ANCHOR QEA

720 Olive Way, Suite 1900
Seattle, Washington 98101
Phone 206.287.9130
Fax 206.287.9131

MEMORANDUM

To:	Nancy Ousley, Assistant City Manager, City of Kenmore	**Date:**	May 20, 2016
From:	Dan Berlin, Anchor QEA, LLC	**Project:**	140891-01.02
Re:	520 Bridge Concrete Test Results		

This memo provides a summary and review of the test results of concrete from the 520 floating bridge and approach structure. This summary is based on the information provided originally provided by Pat Schneider of Foster Pepper, PLLC, to Rod Kaseguma, City of Kenmore Attorney on May 12, 2016. The file contains several lower quality scans that describe approximate sample locations from the floating bridge and approach structure, as well as chemical test results from NVL Laboratories.

FLOATING BRIDGE TEST RESULTS

Testing was conducted on six samples collected from the floating bridge structure, which appears to be sampled from piles on pontoons on the eastern and western ends that support the road structure. Samples were tested using the toxicity characteristic leaching procedure (TCLP), which is a test to determine the mobility of organic and inorganic analytes. The test is usually conducted to determine if a waste qualifies as a hazardous waste under the Resource Conservation and Recovery Act (RCRA) and is designed to simulate landfill conditions and approximate contaminant concentrations in leachate.

Samples appear to be collected from piles at five locations on both the eastern and western ends of the structure. It is unclear how samples were combined to support the analysis of six samples. There are 40 contaminants with TCLP criteria, but this analysis was only conducted on eight metals: silver, arsenic, barium, cadmium, chromium, mercury, lead, and selenium. Only barium was detected, slightly above the detection limit. All other analytes were not detected above the detection limit. All concentrations were below the RCRA threshold of "maximum concentration of contaminants for toxicity characteristic".

APPROACH STRUCTURE TEST RESULTS

Testing was conducted on four samples collected from the eastern and western approach structures, which appears to be sampled from piles extending between the lake to the road structure, the roadway, girders, bents, and footings. Samples appear to be collected from 20 locations. It is unclear how samples were combined to support the analysis of four samples. Samples were tested only for arsenic. Arsenic was not detected above the detection limit in any of the four samples. Detection limits were less than 8.1 mg/kg, which was below the Model Toxics Cleanup Act (MTCA) Method A soil cleanup level for unrestricted land use of 20 mg/kg.

OTHER CONTAMINANTS

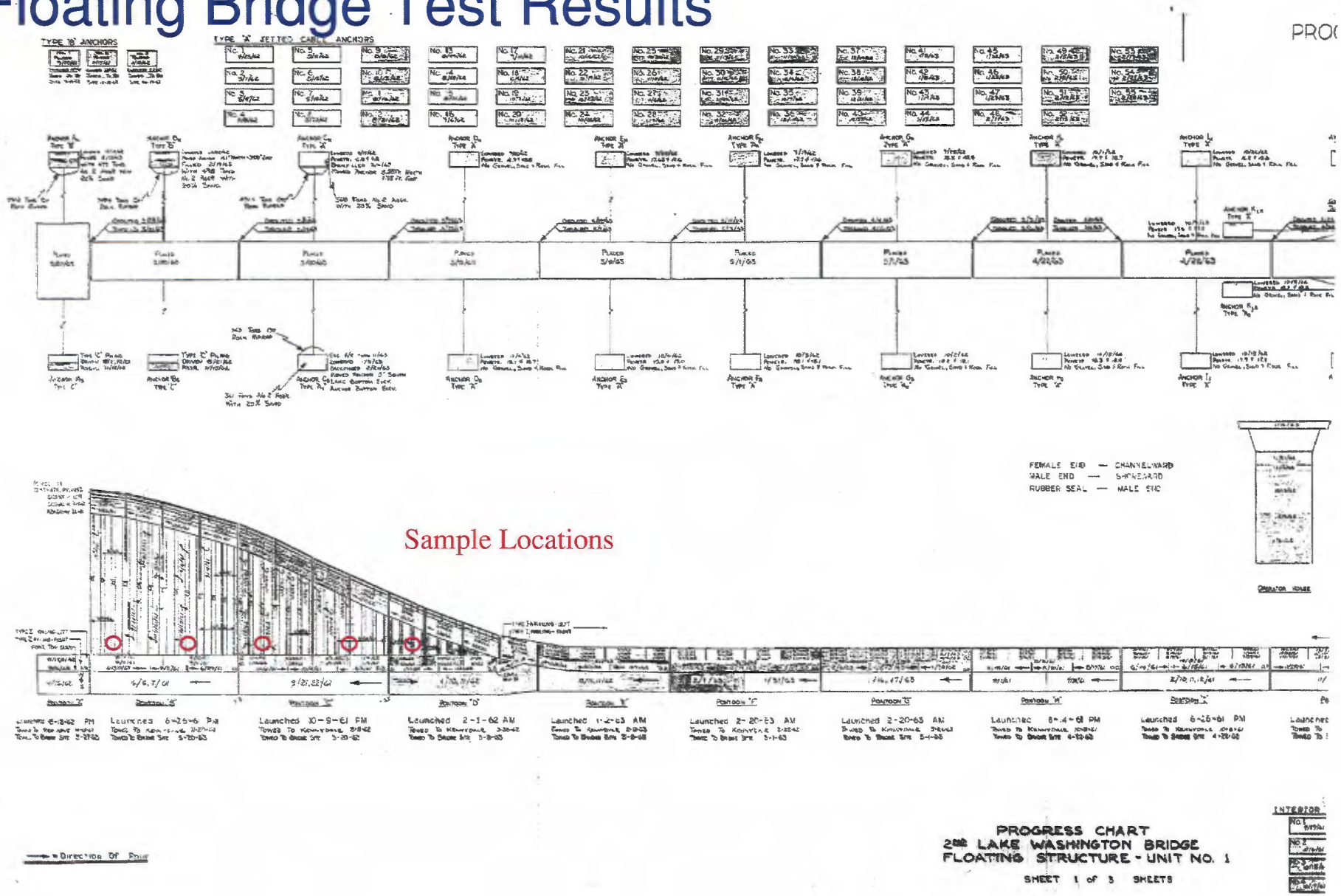
Other contaminants can be present in concrete, depending on the materials used to manufacture the concrete. One source of contaminants in concrete could be fly ash, which can contain elevated metals concentrations and has sometimes been used as a substitute for Portland cement, depending on the type of application and use of the concrete. Asbestos has also been used historically in concrete, but not typically in structural concrete. Other potential sources of contamination may include water-reducing admixtures, which can contain a wide range of chemicals.

No information has been provided that suggests original concrete construction used materials that could have contained contaminants. However, test results provided are not comprehensive. It is unclear why other metals besides arsenic were not tested in the bulk concrete samples from the approach structure. It is also unclear why testing of the bulk concrete from the floating bridge structure was not tested (in addition to the TCLP testing, which is a test focused on leachate quality).

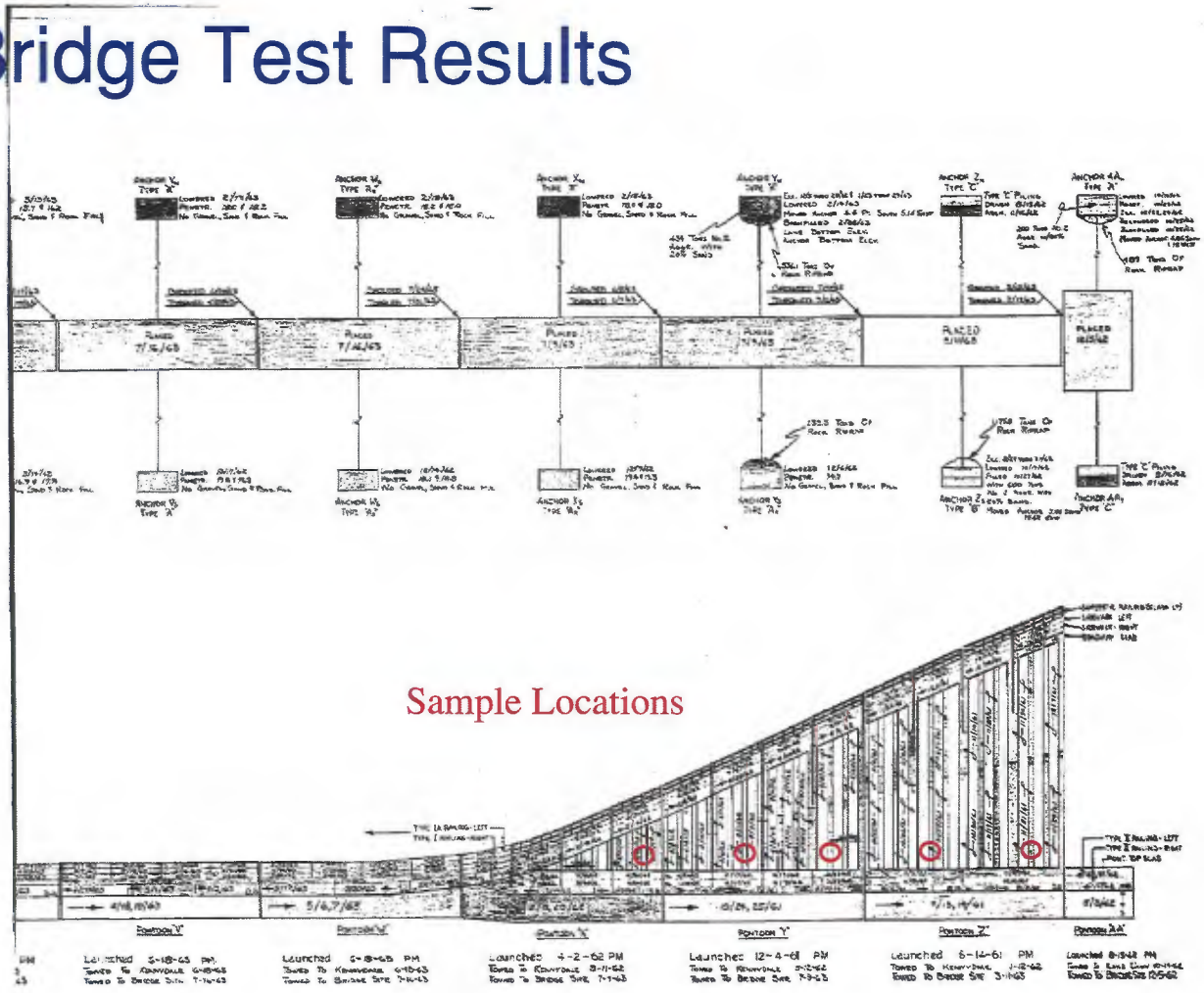
Attachment

520 Conc test results.pdf

Floating Bridge Test Results



Floating Bridge Test Results



PROGRESS CHART
2ND LAKE WASHINGTON BRIDGE
FLOATING STRUCTURE - UNIT NO. 1
SHEET 3 of 3 SHEETS

Floating Bridge Test Results

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Analysis Report

Toxicity Characteristic Leaching Procedure (TCLP)

Client: Kiewit
Address: 2891 Evergreen point Rd.
Medina, WA 98039

Attention: Mr. Benjamin Moseid
Project Location: Medina, WA

Batch #: 1601923.00
Matrix: Bulk
Method: EPA 1311/6010C/7470A
Client Project #: 22239
Date Received: 1/19/2016
Samples Received: 6
Samples Analyzed: 6

Lab ID	Client Sample #	Elements	RL in mg / L	Results in mg / L	Results in ppm
16166494	WS 1	Silver (Ag)	0.20	< 0.20	< 0.20
		Arsenic (As)	0.20	< 0.20	< 0.20
		Barium (Ba)	0.20	1.20	1.20
		Cadmium (Cd)	0.20	< 0.20	< 0.20
		Chromium (Cr)	0.20	< 0.20	< 0.20
		Mercury (Hg)	0.01	< 0.01	< 0.01
		Lead (Pb)	0.20	< 0.20	< 0.20
		Selenium (Se)	0.20	< 0.20	< 0.20
16166495	WS 2	Silver (Ag)	0.20	< 0.20	< 0.20
		Arsenic (As)	0.20	< 0.20	< 0.20
		Barium (Ba)	0.20	1.40	1.40
		Cadmium (Cd)	0.20	< 0.20	< 0.20
		Chromium (Cr)	0.20	< 0.20	< 0.20
		Mercury (Hg)	0.01	< 0.01	< 0.01
		Lead (Pb)	0.20	< 0.20	< 0.20
		Selenium (Se)	0.20	< 0.20	< 0.20
16166496	WS 3	Silver (Ag)	0.20	< 0.20	< 0.20
		Arsenic (As)	0.20	< 0.20	< 0.20
		Barium (Ba)	0.20	1.10	1.10
		Cadmium (Cd)	0.20	< 0.20	< 0.20
		Chromium (Cr)	0.20	< 0.20	< 0.20
		Mercury (Hg)	0.01	< 0.01	< 0.01
		Lead (Pb)	0.20	< 0.20	< 0.20
		Selenium (Se)	0.20	< 0.20	< 0.20

Sampled by: Client
Analyzed by: Shalini Patel
Reviewed by: Nick Ly

Date Analyzed: 01/20/2016
Date Issued: 01/20/2016

DRAFT

mg/ L = Milligrams per liter
N/A = Not Applicable

RL = Reporting Limit
'<' = Below the reporting Limit

Note : Method QC results are acceptable unless stated otherwise.
Unless otherwise indicated, the condition of all samples was acceptable at time of receipt.

Bench Run No: 2016-0119-06

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Floating Bridge Test Results

Analysis Report

Toxicity Characteristic Leaching Procedure (TCLP)

Client: Kiewit
Address: 2891 Evergreen point Rd.
Medina, WA 98039

Attention: Mr. Benjamin Moseid
Project Location: Medina, WA

Batch #: 1601923.00
Matrix: Bulk
Method: EPA 1311/6010C/7470A
Client Project #: 22239
Date Received: 1/19/2016
Samples Received: 6
Samples Analyzed: 6

Lab ID	Client Sample #	Elements	RL in mg / L	Results in mg / L	Results in ppm
16166497	ES 1	Silver (Ag)	0.20	< 0.20	< 0.20
		Arsenic (As)	0.20	< 0.20	< 0.20
		Barium (Ba)	0.20	1.20	1.20
		Cadmium (Cd)	0.20	< 0.20	< 0.20
		Chromium (Cr)	0.20	< 0.20	< 0.20
		Mercury (Hg)	0.01	< 0.01	< 0.01
		Lead (Pb)	0.20	< 0.20	< 0.20
		Selenium (Se)	0.20	< 0.20	< 0.20
16166498	ES 2	Silver (Ag)	0.20	< 0.20	< 0.20
		Arsenic (As)	0.20	< 0.20	< 0.20
		Barium (Ba)	0.20	1.20	1.20
		Cadmium (Cd)	0.20	< 0.20	< 0.20
		Chromium (Cr)	0.20	< 0.20	< 0.20
		Mercury (Hg)	0.01	< 0.01	< 0.01
		Lead (Pb)	0.20	< 0.20	< 0.20
		Selenium (Se)	0.20	< 0.20	< 0.20
16166499	ES 3	Silver (Ag)	0.20	< 0.20	< 0.20
		Arsenic (As)	0.20	< 0.20	< 0.20
		Barium (Ba)	0.20	1.20	1.20
		Cadmium (Cd)	0.20	< 0.20	< 0.20
		Chromium (Cr)	0.20	< 0.20	< 0.20
		Mercury (Hg)	0.01	< 0.01	< 0.01
		Lead (Pb)	0.20	< 0.20	< 0.20
		Selenium (Se)	0.20	< 0.20	< 0.20

Sampled by: Client
Analyzed by: Shalini Patel
Reviewed by: Nick Ly

Date Analyzed: 01/20/2016
Date Issued: 01/20/2016

DRAFT

mg/ L = Milligrams per liter
N/A = Not Applicable

RL = Reporting Limit
'<' = Below the reporting Limit

Note : Method QC results are acceptable unless stated otherwise.
Unless otherwise indicated, the condition of all samples was acceptable at time of receipt.

Bench Run No: 2016-0119-06

Floating Bridge Test Results

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

METAL LABORATORY SERVICES

NVL LABS

Company Kiewit
Address 2891 Evergreen point Rd.
Medina, WA 98039
Project Manager Mr. Benjamin Moseid
Phone (253) 777-5170

NVL Batch Number 1601923.00
TAT 1 Day **AH** No
Rush TAT
Due Date 1/20/2016 **Time** 3:00 PM
Email benjamin.moseid@kiewit.com
Fax

Project Name/Number: 22239 **Project Location:** Medina, WA

Subcategory Inductively Coupled Plasma (ICP) - Group Tests
Item Code TCLP-G1 EPA 1311/6010B/7470A (RCRA 8) <TCLP>

Total Number of Samples 6 **Rush Samples**

	Lab ID	Sample ID	Description	A/R
1	16166494	WS 1		A
2	16166495	WS 2		A
3	16166496	WS 3		A
4	16166497	ES 1		A
5	16166498	ES 2		A
6	16166499	ES 3		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Fatima Khan		NVL	1/19/16	1500
Analyzed by	Shalini Patel		NVL	1/20/16	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 1/19/2016
Time: 3:00 PM
Entered By: Fatima Khan

Floating Bridge Test Results

METAL LABORATORY SERVICES

NVL LABS

Company	Kiewit	**NVL Batch Number**	**1601923.00**
Address	2891 Evergreen point Rd. Medina, WA 98039	**TAT**	1 Day **AH** No
		Rush TAT	
Project Manager	Mr. Benjamin Moseid	**Due Date**	1/20/2016 **Time** 3:00 PM
Phone	(253) 777-5170	**Email**	benjamin.moseid@kiewit.com
		Fax	

206 8491241

Project Name/Number: 22239 **Project Location:** Medina, WA

Subcategory Inductively Coupled Plasma (ICP) - Group Tests

Item Code TCLP-G3 **Method** EPA 1311/200.7/7470A (RCRA 8) ~~<WASTE WATER>~~ Dark

Total Number of Samples 6 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	16166494	WS 1	✓	A
2	16166495	WS 2		A
3	16166496	WS 3		A
4	16166497	WS 1		A
5	16166498	WS 2		A
6	16166499	WS 3		A

PAID
1/19

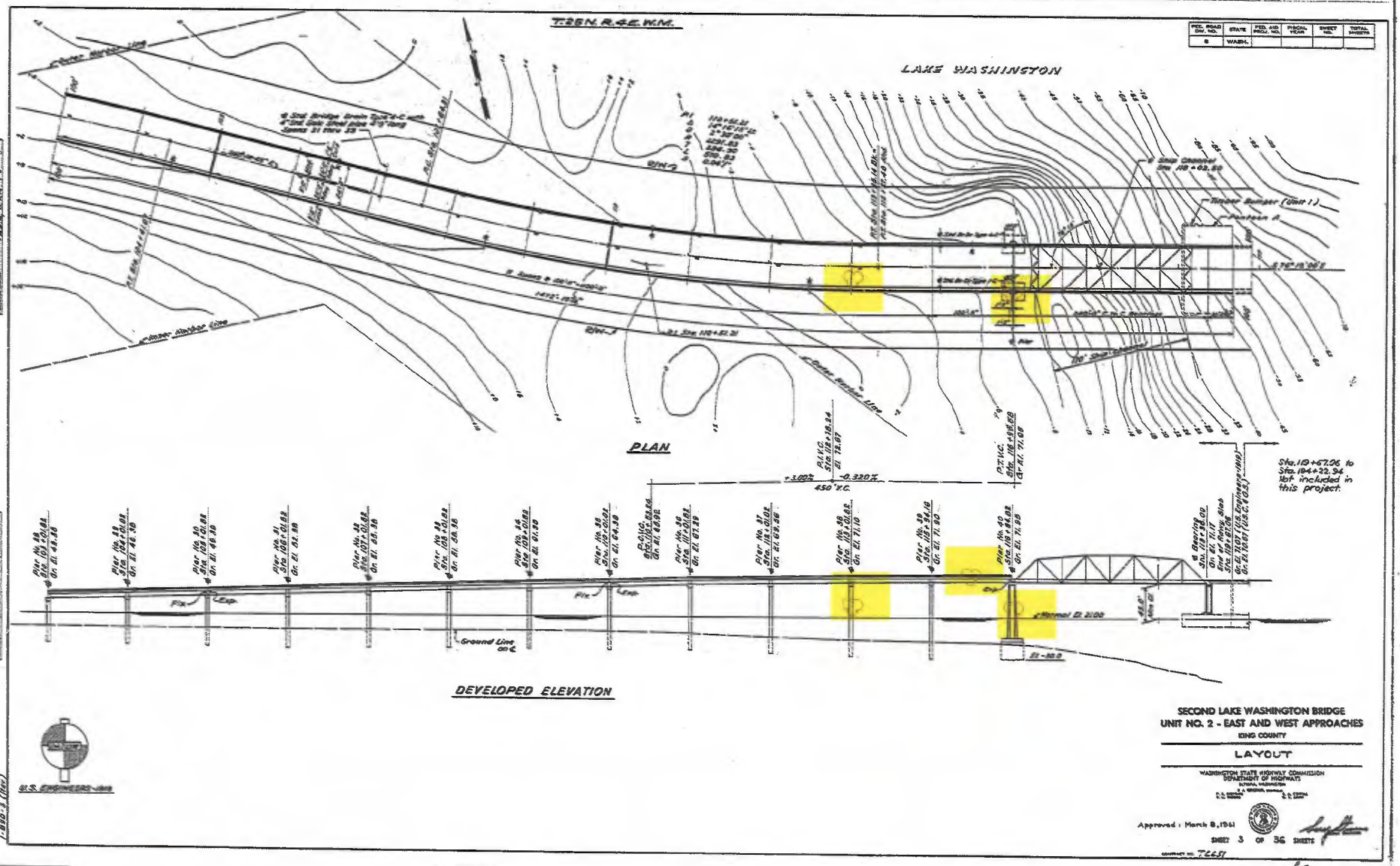
	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Fatima Khan		NVL	1/19/16	1500
Analyzed by			NVL		
Results Called by					
☐ **Faxed** ☐ **Emailed**					

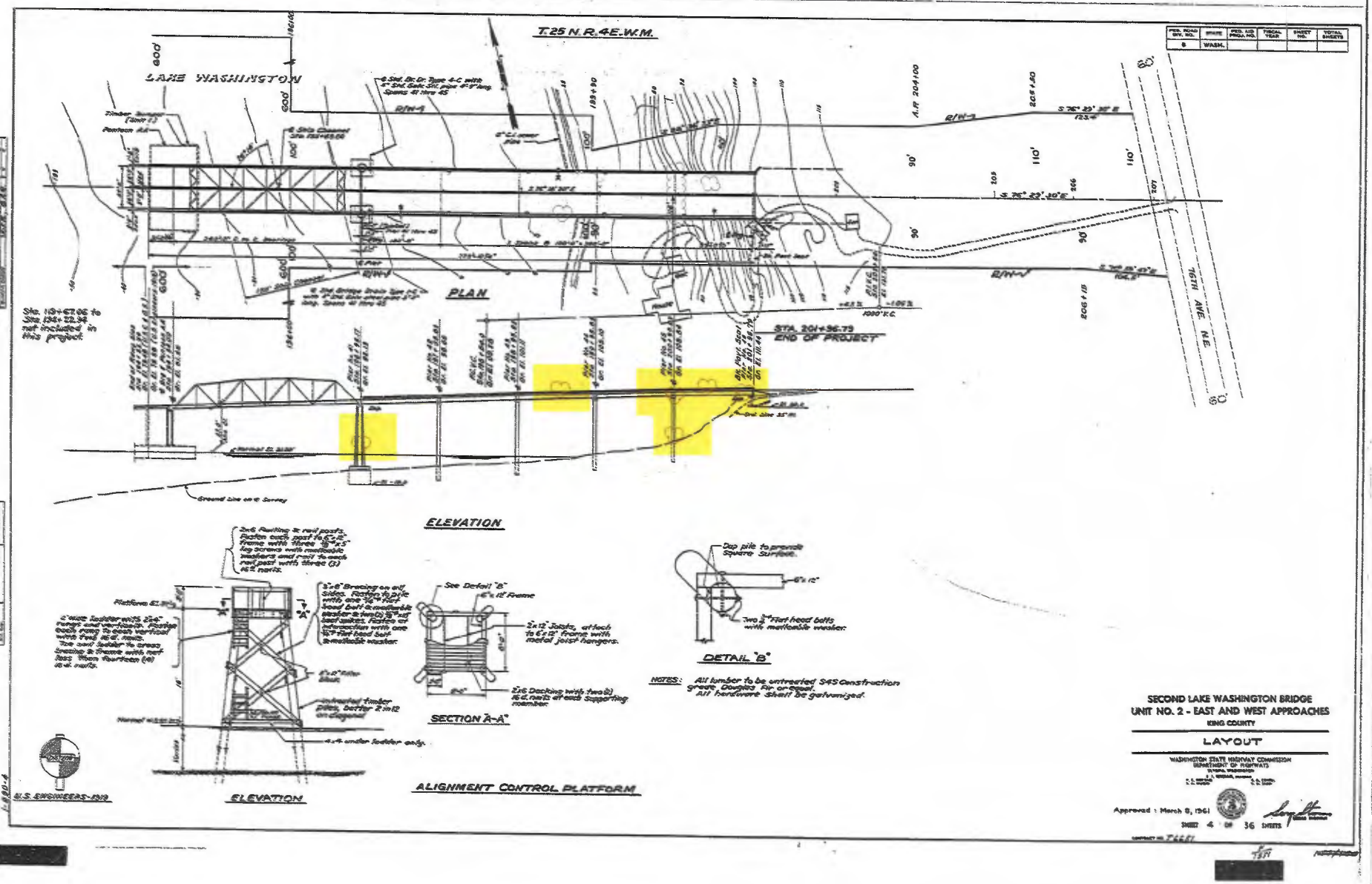
Special Instructions: email john.page@kiewit.com
non pressurized
M 817 789 2380

Entered By: Fatima Khan Date: 1/19/2016 Time: 3:00 PM 1 of 1

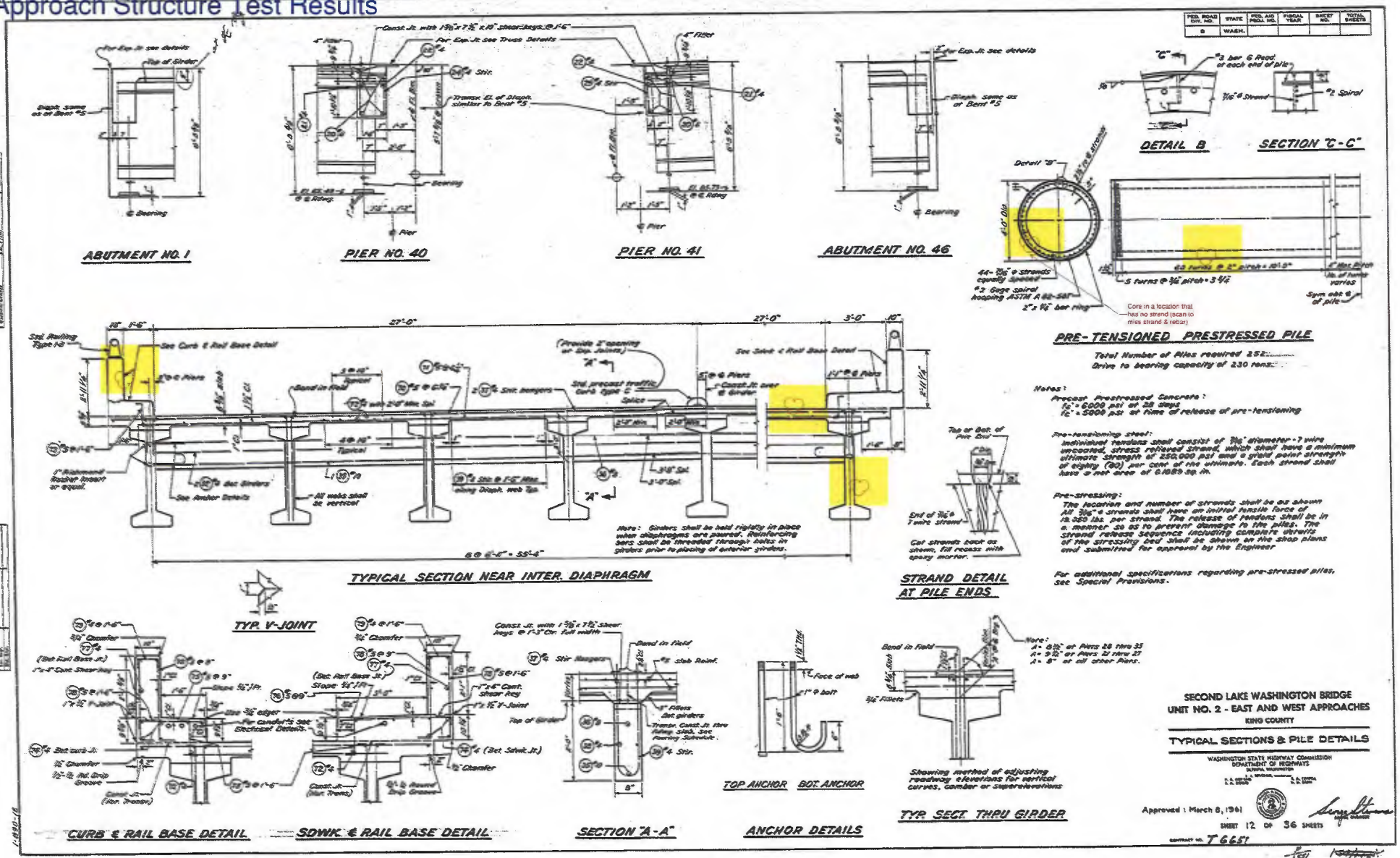
Approach Structure Test Results



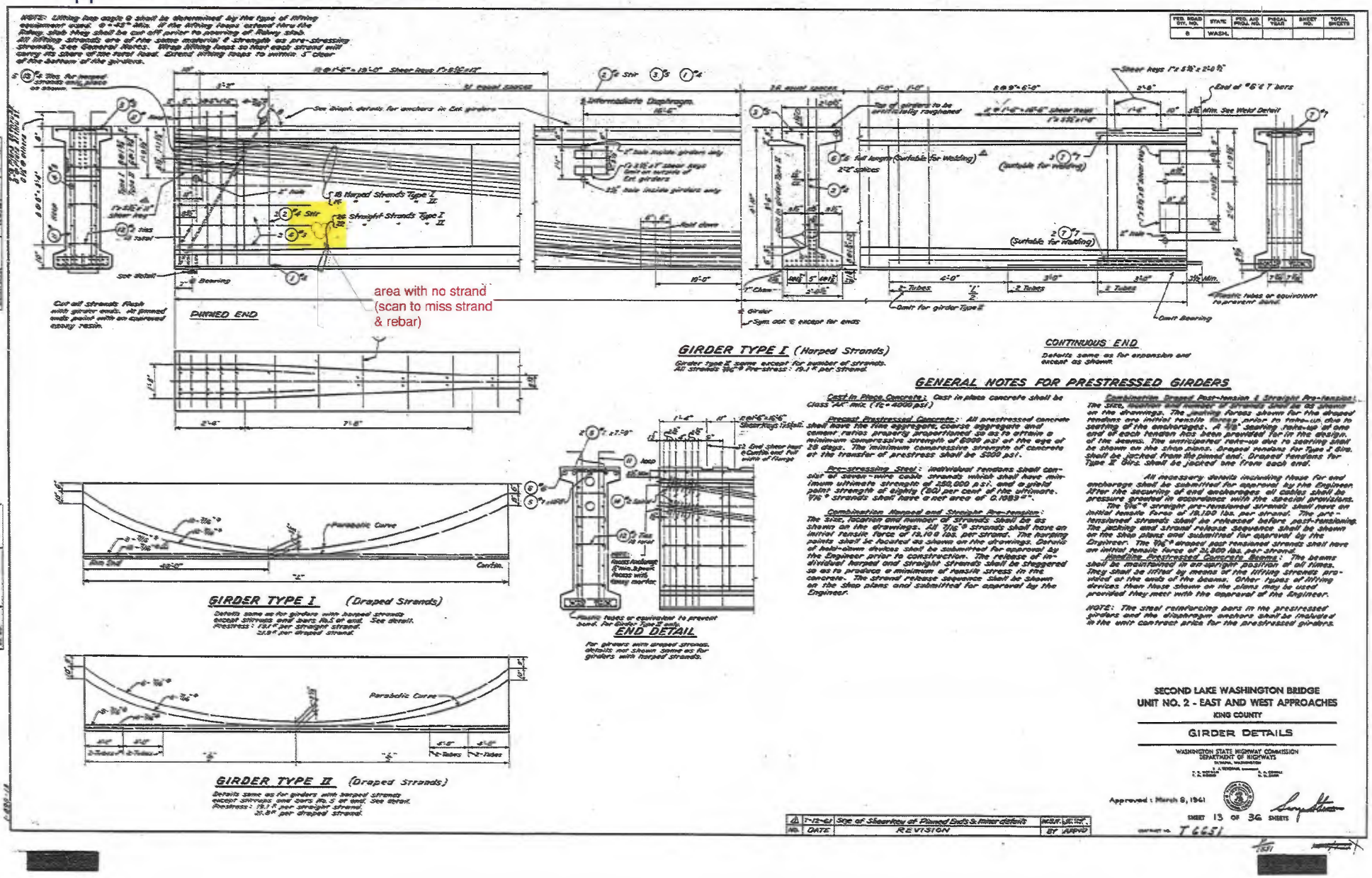
Approach Structure Test Results



Approach Structure Test Results



Approach Structure Test Results



PINNED END

GIRDER TYPE I (Harped Strands)

CONTINUOUS END

GIRDER TYPE I (Draped Strands)

END DETAIL

GIRDER TYPE II (Draped Strands)

GENERAL NOTES FOR PRESTRESSED GIRDERS

Cast in Place Concrete: Cast in place concrete shall be Class "AA" mix. (f'_c = 4000 psi.)

Precast Prestressed Concrete: All prestressed concrete shall have fine aggregate, coarse aggregate and cement ratios properly proportioned so as to attain a minimum compressive strength of 6000 psi at the age of 28 days. The minimum compressive strength of concrete at the transfer of prestress shall be 5200 psi.

Pre-stressing Steel: Individual tendons shall consist of seven-wire cable strands which shall have minimum ultimate strength of 250,000 psi, and a yield point strength of eighty (80) per cent of the ultimate. 7/16" strands shall have a net area of 0.1089 in^2.

Combination Harped and Straight Pre-tension: The size, location and number of Strands shall be as shown on the drawings. All 7/16" strands shall have an initial tensile force of 18,100 lbs. per strand. The harping points shall be located as shown on the drawings. Details of hold-down devices shall be submitted for approval by the Engineer prior to construction. The release of individual harped and Straight strands shall be staggered so as to produce a minimum of tensile stress in the concrete. The strand release sequence shall be shown on the shop plans and submitted for approval by the Engineer.

Combination Draped Post-tension & Straight Pre-tension: The size, location and number of Strands shall be as shown on the drawings. The jacking forces shown for the draped tendons are initial tensile forces, prior to take-up due to seating of the anchorages. A 3/16" seating take-up at one end of each tendon has been provided for in the design of the beams. The anticipated take-up due to seating shall be shown on the shop plans. Draped tendons for Type I Gird. shall be jacked from the pinned end. Draped tendons for Type II Girs. shall be jacked one from each end.

All necessary details including those for end anchorage shall be submitted for approval by the Engineer. After the securing of end anchorages, all cables shall be pressure grouted in accordance with the special provisions.

The 7/16" ø straight pre-tensioned strands shall have an initial tensile force of 18,100 lbs. per strand. The pre-tensioned strands shall be released before post-tensioning. The jacking and strand release sequence shall be shown on the shop plans and submitted for approval by the Engineer. The 7/16" ø draped post tensioned strands shall have an initial tensile force of 31,900 lbs. per strand.

Handling Prestressed Concrete Beams: The beams shall be maintained in an upright position at all times. They shall be lifted by means of the lifting strands provided at the ends of the beams. Other types of lifting devices than those shown on the plans may be used provided they meet with the approval of the Engineer.

NOTE: The steel reinforcing bars in the prestressed girders and the diaphragms shall be included in the unit contract price for the prestressed girders.

SECOND LAKE WASHINGTON BRIDGE
UNIT NO. 2 - EAST AND WEST APPROACHES
KING COUNTY

GIRDER DETAILS

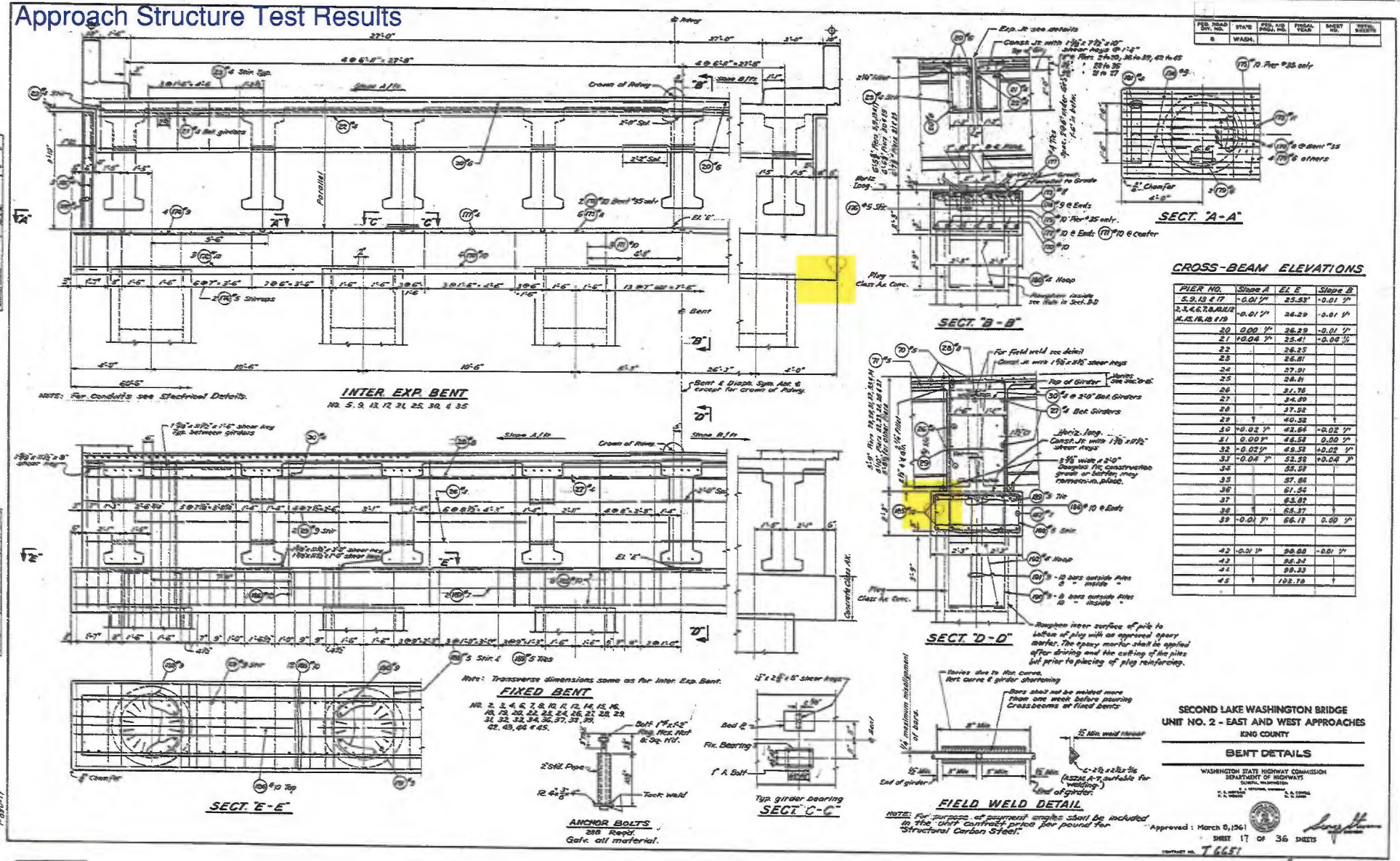
WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS

Approved: March 8, 1961

SHEET 13 OF 36 SHEETS

T 6651

Approach Structure Test Results



CROSS-BEAM ELEVATIONS

PIER NO.	Slope A	El. E	Slope B
5, 9, 13 & 17	-0.01'	25.35'	-0.01'
2, 3, 4, 6, 7, 8, 10, 11, 12, 14, 15, 16, 18, 19	-0.01'	26.29	-0.01'
20	0.00'	26.29	-0.01'
21	+0.04'	25.41	-0.06'
22		26.25	
23		26.81	
24		27.91	
25		28.11	
26		31.76	
27		34.89	
28		37.92	
29		40.52	
30	+0.02'	42.86	-0.02'
31	0.00'	46.58	0.00'
32	-0.02'	49.53	+0.02'
33	-0.04'	52.98	+0.04'
34		55.59	
35		57.86	
36		61.54	
37		63.82	
38		65.37	
39	-0.01'	66.18	0.00'
42	-0.01'	98.88	-0.01'
43		98.34	
44		99.33	
45		102.78	

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
8	WASH.				

SECOND LAKE WASHINGTON BRIDGE
UNIT NO. 2 - EAST AND WEST APPROACHES
KING COUNTY

BENT DETAILS

WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS

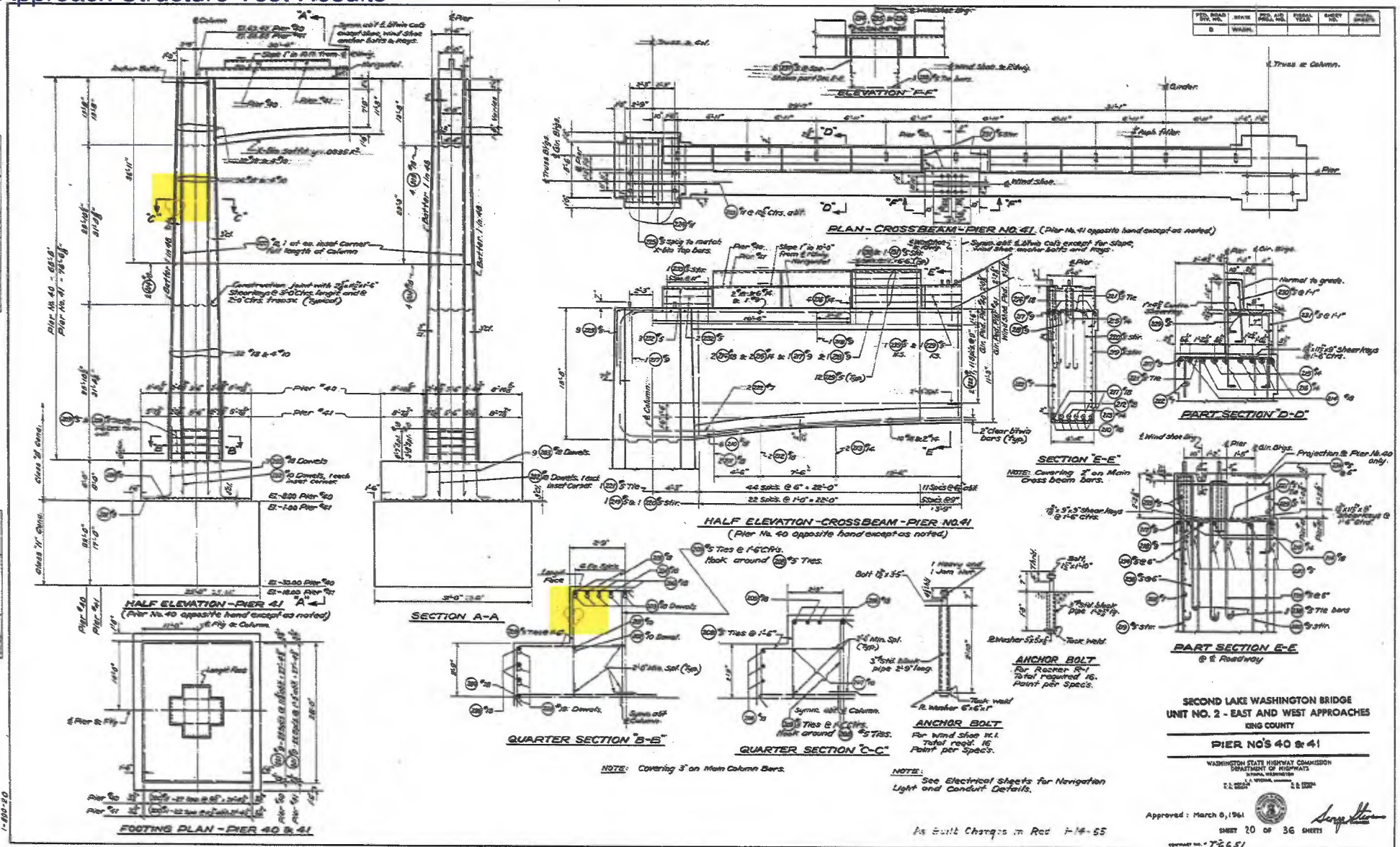
Approved : March 8, 1961

SHEET 17 OF 36 SHEETS

CONTRACT NO. 7 6651

1551

Approach Structure Test Results



Approach Structure Test Results

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Analysis Report

Total Metals

Client: Kiewit
Address: 2891 Evergreen point Rd.
Medina, WA 98039

Attention: Mr. Benjamin Moseid
Project Location: Medina

Batch #: 1521458.00
Matrix: Bulk
Method: EPA 3051/6010C
Client Project #: 22239
Date Received: 11/23/2015
Samples Received: 4
Samples Analyzed: 4

Lab ID	Client Sample #	Elements	Sample wt (g)	RL mg / kg	Results in mg / kg	Results in ppm
15128779	1	Arsenic (As)	0.4923	8.1	< 8.1	< 8.1
15128780	2	Arsenic (As)	0.4979	8.0	< 8.0	< 8.0
15128781	3	Arsenic (As)	0.5092	7.9	< 7.9	< 7.9
15128782	4	Arsenic (As)	0.4957	8.1	< 8.1	< 8.1

Sampled by: Client
Analyzed by: Shalini Patel
Reviewed by: Nick Ly

Date Analyzed: 11/24/2015
Date Issued: 11/24/2015

DRAFT

mg/ kg = Milligrams per kilogram
ppm = Parts per million

RL = Reporting Limit
'<' = Below the reporting Limit

Note : Method QC results are acceptable unless stated otherwise.
Unless otherwise indicated, the condition of all samples was acceptable at time of receipt.

Bench Run No: 35-1124-03

Approach Structure Test Results

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

METAL LABORATORY SERVICES

NVL LABS

Company Kiewit
Address 2891 Evergreen point Rd.
Medina, WA 98039
Project Manager Mr. Benjamin Moseid
Phone (253) 777-5170

NVL Batch Number 1521458.00
TAT 1 Day **AH** No
Rush TAT
Due Date 11/24/2015 **Time** 1:30 PM
Email benjamin.moseid@kiewit.com
Fax

Project Name/Number: 22239 **Project Location:** Medina

Subcategory Inductively Coupled Plasma (ICP) - Group Tests
Item Code ICP-M2 EPA 6010B (price per analyte) <paint>
Metals Arsenic (As)

Total Number of Samples 4 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	15128779	1		A
2	15128780	2		A
3	15128781	3		A
4	15128782	4		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Maxwell Raymond		NVL	11/23/15	1330
Analyzed by	Shalini Patel		NVL	11/24/15	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Date: 11/23/2015
Time: 1:30 PM
Entered By: Maxwell Raymond

Approach Structure Test Results

METAL LABORATORY SERVICES

NVL LABS

Company Kiewit
Address 2891 Evergreen point Rd.
Medina, WA 98039
Project Manager Mr. Benjamin Moseid
Phone (253) 777-5170

NVL Batch Number 1521458.00
TAT 1 Day AH No
Rush TAT
Due Date 11/24/2015 **Time** 1:30 PM
Email benjamin.moseid@kiewit.com
Fax

Project Name/Number: 22239 **Project Location:** Medina

Subcategory Inductively Coupled Plasma (ICP) - Group Tests
Item Code ICP-M2 **Method** EPA 6010B (price per analyte) <paint>
Metals Arsenic (As)

Total Number of Samples 4 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	15128779	1		A
2	15128780	2		A
3	15128781	3		A
4	15128782	4		A

PAID
VF# 11/23

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Maxwell Raymond		NVL	11/23/15	1330
Analyzed by			NVL		
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions:

Entered By: Maxwell Raymond Date: 11/23/2015 Time: 1:30 PM 1 of 1