

# SUBMITTAL



Submittal number	94.0	Date	12/11/2019
Project	TRAILS AT CROWFOOT F1 & 9	6954 N. CROWFOOT VALLEY RD. PARKER, CO 80134	
Project number	201810		
Spec section			
Subsection		Status	Open
Current action	Submitted	Ball in court	
Topic	Concrete Break Submittal: Alpine Phlox		

Submitter	MICHAEL TOMAS SNYDER
Reviewer	
Cc	

Date submitted	12/11/2019	Submission due date	12/11/2019
Released for review	12/11/2019	Review due date	12/18/2019
Date returned		Required on site date	
Date closed			

<b>Notes</b>
Concrete Breaks for storm structures in Alpine Phlox from SSA to NPP



# CTL THOMPSON Compressive Strength of Concrete

INCORPORATED

Test Method: ASTM C 39

Report Date: 8/14/2019  
Sample: 59224

**Denver**

1971 West 12th Avenue  
Denver, CO 80204  
Phone: 303-825-0777  
Fax: 303-825-4252

**Client:**

E5X Management  
7353 South Alton Way Suite A-100  
Englewood, CO 80112

**Project:**

DN48372.000F-365  
Trails at Crowfoot, Filings 1 and 9  
NE of Pradera Parkway & North Crowfoot Valley...  
Douglas County, CO

**Sample Details**

<b>Set #:</b>	12	<b>Technician:</b>	Walker, Jess	<b>Batched:</b>	14:33 MDT
<b>Specimen Size:</b>	4" X 8"	<b>Cast By:</b>	Walker, Jess	<b>Sampled:</b>	15:15 MDT
<b>Specimens In Set:</b>	5	<b>Date Cast:</b>	07/09/19	<b>Cast:</b>	15:30 MDT
<b>Truck / Ticket #:</b>	117 / 84590490	<b>Sampled From:</b>	Chute	<b>Truck Empty:</b>	
<b>Contractor:</b>	MLL	<b>Placement Method:</b>	Chute	<b>Placement Time:</b>	

**Location**

<b>Placement Location:</b>	Inlet Wall
<b>Location Details:</b>	Walls on inlet 46
<b>Sample Location / Notes:</b>	Walls on inlet 46

**Batch Log**

<b>Supplier:</b>	Aggregate Industries-Denver	<b>Mix Design:</b>	9456623.	<b>Strength:</b>	4500 (psi)
<b>Plant:</b>	4925				
<b>On-Site Admixtures:</b>	12.00 Gal Water (10 yd <sup>3</sup> )				

**Specifications****Field Measurements**

<b>Weather:</b>		<b>Slump (in):</b>	4-1/4	<b>Plastic Unit Weight:</b>	142.0 (lb/ft <sup>3</sup> )
<b>Air Temperature (F):</b>		<b>Concrete Temp (F):</b>	86	<b>Air Content:</b>	5.5
				<b>Load Volume:</b>	10 (yd <sup>3</sup> )

**Standard Cure****Field Cure**

	<b>Min / Max Temp (F):</b>	66/72
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**Lab Test Results**

Testing Lab: 22 Lipan, 22 Lipan, Denver, CO, 80223

Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in <sup>2</sup> )	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
12-1	7 FC	07/16/19	1 / 6	4.00	12.57	65,283	5,190	2		N
12-2	28 FC	08/06/19	1 / 27	4.00	12.57	79,138	6,300	2	C4	N
12-3	28 FC	08/06/19	1 / 27	4.00	12.57	79,101	6,290	3	C4	N
12-4	28 FC	08/06/19	1 / 27	4.00	12.57	80,700	6,420	5	C4	N
12-5	28 FC	08/06/19	1 / 27	4.00	12.57	76,587	6,090	2	C4	N

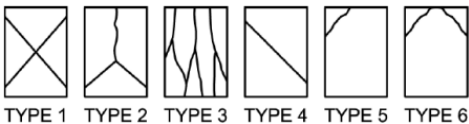
Test Age Average Strengths (psi): 7 Day FC - 5190, 28 Day FC - 6280

**Capping Methods**

<b>C4:</b> Strength is greater than or equal to f'c.	<b>N:</b> Unbonded Caps (ASTM C1231)
<b>Tested By:</b> Patrick Patterson (1,2,3,4,5)	
<b>Checked In :</b> 07/10/2019 (1,2,3,4,5)	

**General Remarks**

Notified contractor of physical property results. Reviewed by PE





# CTL THOMPSON Compressive Strength of Concrete

INCORPORATED

Test Method: ASTM C 39

Report #: CC-000028

07/30/2019

Report Date: 9/3/2019

Sample: 60530

### Denver

1971 West 12th Avenue  
Denver, CO 80204  
Phone: 303-825-0777  
Fax: 303-825-4252

### Client:

E5X Management  
7353 South Alton Way Suite A-100  
Englewood, CO 80112

### Project:

DN48372.000F-365  
Trails at Crowfoot, Filings 1 and 9  
NE of Pradera Parkway & North Crowfoot Valley...  
Douglas County, CO

### Sample Details

<b>Set #:</b>	26	<b>Technician:</b>	Frye, Craig	<b>Batched:</b>	02:50 MDT
<b>Specimen Size:</b>	4" X 8"	<b>Cast By:</b>	Frye, Craig	<b>Sampled:</b>	03:35 MDT
<b>Specimens In Set:</b>	5	<b>Date Cast:</b>	07/30/19	<b>Cast:</b>	03:50 MDT
<b>Truck / Ticket #:</b>	9261 / 84591286	<b>Sampled From:</b>	Chute	<b>Truck Empty:</b>	
<b>Contractor:</b>	MLL	<b>Placement Method:</b>	Chute	<b>Placement Time:</b>	

### Location

<b>Placement Location:</b>	Inlet Top Slab
<b>Location Details:</b>	Inlet number 47
<b>Sample Location / Notes:</b>	Inlet number 47

### Batch Log

<b>Supplier:</b>	Aggregate Industries-Denver	<b>Mix Design:</b>	9456623.	<b>Strength:</b>	4500 (psi)
<b>Plant:</b>	4925			<b>Air:</b>	5.0 - 8.0 (%)
<b>On-Site Admixtures:</b>	5.00 Gal Water			<b>Slump:</b>	4 - 6 (in)

### Specifications

### Field Measurements

<b>Weather:</b>		<b>Slump (in):</b>	4	<b>Plastic Unit Weight:</b>	148.2 (lb/ft³)
<b>Air Temperature (F):</b>		<b>Concrete Temp (F):</b>	80	<b>Air Content:</b>	8.0
				<b>Load Volume:</b>	8 (yd³)

### Lab Test Results

<b>Testing Lab:</b> 22 Lipan, 22 Lipan, Denver, CO, 80223										
Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in²)	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
26-1	7 FC	08/06/19	1 / 6	4.00	12.57	53,956	4,290	2		N
26-2	28 FC	08/27/19	1 / 27	4.00	12.57	67,280	5,350	2	C4	N
26-3	28 FC	08/27/19	1 / 27	4.00	12.57	63,305	5,040	3	C4	N
26-4	28 FC	08/27/19	1 / 27	4.00	12.57	64,405	5,120	3	C4	N
26-5	28 FC	08/27/19	1 / 27	4.00	12.57	60,500	4,810	3	C4	N

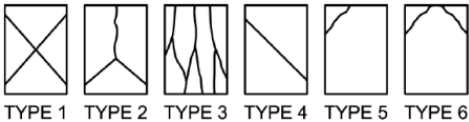
**Test Age Average Strengths (psi):** 7 Day FC - 4290, 28 Day FC - 5080

### Capping Methods

<b>C4:</b> Strength is greater than or equal to f'c.	<b>N:</b> Unbonded Caps (ASTM C1231)
<b>Tested By:</b> Patrick Patterson (1,2,3,4,5)	
<b>Checked In :</b> 07/31/2019 (1,2,3,4,5)	

### General Remarks

**Notified contractor of physical property results. Reviewed by PE**





# CTL THOMPSON Compressive Strength of Concrete

INCORPORATED

Test Method: ASTM C 39

Report Date: 8/14/2019  
Sample: 59017

### Denver

1971 West 12th Avenue  
Denver, CO 80204  
Phone: 303-825-0777  
Fax: 303-825-4252

### Client:

E5X Management  
7353 South Alton Way Suite A-100  
Englewood, CO 80112

### Project:

DN48372.000F-365  
Trails at Crowfoot, Filings 1 and 9  
NE of Pradera Parkway & North Crowfoot Valley...  
Douglas County, CO

### Sample Details

<b>Set #:</b>	8	<b>Technician:</b>	Hayes, Randall	<b>Batched:</b>	
<b>Specimen Size:</b>	4" X 8"	<b>Cast By:</b>	Hayes, Randall	<b>Sampled:</b>	09:15 MDT
<b>Specimens In Set:</b>	5	<b>Date Cast:</b>	07/02/19	<b>Cast:</b>	09:30 MDT
<b>Truck / Ticket #:</b>	1297 / 20192928	<b>Sampled From:</b>	Chute	<b>Truck Empty:</b>	
<b>Contractor:</b>	JBS	<b>Placement Method:</b>	Chute	<b>Placement Time:</b>	

### Location

<b>Placement Location:</b>	Manhole
<b>Location Details:</b>	Base manhole 66
<b>Sample Location / Notes:</b>	Base manhole 66

### Batch Log

<b>Supplier:</b>	Bestway Concrete	<b>Mix Design:</b>	45VN21B2C	<b>Strength:</b>	4500 (psi)
<b>Plant:</b>	609				
<b>On-Site Admixtures:</b>	None				

### Specifications

### Field Measurements

<b>Weather:</b>		<b>Slump (in):</b>	2-3/4	<b>Plastic Unit Weight:</b>	142.9 (lb/ft³)
<b>Air Temperature (F):</b>		<b>Concrete Temp (F):</b>	77	<b>Air Content:</b>	6.9
				<b>Load Volume:</b>	7 (yd³)

### Standard Cure

### Field Cure

### Lab Test Results

<b>Testing Lab:</b> 22 Lipan, 22 Lipan, Denver, CO, 80223										
Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in²)	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
8-1	7 FC	07/09/19	1 / 6	4.00	12.57	45,720	3,640	2		N
8-2	28 FC	07/30/19	1 / 27	4.00	12.57	58,229	4,630	2	C4	N
8-3	28 FC	07/30/19	1 / 27	4.00	12.57	63,035	5,020	2	C4	N
8-4	28 FC	07/30/19	1 / 27	4.00	12.57	61,671	4,910	2	C4	N
8-5	28 FC	07/30/19	1 / 27	4.00	12.57	60,709	4,830	3	C4	N

**Test Age Average Strengths (psi):** 7 Day FC - 3640, 28 Day FC - 4850

### Capping Methods

<b>C4:</b> Strength is greater than or equal to f'c.	<b>N:</b> Unbonded Caps (ASTM C1231)
<b>Tested By:</b> Patrick Patterson (1,2,3,4,5)	
<b>Checked In :</b> 07/03/2019 (1,2,3,4,5)	

### General Remarks

Notified contractor of physical property results. Reviewed by PE



TYPE 1 TYPE 2 TYPE 3 TYPE 4 TYPE 5 TYPE 6



# CTL THOMPSON Compressive Strength of Concrete

INCORPORATED

Test Method: ASTM C 39

Report Date: 8/14/2019  
Sample: 59161

**Denver**

1971 West 12th Avenue  
Denver, CO 80204  
Phone: 303-825-0777  
Fax: 303-825-4252

**Client:**

E5X Management  
7353 South Alton Way Suite A-100  
Englewood, CO 80112

**Project:**

DN48372.000F-365  
Trails at Crowfoot, Filings 1 and 9  
NE of Pradera Parkway & North Crowfoot Valley...  
Douglas County, CO

**Sample Details**

<b>Set #:</b>	11	<b>Technician:</b>	Bole, Michael	<b>Batched:</b>	08:06 MDT
<b>Specimen Size:</b>	4" X 8"	<b>Cast By:</b>	Bole, Michael	<b>Sampled:</b>	09:08 MDT
<b>Specimens In Set:</b>	5	<b>Date Cast:</b>	07/08/19	<b>Cast:</b>	09:23 MDT
<b>Truck / Ticket #:</b>	1204 / 20193736	<b>Sampled From:</b>	Chute	<b>Truck Empty:</b>	
<b>Contractor:</b>	JBS Pipeline	<b>Placement Method:</b>	Bucket	<b>Placement Time:</b>	

**Location**

**Placement Location:** Manhole  
**Location Details:** Manhole base 68  
**Sample Location / Notes:** Manhole base 68

**Batch Log**

<b>Supplier:</b>	Bestway Concrete	<b>Mix Design:</b>	45VN21B2C
<b>Plant:</b>	609		
<b>On-Site Admixtures:</b>	None		

**Specifications**

**Strength:** 4500 (psi)

**Field Measurements**

<b>Weather:</b>		<b>Slump (in):</b>	2-1/2	<b>Plastic Unit Weight:</b>	144.7 (lb/ft³)
<b>Air Temperature (F):</b>		<b>Concrete Temp (F):</b>	80	<b>Air Content:</b>	5.4
				<b>Load Volume:</b>	8 (yd³)

**Standard Cure****Field Cure**

**Min / Max Temp (F):** 58/76

**Lab Test Results**

**Testing Lab:** 22 Lipan, 22 Lipan, Denver, CO, 80223

Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in²)	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
11-1	7 FC	07/15/19	2 / 5	4.00	12.57	65,891	5,240	3		N
11-2	28 FC	08/05/19	2 / 26	4.00	12.57	78,663	6,260	3	C4	N
11-3	28 FC	08/05/19	2 / 26	4.00	12.57	80,979	6,440	2	C4	N
11-4	28 FC	08/05/19	2 / 26	4.00	12.57	79,618	6,330	2	C4	N
11-5	28 FC	08/05/19	2 / 26	4.00	12.57	80,028	6,370	3	C4	N

**Test Age Average Strengths (psi):** 7 Day FC - 5240, 28 Day FC - 6350

**Capping Methods**

**C4:** Strength is greater than or equal to f'c.

**Tested By:** Patrick Patterson (1,2,3,4,5)

**Checked In :** 07/10/2019 (1,2,3,4,5)

**N:** Unbonded Caps (ASTM C1231)

**General Remarks**

**Notified contractor of physical property results. Reviewed by PE**



TYPE 1 TYPE 2 TYPE 3 TYPE 4 TYPE 5 TYPE 6



# CTL THOMPSON Compressive Strength of Concrete

INCORPORATED

Test Method: ASTM C 39

Report Date: 8/14/2019  
Sample: 58864

**Denver**

1971 West 12th Avenue  
Denver, CO 80204  
Phone: 303-825-0777  
Fax: 303-825-4252

**Client:**

E5X Management  
7353 South Alton Way Suite A-100  
Englewood, CO 80112

**Project:**

DN48372.000F-365  
Trails at Crowfoot, Filings 1 and 9  
NE of Pradera Parkway & North Crowfoot Valley...  
Douglas County, CO

**Sample Details**

<b>Set #:</b>	6	<b>Technician:</b>	Kunkel, Josh	<b>Batched:</b>	08:36 MDT
<b>Specimen Size:</b>	4" X 8"	<b>Cast By:</b>	Kunkel, Josh	<b>Sampled:</b>	09:30 MDT
<b>Specimens In Set:</b>	5	<b>Date Cast:</b>	06/28/19	<b>Cast:</b>	09:45 MDT
<b>Truck / Ticket #:</b>	1205 / 20192107	<b>Sampled From:</b>	Chute	<b>Truck Empty:</b>	
<b>Contractor:</b>	JBS	<b>Placement Method:</b>	Chute	<b>Placement Time:</b>	

**Location**

<b>Placement Location:</b>	Manhole
<b>Location Details:</b>	Manhole 89
<b>Sample Location / Notes:</b>	Manhole 89

**Batch Log**

<b>Supplier:</b>	Bestway Concrete	<b>Mix Design:</b>	45VM21B2C	<b>Strength:</b>	4500 (psi)
<b>Plant:</b>	609				
<b>On-Site Admixtures:</b>	None				

**Specifications****Field Measurements**

<b>Weather:</b>	Sunny	<b>Slump (in):</b>	2-1/2	<b>Plastic Unit Weight:</b>	142.8 (lb/ft³)
<b>Air Temperature (F):</b>	75	<b>Concrete Temp (F):</b>	80	<b>Air Content:</b>	6.8
				<b>Load Volume:</b>	10 (yd³)

**Standard Cure****Field Cure**

Min / Max Temp (F): 62/77

**Lab Test Results**

<b>Testing Lab:</b> 22 Lipan, 22 Lipan, Denver, CO, 80223											
Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in²)	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method	
6-1	7 FC	07/05/19	3 / 4	4.00	12.57	54,510	4,340	2		N	
6-2	28 FC	07/26/19	3 / 25	4.00	12.57	64,378	5,120	2	C4	N	
6-3	28 FC	07/26/19	3 / 25	4.00	12.57	66,903	5,320	3	C4	N	
6-4	28 FC	07/26/19	3 / 25	4.00	12.57	67,265	5,350	2	C4	N	
6-5	28 FC	07/26/19	3 / 25	4.00	12.57	68,802	5,470	5	C4	N	

**Test Age Average Strengths (psi):** 7 Day FC - 4340, 28 Day FC - 5320

**Capping Methods**

<b>C4:</b> Strength is greater than or equal to f'c. <b>Tested By:</b> Patrick Patterson (1,2,3,4,5) <b>Checked In :</b> 07/01/2019 (1,2,3,4,5)	<b>N:</b> Unbonded Caps (ASTM C1231)
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TYPE 1 TYPE 2 TYPE 3 TYPE 4 TYPE 5 TYPE 6



**Denver**  
1971 West 12th Avenue  
Denver, CO 80204  
Phone: 303-825-0777  
Fax: 303-825-4252

**Client:**  
E5X Management  
7353 South Alton Way Suite A-100  
Englewood, CO 80112

**Project:**  
DN48372.000F-365  
Trails at Crowfoot, Filings 1 and 9  
NE of Pradera Parkway & North Crowfoot Valley...  
Douglas County, CO

Sample Details			
<b>Set #:</b>	9	<b>Technician:</b>	Johnson, Mashaun
<b>Specimen Size:</b>	4" X 8"	<b>Cast By:</b>	Johnson, Mashaun
<b>Specimens In Set:</b>	5	<b>Date Cast:</b>	07/03/19
<b>Truck / Ticket #:</b>	1297 / 20193310	<b>Sampled From:</b>	Chute
<b>Contractor:</b>	JBS Pipeline	<b>Placement Method:</b>	Bucket
<b>Batched:</b>	08:52 MDT	<b>Sampled:</b>	10:00 MDT
<b>Cast:</b>	10:15 MDT	<b>Truck Empty:</b>	
<b>Placement Time:</b>			

Location	
<b>Placement Location:</b>	Manhole
<b>Location Details:</b>	Crowfoot Valley Rd and Pradera Pkwy
<b>Sample Location / Notes:</b>	Manhole base number 150 near Crowfoot Valley Rd and Pradera Pkwy

Batch Log		Specifications	
<b>Supplier:</b>	Bestway Concrete	<b>Mix Design:</b>	45VM21B2C
<b>Plant:</b>	609	<b>Strength:</b>	4500 (psi)
<b>On-Site Admixtures:</b>	None	<b>Air:</b>	5.0 - 8.0 (%)
		<b>Slump:</b>	3 - 5 (in)

Field Measurements			
<b>Weather:</b>		<b>Slump (in):</b>	1-1/2
<b>Air Temperature (F):</b>		<b>Concrete Temp (F):</b>	75
		<b>Plastic Unit Weight:</b>	145.5 (lb/ft³)
		<b>Air Content:</b>	5.6
		<b>Load Volume:</b>	9 (yd³)

Standard Cure	Field Cure
	<b>Min / Max Temp (F):</b> 70/84

**Lab Test Results**

Testing Lab: 22 Lipan, 22 Lipan, Denver, CO, 80223

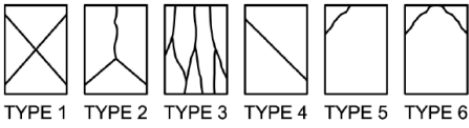
Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in²)	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
9-1	7 FC	07/10/19	2 / 5	4.00	12.57	48,580	3,870	2		N
9-2	28 FC	07/31/19	2 / 26	4.00	12.57	59,495	4,730	2	C4	N
9-3	28 FC	07/31/19	2 / 26	4.00	12.57	59,209	4,710	5	C4	N
9-4	28 FC	07/31/19	2 / 26	4.00	12.57	64,190	5,110	3	C4	N
9-5	28 FC	07/31/19	2 / 26	4.00	12.57	58,331	4,640	2	C4	N

Test Age Average Strengths (psi): 7 Day FC - 3870, 28 Day FC - 4800

Capping Methods	
<b>C4:</b> Strength is greater than or equal to f'c. <b>Tested By:</b> Patrick Patterson (1,2,3,4,5) <b>Checked In :</b> 07/05/2019 (1,2,3,4,5)	<b>N:</b> Unbonded Caps (ASTM C1231)

**General Remarks**

Notified contractor of physical property results. Reviewed by PE





# CTL THOMPSON Compressive Strength of Concrete

INCORPORATED

Test Method: ASTM C 39

Report #: CC-000011

06/28/2019

Report Date: 7/31/2019

Sample: 58864

### Denver

1971 West 12th Avenue  
Denver, CO 80204  
Phone: 303-825-0777  
Fax: 303-825-4252

### Client:

E5X Management  
7353 South Alton Way Suite A-100  
Englewood, CO 80112

### Project:

DN48372.000F-365  
Trails at Crowfoot, Filings 1 and 9  
NE of Pradera Parkway & North Crowfoot Valley...  
Douglas County, CO

### Sample Details

<b>Set #:</b>	6	<b>Technician:</b>	Kunkel, Josh	<b>Batched:</b>	08:36 MDT
<b>Specimen Size:</b>	4" X 8"	<b>Cast By:</b>	Kunkel, Josh	<b>Sampled:</b>	09:30 MDT
<b>Specimens In Set:</b>	5	<b>Date Cast:</b>	06/28/19	<b>Cast:</b>	09:45 MDT
<b>Truck / Ticket #:</b>	1205 / 20192107	<b>Sampled From:</b>	Chute	<b>Truck Empty:</b>	
<b>Contractor:</b>	JBS	<b>Placement Method:</b>	Chute	<b>Placement Time:</b>	

### Location

<b>Placement Location:</b>	Manhole
<b>Location Details:</b>	Manhole 89
<b>Sample Location / Notes:</b>	Manhole 89

### Batch Log

<b>Supplier:</b>	Bestway Concrete	<b>Mix Design:</b>	45VM21B2C	<b>Strength:</b>	4500 (psi)
<b>Plant:</b>	609				
<b>On-Site Admixtures:</b>	None				

### Specifications

### Field Measurements

<b>Weather:</b>	Sunny	<b>Slump (in):</b>	2-1/2	<b>Plastic Unit Weight:</b>	142.8 (lb/ft³)
<b>Air Temperature (F):</b>	75	<b>Concrete Temp (F):</b>	80	<b>Air Content:</b>	6.8
				<b>Load Volume:</b>	10 (yd³)

### Lab Test Results

<b>Testing Lab:</b> 22 Lipan, 22 Lipan, Denver, CO, 80223										
Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in²)	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
6-1	7 FC	07/05/19	3 / 4	4.00	12.57	54,510	4,340	2		N
6-2	28 FC	07/26/19	3 / 25	4.00	12.57	64,378	5,120	2	C4	N
6-3	28 FC	07/26/19	3 / 25	4.00	12.57	66,903	5,320	3	C4	N
6-4	28 FC	07/26/19	3 / 25	4.00	12.57	67,265	5,350	2	C4	N
6-5	28 FC	07/26/19	3 / 25	4.00	12.57	68,802	5,470	5	C4	N

**Test Age Average Strengths (psi):** 7 Day FC - 4340, 28 Day FC - 5320

### Capping Methods

<b>C4:</b> Strength is greater than or equal to f'c.	<b>N:</b> Unbonded Caps (ASTM C1231)
<b>Tested By:</b> Patrick Patterson (1,2,3,4,5)	
<b>Checked In :</b> 07/01/2019 (1,2,3,4,5)	



TYPE 1 TYPE 2 TYPE 3 TYPE 4 TYPE 5 TYPE 6



# CTL THOMPSON Compressive Strength of Concrete

INCORPORATED

Test Method: ASTM C 39

Report #: CC-000016

07/09/2019

Report Date: 8/6/2019

Sample: 59224

### Denver

1971 West 12th Avenue  
Denver, CO 80204  
Phone: 303-825-0777  
Fax: 303-825-4252

### Client:

E5X Management  
7353 South Alton Way Suite A-100  
Englewood, CO 80112

### Project:

DN48372.000F-365  
Trails at Crowfoot, Filings 1 and 9  
NE of Pradera Parkway & North Crowfoot Valley...  
Douglas County, CO

### Sample Details

<b>Set #:</b>	12	<b>Technician:</b>	Walker, Jess	<b>Batched:</b>	14:33 MDT
<b>Specimen Size:</b>	4" X 8"	<b>Cast By:</b>	Walker, Jess	<b>Sampled:</b>	15:15 MDT
<b>Specimens In Set:</b>	5	<b>Date Cast:</b>	07/09/19	<b>Cast:</b>	15:30 MDT
<b>Truck / Ticket #:</b>	117 / 84590490	<b>Sampled From:</b>	Chute	<b>Truck Empty:</b>	
<b>Contractor:</b>	MLL	<b>Placement Method:</b>	Chute	<b>Placement Time:</b>	

### Location

<b>Placement Location:</b>	Inlet Wall
<b>Location Details:</b>	Walls on inlet 46
<b>Sample Location / Notes:</b>	Walls on inlet 46

### Batch Log

<b>Supplier:</b>	Aggregate Industries-Denver	<b>Mix Design:</b>	9456623.	<b>Strength:</b>	4500 (psi)
<b>Plant:</b>	4925				
<b>On-Site Admixtures:</b>	12.00 Gal Water (10 yd <sup>3</sup> )				

### Specifications

### Field Measurements

<b>Weather:</b>		<b>Slump (in):</b>	4-1/4	<b>Plastic Unit Weight:</b>	142.0 (lb/ft <sup>3</sup> )
<b>Air Temperature (F):</b>		<b>Concrete Temp (F):</b>	86	<b>Air Content:</b>	5.5
				<b>Load Volume:</b>	10 (yd <sup>3</sup> )

### Lab Test Results

<b>Testing Lab:</b> 22 Lipan, 22 Lipan, Denver, CO, 80223										
Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in <sup>2</sup> )	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
12-1	7 FC	07/16/19	1 / 6	4.00	12.57	65,283	5,190	2		N
12-2	28 FC	08/06/19	1 / 27	4.00	12.57	79,138	6,300	2	C4	N
12-3	28 FC	08/06/19	1 / 27	4.00	12.57	79,101	6,290	3	C4	N
12-4	28 FC	08/06/19	1 / 27	4.00	12.57	80,700	6,420	5	C4	N
12-5	28 FC	08/06/19	1 / 27	4.00	12.57	76,587	6,090	2	C4	N

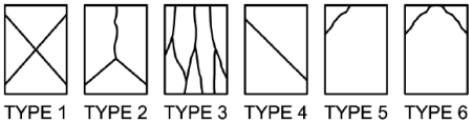
**Test Age Average Strengths (psi):** 7 Day FC - 5190, 28 Day FC - 6280

### Capping Methods

<b>C4:</b> Strength is greater than or equal to f'c.	<b>N:</b> Unbonded Caps (ASTM C1231)
<b>Tested By:</b> Patrick Patterson (1,2,3,4,5)	
<b>Checked In :</b> 07/10/2019 (1,2,3,4,5)	

### General Remarks

**Notified contractor of physical property results. Reviewed by PE**





# CTL THOMPSON Compressive Strength of Concrete

INCORPORATED

Test Method: ASTM C 39

Report #: CC-000065

09/06/2019

Report Date: 10/8/2019

Sample: 62306

### Denver

1971 West 12th Avenue  
Denver, CO 80204  
Phone: 303-825-0777  
Fax: 303-825-4252

### Client:

E5X Management  
7353 South Alton Way Suite A-100  
Englewood, CO 80112

### Project:

DN48372.000F-365  
Trails at Crowfoot, Filings 1 and 9  
NE of Pradera Parkway & North Crowfoot Valley...  
Douglas County, CO

### Sample Details

<b>Set #:</b>	62	<b>Technician:</b>	Frye, Craig	<b>Batched:</b>	13:52 MDT
<b>Specimen Size:</b>	4" X 8"	<b>Cast By:</b>	Frye, Craig	<b>Sampled:</b>	14:45 MDT
<b>Specimens In Set:</b>	5	<b>Date Cast:</b>	09/06/19	<b>Cast:</b>	15:00 MDT
<b>Truck / Ticket #:</b>	9261 / 84592606	<b>Sampled From:</b>	Chute	<b>Truck Empty:</b>	
<b>Contractor:</b>	MLL, Inc	<b>Placement Method:</b>	Chute	<b>Placement Time:</b>	

### Location

<b>Placement Location:</b>	Footings
<b>Location Details:</b>	Top slab for SDIN-90 along with the walls for SDIN-105
<b>Sample Location / Notes:</b>	SDIN-90 top slab SDIN-105 walls

### Batch Log

<b>Supplier:</b>	Aggregate Industries-Denver	<b>Mix Design:</b>	9456623.	<b>Strength:</b>	4500 (psi)
<b>Plant:</b>	4925			<b>Air:</b>	5.0 - 8.0 (%)
<b>On-Site Admixtures:</b>	None			<b>Slump:</b>	3 - 6 (in)

### Specifications

### Field Measurements

<b>Weather:</b>		<b>Slump (in):</b>	4	<b>Plastic Unit Weight:</b>	142.8 (lb/ft³)
<b>Air Temperature (F):</b>		<b>Concrete Temp (F):</b>	80	<b>Air Content:</b>	5.5
				<b>Load Volume:</b>	5 (yd³)

### Lab Test Results

<b>Testing Lab:</b> 22 Lipan, 22 Lipan, Denver, CO, 80223										
Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in²)	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
62-1	7 FC	09/13/19	1 / 6	4.00	12.57	44,415	3,530	5		N
62-2	28 FC	10/04/19	1 / 27	4.00	12.57	61,442	4,890	5	C4	N
62-3	28 FC	10/04/19	1 / 27	4.00	12.57	59,934	4,770	5	C4	N
62-4	28 FC	10/04/19	1 / 27	4.00	12.57	59,972	4,770	3	C4	N
62-5	28 FC	10/04/19	1 / 27	4.00	12.57	63,305	5,040	2	C4	N

**Test Age Average Strengths (psi):** 7 Day FC - 3530, 28 Day FC - 4870

### Capping Methods

<b>C4:</b> Strength is greater than or equal to f'c.	<b>N:</b> Unbonded Caps (ASTM C1231)
<b>Tested By:</b> Patrick Patterson (1,2,3,4,5)	
<b>Checked In :</b> 09/07/2019 (1,2,3,4,5)	

### General Remarks

**Notified contractor of physical property results. Reviewed by PE**



TYPE 1 TYPE 2 TYPE 3 TYPE 4 TYPE 5 TYPE 6



# CTL THOMPSON Compressive Strength of Concrete

INCORPORATED

Test Method: ASTM C 39

Report #: CC-000013

07/03/2019

Report Date: 8/1/2019

Sample: 59110

### Denver

1971 West 12th Avenue  
Denver, CO 80204  
Phone: 303-825-0777  
Fax: 303-825-4252

### Client:

E5X Management  
7353 South Alton Way Suite A-100  
Englewood, CO 80112

### Project:

DN48372.000F-365  
Trails at Crowfoot, Filings 1 and 9  
NE of Pradera Parkway & North Crowfoot Valley...  
Douglas County, CO

### Sample Details

<b>Set #:</b>	9	<b>Technician:</b>	Johnson, Mashaun	<b>Batched:</b>	08:52 MDT
<b>Specimen Size:</b>	4" X 8"	<b>Cast By:</b>	Johnson, Mashaun	<b>Sampled:</b>	10:00 MDT
<b>Specimens In Set:</b>	5	<b>Date Cast:</b>	07/03/19	<b>Cast:</b>	10:15 MDT
<b>Truck / Ticket #:</b>	1297 / 20193310	<b>Sampled From:</b>	Chute	<b>Truck Empty:</b>	
<b>Contractor:</b>	JBS Pipeline	<b>Placement Method:</b>	Bucket	<b>Placement Time:</b>	

### Location

**Placement Location:** Manhole  
**Location Details:** Crowfoot Valley Rd and Pradera Pkwy  
**Sample Location / Notes:** Manhole base number 150 near Crowfoot Valley Rd and Pradera Pkwy

### Batch Log

**Supplier:** Bestway Concrete  
**Plant:** 609  
**On-Site Admixtures:** None

**Mix Design:** 45VM21B2C

### Specifications

**Strength:** 4500 (psi)  
**Air:** 5.0 - 8.0 (%)  
**Slump:** 3 - 5 (in)

### Field Measurements

**Weather:**  
**Air Temperature (F):**

**Slump (in):** 1-1/2  
**Concrete Temp (F):** 75

**Plastic Unit Weight:** 145.5 (lb/ft<sup>3</sup>)  
**Air Content:** 5.6  
**Load Volume:** 9 (yd<sup>3</sup>)

### Lab Test Results

Testing Lab: 22 Lipan, 22 Lipan, Denver, CO, 80223

Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in <sup>2</sup> )	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
9-1	7 FC	07/10/19	2 / 5	4.00	12.57	48,580	3,870	2		N
9-2	28 FC	07/31/19	2 / 26	4.00	12.57	59,495	4,730	2	C4	N
9-3	28 FC	07/31/19	2 / 26	4.00	12.57	59,209	4,710	5	C4	N
9-4	28 FC	07/31/19	2 / 26	4.00	12.57	64,190	5,110	3	C4	N
9-5	28 FC	07/31/19	2 / 26	4.00	12.57	58,331	4,640	2	C4	N

Test Age Average Strengths (psi): 7 Day FC - 3870, 28 Day FC - 4800

### Capping Methods

C4: Strength is greater than or equal to f'c.

Tested By: Patrick Patterson (1,2,3,4,5)

Checked In : 07/05/2019 (1,2,3,4,5)

N: Unbonded Caps (ASTM C1231)

### General Remarks

Notified contractor of physical property results. Reviewed by PE



TYPE 1 TYPE 2 TYPE 3 TYPE 4 TYPE 5 TYPE 6



# CTL THOMPSON Compressive Strength of Concrete

INCORPORATED

Test Method: ASTM C 39

Report #: CC-000008

06/26/2019

Report Date: 7/26/2019

Sample: 58692

### Denver

1971 West 12th Avenue  
Denver, CO 80204  
Phone: 303-825-0777  
Fax: 303-825-4252

### Client:

E5X Management  
7353 South Alton Way Suite A-100  
Englewood, CO 80112

### Project:

DN48372.000F-365  
Trails at Crowfoot, Filings 1 and 9  
NE of Pradera Parkway & North Crowfoot Valley...  
Douglas County, CO

### Sample Details

<b>Set #:</b>	3	<b>Technician:</b>	Walker, Jess	<b>Batched:</b>	08:51 MDT
<b>Specimen Size:</b>	4" X 8"	<b>Cast By:</b>	Walker, Jess	<b>Sampled:</b>	09:45 MDT
<b>Specimens In Set:</b>	5	<b>Date Cast:</b>	06/26/19	<b>Cast:</b>	10:00 MDT
<b>Truck / Ticket #:</b>	9262 / 62284848	<b>Sampled From:</b>	Chute	<b>Truck Empty:</b>	
<b>Contractor:</b>	JVS Pipeline	<b>Placement Method:</b>	Bucket	<b>Placement Time:</b>	

### Location

<b>Placement Location:</b>	Manhole
<b>Location Details:</b>	Manhole 64
<b>Sample Location / Notes:</b>	Base of manhole 64

### Batch Log

<b>Supplier:</b>	Aggregate Industries-Denver	<b>Mix Design:</b>	7454122.	<b>Strength:</b>	4500 (psi)
<b>Plant:</b>	4912				
<b>On-Site Admixtures:</b>	None				

### Specifications

### Field Measurements

<b>Weather:</b>		<b>Slump (in):</b>	2-1/2	<b>Plastic Unit Weight:</b>	142.8 (lb/ft <sup>3</sup> )
<b>Air Temperature (F):</b>		<b>Concrete Temp (F):</b>	85	<b>Air Content:</b>	5.2
				<b>Load Volume:</b>	8 (yd <sup>3</sup> )

### Lab Test Results

<b>Testing Lab:</b> 22 Lipan, 22 Lipan, Denver, CO, 80223										
Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in <sup>2</sup> )	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
3-1	7 FC	07/03/19	1 / 6	4.00	12.57	55,115	4,390	2		N
3-2	28 FC	07/24/19	1 / 27	4.00	12.57	70,131	5,580	3	C4	N
3-3	28 FC	07/24/19	1 / 27	4.00	12.57	74,463	5,920	2	C4	N
3-4	28 FC	07/24/19	1 / 27	4.00	12.57	73,946	5,880	4	C4	N
3-5	28 FC	07/24/19	1 / 27	4.00	12.57	69,622	5,540	2	C4	N

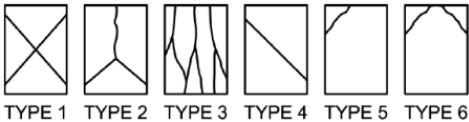
**Test Age Average Strengths (psi):** 7 Day FC - 4390, 28 Day FC - 5730

### Capping Methods

<b>C4:</b> Strength is greater than or equal to f'c.	<b>N:</b> Unbonded Caps (ASTM C1231)
<b>Tested By:</b> Patrick Patterson (1,2,3,4,5)	
<b>Checked In :</b> 06/27/2019 (1,2,3,4,5)	

### General Remarks

**Notified contractor of physical property results. Reviewed by PE**





# CTL THOMPSON Compressive Strength of Concrete

INCORPORATED

Test Method: ASTM C 39

Report #: CC-000037

08/13/2019

Report Date: 9/17/2019

Sample: 61047

### Denver

1971 West 12th Avenue  
Denver, CO 80204  
Phone: 303-825-0777  
Fax: 303-825-4252

### Client:

E5X Management  
7353 South Alton Way Suite A-100  
Englewood, CO 80112

### Project:

DN48372.000F-365  
Trails at Crowfoot, Filings 1 and 9  
NE of Pradera Parkway & North Crowfoot Valley...  
Douglas County, CO

### Sample Details

<b>Set #:</b>	37	<b>Technician:</b>	Frye, Craig	<b>Batched:</b>	07:06 MDT
<b>Specimen Size:</b>	4" X 8"	<b>Cast By:</b>	Frye, Craig	<b>Sampled:</b>	08:15 MDT
<b>Specimens In Set:</b>	5	<b>Date Cast:</b>	08/13/19	<b>Cast:</b>	08:30 MDT
<b>Truck / Ticket #:</b>	1292 / 20203587	<b>Sampled From:</b>	Chute	<b>Truck Empty:</b>	
<b>Contractor:</b>	JBS	<b>Placement Method:</b>	Chute	<b>Placement Time:</b>	

### Location

<b>Placement Location:</b>	Manhole
<b>Location Details:</b>	Base/SDMH-144
<b>Sample Location / Notes:</b>	SDMH-144

### Batch Log

<b>Supplier:</b>	Bestway Concrete	<b>Mix Design:</b>	45VM21B2C	<b>Strength:</b>	4500 (psi)
<b>Plant:</b>	609			<b>Air:</b>	5.0 - 8.0 (%)
<b>On-Site Admixtures:</b>	None			<b>Slump:</b>	1 - 3 (in)

### Specifications

### Field Measurements

<b>Weather:</b>		<b>Slump (in):</b>	2	<b>Plastic Unit Weight:</b>	146.0 (lb/ft³)
<b>Air Temperature (F):</b>		<b>Concrete Temp (F):</b>	80	<b>Air Content:</b>	5.5
				<b>Load Volume:</b>	9 (yd³)

### Lab Test Results

<b>Testing Lab:</b> 22 Lipan, 22 Lipan, Denver, CO, 80223										
Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in²)	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
37-1	7 FC	08/20/19	1 / 6	4.00	12.57	54,824	4,360	5		N
37-2	28 FC	09/10/19	1 / 27	4.00	12.57	70,207	5,590	3	C4	N
37-3	28 FC	09/10/19	1 / 27	4.00	12.57	70,547	5,610	3	C4	N
37-4	28 FC	09/10/19	1 / 27	4.00	12.57	72,399	5,760	5	C4	N
37-5	28 FC	09/10/19	1 / 27	4.00	12.57	68,168	5,420	3	C4	N

**Test Age Average Strengths (psi):** 7 Day FC - 4360, 28 Day FC - 5600

### Capping Methods

<b>C4:</b> Strength is greater than or equal to f'c.	<b>N:</b> Unbonded Caps (ASTM C1231)
<b>Tested By:</b> Patrick Patterson (1,2,3,4,5)	
<b>Checked In :</b> 08/14/2019 (1,2,3,4,5)	

### General Remarks

**Notified contractor of physical property results. Reviewed by PE**



TYPE 1 TYPE 2 TYPE 3 TYPE 4 TYPE 5 TYPE 6



# CTL THOMPSON Compressive Strength of Concrete

INCORPORATED

Test Method: ASTM C 39

08/06/2019  
Report Date: 9/5/2019  
Sample: 60693

**Denver**

1971 West 12th Avenue  
Denver, CO 80204  
Phone: 303-825-0777  
Fax: 303-825-4252

**Client:**

E5X Management  
7353 South Alton Way Suite A-100  
Englewood, CO 80112

**Project:**

DN48372.000F-365  
Trails at Crowfoot, Filings 1 and 9  
NE of Pradera Parkway & North Crowfoot Valley...  
Douglas County, CO

**Sample Details**

<b>Set #:</b>	32	<b>Technician:</b>	Frye, Craig	<b>Batched:</b>	10:02 MDT
<b>Specimen Size:</b>	4" X 8"	<b>Cast By:</b>	Frye, Craig	<b>Sampled:</b>	11:05 MDT
<b>Specimens In Set:</b>	5	<b>Date Cast:</b>	08/06/19	<b>Cast:</b>	11:20 MDT
<b>Truck / Ticket #:</b>	1297 / 20201916	<b>Sampled From:</b>	Chute	<b>Truck Empty:</b>	
<b>Contractor:</b>	JBS	<b>Placement Method:</b>	Chute	<b>Placement Time:</b>	

**Location**

<b>Placement Location:</b>	Manhole
<b>Location Details:</b>	Base for SDMH-145
<b>Sample Location / Notes:</b>	SDMH-145

**Batch Log**

<b>Supplier:</b>	Bestway Concrete	<b>Mix Design:</b>	45VM21B2C	<b>Strength:</b>	4500 (psi)
<b>Plant:</b>	609			<b>Air:</b>	5.0 - 8.0 (%)
<b>On-Site Admixtures:</b>	None			<b>Slump:</b>	1 - 3 (in)

**Specifications****Field Measurements**

<b>Weather:</b>		<b>Slump (in):</b>	2	<b>Plastic Unit Weight:</b>	140.4 (lb/ft <sup>3</sup> )
<b>Air Temperature (F):</b>		<b>Concrete Temp (F):</b>	80	<b>Air Content:</b>	7.5
				<b>Load Volume:</b>	10 (yd <sup>3</sup> )

**Lab Test Results**

<b>Testing Lab:</b> 22 Lipan, 22 Lipan, Denver, CO, 80223										
Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in <sup>2</sup> )	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
32-1	7 FC	08/13/19	1 / 6	4.00	12.57	47,148	3,750	5		N
32-2	28 FC	09/03/19	1 / 27	4.00	12.57	55,462	4,410	3	C2	N
32-3	28 FC	09/03/19	1 / 27	4.00	12.57	57,453	4,570	3	C4	N
32-4	28 FC	09/03/19	1 / 27	4.00	12.57	56,260	4,480	3	C4	N

**Test Age Average Strengths (psi):** 7 Day FC - 3750, 28 Day FC - 4490

**Capping Methods**

<b>C2:</b> Strength is less than f'c. One cylinder will be held to break at 56 days.	<b>N:</b> Unbonded Caps (ASTM C1231)
<b>C4:</b> Strength is greater than or equal to f'c.	
<b>Tested By:</b> Patrick Patterson (1,2,3,4)	
<b>Checked In :</b> 08/07/2019 (1,2,3,4)	

**General Remarks**

**Notified contractor of physical property results. Reviewed by PE**



TYPE 1 TYPE 2 TYPE 3 TYPE 4 TYPE 5 TYPE 6