EXC03-00015

Foundation Engineering, Inc.

Professional Geotechnical Services

RECEIVED
AUG 16 2004
DEVELOPMENT SERVICES

Peter Brennan
Willamette Builders Group
750 SW Harbor Way
Portland, Oregon 97202

August 12, 2004

Grand Oaks Summit Apartments – Building Pads **Project 2031084**
Geotechnical Consultation
Corvallis, Oregon

Dear Mr. Japport:

This letter summarizes the building pad preparation conducted to date at the above-referenced project. The building pads have been prepared by excavating the soils to firm subgrade consisting of on-site fill, which was placed and compacted last fall. We were present throughout the grading last fall to observe the placement and compaction procedure for the fill. We were also present periodically during construction of the granular building pads this spring. Upon excavation to the approved subgrade level the building pad, consisting of imported crushed rock, was constructed. Several of the building pads required greater than one foot of fill. At these locations a coarser granular fill was used for the lower portion of the fill and was subsequently capped with ¾-inch minus crushed rock. All of the building pads, with the exception of Building No. 18 were prepared in this manner.

FEI Testing & Inspection, Inc. was retained to conduct density testing on the imported crushed rock fill used to construct the building pads. The results of their density test results are attached. Pad locations where the rock did not initially meet the required 95% relative compaction were recompacted and retested. The results of the field density testing suggest that the rock was adequately compacted.

We understand that some additional fill placement may be required on some building pads prior to foundation construction. Therefore, we should be contacted prior to placement of additional fill to observe stripping and subgrade conditions. Additionally, field density testing will be required on additional fill that is necessary in these areas.

It has been a pleasure assisting you with this phase of your project. Please do not hesitate to contact us if you have any questions or if you require further assistance.

Sincerely,

FOUNDATION ENGINEERING, INC.

Mel McCracken, P.E.
Project Manager

DOES NOT FULFILL PAD CERTIFICATION REQMTS. REFER TO 3RD PR LETTER.

MJM/cs
Attachment

cc: Darrin Stairs, P.E., OTAK

Portland • Corvallis
820 NW Cornell Avenue • Corvallis, Oregon 97330-4517 • Bus. (541) 757-7645 • Fax (541) 757-7650

FEI TESTING & INSPECTION, INC.

Geotechnical & Construction Services

Field Density Test Results - ASTM D 2922

Client: Mel McCracken, P.E.
Foundation Engineering, Inc.
820 NW Cornell Avenue
Corvallis, Oregon 97330

Project: Grand Oaks Multi-Family Apartments
Corvallis, Oregon

Date: 9-30-03
Project No.: 2036176
Report No. C-03258

MOISTURE/DENSITY DATA: ASTM D 698 – Max. Dry Density 85.0 pcf, Optimum Moisture 32.0%.
M/D information obtained from our sample no. 1556 dated 10-01-03 for light brownish, iron-stained clayey SILT.

Approximate Test Location	Approx. Elev.	Wet Density (pcf)	Percent Moisture	Dry Density (pcf)	Percent Compaction	Compaction Requirement (percent)
front side of Building 21	2' BFSG	119.3	29.1	90.2	100+	95
back side of Building 21	2' BFSG	111.4	28.2	83.3	98	95
front side of Building 20	2' BFSG	115.0	32.9	82.0	96	95
back side of Building 20	2' BFSG	111.3	28.5	82.8	97	95
front side of Building 19	2' BFSG	118.7	31.5	87.2	100+	95
back side of Building 19	2' BFSG	126.6	25.1	101.5	100+	95
middle of Building 16	4' BFSG	118.3	30.6	87.7	100+	95

Tests performed at the above-noted elevations of fill under buildings 16, 19, 20 and 21.

Respectfully,

M. L. Meyer

Michael L. Meyer, Technical Manager

COPY

c: OTAK, Inc. – Darrin Stairs, P.E.
Willamette Builders Group, L.L.C. – Neal Japport

MLM:ah

FEI TESTING & INSPECTION, INC.

Geotechnical & Construction Services

Field Density Test Results - ASTM D 2922

Client: Mel McCracken, P.E.
Foundation Engineering, Inc.
820 NW Cornell Avenue
Corvallis, Oregon 97330

Project: Grand Oaks Multi-Family Apartments
Corvallis, Oregon

Date: 10-03-03
Project No.: 2036176
Report No. C-03335

MOISTURE/DENSITY DATA: ASTM D 698 – Max. Dry Density 86.5 pcf, Optimum Moisture 28.0%.
M/D information obtained from our sample no. 1556 dated 10-01-03 for light brownish, iron-stained clayey SILT.

Test No.	Approximate Test Location	Approx. Elev.	Wet Density (pcf)	Percent Moisture	Dry Density (pcf)	Percent Compaction	Compaction Requirement (percent)
8	25' south of center of Building 15	FG	117.8	24.8	94.4	100+	95
9	20' south, 15' west of center of Building 16	-1.5'	117.5	23.4	95.3	100+	95
10	25' south, 25' west of center of Building 17	FG	97.0	16.1	83.5	97	95
11	center of Building 18	-1.5'	111.7	29.9	86.0	99	95
12	center of Building 20	FG	117.1	25.4	93.4	100+	95
13	center of Building 21*	-4'	122.6	24.0	98.9	100+	95

Tests performed at finished grade and below finished grade of fill under building pads.

*rock present in area of test

Respectfully,

M. L. Meyer

Michael L. Meyer, Technical Manager

c: OTAK, Inc. – Darrin Stairs, P.E.
Willamette Builders Group, L.L.C. – Neal Japport

MLM:ah

*REVISED 10-03-03**

FEI TESTING & INSPECTION, INC.

Geotechnical & Construction Services

Field Density Test Results - ASTM D 2922

Client: Mel McCracken, P.E.
Foundation Engineering, Inc.
820 NW Cornell Avenue
Corvallis, Oregon 97330

Project: Grand Oaks Multi-Family Apartments
Corvallis, Oregon

Date: 9-30-03
Project No.: 2036176
Report No. C-03258

MOISTURE/DENSITY DATA: ASTM D 698 – Max. Dry Density 86.5* pcf, Optimum Moisture 28.0*%.
M/D information obtained from our sample no. 1556 dated 10-01-03 for light brownish, iron-stained clayey SILT.

Test No.*	Approximate Test Location	Approx. Elev.	Wet Density (pcf)	Percent Moisture	Dry Density (pcf)	Percent Compaction	Compaction Requirement (percent)
1	front side of Building 21	2' BFSG	119.3	29.1	90.2	100+	95
2	back side of Building 21	2' BFSG	111.4	28.2	83.3	96*	95
3	front side of Building 20	2' BFSG	115.0	32.9	82.0	95*	95
4	back side of Building 20	2' BFSG	111.3	28.5	82.8	96*	95
5	front side of Building 19	2' BFSG	118.7	31.5	87.2	100+	95
6	back side of Building 19	2' BFSG	126.6	25.1	101.5	100+	95
7	middle of Building 16	4' BFSG	118.3	30.6	87.7	100+	95

Tests performed at the above-noted elevations of fill under buildings 16, 19, 20 and 21.

Respectfully,

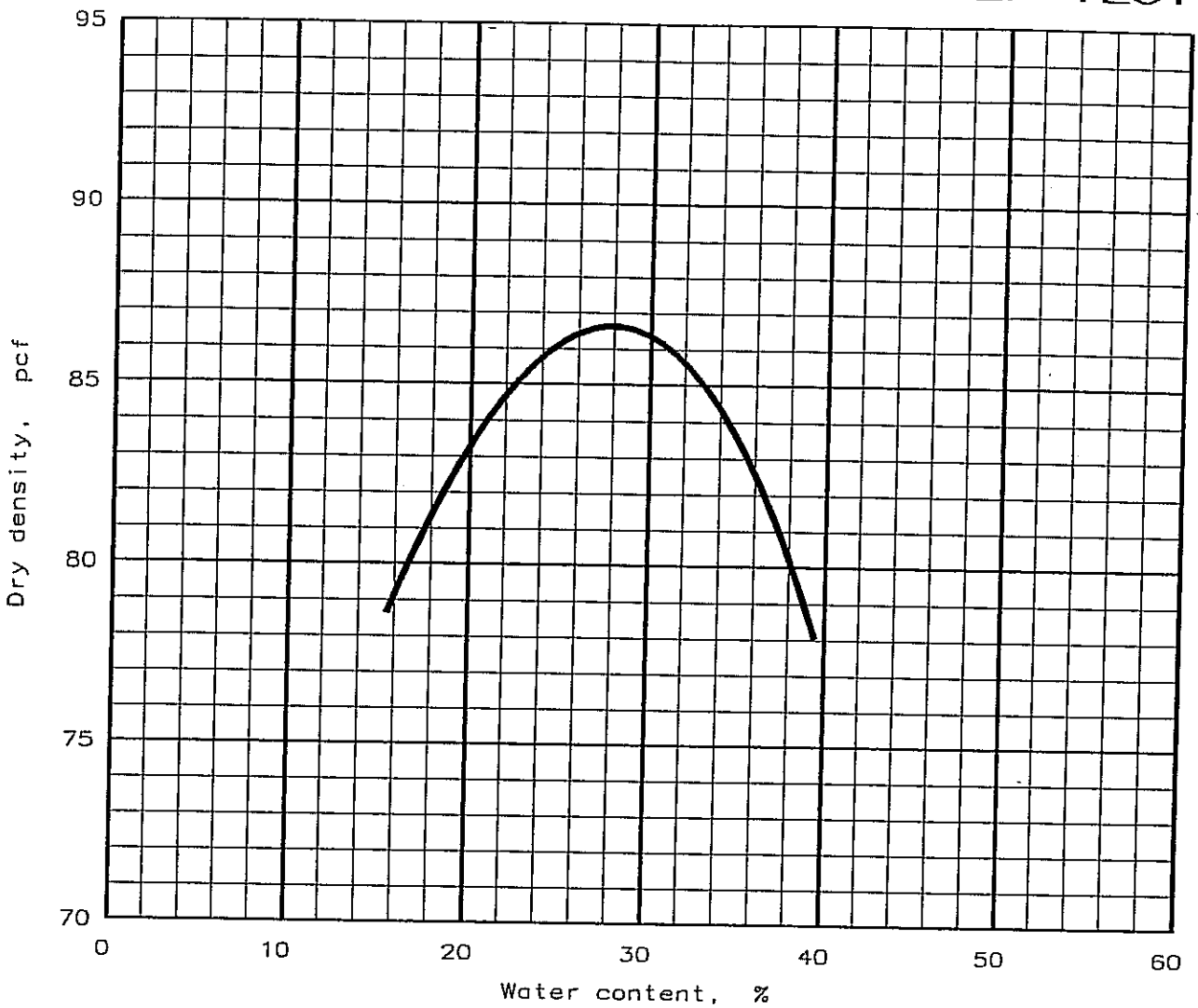
Michael L. Meyer, Technical Manager

c: OTAK, Inc. – Darrin Stairs, P.E.
Willamette Builders Group, L.L.C. – Neal Japport

Attachment – Moisture-Density Relationship Test (1 page)*

MLM:ah

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Method A, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 86.5 pcf Optimum moisture = 28.0 %	Light brownish iron stained clayey Silt

Project No.: 2036176

Project: Grand Oaks Multifamily

Location: Corvallis, Oregon

Date: 10-01-2003

Remarks:

Sample #1556

MOISTURE-DENSITY RELATIONSHIP TEST

FEI TESTING AND INSPECTION, INC.

Fig. No. 1

FEI TESTING & INSPECTION, INC.

Geotechnical & Construction Services

Field Density Test Results - ASTM D 2922

Client: Mel McCracken, P.E.
Foundation Engineering, Inc.
820 NW Cornell Avenue
Corvallis, Oregon 97330

Project: Grand Oaks Multi-Family Apartments
Corvallis, Oregon

Date: 3-10-04
Project No.: 2036176
Report No. C-04165

MOISTURE/DENSITY DATA: ASTM D 698 – Max. Dry Density 123.0 pcf, Optimum Moisture 9.5%. M/D information obtained from our sample no. 1623 dated 2-05-04 for 3/4" minus, crushed gravel (Morse Bros., Inc – Corvallis Pit).

Test No.	Approximate Test Location	Approx. Elev.	Wet Density (pcf)	Percent Moisture	Dry Density (pcf)	Percent Compaction	Compaction Requirement (percent)
	Storm Drain Trench – Line FF						
29	near STA 10+90	FG	131.4	11.9	117.4	95	95
30	near STA 11+90	FG	126.3	8.5	116.4	95	95
31	near STA 12+80	FG	139.4	10.6	126.0	100+	95
32	near STA 13+80	FG	129.5	9.9	117.8	96	95
33	near STA 14+80	FG	131.1	11.2	117.9	96	95
34	near STA 15+30	FG	127.3	9.3	116.5	95	95
	Storm Drain Trench – Line EE						
35	near STA 3+50	FG	125.3	7.7	116.4	95	95
36	near STA 2+50	FG	125.6	6.4	118.1	96	95
	Building Pad #22						
37	near center east 1/2 of upper level	FG	128.9	6.1	121.5	99	95
38	near center west 1/2 of upper level	FG	133.1	6.9	124.4	100+	95
39	near center west 1/2 of lower level	FG	126.7	5.8	119.8	97	95
40	near center east 1/2 of lower level	FG	126.9	6.6	119.0	97	95
	Building Pad #14						
41	near center east 1/2 of lower level	FG	123.4	4.9	117.6	96	95
42	near center west 1/2 of lower level	FG	122.6	6.7	114.9	**93**	95
43	near center east 1/2 of upper level	FG	120.6	6.4	113.4	**92**	95
44	near center west 1/2 of upper level	FG	127.7	6.1	120.4	98	95

Tests performed at finished grade of trench backfill and base rock. REMARKS: **Bolding** denotes failing test.

Respectfully,

Keith R. Kernan, President

COPY

c: OTAK, Inc. – Darrin Stairs, P.E. (FAX)
Willamette Builders Group, L.L.C. – Neal Jappport (FAX)

KRK:ah

FEI TESTING & INSPECTION, INC.

Geotechnical & Construction Services

Field Density Test Results - ASTM D 2922

Client: Mel McCracken, P.E.
Foundation Engineering, Inc.
820 NW Cornell Avenue
Corvallis, Oregon 97330

Project: Grand Oaks Multi-Family Apartments
Corvallis, Oregon

Date: 3-12-04
Project No.: 2036176
Report No. C-04177

MOISTURE/DENSITY DATA: ASTM D 698 – Max. Dry Density 123.0 pcf, Optimum Moisture 9.5%. M/D information obtained from our sample no. 1623 dated 2-05-04 for 3/4" minus, crushed gravel (Morse Bros., Inc – Corvallis Pit).

Test No.	Approximate Test Location	Approx. Elev.	Wet Density (pcf)	Percent Moisture	Dry Density (pcf)	Percent Compaction	Compaction Requirement (percent)
	Building Pad #14						
42A	near center west 1/2 of lower level	FG	128.5	7.4	119.7	97	95
43A	near center east 1/2 of upper level	FG	129.0	8.6	118.8	97	95
	Storm Drain Trench – Line JJ						
45	near STA 2+32	FG	137.4	11.3	123.5	100	95
46	near STA 3+37	FG	133.6	10.0	121.5	99	95

Tests performed at finished grade of trench backfill and base rock.

Respectfully,

Keith R. Kernan, President

COPY

c: OTAK, Inc. – Darrin Stairs, P.E. (FAX)
Willamette Builders Group, L.L.C. – Neal Japport (FAX)

KRK:ah

FEI TESTING & INSPECTION, INC.

Geotechnical & Construction Services

Field Density Test Results - ASTM D 2922

Client: Mel McCracken, P.E.
Foundation Engineering, Inc.
820 NW Cornell Avenue
Corvallis, Oregon 97330

Project: Grand Oaks Multi-Family Apartments
Corvallis, Oregon

Date: 4-06-04
Project No.: 2036176
Report No.: C-04298

MOISTURE/DENSITY DATA: ASTM D 698 – Max. Dry Density 129.5 pcf, Optimum Moisture 10.5%.
M/D information obtained from our sample no. 1661 dated 4-01-04 for 3/4" minus (Hardrock Pit).

Test No.	Approximate Test Location	Approx. Elev.	Wet Density (pcf)	Percent Moisture	Dry Density (pcf)	Percent Compaction	Compaction Requirement (percent)
	Pad 21						
55	upper west one-half	FG	132.2	7.5	123.0	95	95
56	upper east one-half	FG	132.8	6.8	124.3	96	95
57	lower west one-half	FG	132.4	7.1	123.6	95	95
58	lower east one-half	FG	134.2	7.3	125.1	97	95
	Pad 20						
59	upper west one-half	FG	134.7	8.0	124.8	96	95
60	upper east one-half	FG	133.1	7.6	123.7	96	95
61	lower west one-half	FG	132.0	7.4	122.9	95	95
62	lower east one-half	FG	133.9	7.9	124.1	96	95
	Pad 19						
63	upper middle	FG	131.0	6.1	123.5	95	95
64	lower west one-half	FG	133.7	7.3	124.6	96	95
65	lower east one-half	FG	131.1	6.9	122.6	95	95

Tests performed at finished grade of fill under building pads.

Respectfully,

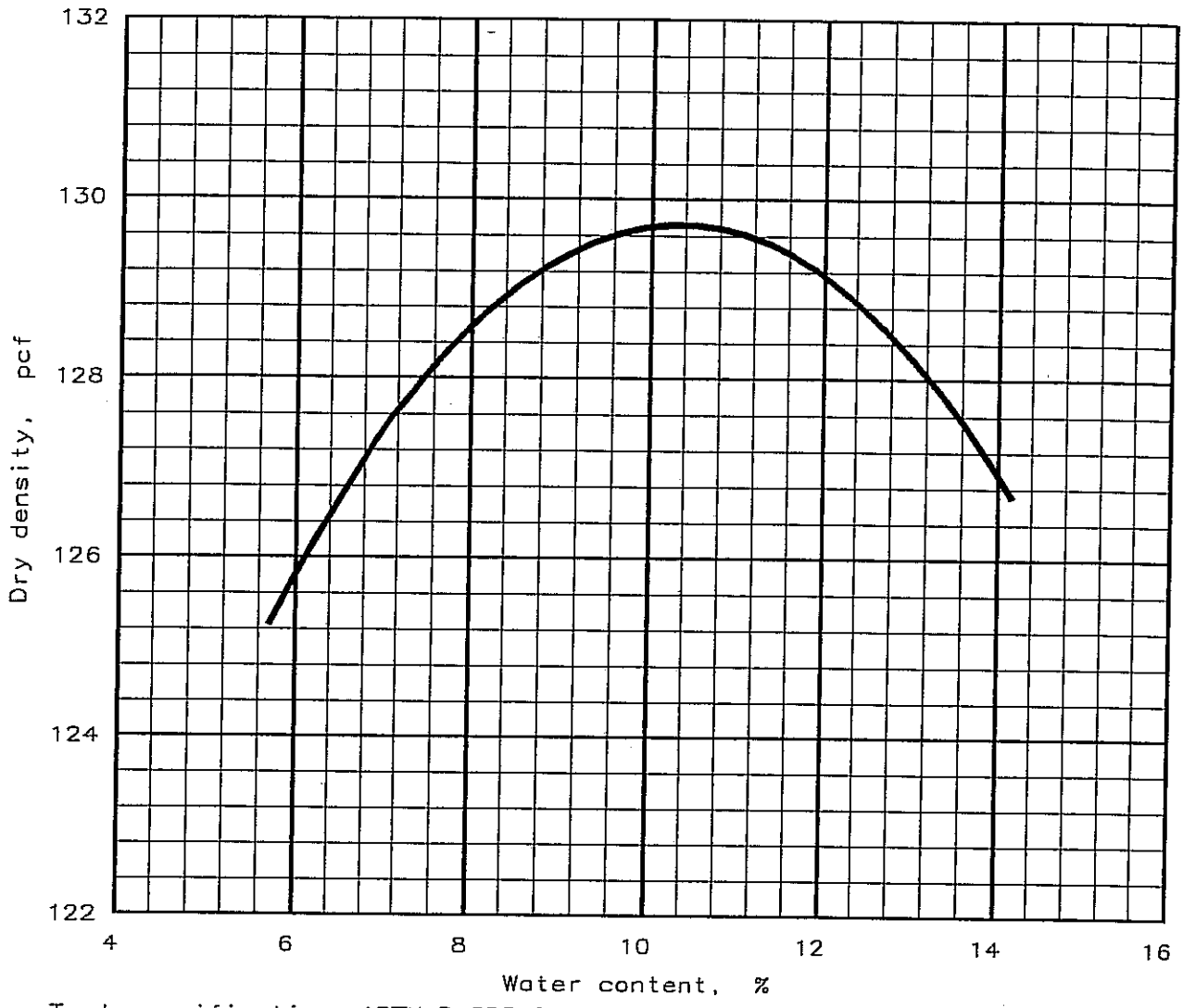
Keith R. Kernan, President

c: OTAK, Inc. – Darrin Stairs, P.E. (FAX)
Willamette Builders Group, L.L.C. – Neal Jappport (FAX)

Attachment – Moisture-Density Relationship Test (1 page)

KRK:ah

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Method C, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 129.5 pcf Optimum moisture = 10.5 %	3/4" minus Hardrock Pit

Project No.: 2036176

Project: Grand Oaks Multi Family

Location: Corvallis, Oregon

Date: 4-01-2004

Remarks:

Sample 1661

MOISTURE-DENSITY RELATIONSHIP TEST

FEI TESTING AND INSPECTION, INC.

Fig. No. 1

FEI TESTING & INSPECTION, INC.

Geotechnical & Construction Services

Field Density Test Results - ASTM D 2922

Client: Mel McCracken, P.E.
Foundation Engineering, Inc.
820 NW Cornell Avenue
Corvallis, Oregon 97330

Project: Grand Oaks Multi-Family Apartments
Corvallis, Oregon

Date: 4-28-04
Project No.: 2036176
Report No.: C-04383

MOISTURE/DENSITY DATA: ASTM D 698 – Max. Dry Density 129.5 pcf, Optimum Moisture 10.5%:.
M/D information obtained from our sample no. 1661 dated 4-01-04 for 3/4" minus (Hardrock Pit).

Test No.	Approximate Test Location	Approx. Elev.	Wet Density (pcf)	Percent Moisture	Dry Density (pcf)	Percent Compaction	Compaction Requirement (percent)
66	100' west of Grand Oaks Drive	FG	154.7	10.2	140.4	100+	95
67	200' west of Grand Oaks Drive	FG	147.6	7.3	137.5	100+	95
68	300' west of Grand Oaks Drive	FG	149.8	6.9	140.2	100+	95
69	400' west of Grand Oaks Drive	FG	153.0	6.7	143.4	100+	95
70	500' west of Grand Oaks Drive	FG	134.7	7.5	125.3	97	95
71	600' west of Grand Oaks Drive	FG	154.7	6.2	145.6	100+	95
72	700' west of Grand Oaks Drive	FG	148.2	8.2	137.0	100+	95
73	800' west of Grand Oaks Drive	FG	139.2	5.8	131.5	100+	95
74	900' west of Grand Oaks Drive	FG	143.9	6.4	135.2	100+	95
75	Pad #17, east pad	FG	132.4	7.0	123.8	96	95
76	Pad #17, west pad	FG	135.7	6.4	127.6	99	95
77	Pad #16, west pad	FG	138.6	6.5	130.1	100+	95
78	Pad #16, east pad	FG	133.5	7.4	124.2	96	95
79	Pad #15, west pad	FG	137.8	6.6	129.3	100	95
80	Pad #15, east pad	FG	135.9	7.8	126.1	97	95

Tests performed at finished grade of base rock in the roadway and building pads.

Respectfully,

Keith R. Kernan, President

c: OTAK, Inc. – Darrin Stairs, P.E. (FAX)
Willamette Builders Group, L.L.C. – Neal Japport (FAX)

KRK:ah