IDAHO TRANSPORTATION DEPARTMENT

RESEARCH REPORT

Long-term Performance of HES Class 50AF Concrete with Polypropylene Fibers as Field-Cast Connection between Deck Bulb-T Girders in SH-36 Bridge over Bear River

RP 288

By

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Prepared for

Idaho Transportation Department

ITD Research Program, Contracting Services

Highways Construction and Operations

September 2022

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Technical Report Documentation Page

1. Report No. FHWA-ID-22-288	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Long-term Performance of HES Class 50AF Concrete with Polypropylene Fibers as Field-Cast Connection between Deck Bulb-T Girders in SH-36 Bridge over Bear River		5. Report Date August 2022 6. Performing Organization Code
7. Author(s) Arya Ebrahimpour, Mustafa Mashal, and Ali Shokrgozar		8. Performing Organization Report No. [Billing code]
9. Performing Organization Name and Address Department of Civil and Environmental Engineering Idaho State University Pocatello, Idaho 83209		10. Work Unit No. (TRAIS) 11. Contract or Grant No. ISU-20-01
12. Sponsoring Agency Name and Address Idaho Transportation Department (SPR) Highways Construction and Operations, Contracting Services, Research Program PO Box 7129 Boise, ID 83707-7129		13. Type of Report and Period Covered Final Report 3/1/220 - 8/31/2022 14. Sponsoring Agency Code RP-288

15. Supplementary Notes

Project performed in cooperation with the Idaho Transportation Department and Federal Highway Administration.

16. Abstract

Idaho Transportation Department (ITD) has been using High-Early Strength (HES) concrete Class 50AF with Polypropylene fibers in several parts of the bridge in Accelerated Bridge Construction. This material is only slightly more expensive than conventional concrete, but speeds up the construction. ITD is interested in the suitability of HES concrete in closure pours between bridge Deck Bulb-T Girders. In the first phase, an optimum HES concrete mix was identified through a series of laboratory experiments. In the second phase, field performance of the HES concrete mix was examined by placing the material in the closure pour joints between Deck Bulb-T Girders in a bridge in Idaho. The objective of the current phase (Phase 3) was to determine the 20-month field performance of the closure pour concrete in the same bridge. Tasks included six visits to the bridge site every four months to: (a) measure strain data under ITD's Under the Bridge Inspection Truck (UBIT), (b) measure strain data under the commercial truck traffic, and (c) inspect the closure pour concrete. Based on the UBIT loading data and inspection results, it is concluded that there are no changes in the closure pour concrete in the last 20 months. Recommendations are provided.

17. Key Words accelerated bridge construction, long-term performance, bridge, deck, high-early strength concrete, connection, precast elements, field performance		18. Distribution Statement Copies available from the [ITD Research Program]	
19. Security Classification (of this report) Unclassified	20. Security Classification (of this page) Unclassified	21. No. of Pages 98	22. Price None

Acknowledgments

The authors would like to thank the Idaho Transportation Department for supporting this research project. We would like to thank the members of the Technical Advisory Committee, Matt Farrar, Dan Gorley, Leonard Ruminski, Ned Parish, and Ed Miltner for their support and valuable input. Leonard Ruminski developed the project and provided extensive input in several key parts of this project. Dr. Bijan Khaleghi of the Washington State Department of Transportation served as the peer reviewer for this project. Jared Canterll, ISU Civil and Enviromental Engineering Department laboratory manager, assisted with the bridge loading and Michael Adams of Campbell Scientific, Inc. provided technical support with the data acquisition system. In addition, the authors are grateful to the ITD Bridge Inspection staff, Rene Leon and Amy Bower, and traffic control staff for their help during the bridge loading. This project provided experience in laboratory and field experimental research, data acquisition, and data analysis for one graduate student (Ali Shokrgozar) and three undergraduate students (Bipin Aryal, Sagar Gaire and Devani Ponce) at Idaho State University. Financial support for the undergraduate student from the Idaho State Board of Education is greatly appreciated.

Technical Advisory Committee

Each research project is overseen by a Technical Advisory Committee (TAC), which is led by an ITD project sponsor and project manager. The TAC is responsible for monitoring project progress, reviewing deliverables, ensuring that study objectives are met, and facilitating implementation of research recommendations, as appropriate. ITD's Research Program Manager appreciates the work of the following TAC members in guiding this research study.

- Project Sponsor: Matt Farrar, P.E.
- Project Manager: Dan Gorley, P.E.
- TAC Members: Leonard Ruminski, P.E., and Ned Parrish
- FHWA-Idaho Advisor: Ed Miltner, P.E.

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List of Abbreviations and Acronyms

ABC .... Accelerated Bridge Construction

ACI .... American Concrete Institute

AASHTO .... American Association of State Highway and Transportation Officials

ASTM .... American Society for Testing and Materials

FE .... Finite Element

FHWA .... Federal Highway Administration

HES .... High-Early Strength

ISU .... Idaho State University

ITD .... Idaho Transportation Department

TAC .... Technical Advisory Committee

UBIT .... Under the Bridge Inspection Truck

UHPC .... Ultra-High Performance Concrete

Executive Summary

Idaho Transportation Department (ITD) has been using High-Early Strength (HES) concrete Class 50AF with Polypropylene fibers in several parts of the bridge in Accelerated Bridge Construction (ABC). This material is only slightly more expensive than conventional concrete, but speeds up the construction by allowing formwork removal after one day of casting instead of four days required for UHPC. ITD is interested in the suitability of HES concrete in closure pours between bridge Deck Bulb-T Girders.

This project is the third phase of a project that started in 2017. In the first phase, an optimum HES concrete mix was identified through a series of standard laboratory experiments and tests on larger specimens. In the second phase, field performance of the HES concrete mix was examined by placing the material in the closure pour joints between Deck Bulb-T Girders in the State Higway 36 (SH-36) Bridge over Bear River near Preston, Idaho. The objective of the current phase (Phase 3) was to determine the 20-month field performance of the closure pour concrete in the same bridge. Tasks included six visits to the bridge site every four months to: (a) measure strain data under ITD's Under the Bridge Inspection Truck (UBIT), (b) measure strain data under the commercial truck traffic, and (c) inspect the closure pour concrete.

The bridge has five girders with four closure pours between the deck portions of the girders. In each closure pour, at a location approximately 20 ft from the south abutment, concrete strains at four interface locations between the closure pour concrete and precast concrete were monitored. At the same location in each closure pour, strains in four steel headed bars near the interfaces were also monitored. This resulted in monitoring strains in 32 locations in total.

UBIT loading consisted of six positions (tests). In Test 1, Closure Pour 1 (CP1) at the location of the instrumentation is directly loaded by the passenger side front wheel of the UBIT. In Tests 2 and 3, Closure Pour 2 (CP2), is directly loaded by the driver and passenger side front wheels, respectively. In Tests 4 and 5, Closure Pour 3 (CP3), is directly loaded by the driver and passenger side front wheels, respectively. Finally, in Test 6, Closure Pour 4 (CP4) is directly loaded by the driver side front wheel. In each test the strains in all the 32 locations were recorded. Before each test, strains were zeroed; this removed any thermal strains due to thermal expansion and contraction of the structure. Therefore, only the UBIT load-induced strains were measured. However, temperature also affects the stiffness of the material. In the warmer temperatures, the stiffness decreases, causing larger strains under the same load. This behavior is shown Figure ES-1. Removing the temperature effect, it can be seen that under UBIT loading the average strains in steel and concrete in the directly-loaded closure pours remained somewhat constant.

For the strain data under truck traffic loads, each time four hours of data were collected. Data were collected for one hour at a time. Before the start of each one-hour data acquisition, all gages were zeroed without any vehicle on the bridge. After processing the traffic data, the maximum strain values in both steel and concrete in each closure pour were tabulated. Figure ES-2 shows the average positive values of maximum truck traffic-induced strains. As shown in Figure ES-2 unlike the UBIT data of Figure ES-1, with the traffic truck-induced strains, it is difficult to see the effect of temperature. Also, at the

beginning of the Covid 19 pandemic, less average strain values were observed. In the second year, the averages for both steel and concrete remained somewhat constant. Having noted the above, it is difficult to draw any definite conclusions from the traffic data.

Traffic loads caused more strains in steel and concrete than the UBIT loads. The maximum steel strain was 158 microstrain, much smaller than the yield strain of 2,069 microstrain. The maximum concrete strain at the interface of 551 was observed which is larger than the Phase 1 laboratory-measured interface bond strain of 120 microstrain. This indicates that although no visible cracks were observed, there could be micro cracks that cause these larger concrete strains.

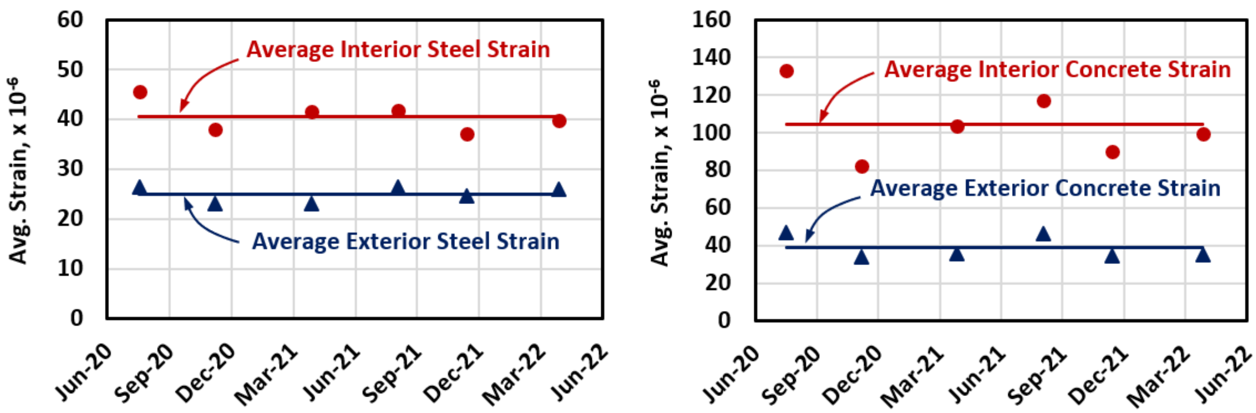

Figure ES-1 Average of the steel and concrete strain data in directly-loaded closure pours under UBIT loads

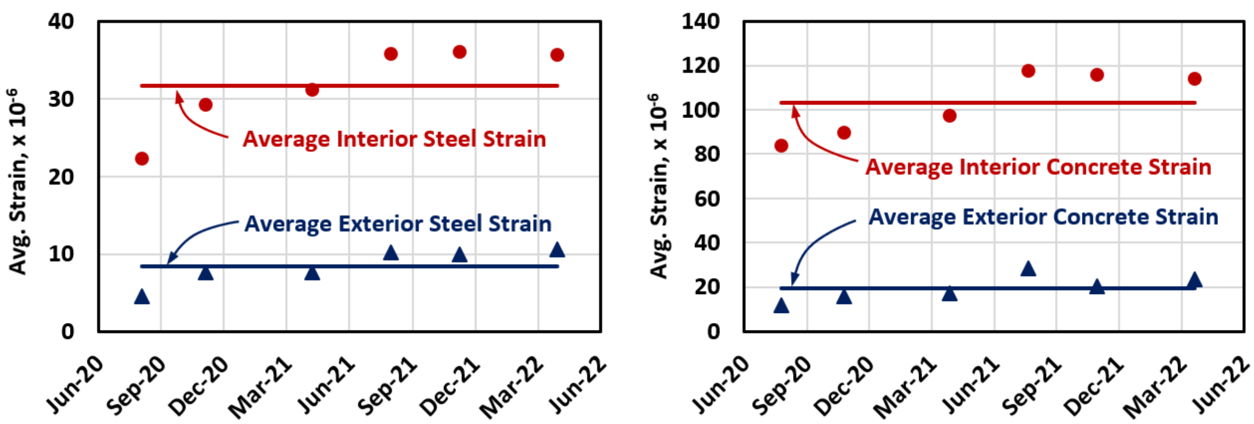

Figure ES-2 Average maximum positive steel and concrete strains in exterior and interior closure pours under truck traffic loads

Each time that the data was collected, the closure pour concrete was also inspected. In each closure pour area five rectangular sections were marked with tape so that the same sections could be photographed every four months. The approach in theAmerican Concrete Insitute (ACI) 201.1R-08 Guide was followed (ACI Committee 201, 2008). The inspections and the corresponding photos did not indicate any *visible* cracks in the closure pour concrete or at any of the interfaces. Based on the UBIT loading data and inspection results, it is concluded that there are no changes in the closure pour concrete in the last 20 months.

The recommendations are: (a) the contractor should follow ITD's construction practice of cleaning the construction joint surface and saturate it with water immediately prior to closure pour concrete placement, (b) in colder temperatures, the contractor should place heaters under the closure pours while concrete is curing, and (c) in order to examine the longer-term (i.e., several years) performance of the High-Early Strength (HES) Class 50AF concrete with polypropylene fibers, it is recommended to perform a series of laboratory tests (compression, tension, rebar pullout, and interface bond tests) after accelerated aging and corrosion caused by freeze-thaw cycles and chloride penetration.

1. Introduction

Accelerated Bridge Construction (ABC) technologies are being adopted by state departments of transportation in the United States. ABC increases safety by lowering exposure to construction activities and increases mobility and economic opportunities by reducing traffic interruptions and delays. ABC requires that bridge precast concrete components be effectively connected to one another in the field.

As an alternative to Ultra-High Performance Concrete (UHPC), Idaho Transportation Department (ITD) is interested in the suitability of High-Early Strength (HES) concrete Class 50AF with Polypropylene fibers in 10-inch closure pours between bridge Deck Bulb-T Girders. The advantages of this alternate material are the reduction in costs and construction time. Currently ITD uses HES concrete for several parts of the bridge in ABC construction including abutment and pier end diaphragms, wing walls, and the closure pours between abutment and pier precast elements. HES concrete is only slightly more expensive than conventional concrete, but speeds up the construction by allowing formwork removal after one day of casting instead of four days required for UHPC.

The project presented in this report, had two previous phases. In the first phase, an optimum HES concrete mix with good material properties was identified through a series of standard laboratory experiments and tests on larger specimens (Ebrahimpour et al. 2018). Based on the laboratory and finite element modeling results, it was concluded that the connection satisfies the American Association of State Highway and Transportation Officials' (AASHTO) design requirements for applicable limit states.

In the second phase, field performance of the HES concrete mix was examined by placing the material in the closure pour joints between Deck Bulb-T Girders in the State Higway 36 (SH-36) Bridge over Bear River near Preston, Idaho (Ebrahimpour et al. 2020). Headed bars and concrete strains at the bottom of the deck were monitored under the loads due to the Under the Bridge Inspection Truck (UBIT) and truck traffic. The following observations were made in the second phase: (1) there were some deviations from the standard construction practices as specified in Idaho Transportation Department's *Standard Specifications for Highway Construction* (ITD 2018); (2) rebar strains were significantly lower than the steel yield strain of $2{,}069 \times 10^{-6}$ (or 2069 microstrain); (3) the maximum concrete strain in one of the closure pours exceeded the Phase 1 laboratory-measured strain at the interface bond strength between precast concrete and closure pour concrete of 120 microstrain; and (4) despite concrete strain exceeding the strain at interface bond strength, no visible cracks were observed under the UBIT loads.

The objective of the third (current) phase of the project was to determine the 20-month field performance of the HES concrete with polypropylene fibers in closure pours of the SH-36 Bridge over Bear River. The two main questions were: (1) will the strain gage data change over a period of two years, and (2) will there be any visible cracks or other damages in concrete. The following tasks were to be completed:

- Task 1: Install new concrete strain gages.

- Task 2: Periodic measurement under UBIT.
- Task 3: Data under commercial traffic.
- Task 4: Closure pour concrete inspection.
- Task 5: Data analysis and preparing the results.
- Task 6: Project presentation to ITD Bridge Section staff.
- Task 7: Submission of the final project report.

This report is divided into five chapters.

- Chapter 1 (this chapter) describes the research problem, the objective, and the project tasks.
- Chapter 2 presents the bridge instrumentation, loading, and inspection.
- Chapter 3 presents the data analysis and results of concrete inspections.
- Chapter 4 presents the summary, conclusions and recommendations.
- Chapter 5 provides a list of references used in this report.

Appendices A to C, respectively, present detailed summary tables of UBIT-induced strain data, detailed tables of traffic-induced strain data, and the inspection photos for the first and last visits in all the closure pours.

2. Instrumentation, Bridge Loading, and Inspection

Installing Access Platform

During the loading and data acquisition of Phase 2 of the project, the research team relied on the platforms installed by the contractor. For the current phase (Phase 3), since the contractor's platforms were removed, as shown in Figure 2-1 and Figure 2-2 in February 2020, new platforms were installed in order to have access to the instrumentation. Figure 2-1 also shows an instrumented box, where the steel bar strain gage wires exit below deck and where the concrete strain gages were located. There were four instrumented boxes, one in each closure pour. The boxes were located approximately 20 feet (ft) from the south abutment and directly above the middle of each 16-ft platform. The south abutment can be seen in Figure 2-2.

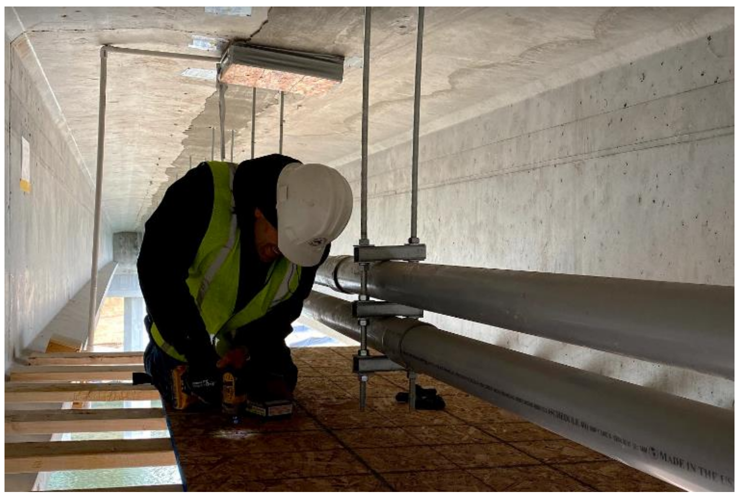

Figure 2-1 Access platform installation

Figure 2-2 Installed access platform

Installing Concrete Strain Gages and Gage Monitoring

Figure 2-3 (a and b) show the bottom views of the bridge beck with the locations of the concrete and steel strain gages for Phase 2 of the project. Note that the headed bars are located at the bottom of the closure pour. In Phase 2 it was observed that all the concrete and steel gages installed at the interfaces had the largest strain values. For this reason, in Phase 3 after removing the concrete gages, four concrete gages were installed at the interfaces. The new arrangement of the concrete strain gages is shown in Figure 2-4(a). In between tests, if concrete strain gages were damaged, replacement gages were installed at the same locations. For steel strain gages, in the current phase, only the gages near the interfaces shown inFigure 2-4(b) were monitored.

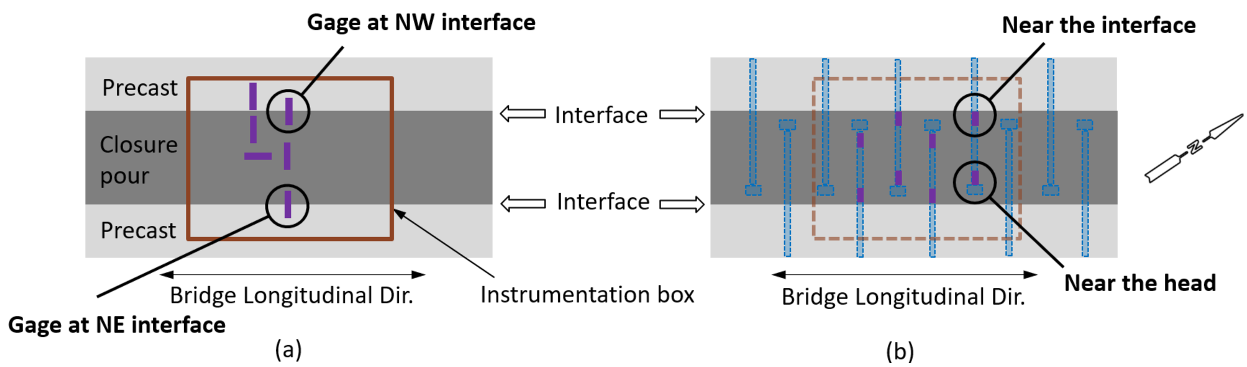

Figure 2-3 Previous project (Phase 2) concrete and steel strain gage locations

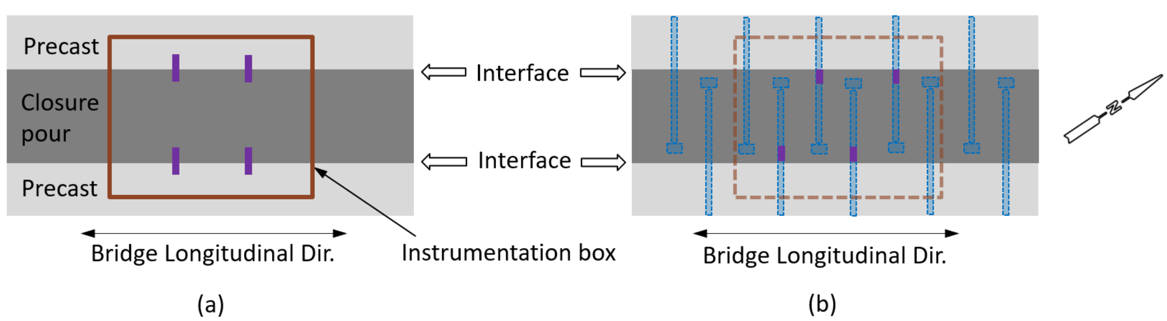

Figure 2-4 Current project (Phase 3) locations of concrete and steel strain gages

Bridge UBIT Loading

Starting August 2020, every four months, strain data were collected under ITD's bridge inspection truck called Under the Bridge Inspection Truck (UBIT). For repeatability, the UBIT loads were repeated two more times, giving a total of three sets of loadings referred to as UBIT1, UBIT2, and UBIT3. As shown in Figure 2-5, each UBIT loading consisted of six positions. These positions are labeled as Tests 1 to 6. In Test 1, Closure Pour 1 (CP1) at the location of the instrumentation is directly loaded by the passenger side front wheel of the UBIT. In Tests 2 and 3, Closure Pour 2 (CP2), is directly loaded by the driver and passenger side front wheels, respectively. In Tests 4 and 5, Closure Pour 3 (CP3), is directly loaded by the driver and passenger side front wheels, respectively. Finally, in Test 6, Closure Pour 4 (CP4) is directly loaded by the driver side front wheel.

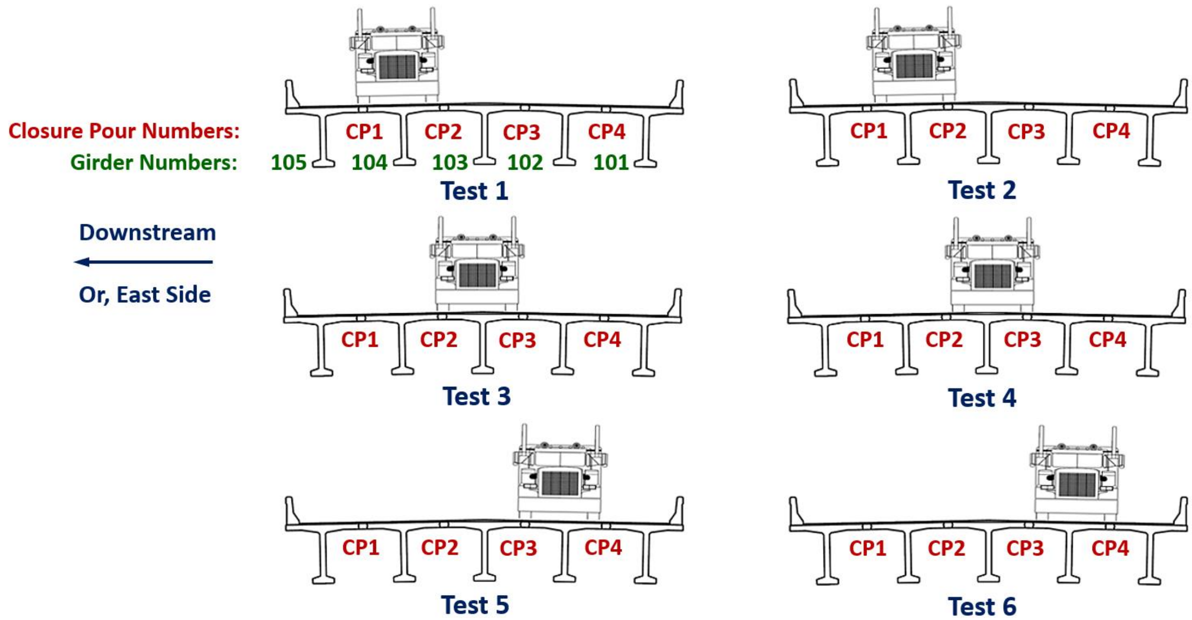

Figure 2-5 UBIT loading positions

Figure 2-5 also shows the girder numbering in the bridge. These are Girders 101 to 105. All the section views in Figure 2-5 are directly toward the south abutment; i.e., the left side of the figure represents the east side of the bridge. For example, CP1 joins the east side of Girder 104 to the west side of Girder 105.

In order to keep track of the measured data, gages and the corresponding wires leading to the data acquisition system were labeled according to the location of the interfaces. Concrete gages were labeled by the closure pour number, followed by "C" for concrete, followed by NE, NW, SE, or SW side of the closure pour. Steel headed bar gages were labeled by the girder number, bars at east or west side of the girder (E or W), followed by north or south interface (NI or SI). For steel bars, there were two gages at each location (top and bottom); the average of the two is used to represent the steel strain at that location. Figure 2-6 shows the labeling for the concrete and steel gages in Closure Pour 1.

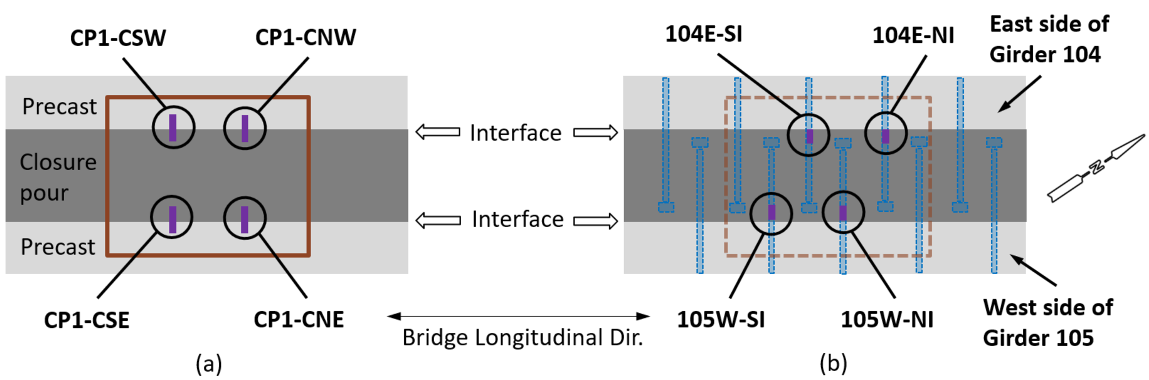

Figure 2-6 Labeling of the strain gages for CP1

For each set of UBIT loading (i.e., while collecting data for Tests 1 to 6), the traffic was stopped on both directions. One person communicated with the person in charge of the data acquisition under the bridge (see Figure 2-7) and the person guiding the UBIT (see Figure 2-8). In order to place the front wheel of the UBIT on the instrumented part of the closure pours, these locations were marked on top of the bridge deck. One of these marks is shown in Figure 2-8.

Figure 2-7 Data acquisition system under the bridge

Figure 2-8 UBIT loading position for Test 3

As it will be discussed in Chapter 3, the strains measured in this project are only due to the truck load on the bridge. Thermal strains are not included in the measured data. Removing the thermal strains were accomplished by “zeroing” the strain gages before each truck load. Figure 2-9 illustrates a typical UBIT load-induced strain data. It is for data collected in UBIT’s third loading (UBIT3) for all the six positions in

Closure Pour 1 steel bar labeled 104E-NI (see Figure 2-6(b) for gage labeling) for August 13, 2020. The truck was initially parked off the bridge. All strain gages were zeroed. The truck was then brought to the position for Test 1 and parked there for approximately 20 seconds, as represented by the first plateau in Figure 2-9. The plateau corresponds to the strain of 26×10^{-6} or 26 microstrain in 104E-NI. Note the horizontal axis in Figure 2-9 corresponds to record or sample number; there are 33 samples per second. The truck was then moved off the bridge and all gages were zeroed again. The truck was brought over to the position corresponding to Test 2 and parked there for 20 seconds, creating the second plateau in Figure 2-9. This second position corresponds to a strain of 22 microstrain. This process was repeated for Tests 3 to 6 as shown by the plateau values of -5, -3, -1, and -1, respectively. Note that for Tests 1 and 2, the curvature in CP1 is concave up which produces a tension or positive strain in the headed bar. However, for Test 3 to 6, this curvature is concave down which produces a compression or negative strain in the headed bar. The UBIT strain data for both steel and concrete gages will be presented in detail in Chapter 3 and Appendix A.

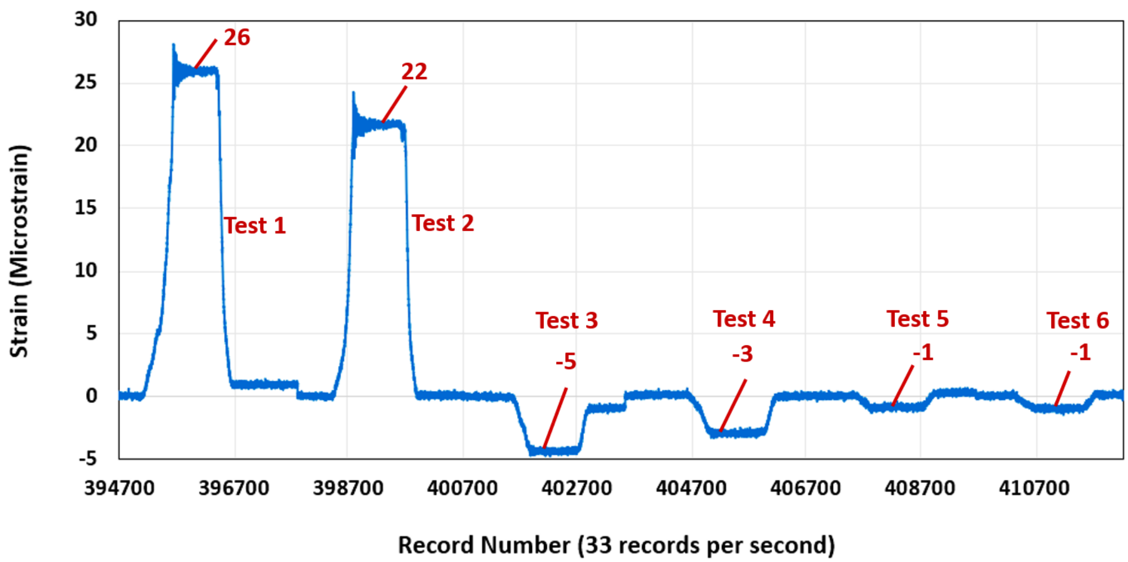

Figure 2-9 Sample data: UBIT's third load (UBIT 3), CP1 steel bar labeled 104E-NI, August 13, 2020

Truck Traffic Loading

The strain data under truck traffic loads were also collected every four months starting August 2020. Four hours of data were collected each time. Data was collected for one hour at a time. Before the start of each one-hour data acquisition, all gages were zeroed without any vehicle on the bridge. Figure 2-10 shows a five-axle truck travelling eastbound at 1:33 p.m. on August 20, 2020. Vehicles having three axles and more were considered. Data for larger two-axle trucks, such as heavier utility trucks, were also included. The following data were collected: (1) time, (2) number of axles, (3) direction (eastbound or westbound), (4) the maximum value of steel strain in each closure pour and the corresponding gage location, and (5) the maximum value of concrete strain and the corresponding gage location. The traffic strain data are presented in Chapter 3 and Appendix B.

Figure 2-10 A 5-axle truck traveling eastbound at 1:33 p.m. on August 20, 2020

Closure Pour Concrete Inspection

Each time that the data were collected, the closure pour concrete was also inspected. As shown in Figure 2-11 and Figure 2-12, in each closure pour area five rectangular sections were marked with tape so that the same sections are photographed every four months. The rectangular sections were labeled. For example, in Closure Pour 1, sections were labeled as CP1A, CP1B, CP1C, CP1D, and CP1E. The approach in the American Concrete Institute (ACI) 201.1R-08 "*Guide for Conducting a Visual Inspection of Concrete in Service"* was followed (ACI Committee 201, 2008). This guide is intended for visual inspection of concrete in service and is limited to surface of the concrete. A crack width ruler, as shown in Figure 2-13 Concrete crack width ruler, was used to measure crack widths, if any cracks were present. The inspection results are presented in Chapter 3 and Appendix C.

Figure 2-11 Five rectangular areas marked in Colure Pour 1

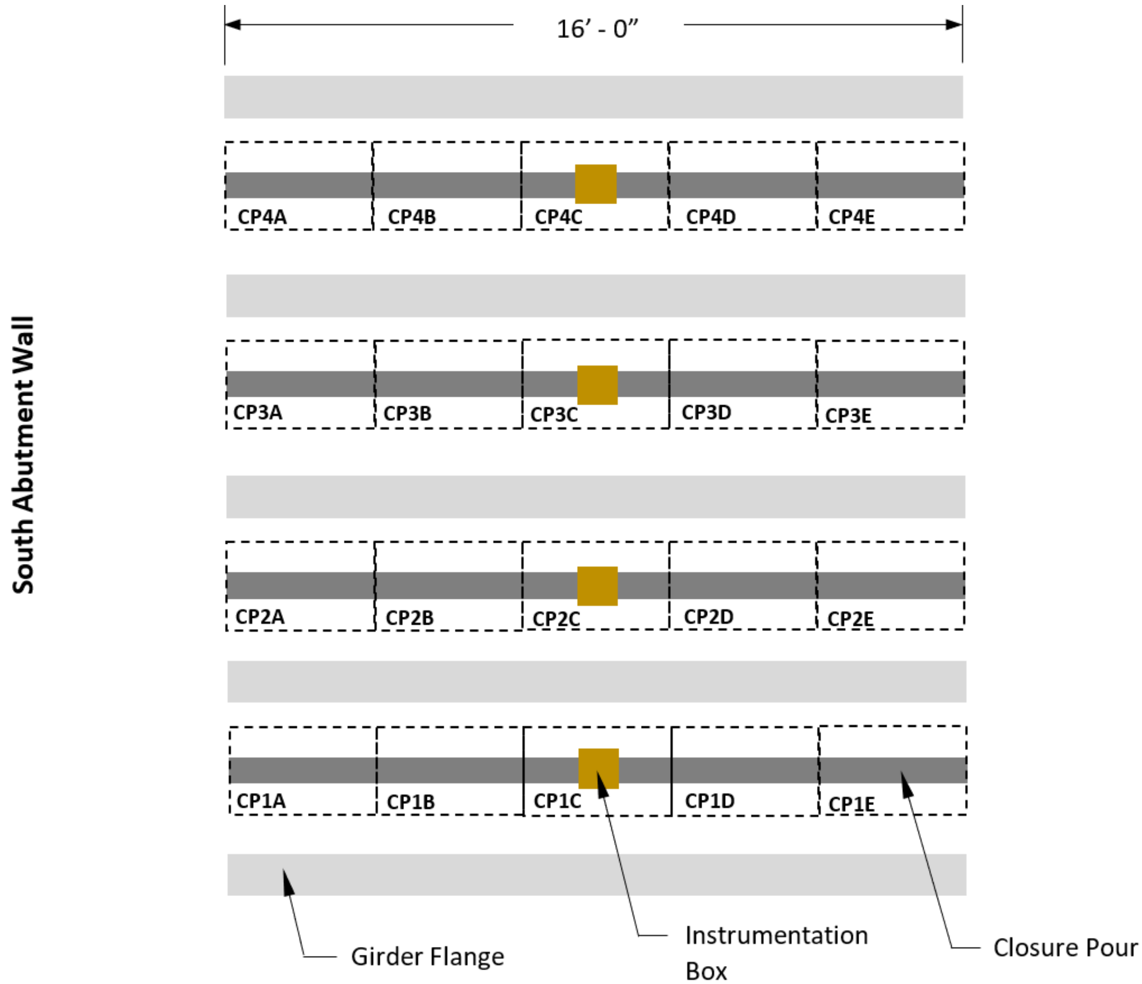

Figure 2-12 Schematic showing bottom view of the deck with dotted line sections representing areas that were photographed and inspected

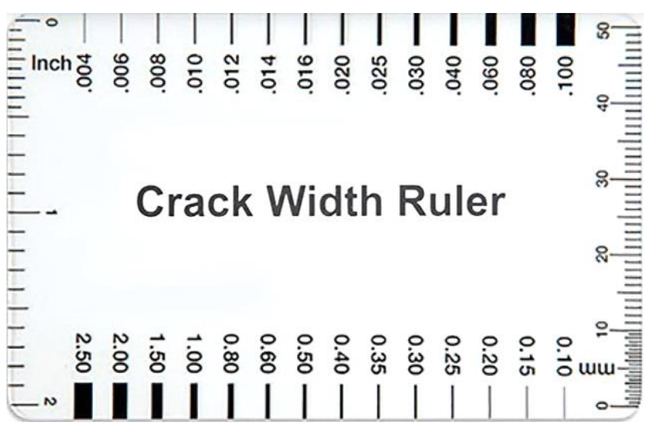

Figure 2-13 Concrete crack width ruler

3. Data Analysis and Results of Concrete Inspection

Strain Data Under UBIT Loading

Tables Table 3-1 and Table 3-2 present the UBIT loading strain data for August 13, 2020 for steel and concrete gages, respectively. The data for December 1, 2020, April 20, 2021, August 24, 2021, December 2, 2021, and April 14, 2022 are given in Appendix A. In Tables Table 3-1 and Table 3-2 the 12 data values corresponding to CP1, Test 1 represent the steel and concrete gage strain values when CP1 is directly loaded. These cells are highlighted in red. The 12 data values corresponding to CP2, Test 2 represent the steel and concrete gage strain values when CP2 is directly loaded by the driver side front wheel. These cells are highlighted in orange. The 12 data values corresponding to CP2, Test 3 represent the steel and concrete gage strain values when CP2 is directly loaded by the passenger side front wheel. These cells are highlighted in yellow. Similarly, the data in CP3, Test 4 and CP3, Test 5 represent when CP3 is directly loaded. These cells are highlighted in light green and green, respectively. Finally, the 12 data values corresponding to CP4, Test 6 represent strain values when CP4 is directly loaded. These cells are highlighted in light blue.

There are large variabilities in each set of 12 values. One reason for these variabilities is that it is difficult to park the front wheel of UBIT exactly on the mark. Another source of variability seems to be the presence of micro cracks in concrete. Although these cracks are not visible, asdiscussed later, the concrete gages in the vicinity of these cracks seem to pick up more strain, leaving less for the remaining strain gages. In order to test this theory and remove any doubt about the gages not working properly, in August 2021 all four concrete gages in CP4 were replaced with new ones in the same locations. Table 3-3 represents the lower right 12 values in Table 3-2 for August 2020. Table 3-4 shows the same 12 strain data in August 2021 (see also Appendix A, Table A-6). As it can be seen, similar strain values are obtained in both sets, with CP4-CNE concrete gage experiencing the largest strain.

Table 3-1 Steel bar strain data (in microstrain) under UBIT Loading, August 13, 2020

	CP1	CP1	CP1	CP1	CP2	CP2	CP2	CP2	CP3	CP3	CP3	CP3	CP4	CP4	CP4	CP4
	104E-NI	104E-SI	105W-NI	105W-SI	103E-NI	103E-SI	104W-NI	104W-SI	102E-NI	102E-SI	103W-NI	103W-SI	101E-NI	101E-SI	102W-NI	102W-SI
UBIT 1, Test 1	28	30	16	14	12	10	48	57	-6	-6	-4	-9	-1	-1	-1	-1
UBIT 2, Test 1	23	28	16	17	12	10	45	51	-7	-7	-11	-11	-1	-1	-1	-2
UBIT 3, Test 1	26	30	15	15	13	11	52	57	-7	-6	-9	-10	-1	-1	-2	-2
UBIT 1, Test 2	13	14	5	4	66	41	36	36	-6	-5	-4	-9	-1	-1	-1	-1
UBIT 2, Test 2	20	20	5	5	51	40	54	55	-7	-7	-10	-11	-1	-1	-1	-2
UBIT 3, Test 2	22	26	6	5	48	36	58	56	-7	-6	-10	-11	-1	-1	-2	-2
UBIT 1, Test 3	-4	-4	-2	-2	41	35	63	64	11	11	19	41	-2	-2	-4	-6
UBIT 2, Test 3	-4	-5	-2	-2	59	44	45	43	14	12	51	53	-2	-2	-5	-6
UBIT 3, Test 3	-5	-5	-2	-2	37	32	70	68	10	10	38	39	-2	-2	-5	-6
UBIT 1, Test 4	-3	-3	-1	-2	28	23	8	8	50	57	8	26	-2	-2	-4	-5
UBIT 2, Test 4	-3	-3	-2	-2	51	37	14	15	41	40	49	45	-2	-2	-5	-6
UBIT 3, Test 4	-3	-3	-2	-2	43	34	14	12	48	54	39	41	-2	-2	-5	-6
UBIT 1, Test 5	-1	-1	0	-1	-8	-7	-8	-9	37	34	23	48	6	9	35	38
UBIT 2, Test 5	-1	-1	0	-1	-9	-6	-9	-9	38	35	54	47	6	9	33	38
UBIT 3, Test 5	-1	-1	-1	-1	-7	-6	-8	-8	45	42	51	47	7	9	37	41
UBIT 1, Test 6	-1	-1	-1	-1	-8	-6	-8	-8	43	37	9	24	15	13	44	42
UBIT 2, Test 6	-1	-1	-1	-1	-7	-6	-9	-9	36	35	15	19	22	16	41	45
UBIT 3, Test 6	-1	-1	-1	-1	-6	-5	-6	-7	45	41	19	23	18	16	47	50

Table 3-2 Concrete strain data (in microstrain) under UBIT loading, August 13, 2020

	CP1-CNE	CP1-CSE	CP1-CNW	CP1-CSW	CP2-CNE	CP2-CSE	CP2-CNW	CP2-CSW	CP3-CNE	CP3-CSE	CP3-CNW	CP3-CSW	CP4-CNE	CP4-CSE	CP4-CNW	CP4-CSW
UBIT 1, Test 1	25	26	72	72	201	194	62	13	-21	-20	-18	-12	-3	0	-1	-1
UBIT 2, Test 1	26	32	72	76	160	166	45	9	-23	-23	-20	-14	-4	0	-1	-1
UBIT 3, Test 1	24	28	81	75	189	185	47	9	-23	-23	-21	-14	-4	0	-1	-1
UBIT 1, Test 2	4	8	30	37	106	119	264	50	-21	-20	-18	-12	-3	0	-0.5	-1
UBIT 2, Test 2	6	10	51	53	159	163	198	37	-23	-23	-20	-14	-4	0	-1	-1
UBIT 3, Test 2	6	10	54	51	165	166	182	34	-23	-23	-21	-14	-3	0	-1	-1
UBIT 1, Test 3	-3	-3	-9	-12	194	191	192	32	127	119	51	28	-11	-1	-2	-3
UBIT 2, Test 3	-3	-3	-10	-13	126	137	222	39	135	140	58	30	-12	-1	-2	-2
UBIT 3, Test 3	-3	-3	-11	-13	205	198	143	29	111	97	39	25	-12	-1	-2	-2
UBIT 1, Test 4	-2	-2	-5	-7	23	30	105	20	75	65	184	137	-9	-1	-2	-3
UBIT 2, Test 4	-3	-3	-7	-8	44	57	178	31	148	120	142	86	-12	-1	-2	-2
UBIT 3, Test 4	-3	-3	-8	-9	36	45	160	27	114	107	158	132	-11	-1	-2	-3
UBIT 1, Test 5	-1	-1	-1	-2	-27	-27	-32	-6	181	133	121	74	96	3	6	10
UBIT 2, Test 5	-1	-1	-2	-2	-29	-29	-36	-7	172	127	129	76	94	3	6	9
UBIT 3, Test 5	-2	-1	-3	-3	-24	-24	-29	-6	155	125	185	94	108	3	6	10
UBIT 1, Test 6	-1	-1	-2	-2	-23	-23	-24	-5	52	58	160	74	131	4	17	21
UBIT 2, Test 6	-1	-1	-3	-3	-23	-21	-21	-5	39	45	128	71	112	1	23	30
UBIT 3, Test 6	-1	-1	-3	-3	-19	-19	-21	-4	49	55	160	89	136	2	18	26

Table 3-3 Concrete strain data (in microstrain) for directly-loaded CP4, August 13, 2020

	CP4-CNE	CP4-CSE	CP4-CNW	CP4-CSW
UBIT 1, Test 6	131	4	17	21
UBIT 2, Test 6	112	1	23	30
UBIT 3, Test 6	136	2	18	26

Table 3-4 Concrete strain data (in microstrain) for directly-loaded CP4, August 24, 2021

	CP4-CNE	CP4-CSE	CP4-CNW	CP4-CSW
UBIT 1, Test 6	127	2	18	24
UBIT 2, Test 6	123	2	21	25
UBIT 3, Test 6	112	3	23	25

The values in Table 3-5 and Table 3-6 represent the average of all directly-loaded closure pour strains for steel and concrete, respectively. For example, the value of 22 microstrain in the first row of Table 3-5 is the average of all 12 values corresponding to CP1, Test 1 (the number highlighted in red) of Table 3-1. The temperature values correspond to the low temperature the night before the test date and the high temperature on the day of the test. When the values in the first row of Table 3-5 and Table 3-6 are compared to the second-row values, it can be seen that the strains in December are lower than the ones in August. Again, as noted in Chapter 2, the thermal strains due to expansion and contraction were removed. The thermal effects captured in these data are due to the effect of temperature on material stiffness (i.e., modulus of elasticity). Both steel and concrete become less stiff in warmer temperatures, producing larger strains under the same UBIT load. Jiao, et al. (2014) have documented the temperature effect on the mechanical properties in concrete structures. Simple laboratory tests were performed at Idaho State University (not documented here) on the effects of temperature change on the modulus of elasticity of concrete. These tests gave similar change in the modulus of elasticity of concrete when compared to the modulus obtained by equation suggested by Jiao, et al.

Another interesting observation from Table 3-5 and Table 3-6 is that the CP1 and CP4 (exterior closure pours) average strains are lower than the average values in CP2 and CP3 (interior closure pours). It appears that the parapets helped in reducing the exterior closure pour responses.

Table 3-7 shows the average of the averages for exterior closure pour and interior closure pour strains for steel and concrete gages under directly-loaded tests. For example, the value of 26.5 microstrain in the first row for steel exterior closure pour strain is the average of 22 and 31 in the first row of Table 3-5. Similarly, the value of 45.5 microstrain for steel interior closure pour strain in the first row of Table 3-7 is the average of 48, 50, 42, and 42 in the first row of Table 3-5.

Table 3-5 Average of steel strain data (microstrain) in directly-loaded closure pours

Date	Temp., Degrees Farenheit, Min/Max	Test 1, CP1 Exterior	Test 2, CP2 Interior	Test 3, CP2 Interior	Test 4, CP3 Interior	Test 5, CP3 Interior	Test 6, CP4 Exterior
Aug. 13, 2020	52/90	22	48	50	42	42	31
Dec. 1, 2020	10/39	19	39	39	36	38	27
April 20, 2021	32/54	17	43	43	40	40	29
Aug. 24, 2021	50/86	21	43	44	41	39	32
Dec. 2, 2021	24/53	21	39	40	36	33	28
April 14, 2022	20/48	19	41	42	36	40	33

Table 3-6 Average of concrete strain data (microstrain) in directly-loaded closure pours

Date	Temp., Degrees Farenheit, Min/Max	Test 1, CP1 Exterior	Test 2, CP2 Interior	Test 3, CP2 Interior	Test 4, CP3 Interior	Test 5, CP3 Interior	Test 6, CP4 Exterior
Aug. 13, 2020	52/90	51	137	142	122	131	43
Dec. 1, 2020	10/39	38	86	84	80	80	30
April 20, 2021	32/54	36	102	104	100	107	36
Aug. 24, 2021	50/86	51	120	125	114	109	42
Dec. 2, 2021	24/53	38	103	102	78	77	31
April 14, 2022	20/48	36	115	113	83	87	34

Table 3-7 Average of strain data (microstrain) in directly-loaded closure pours

Date	Temp., Degrees Farenheit, Min/Max	Steel Exterior Closure Pours	Steel Interior Closure Pours	Concrete Exterior Closure Pours	Concrete Interior Closure Pours
Aug. 13, 2020	52/90	26.5	45.5	47.0	133.0
Dec. 1, 2020	10/39	23.0	38.0	34.0	82.5
April 20, 2021	32/54	23.0	41.5	36.0	103.3
Aug. 24, 2021	50/86	26.5	41.8	46.5	117.0
Dec. 2, 2021	24/53	24.5	37.0	34.5	90.0
April 14, 2022	20/48	26.0	39.8	35.0	99.5

Figure 3-1 and Figure 3-2 provide the same information as Table 3-7, but graphically. The horizontal lines in these figures represent the averages of the corresponding strain values in the third to sixth columns of Table 3-7. In these two figures, the effects of temperature can be better seen, with the August values being above the lines, December values being below the lines, and the April values being somewhere close to the lines. Removing the effect of the temperature, the UBIT data show that no changes can be observed in the closure pour behavior over a period of 20 months.

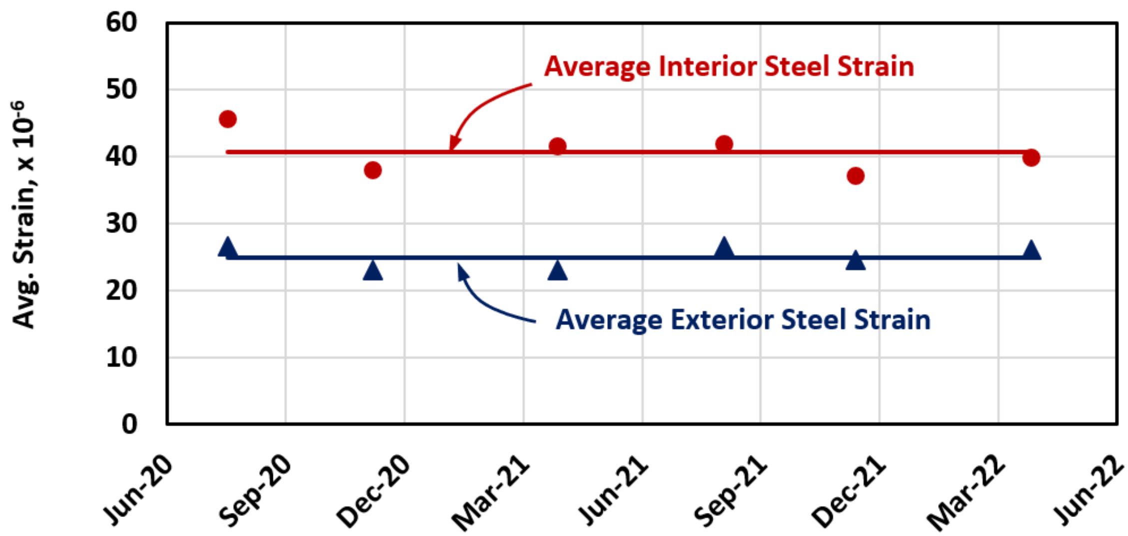

Figure 3-1 Average of steel strain data in directly-loaded closure pours

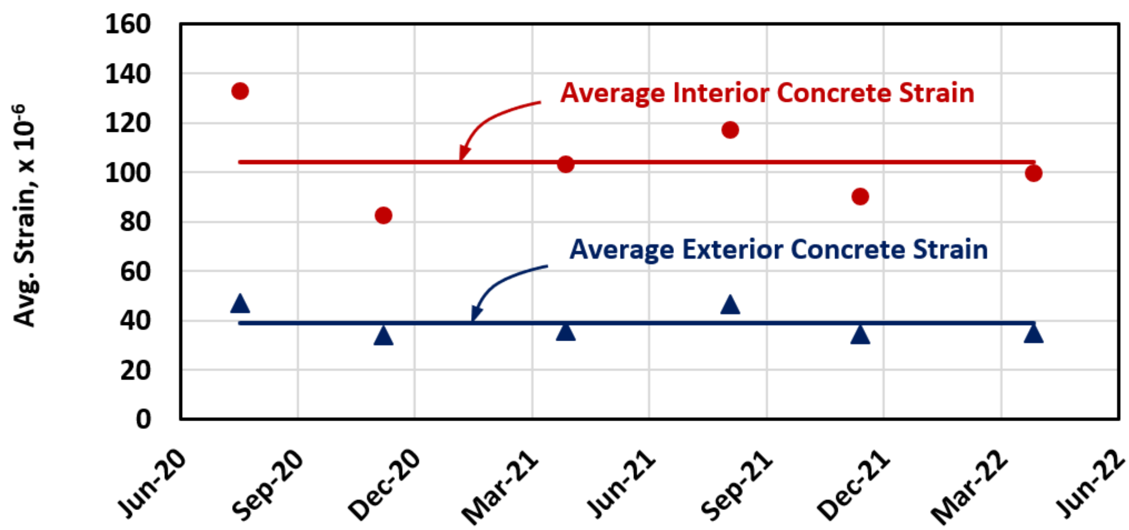

Figure 3-2 Average of concrete strain data in directly-loaded closure pours

Strain Data Under Truck Traffic

Unlike the strain data under UBIT loading shown in Figure 2-9, the truck strain data appear somewhat random. For each truck passage, a picture was taken with a time stamp and key information such as time, number of axles, direction and any other notes were recorded by hand on data sheets. A typical blank truck traffic data sheet is given in Appendix B, Table B-1. When processing the data, large peak strains corresponding to the time the truck passed over the bridge were identified. In each closure pour, the maximum steel strain and concrete strain and the corresponding locations were recorded. The traffic data corresponding August 20, 2020, November 19, 2020, April 13 & 20, 2021, August 10 & 11, 2021, November 16 & 18, 2021, and April 5 & 7, 2022 are provided in Appendix B Tables B-2 to B-19.

Partial truck strain data for August 20, 2020 are given in this section in Tables 3-8 and 3-9 for steel and concrete gages, respectively. These data represent the last half an hour of the data collected on August 20, 2020 (the full versions are in Table B-2 and Table B-3).

Table 3-8 Partial list of maximum steel strain data (in microstrain) for August 20, 2020

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
1:26 PM	3	E	4	104-ENI	29	103-WNI	-6	103-WSI	-3	102-WSI
1:27 PM	4	E	4	104-ENI	17	103-WNI	-4	103-WSI	-2	102-WSI
1:29 PM	3	W	-1	104-ENI	-3	104-WSI	11	103-WSI	2	102-WSI
1:33 PM	5	E	6	104-ENI	63	104-WSI	-4	103-WSI	-9	102-WSI
1:34 PM	7	W	-3	104-ENI	-4	104-WSI	25	103-WSI	7	102-WSI
1:35 PM	3	E	7	104-ENI	60	104-WSI	-15	103-WSI	-5	102-WSI
1:48 PM	5	W	-3	104-ENI	-8	104-WSI	44	103-WSI	14	102-WSI
1:52 PM	5	E	10	104-ENI	57	104-WSI	-16	103-WSI	-5	102-WSI
1:52 PM	3	E	3	104-ENI	26	104-WSI	-6	103-WSI	-3	102-WSI
1:59 PM	2	W	-1	104-ENI	-2	104-WSI	11	103-WSI	1	103-WSI

Table 3-9 Partial list of maximum concrete strain data (in microstrain) for August 20, 2020

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
1:26 PM	3	E	10	SW	100	SE	-8	NE	-4	NE
1:27 PM	4	E	9	SW	49	NE	-8	NE	-4	NE
1:29 PM	3	W	-2	SW	-7	SE	63	NE	5	NE
1:33 PM	5	E	14	SW	208	SE	-10	NE	-18	NE
1:34 PM	7	W	-7	SW	-10	SE	132	NE	16	NE
1:35 PM	3	E	16	SW	187	SE	-46	NE	-10	NE
1:48 PM	5	W	-8	SW	-22	SE	234	NE	32	NE
1:52 PM	5	E	24	SW	208	SE	-44	NE	-11	NE
1:52 PM	3	E	10	SW	79	SE	-13	NE	-6	NE
1:59 PM	2	W	-1	SW	-5	SE	50	NE	5	NE

The fourth row in Table 3-8 and Table 3-9 correspond to the eastbound truck shown earlier in Figure 2-10 in which CP1 and CP2 are loaded (experience positive strains) and CP3 and CP4 experience negative strains. The values of 6, 63, -4, and -9 in the fourth row of Table 3-8 correspond to maximum tension (positive) or compression (negative) values experienced by the rebar gages in each closure pour and the locations in the next column. A similar pattern can be observed for the fourth row in Table 3-9 for concrete gages.

Table 3-10 shows the mean and standard deviation of the maximum positive strains in each closure pour of all the trucks. Similar to what done for the UBIT data, Table 3-11 presents the mean of the exterior closure pour data (CP1 and CP4) and the mean of the interior closure pour data (CP2 and CP3). Again, it can be seen that exterior closure pours experience less strains compared to the interior closure pours.

Figure 3-3 and Figure 3-4 show the same data as those in Tables 3-11, but graphically. Unlike the UBIT data of Figure 3-1 and Figure 3-2, here it is difficult to see the effects of temperature on the strain data. Also, it should be noted that at the beginning of the Covid 19 pandemic, less average strain values were observed. But, in the second year, the averages for both steel and concrete remained somewhat constant. Having noted the above, it is difficult to draw any definite conclusions from the traffic data.

Table 3-10 Mean and standard deviation (in parentheses) of maximum strains (microstrain)

Date	Steel CP1	Steel CP2	Steel CP3	Steel CP4	Concrete CP1	Concrete CP2	Concrete CP3	Concrete CP4
August 20, 2020	3.6 (3.4)	24.5 (20.4)	20.1 (10.6)	5.5 (3.6)	9.0 (9.0)	92.6 (84.5)	75.1 (62.3)	14.3 (12.3)
Nov. 19, 2020	6.1 (6.5)	28.6 (21.4)	30.0 (20.7)	9.0 (8.1)	15.1 (17.2)	90.1 (72.7)	89.0 (74.8)	16.9 (14.6)
April 13 & 20, 2021	7.0 (7.8)	36.8 (31.2)	25.6 (18.5)	8.1 (7.5)	17.4 (21.3)	117.0 (116.7)	77.1 (62.1)	16.8 (15.8)
Aug. 10 & 11, 2021	8.2 (7.4)	39.5 (27.8)	32.2 (21.2)	12.1 (10.5)	22.1 (22.1)	130.7 (99.1)	104.1 (74.2)	34.7 (32.9)
Nov. 16 & 18, 2021	8.7 (9.5)	37.8 (36.7)	34.4 (18.5)	11.2 (11.6)	19.4 (22.3)	118.6 (132.1)	82.1 (52.8)	20.9 (21.4)
April 5 & 7, 2022	9.1 (8.1)	35.5 (26.8)	35.9 (21.4)	12.0 (7.7)	21.7 (19.9)	123.9 (96.6)	103.7 (80.4)	25.4 (20.0)

Table 3-11 Average maximum strains (in microstrain) in exterior and interior closure pours

Date	Mean of Exterior Closure Pours	Mean of Interior Closure Pours	Mean of Exterior Closure Pours	Mean of Interior Closure Pours
August 20, 2020	4.6	22.3	11.7	83.9
November 19, 2020	7.6	29.3	16.0	89.6
April 13 & 20, 2021	7.6	31.2	17.2	97.1
August 10 & 11, 2021	10.2	35.9	28.4	117.4
November 16 & 18, 2021	10.0	36.1	20.2	115.8
April 5 & 7, 2022	10.6	35.7	23.6	113.8

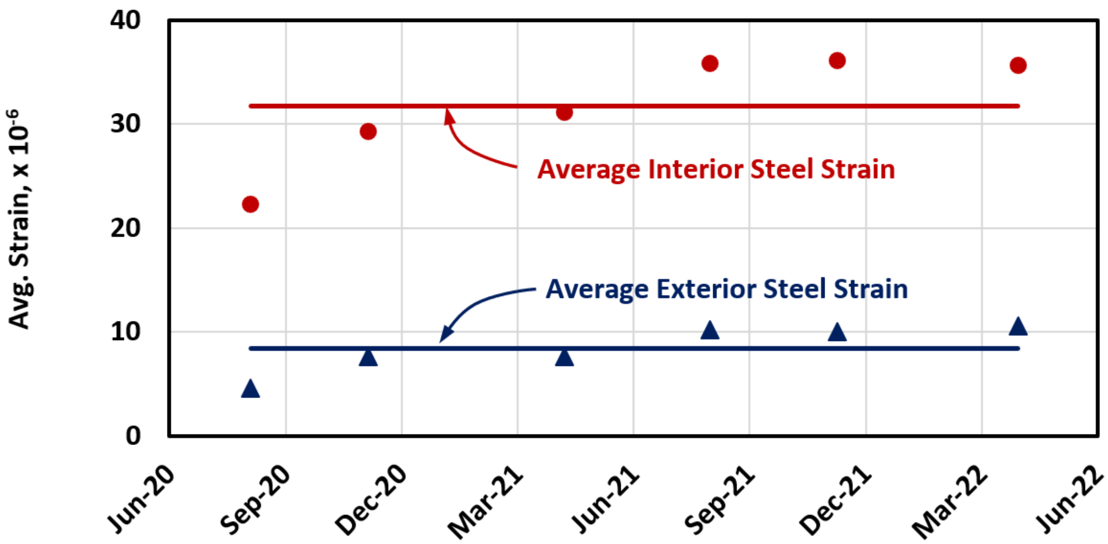

Figure 3-3 Average maximum steel strains in exterior and interior closure pours

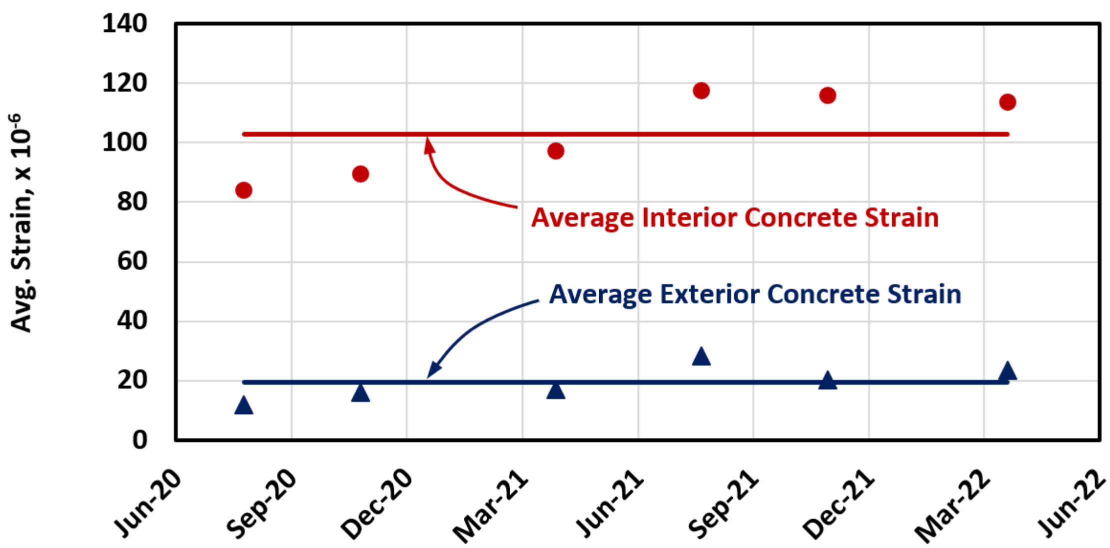

Figure 3-4 Average maximum concrete strains in exterior and interior closure pours

In reviewing the statistics of traffic strain data in Appendix B TablesTable B-4, Table B-7, Table B-10, Table B-13, Table B-16, and Table B-19, it can be seen that the maximum steel rebar strain experienced under the traffic loads is significantly lower than the steel yield strain of 2,069 microstrain. The maximum steel strain is 158 microstrain. On the other hand, the maximum concrete strain at the interface is 551 microstrain which is larger than the Phase 1 laboratory-measured bond strain of 120 microstrain. This indicates that although no visible cracks were present (as it will be discussed in the next section), there could be micro cracks in concrete that cause these larger concrete strains. Also, note that both maximum steel and concrete strains occurred in CP2 under the same 4-axle truck on November 16, 2021; see Tables Table B-14 and Table B-15 for the truck passing over the bridge at 11:51 a.m.

Closure Pour Concrete Inspection

On August 27, 2020, the first inspection of the closure pour concrete was made. Pictures were taken from under the deck from the 16-foot-long platform sections that were installed under the bridge deck. Above each platform, 8-foot deck segments on both sides of the instrumented area were inspected.

Figures C-1 to C-20 in Appendix C show the photographs of the sections. As recommended in the ACI 201.1R-08 Guide, in all photographs a scale is shown to indicate dimension (ACI Committee 201 2008). For the August 27, 2020, the following observations were made:

- The hardness of the closure pour concrete is less than the precast concrete. This can easily be verified with a fingernail test.
- In most locations the closure pour concrete is moved beyond the 10-inch closure width. This is because the concrete forms were not tightly installed. The close-up view in Figure C-1 of Appendix C shows one of these uneven areas at the left interface. The uneven surface made installation of the concrete strain gages more difficult. In some places the concrete had to be grinded to create a flat surface before installation of the concrete gages.
- There were no cracks observed in any of the closure pour concrete or at the interface of closure pour concrete and precast concrete that could be measured with the crack width ruler. However, the data clearly shows that under traffic load and the UBIT loads, the concrete strain exceeds the strain of the interface bond of 120 microstrain.
- There was no moisture present during the inspection. It was also observed that an overlay was placed over the bridge deck. In late 2018 and early 2019 (i.e., during the Phase 2 of this project), when the overlay was not placed yet, the research team observed that moisture was present in some areas. With the presence of the overlay, it is assumed that no moisture can penetrate in the closure pour areas.
- Regularly placed holes (sleeves) with less than an inch in diameter were observed in the precast girders. Concrete is present in some of the holes; for example, see the close-up view in Figure C-8. But others are not completely filled with concrete and at some point, water from the top of the deck has penetrated through these holes, presumably before placement of the overlay. The water marks are shown with yellow arrows labeled with number 1 in most of the photographs of Figures Figure C-1 to Figure C-20.
- There were some water marks at the interface of the closure pour concrete and the precast concrete. It is possible that the same water from the sleeves has caused these water marks. Some of these water marks are shown with red arrows labeled with number 2 in Figures Figure C-1 to Figure C-20.

- It was noticed that in several locations the contractor patched the edges of the closure pour concrete from below (perhaps with concrete epoxy). This may have been necessary when the plywood forms were removed. Some of the patches are shown with blue arrows labeled with number 3 in Figures Figure C-1 to Figure C-20.

On December 1, 2020, the second inspection of the closure pour concrete was made. No cracks were observed. All the other observations made in the first inspection remained the same, except the concrete surface from below appeared damp, most likely due to moisture condensation.

Four more sets of inspections were made approximately every four months at the same times the strain measurements were made. In December 2021, again moisture was present on the surface below the bridge deck. Although photos were taken in all the inspections, not all are presented in this report. In order to compare the first set of inspection photos with the last set, the photos for April 2022 are also included in Appendix C Figures Figure C-21 to Figure C-40. The arrows shown in the first set of inspection photos are not repeated. In all six inspections, no *visible* cracks were observed in any of the closure pour concrete, or at any of the interfaces of closure pour concrete and precast concrete.

4. Summary, Conclusions and Recommendations

The objective of this project was to determine the 20-month field performance of High-Early Strength (HES) Class 50AF concrete with polypropylene fibers as field-cast connection between Deck Bulb-T Girders in SH-36 Bridge over Bear River in Preston, Idaho. The advantages of this alternate material are the reduction in costs and construction time. ITD has been using HES concrete in bridge components for accelerated construction. Two main research questions were: (1) will the strain gage data change over a period of two years indicating deterioration of closure pour concrete?, and (2) will there be any visible cracks or other damages in concrete?

To provide answers to the above research questions, six sets of data under the large UBIT and truck traffic were collected and six inspections were performed. When needed, concrete strain gages were replaced, by placing new gages at the same locations. Compared to results of Phase 2, in this phase both interior closure pours have similar strains, and they are larger than the strains in the exterior closure pours.

Although the thermal strains due to expansion and contraction of the structure were removed from the data, the thermal effects on the stiffness of the material caused fluctuations in UBIT strain data. Removing the effects of the temperature, the strain data under UBIT loading remained somewhat constant. However, no definite conclusions can be made from the truck traffic data.

The inspections and the corresponding photos did not indicate any *visible* cracks in the closure pour concrete or at any of the interfaces. Based on the UBIT loading data and inspection results, it is concluded that there were no changes in the closure pour concrete over a period of 20 months.

There are some recommendations that can be made:

- When placing closure pour concrete, the contractor should follow the construction practices outlined in the ITD's "*Standard Specifications for Highway Construction*" (ITD 2018). In particular, Subsection 501.03 G states that the contractor should clean the construction joint surface and saturate it with water immediately prior to concrete placement.
- In colder weather, the contractor should place heaters under the closure pours while concrete is curing. In the SH-36 bridge, the concrete materials for three of the closure pours (CP2, CP3, and CP4) were placed in November 2018 without any heating source under the joints while CP1 concrete was placed in August 2018.
- In order to examine the longer-term (i.e., several years) performance of the High-Early Strength (HES) Class 50AF concrete with polypropylene fibers, it is recommended to perform a series of laboratory tests (compression, tension, rebar pullout, and interface bond tests) after accelerated aging and corrosion caused by freeze-thaw cycles and chloride penetration.

5. Cited Works

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A. Strain Data under UBIT Loading

Tables A-1 to A-10 summarize the closure pour steel and concrete strain data under UBIT loading for measurements made on December 2020, April 2021, August 2021, December 2021, and April 2022. For repeatability, each table has three loadings referred to as UBIT 1, UBIT 2, and UBIT 3. Each UBIT loading has six different positions denoted by Test 1 to Test 6. The steel and concrete strain data for August 2020 are given in Tables 3-1 and 3-2 of Chapter 3 and are not repeated in this section.

Table A-1 Steel bar strain data (in microstrain) under UBIT loading, December 1, 2020

	CP1 104E-NI	CP1 104E-SI	CP1 105W-NI	CP1 105W-SI	CP2 103E-NI	CP2 103E-SI	CP2 104W-NI	CP2 104W-SI	CP3 102E-NI	CP3 102E-SI	CP3 103W-NI	CP3 103W-SI	CP4 101E-NI	CP4 101E-SI	CP4 102W-NI	CP4 102W-SI
UBIT 1, Test 1	28	26	14	11	8	9	53	44	-5	-5	-8	-7	-1	-1	-1	-2
UBIT 2, Test 1	21	24	15	15	26	8	43	44	-5	-5	-8	-7	-1	-1	-1	-1
UBIT 3, Test 1	19	25	12	15	14	11	44	46	-5	-6	-8	-7	-1	-1	-1	-1
UBIT 1, Test 2	23	20	7	6	25	19	60	55	-5	-4	-7	-7	-1	0	-1	-1
UBIT 2, Test 2	16	15	6	4	39	26	46	41	-5	-5	-8	-7	-1	-1	-1	-1
UBIT 3, Test 2	17	16	5	4	36	26	51	47	-4	-5	-8	-7	-1	-1	-1	-1
UBIT 1, Test 3	-3	-3	2	-2	32	21	48	39	11	13	37	33	-2	-2	-3	-3
UBIT 2, Test 3	-4	-5	-2	-2	37	26	53	47	10	10	39	37	-2	-2	-3	-3
UBIT 3, Test 3	-5	-5	-2	-2	28	22	61	56	8	8	37	35	-2	-2	-3	-4
UBIT 1, Test 4	-2	-2	-1	-2	26	19	13	14	40	37	32	32	-2	-2	-2	-4
UBIT 2, Test 4	-3	-3	-2	-2	35	23	15	14	35	35	37	38	-2	-2	-2	-4
UBIT 3, Test 4	-3	-3	-2	-2	37	24	16	17	33	32	41	40	-2	-2	-3	-3
UBIT 1, Test 5	-1	-1	-1	-1	-4	-4	-6	-6	35	34	39	38	7	9	28	33
UBIT 2, Test 5	0	0	0	0	-4	-4	-6	-5	27	30	47	48	8	7	23	29
UBIT 3, Test 5	-1	-1	-1	-1	-4	-4	-6	-7	35	34	43	40	7	9	26	31
UBIT 1, Test 6	-1	-1	-1	-1	-3	-3	-7	-5	31	29	18	19	15	13	32	32
UBIT 2, Test 6	0	0	0	-1	-3	-3	-6	-5	32	33	14	18	21	17	33	41
UBIT 3, Test 6	-1	-1	-1	-1	-3	-3	-7	-6	36	36	15	18	18	16	37	43

Table A-2 Concrete strain data (in microstrain) under UBIT loading, December 1, 2020

	CP1-CNE	CP1-CSE	CP1-CNW	CP1-CSW	CP2-CNE	CP2-CSE	CP2-CNW	CP2-CSW	CP3-CNE	CP3-CSE	CP3-CNW	CP3-CSW	CP4-CNE	CP4-CSE	CP4-CNW	CP4-CSW
UBIT 1, Test 1	19	18	57	50	122	-	30	18	-12	-13	-9	-8	-2	0	0	0
UBIT 2, Test 1	23	24	51	54	124	-	35	14	-12	-14	-10	-9	-2	0	-1	-1
UBIT 3, Test 1	18	21	51	69	142	-	46	18	-16	-19	-11	-9	-1	0	-1	-1
UBIT 1, Test 2	6	10	45	40	121	-	70	37	-11	-13	-9	-7	-2	0	-1	0
UBIT 2, Test 2	5	8	30	31	93	-	122	50	-13	-14	-10	-9	-2	0	0	0
UBIT 3, Test 2	4	7	34	37	113	-	118	49	-16	-16	-10	-8	-1	0	-1	-1
UBIT 1, Test 3	-3	-2	-6	-7	83	-	90	41	91	76	26	22	-5	-1	-2	-2
UBIT 2, Test 3	-3	-3	-7	-8	109	-	109	46	81	78	30	19	-5	-1	-2	-2
UBIT 3, Test 3	-3	-3	-6	-8	148	-	90	43	69	71	25	16	-6	-1	-2	-2
UBIT 1, Test 4	-2	-2	-5	-5	23	-	76	31	72	69	102	57	-5	-1	-1	-2
UBIT 2, Test 4	-2	-2	-5	-6	33	-	100	42	94	85	89	55	-5	-1	-2	-2
UBIT 3, Test 4	-2	-2	-5	-6	38	-	107	42	106	93	84	53	-6	-1	-2	-2
UBIT 1, Test 5	-1	-1	-2	-2	-13	-	-12	-6	85	80	81	51	63	8	6	8
UBIT 2, Test 5	0	-1	-1	-2	-12	-	-10	-6	94	107	67	48	50	6	6	6
UBIT 3, Test 5	-1	-1	-2	-2	-16	-	-15	-7	104	97	87	56	60	6	5	7
UBIT 1, Test 6	-2	-1	-2	-1	-11	-	-7	-4	29	35	81	42	76	8	17	20
UBIT 2, Test 6	-1	-1	-2	-1	-11	-	-8	-4	29	26	80	52	70	5	17	25
UBIT 3, Test 6	-2	-1	-2	-2	-13	-	-8	-5	27	39	95	56	83	6	16	22

Table A-3 Steel bar strain data (in microstrain) under UBIT loading, April 20, 2021

	CP1	CP1	CP1	CP1	CP2	CP2	CP2	CP2	CP3	CP3	CP3	CP3	CP4	CP4	CP4	CP4
	104E-NI	104E-SI	10W-NI	105W-SI	103E-NI	103E-SI	104W-NI	104W-SI	102E-NI	102E-SI	103W-NI	103W-SI	101E-NI	101E-SI	102W-NI	102W-SI
UBIT 1, Test 1	31	28	14	10	11	12	56	62	-6	-7	-10	-11	-1	-1	-1	-1
UBIT 2, Test 1	20	20	16	12	8	9	39	41	-6	-6	-8	-9	-1	-1	-1	-1
UBIT 3, Test 1	16	21	9	12	17	14	37	47	-5	-6	-7	-8	-1	-1	-1	-1
UBIT 1, Test 2	26	22	8	6	26	22	65	62	-5	-6	-9	-9	-1	-1	-1	-2
UBIT 2, Test 2	14	13	6	4	52	30	40	39	-6	-6	-8	-9	-1	-1	-2	-2
UBIT 3, Test 2	19	18	7	5	47	34	52	50	-6	-6	-8	-9	-1	-1	-1	-2
UBIT 1, Test 3	-4	-4	-2	-2	40	30	55	52	11	10	41	42	-2	-2	-4	-5
UBIT 2, Test 3	-3	-3	-2	-2	30	32	46	58	13	13	31	36	-2	-2	-3	-4
UBIT 3, Test 3	-3	-4	-2	-1	38	40	44	49	15	14	37	44	-2	-2	-3	-4
UBIT 1, Test 4	-3	-3	-2	-2	41	29	13	16	42	40	42	42	-2	-2	-4	-5
UBIT 2, Test 4	-3	-3	-1	-1	38	31	15	13	39	46	38	41	-2	-2	-3	-4
UBIT 3, Test 4	-2	-3	-1	-2	33	28	16	12	34	42	33	38	-2	-2	-3	-4
UBIT 1, Test 5	-1	-1	-1	-1	-6	-5	-7	-8	43	37	38	38	7	10	36	40
UBIT 2, Test 5	-1	-1	-1	-1	-6	-5	-8	-7	34	34	52	50	8	8	28	38
UBIT 3, Test 5	-1	-1	-1	-1	-6	-5	-8	-8	29	27	52	44	5	7	26	31
UBIT 1, Test 6	-1	-1	-1	-1	-5	-4	-7	-8	44	38	25	26	12	13	44	43
UBIT 2, Test 6	-1	-1	-1	-1	-5	-4	-7	-7	43	48	18	21	17	17	42	58
UBIT 3, Test 6	-1	-1	-1	-1	-6	-5	-7	-7	35	32	19	22	14	12	37	38

Table A-4 Concrete strain data (in microstrain) under UBIT loading, April 20, 2021

	CP1-CNE	CP1-CSE	CP1-CNW	CP1-CSW	CP2-CNE	CP2-CSE	CP2-CNW	CP2-CSW	CP3-CNE	CP3-CSE	CP3-CNW	CP3-CSW	CP4-CNE	CP4-CSE	CP4-CNW	CP4-CSW
UBIT 1, Test 1	16	17	63	52	201	-	37	26	-19	-20	-17	-11	-2	-1	-1	-1
UBIT 2, Test 1	30	21	44	43	128	-	24	16	-17	-19	-16	-11	-3	-1	-1	-1
UBIT 3, Test 1	15	16	42	72	155	-	44	15	-16	-18	-15	-10	-2	0	-1	-1
UBIT 1, Test 2	7	10	50	42	179	-	71	43	-17	-19	-15	-10	-3	-1	-1	-2
UBIT 2, Test 2	5	7	28	29	116	-	130	53	-18	-19	-16	-11	-3	-1	-1	-1
UBIT 3, Test 2	5	8	39	40	151	-	127	45	-18	-19	-16	-11	-3	-1	-1	-1
UBIT 1, Test 3	-3	-3	-7	-8	154	-	101	52	98	105	41	23	-8	-1	-2	-2
UBIT 2, Test 3	-3	-3	-7	-8	187	-	83	34	70	87	40	20	-7	-1	-2	-2
UBIT 3, Test 3	-3	-3	-7	-9	155	-	125	43	83	109	52	25	-8	-1	-2	-2
UBIT 1, Test 4	-3	-2	-5	-6	45	-	96	46	119	100	126	76	-8	-1	-2	-2
UBIT 2, Test 4	-2	-2	-4	-6	36	-	96	41	91	104	115	98	-7	-1	-2	-2
UBIT 3, Test 4	-3	-2	-5	-6	35	-	90	33	79	89	99	101	-7	-1	-2	-2
UBIT 1, Test 5	-1	-1	-2	-2	-22	-	-16	-8	110	94	132	67	95	5	6	10
UBIT 2, Test 5	-2	-1	-2	-2	-22	-	-16	-7	125	138	101	69	70	3	6	7
UBIT 3, Test 5	-1	-1	-2	-2	-24	-	-16	-8	174	126	87	55	67	4	5	8
UBIT 1, Test 6	-1	-1	-2	-2	-17	-	-12	-6	51	59	139	68	120	5	12	18
UBIT 2, Test 6	-1	-1	-2	-2	-18	-	-11	-7	52	50	125	98	95	3	13	16
UBIT 3, Test 6	-1	-1	-2	-2	-19	-	-14	-7	44	50	128	59	105	4	17	20

Table A-5 Steel bar strain data (in microstrain) under UBIT loading, August 24, 2021

	CP1	CP1	CP1	CP1	CP2	CP2	CP2	CP2	CP3	CP3	CP3	CP3	CP4	CP4	CP4	CP4
	104E-NI	104E-SI	105W-NI	105W-SI	103E-NI	103E-SI	104W-NI	104W-SI	102E-NI	102E-SI	103W-NI	103W-SI	101E-NI	101E-SI	102W-NI	102W-SI
UBIT 1, Test 1	27	31	15	12	10	11	49	50	-6	-7	-10	-10	-1	-1	-1	-2
UBIT 2, Test 1	23	30	13	15	13	11	44	50	-6	-7	-9	-10	-1	-1	-2	-2
UBIT 3, Test 1	24	32	12	13	14	13	44	52	-6	-7	-9	-10	-1	-1	-2	-2
UBIT 1, Test 2	17	18	6	4	47	27	46	42	-6	-7	-10	-11	-1	-1	-1	-2
UBIT 2, Test 2	19	19	6	4	43	29	53	48	-6	-7	-9	-11	-1	-1	-2	-2
UBIT 3, Test 2	21	22	5	4	38	28	56	54	-7	-7	-9	-10	-1	-1	-1	-2
UBIT 1, Test 3	-4	-4	-2	-2	34	32	51	57	11	10	33	39	-2	-2	-4	-6
UBIT 2, Test 3	-4	-3	-1	-1	46	37	50	47	12	12	42	48	-1	-1	-3	-6
UBIT 3, Test 3	-4	-4	-2	-2	34	26	62	55	10	10	37	38	-2	-2	-4	-6
UBIT 1, Test 4	-3	-4	-2	-2	39	24	12	11	42	46	40	42	-2	-2	-5	-6
UBIT 2, Test 4	-3	-3	-1	-1	35	21	14	15	46	43	36	36	-2	-2	-5	-6
UBIT 3, Test 4	-3	-3	-1	-1	38	22	14	14	44	43	40	39	-2	-2	-4	-5
UBIT 1, Test 5	-1	-1	-1	-1	-7	-4	-8	-9	20	21	57	52	5	7	24	30
UBIT 2, Test 5	-1	-1	-1	-1	-7	-5	-8	-8	29	28	52	47	5	8	29	34
UBIT 3, Test 5	-1	-1	-1	-1	-6	-5	-8	-9	21	20	59	64	5	6	24	28
UBIT 1, Test 6	-1	-1	-1	-1	-6	-5	-9	-9	42	43	15	21	18	16	50	54
UBIT 2, Test 6	-1	-1	-1	-1	-5	-3	-8	-8	38	38	16	20	18	16	47	50
UBIT 3, Test 6	-1	-1	-1	-1	-6	-4	-8	-9	36	34	16	20	18	15	41	45

Table A-6 Concrete strain data (in microstrain) under UBIT loading, August 24, 2021

	CP1-CNE	CP1-CSE	CP1-CNW	CP1-CSW	CP2-CNE	CP2-CSE	CP2-CNW	CP2-CSW	CP3-CNE	CP3-CSE	CP3-CNW	CP3-CSW	CP4-CNE	CP4-CSE	CP4-CNW	CP4-CSW
UBIT 1, Test 1	24	24	75	72	165	154	44	25	-19	-22	-19	-14	-3	-1	-1	-1
UBIT 2, Test 1	22	26	71	87	156	159	45	19	-20	-27	-20	-14	-3	0	-1	-1
UBIT 3, Test 1	20	22	77	95	185	198	52	19	-21	-23	-21	-15	-3	0	-1	-1
UBIT 1, Test 2	6	9	40	44	112	113	159	70	-19	-21	-18	-14	-4	0	-1	-1
UBIT 2, Test 2	6	9	45	50	129	128	148	66	-20	-22	-19	-13	-4	0	-1	-1
UBIT 3, Test 2	6	9	51	57	151	151	147	64	-20	-22	-19	-14	-3	-1	-1	-1
UBIT 1, Test 3	-3	-3	-9	-10	162	170	127	58	80	103	42	19	-10	-1	-2	-2
UBIT 2, Test 3	-3	-2	-7	-9	126	131	172	74	102	126	51	27	-7	-1	-1	-2
UBIT 3, Test 3	-3	-3	-9	-12	154	150	122	55	101	101	36	30	-11	0	-2	-3
UBIT 1, Test 4	-3	-3	-7	-8	29	37	130	55	103	111	138	102	-11	-1	-2	-3
UBIT 2, Test 4	-3	-2	-6	-8	39	45	110	47	95	93	172	91	-10	-1	-2	-3
UBIT 3, Test 4	-2	-2	-7	-7	38	46	123	50	107	108	149	98	-10	0	-2	-2
UBIT 1, Test 5	-1	-1	-2	-3	-24	-24	-24	-12	162	146	67	53	64	2	4	7
UBIT 2, Test 5	-1	-1	-2	-3	-23	-22	-22	-10	159	131	92	66	76	3	6	9
UBIT 3, Test 5	-1	-1	-2	-2	-25	-25	-23	-11	131	177	72	48	61	0	5	6
UBIT 1, Test 6	-1	-1	-2	-3	-20	-20	-18	-10	40	49	142	82	127	2	18	24
UBIT 2, Test 6	-1	-1	-2	-3	-19	-19	-16	-8	37	47	134	77	123	2	21	25
UBIT 3, Test 6	-1	-1	-2	-2	-18	-21	-8	-8	34	43	124	70	112	3	23	25

Table A-7 Steel bar strain data (in microstrain) under UBIT loading, December 2, 2021

	CP1 104E-NI	CP1 104E-SI	CP1 105W-NI	CP1 105W-SI	CP2 103E-NI	CP2 103E-SI	CP2 104W-NI	CP2 104W-SI	CP3 102E-NI	CP3 102E-SI	CP3 103W-NI	CP3 103W-SI	CP4 101E-NI	CP4 101E-SI	CP4 102W-NI	CP4 102W-SI
UBIT 1, Test 1	21	29	16	16	12	12	36	38	-5	-5	-8	-8	-1	-1	-1	-2
UBIT 2, Test 1	23	31	15	13	14	14	41	43	-5	-6	-9	-9	-1	-1	-1	-1
UBIT 3, Test 1	22	34	12	14	17	15	42	48	-5	-5	-7	-9	-1	-1	-1	-1
UBIT 1, Test 2	17	17	6	5	43	32	43	36	-4	-5	-9	-8	-1	-1	-1	-1
UBIT 2, Test 2	19	18	7	5	40	28	47	38	-5	-5	-9	-8	-1	-1	-1	-1
UBIT 3, Test 2	17	18	5	5	47	35	44	40	-4	-5	-8	-9	-1	-1	-1	-1
UBIT 1, Test 3	-3	-4	-2	-2	33	30	51	52	7	7	29	31	-2	-2	-3	-3
UBIT 2, Test 3	-3	-4	-2	-2	27	24	61	46	7	8	25	25	-2	-2	-2	-3
UBIT 3, Test 3	-3	-4	-1	-2	26	22	58	45	7	8	26	25	-2	-2	-3	-3
UBIT 1, Test 4	-3	-3	-2	-2	41	28	8	8	35	37	37	37	-2	-2	-3	-3
UBIT 2, Test 4	-2	-3	-1	-2	38	24	9	10	40	37	32	33	-2	-2	-3	-3
UBIT 3, Test 4	-3	-3	-1	-1	42	26	12	13	36	32	39	34	-1	-2	-3	-3
UBIT 1, Test 5	-1	-1	-1	-1	-4	-4	-6	-6	31	28	38	36	6	10	26	28
UBIT 2, Test 5	-1	-1	-1	-1	-5	-4	-5	-6	26	25	43	38	5	9	23	26
UBIT 3, Test 5	-1	-1	-1	-1	-5	-4	-5	-6	27	26	44	39	6	9	23	27
UBIT 1, Test 6	-1	-1	-1	-1	-4	-4	-6	-5	31	30	15	19	17	15	33	36
UBIT 2, Test 6	-1	-1	-1	-1	-5	-4	-5	-5	40	39	15	19	18	17	39	48
UBIT 3, Test 6	-1	-1	-1	-1	-4	-4	-6	-5	35	33	17	21	15	14	39	40

Table A-8 Concrete strain data (in microstrain) under UBIT loading, December 2, 2021

	CP1-CNE	CP1-CSE	CP1-CNW	CP1-CSW	CP2-CNE	CP2-CSE	CP2-CNW	CP2-CSW	CP3-CNE	CP3-CSE	CP3-CNW	CP3-CSW	CP4-CNE	CP4-CSE	CP4-CNW	CP4-CSW
UBIT 1, Test 1	23	23	50	52	110	111	46	26	-12	-15	-10	-7	-2	-0.5	-1	-1
UBIT 2, Test 1	21	20	56	53	124	125	54	31	-13	-16	-11	-9	-2	0	-1	-1
UBIT 3, Test 1	19	18	59	66	141	152	60	31	-14	-16	-11	-8	-2	-1	-1	-1
UBIT 1, Test 2	5	8	30	31	81	84	150	78	-12	-15	-10	-7	-2	-0.5	-1	-1
UBIT 2, Test 2	5	8	34	31	91	93	133	72	-13	-16	-8	-8	-3	-1	-1	-1
UBIT 3, Test 2	5	7	32	36	97	104	167	86	-13	-16	-11	-8	-2	-1	-1	-1
UBIT 1, Test 3	-2	-2	-6	-7	130	131	112	65	53	64	23	12	-5	-1	-2	-2
UBIT 2, Test 3	-3	-2	-6	-8	121	117	99	59	50	54	16	16	-5	-1	-2	-2
UBIT 3, Test 3	-2	-2	-7	-8	120	117	94	54	52	53	15	17	-5	-1	-2	-2
UBIT 1, Test 4	-2	-2	-5	-5	15	23	132	68	73	82	82	64	-5	-1	-2	-2
UBIT 2, Test 4	-2	-1	-4	-5	20	28	116	60	71	72	111	62	-5	-1	-2	-2
UBIT 3, Test 4	-2	-2	-5	-5	29	37	123	64	87	78	95	55	-6	-1	-2	-2
UBIT 1, Test 5	-1	-1	-2	-2	-13	-14	-17	-10	93	81	74	46	59	8	6	9
UBIT 2, Test 5	-1	-1	-1	-2	-11	-11	-17	-10	114	94	61	44	49	7	6	8
UBIT 3, Test 5	-1	-1	-2	-2	-15	-15	-17	-9	114	94	66	46	52	7	6	8
UBIT 1, Test 6	-1	-1	-2	-2	-11	-12	-13	-7	26	36	82	47	75	8	20	21
UBIT 2, Test 6	-1	-1	-2	-2	-11	-11	-13	-7	32	38	91	65	76	7	16	19
UBIT 3, Test 6	-1	-1	-2	-2	-11	-12	-13	-8	31	42	103	54	91	8	17	19

Table A-9 Steel bar strain data (in microstrain) under UBIT loading, April 14, 2022

	CP1 104E-NI	CP1 104E-SI	CP1 105W-NI	CP1 105W-SI	CP2 103E-NI	CP2 103E-SI	CP2 104W-NI	CP2 104W-SI	CP3 102E-NI	CP3 102E-SI	CP3 103W-NI	CP3 103W-SI	CP4 101E-NI	CP4 101E-SI	CP4 102W-NI	CP4 102W-SI
UBIT 1, Test 1	20	28	15	17	12	12	40	43	-6	-6	-6	-10	-1	-1	-1	-2
UBIT 2, Test 1	17	26	13	16	15	12	38	41	-6	-6	-9	-9	-1	-1	-1	-2
UBIT 3, Test 1	21	30	14	16	12	12	42	46	-6	-7	-10	-6	-1	-1	-2	-1
UBIT 1, Test 2	16	16	5	5	46	36	45	42	-6	-6	-9	-9	-1	-1	-1	-2
UBIT 2, Test 2	16	22	5	6	32	30	46	52	-6	-6	-9	-9	-1	-1	-1	-2
UBIT 3, Test 2	21	20	7	5	35	24	56	49	-7	-5	-10	-10	-1	-1	-1	-2
UBIT 1, Test 3	-3	-4	-2	-2	42	38	39	40	16	13	36	47	-2	-2	-4	-5
UBIT 2, Test 3	-4	-4	-1	-2	32	26	57	56	11	9	31	36	-2	-2	-4	-5
UBIT 3, Test 3	-4	-4	-2	-2	32	26	57	53	11	9	32	37	-2	-2	-3	-4
UBIT 1, Test 4	-3	-3	-2	-2	47	25	17	20	34	27	43	40	-2	-2	-3	-4
UBIT 2, Test 4	-3	-3	-1	-2	41	24	17	20	42	32	42	39	-2	-2	-4	-4
UBIT 3, Test 4	-3	-3	-2	-2	42	22	22	24	32	26	42	37	-2	-2	-3	-4
UBIT 1, Test 5	-1	-1	-1	-1	-6	-5	-7	-7	43	33	42	40	8	10	30	35
UBIT 2, Test 5	-2	-1	-1	-1	-6	-4	-7	-7	45	36	41	40	8	10	30	37
UBIT 3, Test 5	-1	-1	-1	-1	-6	-4	-7	-7	42	34	43	44	8	9	28	34
UBIT 1, Test 6	-1	-1	-1	-1	-5	-4	-7	-7	37	36	13	18	23	19	39	47
UBIT 2, Test 6	-1	-1	-1	-1	-5	-5	-7	-7	44	47	15	21	18	17	46	53
UBIT 3, Test 6	-1	-1	-1	-1	-5	-4	-7	-7	43	38	10	21	18	17	46	50

Table A-10 Concrete strain data (in microstrain) under UBIT loading, April 14, 2022

	CP1-CNE	CP1-CSE	CP1-CNW	CP1-CSW	CP2-CNE	CP2-CSE	CP2-CNW	CP2-CSW	CP3-CNE	CP3-CSE	CP3-CNW	CP3-CSW	CP4-CNE	CP4-CSE	CP4-CNW	CP4-CSW
UBIT 1, Test 1	21	23	44	53	131	139	40	23	-16	-18	-14	-10	-3	-1	-1	-1
UBIT 2, Test 1	18	22	40	60	136	150	41	20	-16	-17	-15	-10	-3	-1	-1	-1
UBIT 3, Test 1	20	21	50	57	147	156	38	20	-15	-17	-14	-10	-3	-1	-1	-1
UBIT 1, Test 2	5	6	26	32	111	111	147	76	-15	-15	-13	-9	-3	-1	-1	-1
UBIT 2, Test 2	9	6	35	46	158	172	106	60	-14	-15	-13	-10	-3	-1	-1	-1
UBIT 3, Test 2	5	8	35	34	136	140	103	58	-15	-15	-13	-10	-3	-1	-2	-1
UBIT 1, Test 3	-2	-2	-5	-7	100	114	141	76	69	92	41	18	-7	-1	-2	-2
UBIT 2, Test 3	-3	-2	-6	-7	155	155	103	60	71	71	30	17	-7	-2	-2	-2
UBIT 3, Test 3	-3	-3	-6	-8	150	152	102	53	74	76	31	19	-7	-2	-2	-3
UBIT 1, Test 4	-3	-2	-5	-5	46	56	121	62	113	88	72	51	-6	-1	-2	-2
UBIT 2, Test 4	-3	-2	-5	-5	46	54	105	55	106	85	94	59	-7	-1	-3	-2
UBIT 3, Test 4	-3	-2	-5	-5	53	68	106	68	127	86	68	49	-7	-1	-2	-3
UBIT 1, Test 5	-1	-1	-2	-2	-19	-21	-19	-11	99	87	91	58	66	7	7	8
UBIT 2, Test 5	-1	-1	-1	-1	-20	-22	-17	-10	92	88	100	64	70	6	7	8
UBIT 3, Test 5	-1	-1	-2	-2	-23	-24	-18	-10	108	100	92	62	64	5	7	6
UBIT 1, Test 6	-1	-1	-2	-2	-15	-16	-11	-8	29	35	91	60	82	5	19	26
UBIT 2, Test 6	-1	-1	-2	-2	-15	-16	-13	-8	36	41	112	74	94	6	16	19
UBIT 3, Test 6	-1	-1	-2	-2	-17	-17	-14	-8	34	41	118	68	99	6	17	21

B. Strain Data under Truck Traffic Loading

Table B-1 Example data sheet used for truck traffic

Time (hour, minute)	Type of Vehicle[1]	No. of Axels	Eastbound	Westbound	Picture of Vehicle	Notes[2]

[1] Examples of vehicle types: pickup and trailer, dump truck, tractor-trailer (big rig or eighteen-wheeler), cement mixer, flatbed (for logging or transporting lumber), tanker (for carrying liquids), refrigerator truck (for grocery stores and food manufacturers).

[2] Examples of notes: horse trailer, empty trailer, trailer carrying hay bales, dump truck carrying gravel.

Table B-2 Max. steel strain data (in microstrain) under truck traffic loading, August 20, 2020

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
8:47 AM	4	E	3	104E-SI	17	103E-NI	-3	103W-SI	-1	102W-SI
8:57 AM	4	E	2	104E-SI	12	103E-NI	-2	103W-NI	-1	102W-SI
9:01 AM	5	W	-3	104E-NI	-3	103E-NI	25	103W-SI	6	102W-SI
9:11 AM	4	E	4	104E-SI	42	103E-NI	-9	103W-SI	-5	102W-SI
9:15 AM	3	W	-3	104E-SI	-6	103E-NI	21	103W-SI	6	102W-SI
9:28 AM	5	E	1	104E-SI	5	103E-NI	-1	103W-SI	-1	102W-SI
9:31 AM	4	W	-1	104E-SI	-4	103E-NI	16	103W-SI	4	102W-SI
9:33 AM	6	E	7	104E-SI	58	103E-NI	-16	103W-SI	-5	102W-SI
9:38 AM	3	W	-1	104E-SI	-1	103E-NI	14	103W-SI	3	102W-SI
9:38 AM	4	W	-1	104E-SI	-3	103E-NI	14	103W-SI	3	102W-SI
9:40 AM	4	W	-1	104E-NI	-1	103E-NI	13	103W-SI	3	102W-SI
9:41 AM	5	W	-2	104E-SI	-7	103W-NI	29	103W-SI	8	102W-SI
9:52 AM	3	E	3	104E-SI	21	104W-NI	-6	103W-SI	-3	102W-SI
9:58 AM	3	E	3	104E-SI	14	104W-NI	-3	103W-SI	-1	102W-SI
10:00 AM	5	E	16	104E-SI	40	104W-NI	-12	103W-SI	-3	102-W-SI
10:05 AM	4	W	-1	104E-NI	-6	104W-NI	30	103W-SI	7	102-W-SI
10:05 AM	3	E	4	104E-SI	36	104W-NI	-9	103W-SI	-3	102-W-SI
10:14 AM	4	E	2	104E-SI	10	104W-SI	-2	103W-SI	-1	102-W-S
10:31 AM	4	E	3	104E-SI	12	104W-SI	-3	104W-SI	-2	102-W-SI
10:31 AM	3	E	2	104E-SI	12	104W-SI	-2	104W-SI	-1	102-W-SI
10:32 AM	3	E	2	104E-SI	8	102-W-SI	-2	102-W-SI	-1	102-W-SI
10:44 AM	4	W	-1	104E-S	-2	102-W-SI	11	102-W-SI	3	102-W-SI
11:04 AM	3	E	1	103E-SI	7	104W-SI	-2	103W-NI	-1	102W-SI
11:05 AM	3	W	-1	103E-SI	-1	104W-SI	8	103W-NI	1	102W-SI
11:15 AM	3	E	10	103E-SI	85	104W-SI	-27	103W-NI	-8	102W-SI
11:18 AM	3	E	1	103E-SI	10	104W-SI	-1	103W-NI	-2	102W-SI
11:20 AM	3	E	1	103E-SI	12	104W-SI	-2	103 W-SI	-1	102W-SI
11:49 AM	4	E	2	104-ENI	13	104-WNI	-3	103-WSI	-1	102-WSI
12:00 PM	4	E	1	104-ESI	9	104-WNI	-2	103-WSI	-1	102-WSI
12:08 PM	2	W	-2	104-ESI	-9	104-WNI	42	103-WSI	12	102-WSI
12:08 PM	4	W	-1	104-ESI	-5	104-WNI	27	103-WSI	8	102-WSI
12:14 PM	4	E	2	104-ESI	15	104-WNI	-2	103-WSI	-2	102-WSI
12:15 PM	3	W	-1	104-ESI	-3	104-WNI	13	103-WSI	9	102-WSI
12:26 PM	2	E	2	104-ESI	13	104-WNI	-4	103-WSI	-1	102-WSI
12:33 PM	2	E	1	104-ESI	17	104-WNI	-3	103-WSI	-2	102-WSI
12:37 PM	4	E	2	104-ESI	12	104-WNI	-3	103-WNI	-2	102-WSI
12:41 PM	2	E	2	104-ESI	17	104-WNI	-3	103-WNI	-2	102-WSI
12:43 PM	2	E	1	104-ESI	12	104-WNI	-2	103-WNI	-1	102-WSI
12:46 PM	4	W	-1	104-ESI	-2	104-WNI	16	103-WSI	4	102-WSI
1:22 PM	2	W	-1	104-ENI	-2	104-WSI	11	103-WSI	3	102-WSI
1:26 PM	3	E	4	104-ENI	29	103-WNI	-6	103-WSI	-3	102-WSI
1:27 PM	4	E	4	104-ENI	17	103-WNI	-4	103-WSI	-2	102-WSI
1:29 PM	3	W	-1	104-ENI	-3	104-WSI	11	103-WSI	2	102-WSI
1:33 PM	5	E	6	104-ENI	63	104-WSI	-4	103-WSI	-9	102-WSI
1:34 PM	7	W	-3	104-ENI	-4	104-WSI	25	103-WSI	7	102-WSI
1:35 PM	3	E	7	104-ENI	60	104-WSI	-15	103-WSI	-5	102-WSI
1:48 PM	5	W	-3	104-ENI	-8	104-WSI	44	103-WSI	14	102-WSI
1:52 PM	5	E	10	104-ENI	57	104-WSI	-16	103-WSI	-5	102-WSI
1:52 PM	3	E	3	104-ENI	26	104-WSI	-6	103-WSI	-3	102-WSI
1:59 PM	2	W	-1	104-ENI	-2	104-WSI	11	103-WSI	1	103-WSI

Table B-3 Max. concrete strain data (in microstrain) under truck traffic loading, August 20, 2020

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
8:47 AM	4	E	7	SW	69	NW	-7	SE	-3	NE
8:57 AM	4	E	4	SW	42	NW	-4	NE	-2	NE
9:01 AM	5	W	-6	SW	-11	NW	53	NE	12	NE
9:11 AM	4	E	11	SW	199	NW	-18	NE	-5	NE
9:15 AM	3	W	-6	SW	-12	NW	46	NE	11	NE
9:28 AM	5	E	1	SW	17	NW	-2	NE	-1	NE
9:31 AM	4	W	-3	SW	-6	NW	31	NE	7	NE
9:33 AM	6	E	15	SW	262	NW	-31	NE	-8	NE
9:38 AM	3	W	-1	SW	-3	NW	32	NE	6	NE
9:38 AM	4	W	-3	SW	-3	NW	32	NE	6	NE
9:40 AM	4	W	-2	SW	-5	NW	30	NE	7	NE
9:41 AM	5	W	-5	SW	-13	SE	77	NE	17	NE
9:52 AM	3	E	5	SW	107	NW	-11	NW	-5	NE
9:58 AM	3	E	6	SW	22	NW	-5	NW	-1	NE
10:00 AM	5	E	43	SW	100	NW	-25	NW	-6	NE
10:05 AM	4	W	-4	SW	-12	NW	77	NW	14	NE
10:05 AM	3	E	10	SW	166	NW	-19	NW	-7	NE
10:14 AM	4	E	5	SW	40	NW	-3	NW	-3	NE
10:31 AM	4	E	7	SW	53	NW	-6	NW	-4	NE
10:31 AM	3	E	6	SW	43	NW	-5	NW	-2	NE
10:32 AM	3	E	3	SW	35	NW	-5	NW	-1	NE
10:44 AM	4	W	-1	SW	-3	NW	24	NW	5	NE
11:04 AM	3	E	3	SW	21	NW	-3	NE	-2	NE
11:05 AM	3	W	-2	SW	-2	NW	19	NE	3	NE
11:15 AM	3	E	30	SW	378	NW	-68	NE	-14	NE
11:18 AM	3	E	4	SW	33	NW	-3	NE	-2	NE
11:20 AM	3	E	4	SW	33	NW	-4	NE	-3	NE
11:49 AM	4	E	4	SW	59	NW	-8	NE	-3	NE
12:00 PM	4	E	2	SW	33	NW	-4	NE	-2	NE
12:08 PM	2	W	-7	SW	-30	NW	252	NE	27	NE
12:08 PM	4	W	-3	SW	-9	NW	104	NE	18	NE
12:14 PM	4	E	5	SW	55	NW	-4	NE	-4	NE
12:15 PM	3	W	-3	SW	-8	NW	51	NE	23	NE
12:26 PM	2	E	4	SW	60	NW	-8	NE	-3	NE
12:33 PM	2	E	4	SW	56	NW	-7	NW	-3	NE
12:37 PM	4	E	6	SW	56	NW	-6	NW	-3	NE
12:41 PM	2	E	5	SW	54	NW	-8	NW	-4	NE
12:43 PM	2	E	3	SW	47	NW	-6	NW	-3	NE
12:46 PM	4	W	-4	SW	-5	NW	101	NE	52	NE
1:22 PM	2	W	-3	SW	-5	SE	69	NE	6	NE
1:26 PM	3	E	10	SW	100	SE	-8	NE	-4	NE
1:27 PM	4	E	9	SW	49	NE	-8	NE	-4	NE
1:29 PM	3	W	-2	SW	-7	SE	63	NE	5	NE
1:33 PM	5	E	14	SW	208	SE	-10	NE	-18	NE
1:34 PM	7	W	-7	SW	-10	SE	132	NE	16	NE
1:35 PM	3	E	16	SW	187	SE	-46	NE	-10	NE
1:48 PM	5	W	-8	SW	-22	SE	234	NE	32	NE
1:52 PM	5	E	24	SW	208	SE	-44	NE	-11	NE
1:52 PM	3	E	10	SW	79	SE	-13	NE	-6	NE
1:59 PM	2	W	-1	SW	-5	SE	50	NE	5	NE

Table B-4 Statistics of maximum steel and concrete strain data (in microstrain) under truck traffic loading, August 20, 2020

	CP1 Steel	CP2 Steel	CP3 Steel	CP4 Steel	CP1 Concrete	CP2 Concrete	CP3 Concrete	CP4 Concrete
Average Positive	3.6	24.5	20.1	5.5	9.0	92.6	77.7	14.3
Average Negative	-1.5	-3.8	-5.6	-2.5	-3.7	-9.0	-12.9	-4.7
Maximum Positive	16	85	44	14	43	378	252	52
Maximum Negative	-3	-9	-27	-9	-8	-30	-68	-18
Std Dev (positive values)	3.4	20.4	10.6	3.6	9.0	84.5	65.6	12.3
Std Dev (negative values)	0.8	2.4	5.9	2.1	2.2	7.0	15.2	3.9

Table B-5 Max. steel strain data (in microstrain) under truck traffic loading, November 19, 2020

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
9:55:00 AM	5	E	14	104-ENI	52	104-WNI	-11	103-WSI	-5	102-WSI
10:08:19 AM	5	W	-4	104-ESI	-13	104-WNI	82	103-WSI	22	102-WSI
10:13:25 AM	2	E	2	104-ESI	20	104-WNI	-2	103-WSI	-1	102-WSI
10:13:36 AM	2	E	7	104-ESI	17	104-WNI	-3	103-WSI	-1	102-WSI
10:17:30 AM	2	W	-2	104-ENI	-6	104-WNI	46	103-WSI	11	102-WSI
10:18:16 AM	4	W	-1	104-ESI	-3	104-WNI	11	103-WSI	6	102-WSI
10:21:43 AM	3	E	33	104-ESI	67	104-WNI	-15	103-WSI	-2	102-WSI
10:24:06 AM	3	W	-1	104-ESI	-4	104-WNI	22	103-WSI	18	102-WSI
10:26:38 AM	2	E	2	104-ENI	17	104-WNI	-4	103-WSI	-1	102-WSI
10:28:53 AM	4	E	2	104-ENI	17	104-WNI	-2	103-WSI	-1	102-WSI
10:29:36 AM	4	E	3	104-ENI	23	104-WNI	-2	103-WSI	-2	102-WSI
10:31:25 AM	3	W	-3	104-ESI	-20	104-WNI	68	103-WSI	35	102-WSI
10:31:33 AM	4	W	-1	104-ESI	-3	104-WNI	23	103-WSI	5	102-WSI
10:33:03 AM	5	W	-1	104-ESI	-5	104-WNI	29	103-WSI	6	102-WSI
10:38:15 AM	4	W	-1	104-ESI	-3	104-WNI	14	103-WSI	3	102-WSI
10:40:48 AM	5	E	4	104-ESI	27	104-WNI	-4	103-WSI	-2	102-WSI
10:41:56 AM	2	W	-1	104-ESI	-4	104-WNI	31	103-WSI	5	102-WSI
10:42:02 AM	2	W	-3	104-ESI	-7	104-WNI	35	103-WSI	13	102-WSI
10:43:01 AM	5	E	14	104-ENI	67	104-WNI	-15	103-WSI	-5	102-WSI
10:49:33 AM	3	W	-1	104-ESI	-1	104-WNI	11	103-WSI	3	102-WSI
10:51:33 AM	3	W	-1	104-ESI	-7	104-WNI	41	103-WSI	12	102-WSI
11:06:20 AM	2	E	7	104-ESI	48	104-WSI	-11	103-WNI	-3	102-WSI
11:09:10 AM	2	E	3	104-ENI	27	104-WNI	-5	103-WNI	-2	102-WSI
11:09:45 AM	4	E	4	104-ENI	16	104-WNI	-2	103-WSI	-2	102-WSI
11:11:15 AM	4	E	3	104-ESI	13	104-WNI	-2	103-WSI	-1	102-WSI
11:12:18 AM	2	E	1	104-ESI	7	104-WNI	-1	103-WSI	-1	102-WSI
11:19:25 AM	4	E	2	104-ESI	9	104-WNI	-1	103-WSI	-1	102-WSI
11:27:21 AM	5	E	5	104-ENI	31	104-WNI	-8	103-WNI	-3	102-WSI
11:36:22 AM	3	E	17	104-ESI	81	104-WNI	-19	103-WNI	-6	102-WSI
11:41:50 AM	4	E	1	104-ESI	10	104-WNI	-2	103-WNI	-1	102-WSI
11:54:00 AM	4	E	5	104-ESI	17	104-WNI	-2	103-WSI	-2	102-WSI
11:56:54 AM	2	W	-2	104-ESI	-4	104-WSI	17	103-WSI	3	102-WSI
11:57:00 AM	4	E	1	104-ESI	12	104-WNI	-22	104-WNI	-1	102-WSI
12:25:32PM	5	W	-5	104-ENI	-14	104-WNI	78	103-WSI	23	102-WSI
12:28:08PM	2	E	5	104-ENI	40	104-WSI	-5	103-WSI	-1	102-WSI
12:30:21PM	3	W	-1	104-ENI	-2	104-WSI	8	104-WNI	2	102-WSI
12:33:26PM	4	W	-1	104-ENI	-3	104-WSI	18	104-WNI	3	102-WSI
12:34:54PM	2	W	-1	104-ENI	-3	104-WSI	10	104-WNI	2	102-WNI
12:37:44PM	3	E	18	104-ENI	97	104-WNI	-20	103-WSI	-7	102-WSI
12:42:57PM	4	E	6	104-ENI	21	104-WNI	-3	103-WSI	-1	102-WSI
12:46:56PM	3	E	3	104-ESI	27	104-WNI	-2	103-WSI	-1	102-WSI
12:50:18PM	5	E	4	104-ENI	32	104-WNI	-5	103-WSI	-3	102-WSI
12:51:16PM	4	E	3	104-ENI	13	104-WNI	-2	103-WSI	-1	102-WSI
12:56:14PM	2	E	5	104-ENI	24	104-WNI	-4	103-WSI	-1	102-WSI
12:58:16PM	2	E	5	104-ENI	24	104-WNI	-3	103-WSI	-1	102-WSI
1:19:04 PM	2	W	-1	104-ENI	-4	104-WNI	17	103-WSI	6	102-WSI
1:23:09 PM	2	E	4	104-ENI	26	104-WSI	-4	103-WNI	-3	102-WSI
1:31:35 PM	2	W	-1	104-ENI	-5	104-WNI	39	103-WSI	12	102-WSI
1:36:34 PM	4	W	-1	104-ENI	-3	104-WNI	10	103-WSI	6	102-WSI
1:37:46 PM	5	W	-2	104-ENI	-5	104-WNI	30	103-WNI	1	102-WSI
1:45:51 PM	4	E	3	104-ENI	11	104-WSI	-1	103-WNI	-2	102-WSI
1:48:48 PM	2	W	-1	104-ENI	-5	104-WSI	28	103-WNI	9	102-WSI
1:57:15 PM	2	E	7	104-ENI	20	104-WNI	-2	103-WNI	-3	102-WSI
2:00:44 PM	3	W	-1	104-ENI	-2	104-WSI	15	103-WNI	3	102-WSI
2:03:38 PM	2	W	-1	104-ENI	-5	104-WSI	23	103-WNI	5	102-WSI
2:06:54 PM	3	W	-3	104-ENI	-11	104-WSI	43	103-WNI	10	102-WSI
2:10:31 PM	2	E	3	104-ENI	29	104-WNI	-4	103-WNI	-2	102-WSI
2:14:13 PM	2	E	-2	104-ENI	12	104-WNI	-2	103-WNI	-2	102-WSI

Table B-6 Max. concrete strain data (in microstrain) under truck traffic loading, Nov. 19, 2020

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
9:55:00 AM	5	E	36	SW	129	NW	-19	NE	-7	NE
10:02:53 AM	4	E	7	SW	53	NW	-9	NW	-4	NE
10:08:19 AM	5	W	-10	SW	-28	NW	278	NE	39	NE
10:13:25 AM	2	E	3	SW	38	NW	-4	NE	-2	NE
10:13:36 AM	2	E	17	SW	22	NW	-6	NE	-2	NE
10:17:30 AM	2	W	-4	SW	-18	NW	97	SE	20	NE
10:18:16 AM	4	W	-1	SW	-5	NW	39	NW	9	NE
10:21:43 AM	3	E	88	SW	191	NE	-30	NE	-4	NE
10:24:06 AM	3	W	-3	SW	-8	NW	41	NW	26	NE
10:26:38 AM	2	E	5	SW	67	NW	-8	NE	-2	NE
10:28:53 AM	4	E	6	SW	26	NW	-3	NE	-2	NE
10:29:36 AM	4	E	6	SW	64	NW	-5	NE	-3	NE
10:31:25 AM	3	W	-8	SW	-42	NW	191	NE	66	NE
10:31:33 AM	4	W	-2	SW	-7	NW	55	NE	9	NE
10:33:03 AM	5	W	-4	SW	-9	NW	63	SE	12	NE
10:38:15 AM	4	W	-2	SW	-5	NW	31	NE	8	NE
10:40:48 AM	5	E	8	SW	74	NW	-8	NW	-5	NE
10:41:56 AM	2	W	-4	SW	-8	NW	65	NW	8	NE
10:42:02 AM	2	W	-4	SW	-16	NW	91	NW	18	NE
10:43:01 AM	5	E	31	SW	237	NW	-29	NE	-10	NE
10:49:33 AM	3	W	-2	SW	-2	NW	20	NW	4	NE
10:51:33 AM	3	W	-4	SW	-14	NW	97	NW	21	NE
11:06:20 AM	2	E	16	SW	-	-	-	-	-5	NE
11:09:10 AM	2	E	6	SW	-	-	-	-	-4	NE
11:09:45 AM	4	E	9	SW	-	-	-	-	-3	NE
11:11:15 AM	4	E	6	SW	-	-	-	-	-3	NE
11:12:18 AM	2	E	2	SW	-	-	-	-	-1	NE
11:19:25 AM	4	E	33	SW	-	-	-	-	-2	NE
11:27:21 AM	5	E	11	SW	-	-	-	-	-5	NE
11:36:22 AM	3	E	45	SW	-	-	-	-	-10	NE
11:41:50 AM	4	E	2	SW	-	-	-	-	-1	NE
11:54:00 AM	4	E	11	SW	-	-	-	-	-3	NE
11:56:54 AM	2	W	-4	SW	-	-	-	-	7	NE
11:57:00 AM	4	E	5	SW	-	-	-	-	-2	NE
12:25:32PM	5	W	-5	NW	-	-	-	-	45	NE
12:28:08PM	2	E	11	SW	-	-	-	-	-1	NE
12:30:21PM	3	W	-2	SW	-	-	-	-	3	NE
12:33:26PM	4	W	-2	SW	-	-	-	-	7	NE
12:34:54PM	2	W	-2	SW	-	-	-	-	4	NE
12:37:44PM	3	E	43	SW	-	-	-	-	-13	NE
12:42:57PM	4	E	15	SW	-	-	-	-	-3	NE
12:46:56PM	3	E	9	SW	-	-	-	-	-3	NE
12:50:18PM	5	E	10	SW	-	-	-	-	-6	NE
12:51:16PM	4	E	9	SW	-	-	-	-	-3	NE
12:56:14PM	2	E	11	SW	-	-	-	-	-3	NE
12:58:16PM	2	E	11	SW	-	-	-	-	-3	NE
1:19:04 PM	2	W	-3	SW	-	-	-	-	15	NE
1:23:09 PM	2	E	8	SW	-	-	-	-	-3	NE
1:31:35 PM	2	W	-3	SW	-	-	-	-	26	NE
1:36:34 PM	4	W	-2	SW	-	-	-	-	11	NE
1:37:46 PM	5	W	-7	SW	-	-	-	-	13	NE
1:45:51 PM	4	E	5	SW	-	-	-	-	-3	NE
1:48:48 PM	2	W	-5	SW	-	-	-	-	16	NE
1:57:15 PM	2	E	19	SW	-	-	-	-	-5	NE
2:00:44 PM	3	W	-3	SW	-	-	-	-	7	NE
2:03:38 PM	2	W	-2	SW	-	-	-	-	9	NE
2:06:54 PM	3	W	-9	SW	-	-	-	-	20	NE
2:10:31 PM	2	E	6	SW	-	-	-	-	-5	NE
2:14:13 PM	2	E	4	SW	-	-	-	-	-3	NE

Note: Blank cells had strains that were questionable. One or more gages stopped working properly.

Table B-7 Statistics of maximum steel and concrete strain data (in microstrain) under truck traffic loading, November 19, 2020

	CP1 Steel	CP2 Steel	CP3 Steel	CP4 Steel	CP1 Concrete	CP2 Concrete	CP3 Concrete	CP4 Concrete
Average Positive	6.1	28.6	30.0	9.0	15.1	90.1	89.0	16.9
Average Negative	-1.7	-5.7	-5.7	-2.1	-3.9	-13.5	-12.1	-3.9
Maximum Positive	33	97	82	35	88	237	278	66
Maximum Negative	-5	-20	-22	-7	-10	-42	-30	-13
Std Dev (positive values)	6.5	21.4	20.7	8.1	17.2	72.7	74.8	14.6
Std Dev (negative values)	1.1	4.4	5.9	1.5	2.4	11.5	10.2	2.7

Table B-8 Max. steel strain data (in microstrain) under truck traffic loading, April 13 & 20, 2021

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
4-13-2021, 1:36:45 PM	7	E	15	104E-NI	79	103E-NI	-12	103WSI	-8	102WSI
1:39:38	2	W	-1	104E-NI	-4	104W-NI	18	103WNI	5	102WNI
1:43:10	6	E	8	104E-SI	44	104W-SI	-9	103WSI	-4	102WSI
1:53:05	3	E	16	104E-SI	95	104W-SI	-23	103WSI	-6	102WSI
1:57:37	5	W	-2	104E-SI	-9	104W-SI	48	103WSI	13	102WSI
2:00:27	8	W	-4	104E-NI	-6	104W-SI	58	103WSI	11	102WSI
2:01:32	4	E	8	104E-NI	23	103ENI	-4	103WNI	-2	102WSI
2:09:28	3	W	-1	104E-NI	-1	103E-SI	9	103WNI	2	102WSI
2:14:42	2	E	1	104E-NI	17	103E-NI	-2	103WSI	-1	102WSI
2:15:30	3	E	16	104E-SI	44	104W-SI	-8	103WNI	-3	102WSI
2:18:23	3	W	-1	104E-SI	-1	104W-SI	9	103WSI	2	102WSI
2:21:40	3	E	2	104E-NI	14	103E-NI	-2	103WNI	-2	102WSI
2:22:05	4	W	-1	104E-NI	-2	104W-NI	10	103WSI	2	102WSI
2:27:38	2	W	-2	104E-SI	-6	104W-NI	34	103WNI	9	102WSI
2:30:18	8	W	-4	104E-NI	-11	104W-SI	70	103WSI	19	102WSI
2:30:35	3	W	-1	104ESI	-2	103ENI	13	103WSI	3	102WSI
2:33:15	2	W	-1	104ENI	-3	104W-NI	13	103WNI	2	102WSI
2:34:09	5	W	-2	104ENI	-5	104W-SI	27	103WSI	6	102WSI
2:44:10	2	E	2	104E-SI	12	104W-SI	-2	103WNI	-1	102WSI
2:45:02	2	E	4	104E-SI	35	103E-SI	-5	103WSI	-2	102WSI
2:46:07	2	W	-1	105W-SI	-3	104W-NI	5	103WNI	14	102WSI
2:52:43	3	E	2	104E-SI	15	104W-SI	-2	103WNI	-1	102WSI
2:53:35	3	E	1	104E-NI	9	104W-SI	-1	103WNI	-1	102WSI
3:00:46	4	E	1	104E-SI	13	103E-SI	-1	102WSI	-2	102WSI
3:01:30	4	E	4	104E-NI	16	103E-NI	-2	103WNI	-2	102WSI
3:02:05	4	E	2	104E-SI	10	104W-NI	-2	102WSI	-1	102WSI
3:05:48	2	E	3	104E-NI	27	103E-NI	-5	103WNI	-2	102WSI
3:06:16	5	W	-1	104E-SI	-2	104W-SI	12	103WNI	4	102WSI
3:13:27	5	E	8	104E-SI	40	104W-NI	-7	102WSI	-3	102WSI
3:25:46	4	W	-2	104E-NI	-4	104W-SI	21	103WNI	6	102WSI
3:35:16	4	W	-1	104E-SI	-2	104W-SI	10	102WSI	3	102WSI
3:36:27	2	W	-1	104E-SI	-3	104W-SI	9	103WNI	2	102WSI
6:45:11	5	E	1	104E-NI	15	104W-NI	-2	103WNI	-1	102WSI
6:45:20	3	W	-3	104E-NI	-10	104W-SI	38	102WSI	12	102WSI
6:49:54	9	E	30	104E-NI	102	104W-SI	-19	103WNI	-10	102WSI
6:50:50	4	W	-2	104E-SI	-3	104W-SI	16	102WSI	3	102WSI
6:59:47	5	W	-2	104E-SI	-4	104W-NI	26	103WNI	6	102WSI
4-20-2021, 8:54:40 AM	8	W	-2	104E-NI	-9	104W-NI	31	103WSI	23	101WSI
9:04:10	4	E	10	104E-NI	27	103E-NI	-6	103WSI	-1	101WSI
9:05:56	3	W	-2	104E-SI	-10	104W-SI	38	103WSI	14	101WSI
9:11:12	4	E	2	104E-NI	9	103E-NI	-3	103WSI	-1	101WSI
9:11:24	4	E	2	104E-NI	7	1034-NI	-1	103WNI	-1	101WNI
9:16:12	3	E	3	104E-NI	31	103E-NI	-8	103WSI	-2	101WSI
9:16:26	2	W	-2	104E-NI	-9	104W-SI	44	103WSI	8	101WSI
9:23:05	3	E	10	104E-NI	58	104W-NI	-15	103WSI	-4	101WSI
9:27:10	4	E	4	104E-NI	23	103E-NI	-4	103WSI	-2	101WSI
9:27:58	5	W	-2	104E-NI	-7	104W-SI	40	103WSI	13	101WSI
9:28:50	4	W	-1	104E-NI	-3	103E-NI	12	103WSI	1	101WSI
9:36:43	4	W	-1	104E-SI	-2	104W-SI	8	103WSI	4	101WSI
9:42:39	4	W	-1	104E-NI	-3	104W-NI	7	103WSI	2	101WSI
9:47:28	4	W	-4	104E-NI	-21	104W-NI	71	103WSI	36	101WSI
11:33:42	3	W	-4	104E-SI	-11	104W-NI	44	103WNI	15	102WSI
11:43:06	3	E	5	104E-SI	28	104W-SI	-2	103WSI	-2	102WSI
11:47:20	5	E	34	104E-NI	130	104W-SI	-25	103WNI	-10	102WSI
11:49:58	3	E	5	104E-SI	38	104W-SI	-6	103WSI	-6	102WSI
11:53:31	3	E	8	104E-NI	66	104W-NI	-4	103WSI	-7	102WSI
11:54:27	4	W	-1	104E-NI	-1	104W-NI	10	103WNI	2	102WSI
11:54:34	4	W	-1	104E-SI	-1	104W-NI	8	103WNI	2	102WSI
11:55:06	2	E	2	104E-NI	18	104W-SI	-1	103WNI	-2	102WSI
11:58:45	3	E	5	104E-NI	34	104W-NI	-3	103WNI	-4	102WSI
12:01:39	4	W	-2	104E-SI	-5	104W-SI	16	103WSI	7	102WSI
12:06:09	5	W	-2	104E-SI	-7	104W-NI	36	103WSI	8	102WSI
12:08:52	5	W	-3	104E-SI	-8	104W-SI	34	103WSI	9	102WSI
12:14:42	3	E	7	104E-SI	86	104W-NI	-1	103WNI	-9	102WSI
12:19:58	4	E	4	104E-SI	12	104W-NI	-2	103WNI	-1	102WSI

Table B-9 Max. concrete strain data (microstrain) under truck traffic loading, April 13 & 20, 2021

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
4-13-2021, 1:36:45 PM	7	E	42	SW	257	SE	-4	NW	-17	NE
1:39:38	2	W	-3	SW	-13	SE	62	SE	11	NE
1:43:10	6	E	22	SW	159	SE	-26	SE	-8	NE
1:53:05	3	E	44	SW	394	SE	-71	SE	-15	NE
1:57:37	5	W	-6	SW	-24	SE	162	SE	33	NE
2:00:27	8	W	-11	SW	-25	SE	205	SE	25	NE
2:01:32	4	E	23	SW	79	SE	-12	SE	-4	NE
2:09:28	3	W	-1	SW	-4	SE	32	SE	4	NE
2:14:42	2	E	3	SW	49	SE	-8	SE	4	NE
2:15:30	3	E	44	SW	157	SE	-27	SE	-7	NE
2:18:23	3	W	-2	SW	-5	SE	31	SE	5	NE
2:21:40	3	E	5	SW	39	SE	-6	NW	-2	NE
2:22:05	4	W	-2	SW	-5	SE	31	SE	5	NE
2:27:38	2	W	-4	SW	-18	SE	127	SE	18	NE
2:30:18	8	W	-13	SW	-38	SE	261	SE	49	NE
2:30:35	3	W	-2	SW	-7	SE	53	SE	7	NE
2:33:15	2	W	-2	SW	-8	SE	53	SE	6	NE
2:34:09	5	W	-7	SW	-18		86	SE	16	NE
2:44:10	2	E	5	SW	34	SE	-6	SE	-2	NE
2:45:02	2	E	9	SW	88	SE	-21	SE	-5	NE
2:46:07	2	W	-2	SW	-7	SE	17	SE	26	NE
2:52:43	3	E	6	SW	52	SE	-7	SE	-2	NE
2:53:35	3	E	3	SW	31	SE	-4	SE	-2	NE
3:00:46	4	E	8	SW	31	SE	-6	SE	-3	NE
3:01:30	4	E	8	SW	42	SE	-8	SE	-4	NE
3:02:05	4	E	3	SW	29	SE	-4	SE	-3	NE
3:05:48	2	E	6	SW	73	SE	-17	SE	-4	NE
3:06:16	5	W	-2	SW	-4	SE	45	SE	7	NE
3:13:27	5	E	23	SW	150	SE	-27	SE	-8	NE
3:25:46	4	W	-3	SW	-4	SE	75	SE	13	NE
3:35:16	4	W	-2	SW	-7	SE	38	SE	5	NE
3:36:27	2	W	-2	SW	-7	SE	31	SE	4	NE
6:45:11	5	E	5	SW	33	SE	-5	SE	-3	NE
6:45:20	3	W	-6	NW	-13	SE	85	NW	25	NE
6:49:54	9	E	81	SW	283	SE	-53	SE	-24	NE
6:50:50	4	W	-3	SW	-6	SE	3	NW	6	NE
6:59:47	5	W	-6	SW	-9	SE	53	NW	12	NE
4-20-2021, 8:54:40 AM	8	W	-7	SW	-16	NE	76	SE	48	NE
9:04:10	4	E	23	SW	46	NE	-10	SE	-2	NE
9:05:56	3	W	-4	SW	-20	NE	92	SE	24	NE
9:11:12	4	E	5	SW	15	SE	-3	SE	-2	NE
9:11:24	4	E	3	SW	9	SE	-3	SE	-1	NE
9:16:12	3	E	6	SW	75	NE	-16	SE	-4	NE
9:16:26	2	W	-3	SW	-19	NE	101	SE	13	NE
9:23:05	3	E	22	SW	179	SE	-32	SE	-5	NE
9:27:10	4	E	7	SW	36	NE	-8	SE	-3	NE
9:27:58	5	W	-4	SW	-14	SE	97	SE	21	NE
9:28:50	4	W	-1	SW	-7	NE	27	SE	7	NE
9:36:43	4	W	-1	SW	-4	NE	14	SE	6	NE
9:42:39	4	W	-1	SW	-3	NE	10	SE	2	NE
9:47:28	4	W	-9	SW	-48	NE	205	SE	74	NE
11:33:42	3	W	-7	SW	-28	NE	139	SE	30	NE
11:43:06	3	E	7	SW	85	NE	-5	SE	-4	NE
11:47:20	5	E	88	SW	488	NE	-65	SE	-19	NE
11:49:58	3	E	7	SW	128	NE	-17	SE	-5	NE
11:53:31	3	E	19	SW	216	NE	-11	SE	-14	NE
11:54:27	4	W	-2	SW	-4	NE	24	SE	5	NE
11:54:34	4	W	-1	SW	-3	NE	22	SE	4	NE
11:55:06	2	E	3	SW	46	NE	-6	SE	-4	NE
11:58:45	3	E	10	SW	108	NE	-9	SE	-7	NE
12:01:39	4	W	-4	SW	-14	NE	61	SE	13	NE
12:06:09	5	W	-5	SW	-23	NE	106	SE	22	NE
12:08:52	5	W	-7	SW	-22	NE	120	SE	22	NE
12:14:42	3	E	12	SW	298	NE	-1	SE	-18	NE
12:19:58	4	E	4	SW	36	NE	-4	SE	-2	NE

Table B-10 Statistics of maximum steel and concrete strain data (in microstrain) under truck traffic loading, April 13 & 20, 2021

	CP1 Steel	CP2 Steel	CP3 Steel	CP4 Steel	CP1 Concrete	CP2 Concrete	CP3 Concrete	CP4 Concrete
Average Positive	7.0	36.8	25.6	8.1	17.4	117.0	77.1	16.8
Average Negative	-1.8	-5.4	-5.9	-3.3	-4.1	-13.5	-15.7	-6.5
Maximum Positive	34	130	71	36	88	488	261	74
Maximum Negative	-4	-21	-25	-10	-13	-48	-71	-24
Std Dev (positive values)	7.8	31.2	18.5	7.5	21.3	116.7	62.1	15.8
Std Dev (negative values)	1.0	4.2	6.4	2.8	3.0	10.7	17.6	6.1

Table B-11 Max. steel strain data (microstrain) under truck traffic loading, August 10 & 11, 2021

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
10:53:17 a.m.	5	W	-3	104E-SI	10	103E-NI	27	103W-SI	6	101W-SI
10:56:51	3	W	-2	104E-NI	-9	104W-SI	32	103W-NI	8	101W-SI
10:56:59	3	W	-2	104E-NI	-8	104W-SI	34	103W-SI	10	101W-SI
10:58:17	3	E	3	104E-NI	21	103E-NI	-3	103W-SI	-2	101W-SI
11:02:00	5	E	16	104E-NI	68	104W-SI	-12	103W-SI	-7	101W-SI
11:07:32	3	W	-2	104E-NI	-4	104W-SI	26	103W-SI	10	101W-SI
11:16:57	8	E	25	104E-SI	49	104W-SI	-14	103W-SI	-5	101W-SI
11:19:50	2	W	-1	104E-NI	-5	104W-SI	15	102E-NI	11	101W-NI
11:21:44	4	E	5	104E-NI	22	104W-SI	-3	102E-SI	3	101W-SI
11:34:47	3	E	12	104E-SI	77	103E-NI	-20	103W-SI	-8	101W-SI
11:35:06	3	E	10	104E-NI	87	103E-NI	-19	103W-SI	-8	101W-SI
11:37:02	3	W	2	104E-SI	9	104W-SI	12	102E-NI	14	101W-SI
11:39:05	2	W	-1	104E-NI	-4	104W-SI	18	102E-SI	5	101W-SI
11:40:04	4	W	-5	104E-SI	-21	104W-SI	55	103W-SI	50	101W-SI
11:47:35	3	E	2	104E-SI	13	103E-NI	-2	103W-SI	-1	101W-SI
11:49:01	2	W	-2	104E-NI	-7	104W-NI	25	103W-SI	9	101W-SI
10:17:31	3	W	-1	104E-NI	-7	104W-NI	34	103W-SI	13	101W-SI
10:38:35	3	E	7	104W-SI	22	104W-SI	-3	103W-SI	-1	101W-SI
10:39:37	4	E	5	104E-NI	39	104W-SI	-9	103W-SI	-3	101W-SI
10:40:35	4	E	4	104E-SI	15	103E-SI	-3	102E-SI	-1	101W-SI
10:45:46	3	W	-3	104E-SI	-7	104W-NI	29	103W-SI	7	101W-SI
10:46:05	8	E	32	104E-NI	70	104W-SI	-17	103W-SI	-9	101W-SI
10:46:10	4	W	-2	104E-NI	-8	104W-NI	30	102E-NI	32	101W-SI
10:52:26	8	E	9	104E-SI	59	104W-SI	-14	103W-NI	-4	101W-SI
10:18:20	3	W	-1	104E-NI	-5	104W-NI	17	102E-SI	11	101W-SI
10:54:58	2	E	4	104E-NI	27	104W-NI	-6	103W-SI	-2	101W-NI
10:55:02	3	E	3	104E-NI	14	103E-NI	-2	103W-SI	-1	101W-NI
10:57:20	8	W	-7	104E-NI	-17	104W-SI	100	103W-SI	31	101W-SI
11:01:00	2	W	-2	104N-NI	-4	104W-SI	16	102E-NI	13	101W-SI
11:05:55	4	E	16	104E-SI	26	104W-SI	-5	103W-SI	-3	101W-SI
11:08:17	3	W	-5	104E-SI	-23	104W-SI	82	103W-SI	34	101W-SI
11:11:25	2	E	3	104E-NI	43	103E-NI	-9	103W-NI	-3	101W-SI
11:13:12	3	E	-4	104E-NI	84	104W-SI	16	103W-NI	-9	101W-SI
11:18:50	2	W	-1	104E-SI	-6	104W-SI	26	102E-NI	12	101W-SI
11:34:12	3	W	-2	104E-SI	-6	104W-NI	32	103W-NI	11	101W-SI
11:35:57	2	W	-2	104E-SI	-5	104W-NI	25	103W-NI	8	101W-SI
11:36:48	3	W	-3	104E-SI	9	103E-SI	26	103W-SI	6	101W-SI
11:40:54	5	E	9	104E-SI	45	104W-SI	-10	103W-NI	-6	101W-SI
11:43:24	4	E	5	104E-SI	25	103E-NI	-4	103W-SI	-3	101W-SI
12:32:42	4	E	2	104E-NI	25	103E-NI	-3	102E-NI	-3	101W-SI
12:32:50	3	W	-1	104E-NI	-3	104W-SI	21	103W-NI	5	101W-SI
12:33:32	4	E	1	104E-NI	11	104W-NI	-2	103W-NI	-1	101E-NI
12:34:59	2	E	10	104E-NI	50	104W-NI	-7	103W-SI	-3	101W-SI
12:36:53	4	W	-1	104E-SI	-3	104W-NI	21	103W-NI	5	101W-SI
12:37:08	4	W	-2	104E-SI	-2	104W-NI	23	103W-NI	4	101W-SI
12:42:58	4	E	3	104E-SI	18	103E-NI	-3	102E-NI	-1	101E-NI
12:43:12	3	W	-3	104E-NI	-7	104W-SI	32	103W-NI	10	101W-SI
12:43:24	3	W	-3	104E-NI	-9	104W-NI	47	103W-NI	16	101W-NI
12:48:04	4	E	6	104E-NI	59	103E-NI	-7	103W-SI	-4	101W-NI
12:49:58	4	W	-1	104E-NI	-5	103E-SI	20	103W-NI	4	101W-NI
12:55:52	2	E	12	104E-SI	41	104W-SI	-8	103W-NI	-5	101W-SI
1:08:30	4	E	3	104E-SI	17	104W-NI	-3	102E-SI	-1	101E-SI
1:11:13	3	E	7	104E-NI	81	103E-NI	-18	103W-SI	-8	101W-SI
1:11:35	3	E	8	104E-NI	93	103E-NI	-18	103W-SI	-8	101W-SI
1:16:30	3	W	-1	104E-NI	-37	103E-SI	16	102E-SI	5	101W-SI
1:19:16	3	W	-2	104E-NI	-8	103E-SI	27	103W-SI	5	101W-SI
1:19:58	9	W	-7	104E-NI	-16	104W-SI	87	103W-SI	21	101W-SI
1:22:35	4	E	5	104E-NI	17	104W-SI	-3	103W-NI	-2	101W-SI
1:22:57	4	W	-2	104E-SI	-3	104W-NI	20	103W-SI	6	101W-SI
1:23:25	4	E	29	104E-SI	99	104W-NI	-20	103W-SI	-9	101W-SI
1:25:50	4	E	6	104E-SI	19	104W-SI	-3	103W-NI	-2	101W-SI
1:30:30	4	W	-1	104E-SI	-4	103E-SI	23	103W-SI	6	101W-SI
1:35:28	2	W	-3	104E-NI	-7	104W-SI	40	103W-SI	10	101W-SI
1:37:10	4	E	2	104E-NI	19	103E-SI	-2	102E-NI	-3	101W-NI
1:38:04	3	W	-3	104E-NI	-8	104W-NI	45	103W-NI	13	101W-SI
1:41:06	4	E	11	104E-SI	24	104W-NI	-4	103W-SI	-2	101W-SI
1:41:29	4	W	-2	104E-NI	-5	103E-SI	19	103W-SI	4	101W-NI
1:44:48	3	E	8	103E-NI	79	103E-NI	-16	103W-SI	-7	101W-SI
1:47:39	4	W	-1	104E-NI	-4	104W-NI	18	103W-NI	8	101W-SI
1:52:17	5	W	-6	104E-NI	-18	104W-SI	81	103W-SI	35	101W-SI
1:56:51	4	W	-2	104E-NI	-4	104W-NI	23	102E-SI	9	101W-SI
1:57:15	4	W	-2	104E-SI	6	103E-SI	16	103W-SI	3	101W-SI
1:59:24	2	E	5	104E-NI	68	104W-SI	-10	103W-NI	-4	101W-SI
2:02:47	4	E	4	104E-NI	19	103E-NI	-3	102E-SI	-1	101W-SI

Table B-12 Max. concrete strain data (microstrain) under truck traffic loading, Aug. 10 & 11, 2021

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
10:53:17 a.m.	5	W	-7	SW	24	SE	83	NW	14	NE
10:56:51	3	W	-7	SW	-21	SE	83	SE	19	NE
10:56:59	3	W	-7	SW	-24	SE	83	SE	21	NE
10:58:17	3	E	9	SW	54	NE	-8	NW	-4	NE
11:02:00	5	E	49	SW	241	SE	-36	NW	-14	NE
11:07:32	3	W	-6	SW	-10	SE	75	SE	23	NE
11:16:57	8	E	70	SW	171	NE	-33	NW	-12	NE
11:19:50	2	W	-3	SW	-14	NE	58	NW	40	NE
11:21:44	4	E	12	SW	67	NE	-7	NW	-7	NE
11:34:47	3	E	38	SW	287	SE	-55	SE	-19	NE
11:35:06	3	E	27	SW	249	NE	-52	SE	-18	NE
11:37:02	3	W	6	SW	26	SE	39	NW	40	NE
11:39:05	2	W	-3	SW	-11	SE	56	NW	12	NE
11:40:04	4	W	-18	SW	-54	NE	260	NW	163	NE
11:47:35	3	E	5	SW	32	NE	-5	NW	-2	NE
11:49:01	2	W	5	SW	18	SE	68	SE	23	NE
10:17:31	3	W	-5	SW	-20	NE	101	NE	25	NE
10:38:35	3	E	18	SW	89	SE	-8	SE	-2	NE
10:39:37	4	E	14	SW	130	NW	-21	SE	-6	NE
10:40:35	4	E	10	SW	54	NW	-7	NW	-3	NE
10:45:46	3	W	-5	SW	-18	SE	80	SE	16	NE
10:46:05	8	E	97	SW	242	SE	-48	NW	-18	NE
10:46:10	4	W	-7	SW	-20	NE	90	NW	78	NE
10:52:26	8	E	20	SW	198	NE	-33	SE	-9	NE
10:18:20	3	W	-4	SW	-13	SE	55	NW	25	NE
10:54:58	2	E	13	SW	84	NE	-14	SE	-4	NE
10:55:02	3	E	10	SW	42	NW	-6	NW	-3	NE
10:57:20	8	W	-19	SW	-44	NE	294	SE	81	NE
11:01:00	2	W	-4	SW	-11	NE	49	NW	32	NE
11:05:55	4	E	5	SW	85	NE	-12	SE	-5	NE
11:08:17	3	W	-15	SW	-72	NE	262	NE	105	NE
11:11:25	2	E	9	SW	168	NW	-23	SE	-7	NE
11:13:12	3	E	-15	SW	304	SE	40	NE	-20	NE
11:18:50	2	W	-3	SW	-16	NE	92	NW	29	NE
11:34:12	3	W	-6	SW	-19	NE	92	SE	28	NE
11:35:57	2	W	-4	SW	-13	NE	73	SE	22	NE
11:36:48	3	W	-10	SW	22	NW	76	NW	18	NE
11:40:54	5	E	26	SW	167	NE	-27	NW	-14	NE
11:43:24	4	E	17	SW	79	NW	-10	NW	-6	NE
12:32:42	4	E	7	SW	83	NW	-9	NE	-6	NE
12:32:50	3	W	-4	SW	-9	NE	60	SE	12	NE
12:33:32	4	E	3	NW	40	NW	-5	NW	-3	NE
12:34:59	2	E	31	NW	187	SE	-21	SE	-8	NE
12:36:53	4	W	-4	SW	-11	NE	66	SE	14	NE
12:37:08	4	W	-4	SW	-7	NE	67	SE	12	NE
12:42:58	4	E	9	SW	58	NW	-8	NW	-4	NE
12:43:12	3	W	-7	SW	-22	NE	101	SE	28	NE
12:43:24	3	W	-7	SW	-28	SE	159	SE	54	NE
12:48:04	4	E	16	NW	178	NW	-22	NE	-13	NE
12:49:58	4	W	-3	NW	-9	NE	61	SE	11	NE
12:55:52	2	E	40	SW	144	SE	-23	NE	-6	NE
1:08:30	4	E	6	NW	54	SE	-7	SE	-3	NE
1:11:13	3	E	19	SW	286	NW	-54	SE	-22	NE
1:11:35	3	E	25	NW	300	NW	-55	SE	-20	NE
1:16:30	3	W	-2	SW	-9	NE	57	SW	13	NE
1:19:16	3	W	-6	NW	-18	SE	97	SE	13	NE
1:19:58	9	W	-21	SW	-57	NE	305	SE	69	NE
1:22:35	4	E	12	NW	57	NE	-8	SE	-4	NE
1:22:57	4	W	-4	NW	-11	SE	70	SE	19	NE
1:23:25	4	E	89	SW	360	NE	-66	SE	-25	NE
1:25:50	4	E	16	SW	65	SE	-8	SE	-6	NE
1:30:30	4	W	-4	NW	-10	NE	72	SE	17	NE
1:35:28	2	W	-7	NW	-26	SE	121	SE	29	NE
1:37:10	4	E	5	NW	56	NE	-7	NW	-7	NE
1:38:04	3	W	-8	NW	-29	SE	156	SE	37	NE
1:41:06	4	E	30	SW	67	NE	-12	SE	-5	NE
1:41:29	4	W	-4	NW	-9	NE	59	SE	11	NE
1:44:48	3	E	23	NW	265	NW	-53	SE	-17	NE
1:47:39	4	W	-4	NW	-16	NE	67	SE	25	NE
1:52:17	5	W	-17	NW	-66	NE	292	SE	107	NE
1:56:51	4	W	-4	NW	-13	SE	91	NW	24	NE
1:57:15	4	W	-4	NW	15	NW	50	SE	10	NE
1:59:24	2	E	15	NW	247	NE	-35	SE	-10	NE
2:02:47	4	E	10	SW	62	NE	-5	SE	-4	NE

Table B-13 Statistics of maximum steel and concrete strain data (in microstrain) under truck traffic loading, August 10 & 11, 2021

	CP1 Steel	CP2 Steel	CP3 Steel	CP4 Steel	CP1 Concrete	CP2 Concrete	CP3 Concrete	CP4 Concrete
Average Positive	8.2	39.5	32.2	12.1	22.1	130.7	104.1	34.7
Average Negative	-2.5	-8.5	-8.1	-4.0	-7.1	-22.1	-22.9	-9.3
Maximum Positive	32	99	100	50	97	360	305	163
Maximum Negative	-7	-37	-20	-9	-21	-72	-66	-25
Std Dev (positive values)	7.4	27.8	21.2	10.5	22.1	99.1	74.2	32.9
Std Dev (negative values)	1.6	7.3	6.2	2.8	5.0	17.1	18.7	6.6

Table B-14 Max. steel strain data (in microstrain) under truck traffic loading, Nov. 16 & 18, 2021

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
Nov. 16, 11:18:00 a.m.	3	E	10	104E-SI	39	104W-NI	-8	103W-SI	-3	101W-SI
11:20:01	5	E	3	104E-NI	26	104W-NI	-4	103W-SI	-2	101W-NI
11:21:26	3	W	-2	104E-SI	-12	103E-SI	36	103W-SI	10	101W-SI
11:24:27	3	W	-3	104E-SI	-7	104W-NI	29	103W-NI	10	101W-SI
11:31:35	5	W	-3	104E-SI	-7	104W-NI	39	103W-SI	11	101W-SI
11:33:42	5	W	-3	104E-SI	-6	104W-NI	41	103W-SI	12	101W-SI
11:40:39	2	E	2	104E-NI	21	104W-SI	-5	103W-NI	-2	101W-NI
11:41:24	5	W	-4	104E-SI	-8	104W-NI	39	103W-SI	12	101W-SI
11:43:58	3	E	14	104E-SI	91	104W-SI	-33	103W-SI	-12	101W-SI
11:44:28	3	E	8	104E-NI	50	104W-NI	-10	103W-SI	-5	101W-SI
11:46:27	5	E	4	104E-SI	22	104W-SI	-18	102E-NI	-2	101W-SI
11:48:53	3	E	12	104E-SI	110	103E-NI	-25	103W-SI	-8	101W-SI
11:51:24	4	E	23	104E-SI	158	104W-SI	-34	103W-SI	-9	101W-SI
11:54:10	3	W	-2	104E-SI	-9	104W-NI	39	103W-SI	14	101W-SI
12:05:38	2	E	7	104E-SI	33	103E-NI	-7	103W-SI	-2	101W-SI
Nov. 18, 9:03:33 a.m.	2	W	-1	104E-NI	-7	104W-NI	42	103W-SI	7	101W-SI
9:05:01	4	W	-1	104E-NI	-2	104W-NI	11	103W-SI	2	101W-NI
9:08:58	3	W	-3	104E-NI	-16	104W-NI	40	102E-NI	63	101W-SI
9:12:19	3	E	25	104E-SI	101	104W-NI	-20	103W-SI	-6	101W-SI
9:18:51	4	E	1	104E-SI	8	104W-NI	-2	103W-SI	-1	101W-SI
9:22:34	5	E	4	104E-NI	21	104W-SI	-3	103W-SI	-1	101W-SI
9:23:07	5	W	-3	104E-SI	-12	104W-NI	60	103W-SI	19	101W-SI
9:29:12	4	W	-1	104E-SI	-4	104W-NI	23	103W-SI	8	101W-SI
9:31:10	4	E	9	104E-SI	61	103E-SI	-10	103W-SI	-3	101W-SI
9:33:09	4	E	7	104E-NI	17	104W-NI	-3	103W-SI	-1	101W-SI
9:35:04	6	W	-4	104E-SI	-13	104W-SI	77	103W-SI	19	101W-SI
9:43:56	4	E	2	104E-NI	9	104W-NI	-1	102E-NI	-1	101W-SI
9:44:46	4	E	3	104E-NI	20	104W-SI	-3	103W-SI	-1	101W-SI
9:46:31	3	E	2	104E-NI	14	104W-NI	-2	103W-NI	-1	101W-SI
9:51:49	3	E	2	104E-NI	22	104W-NI	-2	103W-NI	-1	101W-SI
10:07:55	4	E	3	104E-NI	14	104W-NI	-2	102E-NI	-1	101W-SI
10:09:32	2	E	6	104E-NI	38	104W-NI	-7	103W-NI	-3	101W-SI
10:14:08	3	W	-2	104E-SI	-7	104W-NI	31	103W-SI	12	101W-SI
10:17:17	3	W	-3	104E-SI	-18	104W-NI	74	103W-SI	21	101W-SI
10:19:28	5	W	-3	104E-NI	-11	104W-NI	71	103W-SI	16	101W-SI
10:21:03	4	E	12	104E-SI	29	104W-NI	-4	102E-SI	-2	101W-SI
10:22:23	2	E	4	104E-NI	41	104W-NI	-9	103W-SI	-3	101W-SI
10:28:07	2	W	-3	104E-SI	-5	104W-SI	28	103W-SI	7	101W-SI
10:30:19	4	W	-1	104E-NI	-2	104W-NI	18	103W-NI	3	101W-SI
10:30:58	2	E	4	104E-NI	25	104W-NI	-5	103W-NI	-2	101W-SI
10:36:11	5	W	-1	104E-SI	15	104W-SI	30	103W-SI	7	101W-SI
10:39:57	3	W	-2	104E-NI	-7	104W-SI	35	103W-SI	13	101W-SI
10:42:42	6	E	13	104E-SI	17	104W-NI	-5	103W-SI	-2	101W-NI
10:58:05	5	W	-2	104E-NI	-4	104W-NI	32	103W-SI	8	101W-SI
10:58:48	4	E	14	104E-SI	24	104W-SI	-5	103W-SI	-2	101W-NI
11:01:00	2	W	-1	104E-NI	-3	104W-NI	20	103W-NI	4	101W-SI
11:01:11	2	W	-1	104E-NI	-3	104W-SI	20	103W-NI	3	101W-NI
11:13:34	4	E	4	104E-SI	14	104W-SI	-1	102E-NI	-1	101E-NI
11:15:12	5	E	9	104E-SI	41	104W-SI	-6	102E-NI	-3	101W-SI
11:26:02	4	W	-2	104E-SI	3	103E-NI	14	103W-NI	5	101W-SI
11:26:52	4	W	-1	104E-NI	3	103W-SI	10	103W-SI	2	101W-SI
11:32:43	2	W	-2	104E-SI	-4	104W-NI	17	103W-SI	5	101W-SI
11:39:27	3	E	51	104E-SI	123	104W-SI	-30	103W-SI	-8	101W-SI
11:45:54	2	E	11	104E-SI	81	104W-SI	-13	103W-SI	-4	101W-SI
11:46:59	2	E	6	104E-NI	22	104W-NI	-2	103W-SI	5	101W-SI
11:47:03	4	W	-1	104E-NI	-3	104W-NI	19	103W-NI	5	101W-SI
11:48:19	4	E	5	104E-SI	16	104W-NI	-2	103W-SI	-1	101W-SI
11:49:22	5	E	3	104E-NI	22	104W-NI	-3	102E-SI	-2	101W-NI
11:53:17	4	E	5	104E-SI	10	104W-SI	-2	103W-SI	-1	101W-NI

Table B-15 Max. concrete strain data (microstrain) under truck traffic loading, Nov. 16 & 18, 2021

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
Nov. 16, 11:18:00 a.m.	3	E	22	SW	112	SE	-15	SE	-5	NE
11:20:01	5	E	8	SW	70	NW	-9	NW	-4	NE
11:21:26	3	W	-5	SW	-18	NE	99	NE	20	NE
11:24:27	3	W	-5	SW	-17	NE	67	NW	17	NE
11:31:35	5	W	-5	NW	-20	SE	84	SE	24	NE
11:33:42	5	W	-6	SW	-19	SE	85	NE	22	NE
11:40:39	2	E	5	SW	52	SE	-10	SE	-3	NE
11:41:24	5	W	-8	SW	-20	NE	84	NE	24	NE
11:43:58	3	E	30	SW	309	SE	-49	NW	-23	NE
11:44:28	3	E	21	SW	169	NW	-22	NW	-9	NE
11:46:27	5	E	9	SW	69	NW	-7	NW	-4	NE
11:48:53	3	E	28	SW	355	SE	-54	NW	-13	NE
11:51:24	4	E	60	SW	551	SE	-71	SE	-18	NE
11:54:10	3	W	-4	NW	-21	SE	114	SE	28	NE
12:05:38	2	E	16	SW	117	NW	-17	SE	-4	NE
Nov. 18, 9:03:33 a.m.	2	W	-3	NW	-5	NE	87	NE	12	NE
9:05:01	4	W	-2	SW	-2	NE	21	NE	4	NE
9:08:58	3	W	-5	NW	-35	SE	103	NW	116	NE
9:12:19	3	E	47	SW	304	SE	-41	SE	-9	NE
9:18:51	4	E	2	NW	18	NE	-2	NE	-1	NE
9:22:34	5	E	10	SW	46	SE	-5	SE	-2	NE
9:23:07	5	W	-5	SW	-27	SE	124	SE	35	NE
9:29:12	4	W	-3	SW	-7	NE	48	NE	13	NE
9:31:10	4	E	19	SW	156	SE	-19	SE	-6	NE
9:33:09	4	E	15	SW	45	SE	-4	SE	-1	NE
9:35:04	6	W	-7	SW	-38	SE	181	SE	36	NE
9:43:56	4	E	4	SW	20	SE	-2	NE	-1	NE
9:44:46	4	E	8	SW	50	SE	-4	SE	-1	NE
9:46:31	3	E	4	SW	33	SE	-3	SE	-1	NE
9:51:49	3	E	4	NE	46	SE	-5	SE	-7	NE
10:07:55	4	E	5	SW	-	-	-	-	-2	NE
10:09:32	2	E	11	SW	-	-	-	-	-4	NE
10:14:08	3	W	-3	SW	-	-	-	-	23	NE
10:17:17	3	W	-8	NE	-	-	-	-	37	NE
10:19:28	5	W	-8	SW	-	-	-	-	27	NE
10:21:03	4	E	24	SW	-	-	-	-	-2	NE
10:22:23	2	E	7	SW	-	-	-	-	-3	NE
10:28:07	2	W	-4	SW	-	-	-	-	13	NE
10:30:19	4	W	-2	NW	-	-	-	-	6	NE
10:30:58	2	E	8	SW	-	-	-	-	-3	NE
10:36:11	5	W	-3	SW	-	-	-	-	14	NE
10:39:57	3	W	-4	SW	-	-	-	-	24	NE
10:42:42	6	E	23	SW	-	-	-	-	-4	NE
10:58:05	5	W	-5	SW	-	-	-	-	15	NE
10:58:48	4	E	32	SW	-	-	-	-	-3	NE
11:01:00	2	W	-2	SW	-	-	-	-	6	NE
11:01:11	2	W	-2	SW	-	-	-	-	5	NE
11:13:34	4	E	8	SW	-	-	-	-	-3	NE
11:15:12	5	E	22	SW	-	-	-	-	-4	NE
11:26:02	4	W	-3	SW	-	-	-	-	9	NE
11:26:52	4	W	-2	SW	-	-	-	-	3	NE
11:32:43	2	W	-3	SW	-	-	-	-	9	NE
11:39:27	3	E	121	SW	-	-	-	-	-14	NE
11:45:54	2	E	24	SW	-	-	-	-	-7	NE
11:46:59	2	E	15	SW	-	-	-	-	12	NE
11:47:03	4	W	-3	NW	-	-	-	-	9	NE
11:48:19	4	E	9	NW	-	-	-	-	-2	NE
11:49:22	5	E	8	NW	-	-	-	-	-4	NE
11:53:17	4	E	11	SW	-	-	-	-	-2	NE

Note: Blank cells had strains that were questionable. One or more gages stopped working properly.

Table B-16 Statistics of maximum steel and concrete strain data (in microstrain) under truck traffic loading, November 16 & 18, 2021

	CP1 Steel	CP2 Steel	CP3 Steel	CP4 Steel	CP1 Concrete	CP2 Concrete	CP3 Concrete	CP4 Concrete
Average Positive	8.7	37.8	34.4	11.2	19.4	140.1	91.4	20.9
Average Negative	-2.1	-7.4	-8.7	-3.0	-4.2	-19.1	-18.8	-5.3
Maximum Positive	51	158	77	63	121	551	181	116
Maximum Negative	-4	-18	-34	-12	-8	-38	-71	-23
Std Dev (positive values)	9.5	36.7	18.5	11.6	22.3	146.8	39.8	21.4
Std Dev (negative values)	1.0	4.4	9.5	2.7	1.9	11.0	20.8	5.2

Table B-17 Max. steel strain data (in microstrain) under truck traffic loading, April 5 & 7, 2022

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
April 5, 11:23:13 AM	4	W	-1	104E-NI	-7	103E-SI	19	103W-NI	5	101W-SI
11:25:08	8	E	11	104E-NI	45	104W-NI	-11	103W-NI	-2	101W-SI
11:30:25	6	W	-4	104E-SI	-9	104W-SI	51	103W-SI	14	101W-SI
11:30:29	4	W	-1	104E-NI	-3	104W-NI	23	103W-SI	8	101W-SI
11:32:01	6	W	-3	104E-SI	-10	104W-SI	46	103W-NI	16	101W-SI
11:35:37	2	E	3	104E-NI	31	103E-NI	-2	103W-NI	-2	101W-NI
11:36:34	2	E	6	104E-SI	35	104W-NI	-7	103W-SI	-2	101W-NI
11:38:22	3	W	-1	104E-NI	-8	103E-SI	31	103W-NI	8	101W-SI
11:43:05	3	E	11	104E-SI	51	104W-SI	-10	103W-SI	-4	101W-SI
11:51:27	5	W	-4	104E-NI	-9	104W-NI	55	103W-SI	14	101W-SI
12:00:28	7	E	35	104E-SI	118	103E-NI	-26	103W-SI	-11	101W-SI
12:02:29	7	E	17	104E-SI	107	104W-SI	-19	103W-NI	-10	101W-SI
12:03:22	3	E	16	104E-SI	56	104W-SI	-11	103W-NI	-4	101W-SI
12:07:46	7	W	-4	104E-SI	-13	104W-NI	54	103W-SI	19	101W-SI
12:11:52	5	W	-5	104E-SI	-13	104W-NI	47	103W-NI	24	101W-SI
12:21:34	4	W	-8	104E-SI	-28	104W-NI	125	103W-SI	35	101W-SI
April 7, 11:32:06 AM	5	W	-3	104E-SI	-6	104W-SI	31	103W-SI	10	101W-SI
11:34:55	5	W	-4	104E-SI	-5	104W-SI	44	103W-SI	11	101W-SI
11:38:48	3	E	2	104E-SI	10	104W-SI	-2	103W-SI	-1	101W-SI
11:39:10	4	E	7	104E-SI	24	104W-NI	-5	102E-NI	-2	101W-SI
11:51:01	3	E	1	104E-SI	11	104W-SI	-2	103W-SI	-1	101W-SI
11:52:26	6	W	-6	104E-NI	-20	104W-NI	74	103W-SI	27	101W-SI
12:01:54	2	W	-2	104E-NI	-6	104W-NI	27	103W-NI	9	101W-SI
12:04:52	2	W	-5	104E-SI	-10	104W-NI	48	103W-SI	14	101W-SI
12:07:46	2	E	10	104E-SI	49	104W-SI	-10	103W-NI	-4	101W-SI
12:12:12	2	W	-2	104E-SI	-4	104W-NI	21	103W-SI	5	101W-SI
12:12:28	4	E	3	104E-NI	10	104W-NI	-1	103W-NI	-1	101W-SI
12:13:19	3	E	4	104E-SI	26	104W-NI	-5	103W-NI	-2	101W-SI
12:15:19	3	W	-1	104E-SI	-2	104W-NI	9	103W-NI	3	101W-SI
12:20:46	4	E	6	104E-NI	17	104W-NI	-3	103W-NI	-2	101W-SI
12:33:00	4	E	9	104E-SI	49	104W-SI	-10	103W-SI	-4	101W-SI
12:33:00	3	E	2	104E-N	10	104W-NI	-1	102E-NI	-1	101W-SI
12:34:00	3	E	14	104E-SI	57	104W-NI	7	103W-SI	2	101W-NI
12:35:52	4	W	-2	104W-SI	-5	104W-SI	18	103W-NI	6	101W-SI
12:38:59	4	E	5	104E-SI	17	104W-SI	-2	102E-NI	-3	101W-SI
12:44:47	6	W	-4	104E-SI	-12	104W-NI	54	103W-SI	16	101W-SI
12:45:42	5	W	-3	104E-SI	-6	104W-NI	39	103W-SI	10	101W-SI
12:46:29	6	W	-3	104E-SI	-8	104W-NI	49	103W-SI	13	101W-SI
12:46:45	5	W	-3	104E-SI	-9	104W-NI	56	103W-SI	22	101W-SI
12:55:50	3	W	-3	104E-SI	-6	104W-SI	23	103W-SI	6	101W-NI
12:57:55	4	W	-2	104E-NI	-4	104W-NI	22	103W-NI	7	101W-NI
12:58:48	3	W	-3	104E-SI	-9	104W-NI	34	103W-SI	8	101W-SI
12:59:36	4	E	5	104E-SI	15	103E-NI	-2	103W-SI	-1	101W-SI
1:09:55	2	E	13	104E-SI	62	104W-SI	-12	103W-SI	-4	101W-SI
1:12:29	5	W	-4	104E-SI	-6	104W-NI	30	103W-SI	9	101W-NI
1:12:56	3	W	-6	104E-SI	-13	104W-NI	59	103W-NI	21	101W-SI
1:15:45	5	E	17	104E-SI	28	104W-NI	-7	103W-SI	-3	101W-SI
1:16:40	3	W	-1	104E-SI	-2	104W-SI	13	103W-NI	2	101W-NI
1:17:38	4	E	6	104E-SI	16	104W-SI	-2	103W-SI	-2	101E-NI
1:21:55	2	W	-3	103W-NI	-3	101W-NI	14	103W-NI	4	103W-NI
1:22:03	4	E	1	104E-NI	5	104W-SI	-1	103W-NI	-1	101W-NI
1:24:55	3	E	2	104E-NI	12	101W-NI	-1	103W-SI	-1	101E-NI
1:28:25	2	E	4	104E-SI	23	103E-NI	-4	103W-NI	-3	101W-SI
1:29:52	4	W	-2	104E-NI	-4	104W-NI	20	102E-SI	14	101W-SI
1:33:49	4	E	6	104E-SI	28	103E-SI	-3	103W-NI	-3	101W-SI
1:35:01	3	E	1	105W-NI	6	104W-NI	-1	102E-NI	-1	101W-NI
1:42:04	4	E	17	105W-NI	41	103E-NI	-7	103W-SI	-4	101W-SI
1:44:40	4	E	5	101E-SI	23	104W-NI	-4	103W-SI	-2	101W-NI
1:44:50	5	E	5	104E-SI	35	104W-NI	-8	103W-SI	-4	101W-SI
1:47:11	6	W	-3	104E-SI	-9	103W-NI	42	103W-SI	14	101W-NI
1:50:10	3	E	34	104E-SI	54	104W-NI	-16	103W-NI	-5	101W-SI
1:58:41	4	W	-2	104E-NI	-6	104W-SI	35	103W-SI	15	101W-SI
2:03:19	3	E	-7	104E-SI	87	104W-NI	19	103W-SI	-10	101W-SI
2:09:19	4	W	-1	104E-NI	-2	104W-NI	15	103W-NI	4	101W-SI
2:12:43	4	W	-1	104E-NI	-2	104W-NI	16	102E-SI	2	101W-SI
2:13:28	4	E	10	104E-SI	27	104W-NI	-4	103W-NI	-2	101W-SI
2:19:01	2	W	-2	104E-SI	-4	104W-NI	41	103W-SI	14	101W-SI
2:27:52	4	W	-2	104E-NI	-4	104W-SI	17	103W-NI	5	101W-SI
2:29:10	4	W	-2	104E-SI	-2	104W-NI	24	103W-NI	4	101W-SI
2:32:49	2	E	9	104E-SI	33	104W-NI	-6	103W-SI	-2	101W-SI
2:34:19	4	E	13	104E-SI	25	104W-SI	-3	103W-NI	-2	101W-SI
2:40:34	4	W	-2	104E-SI	-3	104W-NI	21	103W-NI	7	101W-SI
2:46:42	6	W	-3	104E-SI	-11	104W-NI	51	103W-NI	17	101W-SI
2:48:03	6	W	-4	104E-SI	-12	104W-NI	50	103W-NI	23	101W-SI
2:48:07	5	W	-4	104E-SI	-16	104W-NI	34	103W-NI	24	101W-SI

Table B-18 Max. concrete strain data (in microstrain) under truck traffic loading, April 5 & 7, 2022

Time	Number of Axles	Direction (E or W)	CP1 Value	CP1 Location	CP2 Value	CP2 Location	CP3 Value	CP3 Location	CP4 Value	CP4 Location
April 5, 11:23:13 AM	4	W	-2	NW	-9	SE	45	SE	10	NE
11:25:08	8	E	27	SW	167	SE	-23	SE	-7	NE
11:30:25	6	W	-7	SW	-7	SW	130	SE	30	NE
11:30:29	4	W	-3	NW	-3	NW	52	NW	15	NE
11:32:01	6	W	-5	SW	-5	SW	122	SE	30	NE
11:35:37	2	E	6	NW	108	NW	-5	SE	-3	NE
11:36:34	2	E	11	SW	113	SE	-14	SE	-4	NE
11:38:22	3	W	-3	NW	-18	SE	84	SE	16	NE
11:43:05	3	E	25	SW	179	SE	-25	SE	-6	NE
11:51:27	5	W	-11	SW	-25	NE	157	SE	29	NE
12:00:28	7	E	72	SW	386	NW	-59	SE	-19	NE
12:02:29	7	E	37	SW	364	SE	-44	SE	-19	NE
12:03:22	3	E	33	SW	191	SE	-26	SE	-7	NE
12:07:46	7	W	-7	SW	-36	SE	166	SE	46	NE
12:11:52	5	W	-11	SW	-36	SE	153	SE	45	NE
12:21:34	4	W	-18	SW	-84	SE	515	SE	75	NE
April 7, 11:32:06 AM	5	W	-5	SW	-19	SE	89	SE	2	NE
11:34:55	5	W	-8	NW	-15	NE	125	NW	2	NE
11:38:48	3	E	3	NW	35	SE	-4	NW	-1	NE
11:39:10	4	E	13	SW	87	SE	-10	NW	-3	NE
11:51:01	3	E	4	SW	32	SE	-4	NW	-1	NE
11:52:26	6	W	-14	SW	-56	SE	186	NE	63	NE
12:01:54	2	W	-5	SW	-17	SE	71	NE	18	NE
12:04:52	2	W	-9	SW	-30	SE	114	NW	31	NE
12:07:46	2	E	21	SW	190	SE	-25	SE	-7	NE
12:12:12	2	W	-3	NW	-10	SE	47	NE	11	NE
12:12:28	4	E	5	SW	44	NW	-4	SE	-1	NE
12:13:19	3	E	8	SW	106	NW	-13	NW	-3	NE
12:15:19	3	W	-1	SW	-5	SE	30	NW	6	NE
12:20:46	4	E	14	SW	70	NW	-9	NW	-5	NE
12:33:00	4	E	20	SW	186	NE	-29	SE	-7	NE
12:33:00	3	E	3	NW	30	SW	-3	SW	-3	NE
12:34:00	3	E	36	SW	210	SE	-20	SE	-5	NE
12:35:52	4	W	-3	SW	-8	SE	46	SE	6	NE
12:38:59	4	E	17	SW	62	SE	-8	SE	-5	NE
12:44:47	6	W	-8	SW	-38	NE	172	NE	40	NE
12:45:42	5	W	-6	SW	-20	NE	105	NE	20	NE
12:46:29	6	W	-8	SW	-27	SE	117	NE	27	NE
12:46:45	5	W	-7	NW	-28	NE	135	NE	55	NE
12:55:50	3	W	-5	SW	-19	SE	54	NE	14	NE
12:57:55	4	W	-4	NW	-12	NE	48	NE	15	NE
12:58:48	3	W	-7	SW	-26	SE	87	NE	18	NE
12:59:36	4	E	10	SW	46	SE	-6	NW	-2	NE
1:09:55	2	E	34	SW	244	SE	-26	NW	-1	NE
1:12:29	5	W	-8	NW	-16	SE	80	NE	1	NE
1:12:56	3	W	-11	NW	-46	SE	168	NE	3	NE
1:15:45	5	E	54	NW	100	SE	-17	NW	-1	NE
1:16:40	3	W	-2	NW	-7	NW	29	NE	6	NE
1:17:38	4	E	11	SW	45	NE	-5	NE	-3	NE
1:21:55	2	W	-3	SW	-20	NE	35	NE	12	NE
1:22:03	4	E	2	NW	16	NW	-3	NE	-1	NE
1:24:55	3	E	5	SW	41	SE	-4	NW	-1	NE
1:28:25	2	E	8	NW	79	SE	-12	NW	-5	NE
1:29:52	4	W	-3	NW	-12	NE	58	NW	34	NE
1:33:49	4	E	16	SW	89	NW	-11	NE	-7	NE
1:35:01	3	E	4	SW	19	NE	-3	SW	-2	NE
1:42:04	4	E	40	SW	122	NW	-19	NW	-8	NE
1:44:40	4	E	13	SW	85	SE	-8	NE	-4	NE
1:44:50	5	E	15	NW	135	SE	-19	NE	-8	NE
1:47:11	6	W	-9	SW	-29	SE	131	NE	49	NE
1:50:10	3	E	90	SW	203	SE	-5	NE	-15	NE
1:58:41	4	W	-6	SW	-15	NW	124	NW	35	NE
2:03:19	3	E	-16	SW	331	SE	49	NE	-1	NE
2:09:19	4	W	-3	NW	-6	SE	37	NE	8	NE
2:12:43	4	W	-3	NW	-7	SE	45	NW	5	NE
2:13:28	4	E	25	SW	9	SE	-10	NW	-3	NE
2:19:01	2	W	-4	SW	-11	NW	94	NE	37	NE
2:27:52	4	W	-4	SW	-12	SE	43	NE	10	NE
2:29:10	4	W	-3	NW	-7	NE	50	NE	8	NE
2:32:49	2	E	23	SW	128	SE	-15	NE	-5	NE
2:34:19	4	E	32	NW	83	NE	-10	NE	-4	NE
2:40:34	4	W	-3	NW	-10	NE	63	NE	16	NE
2:46:42	6	W	-7	SW	-32	NE	134	NE	45	NE
2:48:03	6	W	-9	NW	-33	SE	152	NE	62	NE
2:48:07	5	W	-8	SW	-28	SE	110	NW	62	NE

Table B-19 Statistics of maximum steel and concrete strain data (in microstrain) under truck traffic loading, April 5 & 7, 2022

	CP1 Steel	CP2 Steel	CP3 Steel	CP4 Steel	CP1 Concrete	CP2 Concrete	CP3 Concrete	CP4 Concrete
Average Positive	9.1	35.5	35.9	12.0	21.7	123.9	103.7	25.4
Average Negative	-3.1	-7.8	-6.3	-3.1	-6.4	-21.1	-14.6	-5.1
Maximum Positive	35	118	125	35	90	386	515	75
Maximum Negative	-8	-28	-26	-11	-18	-84	-59	-19
Std Dev (positive values)	8.1	26.8	21.4	7.7	19.9	96.6	80.4	20.0
Std Dev (negative values)	1.7	5.3	5.8	2.6	3.8	16.0	12.4	4.6

C. Closure Pour Concrete Inspection Photos

August 27, 2020 Photos

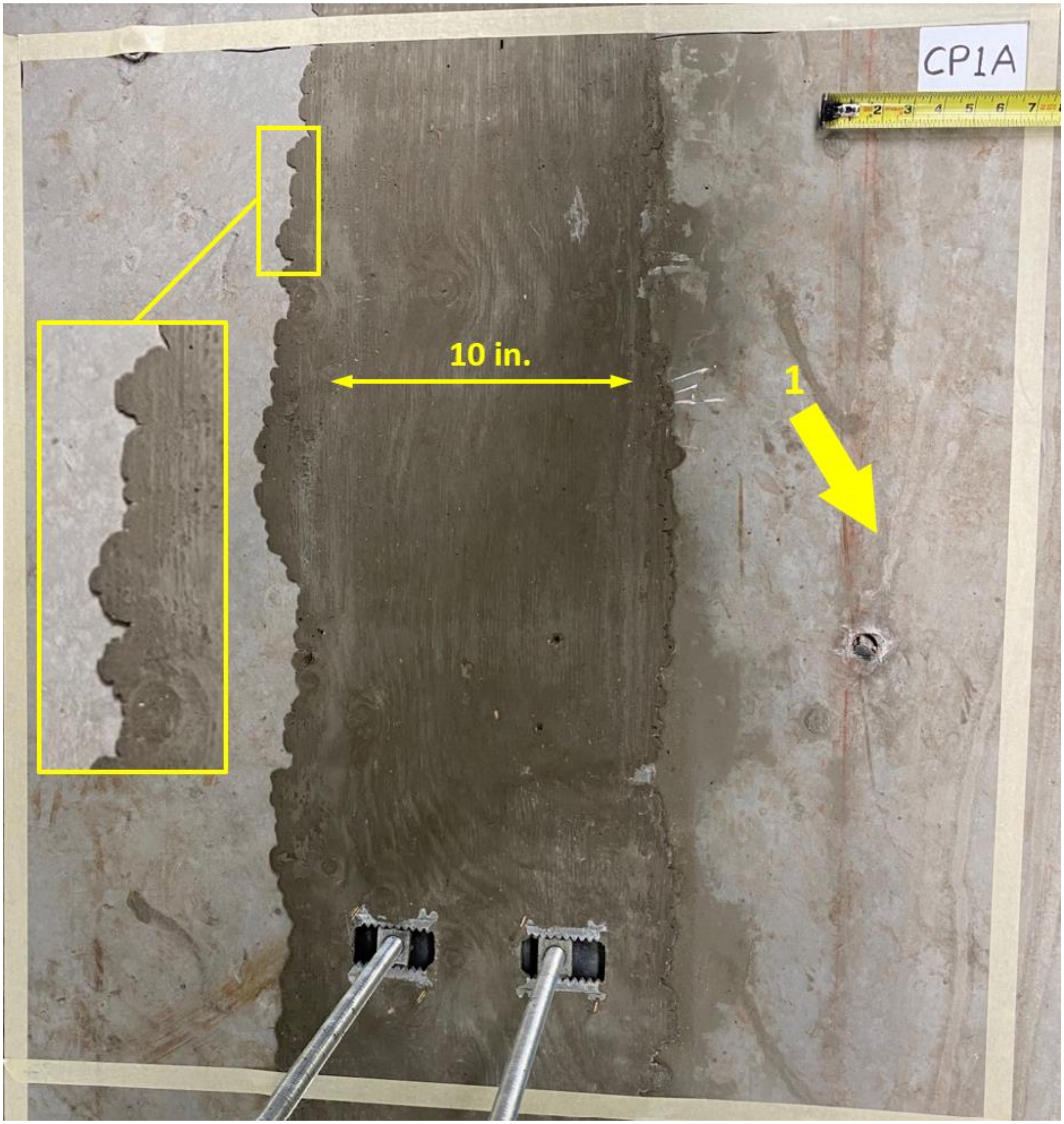

Figure C-1 View of section CP1A, August 27, 2020

Figure C-2 View of section CP1B, August 27, 2020

Figure C-3 View of section CP1C, August 27, 2020

Figure C-4 View of section CP1D, August 27, 2020

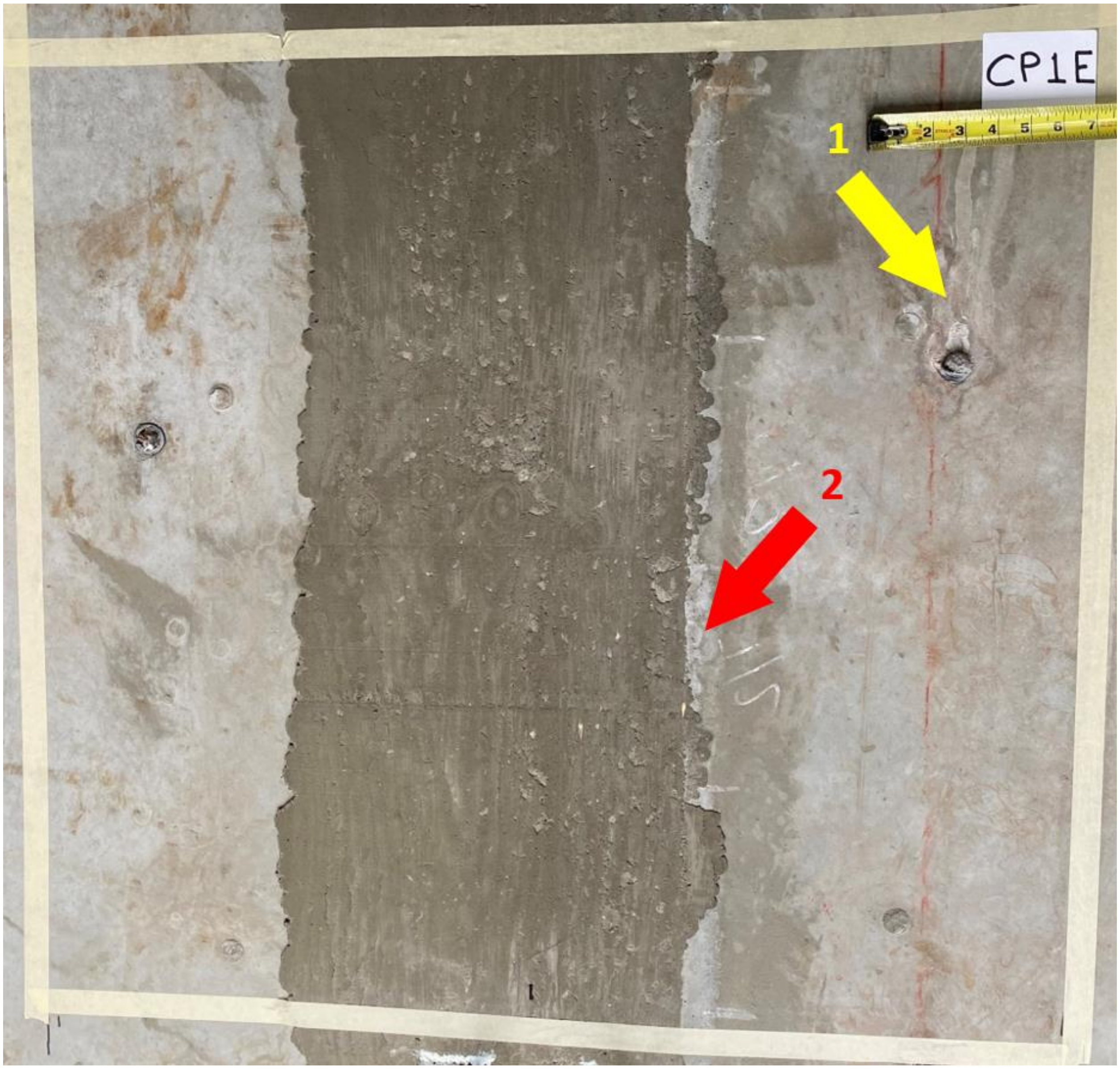

Figure C-5 View of section CP1E, August 27, 2020

Figure C-6 View of section CP2A, August 27, 2020

Figure C-7 View of section CP2B, August 27, 2020

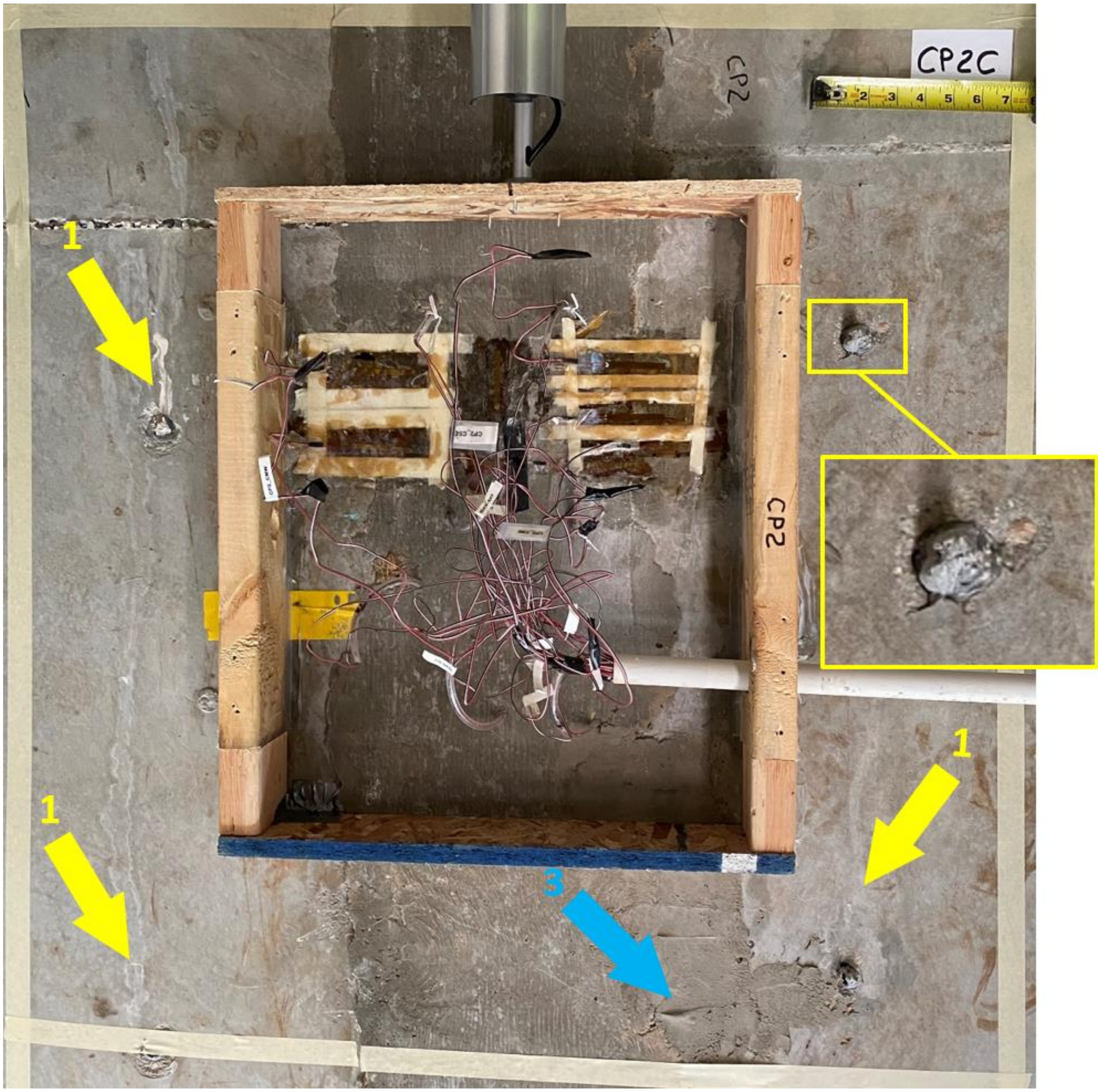

Figure C-8 View of section CP2C, August 27, 2020

Figure C-9 View of section CP2D, August 27, 2020

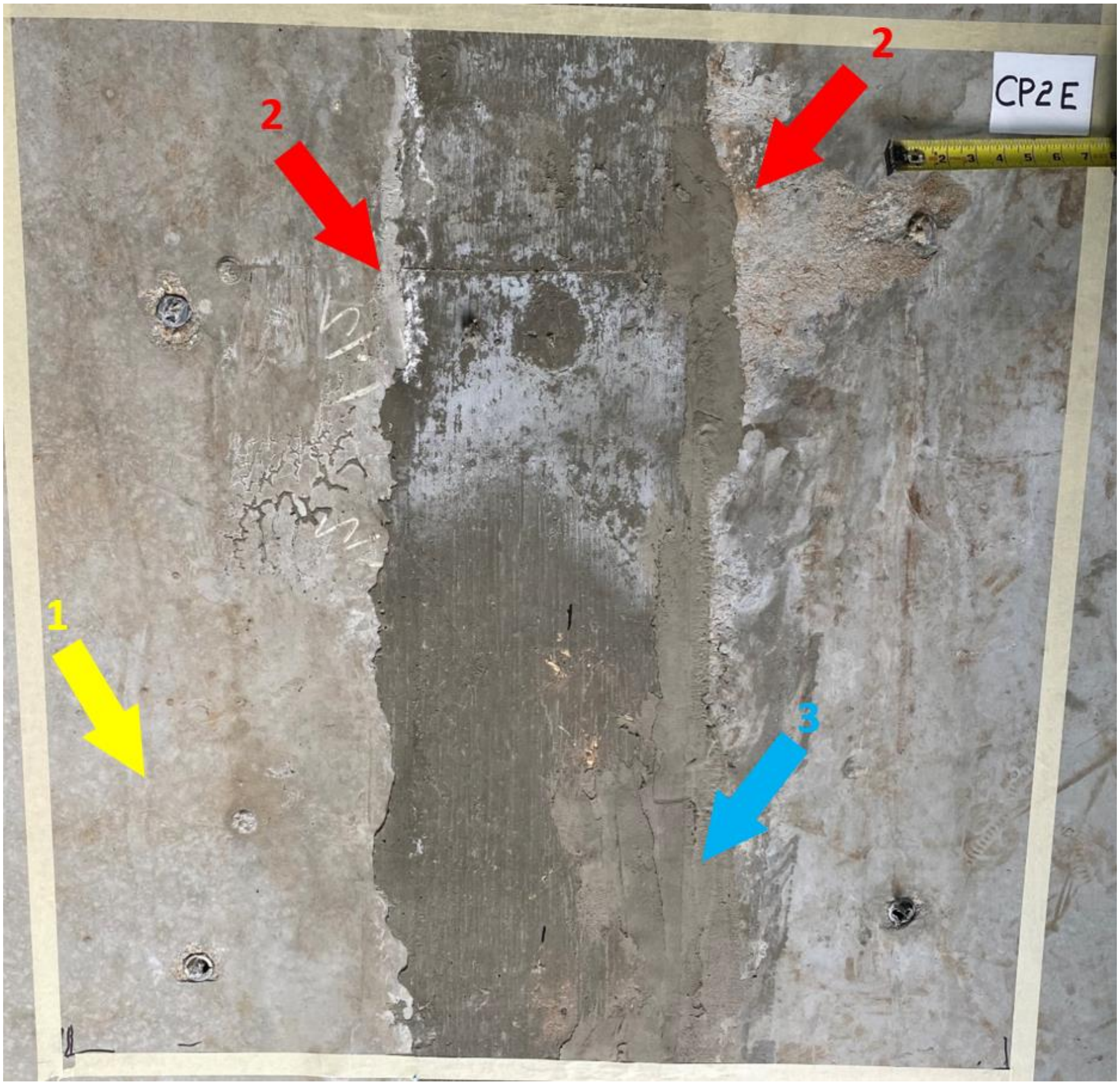

Figure C-10 View of section CP2E, August 27, 2020

Figure C-11 View of section CP3A, August 27, 2020

Figure C-12 View of section CP3B, August 27, 2020

Figure C-13 View of section CP3C, August 27, 2020

Figure C-14 View of section CP3D, August 27, 2020

Figure C-15 View of section CP3E, August 27, 2020

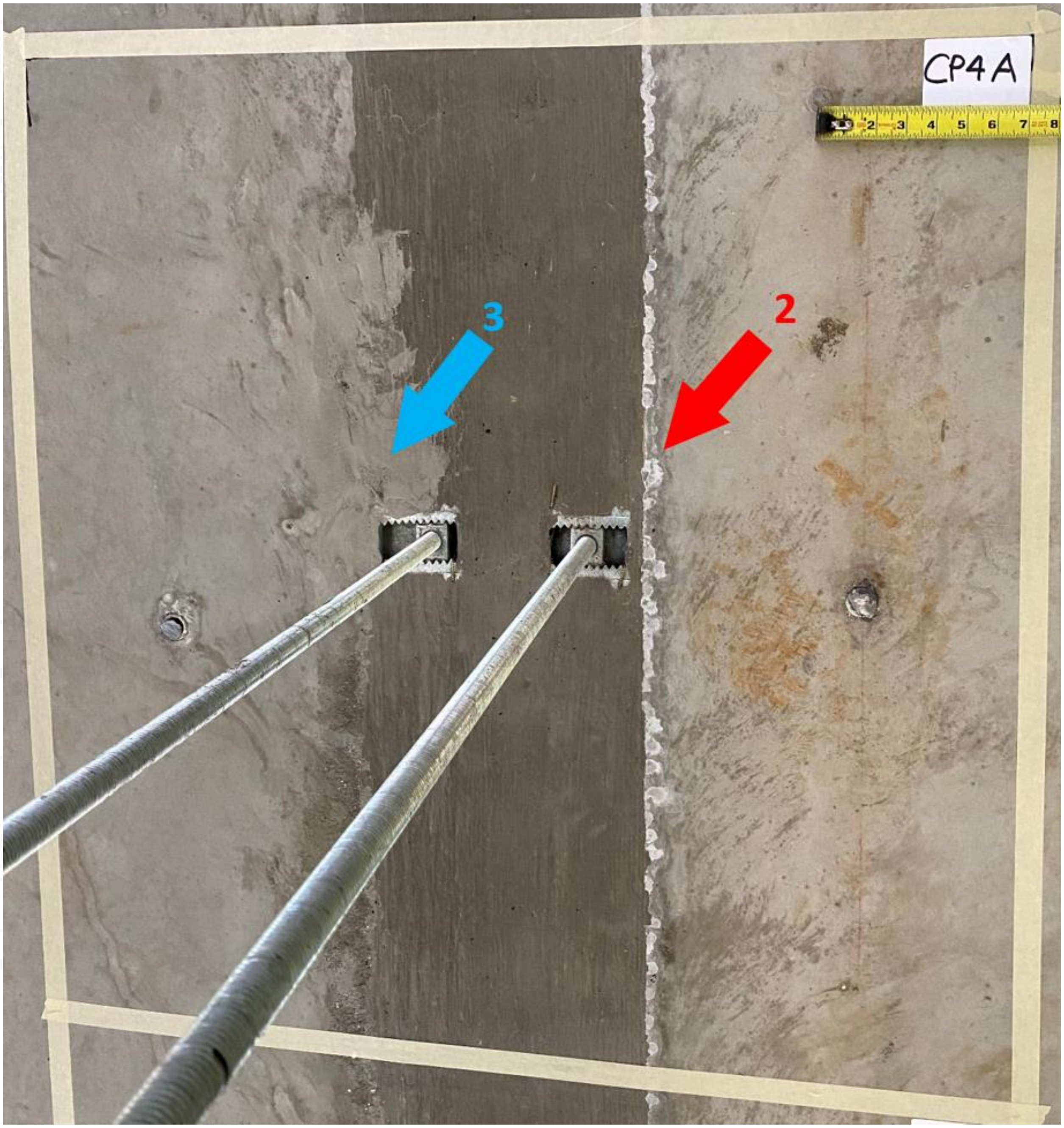

Figure C-16 View of section CP4A, August 27, 2020

Figure C-17 View of section CP4B, August 27, 2020

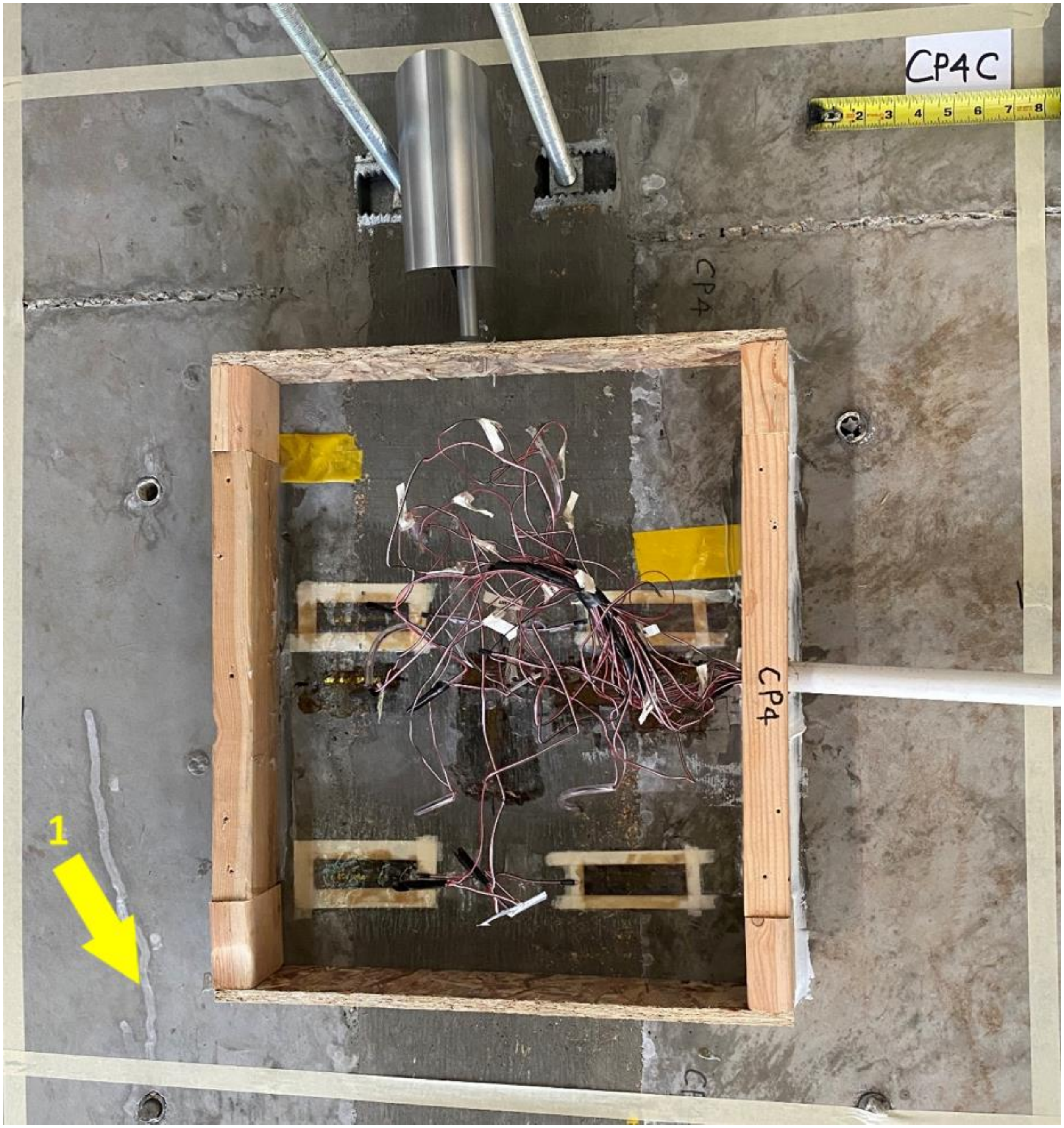

Figure C-18 View of section CP4C, August 27, 2020

Figure C-19 View of section CP4D, August 27, 2020

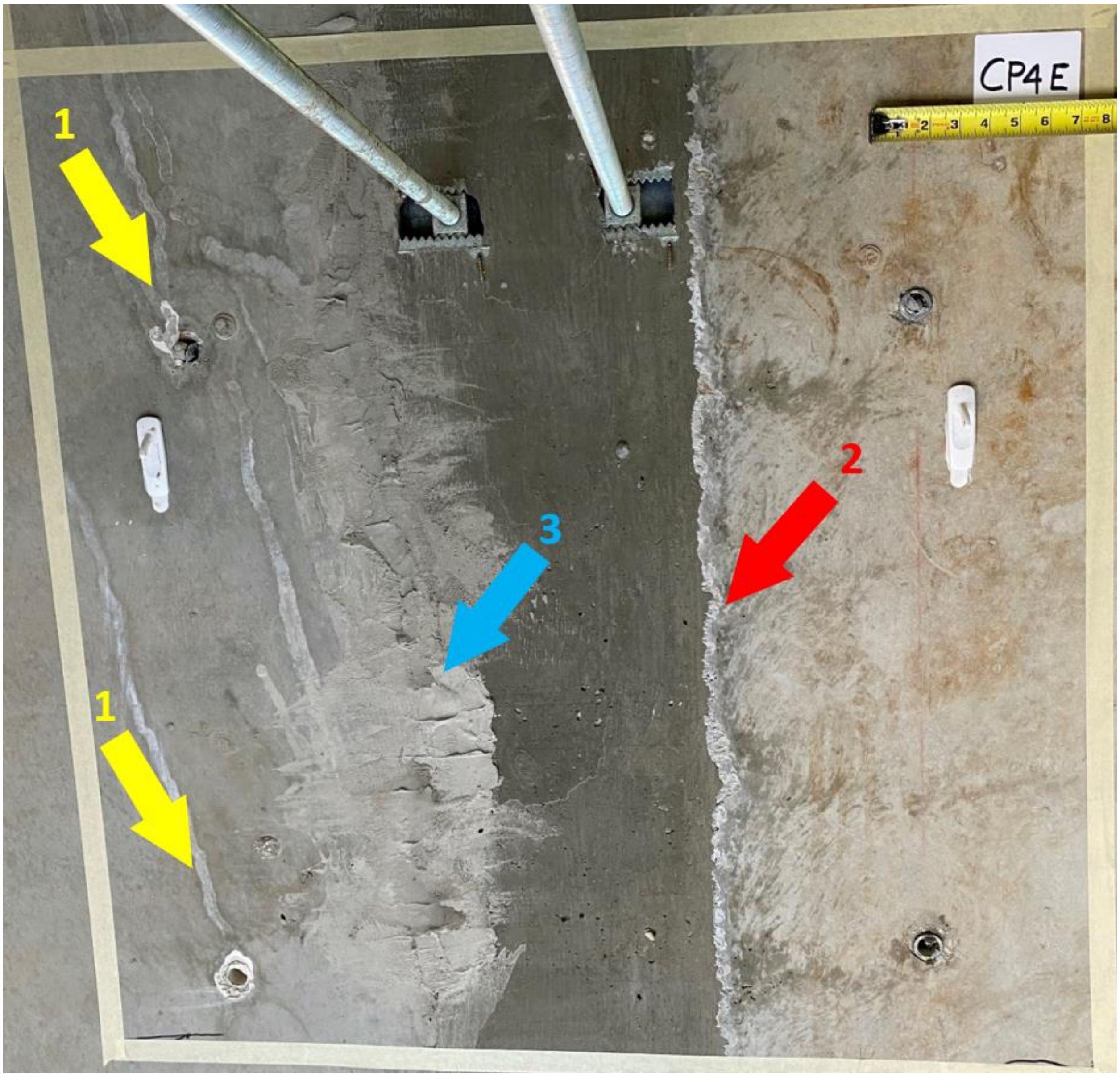

Figure C-20 View of section CP4E, August 27, 2020

April 5, 2022 Photos

Figure C-21 View of section CP1A, April 5, 2022

Figure C-22 View of section CP1B, April 5, 2022

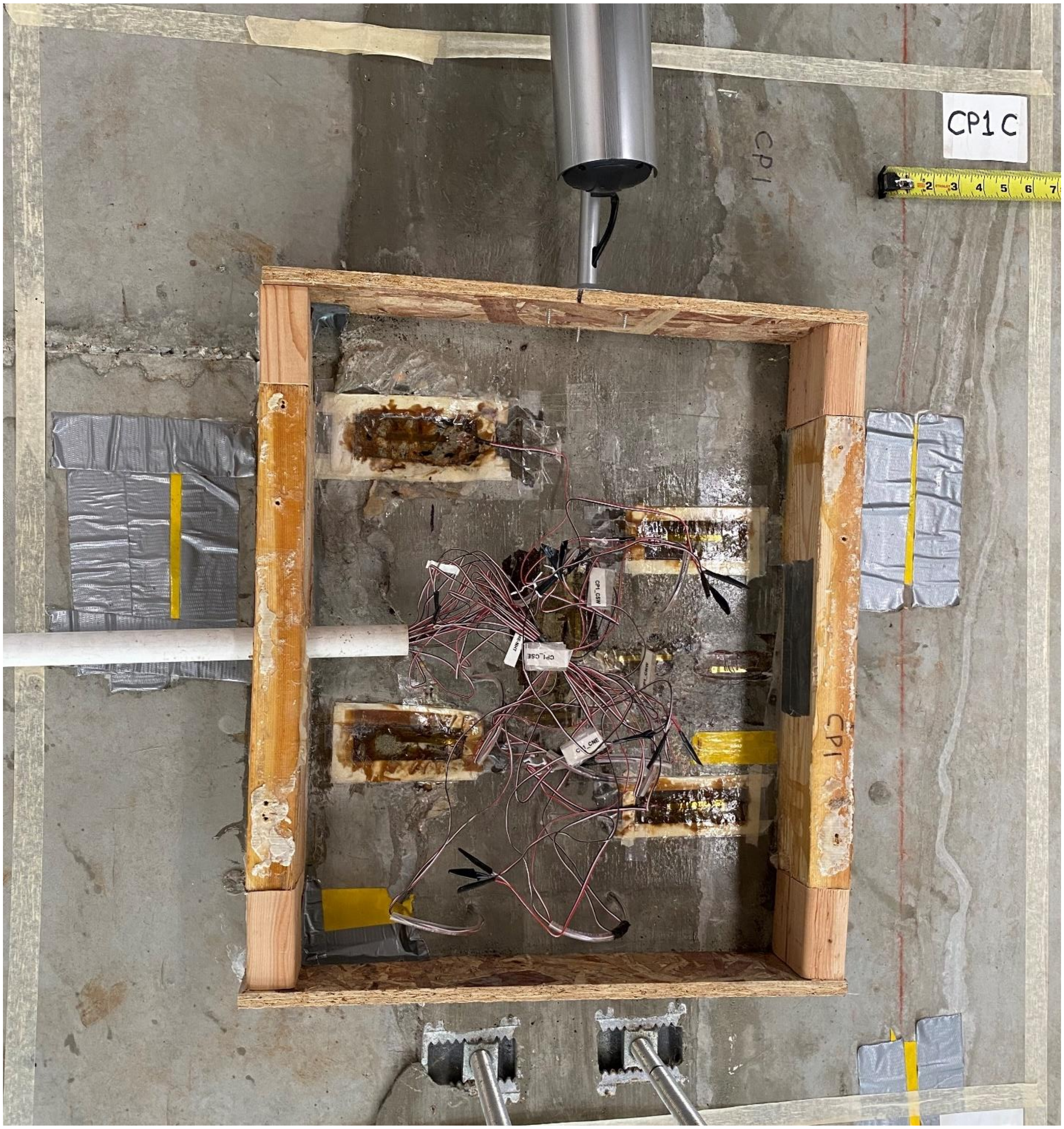

Figure C-23 View of section CP1C, April 5, 2022

Figure C-24 View of section CP1D, April 5, 2022

Figure C-25 View of section CP1E, April 5, 2022

Figure C-26 View of section CP2A, April 5, 2022

Figure C-27 View of section CP2B, April 5, 2022

Figure C-28 View of section CP2C, April 5, 2022

Figure C-29 View of section CP2D, April 5, 2022

Figure C-30 View of section CP2E, April 5, 2022

Figure C-31 View of section CP3A, April 5, 2022

Figure C-32 View of section CP3B, April 5, 2022

Figure C-33 View of section CP3C, April 5, 2022

Figure C-34 View of section CP3D, April 5, 2022

Figure C-35 View of section CP3E, April 5, 2022

Figure C-36 View of section CP4A, April 5, 2022

Figure C-37 View of section CP4B, April 5, 2022

Figure C-38 View of section CP4C, April 5, 2022

Figure C-39 View of section CP4D, April 5, 2022

Figure C-40 View of section CP4E, April 5, 2022