Applied Geotechnical Engineering Consultants, Inc.

January 17, 2011

Western Telecom
4800 South 392 West
Murray, UT 84123

Attention: John Wall
E-mail: jwall@wt-inc.com

Subject: SAL - Oaks
750 Ogden Canyon Road
Ogden, UT
AGEC Project No. 1100891

Gentlemen:

Applied Geotechnical Engineering Consultants, Inc., (AGEC) was requested to provide construction materials testing and special inspection services for the SAL - Oaks project located at 750 Ogden Canyon Road in Ogden, UT. This letter summarizes our observations, inspections and testing of the soils and concrete for the project.

In-place density testing of structural fill was performed from November 12, 2010 to November 23, 2010. Results on November 12, 2010 reported as less than 95%. We understand 90% or greater was acceptable. A revised report is attached.

An inspection for the building slab was performed on November 29, 2010.The work observed, on the date noted, was in conformance with the approved plans and specifications.

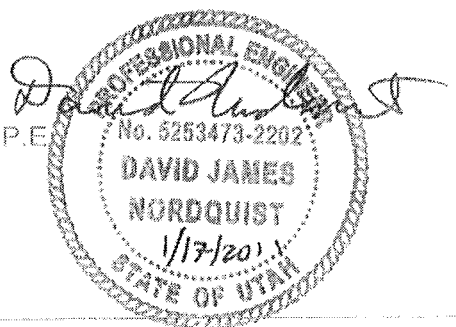
We observed the placement of approximately 42 cubic yards of concrete from November 13, 2010 to November 29, 2010. 4 sets of concrete test cylinders were cast. The concrete tested met the required design strength.

Sincerely,
APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

Phillip G. Sorensen
Project Manager

Reviewed by David J. Nordquist, P.E.
Project Engineer

PGS/pgs



LETTER OF TRANSMITTAL

AGEC
Applied GeoTech

DATE: January 4, 2011

TO: Western Telecom
Attn: Randy Riches
392 West 4800 South
Murray, UT 84123
rriches@wt-inc.com

CC:
- Western Telecom, Attn: John Wall
  Jwall@wt-inc.com
- Crown Castle, Attn: Nancy Smith
  Nancy.smith@crowncastle.com
- Western Telecom, Attn: Troy Hall
  Thall@wt-inc.com
- Telespan, Attn: Larry Hinojosa
  Lhinojosa@tspanllc.com

PROJECT: Cell Tower at The Oaks

LOCATION: 750 Ogden Canyon Road
Ogden, UT

PROJECT NO: 1100891

Your Action Please:	As Checked below:	Via:
■ For your use	☐ As Requested	☐ Regular Mail
☐ For your approval & signature	■ Report	☐ UPS/Express Mail
☐ Please return one copy	☐ Proposal/Agreement	☐ Hand Delivered
☐ Please return	☐ Change Order	☐ Fax
☐ For your review & comment	☐ Task Order	■ Email (5)
☐ Other	☐ Letter	☐ Pick Up
	■ Laboratory Test Results	Client:
	■ Field Testing (Inspection Report)	Other:
	☐ Other	

Quantity	Description of Items Sent
1	Construction Services Reports

Notes/Remarks:

From: Kim Sorensen Construction Services Report Coordinator

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • (801) 566-6493

AGEC
Applied GeoTech

LETTER OF TRANSMITTAL

DATE: December 15, 2010

TO: Western Telecom
Attn: Randy Riches
392 West 4800 South
Murray, UT 84123
rriches@wt-inc.com

CC:
- Western Telecom, Attn: John Wall
  Jwall@wt-inc.com
- Crown Castle, Attn: Nancy Smith
  Nancy.smith@crowncastle.com
- Western Telecom, Attn: Troy Hall
  Thall@wt-inc.com
- Telespan, Attn: Larry Hinojosa
  Lhinojosa@tspanllc.com

PROJECT: Cell Tower at The Oaks

LOCATION: 750 Ogden Canyon Road
Ogden, UT

PROJECT NO: 1100891

Your Action Please:	As Checked below:	Via:
■ For your use	☐ As Requested	☐ Regular Mail
☐ For your approval & signature	■ Report	☐ UPS/Express Mail
☐ Please return one copy	☐ Proposal/Agreement	☐ Hand Delivered
☐ Please return	☐ Change Order	☐ Fax
☐ For your review & comment	☐ Task Order	■ Email (5)
☐ Other	☐ Letter	☐ Pick Up
	■ Laboratory Test Results	Client:
	■ Field Testing (Inspection Report)	Other:
	☐ Other	

Quantity	Description of Items Sent
1	Construction Services Reports

Notes/Remarks:

From: Kim Sorensen Construction Services Report Coordinator

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • (801) 566-6493

AGEC
Applied GeoTech

LETTER OF TRANSMITTAL

DATE: December 6, 2010

TO: Western Telecom
Attn: Randy Riches
392 West 4800 South
Murray, UT 84123
rriches@wt-inc.com

CC:
- Western Telecom, Attn: John Wall
  Jwall@wt-inc.com
- Crown Castle, Attn: Nancy Smith
  Nancy.smith@crowncastle.com
- Western Telecom, Attn: Troy Hall
  Thall@wt-inc.com
- Telespan, Attn: Larry Hinojosa
  Lhinojosa@tspanllc.com

PROJECT: Cell Tower at The Oaks

LOCATION: 750 Ogden Canyon Road
Ogden, UT

PROJECT NO: 1100891

Your Action Please:	As Checked below:	Via:
■ For your use	☐ As Requested	☐ Regular Mail
☐ For your approval & signature	■ Report	☐ UPS/Express Mail
☐ Please return one copy	☐ Proposal/Agreement	☐ Hand Delivered
☐ Please return	☐ Change Order	☐ Fax
☐ For your review & comment	☐ Task Order	■ Email (5)
☐ Other	☐ Letter	☐ Pick Up
	■ Laboratory Test Results	Client:
	■ Field Testing (Inspection Report)	Other:
	☐ Other	

Quantity	Description of Items Sent
1	Construction Services Reports

Notes/Remarks:

From: Kim Sorensen Construction Services Report Coordinator

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • (801) 566-6493

AGEC
Applied GeoTech

DAILY REPORT OF OBSERVATIONS, SPECIAL INSPECTION and TESTING

PROJECT: CELL TOWER @ THE OAKS
PROJECT NUMBER: 1100891
DATE: 11/30/10
CONTRACTOR: WESTERN TELECOM
PERMIT NUMBER:
SERVICES REQUESTED: ☐ Soils ☐ Reinforced Concrete ☐ Structural Steel ☑ Concrete ☐ Asphalt ☐ Fireproofing ☐ Masonry ☐ _____
P.O. NUMBER:
MILEAGE TO PROJECT SITE: 55
WEATHER: ☐ Cloudy ☐ Partly Cloudy ☑ Clear ☐ Rain ☐ Snow ☐ _____
Temperature Range: 10 ° F to 15 ° F
Winds: ☐ Strong ☐ Moderate ☐ Light ☑ Calm

SITE VISITS:
START TIME: 8:00 (AM) PM FINISH TIME: 10:30 (AM) PM
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM

TYPE OF SERVICE:	HRS	MATERIAL SAMPLED:	QTY.	MATERIAL DESCRIPTION:	NON-COMPLIANCE ITEM(S) THIS REPORT:
Asphalt		Asphaltic Cores			☐ YES / ☒ NO
Concrete	X	Concrete Cylinders		Conc. Mix # _____ Req. psi _____	
Reinforced Concrete		Concrete Cores			NON-COMPLIANCE ITEM(S) FOLLOW UP:
Sample Pick-up		Grout Samples		Conc. Mix # _____ Req. psi _____	☐ YES / ☒ NO
Soils		Masonry Prisms			
Structural Masonry		Mortar Samples		Grout Mix # _____ Req. psi _____	ORIGINAL DATE:
Structural Steel		Soil Series			
_____		Soil Series		Mortar Type N / S / M Req. psi _____	_____
_____		_____			
Total Hrs.	2.5	_____		Prisms Hollow / Grouted Req. psi _____	

Observations: PICKED - UP (1) SET OF CONCRETE CYLINDERS CAST 11/29/10.

_____ / _____
RECEIVED BY COMPANY

D. Epperson
CONSTRUCTION OBSERVER

_____
CERTIFICATION NUMBER

Reviewed by: _____ Date: 12/1

03/05/2007

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 South 270 East • St. George, Utah 84790 • (435) 637-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 • (435) 586-8387 • FAX (435) 586-8582

Applied Geotechnical
Engineering Consultants, Inc.

Report of Compressive Strength

Test Methods: ASTM C 31, C 39, C42, C 172, C 780, C 1019 and E 447

PROJECT: Cell Tower at The Oaks

PROJECT #: 1100891

LOCATION: 750 Ogden Canyon Road
Ogden, UT

DATE CAST: 11/29/10

FIELD DATA [ASTM C 172]		DESIGN DATA [ASTM C 94]	
Contractor:	Western Telecom	Ready Mix Supplier:	Geneva Rock Products
Time Cast:	10:45 am	Mix Design Number:	H 6003
Slump (in) [C 143]:	4	Specified Slump (in):	4 maximum
Air Content (%) [C 231] :	4.0	Specified Air Content (%):	2 - 4
Mix Temp. (°F) [C 1064]:	65	**Specified Strength:**	**4000 psi @ 28 days**
Air Temp. (°F):	24	Ticket No/Truck No:	25140792 / 432
Unit Wt. (pcf) [C 138]:		Elapsed Batch Time (min):	66
Material Type:	Concrete	Cement (lbs): 2,490	Fly ash (lbs): 430
Sample Cast By:	C. Landgraf	Water (gal): 100	Added on Site (gal): 0
Set Number:	1 of 1	Fine Aggregate (lbs):	6,480 (Moisture 5.5%)
		Coarse Aggregate, small (lbs):	(Moisture 0.0%)
Samples Per Set:	4	Coarse Aggregate, large (lbs):	8,840 (Moisture 0.2%)
Placement Location:	Generator slab on grade	Admixtures:	WR, AE, NCA
		Batch Size (yd^3):	5
		Accum. No./Total (yd^3):	5 of 5
Sample Location:	Generator slab on grade	Sampled at: Truck	

Sample Identification Number	Test Age (Days)	Date of Test	Sample Size (in)	Cross Sectional Area (sq. in.)	Maximum Load (lbs.)	Compressive Strength (psi)
33632-1	7	12/06	4 x 8	12.56	55,940	4,450
33632-2	28	12/27	4 x 8	12.56	73,810	5,880
33632-3	28	12/27	4 x 8	12.56	69,940	5,570
33632-4	28	12/27	4 x 8	12.56	73,950	5,890

Average Compressive Strength at 28 Days (psi): **5,780**

Remarks:

Reviewed By:

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 North 270 East • St. George, Utah 84790 •(435) 673-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 •(435) 586-8387 • FAX (435) 586-8582

AGEC
Applied GeoTech

DAILY REPORT OF OBSERVATIONS, SPECIAL INSPECTION and TESTING

PROJECT: Cell Tower at The Oaks
PROJECT NUMBER: 1100891
DATE: 11-29-10
CONTRACTOR: Western Telecom
PERMIT NUMBER:
P.O. NUMBER:
MILEAGE TO PROJECT SITE: 115

SERVICES REQUESTED: ☐ Soils ☒ Reinforced Concrete ☐ Structural Steel ☐ Concrete ☐ Asphalt ☐ Fireproofing ☐ Masonry ☐ _____

WEATHER: ☒ Cloudy ☐ Partly Cloudy ☐ Clear ☐ Rain ☐ Snow ☐ _____
Temperature Range: 25 ° F to ____ ° F
Winds: ☐ Strong ☐ Moderate ☒ Light ☐ Calm

SITE VISITS:
START TIME: 9:15 (AM) / PM FINISH TIME: 12:30 AM (PM)
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM

TYPE OF SERVICE:	HRS	MATERIAL SAMPLED:	QTY.	MATERIAL DESCRIPTION:	NON-COMPLIANCE ITEM(S) THIS REPORT:
Asphalt		Asphaltic Cores			
Concrete		Concrete Cylinders	4	Conc. Mix # H6003 Req. psi 4,000	☐ YES / ☐ NO
Reinforced Concrete	X	Concrete Cores			
Sample Pick-up		Grout Samples		Conc. Mix # _____ Req. psi _____	NON-COMPLIANCE ITEM(S) FOLLOW UP:
Soils		Masonry Prisms			
Structural Masonry		Mortar Samples		Grout Mix # _____ Req. psi _____	☐ YES / ☐ NO
Structural Steel		Soil Series			
_____		Soil Series		Mortar Type N / S / M Req. psi _____	ORIGINAL DATE:
_____		_____			_____
Total Hrs.	3¼	_____		Prisms Hollow / Grouted Req. psi _____	

Observations: AGEC was on site, as requested, to perform concrete special inspection. 5 cubic yards of a 4000 psi concrete (mix H6003), supplied by Geneva, were placed in the generator slab. The reinforcing steel was inspected and found to conform to the project drawings (detail on S100). It was #4 reinforcing steel at 12 inch centers. Adequate bar laps were present. The concrete was tested. One set of concrete test cylinders was cast. An air entrained concrete was ordered. The air test was 4.0%. See the test report for more information.

_____ / _____
RECEIVED BY COMPANY

Curtis Lindsay
CONSTRUCTION OBSERVER

0846085
CERTIFICATION NUMBER

Reviewed by: _____ Date: 11/30

03/05/2007

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 South 270 East • St. George, Utah 84790 • (435) 637-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 • (435) 586-8387 • FAX (435) 586-8582

AGEC
Applied GeoTech

DAILY REPORT OF OBSERVATIONS, SPECIAL INSPECTION and TESTING

PROJECT: Cell Tower @ The Oaks
PROJECT NUMBER: 1100891
DATE: 11/23/10
CONTRACTOR: Western Telecom
PERMIT NUMBER:
P.O. NUMBER:
MILEAGE TO PROJECT SITE: 60

SERVICES REQUESTED: ☐ Soils ☐ Reinforced Concrete ☐ Structural Steel ☐ Concrete ☐ Asphalt ☐ Fireproofing ☐ Masonry ☐ _____

WEATHER: ☒ Cloudy ☐ Partly Cloudy ☐ Clear ☐ Rain ☐ Snow ☐ _____
Temperature Range: 35 °F to 45 °F
Winds: ☐ Strong ☒ Moderate ☐ Light ☐ Calm

SITE VISITS:
START TIME: 1:30 AM / (PM) FINISH TIME: 3:15 AM / (PM)
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM

TYPE OF SERVICE:	HRS	MATERIAL SAMPLED:	QTY.	MATERIAL DESCRIPTION:	NON-COMPLIANCE ITEM(S) THIS REPORT:
Asphalt		Asphaltic Cores			
Concrete		Concrete Cylinders		Conc. Mix # _____ Req. psi _____	☐ YES / ☒ NO
Reinforced Concrete		Concrete Cores			
Sample Pick-up		Grout Samples		Conc. Mix # _____ Req. psi _____	NON-COMPLIANCE ITEM(S) FOLLOW UP:
Soils	X	Masonry Prisms			
Structural Masonry		Mortar Samples		Grout Mix # _____ Req. psi _____	☐ YES / ☐ NO
Structural Steel		Soil Series			
_____		Soil Series		Mortar Type N / S / M Req. psi _____	ORIGINAL DATE:
_____		_____			_____
Total Hrs.	1.75	_____		Prisms Hollow / Grouted Req. psi _____	

Observations: Performed in place density test on subgrade fill for cell tower base. Material placed with mini-ex and compacted with jumping jack compactor prior to my arrival. Please see attached report for test results & specifics.

_____ / _____
RECEIVED BY / COMPANY

Josh Parker
CONSTRUCTION OBSERVER

_____
CERTIFICATION NUMBER

Reviewed by: _____ Date: 11/24

03/05/2007

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 South 270 East • St. George, Utah 84790 • (435) 637-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 • (435) 586-8387 • FAX (435) 586-8582

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

158 West 1600 South
St. George, UT 84770
(435) 673-6850

600 West Sandy Parkway
Sandy, Utah 84070
(801) 566-6399

429 North 2150 West, Suite 1
Cedar City, UT 84721
(435) 586-8387

FILL OBSERVATION AND TESTING REPORT

PROJECT NAME: Cell Tower at The Oaks
PROJECT NO.: 1100891 DATE: 11/23/10
DESCRIPTION OF LOCATION: Structural fill under cell tower slab on grade

NUCLEAR GAUGE SERIAL NO.: 30840
DENSITY STANDARD COUNT: 1878
MOISTURE STANDARD COUNT: 711

TEST ID	LOCATION	TEST DEPTH	TEST ELEV.	LABORATORY			FIELD					
				Proctor ID	MDD (PCF)	OMC (%)	Wet Density	Dry Density	Moisture Content	Compaction %		Retest Needed
										Field	Spec.	
11/23-1	5' south and 9' east of northwest slab on grade corner	8"	Grade	C1657	123.0	10.3	134.8	123.4	9.2	100	95	

Remarks: Grade = top of subgrade
Proctor value of 123.0 @ 10.3 was supplied by the contractor.

Proctor ID	ASTM Test Method	Soil Description
C1657		Import Fill

J. Parker
FIELD OBSERVER

REVIEWED BY

This report presents opinions formed as a result of our observation of fill placement. We have relied on the contractor to continue applying the recommended compactive effort and moisture to the fill during times our observer is not observing operations. Tests are made of the fill only as believed necessary to calibrate our observer's judgement. Test data are not the sole basis for opinions on whether the fill meets specifications.

The services referred to herein were performed in accordance with the standard of care practiced locally for the referenced method(s) and relate only to the condition(s) observed or sample(s) tested at the time and place stated herein. AGEC makes no other warranty or representation, including source of materials submitted by others.

LETTER OF TRANSMITTAL

AGEC
Applied GeoTech

DATE: November 19, 2010

TO: Western Telecom
Attn: Randy Riches
392 West 4800 South
Murray, UT 84123
rriches@wt-inc.com

CC:
- Western Telecom, Attn: John Wall
  Jwall@wt-inc.com
- Crown Castle, Attn: Nancy Smith
  Nancy.smith@crowncastle.com
- Western Telecom, Attn: Troy Hall
  Thall@wt-inc.com
- Telespan, Attn: Larry Hinojosa
  Lhinojosa@tspanllc.com

PROJECT: Cell Tower at The Oaks

LOCATION: 750 Ogden Canyon Road
Ogden, UT

PROJECT NO: 1100891

Your Action Please:	As Checked below:	Via:
■ For your use	☐ As Requested	☐ Regular Mail
☐ For your approval & signature	■ Report	☐ UPS/Express Mail
☐ Please return one copy	☐ Proposal/Agreement	☐ Hand Delivered
☐ Please return	☐ Change Order	☐ Fax
☐ For your review & comment	☐ Task Order	■ Email (5)
☐ Other	☐ Letter	☐ Pick Up
	■ Laboratory Test Results	Client:
	■ Field Testing (Inspection Report)	Other:
	☐ Other	

Quantity	Description of Items Sent
1	Construction Services Reports

Notes/Remarks:

From: Kim Sorensen Construction Services Report Coordinator

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • (801) 566-6493

AGEC
Applied GeoTech

DAILY REPORT OF OBSERVATIONS, SPECIAL INSPECTION and TESTING

PROJECT: Cell Tower at The Oaks
PROJECT NUMBER: 1100841
DATE: 11/17/10
CONTRACTOR: Western Telecom
PERMIT NUMBER:
P.O. NUMBER:
MILEAGE TO PROJECT SITE: 55

SERVICES REQUESTED: ☐ Soils ☐ Reinforced Concrete ☐ Structural Steel ☑ Concrete ☐ Asphalt ☐ Fireproofing ☐ Masonry ☐ _____

WEATHER: ☐ Cloudy ☐ Partly Cloudy ☑ Clear ☐ Rain ☐ Snow ☐ _____
Temperature Range: 40 ° F to ____ ° F
Winds: ☐ Strong ☐ Moderate ☐ Light ☑ Calm

SITE VISITS:
START TIME: 11:30 (AM) / PM FINISH TIME: 1:00 AM / (PM)
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM

TYPE OF SERVICE:	HRS	MATERIAL SAMPLED:	QTY.	MATERIAL DESCRIPTION:	NON-COMPLIANCE ITEM(S) THIS REPORT:
Asphalt		Asphaltic Cores			
Concrete	X	Concrete Cylinders		Conc. Mix # _____ Req. psi _____	☐ YES / ☑ NO
Reinforced Concrete		Concrete Cores			
Sample Pick-up		Grout Samples		Conc. Mix # _____ Req. psi _____	NON-COMPLIANCE ITEM(S) FOLLOW UP:
Soils		Masonry Prisms			
Structural Masonry		Mortar Samples		Grout Mix # _____ Req. psi _____	☐ YES / ☐ NO
Structural Steel		Soil Series			
_____		Soil Series		Mortar Type N / S / M Req. psi _____	ORIGINAL DATE:
_____		_____			_____
Total Hrs.	1.5	_____		Prisms Hollow / Grouted Req. psi _____	

Observations: Picked up one set of Concrete Cylinders Cast 11/16/10.

_____ / _____ D. Jensen _____
RECEIVED BY / COMPANY CONSTRUCTION OBSERVER CERTIFICATION NUMBER

Reviewed by: _____ Date: _____

03/05/2007

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 South 270 East • St. George, Utah 84790 • (435) 637-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 • (435) 586-8387 • FAX (435) 586-8582

Applied Geotechnical
Engineering Consultants, Inc.

Report of Compressive Strength

Test Methods: ASTM C 31, C 39, C42, C 172, C 780, C 1019 and E 447

PROJECT: Cell Tower at The Oaks

PROJECT #: 1100891

LOCATION: 750 Ogden Canyon Road
Ogden, UT

DATE CAST: 11/16/10

FIELD DATA [ASTM C 172]		DESIGN DATA [ASTM C 94]	
Contractor:	Western Telecom	Ready Mix Supplier:	Geneva Rock Products
Time Cast:	3:00 pm	Mix Design Number:	H 6007
Slump (in) [C 143]:	2¾	Specified Slump (in):	4 maximum
Air Content (%) [C 231] :	2.5	Specified Air Content (%):	2 - 4
Mix Temp. (°F) [C 1064]:	60	**Specified Strength:**	**4000 psi @ 28 days**
Air Temp. (°F):	38	Ticket No/Truck No:	27029012 / 433
Unit Wt. (pcf) [C 138]:		Elapsed Batch Time (min):	89
Material Type:	Concrete	Cement (lbs): 3,390	Fly ash (lbs): 610
Sample Cast By:	D. Jeppson	Water (gal): 142	Added on Site (gal): 0
Set Number:	1 of 1	Fine Aggregate (lbs):	9,720 (Moisture 6.9%)
		Coarse Aggregate, small (lbs):	(Moisture 0.0%)
Samples Per Set:	4	Coarse Aggregate, large (lbs):	11,600 (Moisture 0.1%)
Placement Location:	Footings for cell tower equipment building	Admixtures:	WR, AE
		Batch Size (yd^3):	7
		Accum. No./Total (yd^3):	7 of 7
Sample Location:	Northeast corner of building	Sampled at: Truck	

Sample Identification Number	Test Age (Days)	Date of Test	Sample Size (in)	Cross Sectional Area (sq. in.)	Maximum Load (lbs.)	Compressive Strength (psi)
33571-1	7	11/23	4 x 8	12.56	48,890	3,890
33571-2	28	12/14	4 x 8	12.56	73,340	5,840
33571-3	28	12/14	4 x 8	12.56	67,990	5,410
33571-4	28	12/14	4 x 8	12.56	69,770	5,550

Average Compressive Strength at 28 Days (psi): **5,600**

Remarks:

Reviewed By:

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 North 270 East • St. George, Utah 84790 •(435) 673-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 •(435) 586-8387 • FAX (435) 586-8582

AGEC
Applied GeoTech

DAILY REPORT OF OBSERVATIONS, SPECIAL INSPECTION and TESTING

PROJECT: Cell Tower at The Oaks
PROJECT NUMBER: 1100891
DATE: 11/16/10
CONTRACTOR: Western Telecom
PERMIT NUMBER:
P.O. NUMBER:
MILEAGE TO PROJECT SITE: 55

SERVICES REQUESTED: ☐ Soils ☐ Reinforced Concrete ☐ Structural Steel ☑ Concrete ☐ Asphalt ☐ Fireproofing ☐ Masonry ☐ _____

WEATHER: ☐ Cloudy ☑ Partly Cloudy ☐ Clear ☐ Rain ☐ Snow ☐ _____
Temperature Range: 35 ° F to 40 ° F
Winds: ☐ Strong ☐ Moderate ☑ Light ☐ Calm

SITE VISITS:
START TIME: 2:30 AM (PM) FINISH TIME: 5:30 AM (PM)
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM

TYPE OF SERVICE:	HRS	MATERIAL SAMPLED:	QTY.	MATERIAL DESCRIPTION:	NON-COMPLIANCE ITEM(S) THIS REPORT:
Asphalt		Asphaltic Cores			
Concrete	X	Concrete Cylinders		Conc. Mix # 116007 Req. psi 4,000	☐ YES / ☑ NO
Reinforced Concrete		Concrete Cores			
Sample Pick-up		Grout Samples		Conc. Mix # _____ Req. psi _____	NON-COMPLIANCE ITEM(S) FOLLOW UP:
Soils		Masonry Prisms			
Structural Masonry		Mortar Samples		Grout Mix # _____ Req. psi _____	☐ YES / ☑ NO
Structural Steel		Soil Series			
_____		Soil Series		Mortar Type N / S / M Req. psi _____	ORIGINAL DATE:
_____		_____			_____
Total Hrs.	3.0	_____		Prisms Hollow / Grouted Req. psi _____	

Observations: -Performed Concrete tests on samples taken from 7 yds. placed as footings for Cell-Tower Equipment Bldg. Tests were in-compliance w/ project specs. One set of Compressive Strength Cylinders Coll.

_____ / _____ D. Gibson _____
RECEIVED BY COMPANY CONSTRUCTION OBSERVER CERTIFICATION NUMBER

Reviewed by: _____ Date: _____

03/05/2007

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 South 270 East • St. George, Utah 84790 • (435) 637-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 • (435) 586-8387 • FAX (435) 586-8582

AGEC
Applied GeoTech

DAILY REPORT OF OBSERVATIONS, SPECIAL INSPECTION and TESTING

PROJECT: CELL TOWER @ THE OAKS
PROJECT NUMBER: 1100891
DATE: 11/14/10
CONTRACTOR: WESTERN TELECOM
PERMIT NUMBER:
SERVICES REQUESTED: ☒ Soils ☐ Reinforced Concrete ☐ Structural Steel
☒ Concrete ☐ Asphalt ☐ Fireproofing
☐ Masonry ☒ Sample Pick Up
P.O. NUMBER:
MILEAGE TO PROJECT SITE:
WEATHER:
☐ Cloudy ☐ Partly Cloudy ☐ Clear
☐ Rain ☐ Snow ☐ _____
Temperature Range: ____° F to ____° F
Winds: ☐ Strong ☐ Moderate ☐ Light ☐ Calm

SITE VISITS:
START TIME: 9:30 (AM) / PM FINISH TIME: 12:30 AM / (PM)
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM

TYPE OF SERVICE:	HRS	MATERIAL SAMPLED:	QTY.	MATERIAL DESCRIPTION:	NON-COMPLIANCE ITEM(S) THIS REPORT:
Asphalt		Asphaltic Cores			
Concrete	X	Concrete Cylinders		Conc. Mix # _____ Req. psi _____	☐ YES / ☐ NO
Reinforced Concrete		Concrete Cores			
Sample Pick-up	3.0	Grout Samples		Conc. Mix # _____ Req. psi _____	NON-COMPLIANCE ITEM(S) FOLLOW UP:
Soils		Masonry Prisms			
Structural Masonry		Mortar Samples		Grout Mix # _____ Req. psi _____	☐ YES / ☐ NO
Structural Steel		Soil Series			
_____		Soil Series		Mortar Type N / S / M Req. psi _____	ORIGINAL DATE:
_____		_____			_____
Total Hrs.	3.0	_____		Prisms Hollow / Grouted Req. psi _____	

Observations: AGEC WAS ON SITE TO COLLECT CONCRETE CYLINDERS CAST ON 11/13/10 AND DELIVER THEM TO THE LAB FOR COMPRESSIVE STRENGTH TESTING

_____ / _____
RECEIVED BY COMPANY

JOHNNY ETCHEMENDY
CONSTRUCTION OBSERVER

_____
CERTIFICATION NUMBER

Reviewed by: _____ Date: 11/14

03/05/2007

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 South 270 East • St. George, Utah 84790 • (435) 637-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 • (435) 586-8387 • FAX (435) 586-8582

Applied Geotechnical
Engineering Consultants, Inc.

Report of Compressive Strength

Test Methods: ASTM C 31, C 39, C42, C 172, C 780, C 1019 and E 447

PROJECT: Cell Tower at The Oaks

PROJECT #: 1100891

LOCATION: 750 Ogden Canyon Road
Ogden, UT

DATE CAST: 11/13/10

FIELD DATA [ASTM C 172]		DESIGN DATA [ASTM C 94]	
Contractor:	Western Telecom	Ready Mix Supplier:	Geneva Rock Products
Time Cast:	10:30 am	Mix Design Number:	A 8002
Slump (in) [C 143]:		Specified Slump (in):	
Air Content (%) [C 231] :		Specified Air Content (%):	
Mix Temp. (°F) [C 1064]:		**Specified Strength:**	**4000 psi @ 28 days**
Air Temp. (°F):		Ticket No/Truck No:	/
Unit Wt. (pcf) [C 138]:		Elapsed Batch Time (min):	
Material Type:	Concrete	Cement (lbs):	Fly ash (lbs):
Sample Cast By:	J. Etchemendy	Water (gal):	Added on Site (gal):
Set Number:	2 of 2	Fine Aggregate (lbs):	(Moisture %)
		Coarse Aggregate, small (lbs):	(Moisture %)
Samples Per Set:	4	Coarse Aggregate, large (lbs):	(Moisture %)
Placement Location:	Cell tower base	Admixtures:	
		Batch Size (yd^3):	10
		Accum. No./Total (yd^3):	20 of 30
Sample Location:	Middle third of base	Sampled at: Truck	

Sample Identification Number	Test Age (Days)	Date of Test	Sample Size (in)	Cross Sectional Area (sq. in.)	Maximum Load (lbs.)	Compressive Strength (psi)
33545-1	4	11/17	4 x 8	12.56	59,430	4,730
33545-2	10	11/23	4 x 8	12.56	70,270	5,590
33545-3	21	12/04	4 x 8	12.56	79,560	6,330
33545-4	28	12/11	4 x 8	12.56	85,700	6,820

Compressive Strength at 28 Days (psi): **6,820**

Remarks:

Reviewed By:

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 North 270 East • St. George, Utah 84790 •(435) 673-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 •(435) 586-8387 • FAX (435) 586-8582

Applied Geotechnical
Engineering Consultants, Inc.

Report of Compressive Strength

Test Methods: ASTM C 31, C 39, C42, C 172, C 780, C 1019 and E 447

PROJECT: Cell Tower at The Oaks

PROJECT #: 1100891

LOCATION: 750 Ogden Canyon Road
Ogden, UT

DATE CAST: 11/13/10

FIELD DATA [ASTM C 172]		DESIGN DATA [ASTM C 94]	
Contractor:	Western Telecom	Ready Mix Supplier:	Geneva Rock Products
Time Cast:	9:35 am	Mix Design Number:	A 8002
Slump (in) [C 143]:	3¼	Specified Slump (in):	
Air Content (%) [C 231] :	5.4	Specified Air Content (%):	
Mix Temp. (°F) [C 1064]:	73	**Specified Strength:**	**4000 psi @ 28 days**
Air Temp. (°F):	34	Ticket No/Truck No:	25139910 / 484
Unit Wt. (pcf) [C 138]:		Elapsed Batch Time (min):	45
Material Type:	Concrete	Cement (lbs): 6,360	Fly ash (lbs): 920
Sample Cast By:	J. Etchemendy	Water (gal): 242	Added on Site (gal): 0
Set Number:	1 of 2	Fine Aggregate (lbs):	11,600 (Moisture 6.0%)
		Coarse Aggregate, small (lbs):	(Moisture 0.0%)
Samples Per Set:	5	Coarse Aggregate, large (lbs):	16,440 (Moisture 0.2%)
Placement Location:	Cell tower base	Admixtures:	NCA,WR, AE
		Batch Size (yd^3):	10
		Accum. No./Total (yd^3):	10 of 30
Sample Location:	Bottom third of base	Sampled at: Truck	

Sample Identification Number	Test Age (Days)	Date of Test	Sample Size (in)	Cross Sectional Area (sq. in.)	Maximum Load (lbs.)	Compressive Strength (psi)
33544-1	4	11/17	4 x 8	12.56	63,030	5,020
33544-2	10	11/23	4 x 8	12.56	67,780	5,400
33544-3	21	12/04	4 x 8	12.56	83,480	6,650
33544-4	28	12/11	4 x 8	12.56	80,810	6,430
33544-5	28	12/11	4 x 8	12.56	81,710	6,510

Average Compressive Strength at 28 Days (psi): **6,470**

Remarks:

Reviewed By:

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 North 270 East • St. George, Utah 84790 •(435) 673-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 •(435) 586-8387 • FAX (435) 586-8582

Applied Geotechnical
Engineering Consultants, Inc.

Report of Compressive Strength

Test Methods: ASTM C 31, C 39, C42, C 172, C 780, C 1019 and E 447

PROJECT: Cell Tower at The Oaks

PROJECT #: 1100891

LOCATION: 750 Ogden Canyon Road
Ogden, UT

DATE CAST: 11/13/10

FIELD DATA [ASTM C 172]		DESIGN DATA [ASTM C 94]	
Contractor:	Western Telecom	Ready Mix Supplier:	Geneva Rock Products
Time Cast:	10:30 am	Mix Design Number:	A 8002
Slump (in) [C 143]:		Specified Slump (in):	
Air Content (%) [C 231] :		Specified Air Content (%):	
Mix Temp. (°F) [C 1064]:		**Specified Strength:**	**4000 psi @ 28 days**
Air Temp. (°F):		Ticket No/Truck No:	/
Unit Wt. (pcf) [C 138]:		Elapsed Batch Time (min):	
Material Type:	Concrete	Cement (lbs):	Fly ash (lbs):
Sample Cast By:	J. Etchemendy	Water (gal):	Added on Site (gal):
Set Number:	2 of 2	Fine Aggregate (lbs):	(Moisture %)
		Coarse Aggregate, small (lbs):	(Moisture %)
Samples Per Set:	4	Coarse Aggregate, large (lbs):	(Moisture %)
Placement Location:	Cell tower base	Admixtures:	
		Batch Size (yd^3):	10
		Accum. No./Total (yd^3):	20 of 30
Sample Location:	Middle third of base	Sampled at: Truck	

Sample Identification Number	Test Age (Days)	Date of Test	Sample Size (in)	Cross Sectional Area (sq. in.)	Maximum Load (lbs.)	Compressive Strength (psi)
33545-1	4	11/17	4 x 8	12.56	59,430	4,730
33545-2	10	11/23	4 x 8	12.56		
33545-3	21	12/04	4 x 8	12.56		
33545-4	28	12/11	4 x 8	12.56		

Compressive Strength at 28 Days (psi):

Remarks:

Reviewed By:

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 North 270 East • St. George, Utah 84790 •(435) 673-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 •(435) 586-8387 • FAX (435) 586-8582

Applied Geotechnical
Engineering Consultants, Inc.

Report of Compressive Strength

Test Methods: ASTM C 31, C 39, C42, C 172, C 780, C 1019 and E 447

PROJECT: Cell Tower at The Oaks

PROJECT #: 1100891

LOCATION: 750 Ogden Canyon Road
Ogden, UT

DATE CAST: 11/13/10

FIELD DATA [ASTM C 172]		DESIGN DATA [ASTM C 94]	
Contractor:	Western Telecom	Ready Mix Supplier:	Geneva Rock Products
Time Cast:	9:35 am	Mix Design Number:	A 8002
Slump (in) [C 143]:	3¼	Specified Slump (in):	
Air Content (%) [C 231] :	5.4	Specified Air Content (%):	
Mix Temp. (°F) [C 1064]:	73	**Specified Strength:**	**4000 psi @ 28 days**
Air Temp. (°F):	34	Ticket No/Truck No:	25139910 / 484
Unit Wt. (pcf) [C 138]:		Elapsed Batch Time (min):	45
Material Type:	Concrete	Cement (lbs): 6,360	Fly ash (lbs): 920
Sample Cast By:	J. Etchemendy	Water (gal): 242	Added on Site (gal): 0
Set Number:	1 of 2	Fine Aggregate (lbs):	11,600 (Moisture 6.0%)
		Coarse Aggregate, small (lbs):	(Moisture 0.0%)
Samples Per Set:	5	Coarse Aggregate, large (lbs):	16,440 (Moisture 0.2%)
Placement Location:	Cell tower base	Admixtures:	NCA,WR, AE
		Batch Size (yd^3):	10
		Accum. No./Total (yd^3):	10 of 30
Sample Location:	Bottom third of base	Sampled at: Truck	

Sample Identification Number	Test Age (Days)	Date of Test	Sample Size (in)	Cross Sectional Area (sq. in.)	Maximum Load (lbs.)	Compressive Strength (psi)
33544-1	4	11/17	4 x 8	12.56	63,030	5,020
33544-2	10	11/23	4 x 8	12.56		
33544-3	21	12/04	4 x 8	12.56		
33544-4	28	12/11	4 x 8	12.56		
33544-5	Hold		4 x 8	12.56		

Compressive Strength at 28 Days (psi):

Remarks:

Reviewed By:

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 North 270 East • St. George, Utah 84790 •(435) 673-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 •(435) 586-8387 • FAX (435) 586-8582

AGEC
Applied GeoTech

DAILY REPORT OF OBSERVATIONS, SPECIAL INSPECTION and TESTING

PROJECT: Cell Tower @ The Oaks
PROJECT NUMBER: 1100891
DATE: 11/13/10
CONTRACTOR: Western Telecom
PERMIT NUMBER:
SERVICES REQUESTED: ☐ Soils ☐ Reinforced Concrete ☐ Structural Steel ☒ Concrete ☐ Asphalt ☐ Fireproofing ☐ Masonry ☐
P.O. NUMBER:
MILEAGE TO PROJECT SITE:
WEATHER: ☐ Cloudy ☐ Partly Cloudy ☐ Clear ☐ Rain ☐ Snow ☐
Temperature Range: ° F to ° F
Winds: ☐ Strong ☐ Moderate ☐ Light ☐ Calm

SITE VISITS:
START TIME: 8:00 (AM) / PM FINISH TIME: 12:00 AM / (PM)
START TIME: AM / PM FINISH TIME: AM / PM
START TIME: AM / PM FINISH TIME: AM / PM

TYPE OF SERVICE:	HRS	MATERIAL SAMPLED:	QTY.
Asphalt		Asphaltic Cores	
Concrete	4.0	Concrete Cylinders	9 (2 sets)
Reinforced Concrete		Concrete Cores	
Sample Pick-up		Grout Samples	
Soils		Masonry Prisms	
Structural Masonry		Mortar Samples	
Structural Steel		Soil Series	
		Soil Series	
Total Hrs.	4.0		

MATERIAL DESCRIPTION: (5000 Design)
Conc. Mix # A8002 Req. psi 4000
Conc. Mix # Req. psi
Grout Mix # Req. psi
Mortar Type N / S / M Req. psi
Prisms Hollow / Grouted Req. psi

NON-COMPLIANCE ITEM(S) THIS REPORT: ☐ YES / ☐ NO
NON-COMPLIANCE ITEM(S) FOLLOW UP: ☐ YES / ☒ NO
ORIGINAL DATE:

Observations: AGEC was on site to perform concrete testing for concrete placed as cell tower base.

Air content, slump, & temperature were tested for compliance. Results recorded on attached Report of Compressive Strength. (No specifications could be found on site.)

9 cylinders were cast for compressive strength testing.

RECEIVED BY / COMPANY

Johnny Etchemendy
CONSTRUCTION OBSERVER

CERTIFICATION NUMBER

Reviewed by: K Date: 11/14

03/05/2007

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 South 270 East • St. George, Utah 84790 • (435) 637-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 • (435) 586-8387 • FAX (435) 586-8582

AGEC
Applied GeoTech

DAILY REPORT OF OBSERVATIONS, SPECIAL INSPECTION and TESTING

PROJECT: CELL TOWER AT THE OAKS

PROJECT NUMBER: 1100891

DATE: 11/12/10

CONTRACTOR: WESTERN TELECOM

PERMIT NUMBER:

SERVICES REQUESTED: ☒ Soils ☐ Reinforced Concrete ☐ Structural Steel ☒ Concrete ☐ Asphalt ☐ Fireproofing ☐ Masonry ☐ _____

P.O. NUMBER:

MILEAGE TO PROJECT SITE:

WEATHER:
☐ Cloudy ☐ Partly Cloudy ☐ Clear
☐ Rain ☐ Snow ☐ _____
Temperature Range: _____ ° F to _____ ° F
Winds: ☐ Strong ☐ Moderate ☐ Light ☐ Calm

SITE VISITS:
START TIME: 12:30 AM (PM) FINISH TIME: 5:30 AM (PM)
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM
START TIME: _____ AM / PM FINISH TIME: _____ AM / PM

TYPE OF SERVICE:	HRS	MATERIAL SAMPLED:	QTY.	MATERIAL DESCRIPTION:	NON-COMPLIANCE ITEM(S) THIS REPORT:
Asphalt		Asphaltic Cores			
Concrete	X	Concrete Cylinders		Conc. Mix # _____ Req. psi _____	☒ YES / ☐ NO
Reinforced Concrete		Concrete Cores			
Sample Pick-up		Grout Samples		Conc. Mix # _____ Req. psi _____	NON-COMPLIANCE ITEM(S) FOLLOW UP:
Soils	0.5	Masonry Prisms			☐ YES / ☒ NO
Structural Masonry		Mortar Samples		Grout Mix # _____ Req. psi _____	
Structural Steel		Soil Series			ORIGINAL DATE:
STANDBY/TRAVEL	4.5	Soil Series		Mortar Type N / S / M Req. psi _____	
Total Hrs.	5.0			Prisms Hollow / Grouted Req. psi _____	

Observations: AGEC WAS ON SITE TO PERFORM MOISTURE DENSITY TESTING FOR ELECTRICAL TRENCH BACKFILL & CONCRETE TESTING FOR CELL TOWER BASE.

SOILS MATERIAL WAS COMPACTED PRIOR TO AGEC ARRIVAL. INITIAL TESTS PERFORMED FAILED TO MEET SITE SPECIFICATION. BASE COURSE WAS RECOMPACTED USING JUMPING JACK. RETESTS PERFORMED STILL FAILED TO MEET SITE SPECIFICATION. CONTRACTOR WAS NOTIFIED OF RESULTS.

CONCRETE CONCRETE ARRIVED 45 MINUTES LATER THAN AGEC TECHNICIAN WAS SCHEDULED FOR, THEN EVENTUALLY TURNED AWAY BECAUSE CONTRACTOR WAS NOT READY TO PLACE CONCRETE WITHIN 90 MINS OF BATCH TIME. AGEC TECHNICIAN WAS REQUESTED TO REMAIN ON SITE FOR AN ADDITIONAL 90 MINS TO TEST CONCRETE LATER IN THE EVENING. (CONT ON PG. 2 →)

_____ / _____
RECEIVED BY COMPANY

JOHNNY ETCHEMENDY
CONSTRUCTION OBSERVER

_____
CERTIFICATION NUMBER

Reviewed by: _____ Date: 11/14

03/05/2007

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
1420 South 270 East • St. George, Utah 84790 • (435) 637-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 • (435) 586-8387 • FAX (435) 586-8582

Applied Geotechnical
Engineering Consultants, Inc.

DAILY REPORT OF OBSERVATIONS, SPECIAL INSPECTION and TESTING

PROJECT: CELL TOWER AT THE OAKS

PROJECT NUMBER: 1100891

DATE: 11/12/10

CONTRACTOR: WESTERN TELECOM

Observations: IN ORDER TO GIVE CONTRACTOR TIME TO FINISH DRILLING HOLE FOR CELL TOWER BASE. DURING DRILLING THE SIDEWALLS OF THE EXCAVATION COLLAPSED AND CONCRETE WAS ONCE AGAIN CANCELED ON SITE

JOHNNY ETCHEMENDY
CONSTRUCTION OBSERVER

600 West Sandy Parkway • Sandy, Utah 84070 • (801) 566-6399 • FAX (801) 566-6493
158 West 1600 South • St. George, Utah 84770 •(435) 673-6850 • FAX (435) 673-1044
429 North 2150 West, Suite 1 • Cedar City, Utah 84721 •(435) 586-8387 • FAX (435) 586-8582

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

158 West 1600 South
St. George, UT 84770
(435) 673-6850

600 West Sandy Parkway
Sandy, Utah 84070
(801) 566-6399

429 North 2150 West, Suite 1
Cedar City, UT 84721
(435) 586-8387

FILL OBSERVATION AND TESTING REPORT

PROJECT NAME: Cell Tower at The Oaks
PROJECT NO.: 1100891 **DATE:** 11/12/10
DESCRIPTION OF LOCATION: Electrical line trench backfill

NUCLEAR GAUGE SERIAL NO.: 24888
DENSITY STANDARD COUNT: 2218
MOISTURE STANDARD COUNT: 602

TEST ID	LOCATION	TEST DEPTH	TEST ELEV.	LABORATORY			FIELD					
				Proctor ID	MDD (PCF)	OMC (%)	Wet Density	Dry Density	Moisture Content	Compaction %		Retest Needed
										Field	Spec.	
11/12-1	25' west of The Oaks	8"	BC	C1657	123.0	10.3	123.0	114.0	7.9	**93**	95	X
11/12-1A	Retest	8"	BC	C1657	123.0	10.3	124.6	114.6	8.7	**93**	95	X
11/12-2	85' west of The Oaks	8"	BC	C1657	123.0	10.3	121.3	111.7	8.7	**91**	95	X
11/12-2A	Retest	8"	BC	C1657	123.0	10.3	123.2	112.4	9.6	**91**	95	X

Remarks: BC = Base Course
Proctor value of 123.0 @ 10.3 was supplied by the contractor.

Proctor ID	ASTM Test Method	Soil Description
C1657		Import Road Base

J. Etchemendy
FIELD OBSERVER

REVIEWED BY

This report presents opinions formed as a result of our observation of fill placement. We have relied on the contractor to continue applying the recommended compactive effort and moisture to the fill during times our observer is not observing operations. Tests are made of the fill only as believed necessary to calibrate our observer's judgement. Test data are not the sole basis for opinions on whether the fill meets specifications.

The services referred to herein were performed in accordance with the standard of care practiced locally for the referenced method(s) and relate only to the condition(s) observed or sample(s) tested at the time and place stated herein. AGEC makes no other warranty or representation, including source of materials submitted by others.

GEOTECHNICAL EVALUATION
SAL - OAKS CELL TOWER
750 OGDEN CANYON ROAD
OGDEN, UTAH
WT JOB NO. 6120JT037

Western Technologies Inc.
The Quality People
Since 1955

SALT LAKE CITY – UTAH
420 West Lawndale Drive
Salt Lake City, Utah 84115-2917
(801) 972-3650 • fax 972-3653

Prepared for:

Technology Associates International Corporation

April 12, 2010

Warren D. Clyde, P.E.
Principal

LICENSED PROFESSIONAL ENGINEER
4/12/10
No. 180305-2202
WARREN D. CLYDE
STATE OF UTAH

Robert E. Wenzel, Jr., P.E.
Director of Geotechnical Services

Western Technologies Inc.
The Quality People
Since 1955

420 West Lawndale Drive
Salt Lake City, Utah 84115-2917
(801) 972-3650 • fax 972-3653

April 12, 2010

Technology Associates International Corporation
380 West Lawndale Drive
Salt Lake City, Utah 84115

Attn: Mr. Mark Kimber

Re: Geotechnical Evaluation
SAL - OAKS CELL TOWER
750 Ogden Canyon Road
Ogden, Utah

WT Job No. 6120JT037

Western Technologies, Inc. (WT) has completed the geotechnical evaluation for the proposed SAL - OAKS Cell Tower to be located at 750 Ogden Canyon Road in Ogden, Utah. This study was performed in general accordance with our proposal number 6120PT024 dated February 9, 2010. The results of our evaluation, including the boring location diagram, boring logs, laboratory test results, and geotechnical recommendations are attached.

We appreciate being of service to you in the geotechnical engineering phase of this project and are prepared to assist you during the construction phases as well. If design conditions change, or if you have any questions concerning this report or any of our materials testing, special inspection, or consulting services, please do not hesitate to contact us. We look forward to working with you on future projects.

Sincerely,
WESTERN TECHNOLOGIES INC.
Geotechnical Engineering Services

Warren D. Clyde, P.E.
Principal

Copies to: Addressee (2)

TABLE OF CONTENTS

1.0 PURPOSE 1

2.0 PROJECT DESCRIPTION 1

3.0 SCOPE OF SERVICES 2
3.1 Field Exploration 2
3.2 Laboratory Analyses 2
3.3 Analyses and Report 2

4.0 SITE CONDITIONS 3
4.1 Surface 3
4.2 Subsurface 3
4.3 Groundwater 3
4.4 Geology and Geologic Hazards 3

5.0 GEOTECHNICAL PROPERTIES & ANALYSIS 4
5.1 Laboratory Tests 4
5.2 Field Tests 4

6.0 RECOMMENDATIONS 4
6.1 General 4
6.2 Design Considerations 4
6.3 Foundations 5
6.3.1 Tower Foundations 5
6.3.2 Shallow Foundations 6
6.4 Lateral Design Criteria 6
6.5 Seismic Considerations 7
6.6 Drainage 7
6.7 Corrosivity 7

7.0 EARTHWORK 7
7.1 General 7
7.2 Excavation 8
7.3 Temporary Excavations and Slopes 8
7.4 Drilled Shaft Preparation 8
7.5 Shallow Foundation Preparation 9
7.6 Materials 9
7.7 Placement and Compaction 9
7.8 Compliance 10

8.0 LIMITATIONS 10

9.0 OTHER SERVICES 11

10.0 CLOSURE 11

VICINITY MAP ..... **Plate 1**
BORING LOCATION DIAGRAM ..... **Plate 2**

APPENDIX A

Definition of Terminology A-1
Method of Soil Classification A-2
Boring Log Notes A-3
Boring Log A-4

APPENDIX B

Laboratory Tests B-1
Inorganic Analytical Report American West Analytical Laboratories

GEOTECHNICAL EVALUATION
SAL - OAKS CELL TOWER
750 OGDEN CANYON ROAD
OGDEN, UTAH
WT JOB NO. 6120JT037

1.0 PURPOSE

This report contains the results of our geotechnical evaluation for the proposed SAL - OAKS cell tower to be located at 750 Ogden Canyon Road in Ogden, Utah. The purpose of these services is to provide information and recommendations regarding:

- Foundation design parameters, including footing types, depths, allowable bearing capacities, and estimated settlements
- Lateral earth pressures
- Seismic considerations
- Earthwork, including site preparation, fill placement, and suitability of existing soils for fill materials
- Excavation conditions

Our services included obtaining information on site conditions, performing field and laboratory testing, performing engineering analyses, providing recommendations for use in foundation, floor slab, and on-site pavement design, and presenting earthwork guidelines. Results of the field exploration, field tests, and laboratory tests are presented in the Appendices.

2.0 PROJECT DESCRIPTION

Project information supplied by Mr. Mark Kimber on February 1, 2010 indicates the proposed cell tower is to be a 80 foot tall monopole tower with a small equipment building adjacent to the cell tower site. Maximum wall and column loads for the equipment building are assumed to be 1 to 2 klf and 50 kips, respectively. The loads on the proposed tower are not known at this time. We anticipate that the foundations for the equipment building will be within 3 feet of the existing site grade and that the top of tower foundation will be at or slightly above existing site grade. Should our assumptions not be correct, we should be notified immediately.

3.0 SCOPE OF SERVICES

3.1 Field Exploration

One boring was drilled to a depth of 36.5 feet below existing grade in the proposed tower area. The boring was at the approximate location shown on the attached Boring Location Diagram. A field log was prepared for the boring. This log contains visual classifications of the materials encountered during drilling as well as interpolation of the subsurface conditions between samples. A Final log, included in Appendix A, represents our interpretation of the field log and may include modifications based on laboratory observations and tests of the field samples. The final log describes the materials encountered, their thicknesses, and the locations where samples were obtained.

The Unified Soil Classification System was used to classify soils. The soil classification symbols appear on the boring log and are briefly described in Appendix A. Local and regional geologic characteristics were used to estimate the seismic design criteria.

3.2 Laboratory Analyses

Laboratory analyses were performed on representative soil samples and core to aid in material classification and to estimate pertinent engineering properties of the on-site soils for preparation of this report. Testing was performed in general accordance with applicable ASTM test methods. The following tests were performed and the results are presented in Appendix B.

- Water Content
- Sulfate Content
- Gradation
- Minus #200 Sieve
- Plasticity

3.3 Analyses and Report

Analyses were performed and this report was prepared for the exclusive purpose of providing geotechnical engineering and/or testing information and recommendations. The scope of services for this project does not include, either specifically or by implication, any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken. We are available to discuss the scope of such studies with you.

This geotechnical engineering report includes a description of the project, a discussion of the field and laboratory testing programs, a discussion of the subsurface conditions, and design recommendations as required to satisfy the purpose previously described.

4.0 SITE CONDITIONS

4.1 Surface

At the time of our exploration, the site was developed with small cabins and a restaurant. An existing cell tower was located just north of the site consisting of a wooden pole with antennas and an equipment panel. Because of existing fencing and landscaping, the boring was located 18 to 20 feet north of the proposed lease area in the existing parking lot. The ground surface was relatively flat and contained a moderate to heavy growth of grass and trees. Site drainage trended to the south as sheet surface flow.

4.2 Subsurface

As presented on the Log of the Boring, surface soils to depths of 5 feet consisted of clayey sandy gravel fill below existing asphalt and untreated base. The materials underlying the surface soils and extending to a depth of 28 feet inter-bedded clay, sand, and gravel layers with large cobbles. The inter-bedded layers were underlain by clayey sand with gravel and cobbles to the total depth explored of 36.5 feet.

4.3 Groundwater

Groundwater was encountered at a depth of 13 feet at the time of exploration. These observations represent the groundwater conditions at the time of measurements and may not be indicative of other times. Groundwater levels can be expected to fluctuate with varying seasonal and weather conditions, groundwater withdrawal and recharge, local irrigation practices, and future development.

4.4 Geology and Geologic Hazards

The site is located in the Ogden Canyon in the Wasatch Range on the Northern Wasatch Front section of the Middle Rocky Mountains Province. The Wasatch Range mountains trends north-south and includes broad alluvial valley bottoms and low hills in the north, and rugged mountains cut by deep valleys in the south. The site is located on stream alluvium deposits consisting mainly gravel and sand. (*Geologic Map of the Northern Wasatch Front, Utah*, Utah Geological Survey, 1985).

The nearest fault is located approximately 3 miles to the east of the site. The liquefaction potential is not mapped because the site is outside of the liquefaction study area. *Selected Critical Facilities and Geologic Hazards, Weber County, Utah* map published by

the Utah Geological Survey.

5.0 GEOTECHNICAL PROPERTIES & ANALYSIS

5.1 Laboratory Tests

Near-surface soils are of nil to low plasticity. These soils typically exhibit low expansion potential when recompacted, confined by loads approximating floor loads and saturated. Slabs-on-grade supported on recompacted native soils have a low potential for heaving if the water content of the soil increases.

Chemical tests were performed on representative samples of the surficial on-site soils to determine the amount of water-soluble sulfates. The test results indicate that the on-site soils would be classified as negligently corrosive to concrete according to ACI 318, Section 4.3 referenced by 1904.4 of the 2006 International Building Code.

5.2 Field Tests

The boring log results included in this report are indicators of subsurface conditions only at the specific location and date noted. Variations from the field conditions represented by the boring may become evident during construction. If variations appear, we should be contacted to re-evaluate our recommendations rates.

6.0 RECOMMENDATIONS

6.1 General

Recommendations contained in this report are based on our understanding of the project criteria described in Section 2.0, Project Description, and the assumption that the soil and subsurface conditions are those disclosed by the boring. Others may change the plans, final elevations, number and type of structures, foundation loads, and floor levels during design or construction. Substantially different subsurface conditions from those described herein may be encountered or become known. Any changes in the project criteria or subsurface conditions shall be brought to our attention in writing.

6.2 Design Considerations

The borings indicate the presence of sand and gravel soils along with groundwater at a depth of 13 feet. These granular soils will ravel and cave into excavations for drilled shafts. In addition, areas of partially flowing sands were encountered. The use of casing to prevent caving and raveling of the granular soils will be required during construction. Large cobbles and boulders may be present in the underlying soil layers. The site has

mature trees with well developed root systems. The organic materials will need to be removed prior to engineered fill placement for the equipment building pad.

6.3 Foundations

6.3.1 Tower Foundations

The tower may be supported on a drilled shaft foundation system that derives its load carrying capacity from skin friction and end bearing in the sand and gravel soils. The shaft should extend a minimum of 15 feet below the existing site grades. We estimate the following allowable (Factor of Safety = 3.0) vertical axial compressive capacities for straight-sided drilled shafts installed in the subsurface conditions disclosed by the boring completed at this site as summarized in Table 1. It is assumed that these conditions are present from the ground surface to the pile tip and at least 10 feet beyond:

Table 1
Estimated Allowable Vertical Axial Compressive Shaft Capacities, (Kips)

	Shaft Diameter (ft)				
Shaft Length (ft)	2	3	4	5	6
15	36	66	104	150	204
20	52	90	135	187	248
25	73	120	175	236	305
30	84	126	167	208	249
35	126	198	276	361	452

The uplift capacity of the shaft can be taken as ½ the vertical compressive capacities presented in Table 1. A 1/3 increase can be used for either wind or seismic loads.

Since actual design loads were not available at the time of this report, estimated settlements were not calculated.

A protective steel casing or drilling fluid will be required to hold the excavation open. If a steel casing is used, it should be removed as the concrete is placed. A head of 3 feet of concrete should be maintained above the bottom of the casing during withdrawal and the contractor should prevent concrete from "hanging-up" inside the shell which can cause soil and water intrusion below the shell.

6.3.2 Shallow Foundations

The proposed equipment building can be supported by conventional shallow spread footings bearing upon native undisturbed sand and gravel soils or engineered fill. Any existing fill should not be used to support the proposed building without removal and re-compaction as engineered fill. The footings should bear a minimum of 48 inches below the existing site grades for frost protection

Footing depths and allowable bearing capacities are presented in the following tabulation:

Footing Depth Below Finished Grade (ft)*	Allowable Bearing Capacity (psf)**
4	2000

* Finished grade is the lowest adjacent grade for perimeter footings and floor level for interior footings in heated spaces.

** Allowable bearing capacities assume fulfillment of **Earthwork** recommendations.

The allowable bearing capacities apply to dead loads plus design live load conditions. The allowable bearing capacity may be increased by one-third when considering total loads that include wind or seismic. Recommended minimum widths of equipment building column and wall footings are 24 inches and 16 inches, respectively.

We anticipate that total and differential movement of the proposed equipment structure, supported as recommended, should be less than 1 inch.

6.4 Lateral Design Criteria

Lateral loads may be resisted by concrete interface friction and by passive resistance. For shallow foundations bearing on properly compacted fill at this site, we recommend the following lateral resistance criteria:

- Coefficient of Friction..... 0.35
- Passive Pressure..... 300 psf/ft

The frictional resistance and the passive pressure may be combined without reduction in determining the total lateral resistance.

6.5 Seismic Considerations

For structural designs based upon the International Building Code 2006 the following criteria will apply. The soil site class is D. S_s, the spectral acceleration for short periods, is 1.160g S_1, the spectral acceleration for a 1-second period, is 0.444 g. F_a and F_v, in accordance with Table 1613.5.3 (1) and 1613.5.3 (2), are 1.036 and 1.556, respectively.

For liquefaction to occur, soils must generally be loose, water-saturated sandy soil. Based upon the relative densities of the sand and gravel soils identified in the Boring, WT does not anticipate liquefaction as a concern at this site

6.6 Drainage

In areas where sidewalks or paving do not immediately adjoin the structure, protective slopes should be provided with an outfall of about 5 percent for at least 10 feet from foundations. Backfill against foundations and in utility and sprinkler line trenches should be well compacted and free of all construction debris to minimize the possibility of moisture infiltration.

6.7 Corrosivity

The chemical test results indicate that the site soils are negligently corrosive to concrete. Concrete should be made with a cement that provides sulfate resistance and that has a maximum water-cementitious materials ratio, sulfate resistance, and minimum compressive strength set forth in ACI 318, Section 4.3 referenced by 1904.4 of the 2006 International Building Code.

7.0 EARTHWORK

7.1 General

The conclusions contained in this report for the proposed construction are contingent upon compliance with recommendations presented in this section. Any excavating, trenching, or disturbance that occurs after completion of the earthwork must be backfilled, compacted and tested in accordance with the recommendations contained herein. It is not reasonable to rely upon our conclusions and recommendations if any future unobserved and untested trenching, earthwork activities or backfilling occurs.

Although underground facilities such as septic tanks, cesspools, basements, utilities, and dry wells were not observed, such features might be encountered during construction. These features should be demolished in accordance with the recommendations of the

geotechnical engineer. Any loose or disturbed soils resulting from demolition should be removed or recompacted as engineered fill and any excavations should be backfilled in accordance with recommendations presented herein.

7.2 Excavation

We anticipate that excavations for utility trenches for the proposed construction can be accomplished with conventional equipment. However, large oversize materials may be encountered which will require heavy duty equipment and drilling and blasting to remove.

The soils to be penetrated by the proposed excavations may vary significantly across the site. Our soil classifications are based solely on the materials encountered in a single exploratory test boring. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are found at the time of construction, we should be contacted immediately to evaluate the conditions encountered.

7.3 Temporary Excavations and Slopes

Excavations into the on-site soils may encounter a variety of conditions. The individual contractor should be made responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local, and federal regulations, including current OSHA excavation and trench safety standards.

If any excavation, including a utility trench, is extended to a depth of more than 20 feet, it will be necessary to have the side slopes designed by a professional engineer.

7.4 Drilled Shaft Preparation

We anticipate that excavations for the drilled shaft construction will require the use of casings and or drilling fluids to prevent caving or flowing sands.

We recommend that the contractor retain a geotechnical engineer to observe the soils exposed in all excavations for compatibility with the assumptions made in this report. This will provide an opportunity to classify the soil types encountered, and to modify the deep shaft recommendations as necessary. The bottom of the drilled shaft should be clean and free of loose soil prior to concrete placement. If utilized, the temporary casing should be carefully removed while maintaining a concrete level at least 3 feet inside the casing. Concrete slump and construction techniques should be as specified in the American Concrete Institute Manual of Concrete Practice (latest edition).

7.5 Shallow Foundation Preparation

Specialized treatment of existing soils within foundation areas for the equipment building is not required. Footings should bear upon undisturbed native soils or engineered fill.

7.6 Materials

Native sand and gravel soils and/or imported materials may be used as fill material for the following:

- equipment building pad
- pavement areas
- backfill

Imported soils should conform to the following:

- Gradation (ASTM C136):

	percent finer by weight
6"	100
4"	85-100
¾"	70-100
No. 4 Sieve	50-100
No. 200 Sieve	30 (max)

The materials used in the upper 3 feet of the building pad should be reasonable free of rocks or lumps having a particle diameter greater than 6 inches. Acceptance of the quantity of oversize material shall be at the discretion of the geotechnical engineer.

7.7 Placement and Compaction

a. Place and compact fill in horizontal lifts, using equipment and procedures that will produce recommended water contents and densities throughout the lift.

b. Uncompacted fill lifts should not exceed 10 inches.

c. Materials should be compacted to the following:

Material	Minimum Percent Compaction (ASTM D1557)
• Imported soil:	
Below footings	95
Below slabs-on-grade	95
• Aggregate base course below slabs-on-grade	95
• Nonstructural backfill	90

On-site and imported soils should be compacted within a water content range of 3 percent below to 3 percent above optimum.

7.8 Compliance

Recommendations for slabs-on-grades and foundations elements supported on compacted fills or prepared subgrade depend upon compliance with **Earthwork** recommendations. To assess compliance, observation and testing should be performed under the direction of a geotechnical engineer.

8.0 LIMITATIONS

This report has been prepared based on our understanding of the project criteria as described in Section 2.0. Others may make changes in the project criteria during design or construction, and substantially different subsurface conditions may be encountered or become known. The conclusions and recommendations presented herein shall not continue to be valid unless all variations are brought to our attention in writing, and we have had an opportunity to assess the effect such variations may have on our conclusions and recommendations and respond in writing.

The recommendations presented are based upon data derived from a limited number of samples obtained from a single boring. The attached logs are indicators of subsurface conditions only at the specific locations and times noted. The geotechnical engineer necessarily makes assumptions as to the uniformity of the geology and soil structure around the boring, but variations can exist. Accordingly, whenever any deviation or change is encountered or become known during design or construction, WT shall be notified in writing. WT shall review the matter, and issue a written response regarding the validity of the conclusions and recommendations presented herein.

This report does not provide information relative to construction methods or sequences. Any person reviewing this report must draw his/her own conclusions regarding site conditions as they relate to the employment or development of construction techniques. This report is valid for one year after the date of issuance unless there is a change in circumstances or discovered variations justifying an earlier expiration of validity. After expiration, no person or entity has any right to rely on this report without further review and reporting by WT under a separate contract.

The recommendations contained herein may be based upon government regulations in effect at the time of this report. Future changes or modifications to these regulations may require modification of this report.

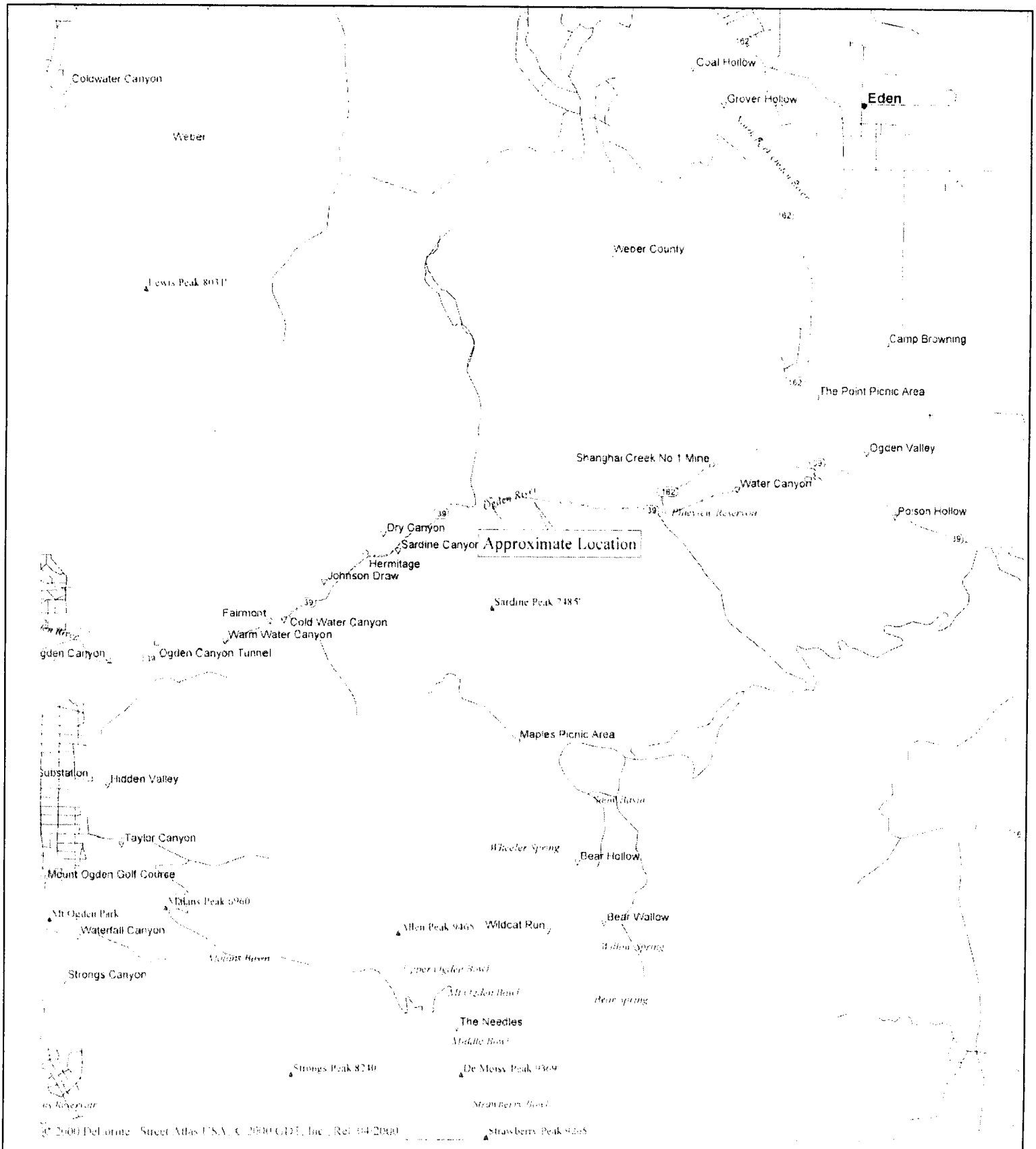
9.0 OTHER SERVICES

The geotechnical engineer should be retained for a general review of final plans and specifications to evaluate compliance with our recommendations.

The geotechnical engineer should also be retained to provide observation and testing services during excavation, earthwork operations, foundation and construction phases of the project. Observation of footing excavations should be performed prior to placement of reinforcing and concrete to confirm that satisfactory bearing materials are present.

10.0 CLOSURE

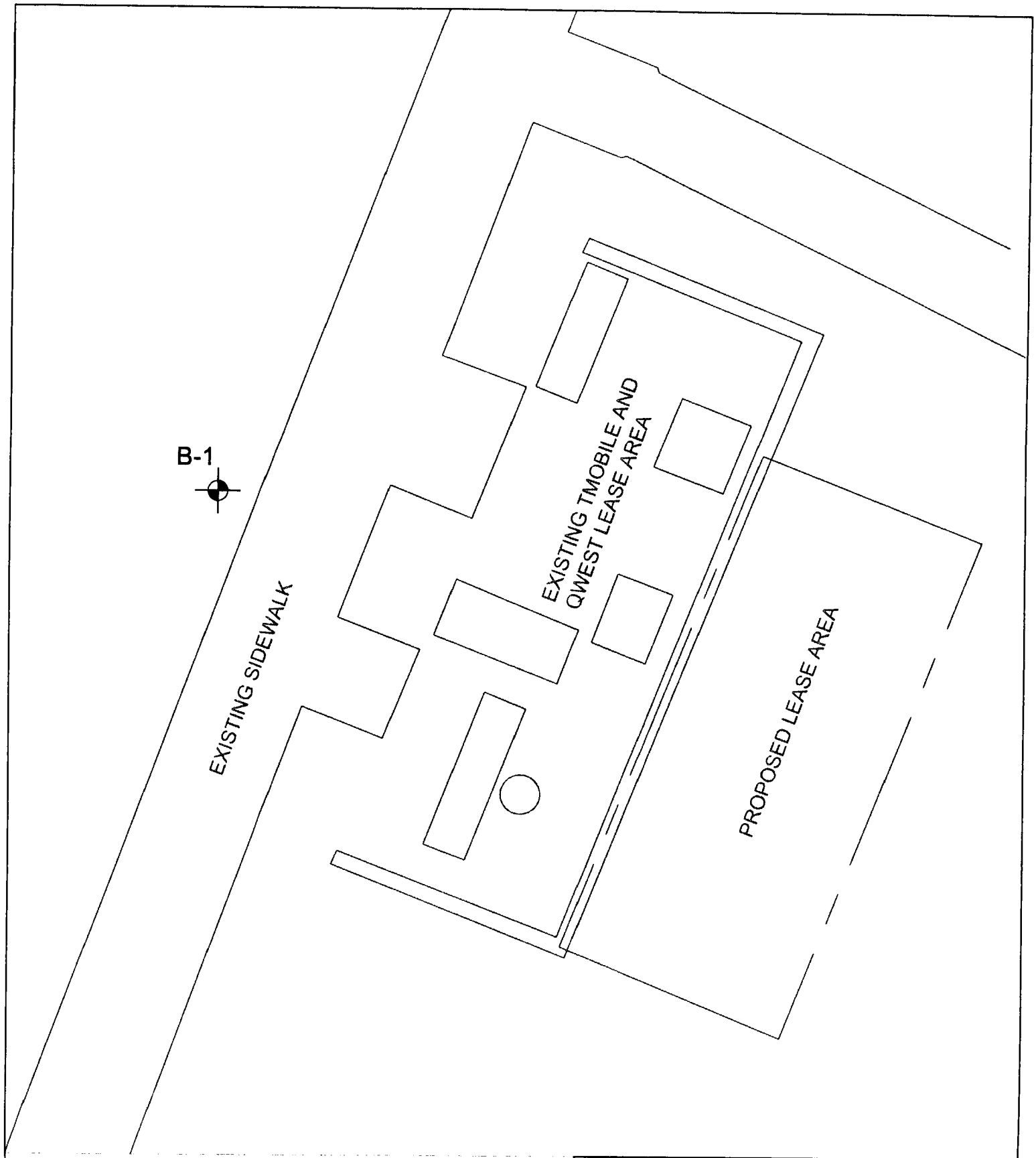
We prepared this report as an aid to the designers of the proposed project. The comments, statements, recommendations and conclusions set forth in this report reflect the opinions of the authors. These opinions are based upon conditions at the location of specific tests, observations and data developed to satisfy the scope of services defined by the contract documents. Work on your project was performed in accordance with generally accepted industry standards and practices by other professionals providing similar services in this locality. No other warranty, express or implied, is made.



N

Not to scale

SAL - OAKS CELL TOWER	
Site Vicinity Map	
Western Technologies, Inc.	
Job No. 6120JT037	Plate: 1



LEGEND

Approximate Borehole Location

Not to scale

SAL - OAKS CELL TOWER	
Boring Location Diagram	
Western Technologies, Inc.	
Job No. 6120JT037	Plate: 2

Allowable Soil Bearing Capacity	The recommended maximum contact stress developed at the interface of the foundation element and the supporting material.
Backfill	A specified material placed and compacted in a confined area.
Base Course	A layer of specified material placed on a subgrade or subbase.
Base Course Grade	Top of base course.
Bench	A horizontal surface in a sloped deposit.
Caisson	A concrete foundation element cast in a circular excavation which may have an enlarged base. Sometimes referred to as a cast-in-place pier.
Concrete Slabs-On-Grade	A concrete surface layer cast directly upon a base, subbase or subgrade.
Crushed Rock Base Course	A base course composed of crushed rock of a specified gradation.
Differential Settlement	Unequal settlement between or within foundation elements of a structure.
Engineered Fill	Specified material placed and compacted to specified density and/or moisture conditions under observations of a representative of a soil engineer.
Existing Fill	Materials deposited through the action of man prior to exploration of the site.
Existing Grade	The ground surface at the time of field exploration.
Expansive Potential	The potential of a soil to expand (increase in volume) due to absorption of moisture.
Fill	Materials deposited by the actions of man.
Finished Grade	The final grade created as a part of the project.
Gravel Base Course	A base course composed of naturally occurring gravel with a specified gradation.
Heave	Upward movement
Native Grade	The naturally occurring ground surface.
Native Soil	Naturally occurring on-site soil.
Rock	A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting or other methods of extraordinary force for excavation.
Sand and Gravel Base	A base course of sand and gravel of a specified gradation.
Sand Base Course	A base course composed primarily of sand of a specified gradation.
Scarify	To mechanically loosen soil or break down existing soil structure.
Settlement	Downward movement.
Soil	Any unconsolidated material composed of discrete solid particles, derived from the physical and/or chemical disintegration of vegetable or mineral matter, which can be separated by gentle mechanical means such as agitation in water.
Strip	To remove from present location.
Subbase	A layer of specified material placed to form a layer between the subgrade and base course.
Subbase Grade	Top of subbase.
Subgrade	Prepared native soil surface.

SAL - OAKS CELL TOWER	
Definition of Terminology	
Western Technologies Inc.	
Job No.: 6120JT037	Plate: A-1

COARSE-GRAINED SOILS

LESS THAN 50% FINES*

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
GW	WELL-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% FINES	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO 4 SIEVE SIZE
GP	POORLY-GRADED GRAVELS OR GRAVEL-SAND MIXTURES, LESS THAN 5% FINES	
GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, MORE THAN 12% FINES	
GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, MORE THAN 12% FINES	
SW	WELL-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% FINES	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE
SP	POORLY-GRADED SANDS OR GRAVELLY SANDS, LESS THAN 5% FINES	
SM	SILTY SANDS, SAND-SILT MIXTURES, MORE THAN 12% FINES	
SC	CLAYEY SANDS, SAND-CLAY MIXTURES, MORE THAN 12% FINES	

NOTE: Coarse-grained soils receive dual symbols if they contain 5% to 12% fines (e.g., SW-SM, GP-GC).

FINE-GRAINED SOILS

MORE THAN 50% FINES

GROUP SYMBOLS	DESCRIPTION	MAJOR DIVISIONS
ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50
CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
OL	ORGANIC SILTS OR ORGANIC SILT-CLAYS OF LOW PLASTICITY	
MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS	SILTS AND CLAYS LIQUID LIMIT MORE THAN 50
CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY	
PT	PEAT, MUCK AND OTHER HIGHLY ORGANIC SOILS	HIGHLY ORGANIC SOILS

NOTE: Fine-grained soils may receive dual classification based upon plasticity characteristics.

SOIL SIZES

COMPONENT	SIZE RANGE
BOULDERS	Above 12 in.
COBBLES	3 in. - 12 in.
GRAVEL	No. 4 - 3 in.
Coarse	3/4 in. - 3 in.
Fine	No. 4 - 3/4 in.
SAND	No. 200 - No. 4
Coarse	No. 10 - No. 4
Medium	No. 40 - No. 10
Fine	No. 200 - No. 40
*Fines (Silt or Clay)	Below No. 200

NOTE: Only sizes smaller than three inches are used to classify soils

CONSISTENCY

CLAYS & SILTS	BLOWS PER FOOT*
VERY SOFT	0 - 2
SOFT	2 - 4
FIRM	4 - 8
STIFF	8 - 16
VERY STIFF	16 - 32
HARD	Over 32

RELATIVE DENSITY

SANDS & GRAVELS	BLOWS PER FOOT*
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	Over 50

*Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1 3/8 inch ID) split spoon (ASTM D1586).

PLASTICITY OF FINE GRAINED SOILS

PLASTICITY INDEX	TERM
0	NON-PLASTIC
1 - 7	LOW
8 - 25	MEDIUM
Over 25	HIGH

DEFINITION OF WATER CONTENT

DRY
SLIGHTLY DAMP
DAMP
MOIST
WET
SATURATED

SAL OAKS CELL TOWER

Method of Classification

Western Technologies Inc.

Job No.: 6120JT037 | Plate: A-2

The number shown in "**BORING NO.**" refers to the approximate location of the same number indicated on the "Boring Location Diagram" as positioned in the field by pacing or measurement from property lines and/or existing features, or through the use of Global Positioning System (GPS) devices.

"**DRILLING TYPE**" refers to the exploratory equipment used in the boring wherein **HSA** = **hollow stem auger**, and the dimension presented is the outside diameter of the HSA used.

"**N**" **in "BLOWS/FT."** refers to a 2-in. outside diameter split-barrel sampler driven into the ground with a 140 lb. drop-hammer dropped 30 in. repeatedly until a penetration of 18 in. is achieved or until refusal. The number of blows, or "blow count", of the hammer is recorded for each of three 6-in. increments totaling 18 in. The number of blows required for advancing the sampler for the last 12 in. (2^{nd} and 3^{rd} increments) is defined as the Standard Penetration Test (SPT) "N"-Value. Refusal to penetration is considered more than 50 blows per foot. (Ref. ASTM D 1586).

"**R**" **in "BLOWS/FT."** refers to a 2.5-in. outside diameter ring-lined split spoon sampler driven into the ground with a 140 lb. drop-hammer dropped 30 in. repeatedly until a penetration of 12 in. is achieved or until refusal. The number of blows required to advance the sampler 12 in. is defined as the "R" blow count. The "R" blow count requires an engineered conversion to an equivalent SPT N-Value. Refusal to penetration is considered more than 50 blows per foot. (Ref. ASTM D 3550).

"**SAMPLE TYPE**" refers to the form of sample recovery, in which **N** = **Split-barrel sample, R** = **Ring-lined sample, G** = **Grab sample, B** = **Bucket sample, C** = **Core sample** (ex. diamond bit rock coring).

"**DRY DENSITY (LBS/CU FT)**" refers to the laboratory-determined dry density in pounds per cubic foot. The symbol "**NR**" indicates that no sample was recovered. The symbol "**DU**" indicates that determination of dry density was not possible.

"**MOISTURE CONTENT (% OF DRY WT.)**" refers to the laboratory-determined water content in percent (Ref. ASTM D2216).

"**USCS**" refers to the "Unified Soil Classification System" Group Symbol for the soil type as defined by ASTM D 2487 and D 2488. The soils were classified visually in the field, and where appropriate, classifications were modified by visual examination of samples in the laboratory and/or by appropriate tests.

These notes and boring logs are intended for use in conjunction with the purposes of our services defined in the text. Boring log data should not be construed as part of the construction plans nor as defining construction conditions.

Boring logs depict our interpretations of subsurface conditions at the locations and on the date(s) noted. Variations in subsurface conditions and characteristics may occur between borings. Groundwater levels may fluctuate due to seasonal variations and other factors.

The stratification lines shown on the boring logs represent our interpretation of the approximate boundary between soil or rock types based upon visual field classification at the boring location. The transition between materials is approximate and may be more or less gradual than indicated.

SAL - OAKS CELL TOWER	
Boring Log Notes	
Western Technologies Inc.	
Job No.: 6120JT037	Plate: A-3

EXCAVATION DATE: **2-10-10**
LOCATION: **See Location Diagram**
ELEVATION: **Not Determined**

BORING NO. B-1

EQUIPMENT TYPE: **CME-55**
EXCAVATION TYPE: **6"HSA**
FIELD ENGINEER: **W.Clyde**

MOISTURE CONTENT (% OF DRY WT.)	DRY DENSITY (LBS/CU FT)	SAMPLE TYPE	SAMPLE	BLOW COUNTS	DEPTH (FEET)	USCS	GRAPHIC	SOIL DESCRIPTION
					0	GC		ASPHALT CONCRETE
								UNTREATED BASE
		N		43 22 13				FILL; clayey sandy gravel, with cobbles, dark brown to black, very dense, moist
		N		7 3 2	5	CL		SANDY GRAVELLY CLAY; black, firm, wet
		N		16 16 16		GC		CLAYEY SANDY GRAVEL; brown to black, dense, moist
		N		20 14 12	10	SP-GP		INTERBEDDED SAND AND GRAVEL LAYERS; with large cobbles, brown to black, medium dense to dense to very dense, moist to saturated ▽
		N		24 16 14	15			
		N		19 11 5	20			
		N		8 50-6"	25			
		N		4 3 2	30	SC		CLAYEY SAND; with gravel and cobbles, gray to brown, loose to dense, saturated
		N		9 7 37	35			BORING TERMINATED AT 36.5 FEET

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH TIME. DATA PRESENTED IS A SIMPLIFICATION.

N- STANDARD PENETRATION TEST
R- RING SAMPLE
NR- NO SAMPLE RECOVERY
G- GRAB SAMPLE
B- BUCKET SAMPLE

NOTES: **Groundwater at 13 feet**

WESTERN TECHNOLOGIES INC.

PROJECT: **SAL - OAKS CELL TOWER**
REF. NO.: **6120JT037**

PLATE **A-1**

BORING LOG

SOIL PROPERTIES

Boring No.	Depth (ft.)	Soil Class.	Initial Dry Density (pcf)	Initial Water Content (%)	CBR VALUE (ksf)	Modified Proctor		Plasticity		Particle Size Distribution (%) Passing by Weight					Remarks
						Max. Dry Density (pcf)	Opt. Moisture Content (%)	Liquid Limit	Plasticity Index	3/4"	#4	#10	#40	#200	
B-1	10	GM		8.3				--	NP	81	52	41	27	15	
B-1	20	SM-GM		10.9				--	NP	95	59	48	26	13	
B-1	30	SC		23.4				31	12	100	86	78	66	30	

Note: Initial Dry Density and Initial Water Content are in-situ values unless otherwise noted.
NP = Non-Plastic

Remarks

1. Compacted density (approx. 95% of ASTM D1557 (max. density at moisture content slightly below optimum.)
2. Submerged to approximate saturation.
3. Slight rebound after saturation.
4. Sample disturbance observed.

SAL - OAKS CELL TOWER

Soil Properties

WESTERN TECHNOLOGIES INC.

Job No. 6120JT037 | Plate: B-1

INORGANIC ANALYTICAL REPORT

Client: Western Technologies, Inc. **Contact:** Robert Wenzel
Project: SAL-Oaks - 6120JT037
Lab Sample ID: 1003174-001
Client Sample ID: B-1 @ 2.5-4'
Collection Date: 3/8/2010 4:16:00 PM
Received Date: 3/10/2010

Analytical Results	Units	Date Analyzed	Method Used	Reporting Limit	Analytical Result	Qual
Sulfate	mg/kg-dry	3/11/2010 7:40:00 AM	A4500-SO4-E	5.7	13	&

& - Analysis is performed on a 1:1 DI water extract for soils.

AMERICAN WEST ANALYTICAL LABORATORIES

463 West 3600 South
Salt Lake City, UT
84115

(801) 263-8686
Toll Free (888) 263-8686
Fax (801)263-8687
email: awal@awal-labs.com

Kyle F. Gross
Laboratory Director

Jose Rocha
QA Officer