

Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Sep 21, 2021
Work Order Date: Aug 24, 2021

Work Order No.: 21-8536.Concrete.0001; ver: 3
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures, Inc
Placement Method: Pumped
Total Quantity Placed: 140 yd³
Placement Location: Bridge abutments

Performed by: Greg Davies
Finish Method: Vibrated- Internally|Hand Finished
Weather: Sunny

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures, Inc	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
		Slump (in)	-	4.25
	Mix Placed	Unit Weight (pcf)	-	142.2
	CDOT 2020138 - Martin Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
1	Location 1 attached	Point of Delivery	10	2034	68114574	10:52 AM	12:25 PM	90	9
2	Location 2 attached	Point of Delivery	20	0769	68114579	11:19 AM	12:42 PM	90	17
3	Location 3 attached	Point of Delivery	30	2031	68114581	11:37 AM	12:57 PM	90	0
4	Location 4 attached	Point of Delivery	80	1640	68114592	1:19 PM	2:26 PM	90	0
5	Location 5 attached	Point of Delivery	110	8644	68114600	2:17 PM	3:25 PM	90	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
1	80	4	6.0	.250	7.80	42.14	137.4	
2	83	4.5	5.0	.250	7.80	42.55	139.0	
3	83	4.25	5.3	.250	8.83	43.70	139.5	Yes
4	83	5.5	5.7	.250	8.83	43.67	139.4	Yes
5	87	5	5.5	.250	8.83	43.60	139.1	Yes

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.



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Concrete

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
3	C8589	7	4.00	12.57	5 / Side	40,070	3,190	-
	C8590	7	4.00	12.57	5 / Side	43,300	3,450	-
	C8591	28	4.00	12.57	5 / Side	63,240	5,030	5,030
	C8592	28	4.00	12.57	5 / Side	59,210	4,710	4,710
	C8593	28	4.00	12.57	5 / Side	59,290	4,720	4,720
Average Compressive Strength (psi):								4,820

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
4	C8595	7	4.00	12.57	3 / Columnar	39,130	3,110	-
	C8596	7	4.00	12.57	5 / Side	45,380	3,610	-
	C8597	28	4.00	12.57	5 / Side	56,930	4,530	4,530
	C8598	28	4.00	12.57	5 / Side	61,990	4,930	4,930
	C8599	28	4.00	12.57	3 / Columnar	61,370	4,880	4,880
Average Compressive Strength (psi):								4,780

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
5	C8601	7	4.00	12.57	3 / Columnar	37,750	3,000	-
	C8602	7	4.00	12.57	5 / Side	42,260	3,360	-
	C8603	28	4.00	12.57	3 / Columnar	59,370	4,720	4,720
	C8604	28	4.00	12.57	3 / Columnar	59,180	4,710	4,710
	C8605	28	4.00	12.57	5 / Side	60,040	4,780	4,780
Average Compressive Strength (psi):								4,740

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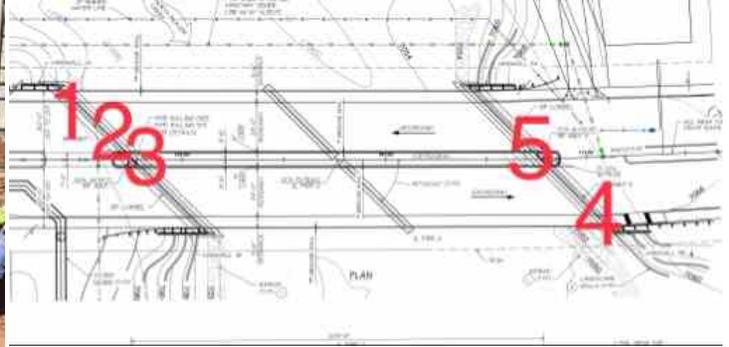
Reviewed by: Josiah Johnson

Concrete

Photos



Concrete placement



Test locations in red



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Sep 23, 2021
Work Order Date: Aug 26, 2021

Work Order No.: 21-8536.Concrete.0003; ver: 4
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures, Inc
Placement Method: Pumped
Total Quantity Placed: 12 yd³
Placement Location: Westbound Caisson 1
Comments: Concrete is a non-air mix therefore air content testing was not necessary per Larry Urioste. Concrete contained hydration stabilizer HS-2 and therefore was allowed to sit for over 90 minutes.

Performed by: Greg Davies
Finish Method: Vibrated- Internally
Weather: Mostly Sunny

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures, Inc	Class BZ - Drilled Shafts/Piers	Air Content (%)	N/A max.	-
		Slump (in)	5 to 8	-
	Mix Placed	Unit Weight (pcf)	-	-
	Martin Marietta XBZ4705	Comp. Strength (psi)	4500	-

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
6	Location 1 attached	Point of Delivery	6	2002	67093631	8:03 AM	10:09 AM	80	6
7	Location 1 attached	Point of Delivery	12	1636	67093635	8:39 AM	10:27 AM	80	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
6	81	6.75		.250	8.88	45.10	144.9	
7	82	7		.250	8.88	45.06	144.7	Yes

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
7	C8656	7	4.00	12.57	5 / Side	55,130	4,390	-
	C8657	28	4.00	12.57	5 / Side	72,180	5,740	5,740
	C8658	28	4.00	12.57	5 / Side	72,470	5,770	5,770
	C8659	28	4.00	12.57	5 / Side	71,340	5,680	5,680
Average Compressive Strength (psi):								5,730

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Work Order Date: Aug 26, 2021

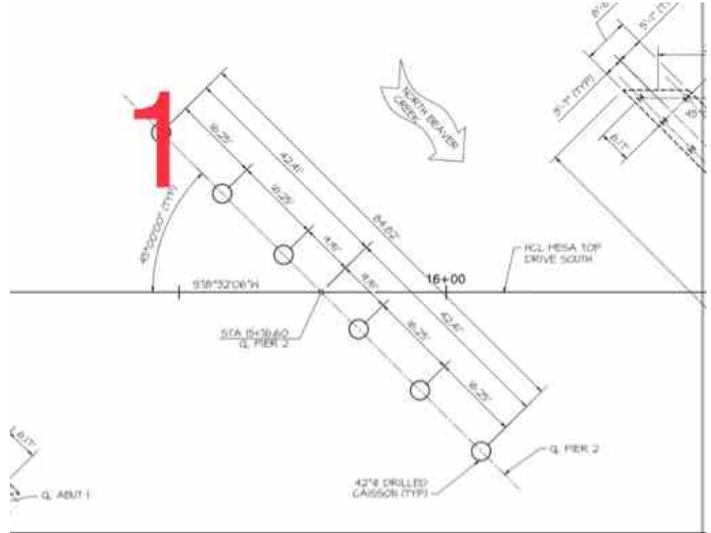
Reviewed by: Josiah Johnson

Concrete

Photos



Concrete location



Test location in red

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Report Date: Sep 24, 2021
Work Order Date: Aug 27, 2021

Work Order No.: 21-8536.Concrete.0004; ver: 5
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures, Inc
Placement Method: Pumped
Total Quantity Placed: 14 yd³
Placement Location: Caissons WB-2 and WB-3
Comments: Concrete is a non-air mix therefore air content testing was not necessary per Larry Urioste. Concrete contained hydration stabilizer HS-2 and we were notified the concrete was allowed to sit for over 90 minutes.

Performed by: Greg Davies
Finish Method: Vibrated- Internally|Hand Finished
Weather: Mostly Sunny

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures, Inc	Class BZ - Drilled Shafts/Piers	Air Content (%)	N/A max.	-
		Slump (in)	5 to 8	-
	Mix Placed	Unit Weight (pcf)	-	-
	Martin Marietta XBZ4705	Comp. Strength (psi)	4500	-

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
8	WB-2	Point of Delivery	9	1915	67093721	7:59 AM	10:10 AM	80	0
9	WB-2	Point of Delivery	17	1636	67093727	8:23 AM	10:25 AM	80	0
10	WB-3	Point of Delivery	9	0647	67093788	2:04 PM	3:20 PM	85	8
11	WB-3	Point of Delivery	17	1748	67093791	2:22 PM	3:40 PM	85	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
8	79	6.25		.250	8.80	45.01	144.8	Yes
9	79	6		.250	8.80	45.01	144.8	
10	87	5.25		.250	8.80	45.27	145.9	Yes
11	86	6.75		.250	8.80	45.09	145.2	

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Work Order Date: Aug 27, 2021

Reviewed by: Josiah Johnson

Concrete

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
8	C8670	7	4.00	12.57	5 / Side	54,990	4,380	-
	C8671	28	4.00	12.57	5 / Side	83,230	6,620	6,620
	C8672	28	4.00	12.57	5 / Side	81,750	6,500	6,500
	C8673	28	4.00	12.57	5 / Side	82,620	6,570	6,570
Average Compressive Strength (psi):								6,560

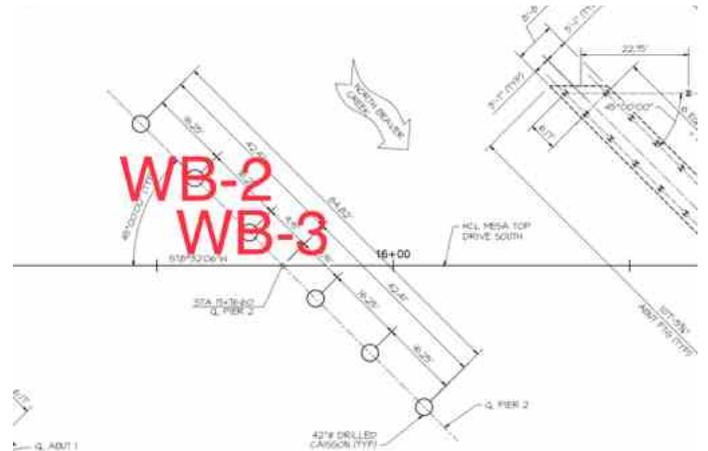
Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
10	C8675	7	4.00	12.57	5 / Side	55,240	4,400	-
	C8676	28	4.00	12.57	5 / Side	78,170	6,220	6,220
	C8677	28	4.00	12.57	3 / Columnar	80,050	6,370	6,370
	C8678	28	4.00	12.57	5 / Side	78,780	6,270	6,270
Average Compressive Strength (psi):								6,290

Photos

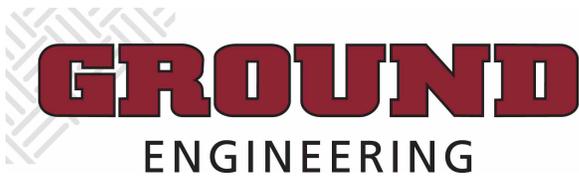


WB-2 concrete



Test locations in red

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Forest Lakes Bridges

Report Date: Sep 27, 2021
Work Order Date: Aug 30, 2021

Work Order No.: 21-8536.Concrete.0005; ver: 3
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures, Inc
Placement Method: Pumped
Total Quantity Placed: 17 yd³
Placement Location: Eastbound caissons

Performed by: Greg Davies
Finish Method: Hand Finished|Vibrated- Internally
Weather: Mostly Sunny

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures, Inc	Class BZ - Drilled Shafts/Piers	Air Content (%)	N/A max.	-
		Slump (in)	5 to 8	-
	Mix Placed	Unit Weight (pcf)	-	-
	Martin Marietta XBZ4705	Comp. Strength (psi)	4500	-

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
12	EB-1	Point of Delivery	10	2001	67093894	11:30 AM	12:55 PM	85	7
13	EB-1	Point of Delivery	17	0643	67093895	11:49 AM	1:20 PM	85	14

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
12	84	5.75		.250	8.88	45.02	144.6	Yes
13	81	5.5		.250	8.88	45.27	145.6	

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
12	C8710	7	4.00	12.57	5 / Side	52,640	4,190	-
	C8711	28	4.00	12.57	5 / Side	69,490	5,530	5,530
	C8712	28	4.00	12.57	5 / Side	71,310	5,670	5,670
	C8713	28	4.00	12.57	5 / Side	69,380	5,520	5,520
Average Compressive Strength (psi):								5,570

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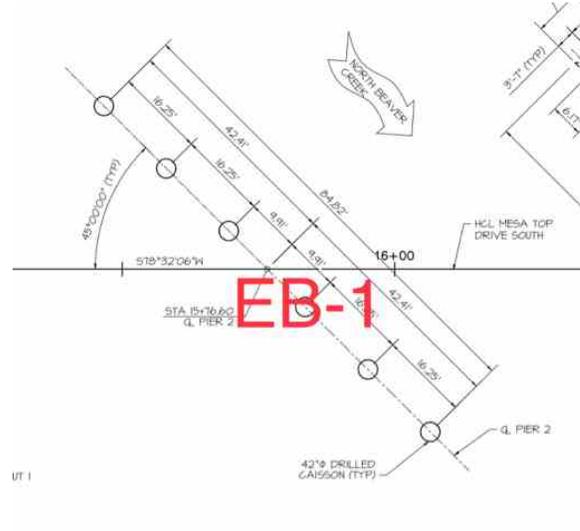
Reviewed by: Josiah Johnson

Concrete

Photos



Concrete placement



Test location in red



Client: Elliott Van Stelle
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4 Inverness Court East, Suite 250
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Forest Lakes Bridges

Report Date: Sep 28, 2021
Work Order Date: Aug 31, 2021

Work Order No.: 21-8536.Concrete.0006; ver: 3
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures, Inc
Placement Method: Pumped
Total Quantity Placed: 34 yd³
Placement Location: Eastbound caissons
Comments: Concrete is a non-air mix and therefore air content testing was not required per Larry Urioste

Performed by: Greg Davies
Finish Method: Vibrated- Internally|Hand Finished
Weather: Mostly Sunny

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures, Inc	Class BZ - Drilled Shafts/Piers	Air Content (%)	N/A max.	-
	Mix Placed	Slump (in)	5 to 8	-
	Martin Marietta XBZ4705	Unit Weight (pcf)	-	-
		Comp. Strength (psi)	4500	-

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
14	EB-2	Point of Delivery	9	2006	68115024	8:47 AM	9:58 AM	85	10
15	EB-2	Point of Delivery	17	0649	68115029	9:04 AM	10:20 AM	85	11
16	EB-3	Point of Delivery	8.5	1632	67093986	12:07 PM	1:20 PM	85	15
17	EB-3	Point of Delivery	17	0652	67093996	12:37 PM	1:45 PM	85	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
14	83	6.5		.250	8.87	45.12	145.0	Yes
15	81	6.75		.250	8.87	44.79	143.7	
16	88	5		.250	8.87	44.80	143.7	Yes
17	85	7.25		.250	8.87	45.23	145.4	

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Work Order Date: Aug 31, 2021

Reviewed by: Josiah Johnson

Concrete

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
14	C8733	7	4.00	12.57	5 / Side	47,460	3,780	-
	C8734	28	4.00	12.57	5 / Side	65,820	5,240	5,240
	C8735	28	4.00	12.57	5 / Side	66,410	5,280	5,280
	C8736	28	4.00	12.57	3 / Columnar	64,620	5,140	5,140
Average Compressive Strength (psi):								5,220

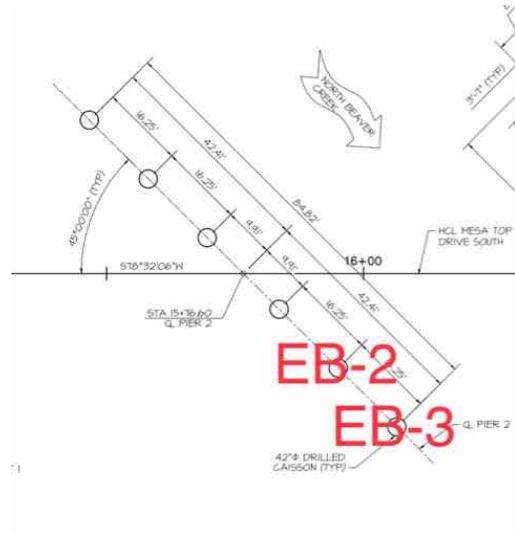
Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
16	C8738	7	4.00	12.57	5 / Side	47,790	3,800	-
	C8739	28	4.00	12.57	5 / Side	65,860	5,240	5,240
	C8740	28	4.00	12.57	3 / Columnar	64,100	5,100	5,100
	C8741	28	4.00	12.57	5 / Side	64,150	5,100	5,100
Average Compressive Strength (psi):								5,150

Photos



Concrete in EB-2



Test locations in red

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Forest Lakes Bridges

Report Date: Oct 11, 2021
Work Order Date: Sep 13, 2021

Work Order No.: 21-8536.Concrete.0008; ver: 3
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures Inc
Placement Method: Pumped
Total Quantity Placed: 120 yd³
Placement Location: East abutment

Performed by: Greg Davies
Finish Method: Vibrated- Internally|Hand Finished
Weather: Mostly Sunny

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures Inc	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
		Slump (in)	-	4.25
	Mix Placed	Unit Weight (pcf)	-	142.2
	CDOT 2020138 - Martin Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
18	Location 1 attached	Point of Delivery	10.25	2032	67094587	6:53 AM	8:08 AM	75	10
19	Location 2 attached	Point of Delivery	20.5	2005	67094591	7:19 AM	8:30 AM	75	0
20	Location 3 attached	Point of Delivery	30.75	2001	67094594	7:36 AM	8:44 AM	80	7
21	Location 4 attached	Point of Delivery	80.5	8670	67094606	9:13 AM	10:25 AM	80	10

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
18	82	5.25	6.2	.250	8.89	43.57	138.7	Yes
19	82	6.25	6.8	.250	8.89	43.20	137.2	
20	83	4	5.7	.250	8.89	44.02	140.5	
21	79	4.75	6.1	.250	8.89	43.93	140.2	Yes

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Reviewed by: Josiah Johnson

Concrete

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
18	C8868	7	4.00	12.57	5 / Side	44,740	3,560	-
	C8869	28	4.00	12.57	3 / Columnar	58,360	4,640	4,640
	C8870	28	4.00	12.57	3 / Columnar	58,220	4,630	4,630
	C8871	28	4.00	12.57	5 / Side	57,530	4,580	4,580
Average Compressive Strength (psi):								4,620

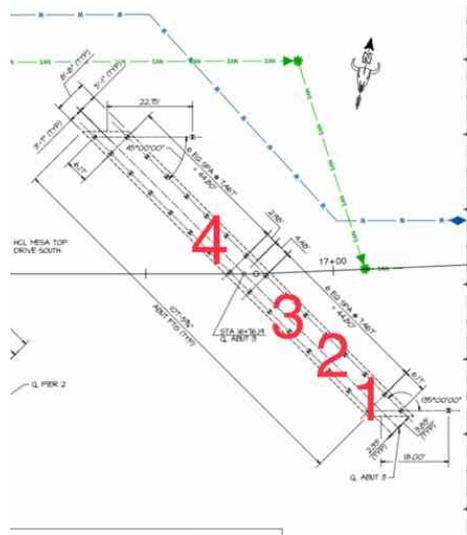
Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
21	C8874	7	4.00	12.57	5 / Side	52,460	4,170	-
	C8875	28	4.00	12.57	5 / Side	67,020	5,330	5,330
	C8876	28	4.00	12.57	3 / Columnar	68,670	5,460	5,460
	C8877	28	4.00	12.57	5 / Side	68,400	5,440	5,440
Average Compressive Strength (psi):								5,410

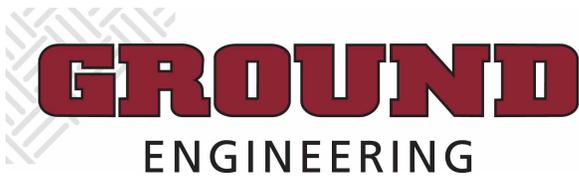
Photos



Concrete placement



Test locations in red



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Nov 12, 2021
Work Order Date: Sep 17, 2021

Work Order No.: 21-8536.Concrete.0009; ver: 4
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures
Placement Method: Pumped
Total Quantity Placed: 12 yd³
Placement Location: Caissons

Performed by: Brian Rivera
Finish Method: Hand Finished
Weather: Clear|Sunny

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures Inc	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
		Slump (in)	-	4.25
	Mix Placed	Unit Weight (pcf)	-	142.2
	CDOT 2020138 - Martin Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
22	STA 15+50 20' LT	Point of Delivery	6	2105	68116018	10:00 AM	11:10 AM	66	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
22	71	5	7.8	.249	7.72	41.82	136.9	Yes

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
22	C8936	7	4.00	12.57	5 / Side	40,240	3,200	-
	C8937	28	4.00	12.57	5 / Side	52,340	4,160	4,160
	C8938	28	4.00	12.57	5 / Side	52,830	4,200	4,200
	C8939	56	4.00	12.57	5 / Side	59,400	4,730	-
	C8940	56	4.00	12.57	5 / Side	60,110	4,780	-
Average Compressive Strength (psi):								4,180

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.

Forest Lakes Bridges

Report Date: Nov 12, 2021

Work Order No.: 21-8536.Concrete.0009; ver: 4

Work Order Date: Sep 17, 2021

Reviewed by: Josiah Johnson

Concrete

Photos





Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Oct 22, 2021
Work Order Date: Sep 22, 2021

Work Order No.: 21-8536.Concrete.0011; ver: 3
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures Inc
Placement Method: Pumped
Total Quantity Placed: 140 yd³
Placement Location: West abutment

Performed by: Greg Davies
Finish Method: Vibrated- Internally|Hand Finished
Weather: Mostly Sunny

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures Inc	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
		Slump (in)	-	4.25
	Mix Placed	Unit Weight (pcf)	-	142.2
	CDOT 2020138 - Martin Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
24	Location 1 attached	Point of Delivery	10	2034	68116285	7:56 AM	9:15 AM	55	0
25	Location 2 attached	Point of Delivery	20	0651	68116292	8:28 AM	9:45 AM	55	5
26	Location 3 attached	Point of Delivery	30	2105	68116299	8:53 AM	10:10 AM	60	5
27	Location 4 attached	Point of Delivery	80	2034	68116314	10:26 AM	11:42 AM	75	0
28	Location 5 attached	Point of Delivery	100	1635	68116322	11:33 AM	12:43 PM	75	10
29	Location 6 attached	Point of Delivery	120	1633	68116327	12:08 PM	1:25 PM	75	10

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
24	62	6	6.3	.250	8.92	43.75	139.3	Yes
25	69	5.75	5.4	.250	8.92	43.94	140.1	
26	71	6.25	6.4	.250	8.92	43.58	138.6	
27	71	6.5	6.8	.250	8.92	43.36	137.8	Yes
28	74	5.75	5.8	.250	8.92	43.81	139.6	
29	73	5.5	5.2	.250	8.89	44.08	140.8	Yes

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Oct 22, 2021
Work Order Date: Sep 22, 2021

Work Order No.: 21-8536.Concrete.0011; ver: 3
Reviewed by: Josiah Johnson

Concrete

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
24	C9013	7	4.00	12.57	5 / Side	47,800	3,800	-
	C9014	28	4.00	12.57	5 / Side	59,950	4,770	4,770
	C9015	28	4.00	12.57	5 / Side	64,200	5,110	5,110
	C9016	28	4.00	12.57	5 / Side	57,530	4,580	4,580
Average Compressive Strength (psi):								4,820

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
27	C9019	7	4.00	12.57	5 / Side	48,740	3,880	-
	C9020	28	4.00	12.57	5 / Side	64,010	5,090	5,090
	C9021	28	4.00	12.57	5 / Side	61,110	4,860	4,860
	C9022	28	4.00	12.57	3 / Columnar	58,410	4,650	4,650
Average Compressive Strength (psi):								4,870

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
29	C9025	7	4.00	12.57	5 / Side	49,940	3,970	-
	C9026	28	4.00	12.57	3 / Columnar	65,630	5,220	5,220
	C9027	28	4.00	12.57	5 / Side	67,520	5,370	5,370
	C9028	28	4.00	12.57	5 / Side	68,410	5,440	5,440
Average Compressive Strength (psi):								5,340

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.

Forest Lakes Bridges

Report Date: Oct 22, 2021
Work Order Date: Sep 22, 2021

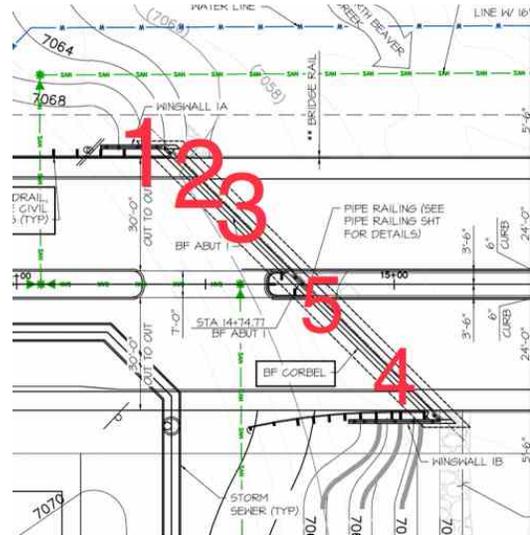
Work Order No.: 21-8536.Concrete.0011; ver: 3
Reviewed by: Josiah Johnson

Concrete

Photos



Concrete placement



Test locations in red



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Nov 1, 2021

Work Order No.: 21-8536.Concrete.0012; ver: 3

Work Order Date: Oct 1, 2021

Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures, Inc.

Performed by: William Sullivan

Placement Method: Pumped

Finish Method: Hand Finished

Total Quantity Placed: 12 yd³

Weather: Cloudy

Placement Location: Pier 2 @ STA 15+76.60

Comments: Both trucks added 1 pack of air after first failing test.

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Elliott Van Stelle with Structures, Inc.	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
	Mix Placed	Slump (in)	-	4.25
	CDOT 2020138 - Martin	Unit Weight (pcf)	-	142.2
	Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
30	Pier 6 on attached image	Point of Delivery	6	1636	67095685	10:49 AM	12:18 PM	56	0
30.1	Pier 6 on attached image	Point of Delivery	6	1636	67095685	10:49 AM	12:30 PM	58	0
31	Pier 4 on attached image	Point of Delivery	12	0650	67095688	11:06 AM	1:10 PM	56	
31.1	Pier 4 on attached image	Point of Delivery	12	0650	67095688	11:06 AM	1:15 PM	59	4

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
30	71	8	4.0	.249	8.70	43.91	141.4	
30.1	71	8	6.0	.249	8.70	43.23	138.7	Yes
31	73	5.5	4.0	.249	8.70	44.61	144.2	
31.1	73	6	5.0	.249	8.70	43.91	141.4	

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
30.1	C9200	3	4.00	12.57	5 / Side	36,230	2,880	-
	C9201	5	4.00	12.57	5 / Side	43,030	3,420	-
	C9202	7	4.00	12.57	5 / Side	46,840	3,730	-
	C9203	28	4.00	12.57	5 / Side	63,130	5,020	5,020
	C9204	28	4.00	12.57	5 / Side	64,210	5,110	5,110
	C9205	28	4.00	12.57	5 / Side	64,620	5,140	5,140
Average Compressive Strength (psi):								5,090

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.

Forest Lakes Bridges

Report Date: Nov 1, 2021

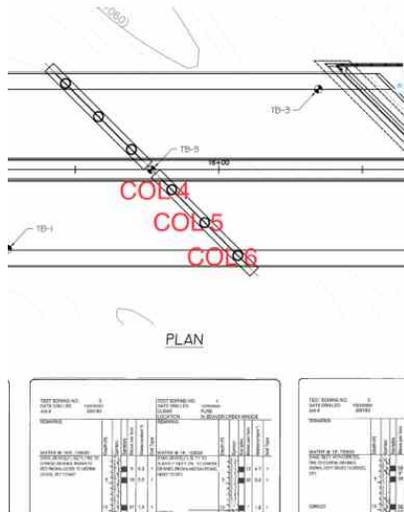
Work Order No.: 21-8536.Concrete.0012; ver: 3

Work Order Date: Oct 1, 2021

Reviewed by: Josiah Johnson

Concrete

Photos





Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Nov 23, 2021
Work Order Date: Oct 20, 2021

Work Order No.: 21-8536.Concrete.0013; ver: 5
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures, inc. Performed by: Cody Jerz
Placement Method: Pumped Finish Method: Vibrated- Internally|Hand Finished
Total Quantity Placed: 60 yd³ Weather: Sunny|Calm|Clear
Placement Location: Pier caps on CL Pier 2 at STA 15+76.60 on Eastbound and Westbound lanes of bridge

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures, inc.	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
		Slump (in)	-	4.25
	Mix Placed	Unit Weight (pcf)	-	142.2
	CDOT 2020138 - Martin Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
32	CL Pier 2 STA 15+85	Point of Delivery	10	2107	67096713	10:58 AM	12:03 PM	54	0
33	CL Pier 2 STA 15+96	Point of Delivery	20	2006	67096714	11:19 AM	12:20 PM	54	7
34	CL Pier 2 STA 16+20	Point of Delivery	30	8670	67096715	11:45 AM	12:50 PM	55	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
32	80	5	5.6	.248	7.66	42.67	141.2	
33	79	5	6.4	.248	7.66	42.43	140.2	
34	81	4.5	6.2	.248	7.66	42.45	140.3	Yes

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
34	C9397	7	4.00	12.57	5 / Side	55,420	4,410	-
	C9398	7	4.00	12.57	5 / Side	56,550	4,500	-
	C9402	14	4.00	12.57	5 / Side	60,340	4,800	-
	C9399	28	4.00	12.57	5 / Side	65,210	5,190	5,190
	C9400	28	4.00	12.57	5 / Side	65,620	5,220	5,220
	C9401	28	4.00	12.57	5 / Side	65,710	5,230	5,230
Average Compressive Strength (psi):								5,210

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.

Forest Lakes Bridges

Report Date: Nov 23, 2021

Work Order No.: 21-8536.Concrete.0013; ver: 5

Work Order Date: Oct 20, 2021

Reviewed by: Josiah Johnson

Concrete

Photos



Rebar and forms on westbound side of bridge



Rebar and forms on eastbound side of bridge



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Dec 2, 2021
Work Order Date: Nov 4, 2021

Work Order No.: 21-8536.Concrete.0015; ver: 3
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures
Placement Method: Pumped
Total Quantity Placed: 20 yd³
Placement Location: Top portion of Abutment 3 and Wingwalls 3A & 3B (see attached)

Performed by: Cody Jerz
Finish Method: Vibrated- Internally|Hand Finished
Weather: Sunny|Clear|Calm

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures, inc.	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
		Slump (in)	-	4.25
	Mix Placed	Unit Weight (pcf)	-	142.2
	CDOT 2020138 - Martin Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
35	10' N of CL of Abutment 3	Point of Delivery	10	8670	67097530	12:25 PM	1:43 PM	59	0
36	6' S of CL of Abutment 3	Point of Delivery	20	2004	67097536	12:58 PM	2:14 PM	59	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
35	74	4	5.7	.248	7.66	43.31	143.8	Yes
36	74	4	5.6	.248	7.66	43.45	144.3	

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
35	C9706	3	4.00	12.57	3 / Columnar	51,760	4,120	-
	C9707	7	4.00	12.57	5 / Side	55,310	4,400	-
	C9708	28	4.00	12.57	5 / Side	63,860	5,080	5,080
	C9709	28	4.00	12.57	5 / Side	63,390	5,040	5,040
	C9710	28	4.00	12.57	3 / Columnar	63,800	5,080	5,080
Average Compressive Strength (psi):								5,070

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.

Forest Lakes Bridges

Report Date: Dec 2, 2021

Work Order No.: 21-8536.Concrete.0015; ver: 3

Work Order Date: Nov 4, 2021

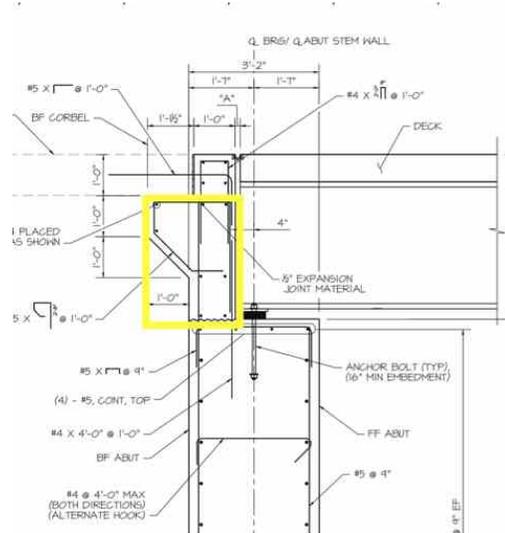
Reviewed by: Josiah Johnson

Concrete

Photos



Concrete being pumped into top portion of abutment 3



Area inside highlighted yellow region was poured.



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Jan 6, 2022
Work Order Date: Nov 11, 2021

Work Order No.: 21-8536.Concrete.0016; ver: 5
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures Inc
Placement Method: Pumped
Total Quantity Placed: 28 yd³
Placement Location: Abutment 1 at STA 14+74.77; Wing walls 1A and 1B.

Performed by: Jeff DeCoster
Finish Method: Vibrated- Internally|Hand Finished
Weather: Windy

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures, Inc.	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
		Slump (in)	-	4.25
	Mix Placed	Unit Weight (pcf)	-	142.2
	CDOT 2020138 - Martin Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
37	Test location 1	Point of Delivery	10	2003	67097959	12:24 PM	1:05 PM	50	0
38	Test location 2	Point of Delivery	20	2107	67097962	12:28 PM	1:22 PM	50	0
39	Test location 3	Point of Delivery	28	8689	67097967	2:48 PM	3:39 PM	50	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
37	73	4.25	5.1	0.250	7.67	42.76	140.4	
38	71	4	5.0	0.250	7.67	42.63	139.8	Yes
39	72	4	5.4	0.250	7.67	42.63	139.8	

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
38	C9817	2	4.00	12.57	5 / Side	42,370	3,370	-
	C9818	6	4.00	12.57	5 / Side	51,130	4,070	-
	C9819	27	4.00	12.57	5 / Side	54,820	4,360	4,360
	C9820	27	4.00	12.57	5 / Side	52,890	4,210	4,210
	C9821	56	4.00	12.57	5 / Side	66,090	5,260	-
	C9822	56	4.00	12.57	5 / Side	65,100	5,180	-
Average Compressive Strength (psi):								4,280

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.

Forest Lakes Bridges

Report Date: Jan 6, 2022
Work Order Date: Nov 11, 2021

Work Order No.: 21-8536.Concrete.0016; ver: 5
Reviewed by: Josiah Johnson

Concrete

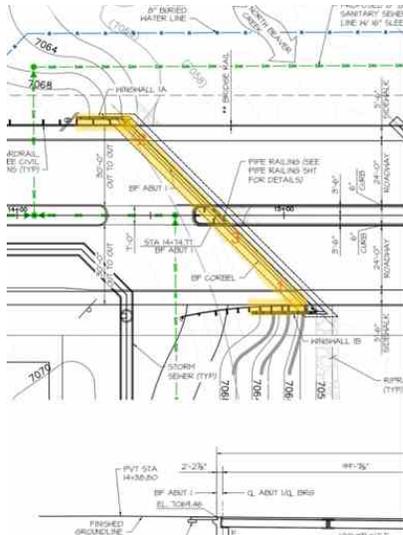
Photos



Placement of concrete for abutment



View of delivery method



Area in yellow represents work location and red numbers represents approximate test location

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Jan 14, 2022
Work Order Date: Dec 13, 2021

Work Order No.: 21-8536.Concrete.0018; ver: 1
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures
Placement Method: Tailgated
Total Quantity Placed: 20 yd³
Placement Location: East and West Side of Bridge
Comments: 20 yard pour for sleeper pad

Performed by: Sashith Weerasundara
Finish Method: Hand Finished
Weather: Sunny

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
		Slump (in)	-	4.25
	Mix Placed	Unit Weight (pcf)	-	142.2
	CDOT 2020138 - Martin Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
40	Location 1	Point of Delivery	10	0644	68121104	11:32 AM	12:40 PM	64	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
40	73	5.5	6.5	.250	8.58	43.60	140.1	Yes

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
40	C361	3	4.00	12.57	3 / Columnar	39,580	3,150	-
	C362	7	4.00	12.57	5 / Side	46,220	3,680	-
	C363	7	4.00	12.57	3 / Columnar	47,220	3,760	-
	C364	28	4.00	12.57	5 / Side	57,820	4,600	4,600
	C365	28	4.00	12.57	5 / Side	56,980	4,530	4,530
	C366	28	4.00	12.57	3 / Columnar	57,900	4,610	4,610

Average Compressive Strength (psi): 4,580

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Forest Lakes Bridges

Report Date: Jan 14, 2022
Work Order Date: Dec 13, 2021

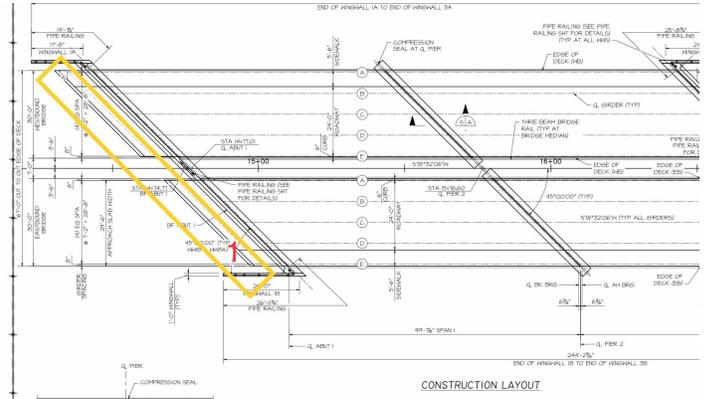
Work Order No.: 21-8536.Concrete.0018; ver: 1
Reviewed by: Josiah Johnson

Concrete

Photos



Pour on sleeper pad in progress



Yellow box represents pour location
Red number represents test location



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Jan 18, 2022
Work Order Date: Dec 20, 2021

Work Order No.: 21-8536.Concrete.0019; ver: 4
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures INC
Placement Method: Tailgated
Total Quantity Placed: 30 yd³
Placement Location: Approach slab at E side of the bridge for WB and EB lanes.

Performed by: Angelo Donnabella
Finish Method: Vibrated- Internally|Hand Finished|Float Finished
Weather: Calm|Clear|Sunny

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Elliott Van Stelle with Structures, Inc.	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
	Mix Placed	Slump (in)	-	4.25
	CDOT 2020138 - Martin	Unit Weight (pcf)	-	142.2
	Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
41	SE side of the Bridge, Test location #1, see attachment	Point of Placement	10	1746	68121479	11:55 AM	1:10 PM	54	10

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
41	65	5.5	5.8	0.248	8.79	44.48	143.9	Yes

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
41	C2959	7	4.00	12.57	5 / Side	51,860	4,130	-
	C2960	28	4.00	12.57	5 / Side	65,590	5,220	5,220
	C2961	28	4.00	12.57	5 / Side	65,650	5,220	5,220
	C2962	28	4.00	12.57	5 / Side	64,920	5,170	5,170
Average Compressive Strength (psi):								5,200

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Forest Lakes Bridges

Report Date: Jan 18, 2022
Work Order Date: Dec 20, 2021

Work Order No.: 21-8536.Concrete.0019; ver: 4
Reviewed by: Josiah Johnson

Concrete

Photos



Concrete being placed



Highlighted region represents area of concrete placement, red number represents test location



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Jan 19, 2022
Work Order Date: Dec 21, 2021

Work Order No.: 21-8536.Concrete.0020; ver: 3
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures Inc
Placement Method: Tailgated
Total Quantity Placed: 30 yd³
Placement Location: Approach slab @ West side of the bridge

Performed by: Tadele Gebretsadik
Finish Method: Vibrated- Internally|Hand Finished
Weather: Sunny|Windy

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry with Structures Inc	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
		Slump (in)	-	4.25
	Mix Placed	Unit Weight (pcf)	-	142.2
	CDOT 2020138 - Martin Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
42	East Bound slab approach (see attachment)	Point of Placement	10	1640	68121551	11:06 AM	12:14 PM	52	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
42	66	2.5	6.6	0.249	7.63	43.44	143.8	Yes

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
42	C1002	21	4.00	12.57	5 / Side	52,670	4,190	-
	C1003	28	4.00	12.57	5 / Side	57,720	4,590	4,590
	C1004	28	4.00	12.57	3 / Columnar	56,890	4,530	4,530
	C1005	28	4.00	12.57	5 / Side	57,490	4,570	4,570
Average Compressive Strength (psi):								4,560

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Forest Lakes Bridges

Report Date: Jan 19, 2022

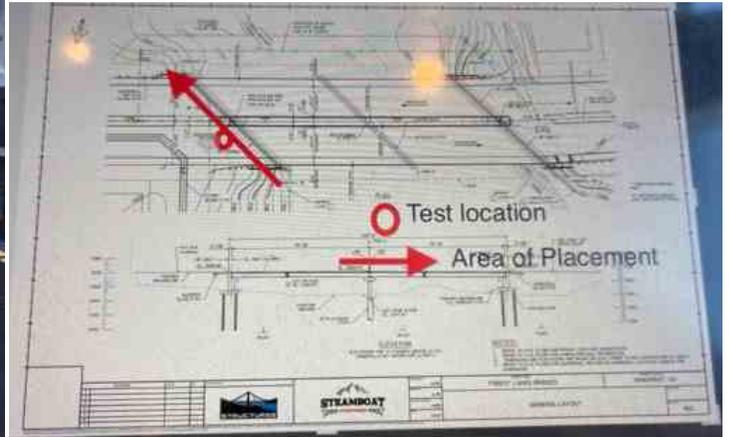
Work Order No.: 21-8536.Concrete.0020; ver: 3

Work Order Date: Dec 21, 2021

Reviewed by: Josiah Johnson

Concrete

Photos



Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Feb 8, 2022
Work Order Date: Jan 10, 2022

Work Order No.: 21-8536.Concrete.0021; ver: 4
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures
Placement Method: Pumped
Total Quantity Placed: 161 yd³
Placement Location: Bridge Deck for Mesa Top Drive from STA 14+40 to 17+10

Performed by: Zach Mitchell
Finish Method: Vibrated- Internally|Machine Finished|Hand Finished
Weather: Mostly Sunny

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Elliott Van Stelle with Structures, Inc.	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
	Mix Placed	Slump (in)	-	4.25
	CDOT 2020138 - Martin	Unit Weight (pcf)	-	142.2
	Marietta: XCD4195	Comp. Strength (psi)	4500	4500

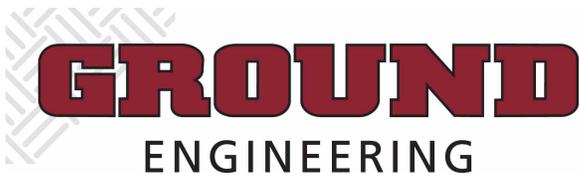
Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
43	STA 14+80, 5' L of CL	Point of Delivery	10	2002	67099607	7:56 AM	9:00 AM	40	0
44	STA 14+70, 20' L of CL	Point of Delivery	19	1747	67099608	8:25 AM	9:30 AM	40	0
45	STA 14+85, 40' L of CL	Point of Delivery	28	1636	67099610	8:48 AM	10:00 AM	42	5
46	STA 16+00, 25' R of CL	Point of Delivery	100	1758	67099630	11:17 AM	12:20 PM	50	0
47	STA 16+25, 35' L of CL	Point of Delivery	145	2002	67099647	1:11 PM	2:33 PM	50	4
47.1	STA 16+25, 35' L of CL	Point of Delivery	145	2002	67099647	1:11 PM	2:43 PM	50	4
48	STA 16+40, 40' L of CL	Point of Delivery	155	2032	67099650	1:30 PM	3:02 PM	52	0
49	STA 16+55, 15' L of CL	Point of Delivery	161	2220	67099658	3:37 PM	4:32 PM	50	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
43	65	4	5.9	.249	7.86	43.03	141.2	
44	61	4.25	6.7	.249	7.86	42.68	139.8	
45	64	4.5	7.4	.249	7.86	42.36	138.6	Yes
46	73	5	7.0	.250	8.58	43.68	140.4	Yes
47	78	4.75	4.5	.247	7.80	43.49	144.5	
47.1	78	5	6.8	.247	7.80	42.50	140.5	
48	77	5.5	5.1	.247	7.80	42.96	142.3	
49	73	4.75	6.5	.247	7.80	42.57	140.8	Yes

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Feb 8, 2022
Work Order Date: Jan 10, 2022

Work Order No.: 21-8536.Concrete.0021; ver: 4
Reviewed by: Josiah Johnson

Concrete

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
45	C1030	3	4.00	12.57	5 / Side	38,500	3,060	-
	C1031	7	4.00	12.57	5 / Side	46,460	3,700	-
	C1032	28	4.00	12.57	5 / Side	56,820	4,520	4,520
	C1033	28	4.00	12.57	5 / Side	56,900	4,530	4,530
	C1034	28	4.00	12.57	5 / Side	58,540	4,660	4,660
Average Compressive Strength (psi):								4,570

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
46	C1036	3	4.00	12.57	5 / Side	39,800	3,170	-
	C1037	7	4.00	12.57	5 / Side	48,110	3,830	-
	C1038	28	4.00	12.57	5 / Side	57,310	4,560	4,560
	C1039	28	4.00	12.57	5 / Side	56,700	4,510	4,510
	C1040	28	4.00	12.57	5 / Side	56,970	4,530	4,530
Average Compressive Strength (psi):								4,530

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
49	C1042	3	4.00	12.57	5 / Side	39,930	3,180	-
	C1043	7	4.00	12.57	5 / Side	48,730	3,880	-
	C1044	28	4.00	12.57	5 / Side	56,680	4,510	4,510
	C1045	28	4.00	12.57	5 / Side	57,110	4,540	4,540
	C1046	28	4.00	12.57	5 / Side	57,910	4,610	4,610
Average Compressive Strength (psi):								4,550

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Mar 15, 2022
Work Order Date: Jan 18, 2022

Work Order No.: 21-8536.Concrete.0024; ver: 5
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures
Placement Method: Pumped
Total Quantity Placed: 160 yd³
Placement Location: Mesa Top Drive, Eastbound Lane Bridge from STA 14+75 to 17+10

Performed by: Zach Mitchell
Finish Method: Vibrated- Internally|Machine Finished
Weather: Mostly Sunny

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
		Slump (in)	-	4.25
	Mix Placed	Unit Weight (pcf)	-	142.2
	CDOT 2020138 - Martin Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
50	STA 14+85, 8' R of CL	Point of Delivery	10.25	2215	67099983	8:05 AM	9:15 AM	43	0
51	STA 15+00, 20' R of CL	Point of Delivery	20.5	2220	67099988	8:30 AM	9:30 AM	43	0
52	STA 15+10, 35' R of CL	Point of Delivery	30.75	2032	67099992	8:53 AM	10:00 AM	44	0
53	STA 15+75, 15' R of CL	Point of Delivery	61.50	2003	67099998	10:16 AM	11:10 AM	47	0
54	STA 16+15, 20' R of CL	Point of Delivery	123	2220	67100018	1:32 PM	2:30 PM	48	0
55	STA 16+78, 10' R of CL	Point of Delivery	152.0	2216	67100023	2:30 PM	3:30 PM	48	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
50	65	4.25	6.5	.249	7.86	42.97	141.0	
51	65	4	6.4	.249	7.86	42.79	140.3	
52	75	5	6.0	.249	7.86	42.39	138.7	Yes
53	73	4.5	6.0	.249	7.86	42.74	140.1	Yes
54	72	4	6.4	.249	7.86	42.57	139.4	Yes
55	76	4.5	5.4	.249	7.86	43.19	141.9	Yes

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

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Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Mar 15, 2022

Work Order No.: 21-8536.Concrete.0024; ver: 5

Work Order Date: Jan 18, 2022

Reviewed by: Josiah Johnson

Concrete

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
52	C1267	3	4.00	12.57	5 / Side	41,360	3,290	-
	C1268	7	4.00	12.57	5 / Side	45,010	3,580	-
	C1269	28	4.00	12.57	3 / Columnar	51,570	4,100	4,100
	C1270	28	4.00	12.57	5 / Side	49,780	3,960	3,960
	C1271	56	4.00	12.57	5 / Side	62,990	5,010	-
	C1272	56	4.00	12.57	5 / Side	65,210	5,190	-
Average Compressive Strength (psi):								4,030

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
53	C1273	3	4.00	12.57	5 / Side	41,640	3,310	-
	C1274	7	4.00	12.57	5 / Side	47,560	3,780	-
	C1275	28	4.00	12.57	5 / Side	57,800	4,600	4,600
	C1276	28	4.00	12.57	3 / Columnar	58,300	4,640	4,640
	C1277	28	4.00	12.57	5 / Side	57,820	4,600	4,600
Average Compressive Strength (psi):								4,610

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
54	C1279	3	4.00	12.57	5 / Side	41,950	3,340	-
	C1280	7	4.00	12.57	5 / Side	47,140	3,750	-
	C1281	28	4.00	12.57	5 / Side	59,920	4,770	4,770
	C1282	28	4.00	12.57	3 / Columnar	60,100	4,780	4,780
	C1283	28	4.00	12.57	5 / Side	58,260	4,640	4,640
Average Compressive Strength (psi):								4,730

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
55	C1285	3	4.00	12.57	5 / Side	44,160	3,510	-
	C1286	7	4.00	12.57	5 / Side	51,670	4,110	-
	C1287	28	4.00	12.57	5 / Side	65,000	5,170	5,170
	C1288	28	4.00	12.57	5 / Side	66,060	5,260	5,260
	C1289	28	4.00	12.57	5 / Side	64,280	5,110	5,110
Average Compressive Strength (psi):								5,180

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Forest Lakes Bridges

Report Date: Mar 15, 2022

Work Order No.: 21-8536.Concrete.0024; ver: 5

Work Order Date: Jan 18, 2022

Reviewed by: Josiah Johnson

Concrete

Photos





Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Mar 10, 2022

Work Order No.: 21-8536.Concrete.0027; ver: 3

Work Order Date: Feb 8, 2022

Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures

Performed by: Josiah Johnson

Placement Method: Tailgated

Finish Method: Hand Finished|Vibrated- Internally

Total Quantity Placed: 30.01 yd³

Weather: Calm|Sunny|Clear

Placement Location: Sidewalk on the Westbound Bridge

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Elliott Van Stelle with Structures, Inc.	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
		Slump (in)	-	4.25
	Mix Placed	Unit Weight (pcf)	-	142.2
	CDOT 2020138 - Martin Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
56	See Attachment for Reference Location of, "Test#1."	Point of Delivery	10	2107	67100596	8:59 AM	10:11 AM	39	0
57	See Attachment for Reference Location of, "Test#2."	Point of Delivery	20	2220	67100604	9:42 AM	11:03 AM	41	4
58	See Attachment for Reference Location of, "Test#3."	Point of Delivery	30	2215	67100613	10:35 AM	12:09 PM	41	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
56	67	5	6.2	0.249	8.63	43.61	140.5	Yes
57	68	5.5	6.2	0.249	8.63	43.43	139.8	
58	67	4.75	6.2	0.249	8.63	43.36	139.5	

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
56	C1665	7	4.00	12.57	5 / Side	44,360	3,530	-
	C1666	28	4.00	12.57	5 / Side	57,410	4,570	4,570
	C1667	28	4.00	12.57	3 / Columnar	58,050	4,620	4,620
	C1668	28	4.00	12.57	5 / Side	57,020	4,540	4,540
Average Compressive Strength (psi):								4,580

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.

Forest Lakes Bridges

Report Date: Mar 10, 2022

Work Order No.: 21-8536.Concrete.0027; ver: 3

Work Order Date: Feb 8, 2022

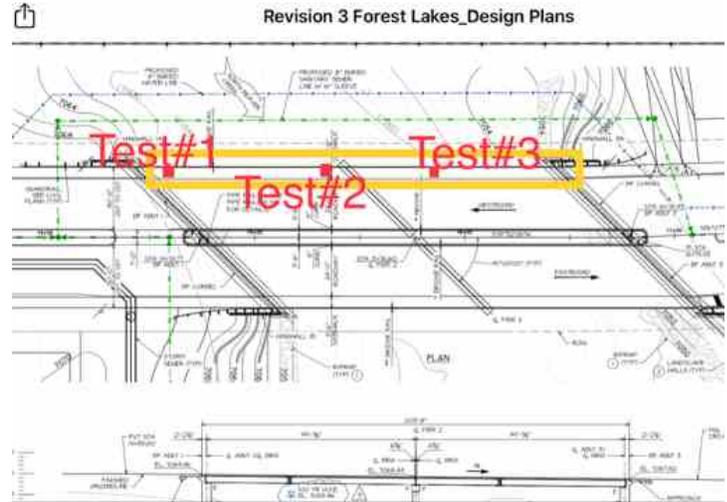
Reviewed by: Josiah Johnson

Concrete

Photos



This image was taken where the third concrete test sample was collected.



This shows the area of concrete pouring (yellow) and the locations that concrete test samples were collected from.



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Apr 13, 2022
Work Order Date: Feb 15, 2022

Work Order No.: 21-8536.Concrete.0028; ver: 4
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures
Placement Method: Tailgated
Total Quantity Placed: 30 yd³
Placement Location: See attachment for location of concrete placement

Performed by: Josiah Johnson
Finish Method: Hand Finished|Vibrated- Internally
Weather: Calm|Clear|Sunny

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Elliott Van Stelle with Structures, Inc.	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
		Slump (in)	-	4.25
	Mix Placed	Unit Weight (pcf)	-	142.2
	CDOT 2020138 - Martin Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
59	See attachment to reference the location of the sample for "Test-1."	Point of Delivery	10	2004	67100976	9:09 AM	10:16 AM	45	5
60	See attachment to reference the location of the sample for "Test-2."	Point of Delivery	20	2271	67100981	10:21 AM	11:17 AM	47	0
61	See attachment to reference the location of the sample for "Test-3."	Point of Delivery	30	2046	67100986	11:42 AM	12:31 PM	51	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
59	68	5.5	5.8	0.025	8.63	43.46	1393.2	Yes
60	66	5.25	6.0	0.025	8.63	43.46	1393.2	
61	67	6.25	6.2	0.025	8.63	43.65	1400.8	

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
59	C1846	7	4.00	12.57	5 / Side	45,440	3,620	-
	C1847	28	4.00	12.57	5 / Side	56,810	4,520	4,520
	C1848	28	4.00	12.57	5 / Side	57,750	4,590	4,590
	C1849	28	4.00	12.57	5 / Side	57,490	4,570	4,570
	C1850	56	4.00	12.57	5 / Side	60,260	4,790	-
	C1851	56	4.00	12.57	5 / Side	60,000	4,770	-
Average Compressive Strength (psi):								4,560

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.

Forest Lakes Bridges

Report Date: Apr 13, 2022

Work Order No.: 21-8536.Concrete.0028; ver: 4

Work Order Date: Feb 15, 2022

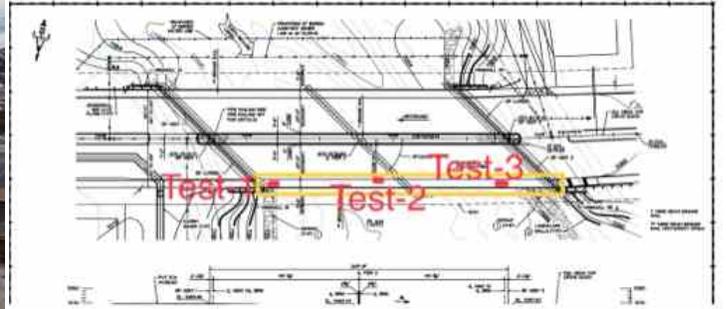
Reviewed by: Josiah Johnson

Concrete

Photos



Concrete placement



The section highlighted with the yellow rectangle represents the sidewalk area that was worked on. Locations where concrete samples were collected are labeled accordingly in red.



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: Apr 26, 2022
Work Order Date: Mar 24, 2022

Work Order No.: 21-8536.Concrete.0029; ver: 3
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures, Inc.
Placement Method: Tailgated

Performed by: Josiah Johnson
Finish Method: Broom Finished|Float Finished|Hand Finished|Vibrated- Internally|Scratch Finished
Weather: Mostly Sunny

Total Quantity Placed: 20 yd³
Placement Location: Bridge Transition at Expansion Joint - East Bound Lanes

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Larry Urioste with Structures, Inc.	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
		Slump (in)	-	4.25
	Mix Placed	Unit Weight (pcf)	-	142.2
	CDOT 2020138 - Martin Marietta: XCD4195	Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
62	West End of East Bound Lanes	Point of Delivery	10	2006	67102293	10:29 AM	11:40 AM	68	5
63	East End of East Bound Lanes	Point of Delivery	20	8605	67102309	12:19 PM	1:30 PM	68	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
62	72	5	7.5	.250	8.56	43.18	138.5	Yes
63	74	5	7.8	.250	8.56	43.81	141.0	

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
62	C2980	3	4.00	12.57	5 / Side	43,600	3,470	-
	C2981	3	4.00	12.57	3 / Columnar	42,660	3,390	-
	C2982	5	4.00	12.57	5 / Side	46,050	3,660	-
	C2983	5	4.00	12.57	5 / Side	45,210	3,600	-
	C2984	7	4.00	12.57	5 / Side	46,470	3,700	-
	C2985	7	4.00	12.57	5 / Side	46,410	3,690	-
	C2986	28	4.00	12.57	5 / Side	56,550	4,500	4,500
	C2987	28	4.00	12.57	5 / Side	56,770	4,520	4,520
	C2988	28	4.00	12.57	5 / Side	57,090	4,540	4,540
Average Compressive Strength (psi):								4,520

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.



Client: Elliott Van Stelle
Structures, Inc.
4 Inverness Court East, Suite 250
Englewood, CO 80112

Forest Lakes Bridges

Report Date: May 3, 2022
Work Order Date: Apr 5, 2022

Work Order No.: 21-8536.Concrete.0030; ver: 5
Reviewed by: Josiah Johnson

Concrete

Concrete Contractor: Structures INC
Placement Method: Tailgated
Total Quantity Placed: 16 yd³
Placement Location: Bridge North bound Expansion joints both sides.
Comments: I used the same concrete which in system beside that Martin Marietta became SRM nothing changed.
City representative requested extra cylinders 3 and 5 days.

Performed by: Timur Nazarov
Finish Method: Vibrated- Internally|Hand Finished
Weather: Clear|Calm

On-site Notifications, Specification, and Mix Information

On-Site Notification(s)	Item / Structure Type	Test	Specified	Mix Design
Elliott Van Stelle with Structures, Inc.	Normal Weight Concrete	Air Content (%)	5 to 8	6.2
	Mix Placed	Slump (in)	-	4.25
	CDOT 2020138 - Martin Marietta: XCD4195	Unit Weight (pcf)	-	142.2
		Comp. Strength (psi)	4500	4500

Sampling (ASTM C172 / AASHTO R60 / CDOT CP61)

Sample No.	Location	Sampled From	Quantity (yd ³)	Truck No.	Ticket No.	Batch Time	Test Time	Air Temp. (°F)	Water Added (gal)
64	Expansion joint on west side.	Point of Delivery	8	2006	12000198	10:30 AM	12:00 PM	45	0
65	Expansion joint East side	Point of Delivery	16	2032	12000213	12:07 PM	1:15 PM	45	0

Field Tests (ASTM C138, C143, C231, and C1064 / AASHTO T119, T121, and T152)

Sample No.	Concrete Temp. (°F)	Slump (in)	Air Cont. (%)	Meas. Vol. (ft ³)	Empty Meas. (lb)	Full Meas. (lb)	Unit Wt. (pcf)	Lab Samples Cast
64	71	6	5.8	.250	8.50	43.73	140.9	Yes
65	73	5.75	5.5	.250	8.50	44.00	142.0	Yes

Results apply only to the specific items and locations referenced and at the time of testing, observations or special inspections. Unless noted otherwise, specimens were received in adequate condition. Compressive strength specimens, if tested, were capped in accordance with ASTM C1231 or ASTM C617, as applicable. This report should not be reproduced, except in full, without the written permission of GROUND Engineering Consultants, Inc.

Forest Lakes Bridges

Report Date: May 3, 2022

Work Order No.: 21-8536.Concrete.0030; ver: 5

Work Order Date: Apr 5, 2022

Reviewed by: Josiah Johnson

Concrete

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
64	C3424	3	4.00	12.57	5 / Side	39,200	3,120	-
	C3425	5	4.00	12.57	5 / Side	48,900	3,890	-
	C3426	7	4.00	12.57	5 / Side	49,960	3,980	-
	C3427	28	4.00	12.57	5 / Side	56,850	4,520	4,520
	C3428	28	4.00	12.57	5 / Side	56,700	4,510	4,510
	C3429	28	4.00	12.57	5 / Side	56,860	4,520	4,520
Average Compressive Strength (psi):								4,520

C3426 Field Cure

Compressive Strength (ASTM C31 and C39 / AASHTO T22 and T23)

Sample No.	Lab ID	Age (d)	Diameter (in)	Area (in ²)	Fracture Type	Max. Load (lb-f)	Corrected Strength (psi)	Strength at Acceptance (psi)
65	C3431	3	4.00	12.57	5 / Side	40,620	3,230	-
	C3432	5	4.00	12.57	5 / Side	45,270	3,600	-
	C3433	7	4.00	12.57	5 / Side	49,750	3,960	-
	C3434	28	4.00	12.57	5 / Side	56,580	4,500	4,500
	C3435	28	4.00	12.57	5 / Side	56,740	4,510	4,510
	C3436	28	4.00	12.57	3 / Columnar	57,030	4,540	4,540
Average Compressive Strength (psi):								4,520

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Forest Lakes Bridges

Report Date: May 3, 2022

Work Order No.: 21-8536.Concrete.0030; ver: 5

Work Order Date: Apr 5, 2022

Reviewed by: Josiah Johnson

Concrete

Photos

