ENT 68509:2016 PG 1 of 34
JEFFERY SMITH
UTAH COUNTY RECORDER
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American Fork UT 84003

NOTICE OF INTEREST, BUILDING REQUIREMENTS, AND ESTABLISHMENT OF RESTRICTIVE COVENANTS

This Notice is recorded to bind the attached Geotechnical Study dated JUNE 19, 2013 along with the site grading plan to the property generally located at 740 EAST 400 SOUTH (address), American Fork, UT 84003 and therefore mandating that all construction be in compliance with said Geotechnical Study and site grading plan per the requirements of American Fork City ordinances and standards and specifications including specifically Ordinance 07-10-47, Section 6-5, Restrictive Covenant Required and 6-2-4, Liquefiable Soils. Said Sections require establishment of a restrictive covenant and notice to property owners of liquefiable soils or other unique soil conditions and construction methods associated with the property.

Exhibit A – Legal Description of Property
Exhibit B – Geotechnical Study
Exhibit C – Site Grading Plan

Dated this 25th day of July, 2016.

OWNER(S):

(Signature) _____ (Signature) _____

Glen K Lent (Printed Name) _____ (Printed Name)

V.P. of Land (Title) _____ (Title)

STATE OF UTAH)
§
COUNTY OF UTAH)

On the 25 day of July, 16, personally appeared before me Glen Lent and _____, Owner(s) of said Property, as (individuals and/or authorized representatives of a company), and acknowledged to me that such individuals or company executed the within instrument freely of their own volition and pursuant to the articles of organization where applicable.

_____
Notary Public
My Commission Expires: 12/28/19

ALLISON NICOL ACKERMAN
NOTARY PUBLIC -STATE OF UTAH
My Comm. Exp 12/28/2019
Commission # 686545

Exhibit A – Legal Description of Property

A parcel of land located in the East Half of Section 24, Township 5 South, Range 1 East, Salt Lake Base and Meridian, the Basis of Bearings is N00°24'14"W between the East Quarter Corner and the Northeast Section Corner of Section 24, said parcel being more particularly described as follows:

Beginning at a point West 1254.19 feet and North 13.89 feet from the East Quarter Corner of Section 24, Township 5 South, Range 1 East, Salt Lake Base and Meridian, and running thence S02°22'08"W 538.88 feet; thence N88°52'23"W 297.59 feet to the beginning of a tangent curve to the left having a radius of 15.00 feet; thence along the arc of said curve a length of 23.57 feet, passing through a central angle of 90°03'41", chord bears S46°06'40"W 21.22 feet; thence S01°04'50"W 59.96 feet; thence N88°55'10"W 66.00 feet; thence N01°04'50"E 60.04 feet to the beginning of a tangent curve to the left, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.55 feet, passing through a central angle of 89°57'12", chord bears N43°53'46"W 21.20 feet; thence N01°03'37"E 66.00 feet to the beginning of a non-tangent curve to the left, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.57 feet, passing through a central angle of 90°02'43", chord bears N46°06'17"E 21.22 feet; thence N01°04'55"E 139.37 feet to the beginning of a tangent curve to the left, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.85, passing through a central angle of 91°04'55", chord bears N44°27'32"W 21.41 feet; thence N01°46'20"E 47.02 feet to the beginning of a non-tangent curve to the left having a radius of 15.00 feet; thence along the arc of said curve a length of 23.28 feet, passing through a central angle of 88°55'05", chord bears N45°32'28"E 21.01 feet; thence N01°04'55"E 95.30 feet; thence East 6.06 feet; thence North 163.94 feet; thence S70°30'24"E 32.71 feet; thence S05°06'07"E 7.53 feet; thence S88°50'44"E 355.89 feet to the point of beginning.

A parcel of land located in the Northwest Quarter of the Southeast Quarter of Section 24, Township 5 South, Range 1 East, Salt Lake Base and Meridian, the Basis of Bearings is N00°24'14"W between the East Quarter Corner and the Northeast Section Corner of Section 24, said parcel being more particularly described as follow:

Beginning at a point West 1647.58 feet and South 124.46 feet from the East Quarter Corner of Section 24, Township 5 South, Range 1 East, Salt Lake Base and Meridian, and running thence S01°04'55"W 95.30 feet to the beginning of a tangent curve to the right, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.28 feet, passing through a central angle of 88°55'05", chord bears S45°32'28"W 21.01 feet; thence S01°46'20"W 47.02 feet to the beginning of a non-tangent curve to the right, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.85 feet, passing through a central angle of 91°04'55", chord bears S44°27'32"E 21.41 feet; thence S01°04'55"W 139.37 feet to the beginning of a tangent curve to the right, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.57 feet, passing through a central angle of 90°02'43", chord bears S46°06'17"W 21.22 feet; thence S01°03'37"W 66.00 feet; thence N88°52'22"W 28.34 feet to the beginning of a tangent curve to the right, having a radius of 483.00 feet; thence along the arc of said curve a length of 54.91 feet, passing through a central angle of 06°30'49", chord bears N85°36'58"W 54.88 feet, to the beginning of a tangent curve to the left, having a radius of 15.00 feet; thence along the arc of said curve a length of 24.14 feet, passing through a central angle of 92°12'56", chord bears S51°31'59"W 21.62 feet; thence N75°19'40"W 47.52 feet to the beginning of a non-tangent curve to the left, having a radius of 15.00 feet; thence along the arc of said curve a length of 21.97 feet, passing through a central angle of 83°54'35", chord bears N35°03'49"W 20.06 feet; thence N77°01'06"W 69.18 feet to the beginning of a tangent curve to the left, having a radius of 417.00 feet; thence along the arc of said curve a length of 93.47 feet, passing through a central angle of 12°50'35", chord bears N83°26'24"W 93.28 feet; thence N89°51'52"W 83.00 feet to the beginning of a tangent curve to the left, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.50 feet, passing through a central angle of 89°45'27", chord bears S45°15'36"W 21.17 feet; thence N89°52'59"W 39.68 feet; thence N00°48'16"E 361.19 feet; thence East 472.60 feet to the point of beginning.

A parcel of land located in the Northwest Quarter of the Southeast Quarter of Section 24, Township 5 South, Range 1 East, Salt Lake Base and Meridian, the Basis of Bearings is N00°24'14"W between the East Quarter Corner and the Northeast Section Corner of Section 24, said parcel being more particularly described as follow:

Beginning at a point West 1276.46 feet and South 524.53 feet from the East Quarter Corner of Section 24, Township 5 South, Range 1 East, Salt Lake Base and Meridian, and running thence S02°22'08"W 419.94 feet; thence N89°51'41"W 369.21 feet; thence N01°04'50"E 64.93 feet to the beginning of a tangent curve to the left, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.81 feet, passing through a central angle of 90°56'30", chord bears N44°23'25"W 21.39 feet; thence N01°36'51"E 52.92 feet to the beginning of a non-tangent curve to the left, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.32 feet, passing through a central angle of 89°03'30", chord bears N45°36'35"E 21.04 feet; thence N01°04'50"E 203.35 feet; thence S88°55'10"E 66.00 feet; thence N01°04'50"E 59.96 feet to the beginning of a tangent curve to the right, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.57 feet, passing through a central angle of 90°03'41", chord bears N46°06'40"E 21.22 feet, thence S88°52'23"E 297.60 feet to the point of beginning.

Exhibit A – Legal Description of Property (continued)

A parcel of land located in the Northwest Quarter of the Southeast Quarter of Section 24, Township 5 South, Range 1 East, Salt Lake Base and Meridian, the Basis of Bearings is N00°24'14"W between the East Quarter Corner and the Northeast Section Corner of Section 24, said parcel being more particularly described as follow:

Beginning at a point West 1655.28 feet and South 532.07 feet from the East Quarter Corner of Section 24, Township 5 South, Range 1 East, Salt Lake Base and Meridian, and running thence S01°04'50"W 263.39 feet to the beginning of a tangent curve to the right, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.31 feet, passing through a central angle of 89°03'30", chord bears S45°36'35"W 21.04 feet; thence S01°36'51"W 52.92 feet to the beginning of a non-tangent curve to the right, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.81 feet, passing through a central angle of 90°56'30", chord bears S44°23'25"E 21.38 feet; thence S01°04'50"W 64.93 feet; thence N89°51'41"W 462.67 feet; thence N00°06'16"W 375.54 feet; thence N00°48'16"E 80.95 feet; thence N89°52'31"E 39.68 feet to the beginning of a non-tangent curve to the right, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.50 feet, passing through a central angle of 89°45'27", chord bears N45°15'36"E 21.17 feet; thence S89°51'41"E 83.00 feet to the beginning of a tangent curve to the right, having a radius of 417.00 feet; thence along the arc of said curve a length of 93.47 feet, passing through a central angle of 12°50'35", chord bears S83°26'24"E 93.28 feet; thence S77°01'06"E 69.18 feet to the beginning of a tangent curve to the right, having a radius of 15.00 feet; thence along the arc of said curve a length of 21.97 feet, passing through a central angle of 83°54'34", chord bears S35°03'49"E 20.06 feet; thence S75°19'40"E 47.52 feet to the beginning of a non-tangent curve to the right, having a radius of 15.00 feet; thence along the arc of said curve a length of 24.14 feet, passing through a central angle of 92°12'56", chord bears N51°31'59"E 21.62 feet, to the beginning of a tangent curve to the left, having a radius of 483.00 feet; thence along the arc of said curve a length of 54.91 feet, passing through a central angle of 06°30'49", chord bears S85°36'58"E 54.88 feet; thence S88°52'22"E 28.34 feet to the beginning of a tangent curve to the right, having a radius of 15.00 feet; thence along the arc of said curve a length of 23.55 feet, passing through a central angle of 89°57'12", chord bears S43°53'46"E 21.20 feet to the point of beginning.

Exhibit B – Geotechnical Study

AGEC
Applied GeoTech

GEOTECHNICAL INVESTIGATION

PROPOSED RESIDENTIAL DEVELOPMENT

350 SOUTH 740 EAST

AMERICAN FORK, UTAH

PREPARED FOR:

H & H ENGINEERING & SURVEYING, INC.
233 EAST MAIN STREET, SUITE 2
AMERICAN FORK, UTAH 84003

ATTENTION: VICTOR HANSEN

PROJECT NO. 1130324 **JUNE 19, 2013**

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

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EXECUTIVE SUMMARY

1. The subsurface soils encountered at the site consist of approximately 5 and 1½ feet of fill in Borings B-1 and B-3, respectively and approximately 4 to 6 inches of topsoil in the other borings. Interlayered silt and silty sand was encountered below the fill and topsoil in all but Boring B-3, which encountered interlayered clay and silty sand. The interlayered silt and silty sand extends to depths of approximately 1½to 7½ feet and is underlain by gravel in all but Boring B-5, which encountered interlayered clay and silty sand for the depth of the boring, approximately 12 feet. Gravel was encountered below the interlayered soil in Boring B-3 at a depth of approximately 13 feet and extended the full depth of the boring, approximately 40 feet.

2. Subsurface water was encountered at depths of approximately 13½ and 10 feet in Borings B-3 and B-5, respectively. Borings B-1, B-2 and B-4 did not extend down to the subsurface water level. Slotted PVC pipe was installed in the borings to facilitate future water level measurements.

3. The site is suitable for the proposed construction. The buildings may be supported on spread footings bearing on the undisturbed natural soil or on compacted structural fill extending down to the undisturbed natural soil and may be designed for a net allowable bearing pressure of 1,200 pounds per square foot. Footings bearing on at least 2 feet of compacted structural fill or on at least 2 feet of the natural undisturbed gravel may be designed for a net allowable bearing pressure of 2,500 pounds per square foot.

4. Some of the fill and natural soil at the site consists predominantly of clay or silt and will be easily disturbed by construction traffic when it is very moist to wet such as in the winter and spring or at times of prolonged rainfall. Placement of 1 to 2 feet of gravel will improve site access when construction occurs when the upper soil consists of very most to wet clay or silt.

5. Geotechnical information related to foundations, subgrade preparation, compaction and materials is included in the report.

SCOPE

This report presents the results of a geotechnical investigation for the proposed residential development located at 350 South 740 East in American Fork, Utah. The report presents the subsurface conditions encountered, laboratory test results and recommendations for foundations and pavement. The study was conducted in general accordance with our proposal dated April 23, 2013.

A field exploration program was conducted to obtain information on the subsurface conditions and to obtain samples for laboratory testing. Samples obtained during the field investigation were tested in the laboratory to determine physical and engineering characteristics of the on-site soil and to define conditions at the site for our engineering analysis. Results of the field exploration and laboratory tests were analyzed to develop recommendations for the proposed foundations and pavement.

This report has been prepared to summarize the data obtained during the study and to present our conclusions and recommendations based on the proposed construction and the subsurface conditions encountered. Design parameters and a discussion of geotechnical engineering considerations related to construction are included in the report.

SITE CONDITIONS

At the time of our field study, the site consisted of an undeveloped field. There are sewer and water lines that extend in a general north/south direction through the center portion of the property and some piles of fill, approximately 5 to 10 feet in height, near the center of the site.

The ground surface at the site is relatively flat and slopes gently down toward the southeast. Vegetation at the site consists of grass and weeds with some trees.

There are commercial buildings to the north and a nursery to the west. There are fields to the south and east.

FIELD STUDY

The field study was conducted on May 21, 2013. Five borings were drilled at the approximate locations indicate on Figure 1 using 8-inch diameter hollow-stem auger powered by a truck-mounted drill rig. The borings were logged and soil samples obtained by an engineer from AGEC. Logs of the subsurface conditions encountered in the borings are graphically shown on Figure 2 with legend and notes on Figure 3.

SUBSURFACE CONDITIONS

The subsurface soils encountered at the site consist of approximately 5 and 1½ feet of fill in Borings B-1 and B-3, respectively and approximately 4 to 6 inches of topsoil in the other borings. Interlayered silt and silty sand was encountered below the fill and topsoil in all but Boring B-3, which encountered interlayered clay and silty sand. The interlayered silt and silty sand extends to depths of approximately 1½to 7½ feet and is underlain by gravel in all but Boring B-5, which encountered interlayered clay and silty sand for the depth of the boring, approximately 12 feet. Gravel was encountered below the interlayered soil in Boring B-3 at a depth of approximately 13 feet and extended the full depth of the boring, approximately 40 feet.

A description of the various soils encountered in the borings follows:

Fill - The fill consists of silty gravel with sand in Boring B-1 and sandy lean clay in Boring B-3. The fill is slightly moist, dark brown and contains occasional organics.

Topsoil - The topsoil consists of silty and clayey sand. It is slightly moist, brown to dark brown and contains roots and organics.

Interlayered Lean Clay and Silty Sand - The interlayered soil contains occasional clayey sand layers. It is soft to medium stiff, loose to medium dense, moist to wet and brown to gray.

Laboratory tests performed on samples of the interlayered soil indicate that it has natural moisture contents ranging from 26 to 34 percent and natural dry densities ranging from 88 to 98 pounds per cubic foot (pcf).

An unconfined compressive strength of 480 pounds per square foot (psf) was measured for a sample of clay tested in the laboratory.

Results of a consolidation test performed on a sample of the interlayered soil indicate that it will compress a small to moderate amount with the addition of light to moderate loads. Results on the consolidation test are presented on Figure 4.

Interlayered Sandy Silt and Silty Sand - The interlayered soil contains occasional gravels. It is medium stiff, medium dense, slightly moist to moist and brown.

Laboratory tests performed on samples of the interlayered soil indicate that it has natural moisture contents ranging from 6 to 12 percent and natural dry densities ranging 73 to 98 pcf.

Poorly-Graded Gravel with Silt - The gravel contains a small to moderate amount of silt and sand with some coarse sand layers. The gravel is medium dense to very dense, slightly moist to wet and grayish brown.

Laboratory tests performed on a sample of the gravel indicate that it has a natural moisture content of 7 percent and a natural dry density of 138 pcf.

Poorly-Graded Gravel - The gravel contains some coarse sand. It is dense to very dense, moist to wet and brownish gray.

Results of the laboratory tests are summarized on Table I and are included on the logs of the borings.

SUBSURFACE WATER

Subsurface water was encountered in Borings B-3 and B-5 at depths of approximately 13½ and 10 feet, respectively, based on water level measurements taken 9 days after drilling. Borings B-1, B-2 and B-4 did not extend down to the water level. Slotted PVC pipe was installed in the borings to facilitate future measurement of the water level. Fluctuations in the water level can be expected over time. An evaluation of such fluctuations is beyond the scope of this report.

PROPOSED CONSTRUCTION

We understand that the property will be subdivided for single-family and multi-family residential buildings. We have assumed maximum column loads of 80 kips and maximum wall loads of 5 kips per lineal foot.

We anticipate that pavement will be included in the development of the site. We have assumed traffic to consist predominantly of car traffic with occasional light delivery trucks and two garbage trucks per week.

If the proposed construction, anticipated building loads or traffic is significantly different from what is described above, we should be notified so that we can reevaluate the recommendations given.

RECOMMENDATIONS

Based on the subsurface conditions encountered, laboratory test results, and the proposed construction, the following recommendations are given:

A. Site Grading

Final site grading plans were not available at the time of our investigation. Based on our understanding of the proposed construction, we anticipate that there will be relatively minor amounts of cut and fill (less than 3 feet) for the proposed project.

1. Pavement Subgrade Preparation

Prior to placing site grading fill or base course, unsuitable fill, topsoil, organics, debris and other deleterious materials should be removed.

The subgrade in proposed pavement areas should be scarified to a depth of approximately 8 inches, the moisture adjusted to within 2 percent of optimum and the subgrade compacted to at least 90 percent of the maximum dry density as determined by ASTM D 1557. The subgrade should be proof-rolled to identify soft areas. If soft areas are encountered, they should be removed and replaced with properly compacted fill.

Some of the upper soil and fill consists predominantly of clay or silt and will easily be disturbed by construction traffic where it is very moist to wet such as in the winter and spring or in times of prolonged rainfall. Placement of 1

to 2 feet of gravel will improve access for construction equipment when the upper soil consists of very moist to wet clay or silt. A separation may be placed between the clay or silt and fill to facilitate construction.

2. Excavation

We anticipate that excavation at the site can be accomplished with typical excavation equipment. Consideration should be given to using excavation equipment with a flat cutting edge when excavating for building foundations in clay, silt or sand to minimize disturbance of the bearing soil.

If excavations extend below the water level, the excavations should be dewatered. The water level should be maintained below the base of the excavation during initial fill and concrete placement. Free-draining gravel with less than 5 percent passing the No. 200 sieve should be used for fill or backfill below the original water level. Consideration should be given to using a support fabric above the subgrade prior to placement of free-draining gravel.

3. Cut and Fill Slopes

Temporary, unretained cut and fill slopes may be constructed at 1½ horizontal to 1 vertical or flatter. This assumes that excavations below the water level are properly dewatered. Permanent, unretained cut and fill slopes may be constructed at 2 horizontal to 1 vertical or flatter. Slopes should be protected from erosion by revegetation or other methods.

4. Materials

Materials placed as fill to support foundations should be non-expansive granular soil. The natural sand and gravel may be suitable for use as structural fill if the topsoil, organics and other deleterious materials are removed and if they meet the recommendations given below for imported structural fill. The sand and gravel may also be used as site grading fill, utility

trench backfill or wall backfill if topsoil, organics and other deleterious materials are removed or they may be used in landscape areas. The silt and clay are not suitable for use as structural fill but may be used as site grading fill, as utility trench backfill and foundation wall backfill, if the topsoil, organics and other deleterious materials are removed, or they may be used in landscape areas.

Some of the on-site soil has relatively high moisture contents and may require drying prior to use as compacted fill. Drying of the soil may not be practical during cold or wet times of the year.

Free-draining gravel with less than 5 percent passing the No. 200 sieve should be used as fill or backfill below the original water level.

Listed below are materials recommended for imported structural fill.

Fill to Support	Recommendation
Footings	Non-expansive granular material Passing No. 200 sieve<35% Liquid Limit < 30% Maximum size 4 inches
Floor Slab (Upper 4 inches)	Non-expansive granular material Passing No. 200 sieve <5% Maximum size 2 inches
Floor Slab	Non-expansive granular material Passing No. 200 sieve <50% Liquid Limit <30% Maximum size 6 inches

5. Compaction

Compaction of materials placed at the site should equal or exceed the minimum densities as indicated below when compared to the maximum dry density as determined by ASTM D 1557.

Fill to Support	Compaction
Foundations	≥95%
Concrete flatwork and Pavement	≥90%
Landscaping	≥85%
Foundation wall backfill	85 - 90%

To facilitate the compaction process, the fill should be compacted at a moisture content within 2 percent of the optimum moisture content.

Base course should be compacted to at least 95 percent of the maximum dry density as determined by ASTM D 1557.

Fill and pavement materials placed for the project should be frequently tested for compaction during placement and compaction. Fill should be placed in thin enough lifts to allow for adequate compaction.

6. Drainage

The ground surface surrounding the proposed structures should be sloped away from the buildings in all directions with a slope of at least 6 inches in 10 feet for a distance of at least 10 feet away from the structures. Roof downspouts and drains should discharge beyond the limits of backfill.

The collection and diversion of drainage away from the pavement surface is important to the satisfactory performance of the pavement section. Proper drainage should be provided.

B. Foundations

1. Bearing Material

The proposed buildings may be supported on spread footings bearing on the undisturbed natural soil or on compacted structural fill extending down to the undisturbed natural soil. Structural fill should extend out away from the edge of footings a distance at least equal to the depth of fill placed beneath the footings.

A layer of free-draining gravel or lean concrete may be needed to provide a working surface for footing construction if footing excavations extend to the very moist to wet soil.

The topsoil, organics, unsuitable fill, debris and other deleterious material should be removed from below proposed foundation areas.

2. Bearing Pressures

Spread footings bearing on the undisturbed natural soil may be designed for a net allowable bearing pressure of 1,200 psf. Footings bearing on at least 2 feet of compacted structural fill extending down to the undisturbed natural soil or on at least 2 feet of the natural gravel may be designed for a net allowable bearing pressure of 2,500 psf.

3. Settlement

Based on the subsoil conditions encountered and the assumed building loads as described in the Proposed Construction section of this report, we estimate that total and differential settlement for foundations designed as indicated above will be less than ¾ and ½ inch, respectively.

Care will be required to not disturb the natural soil at the base of foundation excavations in order to maintain settlement within tolerable limits.

4. Footing Width and Embedment

The footings should have a minimum width of 1½ feet and a minimum depth of embedment of 1 foot.

5. Temporary Loading Conditions

The allowable bearing pressures may be increased by one-half for temporary loading conditions such as wind and seismic loads.

6. Frost Depth

Exterior footings and footings beneath unheated areas should be placed at least 30 inches below grade for frost protection.

7. Foundation Base

The base of foundation excavations should be cleared of loose or deleterious material prior to fill or concrete placement.

8. Construction Observation

A representative of the geotechnical engineer should observe footing excavations prior to structural fill or concrete placement.

C. Concrete Slab-on-Grade

1. Slab Support

Concrete slabs may be supported on the natural undisturbed soil or on compacted structural fill extending down to the undisturbed natural soil.

Unsuitable fill, topsoil, organics and other deleterious materials should be removed from below proposed floor slabs.

2. Underslab Gravel

A 4-inch layer of free draining gravel (less than 5 percent passing the No. 200 sieve) should be placed below the floor slab for ease of construction and to promote even curing of the slab concrete.

D. Lateral Earth Pressures

1. Lateral Resistance for Footings

Lateral resistance for footings placed on compacted structural fill or on the natural soil is controlled by the lower sliding resistance developed between the footing and the structural fill or natural soil or between the structural fill and the natural soil plus the passive resistance of the structural fill against the natural soil. A friction value of 0.35 may be used in design for ultimate lateral resistance.

2. Subgrade Walls and Retaining Structures

The following equivalent fluid weights are given for design of subgrade walls and retaining structures. The active condition is where the wall moves away from the soil. The passive condition is where the wall moves into the soil and the at-rest condition is where the wall does not move. The values listed assume a horizontal surface adjacent the top and bottom of the wall.

Soil Type	Active	At-Rest	Passive
Sand/Gravel	40 pcf	55 pcf	300 pcf
Clay/Silt	50 pcf	65 pcf	250 pcf

3. Seismic Conditions

Under seismic conditions, the equivalent fluid weight should be increased by 32 pcf for active and 17 pcf for at-rest conditions and decreased by 32 pcf for the passive condition. This assumes a peak horizontal ground acceleration of 0.52g which represents a 2 percent probability of exceedance in a 50-year period (IBC, 2012).

4. Safety Factors

The values recommended above assume mobilization of the soil to achieve ultimate soil strength. Conventional safety factors used for structural analysis for such items as overturning and sliding resistance should be used in design.

E. Subsurface Drains

If the lowest floor level of a residence extends below original grade, the subgrade floor portion of the residence should be protected with a perimeter drain system. The perimeter drain system should consist of at least the following items:

a. The underdrain system should consist of a perforated pipe installed in a gravel filled trench around the perimeter of the subgrade floor portion of the building.

b. The flow line of the pipe should be placed at least 18 inches below the finished floor level and should slope to a sump or outlet where water can be removed by pumping or by gravity flow.

c. If placing the gravel and drain pipe requires excavation below the bearing level of the footing, the excavation for the drain pipe and gravel should have a slope no steeper than 1 horizontal to 1 vertical so as not to disturb the soil below the footing.

d. A filter fabric should be placed between the natural soil and the drain gravel. This will help reduce the potential for fine-grained material filling in the void spaces of the gravel.

e. The subgrade floor slab should have at least 6 inches of free-draining gravel placed below it and the underslab gravel should connect to the perimeter drain.

f. Consideration should be given to installing cleanouts to allow access into the perimeter drain should cleaning of the pipe be required in the future.

F. Seismicity, Faulting and Liquefaction

1. Seismicity

Listed below is a summary of the site parameters for the International Building Code 2012:

a.	Site Class	D
b.	Short Period Spectral Response Acceleration, S_s	1.19g
c.	One Second Period Spectral Response Acceleration, S_1	0.42g

2. Faulting

There are no mapped active faults extending through the project site. The closest mapped active fault to the site is the Wasatch Fault located approximately 2.7 miles to the east/northeast (Black and others, 2003)

3. Liquefaction

The site is located in an area mapped as having a "moderate" liquefaction potential (Anderson and others, 1994). Research indicates that the soil type

most susceptible to liquefaction during a large magnitude earthquake is loose, clean sand. In order for liquefaction to occur, the soil must be saturated. The liquefaction potential for soil tends to decrease with an increase in fines content and density.

The subsurface soil encountered at the site to the depth investigated, consists predominantly of clay, silt and sand over gravel. The gravel and soil above the water level are not considered susceptible to liquefaction. There is silt and sand in Boring B-5 that is below the water level and could potentially be susceptible to liquefaction. Liquefaction induced settlement for an IBC 2012 seismic event based on the subsurface conditions encountered is estimated to be on the order of 1 inch.

G. Water Soluble Sulfates

One sample of the natural soil was tested for water soluble sulfate content. Results of the test indicate a negligible sulfate attack potential on concrete based on a rating of negligible, positive, severe and very severe. Sulfate-resistant cement is not needed for concrete placed in contact with the natural soil.

H. Pavement

Based on the subsoil conditions encountered, laboratory test results and the assumed traffic, the following pavement support recommendations are given.

1. Subgrade Support

   The upper natural soil at the site consists of clay, silt and sand. A California Bearing Ratio (CBR) of 3 percent was assumed for the analysis which assumes a clay subgrade.

2. Pavement Thickness

Based on the subsoil conditions, assumed traffic as described in the Proposed Construction section of the report, a design life of 20 years for flexible and 30 years for rigid pavements and methods presented by the Utah Department of Transportation, a flexible pavement section consisting of 3 inches of asphaltic concrete overlying 6 inches of high quality base course is calculated. The base course thickness should be increased to 9 inches in areas of significant truck traffic. Alternatively, a rigid pavement section consisting of 5 inches of Portland cement concrete may be used.

3. Pavement Material and Construction

a. Flexible Pavement (Asphaltic Concrete)

The pavement materials should meet the specifications for the applicable jurisdiction. Other materials may be considered for use in the pavement section. The use of other materials may result in the need for different pavement material thicknesses.

b. Rigid Pavement (Portland Cement Concrete)

The pavement thickness indicated above assumes that the pavement will have aggregate interlock joints and that a concrete shoulder or curb will be provided.

The pavement materials should meet the specifications for the applicable jurisdiction. The pavement thickness indicated above assumes that the concrete will have a 28-day compressive strength of 4,000 pounds per square inch. Concrete should be air entrained with approximately 6 percent air. The maximum allowable slump will depend on the method of placement, but should not exceed 4 inches.

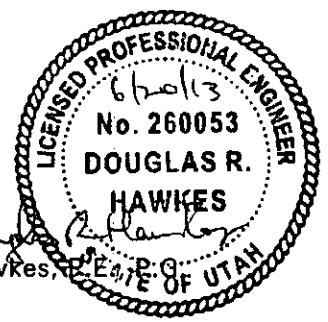
4. Jointing

Joints for concrete pavement should be laid out in a square or rectangular pattern. Joint spacings should not exceed 30 times the thickness of the slab. The joint spacings indicated should accommodate the contraction of the concrete and under these conditions steel reinforcing will not be required. The depth of joints should be approximately one-fourth of the slab thickness.

LIMITATIONS

This report has been prepared in accordance with generally accepted soil and foundation engineering practices in the area for the use of the client for design purposes. The conclusions and recommendations included within the report are based on the information obtained from the borings drilled at the approximate locations indicated on the site plan and the data obtained from laboratory testing. Variations in the subsurface conditions may not become evident until additional exploration or excavation is conducted. If the subsurface conditions or groundwater level is found to be significantly different from what is described above, we should be notified to reevaluate the recommendations given.

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.



Douglas R. Hawkes, P.E., P.G.

Reviewed by Christopher J. Beckman, P.E.

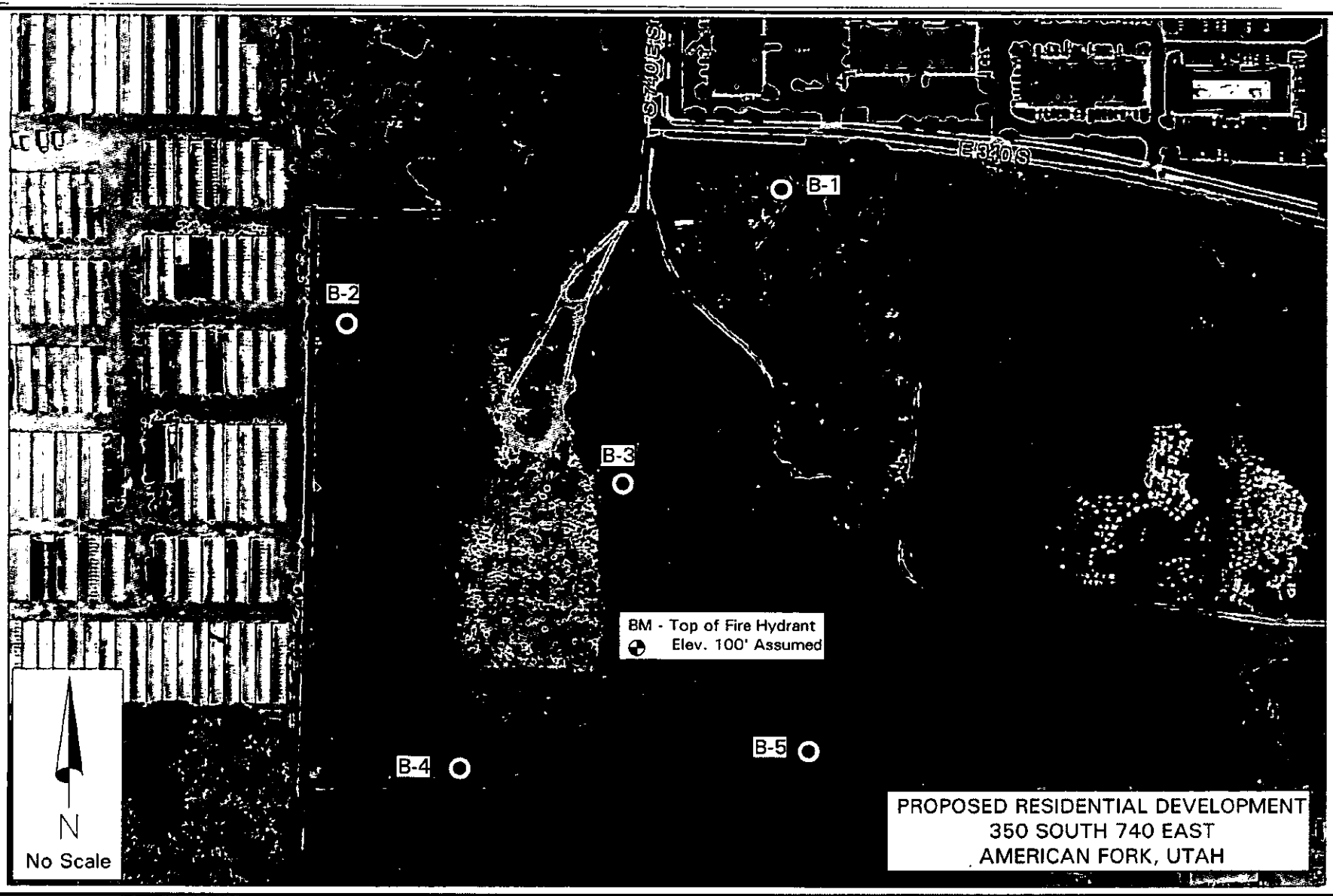
DRH/rs

REFERENCES

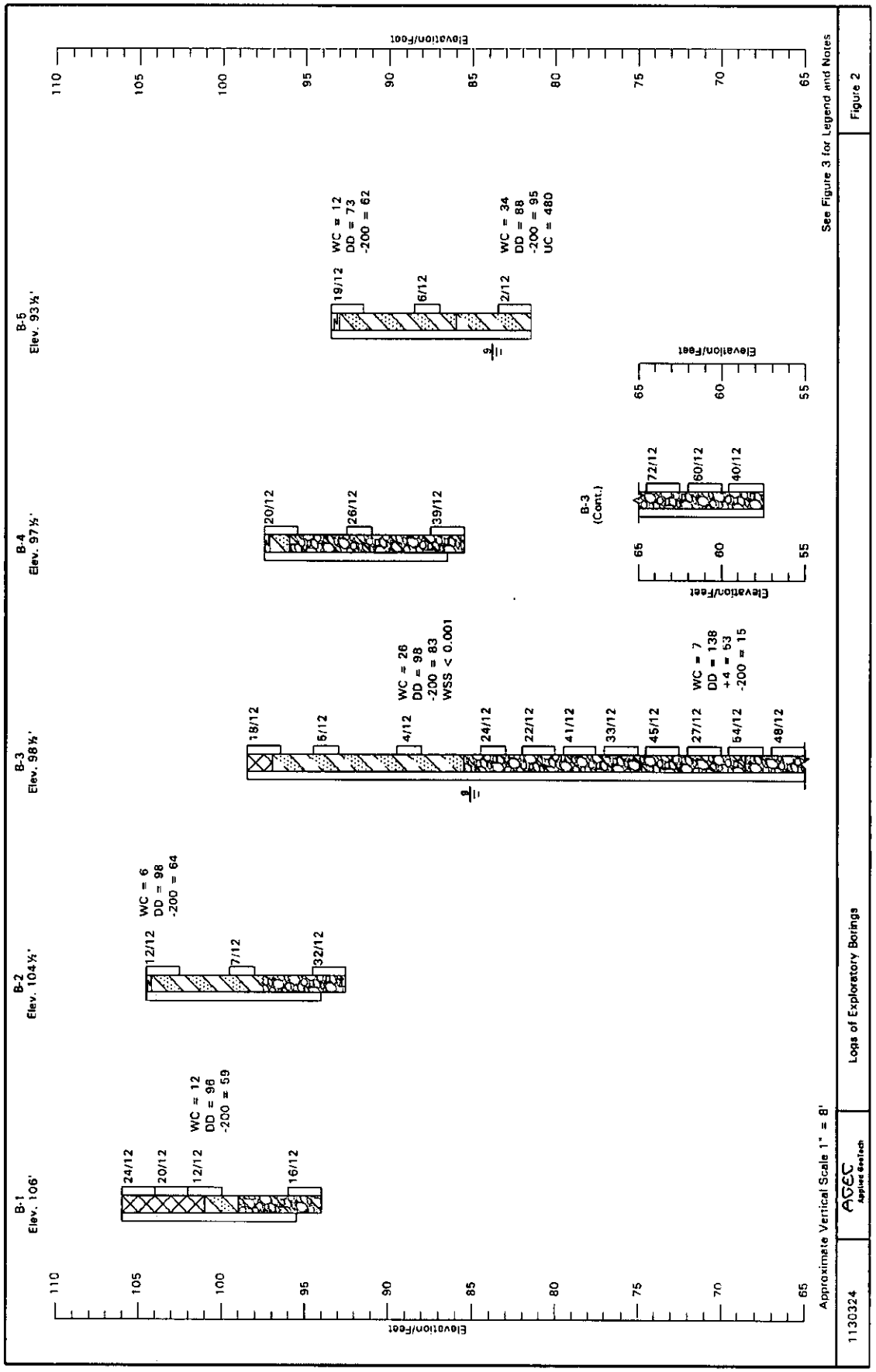
Anderson, L. R., Keaton, J. R. and Bischoff, J. E., 1994; Liquefaction Potential Map for Utah County, Utah Geological Survey Contract Report 94-8.

Black, B.D., Hecker, S., Hylland, M.D., Christenson, G.E., and McDonald, G.N., 2003; Quaternary fault and fold database and map of Utah; Utah Geological Survey Map 193DM.

International Building Code, 2012; International Code Council, Inc. Falls Church, Virginia.



1130324	AGEC Applied GeoTech	Locations of Exploratory Borings	Figure 1


B-1
Elev. 106'
24/12
20/12
12/12
16/12
WC = 12
DD = 98
-200 = 59
B-2
Elev. 104½'
12/12
7/12
32/12
WC = 6
DD = 98
-200 = 64
B-3
Elev. 98½'
18/12
5/12
4/12
24/12
22/12
41/12
33/12
45/12
27/12
54/12
48/12
WC = 26
DD = 98
-200 = 83
WSS < 0.001
WC = 7
DD = 138
+4 = 53
-200 = 15
B-4
Elev. 97½'
20/12
26/12
39/12
B-5
Elev. 93½'
19/12
6/12
2/12
WC = 12
DD = 73
-200 = 62
WC = 34
DD = 88
-200 = 95
UC = 480
B-3
(Cont.)
72/12
60/12
40/12
Elevation/Feet
110
105
100
95
90
85
80
75
70
65
60
55
See Figure 3 for Legend and Notes
Approximate Vertical Scale 1" = 8'
1130324
AGEC
Applied Geotech
Logs of Exploratory Borings
Figure 2

LEGEND:


Fill; silty gravel with sand in Boring B-1, sandy lean clay in Boring B-3, slightly moist, dark brown, occasional organics.


Topsoil; silty and clayey sand, slightly moist, brown to dark brown, roots and organics.


Lean Clay and Silty Sand (CL/SM); interlayered, occasional clayey sand, soft to medium dense, moist to wet, brown to gray.


Sandy Silt and Silty Sand (ML/SM); very occasional gravel, medium stiff/medium dense, slightly moist to moist, brown.


Poorly-graded Gravel with Silt (GP-GM); small to moderate amounts of silt and sand, some coarse sand layers, medium dense to very dense, slightly moist to wet, grayish-brown.


Poorly-graded Gravel (GP); some coarse sand, dense to very dense, moist to wet, brownish-gray.


10/12 California Drive sample taken. The symbol 10/12 indicates that 10 blows from a 140 pound automatic hammer falling 30 inches were required to drive the sampler 12 inches.


Indicates slotted 1 ½ inch PVC pipe installed in the boring to the depth shown.

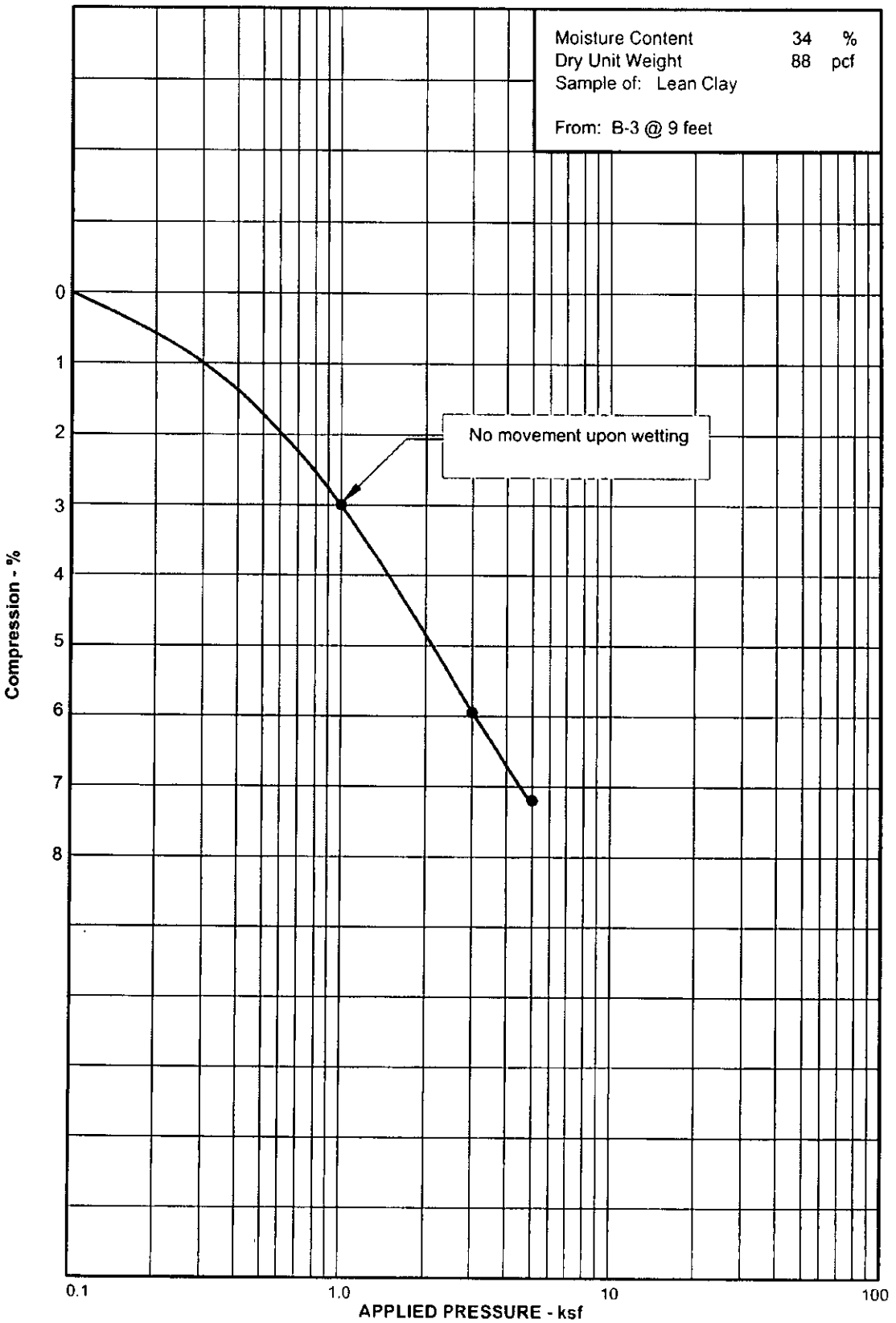

Indicates the depth to free water and the number of days after drilling the measurement was taken.

NOTES:

1. Borings were drilled on May 21, 2013 with 8-inch diameter hollowstem auger.
2. Locations of borings were measured approximately by pacing from features shown on the site plan provided.
3. Elevations of borings were measured with an automatic level and refer to the bench mark shown on Figure 1.
4. The boring locations and elevations should be considered accurate only to the degree implied by the method used.
5. The lines between the materials shown on the boring logs represent the approximate boundaries between material types and the transitions may be gradual.
6. Water level readings shown on the logs were made at the time and under the conditions indicated. Fluctuations in the water level may occur with time.
7. WC = Water Content (%);
   DD = Dry Density (pcf);
   +4 = Percent Retained on No. 4 Sieve;
   -200 = Percent Passing No. 200 Sieve;
   UC = Unconfined Compressive Strength (psf);
   WSS = Water Soluble Sulfates (%).

1130324	AGEC Applied GeoTech	Legend and Notes of Exploratory Borings	Figure 3

Applied Geotechnical Engineering Consultants, Inc.



Project No. 1130324

CONSOLIDATION TEST RESULTS

Figure 4

APPLIED GEOTECHNICAL ENGINEERING CONSULTANTS, INC.

TABLE I

SUMMARY OF LABORATORY TEST RESULTS

PROJECT NUMBER 1130324

SAMPLE LOCATION		NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (PCF)	GRADATION			ATTERBERG LIMITS		UNCONFINED COMPRESSIVE STRENGTH (PSF)	WATER SOLUBLE SULFATE (%)	SAMPLE CLASSIFICATION
BORING	DEPTH (FEET)			GRAVEL (%)	SAND (%)	SILT/ CLAY (%)	LIQUID LIMIT (%)	PLASTICITY INDEX (%)			
B-1	4	12	96			59					Sandy Silt (ML)
B-2	0	6	98			64					Sandy Silt (ML)
B-3	9	26	98			83				<0.001	Lean Clay with Sand (CL)
	26½	7	138	53	32	15					Silty Gravel with Sand (GM)
B-5	0	12	73			62					Sandy Silt (ML)
	10	34	88			95			480		Lean Clay (CL)

Exhibit C – Site Grading Plan

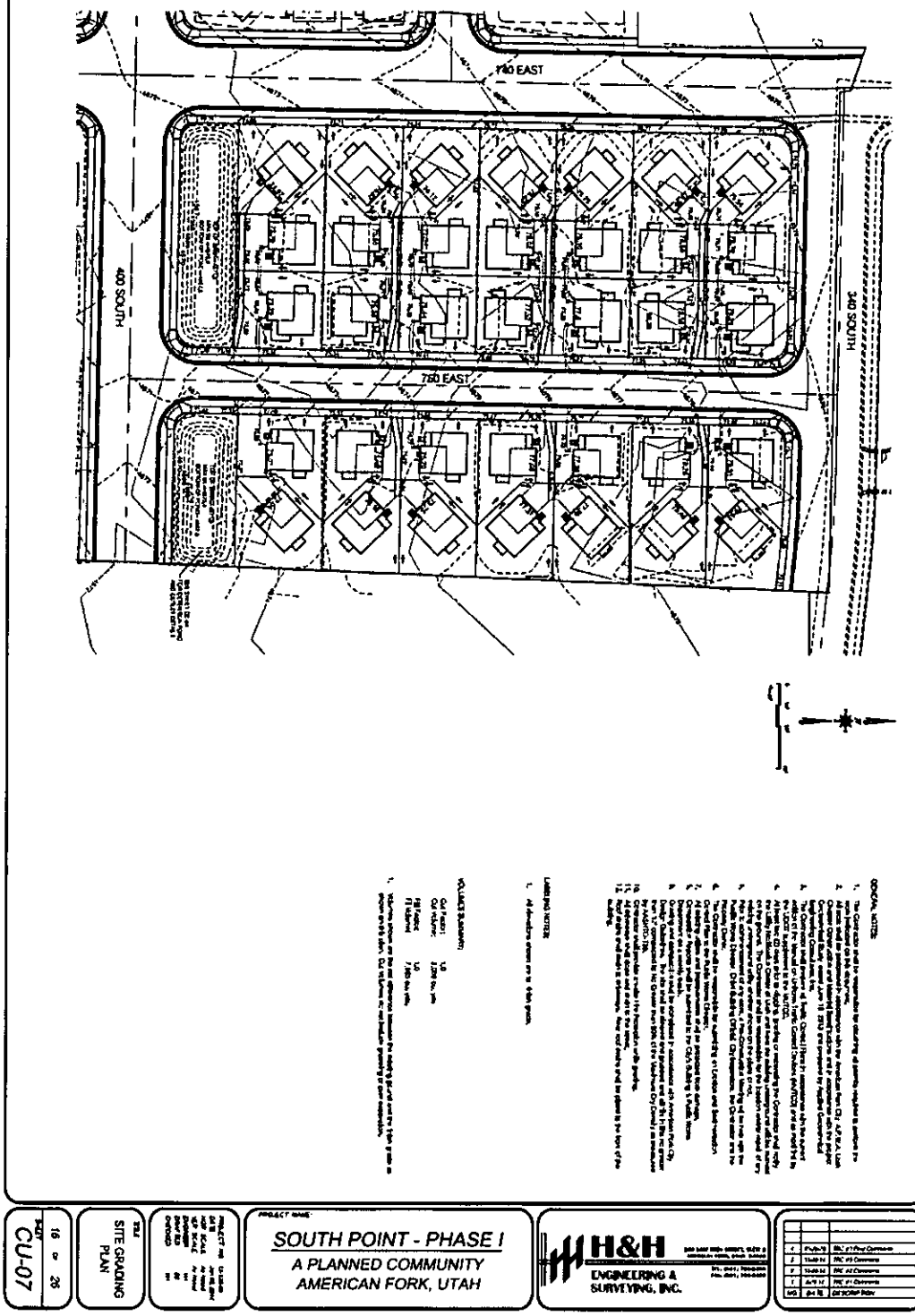


Exhibit C – Site Grading Plan (continued)

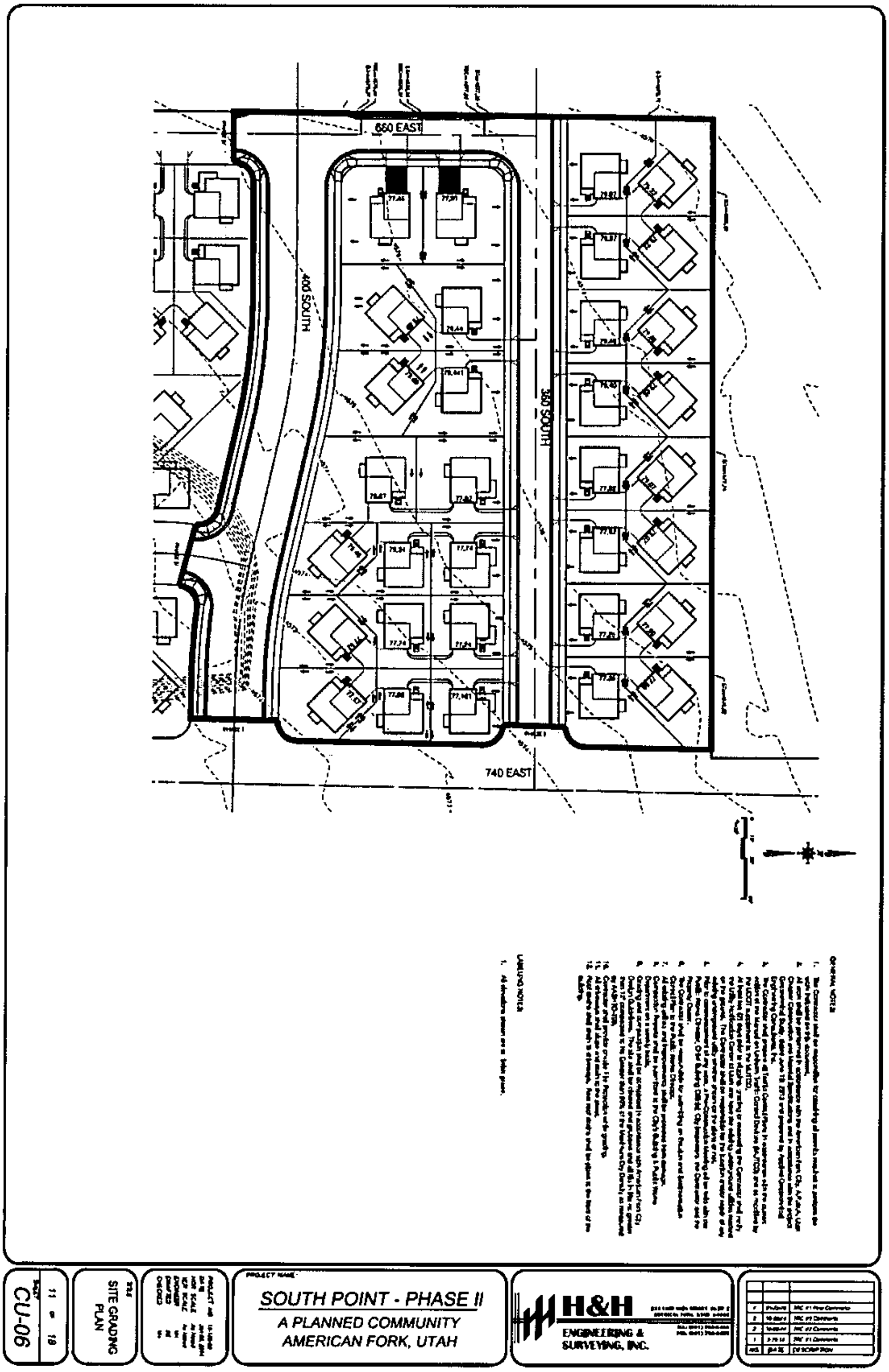
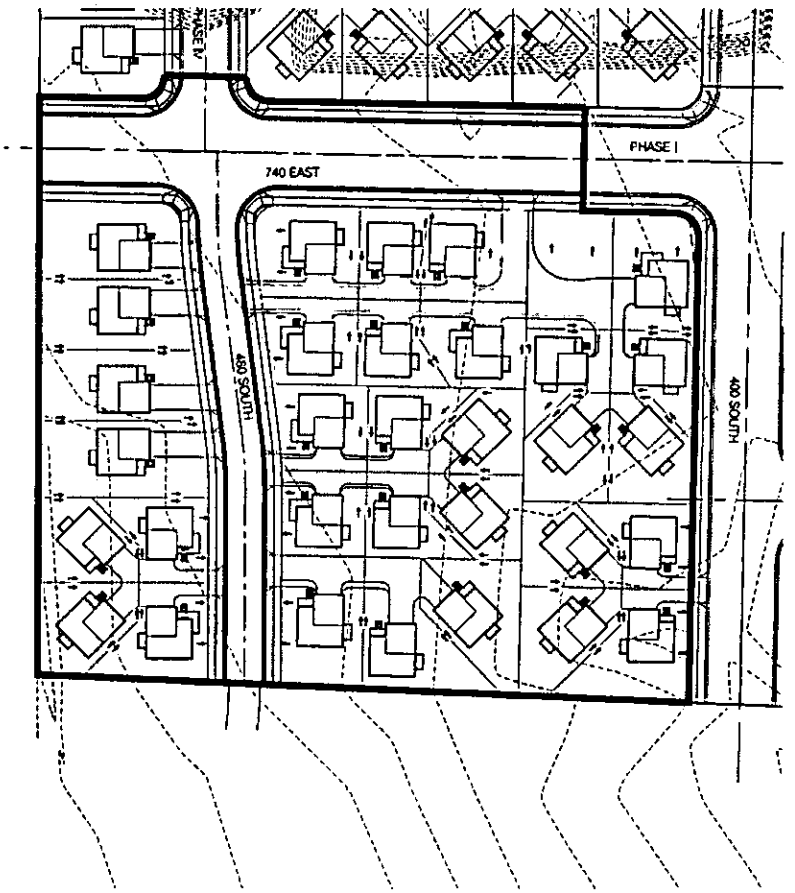


Exhibit C – Site Grading Plan (continued)



GENERAL NOTES

LABELING NOTES

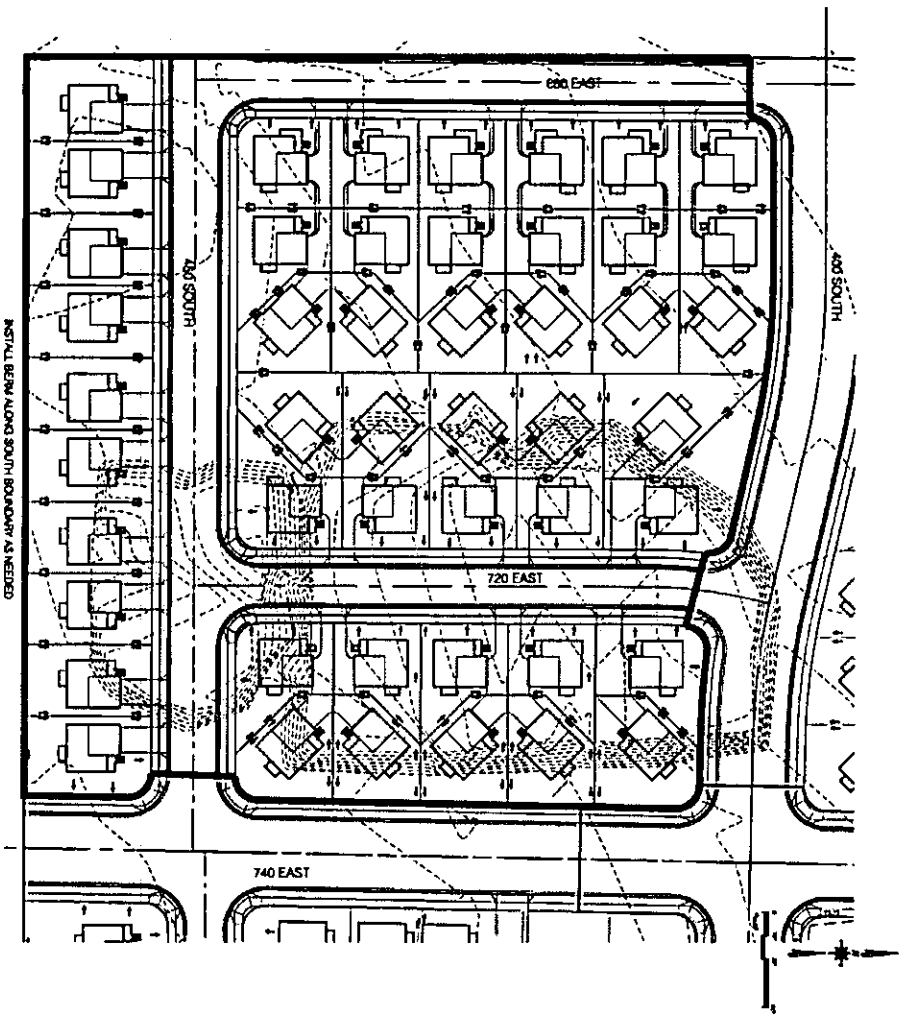
SOUTH POINT - PHASE III
A PLANNED COMMUNITY
AMERICAN FORK, UTAH

H&H ENGINEERING & SURVEYING, INC.

SITE GRADING PLAN

CU-06

Exhibit C – Site Grading Plan (continued)



SOUTH POINT - PHASE IV
A PLANNED COMMUNITY
AMERICAN FORK, UTAH

H&H ENGINEERING & SURVEYING, INC.

SITE GRADING PLAN

CU-06