

**CONSTRUCTION OBSERVATION AND
TESTING REPORT FOR**

**GEOS NEIGHBORHOOD
69TH AND JOYCE STREET
ARVADA, COLORADO**

PREPARED FOR

**COTTONWOOD PARK WEST, LLC
1240 LEHIGH STREET
BOULDER, COLORADO 80305**

**AUGUST 2, 2017
PROJECT NUMBER 14725UF**

A.G. Wassenaar

Geotechnical and Environmental Consultants

2180 South Ivanhoe Street, Suite 5
Denver, Colorado 80222-5710
303-759-8100 Fax 303-756-2920
www.agwassenaar.com

Inc.

August 2, 2017

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, Colorado 80305

Subject: Construction Observation and Testing Report for
Geos Neighborhood
69th and Joyce Street
Arvada, Colorado
Project Number 144725UF

As requested, we have summarized our previously issued test reports in order to provide a more convenient record of this data:

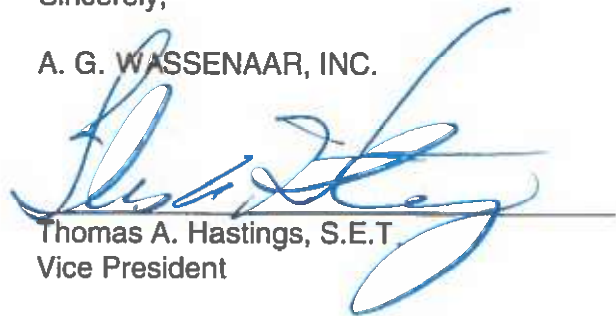
Section 1 provides all soils testing conducted.
Section 2 provides all concrete testing conducted.
Section 3 provides all asphalt testing.

We trust this consolidated report provides a more readily accessible format of the testing provided. Supplemental data may be issued in the future.

If we can be of further assistance, please do not hesitate to call.

Sincerely,

A. G. WASSENAAR, INC.



Thomas A. Hastings, S.E.T.
Vice President

TAH/klm

SECTION 1

Fill Testing

Report #: FT-000001

Report Date: 8/17/2015

Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone (303) 759-8100

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
1		7/23/15	03	ASTM D698	A-4	14.0	116.0	14.2	114.2	8	98	95	-3 / 3	Pass
2		7/23/15	03	ASTM D698	A-4	14.0	116.0	14.1	115.7	8	100	95	-3 / 3	Pass
3		7/23/15	03	ASTM D698	A-4	14.0	116.0	14.9	114.4	8	99	95	-3 / 3	Pass
4		7/23/15	03	ASTM D698	A-4	14.0	116.0	16.1	101.8	8	88	95	-3 / 3	Fail
5		7/23/15	03	ASTM D698	A-4	14.0	116.0	14.7	114.9	8	99	95	-3 / 3	Pass
6		7/23/15	03	ASTM D698	A-4	14.0	116.0	14.0	115.2	8	99	95	-3 / 3	Pass
7		7/23/15	03	ASTM D698	A-4	14.0	116.0	14.7	114.0	8	98	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
1	Sanitary Sewer Service: Alley B, Station 3+21.00	3.0	BSG	Troxler 3430 036306	Bentley, Jim
2	Sanitary Sewer Service: Alley B, Station 2+90.00	3.0	BSG	Troxler 3430 036306	Bentley, Jim
3	Sanitary Sewer Service: Alley B, Station 2+74.00	3.0	BSG	Troxler 3430 036306	Bentley, Jim
4	Sanitary Sewer Service: Alley B, Station 2+58.00	3.0	BSG	Troxler 3430 036306	Bentley, Jim
5	Sanitary Sewer Manhole: Alley B, 75' west of SSMH-156-56	5.0	BSG	Troxler 3430 036306	Bentley, Jim
6	Sanitary Sewer Manhole: Alley B, 125' west of SSMH-156-56	2.0	BSG	Troxler 3430 036306	Bentley, Jim
7	Sanitary Sewer Manhole: Alley B, 175' west of SSMH-156-56	2.0	BSG	Troxler 3430 036306	Bentley, Jim

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 7: The Contractor, E-Z Excavating dug test pits for the previously backfilled sanitary Sewer, mainline and services in Alley B. The Contractor was informed that tests taken this day could not be conclusively passed or failed due to the samples were taken a day before testing. The Contractor was continuing to backfill utilizing an excavator with a compaction wheel to apply compactive effort to the fill material. A water truck is on site if needed.	Test #	Related Test #	Test Type
Fail: Density Fail / Moisture Pass				

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone: (303) 759-8100

Fill Testing
Report #: FT-000002

Report Date: 8/18/2015

Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
8	4	7/24/15	03	ASTM D698	A-4	14.0	116.0	14.1	111.4	8	96	95	-3 / 3	Pass
9		7/24/15	01	ASTM D698	A-6	10.1	121.7	10.5	117.6	8	97	95	-1 / 3	Pass
10		7/24/15	01	ASTM D698	A-6	10.1	121.7	11.3	116.7	8	96	95	-1 / 3	Pass
11		7/24/15	01	ASTM D698	A-6	10.1	121.7	11.9	117.4	8	96	95	-1 / 3	Pass
12		7/24/15	01	ASTM D698	A-6	10.1	121.7	10.8	116.9	8	96	95	-2 / 2	Pass
13		7/24/15	01	ASTM D698	A-6	10.1	121.7	11.2	117.6	8	97	95	-2 / 2	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
8	Sanitary Sewer Service: Alley B, Station 2+58.00	3.0	BSG	Troxler 3430 33687	Plack, Ron
9	Sanitary Sewer Mainline: Alley B, 140' west of Manhole 156-56	6.0	BSG	Troxler 3430 33687	Plack, Ron
10	Sanitary Sewer Mainline: Alley B, 130' west of Manhole 156-56	5.0	BSG	Troxler 3430 33687	Plack, Ron
11	Sanitary Sewer Mainline: Alley B, 125' west of Manhole 156-56	4.0	BSG	Troxler 3430 33687	Plack, Ron
12	Sanitary Sewer Service: Alley B at Station 2+41+00	3.0	BSG	Troxler 3430 33687	Plack, Ron
13	Sanitary Sewer Service: Alley B at Station 2+11+00	3.0	BSG	Troxler 3430 33687	Plack, Ron

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 13: The Contractor placed fill in the trench and services using a loader. No additional moisture was added and a sheepsfoot wheel attached to a trackhoe applied compactive effort.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

Report #: FT-000003
Report Date: 8/18/2015
Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results														
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
14		7/28/15	01	ASTM D698	A-6	10.1	121.7	11.1	107.4	8	88	95	-1 / 3	Fail
15	14	7/28/15	01	ASTM D698	A-6	10.1	121.7	11.5	115.7	8	95	95	-1 / 3	Pass
Test Information														
Test #	Test Location							Elevation	Reference		Gauge Make / Model / SN		Field Technician	
14	Sanitary Sewer Service: Alley B at Station 1+95+00							4.0	BSG		Troxler 3430 33687		Plack, Ron	
15	Sanitary Sewer Service: Alley B at Station 1+95+00							4.0	BSG		Troxler 3430 33687		Plack, Ron	
Remarks						Comments					Related Tests			
Fail: Density Fail / Moisture Pass Pass: Density Pass / Moisture Pass						Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 15: The Contractor placed material in the trench and services using a loader. No additional moisture was added and a sheepsfoot wheel attached to a trackhoe applied compactive effort.					Test #	Related Test #		Test Type

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone: (303) 759-8100

Fill Testing
Report #: FT-000004

Report Date: 8/18/2015

Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
16		7/29/15	01	ASTM D698	A-6	10.1	121.7	10.4	110.3	8	91	95	-1 / 3	Fail
17		7/29/15	01	ASTM D698	A-6	10.1	121.7	11.2	115.9	8	95	95	-1 / 3	Pass
18		7/29/15	01	ASTM D698	A-6	10.1	121.7	10.9	117.3	8	96	95	-1 / 3	Pass
19		7/29/15	01	ASTM D698	A-6	10.1	121.7	11.3	116.8	8	96	95	-1 / 3	Pass
20		7/29/15	01	ASTM D698	A-6	10.1	121.7	10.0	117.0	8	96	95	-1 / 3	Pass
21	16	7/29/15	01	ASTM D698	A-6	10.1	121.7	10.3	117.8	8	97	95	-1 / 3	Pass
22		7/29/15	01	ASTM D698	A-6	10.1	121.7	11.1	118.2	8	97	95	-1 / 3	Pass
23		7/29/15	01	ASTM D698	A-6	10.1	121.7	10.8	119.2	8	98	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
16	Sanitary Sewer Service: Alley B at Station 1+78+00	5.0	BSG	Troxler 3430 33687	Plack, Ron
17	Sanitary Sewer Service: Alley B at Station 1+63+00	4.0	BSG	Troxler 3430 33687	Plack, Ron
18	Sanitary Sewer Mainline: Alley B, 30' east of Manhole 156-28	6.0	BSG	Troxler 3430 33687	Plack, Ron
19	Sanitary Sewer Mainline: Alley B, 40' east of Manhole 156-28	4.0	BSG	Troxler 3430 33687	Plack, Ron
20	Sanitary Sewer Mainline: Alley B, 50' east of Manhole 156-28	2.0	BSG	Troxler 3430 33687	Plack, Ron
21	Sanitary Sewer Service: Alley B at Station 1+78+00	5.0	BSG	Troxler 3430 33687	Plack, Ron
22	Sanitary Sewer Service: Alley B at Station 1+47+00	6.0	BSG	Troxler 3430 33687	Plack, Ron
23	Sanitary Sewer Mainline: Alley B, 45' east of Manhole 156-28	3.0	BSG	Troxler 3430 33687	Plack, Ron

Remarks	Comments	Related Tests		
Fail: Density Fail / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 23: The Contractor placed fill using a loader. No additional moisture was added, and a sheepsfoot wheel attached to a trackhoe applied compactive effort.	Test #	Related Test #	Test Type
Pass: Density Pass / Moisture Pass				

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

Report #: FT-000005

Report Date: 8/18/2015

Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (In)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
24		7/30/15	01	ASTM D698	A-6	10.1	121.7	10.1	115.6	8	95	95	-1 / 3	Pass
25		7/30/15	01	ASTM D698	A-6	10.1	121.7	10.7	116.1	8	95	95	-1 / 3	Pass
26		7/30/15	03	ASTM D698	A-4	14.0	116.0	15.3	112.3	8	97	95	-3 / 3	Pass
27		7/30/15	03	ASTM D698	A-4	14.0	116.0	14.2	113.4	8	98	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
24	Sanitary Sewer Service: West 68th Place at Station 0+32+67	5.0	BSG	Troxler 3430 33687	Plack, Ron
25	Sanitary Sewer Service: Alley B at station 1+31+00	2.0	BSG	Troxler 3430 33687	Plack, Ron
26	Sanitary Sewer Mainline: West 68th Place 50' west of Manhole 156-55	6.0	BSG	Troxler 3430 33687	Plack, Ron
27	Sanitary Sewer Mainline: West 68th Place, 45' west of Manhole 156-55	5.0	BSG	Troxler 3430 33687	Plack, Ron

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 27: The Contractor placed material in the mainline and services using a loader. Moisture was added using a fire hose attached to a water truck, and a sheepfoot wheel attached to a trackhoe mixed and applied compactive effort. The Contractor has previously been informed that the sheepfoot wheel attachment is a very subjective piece of compaction equipment and that the operator has continuous control. Therefore, our tests may not represent the compaction of the backfill as a whole as the Contractor can alter methods when tests are conducted.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

A.G. WassenaarConsulting Engineers
Geotechnical, Environmental
and Related ServicesField Services
2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone (303) 759-8100**Fill Testing**Report #: FT-000006
Report Date: 8/18/2015
Test Method: ASTM D 6938**Client:**Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305**Project:**144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO**Test Results**

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
28		7/31/15	01	ASTM D698	A-6	10.1	121.7	11.1	110.3	8	91	95	-1 / 3	Fail
29		7/31/15	01	ASTM D698	A-6	10.1	121.7	10.9	109.6	8	90	95	-1 / 3	Fail
30	28	7/31/15	01	ASTM D698	A-6	10.1	121.7	11.5	115.7	8	95	95	-1 / 3	Pass
31	29	7/31/15	01	ASTM D698	A-6	10.1	121.7	11.1	115.9	8	95	95	-1 / 3	Pass
32		7/31/15	03	ASTM D698	A-4	14.0	116.0	14.3	111.4	8	96	95	-3 / 3	Pass
33		7/31/15	03	ASTM D698	A-4	14.0	116.0	14.1	112.3	8	97	95	-3 / 3	Pass
34		7/31/15	03	ASTM D698	A-4	14.0	116.0	14.7	113.2	8	98	95	-3 / 3	Pass
35		7/31/15	03	ASTM D698	A-4	14.0	116.0	14.9	112.7	8	97	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
28	Sanitary Sewer Service: West 68th Place, Station 0+60+67	3.0	BSG	Troxler 3430 33687	Plack, Ron
29	Sanitary Sewer Service: West 68th Place, Station 0+93+67	3.0	BSG	Troxler 3430 33687	Plack, Ron
30	Sanitary Sewer Service: West 68th Place, Station 0+60+67	3.0	BSG	Troxler 3430 33687	Plack, Ron
31	Sanitary Sewer Service: West 68th Place, Station 0+93+67	3.0	BSG	Troxler 3430 33687	Plack, Ron
32	Sanitary Sewer Service: Alley A, Station 3+73+34	6.0	BSG	Troxler 3430 33687	Plack, Ron
33	Sanitary Sewer Service: Alley A, Station 3+56+64	5.0	BSG	Troxler 3430 33687	Plack, Ron
34	Sanitary Sewer Service: Alley A, Station 3+24+76	4.0	BSG	Troxler 3430 33687	Plack, Ron
35	Sanitary Sewer Service: West 68th Place, Station 0+7.0	5.0	BSG	Troxler 3430 33687	Plack, Ron

Remarks	Comments	Related Tests		
Fail: Density Fail / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.	Test #	Related Test #	Test Type
Pass: Density Pass / Moisture Pass				

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone: (303) 759-8100

Fill Testing
Report #: FT-000006

Report Date: 8/18/2015

Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
36		7/31/15	03	ASTM D698	A-4	14.0	116.0	14.2	111.4	8	96	95	-3 / 3	Pass
37		7/31/15	03	ASTM D698	A-4	14.0	116.0	14.5	112.0	8	97	95	-3 / 3	Pass
38		7/31/15	01	ASTM D698	A-6	10.1	121.7	11.1	116.6	8	96	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
36	Sanitary Sewer Mainline: West 68th Place, 30' west of Manhole 156-55	3.0	BSG	Troxler 3430 33687	Plack, Ron
37	Sanitary Sewer Mainline: West 68th Place, 35' west of Manhole 156-55	2.0	BSG	Troxler 3430 33687	Plack, Ron
38	Sanitary Sewer Mainline: West 68th Place, 40' west of Manhole 156-55	1.0	BSG	Troxler 3430 33687	Plack, Ron

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 38: The Contractor placed material in the trench and services using a loader. Moisture was added with a fire hose attached to a water truck and a sheepfoot wheel attached to a trackhoe mixed and applied compactive effort.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Field Services

 2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone (303) 759-8100

Fill Testing
Report #: FT-000007

Report Date: 8/18/2015

Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
39		8/3/15	03	ASTM D698	A-4	14.0	116.0	14.1	113.7	8	98	95	-3 / 3	Pass
40		8/3/15	03	ASTM D698	A-4	14.0	116.0	14.7	115.2	8	99	95	-3 / 3	Pass
41		8/3/15	03	ASTM D698	A-4	14.0	116.0	15.1	114.7	8	99	95	-3 / 3	Pass
42		8/3/15	03	ASTM D698	A-4	14.0	116.0	16.4	112.6	8	97	95	-3 / 3	Pass
43		8/3/15	02	ASTM D698	A-6	15.8	109.1	19.5	105.8	8	97	95	-1 / 3	Pass
44		8/3/15	02	ASTM D698	A-6	15.8	109.1	18.7	106.9	8	98	95	-1 / 3	Pass
45		8/3/15	02	ASTM D698	A-6	15.8	109.1	18.6	108.4	8	99	95	-1 / 3	Pass
46		8/3/15	02	ASTM D698	A-6	15.8	109.1	20.9	105.6	8	97	95	-1 / 3	Fail

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
39	Sanitary Sewer Mainline: Alley A, 10' north of SSMH 156-28	2.0	BSG	InstroTek 3500 1910	Blom, Doug
40	Sanitary Sewer Manhole: Alley A, South of SSMH 156-28	6.0	BSG	InstroTek 3500 1910	Blom, Doug
41	Sanitary Sewer Manhole: Alley A, North of SSMH 156-28	5.0	BSG	InstroTek 3500 1910	Blom, Doug
42	Sanitary Sewer Manhole: Alley A, North of SSMH 156-28	3.0	BSG	InstroTek 3500 1910	Blom, Doug
43	Sanitary Sewer Mainline: Alley A, 30' north of SSMH 156-28	5.0	BSG	InstroTek 3500 1910	Blom, Doug
44	Sanitary Sewer Mainline: Alley A, 20' north of SSMH 156-28	3.0	BSG	InstroTek 3500 1910	Blom, Doug
45	Sanitary Sewer Manhole: Alley A, North of SSMH 156-28	2.0	BSG	InstroTek 3500 1910	Blom, Doug
46	Sanitary Sewer Manhole: Alley A, West of SSMH 156-28	2.0	BSG	InstroTek 3500 1910	Blom, Doug

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.	Test #	Related Test #	Test Type
Fail: Density Pass / Moisture Fail				

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone: (303) 759-8100

Fill Testing

Report #: FT-000007

Report Date: 8/18/2015

Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
47	46	8/3/15	02	ASTM D698	A-6	15.8	109.1	19.0	107.1	8	98	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
47	Sanitary Sewer Manhole: Alley A, West of SSMH 156-28	2.0	BSG	InsitroTek 3500 1910	Blom, Doug

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 47: The Contractor, E-Z Excavating, utilized an excavator with a wheel attachment (Deere 892E LC) to apply compactive effort to the utility trench backfill. No moisture was applied to the fill.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

Report #: FT-000008

Report Date: 8/18/2015

Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone: (303) 759-8100

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
48		8/4/15	03	ASTM D698	A-4	14.0	116.0	15.9	110.4	8	95	95	-3 / 3	Pass
49		8/4/15	01	ASTM D698	A-6	10.1	121.7	11.7	116.3	8	96	95	-1 / 3	Pass
50		8/4/15	01	ASTM D698	A-6	10.1	121.7	11.5	115.9	8	95	95	-1 / 3	Pass
51		8/4/15	01	ASTM D698	A-6	10.1	121.7	11.3	116.3	8	96	95	-1 / 3	Pass
52		8/4/15	01	ASTM D698	A-6	10.1	121.7	10.9	115.7	8	95	95	-1 / 3	Pass
53		8/4/15	01	ASTM D698	A-6	10.1	121.7	11.8	116.6	8	96	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
48	Sanitary Sewer Mainline: Alley A, 60' north of Manhole 156-28	7.0	BSG	Troxler 3430 33687	Plack, Ron
49	Sanitary Sewer Mainline: Alley A, 50' north of Manhole 156-28	5.0	BSG	Troxler 3430 33687	Plack, Ron
50	Sanitary Sewer Mainline: Alley A, 45' north of Manhole 156-28	3.0	BSG	Troxler 3430 33687	Plack, Ron
51	Sanitary Sewer Service: Alley A, Station 2+93+27	3.0	BSG	Troxler 3430 33687	Plack, Ron
52	Sanitary Sewer Service: Alley A, Station 2+98+27	3.0	BSG	Troxler 3430 33687	Plack, Ron
53	Sanitary Sewer Service: Alley A, 65' north of Manhole 156-28	6.0	BSG	Troxler 3430 33687	Plack, Ron

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 53: The Contractor placed material in the main and services using a loader. Moisture was added with a water truck and a sheepsfoot wheel attached to a trackhoe mixed and applied compactive effort.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

 Report #: FT-000009
Report Date: 8/18/2015
Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
54		8/6/15	03	ASTM D698	A-4	14.0	116.0	15.6	111.4	8	96	95	-3 / 3	Pass
55		8/6/15	03	ASTM D698	A-4	14.0	116.0	14.5	112.3	8	97	95	-3 / 3	Pass
56		8/6/15	01	ASTM D698	A-6	10.1	121.7	9.4	119.3	8	98	95	-1 / 3	Pass
57		8/6/15	01	ASTM D698	A-6	10.1	121.7	9.3	119.9	8	99	95	-1 / 3	Pass
58		8/6/15	01	ASTM D698	A-6	10.1	121.7	9.6	120.4	8	99	95	-1 / 3	Pass
59		8/6/15	01	ASTM D698	A-6	10.1	121.7	10.0	120.0	8	99	95	-1 / 3	Pass
60		8/6/15	01	ASTM D698	A-6	10.1	121.7	10.7	119.7	8	98	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
54	Sanitary Sewer Manhole: Alley A, North side of Manhole, 100' south of Manhole 156-28	5.0	BSG	Troxler 3430 33687	Plack, Ron
55	Sanitary Sewer Manhole: Alley A, South side of Manhole, 100' south of Manhole 156-28	3.0	BSG	Troxler 3430 33687	Plack, Ron
56	Sanitary Sewer Service: Alley A, Station 2+54+82	4.0	BSG	Troxler 3430 33687	Plack, Ron
57	Sanitary Sewer Service: Alley A, Station 2+35+38	3.0	BSG	Troxler 3430 33687	Plack, Ron
58	Sanitary Sewer Service: Alley A, Station 2+30+38	3.0	BSG	Troxler 3430 33687	Plack, Ron
59	Sanitary Sewer Service: Alley A, Station 1+84+84	5.0	BSG	Troxler 3430 33687	Plack, Ron
60	Sanitary Sewer Mainline: 170' north of Manhole 156+28	5.0	BSG	Troxler 3430 33687	Plack, Ron

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 60: The Contractor placed fill in the main and services using a loader. Moisture was added with a fire hose attached to a water truck, and a sheepfoot wheel attached to a trackhoe mixed and applied compactive effort.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

 Report #: FT-000010
Report Date: 8/18/2015
Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
61		8/7/15	03	ASTM D698	A-4	14.0	116.0	15.9	110.3	8	95	95	-3 / 3	Pass
62		8/7/15	03	ASTM D698	A-4	14.0	116.0	16.2	105.1	8	91	95	-3 / 3	Fail
63	62	8/7/15	03	ASTM D698	A-4	14.0	116.0	16.0	110.7	8	95	95	-3 / 3	Pass
64		8/7/15	03	ASTM D698	A-4	14.0	116.0	14.3	110.9	8	96	95	-3 / 3	Pass
65		8/7/15	03	ASTM D698	A-4	14.0	116.0	14.8	111.6	8	96	95	-3 / 3	Pass
66		8/7/15	03	ASTM D698	A-4	14.0	116.0	14.0	110.5	8	95	95	-3 / 3	Pass
67		8/7/15	03	ASTM D698	A-4	14.0	116.0	14.5	111.3	8	96	95	-3 / 3	Pass
68		8/7/15	03	ASTM D698	A-4	14.0	116.0	15.1	110.8	8	96	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
61	Sanitary Sewer Manhole: West 68th Place, Manhole 156-54	4.0	BSG	Troxler 3430 33687	Plack, Ron
62	Sanitary Sewer Manhole: West 68th Place, Manhole 156-54	2.0	BSG	Troxler 3430 33687	Plack, Ron
63	Sanitary Sewer Manhole: West 68th Place, Manhole 156-54	2.0	BSG	Troxler 3430 33687	Plack, Ron
64	Sanitary Sewer Manhole: West 68th Place, west side of Manhole 156-54	1.0	BSG	Troxler 3430 33687	Plack, Ron
65	Sanitary Sewer Service: Alley A, Station 1+62+84	1.0	BSG	Troxler 3430 33687	Plack, Ron
66	Sanitary Sewer Service: Alley A, Station 1+26+34	3.0	BSG	Troxler 3430 33687	Plack, Ron
67	Sanitary Sewer Service: Alley A, Station 1+21+34	3.0	BSG	Troxler 3430 33687	Plack, Ron
68	Sanitary Sewer Mainline: Alley A, 40' south of Manhole 156-53	4.0	BSG	Troxler 3430 33687	Plack, Ron

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.	Test #	Related Test #	Test Type
Fail: Density Fail / Moisture Pass				

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone: (303) 759-8100

Fill Testing**Report #:** FT-000010**Report Date:** 8/18/2015**Test Method:** ASTM D 6938**Client:**

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
69		8/7/15	03	ASTM D698	A-4	14.0	116.0	14.9	111.0	8	96	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
69	Sanitary Sewer Mainline, Alley A, 45' south of Manhole 156-53	2.0	BSG	Troxler 3430 33687	Plack, Ron

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 69: The Contractor placed material in the main and services using a loader. No additional moisture was added and a sheepsfoot wheel attached to a trackhoe mixed and applied compactive effort.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

 Report #: FT-000011
Report Date: 8/18/2015
Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
70		8/10/15	01	ASTM D698	A-6	10.1	121.7	10.0	120.1	8	99	95	-1 / 3	Pass
71		8/10/15	03	ASTM D698	A-4	14.0	116.0	14.3	112.8	8	97	95	-3 / 3	Pass
72		8/10/15	03	ASTM D698	A-4	14.0	116.0	15.4	113.6	8	98	95	-3 / 3	Pass
73		8/10/15	03	ASTM D698	A-4	14.0	116.0	15.7	111.9	8	96	95	-3 / 3	Pass
74		8/10/15	03	ASTM D698	A-4	14.0	116.0	15.8	112.3	8	97	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
70	Water Main: West 68th Place, 150' west of Joyce Street	1.0	BSG	Troxler 3430 33687	Plack, Ron
71	Sanitary Sewer Service: West of Alley A, Station 0+60.13	2.0	BSG	Troxler 3430 33687	Plack, Ron
72	Sanitary Sewer Service: West of Alley A, Station 0+76.24	4.0	BSG	Troxler 3430 33687	Plack, Ron
73	Sanitary Sewer Mainline: West of Alley A at Station 0+60.0	2.0	BSG	Troxler 3430 33687	Plack, Ron
74	Sanitary Sewer Mainline: West of Alley A at Station 0+76.0	4.0	BSG	Troxler 3430 33687	Plack, Ron

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 74: The Contractor placed material in the main and services using a loader. Moisture was added with a fire hose attached to a water truck and a sheepfoot wheel attached to a trackhoe mixed and applied compactive effort.	Test #	Related Test #	Test Type

Fill Testing

 Report #: FT-000012
Report Date: 8/18/2015
Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
75		8/11/15	03	ASTM D698	A-4	14.0	116.0	15.7	110.4	8	95	95	-3 / 3	Pass
76		8/11/15	03	ASTM D698	A-4	14.0	116.0	14.9	102.7	8	89	95	-3 / 3	Fail
77		8/11/15	03	ASTM D698	A-4	14.0	116.0	15.1	111.4	8	96	95	-3 / 3	Pass
78		8/11/15	03	ASTM D698	A-4	14.0	116.0	14.8	103.6	8	89	95	-3 / 3	Fail
79	76	8/11/15	03	ASTM D698	A-4	14.0	116.0	15.0	111.0	8	96	95	-3 / 3	Pass
80	78	8/11/15	03	ASTM D698	A-4	14.0	116.0	15.0	111.0	8	96	95	-3 / 3	Pass
81		8/11/15	03	ASTM D698	A-4	14.0	116.0	15.3	110.5	8	95	95	-3 / 3	Pass
82		8/11/15	01	ASTM D698	A-6	10.1	121.7	11.1	115.7	8	95	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
75	Sanitary Sewer Service: West of Alley A, Station 0+92.24	4.0	BSG	Troxler 3430 33687	Plack, Ron
76	Sanitary Sewer Service: West of Alley A, Station 1+10.33	5.0	BSG	Troxler 3430 33687	Plack, Ron
77	Sanitary Sewer Mainline: West of Alley A at Station 0+93.0	4.0	BSG	Troxler 3430 33687	Plack, Ron
78	Sanitary Sewer Mainline: West of Alley A at Station	5.0	BSG	Troxler 3430 33687	Plack, Ron
79	Sanitary Sewer Service: West of Alley A, Station 1+10.33	5.0	BSG	Troxler 3430 33687	Plack, Ron
80	Sanitary Sewer Mainline: West of Alley A at Station	5.0	BSG	Troxler 3430 33687	Plack, Ron
81	Sanitary Sewer Manhole: Alley A, South side of Manhole 156-53	5.0	BSG	Troxler 3430 33687	Plack, Ron
82	Water Main: West 68th Place, 600' west of Joyce Street	1.0	BSG	Troxler 3430 33687	Plack, Ron

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.	Test #	Related Test #	Test Type
Fail: Density Fail / Moisture Pass				

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

 Report #: FT-000012
Report Date: 8/18/2015
Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
83		8/11/15	03	ASTM D698	A-4	14.0	116.0	14.2	110.3	8	95	95	-3 / 3	Pass
84		8/11/15	03	ASTM D698	A-4	14.0	116.0	14.5	106.7	8	92	95	-3 / 3	Fail
85	84	8/11/15	03	ASTM D698	A-4	14.0	116.0	14.7	110.2	8	95	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
83	Sanitary Sewer Mainline: West of Alley A at Station 0+95.0	1.0	BSG	Troxler 3430 33687	Plack, Ron
84	Sanitary Sewer Manhole: Alley A, West side of Manhole 156-53	2.0	BSG	Troxler 3430 33687	Plack, Ron
85	Sanitary Sewer Manhole: Alley A, West side of Manhole 156-53	2.0	BSG	Troxler 3430 33687	Plack, Ron

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 85: The Contractor placed fill in the main and services using a loader. Moisture was added with a fire hose attached to a water truck and a sheepfoot wheel attached to a trackhoe mixed and applied compactive effort.	Test #	Related Test #	Test Type
Fail: Density Fail / Moisture Pass				

Fill Testing

 Report #: FT-000013
Report Date: 8/18/2015
Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
86		8/12/15	01	ASTM D698	A-6	10.1	121.7	11.0	119.4	8	98	95	-1 / 3	Pass
87		8/12/15	01	ASTM D698	A-6	10.1	121.7	10.2	120.6	8	99	95	-1 / 3	Pass
88		8/12/15	01	ASTM D698	A-6	10.1	121.7	10.1	117.9	8	97	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
86	Water Main: West 68th Place, 155' east of Kilmer Street	2.0	BSG	Troxler 3430 33687	Plack, Ron
87	Water Valve: West 68th Place, West side of valve, 150' East of Kilmer Street	2.0	BSG	Troxler 3430 33687	Plack, Ron
88	Water Main: West 68th Place, 165' east of Kilmer Street	0.0	TSG	Troxler 3430 33687	Plack, Ron

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 88: The Contractor placed material in the trench using a loader. Moisture was added using a fire hose attached to a water truck and a sheep's foot wheel attached to a trackhoe mixed and applied compactive effort.	Test #	Related Test #	Test Type

A.G. WassenaarConsulting Engineers
Geotechnical, Environmental
and Related ServicesField Services
2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone (303) 759-8100**Fill Testing**

Report #: FT-000014

Report Date: 8/18/2015

Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO**Test Results**

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
89		8/13/15	03	ASTM D698	A-4	14.0	116.0	14.5	111.8	8	96	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
89	Water Main: West 69th Avenue, 10' north of Juniper Court	1.0	BSG	InstroTek 3500 1910	Blom, Doug

Remarks	Comments	Related Tests						
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 89: The Contractor utilized an excavator with a wheel attachment to apply compactive effort to the utility trench backfill. No moisture was added to the fill.	<table> <tr> <th>Test #</th><th>Related Test #</th><th>Test Type</th></tr> <tr> <td></td><td></td><td></td></tr> </table>	Test #	Related Test #	Test Type			
Test #	Related Test #	Test Type						

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Field Services

 2180 South Ivanhoe Street, Suite 5
Denver CO 80222
Phone: (303) 759-8100

Fill Testing
Report #: FT-000015

Report Date: 8/18/2015

Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (In)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
90		8/14/15	03	ASTM D698	A-4	14.0	116.0	15.2	109.9	8	95	95	-3 / 3	Pass
91		8/14/15	03	ASTM D698	A-4	14.0	116.0	16.0	110.2	8	95	95	-3 / 3	Pass
92		8/14/15	03	ASTM D698	A-4	14.0	116.0	15.7	110.9	8	96	95	-3 / 3	Pass
93		8/14/15	01	ASTM D698	A-6	10.1	121.7	11.5	119.4	8	98	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
90	Water Main: Juniper Court, 25' north of West 69th Avenue	1.0	BSG	InstroTek 3500 1910	Blom, Doug
91	Water Main: Juniper Court, 100' north of West 69th Avenue	2.0	BSG	InstroTek 3500 1910	Blom, Doug
92	Water Main: Juniper Court, 125' north of West 69th Avenue	1.0	BSG	InstroTek 3500 1910	Blom, Doug
93	Water Main: Juniper Court, 50' north of West 68th Place	1.0	BSG	InstroTek 3500 1910	Blom, Doug

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 93: The Contractor utilized an excavator with a wheel attachment to apply compactive effort to the utility trench backfill. Moisture was applied to the fill.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone (303) 759-8100

Fill Testing

Report #: FT-000016

Report Date: 8/31/2015

Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
94		8/17/15	03	ASTM D1557	A-4	14.0	116.0	13.5	110.0	8	95	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
94	Storm Sewer Main: West 69th Place, 25' north of Tract B	2.0	BSG	InstroTek 3500 1910	Blom, Doug

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 94: The Contractor utilized an excavator with a wheel attachment to apply compactive effort to the utility trench backfill. Moisture was applied to the fill.	Test #	Related Test #	Test Type

A.G. WassenaarConsulting Engineers
Geotechnical, Environmental
and Related Services**Field Services**

2180 South Ivanhoe Street Suite 5

Denver, CO 80222

Phone (303) 759-8100

Fill Testing**Report #:** FT-000017**Report Date:** 8/31/2015**Test Method:** ASTM D 6938**Client:**

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
95		8/18/15	01	ASTM D698	A-6	10.1	121.7	12.0	119.4	8	98	95	-1 / 3	Pass
96		8/18/15	01	ASTM D698	A-6	10.1	121.7	11.9	117.1	8	96	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
95	Storm Sewer Main: Juniper Court, 75' south of West 69th Place	1.0	BSG	InstroTek 3500 1910	Blom, Doug
96	Storm Sewer Main: Juniper Court, 100' south of West 69th Place	3.0	BSG	InstroTek 3500 1910	Blom, Doug

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 96: The Contractor utilized an excavator with a wheel attachment to apply compactive effort to the utility trench backfill. Moisture was applied to the fill	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone (303) 759-8100

Fill Testing
Report #: FT-000018

Report Date: 8/31/2015

Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
97		8/19/15	03	ASTM D1557	A-4	14.0	116.0	14.3	114.5	8	99	95	-3 / 3	Pass
98		8/19/15	03	ASTM D1557	A-4	14.0	116.0	15.4	111.0	8	96	95	-3 / 3	Pass
99		8/19/15	03	ASTM D1557	A-4	14.0	116.0	14.9	112.0	8	97	95	-3 / 3	Pass
100		8/19/15	03	ASTM D1557	A-4	14.0	116.0	15.7	110.1	8	95	95	-3 / 3	Pass
101		8/19/15	03	ASTM D1557	A-4	14.0	116.0	16.1	109.8	8	95	95	-3 / 3	Pass
102		8/19/15	03	ASTM D1557	A-4	14.0	116.0	14.5	112.1	8	97	95	-3 / 3	Pass
103		8/19/15	03	ASTM D1557	A-4	14.0	116.0	15.6	110.6	8	95	95	-3 / 3	Pass
104		8/19/15	03	ASTM D1557	A-4	14.0	116.0	15.1	110.3	8	95	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
97	Storm Sewer Manhole: West 69th Place, north of STM MH 13	3.0	BSG	InstroTek 3500 1910	Blom, Doug
98	Storm Sewer Manhole: West 69th Place, south of STM MH 13	2.0	BSG	InstroTek 3500 1910	Blom, Doug
99	Storm Sewer Main: West 69th Place, 10' west of STM MH 13	2.0	BSG	InstroTek 3500 1910	Blom, Doug
100	Storm Sewer Main: West 69th Place, 10' west of STM MH 2	1.0	BSG	InstroTek 3500 1910	Blom, Doug
101	Storm Sewer Manhole: West 69th Place, south of STM MH 2	3.0	BSG	InstroTek 3500 1910	Blom, Doug
102	Storm Sewer Manhole: West 69th Place, north of STM MH 2	1.0	BSG	InstroTek 3500 1910	Blom, Doug
103	Storm Sewer Manhole: West 69th Place, west of STM MH 13	1.0	BSG	InstroTek 3500 1910	Blom, Doug
104	Storm Sewer Manhole: West of STM MH 13	1.0	BSG	InstroTek 3500 1910	Blom, Doug

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 104: The Contractor utilized an excavator with a wheel attachment to apply compactive effort to the utility trench backfill. Moisture was applied to the fill.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

 Report #: FT-000019
Report Date: 10/30/2015
Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (In)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
105		8/21/15	03	ASTM D1557	A-4	14.0	116.0	15.7	112.4	8	97	95	-3 / 3	Pass
106		8/21/15	03	ASTM D1557	A-4	14.0	116.0	14.9	111.7	8	96	95	-3 / 3	Pass
107		8/21/15	03	ASTM D1557	A-4	14.0	116.0	14.6	111.8	8	96	95	-3 / 3	Pass
108		8/21/15	03	ASTM D1557	A-4	14.0	116.0	14.5	113.8	8	98	95	-3 / 3	Pass
109		8/21/15	02	ASTM D698	A-6	15.8	109.1	17.5	106.0	8	97	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
105	Storm Sewer Main: Juniper Court, 10' south of STM MH 12-1	3.0	BSG	InstroTek 3500 1910	Blom, Doug
106	Storm Sewer Main: Juniper Court, 20' south of STM MH 12-1	1.0	BSG	InstroTek 3500 1910	Blom, Doug
107	Storm Sewer Main: Juniper Court, 25' north of STM MH 12	2.0	BSG	InstroTek 3500 1910	Blom, Doug
108	Storm Sewer Main: Juniper Court, 20' north of STM MH 12	1.0	BSG	InstroTek 3500 1910	Blom, Doug
109	Storm Sewer Main: Juniper Court, 15' North of STM MH 12	5.0	BTFW	InstroTek 3500 1910	Blom, Doug

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 109: The Contractor utilized an excavator with a wheel attachment to apply compactive effort to the utility trench backfill. Moisture was added to the fill.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

 Report #: FT-000020
Report Date: 10/30/2015
Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
110		8/25/15	02	ASTM D698	A-6	15.8	109.1	14.8	109.1	8	100	95	-1 / 3	Pass
111		8/25/15	02	ASTM D698	A-6	15.8	109.1	15.7	108.2	8	99	95	-1 / 3	Pass
112		8/25/15	03	ASTM D1557	A-4	14.0	116.0	14.6	110.6	8	95	95	-3 / 3	Pass
113		8/25/15	03	ASTM D1557	A-4	14.0	116.0	14.3	111.2	8	96	95	-3 / 3	Pass
114		8/25/15	03	ASTM D1557	A-4	14.0	116.0	14.8	111.1	8	96	95	-3 / 3	Pass
115		8/25/15	03	ASTM D1557	A-4	14.0	116.0	13.7	111.6	8	96	95	-3 / 3	Pass
116		8/25/15	03	ASTM D1557	A-4	14.0	116.0	14.8	107.2	8	92	95	-3 / 3	Fail
117	116	8/25/15	03	ASTM D1557	A-4	14.0	116.0	15.1	110.1	8	95	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
110	Storm Sewer Manhole: West 69th Avenue, west of STM MH 11	0.0	TSG	InstroTek 3500 1910	Blom, Doug
111	Storm Sewer Manhole: West 69th Avenue, east of STM MH 11	1.0	BSG	InstroTek 3500 1910	Blom, Doug
112	Storm Sewer Main: West 69th Avenue, 25' west of STM MH 12	2.0	BSG	InstroTek 3500 1910	Blom, Doug
113	Storm Sewer Main: West 69th Avenue, 10' west of STM MH 12	1.0	BSG	InstroTek 3500 1910	Blom, Doug
114	Storm Sewer Manhole: West 69th Avenue, west of STM MH 12	2.0	BSG	InstroTek 3500 1910	Blom, Doug
115	Storm Sewer Manhole: West 69th Avenue, north of STM MH 12	1.0	BSG	InstroTek 3500 1910	Blom, Doug
116	Storm Sewer Manhole: West 69th Avenue, east of STM MH 12	0.0	TSG	InstroTek 3500 1910	Blom, Doug
117	Storm Sewer Manhole: West 69th Avenue, east of STM MH 12	0.0	TSG	InstroTek 3500 1910	Blom, Doug

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 117: The Contractor, E-Z Excavating, utilized an excavator with a wheel attachment to apply compactive effort to the utility trench backfill. Moisture was applied to the fill.	Test #	Related Test #	Test Type
Fail: Density Fail / Moisture Pass				

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

Report #: FT-000021
Report Date: 10/30/2015
Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
118		8/26/15	02	ASTM D698	A-6	15.8	109.1	18.7	105.0	8	96	95	-1 / 3	Pass
119		8/26/15	02	ASTM D698	A-6	15.8	109.1	17.9	105.8	8	97	95	-1 / 3	Pass
120		8/26/15	02	ASTM D698	A-6	15.8	109.1	17.3	105.3	8	97	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
118	Storm Sewer Main: Juniper Court, 10' north of STM MH 12	1.0	BSG	InstroTek 3500 1910	Blom, Doug
119	Storm Sewer Manhole: Juniper Court, north of STM MH 12	2.0	BSG	InstroTek 3500 1910	Blom, Doug
120	Storm Sewer Manhole: Juniper Court, south of STM MH 12	1.0	BSG	InstroTek 3500 1910	Blom, Doug

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 120: The Contractor utilized an excavator with a wheel attachment to apply compactive effort to the utility trench backfill. Moisture was applied to the fill.	Test #	Related Test #	Test Type

Fill Testing

 Report #: FT-000022
Report Date: 10/30/2015
Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
121		9/11/15	03	ASTM D1557	A-4	14.0	116.0	13.7	112.0	8	97	95	-3 / 3	Pass
122		9/11/15	03	ASTM D1557	A-4	14.0	116.0	14.1	113.0	8	97	95	-3 / 3	Pass
123		9/11/15	03	ASTM D1557	A-4	14.0	116.0	11.5	115.7	8	100	95	-3 / 3	Pass
124		9/11/15	03	ASTM D1557	A-4	14.0	116.0	13.8	113.4	8	98	95	-3 / 3	Pass
125		9/11/15	03	ASTM D1557	A-4	14.0	116.0	14.8	111.0	8	96	95	-3 / 3	Pass
126		9/11/15	03	ASTM D1557	A-4	14.0	116.0	13.2	112.1	8	97	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
121	Inlet: Juniper Court, Station 5+08.93, east of storm inlet	1.0	BSG	InstroTek 3500 1910	Blom, Doug
122	Inlet: Juniper Court, Station 5+08.93, west of storm inlet	0.0	TSG	InstroTek 3500 1910	Blom, Doug
123	Inlet: West 68th Place, North Inlet, Station 17+65.60, north of storm inlet	1.0	BSG	InstroTek 3500 1910	Blom, Doug
124	Inlet: West 68th Place, North Inlet, Station 17+65.60, east of storm inlet	0.0	TSG	InstroTek 3500 1910	Blom, Doug
125	Inlet: West 68th Place, South Inlet, Station 17+65.60, south of storm inlet	1.0	BSG	InstroTek 3500 1910	Blom, Doug
126	Inlet: West 68th Place, South Inlet, Station 17+65.60, west of storm inlet	0.0	TSG	InstroTek 3500 1910	Blom, Doug

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 126: The Contractor, E-Z Excavating, utilized an excavator with a wheel attachment to apply compactive effort to the utility trench backfill. Moisture was applied to the fill.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

Report #: FT-000023

Report Date: 12/15/2015

Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
127		11/10/15	01	ASTM D698	A-6	10.1	121.7	12.5	118.4	8	97	95	-1 / 3	Pass
128		11/10/15	03	ASTM D1557	A-4	14.0	116.0	14.1	110.4	8	95	95	-3 / 3	Pass
129		11/10/15	03	ASTM D1557	A-4	14.0	116.0	16.2	112.9	8	97	95	-3 / 3	Pass
130		11/10/15	03	ASTM D1557	A-4	14.0	116.0	16.2	112.9	8	97	95	-3 / 3	Pass
131		11/10/15	02	ASTM D698	A-6	15.8	109.1	14.9	107.7	8	99	95	-1 / 3	Pass
132		11/10/15	03	ASTM D1557	A-4	14.0	116.0	13.2	113.1	8	98	95	-3 / 3	Pass
133		11/10/15	03	ASTM D1557	A-4	14.0	116.0	13.8	113.5	8	98	95	-3 / 3	Pass
134		11/10/15	03	ASTM D1557	A-4	14.0	116.0	14.4	113.8	8	98	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
127	Utility Trench Backfill: Water Service, West 69th Place, eastbound, first service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
128	Utility Trench Backfill: Water Service, West 69th Place, eastbound, second service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
129	Utility Trench Backfill: Water Service, West 69th Place, eastbound, third service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
130	Utility Trench Backfill: Water Service, West 69th Place, eastbound, fourth service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
131	Utility Trench Backfill: Water Service, Juniper Court, northbound, first service south of West 69th Place	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
132	Utility Trench Backfill: Water Service, Juniper Court, northbound, second service south of West 69th Place	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
133	Utility Trench Backfill: Water Service, Juniper Court, northbound, third service south of West 69th Place	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
134	Utility Trench Backfill: Water Service, Juniper Court, northbound, fourth service south of West 69th Place	2.0	BSG	InstroTek 3500 1937	Haidak, Jake

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

Report #: FT-000023
Report Date: 12/15/2015
Test Method: ASTM D 6938

Client:
Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:
144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.	Test #	Related Test #	Test Type

Fill Testing

Report #: FT-000023

Report Date: 12/15/2015

Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
135		11/10/15	03	ASTM D1557	A-4	14.0	116.0	14.0	113.0	8	97	95	-3 / 3	Pass
136		11/10/15	03	ASTM D1557	A-4	14.0	116.0	13.7	113.4	8	98	95	-3 / 3	Pass
137		11/10/15	03	ASTM D1557	A-4	14.0	116.0	14.2	112.8	8	97	95	-3 / 3	Pass
138		11/10/15	03	ASTM D1557	A-4	14.0	116.0	14.1	114.1	8	98	95	-3 / 3	Pass
139		11/10/15	01	ASTM D698	A-6	10.1	121.7	12.0	117.2	8	96	95	-1 / 3	Pass
140		11/10/15	01	ASTM D698	A-6	10.1	121.7	11.7	118.1	8	97	95	-1 / 3	Pass
141		11/10/15	03	ASTM D1557	A-4	14.0	116.0	13.9	113.8	8	98	95	-3 / 3	Pass
142		11/10/15	01	ASTM D698	A-6	10.1	121.7	12.7	117.7	8	97	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
135	Utility Trench Backfill: Water Service, Juniper Court, northbound, fifth service south of West 69th Place	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
136	Utility Trench Backfill: Water Service, Juniper Court, northbound, eighth service south of West 69th Place	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
137	Utility Trench Backfill: Water Service, Juniper Court, northbound, ninth service south of West 69th Place	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
138	Utility Trench Backfill: Water Service, Juniper Court, northbound, 10th service south of West 69th Place	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
139	Utility Trench Backfill: Water Service, Juniper Court, northbound, 11th service south of West 69th Place	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
140	Utility Trench Backfill: Water Service, Juniper Court, northbound, 12th service south of West 69th Place	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
141	Utility Trench Backfill: Water Service, Juniper Court, northbound, 13th service south of West 69th Place	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
142	Utility Trench Backfill: Water Service, West 68th Place, westbound, first service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

A.G. WassenaarConsulting Engineers
Geotechnical, Environmental
and Related ServicesField Services
2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone (303) 759-8100**Fill Testing****Report #:** FT-000023**Report Date:** 12/15/2015**Test Method:** ASTM D 6938**Client:**Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305**Project:**144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

Report #: FT-000023

Report Date: 12/15/2015

Test Method: ASTM D 6938

Client:Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305**Project:**144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO**Test Results**

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
143		11/10/15	03	ASTM D1557	A-4	14.0	116.0	12.0	114.8	8	99	95	-3 / 3	Pass
144		11/10/15	03	ASTM D1557	A-4	14.0	116.0	13.1	114.2	8	98	95	-3 / 3	Pass
145		11/10/15	03	ASTM D1557	A-4	14.0	116.0	15.2	113.5	8	98	95	-3 / 3	Pass
146		11/10/15	03	ASTM D1557	A-4	14.0	116.0	14.2	113.9	8	98	95	-3 / 3	Pass
147		11/10/15	03	ASTM D1557	A-4	14.0	116.0	14.4	113.3	8	98	95	-3 / 3	Pass
148		11/10/15	03	ASTM D1557	A-4	14.0	116.0	14.9	112.8	8	97	95	-3 / 3	Pass
149		11/10/15	01	ASTM D698	A-6	10.1	121.7	12.2	116.7	8	96	95	-1 / 3	Pass
150		11/10/15	03	ASTM D1557	A-4	14.0	116.0	13.8	113.6	8	98	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
143	Utility Trench Backfill: Water Service, West 68th Place, westbound, second service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
144	Utility Trench Backfill: Water Service, West 68th Place, westbound, third service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
145	Utility Trench Backfill: Water Service, West 68th Place, westbound, fourth service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
146	Utility Trench Backfill: Water Service, West 68th Place, westbound, fifth service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
147	Utility Trench Backfill: Water Service, West 68th Place, westbound, sixth service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
148	Utility Trench Backfill: Water Service, West 68th Place, westbound, seventh service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
149	Utility Trench Backfill: Water Service, West 68th Place, westbound, eighth service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
150	Utility Trench Backfill: Water Service, West 68th Place, westbound, ninth service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

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1240 Lehigh Street
Boulder, CO 80305**Project:**144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone (303) 759-8100

Fill Testing**Report #:** FT-000023**Report Date:** 12/15/2015**Test Method:** ASTM D 6938**Client:**

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
151		11/10/15	03	ASTM D1557	A-4	14.0	116.0	13.8	114.0	8	98	95	-3 / 3	Pass
152		11/10/15	03	ASTM D1557	A-4	14.0	116.0	14.4	113.5	8	98	95	-3 / 3	Pass
153		11/10/15	03	ASTM D1557	A-4	14.0	116.0	14.1	113.2	8	98	95	-3 / 3	Pass
154		11/10/15	03	ASTM D1557	A-4	14.0	116.0	15.5	112.7	8	97	95	-3 / 3	Pass
155		11/10/15	01	ASTM D698	A-6	10.1	121.7	12.2	118.5	8	97	95	-1 / 3	Pass
156		11/10/15	01	ASTM D698	A-6	10.1	121.7	11.7	117.4	8	96	95	-1 / 3	Pass
157		11/10/15	03	ASTM D1557	A-4	14.0	116.0	14.9	112.5	8	97	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
151	Utility Trench Backfill: Water Service, West 68th Place, westbound, 10th service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
152	Utility Trench Backfill: Water Service, West 68th Place, westbound, 11th service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
153	Utility Trench Backfill: Water Service, West 68th Place, westbound, 12th service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
154	Utility Trench Backfill: Water Service, West 68th Place, westbound, 13th service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
155	Utility Trench Backfill: Water Service, West 68th Place, westbound, 14th service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
156	Utility Trench Backfill: Water Service, West 68th Place, westbound, 15th service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake
157	Utility Trench Backfill: Water Service, West 68th Place, westbound, 16th service east of Juniper Court	2.0	BSG	InstroTek 3500 1937	Haidak, Jake

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Field Services2180 South Ivanhoe Street, Suite 5
Denver CO 80222
Phone: (303) 759-8100**Fill Testing****Report #:** FT-000023**Report Date:** 12/15/2015**Test Method:** ASTM D 6938**Client:**Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305**Project:**144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Remarks	Comments	Related Tests		
		Test #	Related Test #	Test Type
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency 157: The Contractor utilized an excavator with a compactor wheel attachment to apply compactive effort to the utility trench backfill. Moisture was applied to the fill.			

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

Report #: FT-000024

Report Date: 3/17/2016

Test Method: ASTM D 6938

Client:Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305**Project:**144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO**Test Results**

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
158		2/25/16	01	ASTM D698	A-6	10.1	121.7	13.0	119.6	8	98	95	-1 / 3	Pass
159		2/25/16	01	ASTM D698	A-6	10.1	121.7	12.5	120.5	8	99	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
158	Alley: Alley B, 25' west of Joyce Street	0.0	TSG	Troxler 3430 27056	Murphy, John
159	Alley: Alley B, 100' west of Joyce Street	0.0	TSG	Troxler 3430 27056	Murphy, John

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 159: The Contractor, E-Z, prepared subgrade prior to our arrival.	Test #	Related Test #	Test Type

Fill Testing

Report #: FT-000025
Report Date: 3/17/2016
Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
160		2/26/16	01	ASTM D698	A-6	10.1	121.7	12.4	115.8	8	95	95	-1 / 3	Pass
161		2/26/16	01	ASTM D698	A-6	10.1	121.7	12.9	119.3	8	98	95	-1 / 3	Pass
162		2/26/16	01	ASTM D698	A-6	10.1	121.7	13.0	117.7	8	97	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
160	Alley: Alley B, 90' west of Joyce street	0.0	TSG	Troxler 3430 23705	Bosserman, Sean
161	Alley: Alley B, 150' west of Joyce street	0.0	TSG	Troxler 3430 23705	Bosserman, Sean
162	Alley: Alley B, 125' west of Joyce street and 50' north	0.0	TSG	Troxler 3430 23705	Bosserman, Sean

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 162: The Contractor prepared the subgrade prior to our arrival	Test #	Related Test #	Test Type

Fill Testing

Report #: FT-000026
Report Date: 3/17/2016
Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results														
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
163		3/3/16	03	ASTM D1557	A-4	14.0	116.0	15.8	111.4	8	96	95	-3 / 3	Pass
164		3/3/16	03	ASTM D1557	A-4	14.0	116.0	13.4	114.5	8	99	95	-3 / 3	Pass
165		3/3/16	01	ASTM D698	A-6	10.1	121.7	11.2	117.6	8	97	95	-1 / 3	Pass
Test Information														
Test #	Test Location							Elevation	Reference	Gauge Make / Model / SN		Field Technician		
163	Street Subgrade: Alley A, 20' south of West 69th Place							0.0	TSG	Troxler 3430 036306		Bentley, Jim		
164	Street Subgrade: Alley A, 150' south of West 69th Place							0.0	TSG	Troxler 3430 036306		Bentley, Jim		
165	Street Subgrade: Alley A, 300' south of West 69th Place							0.0	TSG	Troxler 3430 036306		Bentley, Jim		
Remarks					Comments						Related Tests			
Pass: Density Pass / Moisture Pass					Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 165: The Contractor, EZ Excavating, previously prepared the street subgrade prior to our arrival. We observed the Contractor perform a proof roll. A small amount of deflection was observed along the west edge of Alley A.						Test #	Related Test #	Test Type	

Fill Testing

Report #: FT-000027
Report Date: 3/17/2016
Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
166		3/11/16	01	ASTM D698	A-6	10.1	121.7	9.9	120.9	8	99	95	-1 / 3	Pass
167		3/11/16	01	ASTM D698	A-6	10.1	121.7	9.9	121.6	8	100	95	-1 / 3	Pass
168		3/11/16	01	ASTM D698	A-6	10.1	121.7	9.7	121.1	8	100	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
166	Curb and Gutter: West 68th Place, north side, 75' east of Juniper Court	0.0	TSG	Troxler 3430 036306	Bentley, Jim
167	Curb and Gutter: Juniper Court, east side, 100' north of West 68th Place	0.0	TSG	Troxler 3430 036306	Bentley, Jim
168	Curb and Gutter: Juniper Court, west side, 100' north of West 68th Place	0.0	TSG	Troxler 3430 036306	Bentley, Jim

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 168: The Contractor, EZ Excavating, previously prepared the subgrade prior to our arrival.	Test #	Related Test #	Test Type

Fill Testing

Report #: FT-000028
Report Date: 3/17/2016
Test Method: ASTM D 6938

Client:
Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:
144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Field Services
2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone: (303) 759-8100

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
169		3/14/16	01	ASTM D698	A-6	10.1	121.7	9.3	118.9	8	98	95	-1 / 3	Pass
170		3/14/16	01	ASTM D698	A-6	10.1	121.7	9.7	120.6	8	99	95	-1 / 3	Pass
171		3/14/16	01	ASTM D698	A-6	10.1	121.7	10.1	115.7	8	95	95	-1 / 3	Pass
172		3/14/16	03	ASTM D1557	A-4	14.0	116.0	15.9	111.3	8	96	95	-3 / 3	Pass
173		3/14/16	03	ASTM D1557	A-4	14.0	116.0	12.8	111.2	8	96	95	-3 / 3	Pass
174		3/14/16	03	ASTM D1557	A-4	14.0	116.0	13.2	113.6	8	98	95	-3 / 3	Pass
175		3/14/16	03	ASTM D1557	A-4	14.0	116.0	7.7	105.2	8	91	95	-3 / 3	Fail
176		3/14/16	01	ASTM D698	A-6	10.1	121.7	12.8	115.8	8	95	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
169	Curb and Gutter: South side of West 68th Place, 375' east of Juniper Court	0.0	TSG	Troxler 3430 036306	Bentley, Jim
170	Curb and Gutter: South side of West 68th Place, 125' east of Juniper Court	0.0	TSG	Troxler 3430 036306	Bentley, Jim
171	Curb and Gutter: South side of West 68th Place, 25' east of Juniper Court	0.0	TSG	Troxler 3430 036306	Bentley, Jim
172	Curb and Gutter: North side of West 68th Place, 325' east of Juniper Court	0.0	TSG	Troxler 3430 036306	Bentley, Jim
173	Curb and Gutter: North side of West 68th Place, 75' east of Juniper Court	0.0	TSG	Troxler 3430 036306	Bentley, Jim
174	Curb and Gutter: East side of Juniper Court, 10' north of West 68th Place	0.0	TSG	Troxler 3430 036306	Bentley, Jim
175	Curb and Gutter: East side of Juniper Court, 10' north of West 68th Place	0.0	TSG	Troxler 3430 036306	Bentley, Jim
176	Curb and Gutter: East side of Juniper Court, 400' north of West 68th Place	0.0	TSG	Troxler 3430 036306	Bentley, Jim

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.	Test #	Related Test #	Test Type
Fail: Density Fail / Moisture Fail				

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

Report #: FT-000028
Report Date: 3/17/2016
Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results															
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark	
177		3/14/16	01	ASTM D698	A-6	10.1	121.7	9.7	117.7	8	97	95	-1 / 3	Pass	
178		3/14/16	01	ASTM D698	A-6	10.1	121.7	10.2	117.0	8	96	95	-1 / 3	Pass	
Test Information															
Test #	Test Location							Elevation	Reference		Gauge Make / Model / SN		Field Technician		
177	Curb and Gutter: West side of Juniper Court, 75' north of West 68th Place							0.0	TSG		Troxler 3430 036306		Bentley, Jim		
178	Curb and Gutter: West side of Juniper Court, 325' north of West 68th Place							0.0	TSG		Troxler 3430 036306		Bentley, Jim		
Remarks						Comments					Related Tests				
Pass: Density Pass / Moisture Pass						Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 178: The Contractor, EZ Excavating, previously prepared the subgrade prior to our arrival. Test 175 was dry and loose fill. The contractor was shown the various areas where loose dry soil was noted.					Test #	Related Test #		Test Type	

Fill Testing

Report #: FT-000029
Report Date: 6/7/2016
Test Method: ASTM D 6938

Client:
Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:
144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Field Services
2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone: (303) 759-8100

Test Results														
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
179		6/3/16	02	ASTM D698	A-6	15.8	109.1	16.8	106.3	8	97	95	-1 / 3	Pass
180		6/3/16	03	ASTM D1557	A-4	14.0	116.0	15.0	114.0	8	98	95	-3 / 3	Pass
181		6/3/16	03	ASTM D1557	A-4	14.0	116.0	15.4	112.5	8	97	95	-3 / 3	Pass
182		6/3/16	03	ASTM D1557	A-4	14.0	116.0	15.0	112.9	8	97	95	-3 / 3	Pass
183		6/3/16	03	ASTM D1557	A-4	14.0	116.0	14.6	112.6	8	97	95	-3 / 3	Pass
184		6/3/16	03	ASTM D1557	A-4	14.0	116.0	16.8	112.8	8	97	95	-3 / 3	Pass
185		6/3/16	02	ASTM D698	A-6	15.8	109.1	15.8	108.1	8	99	95	-1 / 3	Pass
186		6/3/16	03	ASTM D1557	A-4	14.0	116.0	14.9	111.9	8	96	95	-3 / 3	Pass
Test Information														
Test #	Test Location							Elevation	Reference	Gauge Make / Model / SN		Field Technician		
179	Curb and Gutter: South side of west 68th Place, 90' west of Joyce Street							0.0	TSG	Troxler 3430 22403		Duggan, Daniel		
180	Curb and Gutter: South side of West 68th Place, 200' west of Joyce Street							0.0	TSG	Troxler 3430 22403		Duggan, Daniel		
181	Curb and Gutter: North side of West 68th Place, 120' west of Joyce Street							0.0	TSG	Troxler 3430 22403		Duggan, Daniel		
182	Curb and Gutter: North side of West 68th Place, 280' west of Joyce Street							0.0	TSG	Troxler 3430 22403		Duggan, Daniel		
183	Curb and Gutter: West side of Juniper Street, 50' north of 68th Place							0.0	TSG	Troxler 3430 22403		Duggan, Daniel		
184	Curb and Gutter: West side of Juniper street, 160' north of 68th place							0.0	TSG	Troxler 3430 22403		Duggan, Daniel		
185	Curb and Gutter: East side of Juniper Street, 100' north of 68th Place							0.0	TSG	Troxler 3430 22403		Duggan, Daniel		
186	Curb and Gutter: East side of Juniper Street, 200' north of 68th Place							0.0	TSG	Troxler 3430 22403		Duggan, Daniel		
Remarks					Comments						Related Tests			
Pass: Density Pass / Moisture Pass					Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 186: The curb and gutter subgrade was prepared prior to my arrival.						Test #	Related Test #	Test Type	

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

Report #: FT-000030
Report Date: 6/30/2016
Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (In)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
187		6/6/16	03	ASTM D1557	A-4	14.0	116.0	9.6	108.4	8	93	95	-1 / 3	Fail
188		6/6/16	03	ASTM D1557	A-4	14.0	116.0	12.3	112.4	8	97	95	-1 / 3	Fail
189		6/6/16	03	ASTM D1557	A-4	14.0	116.0	11.8	111.9	8	96	95	-1 / 3	Fail
190		6/6/16	03	ASTM D1557	A-4	14.0	116.0	12.5	115.0	8	99	95	-1 / 3	Fail
191		6/6/16	01	ASTM D698	A-6	10.1	121.7	10.5	119.7	8	98	95	-1 / 3	Pass
192		6/6/16	01	ASTM D698	A-6	10.1	121.7	11.9	120.5	8	99	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
187	Curb and Gutter: South side of 68th Place, 140' west of Joyce Street	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
188	Curb and Gutter: West side of Juniper Street, 40' north of 68th Place	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
189	Curb and Gutter: West side of Juniper Street, 130' north of 68th Place	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
190	Street Subgrade: Northbound lane on 68th, 80' west of Joyce Street	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
191	Street Subgrade: Southbound lane on 68th, 170' west of Joyce Street	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
192	Street Subgrade: Northbound lane on 68th, 210' west of Joyce Street	0.0	TSG	Troxler 3430 22403	Duggan, Daniel

Remarks	Comments	Related Tests
Fail: Density Fail / Moisture Fail	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 192: The contractor utilized a grader to apply compactive effort to the subgrade. Moisture was applied to the subgrade.	Test # Related Test # Test Type
Fail: Density Pass / Moisture Fail		
Pass: Density Pass / Moisture Pass		

Fill Testing

 Report #: FT-000031
Report Date: 6/30/2016
Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
193	190	6/7/16	03	ASTM D1557	A-4	14.0	116.0	14.6	114.9	8	99	95	-1 / 3	Pass
194	187	6/7/16	03	ASTM D1557	A-4	14.0	116.0	15.4	114.5	8	99	95	-1 / 3	Pass
195		6/7/16	03	ASTM D1557	A-4	14.0	116.0	13.1	114.9	8	99	95	-1 / 3	Pass
196		6/7/16	03	ASTM D1557	A-4	14.0	116.0	13.1	110.5	8	95	95	-1 / 3	Pass
197		6/7/16	03	ASTM D1557	A-4	14.0	116.0	13.2	113.7	8	98	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
193	Street Subgrade: Northbound lane on 68th, 80' west of Joyce Street	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
194	Curb and Gutter: South side of 68th Place, 140' west of Joyce Street	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
195	Curb and Gutter: South side of 68th Place, 30' west of Joyce Street	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
196	Curb and Gutter: South side of 68th Place, 80' west of Joyce Street	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
197	Street Subgrade: Southbound lane of 68th Place, 200' west of Joyce Street	0.0	TSG	Troxler 3430 22403	Duggan, Daniel

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 197: The subgrade was prepared prior to my arrival.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

 Report #: FT-000032
Report Date: 6/30/2016
Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
198	188	6/8/16	03	ASTM D1557	A-4	14.0	116.0	15.3	112.5	8	97	95	-1 / 3	Pass
199	189	6/8/16	03	ASTM D1557	A-4	14.0	116.0	14.4	114.6	8	99	95	-1 / 3	Pass
200		6/8/16	03	ASTM D1557	A-4	14.0	116.0	15.4	115.3	8	99	95	-1 / 3	Pass
201		6/8/16	03	ASTM D1557	A-4	14.0	116.0	14.5	114.8	8	99	95	-1 / 3	Pass
202		6/8/16	01	ASTM D698	A-6	10.1	121.7	12.9	118.7	8	98	95	-1 / 3	Pass
203		6/8/16	01	ASTM D698	A-6	10.1	121.7	11.8	120.6	8	99	95	-1 / 3	Pass
204		6/8/16	01	ASTM D698	A-6	10.1	121.7	12.4	119.3	8	98	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
198	Curb and Gutter: West side of Juniper Street, 40' north of 68th Place	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
199	Curb and Gutter: West side of Juniper Street, 130' north of 68th Place	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
200	Curb and Gutter: East side of Juniper Street, 40' north of 68th Place	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
201	Curb and Gutter: East side of Juniper Street, 150' north of 68th Place	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
202	Street Subgrade: East lane on Juniper Street, 10' north of 68th Place	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
203	Street Subgrade: East lane on Juniper Street, 180' north of 68th Place	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
204	Street Subgrade: West lane on Juniper Street, 130' north of 68th Place	0.0	TSG	Troxler 3430 22403	Duggan, Daniel

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 204: The Contractor utilized a roller to apply compactive effort to the subgrade. Moisture was applied to the street subgrade.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

A.G. WassenaarConsulting Engineers
Geotechnical, Environmental
and Related Services**Field Services**2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone (303) 759-8100**Fill Testing****Report #:** FT-000033**Report Date:** 6/30/2016**Test Method:** ASTM D 6938**Client:**Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305**Project:**144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO**Test Results**

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
205		6/14/16	02	ASTM D698	A-6	15.8	109.1	14.9	106.8	8	98	95	-1 / 3	Pass
206		6/14/16	02	ASTM D698	A-6	15.8	109.1	15.6	105.3	8	97	95	-1 / 3	Pass
207		6/14/16	03	ASTM D1557	A-4	14.0	116.0	15.2	114.8	8	99	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
205	Curb and Gutter: South side of 68th Place, 90' west of Joyce Street.	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
206	Curb and Gutter: East side of Juniper Street, 10' north of 68th Place.	0.0	TSG	Troxler 3430 22403	Duggan, Daniel
207	Crossspan: North side of Joyce Street at the intersection of Joyce Street and 68th Place	0.0	TSG	Troxler 3430 22403	Duggan, Daniel

Remarks	Comments	Related Tests		
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 206: The Contractor utilized a loader to apply compactive effort to the sidewalk subgrade. Moisture was applied to the subgrade.	Test #	Related Test #	Test Type

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone: (303) 759-8100

Fill Testing

Report #: FT-000034

Report Date: 8/15/2016

Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
208	175	6/30/16	03	ASTM D1557	A-4	14.0	116.0	13.9	113.9	8	98	95	-3 / 3	Pass
209		6/30/16	01	ASTM D698	A-6	10.1	121.7	9.9	119.5	8	98	95	-1 / 3	Pass
210		6/30/16	01	ASTM D698	A-6	10.1	121.7	9.2	118.9	8	98	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
208	Curb and Gutter: East side of Juniper Court, 10' north of West 68th Place	0.0	TSG	Troxler 3430 +	Frase, Jeremiah
209	Crossspan: Center of crossspan at 68th Place and Joyce Street	0.0	TSG	Troxler 3430 +	Frase, Jeremiah
210	Crossspan: Center of crossspan at 69th Avenue and Juniper Court	0.0	TSG	Troxler 3430 +	Frase, Jeremiah

Remarks**Comments**

Pass: Density Pass / Moisture Pass

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.
210: The Contractor, CCC, had prepared the subgrade prior to our arrival.

Field Services

2180 South Ivanhoe Street, Suite 5
Denver CO 80222
Phone: (303) 759-8100**Fill Testing**

Report #: FT-000035

Report Date: 8/15/2016

Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO**Test Results**

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
211		7/5/16	01	ASTM D698	A-6	10.1	121.7	9.5	118.6	8	97	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
211	Crossspan: Center of crossspan at 69th Avenue and Juniper Court	0.0	TSG	Troxler 3430 32100	Frase, Jeremiah

Remarks**Comments**

Pass: Density Pass / Moisture Pass

Tests are "Direct Transmission" (Method A) unless probe depth is noted as
"Backscatter". Gauge calibration data on file with the testing agency.

211: The Contractor had prepared the subgrade prior to our arrival.

Fill Testing

Report #: FT-000036

Report Date: 7/3/2017

Test Method: ASTM D 6938

Client:Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305**Project:**144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO**Test Results**

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
212		10/20/16	01	ASTM D698	A-6	10.1	121.7	11.3	119.3	8	98	95	-1 / 3	Pass
213		10/20/16	01	ASTM D698	A-6	10.1	121.7	10.9	118.4	8	97	95	-1 / 3	Pass
214		10/20/16	01	ASTM D698	A-6	10.1	121.7	11.0	116.7	8	96	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
212	Sidewalk: 70' east of Juniper Street, north side of West 68th Street	0.0	TSG	Troxler 3430 33202	Plack, Ron
213	Sidewalk: 80' north of West 68th Street, East side of Juniper Street	0.0	TSG	Troxler 3430 33202	Plack, Ron
214	Curb and Gutter: 20' north of West 68th Street, west side of Juniper Street	0.0	TSG	Troxler 3430 33202	Plack, Ron

Remarks	Comments
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 214: The Contractor prepared sidewalk and curb and gutter subgrade for density testing prior to our arrival.

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

Report #: FT-000037

Report Date: 7/3/2017

Test Method: ASTM D 6938

Client:Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305**Project:**144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO**Test Results**

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
215		10/28/16	03	ASTM D1557	A-4	14.0	116.0	9.3	114.5	8	99	95	-3 / 3	Fail
216		10/28/16	03	ASTM D1557	A-4	14.0	116.0	9.0	114.1	8	98	95	-3 / 3	Fail

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
215	Street Subgrade: 50' east of Juniper Street, eastbound lane of West 68th Place	0.0	TSG	Troxler 3430 33202	Plack, Ron
216	Street Subgrade: 150' east of Juniper Street, eastbound lane of West 68th Place	0.0	TSG	Troxler 3430 33202	Plack, Ron

Remarks	Comments
Fail: Density Pass / Moisture Fail	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 216: The Contractor prepared the street subgrade for density testing prior to our arrival.

Field Services

 2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone: (303) 759-8100

Fill Testing
Report #: FT-000038

Report Date: 7/3/2017

Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
217		10/31/16	03	ASTM D1557	A-4	14.0	116.0	9.4	113.9	8	98	95	-3 / 3	Fail
218		10/31/16	03	ASTM D1557	A-4	14.0	116.0	9.7	114.5	8	99	95	-3 / 3	Fail
219	217	10/31/16	03	ASTM D1557	A-4	14.0	116.0	11.3	111.7	8	96	95	-3 / 3	Pass
220	218	10/31/16	03	ASTM D1557	A-4	14.0	116.0	11.0	112.4	8	97	95	-3 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
217	Sidewalk: 180' east of Juniper Street, north side of West 68th Place	0.0	TSG	Troxler 3430 33202	Plack, Ron
218	Sidewalk: 40' east of Juniper Street, north side of West 68th Place	0.0	TSG	Troxler 3430 33202	Plack, Ron
219	Sidewalk: 180' east of Juniper Street, north side of West 68th Place	0.0	TSG	Troxler 3430 33202	Plack, Ron
220	Sidewalk: 40' east of Juniper Street, north side of West 68th Place	0.0	TSG	Troxler 3430 33202	Plack, Ron

Remarks	Comments
Fail: Density Pass / Moisture Fail	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.
Pass: Density Pass / Moisture Pass	220: The Contractor prepared the sidewalk subgrade for density testing prior to our arrival.

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

Report #: FT-000039
Report Date: 7/3/2017
Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results														
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
221		11/1/16	01	ASTM D698	A-6	10.1	121.7	11.4	117.3	8	96	95	-1 / 3	Pass
222	215	11/1/16	03	ASTM D1557	A-4	14.0	116.0	12.7	114.4	8	99	95	-3 / 3	Pass
223	216	11/1/16	03	ASTM D1557	A-4	14.0	116.0	13.1	113.3	8	98	95	-3 / 3	Pass
224		11/1/16	01	ASTM D698	A-6	10.1	121.7	9.6	119.3	8	98	95	-1 / 3	Pass
Test Information														
Test #	Test Location							Elevation	Reference	Gauge Make / Model / SN			Field Technician	
221	Crossspan: East side of the crossspan on Juniper Street, at West 69th Place							0.0	TSG	Troxler 3430 33202			Plack, Ron	
222	Street Subgrade: 50' east of Juniper Street, eastbound lane of West 68th Place							0.0	TSG	Troxler 3430 33202			Plack, Ron	
223	Street Subgrade: 150' east of Juniper Street, eastbound lane of West 68th Place							0.0	TSG	Troxler 3430 33202			Plack, Ron	
224	Street Subgrade: 80' north of West 68th Place, northbound lane of Juniper Street							0.0	TSG	Troxler 3430 33202			Plack, Ron	
Remarks					Comments									
Pass: Density Pass / Moisture Pass					Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter" Gauge calibration data on file with the testing agency. 224: The Contractor prepared the crossspan subgrade for density testing prior to our arrival. The Contractor had reworked the failing street subgrade and prepared more subgrade for density testing prior to our arrival.									

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Fill Testing

Report #: FT-000040
Report Date: 7/3/2017
Test Method: ASTM D 6938

Client:

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results														
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
225		11/3/16	01	ASTM D698	A-6	10.1	121.7	9.1	115.4	8	95	95	-1 / 3	Pass
Test Information														
Test #	Test Location						Elevation	Reference		Gauge Make / Model / SN		Field Technician		
225	Crossspan: South side, intersection of West 68th Place and Juniper Court						0.0	TSG		Troxler 3430 36855		Granato, Michael		
Remarks					Comments									
Pass: Density Pass / Moisture Pass					Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 225: The Contractor prepared the subgrade prior to our arrival.									

Fill Testing

 Report #: FT-000041
 Report Date: 7/3/2017
 Test Method: ASTM D 6938

Client:

 Cottonwood Park West, LLC
 1240 Lehigh Street
 Boulder, CO 80305

Project:

 144725UF
 Geos Neighborhood
 69th and Joyce Street
 Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
226		11/10/16	01	ASTM D698	A-6	10.1	121.7	10.9	119.0	8	98	95	-1 / 3	Pass
227		11/10/16	01	ASTM D698	A-6	10.1	121.7	10.9	118.9	8	98	95	-1 / 3	Pass
228		11/10/16	01	ASTM D698	A-6	10.1	121.7	10.2	117.6	8	97	95	-1 / 3	Pass
229		11/10/16	01	ASTM D698	A-6	10.1	121.7	10.5	118.2	8	97	95	-1 / 3	Pass
230		11/10/16	01	ASTM D698	A-6	10.1	121.7	11.2	117.8	8	97	95	-1 / 3	Pass
231		11/10/16	01	ASTM D698	A-6	10.1	121.7	11.0	116.1	8	95	95	-1 / 3	Pass
232		11/10/16	01	ASTM D698	A-6	10.1	121.7	9.9	117.8	8	97	95	-1 / 3	Pass
233		11/10/16	01	ASTM D698	A-6	10.1	121.7	10.0	119.3	8	98	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
226	Sidewalk: West 68th Place, westbound, 250' west of Joyce Street	0.0	TSG	Troxler 3430 36855	Granato, Michael
227	Sidewalk: West 68th Place, westbound, 200' east of Juniper Court	0.0	TSG	Troxler 3430 36855	Granato, Michael
228	Sidewalk: Juniper Court, northbound, 200' north of West 68th Place	0.0	TSG	Troxler 3430 36855	Granato, Michael
229	Sidewalk: Juniper Court, northbound, 450' north of West 68th Place	0.0	TSG	Troxler 3430 36855	Granato, Michael
230	Street Subgrade: Juniper Court, northbound, 125' north of West 68th Place	0.0	TSG	Troxler 3430 36855	Granato, Michael
231	Street Subgrade: Juniper Court, northbound, 375' north of West 68th Place	0.0	TSG	Troxler 3430 36855	Granato, Michael
232	Street Subgrade: Juniper Court, southbound, 250' north of West 68th Place	0.0	TSG	Troxler 3430 36855	Granato, Michael
233	Street Subgrade: Juniper Court, southbound, 500' north of West 68th Place	0.0	TSG	Troxler 3430 36855	Granato, Michael

Remarks	Comments
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
234		11/10/16	01	ASTM D698	A-6	10.1	121.7	12.1	116.8	8	96	95	-1 / 3	Pass
235		11/10/16	01	ASTM D698	A-6	10.1	121.7	11.8	117.2	8	96	95	-1 / 3	Pass
236		11/10/16	01	ASTM D698	A-6	10.1	121.7	9.9	117.3	8	96	95	-1 / 3	Pass
237		11/10/16	01	ASTM D698	A-6	10.1	121.7	11.1	118.5	8	97	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
234	Street Subgrade: West 68th Place, eastbound, 125' east of Juniper Court	0.0	TSG	Troxler 3430 36855	Granato, Michael
235	Street Subgrade: West 68th Place, eastbound, 375' east of Juniper Court	0.0	TSG	Troxler 3430 36855	Granato, Michael
236	Street Subgrade: West 68th Place, westbound, 250' east of Juniper Court	0.0	TSG	Troxler 3430 36855	Granato, Michael
237	Street Subgrade: West 68th Place, westbound, 500' east of Juniper Court	0.0	TSG	Troxler 3430 36855	Granato, Michael

Remarks	Comments
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 237: The Contractor prepared the subgrade prior to our arrival.

Fill Testing

Report #: FT-000042
Report Date: 7/3/2017
Test Method: ASTM D 6938

Client:
Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:
144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results														
Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
238		11/14/16	02	ASTM D698	A-6	15.8	109.1	15.3	106.1	8	97	95	-1 / 3	Pass
Test Information														
Test #	Test Location							Elevation	Reference	Gauge Make / Model / SN			Field Technician	
238	Sidewalk, Northbound, Juniper Court, 120' south of West 69th Place							0.0	TSG	Troxler 3430 21919			Knauff, Stephen	
Remarks					Comments									
Pass: Density Pass / Moisture Pass					Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency 238: The Contractor prepared the subgrade prior to our arrival.									

Field Services2180 South Ivanhoe Street, Suite 5
Denver CO 80222
Phone: (303) 759-8100**Fill Testing****Report #:** FT-000043**Report Date:** 7/3/2017**Test Method:** ASTM D 6938**Client:**Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305**Project:**144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO**Test Results**

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
239		11/16/16	03	ASTM D1557	A-4	14.0	116.0	12.8	113.5	8	98	95	-3 / 3	Pass
240		11/16/16	02	ASTM D698	A-6	15.8	109.1	15.8	103.4	8	95	95	-1 / 3	Pass
241		11/16/16	01	ASTM D698	A-6	10.1	121.7	10.5	119.4	8	98	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
239	Sidewalk: Eastbound Juniper Court, 5' east of East 69th Avenue	0.0	TSG	Troxler 3430 21919	Knauff, Stephen
240	Sidewalk: Northbound, East 69th Avenue, 15' east of Juniper Court	0.0	TSG	Troxler 3430 21919	Knauff, Stephen
241	Sidewalk: Eastbound, West 69th Place, 60' east of Juniper Court	0.0	TSG	Troxler 3430 21919	Knauff, Stephen

Remarks	Comments
Pass: Density Pass / Moisture Pass	Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency. 241: The Contractor prepared the subgrade prior to our arrival.

A representative of the Contractor was informed of our test results and observations. Observation services were conducted on an on-call basis. The test depths and locations are approximate and are based upon information provided by the Contractor. The lateral and vertical extents of any subexcavation were not measured or verified by this firm. The site conditions noted and test results reported apply only to the locations and depths tested at the time of our visit. It remains the Contractor's responsibility to apply the necessary compactive effort and moisture conditioning to meet the project specifications.

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone (303) 759-8100

Fill Testing**Report #:** FT-000044**Report Date:** 7/3/2017**Test Method:** ASTM D 6938**Client:**

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Test Results

Test #	Retest Of	Test Date	Proctor ID	Method	Soil Classification	Optimum Moisture (%)	Maximum Dry Density (pcf)	In Place Moisture (%)	In Place Dry Density (pcf)	Probe Depth (in)	Percent Compaction	Min Comp. (%)	Optimum Moisture Tolerance (%)	Remark
242		6/28/17	02	ASTM D698	A-6	15.8	109.1	16.0	104.2	8	96	95	-1 / 3	Pass

Test Information

Test #	Test Location	Elevation	Reference	Gauge Make / Model / SN	Field Technician
242	Water Main: Southbound Juniper Court, 225' south of West 96th Place	1.0	BSG	Troxler 3430 21919	Knauff, Stephen

Remarks**Comments**

Pass: Density Pass / Moisture Pass

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter". Gauge calibration data on file with the testing agency.

242: The Contractor prepared the subgrade around the water valve box (or range box?) prior to our arrival.

SECTION 2

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone: (303) 759-8100

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Sample Details											
Set #:	1	Technician:	Duggan, Daniel	Batched:	12:12 MDT						
Specimen Size:	4" X 8"	Cast By:	Duggan, Daniel	Sampled:	13:20 MDT						
Specimens In Set:	5	Date Cast:	06/08/16	Cast:	13:35 MDT						
Truck / Ticket #:	1608 / 46026739	Sampled From:	Chute	Truck Empty:							
Contractor:	Colorado Concrete Construction	Placement Method:	Chute	Placement Time:							
Location											
Placement Location:	Curb and Gutter										
Location Details:	North side of 68th Place, 25' east of Juniper Street										
Sample Location / Notes:	NTP										
Batch Log						Specifications					
Supplier:	Martin Marietta Materials		Mix Design:	A4461		Strength:	4500 (psi)				
On-Site Admixtures:	None					Air:	5.0 - 8.0 (%)				
						Slump:	1 - 4 (in)				
Field Measurements											
Weather:	Sunny		Slump (in):	2-1/2 (ASTM C143)		Plastic Unit Weight:	144.1 (lb/ft³) (ASTM C138)				
Air Temperature (F):	83		Concrete Temp (F):	82 (ASTM C1064)		Air Content:	5.9 (%) (ASTM C231)				
						Load Volume:	10 (yd³)				
Standard Cure						Field Cure					
Min / Max Temp (F):	52/84										
Initial Cure Method:	Cooler, closed lid										
Final Cure Method:	ASTM C511										
Lab Test Results											
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	
1-1	7	06/15/16	1 / 6	4.00	12.57	40,655	3,230	5		N	
1-2	28	07/06/16	1 / 27	4.00	12.57	61,160	4,870	4		N	
1-3	28	07/06/16	1 / 27	4.00	12.57	63,905	5,080	1		N	
1-4	28	07/06/16	1 / 27	4.00	12.57	60,945	4,850	4		N	
1-5	56	08/03/16	1 / 55								
Test Age Average Strengths (psi): 7 Day - 3230, 28 Day - 4930											
Break Remarks								Capping Methods			
								N: Unbonded Caps (ASTM C1231)			
General Remarks											
Delivered 10 of 80.1 cubic yards											



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

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone (303) 759-8100

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

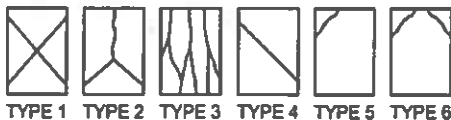
144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Sample Details										
Set #:	2	Technician:	Duggan, Daniel	Batched:	15 54 MDT					
Specimen Size:	4" X 8"	Cast By:	Duggan, Daniel	Sampled:	17 05 MDT					
Specimens in Set:	5	Date Cast:	06/08/16	Cast:	17 20 MDT					
Truck / Ticket #:	1627 / 45049055	Sampled From:	Chute	Truck Empty:						
Contractor:	Colorado Concrete Construction	Placement Method:	Chute	Placement Time:						
Location										
Placement Location:	Curb and Gutter									
Location Details:	East side of Juniper Street, 80' north of 68th Place									
Sample Location / Notes:	NTP									
Batch Log			Specifications							
Supplier:	Martin Marietta Materials	Mix Design:	A4461	Strength:	4500 (psi)					
On-Site Admixtures:	None			Air:	5.0 - 8.0 (%)					
				Slump:	1 - 4 (in)					
Field Measurements										
Weather:	Cloudy	Slump (in):	3 (ASTM C143)	Plastic Unit Weight:	143.7 (lb/ft³) (ASTM C138)					
Air Temperature (F):	81	Concrete Temp (F):	88 (ASTM C1064)	Air Content:	5.0 (%) (ASTM C231)					
				Load Volume:	10 (yd³)					
Standard Cure			Field Cure							
Min / Max Temp (F):	52/84									
Initial Cure Method:	Cooler, closed lid									
Final Cure Method:	ASTM C511									
Lab Test Results										
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
2-1	7	06/15/16	1 / 6	4.00	12.57	49,790	3,960	3		N
2-2	28	07/06/16	1 / 27	4.00	12.57	77,320	6,150	4		N
2-3	28	07/06/16	1 / 27	4.00	12.57	78,840	6,270	4		N
2-4	28	07/06/16	1 / 27	4.00	12.57	80,155	6,380	4		N
2-5	56	08/03/16	1 / 55							
Test Age Average Strengths (psi): 7 Day - 3960, 28 Day - 6270										
Break Remarks								Capping Methods		
								N: Unbonded Caps (ASTM C1231)		
General Remarks										
Delivered 55 of 55 cubic yards Fibermesh										



Compressive Strength of Concrete

Test Method: ASTM C 39

Report #: CC-000006

Report Date: 7/12/2016

Sample: 3695

Field Services

2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone (303) 759-8100

Client:

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Sample Details										
Set #:	3	Technician:	Duggan, Daniel	Batched:	07:31 MDT					
Specimen Size:	4" X 8"	Cast By:	Duggan, Daniel	Sampled:	08:15 MDT					
Specimens In Set:	5	Date Cast:	06/13/16	Cast:	08:30 MDT					
Truck / Ticket #:	8816 / 20053147	Sampled From:	Chute	Truck Empty:						
Contractor:	Colorado Concrete Construction	Placement Method:	Chute	Placement Time:						
Location										
Placement Location:	Curb and Gutter									
Location Details:	North side of 68th place, 10' east of Juniper Street									
Sample Location / Notes:	NTP									
Batch Log			Specifications							
Supplier:	Martin Marietta Materials	Mix Design:	A4464	Strength:	4500 (psi)					
On-Site Admixtures:	None			Air:	5.0 - 8.0 (%)					
				Slump:	1 - 4 (in)					
Field Measurements										
Weather:	Sunny	Slump (in):	4 (ASTM C143)	Plastic Unit Weight:	142.9 (lb/ft ³) (ASTM C138)					
Air Temperature (F):	69	Concrete Temp (F):	82 (ASTM C1064)	Air Content:	5.4 (%) (ASTM C231)					
				Load Volume:	10 (yd ³)					
Standard Cure			Field Cure							
Min / Max Temp (F):	49/78									
Initial Cure Method:	Cooler, closed lid									
Final Cure Method:	ASTM C511									
Lab Test Results										
Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in ²)	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
3-1	7	06/20/16	2 / 5	4.00	12.57	45,420	3,610	5		N
3-2	28	07/11/16	2 / 26	4.00	12.57	57,360	4,560	4		N
3-3	28	07/11/16	2 / 26	4.00	12.57	57,265	4,560	4		N
3-4	28	07/11/16	2 / 26	4.00	12.57	56,885	4,530	5		N
3-5	56	08/08/16	2 / 54							
Test Age Average Strengths (psi): 7 Day - 3610, 28 Day - 4550										
Break Remarks								Capping Methods		
								N: Unbonded Caps (ASTM C1231)		
General Remarks										
Delivered 10 of 20.1 cubic yards Fibermesh										



TYPE 1



TYPE 2



TYPE 3



TYPE 4



TYPE 5



TYPE 6

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone: (303) 759-8100

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725C

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Sample Details										
Set #:	1	Technician:	Frase, Jeremiah	Batched:	08:04 MDT					
Specimen Size:	4" X 8"	Cast By:	Frase, Jeremiah	Sampled:	09:00 MDT					
Specimens In Set:	5	Date Cast:	07/01/16	Cast:	09:15 MDT					
Truck / Ticket #:	1607 / 45050108	Sampled From:	Chute	Truck Empty:						
Contractor:	Colorado Concrete Construction	Placement Method:	Chute	Placement Time:						
Location										
Placement Location:	Crossspan									
Location Details:	South end of crossspan at 68th and Joyce									
Sample Location / Notes:	25' South of the crossspan									
Batch Log						Specifications				
Supplier:	Martin Marietta Materials	Mix Design:	A4464	Strength:	4500 (psi)					
On-Site Admixtures:	None			Air:	5.0 - 8.0 (%)					
Slump:				Slump:	1 - 4 (in)					
Field Measurements										
Weather:				Slump (in):	4 (ASTM C143)	Plastic Unit Weight:	138.8 (lb/ft³) (ASTM C138)			
Air Temperature (F):	70			Concrete Temp (F):	81 (ASTM C1064)	Air Content:	6.4 (%) (ASTM C231)			
						Load Volume:	10 (yd³)			
Standard Cure						Field Cure				
Min / Max Temp (F):	62/90									
Lab Test Results										
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
1-1	7	07/08/16	1 / 6	4.00	12.57	52,155	4,150	4		N
1-2	28	07/29/16	1 / 27	4.00	12.57	63,735	5,070	5		N
1-3	28	07/29/16	1 / 27	4.00	12.57	64,210	5,110	3		N
1-4	28	07/29/16	1 / 27	4.00	12.57	63,555	5,060	2		N
1-5	56	08/26/16	1 / 55							
Test Age Average Strengths (psi): 7 Day - 4150, 28 Day - 5080										
Break Remarks								Capping Methods		
								N: Unbonded Caps (ASTM C1231)		
General Remarks										
Delivered 10 of 30.10 cubic yards										



Field Services

 2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone: (303) 759-8100

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725C
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Sample Details			
Set #:	2	Technician:	Frase, Jeremiah
Specimen Size:	4" X 8"	Cast By:	Frase, Jeremiah
Specimens In Set:	5	Date Cast:	07/05/16
Truck / Ticket #:	8303 / 20054289	Sampled From:	Chute
Contractor:	Colorado Concrete	Placement Method:	Chute
Batched:	09 34 MDT	Sampled:	10 45 MDT
		Cast:	11:00 MDT
		Truck Empty:	
		Placement Time:	
Location			
Placement Location:	Crossspan		
Location Details:	South end of crossspan at 69th Avenue and Juniper Street		
Sample Location / Notes:	NTP		
Batch Log		Specifications	
Supplier:	Martin Marietta Materials	Mix Design:	CD4465
On-Site Admixtures:	None	Strength:	4500 (psi)
		Air:	5.0 - 8.0 (%)
		Slump:	1 - 4 (in)
Field Measurements			
Weather:	Slump (in):	4 (ASTM C143)	Plastic Unit Weight:
Air Temperature (F): 85	Concrete Temp (F):	88 (ASTM C1064)	142.0 (lb/ft³) (ASTM C138)
		Air Content:	6.2 (%) (ASTM C231)
		Load Volume:	10 (yd³)
Standard Cure		Field Cure	

Lab Test Results										
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
2-1	7	07/12/16	2 / 5	4.00	12.57	56,800	4,520	4		N
2-2	28	08/02/16	2 / 26	4.00	12.57	64,270	5,110	2		N
2-3	28	08/02/16	2 / 26	4.00	12.57	66,265	5,270	2		N
2-4	28	08/02/16	2 / 26	4.00	12.57	63,365	5,040	2		N
2-5	56	08/30/16	2 / 54							
Test Age Average Strengths (psi): 7 Day - 4520, 28 Day - 5140										
Break Remarks								Capping Methods		
								N: Unbonded Caps (ASTM C1231)		
General Remarks										
Delivered 10 of 20.1 cubic yards Fibermesh										



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

Field Services

 2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone (303) 759-8100

Client:

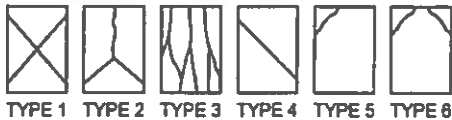
 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Sample Details			
Set #:	4	Technician:	Frase, Jeremiah
Specimen Size:	4" X 8"	Cast By:	Frase, Jeremiah
Specimens In Set:	5	Date Cast:	07/14/16
Truck / Ticket #:	801 / 2570122	Sampled From:	Chute
Contractor:	Concrete Structure	Placement Method:	Chute
Batched:	08.24 MDT	Sampled:	09:30 MDT
		Cast:	09:45 MDT
		Truck Empty:	
		Placement Time:	
Location			
Placement Location:	Inlet Wall		
Location Details:	Inlet structure at north end of Pond E		
Sample Location / Notes:	NTP		
Batch Log		Specifications	
Supplier:	Bestway Concrete	Mix Design:	4531494
On-Site Admixtures:	None	Strength:	4500 (psi)
		Air:	5.0 - 8.0 (%)
		Slump:	1 - 4 (in)
Field Measurements			
Weather:	Slump (in):	4 (ASTM C143)	Plastic Unit Weight:
Air Temperature (F): 80	Concrete Temp (F):	78 (ASTM C1064)	137.6 (lb/ft³) (ASTM C138)
			Air Content:
			7.0 (ASTM C231)
			Load Volume:
			4 (yd³)
Standard Cure		Field Cure	
Min / Max Temp (F):	74/101		

Lab Test Results										
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
4-1	7	07/21/16	1 / 6	4.00	12.57	36,140	2,880	2		N
4-2	28	08/11/16	1 / 27	4.00	12.57	50,725	4,040	2		N
4-3	28	08/11/16	1 / 27	4.00	12.57	49,490	3,940	2		N
4-4	28	08/11/16	1 / 27	4.00	12.57	48,950	3,890	2		N
4-5	56	09/08/16	1 / 55	4.00	12.57	57,080	4,540	2		N
Test Age Average Strengths (psi): 7 Day - 2880, 28 Day - 3960, 56 Day - 4540										
Break Remarks								Capping Methods		
								N: Unbonded Caps (ASTM C1231)		
General Remarks										
Delivered 4 of 4 cubic yards										
4-2: Ground, 4-3: Ground, 4-4: Ground										



Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone: (303) 759-8100

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Sample Details			
Set #:	5	Technician:	Sabin, Cole
Specimen Size:	4" X 8"	Cast By:	Sabin, Cole
Specimens In Set:	5	Date Cast:	10/20/16
Truck / Ticket #:	0610 / 20060298	Sampled From:	Chute
Contractor:	E-Z Excavating, Inc.	Placement Method:	Chute
Batched:	12:03 MDT	Sampled:	12:45 MDT
Cast:	13:00 MDT	Truck Empty:	
Placement Time:			
Location			
Placement Location:	Curb and Gutter		
Location Details:	Southwest corner of West 69th Place and Juniper Court		
Sample Location / Notes:	NTP		
Batch Log		Specifications	
Supplier:	Martin Marietta Materials	Mix Design:	CD4525
On-Site Admixtures:	None		Strength:
			4000 (psi)
			Air:
			5.0 - 7.0 (%)
			Slump:
			1 - 4 (in)
Field Measurements			
Weather:	Slump (in):	3-1/4 (ASTM C143)	Plastic Unit Weight:
Air Temperature (F): 64	Concrete Temp (F):	77 (ASTM C1064)	142.9 (lb/ft³) (ASTM C138)
			Air Content:
			6.2 (ASTM C231)
			Load Volume:
			6 (yd³)
Standard Cure		Field Cure	
Min / Max Temp (F):	36/69		
Initial Cure Method:	Bucket with water, open lid		
Final Cure Method:	ASTM C511		

Lab Test Results										
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
5-1	7	10/27/16	1 / 6	4.00	12.57	68,205	5,430	2		N
5-2	28	11/17/16	1 / 27	4.00	12.57	71,350	5,680	2		N
5-3	28	11/17/16	1 / 27	4.00	12.57	72,745	5,790	2		N
5-4	28	11/17/16	1 / 27	4.00	12.57	71,935	5,720	2		N
5-5	56	12/15/16	1 / 55							
Test Age Average Strengths (psi): 7 Day - 5430, 28 Day - 5730										
Break Remarks								Capping Methods		
								N: Unbonded Caps (ASTM C1231)		
General Remarks										
Delivered 6 of 12 cubic yards										



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

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone: (303) 759-8100

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Sample Details										
Set #:	6	Technician:	Plack, Ron	Batched:	07:09 MDT					
Specimen Size:	4" X 8"	Cast By:	Plack, Ron	Sampled:	08:25 MDT					
Specimens In Set:	5	Date Cast:	10/31/16	Cast:	08:40 MDT					
Truck / Ticket #:	228 / 35044336	Sampled From:	Chute	Truck Empty:						
Contractor:	E-Z Excavating, Inc.	Placement Method:	Chute	Placement Time:						
Location										
Placement Location:	Sidewalk									
Location Details:	150' east of Juniper Street, north side of West 68th Place									
Sample Location / Notes:	NTP									
Batch Log			Specifications							
Supplier:	Martin Marietta Materials	Mix Design:	CD4525	Strength:	4000 (psi)					
On-Site Admixtures:	None			Air:	5.0 - 7.0 (%)					
				Slump:	1 - 4 (in)					
Field Measurements										
Weather:	Clear	Slump (in):	3-1/2 (ASTM C143)	Plastic Unit Weight:	143.2 (lb/ft³) (ASTM C138)					
Air Temperature (F):	50	Concrete Temp (F):	70 (ASTM C1064)	Air Content:	5.5 (ASTM C231)					
				Load Volume:	10 (yd³)					
Standard Cure			Field Cure							
Min / Max Temp (F):	45/82									
Lab Test Results										
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	11/07/16	1 / 6	4.00	12.57	64,850	5,160	2		N
6-2	28	11/28/16	1 / 27	4.00	12.57	75,540	6,010	2		N
6-3	28	11/28/16	1 / 27	4.00	12.57	79,825	6,350	3		N
6-4	28	11/28/16	1 / 27	4.00	12.57	78,170	6,220	2		N
6-5	56	12/26/16	1 / 55							
Test Age Average Strengths (psi): 7 Day - 5160, 28 Day - 6190										
Break Remarks								Capping Methods		
								N: Unbonded Caps (ASTM C1231)		
General Remarks										
Delivered 10 of 40 cubic yards										



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

Compressive Strength of Concrete

Test Method: ASTM C 39

Report #: CC-000012

Report Date: 6/28/2017

Sample: 7309

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone (303) 759-8100

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Sample Details					
Set #:	7	Technician:	Granato, Michael	Batched:	09:08 MDT
Specimen Size:	4" X 8"	Cast By:	Granato, Michael	Sampled:	10:10 MDT
Specimens In Set:	5	Date Cast:	11/04/16	Cast:	10:25 MDT
Truck / Ticket #:	0552 / 45055991	Sampled From:	Chute	Truck Empty:	
Contractor:	E-Z Excavating, Inc.	Placement Method:	Chute	Placement Time:	
Location					
Placement Location:	Curb and Gutter				
Location Details:	West 69th Place, eastbound, 40' west of Juniper Court				
Sample Location / Notes:	NTP				
Batch Log			Specifications		
Supplier:	Martin Marietta Materials	Mix Design:	CD4525	Strength:	4000 (psi)
On-Site Admixtures:	None			Air:	5.0 - 7.0 (%)
				Slump:	1 - 4 (in)
Field Measurements					
Weather:		Slump (in):	2-1/2 (ASTM C143)	Plastic Unit Weight:	143.9 (lb/ft³) (ASTM C138)
Air Temperature (F):	57	Concrete Temp (F):	70 (ASTM C1064)	Air Content:	5.1 (ASTM C231)
				Load Volume:	10 (yd³)
Standard Cure			Field Cure		
Initial Cure Method:	Cooler, closed lid				
Final Cure Method:	ASTM C511				

Lab Test Results										
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
7-1	7	11/11/16	1 / 6	4.00	12.57	55,400	4,410	2		N
7-2	28	12/02/16	1 / 27	4.00	12.57	76,875	6,120	2		N
7-3	28	12/02/16	1 / 27	4.00	12.57	73,660	5,860	2		N
7-4	28	12/02/16	1 / 27	4.00	12.57	79,505	6,330	2		N
7-5	56	12/30/16	1 / 55							
Test Age Average Strengths (psi): 7 Day - 4410, 28 Day - 6100										
Break Remarks								Capping Methods		
								N: Unbonded Caps (ASTM C1231)		
General Remarks										
Delivered 10 of 20.1 cubic yards										



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

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone: (303) 759-8100

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725UF

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Sample Details			
Set #:	8	Technician:	Knauff, Stephen
Specimen Size:	4" X 8"	Cast By:	Knauff, Stephen
Specimens In Set:	5	Date Cast:	11/14/16
Truck / Ticket #:	0229 / 35044773	Sampled From:	Chute
Contractor:	Colorado Concrete, Inc.	Placement Method:	Chute
Batched:	08:18 MST	Sampled:	09:15 MST
Cast:	09:30 MST	Truck Empty:	
Placement Time:			
Location			
Placement Location:	Sidewalk		
Location Details:	Northbound, Juniper Court, 140' south of West 69th Place		
Sample Location / Notes:	NTP		
Batch Log		Specifications	
Supplier:	Martin Marietta Materials	Mix Design:	A4464
On-Site Admixtures:	None		
Strength:	4000 (psi)		
Air:	5.0 - 8.0 (%)		
Slump:	1 - 4 (in)		
Field Measurements			
Weather:	Clear	Slump (in):	4 (ASTM C143)
Air Temperature (F):	63	Concrete Temp (F):	71 (ASTM C1064)
Plastic Unit Weight:	135.7 (lb/ft³) (ASTM C138)		
Air Content:	7.8 (ASTM C231)		
Load Volume:	10 (yd³)		
Standard Cure		Field Cure	
Min / Max Temp (F):	52/90		

Lab Test Results										
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	11/21/16	1 / 6	4.00	12.57	39,405	3,140	2		N
8-2	28	12/12/16	1 / 27	4.00	12.57	52,510	4,180	2		N
8-3	28	12/12/16	1 / 27	4.00	12.57	54,560	4,340	2		N
8-4	28	12/12/16	1 / 27	4.00	12.57	54,020	4,300	2		N
8-5	56	01/09/17	1 / 55							
Test Age Average Strengths (psi): 7 Day - 3140, 28 Day - 4270										
Break Remarks								Capping Methods		
								N: Unbonded Caps (ASTM C1231)		
General Remarks										
Delivered 10 of 20.1 cubic yards										



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

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone: (303) 759-8100

Client:

Cottonwood Park West, LLC

1240 Lehigh Street

Boulder, CO 80305

Project:

144725C

Geos Neighborhood

69th and Joyce Street

Arvada, CO

Sample Details										
Set #:	3	Technician:	Abbott, Shane	Batched:	06 55 MST					
Specimen Size:	4" X 8"	Cast By:	Abbott, Shane	Sampled:	08 15 MST					
Specimens In Set:	5	Date Cast:	11/11/16	Cast:	08 30 MST					
Truck / Ticket #:	1515 / 46031589	Sampled From:	Chute	Truck Empty:						
Contractor:	E-Z Excavating, Inc.	Placement Method:	Chute	Placement Time:						
Location										
Placement Location:	Sidewalk									
Location Details:	West 69th Avenue, 25' west of Joyce Street, westbound lane									
Sample Location / Notes:	NTP									
Batch Log			Specifications							
Supplier:	Martin Marietta Materials	Mix Design:	A4464	Strength:	4500 (psi)					
On-Site Admixtures:	None			Air:	5.0 - 8.0 (%)					
				Slump:	1 - 4 (in)					
Field Measurements										
Weather:		Slump (in):	4 (ASTM C143)	Plastic Unit Weight:	140.9 (lb/ft ³) (ASTM C138)					
Air Temperature (F):	42	Concrete Temp (F):	72 (ASTM C1064)	Air Content:	8.0 (ASTM C231)					
				Load Volume:	10 (yd ³)					
Standard Cure			Field Cure							
Min / Max Temp (F):	42/67									
Lab Test Results										
Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in ²)	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
3-1	7	11/18/16	1 / 6	4.00	12.57	54,475	4,330	2		N
3-2	28	12/09/16	1 / 27	4.00	12.57	62,785	5,000	2		N
3-3	28	12/09/16	1 / 27	4.00	12.57	68,960	5,490	3		N
3-4	28	12/09/16	1 / 27	4.00	12.57	63,470	5,050	3		N
3-5	56	01/06/17	1 / 55							
Test Age Average Strengths (psi): 7 Day - 4330, 28 Day - 5180										
Break Remarks								Capping Methods		
								N: Unbonded Caps (ASTM C1231)		
General Remarks										
Delivered 10 of 60.1 cubic yards										



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

Compressive Strength of Concrete

Test Method: ASTM C 39

Report #: CC-000014

Report Date: 6/28/2017

Sample: 3636

Field Services

2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone: (303) 759-8100

Client:

Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

144725UF
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Sample Details										
Set #:	1	Technician:	Duggan, Daniel	Batched:	12.12 MDT					
Specimen Size:	4" X 8"	Cast By:	Duggan, Daniel	Sampled:	13.20 MDT					
Specimens In Set:	5	Date Cast:	06/08/16	Cast:	13.35 MDT					
Truck / Ticket #:	1608 / 46026739	Sampled From:	Chute	Truck Empty:						
Contractor:	Colorado Concrete Construction	Placement Method:	Chute	Placement Time:						
Location										
Placement Location:	Curb and Gutter									
Location Details:	North side of 68th Place, 25' east of Juniper Street									
Sample Location / Notes:	NTP									
Batch Log			Specifications							
Supplier:	Martin Marietta Materials	Mix Design:	A4461	Strength:	4500 (psi)					
On-Site Admixtures:	None			Air:	5.0 - 8.0 (%)					
				Slump:	1 - 4 (in)					
Field Measurements										
Weather:	Sunny	Slump (in):	2-1/2 (ASTM C143)	Plastic Unit Weight:	144.1 (lb/ft ³) (ASTM C138)					
Air Temperature (F):	83	Concrete Temp (F):	82 (ASTM C1064)	Air Content:	5.9 (ASTM C231)					
				Load Volume:	10 (yd ³)					
Standard Cure			Field Cure							
Min / Max Temp (F):	52/84									
Initial Cure Method:	Cooler, closed lid									
Final Cure Method:	ASTM C511									
Lab Test Results										
Specimen Number	Test Age Days	Test Date	Field / Lab Cure Days	Average Cylinder Diameter (in)	Cylinder Area (in ²)	Max Load (lbs)	Strength (psi)	Fracture Type	Break Remark	Capping Method
1-1	7	06/15/16	1 / 6	4.00	12.57	40,655	3,230	5		N
1-2	28	07/06/16	1 / 27	4.00	12.57	61,160	4,870	4		N
1-3	28	07/06/16	1 / 27	4.00	12.57	63,905	5,080	1		N
1-4	28	07/06/16	1 / 27	4.00	12.57	60,945	4,850	4		N
1-5	56	08/03/16	1 / 55							
Test Age Average Strengths (psi): 7 Day - 3230, 28 Day - 4930										
Break Remarks								Capping Methods		
								N: Unbonded Caps (ASTM C1231)		
General Remarks										
Delivered 10 of 80.1 cubic yards										



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

Compressive Strength of Concrete

Test Method: ASTM C 39

Report #: CC-000002

Report Date: 2/10/2017

Sample: 8276

Field Services

2180 South Ivanhoe Street, Suite 5

Denver, CO 80222

Phone (303) 759-8100

Client:

E-Z Excavating, Inc.

PO Box 1439

Longmont, CO 80502-1439

Project:

170023

Geo's Subdivision

E-Z Excavating

Arvada, CO

Sample Details										
Set #:	1	Technician:	Norelius, Jarod	Batched:	11:04 MST					
Specimen Size:	4" X 8"	Cast By:	Norelius, Jarod	Sampled:	11:55 MST					
Specimens In Set:	5	Date Cast:	01/13/17	Cast:	12:10 MST					
Truck / Ticket #:	1511 / 45058206	Sampled From:	Chute	Truck Empty:						
Contractor:	Colorado Concrete Construction	Placement Method:	Chute	Placement Time:						
Location										
Placement Location:	Sidewalk									
Location Details:	West 69th Place, south sidewalk, 50' east of Juniper Court									
Sample Location / Notes:	NTP									
Batch Log			Specifications							
Supplier:	Martin Marietta Materials	Mix Design:	A4464	Strength:	4500 (psi)					
On-Site Admixtures:	None			Air:	5.0 - 8.0 (%)					
				Slump:	1 - 4 (in)					
Field Measurements										
Weather:	Sunny	Slump (in):	4 (ASTM C143)	Plastic Unit Weight:	138.7 (lb/ft³) (ASTM C138)					
Air Temperature (F):	35	Concrete Temp (F):	68 (ASTM C1064)	Air Content:	7.2 (ASTM C231)					
				Load Volume:	6.5 (yd³)					
Standard Cure			Field Cure							
Min / Max Temp (F):	38/53									
Initial Cure Method:	Cooler, closed lid									
Final Cure Method:	ASTM C511									
Lab Test Results										
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
1-1	7	01/20/17	1 / 6	4.00	12.57	47,190	3,750	2		N
1-2	28	02/10/17	1 / 27	4.00	12.57	57,300	4,560	2		N
1-3	28	02/10/17	1 / 27	4.00	12.57	60,070	4,780	3		N
1-4	28	02/10/17	1 / 27	4.00	12.57	60,675	4,830	2		N
1-5	56	03/10/17	1 / 55							
Test Age Average Strengths (psi): 7 Day - 3750, 28 Day - 4720										
Break Remarks								Capping Methods		
								N: Unbonded Caps (ASTM C1231)		
General Remarks										
Delivered 6.25 of 6.25 cubic yards										



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

SECTION 3

Field Services

 2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone: (303) 759-8100

Asphalt Testing

 Report #: AT-000001
Report Date: 7/5/2017
Test Method: D2950

Client:

 Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305

Project:

 144725A
Geos Neighborhood
69th and Joyce Street
Arvada, CO

Test Results															
Test #	Retest Of	Test Date	Test Location	Material	Mix Design	Thickness (in)	Max Wet Density (pcf)	Max Density Source	In Place Density (pcf)	Probe Depth (in)	Percent Comp.	Min/Max Comp. (%)	Remark	Gauge SN	Technician
1		11/11/16	Asphalt: Bottom Lift: West 68th Place, eastbound, 500' east of Juniper Court	S	40013-16		156.5	1 / RICE ASTM D2041	145.0	Backscatter	93	92 / 96		36855	Granato, Michael
2		11/11/16	Asphalt: Bottom Lift: West 68th Place, westbound, 125' east of Juniper Court	S	40013-16		156.5	1 / RICE ASTM D2041	144.5	Backscatter	92	92 / 96		36855	Granato, Michael
3		11/11/16	Asphalt: Bottom Lift: West 68th Place, westbound, 375' east of Juniper Court	S	40013-16		156.5	1 / RICE ASTM D2041	146.1	Backscatter	93	92 / 96		36855	Granato, Michael
4		11/11/16	Asphalt: Bottom Lift: Juniper Court, southbound, 375' north of West 68th Place	S	40013-16		156.5	1 / RICE ASTM D2041	146.0	Backscatter	93	92 / 96		36855	Granato, Michael
5		11/11/16	Asphalt: Bottom Lift: Juniper Court, southbound, 125' north of West 68th Place	S	40013-16		156.5	1 / RICE ASTM D2041	143.2	Backscatter	92	92 / 96		36855	Granato, Michael
6		11/11/16	Asphalt: Bottom Lift: Juniper Court, northbound, 250' north of West 68th Place	S	40013-16		156.5	1 / RICE ASTM D2041	144.6	Backscatter	92	92 / 96		36855	Granato, Michael
Remarks								Comments							
								Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter"							
Gauge Information															
Gauge SN	Make	Model	Density Count		Moisture Count		Standard Count Date		Last Calibration Date		Calibrated By				
36855	Troxler	3430	2245		760		11/11/16		7/21/16						

The density test/compaction results shown are an indicator of the degree of compactive effort applied during paving operations. The Contractor has been informed that these results have not been correlated and hence not considered final compaction results. The Contractor has sole responsibility for proper compaction regardless of any field results provided. The industry and engineering standard for obtaining density of compacted asphalt is the drilled core. We recommend the pavement be cored for actual density and thickness determination.

Asphalt TestingReport #: AT-000002
Report Date: 7/5/2017
Test Method: D2950**Client:**Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305**Project:**144725A
Geos Neighborhood
69th and Joyce Street
Arvada, CO**Test Results**

Test #	Retest Of	Test Date	Test Location	Material	Mix Design	Thickness (in)	Max Wet Density (pcf)	Max Density Source	In Place Density (pcf)	Probe Depth (in)	Percent Comp.	Min/Max Comp. (%)	Remark	Gauge SN	Technician
7		11/12/16	Asphalt: Bottom Lift: Juniper Court, northbound, 500' north of West 68th Place	S	40013-16		159.0	2 / RICE ASTM D2041	145.2	Backscatter	91	92 / 96		36855	Granato, Michael
8		11/12/16	Asphalt: Bottom Lift: West 68th Place, eastbound, 250' east of Juniper Court	S	40013-16		159.0	2 / RICE ASTM D2041	143.9	Backscatter	91	92 / 96		36855	Granato, Michael

Remarks**Comments**

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter"

Gauge Information

Gauge SN	Make	Model	Density Count	Moisture Count	Standard Count Date	Last Calibration Date	Calibrated By
36855	Troxler	3430	2250	763	11/12/16	7/21/16	

The density test/compaction results shown are an indicator of the degree of compactive effort applied during paving operations. The Contractor has been informed that these results have not been correlated and hence not considered final compaction results. The Contractor has sole responsibility for proper compaction regardless of any field results provided. The industry and engineering standard for obtaining density of compacted asphalt is the drilled core. We recommend the pavement be cored for actual density and thickness determination.

A.G. WassenaarConsulting Engineers
Geotechnical, Environmental
and Related Services**Field Services**2180 South Ivanhoe Street, Suite 5
Denver, CO 80222
Phone (303) 759-8100**Asphalt Testing**

Report #: AT-000003

Report Date: 7/5/2017

Test Method: D2950

Client:Cottonwood Park West, LLC
1240 Lehigh Street
Boulder, CO 80305**Project:**144725A
Geos Neighborhood
69th and Joyce Street
Arvada, CO**Test Results**

Test #	Retest Of	Test Date	Test Location	Material	Mix Design	Thickness (in)	Max Wet Density (pcf)	Max Density Source	In Place Density (pcf)	Probe Depth (in)	Percent Comp.	Min/Max Comp. (%)	Remark	Gauge SN	Technician
9		11/14/16	Asphalt: Top Lift: Northbound Janice Court, 450' South of West 69th Place	SX	40053-16		155.2	3 / RICE ASTM D2041	151.1	Backscatter	97	92 / 96		21919	Knauff, Stephen
10		11/14/16	Asphalt: Top Lift: Eastbound Juniper Court, 100' West of West 69th Avenue	SX	40053-16		155.2	3 / RICE ASTM D2041	156.7	Backscatter	101	92 / 96		21919	Knauff, Stephen

Remarks**Comments**

Tests are "Direct Transmission" (Method A) unless probe depth is noted as "Backscatter"

Gauge Information

Gauge SN	Make	Model	Density Count	Moisture Count	Standard Count Date	Last Calibration Date	Calibrated By
21919	Troxler	3430	2178	715	11/14/16	5/3/17	

The density test/compaction results shown are an indicator of the degree of compactive effort applied during paving operations. The Contractor has been informed that these results have not been correlated and hence not considered final compaction results. The Contractor has sole responsibility for proper compaction regardless of any field results provided. The industry and engineering standard for obtaining density of compacted asphalt is the drilled core. We recommend the pavement be cored for actual density and thickness determination.

CLIENT: Cottonwood Park West, LLC
 PROJECT NAME: Geos Neighborhood
 LOCATION: Arvada, Colorado

DATE: December 22, 2016
 PROJECT NUMBER: 144725

ASPHALT MIX DESIGN SUMMARY

Supplier	Brannan Sand and Gravel	Brannan Sand and Gravel				
Paving Contractor	Brannan Sand and Gravel	Brannan Sand and Gravel				
Mix I.D.	40013-16	40053-16				
Mix Type	S	SX				
Asphalt Content (%)	4.90	5.3				
Theo Max Spg	2.503	2.491				
Theo Max Density / Marshall Unit Wt. (pcf)	155.8	155.1				

Sieve Analysis						
1 1/2"	100	100				
1"	100	100				
3/4"	97	100				
1/2"	81	97				
3/8"	75	89				
#4	64	68				
#8	49	55				
#16	38	41				
#30	27	29				
#50	15	18				
#100	10	11				
#200	6.4	7.0				

Air Voids (%)						
N (initial)						
N (design)	3.8	3.8				

Marshall Properties						
Stability (lbs.)						
Flow (0.01 in.)						
Specified Compaction	92 to 96	92 to 96				

CLIENT: Cottonwood Park West, LLC
 PROJECT NAME: Geos Neighborhood
 LOCATION: Arvada, Colorado

DATE: December 22, 2016
 PROJECT NUMBER: 144725

ASPHALT LABORATORY TESTING SUMMARY

Sample No.	1	2	3		
Date	11/11/16	11/12/16	11/14/16		
Location	West 68th Place, eastbound, 500' east of Juniper Court	Juniper Court, northbound, 250' north of West 68th Place	Juniper Court, northbound, 450' south of West 69th Place		
Lift	Bottom	Bottom	Top		
Mix I.D.	40013-16	40013-16	40053-16		
Mix Type	S	S	SX		
Asphalt Content (%)	4.96	4.69	5.41		
Theo Max Spg	2.514	2.555	2.493		
Theo Max Density / Marshall Unit Wt. (pcf)	156.5	159.0	155.2		

Sieve Analysis					
1 1/2"	100	100	100		
1"	100	100	100		
3/4"	97	90 *	100		
1/2"	81	72 *	97		
3/8"	76	66 *	89		
#4	67	55 *	68		
#8	54	44	54		
#16	42	35	41		
#30	32 *	26	30		
#50	21	18	19		
#100	12	11	12		
#200	7.9	7.0	7.3		
Voids N (design)	4.32	5.08	4.5		
Lottman (CP-L5109)					
Voids Con/Unc	0.0	0.0	0.0		
Strength Con/Unc	0.0	0.0	0.0		
TSR (%)	0	0	0		

* Indicates out of tolerance

Niether an asphalt content nor an aggregate gradation correction factor has been applied.