := 27.07\ in$
(Rolled Shape Section Depth, Plate Shape Web Depth)

Web Shear "Unbraced Depth" $D_v := 24\ in$
(Rolled Shape Web Flat Depth, Plate Shape Web Depth)

Bottom Flange + Fillet Height $k := 1.5625\ in$

Section Original Web Thickness $t_{wo} := 0.518\ in$

Weighted Average Web Thickness $t_w := t_{wm} \cdot t_{ww} = 0.442\ in$

Thickness at Bottom of Web $t_{wb} := t_{wm_2} = 0.291\ in$

Bottom Flange Thickness $t_{fb} := 0.827\ in$

Girder Extension Beyond Centerline of Bearing $ext := 5\ in$
(input zero for interior support)

Bearing Contact Length $N := 6\ in$

Existing Girder End Section Resistance (LRFR)

- Span 4 Girder G8 Begin
  -- Web Panel Shear [AASHTO LRFD 6.10.9]

Shear-Buckling Coefficient (unstiffened) $k_v := 5$

Web Compactness

$$\lambda_v := \frac{D_v}{t_w} = 54.3 \qquad \lambda_{pv} := 1.12 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 74.2 \qquad \lambda_{rv} := 1.40 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 92.8$$

Shear-Buckling Ratio

$$C := \text{if } \lambda_v \le \lambda_{rv} \;\; \left\| min\left(1, \frac{\lambda_{pv}}{\lambda_v}\right) \right. \;\; \text{else} \;\; \left\| 1.57 \cdot \frac{E \cdot k_v}{{\lambda_v}^2 \cdot F_{yw}} \right. = 1.000$$

Web Plastic Shear Strength

$$V_p := 0.58 \cdot F_{yw} \cdot d \cdot t_w = 229.2 \; \textbf{\textit{kip}}$$

Nominal Resistance

$$V_n := C \cdot V_p = 229.2 \; \textbf{\textit{kip}}$$

Section Loss based on Web Thickness

$$Loss_v := 1 - \frac{t_w}{t_{wo}} = 14.6\% \qquad \phi_{c.v} := \phi_c\left(Loss_v\right) = 0.916$$

$$V_r := \phi_{c.v} \cdot \phi_v \cdot V_n = 210.0 \; \textbf{\textit{kip}} \qquad RF_v := \frac{V_r - \gamma_{DC} \cdot V_{DC} - \gamma_{DW} \cdot V_{DW}}{\gamma_{LL} \cdot V_{HL}} = \begin{bmatrix} 1.65 \\ 2.14 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 4 Girder G8 Begin
  - -- Web Local Yielding [AASHTO LRFD D6.5.2]

For Rating, Let Bearing Resistance be the sum of
Web Local Yielding and Stiffener Contact Stress

$$R_{ny} := \text{if } ext > d \vee ext = 0 \textit{ in} \;\; \| (5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \;\; \text{else} \;\; \| (2.5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \quad = 95.1 \; \textit{kip}$$

Section Loss based on Thickness at Base of Web

$$Loss_b := 1 - \frac{t_{wb}}{t_{wo}} = 43.8\% \qquad \phi_{c.b} := \phi_c \left(Loss_b\right) = 0.900$$

$$R_{ry} := \phi_{c.b} \cdot \phi_s \cdot \phi_b \cdot R_{ny} = 85.6 \; \textit{kip}$$

$$RF_b := \frac{R_{ry} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.54 \\ 0.70 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 4 Girder G8 Begin
  -- Web Local Crippling [AASHTO LRFD D6.5.3]

$$R_{nw} := \text{if } ext > \frac{d}{2} \vee ext = 0\ in$$

$$\quad 0.8 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$

$$\text{else if } \frac{N}{d} \le 0.2$$

$$\quad 0.4 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$

$$\text{else}$$

$$\quad 0.4 \cdot t_w^{\ 2} \cdot \left(1 + \left(\frac{4\ N}{d} - 0.2\right) \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$

$$= 132.8\ kip$$

Section Loss based on Web Thickness

$$Loss_w := Loss_v = 14.6\% \qquad \phi_{c.w} := \phi_c\left(Loss_w\right) = 0.916$$

$$R_{rw} := \phi_{c.w} \cdot \phi_s \cdot \phi_w \cdot R_{nw} = 97.3\ kip$$

$$RF_w := \frac{R_{rw} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.64 \\ 0.83 \end{bmatrix}$$

PROJECT	Kensington Expressway	SHEET	OF
PROJECT NO.	2230860	CALC. BY CSP	DATE 09/06/23
SUBJECT	BIN 1022609 Best	SCALE	
CHECKED BY	WJK 11/06/23		

Existing Girder End Section Resistance (LFR)

- Span 4 Girder G8 Begin
  - -- Lack of Bearing Stiffeners on Rolled Shapes

[AASHTO 10.48.7] Redirects all Load Factor Design for Bearing Stiffeners back to the Allowable Stress part of the Code.
[10.33.2] Stiffeners only required where end shear exceeds 75% of allowable

Translate this to LFR by letting the Strength be 75% of the Web Panel Shear

-- Applied Load and LFR Factors

Applied End Shear $V_D := V_{DC} + V_{DW} = 19.58\ \boldsymbol{kip}$ $V_{HS} := 44.69\ \boldsymbol{kip}$

LFR Load Factors $A_1 := 1.3$ $A_2 := \begin{bmatrix} 2.17 \\ 1.3 \end{bmatrix}$

-- Web Panel Shear Strength

Math setup is the same as LRFR

$V_u := V_n = 229.2\ \boldsymbol{kip}$ $75\% \cdot V_u = 171.9\ \boldsymbol{kip}$

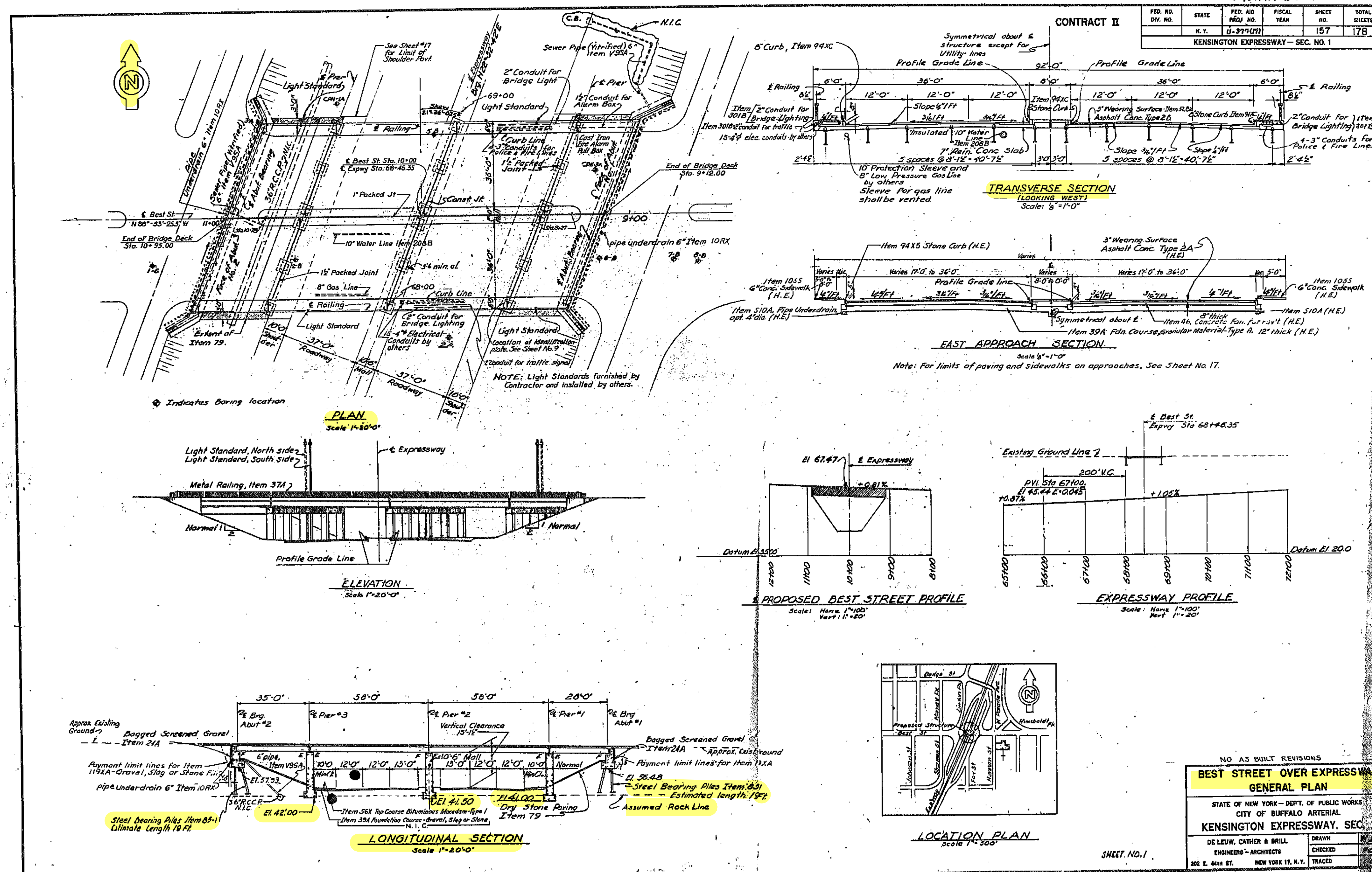
$$RF_{HS} := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_{HS}} = \begin{bmatrix} 1.51 \\ 2.52 \end{bmatrix}$$

F.A.C. 59-1

CONTRACT II

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-377(17)		157	178

KENSINGTON EXPRESSWAY – SEC. NO. 1



NO AS BUILT REVISIONS

BEST STREET OVER EXPRESSWAY
GENERAL PLAN

STATE OF NEW YORK – DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC

DE LEUW, CATHER & BRILL
ENGINEERS – ARCHITECTS
200 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN
CHECKED
TRACED

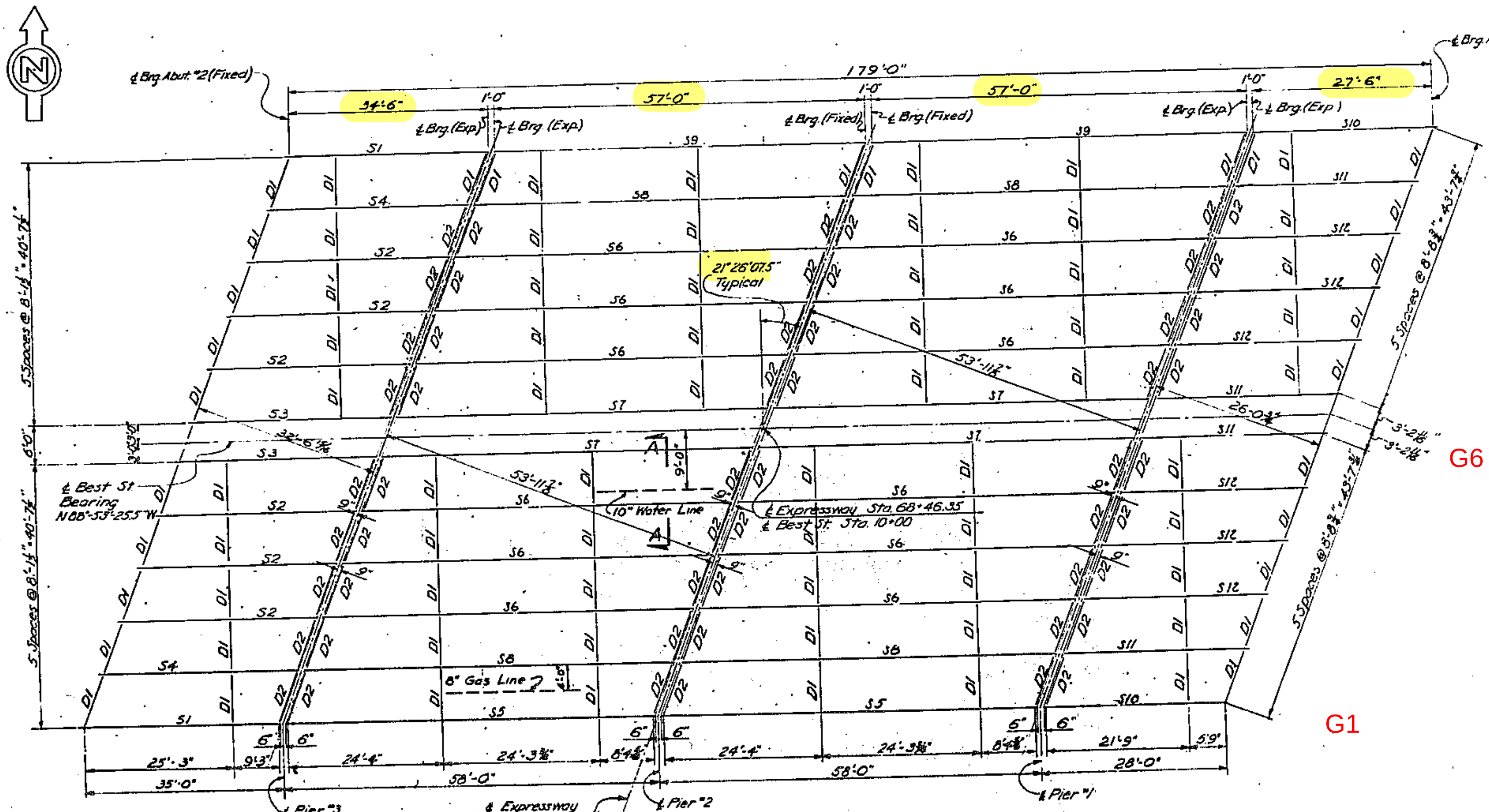
F.A.C. 59-19

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		158	178
KENSINGTON EXPRESSWAY — SEC. NO. 1					

CONTRACT II

NOTE:
Diaphragm Schedule
D1 = 15[33.9"
D2 = 16WF 36"

NOTE:
Stringers shall be field welded to sole plates after the bearings have been set and aligned to their proper positions on the bridge seats.



NOTE: Field welding of spiral reinforcement will not be permitted.

FRAMING PLAN - BRIDGE OVER EXPRESSWAY

Scale: 3/32" = 1'-0"

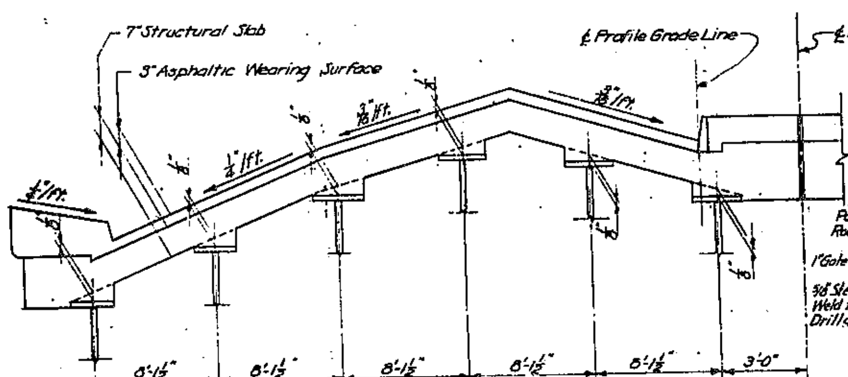
ITEM No.	DESCRIPTION	UNIT	TOTAL NEAT	TOTAL ROUNDED	FINAL
	ESTIMATE OF QUANTITIES				
5	Trench, Culvert and Bridge Excavation	C.Y.	640	675	725.8
V95A	Sewer Pipe (Vitrified) 6" Dia.	L.F.	100	103	8
10RX	Pipe Underdrain, Opt. 6" Dia	L.F.	250	260	360
*152	Portland Cement, Type 2	Bbl.	1716	1,920	1891.8
185	Class 1A Concrete for Structures	C.Y.	800	805	771.7
205	Class 1 Concrete	C.Y.	380	390	391.8
24A	Bagged Screened Gravel	C.Y.	50	51	56.1
28RR	Bar Reinforcement for Structures	Lbs	179,972	185,450	176,496.3
28A	Spiral Bar Shear Connectors	Lbs	3898	4,100	3934
29A	Structural Steel	Lbs	358872	369,600	367,919
37A	Metal Railing	L.F.	395	400	400.9
52BX	Asphalt Concrete, Type 2B	Ton	252	265	260.3
61	Bituminous Material	Gal.	62	65	36
361	Protective Coating for Concrete	Gal.	268	280	150
79	Dry Stone Paving	S.Y.	763	790	812
85-1	Steel Bearing Piles (10" BP 42)	L.F.	1216	1,280	1216
85-A	Splices for Steel Bearing Piles	Ea.	21	23	0
87	Furnishing Equipment for Driving Piles	L.S.	Nec.	Nec.	100 %
94XC	8" Stone Curb (Bridge)	L.F.	692	730	693.2
119XA	Gravel, Slag or Stone Fill	C.Y.	183	185	126.4
301B	Furnish & Install 2" Galvanized Steel Conduit	L.F.	549	580	558
303B	Furnish Light Std., Type B (30' Mount. Hgt)	Ea.	4	4	4
305	Miscellaneous Metals	Lb.	280	290	234.2
351X	Joint Sealing Compound	Gal.	18	18	18
513	Surface Dusting with Fine Aggregate	S.Y.	1487	1,510	1485.3

* With Darex A.E.A. added.

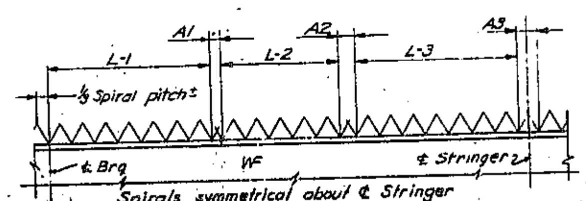
STRINGER SCHEDULE

STRINGER MK.	NO.	SIZE	CENTER TO CENTER BRG.	BOTTOM COV. ℞ SIZE	LENGTH	SPIRAL SHEAR CONNECTORS SECTION L-1 Length	Pitch	SECTION L-2 Length	Pitch	SECTION L-3 Length	Pitch	DIMENSION A1	A2	A3	DEAD LOAD CAMBER
S1	3	33WF130	34'-6"	NONE											½"
S2	6	30WF132	34'-6"	NONE											½"
S3	2	30WF108	34'-6"	NONE											½"
S4	1	30WF116	34'-6"	NONE											½"
S5	2	33WF150	57'-0"	16 x ¾	41'-6"	10'-0"	4"	9'-11"	7"	7'-10½"	13½"	3½	3½	3	1⅜"
S6	12	33WF130	57'-0"	16 x ¾	41'-6"	10'-0"	4"	9'-6"	6"	8'-3"	9"	3½	3½	4	⅞"
S7	4	33WF130	57'-0"	16 x ⅜	31'-6"	10'-1"	5½	10'-8	8"	7'-3"	14½"	2½	2½	2	1⅛"
S8	2	33WF130	57'-0"	16 x ⅝	41'-6"	10'-1½"	4½	10'-3½	6½"	7'-6"	10"	2½	3	3	1"
S9	2	33WF130	57'-0"	16 x ⅜	31'-6"	10'-1"	5½	10'-0"	8	8'-0"	16"	2	2	2	1⅜"
S10	3	33WF130	27'-6"	NONE											½"
S11	3	27WF94	27'-6"	NONE											½"
S12	6	27WF102	27'-6"	NONE											½"

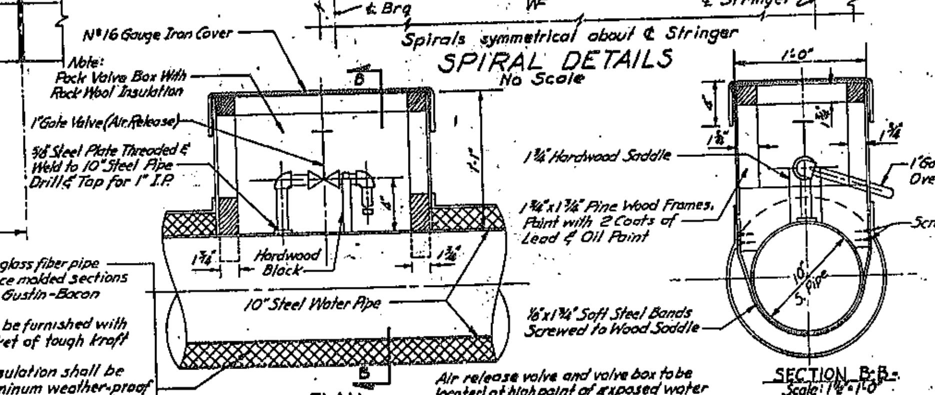
NOTE: Cover ℞s symmetrical about ℄ Stringer. Camber of beam to be measured with beam lying on its side.



DIAGRAMMATIC SECTION
Not to Scale



SPIRAL DETAILS
No Scale



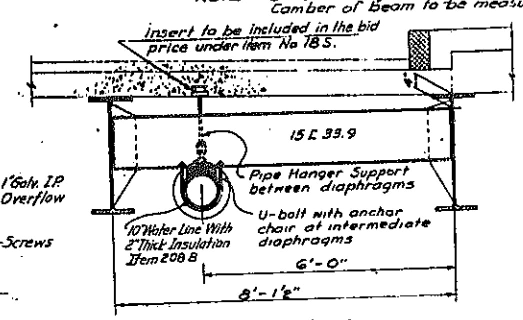
Note: Insulation shall be glass fiber pipe insulation in one piece molded sections 2" thick, as mfgd. by Gustin-Bacon Mfg. Co., or equal. Pipe insulation to be furnished with vapor barrier jacket of tough kraft foil laminate. Jacketed pipe insulation shall be covered with Aluminum weather-proof jacketing as mfgd. by Childers Mfg. Co., or equal.

PLAN
Scale: 1½" = 1'-0"

Air release valve and valve box to be located at high point of exposed water line under structure.

SECTION B-B
Scale: 1½" = 1'-0"

DETAIL OF AIR RELEASE VALVE & VALVE BOX



SECTION A-A
Scale ½" = 1'-0"

NOTE: Spacing between pipe supports to be 12 ft. ±. For details of pipe supports see Sheet No. 11.

NOTE: 8" Low Pressure Gas Line supported in a similar manner located as shown on the Framing Plan.

Sheet No 2

REVISION TO QUANTITIES TABLE

BEST STREET OVER EXPRESSWAY FRAMING PLAN

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

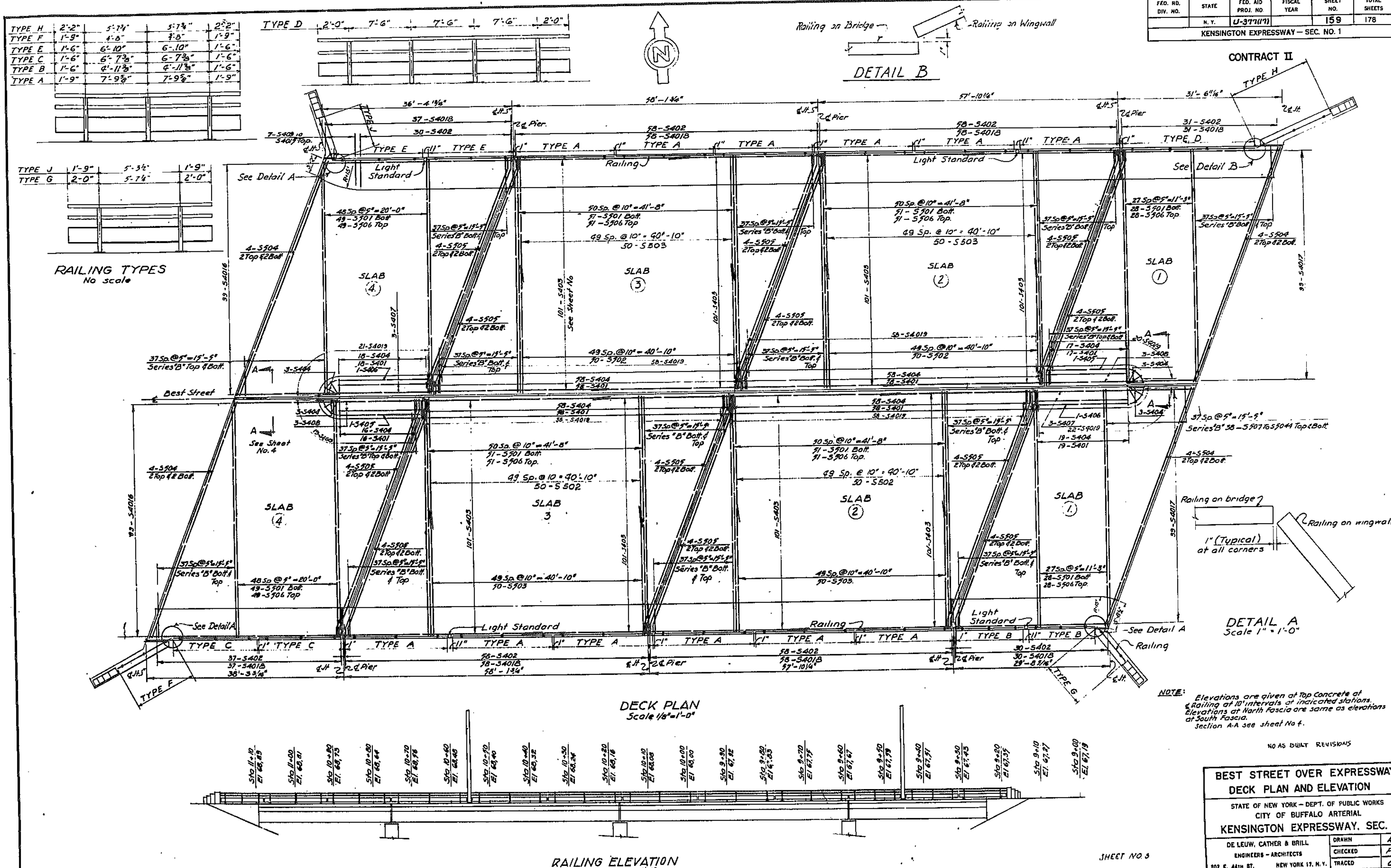
DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	SGG
CHECKED	BTH
TRACED	CB

.A.C. 5 -15

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		159	178
KENSINGTON EXPRESSWAY — SEC. NO. 1					

CONTRACT II



NOTE: Elevations are given at Top Concrete at ℄ Railing at 10' intervals at indicated stations. Elevations at North Fascia are same as elevations at South Fascia.
Section A-A see sheet No 4.

NO AS BUILT REVISIONS

SHEET NO 3

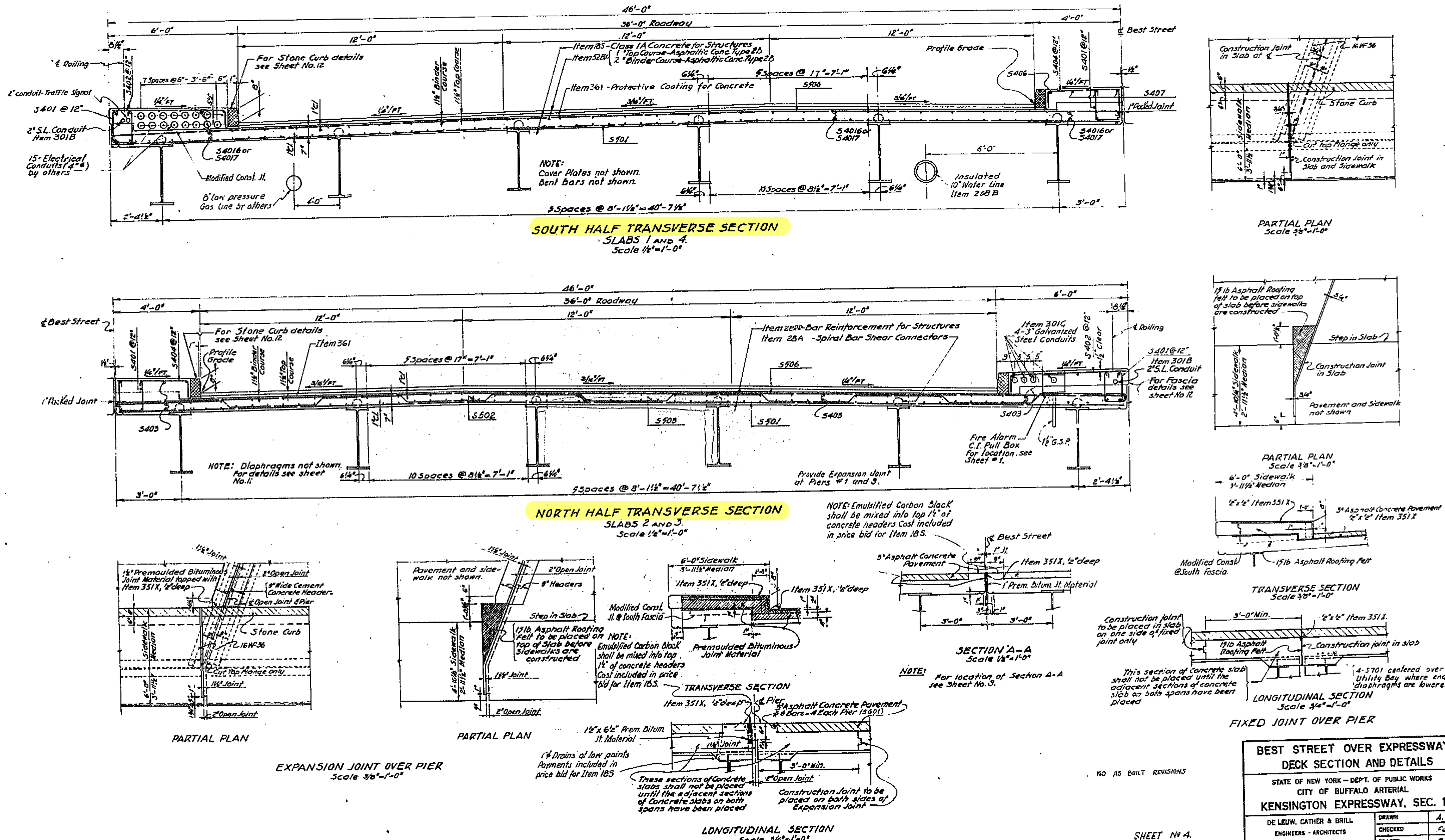
BEST STREET OVER EXPRESSWAY DECK PLAN AND ELEVATION	
STATE OF NEW YORK — DEP'T. OF PUBLIC WORKS CITY OF BUFFALO ARTERIAL KENSINGTON EXPRESSWAY. SEC. 1	
DE LEUW, CATHER & BRILL ENGINEERS — ARCHITECTS 202 E. 44TH ST. NEW YORK 17, N. Y.	DRAWN AL. CHECKED FCC TRACED CB

F.A.C. 5

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		160	178

KENSINGTON EXPRESSWAY – SEC. NO. 1

CONTRACT II



NO AS BUILT REVISIONS

SHEET Nº 4.

BEST STREET OVER EXPRESSWAY
DECK SECTION AND DETAILS

STATE OF NEW YORK – DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS – ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N.Y.

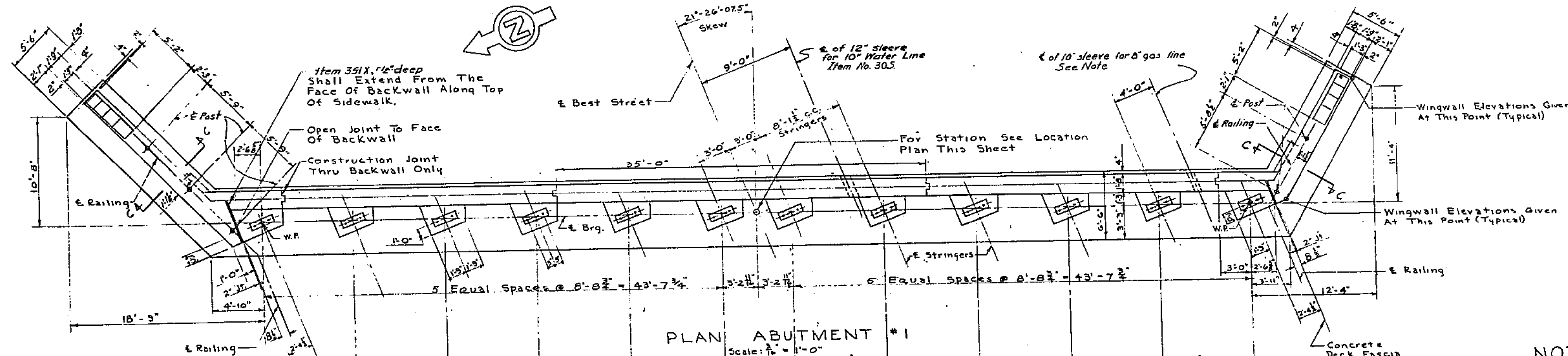
DRAWN	A.L.
CHECKED	F.C.L.
TRACED	C.B.

F.A.C. 59-19

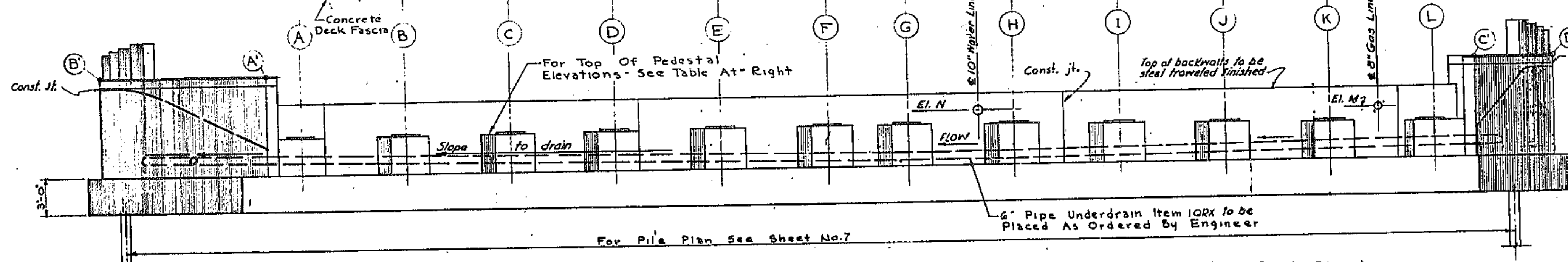
FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-377(17)		161	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

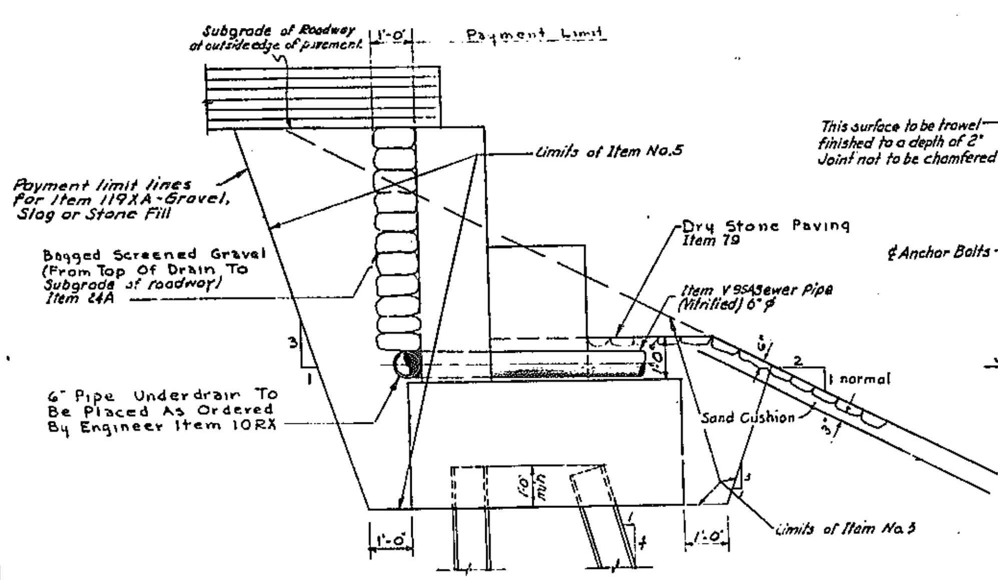
CONTRACT II



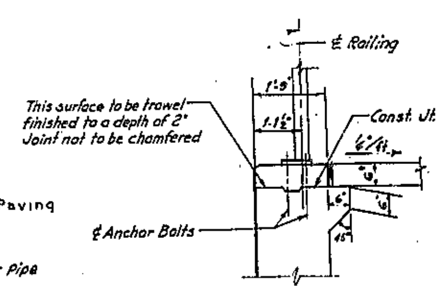
PLAN ABUTMENT #1
Scale: 3/16" = 1'-0"



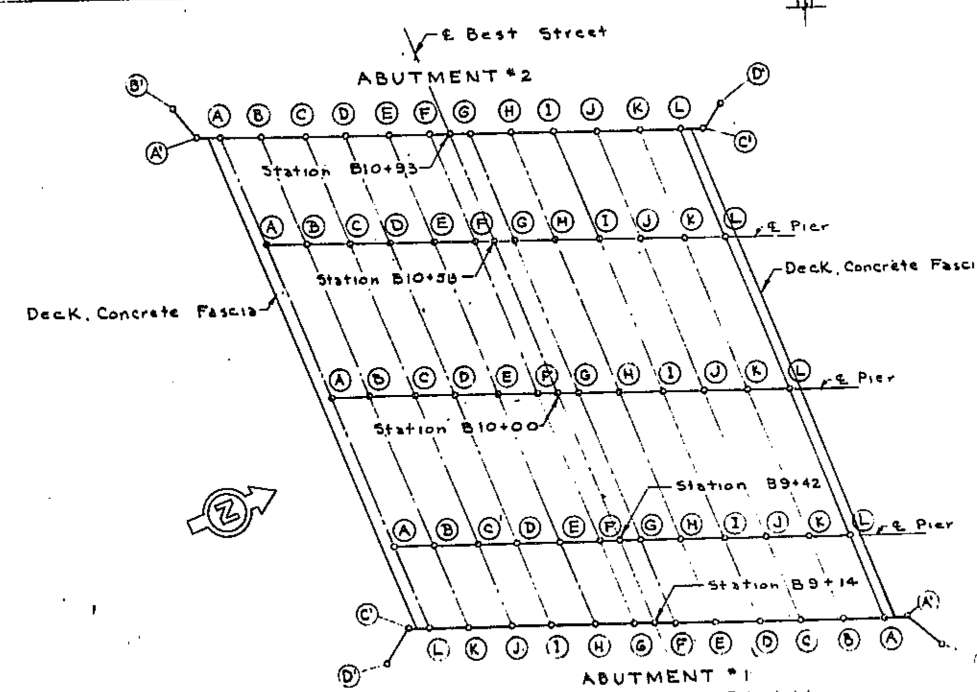
ELEVATION
Scale: 3/16" = 1'-0"



EMBANKMENT DETAILS AT ABUTMENTS
Scale ½" = 1'-0"



SECTION C-C



LOCATION PLAN
No Scale

SHEET NO. 5

NOTES:

For sections and reinforcing see Sheet Nº 7.
For footing plan see Sheet Nº 7.
For pylon dimensions see Sheet Nº 6.
For all other notes see Sheet Nº 6.
Sleeves for gas lines through backwall will be supplied by the utility company and placed by the contractor under item 18S.

TABLE OF ELEVATIONS		
LOCATION	ABUT. #1	ABUT. #2
Top Of Footing	59.48	60.93
Top Of Pedestal Ⓐ	62.45	64.17
" " Ⓑ	62.64	64.58
" " Ⓒ	63.34	64.63
" " Ⓓ	63.48	64.79
" " Ⓔ	63.48	64.74
" " Ⓕ	63.40	64.63
" " Ⓖ	63.42	64.61
" " Ⓗ	63.56	64.67
" " Ⓘ	63.61	64.67
" " Ⓙ	63.51	64.52
" " Ⓚ	63.38	64.09
" " Ⓛ	62.72	63.90
Top Of Wingwall Ⓐ'	67.23	68.92
" " Ⓑ'	66.36	68.48
" " Ⓒ'	67.43	68.66
" " Ⓓ'	66.46	67.75
Top Of Backwall	65.05	66.50
Sta. ℄ Bearing	B9+14	B10+93
Backwall El. M	63.70	65.15
Backwall El. N	63.80	65.25

NO AS BUILT REVISIONS

BEST STREET OVER EXPRESSWAY
ABUTMENT NO. 1

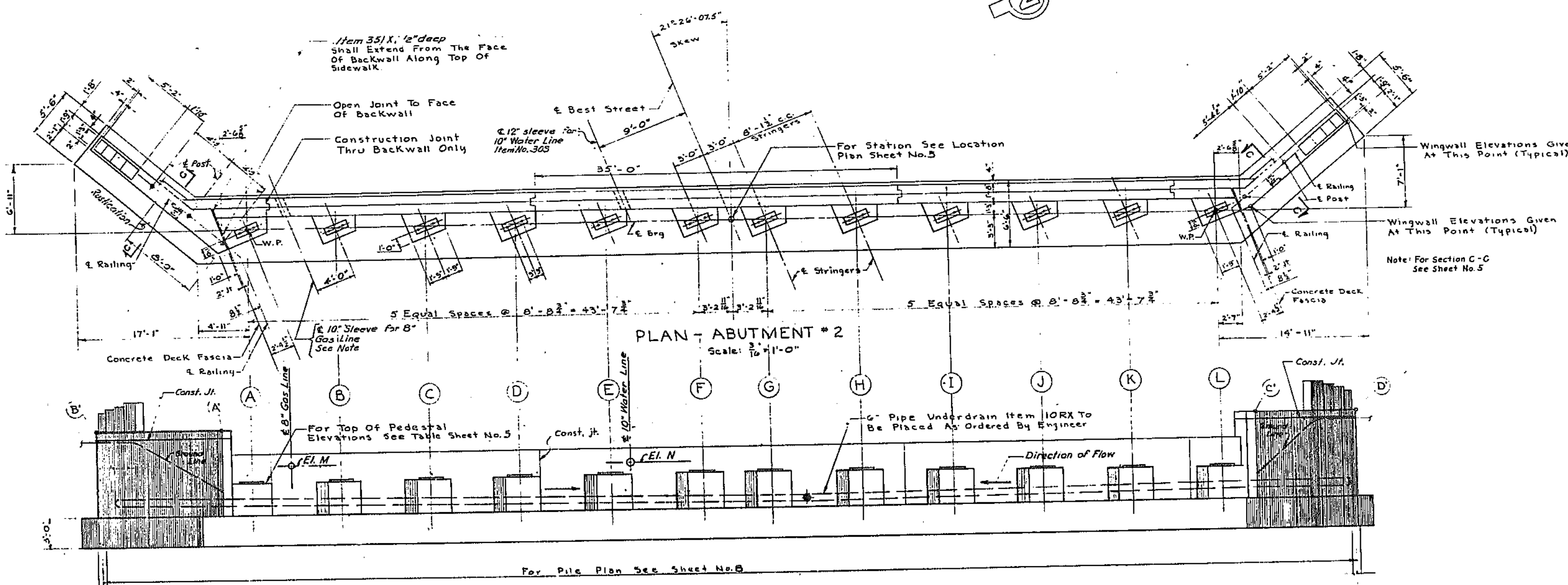
STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL ENGINEERS - ARCHITECTS 302 E. 44TH ST. NEW YORK 17, N.Y.	DRAWN	E.R.
	CHECKED	FCC
	TRACED	CB

F.A.C. 56-1

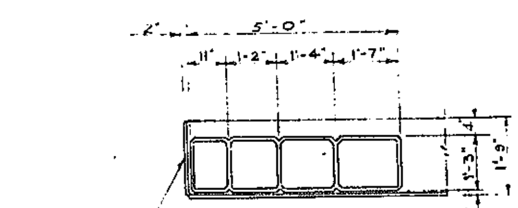
FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		162	178
KENSINGTON EXPRESSWAY – SEC. NO. 1					

CONTRACT II

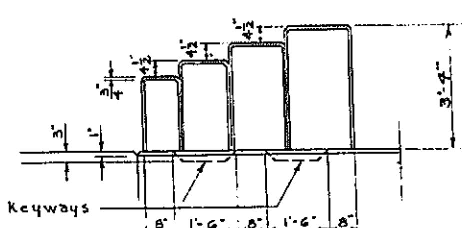


PLAN – ABUTMENT #2
Scale: $\frac{3}{16}$" = 1'-0"

ELEVATION
Scale: $\frac{3}{16}$" = 1'-0"



PLAN



ELEVATION – PYLON
Scale: ½" = 1'-0"

NOTES: (For Abutments No 1 & No 2)
For Location Plan See Sheet No. 5
For Elevation Of Footings & Pedestals See Sheet No. 5
For Sections & Reinforcing See Sheet No. 8
For Footing Plan See Sheet No. 8

All Concrete In The Abutments Shall Be Class I
Concrete Item 20S

For Design Purposes Load On Piles Does Not Exceed 26 Tons

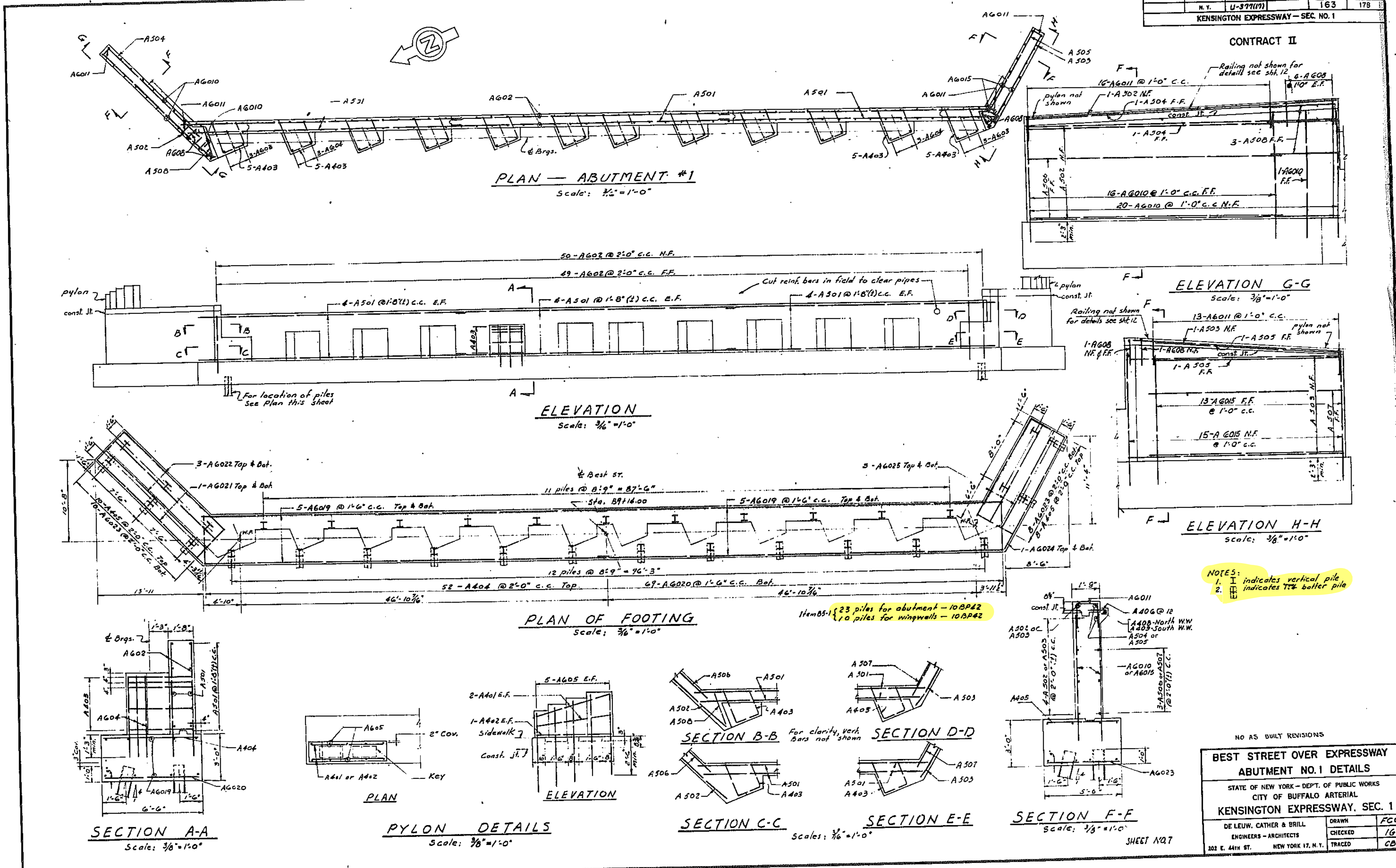
For Embankment Details See Sheet No. 5

Concrete in Pylons Item 18S
Sleeves for gas lines through backwall will be furnished by the utility company and placed by the contractor under item 18S.

NO AS BUILT REVISIONS

Sheet No 6

BEST STREET OVER EXPRESSWAY ABUTMENT NO. 2		
STATE OF NEW YORK – DEPT. OF PUBLIC WORKS CITY OF BUFFALO ARTERIAL KENSINGTON EXPRESSWAY, SEC. 1		
DE LEUW, CATHER & BRILL ENGINEERS – ARCHITECTS 202 E. 44TH ST. NEW YORK 17, N.Y.	DRAWN	E.R.
	CHECKED	FCC
	TRACED	CB



FED. RD. DIV. NO	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-377(17)		163	178

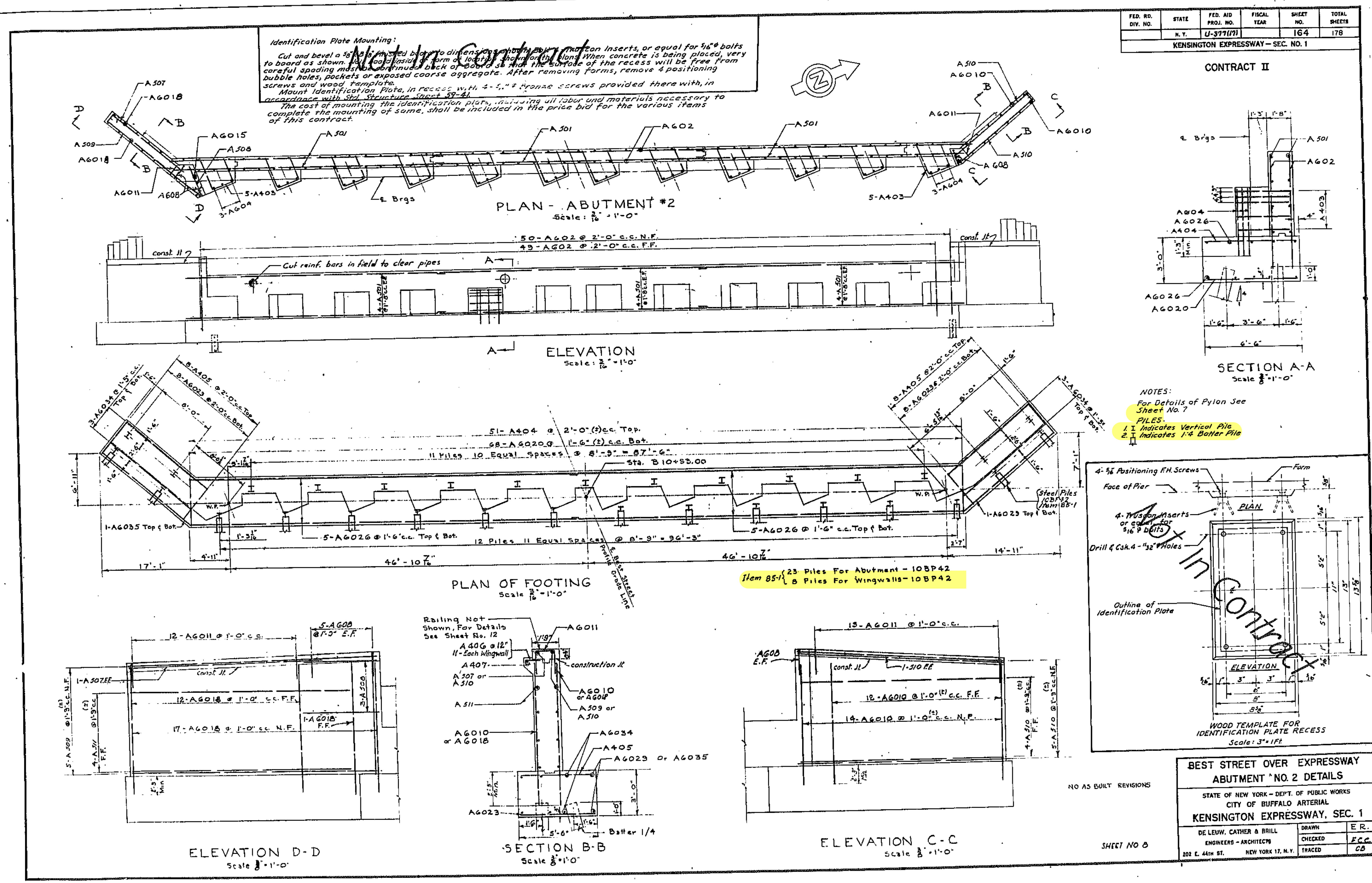
KENSINGTON EXPRESSWAY — SEC. NO. 1

BEST STREET OVER EXPRESSWAY
ABUTMENT NO. 1 DETAILS

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	FCC
CHECKED	IG
TRACED	CB

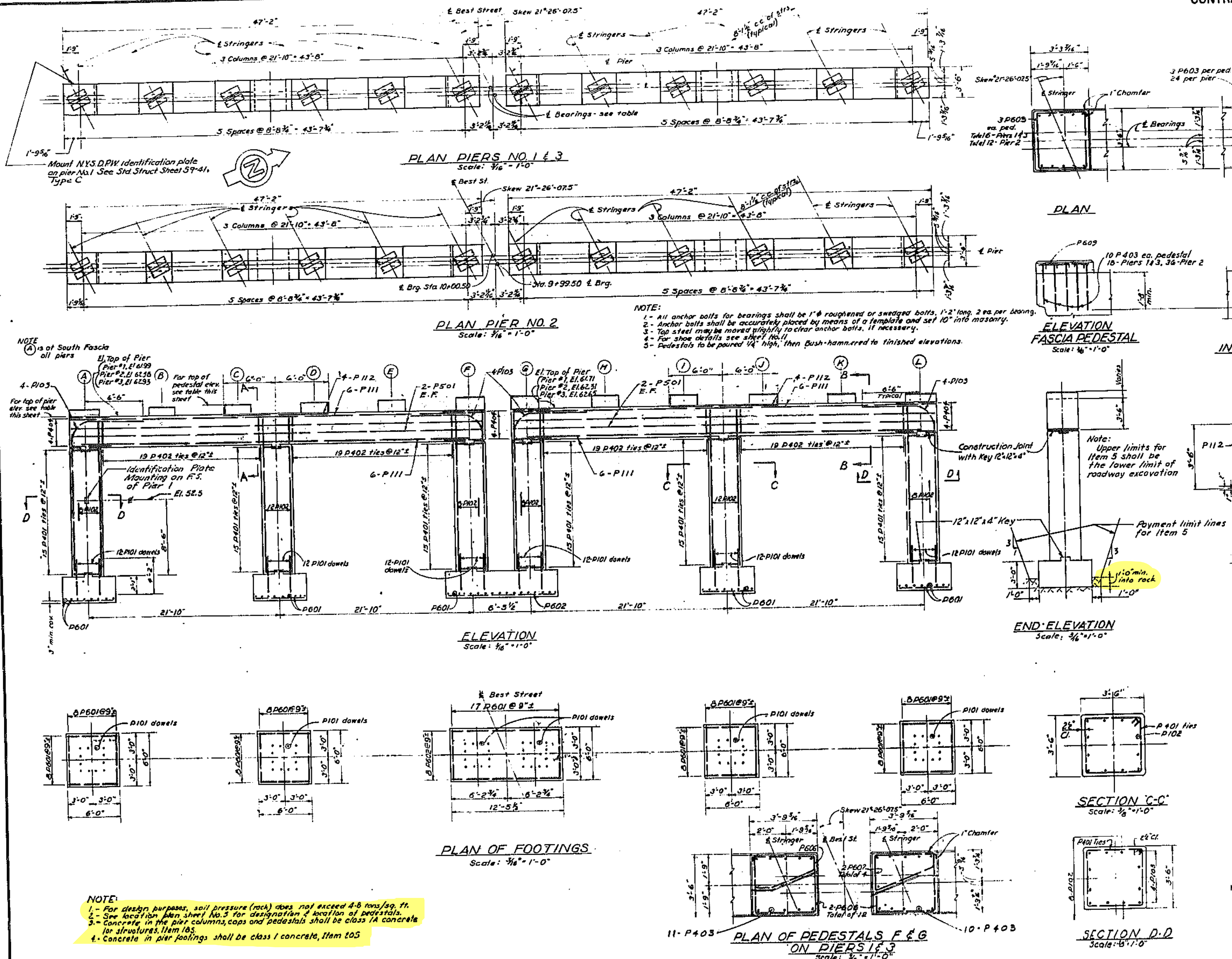


FED. RD. DIV. NO. | STATE N.Y. | FED. AID PROJ. NO. U-377(17) | FISCAL YEAR | SHEET NO. 164 | TOTAL SHEETS 178
KENSINGTON EXPRESSWAY – SEC. NO. 1
CONTRACT II
Not In Contract
Identification Plate Mounting:
Mount Identification Plate, in recess with 4-5/16" bronze screws provided there with, in accordance with Std. Structure Sheet 59-41.
The cost of mounting the identification plate, including all labor and materials necessary to complete the mounting of same, shall be included in the price bid for the various items of this contract.
PLAN - ABUTMENT #2
Scale: 3/16" = 1'-0"
ELEVATION
Scale: 3/16" = 1'-0"
Cut reinf. bars in field to clear pipes
50-A602 @ 2'-0" c.c. N.F.
49-A602 @ 2'-0" c.c. F.F.
SECTION A-A
Scale 3/8" = 1'-0"
NOTES:
For Details of Pylon See Sheet No. 7
PILES:
Indicates Vertical Pile
Indicates 1:4 Batter Pile
51-A404 @ 2'-0" (±) c.c. Top.
68-A6020 @ 1'-6" (±) c.c. Bot.
11 Piles 10 Equal Spaces @ 8'-9" = 87'-6"
Sta. B 10+53.00
12 Piles 11 Equal Spaces @ 8'-9" = 96'-3"
5-A6026 @ 1'-6" c.c. Top & Bot.
Steel Piles 10BP42 Item 85-1
PLAN OF FOOTING
Scale 3/16" = 1'-0"
Item 85-1 { 23 Piles For Abutment - 10BP42 / 8 Piles For Wingwalls - 10BP42
WOOD TEMPLATE FOR IDENTIFICATION PLATE RECESS
Scale: 3" = 1 Ft
Outline of Identification Plate
Railing Not Shown, For Details See Sheet No. 12
ELEVATION D-D
Scale 3/8" = 1'-0"
SECTION B-B
Scale 3/8" = 1'-0"
ELEVATION C-C
Scale 3/8" = 1'-0"
NO AS BUILT REVISIONS
SHEET NO 8
BEST STREET OVER EXPRESSWAY
ABUTMENT NO. 2 DETAILS
STATE OF NEW YORK – DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1
DE LEUW, CATHER & BRILL ENGINEERS – ARCHITECTS 202 E. 44TH ST. NEW YORK 17, N.Y.
DRAWN E.R. CHECKED F.C.C. TRACED CB

CONTRACT II

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-377(17)		165	178

KENSINGTON EXPRESSWAY — SEC. NO. 1



NOTE:
1 - All anchor bolts for bearings shall be 1" ϕ roughened or swedged bolts, 1'-2" long, 2 ea. per bearing.
2 - Anchor bolts shall be accurately placed by means of a template and set 10" into masonry.
3 - Top steel may be moved slightly to clear anchor bolts, if necessary.
4 - For shoe details see sheet No. 11
5 - Pedestals to be poured 1/4" high, then Bush-hammered to finished elevations.

NOTE:
1. - For design purposes, soil pressure (rock) does not exceed 4-8 tons/sq. ft.
2. - See location plan sheet No. 5 for designation & location of pedestals.
3. - Concrete in the pier columns, caps and pedestals shall be class 1A concrete for structures, Item 18S.
4. - Concrete in pier footings shall be class 1 concrete, Item 20S

TABLE OF ELEVATIONS

LOCATION	ELEVATION				
	Pier #1		Pier #2	Pier #3	
	E. Brg.	W. Brg.		E. Brg.	W. Brg.
Top of footing	44.00		44.50	45.00	
Top of pier		See	Elevation		
Top of pedestal A	62.82	62.82	63.42	63.76	63.76
" " " B	63.48	62.97	63.56	63.91	64.17
" " " C	63.61	63.11	63.70	64.05	64.29
" " " D	63.71	63.21	63.80	64.15	64.39
" " " E	63.66	63.16	63.75	64.10	64.34
" " " F	63.52	63.01	63.60	63.94	64.22
" " " G	63.50	62.99	63.58	63.92	64.20
" " " H	63.59	63.09	63.68	64.02	64.27
" " " I	63.59	63.09	63.68	64.02	64.27
" " " J	63.43	62.94	63.53	63.87	64.11
" " " K	62.75	62.75	63.33	63.68	63.69
" " " L	62.54	62.54	63.14	63.48	63.48
Sta. ℄ Bearing	9+41.50	9+42.50	see plan	10+57.50	10+58.50

NO AS BUILT REVISIONS

SHEET NO. 9

BEST STREET OVER EXPRESSWAY
PIER

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

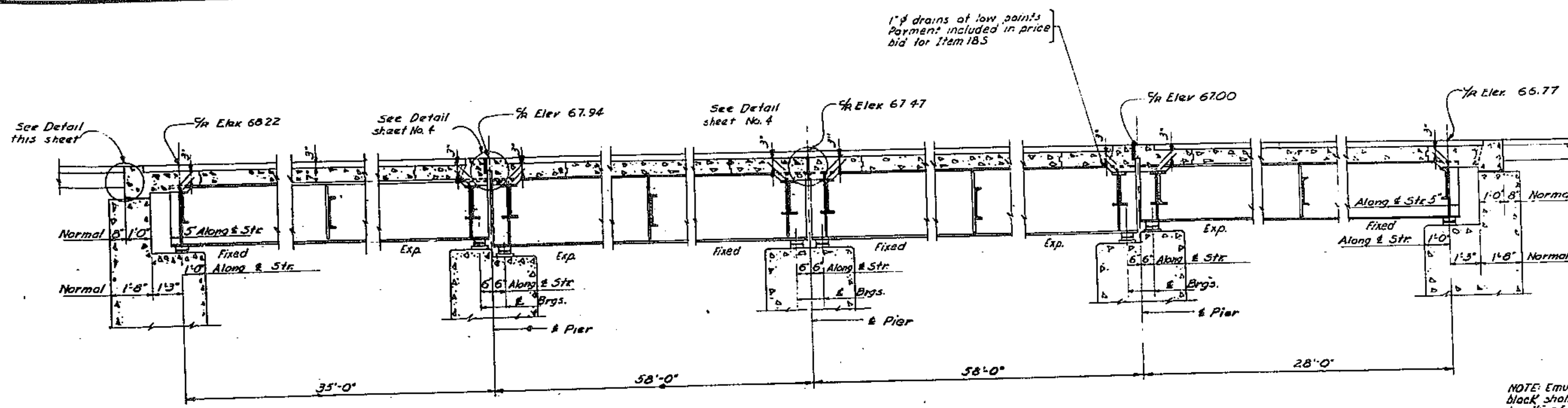
DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
302 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	FRL
CHECKED	RCF
TRACED	CB

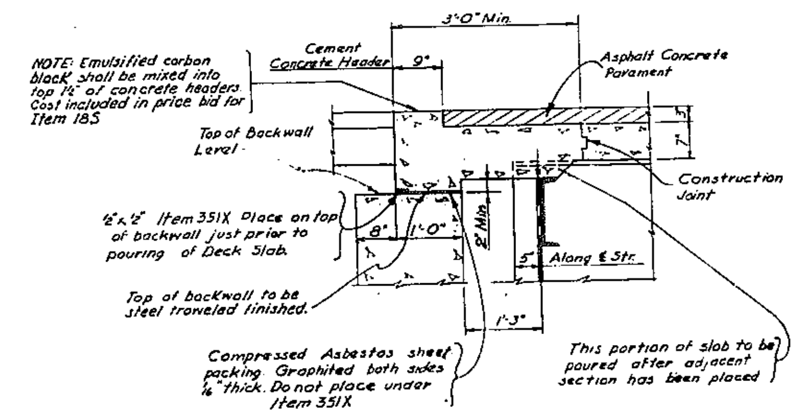
FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		166	178

KENSINGTON EXPRESSWAY – SEC. NO. 1

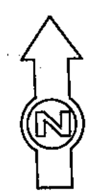
CONTRACT II

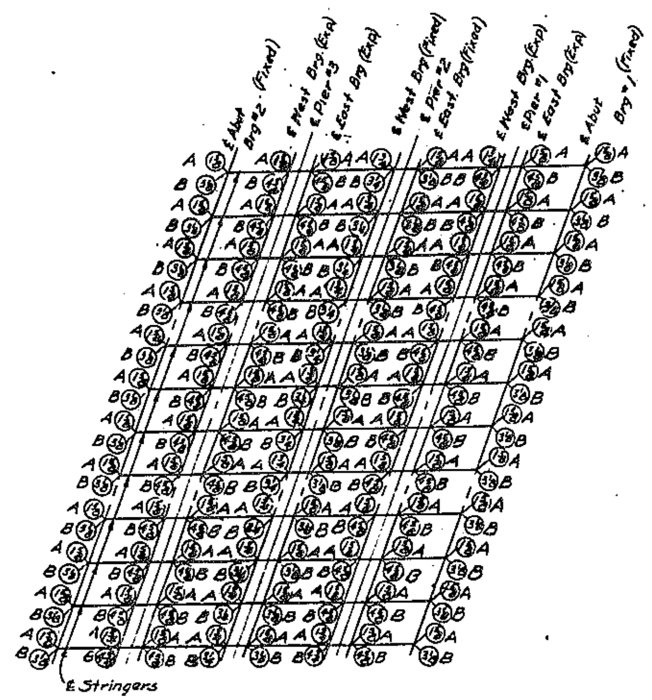


LONGITUDINAL SECTION ALONG PROFILE GRADE LINE
(Looking North)
Scale 1/8" = 1'-0"



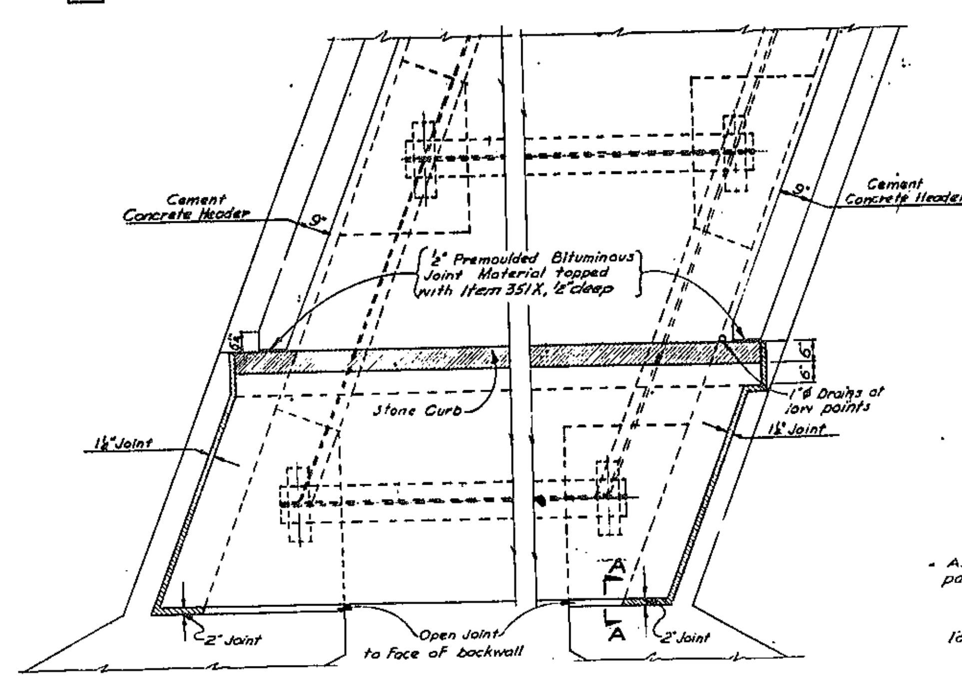
LONGITUDINAL SECTION AT ABUTMENTS
Scale ¾" = 1'-0"





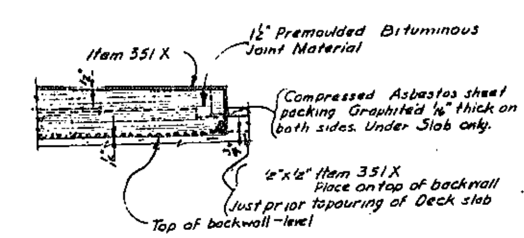
KEY PLAN FOR BEARING DIMENSIONS
Not to Scale

A is thickness of Sole plate at ℄ bearing.
B is total thickness of shoe.

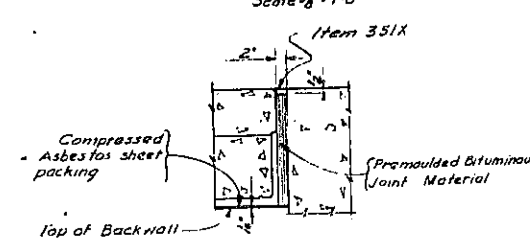


PARTIAL PLAN
Scale ⅛" = 1'-0"

JOINT AT ABUTMENTS



TRANSVERSE SECTION ALONG JOINT
Scale ⅛" = 1'-0"



SECTION A-A
Scale ¾" = 1'-0"

NO AS BUILT REVISIONS

SHEET NO. 10

BEST STREET OVER EXPRESSWAY
LONGITUDINAL SECTION AND DETAILS

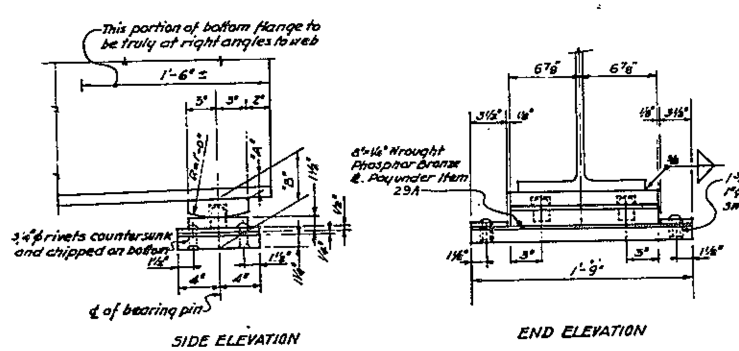
STATE OF NEW YORK – DEP'T. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS – ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	WJS
CHECKED	RCF
TRACED	CB

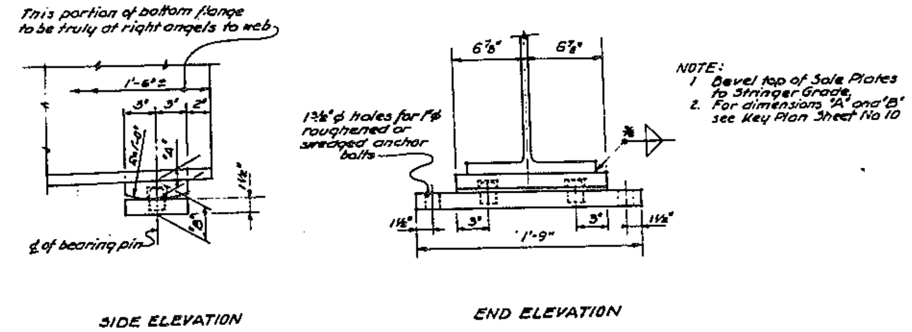
FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		167	178

KENSINGTON EXPRESSWAY – SEC. NO. 1

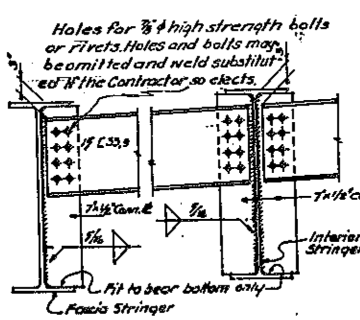


EXPANSION BEARING. Scale 1½"=1'-0"

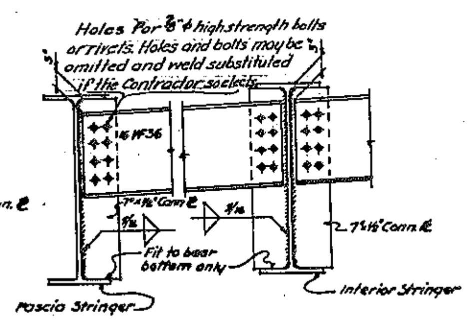
NOTE: Anchor bolts shall be accurately placed by means of a template and set 10" into masonry.



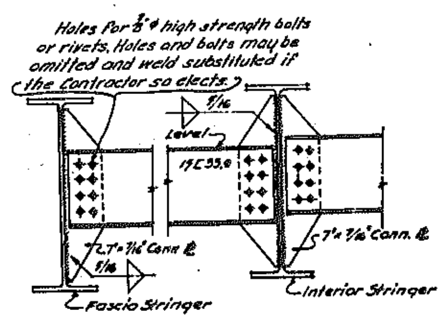
FIXED BEARING Scale 1½"=1'-0"



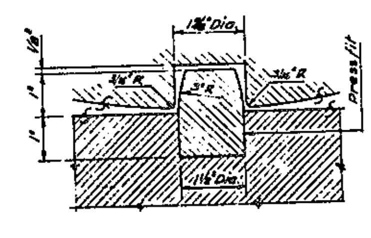
END DIAPHRAGMS AT ABUTMENTS Scale ¾"=1'-0"



END DIAPHRAGMS AT PIERS Scale ¾"=1'-0"

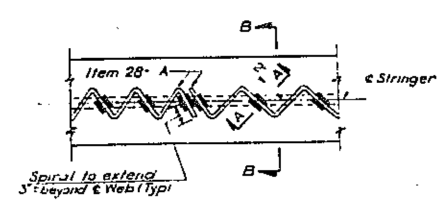


INTERMEDIATE DIAPHRAGMS Scale ¾"=1'-0"



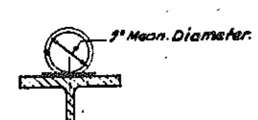
SECTION THRU DOWEL Scale 6"=1'-0"

NOTE: See Sheet No. 2 for diaphrams in utility bays.



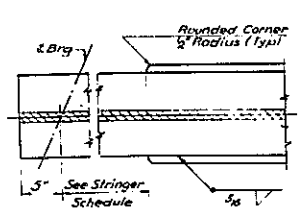
PLAN Scale: 6"=1'-0"

SECTION A-A Half Size



SECTION B-B Scale 1"=1'-0"

SPIRAL DETAILS



COVER PLATE DETAILS Scale 1"=1'-0"

NOTE: Special precautions must be exercised where welding crosses edge of flange to avoid any possibility of "undercut" or nicks in edge of flange

NOTE:

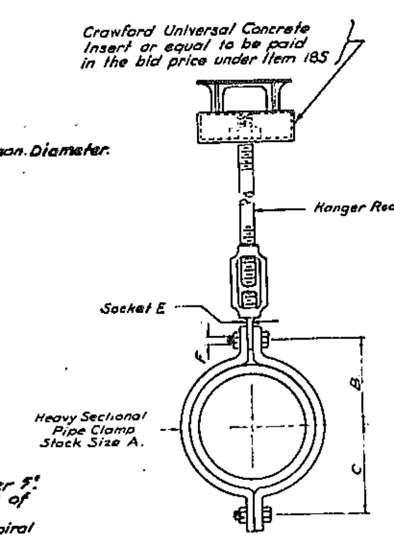
All spirals shall be ⅝" ϕ plain bars with mean diameter 5".

All spirals shall have two structural welds at each point of contact with beam, one weld each side of rod.

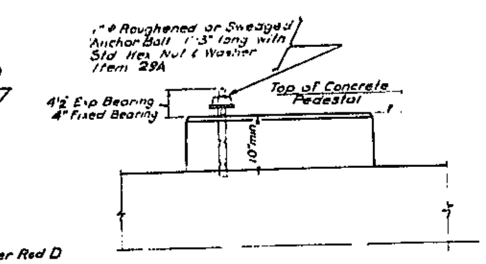
5/32" or 3/16" diameter electrodes shall be used in welding the spiral Bar Shear Connectors.

At the end of beam the spiral shall project about one third of the pitch beyond the end weld.

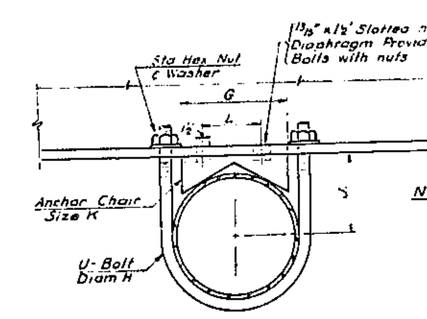
The Contractor's attention is called to the possibility of interference between the reinforcing steel in the slab and the beam spirals. To avoid this interference the bar spacings may be varied 1"± with the understanding that the required area of steel will be placed in each 1'±. Even then, some bars will have to be threaded thru one or more spirals.



PIPE HANGER WITH TURNBUCKLE & INSERT Scale 3"=1'-0"



ANCHOR BOLT DETAIL (TYPICAL) Not to scale



ANCHOR CHAIR WITH U-BOLT Scale 3"=1'-0"

CONTRACT II

GENERAL NOTES

DESIGN SPECIFICATIONS: A A S.H O 1953 modified - loading H 20 - S16 - 44

MATERIALS & FABRICATION: Specifications of New York State Department of Public Works, dated Jan. 2, 1957 and current modifications and additions.

The cost of furnishing and installing, premoulded bituminous joint material, asbestas sheet packing, and 15 lbs. asphalt roofing felt shall be included in the prices bid for the various items in the contract.

Joint Sealing Compound shall be paid for under Item 351X.

Bituminous material, item 61, shall be applied to the backs of all abutments and wingwalls from the tops of footings to the bottom of pavement.

When the concrete is cured, finished and (if ordered) rubbed, and the surface is clean and dry, the contractor shall apply a water soluble silicone solution to all exposed surfaces except the underside of slab

Item 208B in highway estimate.

No construction joints other than those shown on the plans will be permitted, without written permission of the Deputy Chief Engineer Bridges.

Field connections shall be made with ⅞" ϕ high strength bolts or rivets. Holes and bolts may be omitted and weld substituted if the Contractor so elects.

Shop paint: Red lead and oil. First field coat to be battleship gray paint. Second field coat to be gray green paint. Spiral bar reinforcement, top flange of stringers and top flange of end channels are not to be painted.

To insure uniform grades for surface of roadway and side-walks under dead load, corrections may be made in the thickness of wearing surface of roadway and side-walks. The minimum thickness indicated is to be increased at the ends of the spans in case of excessive camber in the beams and increased at the center of the span in case of insufficient camber.

Identification plates in accordance with N.Y.S. D.P.W. Standard 59-41 will be furnished by New York State Department of Public Works and shall be installed by the Contractor at locations indicated on the plans.

The Contractor's attention is directed to the special notes for this structure which appear in the proposal. Particular attention should be given to the substructure notes which briefly outline the anticipated structure conditions at the site of the structure and which specify certain requirements relative to construction.

All welding shall comply with the current Specifications of the American Welding Society unless otherwise noted on the plans and with the exception noted below.

Bridge sidewalks shall not be scored.

Surface of bridge seats be poured ¼" higher than elevation specified and bush hammered to exact elevation.

All cement used in the concrete Items for the structure shall be Portland Cement, Type 2, with Darex A.E.A Air Entraining Agent added.

Darex A.E.A in its concentrated form shall be added to the aggregate and cement batch with the water in the mixer at the beginning of the mixing period. The concrete mixer shall be equipped with an approved Darex A.E.A dispenser. The amount of Darex A.E.A. to be added shall be of such a quantity as to insure a controlled air entrainment within the range of 3% minimum and 6% maximum (with the desired average between 4½% and 5%) to the satisfaction of the Engineer.

The cost of furnishing and adding the Darex A.E.A and all labor and equipment necessary to control the air entrainment will be included in the unit price bid for the concrete Items.

All superstructure concrete and all concrete in pier columns, caps and pedestals shall be Item 18S. Pylon concrete shall be Item 18S

All concrete in abutments including wingwalls and footings and pier column footings shall be Item 20S.

Maximum payment limits for excavation, Item 5, in rock shall be the neat lines of the footing.

FOOTING ON ROCK: See note No. 23 Sheet No. 132.

A retarding densifier shall be used in Item 18S and Item 20S.

Size of pipe sleeves and type of hangers shall be verified with the Iroquois Gas Corp. or Division of Water of the City of Buffalo before fabrication of diaphragms. See sheet No. 140 for additional note.

PIPE SUPPORT DIMENSIONS											
PIPE SIZE	A	B	C	D	E	F	G	H	J	K	L
10"	½"×2"	7⅜"	6⅞"	¾"	1"	¾"	8"	⅝"	6½"	4" Cor L	5½"

NOTE:
Pipe supports for Water Line shall be included in the bid price for Item 18S.
Anchor Chairs with U-Bolts and pipe hangers for Gas Line to be furnished and erected by others.
Holes in diaphragms to be provided by Contractor.

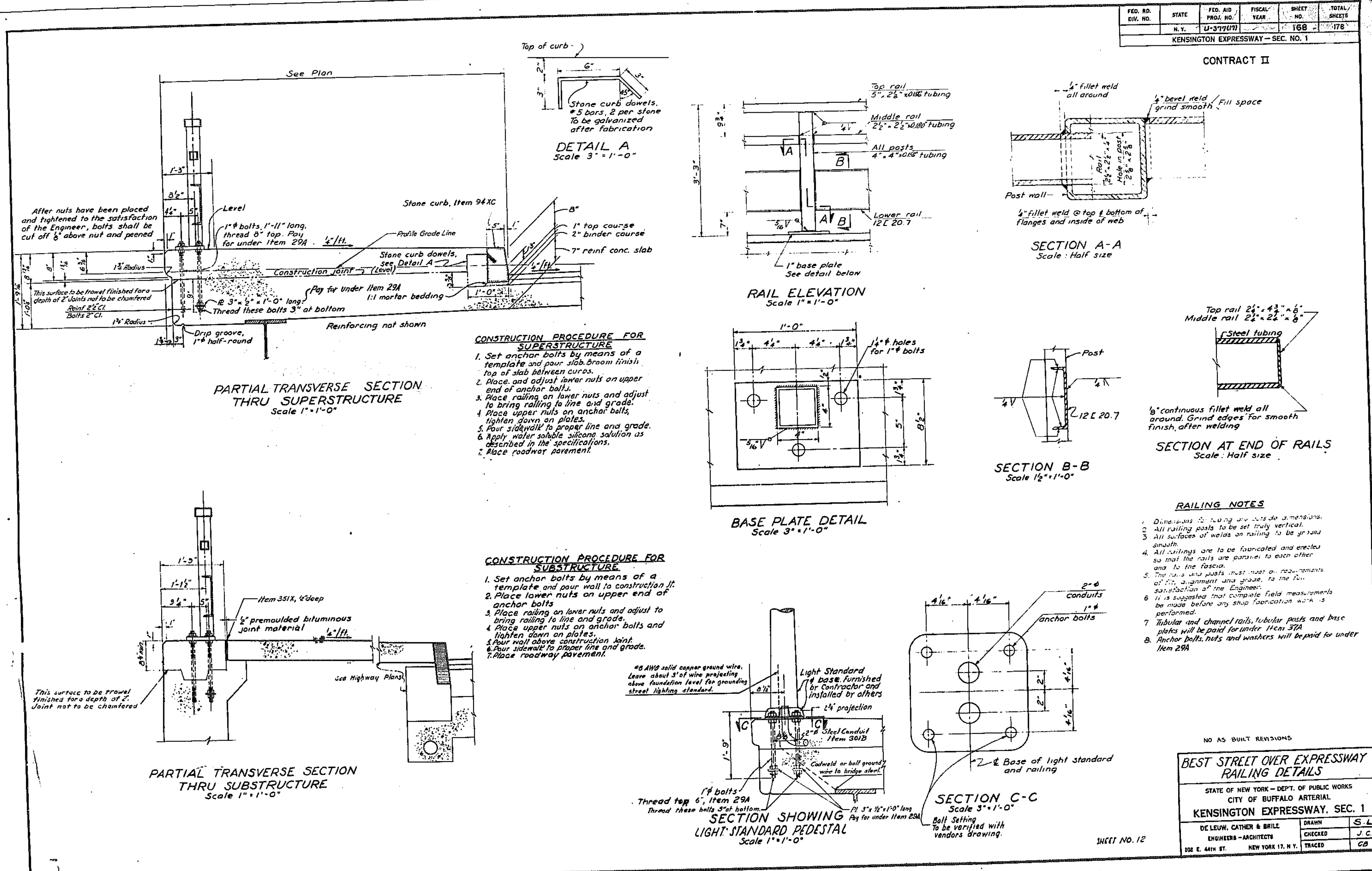
Sheet No 11

NO AS BUILT REVISIONS

BEST STREET OVER EXPRESSWAY
DIAPHRAGM DETAILS AND SHOES

STATE OF NEW YORK – DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL ENGINEERS – ARCHITECTS 202 E. 44TH ST. NEW YORK 17, N.Y.	DRAWN	A.L.
	CHECKED	J.C.
	TRACED	CB



FED. RD. DIV. NO. | STATE N.Y. | FED. AID PROJ. NO. U-377(17) | FISCAL YEAR | SHEET NO. 168 | TOTAL SHEETS 178
KENSINGTON EXPRESSWAY — SEC. NO. 1
CONTRACT II
Top of curb
Stone curb dowels, #5 bars, 2 per stone. To be galvanized after fabrication
DETAIL A
Scale 3" = 1'-0"
See Plan
After nuts have been placed and tightened to the satisfaction of the Engineer, bolts shall be cut off 1/8" above nut and peened
Level
1"ϕ bolts, 1'-11" long, thread 8" top. Pay for under Item 29A
Profile Grade Line
Stone curb, Item 94XC
1" top course
2" binder course
7" reinf conc. slab
Stone curb dowels, see Detail A
Construction joint (Level)
This surface to be trowel finished for a depth of 2". Joints not to be chamfered
Reinf 2½" Cl.
Bolts 2" Cl.
3" x ½" x 1'-0" long. Thread these bolts 3" at bottom
Pay for under Item 29A
1:1 mortar bedding
Reinforcing not shown
Drip groove, 1"ϕ half-round
PARTIAL TRANSVERSE SECTION THRU SUPERSTRUCTURE
Scale 1" = 1'-0"
Top rail 5" x 2½" x 0.156" tubing
Middle rail 2½" x 2½" x 0.180" tubing
All posts 4" x 4" x 0.156" tubing
Lower rail 12 ⊏ 20.7
1" base plate. See detail below
RAIL ELEVATION
Scale 1" = 1'-0"
¼" fillet weld all around
¼" bevel weld, grind smooth
Fill space
Post wall
Rail 2½" x 2½" x ¼"
Hole in post 2⅝" x 2⅝"
¼" fillet weld @ top & bottom of flanges and inside of web
SECTION A-A
Scale: Half size
CONSTRUCTION PROCEDURE FOR SUPERSTRUCTURE
1. Set anchor bolts by means of a template and pour slab. Broom finish top of slab between curbs.
2. Place and adjust lower nuts on upper end of anchor bolts.
3. Place railing on lower nuts and adjust to bring railing to line and grade.
4. Place upper nuts on anchor bolts, tighten down on plates.
5. Pour sidewalk to proper line and grade.
6. Apply water soluble silicone solution as described in the specifications.
7. Place roadway pavement.
1¼"ϕ holes for 1"ϕ bolts
BASE PLATE DETAIL
Scale 3" = 1'-0"
Post
12 ⊏ 20.7
SECTION B-B
Scale 1½" = 1'-0"
Top rail 2½" x 4½" x ⅛"
Middle rail 2½" x 2½" x ⅛"
Steel tubing
⅛" continuous fillet weld all around. Grind edges for smooth finish, after welding
SECTION AT END OF RAILS
Scale: Half size
RAILING NOTES
1. Dimensions for tubing are outside dimensions.
2. All railing posts to be set truly vertical.
3. All surfaces of welds on railing to be ground smooth.
4. All railings are to be fabricated and erected so that the rails are parallel to each other and to the fascia.
5. The rails and posts must meet all requirements of fit, alignment and grade, to the full satisfaction of the Engineer.
6. It is suggested that complete field measurements be made before any shop fabrication work is performed.
7. Tubular and channel rails, tubular posts and base plates will be paid for under Item 37A
8. Anchor bolts, nuts and washers will be paid for under Item 29A
CONSTRUCTION PROCEDURE FOR SUBSTRUCTURE
1. Set anchor bolts by means of a template and pour wall to construction Jt.
2. Place lower nuts on upper end of anchor bolts
3. Place railing on lower nuts and adjust to bring railing to line and grade.
4. Place upper nuts on anchor bolts and tighten down on plates.
5. Pour wall above construction joint.
6. Pour sidewalk to proper line and grade.
7. Place roadway pavement.
Item 351X, ½" deep
½" premoulded bituminous joint material
See Highway Plans
This surface to be trowel finished for a depth of 2". Joint not to be chamfered
PARTIAL TRANSVERSE SECTION THRU SUBSTRUCTURE
Scale 1" = 1'-0"
#6 AWG solid copper ground wire. Leave about 3' of wire projecting above foundation level for grounding street lighting standard.
Light Standard ϕ base. Furnished by Contractor and installed by others
2¼" projection
2"ϕ Steel Conduit Item 301B
Cadweld or bolt ground wire to bridge steel.
1"ϕ bolts
Thread top 6", Item 29A
Thread these bolts 3" at bottom.
Pl 3" x ½" x 1'-0" long. Pay for under Item 29A
SECTION SHOWING LIGHT STANDARD PEDESTAL
Scale 1" = 1'-0"
2-ϕ conduits
1"ϕ anchor bolts
℄ Base of light standard and railing
SECTION C-C
Scale 3" = 1'-0"
Bolt Setting to be verified with vendors drawing.
SHEET NO. 12
NO AS BUILT REVISIONS
BEST STREET OVER EXPRESSWAY
RAILING DETAILS
STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1
DE LEUW, CATHER & BRILL ENGINEERS — ARCHITECTS
200 E. 44TH ST. NEW YORK 17, N.Y.
DRAWN S.L. | CHECKED J.C. | TRACED CB

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(7)		169	178

KENSINGTON EXPRESSWAY – SEC. NO. 1

BAR LIST

ABUTMENTS 2

Mark	Size	Length	Type	Number Total	#1	#2	A	B	C	Description
FOOTINGS										
A404	#4	6'-0"	Str.	103	52	51				Transverse Bar, Top
A405	#4	5'-0"	Str.	34	18	16				Transverse Bar, Top
										Longitudinal Bar, Top & Bot.
A6019	#6	51'-9"	Str.	20	20					Transverse Bar, Bot.
A6020	#6	6'-0"	Str.	137	69	68				Longitudinal Bar, Top & Bot.
A6021	#6	19'-0"	Str.	2	2					Longitudinal Bar, Bot.
A6022	#6	18'-0"	Str.	6	6					Transverse Bar, Bot.
A6023	#6	5'-0"	Str.	34	18	16				Longitudinal Bar, Top & Bot.
A6024	#6	16'-3"	Str.	2	2					Longitudinal Bar, Top & Bot.
A6025	#6	14'-3"	Str.	6	6					Longitudinal Bar, Top & Bot.
A6026	#6	51'-0"	Str.	20		20				Longitudinal Bar, Top & Bot.
A6029	#6	15'-11"	Str	2		2				Longitudinal Bar, Top & Bot.
A6034	#6	14'-0"	Str.	12		12				Longitudinal Bar, Top & Bot.
A6035	#6	15'-7	Str.	2		2				
WALLS										
A403	#4	10'-8"	XIII	120	60	60	4'-3"	3'-2"	3'-3"	Horizontal Ties, Pedestal
A501	#5	34'-10"	Str.	48	24	24				Horizontal Bar
A602	#6	7'-9"	Str.	198	99	99				Vertical Bar
A603	#6	4'-4"	Str.	6	6					Vertical Bar, Pedestal
A604	#6	5'-0"	Str.	66	30	36				Vertical Bar, Pedestal
A606										Not used
A607										Not used
A608	#6	4'-0"	III	22	10	12	2'-6"	1'-6		Transverse Bar Cap (2-6" Vert)
A6010	#6	9'-0"	Str.	63	37	26				Vertical Bar
A6011	#6	4'-5"	IX	54	29	25	1'-6"	1'-5"		Transverse Bar Cap
A6012										Not used
A6013										Not used
A6014										Not used
A6015	#6	9'-2"	Str.	28	28					Vertical Bar
A6016										Not used
A6017										Not used
A6018	#6	9'-6"	Str.	30		30				Vertical Bar
A6030										Not used
A6032										Not used
A6033										Not used
A406	#4	1'-10"	X	49	27	22	1'-4"	6"		Transverse Bar, Shelf
A407	#4	10'-0"	Str.	2		2				Longitudinal Bar, Shelf
A408	#4	14'-2"	Str	1	1					Longitudinal Bar, Shelf
A409	#4	11'-5	Str.	1	1					Longitudinal Bar, Shelf
A502	#5	19'-6"	Str.	5	5					Horizontal Bar.
A503	#5	13'-6"	Str	5	5					Horizontal Bar
A504	#5	17'-0"	Str.	2	2					Horizontal Bar
A505	#5	13'-0"	Str.	2	2					Horizontal Bar
PYLONS										
A506	#5	16'-0"	Str.	3	3					Horizontal Bar
A507	#5	12'-6"	Str.	4	3	1				Horizontal Bar
A508	#5	4'-0"	Str.	6	3	3				Horizontal Bar
A509	#5	16'-0"	Str.	5		5				Horizontal Bar
A510	#5	13'-0"	Str.	10		10				Horizontal Bar
A511	#5	12'-0"	Str.	4		4				Horizontal Bar
A401	#4	4'-10"	Str.	16	8	8				Horizontal Bar
A402	#4	4'-8"	Str.	8	4	4				Horizontal Bar
A605	#6	5'-8"	Str.	40	20	20				Vertical Bar

PIERS 3

Mark	Size	Length	Type	Number Total	#1	#2	#3	A	B	C	Description
243 FOOTINGS											
P601	#6	5'-6"	Str.	~~363~~	~~121~~	~~121~~	~~121~~ 81				Horizontal Bar
P602	#6	12'-0"	Str.	~~36~~ 24	~~12~~	~~12~~	~~12~~ 8				Horizontal Bar
P101	#10	4'-2"	Str.	216	72	72	72				Dowels
SHAFTS											
P401	#4	13'-1"	VII	270	90	90	90	3'-1"	3'-1"	4½"	Column Ties
P402	#4	13'-5"	VII	228	76	76	76	3'-2"	3'-2"	4½"	Cap Stirrups
P404	#4	11'-10"	IX	48	16	16	16	4'-4"	3'-2"		Corner Bar Cap
P501	#5	46'-9"	Str.	24	8	8	8				Horizontal Bar
P102	#10	17'-7"	Str.	168	56	56	56				Vertical Bar
P103	#10	24'-7"	VI	48	16	16	16	5'-11"	3'-3"	15'-5"	Vertical Bar
P111	#11	46'-9"	Str.	72	24	24	24				Horizontal Bar
P112	#11	12'-0"	Str.	24	8	8	8				Horizontal Bar
PEDESTALS											
P403	#4	4'-0"	X	396	138	120	138	3'-6"	6"		Dowels
P603	#6	12'-4"	XII	16		16		2'-8"	3'-2"	4"	Ties, Interior Pedestals
P604	#6	10'-7"	XVI	32	16		16	1'-9"	3'-8"	8"	Ties, Interior Pedestals
P605	#6	14'-4"	XII	32	16		16	3'-8"	3'-2"	4"	Ties, Interior Pedestals
P606	#6	10'-0"	XV	4	2		2	3'-5"	9"	2'-4"	Ties, Fascia Pedestals
P607	#6	10'-5"	XIV	4	2		2	3'-5"	2'-0"	8"	Ties, Fascia Pedestals
P608	#6	13'-10"	XII	8	4		4	3'-2"	3'-5"	4"	Ties, Fascia Pedestals
P609	#6	12'-10"	XII	8	2	4	2	3'-2"	2'-11"	4"	Ties, Fascia Pedestals

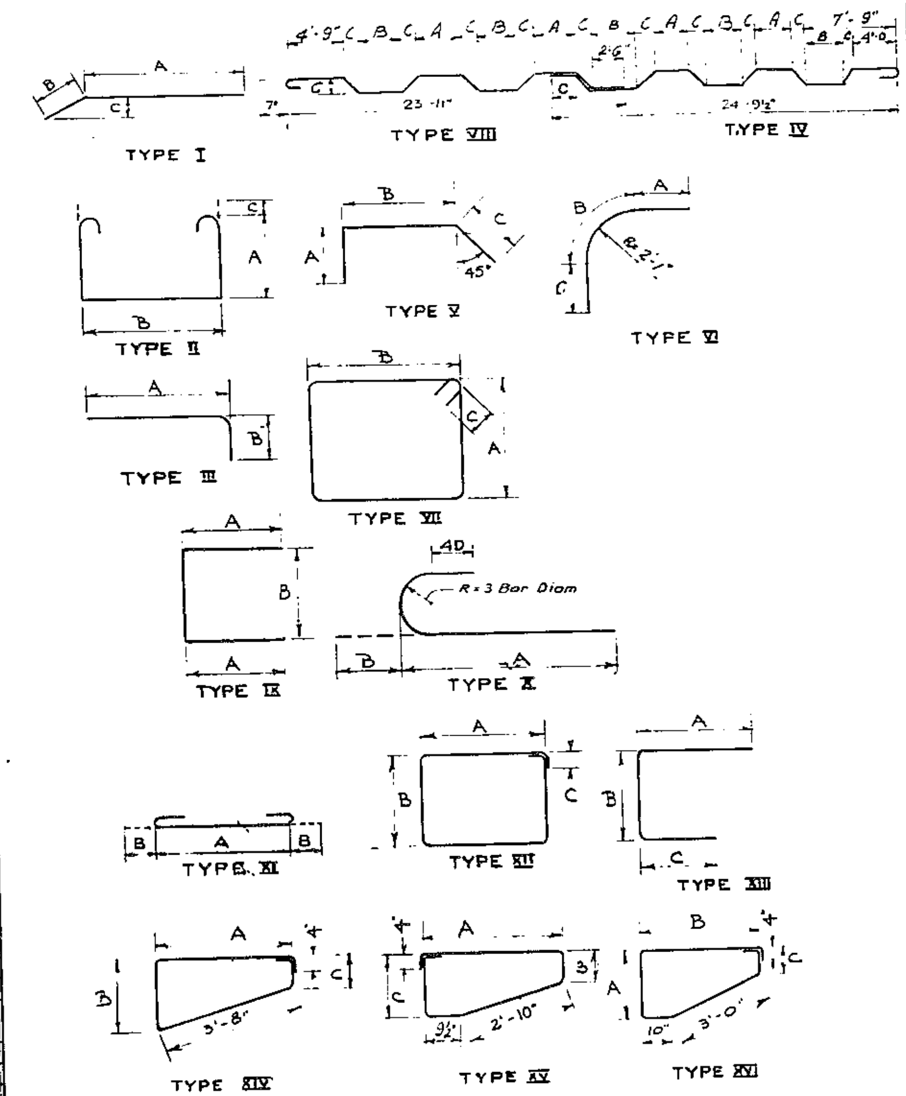
SLABS

Mark	Size	Length	Type	Number	A	B	C	Description
S401	#4	5'-0"	II	302	1'-6"	1'-0"	6"	Ties, Median
S402	#4	5'-9"	III	359	5'-2"	7"		Transverse Bar, Sidewalk
S403	#4	29'-3"	Str.	808				Longitudinal Bar
S404	#4	4'-4"	III	314	3'-9"	7"		Transverse Bar, Median
S405	#4	21'-0"	XVI	2	16'-0"	5'-0"	3'-0¾"	Longitudinal Bar, Median
S406	#4	23'-0"	XVI	2	18'-0"	5'-0"	3'-0¾"	Longitudinal Bar, Median
S407	#4	19'-0"	Str.	6				Longitudinal Bar, Median
S408	#4	17'-0"	Str.	6				Longitudinal Bar, Median
~~S409 to~~	~~#4~~	~~Av.~~	~~III~~	~~1 Ea. of~~				~~Transverse Bar, Sidewalk, Each~~
~~S4015~~		~~4'-11½"~~		~~7 Bars~~				~~Bar Varies By 4" From 3'-11½" to 5'-11½"~~
S4016	#4	37'-0"	Str.	198				Longitudinal Bar
S4017	#4	30'-0"	Str.	198				Longitudinal Bar
S4018	#4	5'-0"	II	367	1'-5"	1'-2"	6"	Ties Sidewalk
S501	#5	45'-6"	Str.	358				Transverse Bar, Bot Slab
S502	#5	25'-4"	VIII	200	4'-0"	3'-3½"	5"	Transverse Bar Slab
S503	#5	26'-4½"	IV	200	4'-0"	3'-3½"	5"	Transverse Bar, Slab
S504	#5	48'-10"	Str.	16				Edge Bar, Slab
~~S505~~	~~#5~~	~~46'-4"~~	~~V~~	~~48~~	~~2'-0"~~	~~43'-3"~~	~~2'-7"~~	~~Edge Bar, Slab~~
S506	#5	46'-8"	XI	358	45'-6"	7"		Transverse Bars, Top Slab
S507 to	#5	Av.	Str.	32 Ea. of				Series "B", Transverse Bar, Each Bar
S5044		24'-8"		38 Bars				Varies By 1'-0⅛" From 5'-0" to 44'-4"
S401	#4	5'-0"		11				
~~S5074~~		~~26'-0~~		~~50 Bars~~				~~Varies by 1'-0" from 11'-6" to 40'-6"~~
S601	#6	38'-6"	Str.	24				Header Bars At Open Joint
S4019	#4	5'-0"	Str.	314				Transverse Bars in mall

STONE CURB. DOWELS

Mark	Size	Length	Type	Number	A	B	C
GC501	#5	1'-0"	V	284	3"	6"	3"

CONTRACT II



BAR EQUIV. TABLE	
Number	Size
4	½" Φ
5	⅝" Φ
6	¾" Φ
7	⅞" Φ
8	1" Φ
9	1" □
10	1⅛" □
11	1¼" □

BAR REVISION - SLABS

SHEET No 13

BEST STREET OVER EXPRESSWAY
BAR LIST

STATE OF NEW YORK – DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL ENGINEERS – ARCHITECTS 202 E. 44TH ST. NEW YORK 17, N.Y.	DRAWN	E. R.
	CHECKED	J C
	TRACED	C B

NY33 BRIDGE CONDITION EVALUATION 2023
KENSINGSTON EXPRESSWAY PROJECT
PIN 5512.52
CITY OF BUFFALO, ERIE COUNTY
DODGE STREET
BIN 1022610

Prepared By:

Jeffrey Young, PE (NYSPE 106588)
Inspection Team Leader | Structural Engineer
Date: 5/30/2023

Reviewed By:

Stephen L. Gauthier, PE (NYSPE 0075775)
Quality Control Engineer | Sr. Structural Engineer
Date: 6/16/2023

LaBella
Powered by partnership.
300 State Street
Rochester, New York 14614
ph: 585-454-6110
www.labellapc.com

PIN 5512.52 – NY33 BRIDGE CONDITION EVALUATION 2023
FIELD INSPECTION SUMMARY

STRUCTURE:	BIN 1022610 – Dodge Street over NY33 Kensington Expressway
STRUCTURE TYPE:	Two (2) span Steel, Multi-Stringer (6 beams) structure with concrete abutments and pier. Year Built: 1963
CURRENT INSPECTION:	05/01/23 – 5/15/23 (LaBella Verification Inspections)
LAST BIENNIAL INSPECTION:	09/16/22
GENERAL RECOMMENDATION:	5
INSPECTION SCOPE:	An element-specific inspection of the subject structure to verify field conditions and obtain and confirm steel measurements found in the field during the latest biennial inspection in order to complete a Level 1 load rating.

GENERAL INSPECTION OBSERVATIONS & CONDITIONS:

- **Superstructure Beam End Section Loss** – Beam end corrosion was reviewed and verified in the field and found to be in reasonable conformance with the latest 2022 biennial bridge inspection reports and additional measurements were taken to represent existing conditions. A minimum of three thickness measurements were taken at each girder end just in front of the centerline of bearings to get an accurate representation of the full height of the web. Additional measurements were taken at the base of the web on either side of the bearing centerline to determine the extent of bearing area loss. Thickness readings at each location can be found in the girder end section loss tables. The following observations were noted:
    - The maximum section loss was typically found at the base of the web which was expected based on past inspection reports. Several girder ends showed some pitting along the base of the web. This pitting has been painted over and only extended approximately 1-2 feet into the span.
    - The average full height section loss is minor for most of the girders (range = 6% - 23%). The maximum average section loss was observed at G5 in span 2 at the pier with 23% loss.
    - To determine bearing area loss, the average of the two thickness measurements at the base of the web on either side of the bearing line was compared to the original web thickness. As expected, these losses were typically higher than the average full height loss. In most cases, the losses found in the field during this inspection were higher than those from the 2022 inspection report to varying degrees.
    - The bearing area loss ranged from 5% to 43%. The maximum loss was observed at G5 in span 2 at the pier with 43% loss in bearing area.
    - The bridge was recently hit, causing significant damage to G1 and G2 in span 1 and some minor damage to G3. A strongback beam was installed and work to repair the girders was going on during the time of inspection. No measurements were taken for G1 and G2 at the abutment due to the ongoing repair work. Refer to the photos attached to this report to see the extent of damage.
    - Several expansion bearings had pack rust between plates causing the plates to bow upwards in the center. Based on the pictures in the 2022 inspection report, this condition has gotten slightly worse.
    - Several small holes were observed in the web and bottom flange of the end diaphragm between G1 and G2 in span 1 at the pier.
    - Movable bearings at the pier in span 1 are overextended. In some cases, the ends of the girders in span 1 and span 2 are touching.

- **Level 1 Load Rating** –

  A Level 1 Load Rating evaluation was completed in conjunction with this inspection and has been attached to this report. A summary of the results is below:

Rating Load	Controlling Mode	Inventory Rating	Operating Rating
Load and Resistance Factor Rating HL-93	Span 2 Girder G5 Original 36WF150 Web Local Yielding	0.31	0.40
Load Factor Rating HS Truck or Lane	Span 1 Girder G5 Original 36WF160 Flexural Strength	HS 26.1 46.9 Ton	HS 41.5 78.3 Ton

  A fatigue analysis was also performed in conjunction with this inspection. The results showed that the existing structure has 1880 years of remaining life.

- **Substructure Concrete Condition** -

  - Abutments – The abutment faces were observed, sounded, and found to be in fair condition. There were no major changes in deterioration from the 2022 inspection report. A few isolated spalls and cracks can be found on each abutment face. There is one large spall at the south end of the begin abutment (approx. 4’x5’) with exposed rebar. All other spalls observed were approximately 1 SF or smaller. Refer to the photos and field sheets attached to this report for more details.

  - Piers – The pier caps, columns, and pedestals were observed, sounded, and found to be in fair to poor condition with some significant distress noted. Like the abutments, there are no major changes in deterioration from the 2022 inspection report. Several spalls can be seen spread over the faces of the pier and on the girder pedestals. A significant number of cracks with heavy rust staining can be seen on all faces as well. A majority of the deterioration is located at the base of the columns and on the pier cap/pedestals. Refer to the photos and field sheets attached to this report for more details.

- **Structural Deck Observations -** The structural deck was observed from below and is considered indicative of the overall deck conditions above. No major changes in deterioration from the 2022 inspection report were noted.

  The general condition of the structural deck was found to be as follows:

  - 3% of the structural deck in ADVANCED state of deterioration

  - 50% of the structural deck in FAIR state of deterioration

  - 47% of the structural deck in relatively GOOD condition

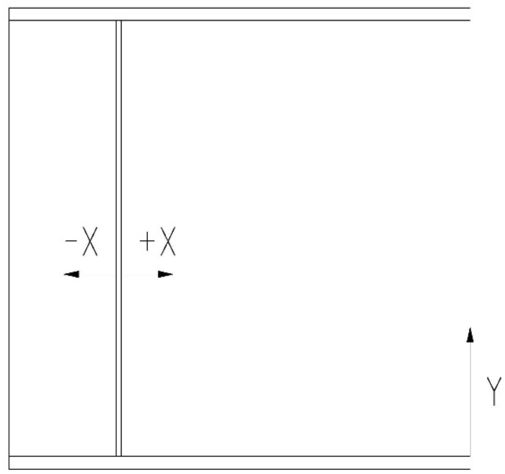
Photos of general deck conditions can be found in the photo log attached to this report.

The September 16, 2022 inspection report has also been attached to this report for a detailed breakdown of the condition of the bridge.

BIN 1022610 – Dodge Street on NY33 Kensington Expressway

Section Loss Measurements

Girder End Section Loss Table Key



DODGE STREET - GIRDER END SECTION LOSS TABLE									
SPAN 1									
ORIG. WEB THICKNESS: G 1,2,5,6 = 0.650", G3,4 = 0.680"									
GIRDER	LOCATION	READING	X (IN.)	Y (IN.)	THICKNESS (IN.)	AVG. FULL HEIGHT THICKNESS (IN.)*	AVG. BEARING AREA THICKNESS (IN.)**	FULL HEIGHT LOSS	BEARING AREA LOSS
G1	PIER	A	8	31	0.616	0.521	0.410	20%	37%
		B		17	0.613				
		C		2	0.333				
		D	32	31	0.615				
		E		17	0.616				
		F		2	0.511				
		G	-2.5	2	0.487				
		H		17	0.611				
G2	PIER	A	4	30	0.614	0.591	0.468	9%	28%
		B		19	0.604				
		C		1.5	0.555				
		D	-2.5	19	0.575				
		E		1.5	0.380				
G3	BEGIN	A	5	30	0.628	0.625	0.620	8%	9%
		B		17	0.632				
		C		1.5	0.616				
		D	-2.5	17	0.627				
		E		1.5	0.624				
	PIER	A	4	30	0.625	0.619	0.546	9%	20%
		B		19	0.627				
		C		2	0.606				
		D	-2.5	19	0.614				
		E		2	0.486				
G4	BEGIN	A	3	30	0.634	0.630	0.643	7%	6%
		B		17	0.635				
		C		1.5	0.620				
		D	-2.5	17	0.640				
		E		1.5	0.665				
	PIER	A	5	30	0.630	0.620	0.480	9%	29%
		B		19	0.630				
		C		1.5	0.599				
		D	22	30	0.633				
		E		19	0.632				
		F		1.5	0.608				
		G	-2.5	19	0.598				
		H		1.5	0.360				
G5	BEGIN	A	5	30	0.616	0.612	0.610	6%	6%
		B		17	0.616				
		C		2	0.605				
		D	-2.5	17	0.620				
		E		2	0.614				
	PIER	A	5	31	0.618	0.608	0.521	6%	20%
		B		18	0.620				
		C		2	0.587				
		D	-2.5	18	0.599				
		E		2	0.454				
		F	22	2	0.585				
G6	BEGIN	A	4	30	0.594	0.595	0.615	8%	5%
		B		17	0.604				
		C		2	0.587				
		D	-2.5	17	0.600				
		E		2	0.642				
	PIER	A	4	28	0.603	0.598	0.587	8%	10%
		B		18	0.606				
		C		1.5	0.585				
		D	-2.5	18	0.617				
		E		1.5	0.589				

* AVG. FULL HEIGHT THICKNESS = (A+B+C)/3

** AVG. BEARING AREA THICKNESS = AVERAGE OF THE BOTTOM TWO READINGS ON EITHER SIDE OF BEARING LINE

BIN 1022610 – Dodge Street on NY33 Kensington Expressway

DODGE STREET - GIRDER END SECTION LOSS TABLE

SPAN 2

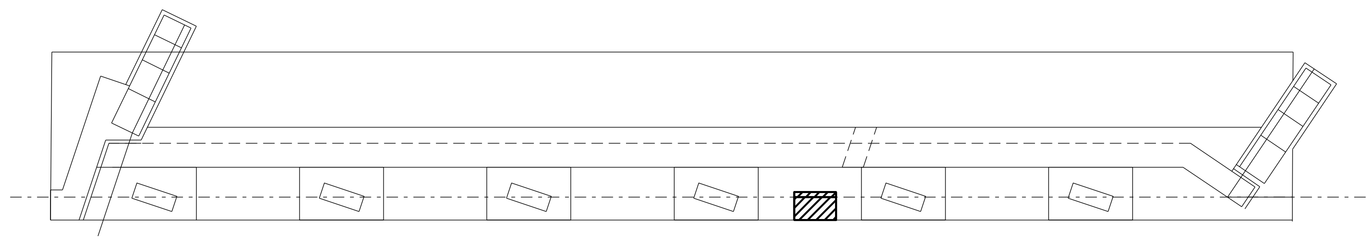
ORIG. WEB THICKNESS: G 1,2,5,6 = 0.625", G3,4 = 0.650"

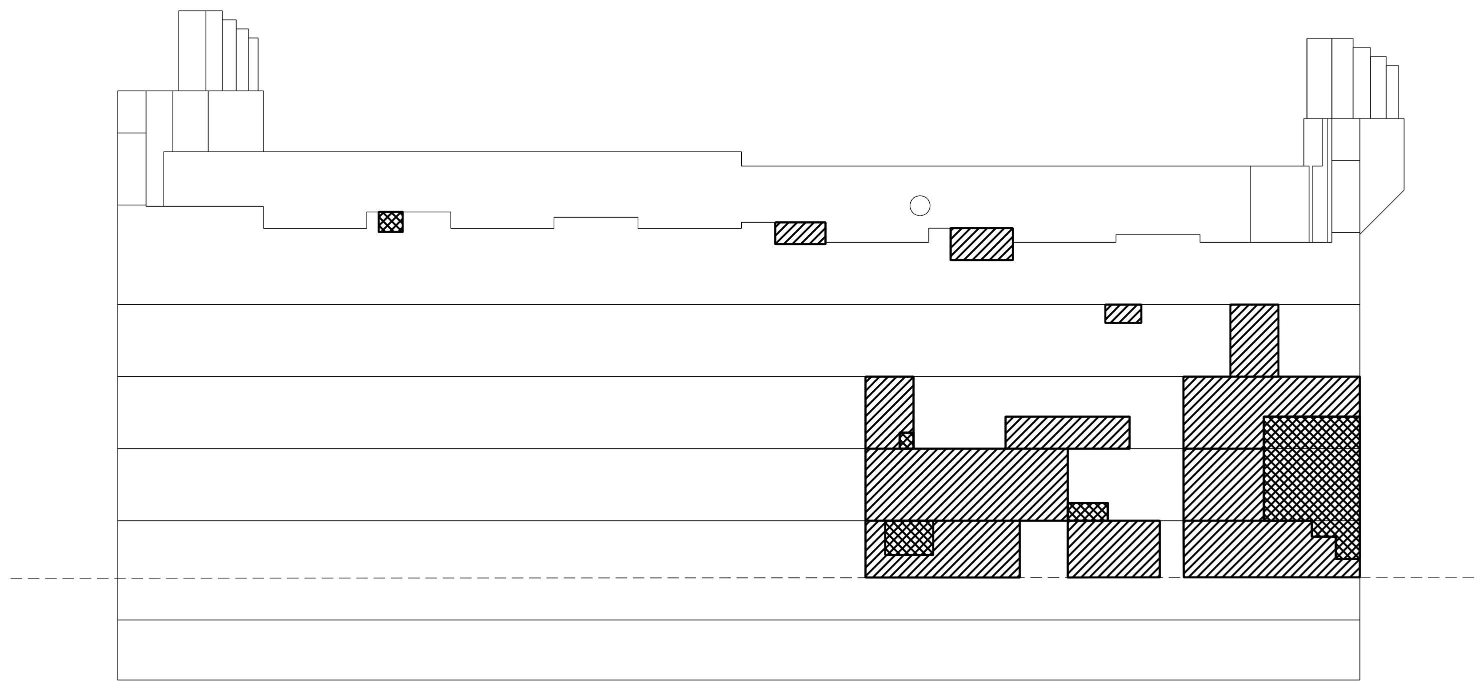
GIRDER	LOCATION	READING	X (IN.)	Y (IN.)	THICKNESS (IN.)	AVG. FULL HEIGHT THICKNESS (IN.)*	AVG. BEARING AREA THICKNESS (IN.)**	FULL HEIGHT	BEARING AREA
G1	PIER	A	4	30	0.58	0.559	0.457	11%	27%
		B		16	0.58				
		C		2	0.516				
		D	-2.5	16	0.555				
		E		2	0.397				
		F	16	2	0.55				
	END	A	3	29	0.585	0.586	0.592	6%	5%
		B		17	0.586				
		C		1.5	0.586				
		D	-2.5	17	0.584				
		E		1.5	0.598				
G2	PIER	A	3.5	31	0.571	0.543	0.461	13%	26%
		B		17	0.581				
		C		1	0.478				
		D	-2.5	17	0.566				
		E		1	0.443				
		F	13	1	0.493				
	END	A	3	31	0.576	0.572	0.560	8%	10%
		B		17	0.571				
		C		2	0.57				
		D	-2.5	17	0.58				
		E		2	0.549				
G3	PIER	A	6	31	0.6	0.585	0.497	10%	24%
		B		17	0.606				
		C		1	0.548				
		D	-2.5	17	0.462				
		E		1	0.446				
		F	16	1	0.577				
	END	A	2	30	0.608	0.610	0.615	6%	5%
		B		17	0.61				
		C		2	0.613				
		D	-2.5	18	0.61				
		E		2	0.616				
G4	PIER	A	5	31	0.601	0.595	0.468	9%	28%
		B		17	0.609				
		C		1	0.574				
		D	-2.5	17	0.599				
		E		1	0.362				
		F	14	1	0.568				
	END	A	3	32	0.61	0.602	0.593	7%	9%
		B		17	0.606				
		C		1.5	0.589				
		D	-2.5	17	0.608				
		E		1.5	0.597				
G5	PIER	A	6	30	0.571	0.483	0.356	23%	43%
		B		18	0.573				
		C		1	0.305				
		D	-2.5	18	0.587				
		E		1	0.406				
		F	16	1	0.504				
	END	A	3	30	0.568	0.569	0.568	9%	9%
		B		17	0.573				
		C		2	0.566				
		D	-2.5	17	0.574				
		E		2	0.569				
G6	PIER	A	4	30	0.562	0.560	0.515	10%	18%
		B		14	0.584				
		C		1	0.535				
		D	-2.5	14	0.583				
		E		1	0.495				
		F	15	1	0.519				
	END	A	4	31	0.556	0.556	0.536	11%	14%
		B		17	0.585				
		C		2	0.526				
		D	-2.5	17	0.596				
		E		2	0.545				

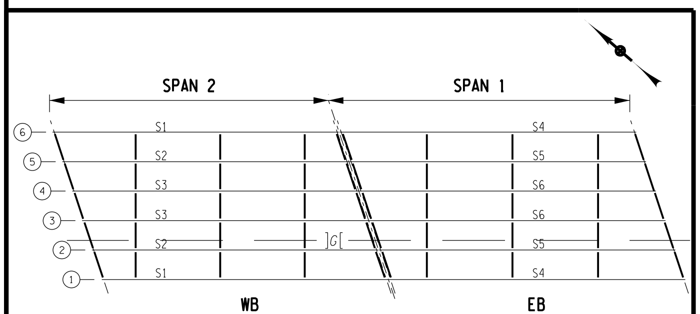
* AVG. FULL HEIGHT THICKNESS = (A+B+C)/3

** AVG. BEARING AREA THICKNESS = AVERAGE OF THE BOTTOM TWO READINGS ON EITHER SIDE OF BEARING LINE

Abutment and Pier Sketches







= DELAMINATION

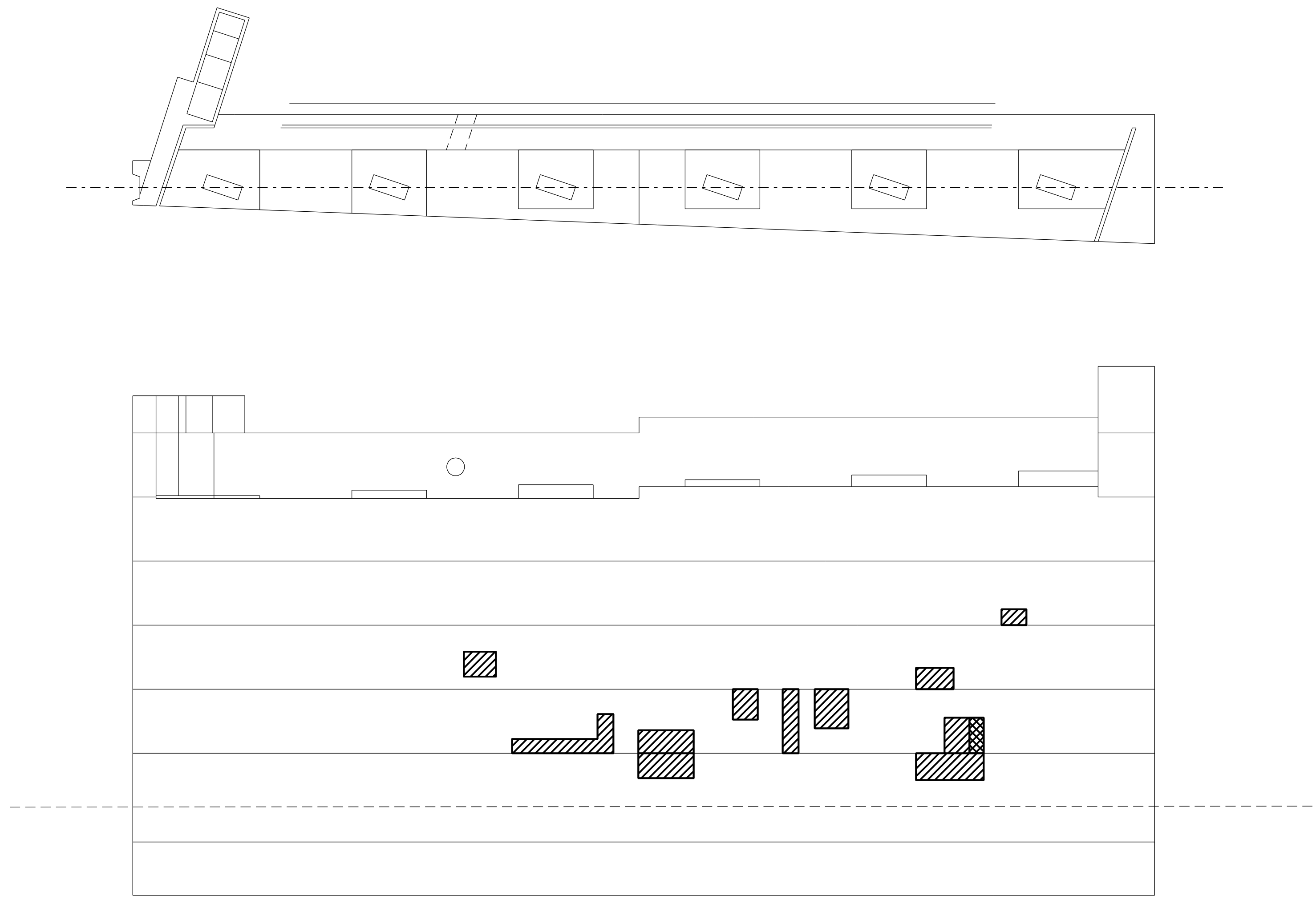
= SPALL

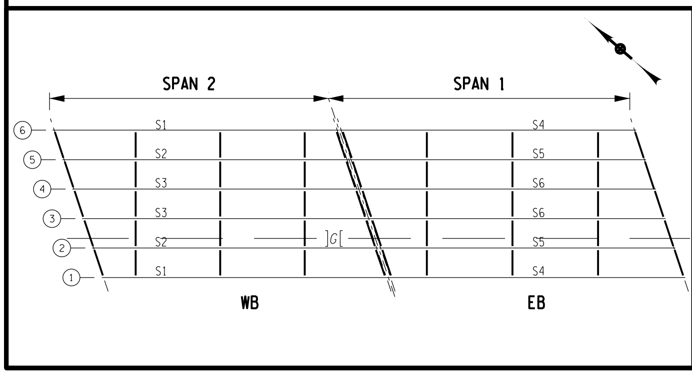
FIELD SHEET - BEGIN ABUTMENT

BY: JCY

DATE: 05/24/2023

SCALE: 1/8" = 1'





= DELAMINATION

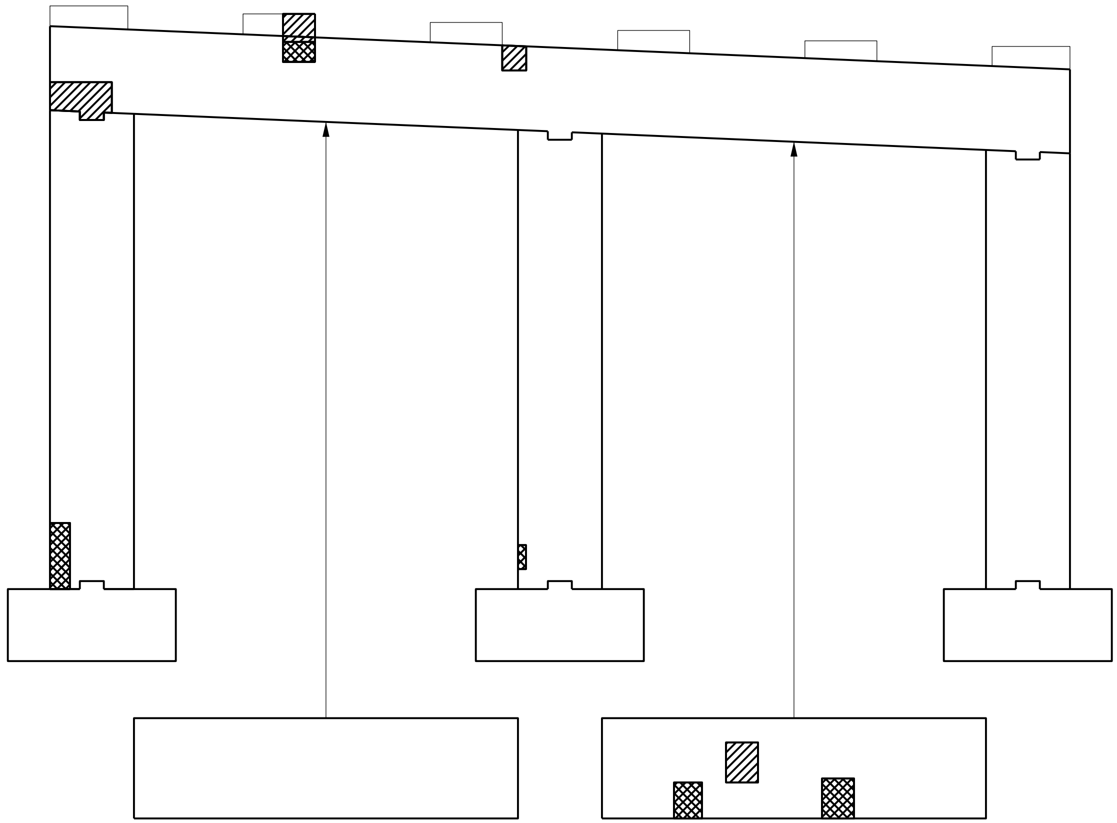
= SPALL

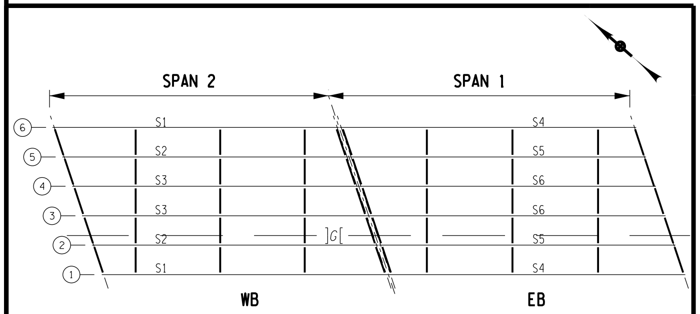
FIELD SHEET - END ABUTMENT

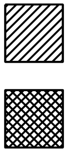
BY: JCY

DATE: 05/24/2023

SCALE: 1/8" = 1'





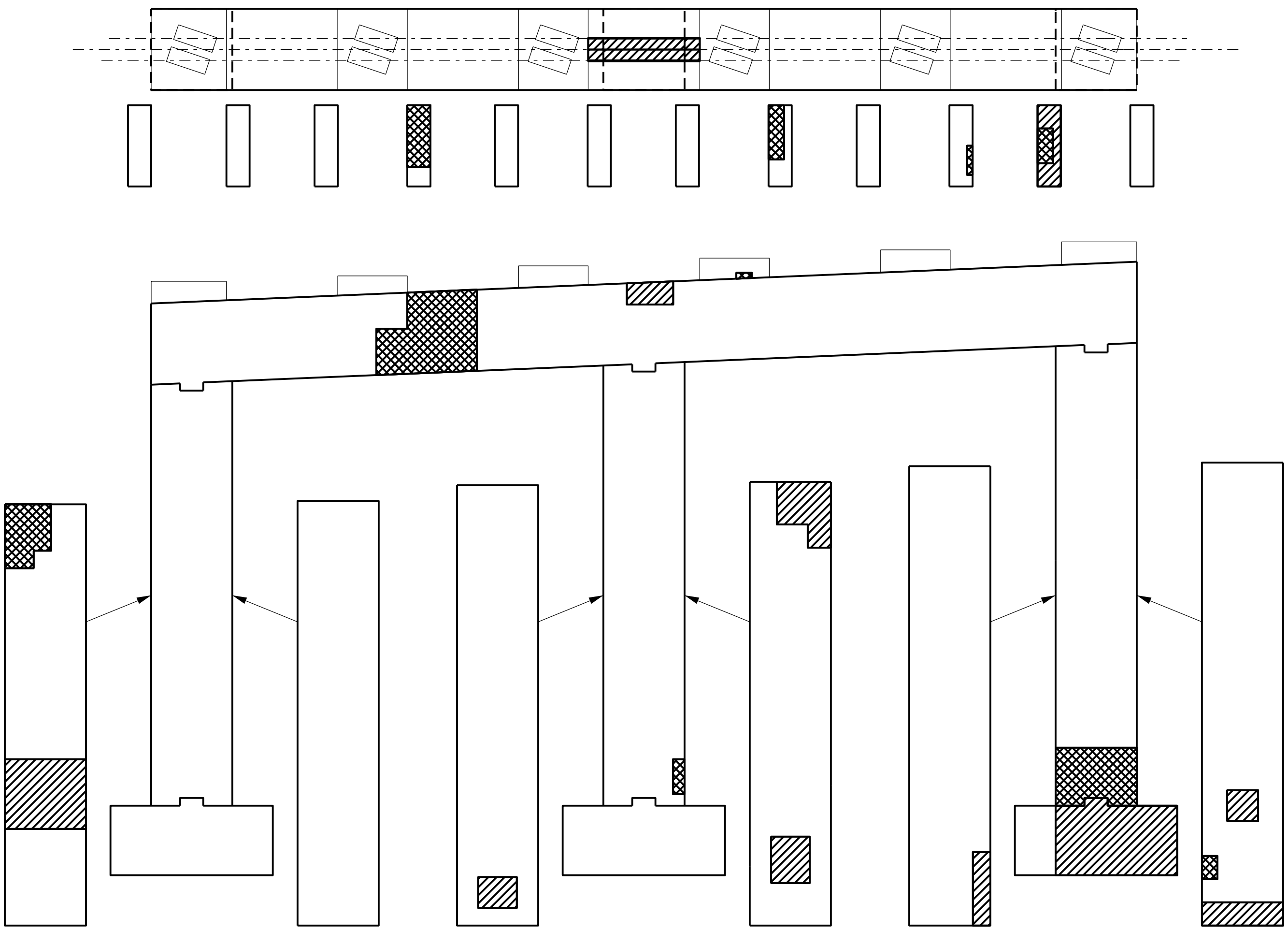


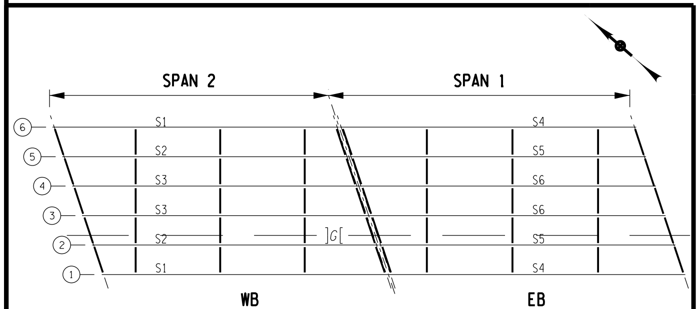
FIELD SHEET - PIER - WESTBOUND

BY: JCY

DATE: 5/24/2023

SCALE: 1/8" = 1'





FIELD SHEET - PIER - EASTBOUND

= DELAMINATION

= SPALL

BY: JCY

DATE: 5/24/2023

SCALE: 1/8" = 1'

Photographs

PHOTO 1

LOCATION:
SPAN 1 LOOKING EAST

DESCRIPTION:
IMPACT DAMAGE TO G1 AND G2, GENERAL DECK CONDITION

PHOTO 2

LOCATION:
G2 IN SPAN 2 AT PIER

DESCRIPTION:
TYPICAL GIRDER END CONDITION

PHOTO 3

LOCATION:
G2 IN SPAN 2 AT PIER

DESCRIPTION:
TYPICAL BEARING AND GIRDER END CONDITION

PHOTO 4

LOCATION:
END DIAPHRAGM SPAN 1 AT PIER BETWEEN G1 AND G2

DESCRIPTION:
SEVERAL HOLES IN WEB AND BOTTOM FLANGE

PHOTO 5

LOCATION:
G4 IN SPAN 2 AT PIER

DESCRIPTION:
OVEREXTENDED BEARINGS CAUSING GIRDERS IN SPAN 1 AND SPAN 2 TO TOUCH

PHOTO 6

LOCATION:
G4 IN SPAN 1 AT PIER

DESCRIPTION:
TYPICAL BEARING CONDITION, PACK RUST CAUSING PLATES TO BOW UPWARDS

PHOTO 7

LOCATION:
BEGIN ABUTMENT

DESCRIPTION:
LARGE SPALL WITH EXPOSED REBAR, WATER LEAKAGE FROM ABOVE

PHOTO 8

LOCATION:
END ABUTMENT

DESCRIPTION:
TYPICAL CONDITION, MAP CRACKING WITH MINOR DELAMINATION

PHOTO 9

LOCATION:
PIER FROM SPAN 2

DESCRIPTION:
CRACKS TO CONCRETE PIER WITH RUST STAINING

PHOTO 10

LOCATION:
PIER PEDESTAL

DESCRIPTION:
SPALLS ON CONCRETE PIER PEDESTAL

PHOTO 11

LOCATION:
SPAN 2 LOOKING WEST

DESCRIPTION:
GENERAL DECK CONDITION, SPALLS WITH EXPOSED REBAR

Appendices

Appendix A

2022 Biennial Bridge Inspection Report

New York State Department of Transportation
General Bridge Inspection Report

Inspection Date: September 16, 2022

Structure Information

BIN: **1022610**
Feature Carried: DODGE STREET
Feature Crossed: 33 33 53011027
Orientation: 8 - NORTHWEST

Region: 05 - BUFFALO
County: ERIE
Political Unit: City of BUFFALO
Approximate Year Built: 1963

Primary Owner: New York State Department of Transportation
Primary Maintenance Responsibility: New York State Department of Transportation
General Type Main Span: 3 - Steel, 02 - Stringer/Multi-Beam or Girder
This Bridge is not a Ramp
Number of Spans: 2

Postings

Posted Load Matches Inventory: Yes
Posted Load in field: Not Posted

Posted Vertical Clearances Match Inventory: N/A
Inventory On: Not Posted
Inventory Under: Not Posted

Number of Flags Issued

Red PIA: 0
Red: 0
Yellow: 0
Safety PIA: 0

New York State Inspection Overview

General Recommendation: 5

Federal NBI Ratings

NBI Deck Condition: 5
NBI Superstructure Condition: 5
NBI Substructure Condition: 6
NBI Channel Condition: N
NBI Culvert Condition: N

Action Items

Non-Structural Condition Observations noted: NO
Vulnerability Reviews Recommended: NO
Diving Inspection Requested: NO
Further Investigation Requested: NO

Inspector & Reviewer Signature Information

Inspection Signature:	Harry A. Watkins, P.E. 071693-1	*Date:* November 15, 2022
Review Signature:	Lawrence A. Mathews, P.E. 051173-1	*Date:* November 16, 2022
Processed by :	William F. Leblanc, P.E. 085471-1	*Date:* November 21, 2022

Report Printed: December 06, 2022 8:43:30 AM

Special Emphasis Inspection

Special Emphasis Detail	"Other" Special Emphasis Detail Description	Hands-On Insp Performed	Hands-On Inspection Note
AASHTO Category D, E, and E' welded details	Connection welds at the ends of the partial length cover plates on all girders in both spans.	Yes	No SE Defects were detected. See the Special Emphasis Sketch included within this Inspection and the BIN Folder. Harry A. Watkins, PE – PE No. 071693.
Other (Unique & unusual features)	Impact damage on G-1, G-2 & G-3 in Span 1 near mid-span	Yes	See the Element Remarks for the defects found during this Inspection. See the Special Emphasis Sketch included within this Inspection. Harry A. Watkins, PE – PE No. 071693.
Steel Web Bearing Area	Section loss exceeding 25%	Yes	Minor changes to the section loss. See the Element Remarks and Section Loss Documentation within this Inspection. See the Special Emphasis Sketch included within this Inspection. Harry A. Watkins, PE – PE No. 071693.

Additional Information

Overloads Observed

No overload vehicles observed during this inspection.

Notes to Next Inspector

The BIN plate is attached to the fence at the Begin Right quadrant.

A Bucket Truck and WZTC were utilized to facilitate this Inspection.

Improvements Observed

2022 – No work history improvements required.
2020 - None

Pedestrian Fence Height

6'

Snow Fence

None

Bin Plate Condition

OK

Scour Critical Rating

N - Bridge not over waterway.

Field Notes

Staff Present During Inspection		
Name	**Title**	**Organization**
Akash Shah	ATL Trainee	Lu Engineers
Brandon Wilson	WZTC – Driver	Traffic Services, Inc.
Cuyler Gentile	WZTC – Supervisor	Traffic Services, Inc.
Dennis J. Barefoot	Assistant Team Leader	Lu Engineers
Mike Pragle	WZTC – Driver	Traffic Services, Inc.
Tim Ward	WZTC – Driver	Traffic Services, Inc.
Tom Mantione	WZTC – Driver	Traffic Services, Inc.

General Equipment Required for Inspection*
Access Type
13 - Walking
19 - Up to 30 Foot Lift
29 - Lane Closure With Shadow Vehicle

*** For span specific equipment requirements refer to the Active Inventory's "Access Needs" tab in BDIS.**

Detailed Time & Weather Conditions				
Field Date	**Arrival**	**Departure**	**Temp (F)**	**Weather Conditions**
07/07/2022	10:00 AM	01:30 PM	80	Sunny
07/08/2022	11:30 AM	02:00 PM	79	Sunny, partly cloudy
09/14/2022	09:00 AM	11:00 AM	68	Sunny
09/16/2022	10:00 AM	11:00 AM	69	Sunny, partly cloudy

Inspection Times (hours)	
Time required for travel, inspection and report preparation	16
Lane closure usage	6
Railroad flagging time	No

Element Quantities

Element Assessment Summary Table

Element	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
12 - Reinforced Concrete Deck	6356	ft^2	3082	3148	126		0
107 - Steel Open Girder/Beam	875	ft	775	88	12		0
205 - Reinforced Concrete Column	3	each		1	2		0
215 - Reinforced Concrete Abutment	100	ft	64	16	20		0
220 - Reinforced Concrete Pile Cap/Footing	289	ft					289
234 - Reinforced Concrete Pier Cap	43	ft	17	13	13		0
301 - Pourable Joint Seal	88	ft				88	0
311 - Movable Bearing	12	each			12		0
313 - Fixed Bearing	12	each		11	1		0
330 - Metal Bridge Railing	303	ft	283	20			0
510 - Wearing Surfaces	4538	ft^2	2208	2238	92		0
515 - Steel Protective Coating	10481	ft^2	8022	1910	496	53	0
800 - Erosion or Scour	310	ft	310				0
810 - Sidewalk	1815	ft^2	1653	81	81		0
811 - Curb	303	ft	298	5			0
830 - Secondary Members	2	each	2				0
831 - Steel Beam End	24	each	12		12		0
850 - Backwall	91	ft	42	28	21		0
851 - Abutment Pedestal	12	each	9	2	1		0
852 - Pier Pedestal	12	each		8	4		0
853 - Wingwall	168	ft	160	8			0

Element Assessment by Span

Element**	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
Span Number : 1							
BA215 - Reinforced Concrete Abutment	52	ft	22	10	20		0
BA220 - Reinforced Concrete Pile Cap/Footing	52	ft					52
BA313 - Fixed Bearing	6	each		6			0
515 - Steel Protective Coating	6	ft^2		3	3		0
BA800 - Erosion or Scour	52	ft	52				0
BA831 - Steel Beam End	6	each	6				0
BA850 - Backwall	47	ft	42	5			0
BA851 - Abutment Pedestal	6	each	3	2	1		0

Element**	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
BW220 - Reinforced Concrete Pile Cap/Footing	112	ft					112
BW800 - Erosion or Scour	112	ft	112				0
BW853 - Wingwall	112	ft	110	2			0
PR205 - Reinforced Concrete Column	3	each		1	2		0
PR220 - Reinforced Concrete Pile Cap/Footing	21	ft					21
PR234 - Reinforced Concrete Pier Cap	43	ft	17	13	13		0
PR301 - Pourable Joint Seal	44	ft				44	0
PR311 - Movable Bearing	6	each			6		0
515 - Steel Protective Coating	6	ft^2			1	5	0
PR313 - Fixed Bearing	6	each		5	1		0
515 - Steel Protective Coating	6	ft^2			1	5	0
PR800 - Erosion or Scour	42	ft	42				0
PR831 - Steel Beam End	6	each			6		0
PR852 - Pier Pedestal	12	each		8	4		0
12 - Reinforced Concrete Deck	3207	ft^2	1569	1574	64		0
510 - Wearing Surfaces	2291	ft^2		2231	60		0
107 - Steel Open Girder/Beam	445	ft	394	45	6		0
515 - Steel Protective Coating	4512	ft^2	4060	226	226		0
330 - Metal Bridge Railing	153	ft	143	10			0
515 - Steel Protective Coating	773	ft^2		735	19	19	0
810 - Sidewalk	916	ft^2	808	54	54		0
811 - Curb	153	ft	153				0
830 - Secondary Members	1	each	1				0
Span Number : 2							
EA215 - Reinforced Concrete Abutment	48	ft	42	6			0
EA220 - Reinforced Concrete Pile Cap/Footing	48	ft					48
EA301 - Pourable Joint Seal	44	ft				44	0
EA311 - Movable Bearing	6	each			6		0
515 - Steel Protective Coating	6	ft^2			1	5	0
EA800 - Erosion or Scour	48	ft	48				0
EA831 - Steel Beam End	6	each	6				0
EA850 - Backwall	44	ft		23	21		0
EA851 - Abutment Pedestal	6	each	6				0
EW220 - Reinforced Concrete Pile Cap/Footing	56	ft					56
EW800 - Erosion or Scour	56	ft	56				0
EW853 - Wingwall	56	ft	50	6			0

Element**	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
PR831 - Steel Beam End	6	each			6		0
12 - Reinforced Concrete Deck	3149	ft^2	1513	1574	62		0
510 - Wearing Surfaces	2247	ft^2	2208	7	32		0
107 - Steel Open Girder/Beam	430	ft	381	43	6		0
515 - Steel Protective Coating	4414	ft^2	3962	226	226		0
330 - Metal Bridge Railing	150	ft	140	10			0
515 - Steel Protective Coating	758	ft^2		720	19	19	0
810 - Sidewalk	899	ft^2	845	27	27		0
811 - Curb	150	ft	145	5			0
830 - Secondary Members	1	each	1				0

** Elements with a prefix designate the locations of BA-Begin Abutment, BW-Begin Wingwall, EA-End Abutment, EW-End Wingwall, CO-Culvert Outlet, and PR-Pier. No prefix generally indicates the element is part of the superstructure.

Inspection Notes

General Notes

2022 – The Inspection was completed beyond the “30 day window” due to Contractual and Scheduling issues.

New Standard Photographs have been taken and have been placed within the Inventory.

No other comment.

Element Condition Notes

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 12 - Reinforced Concrete Deck	3207	1569	1574	64	0	0
Span 2: 12 - Reinforced Concrete Deck	3149	1513	1574	62	0	0

Condition State 3 Note

Referenced Photo(s): 1, 2

Referenced Sketch(es): None

2022 – The underside of the reinforced concrete deck in both spans exhibit scattered areas of delaminated and spalled concrete with exposed corroded reinforcement. The worst conditions were found in Bays 1 and 2 of Span 1 and Bays 2, 3 and 4 in Span 2. Overall, the deterioration affects approximately 2% of the total surface area in both spans. Deck Deterioration Documentation is not warranted at this time. (Photo No’s. 1 and 2)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 12 - Reinforced Concrete Deck-510 - Wearing Surfaces	2291	0	2231	60	0	0

Condition State 3 Note

Referenced Photo(s): 3

Referenced Sketch(es): None

2022 – The wearing surface in Span 1 exhibits cracking with raveling at the Begin Right of the span and along the Begin side of the pier joint (Photo No. 3).

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 107 - Steel Open Girder/Beam	445	394	45	6	0	0
Span 2: 107 - Steel Open Girder/Beam	430	381	43	6	0	0

Common

Referenced Photo(s): 5, 6, 7, 27

Referenced Sketch(es): 2, 3

2022 - The superstructure girder ends exhibit old, painted-over localized minor pitting and section loss within the bearing areas on the girder ends over Begin abutment, Pier 1 and the End abutment. Section loss measurements were taken with a D-Meter, calipers and/or a pit gauge throughout. The section loss measurements varied between 0% and 42%. There is no apparent distress or web crippling. The "Range" of the painted-over" minor pitting and section loss on each girder end is typically 1 LF or less. The Bearing area section loss exceeds 10% at the following locations which are assessed CS-3:

Span 1, G-1 at the End = 15% (2020 = 13%) (Photo No. 5)
Span 1, G-1 at the End = 42% (2020 = 33%)
Span 1, G-3 at the End = 16% (2020 = 13%)
Span 1, G-4 at the End = 38% (2020 = 24%) (Photo No. 6)
Span 1, G-5 at the End = 16% (2020 = 15%)
Span 1, G-6 at the End = 15% (2020 = 13%)

Span 2, G-1 at the Begin = 14% (2020 = 12%) (Photo No. 5)
Span 2, G-2 at the Begin = 20% (2020 = 18%)
Span 2, G-3 at the Begin = 33% (2020 = 28%)
Span 2, G-4 at the Begin = 32% (2020 = 24%) (Photo No. 6)
Span 2, G-5 at the Begin = 42% (2020 = 36%)
Span 2, G-6 at the Begin = 15% (2020 = 15%)

There are some changes to the measurements since the previous Inspection. The changes are due to the location of the measurement on the girder end. The painted-over section loss on the remaining girders throughout both spans is typically less than 10%. There is no active corrosion on any of the girder ends. The paint system continues to function as designed. See the Girder End Section Loss Documentation included within this Inspection.

Additionally, girders G-1 thru G-3 in Span 1 exhibit impact damage over the center and Right travel lanes. There is no apparent relative distress or cracks fond in the impacted areas. (Photo No. 7)

The End diaphragm at the Begin of Span 2 in Bay 1 exhibits heavy active corrosion with bottom flange loss. The deck over the diaphragm remains in good condition. (Photo No. 27)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 107 - Steel Open Girder/Beam-515 - Steel Protective Coating	4512	4060	226	226	0	0
Span 2: 107 - Steel Open Girder/Beam-515 - Steel Protective Coating	4414	3962	226	226	0	0

Common

Referenced Photo(s): 8, 9

Referenced Sketch(es): None

2022 – The superstructure girders exhibit paint deterioration in both spans. The paint deterioration includes faded and flaking paint with rust bleed, rust staining and corrosion beginning to affect approximately 5% in Spans 1 and 2. The assessment is broken down as follows: Span 1: CS-1 = 4,060 SF, CS-2 = 226 SF and CS-3 = 226 SF and Span 2: CS-1 = 3,962 SF, CS-2 = 226 SF and CS-3 = 226 SF. (Photo No's. 8 and 9)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR205 - Reinforced Concrete Column	3	0	1	2	0	0

Condition State 3 Note

Referenced Photo(s): 10

Referenced Sketch(es): None

2022 – Reinforced concrete columns C-2 and C-3 exhibit delaminated and spalled concrete as follows:

C-2 – There is a 0.5 foot wide by 1.8 foot high by 1-1/4" deep spall at the bottom of the Begin Right corner of the column with no exposed reinforcement.

C-3 – The Begin face of the column exhibits a 3.6 foot wide by 4.9 foot high by 1” to 2-1/2” deep spall with exposed corroded reinforcement (Photo No. 10). There is a 6 foot high area of delaminated concrete on the End Right corner with a 3 foot high by 2” deep spall with no exposed reinforcement. The bottom of the End face exhibits an area of cracked and delaminated concrete measuring 2 feet wide by 3 foot high.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA215 - Reinforced Concrete Abutment	52	22	10	20	0	0

Condition State 3 Note

Referenced Photo(s): 11

Referenced Sketch(es): None

2022 – The Begin abutment exhibits 20 foot wide area of delaminated concrete with 3 separate spalls between the Left end and to below the G-2 pedestal. The affected widths of the spalls are 3.7 feet, 1.7 feet and 1.9 feet reaching between 1-1/4” and 2” deep. There is exposed corroded bonded reinforcement within all three spalls. (Photo No. 11)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR234 - Reinforced Concrete Pier Cap	43	17	13	13	0	0

Condition State 3 Note

Referenced Photo(s): 12, 13

Referenced Sketch(es): None

2022 – The reinforced concrete pier cap cracked, delaminated and spalled concrete as follows:

Begin:
Bay 2 – There are two spalls within a 4.5 foot wide area of delaminated concrete that measure up to 2 feet wide by 1-1/2” deep. (Photo No. 12)
Column Bay 2 – There are two 1 SF by 1-1/2” deep spalls on the Begin face between C-2 and C-3.
Bay 3 – There is a 3 foot long wide horizontal crack across the top corner in Bay 3 with hollowness along its length.

End:
Below G-3 – There is a 1 foot wide by 1” deep spall near the top of the cap beam.

Underside:
In Column Bay 2 there are two 1 SF by 1-1/2” deep spalls with exposed bonded reinforcement. (Photo No. 13)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR301 - Pourable Joint Seal	44	0	0	0	44	0

Condition State 4 Note

Referenced Photo(s): 3

Referenced Sketch(es): None

2022 – Above deck, the pier joint seal is partially covered with grit. There is some vegetation growth at the Left end. The exposed seal exhibits depressed areas. (Photo No. 3)

Below deck, there is evidence of active leakage affecting nearly the full length of the joint.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR311 - Movable Bearing-515 - Steel Protective Coating	6	0	0	1	5	0
Span 1: BA313 - Fixed Bearing-515 - Steel Protective Coating	6	0	3	3	0	0
Span 1: PR313 - Fixed Bearing-515 - Steel Protective Coating	6	0	0	1	5	0
Span 2: EA311 - Movable Bearing-515 - Steel Protective Coating	6	0	0	1	5	0

Common

Referenced Photo(s): 15, 16, 17, 18

Referenced Sketch(es): None

2022 – The bearings on the Begin abutment, Piers 1 and the End abutment exhibit paint deterioration. The paint deterioration includes faded paint with rust bleed, rust staining and corrosion affecting the bearings as follows (assessments are CS-3, unless otherwise noted):

Begin abutment, fixed bearings – The bearings below girders G-1, G-2 and G-6 are assessed CS-3. (Photo No. 15)

Pier 1, expansion bearings at the End of Span 1 - The bearing below girder G-6 is assessed CS-3. The bearings below girder G-1 thru G-5 are assessed CS-4. (Photo No's. 16 and 17)

Pier 1, fixed bearings at the Begin of Span 2 - The bearing below girder G-6 is assessed CS-3. The bearings below girder G-1 thru G-5 are assessed CS-4. (Photo No. 17)

End abutment, expansion bearings - The bearing below girder G-2 thru G-6 are assessed CS-3. The bearing below girder G-1 is assessed CS-4. (Photo No. 18)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR311 - Movable Bearing	6	0	0	6	0	0

Condition State 3 Note

Referenced Photo(s): 16

Referenced Sketch(es): None

2022 – The expansion bearings at the End of Span 1 below girders G-4 thru G-6 are all shifted toward the Left. All six bearings exhibit pack rust between the bronze slide plate and the masonry plate. The bronze plates are bowed upward between 3/8" and 5/8" inhibiting proper thermal movement. Additionally, the bearings below girders G-4 thru G-6 are in expanded positions at 79 degrees F. The sole plates are expanded between flush and within ¼". Additionally, the Left anchor nut on the G-1 bearing is raised. (Photo No. 16)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR313 - Fixed Bearing	6	0	5	1	0	0

Condition State 3 Note

Referenced Photo(s): 17

Referenced Sketch(es): None

2022 – The Left anchor nut on the G-1 fixed bearing is raised. (Photo No. 17)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 330 - Metal Bridge Railing	153	143	10	0	0	0

Condition State 2 Note

Referenced Photo(s): 19

Referenced Sketch(es): None

2022 – The Right side bridge rail exhibits impact damage between the 2nd and 3rd post that has bent the rails affecting 8 LF. The 1st post is bent. The bridge rail remains solid when pushed. (Photo No. 19)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 330 - Metal Bridge Railing-515 - Steel Protective Coating	773	0	735	19	19	0
Span 2: 330 - Metal Bridge Railing-515 - Steel Protective Coating	758	0	720	19	19	0

Common

Referenced Photo(s): 28, 29

Referenced Sketch(es): None

2022 – The Left and Right bridge rails exhibit paint deterioration throughout. The paint deterioration includes faded and flaking paint with rust bleed, rust staining and corrosion affecting approximately 5% of the total surface area of the rolled steel components. The balance of the rolled steel components and W-beam are assessed CS-2 throughout. The assessment is broken down as follows: Span 1 - CS-2 = 735 SF, CS-3 = 19 SF and CS-4 = 19 SF; Span 2 - CS-2 = 720 SF, CS-3 = 19 SF and CS-4 = 19 SF. (Photo No's. 28 and 29)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 810 - Sidewalk	916	808	54	54	0	0
Span 2: 810 - Sidewalk	899	845	27	27	0	0

Condition State 3 Note

Referenced Photo(s): 21, 22

Referenced Sketch(es): None

2022 – The Span 1 and Span 2 sidewalks exhibits bands of spalling behind the curbs that varies between 2" and 12" wide by up to 1-1/2" deep. The worst spalling was found at the Begin Left of Span 1 Begin Right of Span 2. No reinforcement was found in any of the spalls. (Photo No's. 21 and 22)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR831 - Steel Beam End	6	0	0	6	0	0
Span 2: PR831 - Steel Beam End	6	0	0	6	0	0

Condition State 3 Note

Referenced Photo(s): 5, 6

Referenced Sketch(es): None

2022 – See Element 107 Steel Open Girder/Beam for Spans 1 and 2 for Remarks and Documentation. (Photo No's. 6 and 7)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA851 - Abutment Pedestal	6	3	2	1	0	0

Common

Referenced Photo(s): 25

Referenced Sketch(es): None

2022 – The Begin pedestal below girder G-1 exhibits spalling that measures 1 foot by 6" by 1-1/4" deep with exposed bonded reinforcement (CS-3) (Photo No. 25). The spalling reaches the edge of the masonry plate with loss of bearing observed. The pedestals below girders G-2 and G-5 exhibit cracked and hollow sounding concrete on their Begin faces (CS-2).

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR852 - Pier Pedestal	12	0	8	4	0	0

Condition State 3 Note

Referenced Photo(s): 26

Referenced Sketch(es): None

2022 – The pier pedestals cracked, hollow sounding and spalled concrete as follows:

G-2 – The Right side of both G-2 pedestals exhibits spalling that measures 2.7 feet wide by 0.8 feet high by 0.4 feet across the top by 2" deep with exposed corroded bonded reinforcement.

G-4 – The Right side of both G-2 pedestals exhibits spalling that measures 2.4 feet wide by 0.8 feet high by 2" to 2-1/2" deep with exposed corroded bonded reinforcement. (Photo No. 26)

The concrete adjacent to both spalls is cracked and hollow sounding.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 2: 12 - Reinforced Concrete Deck-510 - Wearing Surfaces	2247	2208	7	32	0	0

Condition State 3 Note

Referenced Photo(s): 3, 4

Referenced Sketch(es): None

2022 – The wearing surface in Span 2 exhibits an area of cracking with 2" deep raveling in the Left travel lane and along the End side of the pier joint (Photo No's. 3 and 4).

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 2: EA301 - Pourable Joint Seal	44	0	0	0	44	0

Condition State 4 Note

Referenced Photo(s): 14

Referenced Sketch(es): None

2022 – Above deck, the End joint exhibits widespread areas of depressed and debonded seal. The joint header is transversely cracked across the full length of the joint. (Photo No. 14)

Below deck, there is evidence of active leakage affecting nearly the full length of the joint.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 2: EA311 - Movable Bearing	6	0	0	6	0	0

Condition State 3 Note

Referenced Photo(s): 18

Referenced Sketch(es): None

2022 – The End abutment expansion bearings are all typically shifted toward the Right. All six bearings exhibit pack rust between the bronze slide plate and the masonry plate. The bronze plates are bowed upward between ¼” and 5/8” inhibiting proper thermal movement. Additionally, the bearings below girders G-4 thru G-6 are in contracted positions at 80 degrees F. (Photo No. 18)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 2: 330 - Metal Bridge Railing	150	140	10	0	0	0

Condition State 2 Note

Referenced Photo(s): 20

Referenced Sketch(es): None

2022 – The Right side bridge rail exhibits impact damage affecting the Begin-most 2 LF of the rail. Additionally, the bottom rail on the Left side is bent adjacent to the 9th post. (Photo No. 20)

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 2: EA850 - Backwall	44	0	23	21	0	0

Condition State 3 Note

Referenced Photo(s): 23, 24

Referenced Sketch(es): None

2022 – The End backwall exhibits areas of cracked, hollow sounding and spalled concrete as follows:

Bay 1 – There are two areas of spalling affecting a total of 5.5 feet wide by 2” to 6” deep with exposed corroded debonded reinforcement affecting the backwall from the Left end and Bay 1. (Photo No’s. 23 and 24)
Bay 2 – There is spalling measuring 3.5 feet wide by 2” to 4” deep with exposed corroded debonded reinforcement.
Bay 3 – There is spalling measuring 5 feet wide by 8” deep with exposed corroded debonded reinforcement.
Bay 5 – There is spalling measuring 5 feet wide by 2” to 8” deep with exposed corroded debonded reinforcement.

Inspection Photographs

Attachment Description: Underside of the reinforced concrete deck in Bays 1 and 2 of Span 1, looking toward the Begin.	Photo Number: **1** Photo Filename: **22 1 RCDeckSp1Bays1-2LookBegin.JPG** 

Attachment Description: Underside of the reinforced concrete deck in Bay 2 of Span 2, looking toward the End.	Photo Number: **2** Photo Filename: **22 2 RCDeckSp2Bay2E.JPG** 

Photo Number: **3** Photo Filename: **22 3 WSPierJointFromLeft.JPG**

Attachment Description:
Wearing surface and pier joint from the Left.

Photo Number: **4** Photo Filename: **22 4 WSSp2LeftaneNearEnd.JPG**

Attachment Description:
Wearing surface in the Left travel lane of Span 2 looking toward the End Right.

	Photo Number: **5** Photo Filename: **22 5 GirderG-1Sps1-2.JPG**
Attachment Description: Girder G-1 over the pier at End of Span 1 and Begin of Span 2.	

	Photo Number: **6** Photo Filename: **22 6 GirderG-4Sps1-2.JPG**
Attachment Description: Girder G-4 over the pier at End of Span 1 and Begin of Span 2.	

Photo Number: **7** Photo Filename: **22 7 GirderG-1Sp1FromEnd.JPG**

Attachment Description:
Girder G-1 in Span 1,
looking toward the Begin.

Photo Number: **8** Photo Filename: **22 8 SSCoatSp1FromBeginLeft.JPG**

Attachment Description:
Superstructure coating in
Span 1, from the Begin Left.

Photo Number: **9** Photo Filename: **22 9 SSCoatSp2FromEndRight.JPG**

Attachment Description:
Superstructure coating in Span 2, from the End Right.

Photo Number: **10** Photo Filename: **22 10 PierColC-3.JPG**

Attachment Description:
Pier column C-3, Begin face.

	Photo Number: **11** Photo Filename: **22 11 BeginAbutLeft.JPG**
Attachment Description: Begin abutment at the Left end.	

	Photo Number: **12** Photo Filename: **22 12 PierCapBeginG-2.JPG**
Attachment Description: Pier cap, begin face below girder G-2.	

Attachment Description: Pier cap, underside of Column Bay 2.	Photo Number: **13** Photo Filename: **22 13 PierCapColBay2.JPG** 

Attachment Description: End joint, from the Right.	Photo Number: **14** Photo Filename: **22 14 EndJointFromRightt.JPG** 

	Photo Number: **15** Photo Filename: **22 15 BegBrgG-6.JPG**
Attachment Description: Begin bearing below girder G-6.	

	Photo Number: **16** Photo Filename: **22 16 Pier1BrgEndSp1G-3.JPG**
Attachment Description: Pier bearing below girder G-3 at the End of Span 1.	

Photo Number: **17** Photo Filename: **22 17 PierBrgsG-1.JPG**

Attachment Description:
Pier bearings below girder G-1 at the End of Span 1 and Begin of Span 2.

Photo Number: **18** Photo Filename: **22 18 EndBrgG-1.JPG**

Attachment Description:
End bearing below girder G-1.

Photo Number: **19** Photo Filename: **22 19 BridgeRailSp1Rt.JPG**

Attachment Description:
Bridge rail in Span 1 at the Begin Right.

Photo Number: **20** Photo Filename: **22 20 BridgeRailSp2Rt.JPG**

Attachment Description:
Bridge rail in Span 2 at the Begin Right.

	Photo Number: **21** Photo Filename: **22 21 SidewalkSp1BeginLeft.JPG**
Attachment Description: Sidewalk in Span 1, Left side from the Begin.	

	Photo Number: **22** Photo Filename: **22 22 SidewalkSp2EndRight.JPG**
Attachment Description: Sidewalk in Span 2, Right side from the End.	

Photo Number: **23** Photo Filename: **22 23 EndBackwallLeft.JPG**

Attachment Description:
End backwall to the Left of girder G-1.

Photo Number: **24** Photo Filename: **22 24 EndBackwallBay1.JPG**

Attachment Description:
End backwall in Bay 1.

Attachment Description: Begin pedestal below girder G-1.	Photo Number: **25** Photo Filename: **22 25 BeginPedG-1.JPG** 

Attachment Description: Pier pedestal below girder G-4, Right side.	Photo Number: **26** Photo Filename: **22 26 PierPedG-4Rt.JPG** 

Photo Number: **27** Photo Filename: **22 27 EndDiaphragmBeginSpan2Bay1.JPG**

Attachment Description:
End diaphragm at the Begin of Bay 1 in Span 2.

Photo Number: **28** Photo Filename: **22 28 BridgeRailSp1Left.JPG**

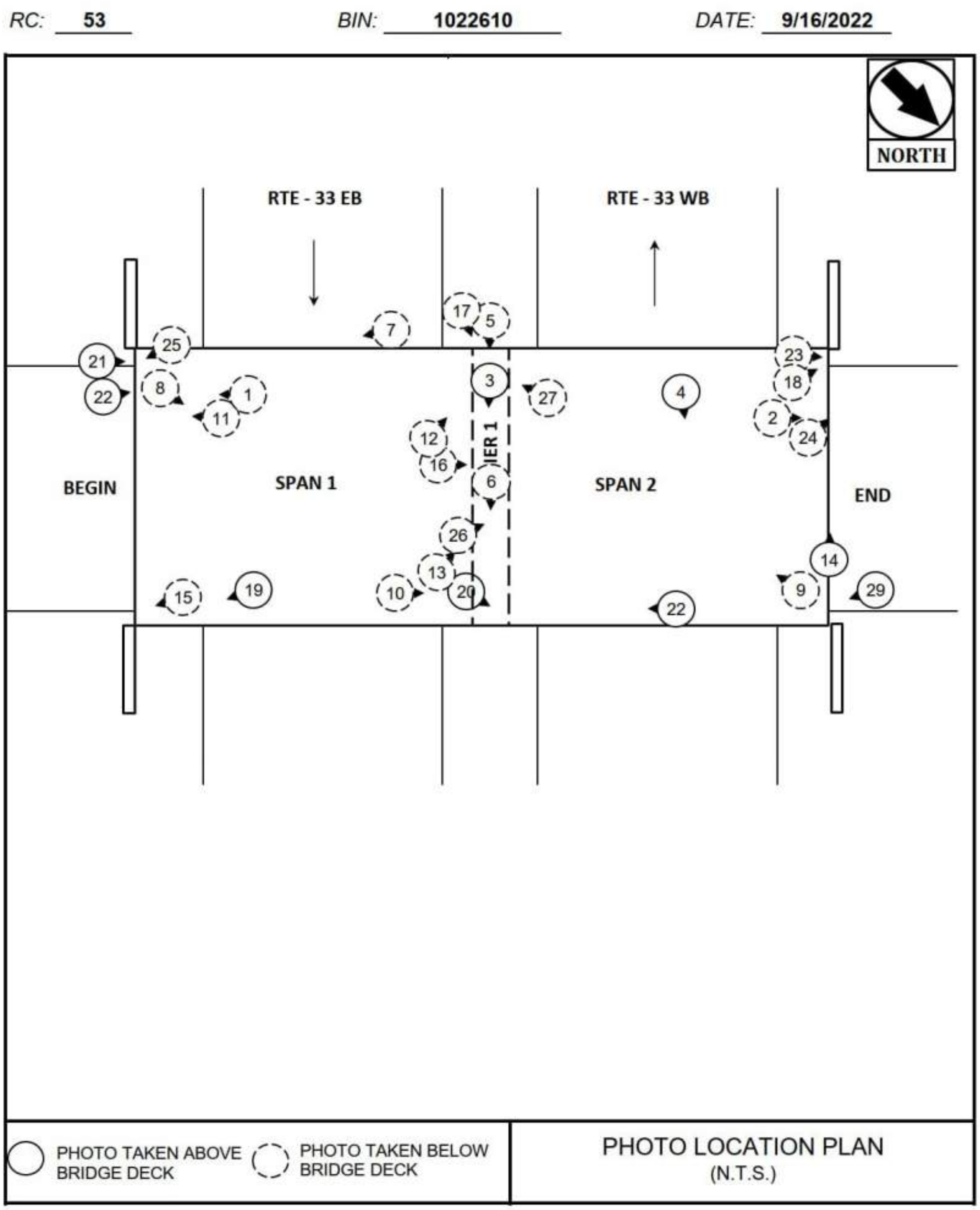
Attachment Description:
Span 1 bridge rail, Left side near Begin.

Photo Number: **29** Photo Filename: **22 29 BridgeRailSp2Right.JPG**

Attachment Description:
Span 2 bridge rail, Right side at the End.

Inspection Sketches

Sketch Number: **1** Sketch Filename: **22 - 1022610 - Photo Location Plan_1.jpg**



Sketch Description: 2022 - Photo Location Plan

Sketch Number: **2** Sketch Filename: **22 - 1022610 - Girder End Section Loss_1.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	of	2

GIRDER END SECTION LOSS MEASUREMENTS (in)

Insp. Date	09/16/22	BIN	1022610

SPAN-1									
	ORIG. WEB THICKNESS: G 1,2,5 and 6 = 0.65", G3 and G4 =0.68"								
Girder Number	Location	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss
G-1	Begin			0.563	13%	0.650	0%	0.650	0%
	Pier 1	0.563	13%	0.500	23%	0.563	13%	0.550	15%
G-2	Begin			0.625	4%	0.650	0%	0.650	0%
	Pier 1	0.360	45%	0.360	45%	0.438	33%	0.380	42%
G-3	Begin			0.680	0%	0.680	0%	0.680	0%
	Pier 1	0.594	13%	0.594	13%	0.594	13%	0.568	16%
G-4	Begin			0.680	0%	0.680	0%	0.680	0%
	Pier 1	0.430	37%	0.430	37%	0.519	24%	0.420	38%
G-5	Begin			0.650	0%	0.650	0%	0.650	0%
	Pier 1	0.549	16%	0.551	15%	0.551	15%	0.546	16%
G-6	Begin			0.650	0%	0.650	0%	0.650	0%
	Pier 1	0.563	13%	0.563	13%	0.563	13%	0.555	15%
INSP. BY, DATE		MAB, 2018		NS, 2018		TK, 2020		DJB 9/16/2022	

G-1,2,5 & 6 are W36x160; Web = 36.01" x 0.650"; Flange 12.00" x 1.02"
G-3 & 4 are W36x170; Web = 36.17" x 0.680"; Flange 12.03" x 1.10"
*NOTE: Readings taken with D-meter or caliper at end of girder
2022 - The typical Range of section loss is 1 foot.

CS-1 = 0% to 4%
CS-2 = 5% to 9%
CS-3 = 10% and up
CS-4 = TL decision

Sketch Description: 2022 – Girder End Section Loss Documentation - Span 1

Sketch Number: **3** Sketch Filename: **22 - 1022610 - Girder End Section Loss_2.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	2	of	2

GIRDER END SECTION LOSS MEASUREMENTS (in)

Insp. Date	09/16/22	BIN	1022610

SPAN-2									
	ORIG. WEB THICKNESS: G 1,2,5 and 6 = 0.65", G3 and G4 =0.68"								
Girder Number	Location	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss
G-1	Pier 1	0.600	4%	0.570	9%	0.570	12%	0.558	14%
	End					0.650	0%		
G-2	Pier 1	0.535	14%	0.535	14%	0.535	18%	0.518	20%
	End					0.650	0%		
G-3	Pier 1	0.480	26%	0.480	26%	0.490	28%	0.455	33%
	End					0.680	0%		
G-4	Pier 1	0.450	31%	0.450	31%	0.520	24%	0.460	32%
	End					0.650	4%		
G-5	Pier 1	0.380	39%	0.380	39%	0.413	36%	0.379	42%
	End					0.650	0%		
G-6	Pier 1	0.552	12%	0.552	12%	0.552	15%	0.554	15%
	End					0.650	0%		
INSP. BY, DATE		MAB, 2018		NS, 2018		TK, 2020		DJB 9/16/2022	

G-1,2,5 & 6 are W36x150; Web = 35.85" x 0.625"; Flange 11.975" x 0.94"
G-3 & 4 are W36x160; Web = 36.01" x 0.650"; Flange 12.0" x 1.02"
*NOTE: Readings taken with D-meter or caliper at end of girder
2022 - The typical Range of section loss is 1 foot.

CS-1 = 0% to 4%
CS-2 = 5% to 9%
CS-3 = 10% and up
CS-4 = TL decision

Sketch Description: 2022 – Girder End Section Loss Documentation - Span 2

Sketch Number: **4** Sketch Filename: **22 - 1022610 - Load Rating Verification_1.jpg**

LOAD RATING FIELD CHECK FORM

RC 53 BIN 1022610 Date: 9/16/2022

Dead load - Note changes in the dead load since the last inspection or state "NONE":

No changes.

Section Loss - note locations and amount of section loss on each girder or state "NONE":

2022 - The superstructure girder ends exhibit old, painted-over localized minor pitting and section loss within the bearing areas on the girder ends over Begin abutment, Pier 1 and the End abutment. Section loss measurements were taken with a D-Meter, calipers and/or a pit gauge throughout. The section loss measurements varied between 0% and 42%. There is no apparent distress or web crippling. The "Range" of the painted-over" minor pitting and section loss on each girder end is typically 1 LF or less. The Bearing area section loss exceeds 10% at the following locations which are assessed CS-3:

Span 1, G-1 at the End = 15% (2020 = 13%)
Span 1, G-1 at the End = 42% (2020 = 33%)
Span 1, G-3 at the End = 16% (2020 = 13%)
Span 1, G-1 at the End = 38% (2020 = 24%)
Span 1, G-1 at the End = 16% (2020 = 15%)
Span 1, G-1 at the End = 15% (2020 = 13%)

Span 2, G-1 at the Begin = 14% (2020 = 12%)
Span 2, G-2 at the Begin = 20% (2020 = 18%)
Span 2, G-3 at the Begin = 33% (2020 = 28%)
Span 2, G-4 at the Begin = 32% (2020 = 24%)
Span 2, G-5 at the Begin = 42% (2020 = 36%)
Span 2, G-6 at the Begin = 15% (2020 = 15%)

There are some changes to the measurements since the previous Inspection. The changes are due to the location of the measurement on the girder end. The painted-over section loss on the remaining girders throughout both spans is typically less than 10%. There is no active corrosion on any of the girder ends. The paint system continues to function as designed.

Additional Notes:

Attachments:

Team Leader: Harry A. Watkins, P.E. PE #: 071693

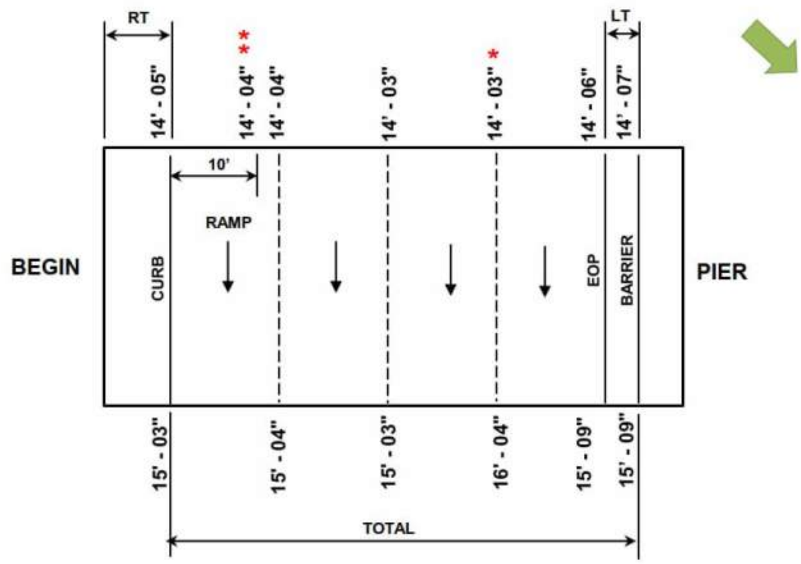
Sketch Description: 2022 - Load Rating Verification

Sketch Number: **5** Sketch Filename: **22 - 1022610 - Vertical Clearances_1.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	2

SPAN 1 HIGHWAY VERTICAL CLEARANCES OUTBOUND (FT.)

INSP. DATE:	9/16/2022		BIN	1022610



OUTBOUND

Date	DEF**	ACT*	TOT	LT	RT
2018	15' - 03"	14' - 02"	62.5'	3.0'	10.5'
2020	14' - 04"	14' - 03"	57.0'	3.0'	11.0'
2022	✓	✓	✓	✓	✓

✓ if no change

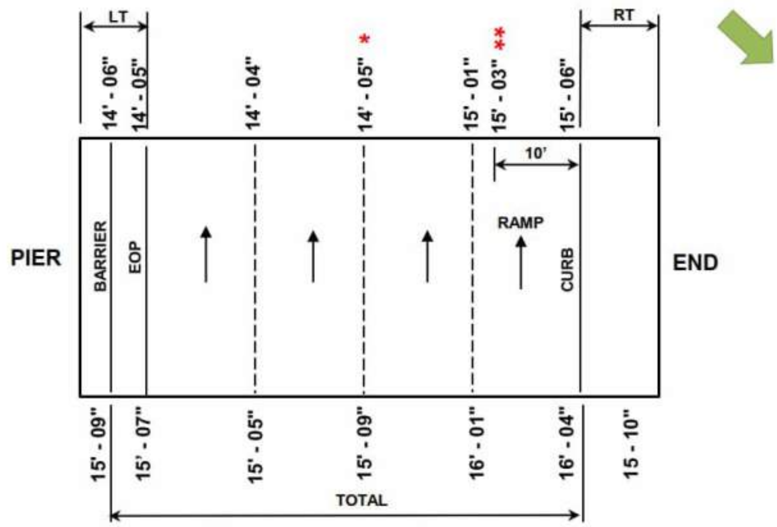
Sketch Description: 2022 – Highway Vertical Clearances - Span 1

Sketch Number: **6** Sketch Filename: **22 - 1022610 - Vertical Clearances_2.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	2	OF	2

SPAN 2 HIGHWAY VERTICAL CLEARANCES INBOUND (FT.)

INSP. DATE:	9/16/2022		BIN	1022610



INBOUND

Date	DEF**	ACT*	TOT	LT	RT
2018	15' - 03"	14' - 02"	62.5'	3.0'	10.5'
2020	15' - 03"	14' - 05"	53.0'	3.0'	11'
9/14/2022	✓	✓	✓	✓	10.5'
✓ if no change					

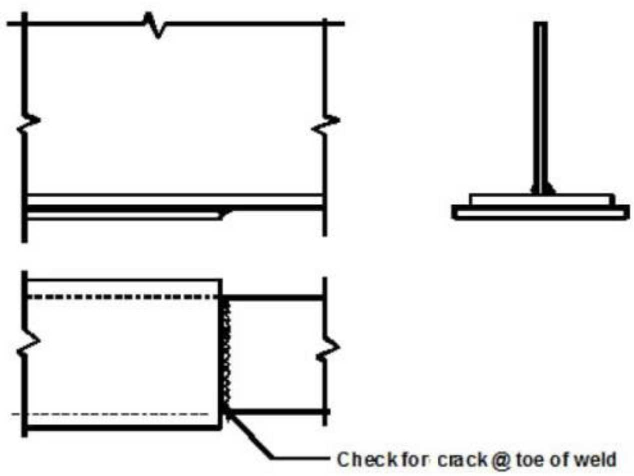
Sketch Description: 2022 – Highway Vertical Clearances - Span 2

Sketch Number: **7** Sketch Filename: **22 - 1022610 - Special Emphasis Sketch _1.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	2

SPECIAL EMPHASIS REQUIRED
COVER PLATES

INSP. DATE:	9/16/2022		BIN	1022610



NOTES:

1) Category “E” welds are located at ends of partial length cover plates on all girders in Span 1 & 2.

2) Span 1 Girders 1, 2 and 3 have field welded repairs to impact damage.

3) All Category “E” welds and field welded repairs shall receive 100% hands on inspection.

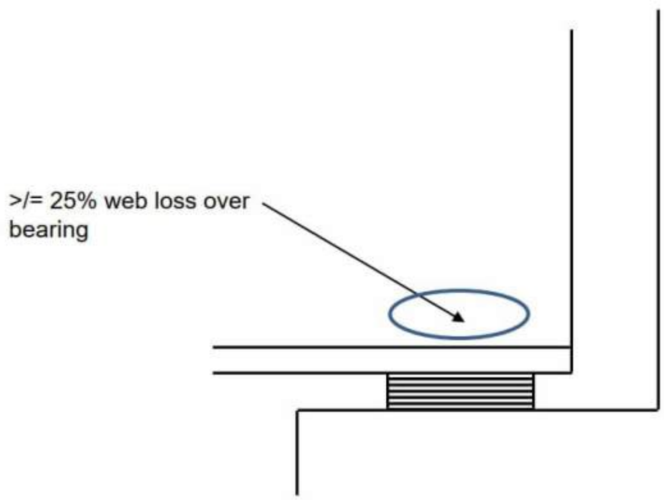
Sketch Description: 2022 – Special Emphasis Sketch – Sheet 1 of 2

Sketch Number: **8** Sketch Filename: **22 - 1022610 - Special Emphasis Sketch _2.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	2	OF	2

SPECIAL EMPHASIS REQUIRED
>/= 25% WEB LOSS OVER BEARINGS

INSP. DATE:	9/14/2022		BIN	1022610



NOTES:

1) **All Girders with >/= 25% web loss over bearings shall receive 100% hands on inspection.**
2) **See Web Loss documentation.**

Sketch Description: 2022 – Special Emphasis Sketch – Sheet 2 of 2

Sketch Number: **9** Sketch Filename: **22 - 1022610 - Electrical Hazard Survey_1.jpg**

BD241(02/17)

NYSDOT Bridge Inspection Report
Sheet 1 of 1

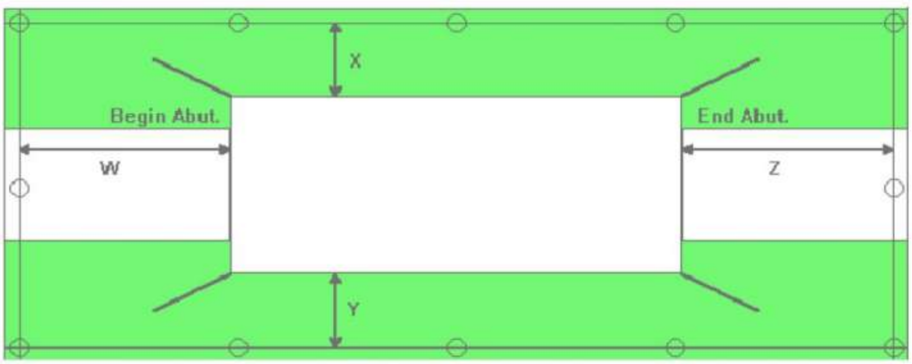
Electrical Hazard Survey

Carried:	DODGE STREET		R/C BIN:	53 1022610
Crossed:	RTE 33		Insp. Date:	9/16/2022
ATL:	Dennis J. Barefoot		Team Leader:	Harry A. Watkins

Electrical Hazard Classification		
		Danger!
		Warning
	X	No Lines Present

Electrical Hazard Alignments		
		Parallel Alignment
		Perpendicular Alignment
		Diagonal Alignment

Utility Name	N/A
System Voltage	N/A



English Units for Offsets

Location (Put X where appropriate)		No Lines Present	Above the Deck	Below the Deck	Above and Below	Horizontal Offset (feet)	Vertical Offset (feet)
Before Begin Abutment	(W)	X					
To Left of Bridge	(X)	X					
To Right of Bridge	(Y)	X					
After End Abutment	(Z)	X					

Sketch Description: 2022 - Electrical Hazard Survey

Sketch Number: **10** Sketch Filename: **22 - 1022610 - Work Zone Traffic Control_1.jpg**

Insp. Date:	9/16/2022		BIN:	1022610

WZTC PLAN

NOTES –

BASIC BRIDGE INSPECTION SHOULDER CLOSURE

(1) WORK ZONE AHEAD + SHOULDER CLOSED SIGNS WITH CONES WERE USED @ BEGIN ABUTMENT FOR 24 FT. LADDER INSPECTION.

EXPRESSWAY

(1) LEFT LANE CLOSURE EB WAS USED @ PIER FOR BUCKET TRUCK INSPECTION.
SEE NYSDOT REGION 5 WZTC MANUAL, SHEET 12 - 1 (STANDARD SHEET 619-31).

(1) SHOULDER CLOSURE WAS USED @ BEGIN ABUTMENT FOR BUCKET TRUCK INSPECTION.
SEE NYSDOT REGION 5 WZTC MANUAL, SHEET 12 - 5 (STANDARD SHEET 619-22).

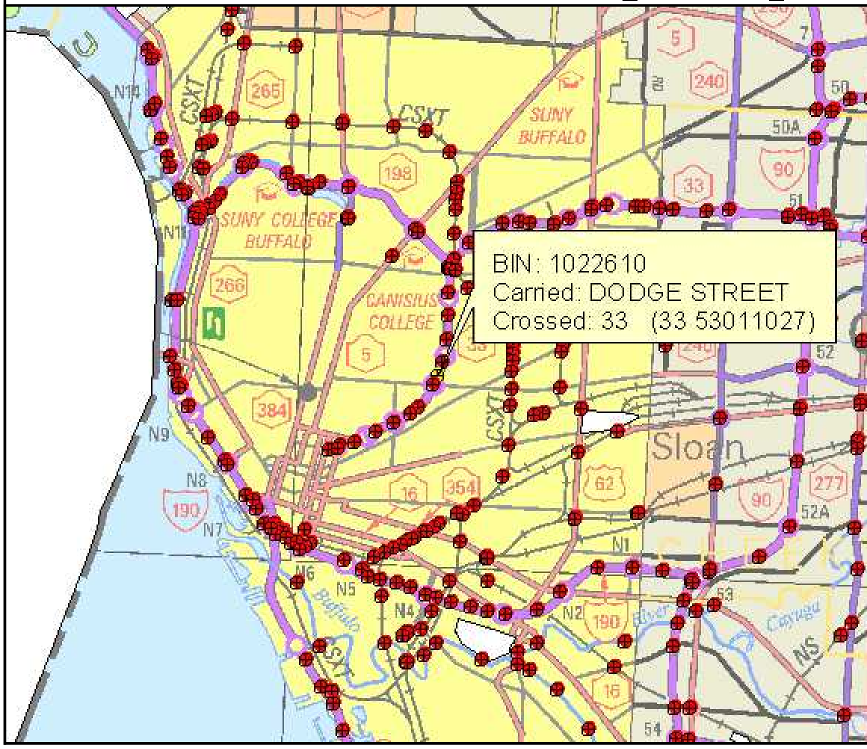
MOVING LANE CLOSURE

(1) A MOBILE LANE CLOSURE WB WAS USED @ PIER FOR BUCKET TRUCK INSPECTION.
SEE NYSDOT REGION 5 WZTC MANUAL, SHEET 14 - 1.

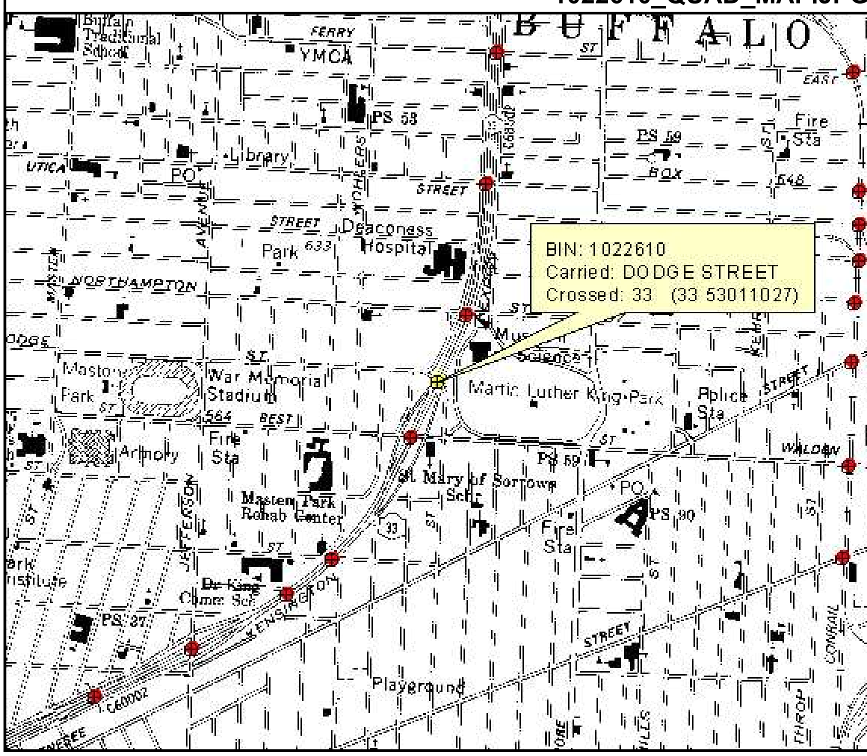
Sketch Description: 2022 – Work Zone Traffic Control

Standard Photographs

1022610_LOCATION_MAP.JPG



1022610_QUAD_MAP.JPG



AbutmentBegin.JPG

AbutmentEnd.JPG

ApproachBegin.JPG

ApproachEnd.JPG

ElevationLeft.JPG

ElevationRight.JPG

Feature2CrossedLeft.JPG

Feature2CrossedRight.JPG

Framing.JPG

Pier.JPG

Wingwall(Typical)BeginLeft.JPG

Appendix B

Bridge Work History Summary

Dodge St. Bridge (BIN 1022610) Work History

Year	Contract	Description of Work
2011	-	Replace Wearing Surface (Asphalt Concrete)
	-	Remove Wearing Surface
	-	Replace Light Standards and Fixtures Replace light standard in Span 2
2009	D260954	Bridge Cleaning
	D261186	Replace Joint System
2008	D260644	Bridge Cleaning
2007	D260336	Bridge Cleaning
2006	D259781	Bridge Painting
	D260001	Bridge Cleaning
2005	-	Beg Rt & Lt sidewalk settlement repaired
	D259745	Bridge Painting
2003	-	Repair Bearings (non-working bearings)
2000	D258210	Sandblast Structural Steel
		Waterproof Bridge Seats and Pier Caps - Pentrating Sealer Abutments, Poiers Sidewalks Fascia
		Clean and Paint Metal Surfaces - Moisture Cure Urethane - Prime Intermed. - Finish
1998	D257523	Bridge Cleaning
1997	D257087	Clean Pier Caps and Abutments
		Clean Superstructure
		Clean Bridge Deck
1996	D256740	Clean Pier Caps and Abutments
		Clean Superstructure
		Maintain and Repair Structural Bridge Deck - Clean Deck
1995	D256372	Clean Pier Caps and Abutments
		Cleaned Deck
		Clean Superstructure
1994	D254824	Clean Pier Caps and Abutments
		Clean Superstructure
		Clean Bridge Deck
1993	D254371	Clean Pier Caps and Abutments
		Clean Superstructure
		Clean Deck
1992	D254105	Clean Superstructure
		Clean Pier Caps and Abutments
		Clean Deck
1991	D253745	Replace Wearing Surface (Asphalt Concrete)
		D253745 - Replace Joint System
	D253631	Maintance Cleaning of Bridges
1988	D252445	Bridge Stringer Repair
1987	D251942	Clean and Paint Metal Surfaces - Bridge Painting Contract

Appendix C

Load Rating Summary

BIN 1022610
Dodge Street
over
Kensington Expressway

City of Buffalo
Erie County, New York

Level 1 Load Rating Calculations

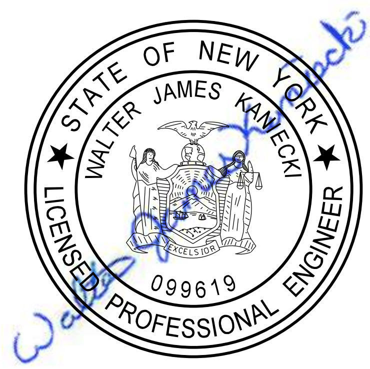
November 2023

Prepared By: Chirag S Patel, PE
Checked By: Walter James Kaniecki, PE

Load Rating Summary

Rating Load	Controlling Mode	Inventory Rating	Operating Rating
Load and Resistance Factor Rating HL-93	Span 2 Girder G5 Original 36*WF*150 Web Local Yielding	0.31	0.40
Load Factor Rating HS Truck or Lane	Span 1 Girder G5 Original 36*WF*160 Flexural Strength	HS 26.1 46.9 Tons	HS 41.5 78.3 Tons

Approved By:
Walter James Kaniecki, PE
License Number 099619



LaBella
Powered by partnership.

Table of Contents

BIN 1022610
Level 1 Load Rating, November 2023

Load Rating Summary

Load and Resistance Factor Rating (LRFR), HL-93

Span 2 Girder G5 Begin
Original 36WF150 with measured Section Loss
Web Local Yielding, No Bearing Stiffeners
0.31 Inventory
0.40 Operating

Load Factor Rating (LFR), HS-Truck or Lane

Span 1 Girder G5 Midspan
Original 36WF160
Flexural Strength
HS 26.1, 46.9 Tons Inventory
HS 41.5, 78.3 Tons Operating

BIN 1022610
Level 1 Load Rating, November 2023

Bridge Information

BIN	1022610
Date of Load Rating	November 2023
Political Unit	City of Buffalo
Feature Carried	Dodge Street
Feature Crossed	Kensington Expressway
Superstructure Type	Steel Multi-Girder
Number of Spans	2 Simple Spans 73’-8” & 71’-1”
Skew	18°-30’-0”
Total Length	152’-0”
Out-to-Out Width	42’-0”
Bridge Width Curb-to-Curb	30’-0”
Number of Actual Travel Lanes	2
Number of Lanes used in Rating	2
Type of Deck	Concrete
Type of Wearing Surface	Asphalt
Type of Sidewalks	Left Side: Concrete Right Side: Concrete
Barrier or Railing Type	Steel Railing
Year Built	1963
Rehabilitation Year(s)	2023
Design Live Load	HS 20-44
Existing Posted Load	Not Posted
Date of Most Recent Inspection	May 2023
List of Plans Included	Excerpts from: 1959 FAC 59-19 Original Plans

BIN 1022610
Level 1 Load Rating, November 2023

General Description

The Dodge Street Bridge over the Kensington Expressway was originally built in 1963. It is a multi-girder bridge with 2 consecutive simple spans. The girders are steel rolled shapes with welded bottom cover plates, and are made composite with the concrete deck. The 30'-wide roadway carries 2 lanes. Both sides have raised sidewalks with curb, steel pedestrian railing, and snow fence.

In 2023, the bridge was struck, affecting the left side of span 1. At the time of inspection, girders G1 & G2 were in the process of being repaired, and are omitted from this load rating.

The bridge orientation is consistently treated as East-to-West among the Record Plans, Inspection Reports, and the existing Level 2 Load Rating Model in AASHTOWare BrR.

Analysis Description

This bridge was analyzed using both:

- Load and Resistance Factor Rating (LRFR)
- Load Factor Rating (LFR)

as described by the American Association of State Highway and Transportation Officials (AASHTO) and the New York State Department of Transportation (NYSDOT).

Three load definitions were evaluated:

- The HL-93 design load definition for LRFR
- The HS 20 truck or lane design load definition for LFR
- For specific ratings with LFR less than HS 20.0 Inventory, re-evaluate for the H 20 truck or lane load definition

This Level 1 Load Rating takes the existing Level 2 Load Rating Model built using AASHTOWare BrR. The input was verified and the most recent inspection information was incorporated into the model.
Due to specific concerns at the girder ends, select locations were manually checked for their capacity in the bearing region.

<u>Modifications to the AASHTOWare BrR File</u>

1. Traffic Information was missing. Added ADT, % Trucks, Directional Percent, and ADTT based on the Bridge Inventory Report.
   Total ADT 3191 w/ 1% Trucks.
   Let directionality be 55% [AASHTO LRFD C3.6.1.4.2] & 1 lane available per direction.
   Assume current ADTT is reasonable for cycles over entire lifetime.

2. The model had linked some interior girders to one definition. Un-linked the girders to differentiate each girder based on current section loss.

3. Every girder definition has 10% additional self load applied with no description given. This was not changed, even though what it is meant to represent is unknown.

4. The weight of utilities were not included in the model.
   a. Members G1 & G2: 8" Gas Line – Standard 8" pipe with a unit weight of 28.580 lb/ft was used. See attached sheet.
      28.580 plf / 2 girders = 0.015 klf

5. The wearing surface was defined differently for each span. Define both spans as uniformly having a 3" thick wearing surface at 144 pcf, "field measured" left unchecked.

6. Added Points of Interest for the Cover Plate End fatigue detail.
   [AASHTO LRFD Table 6.6.1.2.3-1] Case 3.5, End Welded Cover Plates
   36 WF 150 t_f = 0.940" > 0.8" → Category E'
   36 WF 160 t_f = 1.020" > 0.8" → Category E'
   36 WF 170 t_f = 1.100" > 0.8" → Category E'

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway			
PROJECT NO.	2230860	SHEET		OF
SUBJECT	BIN 1022610 Dodge			
CALC. BY	CSP	DATE	11/15/2023	
CKD. BY	WJK	DATE	11/17/2023	

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W ← E	W ← E

AASHTOWare BrR Rating Output

- Load and Resistance Factor Rating, HL-93
  - Whole Structure

Member Identity presented here following Inspection Orientation

Structure	Member	Inventory rating factor	Operating rating factor	Inventory capacity (Ton)	Operating capacity (Ton)	Inventory location (ft)
Span 1	G1	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Span 1	G2	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Span 1	G3	1.388	1.800	49.985	64.795	36.84
Span 1	G4	1.389	1.800	49.986	64.797	36.84
Span 1	G5	1.252	1.623	45.073	58.429	36.84
Span 1	G6	1.699	2.203	61.168	79.291	36.84
Span 2	G1	1.756	2.276	63.207	81.935	35.54
Span 2	G2	1.281	1.661	46.132	59.801	35.54
Span 2	G3	1.428	1.852	51.423	66.659	35.54
Span 2	G4	1.428	1.852	51.422	66.658	35.54
Span 2	G5	1.296	1.680	46.658	60.482	35.54
Span 2	G6	1.776	2.302	63.930	82.872	35.54

  - Controlling Member, Span 1 G5

Live Load Type	Inventory rating factor	Operating rating factor	Location (ft)	Location Span-(%)	Limit State
Truck + Lane	1.252	1.623	36.84	(50)	STRENGTH-I Steel Flexure

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

AASHTOWare BrR Rating Output

- Load Factor Rating, HS20-44
  - Whole Structure

Member Identity presented here following Inspection Orientation

Structure	Member	Inventory rating factor	Operating rating factor	Inventory capacity (Ton)	Operating capacity (Ton)	Inventory location (ft)
Span 1	G1	[redacted]				
Span 1	G2	[redacted]				
Span 1	G3	1.395	2.330	50.233	83.890	36.84
Span 1	G4	1.395	2.330	50.235	83.892	36.84
Span 1	G5	1.303	2.176	46.901	78.325	36.84
Span 1	G6	1.391	2.323	50.074	83.623	36.84
Span 2	G1	1.417	2.367	51.021	85.205	35.54
Span 2	G2	1.349	2.253	48.561	81.097	35.54
Span 2	G3	1.454	2.428	52.340	87.407	35.54
Span 2	G4	1.454	2.428	52.339	87.405	35.54
Span 2	G5	1.364	2.278	49.116	82.023	35.54
Span 2	G6	1.434	2.394	51.617	86.200	35.54

  - Controlling Member, Span 1 G5

Live Load Type	Inventory rating factor	Operating rating factor	Location (ft)	Location Span-(%)	Limit State
Axle Load	1.303	2.176	36.84	(50)	Design Flexure - Steel

- Fatigue Evaluation, HL-93 (Fatigue)
  - End Welded Cover Plates

		Infinite Life Check		Finite Life Analysis				
Member	Stress Range, Δf (ksi)	Infinite Life Range, Δf Max (ksi)	Threshold Stress, ΔF TH (ksi)	Finite Life Range, Δf eff (ksi)	Current Cycles, N1	Available Cycles, Nav	Remaining Life, Y REM (yrs)	Fatigue Serviceabilit y Index, Q
1G3 & 4	3.26	5.73	2.60	2.62	759200	28229726	2352	0.88
1G5	3.44	6.05	2.60	2.76	759200	24004461	1990	0.87
2G3 & 4	3.32	5.86	2.60	2.67	759200	26740893	2224	0.87
2G2 & 5	3.51	6.16	2.60	2.82	759200	22714810	1880	0.87

LaBella
Powered by partnership.

300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022610 Dodge		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	11/06/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W ← E	W ← E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 1

Begin

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1												
G2												
G3	7.711	0.771		0.616	23.837	1.093	11.051		6.630	82.720	64.850	51.130
G4	7.711	0.771		0.642	23.837	1.093	11.051		6.630	87.910	64.850	51.130
G5	7.155	0.715		0.668	23.837	1.093	11.051		6.630	88.030	46.780	36.881
G6	7.335	0.734	-0.009	0.347	20.010	1.093	11.051		6.630	55.650	10.140	7.997

End

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1												
G2												
G3	7.708	0.771		0.653	23.837	1.093	11.051		6.630	87.910	64.850	51.130
G4	7.708	0.771		0.627	23.837	1.093	11.051		6.630	82.720	64.850	51.130
G5	7.152	0.715		0.601	23.837	1.093	11.051		6.630	82.720	46.780	36.881
G6	7.332	0.733	-0.009	0.288	20.010	1.093	11.051		6.630	52.300	10.140	7.997

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT: Kensington Expressway
PROJECT NO.: 2230860 SHEET ____ OF ____
SUBJECT: BIN 1022610 Dodge
CALC. BY: CSP DATE: 09/06/2023
CKD. BY: WJK DATE: 11/06/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W ← E	W ← E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 2

Begin

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	6.654	0.665	0.027	0.287	19.306	1.054	10.662	0.533	6.397	51.680	10.116	7.884
G2	6.567	0.657		0.600	22.999	1.054	10.662	0.533	6.397	81.744	46.655	36.361
G3	7.080	0.708		0.627	22.999	1.054	10.662	[redacted]	6.397	81.744	64.675	50.405
G4	7.080	0.708		0.654	22.999	1.054	10.662	[redacted]	6.397	86.927	64.675	50.405
G5	6.567	0.657		0.681	22.999	1.054	10.662	[redacted]	6.397	87.039	46.655	36.361
G6	6.654	0.665	0.027	0.354	19.307	1.054	10.662	[redacted]	6.397	55.024	10.116	7.884

End

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	6.653	0.665	0.027	0.348	19.306	1.054	10.662	0.533	6.397	55.023	10.116	7.884
G2	6.566	0.657		0.669	22.999	1.054	10.662	0.533	6.397	87.039	46.655	36.361
G3	7.078	0.708		0.642	22.999	1.054	10.662	[redacted]	6.397	86.927	64.675	50.405
G4	7.078	0.708		0.615	22.999	1.054	10.662	[redacted]	6.397	81.744	64.675	50.405
G5	6.566	0.657		0.588	22.999	1.054	10.662	[redacted]	6.397	81.744	46.655	36.361
G6	6.653	0.665	0.027	0.281	19.307	1.054	10.662	[redacted]	6.397	51.680	10.116	7.884

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022610 Dodge		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	11/06/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W ← E	W ← E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 1

	Begin					End				
	DC	DW	HL-93	HS 20	H 20	DC	DW	HL-93	HS 20	H 20
G1	[redacted]					[redacted]				
G2	[redacted]					[redacted]				
G3	45.08	6.63	82.72	64.85	51.13	45.11	6.63	87.91	64.85	51.13
G4	45.11	6.63	87.91	64.85	51.13	45.09	6.63	82.72	64.85	51.13
G5	44.52	6.63	88.03	46.78	36.88	44.45	6.63	82.72	46.78	36.88
G6	40.56	6.63	55.65	10.14	8.00	40.50	6.63	52.30	10.14	8.00

  - Span 2

	Begin					End				
	DC	DW	HL-93	HS 20	H 20	DC	DW	HL-93	HS 20	H 20
G1	38.66	6.93	51.68	10.12	7.88	38.72	6.93	55.02	10.12	7.88
G2	42.54	6.93	81.74	46.66	36.36	42.61	6.93	87.04	46.66	36.36
G3	43.13	6.40	81.74	64.68	50.41	43.14	6.40	86.93	64.68	50.41
G4	43.16	6.40	86.93	64.68	50.41	43.12	6.40	81.74	64.68	50.41
G5	42.62	6.40	87.04	46.66	36.36	42.53	6.40	81.74	46.66	36.36
G6	38.72	6.40	55.02	10.12	7.88	38.65	6.40	51.68	10.12	7.88

Existing Girder End Section Resistance (LRFR)

- 36WF150 Mixed Properties
  - -- Applied Load and LRFR Factors

Assumptions & Limitations of this Worksheet
Girder not Longitudinally Stiffened
Girder not Transversely Stiffened
No Bearing Stiffeners

Mix Properties to envelope over worst potential rating:
Use Loads from 2G2 End (Greatest Reaction)
Use Loss from 2G5 Begin (Greatest Loss)

Applied End Shear $V_{DC} := 42.61\ \boldsymbol{kip}$ $V_{DW} := 6.93\ \boldsymbol{kip}$ $V_{HL} := 87.04\ \boldsymbol{kip}$

Applied Reaction Force $R_{DC} := 42.61\ \boldsymbol{kip}$ $R_{DW} := 6.93\ \boldsymbol{kip}$ $R_{HL} := 87.04\ \boldsymbol{kip}$

STRENGTH Load Factors $\gamma_{DC} := 1.25$ $\gamma_{DW} := 1.50$ $\gamma_{LL} := \begin{bmatrix} 1.75 \\ 1.35 \end{bmatrix}$

Condition Resistance Reduction Factor [AASHTO MBE 6A.4.2.3]
Smooth polynomial connecting (0%, 1.00), (5%, 0.98), & (20%, 0.90)
with tangent at minimum value of 0.90

$$\phi_c(Loss) := \begin{cases} \dfrac{190}{9} \cdot Loss^3 - \dfrac{107}{18} \cdot Loss^2 - \dfrac{7}{45} \cdot Loss + 1 & \text{if } Loss \le 0.2 \\ 0.900 & \text{else} \end{cases}$$

System Redundancy Resistance Reduction Factor [AASHTO MBE 6A.4.2.4]
Regular Multi-Girder System with > 3 Girders $\phi_s := 1$

Rating Check Resistance Reduction Factors
Shear $\phi_v := 1$ Yielding $\phi_b := 1$ Crippling $\phi_w := 0.8$

Existing Girder End Section Resistance (LRFR)

- 36WF150 Mixed Properties
  - -- Girder Geometry

		Web	Flange
Steel Properties	$E:=29000\ ksi$	$F_{yw}:=33\ ksi$	$F_{yf}:=33\ ksi$

Web Thickness Measurements and "Weight"

t_{wm} (in)	t_{ww} (in)
0.571	8.25
0.573	$14.5 \div 2$
0.305	$9.5 \div 2$
0.587	$14.5 \div 2$
0.406	$9.5 \div 2$

Web Monolithic Steel Depth $d:=35.84\ in$
(Rolled Shape Section Depth, Plate Shape Web Depth)

Web Shear "Unbraced Depth" $D_v:=32.25\ in$
(Rolled Shape Web Flat Depth, Plate Shape Web Depth)

Bottom Flange + Fillet Height $k:=1.8125\ in$

Section Original Web Thickness $t_{wo}:=0.625\ in$

Weighted Average Web Thickness $t_w:=t_{wm} \cdot \dfrac{t_{ww}}{D_v}=0.512\ in$

Thickness at Bottom of Web $t_{wb}:=\left(t_{wm_2}+t_{wm_4}\right) \div 2=0.356\ in$

Bottom Flange Thickness $t_{fb}:=0.940\ in$

Girder Extension Beyond Centerline of Bearing $ext:=5\ in$
(input zero for interior support)

Bearing Contact Length $N:=6\ in$

Existing Girder End Section Resistance (LRFR)

- 36WF150 Mixed Properties
  -- Web Panel Shear [AASHTO LRFD 6.10.9]

Shear-Buckling Coefficient (unstiffened) $k_v := 5$

Web Compactness

$$\lambda_v := \frac{D_v}{t_w} = 63.0 \qquad \lambda_{pv} := 1.12 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 74.2 \qquad \lambda_{rv} := 1.40 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 92.8$$

Shear-Buckling Ratio

$$C := \text{if } \lambda_v \le \lambda_{rv} \;\; \left\| min\left(1, \frac{\lambda_{pv}}{\lambda_v}\right) \right. \;\; \text{else} \;\; \left\| 1.57 \cdot \frac{E \cdot k_v}{{\lambda_v}^2 \cdot F_{yw}} \right. = 1.000$$

Web Plastic Shear Strength

$$V_p := 0.58 \cdot F_{yw} \cdot d \cdot t_w = 350.9 \ \boldsymbol{kip}$$

Nominal Resistance

$$V_n := C \cdot V_p = 350.9 \ \boldsymbol{kip}$$

Section Loss based on Web Thickness

$$Loss_v := 1 - \frac{t_w}{t_{wo}} = 18.1\% \qquad \phi_{c.v} := \phi_c\left(Loss_v\right) = 0.902$$

$$V_r := \phi_{c.v} \cdot \phi_v \cdot V_n = 316.6 \ \boldsymbol{kip} \qquad RF_v := \frac{V_r - \gamma_{DC} \cdot V_{DC} - \gamma_{DW} \cdot V_{DW}}{\gamma_{LL} \cdot V_{HL}} = \begin{bmatrix} 1.66 \\ 2.15 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- 36WF150 Mixed Properties
  - -- Web Local Yielding [AASHTO LRFD D6.5.2]

For Rating, Let Bearing Resistance be the sum of
Web Local Yielding and Stiffener Contact Stress

$$R_{ny} := \text{if } ext > d \vee ext = 0\ in \quad \left\| \left(5 \cdot k + N\right) \cdot F_{yw} \cdot t_{wb} \right. \quad \text{else} \quad \left\| \left(2.5 \cdot k + N\right) \cdot F_{yw} \cdot t_{wb} \right. = 123.5\ kip$$

Section Loss based on Thickness at Base of Web

$$Loss_b := 1 - \frac{t_{wb}}{t_{wo}} = 43.1\% \qquad \phi_{c.b} := \phi_c\left(Loss_b\right) = 0.900$$

$$R_{ry} := \phi_{c.b} \cdot \phi_s \cdot \phi_b \cdot R_{ny} = 111.2\ kip$$

$$RF_b := \frac{R_{ry} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.31 \\ 0.40 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- 36WF150 Mixed Properties
  - -- Web Local Crippling [AASHTO LRFD D6.5.3]

$$R_{nw} := \text{if } ext > \frac{d}{2} \vee ext = 0\ in$$

$$\left\| 0.8 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$

$$\text{else if } \frac{N}{d} \le 0.2$$

$$\left\| 0.4 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$

$$\text{else}$$

$$\left\| 0.4 \cdot t_w^{\ 2} \cdot \left(1 + \left(\frac{4\ N}{d} - 0.2\right) \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$

$$= 166.8\ kip$$

Section Loss based on Web Thickness

$$Loss_w := Loss_v = 18.1\% \qquad \phi_{c.w} := \phi_c\left(Loss_w\right) = 0.902$$

$$R_{rw} := \phi_{c.w} \cdot \phi_s \cdot \phi_w \cdot R_{nw} = 120.4\ kip$$

$$RF_w := \frac{R_{rw} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.37 \\ 0.48 \end{bmatrix}$$

Existing Girder End Section Resistance (LFR)

- 36WF150 Mixed Properties
  - -- Lack of Bearing Stiffeners on Rolled Shapes

[AASHTO 10.48.7] Redirects all Load Factor Design for Bearing Stiffeners back to the Allowable Stress part of the Code.
[10.33.2] Stiffeners only required where end shear exceeds 75% of allowable

Translate this to LFR by letting the Strength be 75% of the Web Panel Shear

-- Applied Load and LFR Factors

Applied End Shear $V_D := V_{DC} + V_{DW} = 49.54\ \boldsymbol{kip}$ $V_{HS} := 46.66\ \boldsymbol{kip}$

LFR Load Factors $A_1 := 1.3$ $A_2 := \begin{bmatrix} 2.17 \\ 1.3 \end{bmatrix}$

-- Web Panel Shear Strength

Math setup is the same as LRFR

$V_u := V_n = 350.9\ \boldsymbol{kip}$ $75\% \cdot V_u = 263.2\ \boldsymbol{kip}$

$$RF_{HS} := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_{HS}} = \begin{bmatrix} 1.96 \\ 3.28 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- 36WF160 Mixed Properties
  - Applied Load and LRFR Factors

Assumptions & Limitations of this Worksheet
Girder not Longitudinally Stiffened
Girder not Transversely Stiffened
No Bearing Stiffeners

Mix Properties to envelope over worst potential rating:
Use Loads from 1G5 Begin, except 2G3/G4 for HS20 (Greatest Reaction)
Use Loss from 2G4 Begin (Greatest Loss)

Applied End Shear $V_{DC} := 44.52\ kip$ $V_{DW} := 6.63\ kip$ $V_{HL} := 88.03\ kip$

Applied Reaction Force $R_{DC} := 44.52\ kip$ $R_{DW} := 6.63\ kip$ $R_{HL} := 88.03\ kip$

STRENGTH Load Factors $\gamma_{DC} := 1.25$ $\gamma_{DW} := 1.50$ $\gamma_{LL} := \begin{bmatrix} 1.75 \\ 1.35 \end{bmatrix}$

Condition Resistance Reduction Factor [AASHTO MBE 6A.4.2.3]
Smooth polynomial connecting (0%, 1.00), (5%, 0.98), & (20%, 0.90)
with tangent at minimum value of 0.90

$$\phi_c(Loss) := \begin{cases} \dfrac{190}{9} \cdot Loss^3 - \dfrac{107}{18} \cdot Loss^2 - \dfrac{7}{45} \cdot Loss + 1 & \text{if } Loss \le 0.2 \\ 0.900 & \text{else} \end{cases}$$

System Redundancy Resistance Reduction Factor [AASHTO MBE 6A.4.2.4]
Regular Multi-Girder System with > 3 Girders $\phi_s := 1$

Rating Check Resistance Reduction Factors
Shear $\phi_v := 1$ Yielding $\phi_b := 1$ Crippling $\phi_w := 0.8$

PROJECT Kensington Expressway		SHEET	OF
PROJECT NO. 2230860	CALC. BY CSP	DATE 09/06/23	
SUBJECT BIN 1022610 Dodge		SCALE	
CHECKED BY WJK 11/06/23			

Existing Girder End Section Resistance (LRFR)

- 36WF160 Mixed Properties
  - -- Girder Geometry

Steel Properties $E := 29000\ ksi$ Web $F_{yw} := 33\ ksi$ Flange $F_{yf} := 33\ ksi$

Web Thickness Measurements and "Weight"

t_{wm} (in)	t_{ww}
0.601	$1 \div 3$
0.599	$1 \div 3$
0.362	$1 \div 3$

Web Monolithic Steel Depth $d := 36.00\ in$
(Rolled Shape Section Depth, Plate Shape Web Depth)

Web Shear "Unbraced Depth" $D_v := 32.25\ in$
(Rolled Shape Web Flat Depth, Plate Shape Web Depth)

Bottom Flange + Fillet Height $k := 1.875\ in$

Section Original Web Thickness $t_{wo} := 0.653\ in$

Weighted Average Web Thickness $t_w := t_{wm} \cdot t_{ww} = 0.521\ in$

Thickness at Bottom of Web $t_{wb} := t_{wm_2} = 0.362\ in$

Bottom Flange Thickness $t_{fb} := 1.020\ in$

Girder Extension Beyond Centerline of Bearing $ext := 5\ in$
(input zero for interior support)

Bearing Contact Length $N := 6\ in$

Existing Girder End Section Resistance (LRFR)

- 36WF160 Mixed Properties
  -- Web Panel Shear [AASHTO LRFD 6.10.9]

Shear-Buckling Coefficient (unstiffened) $k_v := 5$

Web Compactness

$$\lambda_v := \frac{D_v}{t_w} = 61.9 \qquad \lambda_{pv} := 1.12 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 74.2 \qquad \lambda_{rv} := 1.40 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 92.8$$

Shear-Buckling Ratio

$$C := \begin{cases} \min\left(1, \dfrac{\lambda_{pv}}{\lambda_v}\right) & \text{if } \lambda_v \le \lambda_{rv} \\ 1.57 \cdot \dfrac{E \cdot k_v}{\lambda_v^{\,2} \cdot F_{yw}} & \text{else} \end{cases} = 1.000$$

Web Plastic Shear Strength

$$V_p := 0.58 \cdot F_{yw} \cdot d \cdot t_w = 358.8 \; \boldsymbol{kip}$$

Nominal Resistance

$$V_n := C \cdot V_p = 358.8 \; \boldsymbol{kip}$$

Section Loss based on Web Thickness

$$Loss_v := 1 - \frac{t_w}{t_{wo}} = 20.3\% \qquad \phi_{c.v} := \phi_c\left(Loss_v\right) = 0.900$$

$$V_r := \phi_{c.v} \cdot \phi_v \cdot V_n = 322.9 \; \boldsymbol{kip} \qquad RF_v := \frac{V_r - \gamma_{DC} \cdot V_{DC} - \gamma_{DW} \cdot V_{DW}}{\gamma_{LL} \cdot V_{HL}} = \begin{bmatrix} 1.67 \\ 2.16 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- 36WF160 Mixed Properties
  - -- Web Local Yielding [AASHTO LRFD D6.5.2]

For Rating, Let Bearing Resistance be the sum of
Web Local Yielding and Stiffener Contact Stress

$$R_{ny} := \text{if } ext > d \vee ext = 0 \ in \quad \begin{array}{l} \left\| (5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \right. \\ \text{else} \\ \left\| (2.5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \right. \end{array} = 127.7 \ kip$$

Section Loss based on Thickness at Base of Web

$$Loss_b := 1 - \frac{t_{wb}}{t_{wo}} = 44.6\% \qquad \phi_{c.b} := \phi_c \left(Loss_b \right) = 0.900$$

$$R_{ry} := \phi_{c.b} \cdot \phi_s \cdot \phi_b \cdot R_{ny} = 114.9 \ kip$$

$$RF_b := \frac{R_{ry} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.32 \\ 0.41 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- 36WF160 Mixed Properties
  -- Web Local Crippling [AASHTO LRFD D6.5.3]

$$R_{nw} := \text{if } ext > \frac{d}{2} \vee ext = 0 \; in$$
$$\left\| 0.8 \cdot t_w^{\,2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$
$$\text{else if } \frac{N}{d} \le 0.2$$
$$\left\| 0.4 \cdot t_w^{\,2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$
$$\text{else}$$
$$\left\| 0.4 \cdot t_w^{\,2} \cdot \left(1 + \left(\frac{4\,N}{d} - 0.2\right) \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$
$$= 175.6 \; kip$$

Section Loss based on Web Thickness

$$Loss_w := Loss_v = 20.3\% \qquad \phi_{c.w} := \phi_c\left(Loss_w\right) = 0.900$$

$$R_{rw} := \phi_{c.w} \cdot \phi_s \cdot \phi_w \cdot R_{nw} = 126.4 \; kip$$

$$RF_w := \frac{R_{rw} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.39 \\ 0.51 \end{bmatrix}$$

Existing Girder End Section Resistance (LFR)

- 36WF160 Mixed Properties
  - -- Lack of Bearing Stiffeners on Rolled Shapes

[AASHTO 10.48.7] Redirects all Load Factor Design for Bearing Stiffeners back to the Allowable Stress part of the Code.
[10.33.2] Stiffeners only required where end shear exceeds 75% of allowable

Translate this to LFR by letting the Strength be 75% of the Web Panel Shear

-- Applied Load and LFR Factors

Applied End Shear $V_D := V_{DC} + V_{DW} = 51.15\ \boldsymbol{kip}$ $V_{HS} := 64.68\ \boldsymbol{kip}$

LFR Load Factors $A_1 := 1.3$ $A_2 := \begin{bmatrix} 2.17 \\ 1.3 \end{bmatrix}$

-- Web Panel Shear Strength

Math setup is the same as LRFR

$V_u := V_n = 358.8\ \boldsymbol{kip}$ $75\% \cdot V_u = 269.1\ \boldsymbol{kip}$

$$RF_{HS} := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_{HS}} = \begin{bmatrix} 1.44 \\ 2.41 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- 36WF170 Mixed Properties
  - Applied Load and LRFR Factors

Assumptions & Limitations of this Worksheet
Girder not Longitudinally Stiffened
Girder not Transversely Stiffened
No Bearing Stiffeners

Mix Properties to envelope over worst potential rating:
Use Loads from 1G3 End / 1G4 Begin (Greatest Reaction)
Use Loss from 1G4 End (Greatest Loss)

Applied End Shear $V_{DC} := 45.11\ kip$ $V_{DW} := 6.63\ kip$ $V_{HL} := 87.91\ kip$

Applied Reaction Force $R_{DC} := 45.11\ kip$ $R_{DW} := 6.63\ kip$ $R_{HL} := 87.91\ kip$

STRENGTH Load Factors $\gamma_{DC} := 1.25$ $\gamma_{DW} := 1.50$ $\gamma_{LL} := \begin{bmatrix} 1.75 \\ 1.35 \end{bmatrix}$

Condition Resistance Reduction Factor [AASHTO MBE 6A.4.2.3]
Smooth polynomial connecting (0%, 1.00), (5%, 0.98), & (20%, 0.90)
with tangent at minimum value of 0.90

$$\phi_c(Loss) := \begin{cases} \dfrac{190}{9} \cdot Loss^3 - \dfrac{107}{18} \cdot Loss^2 - \dfrac{7}{45} \cdot Loss + 1 & \text{if } Loss \le 0.2 \\ 0.900 & \text{else} \end{cases}$$

System Redundancy Resistance Reduction Factor [AASHTO MBE 6A.4.2.4]
Regular Multi-Girder System with > 3 Girders $\phi_s := 1$

Rating Check Resistance Reduction Factors
Shear $\phi_v := 1$ Yielding $\phi_b := 1$ Crippling $\phi_w := 0.8$

PROJECT	Kensington Expressway	SHEET		OF	
PROJECT NO.	2230860	CALC. BY	CSP	DATE	09/06/23
SUBJECT	BIN 1022610 Dodge	SCALE			
CHECKED BY	WJK 11/06/23				

Existing Girder End Section Resistance (LRFR)

- 36WF170 Mixed Properties
  - -- Girder Geometry

Steel Properties $E := 29000\ ksi$ Web $F_{yw} := 33\ ksi$ Flange $F_{yf} := 33\ ksi$

Web Thickness Measurements and "Weight"

t_{wm} (in)	t_{ww}
0.630	$1 \div 3$
0.598	$1 \div 3$
0.360	$1 \div 3$

Web Monolithic Steel Depth $d := 36.160\ in$
(Rolled Shape Section Depth, Plate Shape Web Depth)

Web Shear "Unbraced Depth" $D_v := 32.25\ in$
(Rolled Shape Web Flat Depth, Plate Shape Web Depth)

Bottom Flange + Fillet Height $k := 1.9375\ in$

Section Original Web Thickness $t_{wo} := 0.680\ in$

Weighted Average Web Thickness $t_w := t_{wm} \cdot t_{ww} = 0.529\ in$

Thickness at Bottom of Web $t_{wb} := t_{wm_2} = 0.36\ in$

Bottom Flange Thickness $t_{fb} := 1.100\ in$

Girder Extension Beyond Centerline of Bearing $ext := 5\ in$
(input zero for interior support)

Bearing Contact Length $N := 6\ in$

Existing Girder End Section Resistance (LRFR)

- 36WF170 Mixed Properties
  - -- Web Panel Shear [AASHTO LRFD 6.10.9]

Shear-Buckling Coefficient (unstiffened) $k_v := 5$

Web Compactness

$$\lambda_v := \frac{D_v}{t_w} = 60.9 \qquad \lambda_{pv} := 1.12 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 74.2 \qquad \lambda_{rv} := 1.40 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 92.8$$

Shear-Buckling Ratio

$$C := \text{if } \lambda_v \le \lambda_{rv} \;\; \left\| \min\left(1, \frac{\lambda_{pv}}{\lambda_v}\right) \right. \;\; \text{else} \;\; \left\| 1.57 \cdot \frac{E \cdot k_v}{\lambda_v^{\,2} \cdot F_{yw}} \right. = 1.000$$

Web Plastic Shear Strength

$$V_p := 0.58 \cdot F_{yw} \cdot d \cdot t_w = 366.4 \; \textbf{\textit{kip}}$$

Nominal Resistance

$$V_n := C \cdot V_p = 366.4 \; \textbf{\textit{kip}}$$

Section Loss based on Web Thickness

$$Loss_v := 1 - \frac{t_w}{t_{wo}} = 22.2\% \qquad \phi_{c.v} := \phi_c\left(Loss_v\right) = 0.900$$

$$V_r := \phi_{c.v} \cdot \phi_v \cdot V_n = 329.7 \; \textbf{\textit{kip}} \qquad RF_v := \frac{V_r - \gamma_{DC} \cdot V_{DC} - \gamma_{DW} \cdot V_{DW}}{\gamma_{LL} \cdot V_{HL}} = \begin{bmatrix} 1.71 \\ 2.22 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- 36WF170 Mixed Properties
  - -- Web Local Yielding [AASHTO LRFD D6.5.2]

For Rating, Let Bearing Resistance be the sum of
Web Local Yielding and Stiffener Contact Stress

$$R_{ny} := \text{if } ext > d \vee ext = 0 \; in \quad \begin{Vmatrix} (5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \end{Vmatrix} \text{ else } \begin{Vmatrix} (2.5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \end{Vmatrix} = 128.8 \; kip$$

Section Loss based on Thickness at Base of Web

$$Loss_b := 1 - \frac{t_{wb}}{t_{wo}} = 47.1\% \qquad \phi_{c.b} := \phi_c \left(Loss_b\right) = 0.900$$

$$R_{ry} := \phi_{c.b} \cdot \phi_s \cdot \phi_b \cdot R_{ny} = 115.9 \; kip$$

$$RF_b := \frac{R_{ry} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.32 \\ 0.42 \end{bmatrix}$$

LaBella Powered by partnership.	PROJECT Kensington Expressway	SHEET	OF
	PROJECT NO. 2230860	CALC. BY CSP	DATE 09/06/23
	SUBJECT BIN 1022610 Dodge	SCALE	
	CHECKED BY WJK 11/06/23		

Existing Girder End Section Resistance (LRFR)

- 36WF170 Mixed Properties
  -- Web Local Crippling [AASHTO LRFD D6.5.3]

$$R_{nw} := \text{if } ext > \frac{d}{2} \lor ext = 0 \; in \quad \left\| 0.8 \cdot t_w^{\,2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right. \quad \text{else if } \frac{N}{d} \le 0.2 \quad \left\| 0.4 \cdot t_w^{\,2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right. \quad \text{else} \quad \left\| 0.4 \cdot t_w^{\,2} \cdot \left(1 + \left(\frac{4\,N}{d} - 0.2\right) \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right. = 184.3 \; kip$$

Section Loss based on Web Thickness

$$Loss_w := Loss_v = 22.2\% \qquad \phi_{c.w} := \phi_c \left(Loss_w\right) = 0.900$$

$$R_{rw} := \phi_{c.w} \cdot \phi_s \cdot \phi_w \cdot R_{nw} = 132.7 \; kip$$

$$RF_w := \frac{R_{rw} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.43 \\ 0.56 \end{bmatrix}$$

Existing Girder End Section Resistance (LFR)

- 36WF170 Mixed Properties
  -- Lack of Bearing Stiffeners on Rolled Shapes

[AASHTO 10.48.7] Redirects all Load Factor Design for Bearing Stiffeners back to the Allowable Stress part of the Code.
[10.33.2] Stiffeners only required where end shear exceeds 75% of allowable

Translate this to LFR by letting the Strength be 75% of the Web Panel Shear

-- Applied Load and LFR Factors

Applied End Shear $V_D := V_{DC} + V_{DW} = 51.74\ kip$ $V_{HS} := 64.85\ kip$

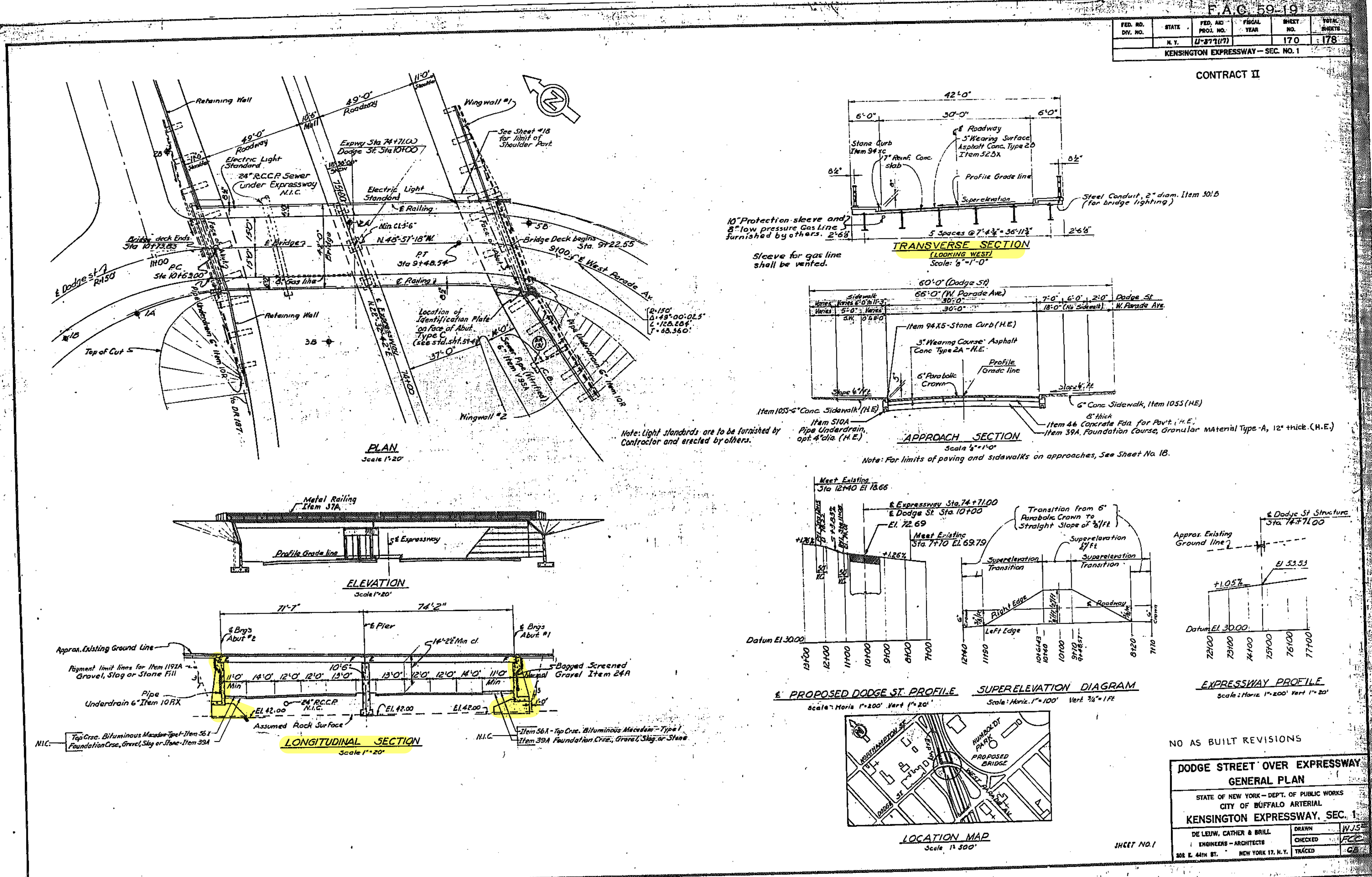
LFR Load Factors $A_1 := 1.3$ $A_2 := \begin{bmatrix} 2.17 \\ 1.3 \end{bmatrix}$

-- Web Panel Shear Strength

Math setup is the same as LRFR

$V_u := V_n = 366.4\ kip$ $75\% \cdot V_u = 274.8\ kip$

$$RF_{HS} := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_{HS}} = \begin{bmatrix} 1.47 \\ 2.46 \end{bmatrix}$$

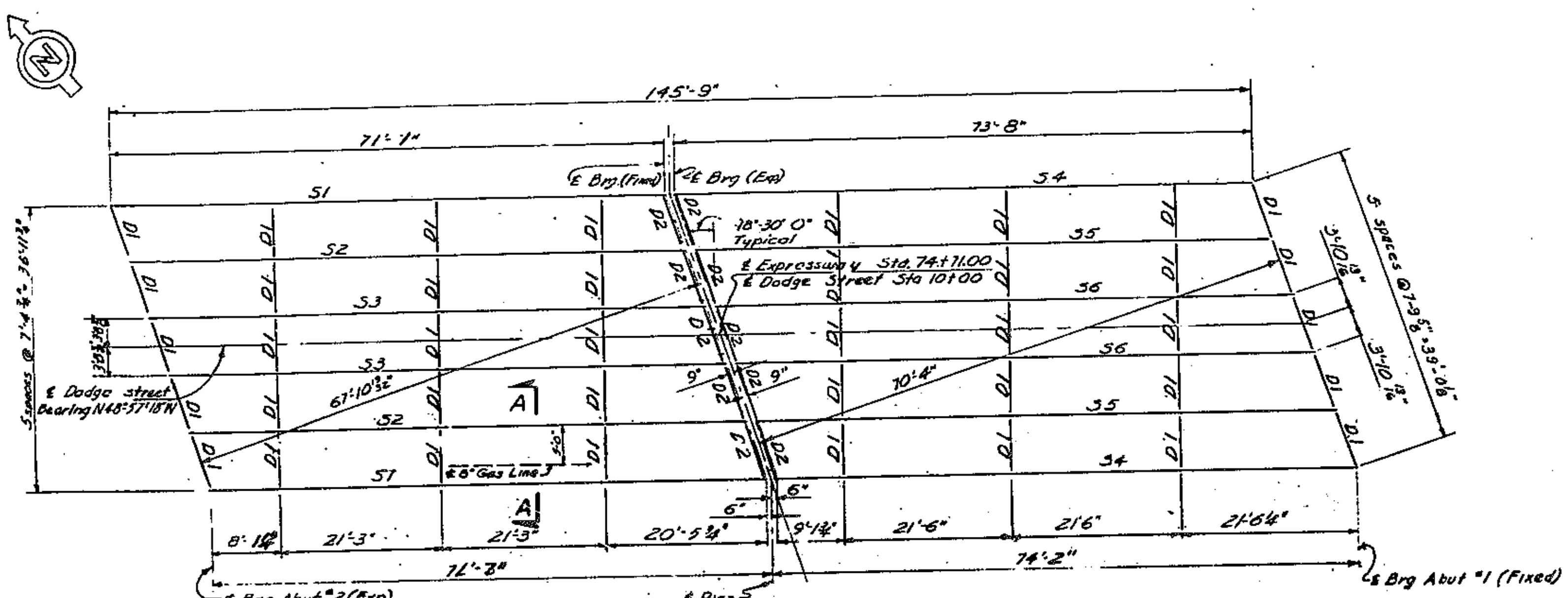


F.A.C. 59-19
FED. RD. DIV. NO. | STATE N.Y. | FED. AID PROJ. NO. U-377(17) | FISCAL YEAR | SHEET NO. 170 | TOTAL SHEETS 178
KENSINGTON EXPRESSWAY — SEC. NO. 1
CONTRACT II
PLAN
Scale 1"=20'
ELEVATION
Scale 1"=20'
LONGITUDINAL SECTION
Scale 1"=20'
TRANSVERSE SECTION
(LOOKING WEST)
Scale: 3/8"=1'-0"
APPROACH SECTION
Scale 3/8"=1'-0"
Note: Light standards are to be furnished by Contractor and erected by others.
Note: For limits of paving and sidewalks on approaches, See Sheet No. 18.
Sleeve for gas line shall be vented.
℄ PROPOSED DODGE ST. PROFILE
SUPERELEVATION DIAGRAM
EXPRESSWAY PROFILE
LOCATION MAP
Scale 1"=300'
NO AS BUILT REVISIONS
SHEET NO. 1
DODGE STREET OVER EXPRESSWAY
GENERAL PLAN
STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1
DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
200 E. 44TH ST. NEW YORK 17, N.Y.
DRAWN WJS
CHECKED FCC
TRACED CB

F.A.C. 59-19

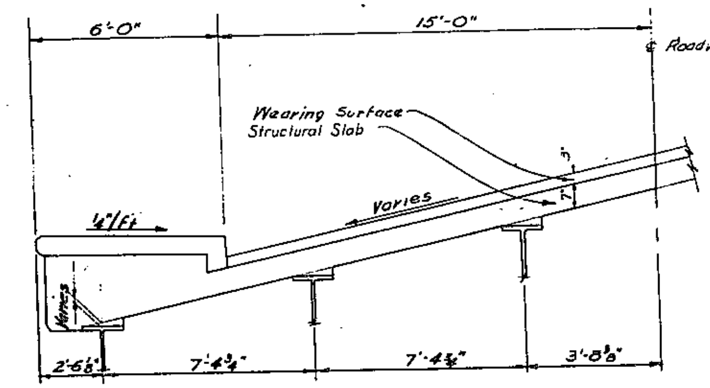
FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-377(17)		171	178
KENSINGTON EXPRESSWAY — SEC. NO. 1					

CONTRACT II



Diaphragm Schedule
D1 15 [33.9
D2 16 WF 36

FRAMING PLAN
Scale 3/32" = 1'-0"



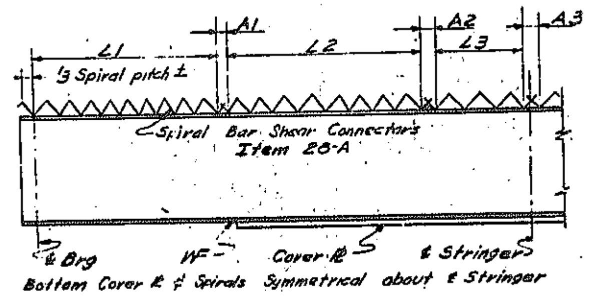
DIAGRAMMATIC SECTION
Not to Scale

ESTIMATE OF QUANTITIES					
ITEM No	DESCRIPTION	UNIT	TOTAL NEAT	TOTAL ROUNDED	FINAL
5	Trench, Culvert and Bridge Excavation	C.Y.	695	730	448
V95A	Sewer Pipe (Vitrified) 6" Dia.	L.F.	26	27	0
10RX	Pipe Underdrain, Opt. 6" Dia.	L.F.	212	220	212
* 15-2	Portland Cement, Type 2	Bbl.	1353	1,500	1423
18S	Class 1A Concrete for Structures	C.Y.	753	755	705
20S	Class 1 Concrete	C.Y.	171	175	169
24A	Bagged Screened Gravel	C.Y.	116	138	86
28RR	Bar Reinforcement for Structures	Lb.	99211	102,200	100,335
28A	Spiral Bar Shear Connectors	Lb.	2380	2,600	2420
29A	Structural Steel	Lb.	190520	196,200	193,538
37A	Metal Railing	L.F.	295	300	298
52 BX	Asphalt Concrete, Type 2B	Ton	88	90	92
61	Bituminous Material	Gal.	139	150	83
561	Protective Coating for Concrete	Gal.	91	95	51
13A	Cast Iron Pipe 6" Diam.				10
83 TT	Temporary Timber Sheet Piling	S.F.	2798	2,940	2101
94 XC	8" Stone Curb (Bridge)	L.F.	302	320	304
119XA	Gravel, Slag or Stone Fill	C.Y.	458	465	1108
301 B	Furnish and Install 2" Galvanized Steel Conduit	L.F.	150	160	151
303 A	Furnish Light Standard, Type A (25' Mount. Hgt.)	Ea.	2	2	2
351X	Joint Sealing Compound	Gal.	7	7	7
513	Surface Dusting with Fine Aggregate	S.Y.	504	510	503

* With Darex A.E.A. added.

STRINGER SCHEDULE															
STRINGER				BOTTOM COV. ℄		SPIRAL SHEAR CONNECTORS						DIMENSION			CAMBER
						SECTION L-1		SECTION L-2		SECTION L-3					
MK	NO	SIZE	CENTER TO CENTER Brgs	SIZE	LENGTH	LENGTH	PITCH	LENGTH	PITCH	LENGTH	PITCH	A-1	A-2	A-3	DEAD LOAD
S1	2	36WF150	71'-1"	16"x 13/16"	51'-3"	10'-0"	5"	9'-11"	7"	15'-0"	12"	3"	3"	3"	2 1/4"
S2	2	36WF150	71'-1"	16"x 7/8"	51'-3"	9'-9"	4 1/2"	10'-0"	6"	15'-0"	9"	3"	4"	5"	1 5/8"
S3	2	36WF160	71'-1"	16"x 1"	51'-3"	10'-0"	4"	10'-0"	5"	14'-8"	8"	3 1/2"	4 1/2"	5"	1 1/2"
S4	2	36WF160	73'-8"	16"x 1"	53'-0"	10'-0"	5"	9'-11"	7"	15'-0"	12"	3"	3"	3"	2 1/2"
S5	2	36WF160	73'-8"	16"x 7/8"	53'-0"	9'-9"	4 1/2"	10'-0"	6"	15'-0"	9"	3"	4"	5"	1 3/4"
S6	2	36WF170	73'-8"	16"x 1"	53'-0"	10'-0"	4"	10'-5"	5"	14'-4 1/2"	7 1/2"	3"	4"	4"	1 5/8"

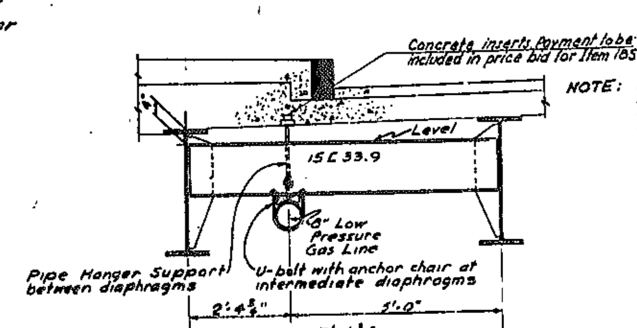
NOTE: Camber of beam to be measured with beam lying on it's side.



Bottom Cover ℄ & Spirals Symmetrical about ℄ Stringer

STRINGER DETAILS
Not to Scale

NOTE: Field welding of spiral reinforcement will not be permitted.



SECTION A-A
Scale 1/2" = 1'-0"

NOTE: Distance between pipe supports shall be 12 ft. ± For details of pipe supports see Sheet No. 12.

SHEET NO. 6

REVISION TO QUANTITY TABLE

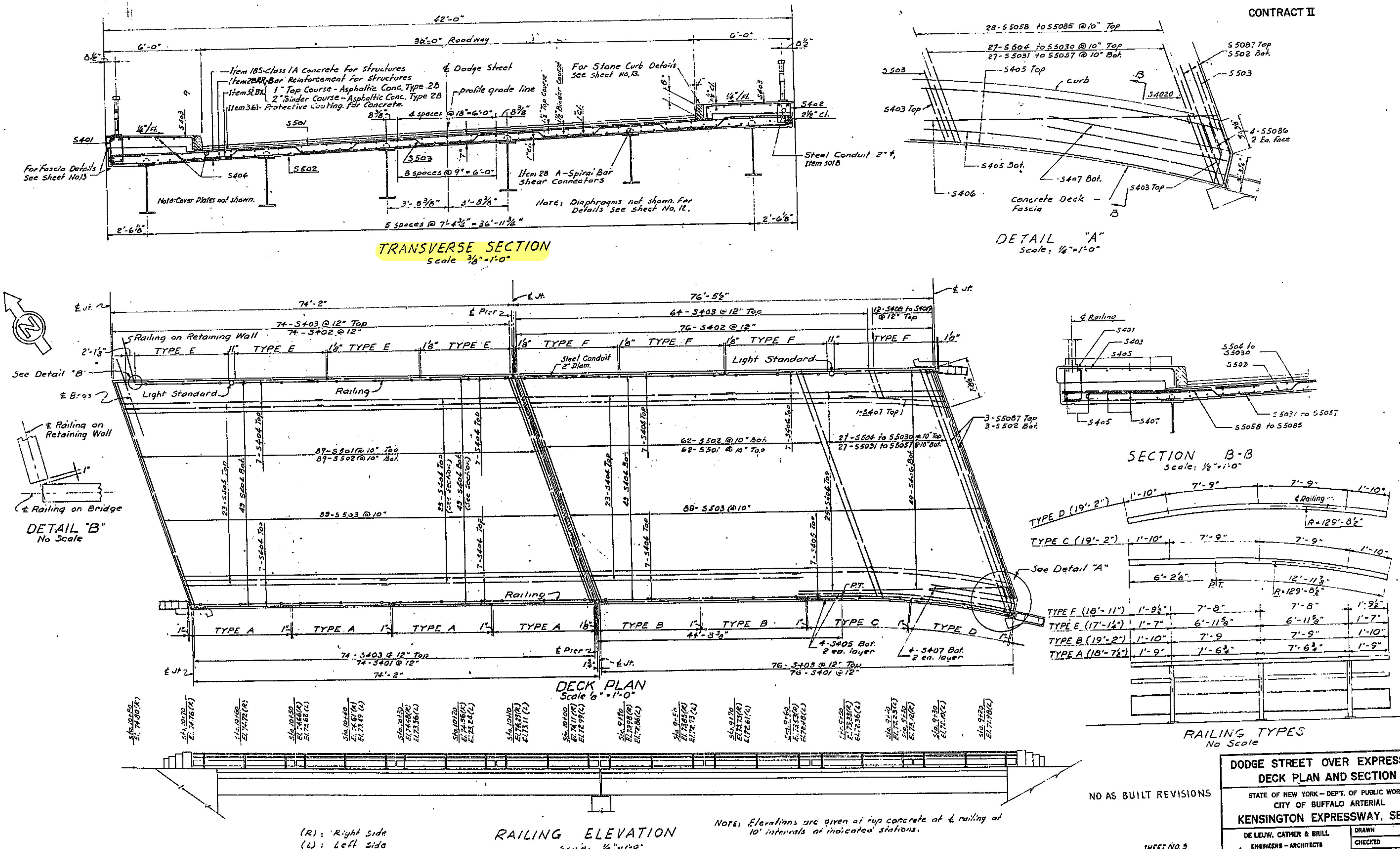
DODGE STREET OVER EXPRESSWAY FRAMING PLAN		
STATE OF NEW YORK — DEP'T. OF PUBLIC WORKS CITY OF BUFFALO ARTERIAL KENSINGTON EXPRESSWAY, SEC. 1		
DE LEUW, CATHER & BRILL ENGINEERS — ARCHITECTS 202 E. 44TH ST. NEW YORK 17, N.Y.	DRAWN	HJS
	CHECKED	F.C.
	TRACED	C.B.

F.A.C. 59-19

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-377(7)		172	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II



NO AS BUILT REVISIONS

SHEET NO. 5

DODGE STREET OVER EXPRESSWAY
DECK PLAN AND SECTION

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N.Y.

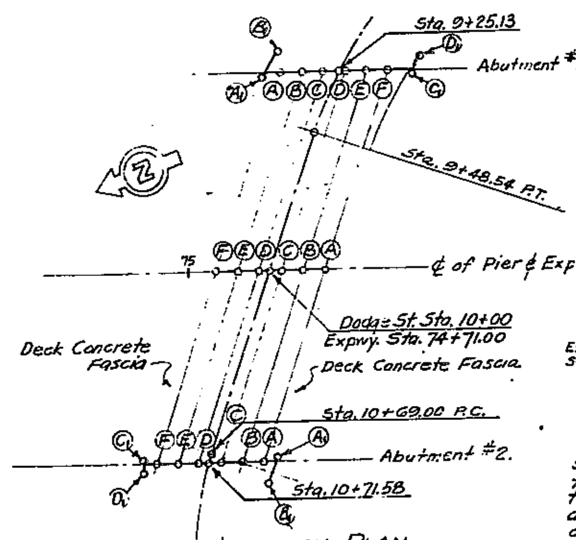
DRAWN	F.C.C.
CHECKED	R.C.F.
TRACED	

F.A.C. 59-19

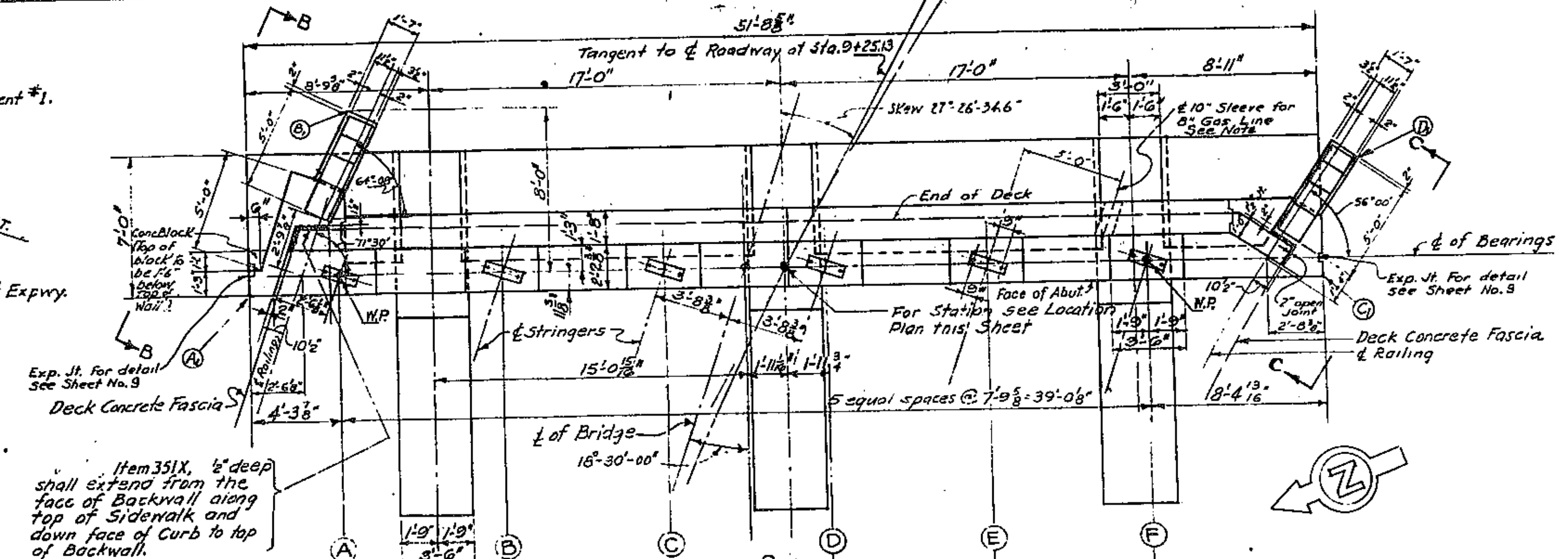
FED. RD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)	-	173	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II



LOCATION PLAN
No Scale

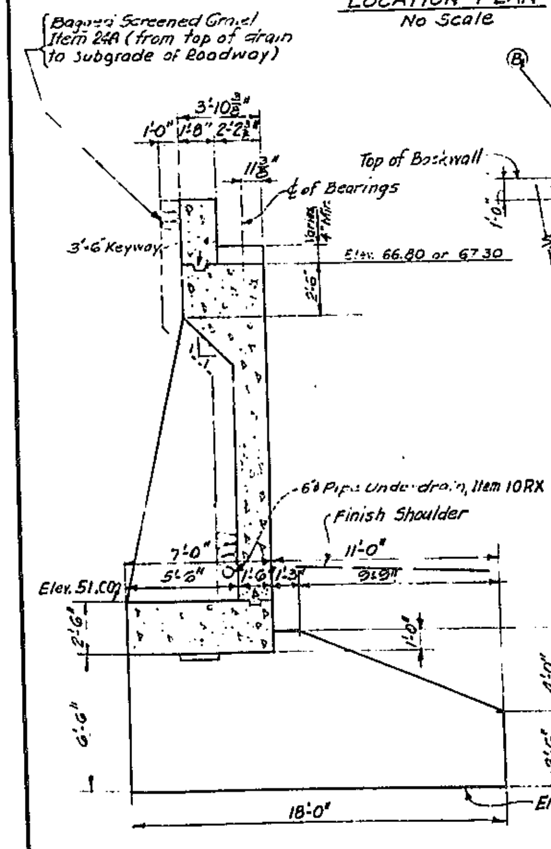


PLAN
Scale 1/4" = 1'-0"

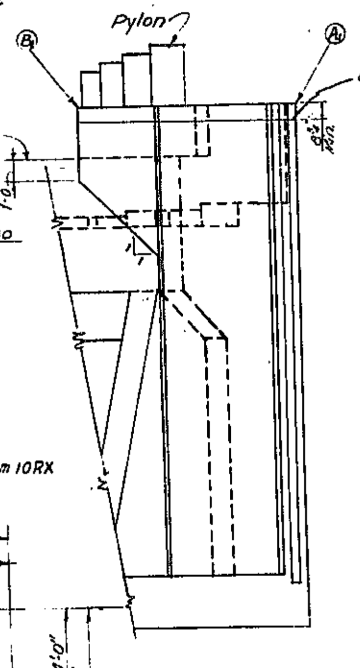
NOTE: Top of backwalls of abutments shall be steel trowel finished.

NOTE: Payment for sleeves included in price bid for Item 18S.

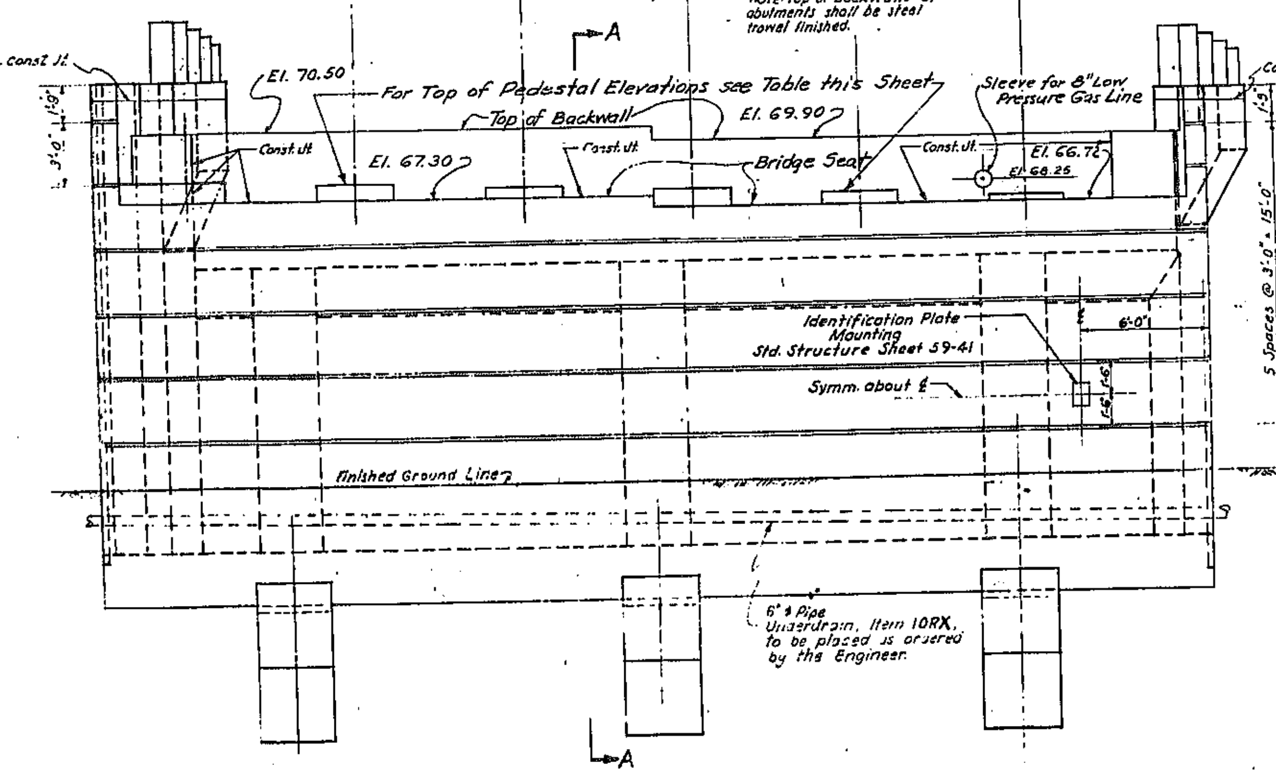
TABLE OF ELEVATIONS		
LOCATION	ABUT. NO 1	ABUT. NO. 2
Top of Footing	51.00	52.50
Bridge Seat	See Abutment Elevation	
Top of Pedestal Ⓐ	68.22	68.72
" " Ⓑ	67.99	68.98
" " Ⓒ	67.77	69.23
" " Ⓓ	67.56	69.47
" " Ⓔ	67.31	69.69
" " Ⓕ	67.05	69.88
Top of Backwall	See Abutment Elevation	
Top of Wingwall A₁	73.03	73.78
" " B₁	72.86	73.92
" " C₁	71.88	74.78
" " D₁	71.79	74.80



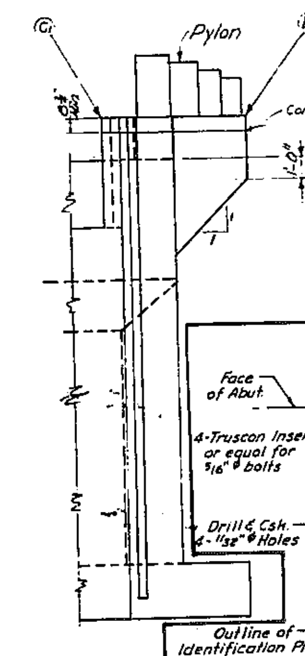
SECTION A-A
Scale 1/4" = 1'-0"



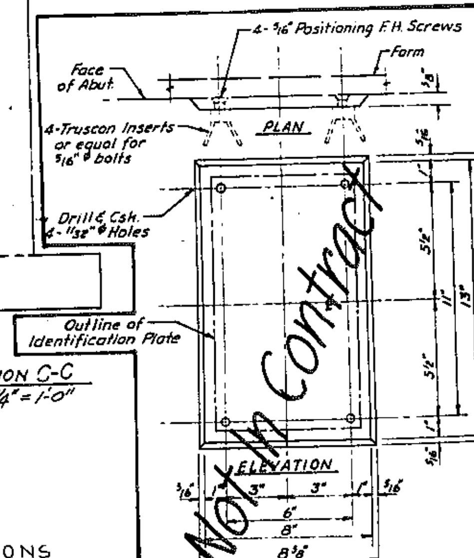
ELEVATION B-B
Scale 1/4" = 1'-0"



ELEVATION
Scale 1/4" = 1'-0"



ELEVATION C-C
Scale 1/4" = 1'-0"



WOOD TEMPLATE FOR IDENTIFICATION PLATE RECESS
Scale: 3" = 1 Ft.

Not in Contract

Cut and bevel a 5/8" x 8 5/8" finished board to dimensions shown. Bolt 4-Truscon Inserts, or equal for 5/16" ϕ bolts to board as shown. Nail board inside of form at location shown on the plans. When concrete is being placed, ... must be continued back of board so that the surface of the recess will be free from bubble holes, pockets or exposed coarse aggregate. After removing forms, remove 4 positioning screws and wood template.

Mount Identification Plate, in recess with 4-5/16" ϕ bronze screws provided therewith, in accordance with Std. Structure Sheet 59-41.

The cost of mounting the identification plate, including all labor and materials necessary to complete the mounting of same, shall be included in the bid price for the various items of this contract.

Not in Contract

NO AS BUILT REVISIONS

NOTES:

All concrete in the Abutments shall be class I A concrete for structures Item 18S.

For design purposes load on abutment foundation does not exceed 8 Tons / S.F.

For elevations of footing and pedestals - see table this sheet.

For sections and reinforcing - see sheet No 6.

For Location Plan - see this sheet.

For embankment details of Abutments - see sheet No 5

For details of Pylons - see sheet No 5.

All concrete in pedestals under footings shall be Item 20S.

Concrete in pylons shall be Item 18S.

Sleeves for gas lines through backwall will be furnished by the utility company and placed by the contractor under item 18S.

SHEET NO. 4

DODGE STREET OVER EXPRESSWAY
ABUTMENT NO. 1

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS - ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N.Y.

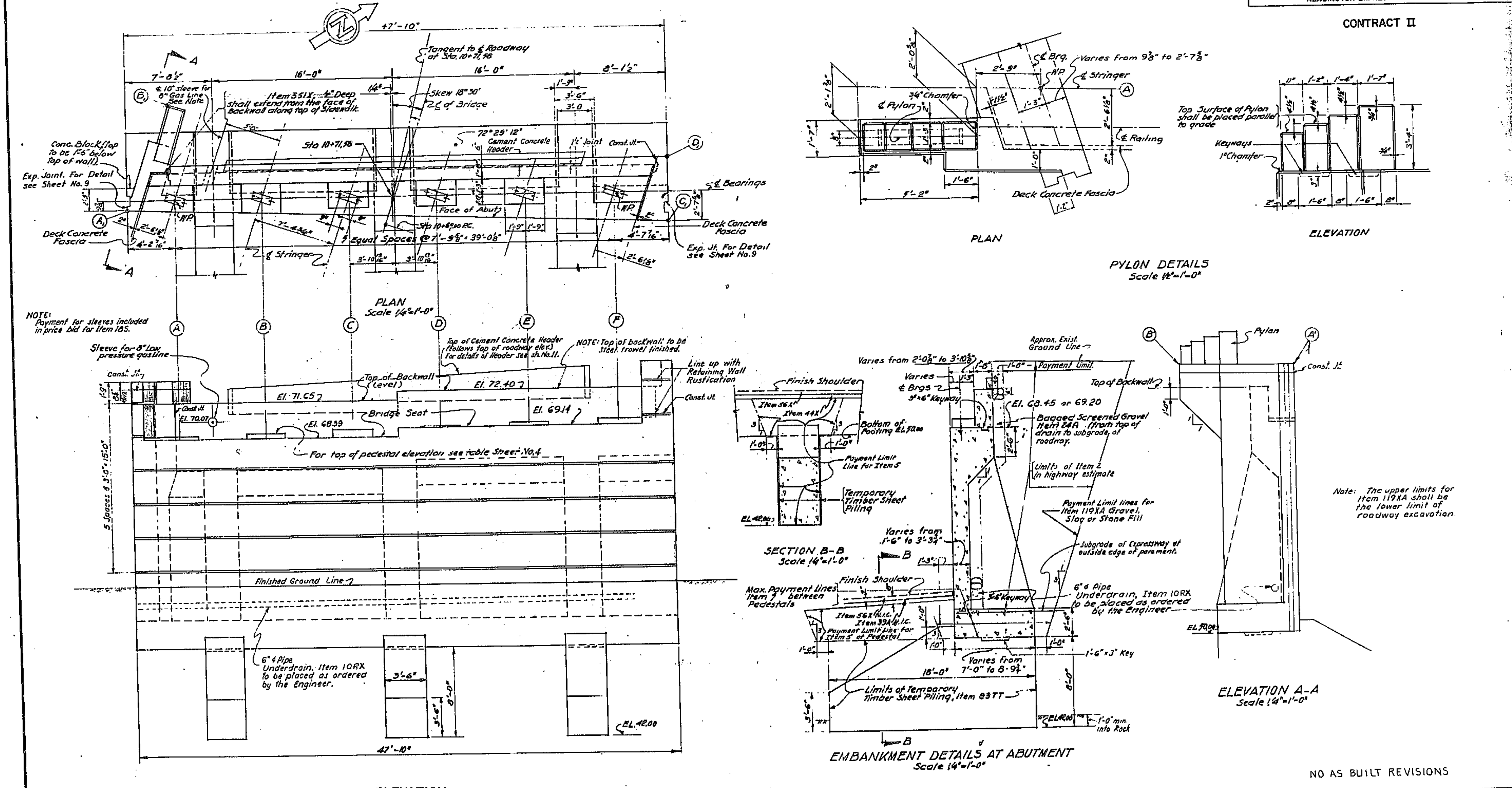
DRAWN	B.T.H.
CHECKED	F.L.C.
TRACED	C.B.

F.A.C. 59-19

FED. RD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-377(7)		174	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II



NO AS BUILT REVISIONS

NOTES:
All concrete in the Abutments, except pedestals under footings, shall be Class 1A Concrete for structures Item 18S.
For design purposes load on abutment foundation does not exceed 8 Tons/S.F.
For elevation of footing and pedestals see table sheet No.4
For sections and reinforcing see sheet No 7
For location plan see sheet No.4
All concrete in pedestals under footings shall be Item 20S.
Sleeves for gas lines through backwall will be furnished by the utility company and placed by the contractor under item 18S.

SHEET NO.5

DODGE STREET OVER EXPRESSWAY
ABUTMENT NO. 2

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
202 E. 44TH ST. NEW YORK 17 N.Y.

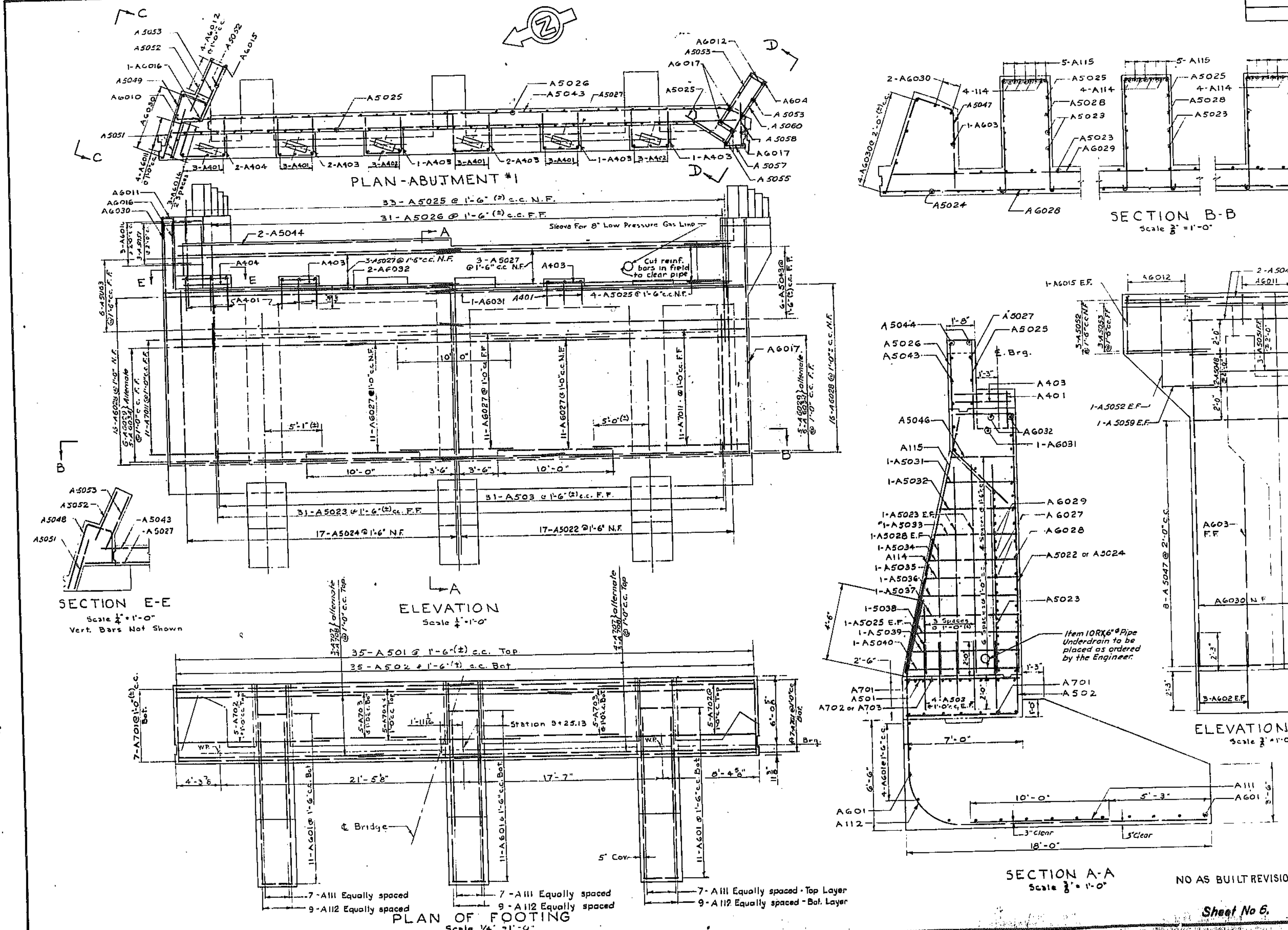
DRAWN	A.L.
CHECKED	F.C.C.
TRACED	C.B.

F.A.C. 59-19

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(1)		175	178

KENSINGTON EXPRESSWAY — SEC. NO. I

CONTRACT II



NOTE:
For Details Of Pylon See Sheet No. 5.

NO AS BUILT REVISIONS

Sheet No 6.

DODGE STREET OVER EXPRESSWAY
ABUTMENT NO. I DETAILS

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. I

DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
NEW YORK 17, N.Y.

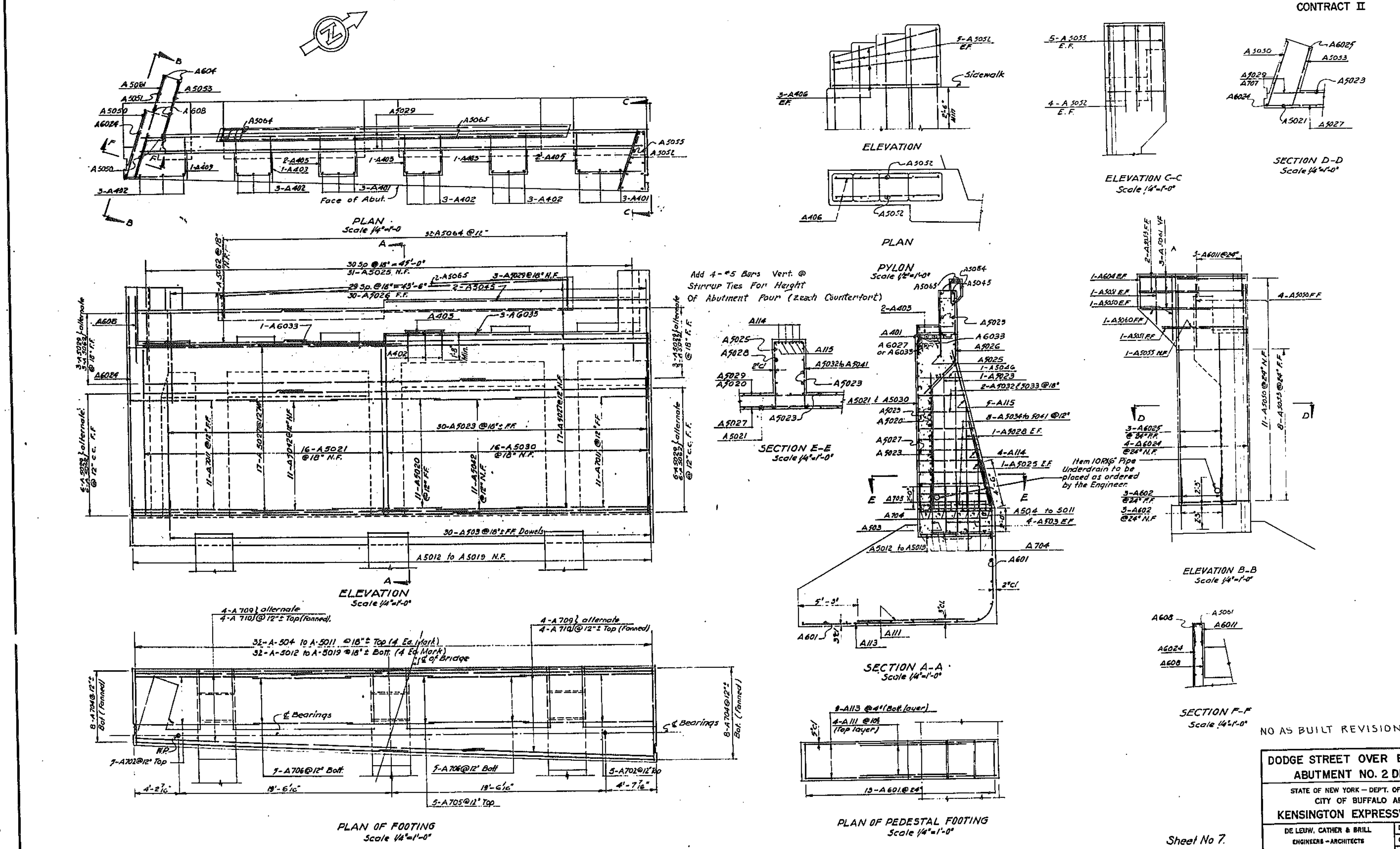
DRAWN E.R.
CHECKED
TRACED

F.A.C. 59-19

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-377(11)		176	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II



NO AS BUILT REVISIONS

Sheet No 7.

DODGE STREET OVER EXPRESSWAY
ABUTMENT NO. 2 DETAILS

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N.Y.

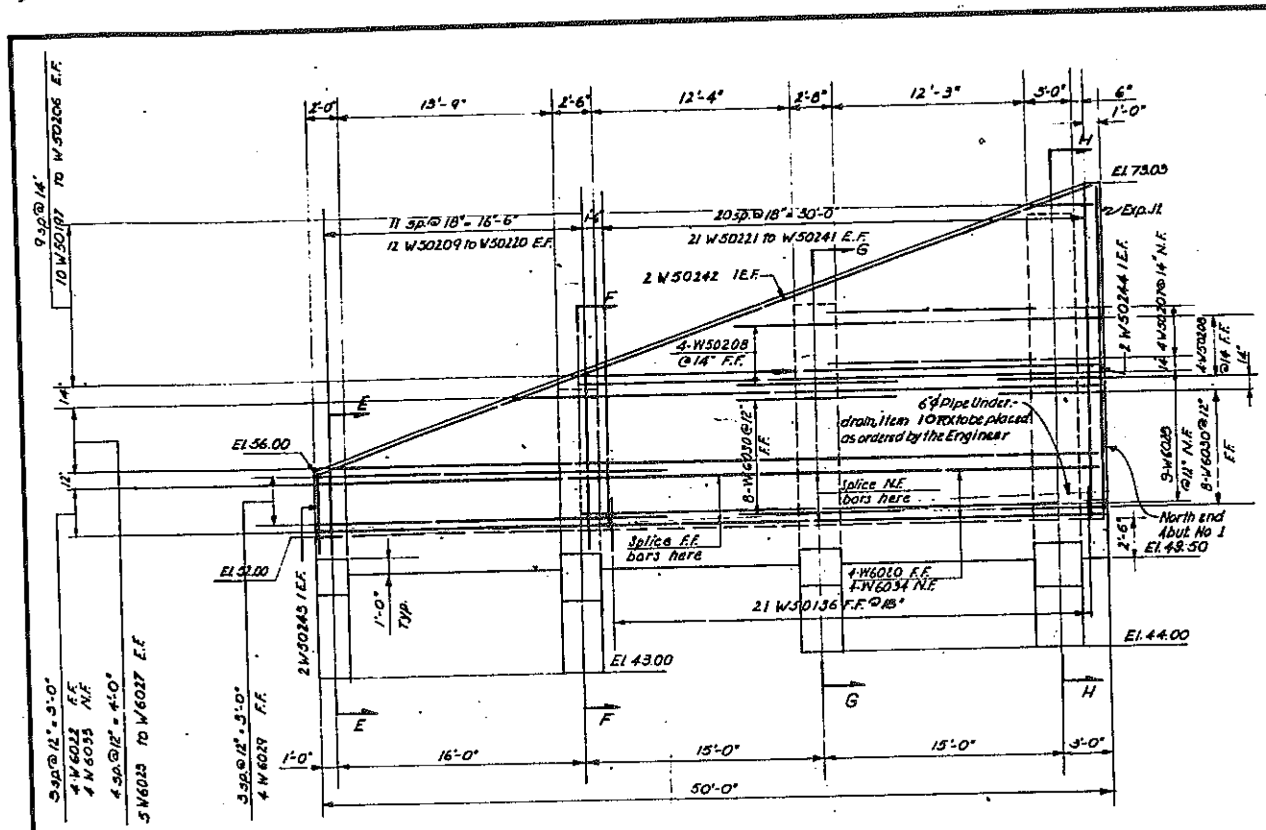
DRAWN | CHECKED | TRACED

F.A.C. 59-19

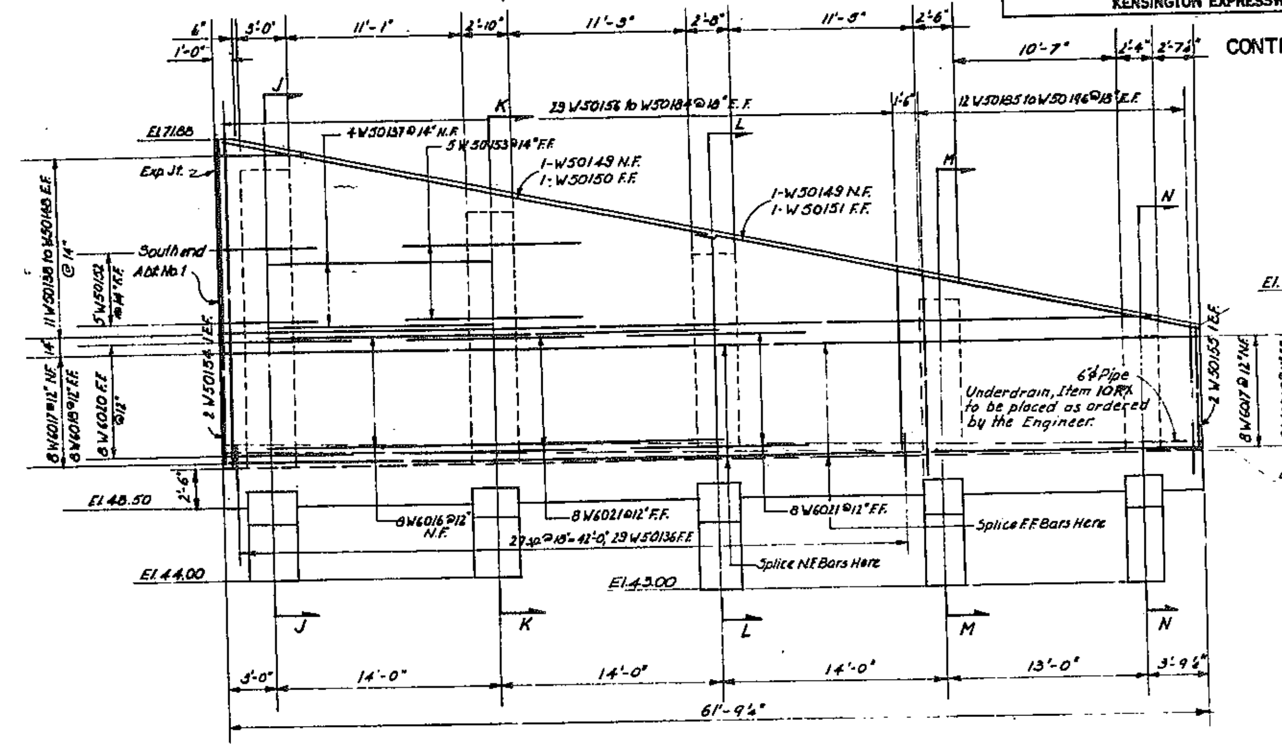
FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-377(17)		177	178

KENSINGTON EXPRESSWAY – SEC. NO. 1

CONTRACT II

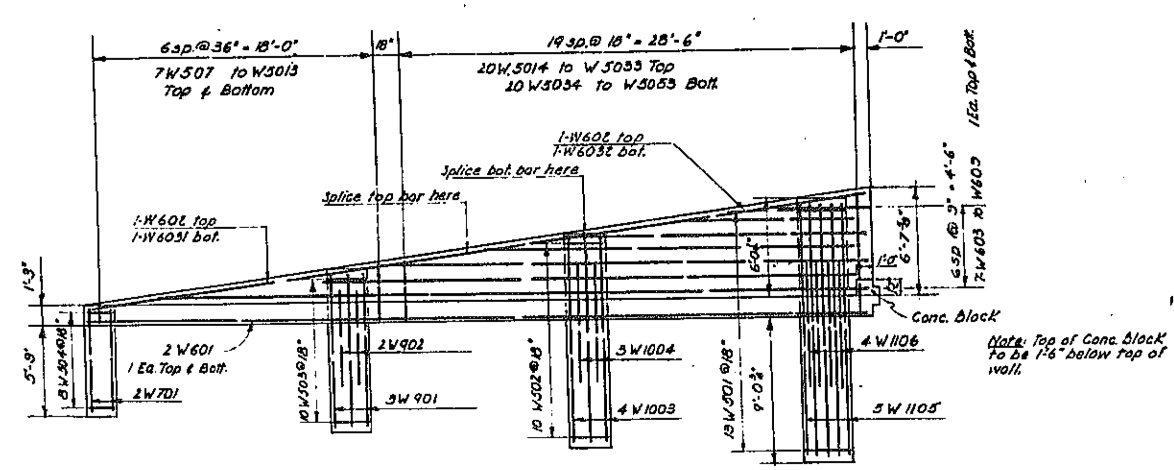


ELEVATION



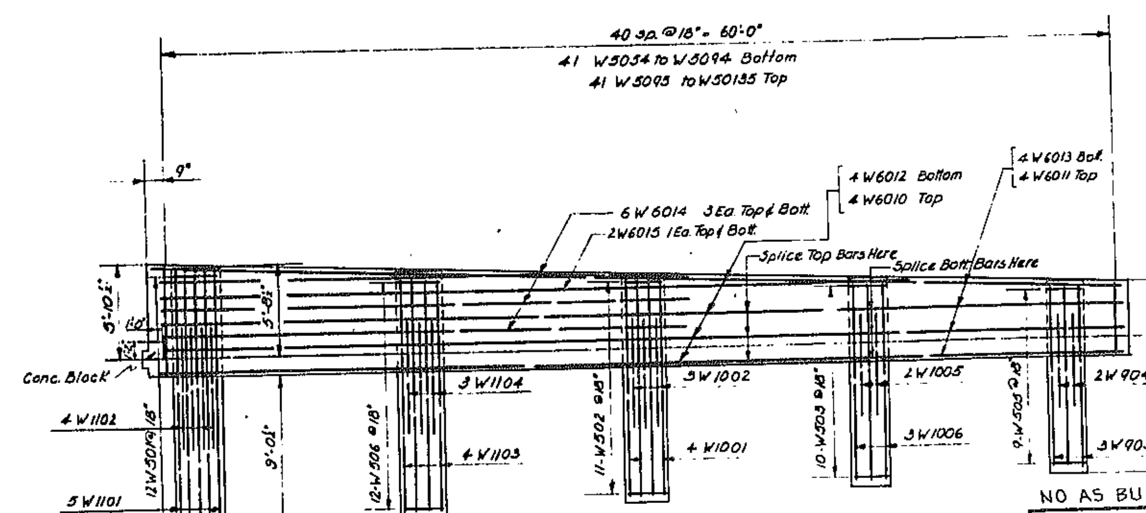
ELEVATION

NOTE:
1. Concrete in wingwalls to be Item 18S.
2. Concrete in wingwall pedestals to be Item 20S.



PLAN

WINGWALL NO 1
Scale 3/16" = 1'-0"



PLAN

WINGWALL NO 2
Scale 3/16" = 1'-0"

SHEET NO. 8

NO AS BUILT REVISIONS

DODGE STREET OVER EXPRESSWAY
WINGWALLS NOS. 1 & 2

STATE OF NEW YORK – DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

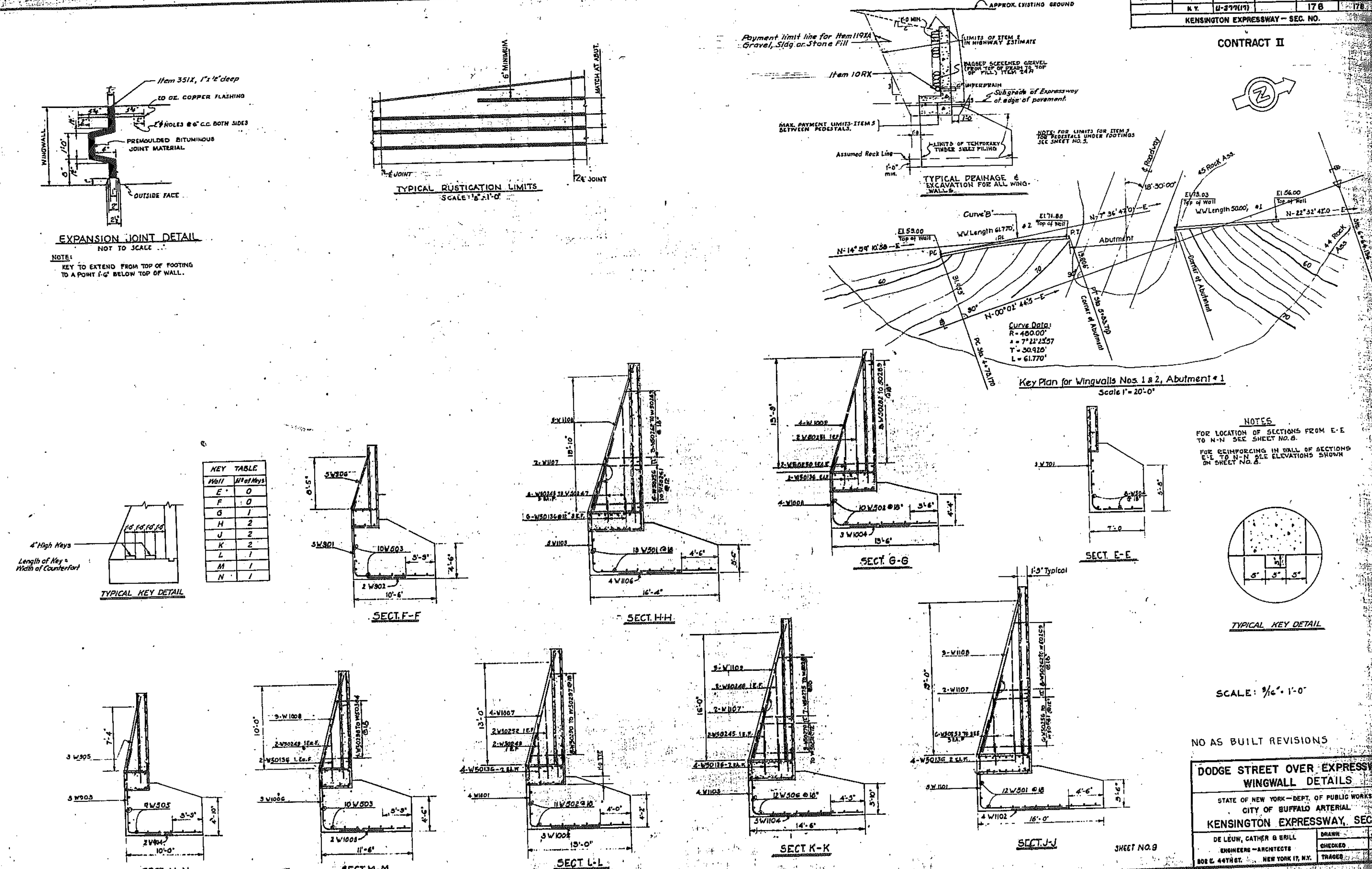
DE LEUW, CATHER & BRILL
ENGINEERS – ARCHITECTS
102 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	H.H.
CHECKED	C.E.
TRACED	C.A.

F.A.C. 59-19

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-377(17)		176	178
KENSINGTON EXPRESSWAY — SEC. NO.					

CONTRACT II



KEY TABLE	
Wall	No of Keys
E	0
F	0
G	1
H	2
J	2
K	2
L	1
M	1
N	1

NOTES

FOR LOCATION OF SECTIONS FROM E-E TO N-N SEE SHEET NO. 8.

FOR REINFORCING IN WALL OF SECTIONS E-E TO N-N SEE ELEVATIONS SHOWN ON SHEET NO. 8.

SCALE: 3/16" = 1'-0"

NO AS BUILT REVISIONS

DODGE STREET OVER EXPRESSWAY
WINGWALL DETAILS

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. I

DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
808 E. 44TH ST. NEW YORK 17, N.Y.

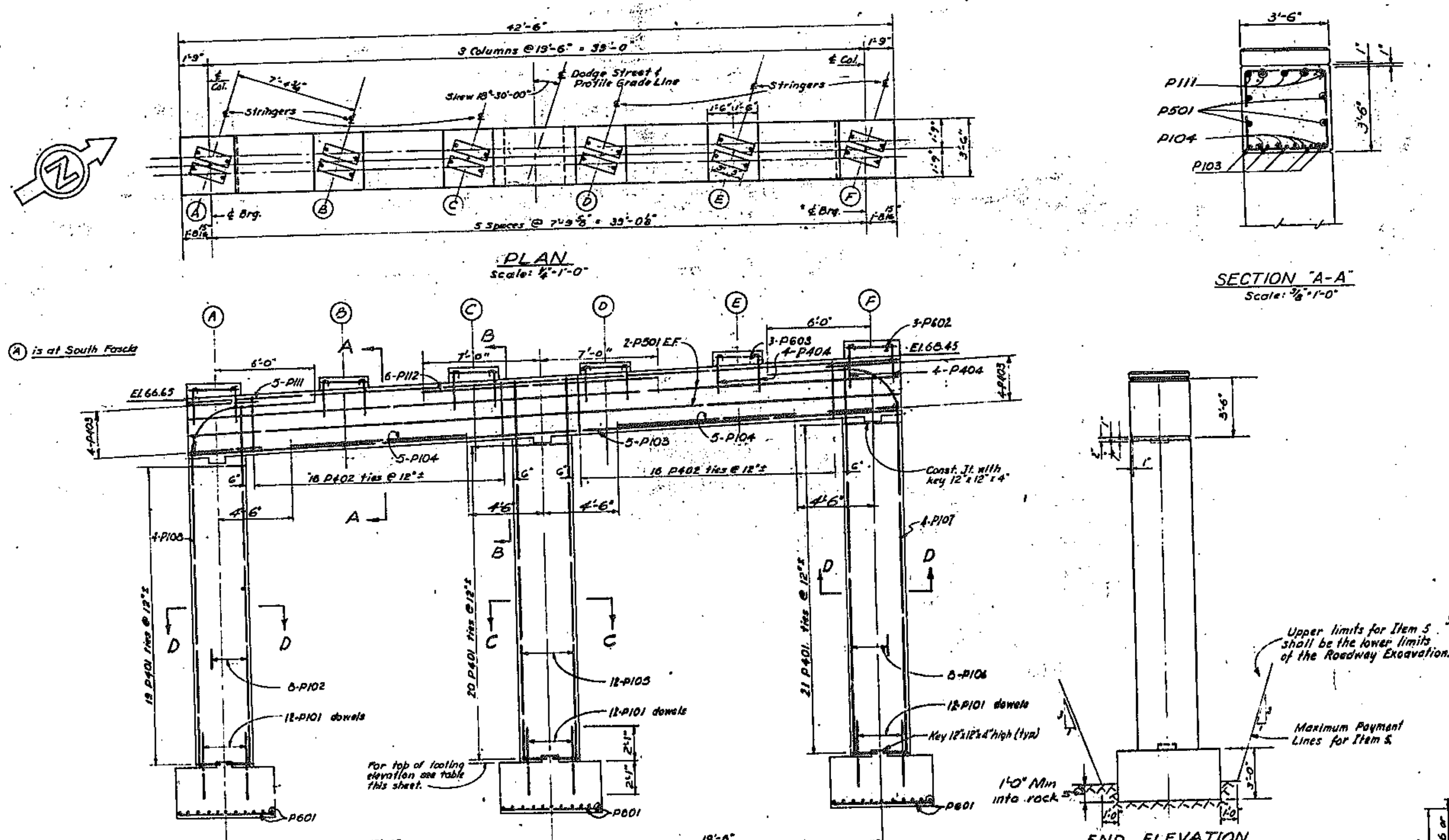
DRAWN
CHECKED
TRACED

F.A.C. 59-19

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-399(17)		179	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II

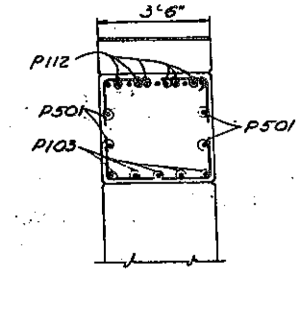


PLAN
Scale: 1/8" = 1'-0"

ELEVATION
Scale: 1/4" = 1'-0"

END ELEVATION
Scale: 1/4" = 1'-0"

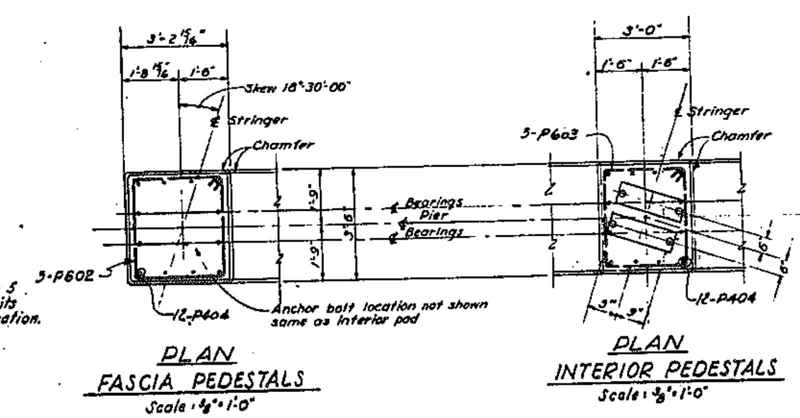
SECTION "A-A"
Scale: 3/8" = 1'-0"



SECTION "B-B"
Scale: 3/8" = 1'-0"

NOTES:
1. For design purposes, soil pressure (rock) does not exceed 8 tons/sq. ft.
2. See location plan sheet No. 4 for designation & location of pedestals.
3. Concrete in pier columns, caps & pedestals shall be Item 18S class IA concrete for structures.
4. Concrete in pier footings shall be Item 20S class I concrete.

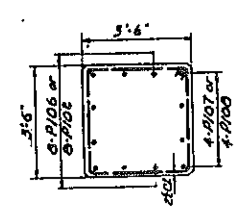
TABLE OF ELEVATIONS	
LOCATION	ELEV.
Top of Footing	45.00
Top of pedestal A	67.61
" " B	67.84
" " C	68.27
" " D	68.61
" " E	68.96
" " F	69.30



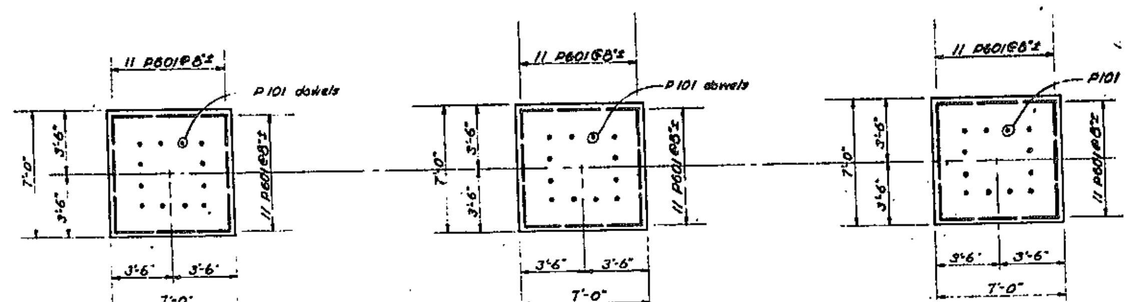
PLAN
FASCIA PEDESTALS
Scale: 3/8" = 1'-0"

PLAN
INTERIOR PEDESTALS
Scale: 3/8" = 1'-0"

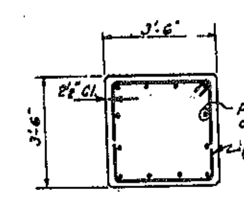
NOTES:
1. All anchor bolts for bearings shall be 1" ϕ roughened or swedged bolts 1'-3" long 2 each per bearing.
2. Anchor bolts shall be accurately placed by means of a template and set 10" into the masonry.
3. Top steel may be moved slightly to clear bolts if necessary.
4. For shoe details see sheet No 12.
5. Pedestals to be poured 1/4" high, then Bush hammered to finished elevations.
6. For detail of anchor bolts see sheet No 12.



SECTION D-D
Scale: 3/8" = 1'-0"



PLAN OF FOOTINGS
Scale: 1/4" = 1'-0"



SECTION "C-C"
Scale: 3/8" = 1'-0"

NO AS BUILT REVISIONS

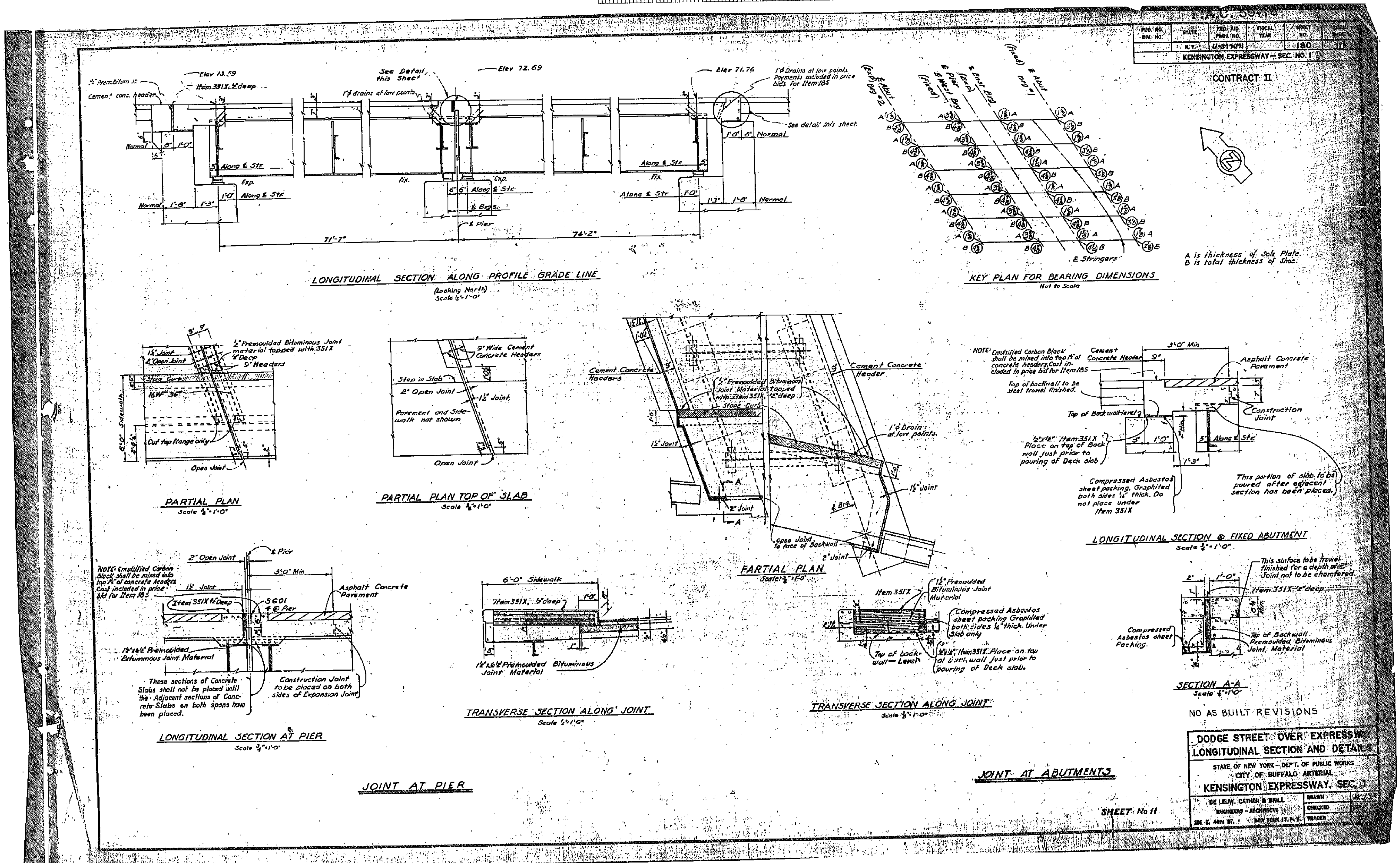
DODGE STREET OVER EXPRESSWAY
PIER

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
302 E. 44th ST. NEW YORK 17, N.Y.

DRAWN
CHECKED
TRACED

SHEET No 10

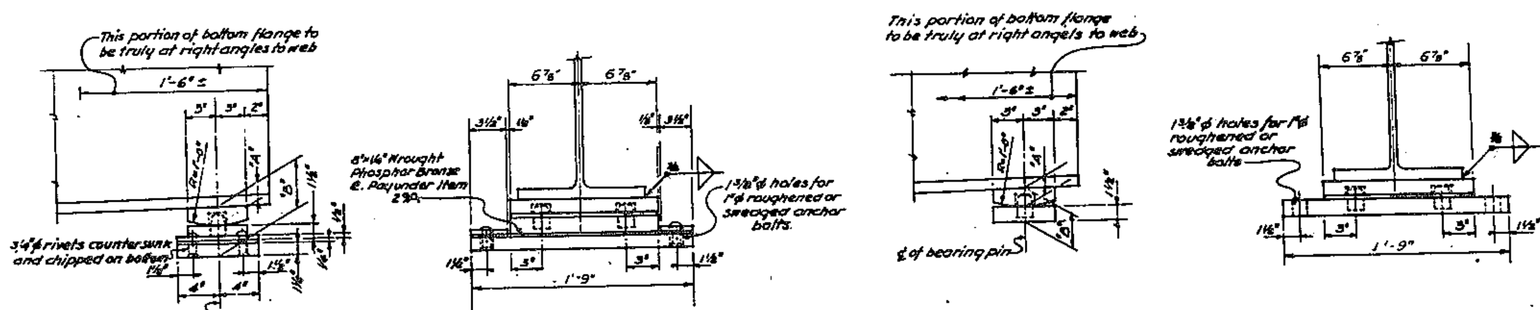


P.A.C. 69-10
N.Y.
U-37707
180
178
KENSINGTON EXPRESSWAY – SEC. NO. 1
CONTRACT II
Elev 73.59
Item 351X, ½" deep
Cement conc. header
See Detail, this Sheet
Elev 72.69
1'-6" drains at low points
Elev 71.76
1'-6" Drains at low points. Payments included in price bids for Item 185
See detail this sheet.
Normal
Along ℄ Str.
Exp.
Fix.
℄ Brgs.
℄ Pier
71'-7"
74'-2"
LONGITUDINAL SECTION ALONG PROFILE GRADE LINE
(Looking North)
Scale ⅛" = 1'-0"
KEY PLAN FOR BEARING DIMENSIONS
Not to Scale
℄ Stringers
A is thickness of Sole Plate.
B is total thickness of Shoe.
2" Premoulded Bituminous Joint material topped with 351X ½" Deep
9" Headers
2" Open Joint
Stone Curb
6'-0" Sidewalk
Cut top flange only
Open Joint
PARTIAL PLAN
Scale ⅜" = 1'-0"
9" Wide Cement Concrete Headers
Step in Slab
2" Open Joint
1½" Joint
Pavement and Sidewalk not shown
Open Joint
PARTIAL PLAN TOP OF SLAB
Scale ⅜" = 1'-0"
Cement Concrete Headers
Cement Concrete Header
½" Premoulded Bituminous Joint Material topped with Item 351X, ½" deep
Stone Curb
1'-6" Drain at low points.
1½" Joint
2" Joint
Open Joint to face of Backwall
2" Joint
PARTIAL PLAN
Scale ⅜" = 1'-0"
NOTE: Emulsified Carbon Black shall be mixed into top 1" of concrete headers. Cost included in price bid for Item 185
Cement Concrete Header
3'-0" Min
Asphalt Concrete Pavement
Top of backwall to be steel trowel finished.
Top of Backwall
Construction Joint
½"x½" Item 351X Place on top of Back wall just prior to pouring of Deck slab
Along ℄ Str.
Compressed Asbestos sheet packing, Graphited both sides ⅛" thick. Do not place under Item 351X
This portion of slab to be poured after adjacent section has been placed.
LONGITUDINAL SECTION @ FIXED ABUTMENT
Scale ½" = 1'-0"
2" Open Joint
℄ Pier
NOTE: Emulsified Carbon Black shall be mixed into top 1" of concrete headers. Cost included in price bid for Item 185
3'-0" Min.
1½" Joint
Item 351X ½" Deep
SG01 4 @ Pier
Asphalt Concrete Pavement
1½"x6½" Premoulded Bituminous Joint Material
These sections of Concrete Slabs shall not be placed until the Adjacent sections of Concrete Slabs on both spans have been placed.
Construction Joint to be placed on both sides of Expansion Joint
LONGITUDINAL SECTION AT PIER
Scale ¾" = 1'-0"
6'-0" Sidewalk
Item 351X, ½" deep
1½"x6½" Premoulded Bituminous Joint Material
TRANSVERSE SECTION ALONG JOINT
Scale ½" = 1'-0"
JOINT AT PIER
Item 351X
1½" Premoulded Bituminous Joint Material
Compressed Asbestos sheet packing Graphited both sides ⅛" thick. Under slab only
Top of backwall – Level
½"x½" Item 351X Place on top of back wall just prior to pouring of Deck slab.
TRANSVERSE SECTION ALONG JOINT
Scale ½" = 1'-0"
JOINT AT ABUTMENTS
This surface to be trowel finished for a depth of 2". Joint not to be chamfered.
Item 351X, ½" deep
Compressed Asbestos sheet Packing.
Top of Backwall
Premoulded Bituminous Joint Material
SECTION A-A
Scale ½" = 1'-0"
NO AS BUILT REVISIONS
DODGE STREET OVER EXPRESSWAY
LONGITUDINAL SECTION AND DETAILS
STATE OF NEW YORK – DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1
DE LEUW, CATHER & BRILL
ENGINEERS – ARCHITECTS
NEW YORK 17, N.Y.
DRAWN
CHECKED
TRACED
SHEET No 11

FED. RD. DIV. NO.	STATE	FED. AID - PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(7)		181	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II



SIDE ELEVATION

END ELEVATION

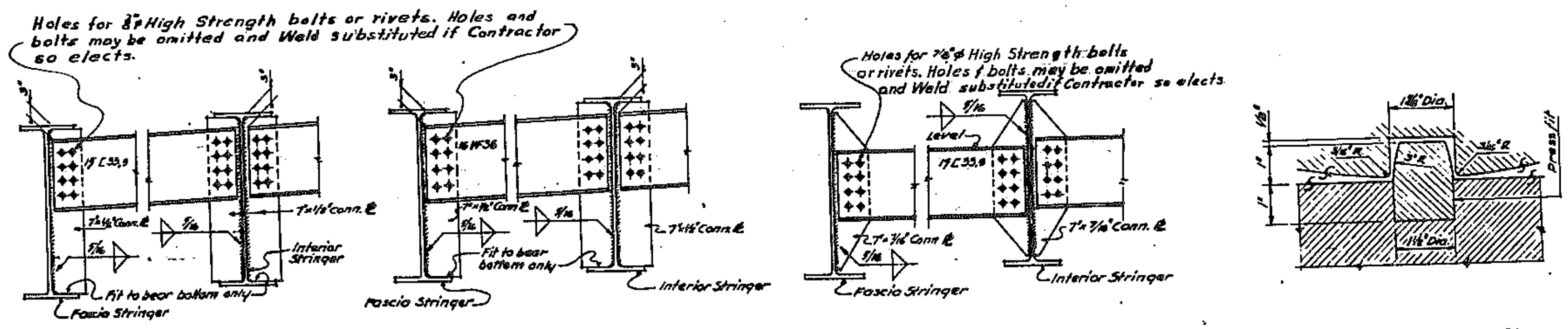
EXPANSION BEARING.
Scale 1½"=1'-0"

NOTE: Anchor bolts shall be accurately placed by means of a template and set 10" into masonry.

SIDE ELEVATION

END ELEVATION

FIXED BEARING
Scale 1½"=1'-0"

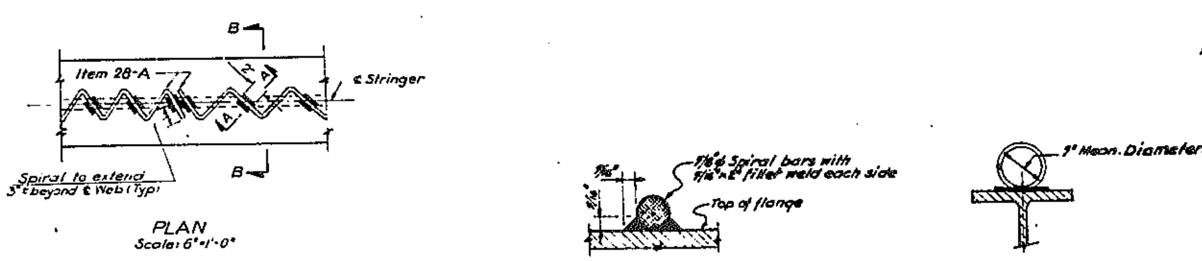


END DIAPHRAGMS AT ABUTMENTS
Scale ¾"=1'-0"

END DIAPHRAGMS AT PIERS
Scale ¾"=1'-0"

INTERMEDIATE DIAPHRAGMS
Scale ¾"=1'-0"

SECTION THRU DOWEL
Scale 6"=1'-0"



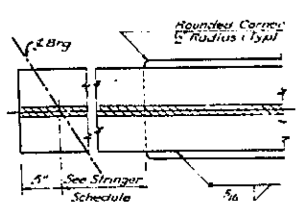
PLAN
Scale: 6"=1'-0"

SECTION A-A
Half Size

SECTION B-B
Scale 1"=1'-0"

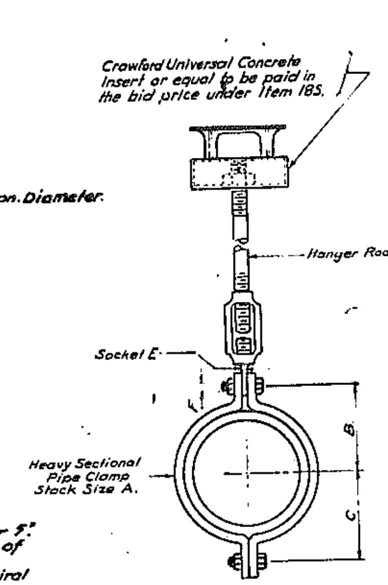
SPIRAL DETAILS

NOTE:
All spirals shall be ⅝"φ plain bars with mean diameter 5".
All spirals shall have two structural welds at each point of contact with beam, one weld each side of rod.
5/32" or 3/16" diameter electrodes shall be used in welding the spiral Bar Shear Connectors.
At the end of beam the spiral shall project about one third of the pitch beyond the end weld.
The Contractor's attention is called to the possibility of interference between the reinforcing steel in the slab and the beam spirals. To avoid this interference the bar spacings may be varied 1"± with the understanding that the required area of steel will be placed in each 5"±. Even then, some bars will have to be threaded thru one or more spirals.

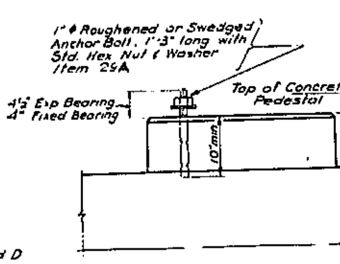


COVER PLATE DETAILS
Scale 1"=1'-0"

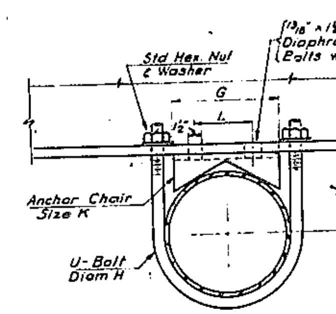
NOTE:
Special precautions must be exercised where welding crosses edge of flange to avoid any possibility of "undercut" or nicks in edge of flange



PIPE HANGER WITH TURNBUCKLE & INSERT
Scale: 3"=1'-0"



ANCHOR BOLT DETAIL
(TYPICAL)
Not to scale



ANCHOR CHAIR WITH U-BOLT
Scale: 3"=1'-0"

GENERAL NOTES

DESIGN SPECIFICATIONS: A A.S.H.O. 1953 modified - loading H.20-S16-44.
MATERIALS & FABRICATION: Specifications of New York State Department of Public Works, dated Jan. 2, 1957 and current modifications and additions.
The cost of furnishing and installing, premoulded bituminous joint material, asbestos sheet packing and 15lbs asphalt roofing felt shall be included in the prices bid for the various items in the contract.
Joint sealing compound shall be paid for under Item 351X.

Bituminous material, Item 61, shall be applied to the backs of all abutments and wingwalls from the tops of footings to the bottom of pavement.
When the concrete is cured, finished and (if ordered) rubbed, and the surface is clean and dry, the contractor shall apply a water soluble silicone solution to all exposed surfaces except the underside of slab.

No construction joints other than those shown on the plans will be permitted, without written permission of the Deputy Chief Engineer Bridges.

Field connections shall be made with ⅞" High Strength bolts or rivets. Holes and Bolts may be omitted and Weld substituted if Contractor so elects.
Shop paint: Red lead and oil. First field coat to be battleship gray paint. Second field coat to be gray green paint. Spiral bar reinforcement, top flange of stringers and top flange of end channels are not to be painted.
To insure uniform grades for surface of roadway and side-walks under dead load, corrections may be made in the thickness of wearing surface of roadway and side-walks. The minimum thickness indicated is to be increased at the ends of the spans in case of excessive camber in the beams and increased at the center of the span in case of insufficient camber.
Identification plates in accordance with N.Y.S.D.P.W. Standard 59-41 will be furnished by New York State Department of Public Works and shall be installed by the Contractor, at locations indicated on the plans.
The Contractor's attention is directed to the special notes for this structure which appear in the proposal. Particular attention should be given to the substructure notes which briefly outline the anticipated structure conditions at the site of the structure and which specify certain requirements relative to construction.
All welding shall comply with the current Specifications of the American Welding Society unless otherwise noted on the plans and with the exception noted below.

Bridge sidewalks shall not be scored.
Surface of bridge seats be poured ¼" higher than elevation specified and bush hammered to exact elevation.
All cement used in the concrete Items for the structure shall be Portland Cement, Type 2, with Darex A.E.A. Air Entraining Agent added.
Darex A.E.A. in its concentrated form shall be added to the aggregate and cement batch with the water in the mixer at the beginning of the mixing period. The concrete mixer shall be equipped with an approved Darex A.E.A dispenser. The amount of Darex A.E.A. to be added shall be of such a quantity as to insure a controlled air entrainment within the range of 3% minimum and 6% maximum (with the desired average between 4½% and 5%) to the satisfaction of the Engineer.
The cost of furnishing and adding the Darex A.E.A. and all labor and equipment necessary to control the air entrainment will be included in the unit price bid for the concrete Items.
All superstructure concrete and all concrete in pier columns, caps and pedestals shall be Item 18S. Pylon concrete shall be Item 18S. Concrete in Abut & Wingwalls including footings shall be Item 18S.
All concrete in Pier footings and pedestals underfootings shall be Item 20S.
Maximum payment limits for excavation, Item 5, in rock shall be the neat lines of the footing.
FOOTING ON ROCK: See note No. 23 sheet No. 132.

A retarding densifier shall be used in Item 18S and 20 S.
Size of pipe sleeves and size and type of hangers shall be verified with the Iroquois Gas Corp. or Division of Water of the City of Buffalo before fabrication of diaphragms. See Sheet No. 14 for additional note.

PIPE SUPPORT DIMENSIONS											
PIPE SIZE	A	B	C	D	E	F	G	H	J	K	L
10"	½"x2"	7⅝"	6⅞"	¾"	1"	¾"	8"	⅝"	6½"	4"Cor.C	5½"

NO AS BUILT REVISIONS

NOTE:
Anchor Chairs with U-Bolts and Pipe Hangers for Gas Line to be furnished and erected by others.
Holes in diaphragms to be provided by Contractor.

Sheet No. 12

DODGE STREET OVER EXPRESSWAY
DIAPHRAGM DETAILS AND SHOES

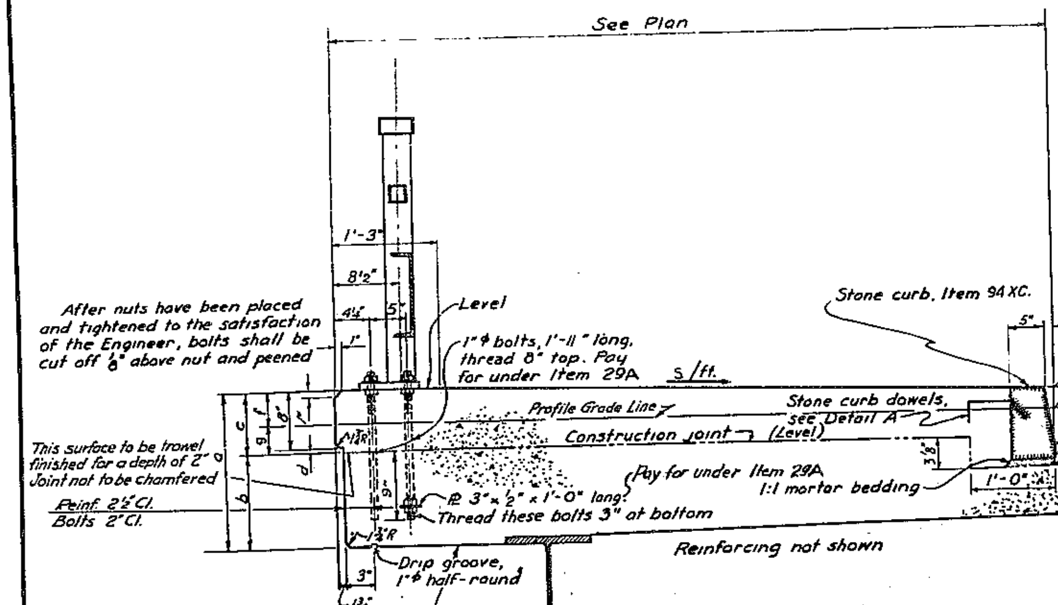
STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL ENGINEERS – ARCHITECTS 302 E. 44TH ST. NEW YORK 17, N.Y.	DRAWN	A.L.
	CHECKED	C.E.
	TRACED	CB

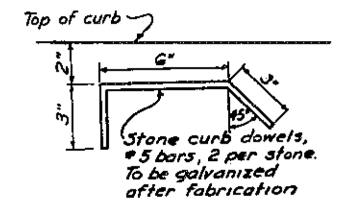
FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		182	178

KENSINGTON EXPRESSWAY—SEC. NO. 1

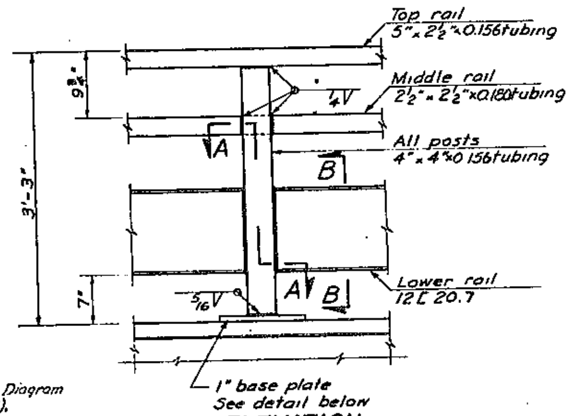
CONTRACT II



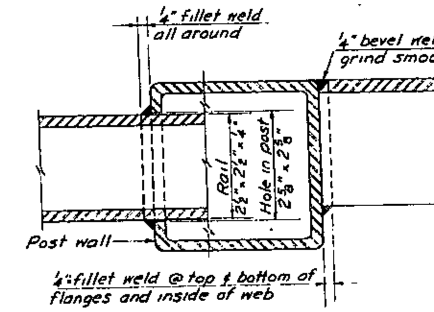
PARTIAL TRANSVERSE SECTION THRU SUPERSTRUCTURE
Scale: 1" = 1'-0"



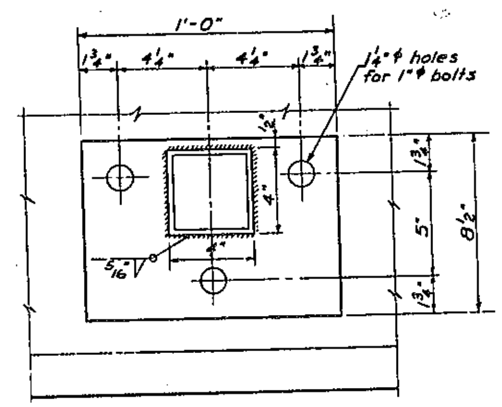
DETAIL A
Scale: 3" = 1'-0"



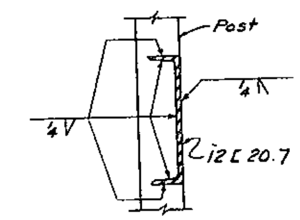
RAIL ELEVATION
Scale: 1" = 1'-0"



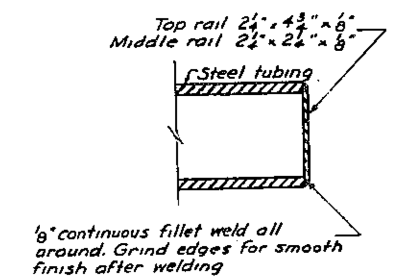
SECTION A-A
Scale: Half size



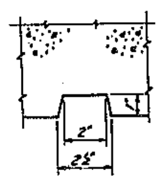
BASE PLATE DETAIL
Scale: 3" = 1'-0"



SECTION B-B
Scale: 1 1/2" = 1'-0"



SECTION AT END OF RAILS
Scale: Half size



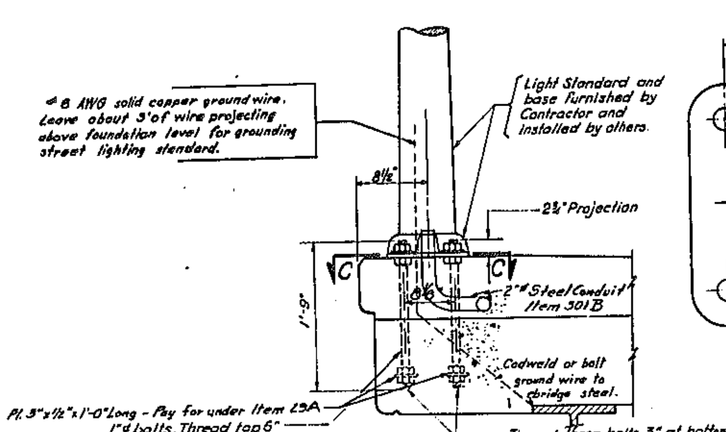
RUSTICATION DETAIL
Scale: 3" = 1'-0"

CONSTRUCTION PROCEDURE FOR SUPERSTRUCTURE

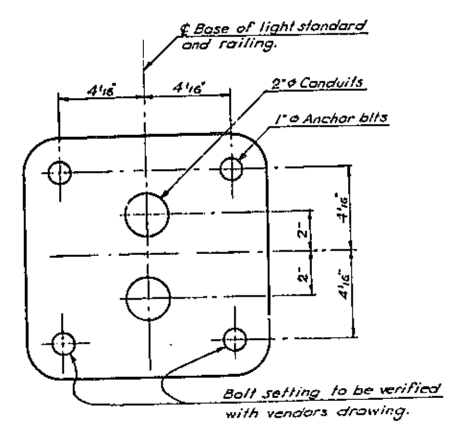
1. Set anchor bolts by means of a template and pour slab. Broom finish top of slab between curbs.
2. Place and adjust lower nuts on upper end of anchor bolts.
3. Place railing on lower nuts and adjust to bring railing to line and grade.
4. Place upper nuts on anchor bolts, tighten down on plates.
5. Pour sidewalk to proper line and grade.
6. Apply water soluble silicone solution as described in the specifications.
7. Place roadway pavement.

Point on Structure	Dimensions							Cross Slope inches per ft.	
Station	a	b	c	d	e	f	g	p, Pavement	s, Sidewalk
Right	(north)	sidewalk:							
Beginning	1'-7 7/16"	10 5/8"	8 13/16"	13/16"	-3 3/4"	1'-0 13/16"	-4 1/8"	-1/4" t	1/4"
9+48.57	↓	10 7/16"	9"	1"	-5 5/8"	1'-3 1/8"	-6 1/8"	-3/8"	5/16"
9+70		10 9/16"	8 7/8"	7/8"	-7 1/2"	1'-5"	-8 1/8"	-1/2"	5/16"
10+40		10 9/16"	8 7/8"	7/8"	-7 1/2"	1'-5"	-8 1/8"	-1/2"	5/16"
10+61.43		10 7/16"	9"	1"	-5 5/8"	1'-3 1/8"	-6 1/8"	-3/8"	5/16"
End		10 5/8"	8 13/16"	13/16"	-3 3/4"	1'-0 13/16"	-4 1/8"	-1/4" t	1/4"
Left	(south)	sidewalk							
Throughout	1'-9 5/8"	1'-0 3/16"	9 7/16"	1 7/16"	5 5/8"	3 9/16"	+5 7/8"	3/8"	1/4"

Dimension g is positive when Profile Grade Line is above construction joint.



SECTION SHOWING LIGHT STANDARD PEDESTAL
Scale: 1" = 1'-0"



SECTION C-C
Scale: 3" = 1'-0"

RAILING NOTES

1. Dimensions for tubing are outside dimensions.
2. All railing posts to be set truly vertical.
3. All surfaces of welds on railing to be ground smooth.
4. All railings are to be fabricated and erected so that the rails are parallel to each other and to the fascia.
5. The rails and posts must meet all requirements of fit, alignment and grade to the full satisfaction of the Engineer.
6. It is suggested that complete field measurements be made before any shop fabrication work is performed.
7. Tubular and channel rails, tubular posts and base plates will be paid for under Item 37A.
8. Anchor bolts, nuts and washers will be paid for under Item 29A.

NO AS BUILT REVISIONS

Sheet No. 13

DODGE STREET OVER EXPRESSWAY, RAILING DETAILS

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS - ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	S.L.
CHECKED	
TRACED	

F.A.C. 59-19

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-377(19)		183	178

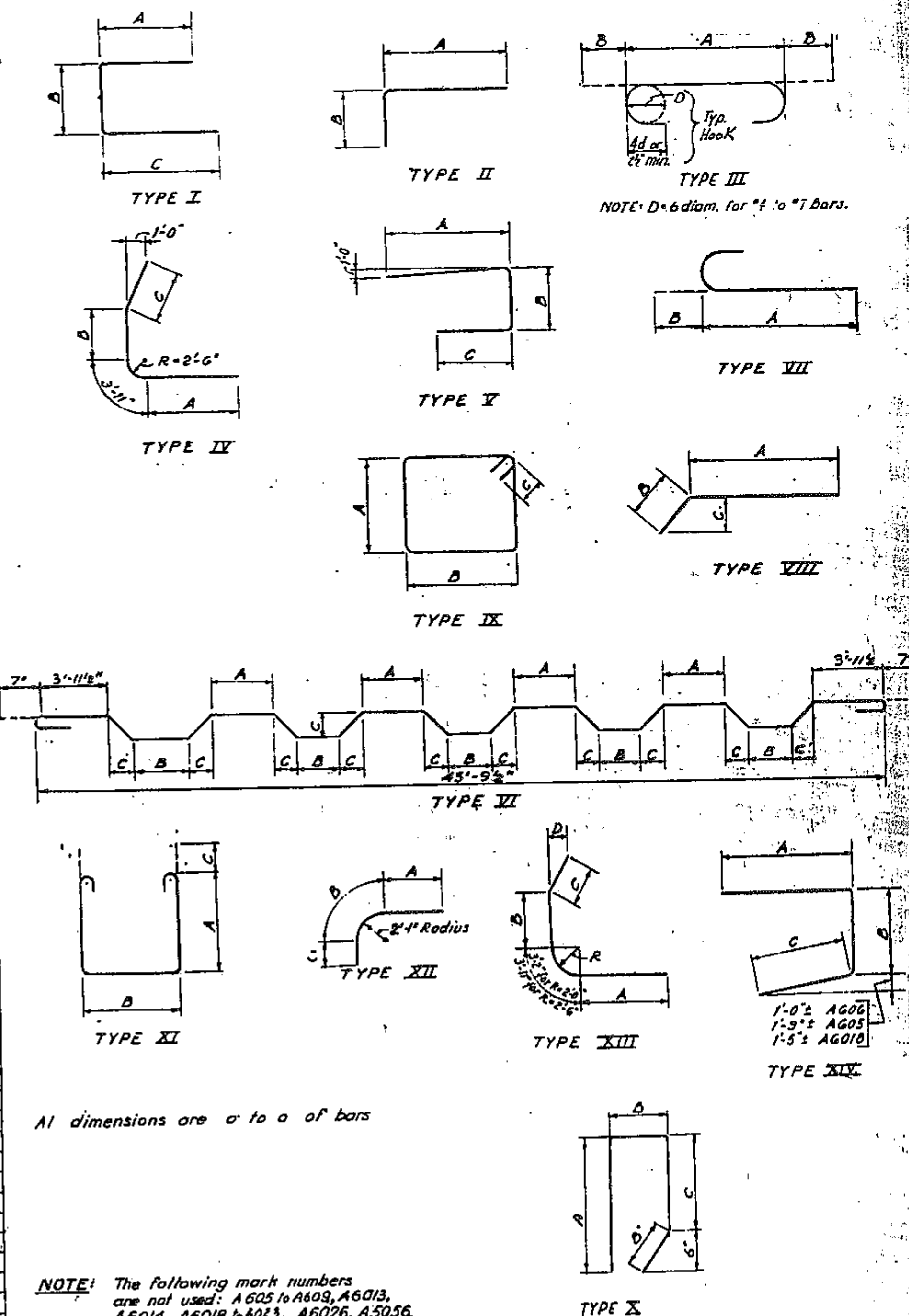
KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II

Mark	Size	Length	Type	Number	A	B	C	Description
PIER								
FOOTING								
P601	#6	6'-6"	Str.	66				Horizontal Bars
P101	#10	4'-2"	Str.	36				Dowels
SHAFTS								
P401	#4	13'-1"	IX	60	3'-1"	3'-1"	4½"	Column Ties
P402	#4	13'-1"	IX	32	3'-1"	3'-1"	4½"	Cap Beam Ties
P403	#4	11'-10"	I	8	4'-4"	3'-2"	4'-4"	Corner U-Bars
P501	#5	42'-0"	Str.	4				Horizontal Bars
P102	#10	21'-6"	Str.	8				Vertical Bars
P103	#10	42'-0"	Str.	5				Horizontal Bars
P104	#10	10'-6"	Str.	10				Horizontal Bars
P105	#10	22'-4"	Str.	12				Vertical Bars
P106	#10	23'-2"	Str.	8				Vertical Bars
P107	#10	29'-10"	XII	4	21'-1"	3'-3"	5'-6"	Vertical Bars
P108	#10	28'-2"	XII	4	19'-5"	3'-3"	5'-6	Vertical Bars
P111	#11	42'-0"	Str.	5				Horizontal Bars
P112	#11	14'-0"	Str.	6				Horizontal Bars
PEDESTALS								
P404	#4	2'-9"	VII	72	2'-3"	6"		Dowels
P602	#6	13'-2"	IX	6	2'-11"	3'-2"	6"	Ties for Fascia Pedestal
P603	#6	12'-8"	IX	12	2'-8	3'-2"	6"	Ties for Interior Pedestals
SLAB								
S401	#4	4'-10"	XI	150	1'-2"	1'-6"	6"	Ties, Sidewalk
S402	#4	4'-8"	XI	150	1'-2	1'-4"	6	Ties, Sidewalk
S403	#4	5'-7"	II	288	5'-0"	7"		Transverse Bars, Sidewalk
S404	#4	37'-6"	Str.	258				Longitudinal Bars
S405	#4	40'-0"	Str.	11				Longitudinal Bars, Sidewalk
S406	#4	39'-3"	Str.	81				Longitudinal Bars
S407	#4	17'-0"	Str.	5				Corner Bars, Sidewalk
S408 to S4019	#4	Av. Lg. 4'-7½"	II	1 each of 12 bars	Varies by 1" fr. [illegible]	8"		Transverse Bars, Sidewalk
S401	#4	2'-6"		150	2'-6"			Additional Bars as Required
S402	#4	2'-4"		150	2'-4"			Additional Bars as Required
S501	#5	4'-0"		151				Additional Splice Bars
S501	#5	42'-8"	III	151	41'-6"	7"		Transverse Top Bars
S502	#5	41'-6"	Str.	154				Transverse Bottom Bars
S503	#5	46'-7½"	VI	181	3'-1"	3'-10½"	5"	Transverse Bars
S504 to S5030	#5	Av. lg. 45'-5½"	Str.	1 each of 27 bars				Transverse Bars, Top. Each bar varies by 1½" from 43'-10" to 47'-1.
S5031 to S5057	#5	Av. lg. 45'-5½"	Str.	1 each of 27 bars				Transverse Bars, Bottom. Each bar varies by 1½" from 43'-10" to 47'-1"
S5058 to S5085	#5	Av. lg. 7'-8¼"	Str	1 each of 28 bars				Transverse Bars. Each bar varies by 1½" from 6'-0" to 3'-4½"
S5086	#5	6'-3"	VIII	4	3'-3"	3'-0"	1'-8"	Corner Bars
S5087	#5	44'-0"	Str.	3				Top Bars East Edge
S601	#6	43'-0"	Str.	4				Header Bars at Open Joint
S406	#4	4'-0"	"	74				Additional Splice Bars

Mark	Size	Length	Type	Number Total	Number #1	Number #2	A	B	C	Description
ABUTMENTS 2										
PEDESTAL FOOTING										
A601	#6	3'-0"	Str.	84	45	39				Horizontal Bars
A111	#11	10'-0"	Str.	33	21	12				Longitudinal Bars, Bottom
A112	#11	29'-10"	IV	27	27		15'-2"	6'-3"	4'-6"	Main Longitudinal Bars
A113	#11	31'-4"	IV	27		27	15'-2"	7'-9"	4'-6"	Main Longitudinal Bars
FOOTINGS										
A501	#5	6'-8"	Str.	35	35					Transverse Bars, Top
A502	#5	11'-0"	II	35	35		6'-8"	4'-4"		Transverse Bars, Bottom
A503	#5	4'-0"	Str.	109	55	54				Footing Dowels
A504 to A5011	#5	Av. Lg. 7'-6½"	Str.	32		4 of ea 8 bars = 32				Transverse Bars, Top. Each bar increased by 3" from 6'-8" to 8'-5"
A5012 to A5019	#5	Av. Lg. 11'-10½"	II	32		4 of ea 8 bars = 32	Varies by 3" fr. 6'-8" to 8'-5"	4'-4"		Transverse Bars, Bottom

Mark	Size	Length	Type	Number Total	Number #1	Number #2	A	B	C	Description
ABUTMENTS 2										
FOOTINGS (Cont.)										
A602	#6	4'-6"	Str.	16	10	6				Footing Dowels
A701	#7	26'-3"	Str.	14	14					Longitudinal Bars, Bottom
A702	#7	13'-3"	Str.	20	10	10				Longitudinal Bars, Top
A703	#7	10'-0"	Str.	15	15					Longitudinal Bars, Top & Bottom
A704	#7	24'-6"	Str	16		16				Longitudinal Bars, Bottom
A705	#7	8'-0"	Str.	5		5				Longitudinal Bars, Top
A706	#7	9'-0"	Str.	10		10				Longitudinal Bars, Bottom
A707	#7	34'-9"	Str.	7	7					Longitudinal Bars Top
A708	#7	17'-9"	Str.	7	7					Longitudinal Bars Top
A709	#7	32'-6"	Str.	8		8				Longitudinal Bars Top
A710	#7	16'-6"	Str.	8		8				Longitudinal Bars Top
WALLS										
A401	#4	3'-0"	VII	18	12	6	2'-6"	6"		Dowels - Pedestal
A402	#4	2'-6"	VII	18	6	12	2'-0"	6"		Dowels - Pedestal
A403	#4	9'-6"	I	12	7	5	3'-3"	3'-0"	3'-3"	Ties - Pedestal
A404	#4	10'-6"	V	2	2		3'-3"	4'-0"	3'-3"	Ties - Pedestal
A405	#4	8'-6"	II	3		3	3'-3"	5'-3"		Ties - Pedestal
A406	#4	4'-8"	Str.	18	12	6				Pylon
A5064	#5	6'-0"	X	32		32	2'-6"	10"	2'-0"	Concrete Header
A5065	#5	31'-4"	Str.	2		2				Concrete Header
A5020	#5	10'-0"	Str.	11		11				Horizontal Bars
A5021	#5	19'-2"	II	16		16	15'-8"	3'-6"		Vertical Bars
A5022	#5	18'-7"	II	17	17		15'-6"	3'-1"		Vertical Bars
A5023	#5	13'-3"	Str.	85	43	42				Vertical Bars, Counterfort & Wall
A5024	#5	19'-1"	II	17	17		16'-0"	3'-1"		Vertical Bars
A5025	#5	5'-0"	Str.	80	43	37				Vert. & Horiz. Bars, Backwall & Counterforts
A5026	#5	9'-8"	VIII	61	31	30	5'-5"	4'-3"	3'-0"	Vertical Bars, Backwall
A5027	#5	24'-6	Str.	40	6	34				Horizontal Bars
A5028	#5	9'-0"	Str.	12	6	6				Vertical Bars, Counterfort
A5029	#5	31'-6"	Str.	21		21				Horizontal Bars
A5030	#5	20'-9"	II	16		16	16'-5"	4'-4"		Vertical Bars
A5031	#5	12'-4"	XI	3	3		4'-3"	2'-8"	7"	Ties - Counterforts
A5032 to A5040	#5	Av. Lg. 14'-10"	XI	54	9 bars, 3 of each = 27	9 bars, 3 of each = 27	Varies by 3" from 4'-6" to 6'-6"	2'-8"	7"	Ties - Counterforts. Each bar varies by 6" from 12'-10" to 16'-10"
A5041	#5	17'-4"	XI	3		3	6'-9"	2'-8"	7"	Ties - Counterforts
A5042	#5	8'-0"	Str.	22		22				Horizontal Bars
A5043	#5	24'-4"	Str.	6	6					Horizontal Bars, Backwall
A5044	#5	24'-3"	Str.	2	2					Horizontal Bars, Backwall Top
A5045	#5	23'-9"	Str.	2		2				Horizontal Bars, Backwall Top
A5046	#5	12'-1"	Str.	3	3		4'-0"	2'-8"	7"	Ties Counterforts
A5062	#5	15'-6"	Str.	21		21				Horizontal Bars
A5063	#5	22'-5"	Str.	6	6					Horizontal Bars
A603	#6	12'-0"	Str.	1	1					Vertical Bars
A604	#6	2'-7"	Str.	4	2	2				Vertical Bars, Wingwall
A5047	#5	12'-9"	XIV	8	8		6'-0"	2'-3"	4'-6"	Ties, Wingwall
A5048	#5	10'-3"	XIV	2	2		6'-0"	2'-3"	2'-6"	Ties, Wingwall
A6049	#5	8'-3"	II	2	2		6'-0"	2'-3"		Ties, Wingwall
A5050	#5	6'-0"	Str.	18	1	17				Vertical & Horizontal Bars
A5051	#5	4'-6"	Str.	6	3	3				Vertical & Horizontal Bars
A6010	#6	2'-4"	Str.	3	3					Horizontal Bars
A6011	#6	3'-8"	I	7	4	3	1'-6"	8"	1'-6"	Transverse Bars, Cap
A6012	#6	2'-3"	I	10	10		6"	1'-3"	6"	Transverse Bars, Cap
A5052	#5	5'-8"	Str.	43	25	18				Vertical & Horizontal Bars. Wall & Pylon
A5053	#5	5'-0"	Str.	16	6	10				Horizontal & Vertical Bars
A6015	#6	3'-3"	Str.	2	2					Vertical Bars
A6016	#6	5'-6"	Str.	4	4					Vertical Bars
A6017	#6	20'-5"	Str.	5	5					Vertical Bars
A5054	#5	7'-10"	XIV	8	8		4'-0"	1'-4"	2'-6"	Ties, Wingwall
A5055	#5	7'-0"	Str.	13	2	11				Vertical & Horizontal Bars
A5057	#5	1'-4"	Str.	4	4					Horizontal Bars
A5058	#5	3'-9"	Str.	4	4					Horizontal Bars
A5059	#5	3'-2"	Str.	4	4					Horizontal Bars
A5060	#5	6'-6"	Str.	4	3	1				Horizontal Bars
A6024	#6	20'-6"	Str.	4		4				Vertical Bars
A6025	#6	15'-0"	Str.	3		3				Vertical Bars
A5061	#5	9'-6"	Str.	3		3				Horizontal Bars
A6027	#6	10'-0"	Str.	33	33					Horizontal Bars
A6028	#6	26'-3"	Str.	32	32					Horizontal Bars
A6029	#6	34'-6"	Str.	11	11					Horizontal Bars
A6030	#6	21'-6"	Str.	6	6					Vertical Bars
A6031	#6	28'-3"	Str.	1	1					Horizontal Bar, Bridge Seat
A6032	#6	25'-5"	Str.	2	2					Horizontal Bars, Bridge Seat
A6033	#6	23'-9"	Str.	4		4				Horizontal Bars, Bridge Seat
A6034	#6	17'-6"	Str	11	11					Horizontal Bars
A7011	#7	13'-9"	Str.	44	22	22				Horizontal Bars
A114	#11	8'-0"	Str.	24	12	12				Inclined Bars, Counterfort
A115	#11	16'-3"	Str.	30	15	15				Inclined Bars, Counterfort



NOTE: The following mark numbers are not used: A605 to A609, A6013, A6014, A6018 to 6023, A6026, A5056.

BAR REVISION - SLAB

Sheet No. 14

DODGE STREET OVER EXPRESSWAY
BAR LIST

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
50E E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	A. M.
CHECKED	J. C.
TRACED	G. B.

F.A.C. 59-19

CONTRACT II

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-377(17)		184	178
KENSINGTON EXPRESSWAY — SEC. NO. 1					

WINGWALLS

Mark	Size	Length	Type	Number Total	#1	#2	A	B	C	D	R	Description
PEDESTAL												
W1101	#11	25'-8"	XIII	5		5	13'-0"	4'-3"	4'-6"	1'-4"	2'-6"	Main Bars
W1102	#11	8'-0"	Str.	4		4						Main Bars
W1103	#11	24'-2"	XIII	4		4	11'-6"	4'-3"	4'-6"	1'-6"	2'-6"	Main Bars
W1104	#11	7'-0"	Str.	3		3						Main Bars
W1105	#11	27'-0"	XIII	5	5		13'-4	5'-3	4'-6"	1'-5½"	2'-6"	Main Bars
W1106	#11	8'-0"	Str.	4	4							Main Bars
W1001	#10	23'-7"	XIII	4		4	10'-6"	5'-9"	4'-2"	1'-6"	2'-0"	Main Bars
W1002	#10	7'-0"	Str.	3		3						Main Bars
W1003	#10	24'-1"	XIII	4	4		11'-0"	5'-9"	4'-2	1'-2½"	2'-0"	Main Bars
W1004	#10	7'-0"	Str.	3	3							Main Bars
W1005	#10	6'-0"	Str.	2		2						Main Bars
W1006	#10	22'-1"	XIII	3		3	9'-0"	5'-9"	4'-2"	2'-2"	2'-0"	Main Bars
W901	#9	21'-8"	XIII	3	3		8'-0"	6'-9"	3'-9"	11"	2'-0"	Main Bars
W902	#9	5'-0"	Str.	2	2							Main Bars
W903	#9	20'-2"	XIII	3		3	7'-6"	5'-9"	3'-9"	1'-10"	2'-0"	Main Bars
W904	#9	4'-0"	Str.	2		2						Main Bars
W701	#7	18'-2"	XIII	2	2		4'-6	10'-6"			2'-0"	Main Bars
W501	#5	2'-6"	Str.	25	13	12						Transverse Bars
W502	#5	2'-2"	Str.	21	10	11						Transverse Bars
W503	#5	2'-0"	Str.	20	10	10						Transverse Bars
W504	#5	1'-6"	Str.	8	8							Transverse Bars
W505	#5	1'-10"	Str.	9		9						Transverse Bars
W506	#6	2'-4"	Str.	12		12						Transverse Bars
FOOTING												
W601	#6	49'-6"	Str.	2	2							Longitudinal Bars, Top & Bottom
W602	#6	25'-9"	Str.	2	2							Longitudinal Bars, Top
W603 to	#6	Av. Lg.	Str.	14	7 Bars 2 of ea = 14							Long. Bars, Top & Bottom. Each
W609		29'-0"										bar varies by 5'-8" from 12'-0" to 46'-0"
W6010	#6	38'-6"	Str.	4		4						Longitudinal Bars, Top
W6011	#6	24'-6"	Str.	4		4						Longitudinal Bars, Top
W6012	#6	45'-6"	Str.	4		4						Longitudinal Bars, Bottom
W6013	#6	17'-6"	Str.	4		4						Longitudinal Bars, Bottom
W6014	#6	32'-3"	Str.	6		6						Longitudinal Bars, Top & Bottom
W6015	#6	46'-3"	Str.	2		2						Longitudinal Bars, Top & Bottom
W6031	#6	32'-6"	Str.	1	1							Longitudinal Bars Bottom
W6032	#6	18'-9"	Str.	1	1							Longitudinal Bars Bottom
W507 to	#5	Av. Lg.	Str.	14	7 bars 2 of ea = 14							Transverse Bars. Each bar varies
W5013		2'-0"										by 5" from 9" to 3'-3"
W5014 to	#5	Av. Lg.	Str.	20	20 bars 1 of ea							Transverse Bars, Top. Each bar
W5033		5'-6½"										varies by 2⅜" from 3'-8" to 7'-5"
W5034 to	#5	Av. Lg.	II	20	20 bars 1 of ea		Var. by 2⅜" fr. 3'-8" to 7'-5"	3'-10"				Transverse Bars, Bottom. Each bar
W5053		9'-4½"										varies by 2⅜" from 7'-6" to 11'-3"
W5054 to	#5	Av. Lg.	II	41	41 bars 1 of ea		Var. by ¾" fr. 4'-3" to 6'-9"	3'-10"				Transverse Bars, Bottom. Each bar
W5094		9'-4"										varies by ¾" from 8'-1" to 10'-7"
W5095 to	#5	Av. Lg.	Str.	41	41 bars 1 of ea							Transverse Bars, Top. Each bar
W50135		5'-6"										varies by ¾" from 4'-3" to 6'-9"
W50136	#5	4'-0"	Str.	72	29	43						Dowels, Footing & Counterfort
STEM												
W6016	#6	28'-0"	Str.	8		8						Horizontal Bars, N.F.
W6017	#6	31'-6"	Str.	16		16						Horizontal Bars, N.F.
W6018	#6	38'-6"	Str.	8		8						Horizontal Bars, F.F.
W6019	#6	24'-3"	Str.	8		8						Horizontal Bars, F.F.
W6020	#6	8'-0"	Str.	8		8						Horizontal Bars, F.F.
W6021	#6	10'-0"	Str.	16		16						Horizontal Bars, F.F.
W6022	#6	25'-4"	Str.	8	8							Horizontal Bars, F.F.
W6023 to	#6	Av. Lg.	Str.	10	6 bars 2 of ea = 10							Horizontal Bars, E.F. Each bar
W6027		42'-10"										varies by 2'-10" from 37'-2" to 48'-6"
W6028	#6	30'-0"	Str.	5	5							Horizontal Bars, N.F.

WINGWALLS (Cont'd.)

Mark	Size	Length	Type	Number Total	#1	#2	A	B	C	D	R	Description
STEM (Cont'd.)												
W50137	#5	14'-0"	Str.	4		4						Horizontal Bars, N.F.
W50138 to	#5	Av. Lg.	Str.	22		11 bars 2 of ea = 11		1				Horizontal Bars at E.F. Each
W50148	#5	29'-6"										bars varies by 5'-0" fr. 4'-6" to 54'-6
W50149	#5	31'-8"	Str.	2		2						Inclined Bars, N.F.
W50150	#5	39'-0"	Str.	1		1						Inclined Bars, F.F.
W50151	#5	25'-0"	Str.	1		1						Inclined Bars, F.F.
W50152	#5	8'-0"	Str.	5		5						Horizontal Bars, F.F.
W50153	#5	10'-0"	Str.	5		5						Horizontal Bars, F.F.
W50154	#5	20'-8"	Str.	2		2						Vertical Bars, E.F.
W50155	#5	7'-9"	Str.	2		2						Vertical Bars, E.F.
W50156 to	#5	Av. Lg.	Str.	58		2 ea. of 29 bars = 58						Vertical Bars, E.F. Each bar varies
W50184		16'-1½"										by 3¾" from 11'-9" to 20'-6"
W50185 to	#5	Av. Lg.	Str.	24		2 ea. of 12 bars = 24						Vertical Bars, E.F. Each bar varies
W50196		11'-2⅝"										by 3¾" from 9'-6" to 12'-11¼"
W50197 to	#5	Av. Lg.	Str.	20	2 ea. of 10 bars = 20							Horizontal Bars, E.F. Each bar
W50206		18'-1½"										varies by 3'-5" from 2'-9" to 33'-6"
W50207	#5	15'-0"	Str.	4	4							Horizontal Bars, N.F.
W50208	#5	10'-0"	Str.	8	8							Horizontal Bars, F.F.
W50209 to	#5	Av. Lg.	Str.	24	2 ea. of 12 bars = 24							Vertical Bars, E.F. Each bar varies
W50220		8'-6"										by 6" from 5'-9" to 11'-3"
W50221 to	#5	Av. Lg.	Str.	42	2 ea. of 21 bars = 42							Vertical Bars, E.F. Each bar varies
W50241		15'-6"										by 6" from 10'-6" to 20'-6"
W50242	#5	52'-3"	Str.	2	2							Inclined Bars, E.F.
W50243		3'-9"	Str.	2	2							Vertical Bars, E.F.
W50244	#5	20'-9"	Str.	2	2							Vertical Bars, E.F.
W6029	#6	21'-9"	Str.	4	4							Horizontal Bars, F.F.
W6030	#6	10'-0"	Str.	16	16							Horizontal Bars, F.F.
W6033	#6	32'-3"	Str.	4	4							Horizontal Bars N.F.
W6034	#6	18'-6"	Str.	4	4							Horizontal Bars N.F.
COUNTERFORTS												
W1107	#11	10'-0"	Str.	6	2	4						Inclined Bars
W1108	#11	20'-6"	Str.	6	3	3						Inclined Bars
W1109	#11	17'-9"	Str.	3		3						Inclined Bars
W1007	#10	14'-9"	Str.	4		4						Inclined Bars
W1008	#10	11'-9"	Str.	3		3						Inclined Bars
W1009	#10	15'-0"	Str.	4	4							Inclined Bars
W905	#9	9'-3"	Str.	3		3						Inclined Bars
W906	#9	9'-6	Str.	3	3							Inclined Bars
W50245	#5	5'-9"	Str.	4	2	2						Vertical Bars
W50246	#5	3'-3"	Str.	2	2							Vertical Bars
W50247	#5	12'-9"	Str.	2	2							Vertical Bars
W50248	#5	11'-6"	Str.	2		2						Vertical Bars
W50249	#5	4'-0"	Str.	4		4						Vertical Bars
W50250	#5	5'-6"	Str.	2	2							Vertical Bars
W50251	#5	10'-0"	Str.	2	2							Vertical Bars
W50252	#5	7'-0"	Str.	2		2						Vertical Bars
W50253	#5	14'-0"	Str.	2		2						Vertical Bars
W50254	#5	9'-10"	Str.	2		2						Vertical Bars
W50255	#5	5'-6"	Str.	2		2						Vertical Bars
W50256 to	#5	Av. Lg.	IX	12	1 of ea = 6	1 of ea = 6	Varies by 6" [illegible]	2'-8	7"			U-Bars
W50261		16'-0"										
W50262 to	#5	Av. Lg.	IX	16	1 of ea = 8	1 of ea = 8	Varies by 6" [illegible]	2'-8	7"			U-Bars
W50269		10'-4"										
W50270 to	#5	Av. Lg.	IX	5		1 of ea = 5	Varies by 4" [illegible]	2'-6"	7"			U-Bars
W50274		14'-6"										
W50275 to	#5	Av. Lg.	IX	7		1 of ea = 7	Varies by 6" [illegible]	2'-6"	7"			U-Bars
W50281		9'-8"										
W50282 to	#5	Av. Lg.	IX	8	1 of ea = 8		Varies by 5" [illegible]	2'-4	7"			U-Bars
W50289		10'-3"										
W50290 to	#5	Av. Lg.	IX	8		1 of ea = 8	Varies by 5" [illegible]	2'-4	7"			U-Bars
W50297		10'-6"										
W50298 to	#5	Av. Lg.	IX	7		1 of ea = 7	Varies by 7" [illegible]	2'-2"	7"			U-Bars
W50304		9'-6"										

Mark	Size	Length	Type	Number Total	#1	#2						Description

EQUIVALENT BAR SIZES	
Number	Size
4	½" ϕ
5	⅝" ϕ
6	¾" ϕ
7	⅞" ϕ
8	1" ϕ
9	1" □
10	1⅛" □
11	1¼" □

Sheet No. 15

NO AS BUILT REVISIONS

DODGE STREET OVER EXPRESSWAY
BAR LIST

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
[illegible] E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	A.H.
CHECKED	J.C.
TRACED	C.B.

NY33 BRIDGE CONDITION EVALUATION 2023

KENSINGSTON EXPRESSWAY PROJECT
PIN 5512.52
CITY OF BUFFALO, ERIE COUNTY
NORTHAMPTON STREET
BIN 1022620

Prepared By:

Jeffrey Young, PE (NYSPE 106588)
Inspection Team Leader |Structural Engineer
Date: 5/30/2023

Reviewed By:

Stephen L. Gauthier, PE (NYSPE 0075775)
Quality Control Engineer | Sr. Structural Engineer
Date: 6/16/2023

LaBella
Powered by partnership.
300 State Street
Rochester, New York 14614
ph: 585-454-6110
www.labellapc.com

PIN 5512.52 – NY33 BRIDGE CONDITION EVALUATION 2023
FIELD INSPECTION SUMMARY

STRUCTURE:	BIN 1022620 – Northampton Street over NY33 Kensington Expressway
STRUCTURE TYPE:	Two (2) span Steel, Multi-Stringer (8 beams) structure with concrete abutments and pier. Year Built: 1963
CURRENT INSPECTION:	05/01/23 – 5/15/23 (LaBella Verification Inspections)
LAST BIENNIAL INSPECTION:	08/16/22
GENERAL RECOMMENDATION:	5
INSPECTION SCOPE:	An element-specific inspection of the subject structure to verify field conditions and obtain and confirm steel measurements found in the field during the latest biennial inspection in order to complete a Level 1 load rating.

GENERAL INSPECTION OBSERVATIONS & CONDITIONS:

- **Superstructure Beam End Section Loss** – Beam end corrosion was reviewed and verified in the field and found to be in reasonable conformance with the latest 2022 biennial bridge inspection reports and additional measurements were taken to represent existing conditions. A minimum of three thickness measurements were taken at each girder end just in from of the centerline of bearings to get an accurate representation of the full height of the web. Additional measurements were taken at the base of the web on either side of the bearing centerline to determine the extent of bearing area loss. Thickness readings at each location can be found in the girder end section loss tables attached to this report. The following observations were noted:

    - Repair plates (1/2” thick) have previously been installed on several girder ends at the pier in span 2. These plates were installed behind the connection plate and were only considered in the bearing area calculations. At all of these locations, there is a negative bearing area section loss meaning that the repair plate thickness was greater than the original web thickness.
    - The maximum section loss was typically found at the base of the web which was expected based on past inspection reports. Several girder ends, specifically at the pier, showed some pitting along the base of the web. This pitting has been painted over and only extended approximately 1-2 feet into the span.
    - The average full height section loss was found to be minor for all girders (range = 7% - 18%). The maximum average section loss was observed at G2 in span 2 at the pier with 18% loss.
    - To determine bearing area loss, the average of the two thickness measurements at the base of the web on either side of the bearing line was compared to the original web thickness. As expected, these losses were typically higher than the average full height loss. In most cases, the losses found in the field during this inspection were higher than those from the 2022 inspection report to varying degrees.
    - The bearing area loss ranged from 9% to 47%, excluding the previously mentioned repair plate locations. The maximum loss was observed at G2 in span 2 at the pier with 47% loss in bearing area.
    - Several expansion bearings had pack rust between plate causing the plates to bow upwards in the center. However, this has not appeared to restrict movement.

A Level 1 Load Rating evaluation was completed in conjunction with this inspection and has been attached to this report. A summary of the results is below:

Rating Load	Controlling Mode	Inventory Rating	Operating Rating
Load and Resistance Factor Rating HL-93	Span 2 Girder G2 Original 33WF130 Web Local Yielding	0.26	0.34
Load Factor Rating HS Truck or Lane	Span 2 Girder G2 Original 33WF130 Unstiffened Bearing Area	HS 25.8 46.4 Ton	HS 43.0 77.4 Ton

A fatigue analysis was also performed in conjunction with this inspection. The results showed that the existing structure has 1204 years of remaining life.

- **Substructure Concrete Condition –**

  - Abutments – The abutment faces were observed, sounded, and found to be in generally good condition. Some areas of delamination were noted at each abutment. The 2022 inspection report did not note any delamination, but the areas observed were minor. There are two vertical cracks in the end abutment that extend from the pedestals. Additionally, some minor map cracking can be seen at the pedestals and bridge seat. None of the changes from the 2022 inspection were significant. Refer to the photos attached to this report for more details.

  - Piers – The pier caps, columns, and pedestals were observed, sounded, and found to be in good condition. Little to no deterioration was noted on any face of the pier. Some very minor map cracking was observed at the faces of the pier cap beam. Refer to the photos attached to this report for more details.

- **Structural Deck Observations -** The structural deck was observed from below and is considered indicative of the overall deck conditions above. No major changes in deterioration from the 2022 inspection report were noted.

  The general condition of the structural deck was found to be as follows:

  - 1% of the structural deck in ADVANCED state of deterioration

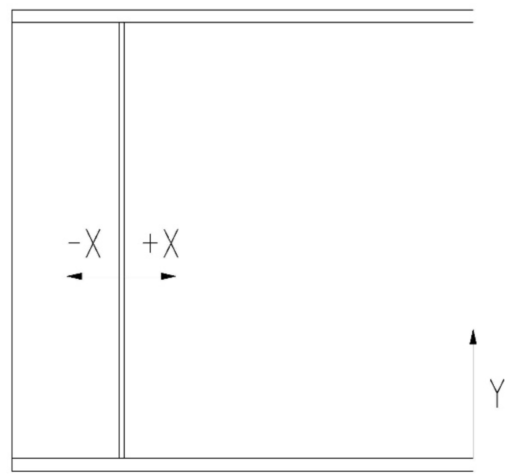
  - 26% of the structural deck in FAIR state of deterioration

  - 73% of the structural deck in relatively GOOD condition

Photos of general deck conditions can be found in the photo log attached to this report.

The August 16, 2022 inspection report has also been attached to this report for a detailed breakdown of the condition of the bridge.

Girder End Section Loss Table Key



NORTHAMPTON STREET - GIRDER END SECTION LOSS TABLE

SPAN 1

ORIG. WEB THICKNESS = 0.580"

GIRDER	LOCATION	READING	X (IN.)	Y (IN.)	THICKNESS (IN.)	AVG. FULL HEIGHT THICKNESS (IN.)*	AVG. BEARING AREA THICKNESS (IN.)**	FULL HEIGHT	BEARING AREA
G1	BEGIN	A	3	28	0.524	0.517	0.491	11%	15%
		B		16	0.534				
		C		1	0.494				
		D	-2.5	16	0.533				
		E		1	0.488				
	PIER	A	3	27	0.524	0.482	0.694	17%	-20%
		B		13	0.534				
		C		1	0.387				
		D	13	1	0.45				
		E	27	1	0.465				
G2	BEGIN	A	3	29	0.522	0.515	0.471	11%	19%
		B		16.5	0.547				
		C		1.5	0.477				
		D	-2.5	16.5	0.514				
		E		1.5	0.464				
	PIER	A	5	28	0.53	0.497	0.405	14%	30%
		B		17	0.539				
		C		1	0.422				
		D	-2.5	17	0.501				
		E		1	0.387				
		F	18	1	0.447				
G3	BEGIN	A	3	29	0.525	0.516	0.482	11%	17%
		B		17	0.535				
		C		1.5	0.488				
		D	-2.5	17	0.524				
		E		1.5	0.476				
	PIER	A	4	28	0.533	0.523	0.429	10%	26%
		B		15	0.54				
		C		1	0.496				
		D	-2.5	15	0.511				
		E		1	0.361				
G4	BEGIN	A	3	28.5	0.529	0.527	0.514	9%	11%
		B		16	0.539				
		C		1.5	0.513				
		D	-2.5	16	0.542				
		E		1.5	0.514				
	PIER	A	4.5	28	0.527	0.518	0.442	11%	24%
		B		16	0.539				
		C		1	0.488				
		D	-2.5	16	0.5				
		E		1	0.396				
G5	BEGIN	A	3.5	28	0.531	0.534	0.524	8%	10%
		B		15.5	0.546				
		C		1	0.525				
		D	-2.5	15.5	0.555				
		E		1	0.523				
	PIER	A	4	27	0.535	0.530	0.752	9%	-30%
		B		14	0.551				
		C		1	0.504				
G6	BEGIN	A	4	28	0.52	0.524	0.514	10%	11%
		B		15.5	0.536				
		C		1.5	0.517				
		D	-2.5	15.5	0.532				
		E		1.5	0.51				
	PIER	A	4	29	0.516	0.523	0.755	10%	-30%
		B		16	0.543				
		C		1	0.51				
G7	BEGIN	A	4	28.5	0.535	0.535	0.530	8%	9%
		B		16	0.546				
		C		1.5	0.525				
		D	-2.5	16	0.552				
		E		1.5	0.535				
	PIER	A	4	27	0.53	0.504	0.722	13%	-24%
		B		15	0.539				
		C		1	0.444				
		D	15	1	0.502				
G8	BEGIN	A	4	27	0.533	0.535	0.521	8%	10%
		B		16	0.548				
		C		1.5	0.524				
		D	-2.5	16	0.548				
		E		1.5	0.518				
	PIER	A	4	28	0.538	0.527	0.750	9%	-29%
		B		15	0.545				
		C		1	0.499				
		D	14	1	0.513				

* AVG. FULL HEIGHT THICKNESS = (A+B+C)/3

** AVG. BEARING AREA THICKNESS = AVERAGE OF THE BOTTOM TWO READINGS ON EITHER SIDE OF BEARING LINE

REPAIR PLATES HAVE BEEN PREVIOUSLY INSTALLED, TOTAL THICKNESS IS LARGER THAN ORIGINAL THICKNESS

BIN 1022620 – Northampton Street on NY33 Kensington Expressway

NORTHAMPTON STREET - GIRDER END SECTION LOSS TABLE

SPAN 2

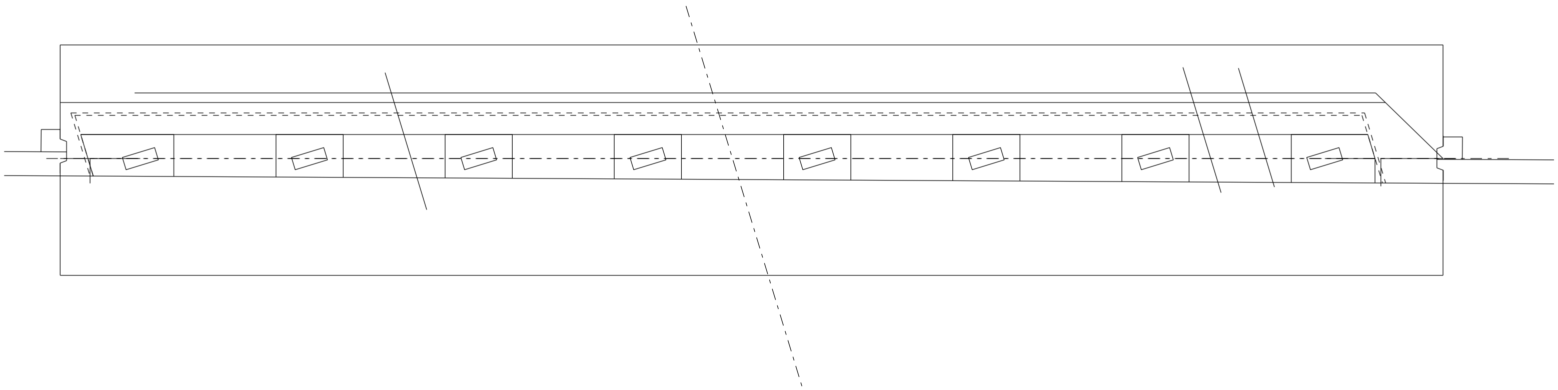
ORIG. WEB THICKNESS = .580"

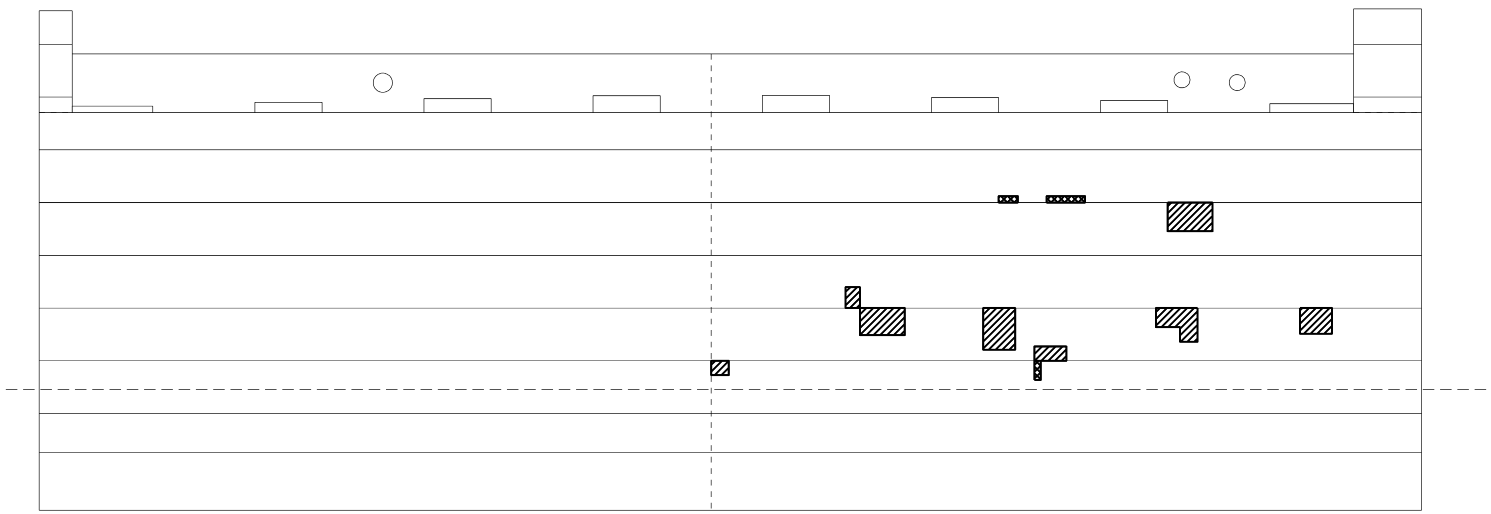
GIRDER	LOCATION	READING	X (IN.)	Y (IN.)	THICKNESS (IN.)	AVG. FULL HEIGHT THICKNESS (IN.)*	AVG. BEARING AREA THICKNESS (IN.)**	FULL HEIGHT	BEARING AREA
G1	PIER	A	3.5	26	0.535	0.504	0.471	13%	19%
		B		15.5	0.533				
		C		1.5	0.443				
		D	-2.5	15.5	0.542				
		E		1.5	0.499				
		F	12	1.5	0.471				
		G	19	1.5	0.472				
	END	A	4	27	0.529	0.530	0.529	9%	9%
		B		15	0.538				
		C		2	0.523				
		D	-2.5	15	0.539				
		E		2	0.534				
G2	PIER	A	5	26	0.528	0.475	0.309	18%	47%
		B		13	0.525				
		C		1.5	0.373				
		D	-2.5	13	0.428				
		E		1.5	0.245				
		F	20	1.5	0.452				
		G	36	1.5	0.465				
	END	A	4	28	0.517	0.518	0.516	11%	11%
		B		16	0.527				
		C		2	0.511				
		D	-2.5	16	0.526				
		E		2	0.52				
G3	PIER	A	5	27	0.535	0.535	0.476	8%	18%
		B		14	0.551				
		C		2	0.519				
		D	-2.5	14	0.53				
		E		2	0.433				
	END	A	4	27	0.524	0.527	0.521	9%	10%
		B		16	0.535				
		C		2	0.522				
		D	-2.5	16	0.534				
		E		2	0.52				
G4	PIER	A	5	27	0.536	0.532	0.476	8%	18%
		B		15	0.547				
		C		2	0.514				
		D	-2.5	15	0.543				
		E		2	0.437				
	END	A	3	28	0.525	0.526	0.518	9%	11%
		B		15	0.535				
		C		2	0.518				
		D	-2.5	15	0.543				
		E		2	0.518				
G5	PIER	A	4	27	0.526	0.519	0.443	10%	24%
		B		15	0.538				
		C		1	0.494				
		D	-2.5	15	0.527				
		E		1	0.391				
	END	A	3	28	0.528	0.522	0.514	10%	11%
		B		16	0.533				
		C		1.5	0.505				
		D	-2.5	16	0.538				
		E		1.5	0.522				
G6	PIER	A	4	27	0.538	0.538	0.504	7%	13%
		B		15	0.549				
		C		1.5	0.526				
		D	-2.5	15	0.552				
		E		1.5	0.482				
	END	A	3	28	0.534	0.536	0.529	8%	9%
		B		16	0.546				
		C		2	0.529				
		D	-2.5	16	0.549				
		E		2	0.528				
G7	PIER	A	5	26	0.523	0.517	0.404	11%	30%
		B		14	0.529				
		C		2	0.498				
		D	-2.5	14	0.5				
		E		2	0.309				
	END	A	3.5	27	0.521	0.520	0.506	10%	13%
		B		15	0.531				
		C		1.5	0.507				
		D	-2.5	15	0.532				
		E		1.5	0.505				
G8	PIER	A	5	27	0.537	0.520	0.490	10%	16%
		B		16	0.541				
		C		2	0.482				
		D	-2.5	16	0.543				
		E		2	0.498				
	END	A	4	28	0.519	0.515	0.510	11%	12%
		B		15	0.531				
		C		2	0.494				
		D	-2.5	15	0.532				
		E		2	0.525				

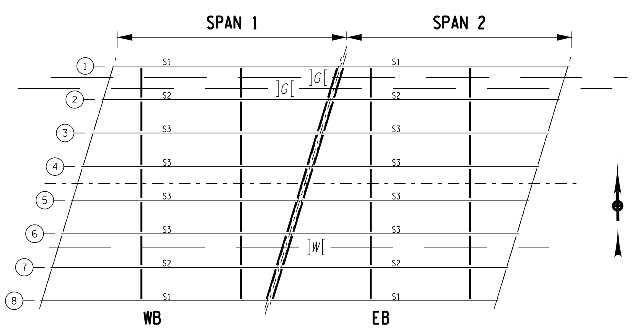
* AVG. FULL HEIGHT THICKNESS = (A+B+C)/3

** AVG. BEARING AREA THICKNESS = AVERAGE OF THE BOTTOM TWO READINGS ON EITHER SIDE OF BEARING LINE

Abutment and Pier Sketches







= DELAMINATION

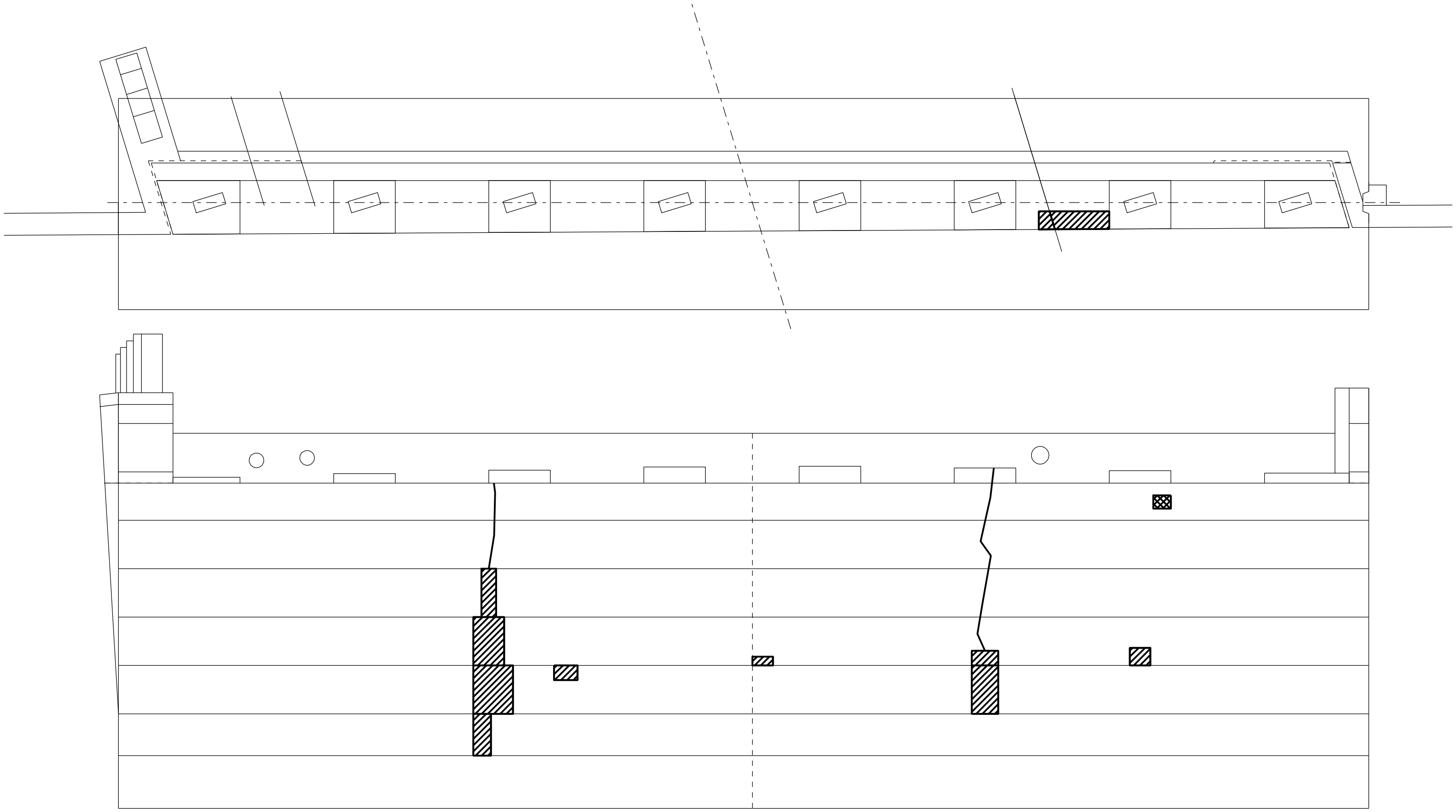
= SPALL

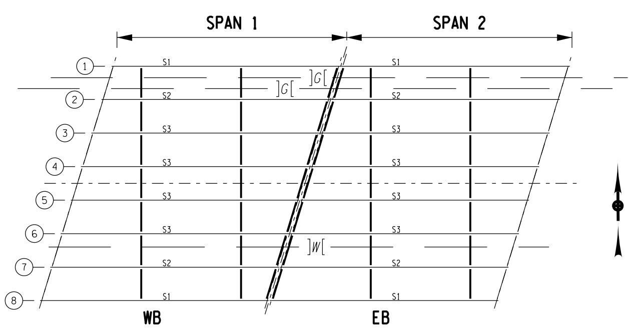
FIELD SHEET - BEGIN ABUTMENT

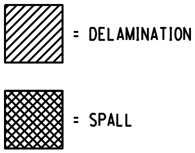
BY: JCY

DATE: 05/25/2023

SCALE: 1" = 10'





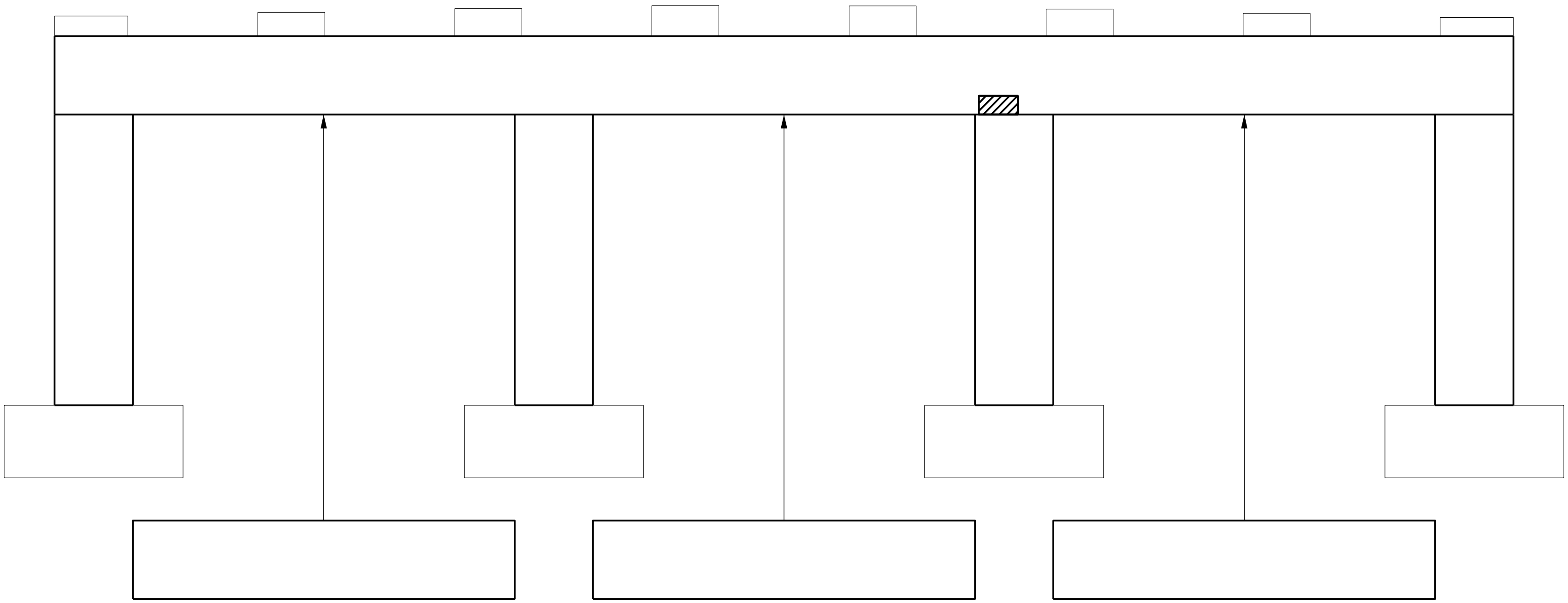


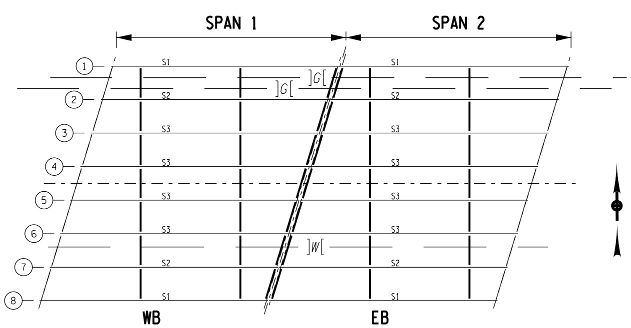
FIELD SHEET - END ABUTMENT

BY: JCY

DATE: 05/25/2023

SCALE: 1" = 10'





= DELAMINATION

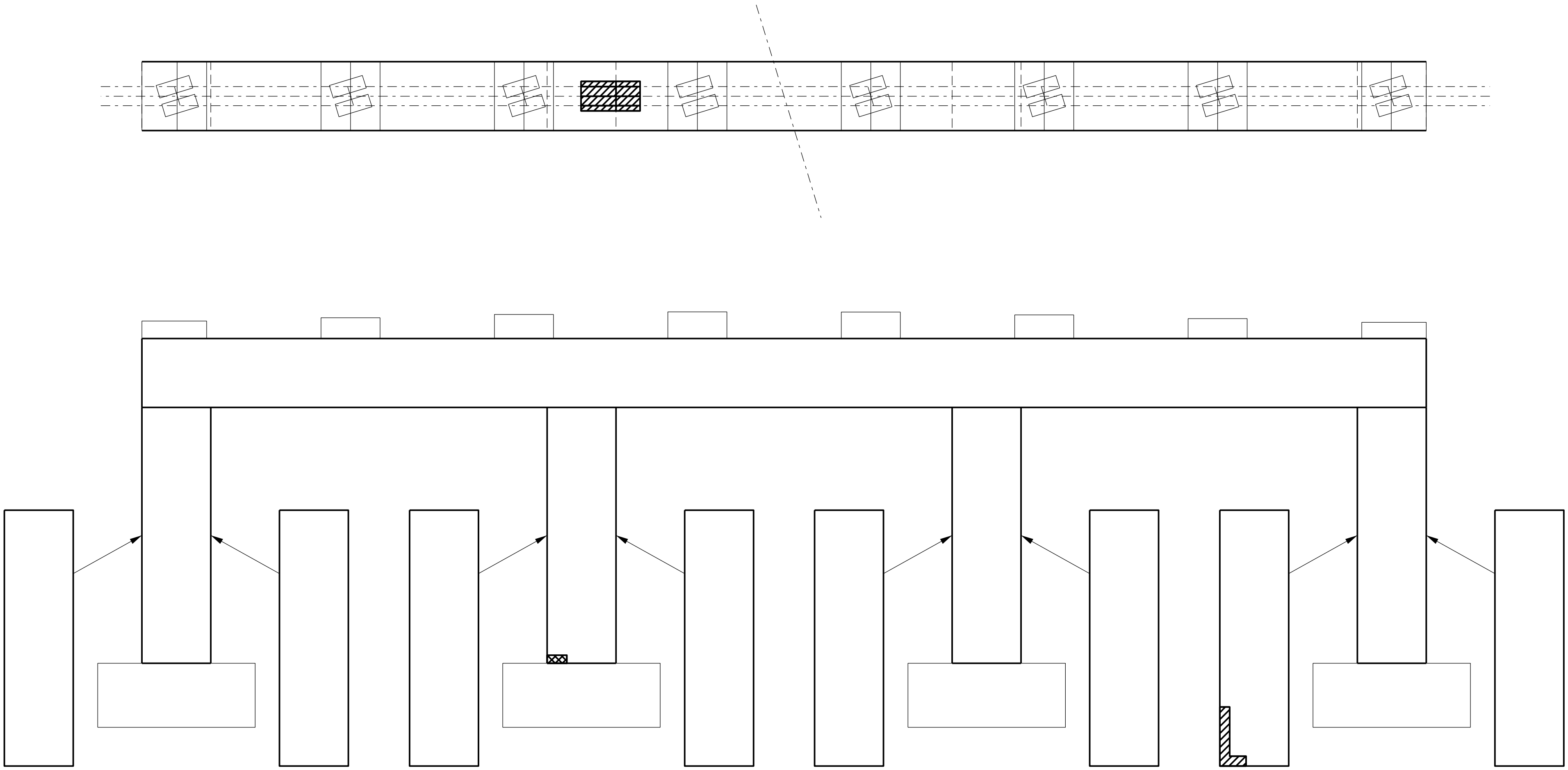
= SPALL

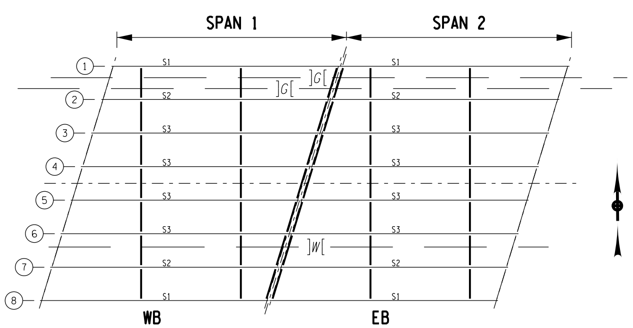
FIELD SHEET - PIER - WESTBOUND

BY: JCY

DATE: 05/25/2023

SCALE: 1/8" = 1'





FIELD SHEET - PIER - EASTBOUND

= DELAMINATION

= SPALL

BY: JCY

DATE: 05/25/2023

SCALE: 1/8" = 1'

Photographs

PHOTO 1:

LOCATION:
G2 IN SPAN 2 AT PIER

DESCRIPTION:
GIRDER END CONDITION PHOTO (WORST CASE FULL HEIGHT LOSS)

PHOTO 2:

LOCATION:
G2 IN SPAN 2 AT PIER

DESCRIPTION:
GIRDER END CONDITION PHOTO (WORST CASE BEARING AREA)

PHOTO 3:

LOCATION:
G4 IN SPAN 2 AT PIER

DESCRIPTION:
TYPICAL BEARING CONDITION, PLATE BOWED UPWARDS

PHOTO 4:

LOCATION:
G1 IN SPAN 1 AT PIER

DESCRIPTION:
REPAIR PLATE LOCATED BEHIND BEARING LINE, ALL OTHER REPAIR PLATES SIMILAR

PHOTO 5:

LOCATION:
BEGIN ABUTMENT

DESCRIPTION:
GENERAL CONDITION PHOTO

PHOTO 6:

LOCATION:
END ABUTMENT

DESCRIPTION:
MAP CRACKING TO CONCRETE, LEAKAGE WITH RUST STAINING AT UTILITY LOCATIONS

PHOTO 7:

LOCATION:
END ABUTMENT

DESCRIPTION:
VERTICAL CRACKS COMING DOWN FROM BRIDGE SEAT/PEDESTALS

PHOTO 8:

LOCATION:
PIER FROM SPAN 1

DESCRIPTION:
GENERAL CONDITION PHOTO, MINOR MAP CRACKING

PHOTO 9:

LOCATION:
PIER FROM SPAN 2

DESCRIPTION:
GENERAL CONDITION PHOTO, MINOR MAP CRAKING TO CONCRETE CAP BEAM AND PEDESTALS

PHOTO 10:

LOCATION:
UNDERSIDE OF DECK FROM SPAN 2

DESCRIPTION:
TYPICAL DECK CONDITION PHOTO

Appendices

- Appendix A: 2022 Biennial Bridge Inspection Report
- Appendix B: Bridge Work History Summary
- Appendix C: Load Rating Summary

Appendix A

2022 Biennial Bridge Inspection Report

New York State Department of Transportation
General Bridge Inspection Report

Inspection Date: August 16, 2022

Structure Information

BIN: **1022620**
Feature Carried: NORTHAMPTON ST
Feature Crossed: 33 33 53011029
Orientation: 3 - EAST

Region: 05 - BUFFALO
County: ERIE
Political Unit: City of BUFFALO
Approximate Year Built: 1963

Primary Owner: New York State Department of Transportation
Primary Maintenance Responsibility: New York State Department of Transportation
General Type Main Span: 3 - Steel, 02 - Stringer/Multi-Beam or Girder
This Bridge is not a Ramp
Number of Spans: 2

Postings

Posted Load Matches Inventory: Yes
Posted Load in field: Not Posted

Posted Vertical Clearances Match Inventory: N/A
Inventory On: Not Posted
Inventory Under: Not Posted

Number of Flags Issued

Red PIA: 0
Red: 0
Yellow: 0
Safety PIA: 0

New York State Inspection Overview

General Recommendation: 5

Federal NBI Ratings

NBI Deck Condition: 7
NBI Superstructure Condition: 5
NBI Substructure Condition: 7
NBI Channel Condition: N
NBI Culvert Condition: N

Action Items

Non-Structural Condition Observations noted: YES
Vulnerability Reviews Recommended: NO
Diving Inspection Requested: NO
Further Investigation Requested: NO

Inspector & Reviewer Signature Information

Inspection Signature:	Nimish Shah	*Date:* September 06, 2022
Review Signature:	Keith Baran, P.E. 082087-1	*Date:* September 08, 2022
Processed by :	William F. Leblanc, P.E. 085471-1	*Date:* November 02, 2022

Report Printed: November 02, 2022 8:11:48 AM

Special Emphasis Inspection

Special Emphasis Detail	"Other" Special Emphasis Detail Description	Hands-On Insp Performed	Hands-On Inspection Note
AASHTO Category D, E, and E' welded details		Yes	All cover plates received hands on inspection.
Steel Web Bearing Area		Yes	All girders received hands on inspection

Additional Information

Overloads Observed

No overload vehicles observed during this inspection.

Notes to Next Inspector

Bin plate is located on the Span 1 begin right railing and Span 2 end left on chain link fence.
Used bucket truck with WZTC in left lane on both sides of Pier and in the shoulder @ both abutments.
NOTE: This bridge was inspected together with 1022620, 1022630 and 1022640.

Improvements Observed

None

Pedestrian Fence Height

8'

Snow Fence

None

Bin Plate Condition

OK

Scour Critical Rating

N - Bridge not over waterway.

Field Notes

Staff Present During Inspection		
Name	**Title**	**Organization**
Brandon Wilson	WZTC Labor	TSI
George Welsted	ATL	NYSDOT
Matt Miller	WZTC Foreman	TSI
Matt Owens	WZTC Labor	TSI
Rob Parks	WZTC Labor	TSI

General Equipment Required for Inspection*
Access Type
13 - Walking
19 - Up to 30 Foot Lift
29 - Lane Closure With Shadow Vehicle

*** For span specific equipment requirements refer to the Active Inventory's "Access Needs" tab in BDIS.**

Detailed Time & Weather Conditions				
Field Date	**Arrival**	**Departure**	**Temp (F)**	**Weather Conditions**
08/15/2022	07:00 AM	02:00 PM	80	Cloudy
08/16/2022	07:00 AM	11:00 AM	80	Cloudy

Inspection Times (hours)	
Time required for travel, inspection and report preparation	9
Lane closure usage	5
Railroad flagging time	No

Element Quantities

Element Assessment Summary Table							
Element	**Total Quantity**	**Unit**	**CS-1**	**CS-2**	**CS-3**	**CS-4**	**CS-5**
12 - Reinforced Concrete Deck	7609	ft^2	5702	1902	5		0
107 - Steel Open Girder/Beam	928	ft	917	6	5		0
205 - Reinforced Concrete Column	4	each	4				0
215 - Reinforced Concrete Abutment	143	ft	141	1	1		0
220 - Reinforced Concrete Pile Cap/Footing	300	ft					300
225 - Steel Pile	142	each					142
234 - Reinforced Concrete Pier Cap	65	ft	58	7			0
301 - Pourable Joint Seal	67	ft	67				0
311 - Movable Bearing	16	each	4	4	8		0
313 - Fixed Bearing	16	each	12	4			0
330 - Metal Bridge Railing	238	ft	214	24			0
510 - Wearing Surfaces	5707	ft^2	5136	571			0
515 - Steel Protective Coating	9945	ft^2	7621	1205	1105	14	0
800 - Erosion or Scour	332	ft	332				0
810 - Sidewalk	1664	ft^2	1660	4			0
811 - Curb	238	ft	232	6			0
830 - Secondary Members	2	each	2				0
831 - Steel Beam End	32	each	14	3	15		0
850 - Backwall	132	ft	113	14	5		0
851 - Abutment Pedestal	16	each	11	5			0
852 - Pier Pedestal	16	each	16				0
853 - Wingwall	125	ft	112	13			0

Element Assessment by Span							
Element**	**Total Quantity**	**Unit**	**CS-1**	**CS-2**	**CS-3**	**CS-4**	**CS-5**
Span Number : 1							
BA215 - Reinforced Concrete Abutment	72	ft	72				0
BA220 - Reinforced Concrete Pile Cap/Footing	72	ft					72
BA225 - Steel Pile	36	each					36
BA311 - Movable Bearing	8	each			8		0
515 - Steel Protective Coating	16	ft^2			16		0
BA800 - Erosion or Scour	72	ft	72				0
BA831 - Steel Beam End	8	each		2	6		0

Element**	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
BA850 - Backwall	67	ft	58	7	2		0
BA851 - Abutment Pedestal	8	each	6	2			0
BW220 - Reinforced Concrete Pile Cap/Footing	59	ft					59
BW225 - Steel Pile	24	each					24
BW800 - Erosion or Scour	59	ft	59				0
BW853 - Wingwall	59	ft	53	6			0
PR205 - Reinforced Concrete Column	4	each	4				0
PR220 - Reinforced Concrete Pile Cap/Footing	32	ft					32
PR225 - Steel Pile	20	each					20
PR234 - Reinforced Concrete Pier Cap	65	ft	58	7			0
PR301 - Pourable Joint Seal	67	ft	67				0
PR311 - Movable Bearing	8	each	4	4			0
515 - Steel Protective Coating	16	ft^2			16		0
PR313 - Fixed Bearing	8	each	4	4			0
515 - Steel Protective Coating	8	ft^2			8		0
PR800 - Erosion or Scour	64	ft	64				0
PR831 - Steel Beam End	8	each	5		3		0
PR852 - Pier Pedestal	16	each	16				0
12 - Reinforced Concrete Deck	3795	ft^2	2846	949			0
510 - Wearing Surfaces	2846	ft^2	2561	285			0
107 - Steel Open Girder/Beam	464	ft	459	2	3		0
515 - Steel Protective Coating	4246	ft^2	2548	849	849		0
330 - Metal Bridge Railing	119	ft	107	12			0
515 - Steel Protective Coating	701	ft^2	624	70		7	0
810 - Sidewalk	830	ft^2	828	2			0
811 - Curb	119	ft	113	6			0
830 - Secondary Members	1	each	1				0
Span Number : 2							
EA215 - Reinforced Concrete Abutment	71	ft	69	1	1		0
EA220 - Reinforced Concrete Pile Cap/Footing	71	ft					71
EA225 - Steel Pile	31	each					31
EA313 - Fixed Bearing	8	each	8				0
515 - Steel Protective Coating	8	ft^2		4	4		0
EA800 - Erosion or Scour	71	ft	71				0
EA831 - Steel Beam End	8	each	8				0
EA850 - Backwall	65	ft	55	7	3		0

Element**	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
EA851 - Abutment Pedestal	8	each	5	3			0
EW220 - Reinforced Concrete Pile Cap/Footing	66	ft					66
EW225 - Steel Pile	31	each					31
EW800 - Erosion or Scour	66	ft	66				0
EW853 - Wingwall	66	ft	59	7			0
PR831 - Steel Beam End	8	each	1	1	6		0
12 - Reinforced Concrete Deck	3814	ft^2	2856	953	5		0
510 - Wearing Surfaces	2861	ft^2	2575	286			0
107 - Steel Open Girder/Beam	464	ft	458	4	2		0
515 - Steel Protective Coating	4246	ft^2	3822	212	212		0
330 - Metal Bridge Railing	119	ft	107	12			0
515 - Steel Protective Coating	704	ft^2	627	70		7	0
810 - Sidewalk	834	ft^2	832	2			0
811 - Curb	119	ft	119				0
830 - Secondary Members	1	each	1				0

** Elements with a prefix designate the locations of BA-Begin Abutment, BW-Begin Wingwall, EA-End Abutment, EW-End Wingwall, CO-Culvert Outlet, and PR-Pier. No prefix generally indicates the element is part of the superstructure.

Inspection Notes

General Notes

None

Element Condition Notes

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 107 - Steel Open Girder/Beam	464	459	2	3	0	0
Span 2: 107 - Steel Open Girder/Beam	464	458	4	2	0	0

Condition State 3 Note

Referenced Photo(s): 5

Referenced Sketch(es): 9

Refer to element PR831 - Steel Beam End notes.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 107 - Steel Open Girder/Beam-515 - Steel Protective Coating	4246	2548	849	849	0	0
Span 2: 107 - Steel Open Girder/Beam-515 - Steel Protective Coating	4246	3822	212	212	0	0

Condition State 3 Note

Referenced Photo(s): 4, 10

Referenced Sketch(es): None

Span 1 has paint failure of 20% along the bottom flange, span 2 has 5% paint failure and has large areas of exposed primer.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA311 - Movable Bearing-515 - Steel Protective Coating	16	0	0	16	0	0
Span 1: PR311 - Movable Bearing-515 - Steel Protective Coating	16	0	0	16	0	0
Span 1: PR313 - Fixed Bearing-515 - Steel Protective Coating	8	0	0	8	0	0
Span 2: EA313 - Fixed Bearing-515 - Steel Protective Coating	8	0	4	4	0	0

Condition State 3 Note

Referenced Photo(s): 2, 5, 7

Referenced Sketch(es): None

The begin and pier (fixed, moveable) bearings has failed paint coating at all bearings. The end fixed bearing has paint failure at bearing 1, 2, 7 and 8.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA311 - Movable Bearing	8	0	0	8	0	0
Span 1: PR311 - Movable Bearing	8	4	4	0	0	0

Condition State 3 Note

Referenced Photo(s): 2, 7

Referenced Sketch(es): None

All of the begin bearings and pier bearings, except G4 and G5, have pack rust between the slider and masonry plate, no evidence of restricted movement was noted.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 330 - Metal Bridge Railing-515 - Steel Protective Coating	701	624	70	0	7	0
Span 2: 330 - Metal Bridge Railing-515 - Steel Protective Coating	704	627	70	0	7	0

Condition State 4 Note

Referenced Photo(s): 1

Referenced Sketch(es): None

The left and right railings at both spans has isolated spots of paint failure and rust bleeding.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA831 - Steel Beam End	8	0	2	6	0	0
Span 1: PR831 - Steel Beam End	8	5	0	3	0	0
Span 2: PR831 - Steel Beam End	8	1	1	6	0	0

Condition State 3 Note

Referenced Photo(s): 5

Referenced Sketch(es): 9

Refer to Web Section Loss Measurements sketch for locations of section loss at the beam ends.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA850 - Backwall	67	58	7	2	0	0

Condition State 3 Note

Referenced Photo(s): 3

Referenced Sketch(es): None

The top of the begin backwall at bay 7 has a 2'x1.5'x2" deep triangular shaped spall.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 2: 12 - Reinforced Concrete Deck	3814	2856	953	5	0	0

Condition State 3 Note

Referenced Photo(s): 4, 8, 9, 10

Referenced Sketch(es): None

The span 2 begin right fascia along the pier joint has a 1'x1'x4" deep spall and at midspan there is a 1'x1' spall to rebar, the left fascia at midspan has a 3'x1.5'x3" deep spall to rebar.

Span 2: EA215 - Reinforced Concrete Abutment

TQ	CS-1	CS-2	CS-3	CS-4	CS-5
71	69	1	1	0	0

Condition State 3 Note

Referenced Photo(s): 11, 12

Referenced Sketch(es): None

The end abutment stem wall has a full height crack that runs the length of the wall on the left side of G3, no delamination was noted.

Span 2: EA850 - Backwall

TQ	CS-1	CS-2	CS-3	CS-4	CS-5
65	55	7	3	0	0

Condition State 3 Note

Referenced Photo(s): 11

Referenced Sketch(es): None

The end backwall to the left of G1 has a 3'x2'x2" deep spall, no delamination was noted.

Non-Structural Condition Observations

Category: ATTACHMENTS - Utilities Quantity: 1 Unit: ft

Referenced Element(s): NONE

Referenced Photo(s): 6
Referenced Sketch(es): NONE

The water line over the pier in bay 6 is leaking onto the pier cap and the shoulders of the expressway.

Inspection Photographs

	Photo Number: **1** Photo Filename: **22_001.JPG**
Attachment Description: End Right Railing, Paint Failure	

	Photo Number: **2** Photo Filename: **22_002.JPG**
Attachment Description: Begin Bearing 1, Pack Rust Under Sliding Plate and Paint Failure	

Attachment Description:
Begin Backwall, Bay 7, Spall

Photo Number: **3** Photo Filename: **22_003.JPG**

Attachment Description:
Span 1 Framing, Paint Failure

Photo Number: **4** Photo Filename: **22_004.JPG**

Attachment Description: Pier, G4 Beam Ends, Section Loss; Bearing 4, Paint Failure	Photo Number: **5** Photo Filename: **22_005.JPG**

Attachment Description: (NSCO) Utility, Bay 6 at Pier, Leaking	Photo Number: **6** Photo Filename: **22_006.JPG**

Attachment Description: Begin Span 2, Pier Bearing 8, Pack Rust Under Sliding Plate and Paint Failure	Photo Number: **7** Photo Filename: **22_007.JPG** 

Attachment Description: Begin Span 2, Right Fascia, Spall to Rebar	Photo Number: **8** Photo Filename: **22_008.JPG** 

Attachment Description: Span 2, Midspan, Left Fascia, Spall to Rebar	Photo Number: **9** Photo Filename: **22_009.JPG** 

Attachment Description: Span 2, G6 - G8, Bottom Flange, Paint Failure	Photo Number: **10** Photo Filename: **22_010.JPG** 

	Photo Number: **11** Photo Filename: **22_011.JPG**
Attachment Description: End Abutment, Left of G1, Spall; End Bearing 1, Paint Failure	

	Photo Number: **12** Photo Filename: **22_012.JPG**
Attachment Description: End Abutment, Bay 2, Crack	

Inspection Sketches

Sketch Number: **1** Sketch Filename: **22_Photolog1.jpg**

BD 186

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	1

PHOTOLOG

Insp. Date:	08/16/2022	BIN:	1022620

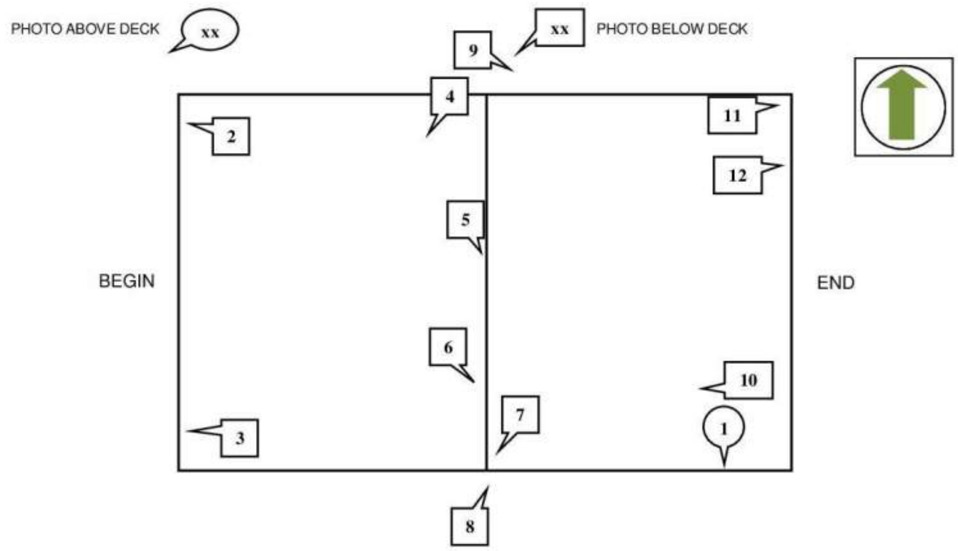


PHOTO NUMBER	JPG NUMBER	COMMENTS
1	22_001	End Right Railing, Paint Failure
2	22_002	Begin Bearing 1, Pack Rust Under Sliding Plate and Paint Failure
3	22_003	Begin Backwall, Bay 7, Spall
4	22_004	Span 1 Framing, Paint Failure
5	22_005	Pier, G4 Beam Ends, Section Loss; Bearing 4, Paint Failure
6	22_006	(NSCO) Utility, Bay 6 at Pier, Leaking
7	22_007	Begin Span 2, Pier Bearing 8, Pack Rust Under Sliding Plate and Paint Failure
8	22_008	Begin Span 2, Right Fascia, Spall to Rebar
9	22_009	Span 2, Midspan, Left Fascia, Spall to Rebar
10	22_010	Span 2, G6 - G8, Bottom Flange, Paint Failure
11	22_011	End Abutment, Left of G1, Spall; End Bearing 1, Paint Failure
12	22_012	End Abutment, Bay 2, Crack

Sketch Description: 22_Photolog1.jpg

Sketch Number: **2** Sketch Filename: **22_ELECTRIC1.jpg**

BD 241

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	1

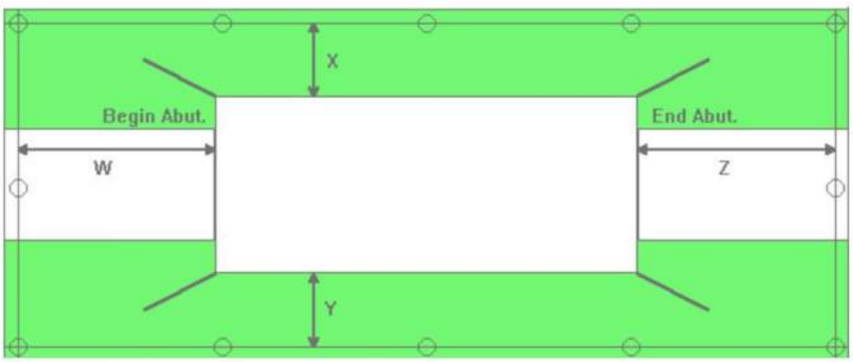
Electrical Hazard Survey

Insp. Date:	08/16/2022	BIN:	1022620

Electrical Hazard Classification (Put an X in appropriate box at right)		Danger!
	X	Warning
		No Lines Present

Electrical Hazard Alignments (Put an X in all appropriate boxes at right)	X	Parallel Alignment
	X	Perpendicular Alignment
		Diagonal Alignment

Utility Name	Unknown
System Voltage	Unknown



(For Clarity, You Must Specify English or Metric Units for Offsets)

Location (Put X where appropriate)	No Lines Present	Above the Deck	Below the Deck	Above and Below	Horizontal Offset	Vertical Offset
Before Begin Abutment (W)		X			15'	20'
To Left of Bridge (X)	X					
To Right of Bridge (Y)		X			-2'	20'
After End Abutment (Z)	X					

Sketch Description: 22_ELECTRIC1.jpg

Sketch Number: **3** Sketch Filename: **22_WZTC_form1.jpg**

Insp. Date:	08/16/2022		BIN:	1022620

WZTC PLAN

NOTES –

EXPRESSWAY

(1) LEFT LANE CLOSURES WERE USED AT PIER FOR BUCKET TRUCK WORK.
SEE NYSDOT REGION 5 WZTC MANUAL, SHEET 12 - 1 (STANDARD SHEET 619-31).

(2) RIGHT SHOULDER CLOSURES WERE USED AT ABUTMENTS FOR BUCKET TRUCK WORK.
SEE NYSDOT REGION 5 WZTC MANUAL, SHEET 12 - 5 (STANDARD SHEET 619-22).

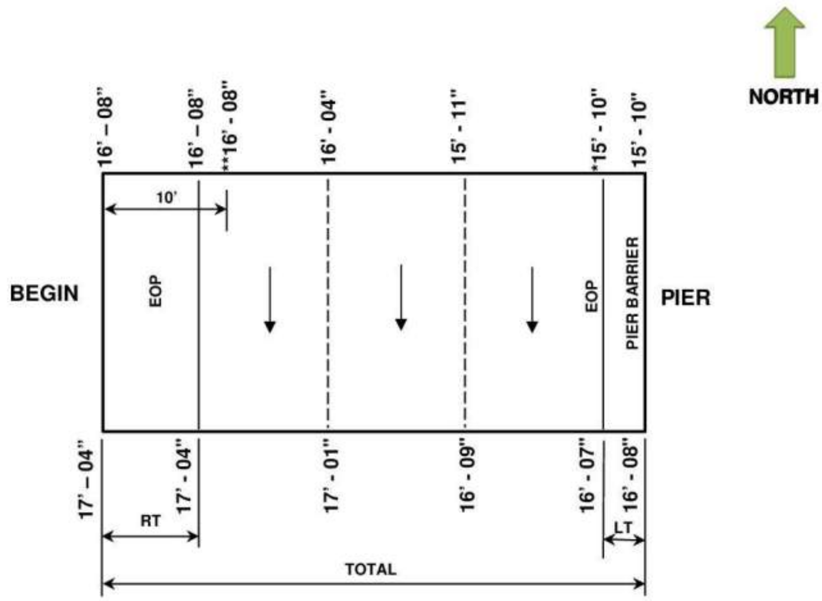
Sketch Description: 22_WZTC_form1.jpg

Sketch Number: **4** Sketch Filename: **22_VC_Under1.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	2

SPAN 1 ROUTE 33 WB HIGHWAY VERTICAL CLEARANCES (FT.)

INSP. DATE:	08/16/2022		BIN	1022620



INBOUND

*2022 Note – Rt 33 WB was milled with temporary striping. 2020 readings were retained for this inspection. Surface will be paved prior to next inspection.

Date	DEF**	ACT*	TOT	LT	RT
2020	16' - 08"	15 - 10"	51.8'	2.5'	8.3'
2022	✓	✓	✓	✓	✓
✓ if no change					

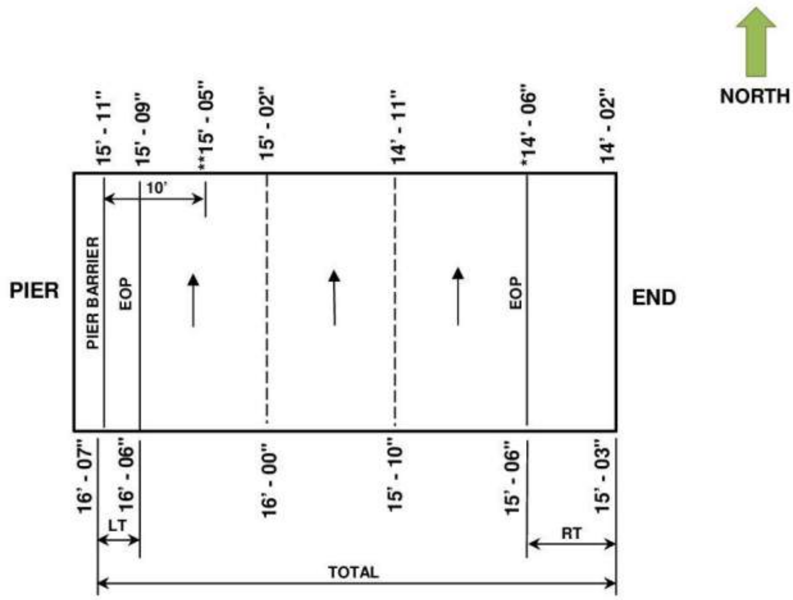
Sketch Description: 22_VC_Under1.jpg

Sketch Number: **5** Sketch Filename: **22_VC_Under2.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	2	OF	2

SPAN 2 ROUTE 33 EB HIGHWAY VERTICAL CLEARANCES (FT.)

INSP. DATE:	08/16/2022		BIN	1022620



OUTBOUND

Date	DEF**	ACT*	TOT	LT	RT
2022	15' - 05"	14' - 06"	51.3'	3.8'	9.7'
✓ if no change					

Sketch Description: 22_VC_Under2.jpg

Sketch Number: **6** Sketch Filename: **22_LdRat1.jpg**

Region 5 LoadRatingFieldCheckForm

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	1

LOAD RATING FIELD CHECK FORM

BIN:	1022620		Insp. Date:	08/16/2022

Dead Load - Note Changes since Last load Rating or state "NONE":

NONE.

Section Loss - Note locations and amount of loss on each girder or state "NONE":

Web loss exceeding 10% was measured in the following locations:

Begin Span 1 G1 – 14%	Begin Span 2 G1 – 14%
Begin Span 1 G3 – 10%	Begin Span 2 G2 – 38%
Begin Span 1 G5 – 10%	Begin Span 2 G3 – 22%
Begin Span 1 G6 – 10%	Begin Span 2 G4 – 14%
Begin Span 1 G7 – 14%	Begin Span 2 G5 – 26%
Begin Span 1 G8 – 14%	Begin Span 2 G7 – 14%

End Span 1 G2 – 33%
End Span 1 G3 – 31%
End Span 1 G4 – 28%

See section loss documentation.

Additional Notes:

Attachments:

22_Web Loss_1022620.xlsx

Team Leader: Nimish Shah, P.E.

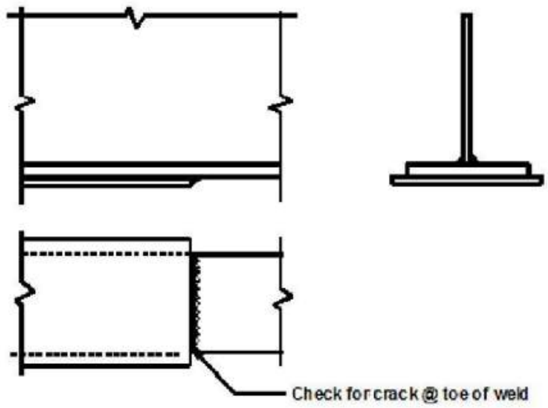
Sketch Description: 22_LdRat1.jpg

Sketch Number: **7** Sketch Filename: **22_Special Emphasis1.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	2

SPECIAL EMPHASIS REQUIRED
COVER PLATE WELDS

INSP. DATE:	08/16/2022		BIN	1022620



NOTES:

1) Category "E" welds are located at ends of cover plates on all girders in both Spans.
2) All Category "E" welds shall receive 100% hands on inspection.

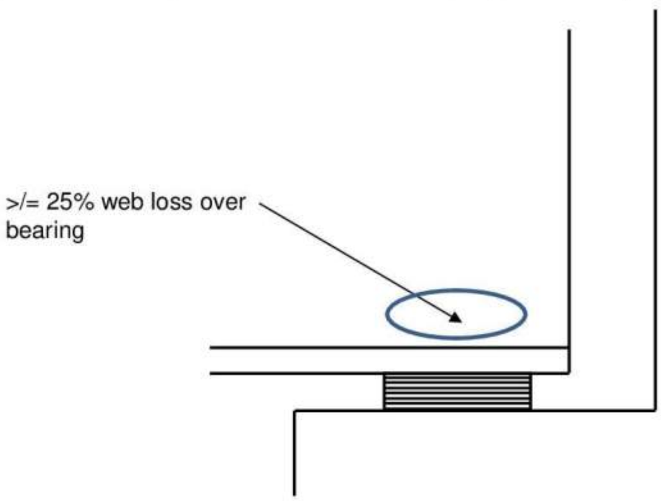
Sketch Description: 22_Special Emphasis1.jpg

Sketch Number: **8** Sketch Filename: **22_Special Emphasis2.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	2	OF	2

SPECIAL EMPHASIS REQUIRED >/= 25% WEB LOSS OVER BEAINGS

INSP. DATE:	08/16/2022		BIN	1022620



NOTES:

1) All Girders with >/= 25% web loss over bearings shall receive 100% hands on inspection.
2) See Web Loss documentation.

Sketch Description: 22_Special Emphasis2.jpg

Sketch Number: **9** Sketch Filename: **22_Web Loss_10226201.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	of	1

WEB SECTION LOSS MEASUREMENTS (in)

Insp. Date	08/16/22	BIN	1022620

SPAN-1							
	ORIG. WEB THICKNESS = 0.580"						
Girder Number	Location	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss
G-1	BEGIN	1/2	14%	1/2	14%	0.50	14%
	PIER-1	Repaired	NA	Repaired	0%	Repaired	0%
G-2	BEGIN	17/32	8%	17/32	8%	0.53	9%
	PIER-1	3/8	35%	13/32	30%	0.39	33%
G-3	BEGIN	17/32	8%	17/32	8%	0.52	10%
	PIER-1	13/32	30%	13/32	30%	0.40	31%
G-4	BEGIN	17/32	8%	17/32	8%	0.53	9%
	PIER-1	7/16	25%	7/16	25%	0.42	28%
G-5	BEGIN	17/32	8%	17/32	8%	0.52	10%
	PIER-1	Repaired	NA	Repaired	0%	Repaired	0%
G-6	BEGIN	17/32	8%	17/32	8%	0.52	10%
	PIER-1	Repaired	NA	Repaired	0%	Repaired	0%
G-7	BEGIN	1/2	14%	1/2	14%	0.50	14%
	PIER-1	Repaired	NA	Repaired	0%	Repaired	0%
G-8	BEGIN	17/32	8%	17/32	8%	0.50	14%
	PIER-1	Repaired	NA	Repaired	0%	Repaired	0%
INSP. BY, DATE		CMC, 2018		TK, 2020		NS, 2022	

G-1 thru G-8 ARE 33 W130, WEB = 33.09" X 0.580" AND FLANGE = 11.51" X 0.855"
At repaired locations, a permanent 1/2" thick plates installed at both sides of web.

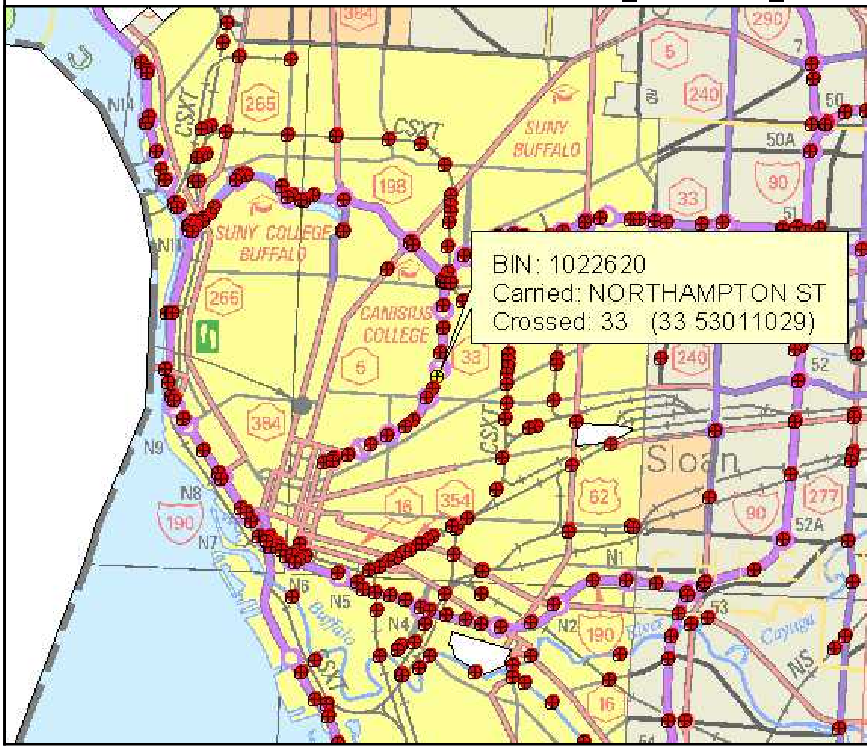
SPAN-2							
	ORIG. WEB THICKNESS = 0.580"						
Girder Number	Location	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss
G-1	PIER-1	1/2	14%	1/2	14%	0.50	14%
	END	9/16	3%	9/16	3%	0.58	0%
G-2	PIER-1	7/16	25%	3/8	35%	0.36	38%
	END	37/64	0%	37/64	0%	0.58	0%
G-3	PIER-1	13/32	30%	15/32	19%	0.45	22%
	END	37/64	0%	37/64	0%	0.58	0%
G-4	PIER-1	0.500	14%	0.500	14%	0.50	14%
	END	37/64	0%	37/64	0%	0.58	0%
G-5	PIER-1	0.396	32%	0.438	25%	0.43	26%
	END	37/64	0%	37/64	0%	0.58	0%
G-6	PIER-1	0.533	8%	0.533	8%	0.53	9%
	END	37/64	0%	37/64	0%	0.58	0%
G-7	PIER-1	0.396	32%	1/2	14%	0.50	14%
	END	1/2	14%	9/16	3%	0.58	0%
G-8	PIER-1	9/16	3%	9/16	3%	0.56	3%
	END	1/2	14%	9/16	3%	0.58	0%
INSP. BY, DATE		CMC, 2018		TK, 2020		NS, 2022	

G-1 thru G-8 ARE 33 W130, WEB = 33.09" X 0.580" AND FLANGE = 11.51" X 0.855"

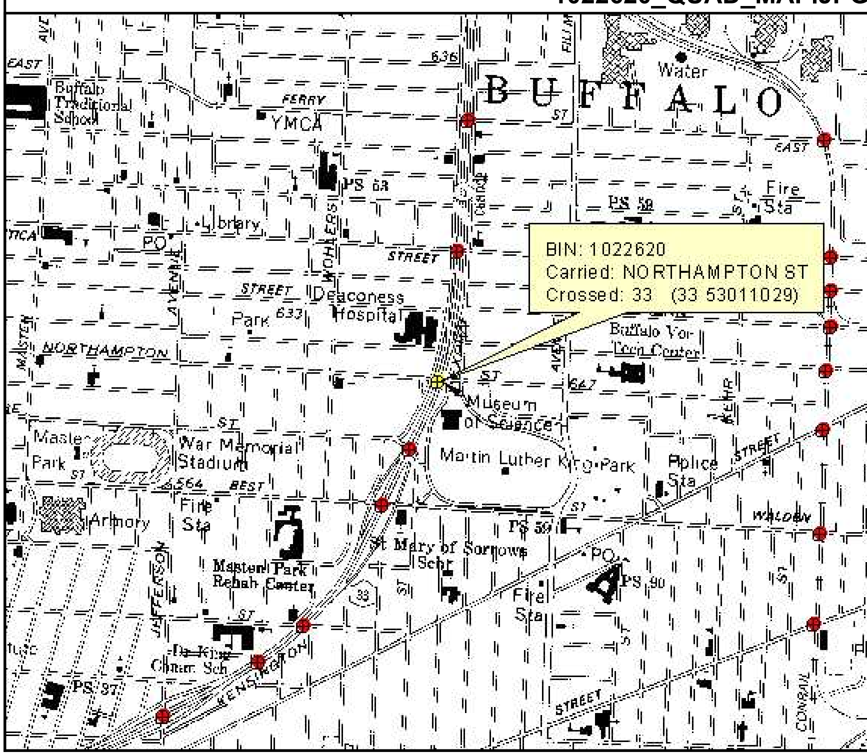
Sketch Description: 22_Web Loss_10226201.jpg

Standard Photographs

1022620_LOCATION_MAP.JPG



1022620_QUAD_MAP.JPG



Abutment_Begin.JPG

Abutment_End.JPG

Approach_Begin.JPG

Approach_End.JPG

Elevation_Left.JPG

Elevation_Right.JPG

FeatureCrossed_Left.JPG

FeatureCrossed_Right.JPG

Framing_Span_1.JPG

Pier.JPG

<u>**Appendix B**</u>

Bridge Work History Summary

Northampton St. Bridge (BIN 1022620) Work History

Year	Contract	Description of Work
2015	D262658	General Rehabilitation
		Repair Abutments - Concrete Repairs @ Begin and End abutment wall
		Straighten, Repair or Replace Structural Members Span 1 primary repairs to end's of girders
		Repair, Replace, or Add to Existing Concrete Substr Concrete repairs to Pier 1
		Repair Sidewalk and Fascia Utility pipe cover replaced
		Clean, Free, and Repair Joint Mechanism
2014	-	Asphalt Patches at Ends of Sidewalks
2013	-	New Mill & Asphalt Overlay - End Appr.
2011	-	Straighten, Repair or Replace Structural Members - Repair Steel Superstructure
2009	D260954	Bridge Cleaning
2008	D260644	Bridge Cleaning
2007	D260336	Bridge Cleaning
2006	D259781	Bridge Painting
	D260001	Bridge Cleaning
2005	D259745	Bridge Painting
2003	D259244	Waterproof Bridge Deck
2001	D258747	Clean Bridge
2000	D258210	Waterproof Bridge Deck
		Waterproof Bridge Seats and Pier Caps - Pentrating Sealer Abutments, Pier, Sidewalk, Fascia
		Sandblast Structural Steel
		Clean and Paint Metal Surfaces - Moisture Cure Urethane - Prime, Intermed., Finish
1998	D257523	Clean Bridge
1997	D257087	Clean Bridge Deck
		Clean Pier Caps and Abutments
		Clean Superstructure
1996	D25674	Clean Pier Caps and Abutments - Clean Abutments & Pier
		Maintain and Repair Structural Bridge Deck - Clean DeckDECK
		Clean Superstructure
1995	D254901	Bridge Deck Repairs ar East & West Ends
		Replace Joint System - Armored Joint System w/ Compression Seal at Pier
		Replace Wearing Surface (All Others) - Micro-silica Concrete Overlay
		Repair, Replace, or Add to Existing Concrete Substr
	D256372	Cleaned Bridge Deck
		Clean Pier Caps and Abutments
		Clean Superstructure
1994	D254824	Clean Pier Caps and Abutments
		Clean Superstructure
		Clean Bridge Deck

Northampton St. Bridge (BIN 1022620) Work History

Year	Contract	Description of Work
1993	D254371	Clean Bridge Deck
		Clean Superstructure
		Clean Pier Caps and Abutments
1992	D254105	Clean Superstructure
		Clean Pier Caps and Abutments
		Clean Bridge Deck
1991	D253631	Maintenance Cleaning of Bridges
1987	D251942	Clean and Paint Metal Surfaces - Bridge Painting Contract

Appendix C

Load Rating Summary

BIN 1022620
Northampton Street
over
Kensington Expressway

City of Buffalo
Erie County, New York

Level 1 Load Rating Calculations

November 2023

Prepared By: Chirag S Patel, PE
Checked By: Walter James Kaniecki, PE

Load Rating Summary

Rating Load	Controlling Mode	Inventory Rating	Operating Rating
Load and Resistance Factor Rating HL-93	Span 2 Girder G2 Original 33*WF*130 Web Local Yielding	0.26	0.34
Load Factor Rating HS Truck or Lane	Span 2 Girder G2 Original 33*WF*130 Unstiffened Bearing Area	HS 25.8 46.4 Tons	HS 43.0 77.4 Tons

Approved By:
Walter James Kaniecki, PE
License Number 099619

LaBella
Powered by partnership.

Table of Contents

BIN 1022620
Level 1 Load Rating, November 2023

Load Rating Summary

Load and Resistance Factor Rating (LRFR), HL-93

Span 2 Girder G2 Begin
Original 33WF130 with measured Section Loss
Web Local Yielding, No Bearing Stiffeners
0.26 Inventory
0.34 Operating

Load Factor Rating (LFR), HS-Truck or Lane

Span 2 Girder G2 Begin
Original 33WF130 with measured Section Loss
Web End Shear, No Bearing Stiffeners
HS 25.8, 46.4 Tons Inventory
HS 43.0, 77.4 Tons Operating

Bridge Information

BIN	1022620
Date of Load Rating	November 2023
Political Unit	City of Buffalo
Feature Carried	Northampton Street
Feature Crossed	Kensington Expressway
Superstructure Type	Steel Multi-Girder
Number of Spans	2 Simple Spans 56’-7” & 56’-7”
Skew	16°-56’-41.87”
Total Length	119’-0”
Out-to-Out Width	64’-0”
Bridge Width Curb-to-Curb	48’-0”
Number of Actual Travel Lanes	4
Number of Lanes used in Rating	4
Type of Deck	Concrete
Type of Wearing Surface	Micro-Silica Overlay
Type of Sidewalks	Left Side: Concrete Right Side: Concrete
Barrier or Railing Type	Steel Railing
Year Built	1963
Rehabilitation Year(s)	
Design Live Load	HS 20-44
Existing Posted Load	Not Posted
Date of Most Recent Inspection	May 2023
List of Plans Included	Excerpts from: 1959 FAC 59-19 Original Plans

BIN 1022620
Level 1 Load Rating, November 2023

General Description

The Northampton Street Bridge over the Kensington Expressway was originally built in 1963. It is a multi-girder bridge with 2 consecutive simple spans. The girders are steel rolled shapes with welded bottom cover plates, and are made composite with the concrete deck. The 48’-wide roadway carries 4 lanes. Both sides have raised sidewalks with curb, steel pedestrian railing, and snow fence.

The bridge orientation differs among the Record Plans, Inspection Reports, and the existing Level 2 Load Rating Model in AASHTOWare BrR.

Record Plans	Inspection Report & This Level 1 Load Rating	AASHTOWare BrR Level 2 Load Rating
West ← East	West → East	West ← East

Analysis Description

This bridge was analyzed using both:

- Load and Resistance Factor Rating (LRFR)
- Load Factor Rating (LFR)

as described by the American Association of State Highway and Transportation Officials (AASHTO) and the New York State Department of Transportation (NYSDOT).

Three load definitions were evaluated:

- The HL-93 design load definition for LRFR
- The HS 20 truck or lane design load definition for LFR
- For specific ratings with LFR less than HS 20.0 Inventory, re-evaluate for the H 20 truck or lane load definition

This Level 1 Load Rating takes the existing Level 2 Load Rating Model built using AASHTOWare BrR. The input was verified and the most recent inspection information was incorporated into the model.
Due to specific concerns at the girder ends, select locations were manually checked for their capacity in the bearing region.

Modifications to the AASHTOWare BrR File

1. Traffic Information was missing. Added ADT, % Trucks, Directional Percent, and ADTT based on the Bridge Inventory Report.
   Total ADT 2301 w/ 3% Trucks.
   Let directionality be 55% [AASHTO LRFD C3.6.1.4.2] & 2 lanes available per direction.
   Assume current ADTT is reasonable for cycles over entire lifetime.

2. The model had linked some interior girders to one definition. Un-linked the girders to differentiate each girder based on current section loss.

3. Updated section loss based on most recent LaBella Element-Specific Inspection.

4. The weight of utilities was included in the model, however was defined as a DC1-type load. Changed the definition to be DW-type load.

5. Added Points of Interest for the Cover Plate End fatigue detail.
   [AASHTO LRFD Table 6.6.1.2.3-1] Case 3.5, End Welded Cover Plates
   33 WF 130 t_f = 0.855” > 0.8” → Category E’

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway				
PROJECT NO.	2230860	SHEET		OF	
SUBJECT	BIN 1022620 Northampton				
	CALC. BY	CSP	DATE	11/15/2023	
	CKD. BY	WJK	DATE	11/17/2023	

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W ← E

AASHTOWare BrR Rating Output

- Load and Resistance Factor Rating, HL-93
  - Whole Structure

Member Identity presented here following Inspection Orientation

Structure	Member	Inventory rating factor	Operating rating factor	Inventory capacity (Ton)	Operating capacity (Ton)	Inventory location (ft)
Span 1	G1	1.762	2.285	63.448	82.247	28.29
Span 1	G2	1.412	1.830	50.816	65.872	28.29
Span 1	G3	1.472	1.909	53.007	68.713	28.29
Span 1	G4	1.472	1.909	53.007	68.713	28.29
Span 1	G5	1.472	1.909	53.007	68.713	28.29
Span 1	G6	1.454	1.885	52.353	67.865	28.29
Span 1	G7	1.408	1.825	50.684	65.702	28.29
Span 1	G8	1.787	2.316	64.332	83.393	28.29
Span 2	G1	1.762	2.285	63.448	82.247	28.29
Span 2	G2	1.412	1.830	50.816	65.872	28.29
Span 2	G3	1.472	1.909	53.007	68.713	28.29
Span 2	G4	1.472	1.909	53.007	68.713	28.29
Span 2	G5	1.472	1.909	53.007	68.713	28.29
Span 2	G6	1.454	1.885	52.353	67.865	28.29
Span 2	G7	1.408	1.825	50.684	65.702	28.29
Span 2	G8	1.787	2.316	64.332	83.393	28.29

- Controlling Member, Typical Span 1 & Span 2 G7

Live Load Type	Inventory rating factor	Operating rating factor	Location (ft)	Location Span-(%)	Limit State
Truck + Lane	1.408	1.825	28.29	(50)	STRENGTH-I Steel Flexure

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model

AASHTOWare BrR Rating Output

- Load Factor Rating, HS20-44
  - Whole Structure

Member Identity presented here following Inspection Orientation

Structure	Member	Inventory rating factor	Operating rating factor	Inventory capacity (Ton)	Operating capacity (Ton)	Inventory location (ft)
Span 1	G1	16.390	27.371	590.026	985.343	28.29
Span 1	G2	1.401	2.339	50.430	84.219	28.29
Span 1	G3	1.469	2.453	52.883	88.314	28.29
Span 1	G4	1.469	2.453	52.883	88.314	28.29
Span 1	G5	1.469	2.453	52.883	88.314	28.29
Span 1	G6	1.449	2.420	52.165	87.116	28.29
Span 1	G7	1.394	2.328	50.191	83.819	28.29
Span 1	G8	16.613	27.744	598.076	998.786	28.29
Span 2	G1	16.391	27.373	590.085	985.443	28.29
Span 2	G2	1.401	2.339	50.430	84.219	28.29
Span 2	G3	1.469	2.453	52.883	88.314	28.29
Span 2	G4	1.469	2.453	52.883	88.314	28.29
Span 2	G5	1.469	2.453	52.883	88.314	28.29
Span 2	G6	1.449	2.420	52.165	87.116	28.29
Span 2	G7	1.394	2.328	50.191	83.819	28.29
Span 2	G8	16.611	27.741	598.010	998.676	28.29

  - Controlling Member, Typical Span 1 & Span 2 G7

Live Load Type	Inventory rating factor	Operating rating factor	Location (ft)	Location Span-(%)	Limit State
Axle Load	1.394	2.328	28.29	(50)	Design Flexure - Steel

- Fatigue Evaluation, HL-93 (Fatigue)
  - End Welded Cover Plates

		Infinite Life Check		Finite Life Analysis				
Member	Stress Range, Δf (ksi)	Infinite Life Range, Δf Max (ksi)	Threshold Stress, ΔF TH (ksi)	Finite Life Range, Δf eff (ksi)	Current Cycles, N1	Available Cycles, Nav	Remaining Life, Y REM (yrs)	Fatigue Serviceabilit y Index, Q
G2 & G7	3.14	5.48	2.60	2.50	1558550	32334686	1204	0.86

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022620 Northampton		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	09/07/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W ← E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 1

Begin

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	4.187	0.084	0.388	0.332	16.631	0.707	7.751	1.273	6.153	51.683	4.240	3.111
G2	4.473	0.089	0.388	0.638	20.860	0.707	7.751	1.132	6.153	86.002	58.122	39.045
G3	4.545	0.091	0.388	0.642	20.860	0.707	7.751	[redacted]	6.153	82.798	64.481	47.755
G4	4.545	0.091	0.388	0.586	20.860	0.707	7.751	[redacted]	6.153	82.798	64.481	47.755
G5	4.545	0.091	0.388	0.560	20.860	0.707	7.751	[redacted]	6.153	82.798	64.481	47.755
G6	4.545	0.091	0.388	0.534	20.860	0.707	7.751	1.697	6.153	82.798	64.481	47.755
G7	4.473	0.089	0.388	0.508	20.860	0.707	7.751	1.697	6.153	82.864	58.122	39.045
G8	4.187	0.084	0.388	0.241	16.632	0.707	7.751	[redacted]	6.153	49.773	4.242	3.112

End

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	4.187	0.084	0.388	0.248	16.631	0.707	7.751	1.273	6.153	49.772	4.240	3.111
G2	4.473	0.089	0.388	0.522	20.860	0.707	7.751	1.132	6.153	82.864	58.122	39.045
G3	4.544	0.091	0.388	0.548	20.860	0.707	7.751	[redacted]	6.153	82.798	64.481	47.755
G4	4.544	0.091	0.388	0.574	20.860	0.707	7.751	[redacted]	6.153	82.798	64.481	47.755
G5	4.544	0.091	0.388	0.600	20.860	0.707	7.751	[redacted]	6.153	82.798	64.481	47.755
G6	4.544	0.091	0.388	0.626	20.860	0.707	7.751	1.697	6.153	82.798	64.481	47.755
G7	4.473	0.089	0.388	0.652	20.860	0.707	7.751	1.697	6.153	86.002	58.122	39.045
G8	4.187	0.084	0.388	0.339	16.632	0.707	7.751	[redacted]	6.153	51.684	4.242	3.112

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022620 Northampton		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	09/07/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W ← E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 2

Begin

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	4.187	0.084	0.388	0.341	16.631	0.707	7.751	1.273	6.153	51.683	4.240	3.111
G2	4.473	0.089	0.388	0.656	20.860	0.707	7.751	1.132	6.153	86.002	58.122	39.045
G3	4.544	0.091	0.388	0.630	20.860	0.707	7.751	[redacted]	6.153	82.798	64.481	47.755
G4	4.544	0.091	0.388	0.604	20.860	0.707	7.751	[redacted]	6.153	82.798	64.481	47.755
G5	4.544	0.091	0.388	0.578	20.860	0.707	7.751	[redacted]	6.153	82.798	64.481	47.755
G6	4.544	0.091	0.388	0.552	20.860	0.707	7.751	1.697	6.153	82.798	64.481	47.755
G7	4.473	0.089	0.388	0.526	20.860	0.707	7.751	1.697	6.153	82.864	58.122	39.045
G8	4.187	0.084	0.388	0.250	16.632	0.707	7.751	[redacted]	6.153	49.773	4.242	3.112

End

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	4.187	0.084	0.388	0.239	16.631	0.707	7.751	1.273	6.153	49.772	4.240	3.111
G2	4.473	0.089	0.388	0.504	20.860	0.707	7.751	1.132	6.153	82.864	58.122	39.045
G3	4.544	0.091	0.388	0.530	20.860	0.707	7.751	[redacted]	6.153	82.798	64.481	47.755
G4	4.544	0.091	0.388	0.556	20.860	0.707	7.751	[redacted]	6.153	82.798	64.481	47.755
G5	4.544	0.091	0.388	0.582	20.860	0.707	7.751	[redacted]	6.153	82.798	64.481	47.755
G6	4.544	0.091	0.388	0.608	20.860	0.707	7.751	1.697	6.153	82.798	64.481	47.755
G7	4.473	0.089	0.388	0.634	20.860	0.707	7.751	1.697	6.153	86.002	58.122	39.045
G8	4.187	0.084	0.388	0.330	16.632	0.707	7.751	[redacted]	6.153	51.684	4.242	3.112

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway
PROJECT NO.	2230860
SHEET	
OF	
SUBJECT	BIN 1022620 Northampton
CALC. BY	CSP
DATE	09/06/2023
CKD. BY	WJK
DATE	09/07/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W ← E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 1

	Begin				
	DC	DW	HL-93	HS 20	H 20
G1	30.08	7.43	51.68	4.24	3.11
G2	34.91	7.29	86.00	58.12	39.05
G3	34.98	6.15	82.80	64.48	47.76
G4	34.93	6.15	82.80	64.48	47.76
G5	34.90	6.15	82.80	64.48	47.76
G6	34.88	7.85	82.80	64.48	47.76
G7	34.78	7.85	82.86	58.12	39.05
G8	29.99	6.15	49.77	4.24	3.11

End				
DC	DW	HL-93	HS 20	H 20
30.00	7.43	49.77	4.24	3.11
34.79	7.29	82.86	58.12	39.05
34.89	6.15	82.80	64.48	47.76
34.92	6.15	82.80	64.48	47.76
34.94	6.15	82.80	64.48	47.76
34.97	7.85	82.80	64.48	47.76
34.92	7.85	86.00	58.12	39.05
30.09	6.15	51.68	4.24	3.11

  - Span 2

	Begin				
	DC	DW	HL-93	HS 20	H 20
G1	30.09	7.43	51.68	4.24	3.11
G2	34.92	7.29	86.00	58.12	39.05
G3	34.97	6.15	82.80	64.48	47.76
G4	34.95	6.15	82.80	64.48	47.76
G5	34.92	6.15	82.80	64.48	47.76
G6	34.89	7.85	82.80	64.48	47.76
G7	34.79	7.85	82.86	58.12	39.05
G8	30.00	6.15	49.77	4.24	3.11

End				
DC	DW	HL-93	HS 20	H 20
29.99	7.43	49.77	4.24	3.11
34.77	7.29	82.86	58.12	39.05
34.87	6.15	82.80	64.48	47.76
34.90	6.15	82.80	64.48	47.76
34.92	6.15	82.80	64.48	47.76
34.95	7.85	82.80	64.48	47.76
34.90	7.85	86.00	58.12	39.05
30.08	6.15	51.68	4.24	3.11

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G3 End
  - Applied Load and LRFR Factors

Assumptions & Limitations of this Worksheet
Girder not Longitudinally Stiffened
Girder not Transversely Stiffened
No Bearing Stiffeners

Span 1 Girder G3 End is the interior location with the most section loss

Applied End Shear $V_{DC} := 34.89\ kip$ $V_{DW} := 6.15\ kip$ $V_{HL} := 82.80\ kip$

Applied Reaction Force $R_{DC} := 34.89\ kip$ $R_{DW} := 6.15\ kip$ $R_{HL} := 82.80\ kip$

STRENGTH Load Factors $\gamma_{DC} := 1.25$ $\gamma_{DW} := 1.50$ $\gamma_{LL} := \begin{bmatrix} 1.75 \\ 1.35 \end{bmatrix}$

Condition Resistance Reduction Factor [AASHTO MBE 6A.4.2.3]
Smooth polynomial connecting (0%, 1.00), (5%, 0.98), & (20%, 0.90)
with tangent at minimum value of 0.90

$$\phi_c(Loss) := \text{if } Loss \le 0.2 \;\; \left\| \frac{190}{9} \cdot Loss^3 - \frac{107}{18} \cdot Loss^2 - \frac{7}{45} \cdot Loss + 1 \right. \;\; \text{else} \;\; \| 0.900$$

System Redundancy Resistance Reduction Factor [AASHTO MBE 6A.4.2.4]
Regular Multi-Girder System with > 3 Girders $\phi_s := 1$

Rating Check Resistance Reduction Factors
Shear $\phi_v := 1$ Yielding $\phi_b := 1$ Crippling $\phi_w := 0.8$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G3 End
  - -- Girder Geometry

Steel Properties $E:=29000\ ksi$ Web $F_{yw}:=33\ ksi$ Flange $F_{yf}:=33\ ksi$

Web Thickness Measurements and "Weight" 33WF130
[AISC 5th, 15th Printing 1953]

t_{wm} (in)	t_{ww} (in)
0.533	9.89
0.540	$13.5 \div 2$
0.496	$8 \div 2$
0.511	$13.5 \div 2$
0.361	$8 \div 2$

Web Monolithic Steel Depth $d:=33.10\ in$
(Rolled Shape Section Depth, Plate Shape Web Depth)

Bottom Flange Thickness $t_{fb}:=0.855\ in$

Web Shear "Unbraced Depth" $D_v:=d-2 \cdot t_{fb}=31.39\ in$
(Rolled Shape Web Flat Depth, Plate Shape Web Depth)

Bottom Flange + Fillet Height $k:=1.6875\ in$

Section Original Web Thickness $t_{wo}:=0.580\ in$

Weighted Average Web Thickness $t_w:=t_{wm} \cdot \dfrac{t_{ww}}{D_v}=0.503\ in$

Thickness at Bottom of Web $t_{wb}:=\left(t_{wm_2}+t_{wm_4}\right) \div 2=0.429\ in$

Girder Extension Beyond Centerline of Bearing $ext:=5\ in$
(input zero for interior support)

Bearing Contact Length $N:=6\ in$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G3 End
  -- Web Panel Shear [AASHTO LRFD 6.10.9]

Shear-Buckling Coefficient (unstiffened) $k_v := 5$

Web Compactness

$$\lambda_v := \frac{D_v}{t_w} = 62.4 \qquad \lambda_{pv} := 1.12 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 74.2 \qquad \lambda_{rv} := 1.40 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 92.8$$

Shear-Buckling Ratio

$$C := \begin{cases} \min\left(1, \dfrac{\lambda_{pv}}{\lambda_v}\right) & \text{if } \lambda_v \le \lambda_{rv} \\ 1.57 \cdot \dfrac{E \cdot k_v}{\lambda_v^{\ 2} \cdot F_{yw}} & \text{else} \end{cases} = 1.000$$

Web Plastic Shear Strength

$$V_p := 0.58 \cdot F_{yw} \cdot d \cdot t_w = 318.8 \ \textit{kip}$$

Nominal Resistance

$$V_n := C \cdot V_p = 318.8 \ \textit{kip}$$

Section Loss based on Web Thickness

$$Loss_v := 1 - \frac{t_w}{t_{wo}} = 13.3\% \qquad \phi_{c.v} := \phi_c\left(Loss_v\right) = 0.924$$

$$V_r := \phi_{c.v} \cdot \phi_v \cdot V_n = 294.6 \ \textit{kip} \qquad RF_v := \frac{V_r - \gamma_{DC} \cdot V_{DC} - \gamma_{DW} \cdot V_{DW}}{\gamma_{LL} \cdot V_{HL}} = \begin{bmatrix} 1.67 \\ 2.16 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G3 End
  -- Web Local Yielding [AASHTO LRFD D6.5.2]

For Rating, Let Bearing Resistance be the sum of
Web Local Yielding and Stiffener Contact Stress

$$R_{ny} := \text{if } ext > d \lor ext = 0 \text{ in} \;\; \left\| (5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \right. \;\; \text{else} \;\; \left\| (2.5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \right. = 144.5 \text{ kip}$$

Section Loss based on Thickness at Base of Web

$$Loss_b := 1 - \frac{t_{wb}}{t_{wo}} = 26.1\% \qquad \phi_{c.b} := \phi_c \left(Loss_b \right) = 0.900$$

$$R_{ry} := \phi_{c.b} \cdot \phi_s \cdot \phi_b \cdot R_{ny} = 130.0 \text{ kip}$$

$$RF_b := \frac{R_{ry} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.53 \\ 0.69 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G3 End
  -- Web Local Crippling [AASHTO LRFD D6.5.3]

$$R_{nw} := \text{if } ext > \frac{d}{2} \vee ext = 0\ in$$
$$\quad 0.8 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$
$$\text{else if } \frac{N}{d} \le 0.2$$
$$\quad 0.4 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$
$$\text{else}$$
$$\quad 0.4 \cdot t_w^{\ 2} \cdot \left(1 + \left(\frac{4\ N}{d} - 0.2\right) \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$
$$= 160.8\ kip$$

Section Loss based on Web Thickness

$$Loss_w := Loss_v = 13.3\% \qquad \phi_{c.w} := \phi_c\left(Loss_w\right) = 0.924$$

$$R_{rw} := \phi_{c.w} \cdot \phi_s \cdot \phi_w \cdot R_{nw} = 118.9\ kip$$

$$RF_w := \frac{R_{rw} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.46 \\ 0.59 \end{bmatrix}$$

LaBella Powered by partnership.	PROJECT	Kensington Expressway	SHEET		OF
	PROJECT NO.	2230860	CALC. BY CSP	DATE	09/06/23
	SUBJECT	BIN 1022620 Northampton	SCALE		
	CHECKED BY	WJK 09/11/23			

Existing Girder End Section Resistance (LFR)

- Span 1 Girder G3 End

-- Lack of Bearing Stiffeners on Rolled Shapes

[AASHTO 10.48.7] Redirects all Load Factor Design for Bearing Stiffeners back to the Allowable Stress part of the Code.
[10.33.2] Stiffeners only required where end shear exceeds 75% of allowable

Translate this to LFR by letting the Strength be 75% of the Web Panel Shear

-- Applied Load and LFR Factors

Applied End Shear $V_D := V_{DC} + V_{DW} = 41.04\ \boldsymbol{kip}$ $V_{HS} := 64.48\ \boldsymbol{kip}$

LFR Load Factors $A_1 := 1.3$ $A_2 := \begin{bmatrix} 2.17 \\ 1.3 \end{bmatrix}$

-- Web Panel Shear Strength

Math setup is the same as LRFR

$V_u := V_n = 318.8\ \boldsymbol{kip}$ $75\% \cdot V_u = 239.1\ \boldsymbol{kip}$

$$RF_{HS} := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_{HS}} = \begin{bmatrix} 1.33 \\ 2.22 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 2 Girder G2 Begin
  -- Applied Load and LRFR Factors

Assumptions & Limitations of this Worksheet
Girder not Longitudinally Stiffened
Girder not Transversely Stiffened
No Bearing Stiffeners

Span 2 Girder G2 Begin is the location with the most section loss

Applied End Shear $V_{DC} := 34.92\ \mathbf{kip}$ $V_{DW} := 7.29\ \mathbf{kip}$ $V_{HL} := 86.00\ \mathbf{kip}$

Applied Reaction Force $R_{DC} := 34.92\ \mathbf{kip}$ $R_{DW} := 7.29\ \mathbf{kip}$ $R_{HL} := 86.00\ \mathbf{kip}$

STRENGTH Load Factors $\gamma_{DC} := 1.25$ $\gamma_{DW} := 1.50$ $\gamma_{LL} := \begin{bmatrix} 1.75 \\ 1.35 \end{bmatrix}$

Condition Resistance Reduction Factor [AASHTO MBE 6A.4.2.3]
Smooth polynomial connecting (0%, 1.00), (5%, 0.98), & (20%, 0.90)
with tangent at minimum value of 0.90

$$\phi_c(Loss) := \begin{cases} \dfrac{190}{9} \cdot Loss^3 - \dfrac{107}{18} \cdot Loss^2 - \dfrac{7}{45} \cdot Loss + 1 & \text{if } Loss \le 0.2 \\ 0.900 & \text{else} \end{cases}$$

System Redundancy Resistance Reduction Factor [AASHTO MBE 6A.4.2.4]
Regular Multi-Girder System with > 3 Girders $\phi_s := 1$

Rating Check Resistance Reduction Factors
Shear $\phi_v := 1$ Yielding $\phi_b := 1$ Crippling $\phi_w := 0.8$

Existing Girder End Section Resistance (LRFR)

- Span 2 Girder G2 Begin
  -- Girder Geometry

Steel Properties $E:=29000\ ksi$ Web $F_{yw}:=33\ ksi$ Flange $F_{yf}:=33\ ksi$

Web Thickness Measurements and "Weight" 33WF130 [AISC 5th, 15th Printing 1953]

t_{wm} (in)	t_{ww} (in)
0.528	11.89
0.525	$12.25 \div 2$
0.373	$7.25 \div 2$
0.428	$12.25 \div 2$
0.245	$7.25 \div 2$

Web Monolithic Steel Depth $d:=33.10\ in$
(Rolled Shape Section Depth, Plate Shape Web Depth)

Bottom Flange Thickness $t_{fb}:=0.855\ in$

Web Shear "Unbraced Depth" $D_v:=d-2 \cdot t_{fb}=31.39\ in$
(Rolled Shape Web Flat Depth, Plate Shape Web Depth)

Bottom Flange + Fillet Height $k:=1.6875\ in$

Section Original Web Thickness $t_{wo}:=0.580\ in$

Weighted Average Web Thickness $t_w:=t_{wm} \cdot \frac{t_{ww}}{D_v}=0.457\ in$

Thickness at Bottom of Web $t_{wb}:=\left(t_{wm_2}+t_{wm_4}\right) \div 2=0.309\ in$

Girder Extension Beyond Centerline of Bearing $ext:=5\ in$
(input zero for interior support)

Bearing Contact Length $N:=6\ in$

PROJECT Kensington Expressway SHEET ____ OF ____

PROJECT NO. 2230860 CALC. BY CSP DATE 09/06/23

SUBJECT BIN 1022620 Northampton SCALE ________

CHECKED BY WJK 09/11/23

Existing Girder End Section Resistance (LRFR)

- Span 2 Girder G2 Begin
  -- Web Panel Shear [AASHTO LRFD 6.10.9]

Shear-Buckling Coefficient (unstiffened) $k_v := 5$

Web Compactness

$$\lambda_v := \frac{D_v}{t_w} = 68.6 \qquad \lambda_{pv} := 1.12 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 74.2 \qquad \lambda_{rv} := 1.40 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 92.8$$

Shear-Buckling Ratio

$$C := \text{if } \lambda_v \le \lambda_{rv} \;\; \left\| \min\left(1, \frac{\lambda_{pv}}{\lambda_v}\right) \right. \;\; \text{else} \;\; \left\| 1.57 \cdot \frac{E \cdot k_v}{{\lambda_v}^2 \cdot F_{yw}} \right. = 1.000$$

Web Plastic Shear Strength

$$V_p := 0.58 \cdot F_{yw} \cdot d \cdot t_w = 289.7 \; \textit{kip}$$

Nominal Resistance

$$V_n := C \cdot V_p = 289.7 \; \textit{kip}$$

Section Loss based on Web Thickness

$$Loss_v := 1 - \frac{t_w}{t_{wo}} = 21.2\% \qquad \phi_{c.v} := \phi_c\left(Loss_v\right) = 0.900$$

$$V_r := \phi_{c.v} \cdot \phi_v \cdot V_n = 260.8 \; \textit{kip} \qquad RF_v := \frac{V_r - \gamma_{DC} \cdot V_{DC} - \gamma_{DW} \cdot V_{DW}}{\gamma_{LL} \cdot V_{HL}} = \begin{bmatrix} 1.37 \\ 1.78 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 2 Girder G2 Begin
  -- Web Local Yielding [AASHTO LRFD D6.5.2]

For Rating, Let Bearing Resistance be the sum of
Web Local Yielding and Stiffener Contact Stress

$$R_{ny} := \text{if } ext > d \vee ext = 0 \textbf{ in} \quad \begin{cases} (5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \\ \text{else} \\ (2.5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \end{cases} = 104.2 \textbf{ kip}$$

Section Loss based on Thickness at Base of Web

$$Loss_b := 1 - \frac{t_{wb}}{t_{wo}} = 46.7\% \qquad \phi_{c.b} := \phi_c \left(Loss_b\right) = 0.900$$

$$R_{ry} := \phi_{c.b} \cdot \phi_s \cdot \phi_b \cdot R_{ny} = 93.8 \textbf{ kip}$$

$$RF_b := \frac{R_{ry} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.26 \\ 0.34 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 2 Girder G2 Begin
  -- Web Local Crippling [AASHTO LRFD D6.5.3]

$$R_{nw} := \text{if } ext > \frac{d}{2} \vee ext = 0\ in$$
$$\left\| 0.8 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$
$$\text{else if } \frac{N}{d} \le 0.2$$
$$\left\| 0.4 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$
$$\text{else}$$
$$\left\| 0.4 \cdot t_w^{\ 2} \cdot \left(1 + \left(\frac{4\ N}{d} - 0.2\right) \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}} \right.$$
$$= 135.7\ kip$$

Section Loss based on Web Thickness

$$Loss_w := Loss_v = 21.2\% \qquad \phi_{c.w} := \phi_c \left(Loss_w\right) = 0.900$$

$$R_{rw} := \phi_{c.w} \cdot \phi_s \cdot \phi_w \cdot R_{nw} = 97.7\ kip$$

$$RF_w := \frac{R_{rw} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.29 \\ 0.37 \end{bmatrix}$$

Existing Girder End Section Resistance (LFR)

- Span 2 Girder G2 Begin

-- Lack of Bearing Stiffeners on Rolled Shapes

[AASHTO 10.48.7] Redirects all Load Factor Design for Bearing Stiffeners back to the Allowable Stress part of the Code.
[10.33.2] Stiffeners only required where end shear exceeds 75% of allowable

Translate this to LFR by letting the Strength be 75% of the Web Panel Shear

-- Applied Load and LFR Factors

Applied End Shear $V_D := V_{DC} + V_{DW} = 42.21\ \textbf{kip}$ $V_{HS} := 58.12\ \textbf{kip}$

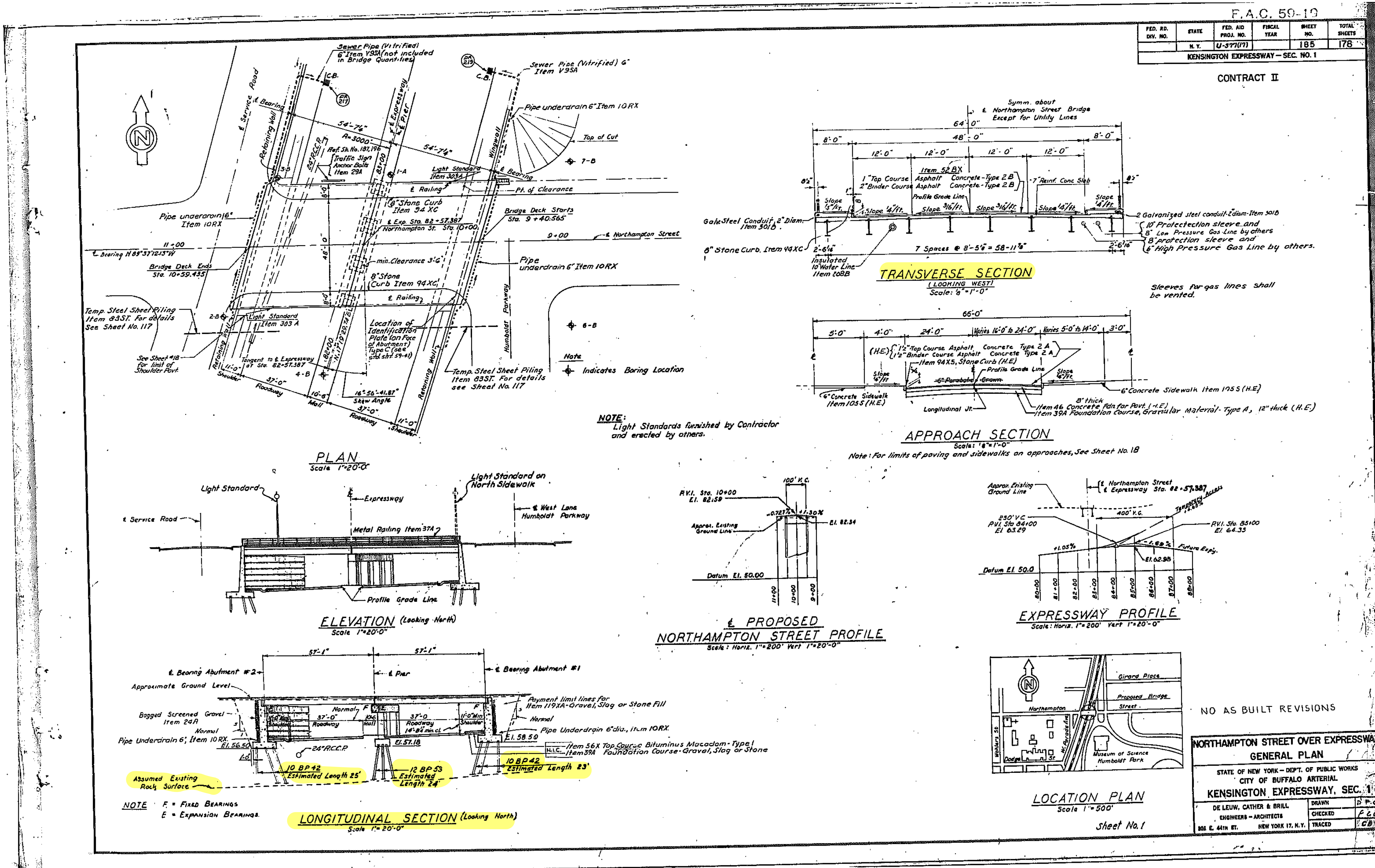
LFR Load Factors $A_1 := 1.3$ $A_2 := \begin{bmatrix} 2.17 \\ 1.3 \end{bmatrix}$

-- Web Panel Shear Strength

Math setup is the same as LRFR

$V_u := V_n = 289.7\ \textbf{kip}$ $75\% \cdot V_u = 217.3\ \textbf{kip}$

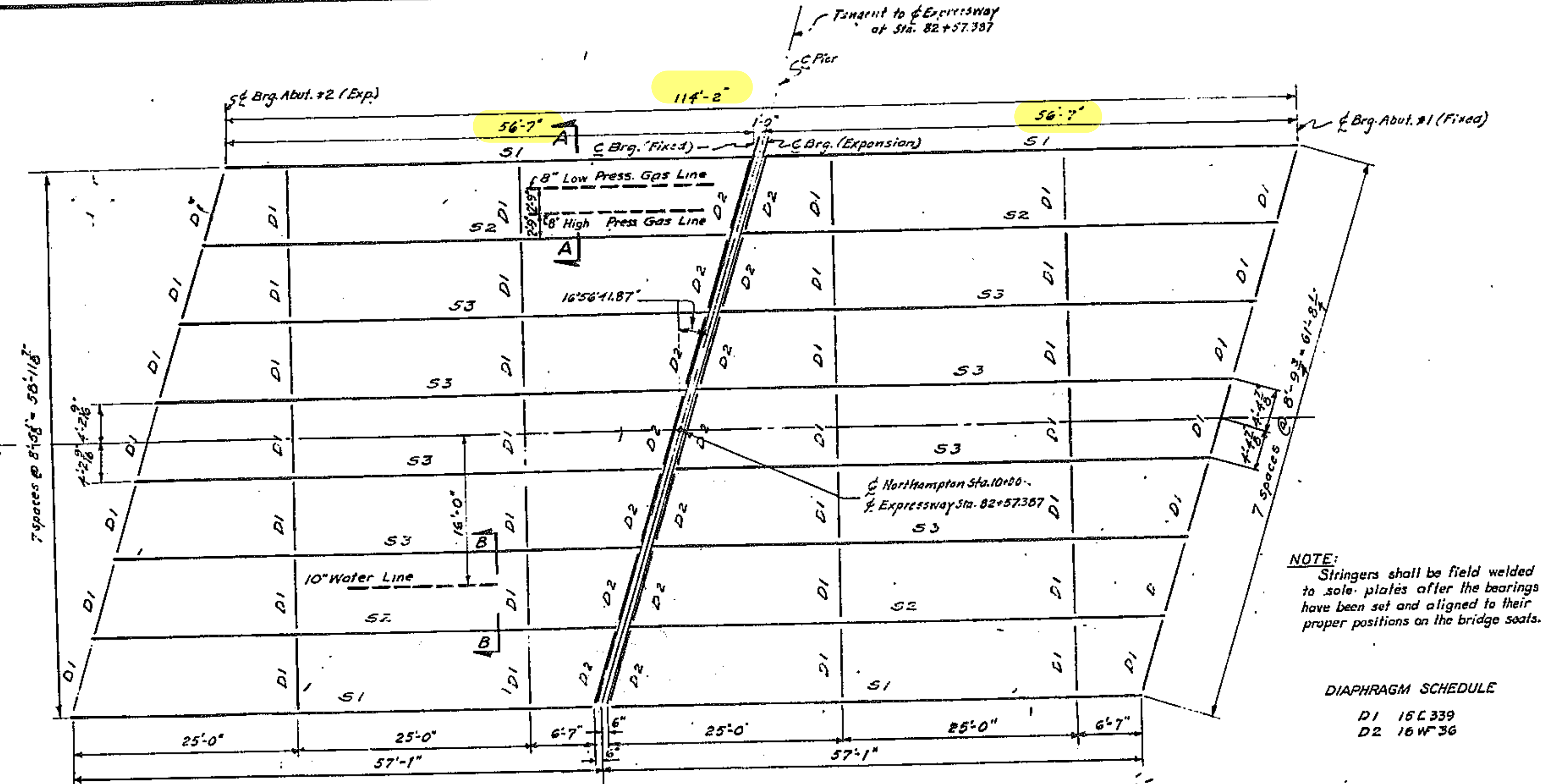
$$RF_{HS} := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_{HS}} = \begin{bmatrix} 1.29 \\ 2.15 \end{bmatrix}$$


F.A.C. 59-19
FED. RD. DIV. NO.
STATE
FED. AID PROJ. NO.
FISCAL YEAR
SHEET NO.
TOTAL SHEETS
N.Y.
U-377(17)
185
178
KENSINGTON EXPRESSWAY — SEC. NO. 1
CONTRACT II
PLAN
Scale 1"=20'-0"
TRANSVERSE SECTION
(LOOKING WEST)
Scale: 1/8"=1'-0"
Symm. about ℄ Northampton Street Bridge Except for Utility Lines
7 Spaces @ 8'-5⅛" = 58'-11⅞"
Sleeves for gas lines shall be vented.
APPROACH SECTION
Note: For limits of paving and sidewalks on approaches, See Sheet No. 18
NOTE: Light Standards furnished by Contractor and erected by others.
Note
Indicates Boring Location
ELEVATION (Looking North)
Scale 1"=20'-0"
℄ PROPOSED NORTHAMPTON STREET PROFILE
Scale: Horiz. 1"=200' Vert 1"=20'-0"
EXPRESSWAY PROFILE
Scale: Horiz. 1"=200' Vert 1"=20'-0"
LONGITUDINAL SECTION (Looking North)
Scale 1"=20'-0"
Assumed Existing Rock Surface
10 BP 42 Estimated Length 25'
12 BP 53 Estimated Length 24'
10 BP 42 Estimated Length 23'
NOTE F = FIXED BEARINGS
E = EXPANSION BEARINGS
LOCATION PLAN
Scale 1"=500'
Sheet No. 1
NO AS BUILT REVISIONS
NORTHAMPTON STREET OVER EXPRESSWAY
GENERAL PLAN
STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1
DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
NEW YORK 17, N.Y.
DRAWN
CHECKED
TRACED

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		186	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II



NOTE: Stringers shall be field welded to sole plates after the bearings have been set and aligned to their proper positions on the bridge seats.

DIAPHRAGM SCHEDULE

D1 15 C 33.9
D2 16 WF 36

FRAMING PLAN

Scale: ⅛" = 1'-0"

** Splices ordered are for either size of piles.

ESTIMATE OF QUANTITIES

ITEM	DESCRIPTION	UNIT	TOTAL NEAT	TOTAL ROUNDED	FINAL
5	Trench, Culvert and Bridge Excavation	C.Y.	505	530	280
V95A	Sewer Pipe (Vitrified) 6" Dia.	L.F.	15	15	0
10RX	Pipe Underdrain, Opt. 6" Dia.	L.F.	180	185	179
*15-2	Portland Cement Type 2	Bbl.	1465	1670	1613
18S	Class 1A Concrete for Structures	C.Y.	330	755	329
20S	Class 1 Concrete	C.Y.	698	720	683
24R	Bagged Screened Gravel	C.Y.	112	115	107
28RA	Bar Reinforcement for Structures	Lb.	92,719	95,500	89,003
28A	Spiral Bar Shear Connectors	Lb.	2,654	2,780	2716
29A	Structural Steel	Lb.	166505	171,500	170,205
37A	Metal Railing	L.F.	229	235	231
52BX	Asphalt Concrete, Type 2B	Ton	109	115	100
61	Bituminous Material	Gal.	131	140	77
361	Protective Coating for Concrete	Gal.	114	120	64
85-1	Steel Bearing Piles (10" BP42)	L.F.	2,013	2,120	2013
85-2	Steel Bearing Piles (12" BP53)	L.F.	480	500	480
** 85A	Splices for Steel Bearing Piles	Ea.	35	37	0
87	Furnishing Equipment for Driving Piles	L.S.	Nec.	Nec.	0
94XC	8" Stone Curb (Bridge)	L.F.	243	255	239
119XA	Gravel, Slag or Stone Fill	C.Y.	368	370	897
13A	Cast Iron Pipe (6" DIAM.)	L.F.	—	—	18
301B	Furnish and Install 2" Galvanized Steel Conduit	L.F.	360	380	355
303A	Furnish Light Standard Type A (25' Mount. H'gt)	Ea.	2	2	2
305	Miscellaneous Metals	Lb.	266	270	229
351X	Joint Sealing Compound	Gal.	9	9	9
513	Surface Dusting with Fine Aggregate	S.Y.	634	640	635
83ST	Temporary Steel Sheet Piling	S.F.	1500	1,575	0

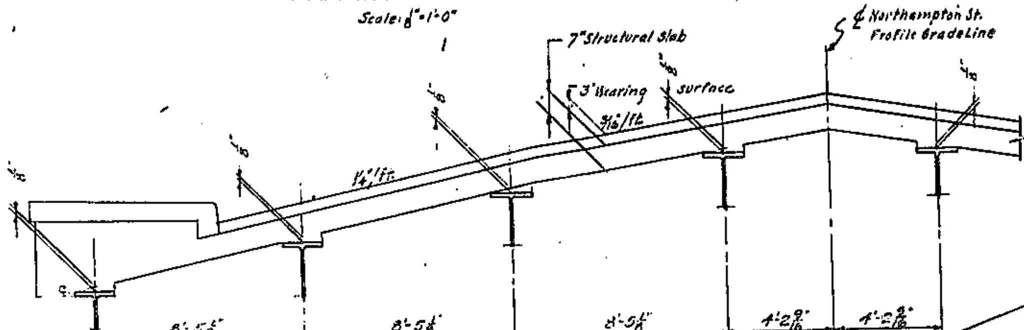
* With Darex A.E.A. Added

STRINGER SCHEDULE

STRINGER			Bot. Cover ℙ		SPIRAL SHEAR CONNECTORS									CAMBER		
					Section L-1			Section L-2			Section L-3					
Mk.	Amount	Size	Size	Length	L-1	Pitch	A-1	L-2	Pitch	A-2	L-3	Pitch	A-3	Dead Load	Vert. Curve	Total
S1	4	33WF130	14"×½"	42'-0"	9'-7½"	5¾"	4½"	10'-6"	9"	4½"	7'-6"	18"	5"	1½"	1"	2½"
S2	4	33WF130	16"×11/16"	42'-0"	10'-0"	4"	3"	10'-0"	6"	3"	7'-11"	9½"	3"	1"	1"	2"
S3	8	33WF130	16"×¾"	42'-0"	10'-3¾"	3¾"	3"	10'-0¾"	5¾"	3"	7'-6"	9"	4"	15/16"	1"	1 15/16"

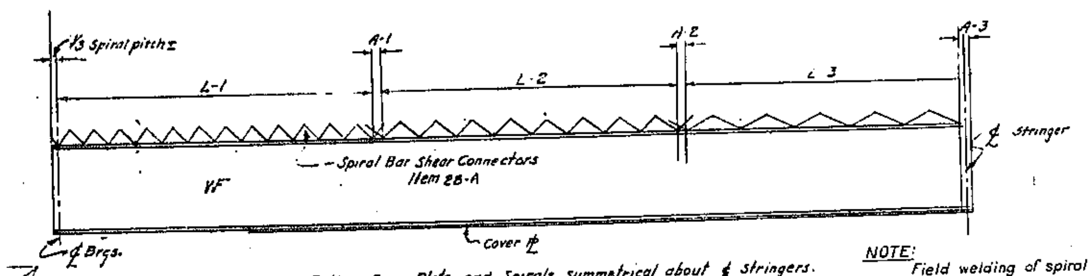
Note: Camber of beam to be measured with beam lying on its side.

Note:
Insulation shall be glass fiber pipe insulation in one piece molded sections 2" thick, as mfgd. by Gustin-Bacon Mfg. Co., or equal.
Pipe insulation to be furnished with vapor barrier jacket of tough Kraft foil laminate.
Jacketed pipe insulation shall be covered with Aluminum weather-proof jacketing as mfgd. by Childers Mfg. Co., or equal.



DIAGRAMMATIC SECTION

Not to Scale

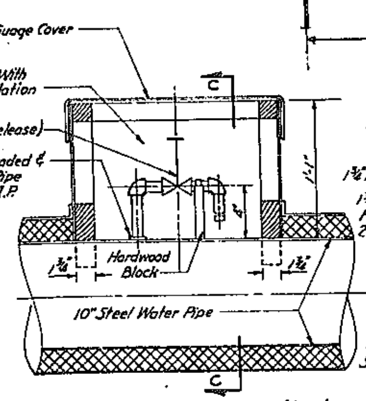


Bottom Cover Plate and Spirals symmetrical about ℄ Stringers.

NOTE: Field welding of spiral reinforcement will not be permitted.

STRINGER DETAILS

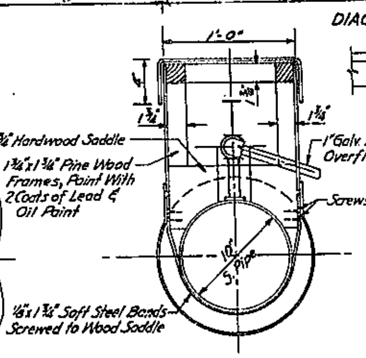
Not to scale



SECTION

Scale 1½" = 1'-0"

Air release valve & valve box to be located at high point of exposed water line under structure.

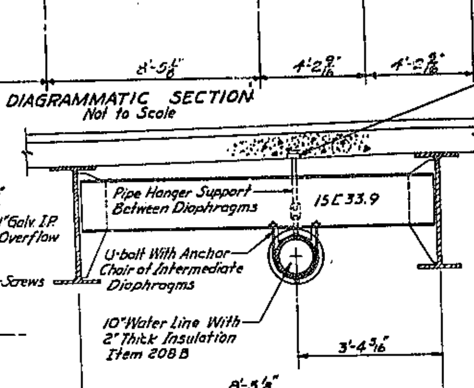


SECTION C-C

Scale 1½" = 1'-0"

DETAIL OF AIR RELEASE VALVE & VALVE BOX

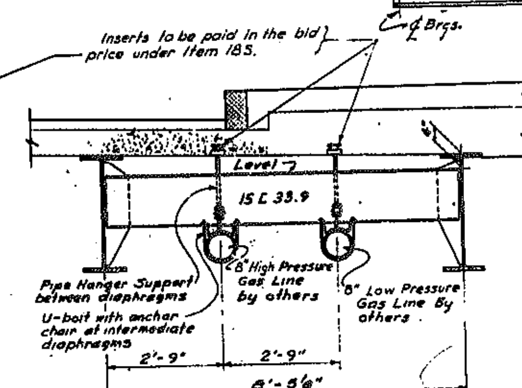
Inserts to be paid in the bid price under Item 185.



SECTION B-B

Scale ½" = 1'-0"

(Intermediate Diaphragms Only)



SECTION A-A

Scale ½" = 1'-0"

(Intermediate Diaphragms only)

Sheet No. 2

FINAL QUANTITY REVISION

NORTHAMPTON STREET OVER EXPRESSWAY
FRAMING PLAN

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

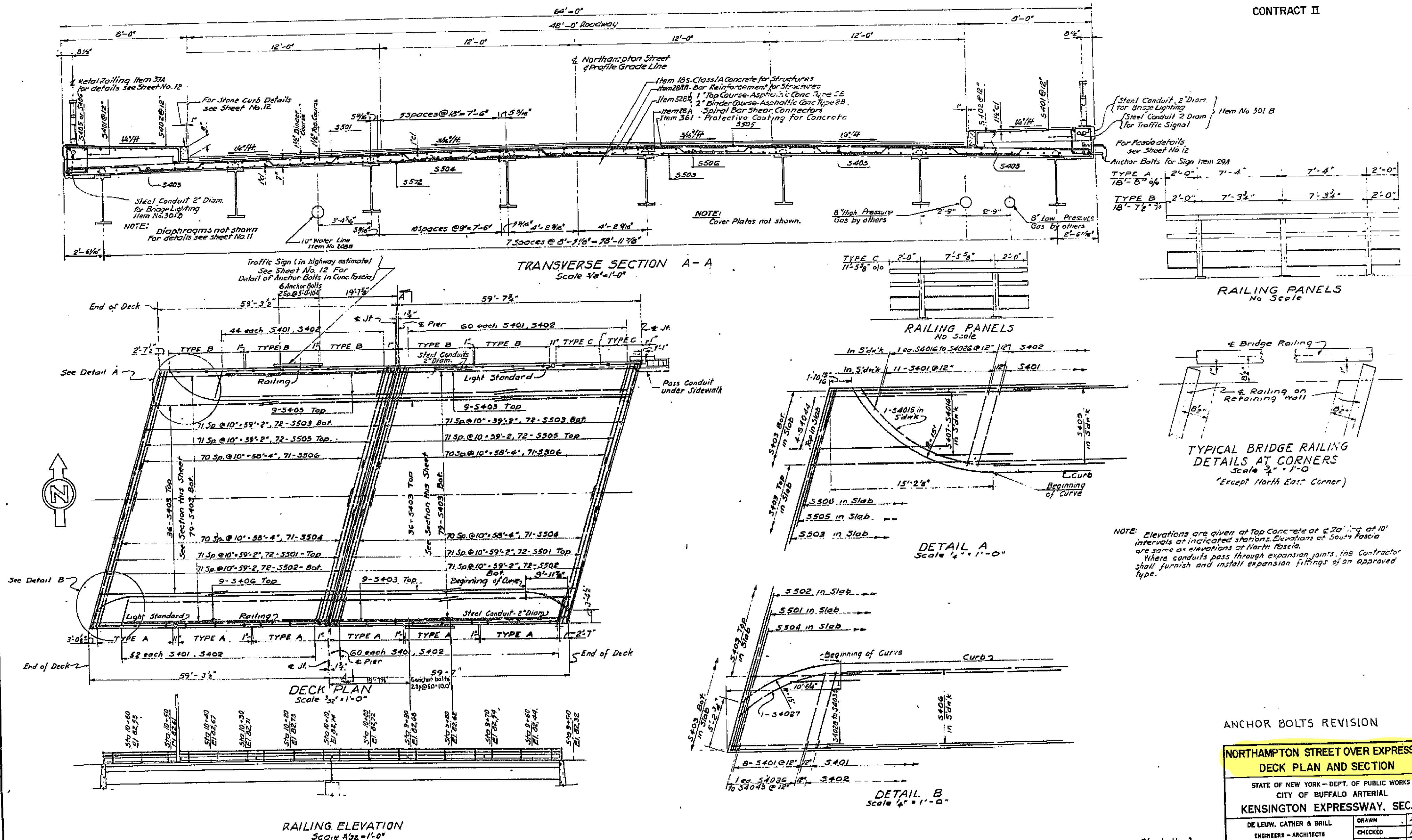
DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	V.B.C.
CHECKED	R.C.F.
TRACED	C.B.

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		187	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II



NOTE: Elevations are given at Top Concrete at ℄ Railing at 10' intervals at indicated stations. Elevations at South Fascia are same as elevations at North Fascia.
Where conduits pass through expansion joints, the Contractor shall furnish and install expansion fittings of an approved type.

ANCHOR BOLTS REVISION

Sheet No. 3

NORTHAMPTON STREET OVER EXPRESSWAY
DECK PLAN AND SECTION

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
302 E. 44TH ST. NEW YORK 17, N. Y.

DRAWN	A.L.
CHECKED	F.C.
TRACED	CB

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		188	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II

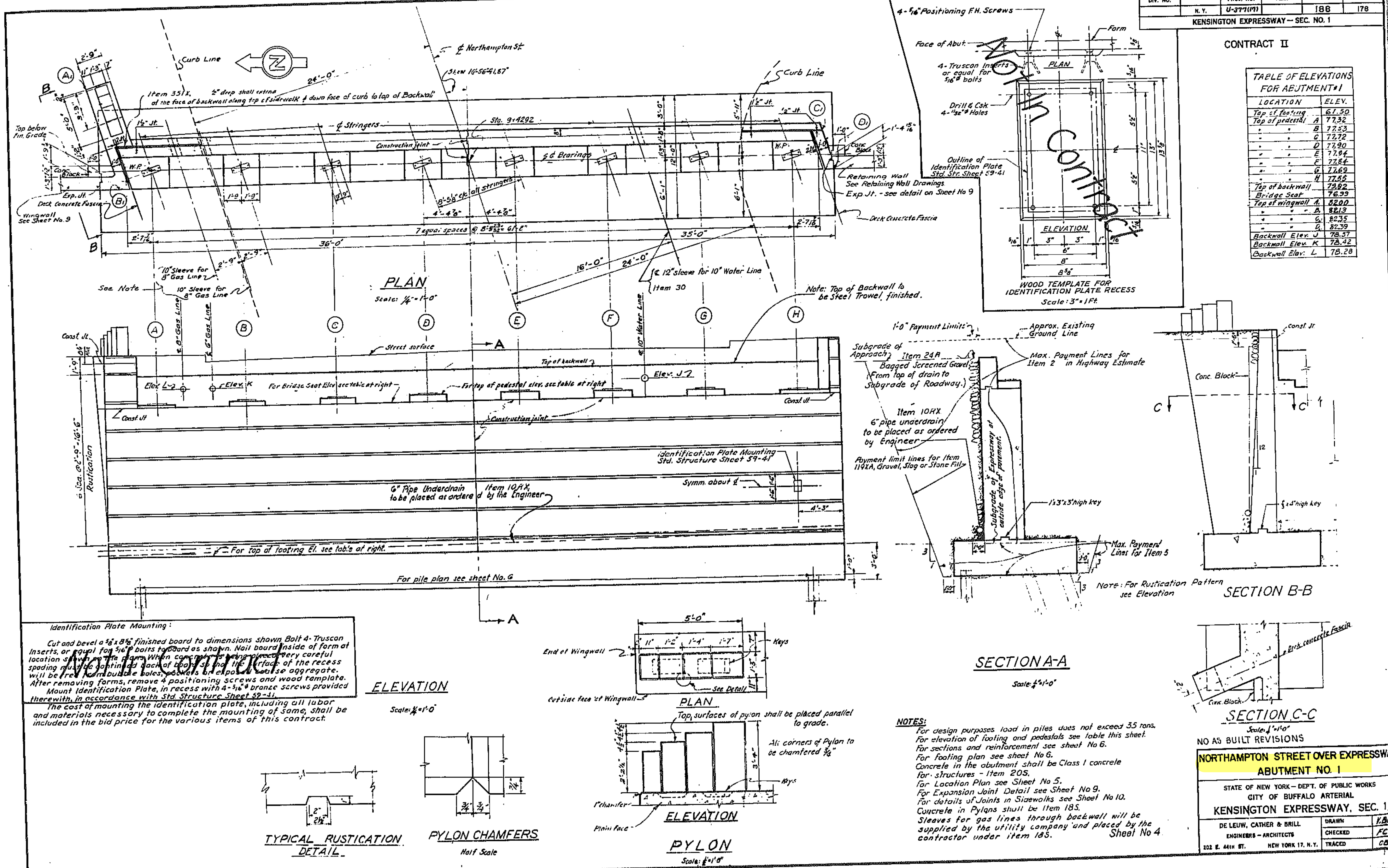


TABLE OF ELEVATIONS FOR ABUTMENT #1	
LOCATION	ELEV.
Top of footing	61.50
Top of pedestal A	77.32
" " B	77.53
" " C	77.72
" " D	77.90
" " E	77.94
" " F	77.84
" " G	77.69
" " H	77.55
Top of backwall	79.82
Bridge Seat	76.99
Top of wingwall A₁	82.00
" " B₁	82.13
" " C₁	82.35
" " D₁	82.39
Backwall Elev. J	78.57
Backwall Elev. K	78.42
Backwall Elev. L	78.28

Identification Plate Mounting:

Cut and bevel a 5/8" x 8 5/8" finished board to dimensions shown. Bolt 4-Truscon Inserts, or equal for 5/16" ∅ bolts to board as shown. Nail board inside of form at location shown on the plans. When concrete is being placed very careful spading must be continued back of board so that the surface of the recess will be free from bubble holes, pockets or exposed course aggregate. After removing forms, remove 4 positioning screws and wood template.

Mount Identification Plate, in recess with 4-5/16" ∅ bronze screws provided therewith, in accordance with Std. Structure Sheet 59-41.

The cost of mounting the identification plate, including all labor and materials necessary to complete the mounting of same, shall be included in the bid price for the various items of this contract.

Not in Contract

NOTES:

For design purposes load in piles does not exceed 35 tons.
For elevation of footing and pedestals see table this sheet.
For sections and reinforcement see sheet No 6.
For footing plan see sheet No 6.
Concrete in the abutment shall be Class I concrete for structures - Item 205.
For Location Plan see Sheet No 5.
For Expansion Joint Detail see Sheet No 9.
For details of Joints in Sidewalks see Sheet No 10.
Concrete in Pylons shall be Item 185.
Sleeves for gas lines through backwall will be supplied by the utility company and placed by the contractor under item 185.

Sheet No 4

NO AS BUILT REVISIONS

NORTHAMPTON STREET OVER EXPRESSWAY
ABUTMENT NO. 1

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1.

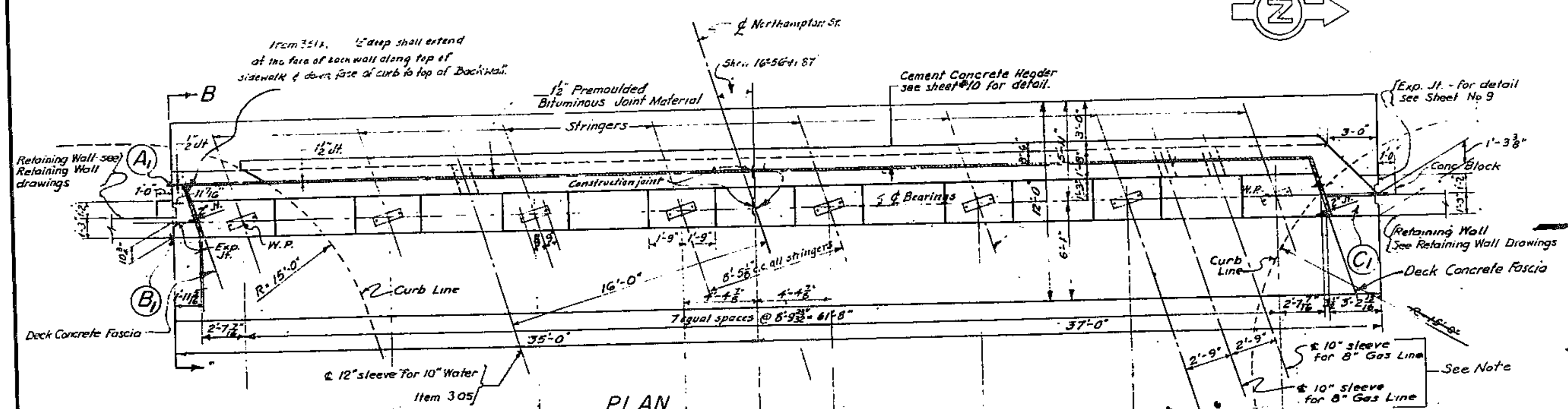
DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	I.B.C.
CHECKED	F.C.C.
TRACED	C.B.

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N.Y.	U-377(17)		189	178

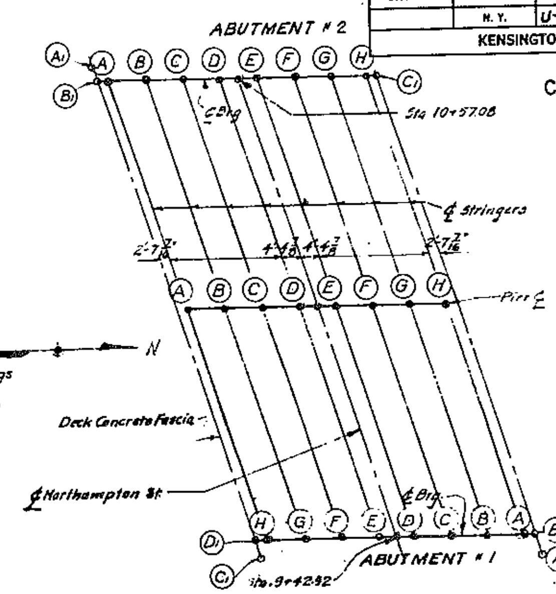
KENSINGTON EXPRESSWAY – SEC. NO. 1

CONTRACT II



PLAN

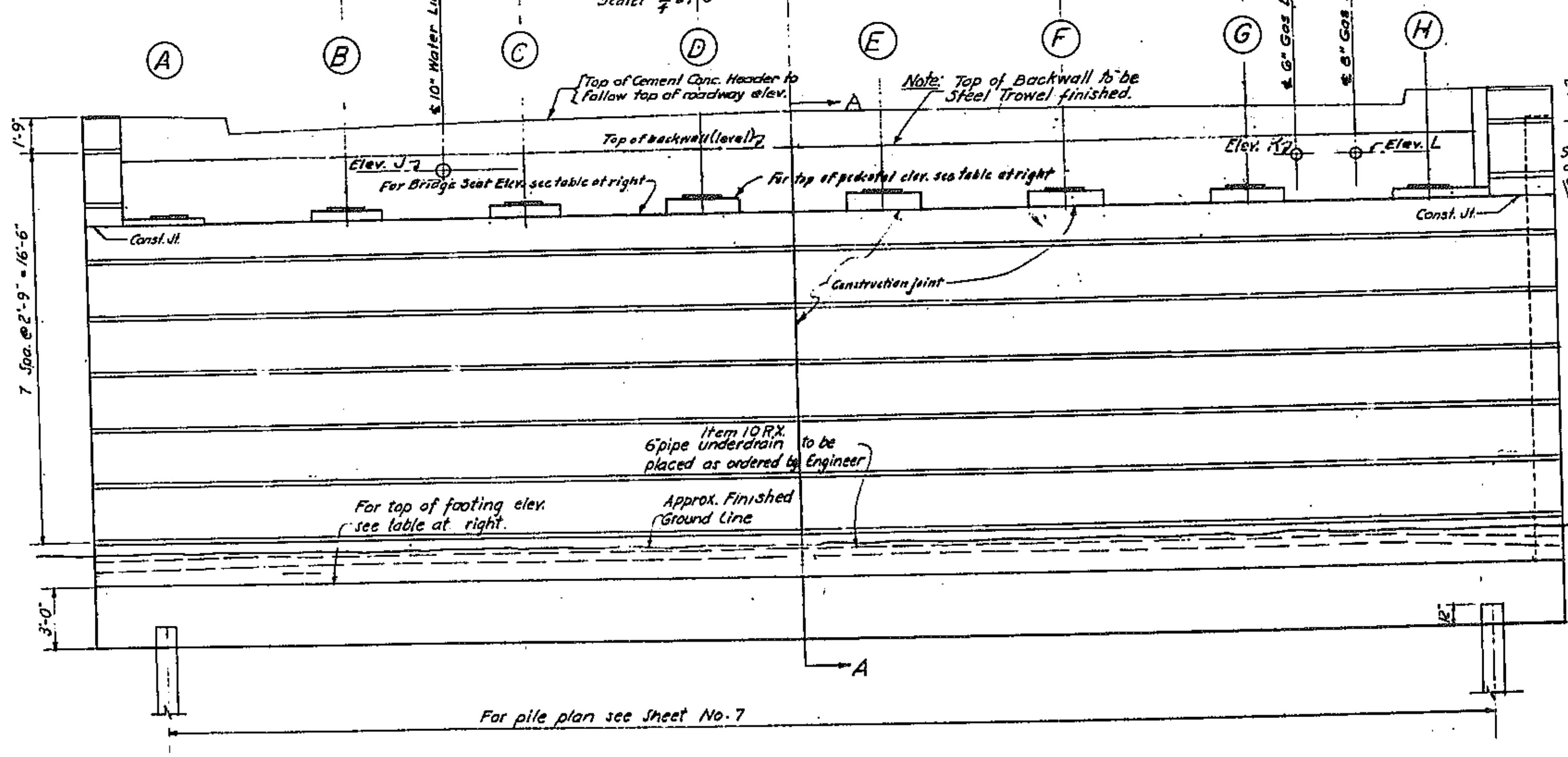
Scale: ⅛"=1'-0"



LOCATION PLAN

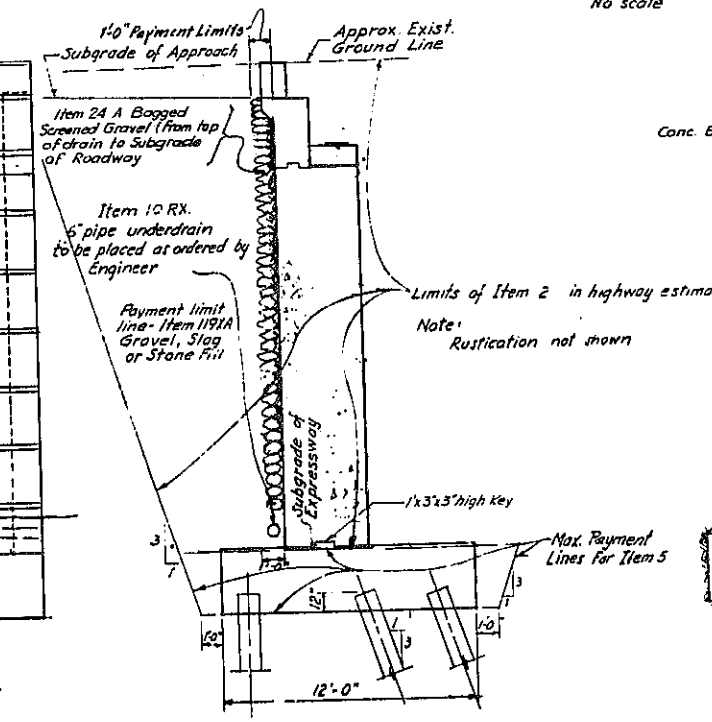
No scale

TABLE OF ELEVATIONS FOR ABUTMENT No2		
LOCATION		ELEV.
Top of footing		59.50
Top of pedestal	A	77.59
" "	B	77.77
" "	C	77.96
" "	D	78.11
" "	E	78.13
" "	F	78.02
" "	G	77.86
" "	H	77.70
Top of backwall		80.29
Bridge Seat		77.24
Top of Curtain Wall	A_1	82.48
" " "	B_1	82.51
" " "	C_1	82.65
Backwall Elev.	J	78.79
" "	K	78.94
" "	L	78.80



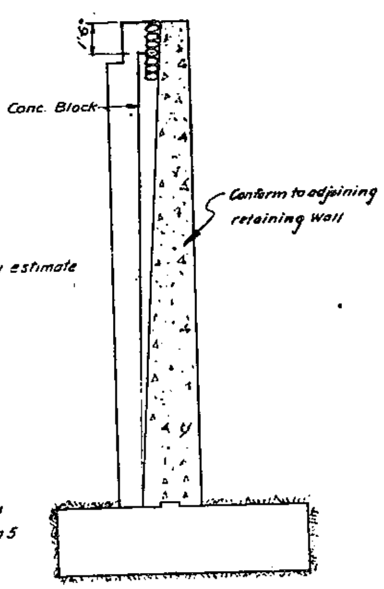
ELEVATION

Scale: ¼"=1'-0"



SECTION A-A

Scale: ¼"=1'-0"



SECTION B-B

Scale: ¼"=1'-0"

NO AS BUILT REVISIONS

Notes

For design purposes, load on piles does not exceed 35 tons
For elevation of footing and pedestals, see table this sheet.
For sections and reinforcement, see Sheet No. 7.
For footing plan see Sheet No. 7.
Concrete in the abutment shall be Class 1 concrete for structures – Item 205.
For Expansion Joint Details, see Sheet No. 9.
For details of joints in sidewalks, see Sheet No. 10.
Sleeves for gas lines through backwall will be supplied by the utility company and placed by the contractor under item 185.

Sheet No. 5

NORTHAMPTON STREET OVER EXPRESSWAY
ABUTMENT NO. 2

STATE OF NEW YORK – DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

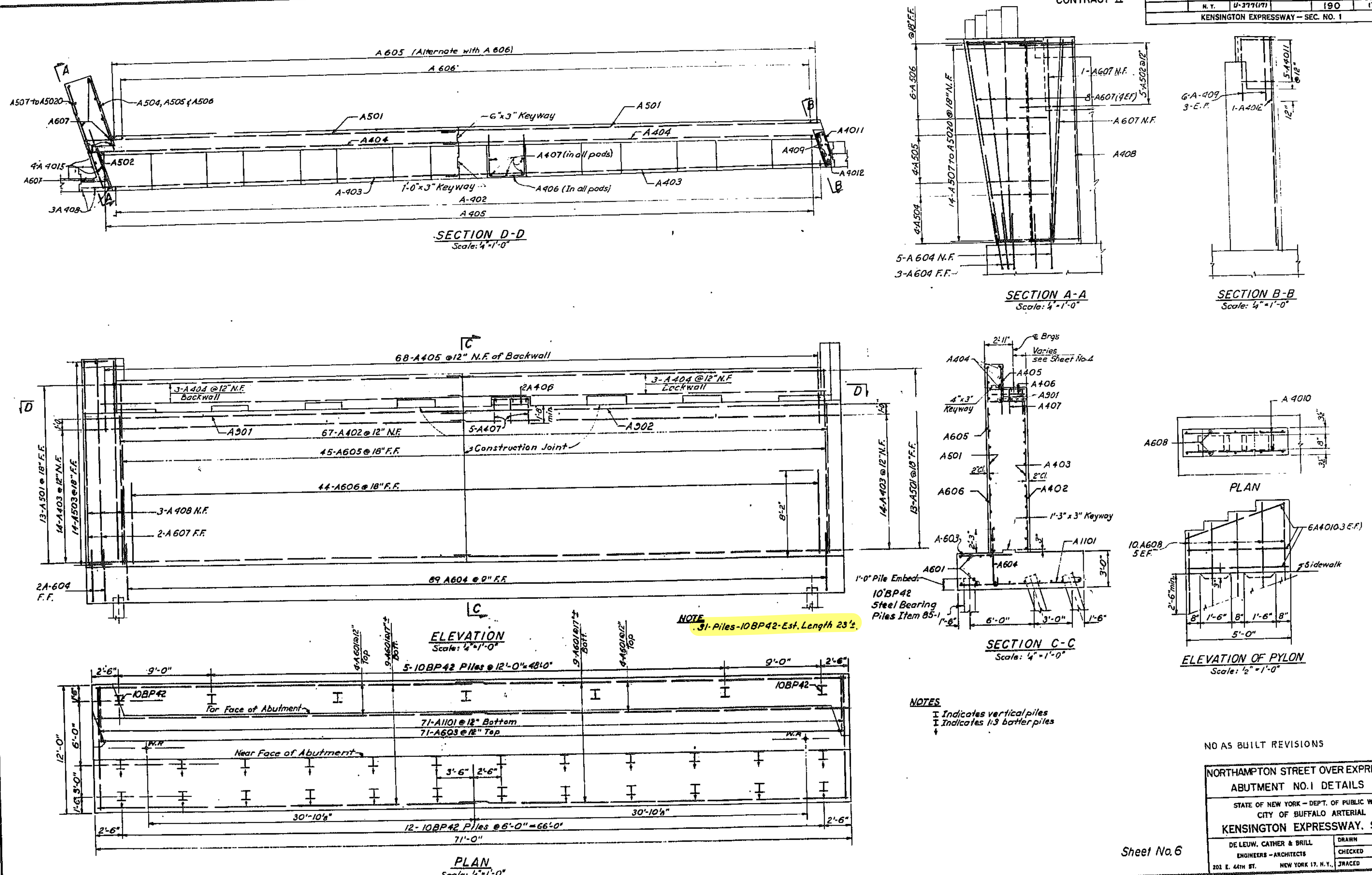
DE LEUW, CATHER & BRILL
ENGINEERS – ARCHITECTS
302 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	VBG
CHECKED	FCC
TRACED	CB

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		190	178

KENSINGTON EXPRESSWAY – SEC. NO. 1

CONTRACT II



NOTE
31-Piles-10BP42-Est. Length 23'±.

NOTES
I Indicates vertical piles
I Indicates 1:3 batter piles

NO AS BUILT REVISIONS

Sheet No. 6

NORTHAMPTON STREET OVER EXPRESSWAY
ABUTMENT NO. 1 DETAILS

STATE OF NEW YORK – DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

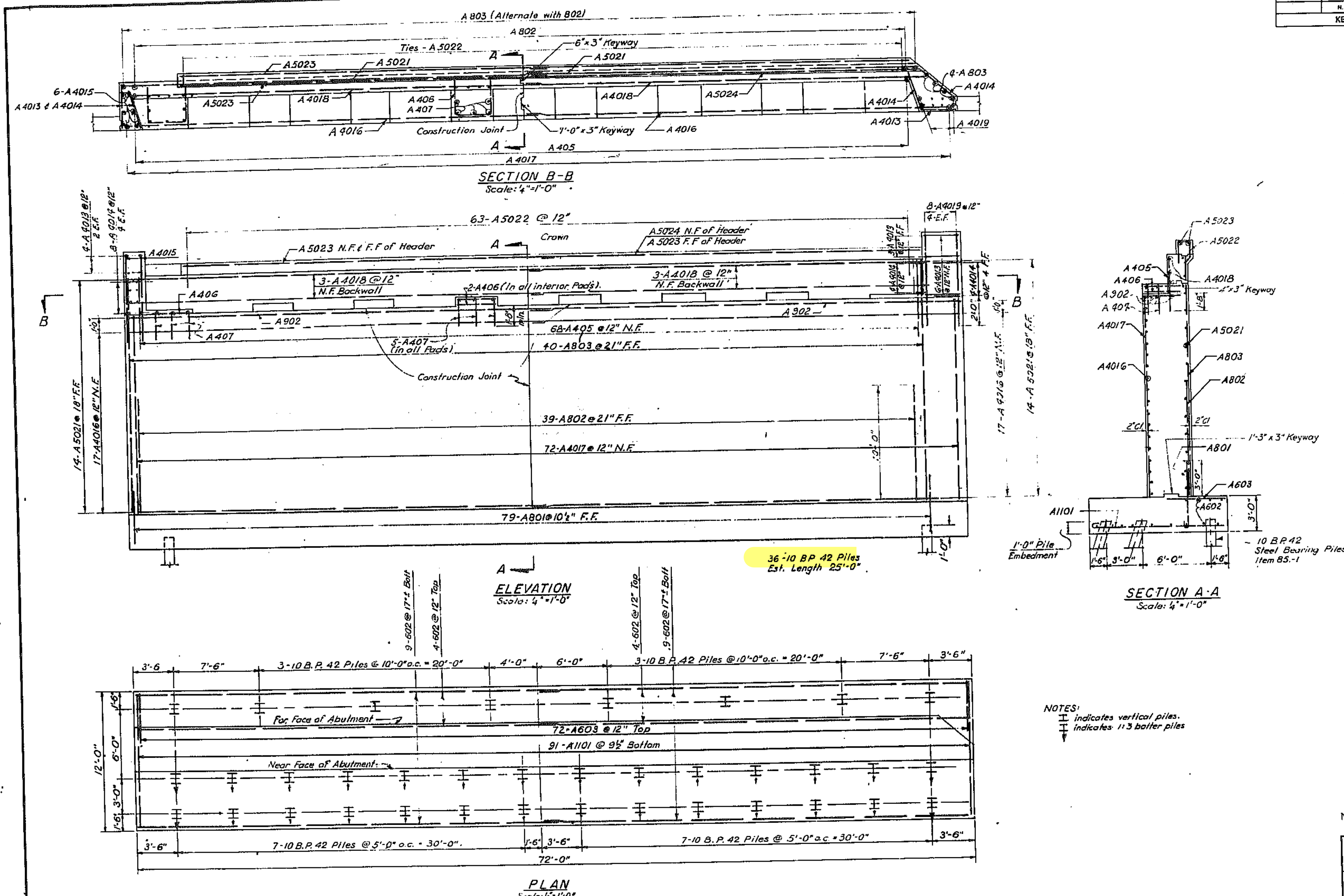
DE LEUW, CATHER & BRILL
ENGINEERS – ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	KC
CHECKED	J.M.
TRACED	CB

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		191	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II



NOTES:
ⵊ indicates vertical piles.
ⵊ indicates 1:3 batter piles

NO AS BUILT REVISIONS

Sheet No.7

NORTHAMPTON STREET OVER EXPRESSWAY
ABUTMENT NO. 2 DETAILS

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	KC
CHECKED	J.M.
TRACED	CB

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		192	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II

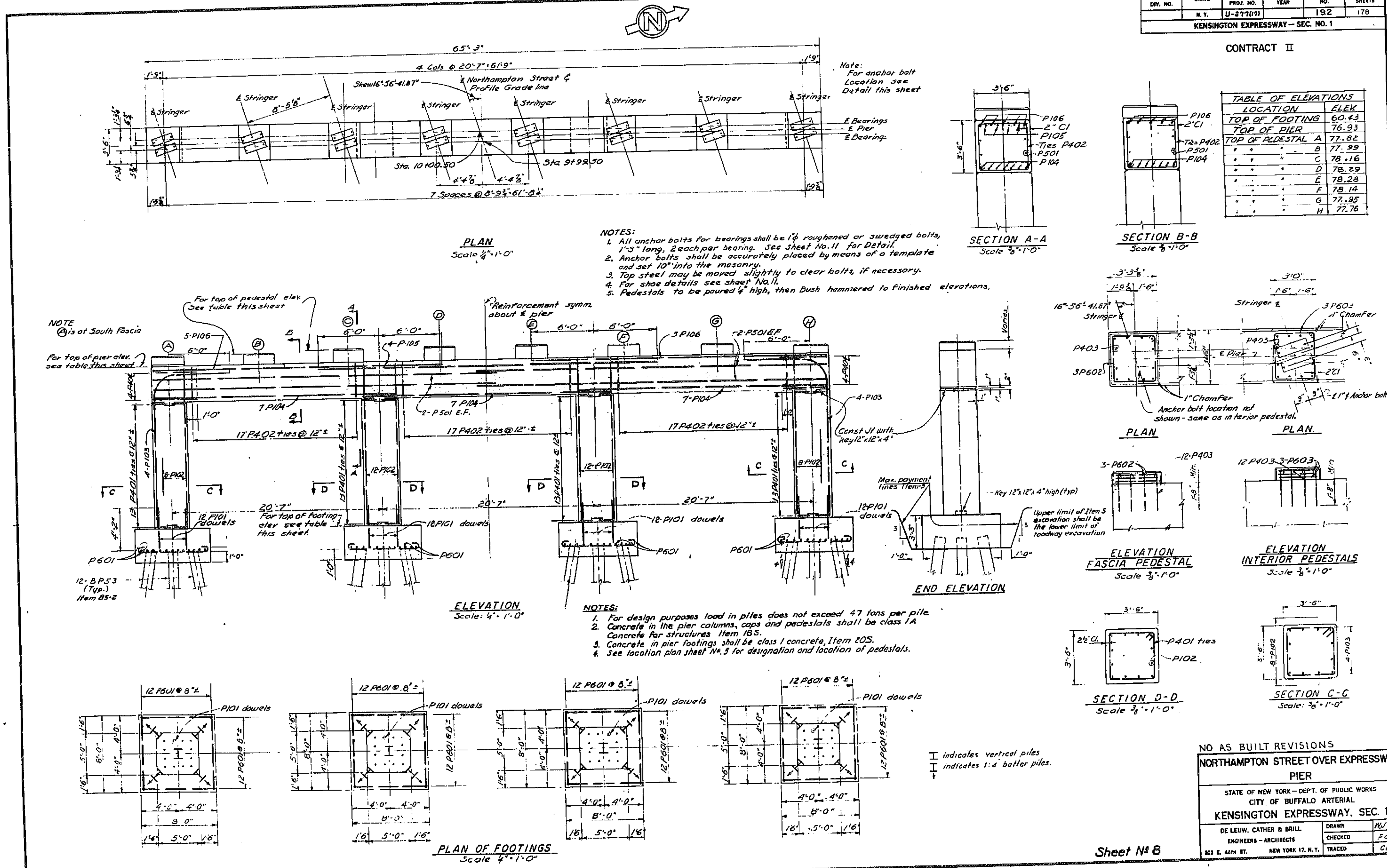


TABLE OF ELEVATIONS		
LOCATION		ELEV.
TOP OF FOOTING		60.43
TOP OF PIER		76.93
TOP OF PEDESTAL	A	77.82
" " "	B	77.99
" " "	C	78.16
" " "	D	78.29
" " "	E	78.28
" " "	F	78.14
" " "	G	77.95
" " "	H	77.76

NOTES:

1. All anchor bolts for bearings shall be 1½ roughened or swedged bolts, 1'-3" long, 2 each per bearing. See Sheet No. 11 for Detail.
2. Anchor bolts shall be accurately placed by means of a template and set 10" into the masonry.
3. Top steel may be moved slightly to clear bolts, if necessary.
4. For shoe details see sheet No. 11.
5. Pedestals to be poured ¼" high, then Bush hammered to finished elevations.

NOTES:

1. For design purposes load in piles does not exceed 47 tons per pile.
2. Concrete in the pier columns, caps and pedestals shall be class IA Concrete for structures Item 18S.
3. Concrete in pier footings shall be class I concrete, Item 20S.
4. See location plan sheet No. 5 for designation and location of pedestals.

NO AS BUILT REVISIONS

NORTHAMPTON STREET OVER EXPRESSWAY
PIER

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
303 E. 44TH ST. NEW YORK 17, N.Y.

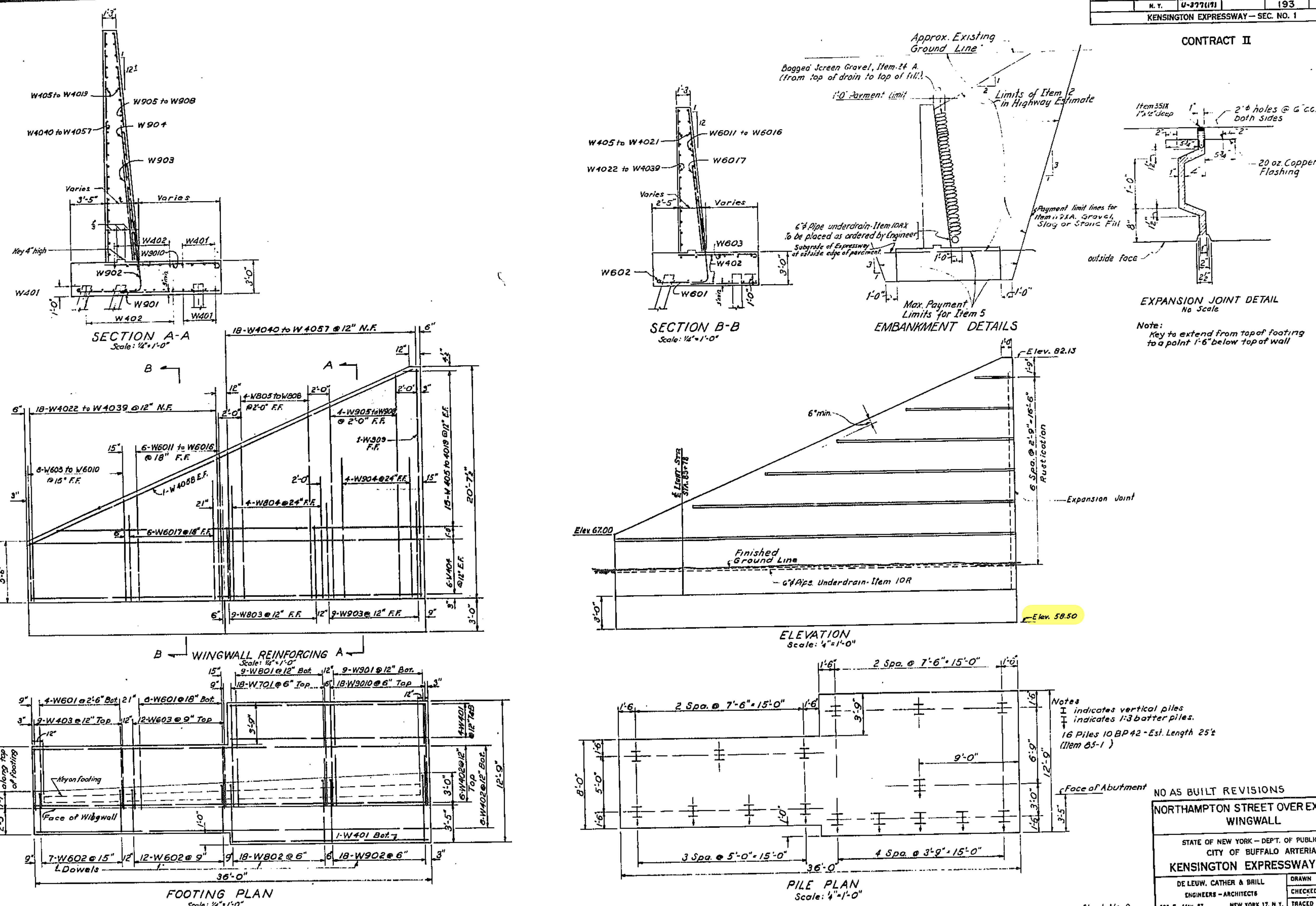
DRAWN	W.J.S.
CHECKED	F.C.C.
TRACED	C.B.

Sheet No 8

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		193	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II



NO AS BUILT REVISIONS

NORTHAMPTON STREET OVER EXPRESSWAY
WINGWALL

STATE OF NEW YORK — DEP'T. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS – ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N. Y.

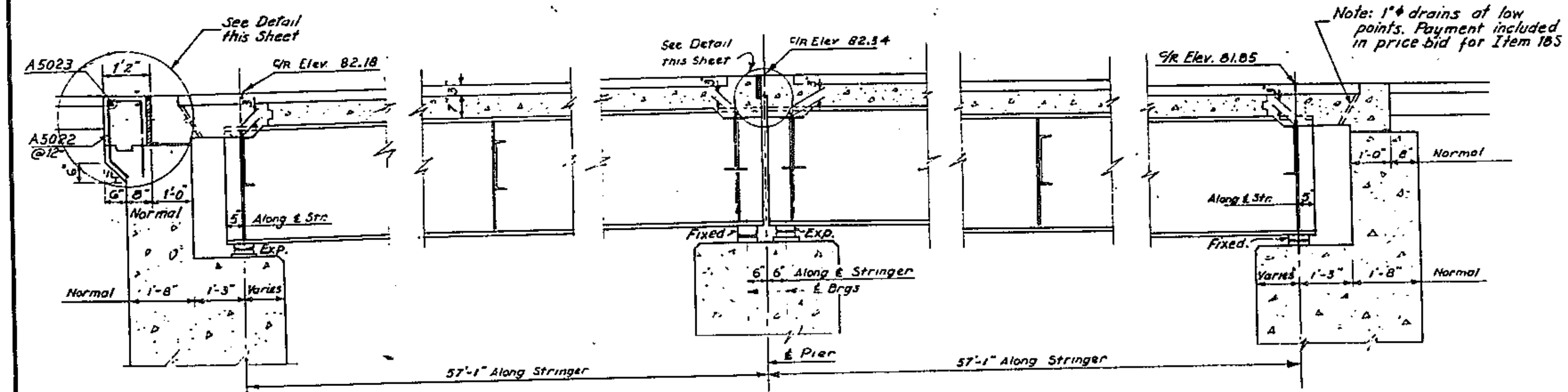
DRAWN	K.C.
CHECKED	H.H.
TRACED	C.B.

Sheet No. 9

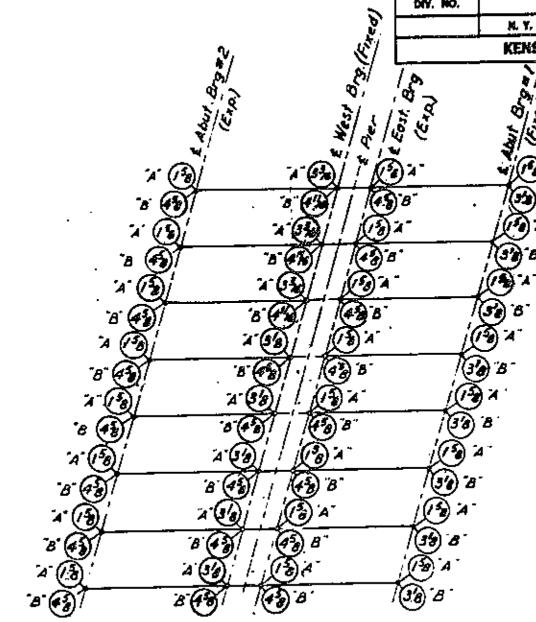
FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		194	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

CONTRACT II

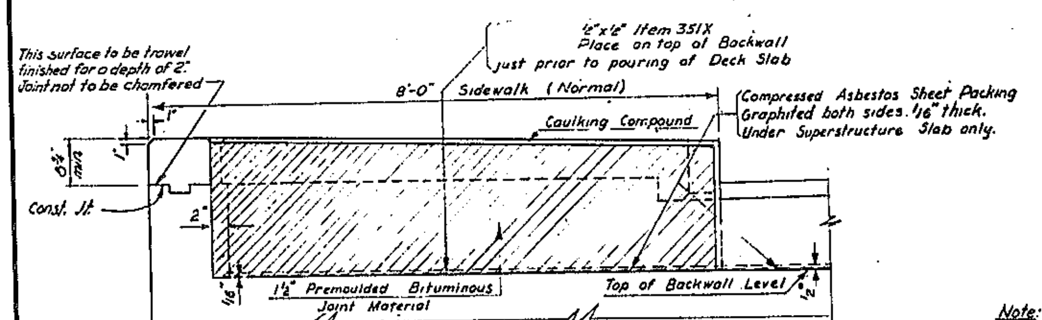


LONGITUDINAL SECTION ALONG PROFILE GRADE LINE (Looking North)
Scale: 1/2" = 1'-0"

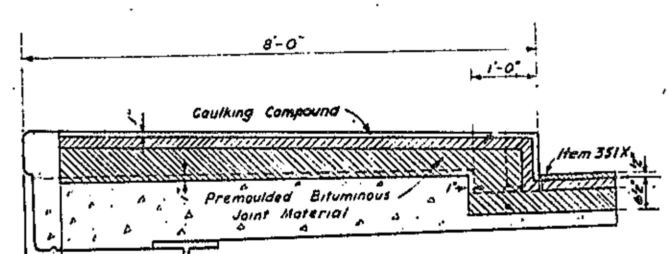


A is thickness of Sole Plate
B is total thickness of Shoe.

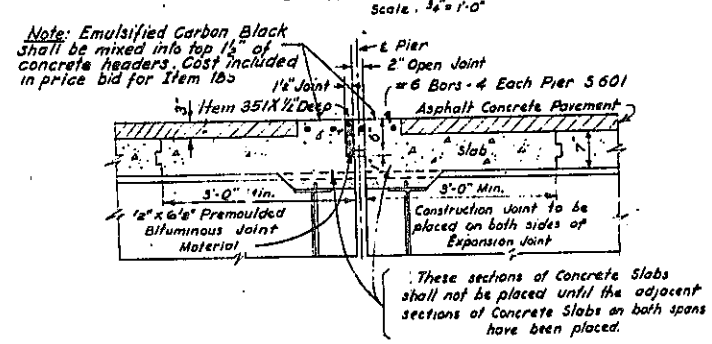
KEY PLAN FOR BEARING DIMENSIONS
Not to Scale



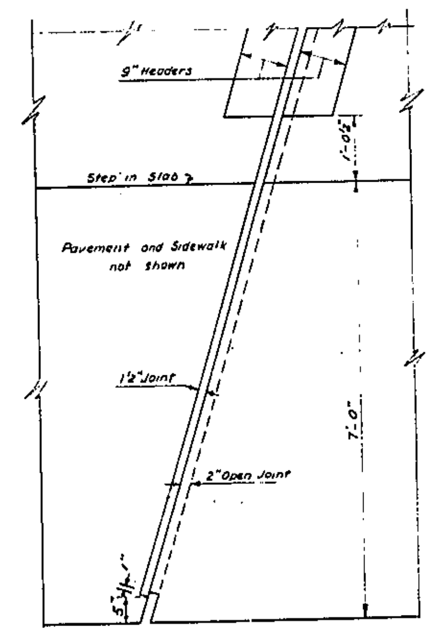
TRANSVERSE SECTION ALONG JOINT (North East Corner)
Scale: 3/4" = 1'-0"
Other corners similar except as shown in plan on Abut. sheets No. 4 and No. 5



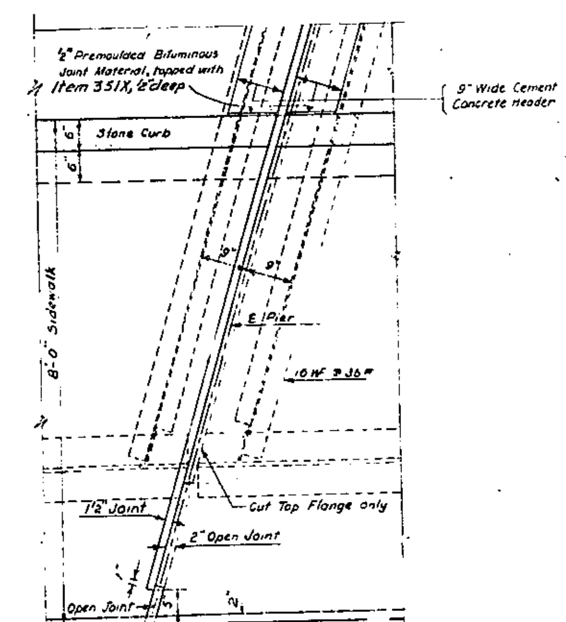
TRANSVERSE SECTION AT FASCIA (along Joint)
Scale: 3/4" = 1'-0"



LONGITUDINAL SECTION
Scale: 3/4" = 1'-0"

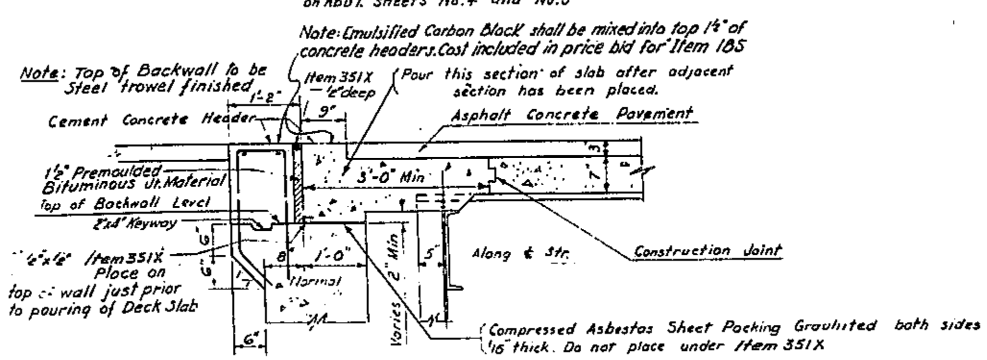


PARTIAL PLAN TOP OF SLAB
Scale: 3/4" = 1'-0"



PARTIAL PLAN
Scale: 3/4" = 1'-0"

JOINT AT PIER



LONGITUDINAL SECTION THRU ROADWAY
Scale: 3/4" = 1'-0"

JOINT AT EXPANSION ABUTMENT

NO AS BUILT REVISIONS

NORTHAMPTON STREET OVER EXPRESSWAY
LONGITUDINAL SECTION AND DETAILS

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

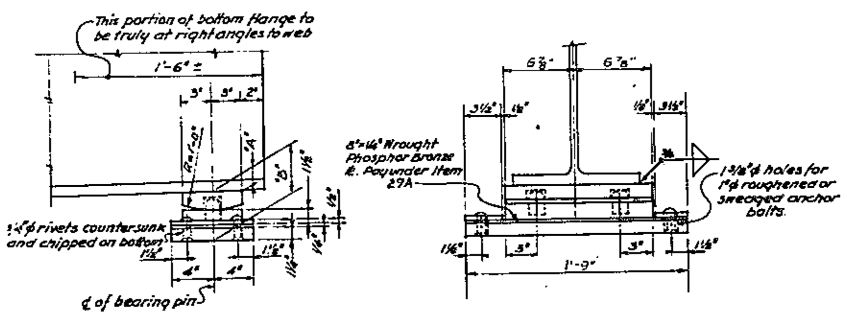
DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
302 E. 44TH ST. NEW YORK 17, N. Y.

DRAWN	F.C.C.
CHECKED	F.C.C.
TRACED	C.B.

Sheet No. 10

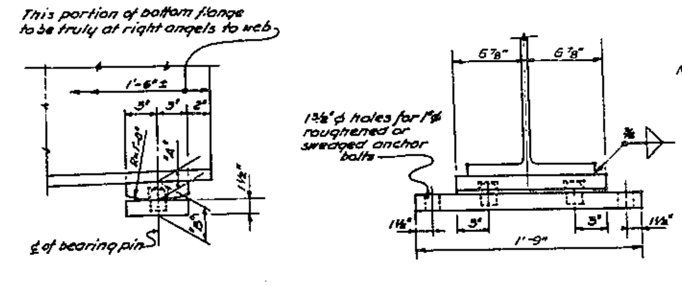
FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		195	178
KENSINGTON EXPRESSWAY — SEC. NO. 1					

CONTRACT II



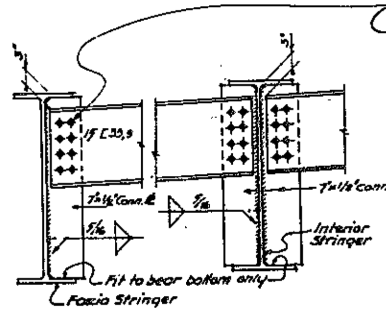
EXPANSION BEARING.
Scale 1½" = 1'-0"

NOTE: Anchor bolts shall be accurately placed by means of a template and set 10" into masonry.

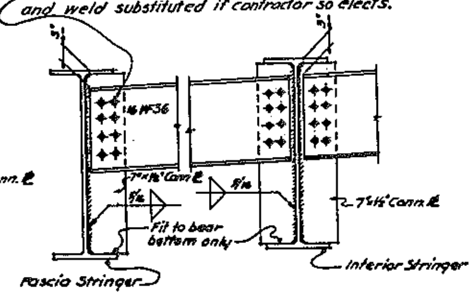


FIXED BEARING
Scale 1½" = 1'-0"

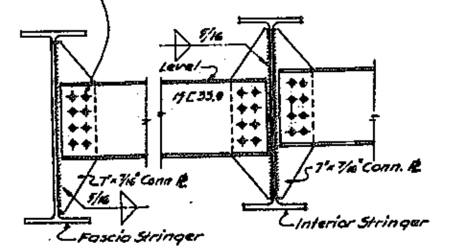
Holes for ⅞ ϕ high strength bolts or rivets. Holes and bolts may be omitted and weld substituted if contractor so elects.



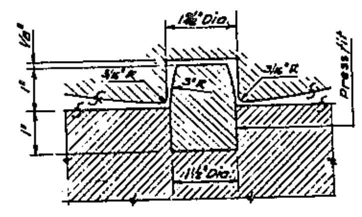
END DIAPHRAGMS AT ABUTMENTS
Scale ¾" = 1'-0"



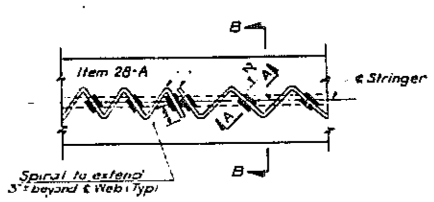
END DIAPHRAGMS AT PIERS
Scale ¾" = 1'-0"



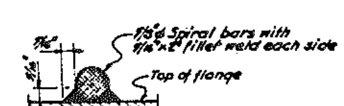
INTERMEDIATE DIAPHRAGMS
Scale ¾" = 1'-0"



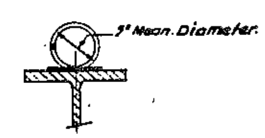
SECTION THRU DOWEL
Scale 6" = 1'-0"



PLAN
Scale: 6" = 1'-0"



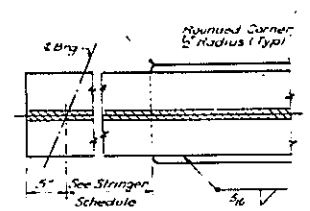
SECTION A-A
Half Size



SECTION B-B
Scale 1" = 1'-0"

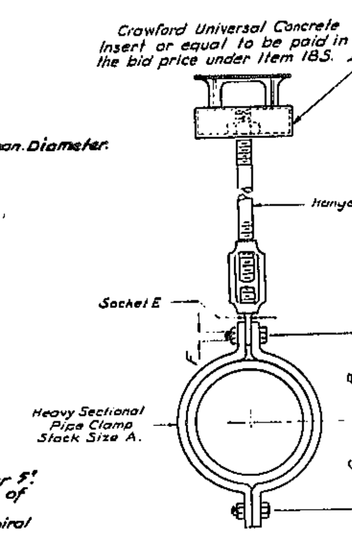
SPIRAL DETAILS

NOTE:
All spirals shall be ⅝" ϕ plain bars with mean diameter 5".
All spirals shall have two structural welds at each point of contact with beam, one weld each side of rod.
5/32" or 3/16" diameter electrodes shall be used in welding the spiral Bar Shear Connectors.
At the end of beam the spiral shall project about one third of the pitch beyond the end weld.
The Contractor's attention is called to the possibility of interference between the reinforcing steel in the slab and the beam spirals. To avoid this interference the bar spacings may be varied 1"± with the understanding that the required area of steel will be placed in each 7"±. Even then, some bars will have to be threaded thru one or more spirals.

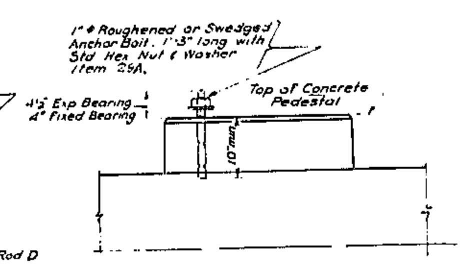


COVER PLATE DETAILS
Scale: 1" = 1'-0"

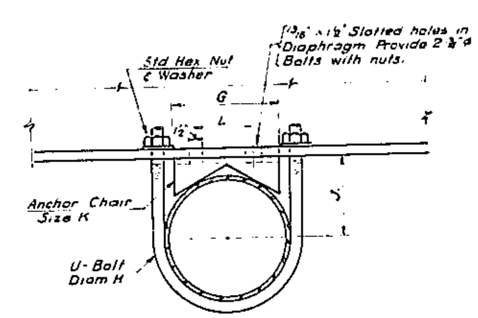
NOTE: Special precautions must be exercised where welding crosses edge of flange to avoid any possibility of "undercut" or nicks in edge of flange.



PIPE HANGER WITH TURNBUCKLE & INSERT
Scale: 3" = 1'-0"



ANCHOR BOLT DETAIL
(TYPICAL)
Not to scale



ANCHOR CHAIR WITH U-BOLT
Scale: 3" = 1'-0"

GENERAL NOTES

DESIGN SPECIFICATIONS: A.A.S.H.O. 1953 modified - loading H 20-S16-44.

MATERIALS & FABRICATION: Specifications of New York State Department of Public Works, dated Jan 2, 1957 and current modifications and additions.

The cost of furnishing and installing, premoulded bituminous joint material, asbestos sheet packing and 15 lbs asphalt roofing felt shall be included in the prices bid for the various items in the contract.

Joint Sealing Compound shall be paid for under item 351X.

Bituminous material, Item 61, shall be applied to the backs of all abutments and wingwalls from the tops of footings to the bottom of pavement.

When the concrete is cured, finished and (if ordered) rubbed, and the surface is clean and dry, the contractor shall apply a water soluble silicone solution to all exposed surfaces except the underside of slab

Item 208B in highway estimate.

No construction joints other than those shown on the plans will be permitted, without written permission of the Deputy Chief Engineer Bridges.

Field connections shall be made with ⅞" high strength bolts or rivets. Holes and bolts may be omitted and weld substituted if contractor so elects.

Shop paint: Red lead and oil. First field coat to be battleship gray paint. Second field coat to be gray green paint. Spiral bar reinforcement, top flange of stringers and top flange of end channels are not to be painted.

To insure uniform grades for surface of roadway and side-walks under dead load, corrections may be made in the thickness of wearing surface of roadway and side-walks. The minimum thickness indicated is to be increased at the ends of the spans in case of excessive camber in the beams and increased at the center of the span in case of insufficient camber.

Identification plates in accordance with N.Y.S.D.P.W. Standard 59-41 will be furnished by New York State Department of Public Works and shall be installed by the Contractor at locations indicated on the plans.

The Contractor's attention is directed to the special notes for this structure which appear in the proposal. Particular attention should be given to the substructure notes which briefly outline the anticipated structure conditions at the site of the structure and which specify certain requirements relative to construction.

All welding shall comply with the current Specifications of the American Welding Society unless otherwise noted on the plans and with the exception noted below.

Bridge sidewalks shall not be scored.

Surface of bridge seats be poured ¼" higher than elevation specified and bush hammered to exact elevation.

All cement used in the concrete items for the structure shall be Portland Cement, Type 2, with Darex A.E.A. Air Entraining Agent added.

Darex A.E.A. in its concentrated form shall be added to the aggregate and cement batch with the water in the mixer at the beginning of the mixing period. The concrete mixer shall be equipped with an approved Darex A.E.A. dispenser. The amount of Darex A.E.A. to be added shall be of such a quantity as to insure a controlled air entrainment within the range of 3% minimum and 6% maximum (with the desired average between 4½% and 5%) to the satisfaction of the Engineer.

The cost of furnishing and adding the Darex A.E.A. and all labor and equipment necessary to control the air entrainment will be included in the unit price bid for the concrete Items.

All superstructure concrete and all concrete in pier columns, caps, pedestals, and wingwalls shall be Item 18S. Pylon concrete shall be Item 18S.

All concrete in abutments including wingwall footings, and pier column footings shall be Item 20S.

A retarding densifier shall be used in Item 18S and 20S.

Size of pipe sleeves and size and type of hangers shall be verified with the Iroquois Gas Corp. or Division of Water of the City of Buffalo before fabrication of diaphragms. See sheet No. 140 for additional note.

PIPE SUPPORT DIMENSIONS

PIPE SIZE	A	B	C	D	E	F	G	H	J	K	L
8"	½"×2"	6 5/16"	5¾"	¾"	1"	¾"	7"	⅝"	5½"	4" Cor.L	4½"
10"	½"×2"	7⅜"	6⅞"	¾"	1"	¾"	8"	⅝"	6½"	4" Cor.L	5½"

NO AS BUILT REVISIONS

Sheet No 11

NORTHAMPTON STREET OVER EXPRESSWAY
DIAPHRAGM DETAILS AND SHOES

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

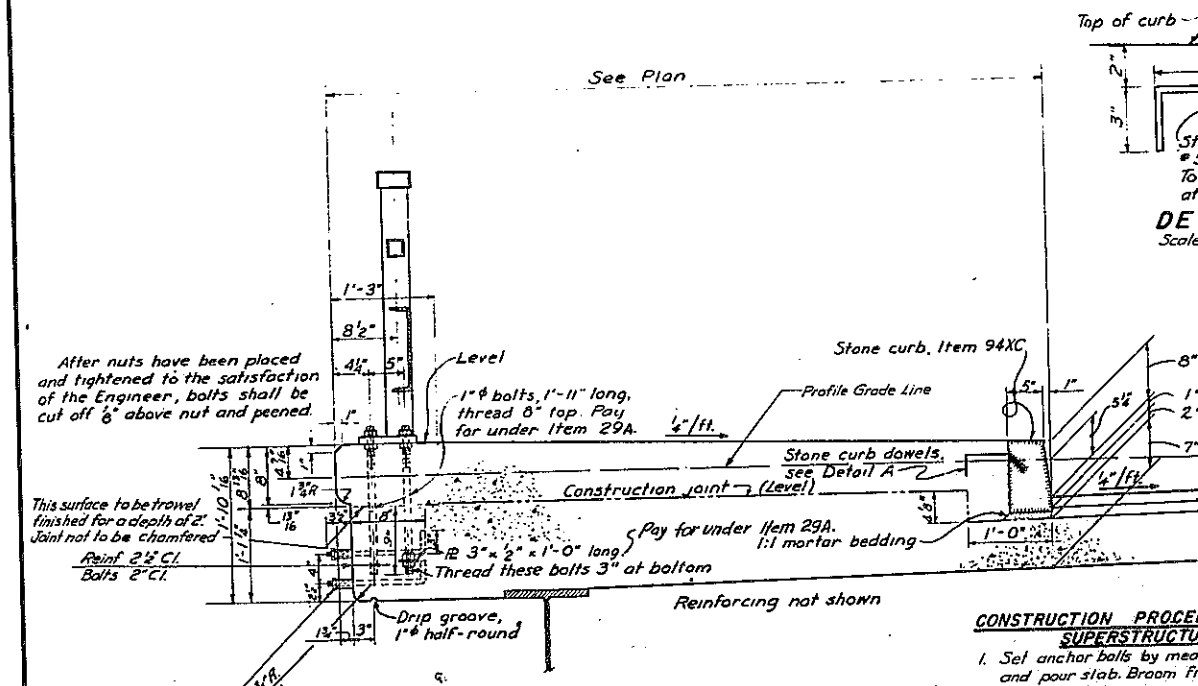
DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
201 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	A.L.
CHECKED	J.C.
TRACED	C.B.

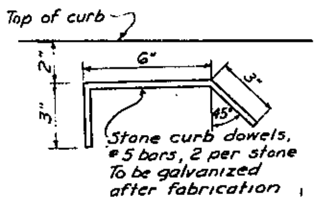
FED. RD. DIV. NO	STATE	FED AID PROJ. NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
	N.Y.	U-377(17)		196	178

KENSINGTON EXPRESSWAY – SEC NO. 1

CONTRACT II



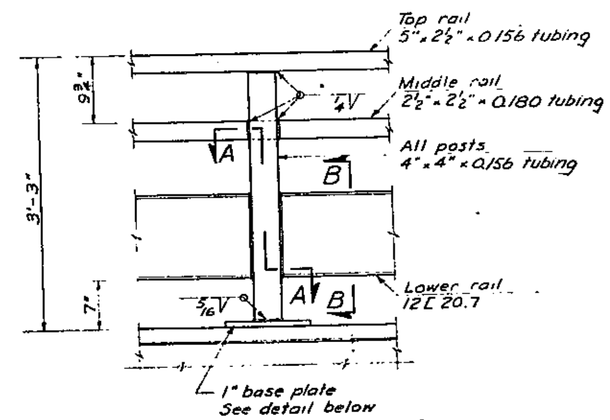
PARTIAL TRANSVERSE SECTION THRU SUPERSTRUCTURE
Scale: 1" = 1'-0"



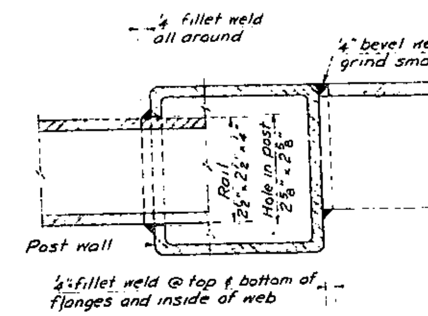
DETAIL A
Scale 3" = 1'-0"

CONSTRUCTION PROCEDURE FOR SUPERSTRUCTURE

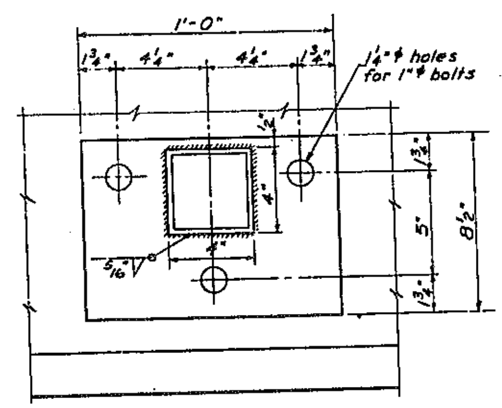
1. Set anchor bolts by means of a template and pour slab. Broom finish top of slab between curbs.
2. Place and adjust lower nuts on upper end of anchor bolts.
3. Place railing on lower nuts and adjust to bring railing to line and grade.
4. Place upper nuts on anchor bolts, tighten down on plates.
5. Pour sidewalk to proper line and grade.
6. Apply water soluble silicone solution as described in the specifications.
7. Place roadway pavement.



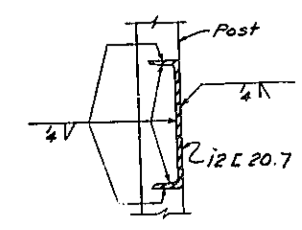
RAIL ELEVATION
Scale: 1" = 1'-0"



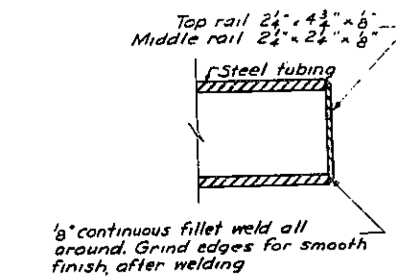
SECTION A-A
Scale: Half size.



BASE PLATE DETAIL
Scale 3" = 1'-0"



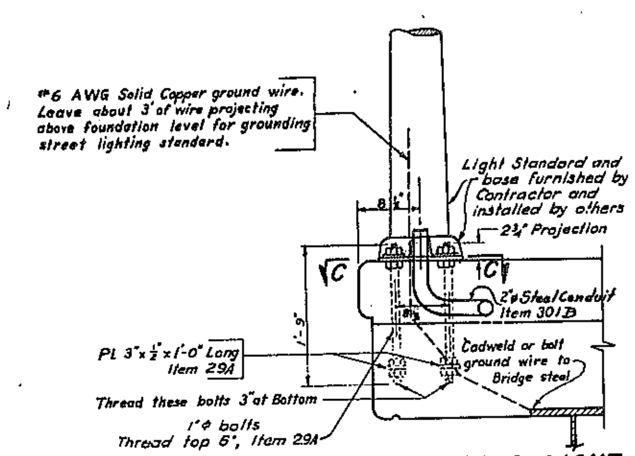
SECTION B-B
Scale: 1½" = 1'-0"



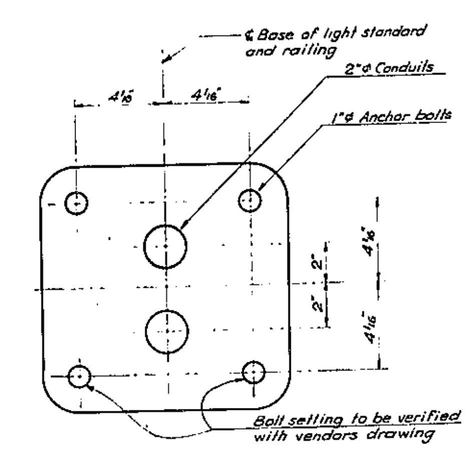
SECTION AT END OF RAILS
Scale: Half size

RAILING NOTES

1. Dimensions for tubing are outside dimensions.
2. All railing posts to be set truly vertical
3. All surfaces of welds on railing to be ground smooth.
4. All railings are to be fabricated and erected so that the rails are parallel to each other and to the fascia.
5. The rails and posts must meet all requirements of fit, alignment and grade to the full satisfaction of the Engineer.
6. It is suggested that complete field measurements be made before any shop fabrication work is performed.
7. Tubular and channel rails, tubular posts and base plates will be paid for under Item 37A.
8. Anchor bolts, nuts and washers will be paid for under Item 29A.



SECTION SHOWING LIGHT STANDARD PEDESTAL
Scale: 1" = 1'-0"



SECTION C-C
Scale: 3" = 1'-0"

NO AS BUILT REVISIONS

Sheet No. 12

NORTHAMPTON STREET OVER EXPRESSWAY
RAILING DETAILS

STATE OF NEW YORK – DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS – ARCHITECTS
202 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	S.L.
CHECKED	I.G.
TRACED	CB

F.A.C. 59.

CONTRACT II

FED. RD. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
	N. Y.	U-377(17)		197	178

KENSINGTON EXPRESSWAY — SEC. NO. 1

Mark	Size	Length	Type	Number	A	B	C	Description
PIER								
FOOTINGS								
P601	#6	8'-10"	XIV	96	7'-6"	8"		Horizontal Bars
P101	#10	5'-10"	Str.	48				Dowels
SHAFTS								
P401	#4	13'-1"	VII	52	3'-1"	3'-1"	4½"	Column Ties
P402	#4	13'-5"	VII	51	3'-2"	3'-2"	4½"	Cap Stirrups
P404	#4	11'-10"	IX	8	4'-4"	3'-2"		Corner Bars - Cap
P501	#5	33'-0"	Str.	8				Horizontal Bars
P102	#10	16'-3"	Str.	40				Vertical Bars
P103	#10	22'-11"	VI	8	5'-5"	3'-3"	14'-5"	Corner Bars - Cap
P104	#10	24'-1"	Str.	21				Horizontal Bars
P105	#10	32'-7"	Str.	4				Horizontal Bars
P106	#10	28'-3"	Str.	10				Horizontal Bars
PEDESTALS								
P403	#4	3'-3"	X	96	2'-10"	5"		Dowels
P602	#6	12'-10"	XI	6	3'-2"	2'-11"	4"	Ties - Fascia Pedestals
P603	#6	12'-4"	XI	18	3'-2"	2'-8"	4"	Ties - Interior Pedestals
WINGWALL								
FOOTINGS								
W401	#4	17'-6"	Str.	9				Longitudinal Bars, Top & Bottom
W402	#4	35'-6"	Str.	14				Longitudinal Bars, Top & Bottom
W403	#4	5'-11"	X	9	5'-5"	6"		Transverse Bars, Top
W601	#6	5'-5"	Str.	10				Transverse Bars, Top & Bottom
W602	#6	9'-10"	VIII	19	4'-2"	5'-0"	8"	Dowels
W603	#6	6'-1"	X	12	5'-5"	8"		Transverse Bars, Top
W701	#7	10'-0"	X	18	9'-2"	10"		Transverse Bars, Top
W801	#8	9'-2"	Str.	9				Transverse Bars, Bottom
W802	#8	13'-3"	VIII	18	5'-5"	6'-9"	1'-1"	Dowels
W901	#9	9'-2"	Str.	9				Transverse Bars, Top & Bottom
W902	#9	15'-6"	VIII	18	5'-8"	6'-9"	1'-3"	Dowels
W9010	#9	~~7'-1"~~	X	18	~~5'-10"~~	1'-3"		Transverse Bars, Top
"	"	10'-5"	"	"	9'-2"	"		" (corrected length)
WALL								
W404	#4	35'-8"	Str.	12				Horizontal Bars
W405 to	#4	Av. Lg	Str.	2 Each of				Horizontal Bars
W4019		17'-3"		15 bars = 30				Each 2 bars vary by 2'-3" from 1'-6" to 33'-0"
W4022 to	#4	Av. Lg.	Str.	1 Each of				Vertical Bars
W4039		7'-6"		18 bars = 18				Each bar varies by 5"± from 5'-3" to 12'-8"
W4040 to	#4	Av. Lg.	Str.	1 Each of				Vertical Bars
W4057		16'-3"		18 bars = 18				Each bar varies by 5" from 13'-2" to 20'-3"
W4058	#4	38'-6"	Str.	2				Top, Parallel to Slope
W603 to	#6	Av. Lg.	Str.	1 Each of				Vertical Bars
W6010		7'-3½"		8 bars = 8				Each bar varies by 7" from 5'-3" to 9'-4"
W6011 to	#6	Av. Lg.	Str.	1 Each of				Vertical Bars
W6016		10'-1½"		6 bars = 6				Each bar varies by 8" from 5'-8" to 13'-0"
W6017	#6	8'-6"	Str	6				Vertical Bars
W803	#8	6'-9"	Str.	9				Vertical Bars
W804	#8	10'-9"	Str.	4				Vertical Bars
W805 to	#8	Av. Lg	Str.	4				Vertical Bars @ length of 13'-9", 14'-9",
W808		14'-3"						15'-6" and 16'-6"
W903	#9	8'-9"	Str.	9				Vertical Bars
W904	#9	13'-0"	Str.	4				Vertical Bars
W905 to	#9	Av. Lg.	Str.	4				Vertical Bars @ length of 17'-3", 18'-3",
W908		18'-3						19'-0" & 19'-9"
W909	#9	20'-4"	Str.	1				Vertical Bar

Note: Bar Nos W4020 & W4021 not used.

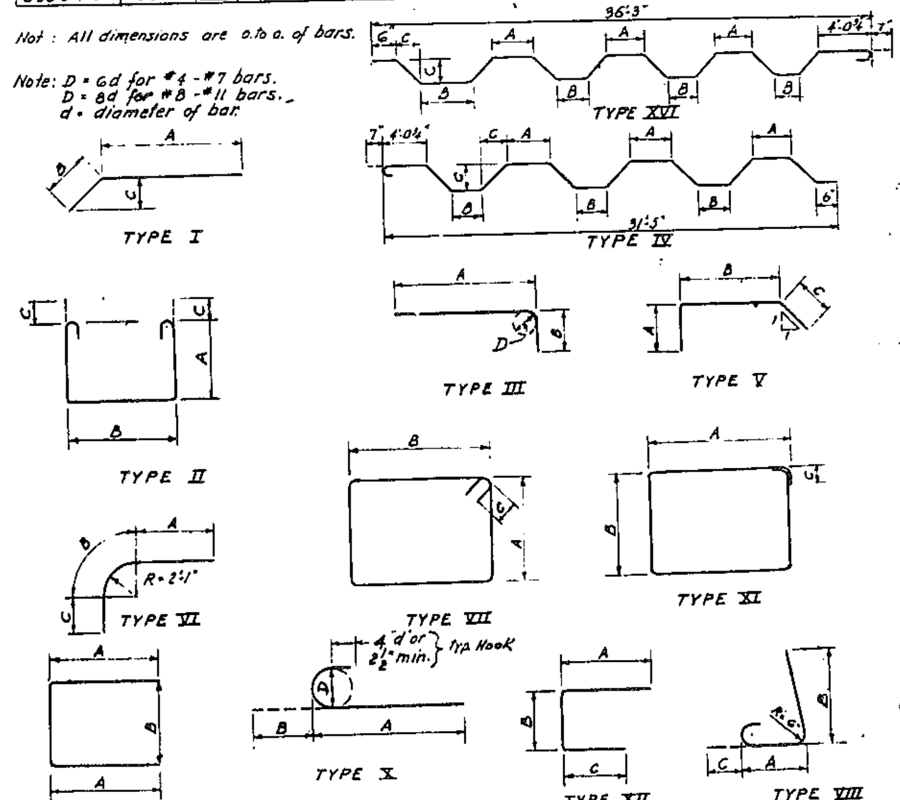
Mark	Size	Length	Type	Number Total	Number #1	Number #2	A	B	C	Description
ABUTMENTS 2										
FOOTINGS										
A401	—	—	—	—	—	—	—	—	—	Not Used
A601	#6	36'-5"	Str.	26	26					Longitudinal Bars
A602	#6	36'-2"	Str.	26		26				Longitudinal Bars
A603	#6	4'-3"	Str.	143	71	72				Transverse Bars, Top
A604	#6	4'-11"	X	89	89		4'-3"	8"		Dowels
A801	#8	6'-10"	X	79		79	5'-9"	1'-1"		Dowels
A1101	#11	13'-1"	X	162	71	91	11'-6"	1'-7"		Transverse Bars
WALLS										
A402	#4	17'-8"	III	67	67		14'-8"	3'-0"		Vertical Bars
A403	#4	35'-9"	Str.	28	28					Horizontal Bars
A404	#4	34'-4"	Str.	6	6					Horizontal Bars
A405	#4	4'-10"	Str.	136	68	68				Vertical Bars
A406	#4	10'-2"	XII	32	16	16	3'-6"	3'-2"	3'-6"	Ties - Pads
A407	#4	2'-11"	X	80	40	40	2'-5"	6"		Vertical Bars - Pads
A408	#4	19'-9"	Str.	3	3					Vertical Bars
A409	#4	7'-9"	Str.	6	6					Vertical Bars
A4010	#4	4'-8"	Str.	6	6					Horizontal & Inclined Bars - Pylon
A4011	#4	7'-10"	XIII	5	5					Ties - Curtain Wall
A4012	#4	19'-9"	Str.	1	1					Vertical Bar - Curtain Wall
A4013	#4	2'-11"	Str.	15		15				Horizontal Bars - Curtain Wall
A4014	#4	3'-6"	Str.	16		16				Horizontal Bars - Curtain Wall
A4015	#4	7'-0"	Str.	10	4	6				Vertical Bars - Curtain Wall
A4016	#4	36'-3	Str.	34		34				Horizontal Bars
A4017	#4	20'-6"	III	72		72	17'-6"	3'-0"		Vertical Bars
A4018	#4	36'-2"	Str.	6		6				Horizontal Bars
A4019	#4	7'-2"	Str.	8		8				Vertical Bars - Curtain Wall
A501	#5	35'-1"	Str.	26	26					Horizontal Bars
A502	#5	6'-0"	Str.	5	5					Horizontal Bars - Pylon Base
A503	#5	2'-3"	Str.	14	14					Horizontal Bars - Pylon Base
A504	#5	4'-6"	Str.	4	4					Horizontal Bars - Pylon Base
A505	#5	5'-5"	Str.	4	4					Horizontal Bars - Pylon Base
A506	#5	6'-0"	Str.	6	6					Horizontal Bars - Pylon Base
A507 to	#5	Av.	Str.	14	1 Each					Horizontal Bars - Pylon Base
A5020		8'-8½"			of 14 bars					Each bar varies by 3" from 7'-1" to 10'-4"
A5021	#5	35'-4"	Str.	28		28				Horizontal Bars
A605	#6	17'-7"	Str.	45	45					Vertical Bars
A606	#6	8'-0"	Str.	44	44					Vertical Bars
A607	#6	19'-9"	Str.	11	11					Vertical Bars - Pylon Base
A608	#6	5'-8"	Str.	10	10					Vertical Bars - Pylon
A802	#8	9'-10"	Str.	39		39				Vertical Bars
A803	#8	20'-6"	Str.	44		44				Vertical Bars
A901	#9	35'-9"	Str.	4	4					Horizontal Bars
A902	#9	36'-10"	Str.	12	4	8				Horizontal Bars
A5022	#5	5'-0"	XV	63		63	10"	2'-0"	1'-6"	Ties - Header
A5023	#5	32'-0"	Str.	3		3				Horizontal Bars - Header
A5024	#5	32'-10"	Str	1		1				Horizontal Bar - Header

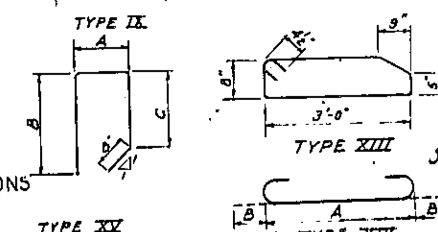
BAR EQUIVALENT TABLE	
Number	Size
4	½" ϕ
5	⅝ ϕ
6	¾ ϕ
7	⅞ ϕ
8	1" ϕ
9	1" □
10	1⅛" □
11	1¼" □

Mark	Size	Length	Type	Number	A	B	C	Description
SLAB								
S401	#4	5'-0"	II	235	1'-5"	1'-2"	6"	Ties in Sidewalk
S402	#4	6'-9"	III	216	6'-2	7"		Transverse Bars - Sidewalk
S403	#4	30'-3"	Str.	456				Longitudinal Bars in Slab
S404	—	—	—	—	—	—	—	Not Used
S405	#4	42'-0"	Str.	9				Longitudinal Bars in Sidewalk
S406	#4	50'-0"	Str.	9				Longitudinal Bars in Sidewalk
S407 to	#4	Av. Lg.	Str.	1 Each of				Longitudinal Bars in Sidewalk
S4014		12'-6"		8 bars = 8				Each bar varies by 1'-0" from 9'-0" to 16'-0"
S4015	#4	17'-0"	Str.	1				Longitudinal Bar in Sidewalk
S4016 to	#4	Av. Lg	II	1 Each of	Varies by 6" from	7"		Transverse Bars in Sidewalk
S4026		3'-9"		11 bars = 11	8" To 5'-8"			
S4027	#4	13'-6"	Str.	1				Longitudinal Bar in Sidewalk
S4028 to	#4	Av. Lg.	Str.	1 Each of				Transverse Bars in Sidewalk
S4035		8'-9"		8 bars = 8				Each bar varies by 6" from 7'-0" to 10'-6"
S4036 to	#4	Av. Lg	II	1 Each of	Varies by 3" from	7"		Transverse Bars in Sidewalk
S4043		4'-3"		7 bars = 7	1'-5" To 5'-11"			
S4044	#4	12'-0"	Str.	4				Longitudinal Bars in Slab
S501	#5	42'-8"	X	144	42'-3"	5"		Transverse Bars in Slab, Top
S502	#5	29'-4"	Str.	144				Transverse Bars in Slab, Bottom
S503	#5	38'-1"	Str	144				Transverse Bars in Slab, Bottom
S504	#5	33'-2"	IV	142	3'-6¾"	4'-5"	5"	Transverse Bars in Slab
S505	#5	25'-0"	X	144	24'-7"	5"		Transverse Bars in Slab, Top
S506	#5	38'-2"	XVI	142	3'-6¾"	4'-5"	5"	Transverse Bars in Slab

Not: All dimensions are o. to o. of bars.

Note: D = 6d for #4 - #7 bars.
D = 8d for #8 - #11 bars.
d = diameter of bar.





Sheet No. 13

NO AS BUILT REVISIONS

NORTHAMPTON STREET OVER EXPRESSWAY
BAR LIST

STATE OF NEW YORK — DEPT. OF PUBLIC WORKS
CITY OF BUFFALO ARTERIAL
KENSINGTON EXPRESSWAY, SEC. 1

DE LEUW, CATHER & BRILL
ENGINEERS — ARCHITECTS
201 E. 44TH ST. NEW YORK 17, N.Y.

DRAWN	A. Mc.
CHECKED	J. Cx
TRACED	CB

NY33 BRIDGE CONDITION VERIFICATION 2023
KENSINGSTON EXPRESSWAY PROJECT
PIN 5512.52
CITY OF BUFFALO, ERIE COUNTY
BIN 1022630

Prepared By:

John J Picard, PE (NYSPE 067412)
Inspection Team Leader | Sr. Structural Engineer
Date: 5/30/2023

Reviewed By:

Stephen L. Gauthier, PE (NYSPE 0075775)
Quality Control Engineer | Sr. Structural Engineer
Date: 6/16/2023

LaBella
Powered by partnership.
300 State Street
Rochester, New York 14614
ph: 585-454-6110
www.labellapc.com

NY33 BRIDGE CONDITION VERIFICATION 2023

KENSINGSTON EXPRESSWAY PROJECT
PIN 5512.52
CITY OF BUFFALO, ERIE COUNTY
BIN 1022630

STRUCTURE:	BIN 1022630 – East Utica Street on NY33 Kensington Expressway
STRUCTURE TYPE:	Two (2) span Steel, Multi-Stringer (9 beams) structure with concrete abutments founded on piles and a four-column pier with spread footing. Year Built: 1968
CURRENT INSPECTION:	05/04/23 – 05/15/23 (LaBella Verification Inspections)
LAST BIENNIAL INSPECTION:	08/16/22
GEN. REC.	5
INSPECTION SCOPE:	An element-specific inspection of the subject structure to verify field conditions and obtain and confirm steel measurements found in the field latest biennial inspection in order to complete a Level 1 load rating.

GENERAL INSPECTION OBSERVATIONS & CONDITIONS:

- **Superstructure Beam End Section Loss** – Beam end corrosion was reviewed and verified in the field and found to be in reasonable conformance with the to the latest 2022 biennial bridge inspection reports and additional measurements were taken to represent existing conditions. Measurements were taken at the critical sections to confirm conditions and extent. The critical beam end locations were identified in the field were in Span 1, Girder 4 (end), Girder 6 (end), Girder 8 (end), and in Span 2, Girder 4 (begin), Girder 6 (begin), Girder 8 (begin). Photos of conditions found in the field can be found in Photo Log section of this report.
    - The maximum section loss was typically found at the base of the web which was expected based on past inspection reports. Several beam ends showed some pitting along the base of the web. This pitting has been painted over and was observed to be primarily located behind the connection plate and did not extend into the span. The connection plate had no apparent section loss.
    - Generally, the maximum steel section loss was found primarily in the web behind the connection plate and directly over the bearing location within 5-8 inches
    - To determine loss in the bearing area, the average of the 1-2 thickness measurements were taken at the base of the web in the immediate vicinity of the bearing line and were compared to the original web thickness. In most cases, the losses found in the field during this inspection were generally found to be equal to or slightly higher than those from the 2022 inspection report. See Section Loss Table below for additional details.
    - The bearing area loss was found to range from 20% to 30% for Span 1 (end), and from 15% to 37% for Span 2 (begin). The maximum loss was measured at Span1 (end) at G8 at 30% and at Span2 (begin) on G6 at 37% loss in bearing area. In the 2022 Inspection report these locations were reported to be 25% and 27%, respectively.
    - The average full height web section loss, excluding the bearing area, was observed to be minimal for most of the beams (less than ~ 5%).

- Several expansion bearings had pack rust noted between plates causing the sliding bronze plates to bow upwards in the center and likely cause the bearing to not function as originally designed. In the 2022 inspection report, this condition was reported as Poor (CS3) for all 18 expansion bearings.

- Significant surface spalling and cracking was noted in fixed bearing pedestals and cap beam of Pier 1. See photos below.

UTICA STREET BRIDGE - GIRDER END SECTION LOSS TABLE				
SPAN 1				
GIRDER	LOCATION	ORIG. WEB THICKNESS (IN.)	MEASURED THICKNESS (IN.)	% SECTION LOSS
G4	PIER	0.468	0.373	20%
G6	PIER		0.342	27%
G8	PIER		0.328	30%
SPAN 2				
GIRDER	LOCATION	ORIG. WEB THICKNESS (IN.)	MEASURED THICKNESS (IN.)	% SECTION LOSS
G4	PIER	0.468	0.363	22%
G6	PIER		0.295	37%
G8	PIER		0.399	15%

- **Load Rating -** A Level 1 Load Rating evaluation was completed in conjunction with this inspection and has been attached to this report. A summary of results is below:

Rating Load	Controlling Mode	Inventory Rating	Operating Rating
Load and Resistance Factor Rating HL-93	Span 2 Girder G6 Original 24WF100 Web Local Crippling	0.40	0.51
Load Factor Rating HS Truck or Lane	Span 2 Girder G6 Original 24WF100 Unstiffened Bearing Area	HS 20.8 37.5 Ton	HS 34.8 62.6 Ton

A fatigue analysis was also performed in conjunction with this inspection. The results showed that the existing structure has 1291 years of remaining life.

- **Substructure Concrete Observations** -

  - Abutments – The abutment faces were observed and found to be in generally Good to Fair condition. There were no major changes in deterioration from the 2022 inspection report. A few locations of spalls to rebar and horizontal cracks are evident on both abutment faces.

  - Pier – The pier caps & columns and pedestals were observed, sounded, and found to be in Fair to Poor condition with significant distress noted. There are no major changes in deterioration from the 2022 inspection report. Several locations of severe spalling to exposed rebar is evident across the faces of the columns, pier caps and girder pedestals. Minor crack locations are also evident across the inside faces of some girder pedestals. Refer completed field sheets attached to this report for additional details.

    Photos of general substructure conditions can be found in Photo Log section of this report.

- **Structural Deck Observations -** The structural deck was observed from below deck and it is considered indicative of the overall deck conditions above. The deck was constructed with Stay-in Place (SIP) forms so direct observation of the bottom of deck was not possible, so observations are based on SIP conditions observed.

  The general condition of the structural deck was found to be as follows:

  - 37% of the structural deck in ADVANCED state of deterioration
  - 63% of the structural deck in FAIR state of deterioration
  - 0% of the structural deck in relatively GOOD condition

Photos of general deck conditions can be found in Photo Log section of this report.

BIN 1022630 BIENNIAL BRIDGE INSPECTION REPORT:

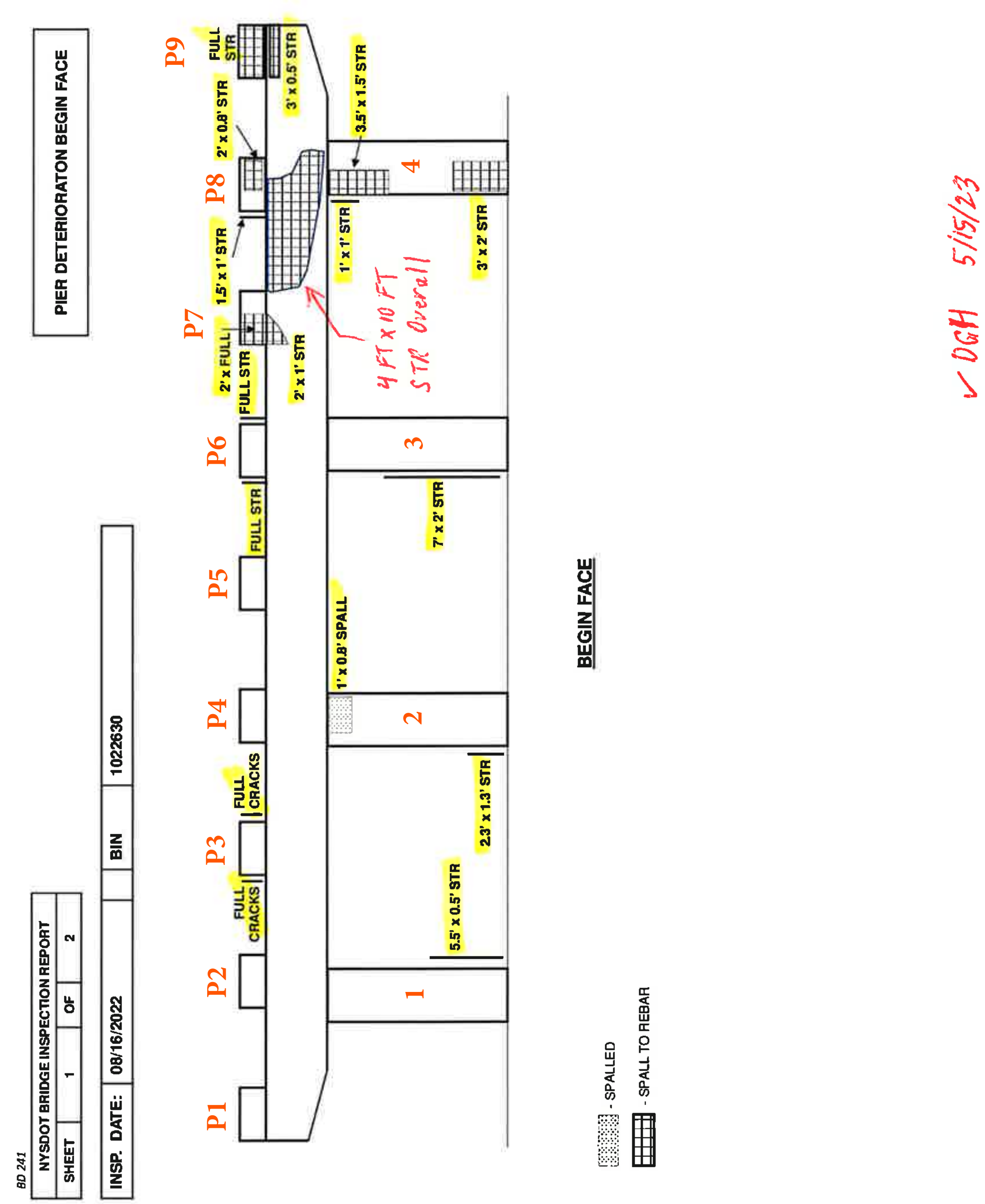
The latest bridge inspection report dated August 16, 2022, can be found in Appendix A of this report. It includes a complete and detailed condition report for ALL elements of the subject bridge.

BIN 1022630 WORK HISTORY

A detailed BIN1022630 Work History can be found in Appendix B of this report.

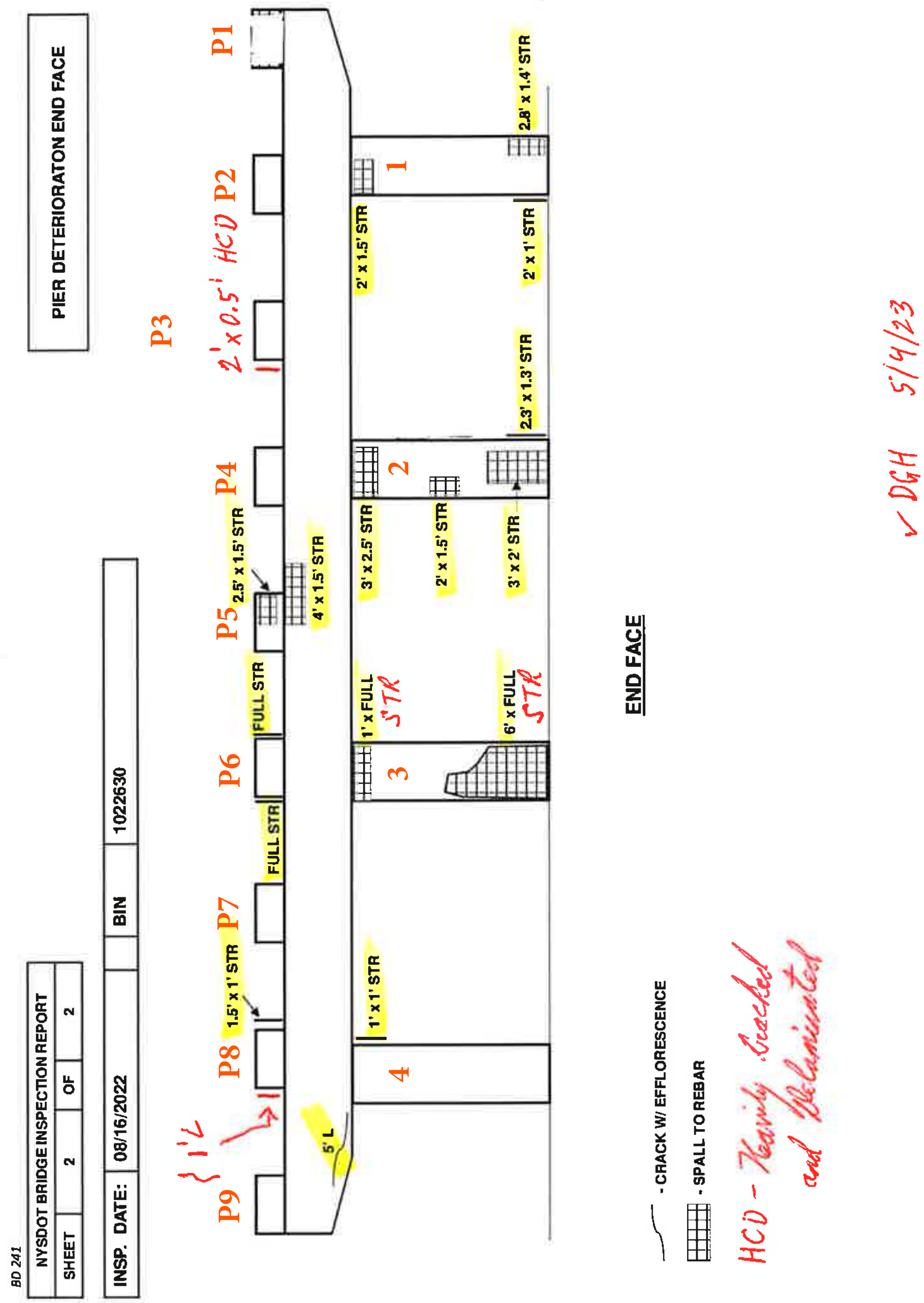
Abutment and Pier Sketches

Sketch Number: **12** Sketch Filename: **22_Pier Deterioration_10226301.jpg**



Sketch Description: 22_Pier Deterioration_10226301.jpg

Sketch Number: **13** Sketch Filename: **22_Pier Deterioration_10226302.jpg**



Sketch Description: 22_Pier Deterioration_10226302.jpg

Photographs

PHOTO 1

LOCATION:
G4 IN SPAN 1 AT PIER

DESCRIPTION:
TYPICAL GIRDER END CONDITION

PHOTO 2

LOCATION:
G4 IN SPANS 1 & 2 AT PIER

DESCRIPTION:
TYPICAL BEARING AND GIRDER END CONDITIONS

PHOTO 3

LOCATION:
G6 IN SPAN 1 AT PIER

DESCRIPTION:
HOLE IN LOWER WEB AT GIRDER END

PHOTO 4

LOCATION:
G6 IN SPANS 1 & 2 AT PIER

DESCRIPTION:
HOLES IN LOWER WEB AT GIRDER ENDS

PHOTO 5

LOCATION:
G8 IN SPAN 1 AT PIER

DESCRIPTION:
TYPICAL GIRDER END CONDITION

PHOTO 6

LOCATION:
G8 IN SPANS 1 & 2 AT PIER

DESCRIPTION:
TYPICAL GIRDER END CONDITION

PHOTO 7

LOCATION:
PIER BEGIN FACE LOOKING WEST

DESCRIPTION:
GENERAL SPALLING CONCRETE CONDITIONS; TYPICAL FOR BOTH FACES

PHOTO 8

LOCATION:
END FACE OF PIER CAP AND PEDESTAL P5

DESCRIPTION:
SPALL TO CORRODED REBAR

PHOTO 9 **LOCATION:** COLUMN 3 END FACE LOOKING WEST **DESCRIPTION:** SPALL TO CORRODED REBAR THROUGHOUT THE COLUMN HEIGHT; TYPICAL FOR ALL COLUMNS

PHOTO 10

LOCATION:
PEDESTAL P6 LOOKING SOUTH

DESCRIPTION:
SPALLS TO CORRODED REBAR ON PEDESTAL

PHOTO 11

LOCATION:
SPAN 1 & BEGIN ABUTMENT LOOKING EAST

DESCRIPTION:
GENERAL DECK CONDITION, CORROSION IN STAY-IN-PLACE FORMS; TYPICAL ABUTMENT CONDITION, MAP CRACKING WITH MINOR DELAMINATION

PHOTO 12

LOCATION:
SPAN 1 LOOKING EAST

DESCRIPTION:
GENERAL DECK CONDITION, CORROSION IN STAY-IN-PLACE FORMS

Appendices

- Appendix A: 2022 Biennial Bridge Inspection Report
- Appendix B: Bridge Work History Summary
- Appendix C: Load Rating Summary

Appendix A

2022 Biennial Bridge Inspection Report

New York State Department of Transportation
General Bridge Inspection Report

Inspection Date: August 16, 2022

Structure Information

BIN: **1022630**
Feature Carried: EAST UTICA ST
Feature Crossed: 33 33 53011032
Orientation: 3 - EAST

Region: 05 - BUFFALO
County: ERIE
Political Unit: City of BUFFALO
Approximate Year Built: 1970

Primary Owner: New York State Department of Transportation
Primary Maintenance Responsibility: New York State Department of Transportation
General Type Main Span: 3 - Steel, 02 - Stringer/Multi-Beam or Girder
This Bridge is not a Ramp
Number of Spans: 2

Postings

Posted Load Matches Inventory: Yes
Posted Load in field: Not Posted

Posted Vertical Clearances Match Inventory: N/A
Inventory On: Not Posted
Inventory Under: Not Posted

Number of Flags Issued

Red PIA: 0
Red: 0
Yellow: 0
Safety PIA: 0

New York State Inspection Overview

General Recommendation: 5

Federal NBI Ratings

NBI Deck Condition: 7
NBI Superstructure Condition: 6
NBI Substructure Condition: 4
NBI Channel Condition: N
NBI Culvert Condition: N

Action Items

Non-Structural Condition Observations noted: YES
Vulnerability Reviews Recommended: NO
Diving Inspection Requested: NO
Further Investigation Requested: NO

Inspector & Reviewer Signature Information

Inspection Signature:	Nimish Shah	*Date:* September 16, 2022
Review Signature:	Keith Baran, P.E. 082087-1	*Date:* September 16, 2022
Processed by :	William F. Leblanc, P.E. 085471-1	*Date:* November 02, 2022

Report Printed: November 02, 2022 8:11:10 AM

Special Emphasis Inspection

Special Emphasis Detail	"Other" Special Emphasis Detail Description	Hands-On Insp Performed	Hands-On Inspection Note
AASHTO Category D, E, and E' welded details		Yes	All cover plate terminations received hands on inspection
Steel Web Bearing Area		Yes	All girders with 25% or greater web loss received hands on inspection.

Additional Information

Overloads Observed

No overload vehicles observed during this inspection.

Notes to Next Inspector

Bin plate is on the end left approach.
Used bucket truck with WZTC in left lane on both sides of Pier and in the shoulder @ both abutments.
NOTE: This bridge was inspected together with 1022620, 1022630 and 1022640.

Improvements Observed

None

Pedestrian Fence Height

8'

Snow Fence

None

Bin Plate Condition

OK

Scour Critical Rating

N - Bridge not over waterway.

Field Notes

Staff Present During Inspection		
Name	**Title**	**Organization**
Brandon Wilson	WZTC Labor	TSI
George Welsted	ATL	NYSDOT
Matt Miller	WZTC Foreman	TSI
Matt Owens	WZTC Labor	TSI
Rob Parks	WZTC Labor	TSI

General Equipment Required for Inspection*
Access Type
13 - Walking
19 - Up to 30 Foot Lift
29 - Lane Closure With Shadow Vehicle

*** For span specific equipment requirements refer to the Active Inventory's "Access Needs" tab in BDIS.**

Detailed Time & Weather Conditions				
Field Date	**Arrival**	**Departure**	**Temp (F)**	**Weather Conditions**
08/15/2022	07:00 AM	02:00 PM	80	Cloudy
08/16/2022	07:00 AM	02:00 PM	80	Cloudy

Inspection Times (hours)	
Time required for travel, inspection and report preparation	15
Lane closure usage	6
Railroad flagging time	No

Element Quantities

Element Assessment Summary Table							
Element	**Total Quantity**	**Unit**	**CS-1**	**CS-2**	**CS-3**	**CS-4**	**CS-5**
12 - Reinforced Concrete Deck	7040	ft^2	4999	2041			0
107 - Steel Open Girder/Beam	954	ft	940	11	3		0
205 - Reinforced Concrete Column	4	each			4		0
215 - Reinforced Concrete Abutment	132	ft	84	24	24		0
220 - Reinforced Concrete Pile Cap/Footing	237	ft					237
234 - Reinforced Concrete Pier Cap	63	ft	39	15	9		0
300 - Strip Seal Expansion Joint	128	ft		64	64		0
311 - Movable Bearing	18	each			18		0
313 - Fixed Bearing	18	each		18			0
330 - Metal Bridge Railing	220	ft	220				0
331 - Reinforced Concrete Bridge Railing	220	ft	220				0
510 - Wearing Surfaces	5720	ft^2	5148	572			0
515 - Steel Protective Coating	7790	ft^2	6500	580	634	76	0
800 - Erosion or Scour	253	ft	253				0
810 - Sidewalk	1100	ft^2	990	110			0
811 - Curb	220	ft	220				0
830 - Secondary Members	2	each	2				0
831 - Steel Beam End	36	each	18		9	7	2
850 - Backwall	128	ft	82	34	12		0
851 - Abutment Pedestal	18	each	15	3			0
852 - Pier Pedestal	18	each	3		15		0
853 - Wingwall	89	ft		52	37		0

Element Assessment by Span							
Element**	**Total Quantity**	**Unit**	**CS-1**	**CS-2**	**CS-3**	**CS-4**	**CS-5**
Span Number : 1							
BA215 - Reinforced Concrete Abutment	66	ft	49	10	7		0
BA220 - Reinforced Concrete Pile Cap/Footing	66	ft					66
BA300 - Strip Seal Expansion Joint	64	ft		64			0
BA311 - Movable Bearing	9	each			9		0
515 - Steel Protective Coating	18	ft^2			18		0
BA800 - Erosion or Scour	66	ft	66				0
BA831 - Steel Beam End	9	each	9				0

Element**	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
BA850 - Backwall	64	ft	47	16	1		0
BA851 - Abutment Pedestal	9	each	9				0
BW220 - Reinforced Concrete Pile Cap/Footing	46	ft					46
BW800 - Erosion or Scour	46	ft	46				0
BW853 - Wingwall	46	ft		26	20		0
PR205 - Reinforced Concrete Column	4	each			4		0
PR220 - Reinforced Concrete Pile Cap/Footing	16	ft					16
PR234 - Reinforced Concrete Pier Cap	63	ft	39	15	9		0
PR313 - Fixed Bearing	18	each		18			0
515 - Steel Protective Coating	18	ft^2			18		0
PR800 - Erosion or Scour	32	ft	32				0
PR831 - Steel Beam End	9	each			4	4	1
PR852 - Pier Pedestal	18	each	3		15		0
12 - Reinforced Concrete Deck	3520	ft^2	2640	880			0
510 - Wearing Surfaces	2860	ft^2	2574	286			0
107 - Steel Open Girder/Beam	477	ft	470	5	2		0
515 - Steel Protective Coating	3868	ft^2	3056	387	387	38	0
330 - Metal Bridge Railing	110	ft	110				0
331 - Reinforced Concrete Bridge Railing	110	ft	110				0
810 - Sidewalk	550	ft^2	495	55			0
811 - Curb	110	ft	110				0
830 - Secondary Members	1	each	1				0
Span Number : 2							
EA215 - Reinforced Concrete Abutment	66	ft	35	14	17		0
EA220 - Reinforced Concrete Pile Cap/Footing	66	ft					66
EA300 - Strip Seal Expansion Joint	64	ft			64		0
EA311 - Movable Bearing	9	each			9		0
515 - Steel Protective Coating	18	ft^2			18		0
EA800 - Erosion or Scour	66	ft	66				0
EA831 - Steel Beam End	9	each	8		1		0
EA850 - Backwall	64	ft	35	18	11		0
EA851 - Abutment Pedestal	9	each	6	3			0
EW220 - Reinforced Concrete Pile Cap/Footing	43	ft					43
EW800 - Erosion or Scour	43	ft	43				0
EW853 - Wingwall	43	ft		26	17		0
PR831 - Steel Beam End	9	each	1		4	3	1

Element**	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
12 - Reinforced Concrete Deck	3520	ft²	2359	1161			0
510 - Wearing Surfaces	2860	ft²	2574	286			0
107 - Steel Open Girder/Beam	477	ft	470	6	1		0
515 - Steel Protective Coating	3868	ft²	3444	193	193	38	0
330 - Metal Bridge Railing	110	ft	110				0
331 - Reinforced Concrete Bridge Railing	110	ft	110				0
810 - Sidewalk	550	ft²	495	55			0
811 - Curb	110	ft	110				0
830 - Secondary Members	1	each	1				0

** Elements with a prefix designate the locations of BA-Begin Abutment, BW-Begin Wingwall, EA-End Abutment, EW-End Wingwall, CO-Culvert Outlet, and PR-Pier. No prefix generally indicates the element is part of the superstructure.

Inspection Notes

General Notes

None

Element Condition Notes

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 107 - Steel Open Girder/Beam	477	470	5	2	0	0
Span 2: 107 - Steel Open Girder/Beam	477	470	6	1	0	0

Condition State 3 Note

Referenced Photo(s): 7, 11, 12

Referenced Sketch(es): 11

Refer to element PR831 - Steel Beam End notes.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 107 - Steel Open Girder/Beam-515 - Steel Protective Coating	3868	3056	387	387	38	0
Span 2: 107 - Steel Open Girder/Beam-515 - Steel Protective Coating	3868	3444	193	193	38	0

Common

Referenced Photo(s): 10, 11, 12, 13, 15, 16

Referenced Sketch(es): None

The paint is in overall good condition but there are isolated areas of paint failure with rust spots and areas at the beam ends with rust and section loss.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR205 - Reinforced Concrete Column	4	0	0	4	0	0

Common

Referenced Photo(s): 15, 16

Referenced Sketch(es): 12, 13

All four columns have spalls to rebar at various locations, refer to Pier Deterioration sketch for spall locations and dimensions.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA215 - Reinforced Concrete Abutment	66	49	10	7	0	0

Condition State 3 Note

Referenced Photo(s): 7

Referenced Sketch(es): None

The begin abutment at G2 has a 5'x6"x3" deep crack with delaminated concrete at the vertical face.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR234 - Reinforced Concrete Pier Cap	63	39	15	9	0	0

Condition State 3 Note

Referenced Photo(s): 15, 16

Referenced Sketch(es): 12, 13

Pier has spalls to rebar on the begin and end faces. Refer to Pier Deterioration sketch for exact locations and dimensions.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA311 - Movable Bearing-515 - Steel Protective Coating	18	0	0	18	0	0
Span 1: PR313 - Fixed Bearing-515 - Steel Protective Coating	18	0	0	18	0	0
Span 2: EA311 - Movable Bearing-515 - Steel Protective Coating	18	0	0	18	0	0

Condition State 3 Note

Referenced Photo(s): 7, 11, 12, 13, 14

Referenced Sketch(es): None

Bearing paint has failed at all bearings to varying degrees but no section loss was noted.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA311 - Movable Bearing	9	0	0	9	0	0
Span 2: EA311 - Movable Bearing	9	0	0	9	0	0

Condition State 3 Note

Referenced Photo(s): 7, 20

Referenced Sketch(es): None

The begin and end bearings have between 1/8" to 1/4" of pack rust between the slider and masonry plates, no sign of restricted movement was noted. All begin bearings are overhanging past the rear edge of the masonry plate by 0" to 5/8", refer to Begin Bearing Skew and Over Expansion.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA831 - Steel Beam End	9	9	0	0	0	0
Span 1: PR831 - Steel Beam End	9	0	0	4	4	1
Span 2: EA831 - Steel Beam End	9	8	0	1	0	0
Span 2: PR831 - Steel Beam End	9	1	0	4	3	1

Common

Referenced Photo(s): 11, 12, 13

Referenced Sketch(es): 11

Section loss percentages at beam ends vary from 0% to 29%, refer to lower web section loss measurements sketch for precise measurements and locations. Girder 7 at the pier is not accessible for inspection.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA850 - Backwall	64	47	16	1	0	0
Span 2: EA850 - Backwall	64	35	18	11	0	0

Condition State 3 Note

Referenced Photo(s): 6, 19

Referenced Sketch(es): None

The begin and end backwall at bay 1 below the utility ducts has a 1'x6"x2" and a 6'x6"x4" spall. The end backwall at bay 6 under the utility ducts has a 5'x6"x2" spall.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR852 - Pier Pedestal	18	3	0	15	0	0

Condition State 3 Note

Referenced Photo(s): 11, 12, 13, 14, 15, 16

Referenced Sketch(es): None

The pier pedestals have the following defects:
G3 right - cracks on left and right
G5 - spall to rebar
G6 - spall to rebar on the left
G7, G8 left. G9 begin - spall to rebar

G9 pedestal at the begin face is severely spalled with exposed rebar but no undermining was noted.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BW853 - Wingwall	46	0	26	20	0	0
Span 2: EW853 - Wingwall	43	0	26	17	0	0

Condition State 3 Note

Referenced Photo(s): 4, 9, 17, 22

Referenced Sketch(es): None

The begin and end wingwalls at the left and right has a 10'x3' area of spalling to rebar.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 2: EA215 - Reinforced Concrete Abutment	66	35	14	17	0	0

Condition State 3 Note

Referenced Photo(s): 18, 21

Referenced Sketch(es): None

The End abutment is generally in fair to good condition, but the following specific defects were noted: There is a 8'x1'x6" deep spall to rebar adjacent to the left wingwall. There is a 10' long horizontal crack near the top of bay 1 and 2.. There is a 2.5' long horizontal crack near the top of bay 6. There is a roughly 2'x2' and a 1'x1' spall near the top of bay 8.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 2: EA300 - Strip Seal Expansion Joint	64	0	0	64	0	0

Condition State 3 Note

Referenced Photo(s): 3

Referenced Sketch(es): None

Elastomeric header is cracked (0.05") for the entire length.

Non-Structural Condition Observations

Category: ATTACHMENTS - Utilities Quantity: 1 Unit: ea Referenced Element(s): NONE Referenced Photo(s): 8 Referenced Sketch(es): NONE
At the begin abutment bay 6 there is a utility bracket that has broken loose.

Inspection Photographs

Attachment Description: Span 1, Right Sidewalk, Spalls and Vegetation Growth	Photo Number: **1** Photo Filename: **22_001.JPG** 

Attachment Description: Span 2, Wearing Surface, Left, Pothole	Photo Number: **2** Photo Filename: **22_002.JPG** 

Attachment Description: End Joint, Header Sealed and Asphalt Patch at Left	Photo Number: **3** Photo Filename: **22_003.JPG**

Attachment Description: Begin Left Wingwall, Cracks and Spall to Rebar	Photo Number: **4** Photo Filename: **22_004.JPG**

	Photo Number: **5** Photo Filename: **22_005.JPG**
Attachment Description: Begin Left Cheekwall, Spall to Rebar	

	Photo Number: **6** Photo Filename: **22_006.JPG**
Attachment Description: Begin Backwall, Bay 1, Spall	

	Photo Number: **7** Photo Filename: **22_007.JPG**
Attachment Description: Begin Abutment at G2, Crack w/ Delamination; Begin Bearing 2, Pack Rust (Typical)	

	Photo Number: **8** Photo Filename: **22_008.JPG**
Attachment Description: (NSCO) Utilities, Begin Bay 6, Loose Bracket	

	Photo Number: **9** Photo Filename: **22_009.JPG**
Attachment Description: Begin Right Wingwall, Cracks and Spall to Rebar	

	Photo Number: **10** Photo Filename: **22_010.JPG**
Attachment Description: Span 1, Bay 7 and 8, SIP Form, Corrosion; G8 and G9, Bottom Flange, Paint Failure	

	Photo Number: **11** Photo Filename: **22_011.JPG**
Attachment Description: Pier Pedestal 3, Right, Cracks (Typical on Left)	

	Photo Number: **12** Photo Filename: **22_012.JPG**
Attachment Description: Pier Pedestal 6, Left, Spall to Rebar; G6, Pier Beam Ends, Section Loss	

	Photo Number: **13** Photo Filename: **22_013.JPG**
Attachment Description: Pier Pedestal 8, Left, Spall to Rebar	

	Photo Number: **14** Photo Filename: **22_014.JPG**
Attachment Description: Pier Pedestal 9, Begin Face, Spall to Rebar	

Attachment Description: Pier Cap, Begin Face, Column Bay 3, Spall to Rebar; Pier Pedestals 7 – 9, Spall to Rebar; Pier Column 4, Spall to Rebar (Typical)	Photo Number: **15** Photo Filename: **22_015.JPG** 

Attachment Description: Pier Cap, End Face, Column Bay 2, Spall to Rebar; Pier Pedestal 5, Spall to Rebar; Pier Columns 2 and 3, Spall to Rebar (Typical)	Photo Number: **16** Photo Filename: **22_016.JPG** 

Attachment Description	Photo
Attachment Description: End Left Wingwall, Cracks and Spall to Rebar	Photo Number: **17** Photo Filename: **22_017.JPG** 
Attachment Description: End Abutment, Left Cheekwall and Bays 1 – 2, Spall to Rebar	Photo Number: **18** Photo Filename: **22_018.JPG** 

Attachment Description: End Backwall, Bay 1, Spall to Rebar (Typical Bay 6)	Photo Number: **19** Photo Filename: **22_019.JPG** 

Attachment Description: End Abutment Bearing 6, Pack Rust (Typical)	Photo Number: **20** Photo Filename: **22_020.JPG** 

Attachment Description	Photo
Attachment Description: End Abutment, Bays 7 – 8, Spall to Rebar and Delamination	Photo Number: **21** Photo Filename: **22_021.JPG** 
Attachment Description: End Right Wingwall, Cracks and Spall to Rebar	Photo Number: **22** Photo Filename: **22_022.JPG** 

Inspection Sketches

Sketch Number: **1** Sketch Filename: **22_Photolog1.jpg**

BD 186

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	2

PHOTOLOG

Insp. Date:	08/16/2022	BIN:	1022630

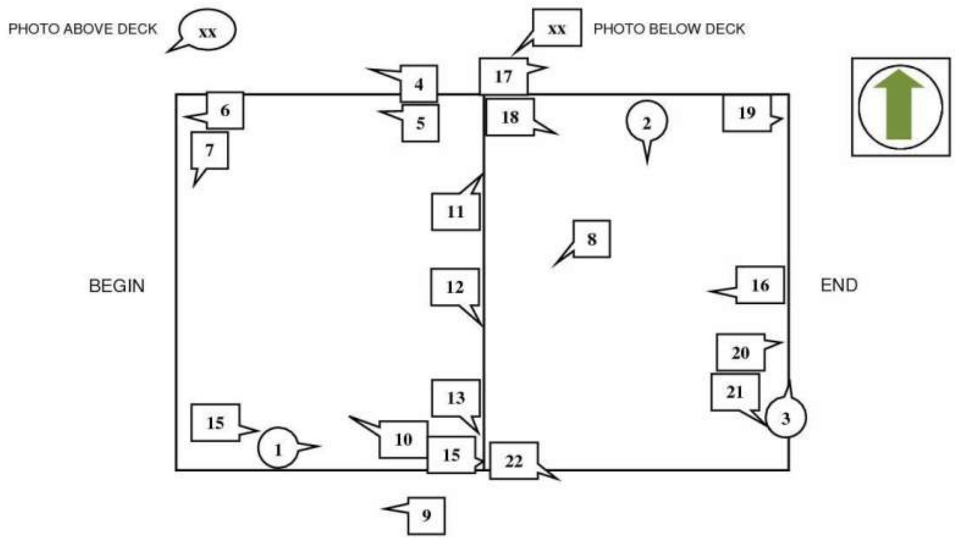


PHOTO NUMBER	JPG NUMBER	COMMENTS
1	22_001	Span 1, Right Sidewalk, Spalls and Vegetation Growth
2	22_002	Span 2, Wearing Surface, Left, Pothole
3	22_003	End Joint, Header Sealed and Asphalt Patch at Left
4	22_004	Begin Left Wingwall, Cracks and Spall to Rebar
5	22_005	Begin Left Cheekwall, Spall to Rebar
6	22_006	Begin Backwall, Bay 1, Spall
7	22_007	Begin Abutment at G2, Crack w/ Delamination; Begin Bearing 2, Pack Rust (Typical)
8	22_008	(NSCO) Utilities, Begin Bay 6, Loose Bracket
9	22_009	Begin Right Wingwall, Cracks and Spall to Rebar
10	22_010	Span 1, Bay 7 and 8, SIP Form, Corrosion; G8 and G9, Bottom Flange, Paint Failure

Sketch Description: 22_Photolog1.jpg

Sketch Number: **2** Sketch Filename: **22_Photolog2.jpg**

BD 186

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	2	OF	2

PHOTOLOG

Insp. Date:	08/16/2022		BIN:	1022630

PHOTO NUMBER	JPG NUMBER	COMMENTS
11	22_011	Pier Pedestal 3, Right, Cracks (Typical on Left)
12	22_012	Pier Pedestal 6, Left, Spall to Rebar; G6, Pier Beam Ends, Section Loss
13	22_013	Pier Pedestal 8, Left, Spall to Rebar
14	22_014	Pier Pedestal 9, Begin Face, Spall to Rebar
15	22_015	Pier Cap, Begin Face, Column Bay 3, Spall to Rebar; Pier Pedestals 7 – 9, Spall to Rebar; Pier Column 4, Spall to Rebar (Typical)
16	22_016	Pier Cap, End Face, Column Bay 2, Spall to Rebar; Pier Pedestal 5, Spall to Rebar; Pier Columns 2 and 3, Spall to Rebar (Typical)
17	22_017	End Left Wingwall, Cracks and Spall to Rebar
18	22_018	End Abutment, Left Cheekwall and Bays 1 – 2, Spall to Rebar
19	22_019	End Backwall, Bay 1, Spall to Rebar (Typical Bay 6)
20	22_020	End Abutment Bearing 6, Pack Rust (Typical)
21	22_021	End Abutment, Bays 7 – 8, Spall to Rebar and Delamination
22	22_022	End Right Wingwall, Cracks and Spall to Rebar

Sketch Description: 22_Photolog2.jpg

Sketch Number: **3** Sketch Filename: **22_ELECTRIC1.jpg**

BD 241

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	1

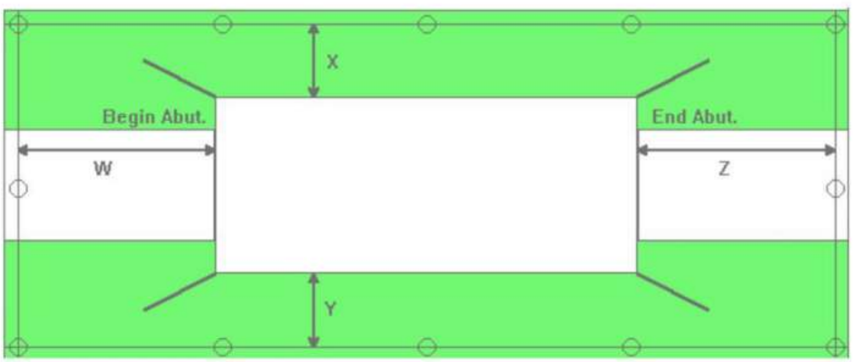
Electrical Hazard Survey

Insp. Date:	08/16/2022		BIN:	1022630

Electrical Hazard Classification (Put an X in appropriate box at right)		Danger!
		Warning
	X	No Lines Present

Electrical Hazard Alignments (Put an X in all appropriate boxes at right)		Parallel Alignment
		Perpendicular Alignment
		Diagonal Alignment

Utility Name	N/A
System Voltage	N/A



(For Clarity, You Must Specify English or Metric Units for Offsets)

Location (Put X where appropriate)	No Lines Present	Above the Deck	Below the Deck	Above and Below	Horizontal Offset	Vertical Offset
Before Begin Abutment (W)	X					
To Left of Bridge (X)	X					
To Right of Bridge (Y)	X					
After End Abutment (Z)	X					

Sketch Description: 22_ELECTRIC1.jpg

Sketch Number: **4** Sketch Filename: **22_WZTC_form1.jpg**

Insp. Date:	08/16/2022		BIN:	1022630

WZTC PLAN

NOTES –

EXPRESSWAY

(1) LEFT LANE CLOSURES WERE USED AT PIER FOR BUCKET TRUCK WORK.
SEE NYSDOT REGION 5 WZTC MANUAL, SHEET 12 - 1 (STANDARD SHEET 619-31).

(2) RIGHT SHOULDER CLOSURES WERE USED AT ABUTMENTS FOR BUCKET TRUCK WORK.
SEE NYSDOT REGION 5 WZTC MANUAL, SHEET 12 - 5 (STANDARD SHEET 619-22).

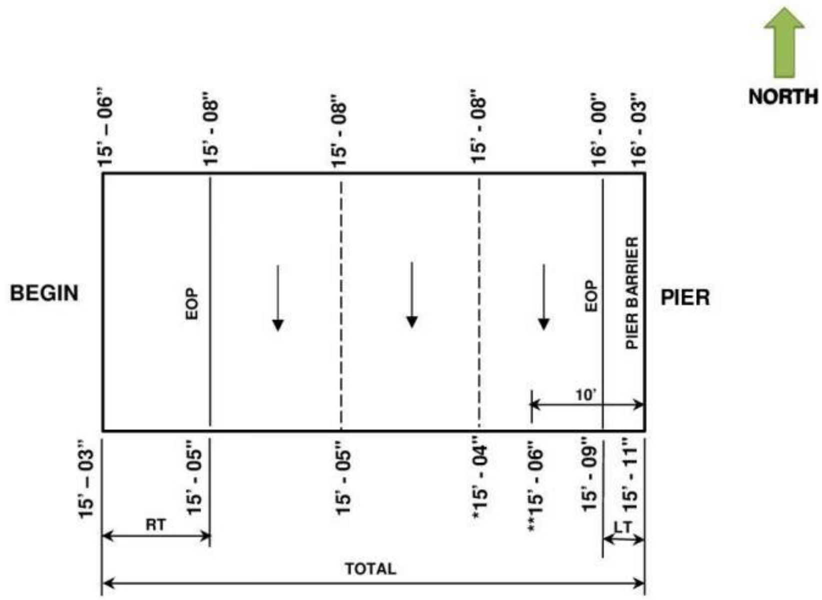
Sketch Description: 22_WZTC_form1.jpg

Sketch Number: **5** Sketch Filename: **22_VC_Under1.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	2

SPAN 1 ROUTE 33 WB HIGHWAY VERTICAL CLEARANCES (FT.)

INSP. DATE:	08/16/2022		BIN	1022630



INBOUND

Date	DEF**	ACT*	TOT	LT	RT
2022	15' - 06"	15 - 04"	49.3'	2.7'	9.6'
✓ if no change					

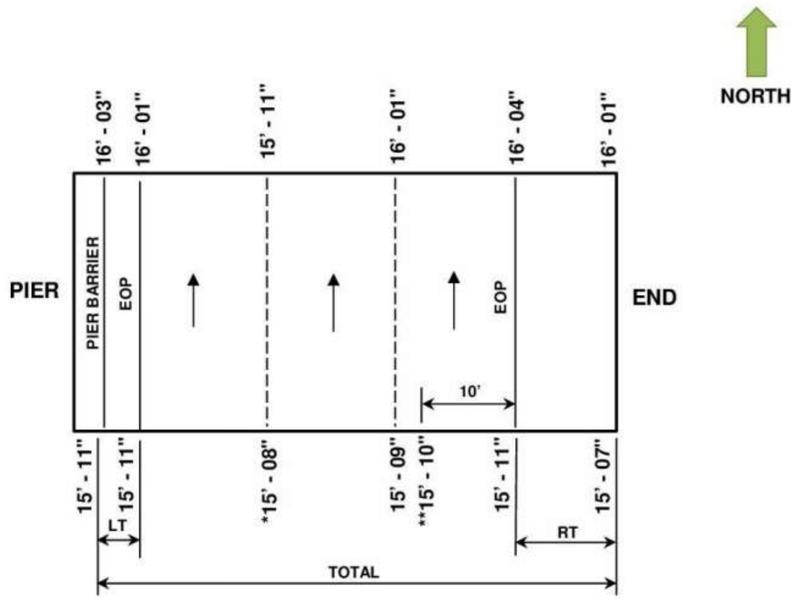
Sketch Description: 22_VC_Under1.jpg

Sketch Number: **6** Sketch Filename: **22_VC_Under2.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	2	OF	2

SPAN 2 ROUTE 33 EB HIGHWAY VERTICAL CLEARANCES (FT.)

INSP. DATE:	08/16/2022		BIN	1022630



OUTBOUND

Date	DEF**	ACT*	TOT	LT	RT
2022	15' - 08"	15' - 10"	49.5'	2.8'	9.5'
✓ if no change					

Sketch Description: 22_VC_Under2.jpg

 Format Version 20220222

Sketch Number: **7** Sketch Filename: **22_LdRat1.jpg**

Region 5 LoadRatingFieldCheckForm

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	1

LOAD RATING FIELD CHECK FORM

BIN:	1022630		Insp. Date:	08/16/2022

Dead Load - Note Changes since Last load Rating or state "NONE":

NONE.

Section Loss - Note locations and amount of loss on each girder or state "NONE":

Web loss exceeding 10% was measured in the following locations:

End Span 1 G1 – 15%	Begin Span 2 G2 – 15%	End Span 2 G9 – 15%
End Span 1 G2 – 10%	Begin Span 2 G3 – 10%	
End Span 1 G3 – 15%	Begin Span 2 G4 – 21%	
End Span 1 G4 – 10%	Begin Span 2 G5 – 15%	
End Span 1 G5 – 29%	Begin Span 2 G6 – 27%	
End Span 1 G6 – 27%	Begin Span 2 G8 – 23%	
End Span 1 G8 – 25%	Begin Span 2 G9 – 15%	
End Span 1 G9 – 21%		

See section loss documentation.

Additional Notes:

Attachments:

22_SectionLoss_1022630.xlsx

Team Leader: Nimish Shah, P.E.

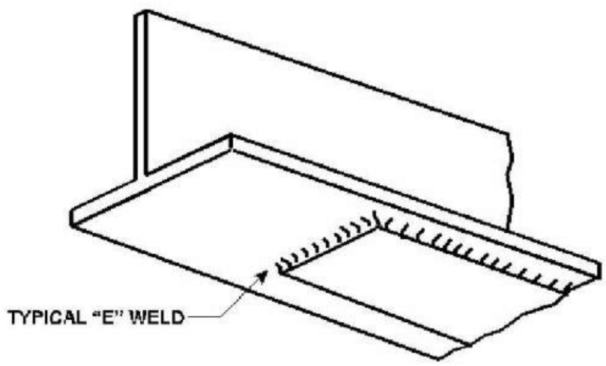
Sketch Description: 22_LdRat1.jpg

Sketch Number: **8** Sketch Filename: **22_Special Emphasis1.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	2

SPECIAL EMPHASIS REQUIRED
COVER PLATE WELDS

INSP. DATE:	08/16/2022		BIN	1022630



NOTES:

1) Category "E" welds are located at ends of cover plates on all girders.
2) All Category "E" welds shall receive 100% hands on inspection.

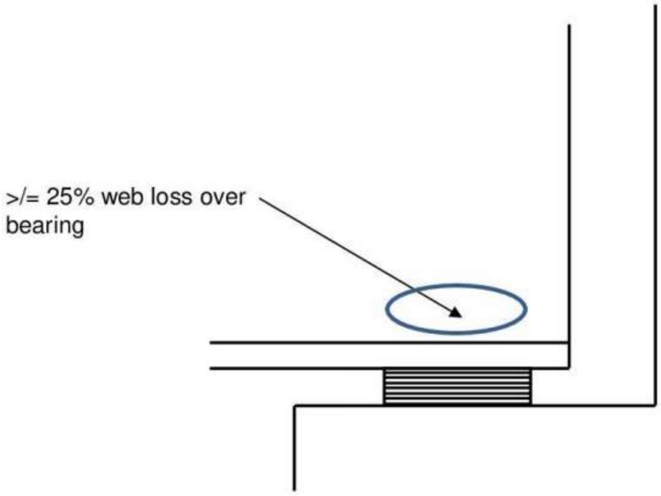
Sketch Description: 22_Special Emphasis1.jpg

Sketch Number: **9**	Sketch Filename: **22_Special Emphasis2.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	2	OF	2

SPECIAL EMPHASIS REQUIRED
>/= 25% WEB LOSS OVER
BEAINGS

INSP. DATE:	08/16/2022		BIN	1022630



NOTES:

1) All Girders with >/= 25% web loss over bearings shall receive 100% hands on inspection.
2) See Web Loss documentation.

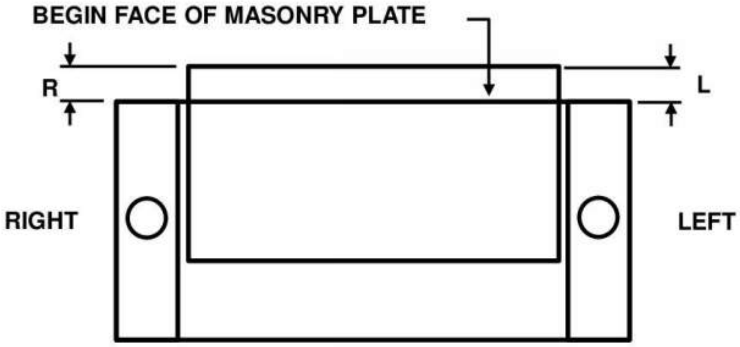
Sketch Description: 22_Special Emphasis2.jpg

Sketch Number: **10** Sketch Filename: **22_Begin Bearing Over Expansion1.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	1

BEGIN BEARING SKEW AND OVER EXPANSION

INSP. DATE:	08/16/2022		BIN	1022630



PLAN

YEAR	TEMP	BEGIN ABUTMENT BEARING DISPLACEMENT (in)									
		G-1		G-2		G-3		G-4		G-5	
		RT	LT	RT	LT	RT	LT	RT	LT	RT	LT
2012	60 F	1/8	1/4	5/8	1/8	1/8	0	1/8	0	1/8	1/16
2014	53 F	1/4	-3/8	9/16	1/8	1/4	1/8	3/8	1/16	3/8	1/2
2016	47 F	1/2	-1/2	3/4	1/2	1/2	3/4	1/2	3/8	3/8	1/2
2018	31 F	1/4	-3/8	1/2	0	1/4	0	1/2	1/8	3/8	1/4
2020	78 F	0	1/8	5/8	1/8	1/2	5/8	1/2	3/8	1/2	5/8
2022	80 F	0	0	5/8	0	1/2	5/8	1/2	3/8	1/2	5/8

YEAR	TEMP	BEGIN ABUTMENT BEARING DISPLACEMENT (in)							
		G-6		G-7		G-8		G-9	
		RT	LT	RT	LT	RT	LT	RT	LT
2012	60 F	0	1/4	1/4	1/2	1/2	3/4	0	1/8
2014	53 F	0	1/2	1/4	1/2	3/8	3/4	0	1/8
2016	47 F	1/8	1/4	1/4	3/4	5/8	7/8	1/8	3/8
2018	31 F	0	1/4	1/8	3/8	1/2	5/8	0	1/8
2020	78 F	1/4	3/8	1/2	5/8	5/8	3/4	1/8	3/8
2022	80 F	1/4	3/8	1/4	1/2	5/8	3/4	0	0

Sketch Description: 22_Begin Bearing Over Expansion1.jpg

Sketch Number: **11** Sketch Filename: **22_SectionLoss_10226301.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	of	1

LOWER WEB SECTION LOSS MEASUREMENTS (in)

Insp. Date	8/16/2022	BIN	1022630

SPAN-1							
	ORIG. WEB THICKNESS = 0.468" FASCIAS AND INTERIORS						
Girder Number	Location	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss
G-1	BEGIN	15/32	0%	7/16	7%	0.47	0%
	PIER-1	13/32	13%	13/32	13%	0.40	15%
G-2	BEGIN	15/32	0%	15/32	0%	0.47	0%
	PIER-1	7/16	7%	7/16	7%	0.42	10%
G-3	BEGIN	15/32	0%	15/32	0%	0.47	0%
	PIER-1	13/32	13%	13/32	13%	0.40	15%
G-4	BEGIN	15/32	0%	15/32	0%	0.47	0%
	PIER-1	7/16	7%	3/8	20%	0.42	10%
G-5	BEGIN	15/32	0%	15/32	0%	0.45	4%
	PIER-1	5/16	33%	11/32	27%	0.33	29%
G-6	BEGIN	15/32	0%	15/32	0%	0.45	4%
	PIER-1	5/16	33%	11/32	27%	0.34	27%
G-7	BEGIN	15/32	0%	15/32	0%	0.47	0%
	PIER-1	Not Accessible		Not Accessible		Not Accessible	
G-8	BEGIN	15/32	0%	15/32	0%	0.47	0%
	PIER-1	3/8	20%	3/8	20%	0.35	25%
G-9	BEGIN	15/32	0%	15/32	0%	0.47	0%
	PIER-1	3/8	20%	3/8	20%	0.37	21%
INSP. BY, DATE		CMC, 2018		TK, 2020		NS, 2022	

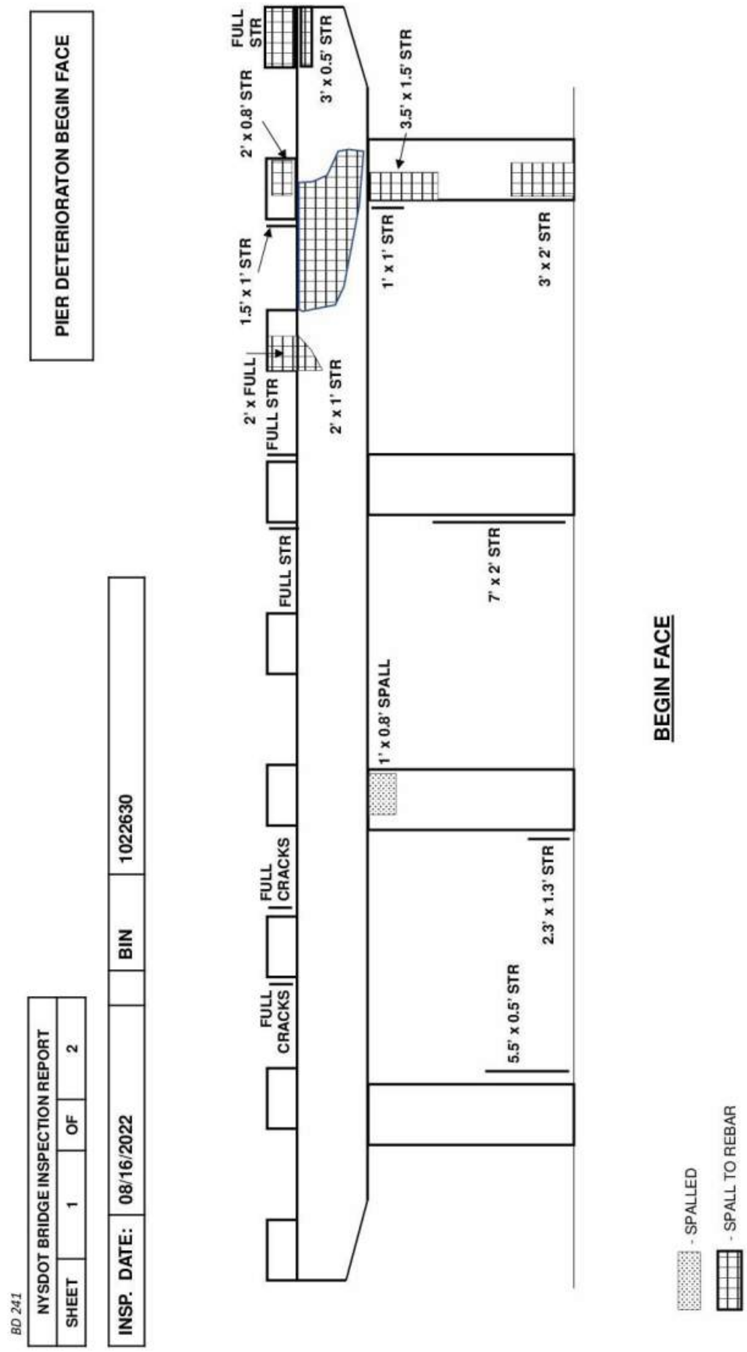
G-1 TO G-9 ARE 24 WF 100 with WEB = 24.0" X 0.468" AND FLANGE = 12.0" X 0.775"

SPAN-2							
	ORIG. WEB THICKNESS = 0.468" FASCIAS AND INTERIORS						
Girder Number	Location	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss
G-1	PIER-1	7/16	7%	7/16	7%	0.47	0%
	END	15/32	0%	15/32	0%	0.47	0%
G-2	PIER-1	13/32	13%	13/32	13%	0.40	15%
	END	15/32	0%	15/32	0%	0.47	0%
G-3	PIER-1	7/16	7%	7/16	7%	0.42	10%
	END	15/32	0%	15/32	0%	0.47	0%
G-4	PIER-1	3/8	20%	3/8	20%	0.37	21%
	END	15/32	0%	15/32	0%	0.47	0%
G-5	PIER-1	13/32	13%	13/32	13%	0.40	15%
	END	15/32	0%	15/32	0%	0.47	0%
G-6	PIER-1	11/32	27%	11/32	27%	0.34	27%
	END	15/32	0%	15/32	0%	0.47	0%
G-7	PIER-1	Not Accessible		Not Accessible		Not Accessible	
	END	15/32	0%	15/32	0%	0.47	0%
G-8	PIER-1	11/32	27%	3/8	20%	0.36	23%
	END	15/32	0%	15/32	0%	0.47	0%
G-9	PIER-1	13/32	13%	13/32	13%	0.40	15%
	END	13/32	13%	13/32	13%	0.40	15%
INSP. BY, DATE		CMC, 2018		TK, 2020		NS, 2022	

G-1 TO G-9 ARE 24 WF 100 with WEB = 24.0" X 0.468" AND FLANGE = 12.0" X 0.775"

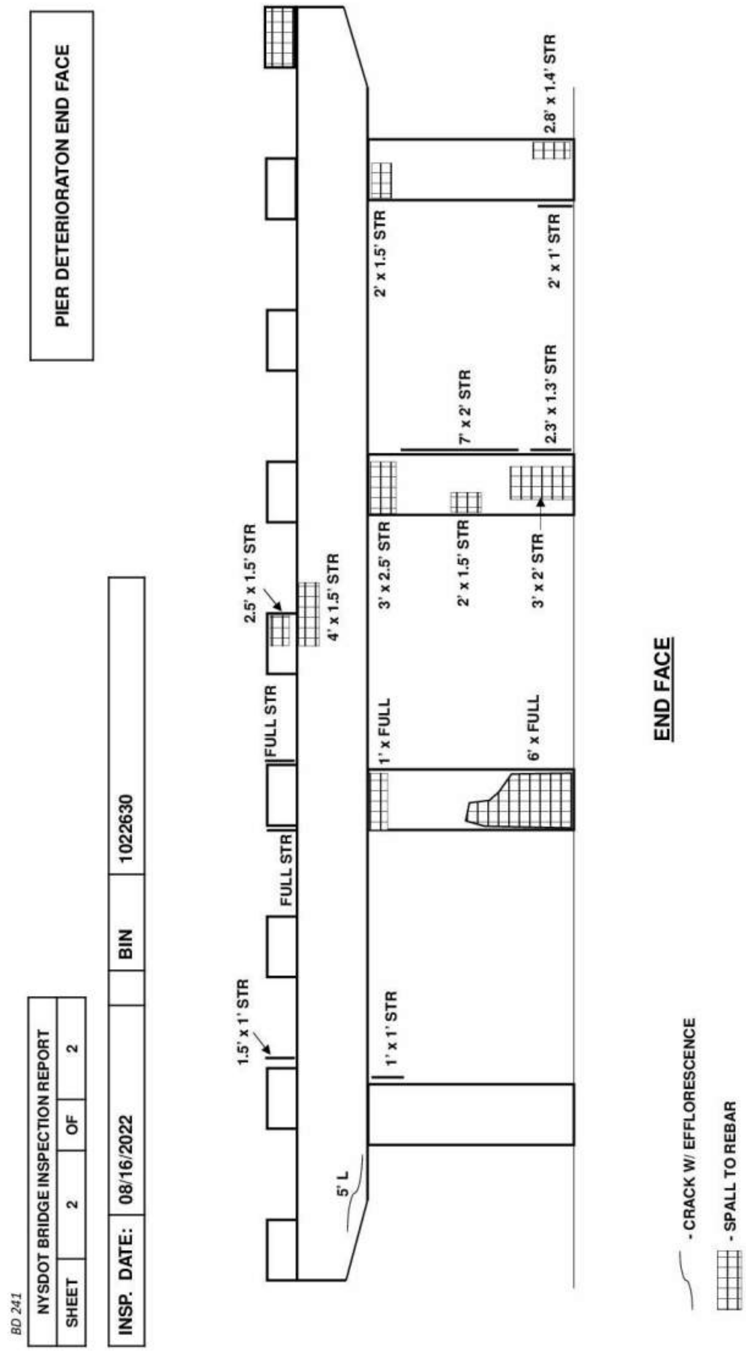
Sketch Description: 22_SectionLoss_10226301.jpg

Sketch Number: **12** Sketch Filename: **22_Pier Deterioration_10226301.jpg**



Sketch Description: 22_Pier Deterioration_10226301.jpg

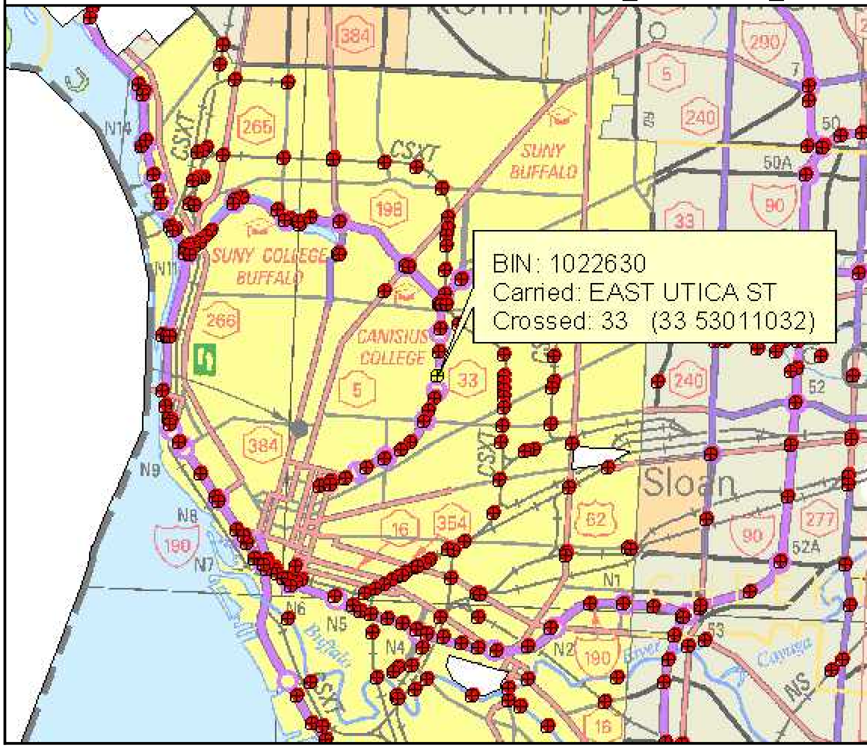
Sketch Number: **13** Sketch Filename: **22_Pier Deterioration_10226302.jpg**



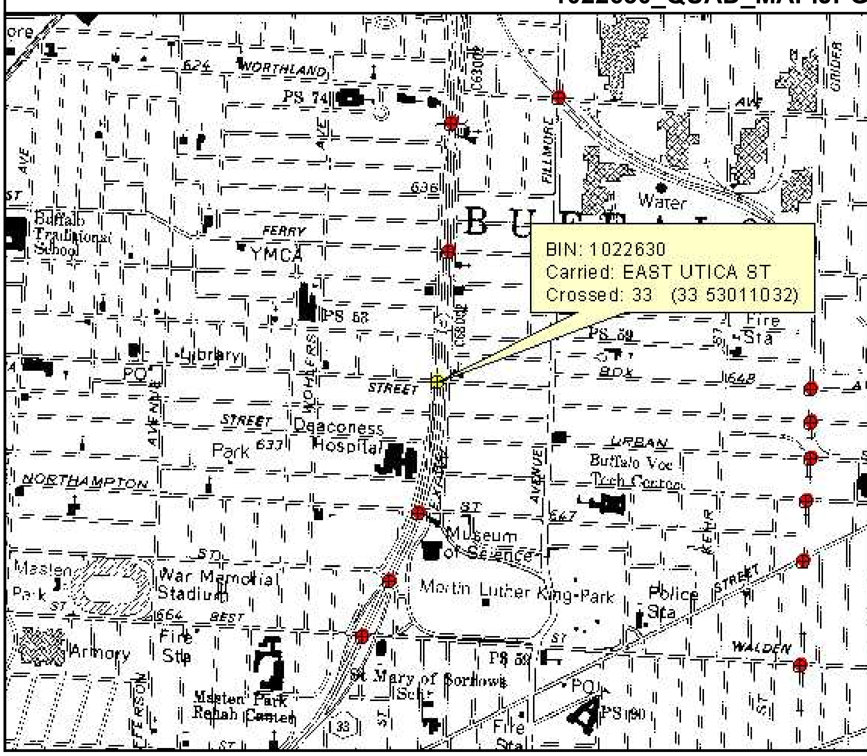
Sketch Description: 22_Pier Deterioration_10226302.jpg

Standard Photographs

1022630_LOCATION_MAP.JPG



1022630_QUAD_MAP.JPG



Abutment_Begin.JPG

Abutment_End.JPG

Approach_Begin.JPG

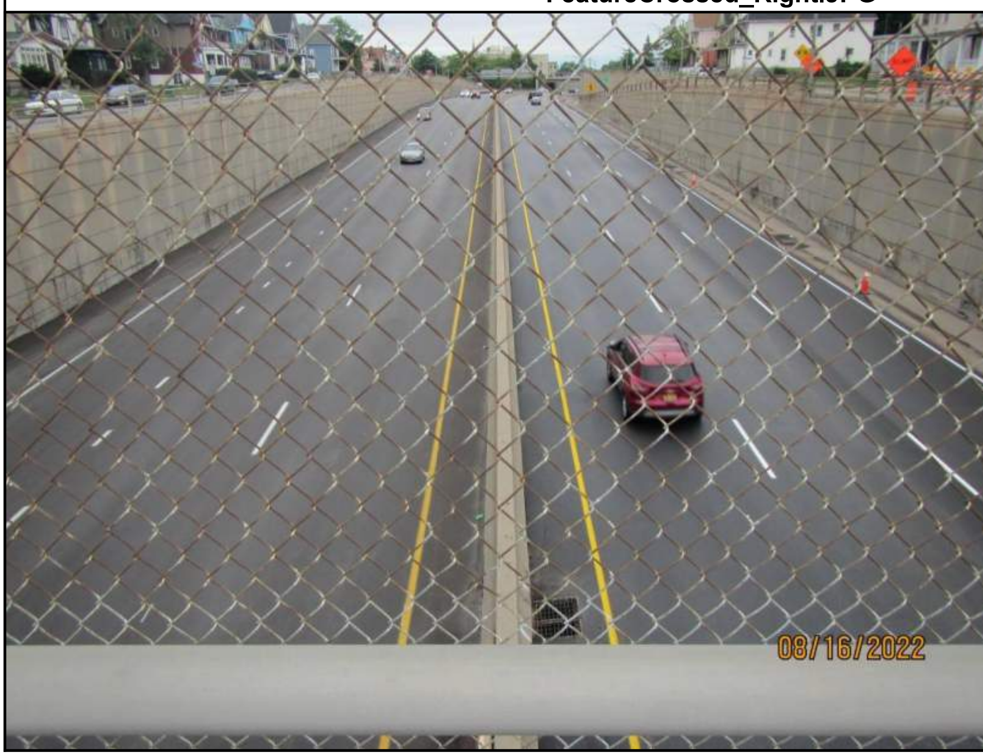
Approach_End.JPG

Elevation_Left.JPG

Elevation_Right.JPG

FeatureCrossed_Left.JPG

FeatureCrossed_Right.JPG



Framing_Span_1.JPG

Pier.JPG

Appendix B

Bridge Work History Summary

East Utica St. Bridge (BIN 1022630) Work History

Year	Contract	Description of Work
2014	-	New Asphalt Pavement at Both Approaches
2010	-	Waterproof Bridge Seats and Pier Caps
2009	D260954	Clean Bridge
2008	D260644	Clean Bridge
2006	D259781	Bridge Painting - Paint Bridge
	D260001	Clean Bridge
2005	D259745	Bridge Painting - Paint Bridge
2003	D259244	Waterproof Bridge Deck
2001	D258747	Clean Bridge
2000	D258317	Clean Bridge
1998	D257523	Clean Bridge
1997	D257087	Clean Pier Caps and Abutments
		Clean Bridge Deck
		Clean Superstructure
1996	D256740	Clean Pier Caps and Abutments - Clean Abutments & Pier
		Maintain and Repair Structural Bridge Deck - Clean Deck
		Clean Superstructure
1995	D256372	Clean Pier Caps and Abutments
		Clean Deck
		Clean Superstructure
1994	D254824	Clean Pier Caps and Abutments
		Clean Bridge Deck
		Clean Superstructure
1993	D254466	Replace Joint System - New Abutment Joints - Armored Joint w/ Compression Seal
		Repair, Replace, or Add to Existing Concrete Substructure - Conrete Repair - Pier & East Abutment
		Maintain and Repair Structural Bridge Deck - Mono Deck Reprair - Micro-silica Overlay
	D254371	Clean Deck
		Clean Superstructure
		Clean Pier Caps and Abutments
1992	D254105	Clean Superstructure
		Clean Deck
		Clean Pier Caps and Abutments
1991	D253631	Maintenance Cleaning of Bridges
1984	D250619	Clean and Paint Metal Surfaces - Bridge Painting Contract

Appendix C

Load Rating Summary

BIN 1022630
East Utica Street
over
Kensington Expressway

City of Buffalo
Erie County, New York

Level 1 Load Rating Calculations

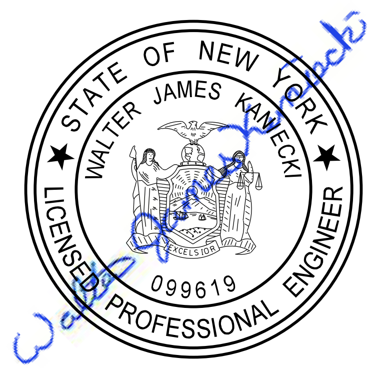
November 2023

Prepared By: Chirag S Patel, PE
Checked By: Walter James Kaniecki, PE

Load Rating Summary

Rating Load	Controlling Mode	Inventory Rating	Operating Rating
Load and Resistance Factor Rating HL-93	Span 2 Girder G6 Original 24*WF*100 Web Local Crippling	0.40	0.51
Load Factor Rating HS Truck or Lane	Span 2 Girder G6 Original 24*WF*100 Unstiffened Bearing Area	HS 20.8 37.5 Tons	HS 34.8 62.6 Tons

Approved By:
Walter James Kaniecki, PE
License Number 099619



LaBella
Powered by partnership.

Table of Contents

BIN 1022630
Level 1 Load Rating, November 2023

Load Rating Summary

Load and Resistance Factor Rating (LRFR), HL-93

Span 2 Girder G6 Begin
Original 24WF100 with measured Section Loss
Web Local Crippling, No Bearing Stiffeners
0.40 Inventory
0.51 Operating

Load Factor Rating (LFR), HS-Truck or Lane

Span 2 Girder G6 Begin
Original 24WF100 with measured Section Loss
Web End Shear, No Bearing Stiffeners
HS 20.8, 37.5 Tons Inventory
HS 34.8, 62.6 Tons Operating

BIN 1022630
Level 1 Load Rating, November 2023

Bridge Information

BIN	1022630
Date of Load Rating	November 2023
Political Unit	City of Buffalo
Feature Carried	East Utica Street
Feature Crossed	Kensington Expressway
Superstructure Type	Steel Multi-Girder
Number of Spans	2 Simple Spans 52’-3” & 52’-3”
Skew	1°-06’-20”
Total Length	110’-0”
Out-to-Out Width	64’-0”
Bridge Width Curb-to-Curb	52’-0”
Number of Actual Travel Lanes	4
Number of Lanes used in Rating	4
Type of Deck	Concrete
Type of Wearing Surface	Micro-Silica Overlay
Type of Sidewalks	Left Side: Concrete Right Side: Concrete
Barrier or Railing Type	Concrete Parapet with Steel Railing
Year Built	1970
Rehabilitation Year(s)	
Design Live Load	HS 20-44
Existing Posted Load	Not Posted
Date of Most Recent Inspection	May 2023
List of Plans Included	Excerpts from: 1968 C 68-2 Original Plans

BIN 1022630
Level 1 Load Rating, November 2023

General Description

The East Utica Street Bridge over the Kensington Expressway was originally built in 1970. It is a multi-girder bridge with 2 consecutive simple spans. The girders are steel rolled shapes with welded bottom cover plates, and are made composite with the concrete deck. The 52'-wide roadway carries 4 lanes. Both sides have raised sidewalks with curb, concrete parapet topped with steel pedestrian railing, and snow fence.

The bridge orientation differs among the Record Plans, Inspection Reports, and the existing Level 2 Load Rating Model in AASHTOWare BrR.

Record Plans	Inspection Report & This Level 1 Load Rating	AASHTOWare BrR Level 2 Load Rating
West ← East	West → East	West ← East

Analysis Description

This bridge was analyzed using both:

- Load and Resistance Factor Rating (LRFR)
- Load Factor Rating (LFR)

as described by the American Association of State Highway and Transportation Officials (AASHTO) and the New York State Department of Transportation (NYSDOT).

Three load definitions were evaluated:

- The HL-93 design load definition for LRFR
- The HS 20 truck or lane design load definition for LFR
- For specific ratings with LFR less than HS 20.0 Inventory, re-evaluate for the H 20 truck or lane load definition

This Level 1 Load Rating takes the existing Level 2 Load Rating Model built using AASHTOWare BrR. The input was verified and the most recent inspection information was incorporated into the model.
Due to specific concerns at the girder ends, select locations were manually checked for their capacity in the bearing region.

LaBella
Powered by partnership.

PROJECT: KENSINGTON EXPY SHEET ___ OF ___
PROJECT NO. D038277 CALC. BY CSP DATE 08/17/23
SUBJECT: BIN 1022630 E. UTICA SCALE ___
CHECKED BY: WJK 08/23/23

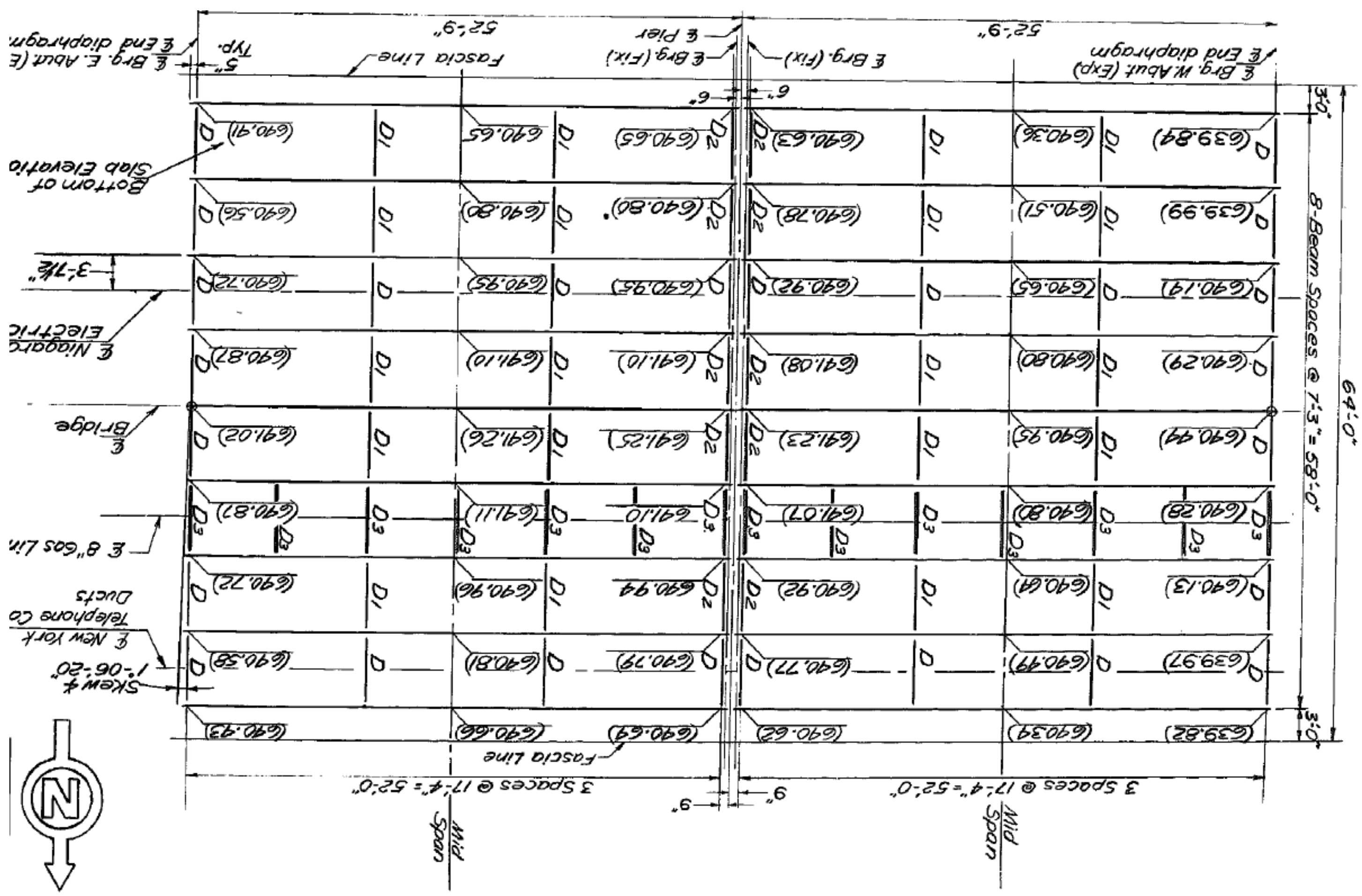
Modifications to the AASHTOWare BrR File

1. Traffic Information was missing. Added ADT, % Trucks, Directional Percent, and ADTT based on the Bridge Inventory Report.
   Total ADT 3719 w/ 5% Trucks.
   Let directionality be 55% [AASHTO LRFD C3.6.1.4.2] & 2 lanes available per direction.
   Assume current ADTT is reasonable for cycles over entire lifetime.

2. The bridge framing is two consecutive simple spans. The model had only defined one span as a representative typical superstructure. Copied the superstructure definition and un-linked girders to differentiate span 1 and span 2 with current section loss.

3. Skew was defined as (+)clockwise. Sign changed to make skew (-)counter-clockwise. LRFR Live Load Distribution Factors re-calculated to reflect change.

4. Diaphragm layout and weights changed to accurately reflect the record plans.



Modifications to the AASHTOWare BrR File

D	15 C 33.9	x 7'-3" = 0.2458 k
D1	18 C 42.7	x 7'-3" = 0.3096 k
D2	16 WF 36	x 7'-3" = 0.2610 k
D3	2-6 C 13	x 7'-3" = 0.1885 k

End Diaphragms placed 0.125' away from centerline of bearings
(52'-3" – 52'-0") / 2 = 1½" End Distance
Although the record plans show the abutment end diaphragms colinear with the centerline of bearing and the pier end diaphragms 3" eccentric, photographs show a multitude of wandered positions. Choose to represent as the average.

5. Removed 10% Additional Self Load in favor of explicitly defining Utilities (as DW loads)
   a. Members G3 & G4: Bank of 9-4" Electrical conduit with a unit weight of 1967 lb/100ft was applied. See attached sheet.
      9 conduit / 2 girders x 1967 lb / 100 ft = 0.089 klf
   b. Members G6 & G7: 8" Gas line – Standard 8" pipe with a unit weight of 28.580 lb/ft was used. See attached sheet.
      28.580 plf / 2 girders = 0.015 klf
   c. Members G8 & G9: Bank of 9-3.5" Telephone conduit with a unit weight of 1604 lb/100 ft was applied. See attached sheet.
      9 conduit / 2 girders x 1604 lb / 100 ft = 0.072 klf

6. Updated section loss based on most recent LaBella Element-Specific Inspection.

7. Added Points of Interest for the Cover Plate End fatigue detail.
   [AASHTO LRFD Table 6.6.1.2.3-1] Case 3.5, End Welded Cover Plates
   24 WF 100 $t_f = 0.775" \leq 0.8"$ → Category E

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway				
PROJECT NO.	2230860	SHEET		OF	
SUBJECT	BIN 1022630 East Utica				
	CALC. BY	CSP	DATE	11/15/2023	
	CKD. BY	WJK	DATE	11/17/2023	

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W ← E

AASHTOWare BrR Rating Output

- Load and Resistance Factor Rating, HL-93
  - Whole Structure

Member Identity presented here following Inspection Orientation

Structure	Member	Inventory rating factor	Operating rating factor	Inventory capacity (Ton)	Operating capacity (Ton)	Inventory location (ft)
Span 1	G1	1.728	2.240	62.198	80.627	26.125
Span 1	G2	1.292	1.674	46.496	60.272	26.125
Span 1	G3	Definition Linked to G4				
Span 1	G4	1.314	1.704	47.321	61.342	26.125
Span 1	G5	Definition Linked to G2				
Span 1	G6	Definition Linked to G7				
Span 1	G7	1.280	1.659	46.062	59.710	52.25
Span 1	G8	1.177	1.526	42.377	54.933	52.25
Span 1	G9	1.791	2.322	64.492	83.600	26.125
Span 2	G1	1.728	2.240	62.198	80.627	26.125
Span 2	G2	1.152	1.493	41.465	53.751	0
Span 2	G3	Definition Linked to G4				
Span 2	G4	1.314	1.704	47.321	61.342	26.125
Span 2	G5	Definition Linked to G2				
Span 2	G6	Definition Linked to G7				
Span 2	G7	0.859	1.114	30.930	40.095	0
Span 2	G8	1.322	1.714	47.592	61.693	26.125
Span 2	G9	1.791	2.322	64.492	83.600	26.125

- Controlling Member, Span 2 G7

Live Load Type	Inventory rating factor	Operating rating factor	Location (ft)	Location Span-(%)	Limit State
Truck + Lane	0.859	1.114	0	(0)	STRENGTH-I Steel Shear

Section Loss based on one measurement, detailed calculation with Bearing Region Check

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway				
PROJECT NO.	2230860	SHEET		OF	
SUBJECT	BIN 1022630 East Utica				
		CALC. BY	CSP	DATE	11/15/2023
		CKD. BY	WJK	DATE	11/17/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model

AASHTOWare BrR Rating Output

- Load Factor Rating, HS20-44
  - Whole Structure

Member Identity presented here following Inspection Orientation

Structure	Member	Inventory rating factor	Operating rating factor	Inventory capacity (Ton)	Operating capacity (Ton)	Inventory location (ft)
Span 1	G1	5.619	9.384	202.291	337.826	26.125
Span 1	G2	1.196	1.997	43.049	71.891	26.125
Span 1	G3	Definition Linked to G4				
Span 1	G4	1.215	2.029	43.740	73.046	26.125
Span 1	G5	Definition Linked to G2				
Span 1	G6	Definition Linked to G7				
Span 1	G7	1.190	1.987	42.825	71.517	26.125
Span 1	G8	1.222	2.040	43.976	73.440	26.125
Span 1	G9	5.819	9.718	209.480	349.832	26.125
Span 2	G1	5.619	9.384	202.291	337.826	26.125
Span 2	G2	1.196	1.997	43.049	71.891	26.125
Span 2	G3	Definition Linked to G4				
Span 2	G4	1.215	2.029	43.740	73.046	26.125
Span 2	G5	Definition Linked to G2				
Span 2	G6	Definition Linked to G7				
Span 2	G7	0.992	1.656	35.706	59.629	0
Span 2	G8	1.222	2.040	43.976	73.440	26.125
Span 2	G9	5.819	9.718	209.480	349.832	26.125

  - Controlling Member, Span 2 G7

Live Load Type	Inventory rating factor	Operating rating factor	Location (ft)	Location Span-(%)	Limit State
Axle Load	0.992	1.656	0	(0)	Design Shear - Steel

Section Loss based on one measurement, detailed calculation with Bearing Region Check

- Fatigue Evaluation, HL-93 (Fatigue)
  - End Welded Cover Plates

		Infinite Life Check		Finite Life Analysis				
Member	Stress Range, Δf (ksi)	Infinite Life Range, Δf Max (ksi)	Threshold Stress, ΔF TH (ksi)	Finite Life Range, Δf eff (ksi)	Current Cycles, N1	Available Cycles, Nav	Remaining Life, Y REM (yrs)	Fatigue Serviceabilit y Index, Q
Exterior	2.17	3.79	4.50					
Interior	3.05	5.33	4.50	2.44	3666060	91359826	1291	0.86

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022630 East Utica		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	10/31/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W ← E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
    - Span 1

Begin

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	SIP Form	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	3.017	-	1.515	0.278	15.817	1.684	4.572	1.881		47.508	11.764	8.498
G2	2.900	-	3.031	0.555	17.757	1.684	4.572	1.881		72.611	49.391	33.669
G3	2.899	-	3.031	0.608	17.757	1.684	4.572	0.392		72.605	49.391	33.669
G4	2.899	-	3.031	0.608	17.757	1.684	4.572	0.392		72.605	49.391	33.669
G5	2.900	-	3.031	0.555	17.757	1.684	4.572			72.605	49.391	33.669
G6	2.899	-	3.031	0.523	17.757	1.684	4.572	2.325		72.605	49.391	33.669
G7	2.899	-	3.031	0.523	17.757	1.684	4.572	2.325		72.605	49.391	33.669
G8	2.900	-	3.031	0.555	17.757	1.684	4.572			72.832	49.391	33.669
G9	3.017	-	1.515	0.278	15.817	1.684	4.572			47.652	11.764	8.498

End

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	SIP Form	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	3.017	-	1.515	0.285	15.818	1.684	4.572	1.881		47.652	11.764	8.498
G2	2.900	-	3.031	0.571	17.757	1.684	4.572	1.881		72.832	49.391	33.669
G3	2.900	-	3.031	0.615	17.757	1.684	4.572	0.392		72.605	49.391	33.669
G4	2.900	-	3.031	0.615	17.757	1.684	4.572	0.392		72.605	49.391	33.669
G5	2.900	-	3.031	0.571	17.757	1.684	4.572			72.605	49.391	33.669
G6	2.900	-	3.031	0.531	17.757	1.684	4.572	2.325		72.605	49.391	33.669
G7	2.900	-	3.031	0.531	17.757	1.684	4.572	2.325		72.605	49.391	33.669
G8	2.900	-	3.031	0.571	17.757	1.684	4.572			72.611	49.391	33.669
G9	3.017	-	1.515	0.285	15.818	1.684	4.572			47.508	11.764	8.498

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022630 East Utica		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	10/31/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W ← E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 2

Begin

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	SIP Form	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	3.017	-	1.515	0.285	15.817	1.684	4.572	1.881		47.508	11.764	8.498
G2	2.900	-	3.031	0.571	17.757	1.684	4.572	1.881		72.611	49.391	33.669
G3	2.899	-	3.031	0.615	17.757	1.684	4.572	0.392		72.605	49.391	33.669
G4	2.899	-	3.031	0.615	17.757	1.684	4.572	0.392		72.605	49.391	33.669
G5	2.900	-	3.031	0.571	17.757	1.684	4.572			72.605	49.391	33.669
G6	2.899	-	3.031	0.531	17.757	1.684	4.572	2.325		72.605	49.391	33.669
G7	2.899	-	3.031	0.531	17.757	1.684	4.572	2.325		72.605	49.391	33.669
G8	2.900	-	3.031	0.571	17.757	1.684	4.572			72.832	49.391	33.669
G9	3.017	-	1.515	0.285	15.817	1.684	4.572			47.652	11.764	8.498

End

	DC1					DC2		DW		LL		
	Self Wt.	Misc. Metals	SIP Form	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	3.017	-	1.515	0.278	15.818	1.684	4.572	1.881		47.652	11.764	8.498
G2	2.900	-	3.031	0.555	17.757	1.684	4.572	1.881		72.832	49.391	33.669
G3	2.900	-	3.031	0.608	17.757	1.684	4.572	0.392		72.605	49.391	33.669
G4	2.900	-	3.031	0.608	17.757	1.684	4.572	0.392		72.605	49.391	33.669
G5	2.900	-	3.031	0.555	17.757	1.684	4.572			72.605	49.391	33.669
G6	2.900	-	3.031	0.523	17.757	1.684	4.572	2.325		72.605	49.391	33.669
G7	2.900	-	3.031	0.523	17.757	1.684	4.572	2.325		72.605	49.391	33.669
G8	2.900	-	3.031	0.555	17.757	1.684	4.572			72.611	49.391	33.669
G9	3.017	-	1.515	0.278	15.818	1.684	4.572			47.508	11.764	8.498

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022630 East Utica		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	10/31/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W ← E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 1

	Begin					End				
	DC	DW	HL-93	HS 20	H 20	DC	DW	HL-93	HS 20	H 20
G1	26.88	1.88	47.51	11.76	8.50	26.89	1.88	47.65	11.76	8.50
G2	30.50	1.88	72.61	49.39	33.67	30.52	1.88	72.83	49.39	33.67
G3	30.55	0.39	72.61	49.39	33.67	30.56	0.39	72.61	49.39	33.67
G4	30.55	0.39	72.61	49.39	33.67	30.56	0.39	72.61	49.39	33.67
G5	30.50	0.00	72.61	49.39	33.67	30.52	0.00	72.61	49.39	33.67
G6	30.47	2.33	72.61	49.39	33.67	30.48	2.33	72.61	49.39	33.67
G7	30.47	2.33	72.61	49.39	33.67	30.48	2.33	72.61	49.39	33.67
G8	30.50	0.00	72.83	49.39	33.67	30.52	0.00	72.61	49.39	33.67
G9	26.88	0.00	47.65	11.76	8.50	26.89	0.00	47.51	11.76	8.50

  - Span 2

	Begin					End				
	DC	DW	HL-93	HS 20	H 20	DC	DW	HL-93	HS 20	H 20
G1	26.89	1.88	47.51	11.76	8.50	26.88	1.88	47.65	11.76	8.50
G2	30.52	1.88	72.61	49.39	33.67	30.50	1.88	72.83	49.39	33.67
G3	30.56	0.39	72.61	49.39	33.67	30.55	0.39	72.61	49.39	33.67
G4	30.56	0.39	72.61	49.39	33.67	30.55	0.39	72.61	49.39	33.67
G5	30.52	0.00	72.61	49.39	33.67	30.50	0.00	72.61	49.39	33.67
G6	30.47	2.33	72.61	49.39	33.67	30.47	2.33	72.61	49.39	33.67
G7	30.47	2.33	72.61	49.39	33.67	30.47	2.33	72.61	49.39	33.67
G8	30.52	0.00	72.83	49.39	33.67	30.50	0.00	72.61	49.39	33.67
G9	26.89	0.00	47.65	11.76	8.50	26.88	0.00	47.51	11.76	8.50

Existing Girder End Section Resistance (LRFR)

- Span 2 Girder 6 Begin
  - -- Applied Load and LRFR Factors

Assumptions & Limitations of this Worksheet
Girder not Longitudinally Stiffened
Girder not Transversely Stiffened
No Bearing Stiffeners

All Girders Identical Section, Span 2 Girder 6 Begin has most section loss

Applied End Shear $V_{DC} := 30.47\ kip$ $V_{DW} := 2.33\ kip$ $V_{HL} := 72.61\ kip$

Applied Reaction Force $R_{DC} := 30.56\ kip$ $R_{DW} := 2.33\ kip$ $R_{HL} := 72.61\ kip$

STRENGTH Load Factors $\gamma_{DC} := 1.25$ $\gamma_{DW} := 1.50$ $\gamma_{LL} := \begin{bmatrix} 1.75 \\ 1.35 \end{bmatrix}$

Condition Resistance Reduction Factor [AASHTO MBE 6A.4.2.3]
Smooth polynomial connecting (0%, 1.00), (5%, 0.98), & (20%, 0.90)
with tangent at minimum value of 0.90

$$\phi_c(Loss) := \begin{array}{l} \text{if } Loss \le 0.2 \\ \quad \left\| \dfrac{190}{9} \cdot Loss^3 - \dfrac{107}{18} \cdot Loss^2 - \dfrac{7}{45} \cdot Loss + 1 \right. \\ \text{else} \\ \quad \left\| 0.900 \right. \end{array}$$

System Redundancy Resistance Reduction Factor [AASHTO MBE 6A.4.2.4]
Regular Multi-Girder System with > 3 Girders $\phi_s := 1$

Rating Check Resistance Reduction Factors
Shear $\phi_v := 1$ Yielding $\phi_b := 1$ Crippling $\phi_w := 0.8$

Existing Girder End Section Resistance (LRFR)

- Span 2 Girder 6 Begin
  -- Girder Geometry

Steel Properties $E := 29000\ ksi$ Web $F_{yw} := 36\ ksi$ Flange $F_{yf} := 36\ ksi$

Web Thickness Measurements and "Weight"

t_{wm} (in)	t_{ww}
0.468	$1 \div 3$
0.468	$1 \div 3$
0.295	$1 \div 3$

Web Monolithic Steel Depth $d := 24\ in$
(Rolled Shape Section Depth, Plate Shape Web Depth)

Web Shear "Unbraced Depth" $D_v := 20.875\ in$
(Rolled Shape Web Flat Depth, Plate Shape Web Depth)

Bottom Flange + Fillet Height $k := 1.5625\ in$

Section Original Web Thickness $t_{wo} := 0.468\ in$

Weighted Average Web Thickness $t_w := t_{wm} \cdot t_{ww} = 0.410\ in$

Thickness at Bottom of Web $t_{wb} := t_{wm_2} = 0.295\ in$

Bottom Flange Thickness $t_{fb} := 0.775\ in$

Girder Extension Beyond Centerline of Bearing $ext := 5\ in$
(input zero for interior support)

Bearing Contact Length $N := 6\ in$

Existing Girder End Section Resistance (LRFR)

- Span 2 Girder 6 Begin
  -- Web Panel Shear [AASHTO LRFD 6.10.9]

Shear-Buckling Coefficient (unstiffened) $k_v := 5$

Web Compactness

$$\lambda_v := \frac{D_v}{t_w} = 50.9 \qquad \lambda_{pv} := 1.12 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 71.1 \qquad \lambda_{rv} := 1.40 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 88.9$$

Shear-Buckling Ratio

$$C := \text{if } \lambda_v \le \lambda_{rv} \;\; \left\| min\left(1, \frac{\lambda_{pv}}{\lambda_v}\right) \right. \;\; \text{else} \;\; \left\| 1.57 \cdot \frac{E \cdot k_v}{\lambda_v^{\ 2} \cdot F_{yw}} \right. = 1.000$$

Web Plastic Shear Strength

$$V_p := 0.58 \cdot F_{yw} \cdot d \cdot t_w = 205.6 \; \boldsymbol{kip}$$

Nominal Resistance

$$V_n := C \cdot V_p = 205.6 \; \boldsymbol{kip}$$

Section Loss based on Web Thickness

$$Loss_v := 1 - \frac{t_w}{t_{wo}} = 12.3\% \qquad \phi_{c.v} := \phi_c\left(Loss_v\right) = 0.930$$

$$V_r := \phi_{c.v} \cdot \phi_v \cdot V_n = 191.2 \; \boldsymbol{kip} \qquad RF_v := \frac{V_r - \gamma_{DC} \cdot V_{DC} - \gamma_{DW} \cdot V_{DW}}{\gamma_{LL} \cdot V_{HL}} = \begin{bmatrix} 1.18 \\ 1.53 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 2 Girder 6 Begin
  -- Web Local Yielding [AASHTO LRFD D6.5.2]

For Rating, Let Bearing Resistance be the sum of
Web Local Yielding and Stiffener Contact Stress

$$R_{ny} := \text{if } ext > d \vee ext = 0\ in \;\; \begin{Vmatrix} (5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \end{Vmatrix} \text{ else } \begin{Vmatrix} (2.5 \cdot k + N) \cdot F_{yw} \cdot t_{wb} \end{Vmatrix} = 105.2\ kip$$

Section Loss based on Thickness at Base of Web

$$Loss_b := 1 - \frac{t_{wb}}{t_{wo}} = 37.0\% \qquad \phi_{c.b} := \phi_c\left(Loss_b\right) = 0.900$$

$$R_{ry} := \phi_{c.b} \cdot \phi_s \cdot \phi_b \cdot R_{ny} = 94.7\ kip$$

$$RF_b := \frac{R_{ry} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.42 \\ 0.54 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 2 Girder 6 Begin
  -- Web Local Crippling [AASHTO LRFD D6.5.3]

$$R_{nw} := \text{if } ext > \frac{d}{2} \vee ext = 0\ in$$

$$\quad 0.8 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$

$$\text{else if } \frac{N}{d} \le 0.2$$

$$\quad 0.4 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$

$$\text{else}$$

$$\quad 0.4 \cdot t_w^{\ 2} \cdot \left(1 + \left(\frac{4\ N}{d} - 0.2\right) \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$

$$= 123.7\ kip$$

Section Loss based on Web Thickness

$$Loss_w := Loss_v = 12.3\% \qquad \phi_{c.w} := \phi_c\left(Loss_w\right) = 0.930$$

$$R_{rw} := \phi_{c.w} \cdot \phi_s \cdot \phi_w \cdot R_{nw} = 92.1\ kip$$

$$RF_w := \frac{R_{rw} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.40 \\ 0.51 \end{bmatrix}$$

Existing Girder End Section Resistance (LFR)

- Span 2 Girder 6 Begin
  -- Lack of Bearing Stiffeners on Rolled Shapes

[AASHTO 10.48.7] Redirects all Load Factor Design for Bearing Stiffeners back to the Allowable Stress part of the Code.
[10.33.2] Stiffeners only required where end shear exceeds 75% of allowable

Translate this to LFR by letting the Strength be 75% of the Web Panel Shear

-- Applied Load and LFR Factors

Applied End Shear $V_D := V_{DC} + V_{DW} = 32.8 \ \textbf{kip}$ $V_{HS} := 49.39 \ \textbf{kip}$

LFR Load Factors $A_1 := 1.3$ $A_2 := \begin{bmatrix} 2.17 \\ 1.3 \end{bmatrix}$

-- Web Panel Shear Strength

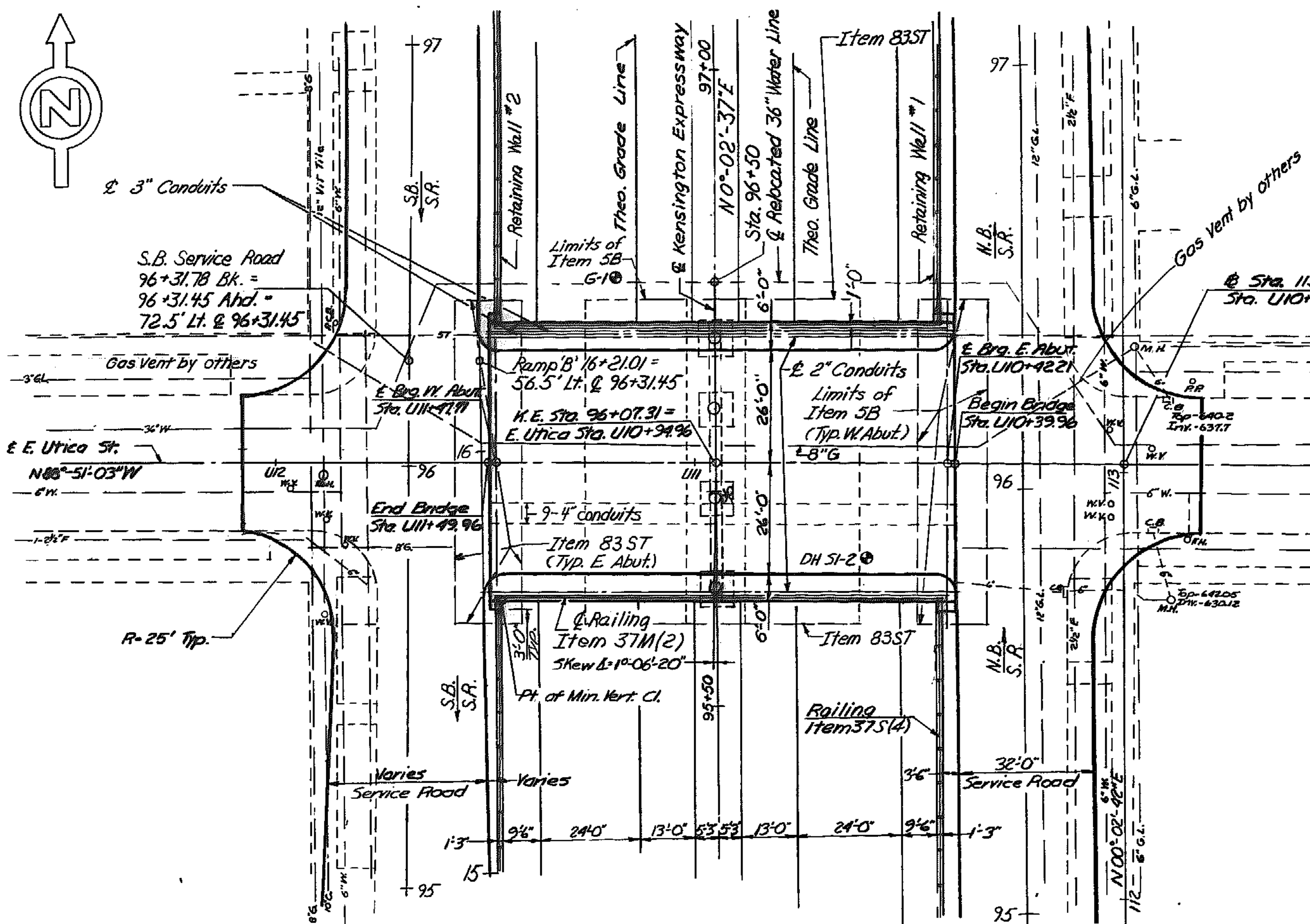
Math setup is the same as LRFR

$V_u := V_n = 205.6 \ \textbf{kip}$ $75\% \cdot V_u = 154.2 \ \textbf{kip}$

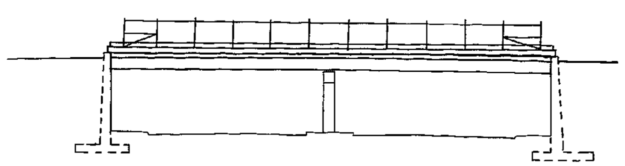
$$RF_{HS} := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_{HS}} = \begin{bmatrix} 1.04 \\ 1.74 \end{bmatrix}$$

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	NEW YORK		189	223

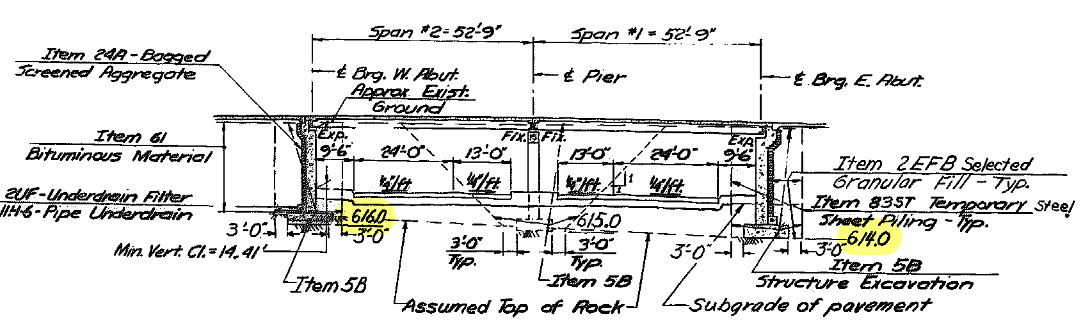
CITY OF BUFFALO
KENSINGTON EXPRESSWAY ARTERIAL SECTION II
NORTHAMPTON ST. TO NORTHLAND AVE.
ERIE COUNTY



PLAN
Scale: 1"=20'



ELEVATION
Scale: 1"=20'



LONGITUDINAL SECTION
Scale: 1"=20'

GENERAL NOTES:

1. Design Specifications A.A.S.H.O. 1965 modified and current A.W.S. modified L.L. HS20-44. The stresses assumed for design purposes conform to 1965 A.A.S.H.O. Specifications with the 28 day concrete stress (f'c) = 3000 psi minimum.
2. Material and Construction Specifications: Specifications of N.Y.S. Department of Public Works dated January 2, 1962 with current additions and modifications.
3. The Contractor's attention is directed to the Special Notes for this structure which appear in the proposal. Particular attention should be given to the foundation note which briefly outlines the anticipated subsurface conditions at the site of the structure and which specifies certain requirements relative to construction.
4. The cost of furnishing and placing water used for selected granular fill will be paid under Item 1W and 1WA of the highway portion of the contract.
5. Reinforcing bars shall be lapped a minimum of 20 diameters.
6. The cost of all joint material will be included in the price bid for the various items of the contract.
7. Concrete Items and Cement:

Description	Item No.	Type of Cement
Sidewalks, pier caps, columns, pedestals, abutment headers, and parapets.	18	2
Monolithic slab	18M	2
Abutments and pier footings	20	2

8. All concrete shall have entrained air in accordance with the specifications.

SUBSTRUCTURE NOTES:

1. All embankment of Selected Fill, Item 2EFB, shall be compacted to a minimum dry density of 100 % of Maximum Density as defined under "h Embankments" of the General Excavation Specifications. However, where the material contains more than 30 %, by weight, of particles retained on 3/4" sieve, a minimum dry density of 95 % of the Maximum Density will be required.
2. Items 2 and 2EF-B shall be placed simultaneously, in contact, on both sides of the vertical payment line. Sheeting or other means shall not be used to separate the two materials.
3. The installation of Selected Fill, Item 2EF-B, as shown on the structural plans, shall be completed immediately following the completion of abutments or walls.
4. All Footings ON ROCK. All disintegrated or shattered material shall be removed to the lines and levels ordered by the Engineer. Where sound rock is found 2' or less below the planned levels of the bottom of the footings, backfill of Class B Concrete shall be installed to the levels shown on the plans. Where sound rock is found to be more than 2' below the planned levels, the Deputy Chief Engineer (Design) shall be so advised and a redesign of the substructure made. Payments for the additional concrete and bar reinforcement if used will be made at the unit price bid for these items. Rock removed below the levels ordered by the Engineer and outside the lines must be replaced as indicated above and as directed by the Engineer for which no payment will be made.
5. ABUTMENTS ON ROCK. Rock shall be presplit along the lower roadway in front of and for 50 feet each side of the abutment. In addition, when the bottom of the abutment footing is more than 5 feet below the rock surface, the rock shall be presplit adjacent to the footing as shown on the plans to the required depth. The presplitting shall be done in the sequence outlined above and the cost shall be included in the price bid for Item 5B.

NOTE A See Sheet No. 196 and Sheet No. 206

Joints which are to be sealed with preformed elastic joint sealers shall be sealed before the structure is opened to traffic, including construction traffic, and before discontinuing operation when work is suspended during the Winter. The joints shall be thoroughly cleaned, using whatever equipment or method is necessary and when they are free of foreign material, M38PE Sealer shall be installed by suitable hand or machine tools and thoroughly secured in place with the lubricant which shall cover both sides of the sealer over the full area in contact with the sides of the joint. The sealer shall be installed in a compressed condition at the depth shown on the contract plans.

Date:	JULY 14, 1967
In Charge Of:	H. G. COLES
Designed By:	K. W. ROOT
Traced By:	G. R. MILLER
Checked By:	W. D. SWECKER

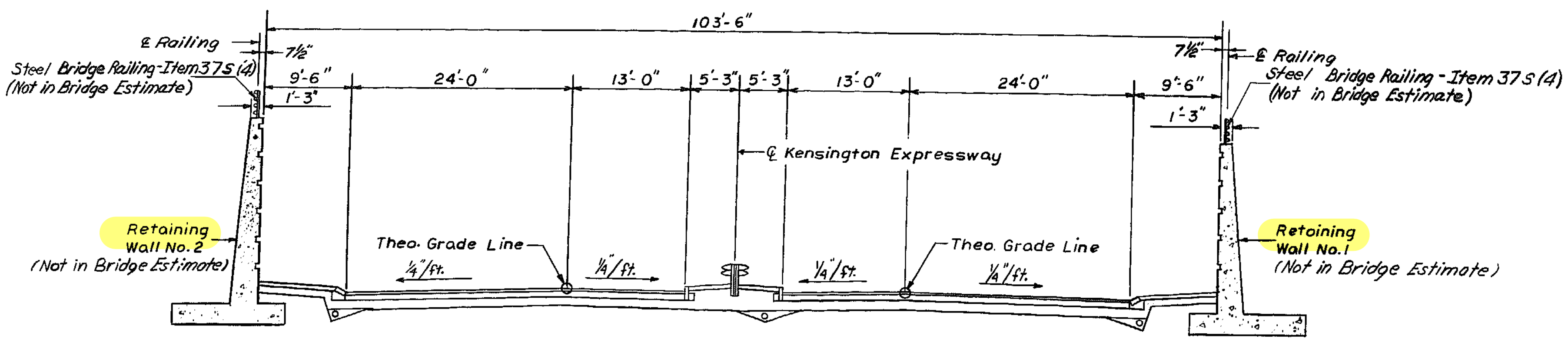
BRIDGE NO. 1.
EAST UTICA STREET
OVER KENSINGTON EXPRESSWAY
GENERAL PLAN AND ELEVATION

PREPARED and RECOMMENDED
N.Y.S.P.E. LIC. NO. 20143 DATE 7-25-67
McFARLAND-JOHNSON ENGINEERS

C 68-2

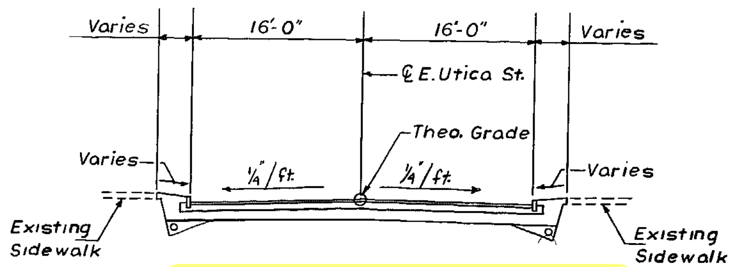
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	NEW YORK		190	223

CITY OF BUFFALO
KENSINGTON EXPRESSWAY ARTERIAL SECTION II
NORTHAMPTON ST. TO NORTHLAND AVE.
ERIE COUNTY



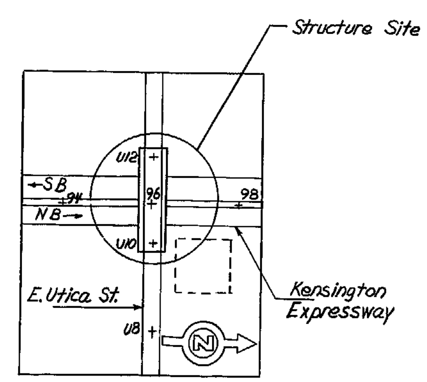
TYPICAL APPROACH SECTION-KENSINGTON EXPRESSWAY

Scale: ⅛" = 1'-0"



TYPICAL SECTION-E. UTICA ST.

Scale: ⅛" = 1'-0"

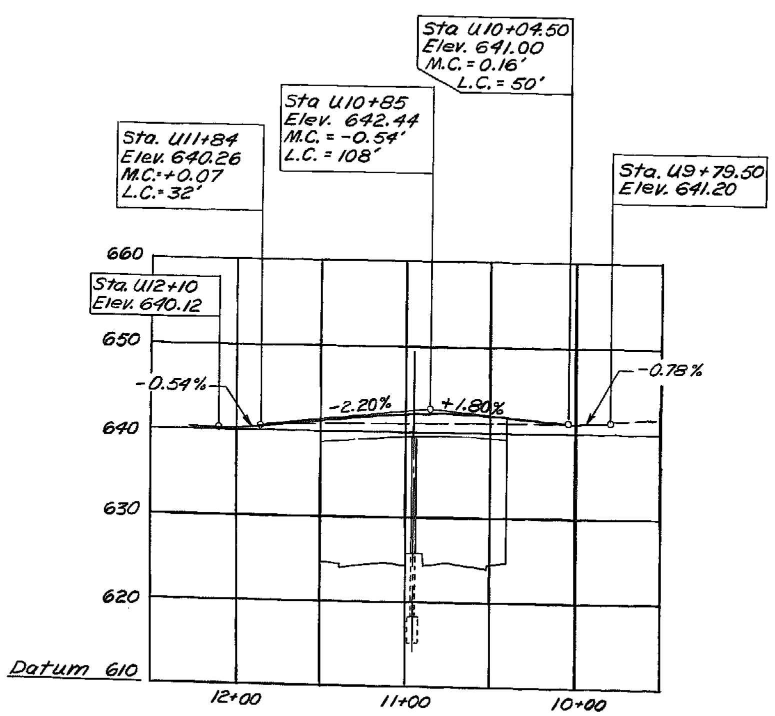


LOCATION PLAN

Scale: 1" = 200'

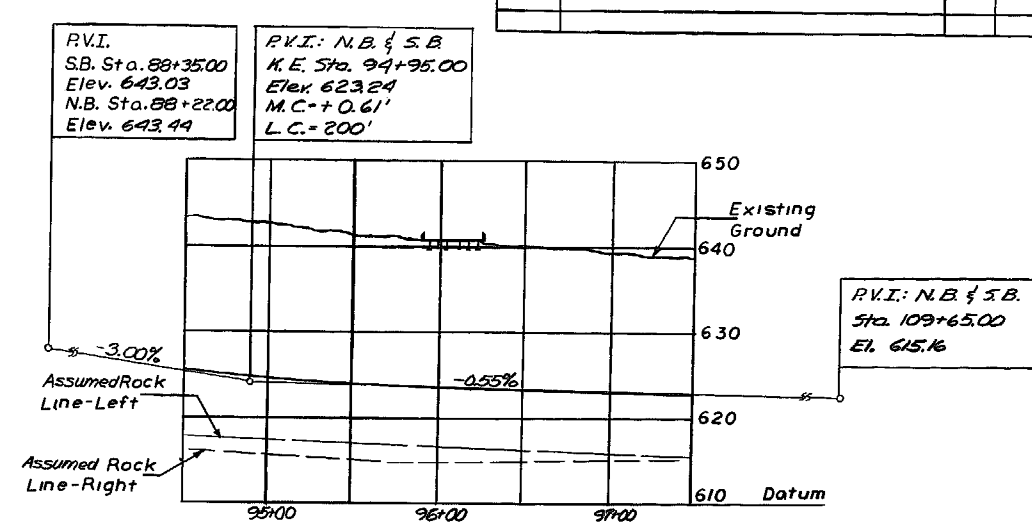
ESTIMATE OF QUANTITIES						
ITEM NO.	DESCRIPTION	UNIT	SUBSTR NEAT	SUPERSTR NEAT	TOTAL NEAT	PROPOSAL
2UF	Underdrain Filter	C.Y.	10		10	10
2EFB	Selected Granular Fill	C.Y.	762		762	800
5B	Structure Excavation	C.Y.	4592		4592	4600
11H-6	Perf. Corr. Metal Pipe Underdrain 6" Dia.	L.F.	133		133	140
18	Class A Concrete for Structures	C.Y.	32	49	81	90
18M	Class A Concrete for Structures (Monolithic Bridge Slab with Integral Wearing Surfaces)	C.Y.		187	187	190
20	Class B Concrete for Structures	C.Y.	438		438	450
24A	Bagged Screened Aggregate	C.Y.	98		98	100
28	Bar Reinforcement for Structures	Lb.	43,769	52,986	96,755	97,000
28C	Shear Connectors	L.F.		941	941	950
29	Structural Steel	Lb.	288	133,356	133,644	133,900
37M(2)	Aluminum Bridge Railing (2 Rail)	L.F.		216	216	220
61	Bituminous Material	Gal.	118		118	120
83ST	Temporary Steel Sheet Piling	S.F.	10,215		10,215	10,300
94SBU	Stone Curb (Bridge Types)	L.F.		246	246	250
363H	Epoxy Protective Coating for Concrete	S.F.	1,802		1,802	1,900
664LD	Linseed Oil Protective Coating for Concrete	Gal.		26	26	30
700A	Installing Electric Conduits	L.S.				Nec.
701	Installing Telephone Conduits	L.S.				Nec.
702	Installing Gas Conduit	L.S.				Nec.
402D	3" Dia. Steel Galv. Conduits	L.F.		212		220
412B	2" Dia. Steel Galv. Conduits	L.F.		212		220
106A6	6' Aluminum Chain Link Fencing	L.F.		200		200

ITEM 29		
TYPE	NEAT	PROPOSAL
A36	25,453	25,500
A325	1,326	1,400
A441	106,665	106,700
A193	200	300
TOTAL	133,644	133,900



PROFILE - E. UTICA ST.

Scale: 1" = 10' Vert. 1" = 50' Horiz.



PROFILE-KENSINGTON EXPRESSWAY

Scale: 1" = 10' Vert. 1" = 50' Horiz.

Date:	JULY 14, 1967
In Charge Of:	H.G. COLES
Designed By:	K.W. ROOT
Traced By:	J. MILLER
Checked By:	W.D. SWECKER

BRIDGE NO. 1

EAST UTICA STREET
OVER KENSINGTON EXPRESSWAY

SECTIONS AND PROFILES

PREPARED and RECOMMENDED

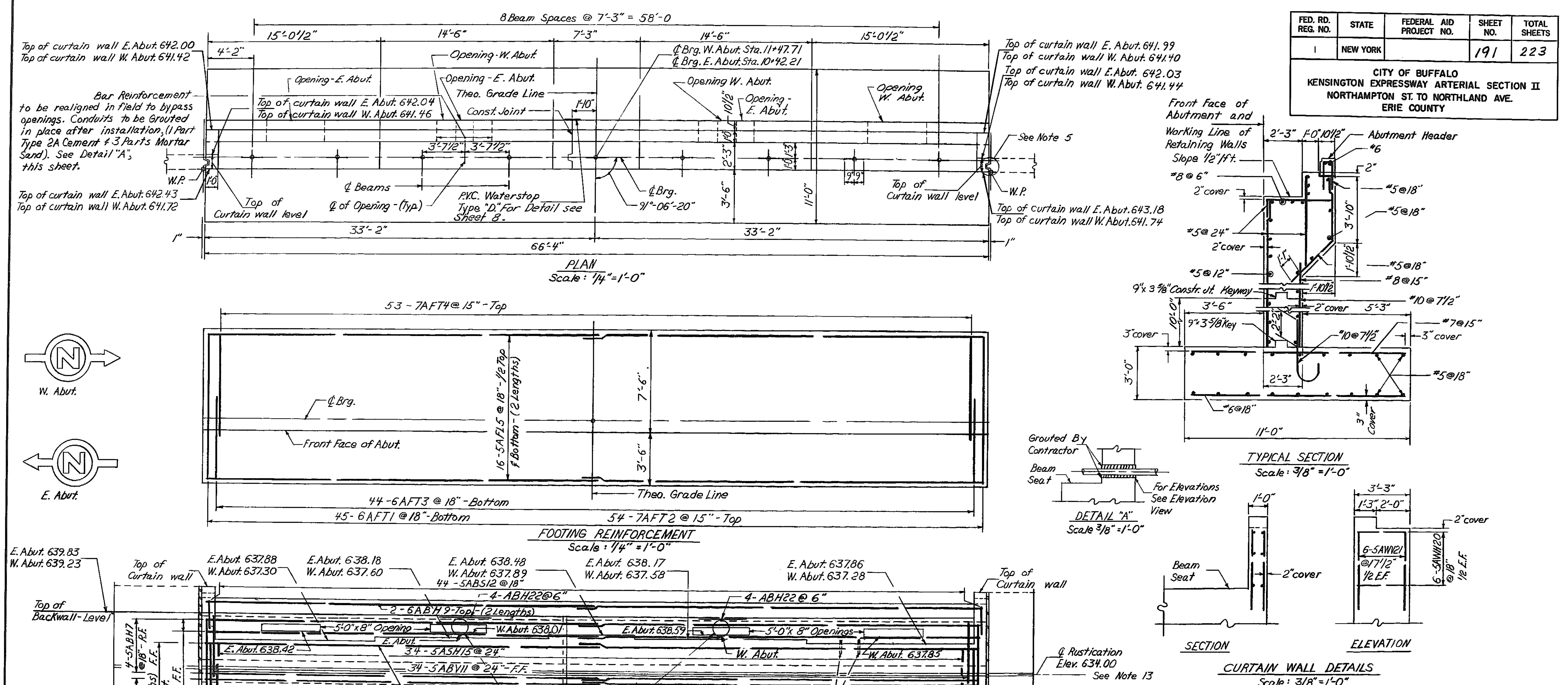
N.Y.S.P.E. LIC. NO. 20143 DATE 7-25-67

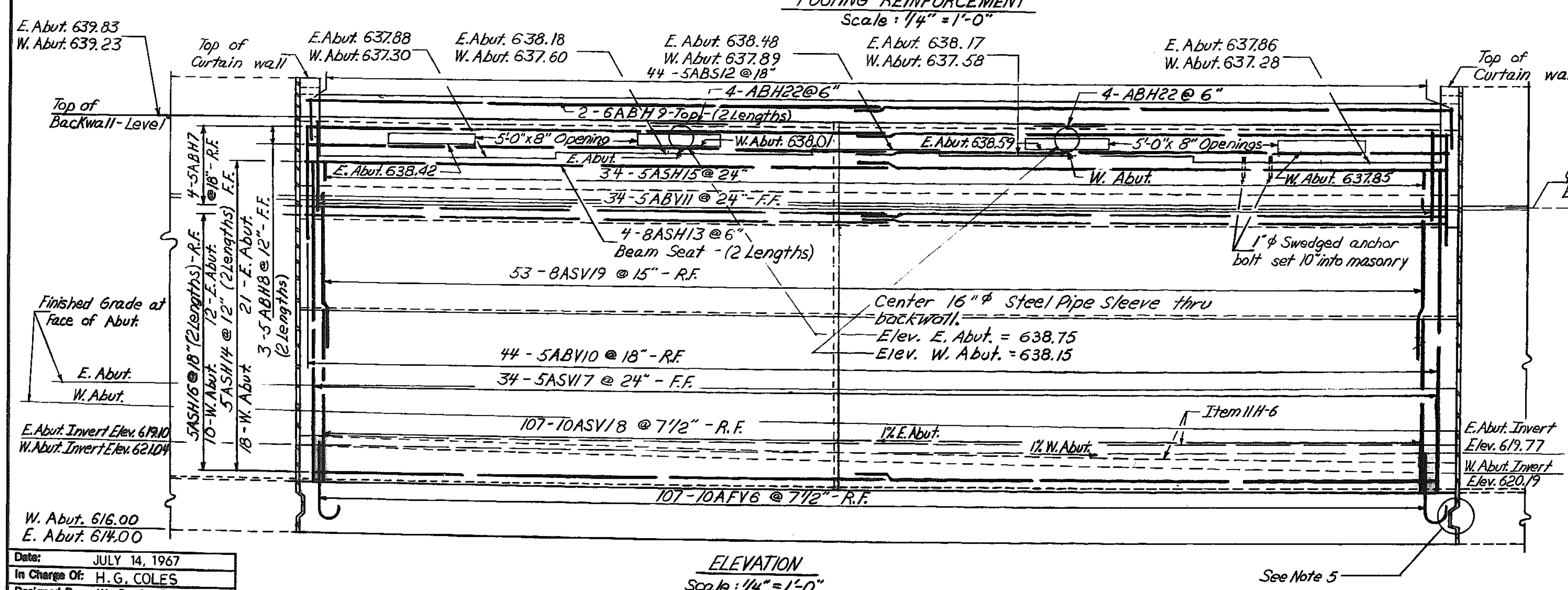
McFARLAND-JOHNSON ENGINEERS

C 68-2

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	NEW YORK		191	223

CITY OF BUFFALO
KENSINGTON EXPRESSWAY ARTERIAL SECTION II
NORTHAMPTON ST. TO NORTHLAND AVE.
ERIE COUNTY





NOTES:

1. Concrete in Abutment shall be Item 20, Class B Concrete for Structures. Concrete in Abutment Header shall be Item 18, Class A Concrete for Structures.
2. Bituminous Material, Item 61, shall be applied to the back of Abutment above top of footing, where fill is in contact with the Wall.
3. Epoxy Protective Coating for Concrete shall be applied to all Exposed Pedestal Surfaces, Bridge Seats, including the area under the Bearings, Exposed Vertical Surfaces of Backwall and Curtain Walls facing the Superstructure.
4. Top of Backwalls on which Asbestos Sheet Packing is to be placed shall be Steel Trowel Finished.
5. For Detail of Expansion Joint at Wall and Footing, see sheet No. 8.
6. For Detail of Expansion Joint between Abutment and Abutment Header, see sheet No. 8.
7. For Railing and Sidewalk Plans at Bridge Corners, see sheet No. 8.
8. For Pay Lines at Abutment, see sheet No. 8.
9. For Bearing Details, see sheet No. 5.
10. For Railing Details, see sheet No. 7.
11. For Conduit Alignment, see sheet No. 5.
12. For Rustication Details, see sheet No. 8.
13. For Bar Schedule, see sheet No. 9.
14. For design purposes, the foundation pressure does not exceed 10 tons per square foot.

Date:	JULY 14, 1967
In Charge Of:	H. G. COLES
Designed By:	W. D. SWECKER
Traced By:	J. F. MEYER
Checked By:	W. D. SWECKER

BRIDGE NO. 1

EAST UTICA STREET
OVER KENSINGTON EXPRESSWAY
ABUTMENT DETAILS

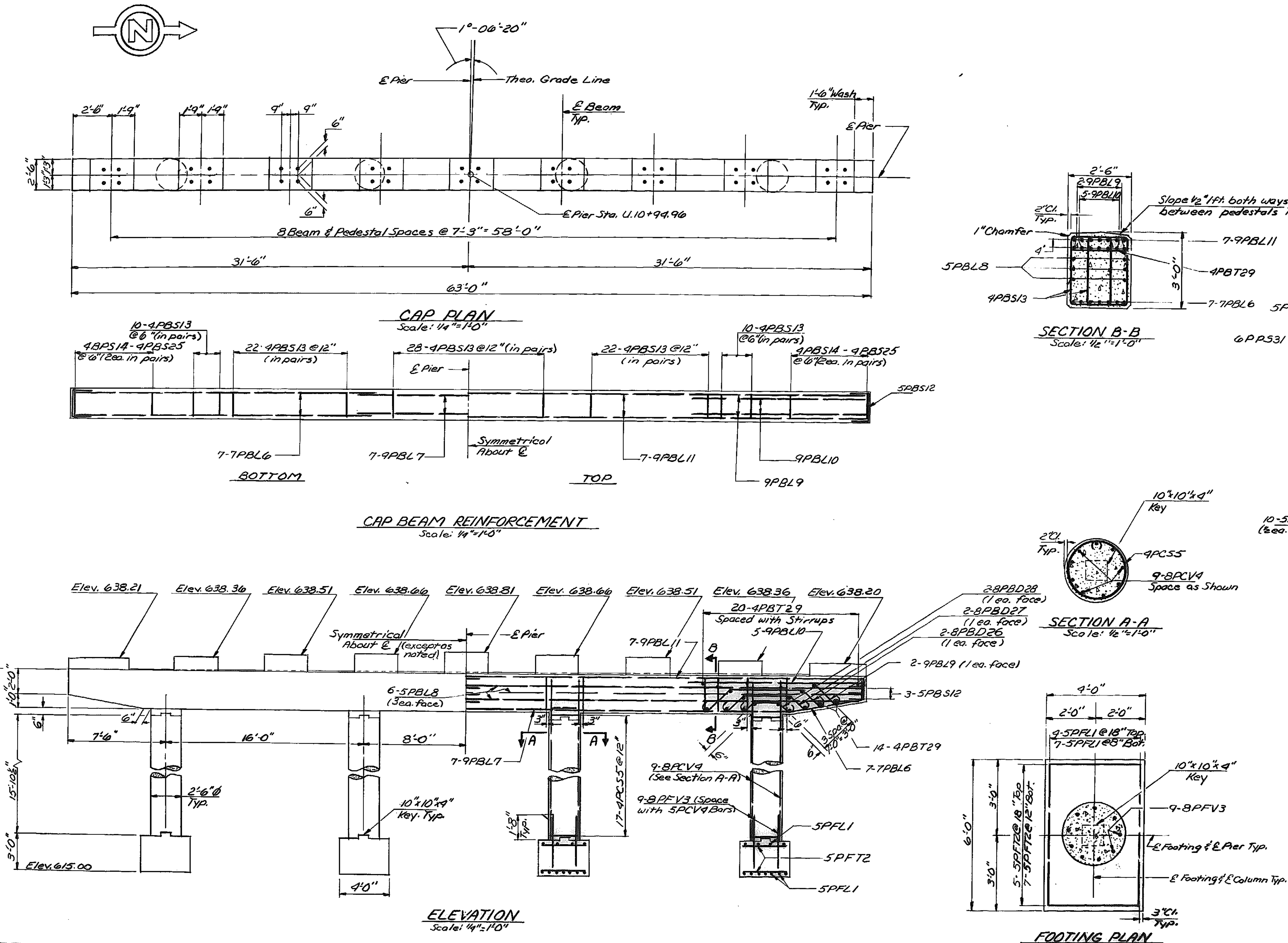
PREPARED and RECOMMENDED
N.Y.S.P.E. LIC. NO. 20143 DATE 7-25-67
McFARLAND-JOHNSON ENGINEERS

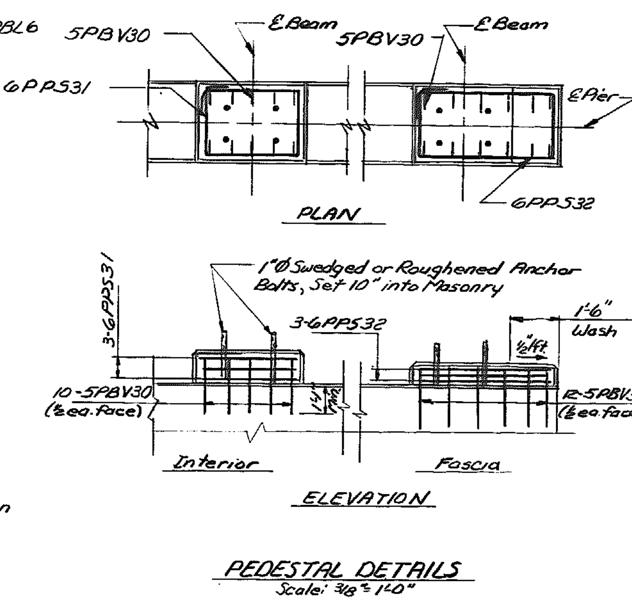
BRIDGE SHEET 3 OF 10

C 68-2

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	NEW YORK		192	223

CITY OF BUFFALO
KENSINGTON EXPRESSWAY ARTERIAL SECTION II
NORTHAMPTON ST. TO NORTHLAND AVE.
ERIE COUNTY





NOTES:

1. For General Notes, see Bridge Sheet 1.
2. For Bar Schedule, see Bridge Sheet 9.
3. Epoxy Protective Coating for Concrete shall be applied to all pedestal surfaces including the area under the bearings, and the top surface of pier between pedestals including the edge chamfer at top edge of pier.
4. For design purposes, the foundation pressure does not exceed 10 tons per square foot.
5. The use of fiber forms will be permitted only if the interior surface of the forms have been treated in such a manner as to prevent helical corrugation marks on finished concrete surface.

Date:	JULY 14, 1967
In Charge Of:	H. G. COLES
Designed By:	L. H. STANLEY
Traced By:	C. J. YONKIN
Checked By:	R. F. CICHOWSKI

BRIDGE NO. 1

EAST UTICA STREET
OVER KENSINGTON EXPRESSWAY

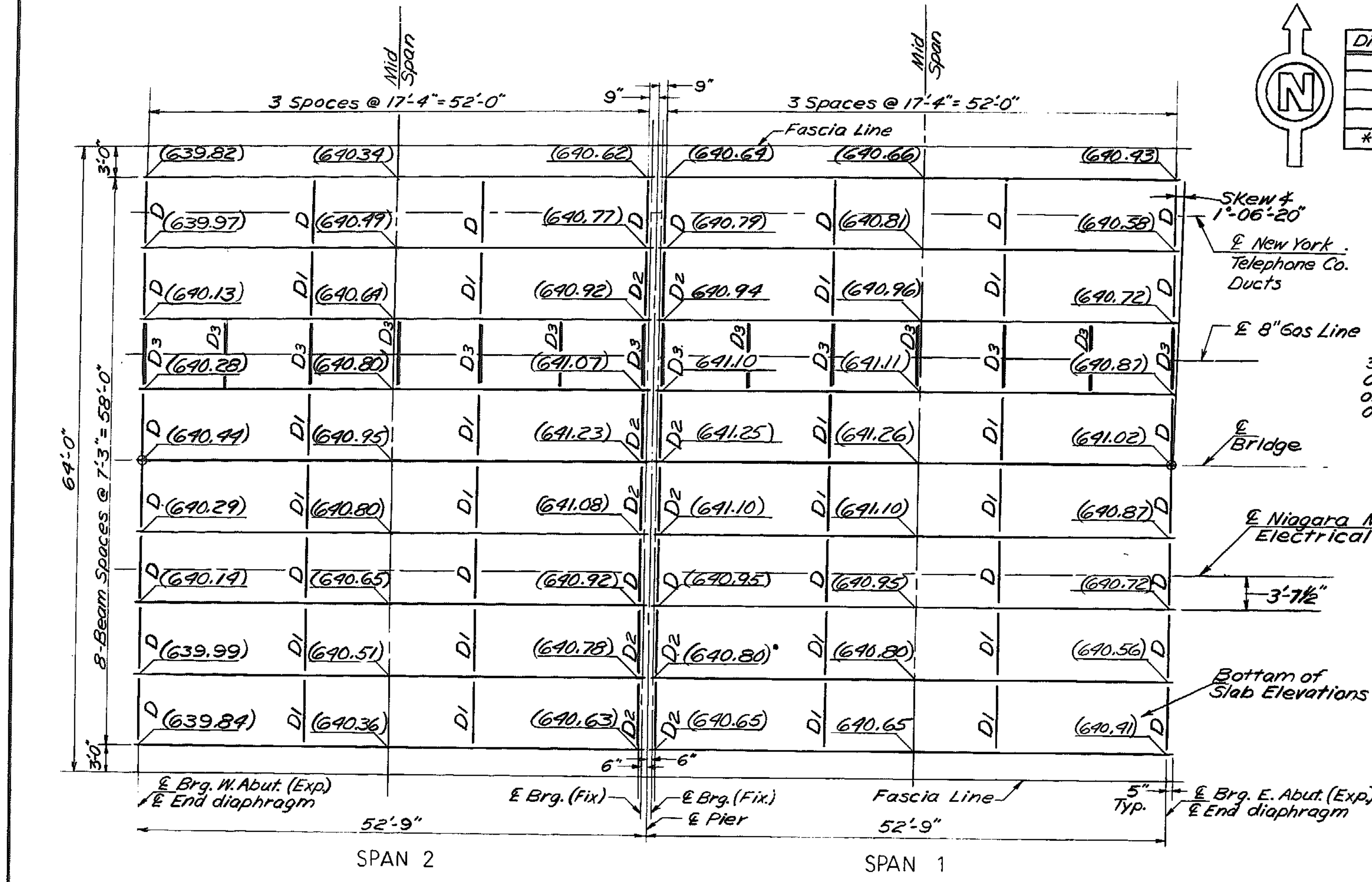
PIER PLANS

PREPARED and RECOMMENDED
N.Y.S.P.E. LIC. NO. 20143 DATE 7-25-67
McFARLAND-JOHNSON ENGINEERS

C-68-2

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	NEW YORK		193	223

CITY OF BUFFALO
KENSINGTON EXPRESSWAY ARTERIAL SECTION II
NORTHAMPTON ST. TO NORTHLAND AVE.
ERIE COUNTY

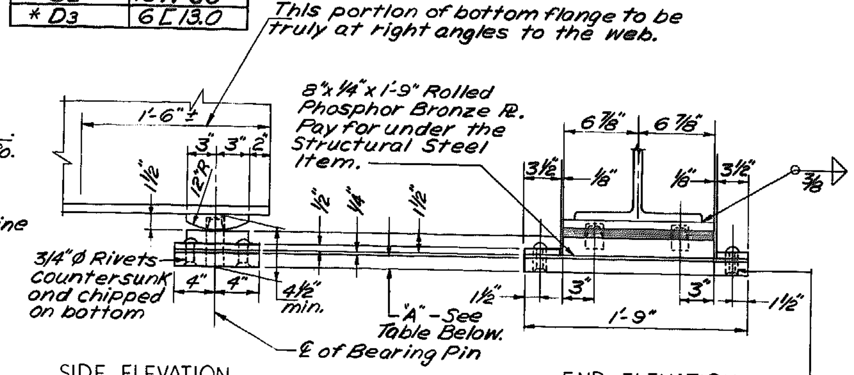


FRAMING PLAN
SCALE: 1/8" = 1'-0"

Diaphragm	Size
D	15[33.9
D1	18[42.7
D2	16 WF 36
* D3	6[13.0

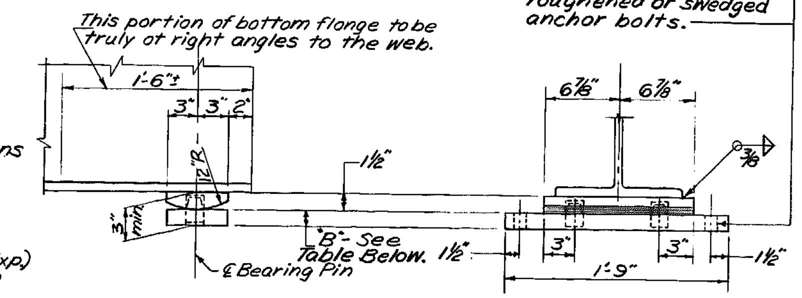
NOTE:
All anchor bolts shall be galvanized in accordance with the requirements of Material Specification M-19.

* Use 2-6[13.0 @ each D3.

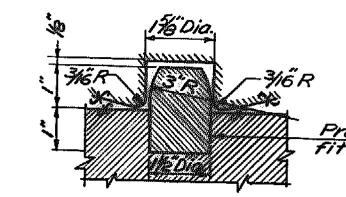


EXPANSION BEARINGS
SCALE: 1 1/2" = 1'-0"

1⅜"Ø holes for 1"Ø x 1'-6" roughened or swedged anchor bolts.



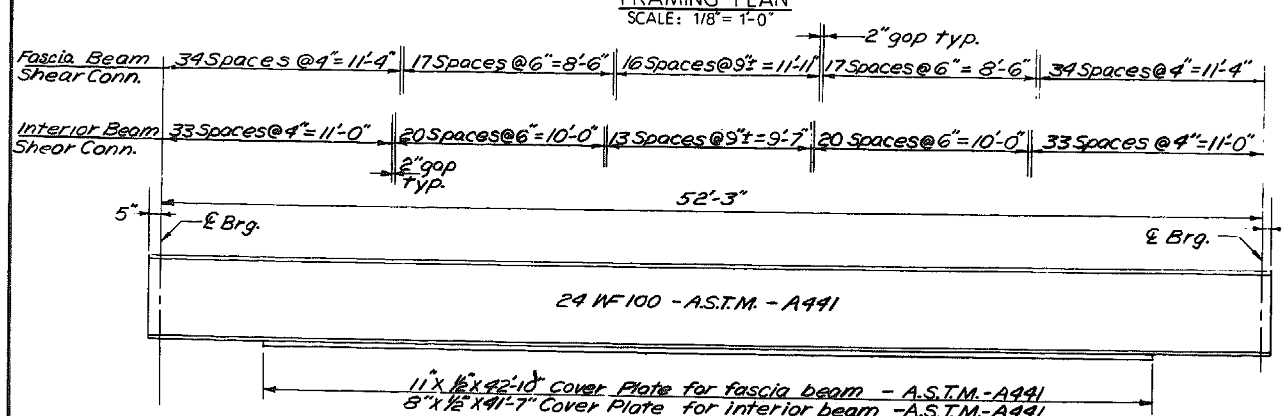
FIXED BEARINGS
SCALE: 1 1/2" = 1'-0"



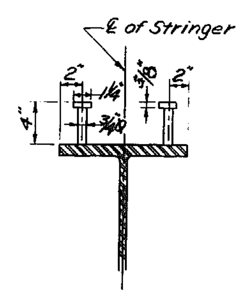
SECTION THRU DOWEL
SCALE: 6" = 1'-0"

SUPERSTRUCTURE NOTES:

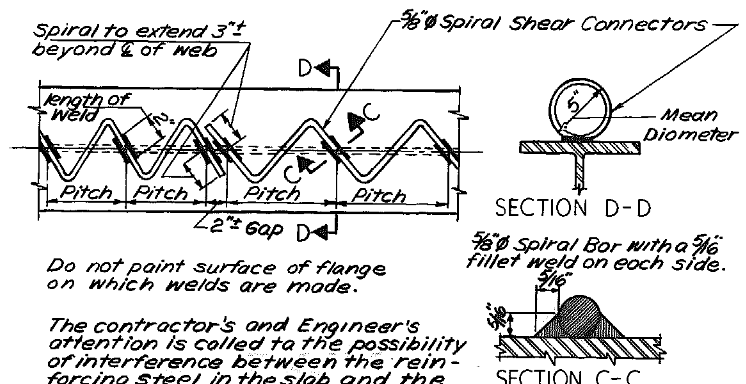
1. After all superstructure steel has been erected, elevations shall be taken on the top of the steel at the ℄ of the web at each ℄ of Bearing, center of span, and at other locations where theoretical bottom of slab elevations are indicated on the plans. The depth of haunch required to position the slab forms is obtained as follows. From the measured top of steel elevations subtract the deflections due to slab and superimposed dead load. Subtract this result from the listed bottom of slab elevation.
2. All bearings are to be field welded to the beams.
3. If the contractor elects to use corrugated metal forms for the structural slab the details of these forms shall be submitted to the Deputy Chief Engineer (Design) for approval, prior to their use. The Contractor's attention is directed to additional notes appearing in the contract documents relative to corrugated metal forms.
4. The end of all beams shall be vertical.
5. All deck slab reinforcement shall have splices alternated.
6. All Structural Steel unless otherwise noted will be paid for under Item 29.
7. All Structural Steel shall be A.S.T.M. A36 except where otherwise specified on the plans or specifications.



TYPICAL ROLLED BEAM STRINGER WITH COVER PLATE
SCALE: NONE



DETAIL OF SEC. E-E
SHEAR CONN.
SCALE: 1 1/2" = 1'-0"



Do not paint surface of flange on which welds are made.

The contractor's and Engineer's attention is called to the possibility of interference between the reinforcing steel in the slab and the beam spirals. To avoid this interference the bar spacings may be varied 1" ± with the understanding that the required area of steel will be placed in each 5 ± ft. Even then some bars may have to be threaded through one or more spirals.

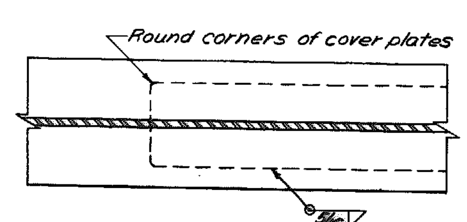
All spirals shall be placed symmetrically about the ℄ of Span on each stringer with the pitches of each section of the spirals decreasing progressively from the ℄ of Span to the ends of the stringer.

PARTIAL PLAN OF SPIRALS
. SCALE : NONE

BEARING PLATE TABLE

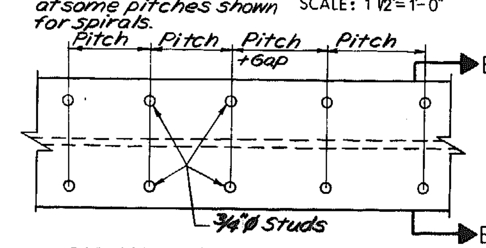
Beam	1	2	3	4	5	6	7	8	9
"A" Span 1	1¼"	3⅛"	1¼"	3⅛"	1¼"	3"	1¼"	3"	1¼"
"A" Span 2	1¼"	3"	1¼"	3"	1¼"	3⅛"	1¼"	3⅛"	1¼"
"B" Span 1	1¾"	1¾"	1¾"	1¾"	1¾"	1¾"	1¾"	1¾"	1¾"
"B" Span 2	1½"	1½"	1½"	1½"	1½"	1½"	1½"	1½"	1½"

Beams are numbered from left to right looking ahead on station.



PLAN SECTION AT END OF COVER PLATE
SCALE: 1 1/2" = 1'-0"

Studs to be spaced at same pitches shown for spirals.



PARTIAL PLAN OF STUDS
SCALE: NONE

Date:	JULY 14, 1967
In Charge Of:	H.G. COLES
Designed By:	K.W. ROOT
Traced By:	R.H. CALICE
Checked By:	W.D. SWECKER

BRIDGE NO. 1

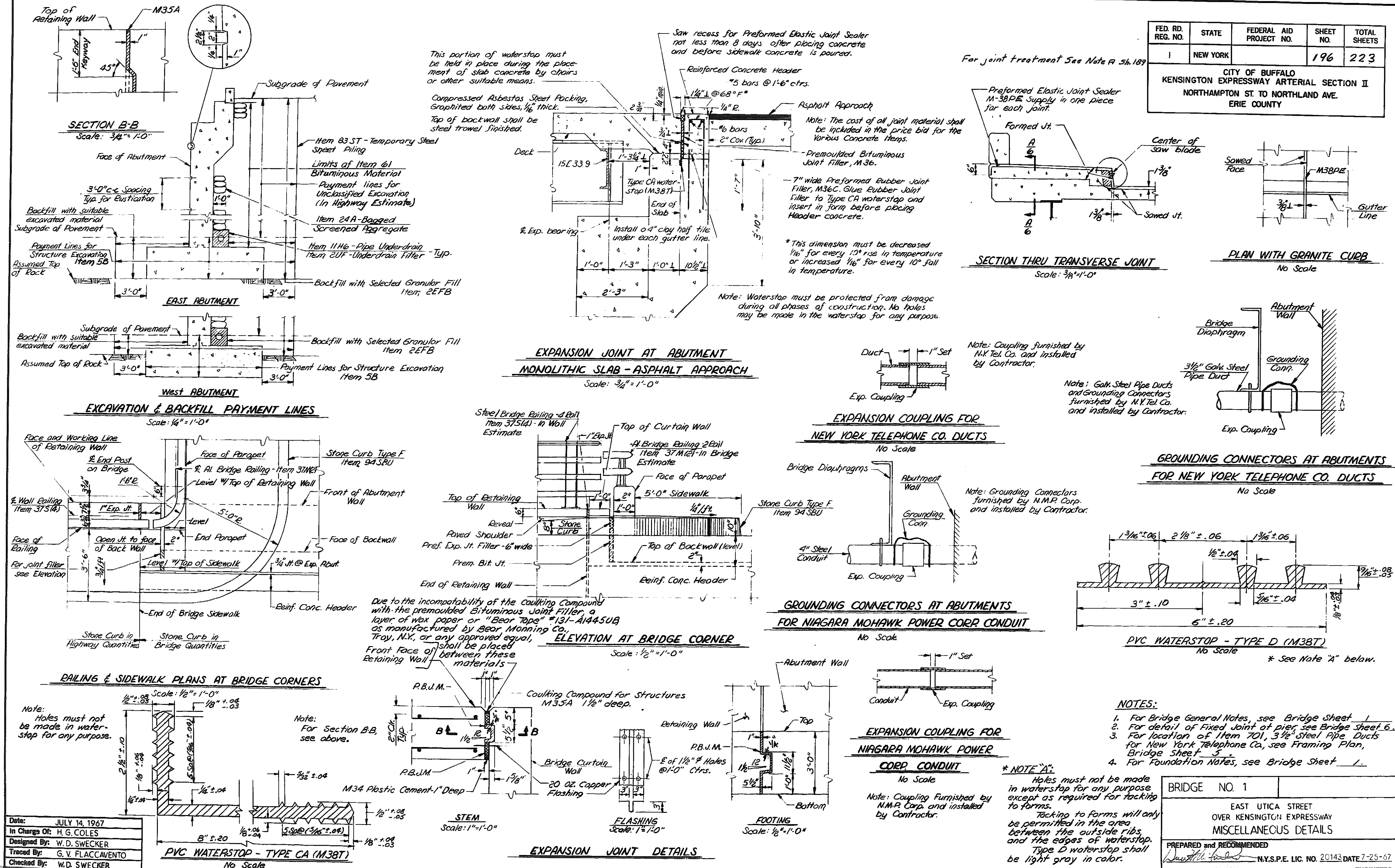
EAST UTICA STREET
OVER KENSINGTON EXPRESSWAY
FRAMING PLAN

PREPARED and RECOMMENDED
N.Y.S.P.E. LIC. NO. 20143 DATE 7-25-67
McFARLAND-JOHNSON ENGINEERS

C 68-2

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	NEW YORK		196	223

CITY OF BUFFALO
KENSINGTON EXPRESSWAY ARTERIAL SECTION II
NORTHAMPTON ST. TO NORTHLAND AVE.
ERIE COUNTY



NOTES:
1. For Bridge General Notes, see Bridge Sheet 1.
2. For detail of Fixed Joint at pier, see Bridge Sheet 6.
3. For location of Item 701, 3½" Steel Pipe Ducts for New York Telephone Co., see Framing Plan, Bridge Sheet 5.
4. For Foundation Notes, see Bridge Sheet 1.

* NOTE "A":
Holes must not be made in waterstop for any purpose except as required for tacking to forms.
Tacking to forms will only be permitted in the area between the outside ribs, and the edges of waterstop.
Type D waterstop shall be light gray in color.

Date:	JULY 14, 1967
In Charge Of:	H. G. COLES
Designed By:	W. D. SWECKER
Traced By:	G. V. FLACCAVENTO
Checked By:	W. D. SWECKER

BRIDGE NO. 1

EAST UTICA STREET
OVER KENSINGTON EXPRESSWAY
MISCELLANEOUS DETAILS

PREPARED and RECOMMENDED N.Y.S.P.E. LIC. NO. 20143 DATE 7-25-67
McFARLAND-JOHNSON ENGINEERS

NY33 BRIDGE CONDITION EVALUATION 2023
KENSINGSTON EXPRESSWAY PROJECT
PIN 5512.52
CITY OF BUFFALO, ERIE COUNTY
EAST FERRY STREET
BIN 1022640

Prepared By:

____

Jeffrey Young, PE (NYSPE 106588)
Inspection Team Leader | Structural Engineer
Date: 5/30/2023

Reviewed By:

____

Stephen L. Gauthier, PE (NYSPE 0075775)
Quality Control Engineer | Sr. Structural Engineer
Date: 6/16/2023

LaBella
Powered by partnership.
300 State Street
Rochester, New York 14614
ph: 585-454-6110
www.labellapc.com

PIN 5512.52 – NY33 BRIDGE CONDITION EVALUATION 2023
FIELD INSPECTION SUMMARY

STRUCTURE:	BIN 1022640 – East Ferry Street over NY33 Kensington Expressway
STRUCTURE TYPE:	Two (2) span Steel, Multi-Stringer (9 beams) structure with concrete abutments and pier. Year Built: 1970
CURRENT INSPECTION:	05/01/23 – 5/15/23 (LaBella Verification Inspections)
LAST BIENNIAL INSPECTION:	08/16/22
GENERAL RECOMMENDATION:	6
INSPECTION SCOPE:	An element-specific inspection of the subject structure to verify field conditions and obtain and confirm steel measurements found in the field during the latest biennial inspection in order to complete a Level 1 load rating.

GENERAL INSPECTION OBSERVATIONS & CONDITIONS:

- **Superstructure Beam End Section Loss** – Beam end corrosion was reviewed and verified in the field and found to be in reasonable conformance with the latest 2022 biennial bridge inspection reports and additional measurements were taken to represent existing conditions. A minimum of three thickness measurements were taken at girder ends just in from of the centerline of bearings to get an accurate representation of the full height of the web. Only three girder ends at the begin abutment were measured because based on the 2022 inspection report and a visual inspection, very little deterioration existed at the other six girder ends. All other girder ends were measured. Additional measurements were taken at the base of the web on either side of the bearing centerline to determine the extent of bearing area loss. Thickness readings at each location can be found in the girder end section loss tables attached to this report. The following observations were noted:
    - The maximum section loss was typically found at the base of the web which was expected based on past inspection reports. Several girder ends showed some pitting along the base of the web. This pitting has been painted over and only extended approximately 1-2 feet into the span.
    - The average full height section loss was found to be minor for all girders (range = 7% - 17%). The maximum average section loss was observed at G8 in span 1 at the pier with 17% loss.
    - To determine the bearing area loss, the average of the two thickness measurements at the base of the web on either side of the bearing line was compared to the original web thickness. As expected, these losses were typically higher than the average full height loss but are still considered to be minor. In many cases, the losses found in the field during this inspection were higher than those from the 2022 inspection report to varying degrees.
    - The bearing area loss ranged from 4% to 25%. The maximum loss was observed at G7 in span 1 at the pier with 25% loss in bearing area.

A Level 1 Load Rating evaluation was completed in conjunction with this inspection and has been attached to this report. A summary of the results is below:

Rating Load	Controlling Mode	Inventory Rating	Operating Rating
Load and Resistance Factor Rating HL-93	Span 1 Girder G7 Original 24WF100 Web Local Crippling	0.24	0.31
Load Factor Rating HS Truck or Lane	Span 1 Girder G7 Original 24WF100 Unstiffened Bearing Area	HS 15.7 28.3 Ton	HS 26.3 47.3 Ton
Load Factor Rating H Truck or Lane	Span 1 Girder G7 Original 24WF100 Unstiffened Bearing Area	H 21.5 21.5 Ton	H 35.9 35.9 Ton

A fatigue analysis was also performed in conjunction with this inspection. The results showed that the existing structure has 1449 years of remaining life.

- **Substructure Concrete** Condition -

  - Abutments – The abutment faces were observed, sounded, and found to be in generally good condition. Some minor areas of delamination were noted at each abutment. At the end abutment, a significant amount of water was observed to be leaking from the joint above which is contributing to the minor deterioration of the bridge seat, pedestals, and abutment face. No significant changed from the 2022 inspection report were noted. Refer to the photos attached to this report for more details.
  - Piers – The pier caps, columns, and pedestals were observed, sounded, and found to be in good condition. Little to no deterioration/delamination was noted on any face of the pier. Some very minor map cracking was observed at the faces of the pier cap beam. Refer to the photos attached to this report for more details.

- **Structural Deck Observations -** The structural deck was observed from below and is considered indicative of the overall deck conditions above. The deck was constructed with Stay-in Place (SIP) form so indirect observation of the bottom of deck based on SIP conditions was conducted. Large areas of rusting to the SIP were observed from below the deck.

  The general condition of the structural deck was found to be as follows:

  - 5% of the structural deck in ADVANCED state of deterioration
  - 45% of the structural deck in FAIR state of deterioration
  - 50% of the structural deck in relatively GOOD condition

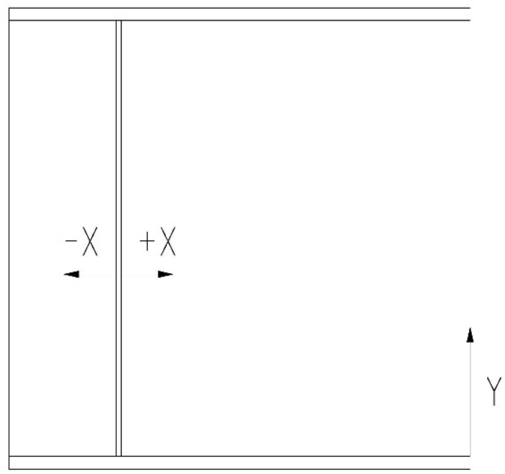
Photos of general deck conditions can be found in the photo log attached to this report.

The August 16, 2022 inspection report has also been attached to this report for a detailed breakdown of the condition of the bridge.

BIN 1022640 – East Ferry Street on NY33 Kensington Expressway

Section Loss Measurements

Girder End Section Loss Table Key



EAST FERRY STREET - GIRDER END SECTION LOSS TABLE									
SPAN 1									
ORIG. WEB THICKNESS = 0.468"									
GIRDER	LOCATION	READING	X (IN.)	Y (IN.)	THICKNESS (IN.)	AVG. FULL HEIGHT THICKNESS (IN.)*	AVG. BEARING AREA THICKNESS (IN.)**	FULL HEIGHT	BEARING AREA
G1	BEGIN	A	3	20	0.423	0.414	0.408	11%	13%
		B		12	0.414				
		C		1.5	0.406				
		D	-2.5	1.5	0.409				
	PIER	A	3	20	0.421	0.404	0.384	14%	18%
		B		12	0.417				
		C		1	0.374				
		D	-2.5	1	0.393				
		E	9	1	0.409				
G2	PIER	A	5	20	0.441	0.412	0.377	12%	20%
		B		12	0.419				
		C		1.5	0.377				
		D	-2.5	1.5	0.376				
G3	PIER	A	2.5	19	0.408	0.399	0.387	15%	17%
		B		11	0.402				
		C		1	0.388				
		D	-2.5	1	0.386				
G4	PIER	A	4	20	0.43	0.410	0.354	12%	24%
		B		13	0.429				
		C		1	0.371				
		D	-2.5	1	0.336				
G5	BEGIN	A	4	20	0.414	0.406	0.408	13%	13%
		B		12	0.408				
		C		1.5	0.395				
		D	-2.5	1.5	0.421				
	PIER	A	3	20	0.423	0.408	0.387	13%	17%
		B		12	0.413				
		C		1	0.387				
		D	-2.5	12	0.386				
		E		1	0.387				
G6	PIER	A	4	20	0.401	0.399	0.362	15%	23%
		B		11	0.41				
		C		1	0.387				
		D	-2.5	11	0.382				
		E		1	0.336				
G7	PIER	A	4	20	0.414	0.405	0.351	13%	25%
		B		12	0.409				
		C		1.5	0.393				
		D	-2.5	1.5	0.309				
		E	9.5	1.5	0.377				
G8	PIER	A	5	20	0.411	0.390	0.359	17%	23%
		B		13	0.401				
		C		1	0.359				
		D	-2.5	1	0.359				
		E	11	1	0.352				
G9	BEGIN	A	2.5	19	0.444	0.430	0.421	8%	10%
		B		10.5	0.443				
		C		1.5	0.403				
		D	-2.5	1.5	0.439				
		E	8	1.5	0.429				
		F	28	1.5	0.396				
	PIER	A	5	19	0.442	0.431	0.406	8%	13%
		B		11	0.438				
		C		1	0.412				
		D	-2.5	1	0.399				

* AVG. FULL HEIGHT THICKNESS = (A+B+C)/3

** AVG. BEARING AREA THICKNESS = AVERAGE OF THE BOTTOM TWO READINGS ON EITHER SIDE OF BEARING LINE

EAST FERRY STREET - GIRDER END SECTION LOSS TABLE

SPAN 2

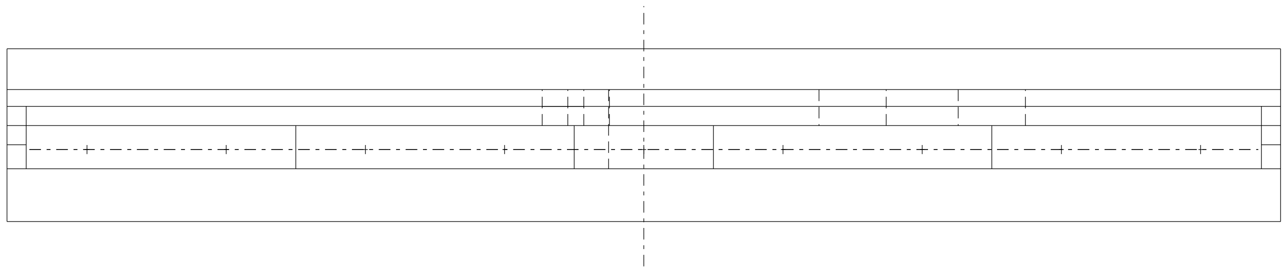
ORIG. WEB THICKNESS = .468"

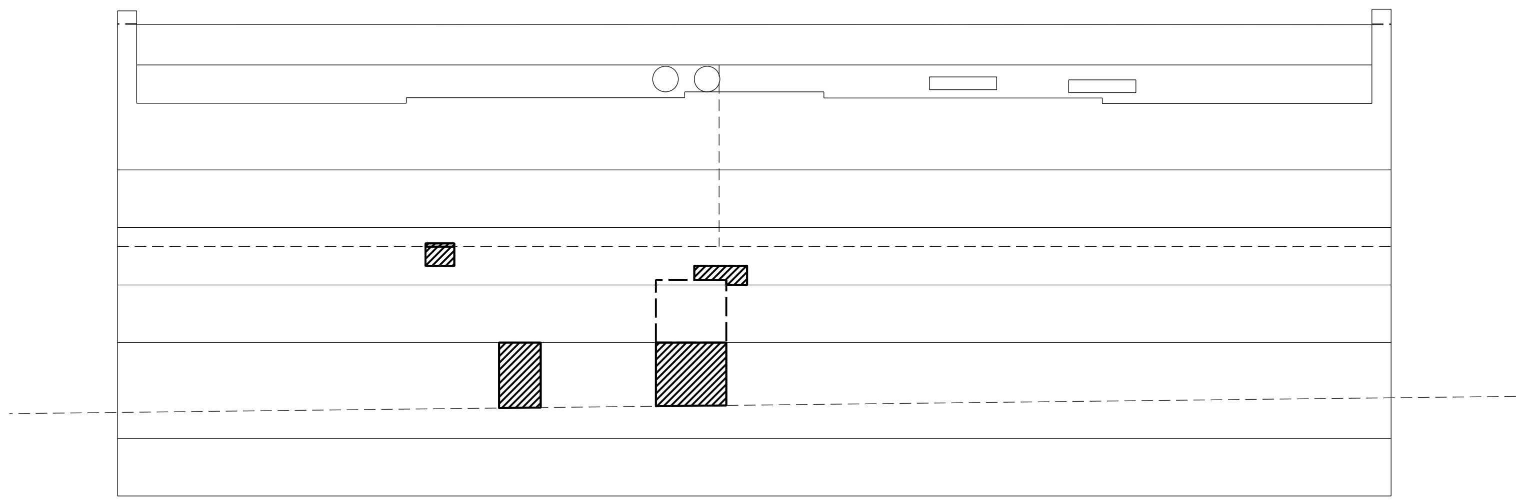
GIRDER	LOCATION	READING	X (IN.)	Y (IN.)	THICKNESS (IN.)	AVG. FULL HEIGHT THICKNESS (IN.)*	AVG. BEARING AREA THICKNESS (IN.)**	FULL HEIGHT	BEARING AREA
G1	PIER	A	4	18	0.423	0.420	0.428	10%	9%
		B		10	0.411				
		C		2	0.426				
		D	-2.5	2	0.429				
	END	A	3.5	19.5	0.429	0.421	0.428	10%	9%
		B		10.5	0.414				
		C		2	0.420				
		D	-2.5	2	0.435				
G2	PIER	A	4	20	0.441	0.434	0.405	7%	14%
		B		12	0.437				
		C		1.5	0.425				
		D	-2.5	1.5	0.384				
	END	A	4	20	0.440	0.437	0.438	7%	6%
		B		11	0.442				
		C		1.5	0.430				
		D	-2.5	1.5	0.446				
G3	PIER	A	3.5	19	0.415	0.405	0.382	14%	18%
		B		12	0.414				
		C		2	0.385				
		D	-2.5	2	0.379				
		E	10	2	0.398				
	END	A	2.5	19	0.420	0.413	0.410	12%	12%
		B		7.5	0.414				
		C		1.5	0.405				
		D	-2.5	1.5	0.415				
G4	PIER	A	3	18.5	0.423	0.429	0.439	8%	6%
		B		11	0.424				
		C		1.5	0.441				
		D	-2.5	1.5	0.436				
	END	A	4	20	0.438	0.435	0.449	7%	4%
		B		11.5	0.424				
		C		1.5	0.443				
		D	-2.5	11.5	0.426				
		E		1.5	0.454				
G5	PIER	A	3	19.5	0.426	0.423	0.420	10%	10%
		B		11.5	0.423				
		C		2.5	0.419				
		D	-2.5	11.5	0.427				
		E		2.5	0.420				
	END	A	2	20	0.434	0.428	0.437	9%	7%
		B		11	0.418				
		C		2	0.432				
		D	-2.5	11	0.423				
		E		2	0.442				
G6	PIER	A	2.5	20	0.431	0.423	0.430	10%	8%
		B		12	0.422				
		C		1.5	0.417				
		D	-2.5	20	0.323				
		E		12	0.417				
		F		1.5	0.443				
	END	A	3	20	0.432	0.427	0.437	9%	7%
		B		11.5	0.417				
		C		2	0.433				
		D	-2.5	11.5	0.422				
		E		2	0.440				
G7	PIER	A	3	20	0.434	0.427	0.396	9%	15%
		B		12	0.426				
		C		1	0.420				
		D	-2.5	1	0.371				
		E	13	1	0.424				
		F	23	1	0.447				
	END	A	3.5	20	0.440	0.435	0.442	7%	6%
		B		11.5	0.422				
		C		1.5	0.443				
		D	-2.5	1.5	0.441				
G8	PIER	A	2.5	19	0.416	0.403	0.394	14%	16%
		B		11	0.414				
		C		1	0.380				
		D	-2.5	1	0.408				
	END	A	5	20	0.426	0.420	0.428	10%	9%
		B		11	0.413				
		C		3	0.421				
		D	-2.5	3	0.435				
G9	PIER	A	3	19	0.424	0.407	0.393	13%	16%
		B		11	0.412				
		C		1.5	0.385				
		D	-2.5	1.5	0.400				
	END	A	4	20	0.429	0.422	0.420	10%	10%
		B		11.5	0.413				
		C		2	0.424				
		D	-2.5	2	0.416				

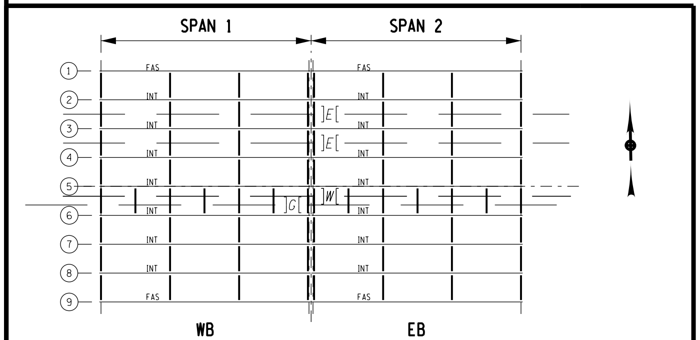
* AVG. FULL HEIGHT THICKNESS = (A+B+C)/3

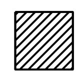
** AVG. BEARING AREA THICKNESS = AVERAGE OF THE BOTTOM TWO READINGS ON EITHER SIDE OF BEARING LINE

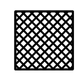
Abutment and Pier Sketches







 = DELAMINATION

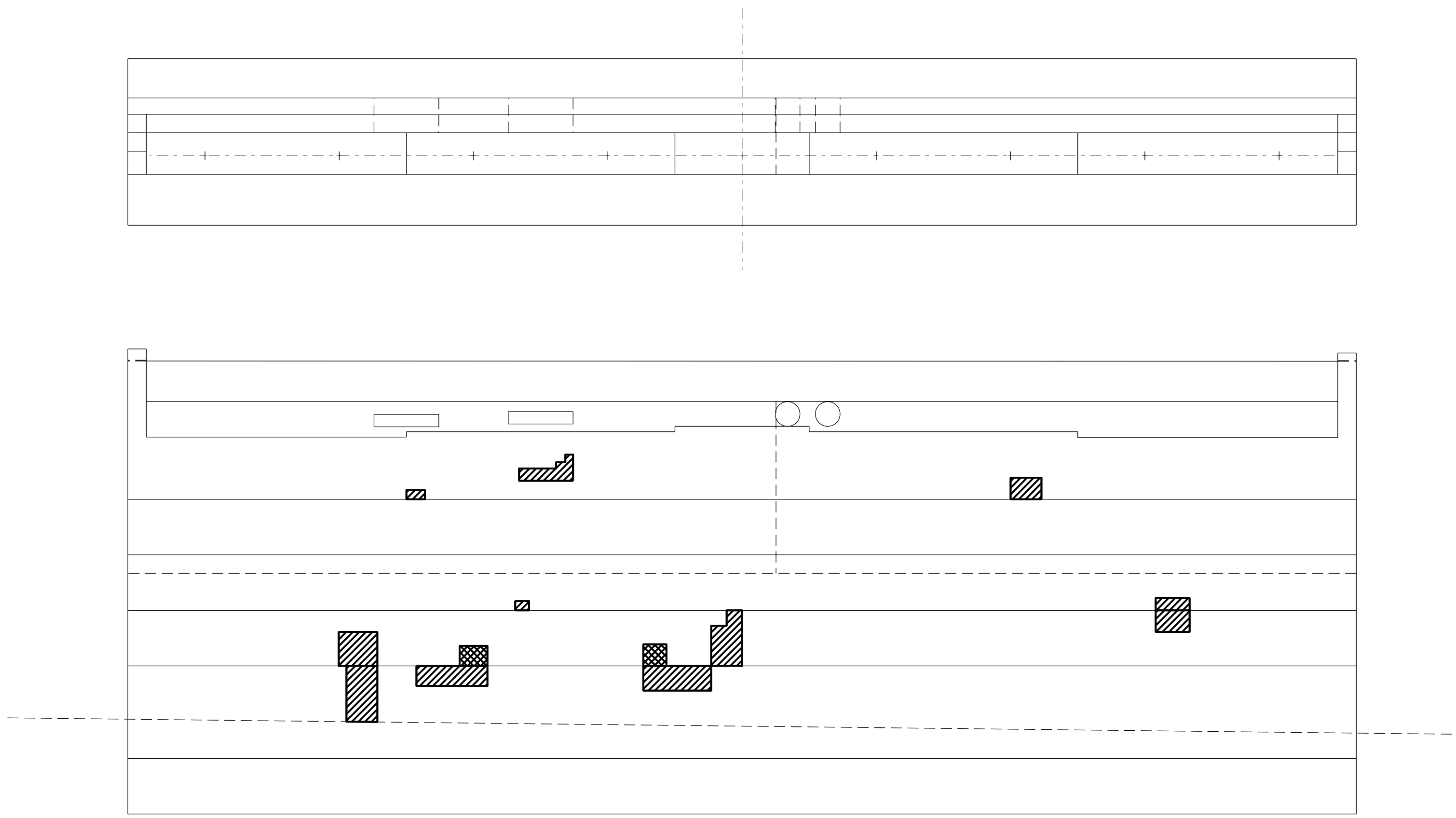
 = SPALL

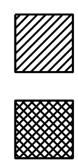
FIELD SHEET - BEGIN ABUTMENT

BY: JCY

DATE: 05/25/2023

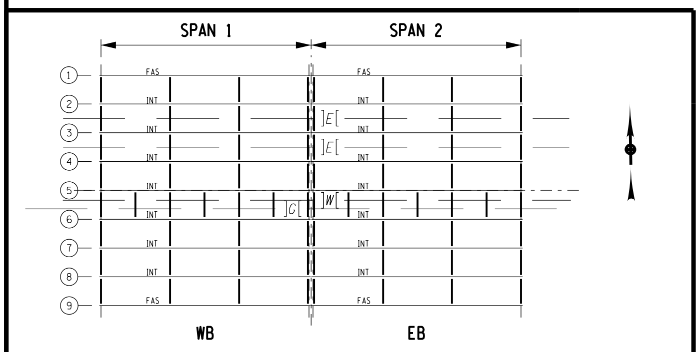
SCALE: 1" = 10'





= DELAMINATION

= SPALL

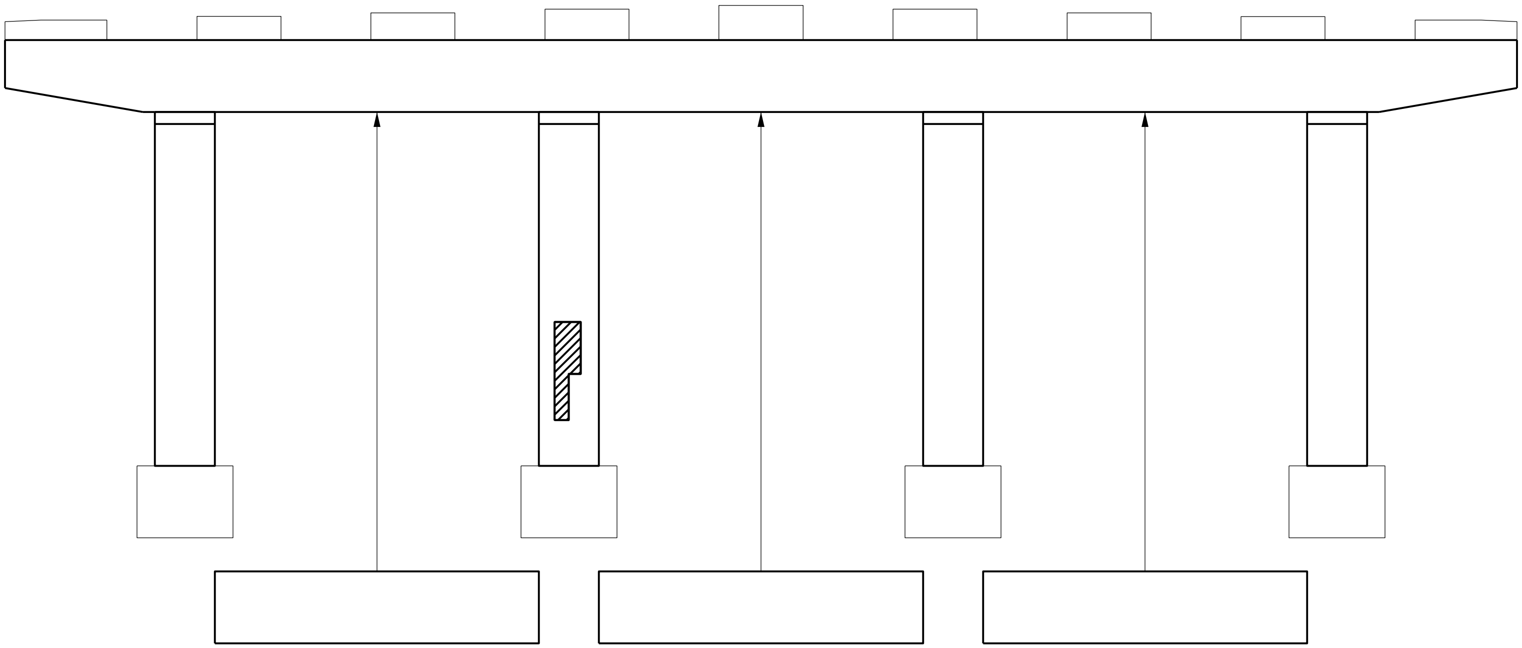


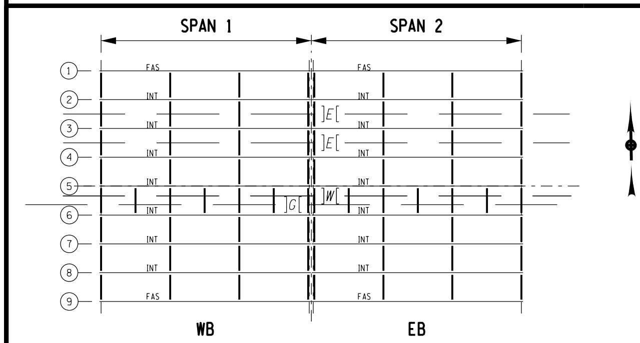
FIELD SHEET - END ABUTMENT

BY: JCY

DATE: 05/25/2023

SCALE: 1" = 10'





= DELAMINATION

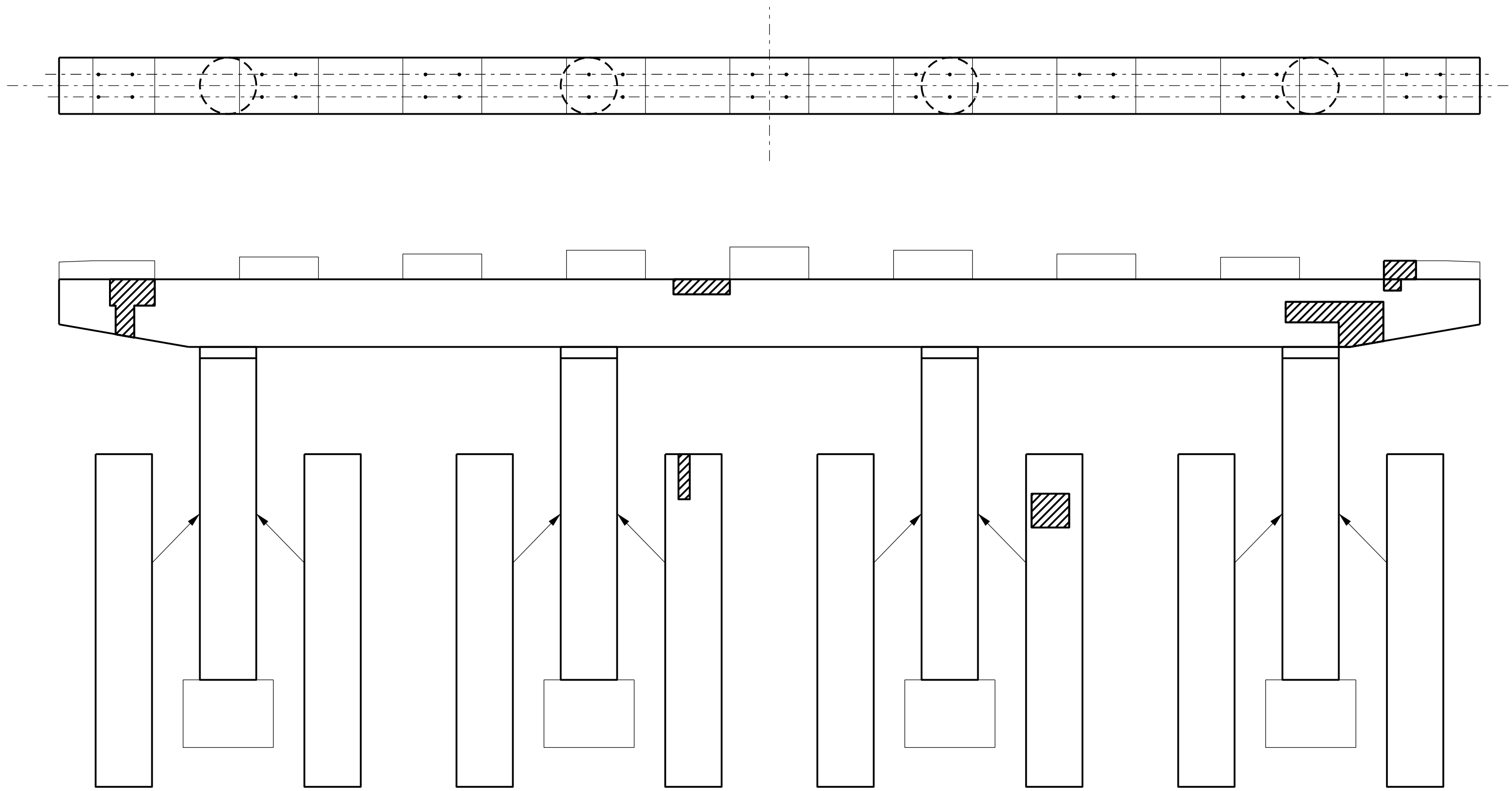
= SPALL

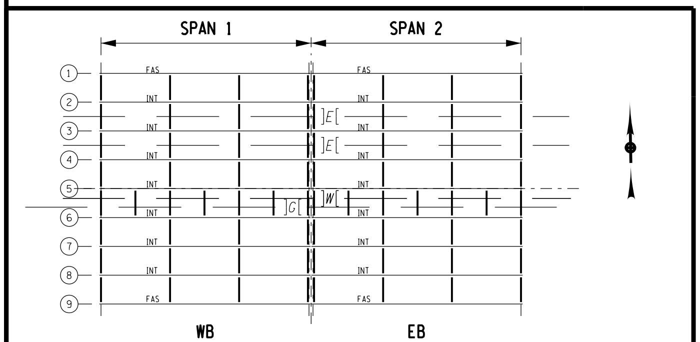
FIELD SHEET - PIER - WESTBOUND

BY: JCY

DATE: 05/25/2023

SCALE: 1/8" = 1'





= DELAMINATION

= SPALL

FIELD SHEET - PIER - EASTBOUND

BY: JCY

DATE: 05/25/2023

SCALE: 1/8" = 1'

Photographs

PHOTO 1:

LOCATION:
G8 IN SPAN 1 AT PIER

DESCRIPTION:
GIRDER END CONDITION PHOTO (WORST CASE FULL HEIGHT)

PHOTO 2:

LOCATION:
G7 IN SPAN 1 AT PIER

DESCRIPTION:
GIRDER END CONDITION PHOTO (WORST CASE BEARING AREA)

PHOTO 3:

LOCATION:
END ABUTMENT

DESCRIPTION:
LEAKAGE AND RUST STAINING TO CONCRETE ABUTMENT/BACKWALL AT UTILITY LOCATIONS

PHOTO 4:

LOCATION:
END ABUTMENT

DESCRIPTION:
GENERAL CONDITION PHOTO, PREVIOUS REPAIR AREA

PHOTO 5:

LOCATION:
BEGIN ABUTMENT

DESCRIPTION:
GENERAL CONDITION PHOTO

PHOTO 6:

LOCATION:
CONCRETE PIER CAP AND PEDESTALS

DESCRIPTION:
MINOR MAP CRACKING TO CONCRETE FACES

PHOTO 7:

LOCATION:
PIER

DESCRIPTION:
GENERAL CONDITION PHOTO

PHOTO 8:

LOCATION:
UNDERSIDE OF DECK IN SPAN 2

DESCRIPTION:
TYPICAL DECK CONDITION PHOTO, SIGNIFICANT RUSTING TO STAY-IN-PLACE FORMS

PHOTO 9:

LOCATION:
UNDERSIDE OF DECK IN SPAN 1

DESCRIPTION:
TYPICAL DECK CONDITION PHOTO, SIGNIFICANT RUSTING TO STAY-IN-PLACE FORMS

Appendices

- Appendix A: 2022 Biennial Bridge Inspection Report
- Appendix B: Bridge Work History Summary
- Appendix C: Load Rating Summary

Appendix A

2022 Biennial Bridge Inspection Report

New York State Department of Transportation
General Bridge Inspection Report

Inspection Date: August 16, 2022

Structure Information

BIN: **1022640**
Feature Carried: EAST FERRY ST
Feature Crossed: 33 33 53011034
Orientation: 3 - EAST

Region: 05 - BUFFALO
County: ERIE
Political Unit: City of BUFFALO
Approximate Year Built: 1970

Primary Owner: New York State Department of Transportation
Primary Maintenance Responsibility: New York State Department of Transportation
General Type Main Span: 3 - Steel, 02 - Stringer/Multi-Beam or Girder
This Bridge is not a Ramp
Number of Spans: 2

Postings

Posted Load Matches Inventory: Yes
Posted Load in field: Not Posted

Posted Vertical Clearances Match Inventory: N/A
Inventory On: Not Posted
Inventory Under: Not Posted

Number of Flags Issued

Red PIA: 0
Red: 0
Yellow: 0
Safety PIA: 0

New York State Inspection Overview

General Recommendation: 6

Federal NBI Ratings

NBI Deck Condition: 7
NBI Superstructure Condition: 7
NBI Substructure Condition: 4
NBI Channel Condition: N
NBI Culvert Condition: N

Action Items

Non-Structural Condition Observations noted: YES
Vulnerability Reviews Recommended: NO
Diving Inspection Requested: NO
Further Investigation Requested: NO

Inspector & Reviewer Signature Information

Inspection Signature:	Nimish Shah	*Date:* September 16, 2022
Review Signature:	Keith Baran, P.E. 082087-1	*Date:* September 16, 2022
Processed by :	William F. Leblanc, P.E. 085471-1	*Date:* October 28, 2022

Report Printed: October 31, 2022 10:19:57 AM

Special Emphasis Inspection

Special Emphasis Detail	"Other" Special Emphasis Detail Description	Hands-On Insp Performed	Hands-On Inspection Note
AASHTO Category D, E, and E' welded details		Yes	All cover plate terminations received hands on inspection

Additional Information

Overloads Observed

No overload vehicles observed during this inspection.

Notes to Next Inspector

Bin plate is on the begin right railing.
Used bucket truck with shoulder closures @ both abutments.
Used bucket truck with lane closures on both sides of pier.
This bridge was inspected in conjunction with BINs 1022620, 1022630 and 1022640.

Improvements Observed

None

Pedestrian Fence Height

8'

Snow Fence

None

Bin Plate Condition

OK

Scour Critical Rating

N - Bridge not over waterway.

Field Notes

Staff Present During Inspection		
Name	**Title**	**Organization**
Brandon Wilson	WZTC Labor	TSI
George Welsted	ATL	NYSDOT
Matt Miller	WZTC Foreman	TSI
Matt Owens	WZTC Labor	TSI
Rob Parks	WZTC Labor	TSI

General Equipment Required for Inspection*
Access Type
13 - Walking
19 - Up to 30 Foot Lift
29 - Lane Closure With Shadow Vehicle

*** For span specific equipment requirements refer to the Active Inventory's "Access Needs" tab in BDIS.**

Detailed Time & Weather Conditions				
Field Date	**Arrival**	**Departure**	**Temp (F)**	**Weather Conditions**
08/15/2022	07:00 AM	02:00 PM	80	Sunny
08/16/2022	07:00 AM	01:00 PM	80	Sunny

Inspection Times (hours)	
Time required for travel, inspection and report preparation	12
Lane closure usage	7
Railroad flagging time	No

Element Quantities

Element Assessment Summary Table							
Element	**Total Quantity**	**Unit**	**CS-1**	**CS-2**	**CS-3**	**CS-4**	**CS-5**
12 - Reinforced Concrete Deck	7008	ft^2	4976	2032			0
107 - Steel Open Girder/Beam	954	ft	944	10			0
205 - Reinforced Concrete Column	4	each	4				0
215 - Reinforced Concrete Abutment	132	ft	103	29			0
220 - Reinforced Concrete Pile Cap/Footing	256	ft					256
234 - Reinforced Concrete Pier Cap	63	ft	57	6			0
302 - Compression Joint Seal	128	ft	32	96			0
311 - Movable Bearing	18	each			18		0
313 - Fixed Bearing	18	each		18			0
330 - Metal Bridge Railing	220	ft	207		13		0
331 - Reinforced Concrete Bridge Railing	220	ft	220				0
510 - Wearing Surfaces	5720	ft^2		5720			0
515 - Steel Protective Coating	7790	ft^2	6500	598	605	87	0
800 - Erosion or Scour	272	ft	272				0
810 - Sidewalk	1100	ft^2	990	110			0
811 - Curb	220	ft	220				0
830 - Secondary Members	2	each	2				0
831 - Steel Beam End	36	each	27		9		0
850 - Backwall	126	ft	96	28	2		0
851 - Abutment Pedestal	18	each	18				0
852 - Pier Pedestal	18	each	16	2			0
853 - Wingwall	108	ft		83	25		0

Element Assessment by Span							
Element**	**Total Quantity**	**Unit**	**CS-1**	**CS-2**	**CS-3**	**CS-4**	**CS-5**
Span Number : 1							
BA215 - Reinforced Concrete Abutment	66	ft	44	22			0
BA220 - Reinforced Concrete Pile Cap/Footing	66	ft					66
BA302 - Compression Joint Seal	64	ft		64			0
BA311 - Movable Bearing	9	each			9		0
515 - Steel Protective Coating	18	ft^2		10	8		0
BA800 - Erosion or Scour	66	ft	66				0
BA831 - Steel Beam End	9	each	9				0

Element**	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
BA850 - Backwall	63	ft	49	12	2		0
BA851 - Abutment Pedestal	9	each	9				0
BW220 - Reinforced Concrete Pile Cap/Footing	54	ft					54
BW800 - Erosion or Scour	54	ft	54				0
BW853 - Wingwall	54	ft		52	2		0
PR205 - Reinforced Concrete Column	4	each	4				0
PR220 - Reinforced Concrete Pile Cap/Footing	16	ft					16
PR234 - Reinforced Concrete Pier Cap	63	ft	57	6			0
PR313 - Fixed Bearing	18	each		18			0
515 - Steel Protective Coating	18	ft^2		9		9	0
PR800 - Erosion or Scour	32	ft	32				0
PR831 - Steel Beam End	9	each	2		7		0
PR852 - Pier Pedestal	18	each	16	2			0
12 - Reinforced Concrete Deck	3504	ft^2	2628	876			0
510 - Wearing Surfaces	2860	ft^2		2860			0
107 - Steel Open Girder/Beam	477	ft	472	5			0
515 - Steel Protective Coating	3868	ft^2	3057	386	386	39	0
330 - Metal Bridge Railing	110	ft	97		13		0
331 - Reinforced Concrete Bridge Railing	110	ft	110				0
810 - Sidewalk	550	ft^2	495	55			0
811 - Curb	110	ft	110				0
830 - Secondary Members	1	each	1				0
Span Number : 2							
EA215 - Reinforced Concrete Abutment	66	ft	59	7			0
EA220 - Reinforced Concrete Pile Cap/Footing	66	ft					66
EA302 - Compression Joint Seal	64	ft	32	32			0
EA311 - Movable Bearing	9	each			9		0
515 - Steel Protective Coating	18	ft^2			18		0
EA800 - Erosion or Scour	66	ft	66				0
EA831 - Steel Beam End	9	each	9				0
EA850 - Backwall	63	ft	47	16			0
EA851 - Abutment Pedestal	9	each	9				0
EW220 - Reinforced Concrete Pile Cap/Footing	54	ft					54
EW800 - Erosion or Scour	54	ft	54				0
EW853 - Wingwall	54	ft		31	23		0
PR831 - Steel Beam End	9	each	7		2		0

Element**	Total Quantity	Unit	CS-1	CS-2	CS-3	CS-4	CS-5
12 - Reinforced Concrete Deck	3504	ft^2	2348	1156			0
510 - Wearing Surfaces	2860	ft^2		2860			0
107 - Steel Open Girder/Beam	477	ft	472	5			0
515 - Steel Protective Coating	3868	ft^2	3443	193	193	39	0
330 - Metal Bridge Railing	110	ft	110				0
331 - Reinforced Concrete Bridge Railing	110	ft	110				0
810 - Sidewalk	550	ft^2	495	55			0
811 - Curb	110	ft	110				0
830 - Secondary Members	1	each	1				0

** Elements with a prefix designate the locations of BA-Begin Abutment, BW-Begin Wingwall, EA-End Abutment, EW-End Wingwall, CO-Culvert Outlet, and PR-Pier. No prefix generally indicates the element is part of the superstructure.

Inspection Notes

General Notes

None

Element Condition Notes

Element	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 107 - Steel Open Girder/Beam-515 - Steel Protective Coating	3868	3057	386	386	39	0
Span 2: 107 - Steel Open Girder/Beam-515 - Steel Protective Coating	3868	3443	193	193	39	0

Common

Referenced Photo(s): 9, 12, 13

Referenced Sketch(es): None

The underside of the bottom flange of the girders and secondary members has paint failure, G1 and G2 are in the worst condition. The beam ends at the pier have paint failure and section loss.

Element	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA311 - Movable Bearing	9	0	0	9	0	0
Span 2: EA311 - Movable Bearing	9	0	0	9	0	0

Condition State 3 Note

Referenced Photo(s): 5, 7, 15

Referenced Sketch(es): 10

Begin and end bearings have 1/4" to 1/2" of pack rust between bronze slider and masonry plates.
All bearings are over expanded and slightly skewed, the worst condtion is along the begin abutment where the bearings have at least 1" of displacement.

Element	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA311 - Movable Bearing-515 - Steel Protective Coating	18	0	10	8	0	0
Span 1: PR313 - Fixed Bearing-515 - Steel Protective Coating	18	0	9	0	9	0
Span 2: EA311 - Movable Bearing-515 - Steel Protective Coating	18	0	0	18	0	0

Common

Referenced Photo(s): 5, 7, 11, 15

Referenced Sketch(es): None

The begin and end bearing have paint failure but no section loss. The pier bearing at the begin has paint failure and section loss at G3 to G9 and at the end G2 and G4.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: 330 - Metal Bridge Railing	110	97	0	13	0	0

Condition State 3 Note

Referenced Photo(s): 2

Referenced Sketch(es): None

The steel railing has impact damage at the begin right approach. One post is missing which leaves a 13 foot long section of the two rail system without support.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: PR831 - Steel Beam End	9	2	0	7	0	0
Span 2: PR831 - Steel Beam End	9	7	0	2	0	0

Condition State 3 Note

Referenced Photo(s): 11, 12

Referenced Sketch(es): 11

The pier begin beam ends from G3 to G9 has over 15% section loss, pier end beam ends at G2 and G4 has 10% section loss.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BA850 - Backwall	63	49	12	2	0	0

Condition State 3 Note

Referenced Photo(s): 6

Referenced Sketch(es): None

The begin backwall under a utility pipe in bay 5 has a 2'x2' area of cracks and spalling, no exposed rebar.

	TQ	CS-1	CS-2	CS-3	CS-4	CS-5
Span 1: BW853 - Wingwall	54	0	52	2	0	0
Span 2: EW853 - Wingwall	54	0	31	23	0	0

Condition State 3 Note

Referenced Photo(s): 8, 14, 16

Referenced Sketch(es): None

The lower portion of the begin right wingwall has a 5'x2' area of cracking and delamination. The lower portion of the end left and end right wingwall has a 5'x2' area of small spalls to rebar, delaminations and rust stained concrete.

Non-Structural Condition Observations

Category: APPROACH - Drainage Quantity: 1 Unit: ea Referenced Element(s): NONE Referenced Photo(s): 1 Referenced Sketch(es): NONE
The begin left approach drainage grate is loose and the opening is blocked with debris.
Category: FENCING - Pedestrian Quantity: 1 Unit: ea Referenced Element(s): NONE Referenced Photo(s): 3 Referenced Sketch(es): NONE
The begin right bottom pedestrian rail is disconnected and loose.
Category: APPROACH - Other -Light post Quantity: 1 Unit: ea Referenced Element(s): NONE Referenced Photo(s): 4 Referenced Sketch(es): NONE
The base of the end right approach light post is open and the wiring is exposed.

Inspection Photographs

Attachment Description: (NSCO) Approach Drainage, Begin Left, Grate Loose and Debris	Photo Number: **1** Photo Filename: **22_001.JPG** 

Attachment Description: Begin Span 1, Right Railing, Impact Damage	Photo Number: **2** Photo Filename: **22_002.JPG** 

Photo Number: **3** Photo Filename: **22_003.JPG**

Attachment Description:
(NSCO) Pedestrian Fence, Begin Span 1, Right, Bottom Rail Disconnected from Post

Photo Number: **4** Photo Filename: **22_004.JPG**

Attachment Description:
(NSCO) Approach Light Post, End Right, Wires Exposed

Photo Number: **5** Photo Filename: **22_005.JPG**

Attachment Description:
Begin Abutment Bearing 2, Pack Rust Under Sliding Plate and Paint Failure

Photo Number: **6** Photo Filename: **22_006.JPG**

Attachment Description:
Begin Backwall, Bay 5, Cracks and Spall

	Photo Number: **7** Photo Filename: **22_007.JPG**
Attachment Description: Begin Abutment Bearing 9, Overexpanded (Typical)	

	Photo Number: **8** Photo Filename: **22_008.JPG**
Attachment Description: Begin Right Wingwall, Cracks with Efflorescence and Rust Staining	

Attachment Description: Span 1, G6 – G9, Bottom Flange, Paint Failure; Bays 6 – 8, SIP Form, Corrosion (Typical)	Photo Number: **9** Photo Filename: **22_009.JPG** 

Attachment Description: Pier Cap, Begin Face, Rust Staining	Photo Number: **10** Photo Filename: **22_010.JPG** 

Photo Number: **11** Photo Filename: **22_011.JPG**

Attachment Description:
Pier Bearing 5, Paint Failure and Section Loss

Photo Number: **12** Photo Filename: **22_012.JPG**

Attachment Description:
End Span 1, G6 Beam End, Section Loss

Attachment Description: Span 2, G2 – G4, Bottom Flange, Paint Failure; Bays 1 – 4, SIP Form, Corrosion (Typical)	Photo Number: **13** Photo Filename: **22_013.JPG** 

Attachment Description: End Left Wingwall, Spalls to Rebar and Cracks with Rust Staining	Photo Number: **14** Photo Filename: **22_014.JPG** 

Photo Number: **15** Photo Filename: **22_015.JPG**

Attachment Description:
End Abutment Bearing 8, Pack Rust Under Sliding Plate and Paint Failure

Photo Number: **16** Photo Filename: **22_016.JPG**

Attachment Description:
End Right Wingwall, Spalls to Rebar and Cracks with Rust Staining

Inspection Sketches

Sketch Number: **1** Sketch Filename: **22_Photolog1.jpg**

BD 186

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	2

PHOTOLOG

Insp. Date:	08/16/2022	BIN:	1022640

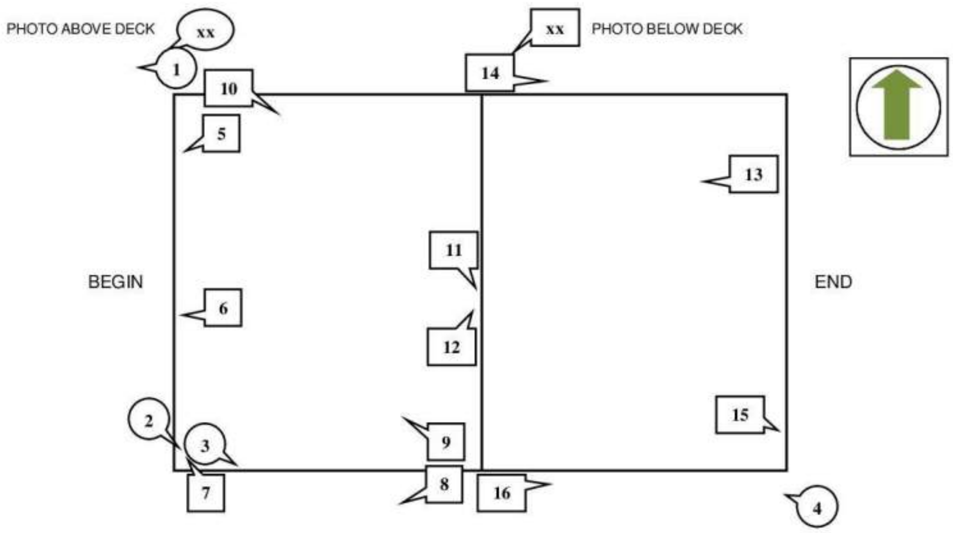


PHOTO NUMBER	JPG NUMBER	COMMENTS
1	22_001	(NSCO) Approach Drainage, Begin Left, Grate Loose and Debris
2	22_002	Begin Span 1, Right Railing, Impact Damage
3	22_003	(NSCO) Pedestrian Fence, Begin Span 1, Right, Bottom Rail Disconnected from Post
4	22_004	(NSCO) Approach Light Post, End Right, Wires Exposed
5	22_005	Begin Abutment Bearing 2, Pack Rust Under Sliding Plate and Paint Failure
6	22_006	Begin Backwall, Bay 5, Cracks and Spall
7	22_007	Begin Abutment Bearing 9, Overexpanded (Typical)
8	22_008	Begin Right Wingwall, Cracks with Efflorescence and Rust Staining
9	22_009	Span 1, G6 – G9, Bottom Flange, Paint Failure; Bays 6 – 8, SIP Form, Corrosion (Typical)
10	22_010	Pier Cap, Begin Face, Rust Staining

Sketch Description: 22_Photolog1.jpg

Sketch Number: **2** Sketch Filename: **22_Photolog2.jpg**

BD 186

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	2	OF	2

PHOTOLOG

Insp. Date:	08/16/2022		BIN:	1022640

PHOTO NUMBER	JPG NUMBER	COMMENTS
11	22_011	Pier Bearing 5, Paint Failure and Section Loss
12	22_012	End Span 1, G6 Beam End, Section Loss
13	22_013	Span 2, G2 – G4, Bottom Flange, Paint Failure; Bays 1 – 4, SIP Form, Corrosion (Typical)
14	22_014	End Left Wingwall, Spalls to Rebar and Cracks with Rust Staining
15	22_015	End Abutment Bearing 8, Pack Rust Under Sliding Plate and Paint Failure
16	22_016	End Right Wingwall, Spalls to Rebar and Cracks with Rust Staining

Sketch Description: 22_Photolog2.jpg

 Format Version 20220222

Sketch Number: **3** Sketch Filename: **22_ELECTRIC1.jpg**

BD 241

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	1

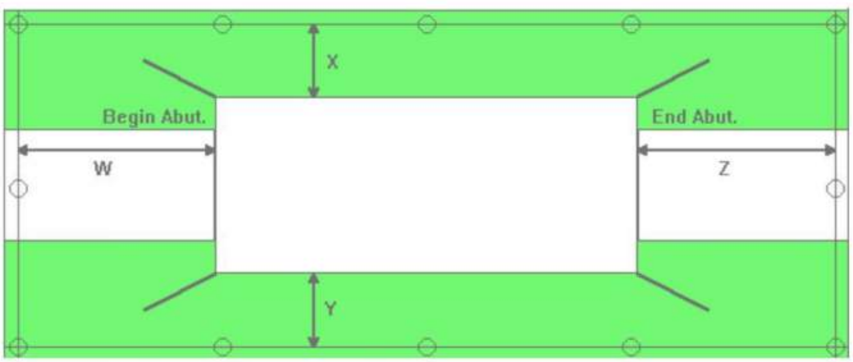
Electrical Hazard Survey

Insp. Date:	08/16/2022	BIN:	1022640

Electrical Hazard Classification (Put an X in appropriate box at right)		
		Danger!
		Warning
	X	No Lines Present

Electrical Hazard Alignments (Put an X in all appropriate boxes at right)		
		Parallel Alignment
		Perpendicular Alignment
		Diagonal Alignment

Utility Name	N/A
System Voltage	N/A



(For Clarity, You Must Specify English or Metric Units for Offsets)

Location (Put X where appropriate)	No Lines Present	Above the Deck	Below the Deck	Above and Below	Horizontal Offset	Vertical Offset
Before Begin Abutment (W)	X					
To Left of Bridge (X)	X					
To Right of Bridge (Y)	X					
After End Abutment (Z)	X					

Sketch Description: 22_ELECTRIC1.jpg

Sketch Number: **4** Sketch Filename: **22_WZTC_form1.jpg**

Insp. Date:	08/16/2022		BIN:	1022640

WZTC PLAN

NOTES –

EXPRESSWAY

(1) LEFT CLOSURES WERE USED FOR BUCKET TRUCK WORK AT PIER.
SEE NYSDOT REGION 5 WZTC MANUAL, SHEET 12 - 1 (STANDARD SHEET 619-31).

(1) RIGHT SHOULDER CLOSURES WERE USED FOR BUCKET TRUCK WORK AT ABUTMENTS.
SEE NYSDOT REGION 5 WZTC MANUAL, SHEET 12 - 5 (STANDARD SHEET 619-22).

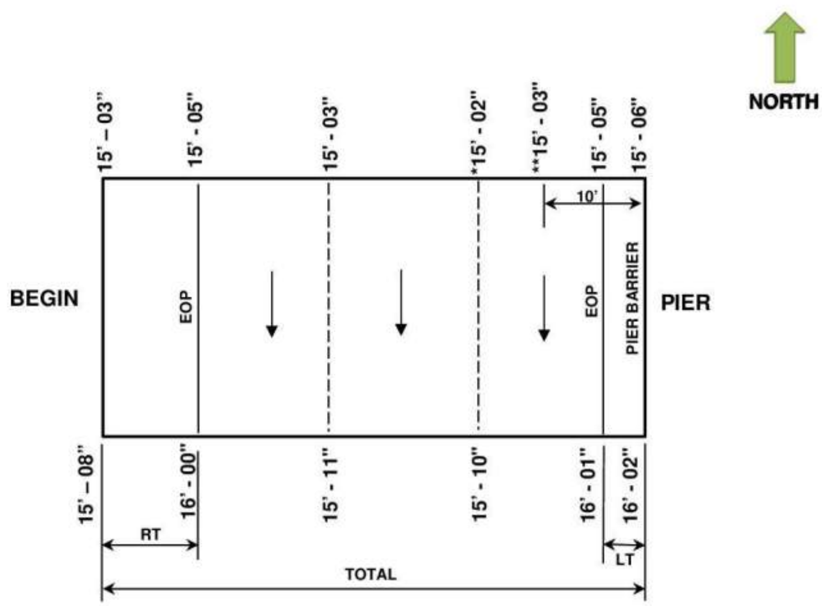
Sketch Description: 22_WZTC_form1.jpg

Sketch Number: **5** Sketch Filename: **22_VC_Under1.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	2

SPAN 1 ROUTE 33 WB HIGHWAY VERTICAL CLEARANCES (FT.)

INSP. DATE:	08/16/2022		BIN	1022640



INBOUND

Date	DEF**	ACT*	TOT	LT	RT
2022	15' - 03"	15 - 02"	49.3'	2.5'	9.7'
✓ if no change					

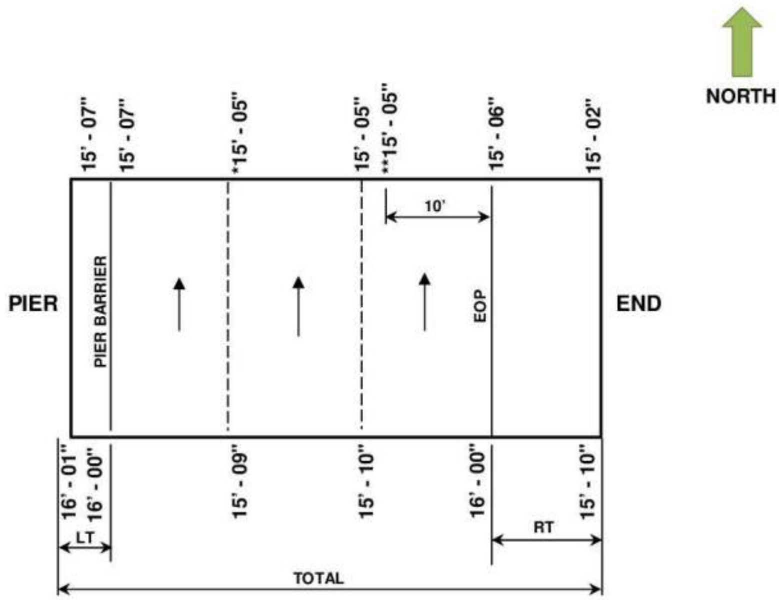
Sketch Description: 22_VC_Under1.jpg

Sketch Number: **6** Sketch Filename: **22_VC_Under2.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	2	OF	2

SPAN 2 ROUTE 33 EB HIGHWAY VERTICAL CLEARANCES (FT.)

INSP. DATE:	08/16/2022		BIN	1022640



OUTBOUND

Date	DEF**	ACT*	TOT	LT	RT
2022	15' - 05"	15' - 05"	49.5'	3.0'	9.6'
✓ if no change					

Sketch Description: 22_VC_Under2.jpg

Sketch Number: **7** Sketch Filename: **22_LdRat1.jpg**

Region 5 LoadRatingFieldCheckForm

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	1

LOAD RATING FIELD CHECK FORM

BIN:	1022640		Insp. Date:	08/16/2022

Dead Load - Note Changes since Last load Rating or state "NONE":

NONE.

Section Loss - Note locations and amount of loss on each girder or state "NONE":

Web loss was measured at beam ends of both spans. Bearing area section loss exceeding 10% was measuring in the following locations:

End Span 1 G3 – 15%
End Span 1 G4 – 12%
End Span 1 G5 – 23%
End Span 1 G6 – 21%
End Span 1 G7 – 15%
End Span 1 G8 – 25%
End Span 1 G9 – 15%

Begin Span 2 G2 – 10%
Begin Span 2 G4 – 10%

See section loss documentation.

Additional Notes:

Attachments:

22_SectionLoss.xlsx

Team Leader: Nimish Shah, P.E.

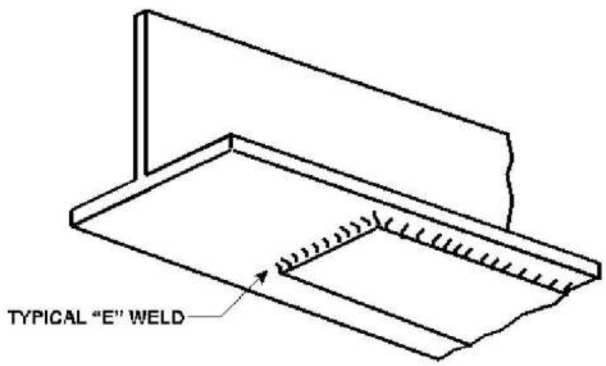
Sketch Description: 22_LdRat1.jpg

Sketch Number: **8** Sketch Filename: **22_Special Emphasis1.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	2

SPECIAL EMPHASIS REQUIRED
COVER PLATE WELDS

INSP. DATE:	08/16/2022		BIN	1022640



NOTES:

1) Category "E" welds are located at ends of cover plates on all girders.
2) All Category "E" welds shall receive 100% hands on inspection.

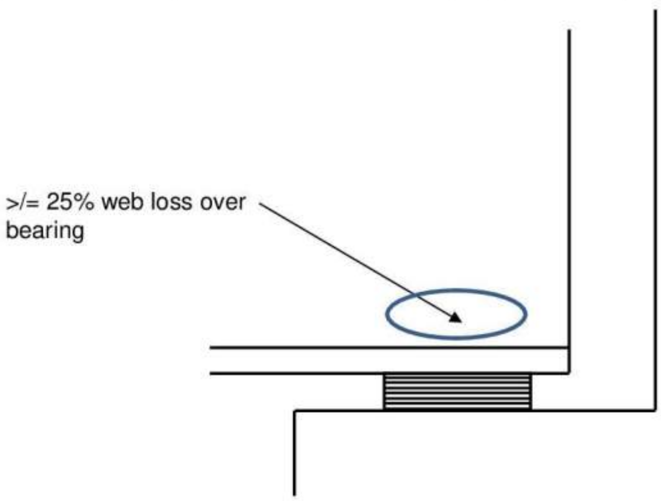
Sketch Description: 22_Special Emphasis1.jpg

Sketch Number: **9** Sketch Filename: **22_Special Emphasis2.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	2	OF	2

SPECIAL EMPHASIS REQUIRED
>/= 25% WEB LOSS OVER
BEAINGS

INSP. DATE:	08/16/2022		BIN	1022640



NOTES:

1) All Girders with >/= 25% web loss over bearings shall receive 100% hands on inspection.
2) See Web Loss documentation.

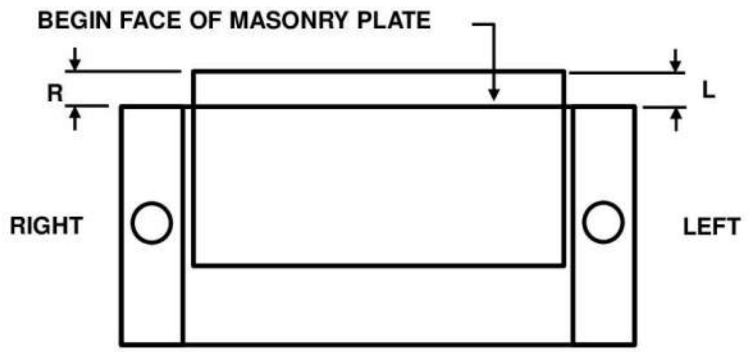
Sketch Description: 22_Special Emphasis2.jpg

Sketch Number: **10** Sketch Filename: **22_Begin Bearings Over Expanded1.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	OF	1

BEGIN BEARINGS - OVER EXPANSION & SKEW

INSP. DATE:	08/16/2022		BIN	1022640



PLAN

YEAR	TEMP	BEGIN ABUTMENT BEARING DISPLACEMENT (in)									
		G-1		G-2		G-3		G-4		G-5	
		RT	LT	RT	LT	RT	LT	RT	LT	RT	LT
2013	55 F	1/2	-3/8	9/16	7/16	13/16	9/16	5/8	5/8	5/8	1/4
2014	53 F	1/2	-3/8	9/16	7/16	13/16	9/16	7/8	7/8	5/8	5/8
2016	47 F	5/8	-1/4	7/8	5/8	7/8	1/2	7/8	7/8	1	7/8
2018	31F	5/8	-1/4	7/8	5/8	7/8	1/2	7/8	5/8	3/4	9/16
2020	78 F	1/4	-1/8	1	3/4	1	3/4	1	1	7/8	11/16
2022	80 F	1/4	0	1	3/4	1	3/4	1	1	7/8	11/16

YEAR	TEMP	BEGIN ABUTMENT BEARING DISPLACEMENT (in)							
		G-6		G-7		G-8		G-9	
		RT	LT	RT	LT	RT	LT	RT	LT
2013	55 F	5/8	9/16	3/4	3/8	15/16	11/16	1 7/16	1 1/8
2014	53 F	5/8	5/8	7/8	11/16	13/16	1 1/8	1 1/16	1
2016	47 F	7/8	7/8	7/8	1	7/8	1 1/8	1 1/4	1 1/2
2018	31 F	3/4	3/4	7/8	7/8	1	1 1/8	1	1 1/4
2020	78 F	1	1	1	1	1-1/8	1-1/4	1-1/4	1-1/2
2022	80 F	1	1	1	1	1-1/8	1-1/4	1-1/4	1-1/2

Sketch Description: 22_Begin Bearings Over Expanded1.jpg

Sketch Number: **11** Sketch Filename: **22_SectionLoss1.jpg**

NYSDOT BRIDGE INSPECTION REPORT			
SHEET	1	of	1

WEB SECTION LOSS MEASUREMENTS (in)

Insp. Date	08/16/22	BIN	1022640

SPAN-1

	ORIG. WEB THICKNESS = 0.468" FASCIAS AND INTERIORS						
Girder Number	Location	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss
G-1	BEGIN	7/16	7%	7/16	7%	0.43	8%
	PIER-1	7/16	7%	7/16	7%	0.44	6%
G-2	BEGIN	15/32	0%	15/32	0%		
	PIER-1	7/16	7%	15/32	0%		
G-3	BEGIN	15/32	0%	15/32	0%		
	PIER-1	13/32	13%	13/32	13%	0.40	15%
G-4	BEGIN	15/32	0%	15/32	0%		
	PIER-1	13/32	13%	3/8	20%	0.41	12%
G-5	BEGIN	7/16	7%	7/16	7%	0.44	6%
	PIER-1	3/8	20%	3/8	20%	0.36	23%
G-6	BEGIN	15/32	0%	15/32	0%		
	PIER-1	0.387	17%	3/8	20%	0.37	21%
G-7	BEGIN	15/32	0%	15/32	0%		
	PIER-1	0.347	26%	3/8	20%	0.40	15%
G-8	BEGIN	15/32	0%	15/32	0%		
	PIER-1	3/8	20%	3/8	20%	0.35	25%
G-9	BEGIN	15/32	0%	15/32	0%		
	PIER-1	15/32	0%	7/16	7%	0.40	15%
INSP. BY, DATE		CMC, 2018		TK, 2020		NS, 2022	

G-1 TO G-9 ARE 24 WF 100 with WEB = 24.0" X 0.468" AND FLANGE = 12.0" X 0.775"

SPAN-2

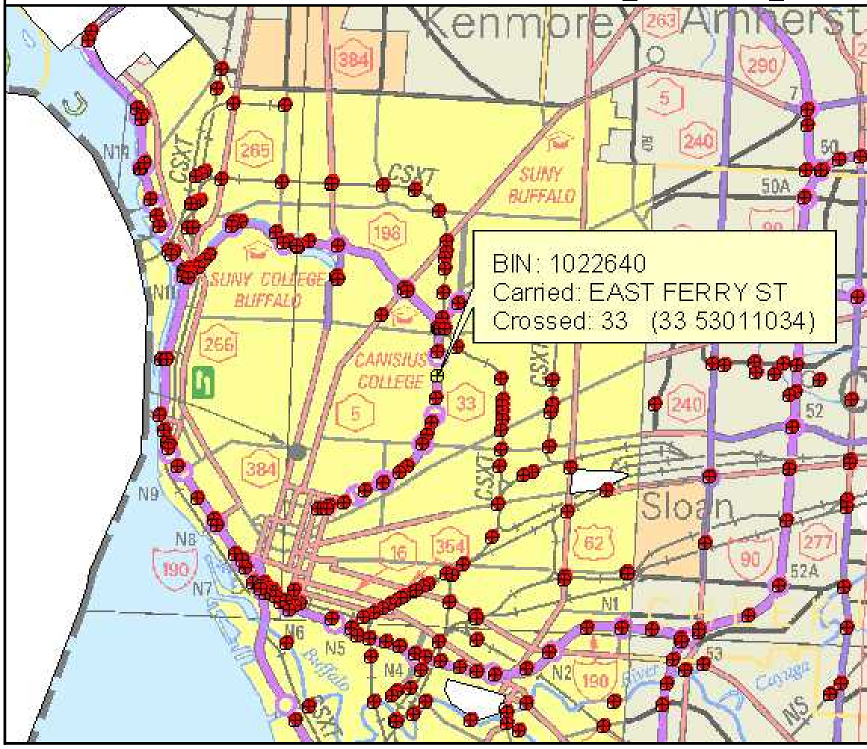
	ORIG. WEB THICKNESS = 0.468" FASCIAS AND INTERIORS						
Girder Number	Location	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss	Web Thick. (Caliper or D-meter)	% Web Loss
G-1	PIER-1	7/16	7%	7/16	7%	0.44	6%
	END	7/16	7%	7/16	7%		
G-2	PIER-1	11/32	27%	7/16	7%	0.42	10%
	END	15/32	0%	15/32	0%		
G-3	PIER-1	7/16	7%	7/16	7%		
	END	15/32	0%	15/32	0%		
G-4	PIER-1	7/16	7%	7/16	7%	0.42	10%
	END	15/32	0%	15/32	0%		
G-5	PIER-1	7/16	7%	7/16	7%	0.43	8%
	END	15/32	0%	15/32	0%		
G-6	PIER-1	15/32	0%	15/32	0%	0.44	6%
	END	15/32	0%	15/32	0%		
G-7	PIER-1	7/16	7%	7/16	7%		
	END	15/32	0%	15/32	0%		
G-8	PIER-1	3/8	20%	7/16	7%	0.43	8%
	END	15/32	0%	15/32	0%		
G-9	PIER-1	7/16	7%	7/16	7%	0.45	4%
	END	7/16	7%	15/32	0%		
INSP. BY, DATE		CMC, 2018		TK, 2020		NS, 2022	

G-1 TO G-9 ARE 24 WF 100 with WEB = 24.0" X 0.468" AND FLANGE = 12.0" X 0.775"

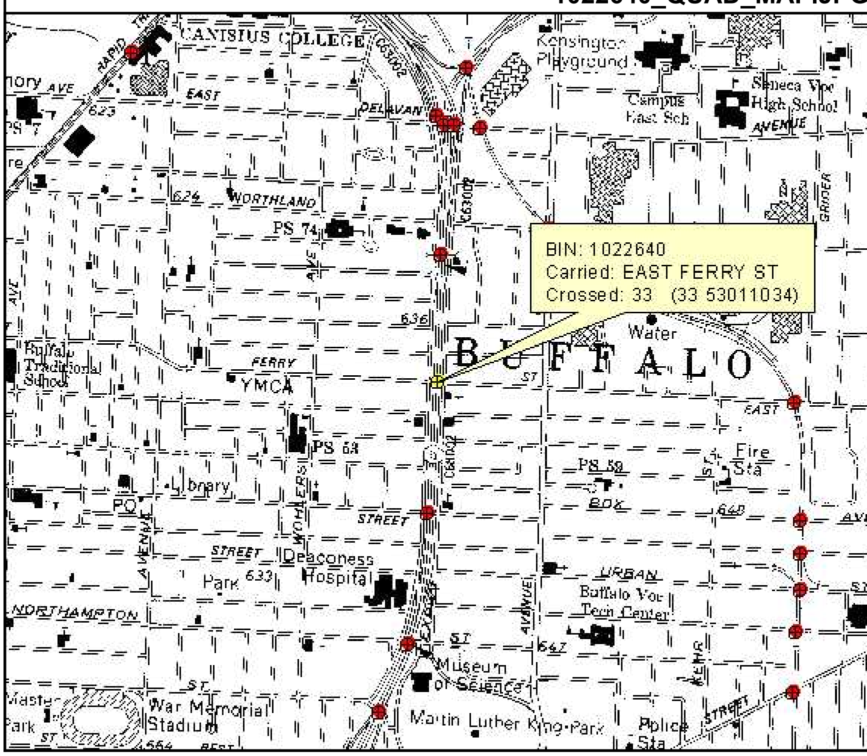
Sketch Description: 22_SectionLoss1.jpg

Standard Photographs

1022640_LOCATION_MAP.JPG



1022640_QUAD_MAP.JPG



Format Version 20220222

Abutment_Begin.JPG

Abutment_End.JPG

Approach_Begin.JPG

Approach_End.JPG

Elevation_Left.JPG

Elevation_Right.JPG

FeatureCrossed_Left.JPG

FeatureCrossed_Right.JPG

Framing_Span_1.JPG

Pier.JPG

Appendix B

Bridge Work History Summary

East Ferry St. Bridge (BIN 1022640) Work History

Year	Contract	Description of Work
2015	D262658	General Rehabilitation D262658
		Maintain Scuppers and Drains
		Repair, Replace, or Add to Existing Concrete Substr
		Repair Bearings (non-working bearings)
		Repair Sidewalk and Fascia
		Clean, Free, and Repair Joint Mechanism
		Replace Joint System
2014	-	New apshalt pavement at both approaches
2010	-	Clean, Free, and Repair Joint Mechanism Repair Joints - Replace Armor Joint with Expansive Co.
	-	Waterproof Bridge Seats and Pier Caps seal substructure
2009	D260954	Bridge Cleaning
2008	-	Clean, Free, and Repair Joint Mechanism
	D260644	Bridge Cleaning
2007	-	Clean, Free, and Repair Joint Mechanism - Repair Joint
	D260336	Bridge Cleaning
2006	D259781	Bridge Painting D259781
	D260001	Bridge Cleaning
2005	-	Maintain and Repair Damaged Railing Replaced ped fence & fixed bridge rail
	-	Maintain Scuppers and Drains Beg-Lt drainage inlet repaired & cleaned
	-	Repair Sidewalk and Fascia Beg-Rt sidewalk settlement fixed
	D259745	Bridge Painting - Paint Bridge
2003	-	Clean, Free, and Repair Joint Mechanism
	D259244	Waterproof Bridge Deck
2002	-	Conc. Parapet Repaired & 1 Railing Bracket Rep
2001	D258747	Clean Bridge
2000	D258317	Clean Bridge
1999	D257936	Waterproof Bridge Deck - Clean Bridge
1998	D257523	Clean Bridge
1997	D257087	Clean Pier Caps and Abutments, Clean Bridge Deck, Clean Superstructure
1996	D256740	Maintain and Repair Structural Bridge Deck, Maintain and Repair Structural Bridge Deck, Clean Pier Caps and Abutments
1995	D256372	Clean Pier Caps and Abutments, Clean Superstructure, Clean Deck
1994	D254824	Clean Pier Caps and Abutments, Clean Superstructure, Clean Bridge Deck
1993	D254371	Clean Pier Caps and Abutments, Clean Bridge Deck, Clean Superstructure
1992	D254200	Clean and Paint Metal Surfaces - Epoxy Prime & Intermed., Urethane Finish Coat, Waterproof Bridge Seats and Pier Caps
1991	D254105	Clean Bridge Deck, Clean Pier Caps and Abutments, Clean Superstructure
1991	D253631	Maintanance Cleaning of Bridges
1984	D250619	Clean and Paint Metal Surfaces - Bridge Painting Contract
1978	D95794	Replace Wearing Surface (Asphalt Concrete) - Monolithic Deck Repair

Appendix C

Load Rating Summary

BIN 1022640
East Ferry Street
over
Kensington Expressway

City of Buffalo
Erie County, New York

Level 1 Load Rating Calculations

November 2023

Prepared By: Chirag S Patel, PE
Checked By: Walter James Kaniecki, PE

Load Rating Summary

Rating Load	Controlling Mode	Inventory Rating	Operating Rating
Load and Resistance Factor Rating HL-93	Span 1 Girder G7 Original 24*WF*100 Web Local Crippling	0.24	0.31
Load Factor Rating HS Truck or Lane	Span 1 Girder G7 Original 24*WF*100 Unstiffened Bearing Area	HS 15.7 28.3 Tons	HS 26.3 47.3 Tons
Load Factor Rating H Truck or Lane	Span 1 Girder G7 Original 24*WF*100 Unstiffened Bearing Area	H 21.5 21.5 Tons	H 35.9 35.9 Tons

No Recommended Load Posting

Approved By:
Walter James Kaniecki, PE
License Number 099619

LaBella
Powered by partnership.

Table of Contents

Load Rating Summary

Load and Resistance Factor Rating (LRFR), HL-93

Span 1 Girder G7 End
Original 24WF100 with measured Section Loss
Web Local Crippling, No Bearing Stiffeners
0.24 Inventory
0.31 Operating

Load Factor Rating (LFR), HS-Truck or Lane

Span 1 Girder G7 End
Original 24WF100 with measured Section Loss
Web End Shear, No Bearing Stiffeners
HS 15.7, 28.3 Tons Inventory
HS 26.3, 47.3 Tons Operating

Load Factor Rating (LFR), H-Truck or Lane

Span 1 Girder G7 End
Original 24WF100 with measured Section Loss
Web End Shear, No Bearing Stiffeners
H 21.5, 21.5 Tons Inventory
H 35.9, 35.9 Tons Operating

Load Posting Analysis per NYSDOT EI 20-026

Table 2 Redundancy Case 3, Condition Rating ≤ 3
→ Safe Load Capacity = 0.80 x H-Operating = 29 Tons
Table 1A Effective Length 52.25 ft → H-Equivalent 27 Tons
29 ≥ 27, No Recommended Posting

Bridge Information

BIN	1022640
Date of Load Rating	November 2023
Political Unit	City of Buffalo
Feature Carried	East Ferry Street
Feature Crossed	Kensington Expressway
Superstructure Type	Steel Multi-Girder
Number of Spans	2 Simple Spans 52’-3” & 52’-3”
Skew	0°-47’-41”
Total Length	110’-0”
Out-to-Out Width	64’-0”
Bridge Width Curb-to-Curb	52’-0”
Number of Actual Travel Lanes	4
Number of Lanes used in Rating	4
Type of Deck	Concrete
Type of Wearing Surface	High-Density Concrete Overlay
Type of Sidewalks	Left Side: Concrete Right Side: Concrete
Barrier or Railing Type	Concrete Parapet with Steel Railing
Year Built	1970
Rehabilitation Year(s)	
Design Live Load	HS 20-44
Existing Posted Load	Not Posted
Date of Most Recent Inspection	May 2023
List of Plans Included	Excerpts from: 1968 C 68-2 Original Plans

BIN 1022640
Level 1 Load Rating, November 2023

General Description

The East Ferry Street Bridge over the Kensington Expressway was originally built in 1970. It is a multi-girder bridge with 2 consecutive simple spans. The girders are steel rolled shapes with welded bottom cover plates, and are made composite with the concrete deck. The 52’-wide roadway carries 4 lanes. Both sides have raised sidewalks with curb, concrete parapet topped with steel pedestrian railing, and snow fence.

The bridge orientation differs among the Record Plans, Inspection Reports, and the existing Level 2 Load Rating Model in AASHTOWare BrR.

Record Plans	Inspection Report & This Level 1 Load Rating	AASHTOWare BrR Level 2 Load Rating
West ← East	West → East	West ← East

Analysis Description

This bridge was analyzed using both:
- Load and Resistance Factor Rating (LRFR)
- Load Factor Rating (LFR)

as described by the American Association of State Highway and Transportation Officials (AASHTO) and the New York State Department of Transportation (NYSDOT).

Three load definitions were evaluated:
- The HL-93 design load definition for LRFR
- The HS 20 truck or lane design load definition for LFR
- For specific ratings with LFR less than HS 20.0 Inventory, re-evaluate for the H 20 truck or lane load definition

This Level 1 Load Rating takes the existing Level 2 Load Rating Model built using AASHTOWare BrR. The input was verified and the most recent inspection information was incorporated into the model.
Due to specific concerns at the girder ends, select locations were manually checked for their capacity in the bearing region.

LaBella
Powered by partnership.

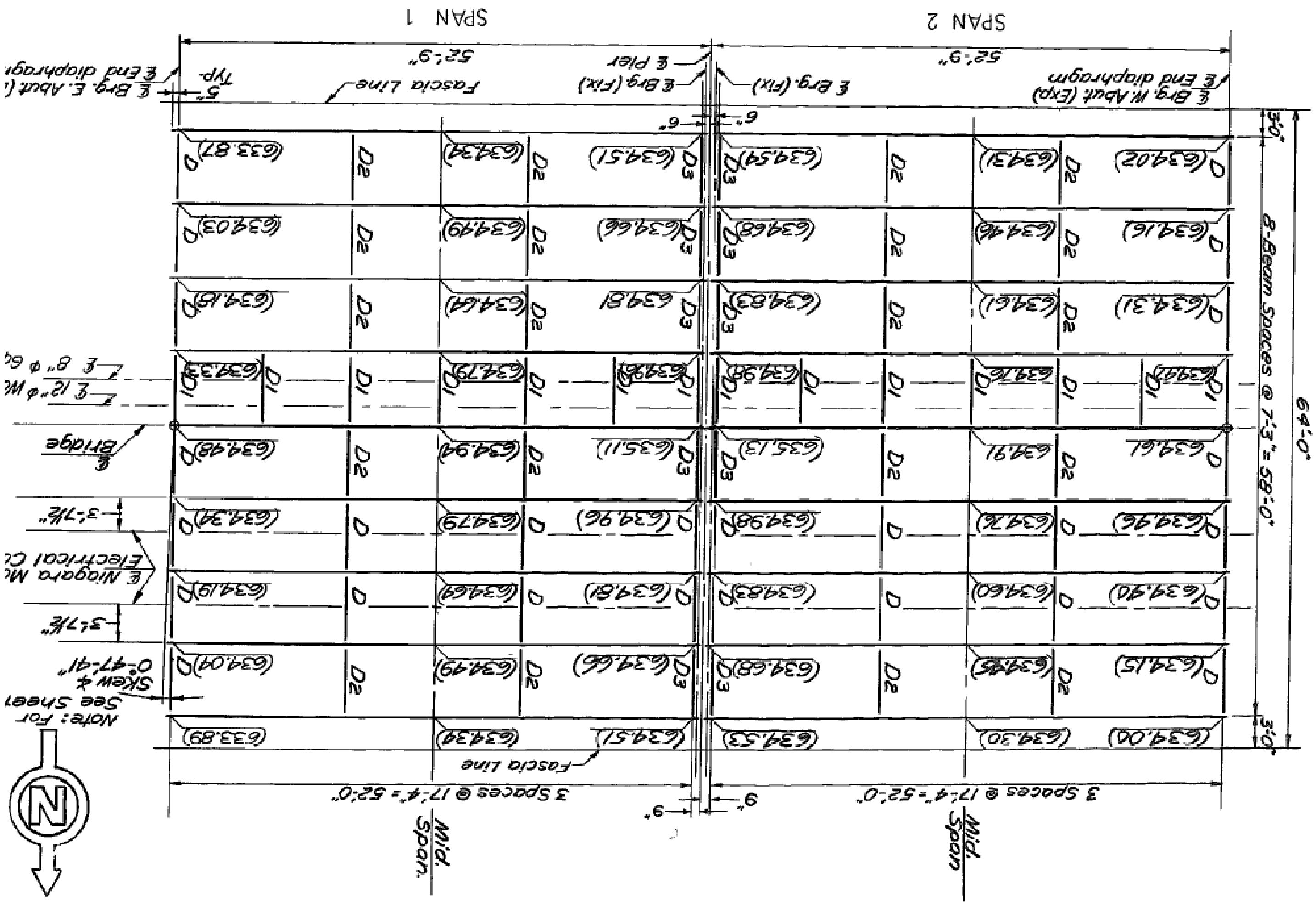
PROJECT: Kensington Expressway SHEET ___ OF ___
PROJECT NO.: 2230860 CALC. BY: CSP DATE: 08/17/23
SUBJECT: BIN 1022640 East Ferry SCALE ___
CHECKED BY: WJK 08/23/23

Modifications to the AASHTOWare BrR File

1. Traffic Information was missing. Added ADT, % Trucks, Directional Percent, and ADTT based on the Bridge Inventory Report.
   Total ADT 8177 w/ 2% Trucks.
   Let directionality be 55% [AASHTO LRFD C3.6.1.4.2] & 2 lanes available per direction.
   Assume current ADTT is reasonable for cycles over entire lifetime.

2. The bridge framing is two consecutive simple spans. The model had only defined one span as a representative typical superstructure. Copied the superstructure definition to differentiate span 1 and span 2 with current section loss.

3. Diaphragm layout and weights changed to accurately reflect the record plans.



Modifications to the AASHTOWare BrR File

D	15 C 33.9	x 7'-3" = 0.2458 k
D1	2-6 C 13	x 7'-3" = 0.1885 k
D2	18 C 42.7	x 7'-3" = 0.3096 k
D3	16 WF 36	x 7'-3" = 0.2610 k

End Diaphragms aligned with centerline of bearings at abutments, 3" eccentric at piers. Photographs show actual layout reasonably matches this layout as shown in the record plans.

4. Weight of utilities (G4-G8 both spans) was moved from the "additional Self Load" tab and added under "member loads" to assign proper DW classification.

5. Updated section loss based on most recent LaBella Element-Specific Inspection.

6. Added Points of Interest for the Cover Plate End fatigue detail.
   [AASHTO LRFD Table 6.6.1.2.3-1] Case 3.5, End Welded Cover Plates
   24 WF 100 t_f = 0.775" ≤ 0.8" → Category E

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway				
PROJECT NO.	2230860	SHEET		OF	
SUBJECT	BIN 1022640 East Ferry				
	CALC. BY	CSP	DATE	11/15/2023	
	CKD. BY	WJK	DATE	11/17/2023	

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W ← E

AASHTOWare BrR Rating Output

- Load and Resistance Factor Rating, HL-93
  - Whole Structure

Member Identity presented here following Inspection Orientation

Structure	Member	Inventory rating factor	Operating rating factor	Inventory capacity (Ton)	Operating capacity (Ton)	Inventory location (ft)
Span 1	G1	1.806	2.341	65.012	84.275	26.125
Span 1	G2	1.352	1.753	48.685	63.111	26.125
Span 1	G3	1.316	1.706	47.380	61.418	26.125
Span 1	G4	1.334	1.729	48.023	62.251	26.125
Span 1	G5	1.312	1.701	47.230	61.224	26.125
Span 1	G6	1.312	1.701	47.230	61.224	26.125
Span 1	G7	1.352	1.752	48.665	63.085	26.125
Span 1	G8	1.352	1.752	48.665	63.085	26.125
Span 1	G9	1.806	2.341	65.012	84.275	26.125
Span 2	G1	1.806	2.341	65.012	84.275	26.125
Span 2	G2	1.352	1.753	48.685	63.111	26.125
Span 2	G3	1.316	1.706	47.380	61.418	26.125
Span 2	G4	1.334	1.729	48.023	62.251	26.125
Span 2	G5	1.312	1.701	47.230	61.224	26.125
Span 2	G6	1.312	1.701	47.230	61.224	26.125
Span 2	G7	1.352	1.752	48.665	63.085	26.125
Span 2	G8	1.352	1.752	48.665	63.085	26.125
Span 2	G9	1.806	2.341	65.012	84.275	26.125

  - Controlling Member, Typical of Span 1 G5 & G6 and Span 2 G5 & G6

Live Load Type	Inventory rating factor	Operating rating factor	Location (ft)	Location Span-(%)	Limit State
Truck + Lane	1.312	1.701	26.125	(50)	STRENGTH-I Steel Flexure

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway				
PROJECT NO.	2230860	SHEET		OF	
SUBJECT	BIN 1022640 East Ferry				
		CALC. BY	CSP	DATE	11/15/2023
		CKD. BY	WJK	DATE	11/17/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model

AASHTOWare BrR Rating Output

- Load Factor Rating, HS20-44
  - Whole Structure

Member Identity presented here following Inspection Orientation

Structure	Member	Inventory rating factor	Operating rating factor	Inventory capacity (Ton)	Operating capacity (Ton)	Inventory location (ft)
Span 1	G1	5.824	9.726	209.672	350.153	26.125
Span 1	G2	1.292	2.158	46.530	77.705	26.125
Span 1	G3	1.260	2.104	45.365	75.760	26.125
Span 1	G4	1.276	2.131	45.937	76.714	26.125
Span 1	G5	1.256	2.098	45.218	75.514	26.125
Span 1	G6	1.256	2.098	45.218	75.514	26.125
Span 1	G7	1.292	2.157	46.508	77.669	26.125
Span 1	G8	1.292	2.157	46.508	77.669	26.125
Span 1	G9	5.824	9.726	209.672	350.153	26.125
Span 2	G1	5.824	9.726	209.672	350.153	26.125
Span 2	G2	1.292	2.158	46.530	77.705	26.125
Span 2	G3	1.260	2.104	45.365	75.760	26.125
Span 2	G4	1.276	2.131	45.937	76.714	26.125
Span 2	G5	1.256	2.098	45.218	75.514	26.125
Span 2	G6	1.256	2.098	45.218	75.514	26.125
Span 2	G7	1.292	2.157	46.508	77.669	26.125
Span 2	G8	1.292	2.157	46.508	77.669	26.125
Span 2	G9	5.824	9.726	209.672	350.153	26.125

  - Controlling Member, Typical of Span 1 G5 & G6 and Span 2 G5 & G6

Live Load Type	Inventory rating factor	Operating rating factor	Location (ft)	Location Span-(%)	Limit State
Axle Load	1.256	2.098	26.125	(50)	Design Flexure - Steel

- Fatigue Evaluation, HL-93 (Fatigue)
  - End Welded Cover Plates

		Infinite Life Check		Finite Life Analysis				
Member	Stress Range, Δf (ksi)	Infinite Life Range, Δf Max (ksi)	Threshold Stress, ΔF TH (ksi)	Finite Life Range, Δf eff (ksi)	Current Cycles, N1	Available Cycles, Nav	Remaining Life, Y REM (yrs)	Fatigue Serviceabilit y Index, Q
Exterior	2.04	3.56	4.50					
Interior	3.01	5.26	4.50	2.40	3409830	94912337	1449	0.87

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022640 East Ferry		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	09/07/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W ← E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 1

Begin

	DC1					DC2		DW		LL		
	Self Wt.	SIP Form	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	3.017	1.515	0.653	0.156	14.763	1.684	3.483		3.774	47.507	11.765	8.499
G2	2.970	3.031	0.653	0.280	16.573	1.684	3.483	1.176	3.774	72.608	49.391	33.669
G3	2.970	3.031	0.653	0.248	16.573	1.684	3.483	2.351	3.774	72.605	56.178	41.141
G4	2.970	3.031	0.653	0.280	16.573	1.684	3.483	1.176	3.774	72.605	56.178	41.141
G5	2.970	3.031	0.653	0.393	16.573	1.684	3.483	2.482	3.774	72.605	56.178	41.141
G6	2.970	3.031	0.653	0.653	16.573	1.684	3.483	2.482	3.774	72.605	56.178	41.141
G7	2.970	3.031	0.653	0.312	16.573	1.684	3.483		3.774	72.605	56.178	41.141
G8	2.970	3.031	0.653	0.312	16.573	1.684	3.483		3.774	72.743	49.391	33.669
G9	3.017	1.515	0.653	0.156	14.763	1.684	3.483		3.774	47.594	11.765	8.499

End

	DC1					DC2		DW		LL		
	Self Wt.	SIP Form	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	3.017	1.515	0.653	0.284	14.763	1.684	3.483		3.774	47.594	11.765	8.499
G2	2.970	3.031	0.653	0.529	16.573	1.684	3.483	1.176	3.774	72.743	49.391	33.669
G3	2.970	3.031	0.653	0.489	16.573	1.684	3.483	2.351	3.774	72.605	56.178	41.141
G4	2.970	3.031	0.653	0.529	16.573	1.684	3.483	1.176	3.774	72.605	56.178	41.141
G5	2.970	3.031	0.653	0.612	16.573	1.684	3.483	2.482	3.774	72.605	56.178	41.141
G6	2.970	3.031	0.653	0.612	16.573	1.684	3.483	2.482	3.774	72.605	56.178	41.141
G7	2.970	3.031	0.653	0.568	16.573	1.684	3.483		3.774	72.605	56.178	41.141
G8	2.970	3.031	0.653	0.568	16.573	1.684	3.483		3.774	72.608	49.391	33.669
G9	3.017	1.515	0.653	0.284	14.763	1.684	3.483		3.774	47.507	11.765	8.499

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022640 East Ferry		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	09/07/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W ← E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 2

Begin

	DC1					DC2		DW		LL		
	Self Wt.	SIP Form	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	3.017	1.515	0.653	0.284	14.763	1.684	3.483	[redacted]	3.774	47.507	11.765	8.499
G2	2.970	3.031	0.653	0.529	16.573	1.684	3.483	1.176	3.774	72.608	49.391	33.669
G3	2.970	3.031	0.653	0.489	16.573	1.684	3.483	2.351	3.774	72.605	56.178	41.141
G4	2.970	3.031	0.653	0.529	16.573	1.684	3.483	1.176	3.774	72.605	56.178	41.141
G5	2.970	3.031	0.653	0.612	16.573	1.684	3.483	2.482	3.774	72.605	56.178	41.141
G6	2.970	3.031	0.653	0.612	16.573	1.684	3.483	2.482	3.774	72.605	56.178	41.141
G7	2.970	3.031	0.653	0.568	16.573	1.684	3.483	[redacted]	3.774	72.605	56.178	41.141
G8	2.970	3.031	0.653	0.568	16.573	1.684	3.483	[redacted]	3.774	72.743	49.391	33.669
G9	3.017	1.515	0.653	0.284	14.763	1.684	3.483	[redacted]	3.774	47.594	11.765	8.499

End

	DC1					DC2		DW		LL		
	Self Wt.	SIP Form	Haunch	Diaphragms	Deck	Railing	Sidewalk	Utilities	Pavement	HL-93	HS 20	H 20
G1	3.017	1.515	0.653	0.156	14.763	1.684	3.483	[redacted]	3.774	47.594	11.765	8.499
G2	2.970	3.031	0.653	0.280	16.573	1.684	3.483	1.176	3.774	72.743	49.391	33.669
G3	2.970	3.031	0.653	0.248	16.573	1.684	3.483	2.351	3.774	72.605	56.178	41.141
G4	2.970	3.031	0.653	0.280	16.573	1.684	3.483	1.176	3.774	72.605	56.178	41.141
G5	2.970	3.031	0.653	0.393	16.573	1.684	3.483	2.482	3.774	72.605	56.178	41.141
G6	2.970	3.031	0.653	0.653	16.573	1.684	3.483	2.482	3.774	72.605	56.178	41.141
G7	2.970	3.031	0.653	0.312	16.573	1.684	3.483	[redacted]	3.774	72.605	56.178	41.141
G8	2.970	3.031	0.653	0.312	16.573	1.684	3.483	[redacted]	3.774	72.608	49.391	33.669
G9	3.017	1.515	0.653	0.156	14.763	1.684	3.483	[redacted]	3.774	47.507	11.765	8.499

LaBella
Powered by partnership.
300 State Street, Suite 201 • Rochester, NY 14614
Phone 585.454.6110 • Fax 585.454.3066
www.labellapc.com

PROJECT	Kensington Expressway		
PROJECT NO.	2230860	SHEET	OF
SUBJECT	BIN 1022640 East Ferry		
CALC. BY	CSP	DATE	09/06/2023
CKD. BY	WJK	DATE	09/07/2023

BRIDGE ORIENTATION		
Record Plan	Inspection	BrR Model
W ← E	W → E	W ← E

EXISTING GIRDER END SECTION RATING

- Support Reactions from AASHTOWare Model
  - Span 1

	Begin					End				
	DC	DW	HL-93	HS 20	H 20	DC	DW	HL-93	HS 20	H 20
G1	25.27	3.77	47.51	11.77	8.50	25.40	3.77	47.59	11.77	8.50
G2	28.67	4.95	72.61	49.39	33.67	28.92	4.95	72.74	49.39	33.67
G3	28.64	6.13	72.61	56.18	41.14	28.88	6.13	72.61	56.18	41.14
G4	28.67	4.95	72.61	56.18	41.14	28.92	4.95	72.61	56.18	41.14
G5	28.79	6.26	72.61	56.18	41.14	29.01	6.26	72.61	56.18	41.14
G6	29.05	6.26	72.61	56.18	41.14	29.01	6.26	72.61	56.18	41.14
G7	28.71	3.77	72.61	56.18	41.14	28.96	3.77	72.61	56.18	41.14
G8	28.71	3.77	72.74	49.39	33.67	28.96	3.77	72.61	49.39	33.67
G9	25.27	3.77	47.59	11.77	8.50	25.40	3.77	47.51	11.77	8.50

  - Span 2

	Begin					End				
	DC	DW	HL-93	HS 20	H 20	DC	DW	HL-93	HS 20	H 20
G1	25.40	3.77	47.51	11.77	8.50	25.27	3.77	47.59	11.77	8.50
G2	28.92	4.95	72.61	49.39	33.67	28.67	4.95	72.74	49.39	33.67
G3	28.88	6.13	72.61	56.18	41.14	28.64	6.13	72.61	56.18	41.14
G4	28.92	4.95	72.61	56.18	41.14	28.67	4.95	72.61	56.18	41.14
G5	29.01	6.26	72.61	56.18	41.14	28.79	6.26	72.61	56.18	41.14
G6	29.01	6.26	72.61	56.18	41.14	29.05	6.26	72.61	56.18	41.14
G7	28.96	3.77	72.61	56.18	41.14	28.71	3.77	72.61	56.18	41.14
G8	28.96	3.77	72.74	49.39	33.67	28.71	3.77	72.61	49.39	33.67
G9	25.40	3.77	47.59	11.77	8.50	25.27	3.77	47.51	11.77	8.50

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G7 End
  -- Applied Load and LRFR Factors

Assumptions & Limitations of this Worksheet
Girder not Longitudinally Stiffened
Girder not Transversely Stiffened
No Bearing Stiffeners

Mix Properties to envelope over worst potential rating:
Use Loads from 1G6 Begin / 2G6 End (Greatest Reaction)
Use Loss from 1G7 End (Greatest Loss)

Applied End Shear $V_{DC} := 29.05\ kip$ $V_{DW} := 6.26\ kip$ $V_{HL} := 72.61\ kip$

Applied Reaction Force $R_{DC} := 29.05\ kip$ $R_{DW} := 6.26\ kip$ $R_{HL} := 72.61\ kip$

STRENGTH Load Factors $\gamma_{DC} := 1.25$ $\gamma_{DW} := 1.50$ $\gamma_{LL} := \begin{bmatrix} 1.75 \\ 1.35 \end{bmatrix}$

Condition Resistance Reduction Factor [AASHTO MBE 6A.4.2.3]
Smooth polynomial connecting (0%, 1.00), (5%, 0.98), & (20%, 0.90)
with tangent at minimum value of 0.90

$$\phi_c(Loss) := \begin{cases} \dfrac{190}{9} \cdot Loss^3 - \dfrac{107}{18} \cdot Loss^2 - \dfrac{7}{45} \cdot Loss + 1 & \text{if } Loss \le 0.2 \\ 0.900 & \text{else} \end{cases}$$

System Redundancy Resistance Reduction Factor [AASHTO MBE 6A.4.2.4]
Regular Multi-Girder System with > 3 Girders $\phi_s := 1$

Rating Check Resistance Reduction Factors
Shear $\phi_v := 1$ Yielding $\phi_b := 1$ Crippling $\phi_w := 0.8$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G7 End
  -- Girder Geometry

Steel Properties $E := 29000\ ksi$ Web $F_{yw} := 36\ ksi$ Flange $F_{yf} := 36\ ksi$

Web Thickness Measurements and "Weight"

t_{wm} (in)	t_{ww}
0.414	$1 \div 3$
0.409	$1 \div 3$
0.309	$1 \div 3$

Web Monolithic Steel Depth $d := 24\ in$
(Rolled Shape Section Depth, Plate Shape Web Depth)

Web Shear "Unbraced Depth" $D_v := 20.875\ in$
(Rolled Shape Web Flat Depth, Plate Shape Web Depth)

Bottom Flange + Fillet Height $k := 1.5625\ in$

Section Original Web Thickness $t_{wo} := 0.468\ in$

Weighted Average Web Thickness $t_w := t_{wm} \cdot t_{ww} = 0.377\ in$

Thickness at Bottom of Web $t_{wb} := t_{wm_2} = 0.309\ in$

Bottom Flange Thickness $t_{fb} := 0.775\ in$

Girder Extension Beyond Centerline of Bearing $ext := 5\ in$
(input zero for interior support)

Bearing Contact Length $N := 6\ in$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G7 End
  -- Web Panel Shear [AASHTO LRFD 6.10.9]

Shear-Buckling Coefficient (unstiffened) $k_v := 5$

Web Compactness

$$\lambda_v := \frac{D_v}{t_w} = 55.3 \qquad \lambda_{pv} := 1.12 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 71.1 \qquad \lambda_{rv} := 1.40 \cdot \sqrt{\frac{E \cdot k_v}{F_{yw}}} = 88.9$$

Shear-Buckling Ratio

$$C := \begin{cases} \text{if } \lambda_v \le \lambda_{rv} \\ \quad min\left(1, \frac{\lambda_{pv}}{\lambda_v}\right) \\ \text{else} \\ \quad 1.57 \cdot \frac{E \cdot k_v}{\lambda_v^{\,2} \cdot F_{yw}} \end{cases} = 1.000$$

Web Plastic Shear Strength

$$V_p := 0.58 \cdot F_{yw} \cdot d \cdot t_w = 189.1 \ \textit{kip}$$

Nominal Resistance

$$V_n := C \cdot V_p = 189.1 \ \textit{kip}$$

Section Loss based on Web Thickness

$$Loss_v := 1 - \frac{t_w}{t_{wo}} = 19.4\% \qquad \phi_{c.v} := \phi_c\left(Loss_v\right) = 0.900$$

$$V_r := \phi_{c.v} \cdot \phi_v \cdot V_n = 170.2 \ \textit{kip} \qquad RF_v := \frac{V_r - \gamma_{DC} \cdot V_{DC} - \gamma_{DW} \cdot V_{DW}}{\gamma_{LL} \cdot V_{HL}} = \begin{bmatrix} 0.98 \\ 1.27 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G7 End
  -- Web Local Yielding [AASHTO LRFD D6.5.2]

For Rating, Let Bearing Resistance be the sum of
Web Local Yielding and Stiffener Contact Stress

$$R_{ny} := \begin{array}{l} \text{if } ext > d \vee ext = 0\ in \\ \quad \left\| \left(5 \cdot k + N\right) \cdot F_{yw} \cdot t_{wb} \right. \\ \text{else} \\ \quad \left\| \left(2.5 \cdot k + N\right) \cdot F_{yw} \cdot t_{wb} \right. \end{array} = 110.2\ kip$$

Section Loss based on Thickness at Base of Web

$$Loss_b := 1 - \frac{t_{wb}}{t_{wo}} = 34.0\% \qquad \phi_{c.b} := \phi_c\left(Loss_b\right) = 0.900$$

$$R_{ry} := \phi_{c.b} \cdot \phi_s \cdot \phi_b \cdot R_{ny} = 99.2\ kip$$

$$RF_b := \frac{R_{ry} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.42 \\ 0.55 \end{bmatrix}$$

Existing Girder End Section Resistance (LRFR)

- Span 1 Girder G7 End
  -- Web Local Crippling [AASHTO LRFD D6.5.3]

$$R_{nw} := \text{if } ext > \frac{d}{2} \vee ext = 0\ in$$
$$\quad 0.8 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$
$$\text{else if } \frac{N}{d} \le 0.2$$
$$\quad 0.4 \cdot t_w^{\ 2} \left(1 + 3 \cdot \frac{N}{d} \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$
$$\text{else}$$
$$\quad 0.4 \cdot t_w^{\ 2} \cdot \left(1 + \left(\frac{4\ N}{d} - 0.2\right) \cdot \left(\frac{t_w}{t_{fb}}\right)^{1.5}\right) \cdot \sqrt{E \cdot F_{yw} \cdot \frac{t_{fb}}{t_w}}$$
$$= 106.1\ kip$$

Section Loss based on Web Thickness

$$Loss_w := Loss_v = 19.4\% \qquad \phi_{c.w} := \phi_c\left(Loss_w\right) = 0.900$$

$$R_{rw} := \phi_{c.w} \cdot \phi_s \cdot \phi_w \cdot R_{nw} = 76.4\ kip$$

$$RF_w := \frac{R_{rw} - \gamma_{DC} \cdot R_{DC} - \gamma_{DW} \cdot R_{DW}}{\gamma_{LL} \cdot R_{HL}} = \begin{bmatrix} 0.24 \\ 0.31 \end{bmatrix}$$

Existing Girder End Section Resistance (LFR)

- Span 1 Girder G7 End
  - Lack of Bearing Stiffeners on Rolled Shapes

[AASHTO 10.48.7] Redirects all Load Factor Design for Bearing Stiffeners back to the Allowable Stress part of the Code.
[10.33.2] Stiffeners only required where end shear exceeds 75% of allowable

Translate this to LFR by letting the Strength be 75% of the Web Panel Shear

-- Applied Load and LFR Factors

Applied End Shear $V_D := V_{DC} + V_{DW} = 35.31\ \textbf{kip}$ $V_{HS} := 56.18\ \textbf{kip}$

LFR Load Factors $A_1 := 1.3$ $A_2 := \begin{bmatrix} 2.17 \\ 1.3 \end{bmatrix}$

-- Web Panel Shear Strength

Math setup is the same as LRFR

$V_u := V_n = 189.1\ \textbf{kip}$ $75\% \cdot V_u = 141.8\ \textbf{kip}$

$$RF_{HS} := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_{HS}} = \begin{bmatrix} 0.79 \\ 1.31 \end{bmatrix}$$

For Inventory < HS 20, check H-Rating

$V_H := 41.14\ \textbf{kip}$

$$RF_H := \frac{75\% \cdot V_u - A_1 \cdot V_D}{A_2 \cdot V_H} = \begin{bmatrix} 1.07 \\ 1.79 \end{bmatrix}$$

[EI 20-026] For Regular Girders in Poor Condition $K := 0.8$

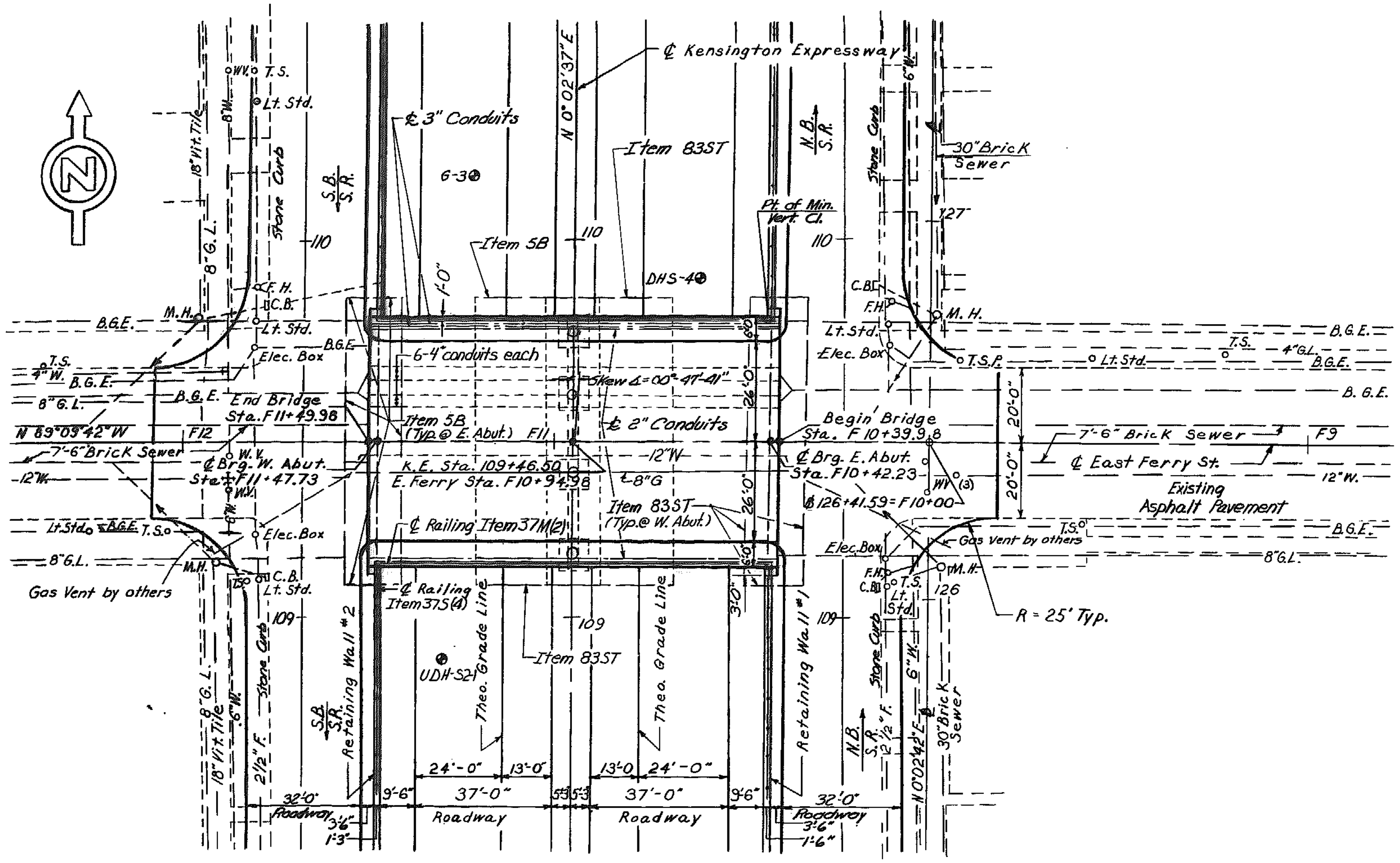
$SLC := K \cdot RF_{H_1} \cdot 20\ \textbf{ton} = 29\ \textbf{ton}$

For Length 52.25', Posting Threshold H27, No Posting Required

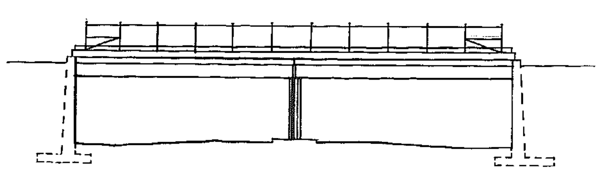
C 68-2

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	NEW YORK		199	223

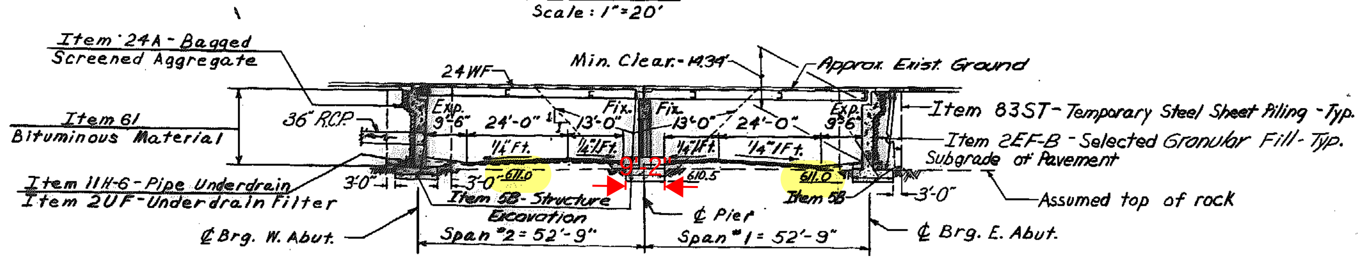
CITY OF BUFFALO
KENSINGTON EXPRESSWAY ARTERIAL SECTION II
NORTHAMPTON ST. TO NORTHLAND AVE.
ERIE COUNTY



PLAN
Scale: 1" = 20'



ELEVATION
Scale: 1" = 20'



LONGITUDINAL SECTION
Scale: 1" = 20'

GENERAL NOTES:

1. Design Specifications A.A.S.H.O. 1965 modified and current A.W.S. modified LL.HS20-44. The stresses assumed for design purposes conform to 1965 A.A.S.H.O. Specifications with the 28 day concrete stress (f'_c) = 3000 psi. minimum.
2. Material and Construction Specifications: Specifications of N.Y.S. Department of Public Works dated January 2, 1962 with current additions and modifications.
3. The Contractor's attention is directed to the Special Notes for this structure which appear in the proposal. Particular attention should be given to the foundation note which briefly outlines the anticipated subsurface conditions at the site of the structure and which specifies certain requirements relative to construction.
4. The cost of furnishing and placing water used for selected granular fill will be paid under Item IW and IWA of the highway portion of the contract.
5. Reinforcing bars shall be lapped a minimum of 20 diameters.
6. The cost of all joint material will be included in the price bid for the various items of the contract.
7. Concrete Items and Cement:

Description	Item No.	Type of Cement
Sidewalks, pier caps, columns, pedestals, headers, and parapets.	18	2
Monolithic slab	18M	2
Abutments and pier footings	20	2

8. All concrete shall have entrained air in accordance with the specifications.

SUBSTRUCTURE NOTES:

1. All embankment of Selected Fill, Item 2EFB, shall be compacted to a minimum dry density of 100% of Maximum Density as defined under "h Embankments" of the General Excavation Specification. However, where the material contains more than 30%, by weight, of particles retained on the 3/4 inch sieve, a minimum dry density of 95% of the Maximum Density will be required.
2. Items 2 and 2EF-B shall be placed simultaneously, in contact, on both sides of the vertical payment line. Sheeting or other means shall not be used to separate the two materials.
3. The installation of Selected Fill, Item 2EF-B, as shown on the structural plans, shall be completed immediately following the completion of abutments or walls.
4. ALL FOOTINGS ON ROCK. All disintegrated or shattered material shall be removed to the lines and levels ordered by the Engineer. Where sound rock is found 2' or less below the planned levels of the bottom of the footings, backfill of Class B Concrete shall be installed to the levels shown on the plans. Where sound rock is found to be more than 2' below the planned levels, the Deputy Chief Engineer (Design) shall be so advised and a redesign of the substructure made. Payments for the additional concrete and bar reinforcement if used will be made at the unit price bid for these items. Rock removed below the levels ordered by the Engineer and outside the lines must be replaced as indicated above and as directed by the Engineer for which no payment will be made.
5. ABUTMENTS ON ROCK. Rock shall be presplit along the lower roadway in front of and for 50 feet each side of the abutment. In addition, when the bottom footing is more than 5 feet below the rock surface, the rock shall be presplit adjacent to the footing as shown on the plans to the required depth. The presplitting shall be done in the sequence outlined above and the cost shall be included in the price bid for Item 5B.

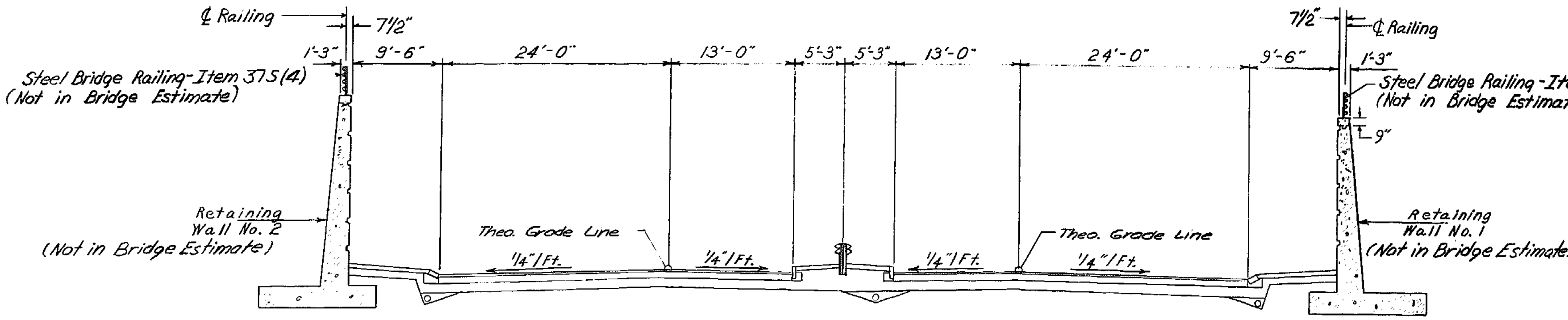
Date:	JULY 14, 1967
In Charge Of:	H. G. COLES
Designed By:	K. W. ROOT
Traced By:	J. F. MEYER
Checked By:	W. D. SWECKER

BRIDGE NO. 2
EAST FERRY STREET
OVER KENSINGTON EXPRESSWAY
GENERAL PLAN AND ELEVATION

PREPARED and RECOMMENDED
N.Y.S.P.E. LIC. NO. 20143 DATE 7-25-67
McFARLAND-JOHNSON ENGINEERS

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	NEW YORK		200	223

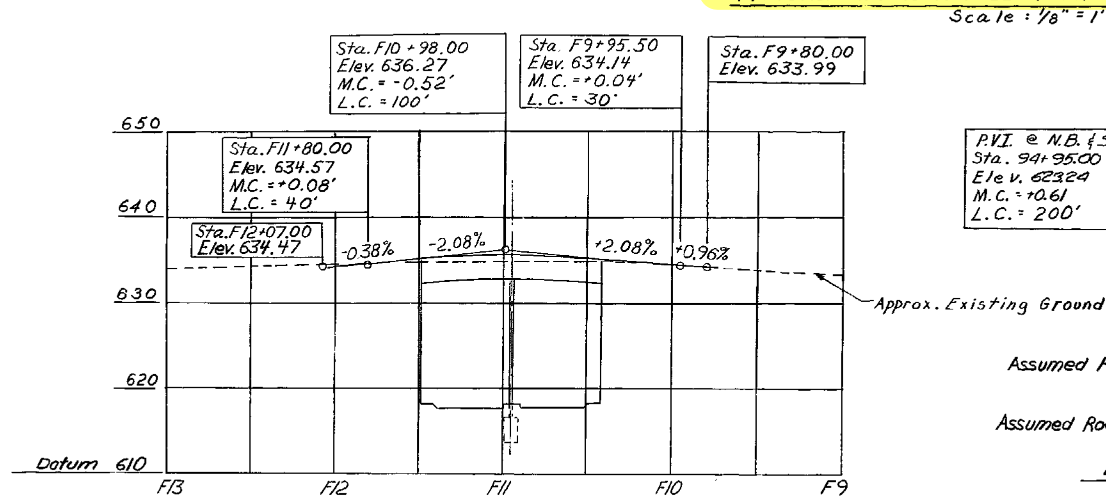
CITY OF BUFFALO
KENSINGTON EXPRESSWAY ARTERIAL SECTION II
NORTHAMPTON ST. TO NORTHLAND AVE.
ERIE COUNTY



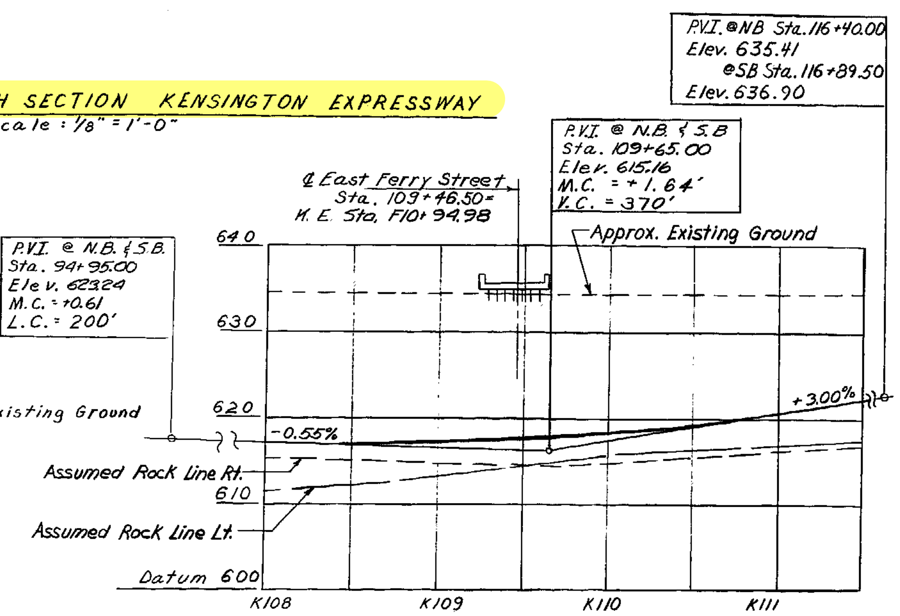
TYPICAL APPROACH SECTION KENSINGTON EXPRESSWAY
Scale : 1/8" = 1'-0"

ESTIMATE OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	SUBSTR NEAT	SUPERSTR NEAT	TOTAL NEAT	PROPOSAL
2UF	Underdrain Filter	C.Y.	10		10	10
2EF-B	Selected Granular Fill	C.Y.	431		431	500
5B	Structure Excavation	C.Y.	3209		3209	3250
11H6	Perf. Corr. Metal Pipe Underdrain 6" Dia.	L.F.	133		133	140
18	Class A Concrete for Structures	C.Y.	31	49	80	90
18M	Class A Concrete for Structures (Monolithic Bridge Slab with Integral Wearing Surfaces)	C.Y.		187	187	190
20	Class B Concrete for Structures	C.Y.	385		385	400
24A	Bagged Screened Aggregate	C.Y.	87		87	90
28	Bar Reinforcement for Structures	Lb.	32,523	52,986	85,509	86,000
28C	Shear Connectors	L.F.		941	941	950
29	Structural Steel	Lb.	288	141,059	141,347	141,600
37M(2)	Aluminum Bridge Railing (2Rail)	L.F.		216	216	220
61	Bituminous Material	Gal.	106		106	110
83ST	Temporary Steel Sheet Piling	S.F.	7876		7876	7900
94SBU	Stone Curb (Bridge Types)	L.F.		246	246	250
363H	Epoxy Protective Coating for Concrete	S.F.	1,800		1,800	1,900
500	Installing 12" ⌀ Water Pipe	L.S.		Nec.		Nec.
664LD	Linseed Oil Protective Coating for Concrete	Gal.		26	26	30
700B	Installing Electric Conduits	L.S.				Nec.
703	Installing Gas Conduits	L.S.				Nec.
402D	3" Dia. Steel Galv. Conduits	L.F.		212		220
412B	2" Dia. Steel Galv. Conduits	L.F.		212		220
106A6	6' Aluminum Chain Link Fencing	L.F.		200		200
30F	Frame and Grate	S.F.	11.1			12

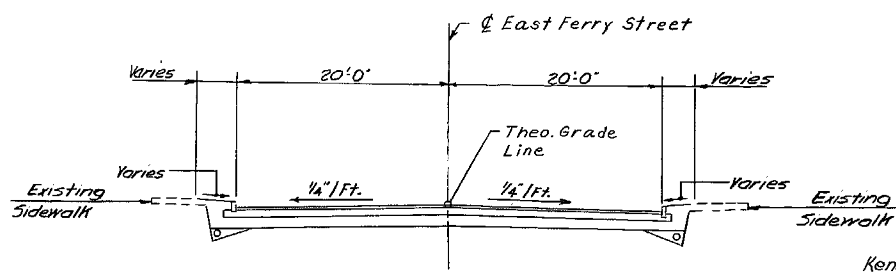


PROFILE - EAST FERRY STREET
Scale: Vert. 1" = 10'
Horiz. 1" = 50'

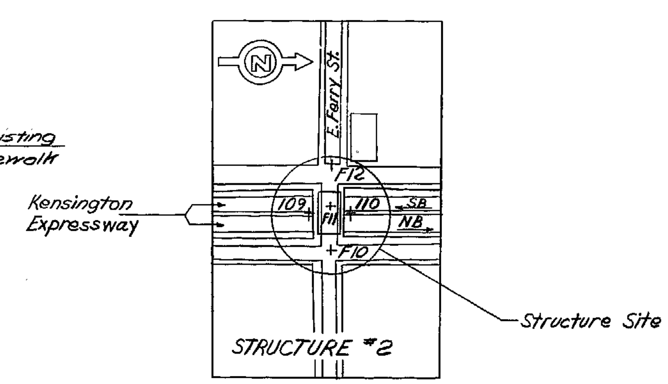


PROFILE KENSINGTON EXPRESSWAY
Scale : Horiz. 1" = 50'
Vert. 1" = 10'

ITEM 29		
TYPE	NEAT	PROPOSAL
A36	31,177	31,200
A325	1,326	1,400
A441	108,644	108,700
A193	200	300
TOTAL	141,347	141,600



TYPICAL SECTION - EAST FERRY STREET
Scale : 1/8" = 1'-0"



LOCATION PLAN
Scale : 1" = 200'

Date:	JULY 14, 1967
In Charge Of:	H. G. COLES
Designed By:	K. W. ROOT
Traced By:	J. F. MEYER
Checked By:	W. D. SWECKER

OGILVIE PRESS, INC., BROOKLYN 17, N.Y. ASTROFILM 678.5M

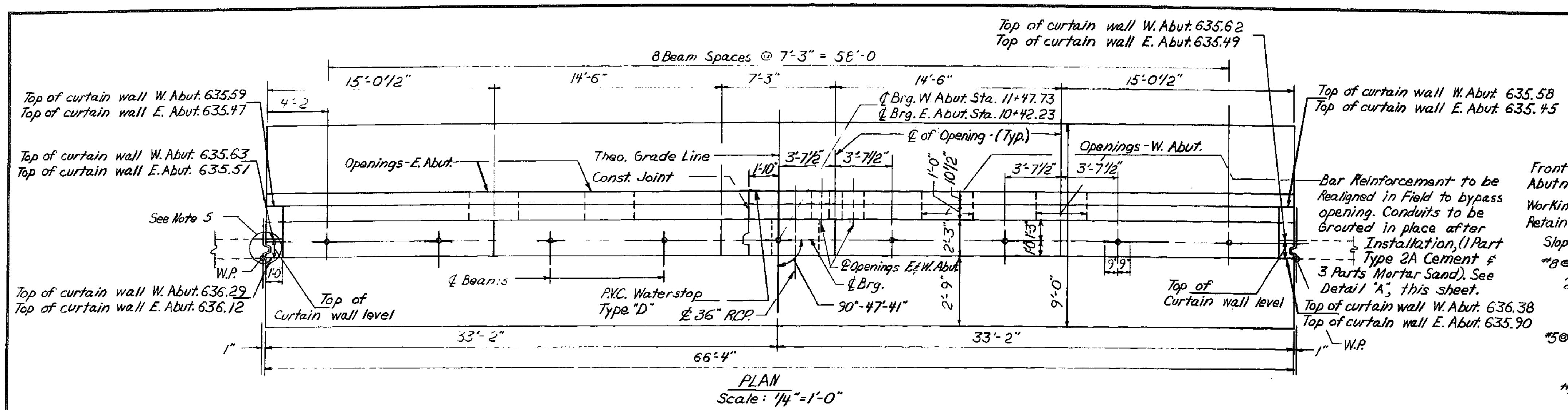
BRIDGE NO. 2
EAST FERRY STREET
OVER KENSINGTON EXPRESSWAY
SECTIONS AND PROFILES

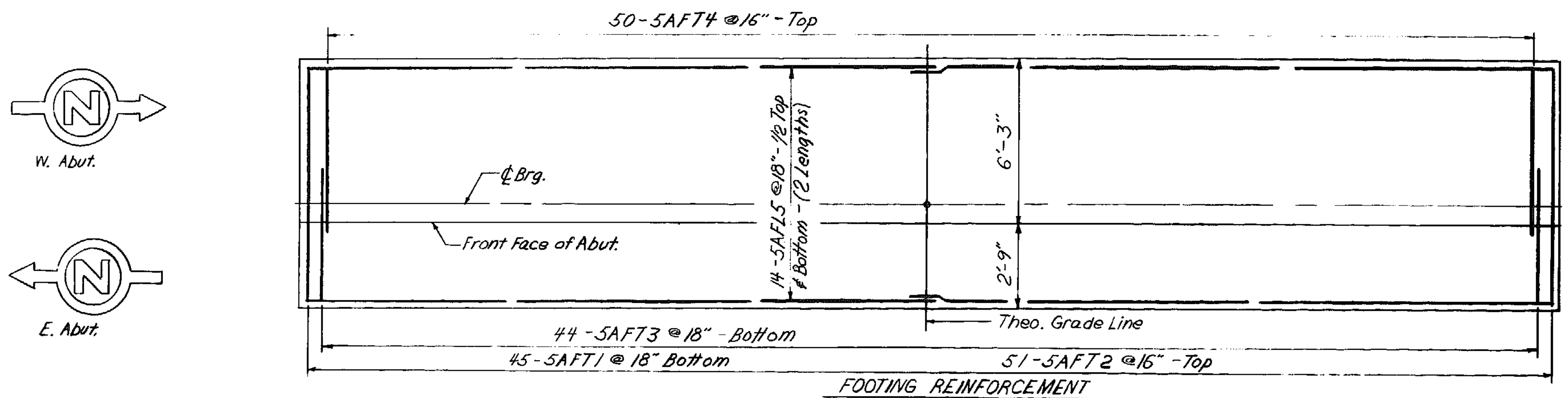
PREPARED and RECOMMENDED
N.Y.S.P.E. LIC. NO. 20143 DATE 7-25-67
McFARLAND-JOHNSON ENGINEERS

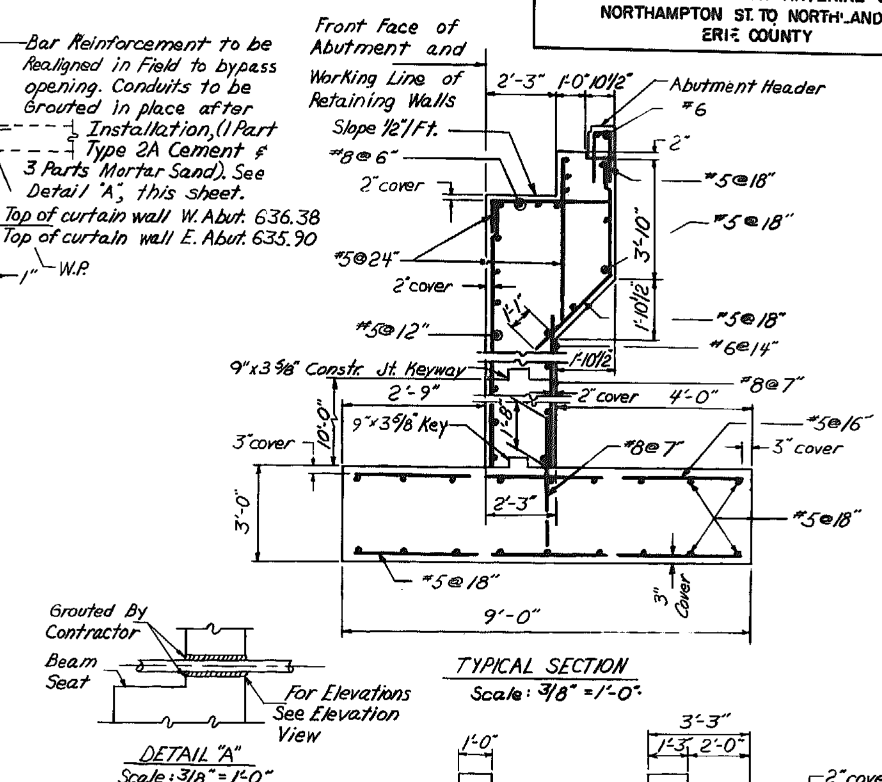
C 68-2

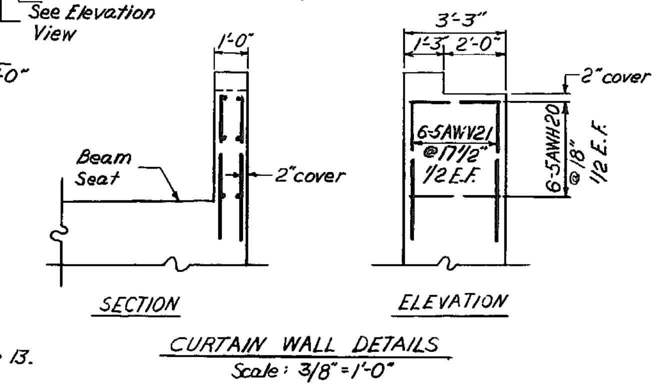
FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
1	NEW YORK		201	223

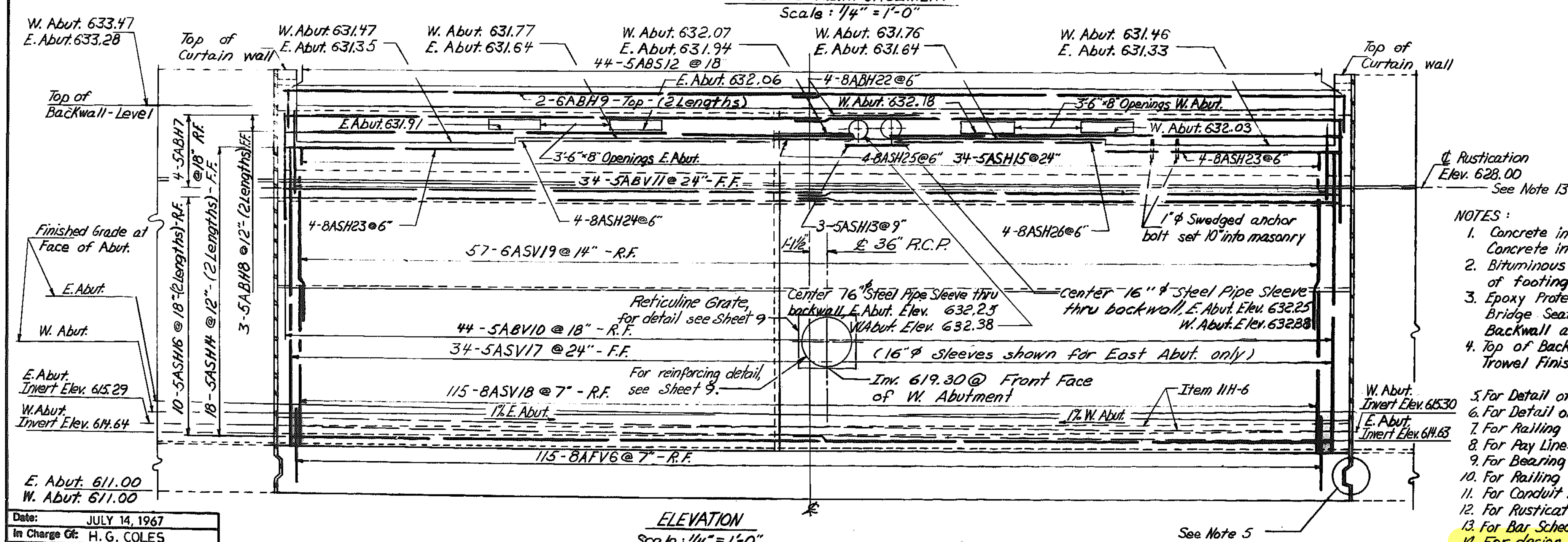
CITY OF BUFFALO
KENSINGTON EXPRESSWAY ARTERIAL SECTION II
NORTHAMPTON ST. TO NORTH'AND AVE
ERIE COUNTY











NOTES:

1. Concrete in Abutment shall be Item 20, Class B Concrete for Structures. Concrete in Abutment Header shall be Item 18; Class A Concrete for Structures.
2. Bituminous Material, Item 61, shall be applied to the back of Abutment above top of footing, where fill is in contact with the wall.
3. Epoxy Protective Coating for Concrete shall be applied to all Exposed Pedestal Surfaces, Bridge Seats, including the Area Under the Bearings, Exposed Vertical Surfaces of Backwall and Curtain Walls Facing the Superstructure.
4. Top of Backwalls on which Asbestos Sheet Packing is to be placed shall be Steel Trowel Finished.
5. For Detail of Expansion Joint at Wall and Footing, see sheet No. 8.
6. For Detail of Expansion Joint between Abutment and Abutment Header, see sheet No. 8.
7. For Railing and Sidewalk Plans at Bridge Corners, see sheet No. 8.
8. For Pay Lines at Abutment, see sheet No. 8.
9. For Bearing Details, see sheet No. 5.
10. For Railing Details, see sheet No. 7.
11. For Conduit Alignment, see sheet No. 5.
12. For Rustication Details, see sheet No. 8.
13. For Bar Schedule, see sheet No. 9.
14. For design purposes, the Foundation Pressure does not exceed 10 tons per square foot

Date:	JULY 14, 1967
In Charge Of:	H. G. COLES
Designed By:	W. D. SWECKER
Traced By:	J. F. MEYER
Checked By:	W. D. SWECKER

BRIDGE NO. 2

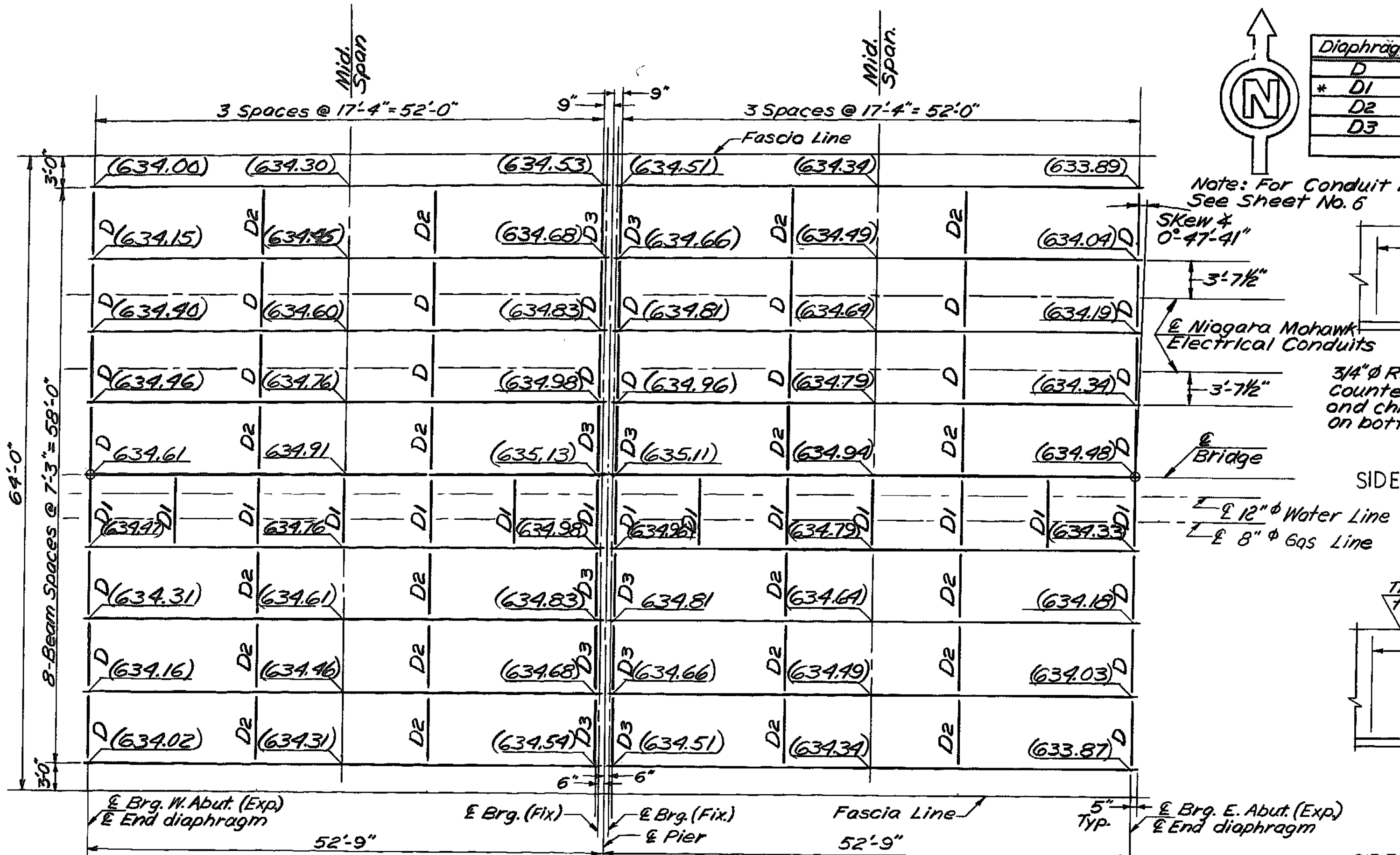
EAST FERRY STREET
OVER KENSINGTON EXPRESSWAY
ABUTMENT DETAILS

PREPARED and RECOMMENDED N.Y.S.P.E. LIC. NO. 20143 DATE 7-25-67
McFARLAND-JOHNSON ENGINEERS

BRIDGE SHEET 3 OF 10

FED. RD. REG. NO.	STATE	FEDERAL AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
I	NEW YORK		203	223

CITY OF BUFFALO
KENSINGTON EXPRESSWAY ARTERIAL SECTION II
NORTHAMPTON ST. TO NORTHLAND AVE.
ERIE COUNTY

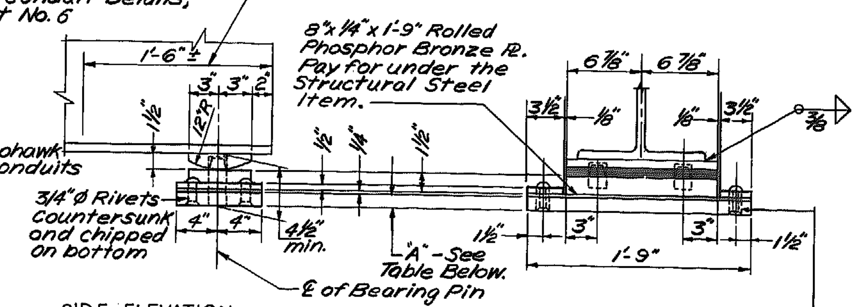


FRAMING PLAN
SCALE: 1/8" = 1'-0"

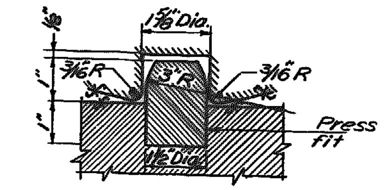
Diaphragm	Size
D	15[33.9
* D1	6[13.0
D2	18[42.7
D3	16 WF 36

* Use 2-6[13.0 @ each D1.

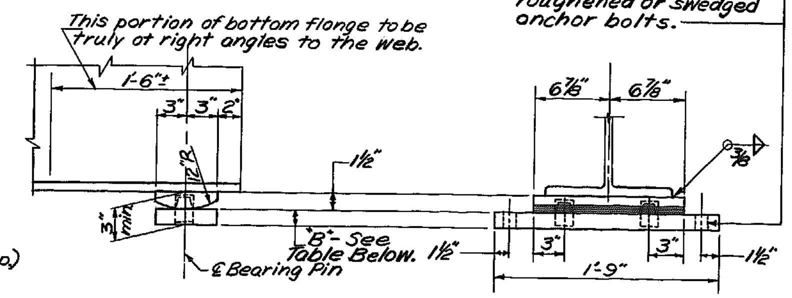
Note:
All Anchor Bolts shall be galvanized in accordance with the requirements of Material Specification M19.



EXPANSION BEARINGS
SCALE: 1½" = 1'-0"



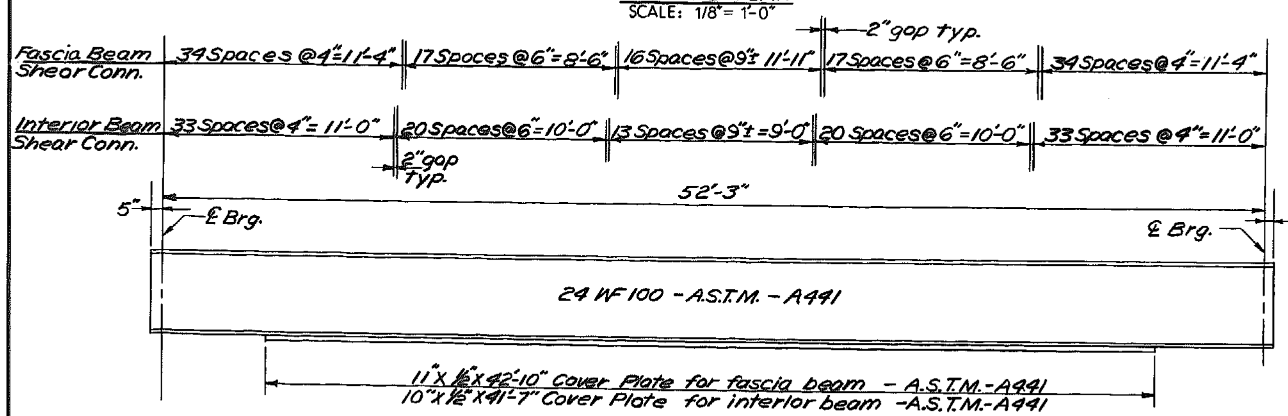
SECTION THRU DOWEL
SCALE: 6" = 1'-0"



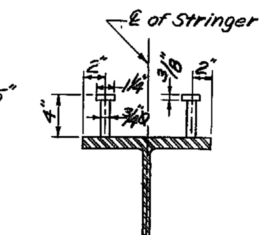
FIXED BEARINGS
SCALE: 1½" = 1'-0"

SUPERSTRUCTURE NOTES:

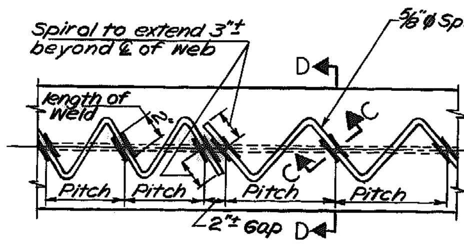
1. After all superstructure steel has been erected, elevations shall be taken on the top of the steel at the ℄ of the web at each ℄ of Bearing, center of span, and at other locations where theoretical bottom of slab elevations are indicated on the plans. The depth of haunch required to position the slab forms is obtained as follows. From the measured top of steel elevations subtract the deflections due to slab and superimposed dead load. Subtract this result from the listed bottom of slab elevation.
2. All bearings are to be field welded to the beams.
3. If the contractor elects to use corrugated metal forms for the structural slab the details of these forms shall be submitted to the Deputy Chief Engineer (Design) for approval, prior to their use. The Contractor's attention is directed to additional notes appearing in the contract documents relative to corrugated metal forms.
4. The end of all beams shall be vertical.
5. All deck slab reinforcement shall have splices alternated.
6. All Structural Steel unless otherwise noted will be paid for under Item 29.
7. All Structural Steel shall be A.S.T.M. A36 except where otherwise specified on the plans or specifications.



TYPICAL ROLLED BEAM STRINGER WITH COVER PLATE
SCALE: NONE



DETAIL OF SEC. E-E
SHEAR CONN.
SCALE: 1½" = 1'-0"

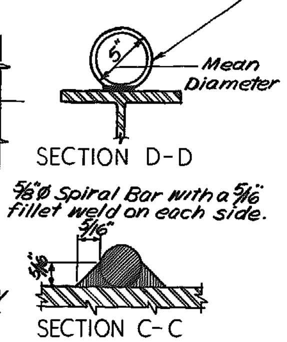


Do not paint surface of flange on which welds are made.

The contractor's and Engineer's attention is called to the possibility of interference between the reinforcing steel in the slab and the beam spirals. To avoid this interference the bar spacings may be varied 1"± with the understanding that the required area of steel will be placed in each 5'± ft. Even then some bars may have to be threaded through one or more spirals.

All spirals shall be placed symmetrically about the ℄ of Span on each stringer with the pitches of each section of the spirals decreasing progressively from the ℄ of Span to the ends of the Stringer.

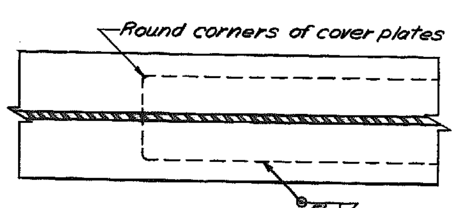
PARTIAL PLAN OF SPIRALS
SCALE: NONE



BEARING PLATE TABLE

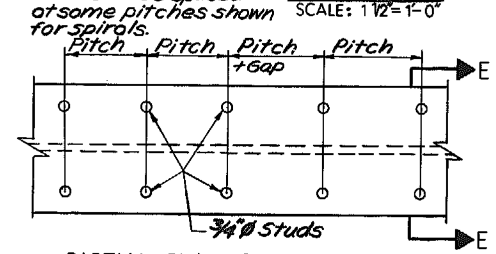
Beam	1	2	3	4	5	6	7	8	9
"A" Span 1	1¼"	3⅛"	1¼"	3⅛"	1¼"	3"	1¼"	3"	1¼"
"A" Span 2	1¼"	3"	1¼"	3"	1¼"	3⅛"	1¼"	3⅛"	1¼"
"B" Span 1	1½"	1½"	1½"	1½"	1½"	1½"	1½"	1½"	1½"
"B" Span 2	1¾"	1¾"	1¾"	1¾"	1¾"	1¾"	1¾"	1¾"	1¾"

Beams are numbered from left to right looking ahead on station.



PLAN SECTION AT END OF COVER PLATE
SCALE: 1½" = 1'-0"

Studs to be spaced at some pitches shown for spirals.



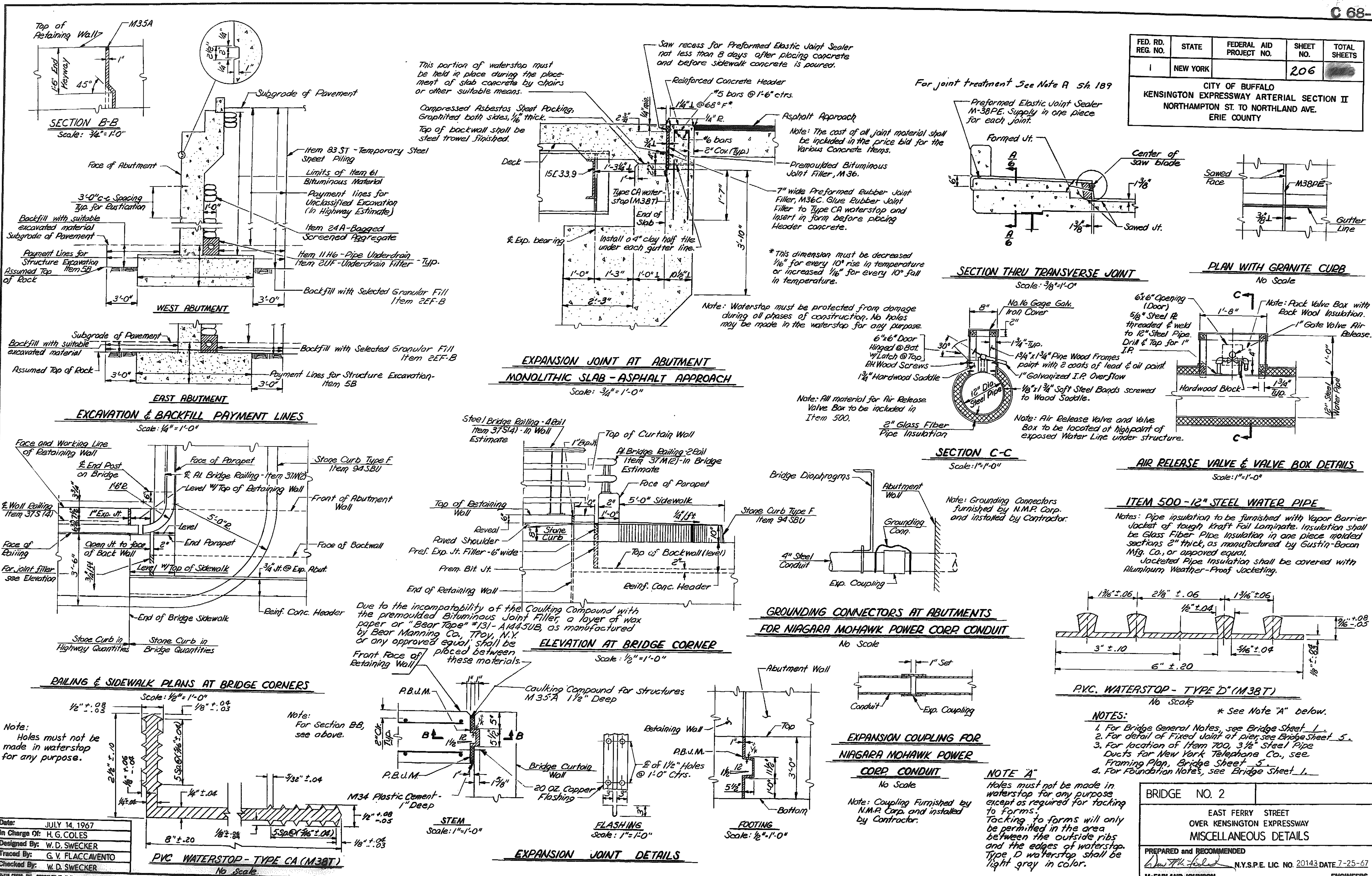
PARTIAL PLAN OF STUDS
SCALE: NONE

Date:	JULY 14, 1967
In Charge Of:	H. G. COLES
Designed By:	K. W. ROOT
Traced By:	R. H. CALICE
Checked By:	W. D. SWECKER

BRIDGE NO. 2

EAST FERRY STREET
OVER KENSINGTON EXPRESSWAY
FRAMING PLAN

PREPARED and RECOMMENDED
N.Y.S.P.E. LIC. NO. 20143 DATE 7-25-67
McFARLAND-JOHNSON ENGINEERS


FED. RD. REG. NO. | STATE | FEDERAL AID PROJECT NO. | SHEET NO. | TOTAL SHEETS
1 | NEW YORK | | 206 |
CITY OF BUFFALO
KENSINGTON EXPRESSWAY ARTERIAL SECTION II
NORTHAMPTON ST. TO NORTHLAND AVE.
ERIE COUNTY
SECTION B-B
Scale: 3/4"=1'-0"
WEST ABUTMENT
EAST ABUTMENT
EXCAVATION & BACKFILL PAYMENT LINES
Scale: 1/4"=1'-0"
Subgrade of Pavement
Item 83 ST - Temporary Steel Sheet Piling
Limits of Item 61 Bituminous Material
Payment lines for Unclassified Excavation (In Highway Estimate)
Item 24A-Bagged Screened Aggregate
Item 11H6-Pipe Underdrain
Item 2UF-Underdrain Filter - Typ.
Backfill with Selected Granular Fill Item 2EF-B
Payment Lines for Structure Excavation-Item 5B
Assumed Top of Rock
Backfill with suitable excavated material
3'-0" c-c Spacing Typ. for Rustication
Face of Abutment
This portion of waterstop must be held in place during the placement of slab concrete by chairs or other suitable means.
Compressed Asbestos Sheet Packing, Graphited both sides, 1/16" thick.
Top of backwall shall be steel trowel finished.
Saw recess for Preformed Elastic Joint Sealer not less than 8 days after placing concrete and before sidewalk concrete is poured.
Reinforced Concrete Header
Asphalt Approach
Note: The cost of all joint material shall be included in the price bid for the Various Concrete Items.
Premoulded Bituminous Joint Filler, M36.
7" wide Preformed Rubber Joint Filler, M36C. Glue Rubber Joint Filler to Type CA waterstop and insert in form before placing Header concrete.
* This dimension must be decreased 1/16" for every 10° rise in temperature or increased 1/16" for every 10° fall in temperature.
Note: Waterstop must be protected from damage during all phases of construction. No holes may be made in the waterstop for any purpose.
EXPANSION JOINT AT ABUTMENT
MONOLITHIC SLAB - ASPHALT APPROACH
Scale: 3/4"=1'-0"
For joint treatment See Note A Sh. 189
Preformed Elastic Joint Sealer M-38PE. Supply in one piece for each joint.
SECTION THRU TRANSVERSE JOINT
Scale: 3/8"=1'-0"
PLAN WITH GRANITE CURB
No Scale
SECTION C-C
Scale: 1"=1'-0"
Note: All material for Air Release Valve Box to be included in Item 500.
Note: Air Release Valve and Valve Box to be located at highpoint of exposed Water Line under structure.
AIR RELEASE VALVE & VALVE BOX DETAILS
Scale: 1"=1'-0"
ITEM 500 - 12" STEEL WATER PIPE
Notes: Pipe insulation to be furnished with Vapor Barrier Jacket of tough Kraft Foil Laminate. Insulation shall be Glass Fiber Pipe Insulation in one piece molded sections 2" thick, as manufactured by Gustin-Bacon Mfg. Co., or approved equal.
Jacketed Pipe Insulation shall be covered with Aluminum Weather-Proof Jacketing.
P.V.C. WATERSTOP - TYPE "D" (M38T)
No Scale
* See Note "A" below.
NOTES:
1. For Bridge General Notes, see Bridge Sheet 1.
2. For detail of Fixed Joint at pier, see Bridge Sheet 5.
3. For location of Item 700, 3 1/2" Steel Pipe Ducts for New York Telephone Co., see Framing Plan, Bridge Sheet 5.
4. For Foundation Notes, see Bridge Sheet 1.
NOTE "A"
Holes must not be made in waterstop for any purpose except as required for tacking to forms.
Tacking to forms will only be permitted in the area between the outside ribs and the edges of waterstop.
Type D waterstop shall be light gray in color.
Note: Grounding Connectors furnished by N.M.P. Corp. and installed by Contractor.
GROUNDING CONNECTORS AT ABUTMENTS
FOR NIAGARA MOHAWK POWER CORP. CONDUIT
No Scale
EXPANSION COUPLING FOR
NIAGARA MOHAWK POWER
CORP. CONDUIT
No Scale
Note: Coupling Furnished by N.M.P. Corp. and installed by Contractor.
ELEVATION AT BRIDGE CORNER
Scale: 1/2"=1'-0"
Due to the incompatability of the Caulking Compound with the premoulded Bituminous Joint Filler, a layer of wax paper or "Bear Tape" #131-A1445UB, as manufactured by Bear Manning Co., Troy, N.Y. or any approved equal, shall be placed between these materials.
RAILING & SIDEWALK PLANS AT BRIDGE CORNERS
Scale: 1/2"=1'-0"
Note: Holes must not be made in waterstop for any purpose.
Note: For Section BB, see above.
Caulking Compound for structures M35A 1 1/2" Deep
M34 Plastic Cement - 1" Deep
20 OZ. Copper Flashing
STEM
Scale: 1"=1'-0"
FLASHING
Scale: 1"=1'-0"
FOOTING
Scale: 1/2"=1'-0"
EXPANSION JOINT DETAILS
PVC WATERSTOP - TYPE CA (M38T)
No Scale
Date: JULY 14, 1967
In Charge Of: H. G. COLES
Designed By: W. D. SWECKER
Traced By: G. V. FLACCAVENTO
Checked By: W. D. SWECKER
BRIDGE NO. 2
EAST FERRY STREET
OVER KENSINGTON EXPRESSWAY
MISCELLANEOUS DETAILS
PREPARED and RECOMMENDED
N.Y.S.P.E. LIC. NO. 20143 DATE 7-25-67
McFARLAND-JOHNSON ENGINEERS