When Recorded Mail To:
American Fork City
51 East Main
American Fork UT 84003

ENT 49455:2023 PG 1 of 239
ANDREA ALLEN
UTAH COUNTY RECORDER
2023 Jul 31 2:49 pm FEE 40.00 BY TM
RECORDED FOR AMERICAN FORK CITY

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

This Notice is recorded to bind the attached Geotechnical Investigations, U.S. Army Corps of Engineers jurisdictional determination, water rights analysis, proposed pond recommendations and related plan set for proposed construction activities to the property generally located at 752 East Quality Drive, American Fork, UT 84003 and therefore mandating that all construction be in compliance with said documents unless field conditions require alternative designs which shall be submitted to American Fork City for review and approval after completing field work and per the requirements of American Fork City ordinances and standards and specification 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 Investigation (Rev. 1) completed by IGES and dated August 16, 2021
Exhibit C – Geotechnical Investigation responses to Additional Review Comments from IGES dated October 11, 2021
Exhibit D – U.S. Army Corps of Engineers jurisdictional determination
Exhibit E – Recommendations for filling in the existing pond as proposed by IGES dated March 1, 2022
Exhibit F – Response to Review Comments – Pond and Spring Plan by IGES dated March 1, 2022
Exhibit G – Hydrologic Evaluation by the Will Group dated April 5, 2022
Exhibit H – Hydrologic Evaluation by Loughlin Water Associates, LLC dated April 6, 2022
Exhibit I – Analysis of Water Rights Associated with Singleton Pond as prepared by Parsons Behle & Latimer dated April 7, 2022
Exhibit J – Civil Plan Set
Exhibit K - CIR Hydrological Drainage Report dated January 16, 2023
Exhibit L - CKR Engineers Structural Review Letter dated January 12, 2023

Dated this 27 day of January, 2023.

OWNER(S):

(Signature) _____ (Signature) _____

John D Hatfield
(Printed Name) (Printed Name)

Managing Member
(Title) (Title)

STATE OF UTAH)

Approved as to form: American Fork City Attorney

On the 27th day of January, 2023, personally appeared before me John D Hadfield 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
ANNE TURNER
720482
MY COMMISSION EXPIRES
SEPTEMBER 19, 2025
STATE OF UTAH

Notary Public
My Commission Expires: 09-19-2025

Approved as to form: American Fork City Attorney

EXHIBIT A

Legal Description

All of Lot 1, PLAT "M", UTAH VALLEY BUSINESS PARK, Including a Vacation of Lot 37 and a Portion of Lot 36,
Plat "J", Amended Utah Valley Business Park, according to the official plat thereof, recorded August 14, 2014 as
Entry No. 56927:2014 (Map Filing No. 14337) in the Utah County Recorder's office.

EXHIBIT B

Approved as to form: American Fork City Attorney

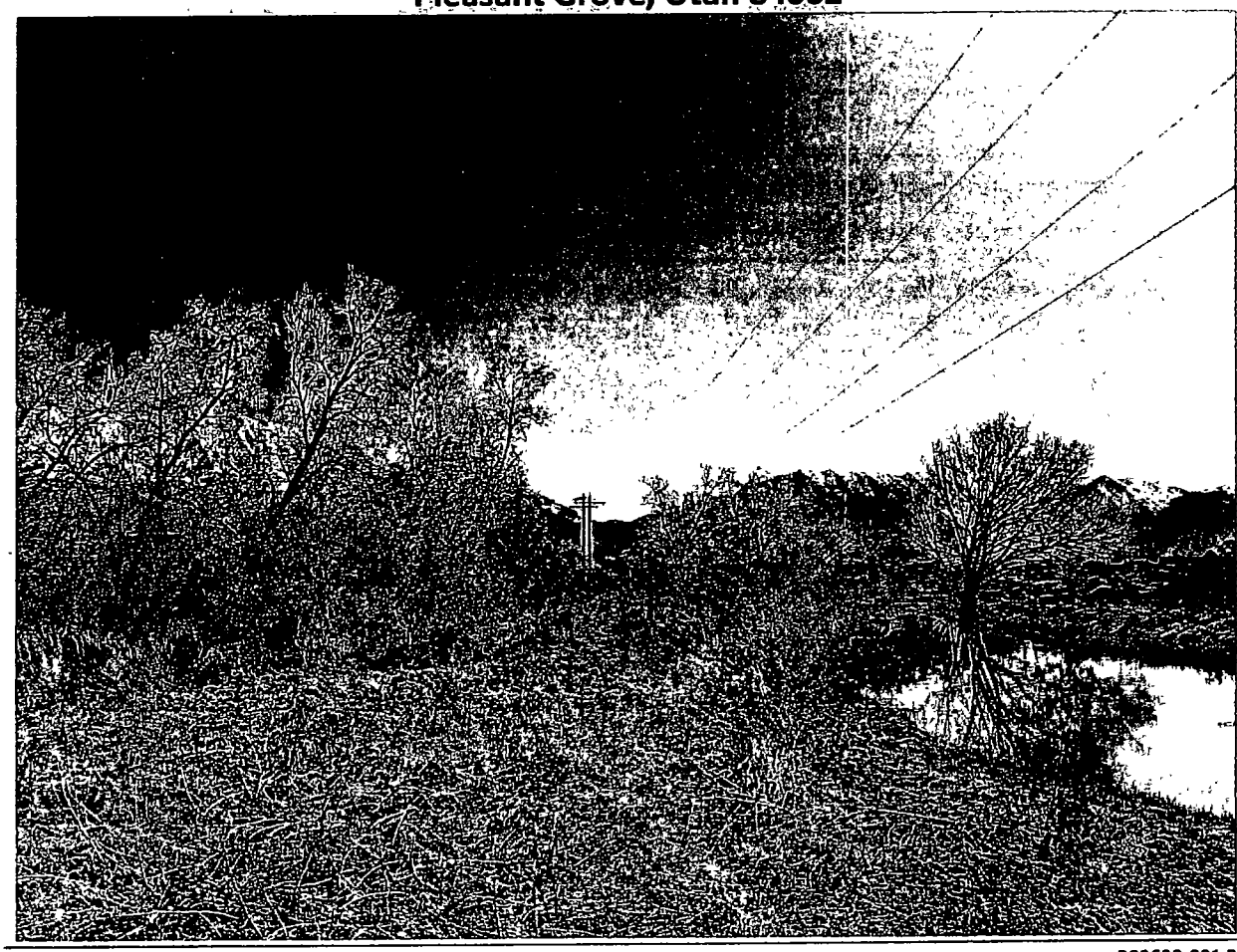
Intermountain GeoEnvironmental Services, Inc.
12429 South 300 East, Suite 100, Draper, Utah, 84020
Phone (801) 748-4044 | Fax (801) 748-4045
www.igesinc.com

Geotechnical Investigation (Rev. 1)
Flex Warehouse
748 East Quality Drive
American Fork, Utah
IGES Project No. 03638-001

August 16, 2021

Prepared for

QDAF QOZB, LLC
881 W. State Road, #140-441
Pleasant Grove, Utah 84062



Geotechnical Investigation (Revision 1)
Flex Warehouse
748 E. Quality Drive
American Fork, Utah

IGES Project No. 03638-001

August 16, 2021

Prepared by:

Erik Fjeldsted, P.E.
Staff Engineer

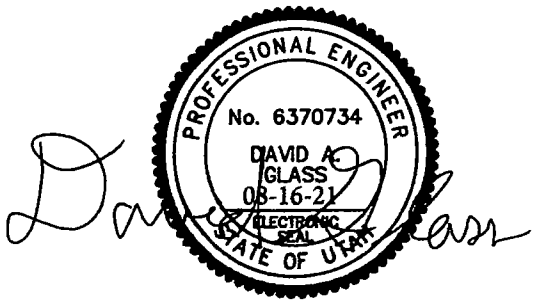
Reviewed by

PROFESSIONAL ENGINEER
No. 6370734
DAVID A. GLASS
08-16-21
ELECTRONIC SEAL
STATE OF UTAH

David A. Glass, P.E.
Senior Geotechnical Engineer

CERTIFICATE[1]

I hereby certify that I am a licensed professional engineer or engineering geologist, as those terms are defined in the "Sensitive Lands Ordinance" Section of the American Fork City Ordinances. I have examined the letter report/geologic report to which this certificate is attached and the information and conclusions contained therein are, without any reasonable reservation not stated therein, accurate and complete. All procedures and tests used in said letter report/geologic report meet minimum applicable professional standards.



David A. Glass, P.E.
Senior Geotechnical Engineer

[1] **Use of the word "certify" or "certification":** The use of the word "certify" or "certification" by a registered professional engineer in the practice of professional engineering or a registered geologist in the practice of professional engineering geology constitutes an expression of professional opinion regarding those facts or findings which are the subject of the certification, and does not constitute a warranty or guarantee, either expressed or implied.

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APPENDICES

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE OF WORK

This report presents the results of a geotechnical investigation for a proposed Flex Warehouse to be constructed at 748 East Quality Drive in American Fork, Utah. The purposes of this investigation were to assess the engineering properties of the subsurface soils at the site, provide detailed information on the soil profile encountered in the test pits and provide graphical logs with soil classifications and results of the laboratory testing as well as recommendations for structural fill, lateral earth pressure coefficients, bearing capacity, estimated settlement and pavement design. This report has been revised from the original report dated April 7, 2021; the changes include the addition of a liquefaction analysis, presenting calculations to support certain recommendations, and other changes arising from review comments by the American Fork City (IGES, 2021).

The scope of work completed for this study included a site reconnaissance, subsurface exploration, soil sampling, laboratory testing, engineering analyses and preparation of this report. The subsurface exploration included five test pits located across the site.

The recommendations contained in this report are subject to the limitations presented in the **Closure and Limitations** section of this report (Section 5.0).

1.2 PROJECT DESCRIPTION

The site is located at 748 East Quality Drive in American Fork, Utah, illustrated on the *Site Vicinity Map,* see Figure A-1. A new flex warehouse is planned for the 4.3-acre site. We understand the new warehouse will have a structural footprint of approximately 84,710 square feet and will be about 34 feet in height. It is assumed that the warehouse will be constructed with tilt-up exterior walls and be constructed with slab on-grade and will be an on-grade structure (no basement). Around the proposed structure associated parking and loading bays for trucks will be constructed. On the southern end of the property is a 6-foot-deep pond with about 2 to 3 feet of standing water; it is understood that this pond will be filled in as part of the development.

2.0 METHODS OF STUDY

2.1 FIELD INVESTIGATION

As a part of this investigation, subsurface soil conditions were explored by excavating six test pits using a JCB-4CX backhoe on March 19, 2021 and one boring using a CME-75 truck-mounted hollow-stem auger drill rig equipped for soil sampling on July 19, 2021, approximate locations of the explorations are shown on the *Geotechnical Map*, Figure A-2. Photos of the site and of the test pits are included in Figure A-3 *Site Photos* in Appendix A. The test pits and boring were spaced across the site to obtain representative coverage of the existing subgrade soils. Graphic logs of the subsurface conditions, as encountered at the time of our excavations, have been presented as Figures A-4 to A-10 in Appendix A. A *Key to Soil Symbols and Terminology* used on the test pit logs is included as Figure A-11.

In the boring, soil samples were obtained at regular intervals every 2½ feet using a Standard Penetration Test (SPT) sampler (ASTM D1586). In the test pits, soil sampling was completed at varying depths to facilitate soil classifications and testing as determined by an experienced member of IGES staff. Disturbed samples were placed in plastic baggies or 5-gallon buckets and relatively undisturbed soil samples were collected with the use of a 6-inch-long brass tube attached to a hand sampler driven with a 2-lb sledgehammer. All samples were transported to our laboratory to evaluate the engineering properties of the various earth materials observed. The soils were classified in general accordance with the *Unified Soil Classification System* (USCS) by a member of our technical staff.

2.2 LABORATORY TESTING

Geotechnical laboratory tests were conducted on selected relatively undisturbed and bulk soil samples obtained during our field investigation. The laboratory testing program was designed to evaluate the engineering characteristics of onsite earth materials. Laboratory tests conducted during this investigation include:

- In Situ Moisture Content and Density (ASTM D7263/D2216)
- Atterberg Limits (ASTM D4318)
- Particle-Size Distribution and Hydrometer (ASTM D6913 and D7928)
- Fines Content (ASTM D1140)
- Consolidation Testing (ASTM D2435)
- Unconsolidated Undrained Triaxial Compression Test (ASTM D2850)
- Corrosion Testing-sulfate and chloride concentrations, pH and resistivity (ASTM D4972, D4327, D4327, C1580 and EPA 300.0)

Results of the laboratory testing are included with this report in Appendix B. Index test results have also been incorporated into the boring and test pit logs (see Figures A-4 to A-10).

2.3 ENGINEERING ANALYSIS

Engineering analyses were performed using soil data obtained from the laboratory test results and empirical correlations from material density, depositional characteristics, and soil classification. Analyses were performed using formulas, calculations and software that represent methods currently accepted by the geotechnical industry. These methods include settlement, bearing capacity, pavement design, lateral earth pressures, and trench stability. Appropriate factors of safety were applied to the results, consistent with industry standards and the accepted standard of care.

3.0 GENERALIZED SITE CONDITIONS

3.1 SURFACE CONDITIONS

At the time of our site investigation the site was undeveloped and was relatively flat; vegetation consisted of a relatively thick growth of grass, weeds and several mature trees. The southern portion of the site has a small pond that measures approximately 80 feet long by 13 feet wide and roughly 6 feet deep; about 2 to 3 feet of standing water was observed at the time of our field investigation, the surface of which is presumed to represent groundwater elevation. The site elevation ranges from a low of approximately 4,545 feet (msl), which represents the bottom of the pond on the south of the property, to as high as 4,552 feet on the northern end of the property. South of the existing pond is well used to draw groundwater for irrigation of nearby properties; we understand that this well will remain in-place and will continue to operate after the warehouse is complete.

3.2 REGIONAL GEOLOGY

The site is located in American Fork, Utah at an elevation of approximately 4,560 feet above sea level. The near-surface geology of the area is predominantly composed of alluvial deposits, which were deposited within the last 30,000 years by Lake Bonneville (Hintze, 1993;). As the lake receded, streams began to incise large deltas formed at the mouths of major canyons along the Wasatch Range, and the eroded material was deposited in shallow lakes and marshes in the basin and in a series of recessional deltas and alluvial fans. Sediments toward the center of the valley are predominately deep-water deposits of clay, silt and fine sand. However, these deep-water deposits are in places covered by a thin post-Bonneville alluvial cover.

Surface sediments at the site are mapped as younger alluvial-fan deposits (Qafy) (Solomon et al., 2009). The Qafy unit is described as "mostly sand, silt and gravel that is poorly stratified and poorly sorted; deposited at drainage mouths; Qafy fans are mostly Holocene and cover Lake Bonneville deposits or deflect stream channels." (Solomon, et al., 2009).

3.3 SEISMICITY AND FAULTING

An active fault is generally defined as a fault that has experienced movement within the Holocene (11,700 years before present). No active faults are mapped through or immediately adjacent to the site (Black et al., 2003). The site is located approximately 2.2 miles northeast of the Utah Lake Faults and Folds, the closest mapped active fault. The next closest mapped fault is the Provo segment of the Wasatch Fault Zone, located 3.2 miles northeast of the project site.

Following the criteria outlined in the 2018 International Building Code (IBC, 2018), spectral response at the site was evaluated for the risk-targeted *Maximum Considered Earthquake* (MCE_R), which represents the spectral response accelerations in the direction of maximum horizontal response represented by a 5% damped acceleration response spectrum that is expected to achieve a 1% probability of structural collapse within a 50-year period. The MCE_R spectral accelerations were determined based on the location of the site using the *ASCE-7 Hazard Tool*; this software incorporates seismic hazard maps depicting probabilistic ground motions and spectral response data developed for the United States by the U. S. Geological Survey. These maps have been incorporated into the *International Building Code* (IBC) (International Code Council, 2018).

To account for site effects, site coefficients that vary with the magnitude of spectral acceleration and *Site Class* are used. Site Class is a parameter that accounts for site amplification effects of soft soils and is based on the average shear wave velocity of the upper 100 feet (30 meters, Vs_{30}); site classifications are identified in Table 3.3A.

Table 3.3A
Site Class Categories

Site Class	Earth Materials	Shear Wave Velocity Range (Vs_{30}) m/s
A	Hard Rock	>1,500
B	Rock	760-1,500
C	Very Dense Soil/Soft Rock	360-760
D	Stiff Soil	180-360
E	Soft Soil	<180
F	Special Soils Requiring Site-Specific Evaluation (e.g. liquefiable)	n/a

Based on our field exploration and our understanding of the geology in this area, the site is underlain by alluvial fan deposits, and would likely classify as Site Class D. However, lacking site-specific shear wave velocity measurements, a conservative approach is mandated, and a default value for Site Class D is assumed. Based on the *assumed* Site Class D site coefficients, the short- and long-period *Design Spectral Response Accelerations* are presented in Table 3.3B. For geotechnical practice, the geo-mean peak ground acceleration (PGA_M) is presented in Table 3.3C.

It should be noted that, for certain structures, particularly those with a longer fundamental natural period, a site-specific seismic hazard analysis may be required; the Structural Engineer should review ASCE-7-16 11.4.8 to assess whether Exception #2 is applicable for the proposed structures. If the simplified approach and mapped spectral accelerations as allowed by Exception #2 are not applicable to this project, IGES should be contacted regarding the completion of a site-specific seismic hazard analysis, which would necessarily include on-site shear wave velocity measurements.

Table 3.3B

Spectral Accelerations for MCE, Risk-Targeted Values (Structural)

Mapped B/C Boundary S_a (g)		Site Coefficient (Site Class D*)		Design Sa (g)		
Ss	S_1	F_a	F_v	PGA	S_{DS}	S_{D1}
1.304	0.476	1.200	1.824	0.417	1.043	0.579

*assumed

1) T_L=8

2) Exception #2 taken, see ASCE-7-16 11.4.8-2, a site-specific ground-motion hazard analysis may be required for some structures

Table 3.3C

Spectral Accelerations for MCE, Geo-Mean Values (Geotechnical)

Mapped B/C Boundary PGA (g)	Site Coefficient F_{PGA} (Site Class D*)	PGA_M (g)
0.590	1.2	0.708

*assumed

3.4 SUBSURFACE CONDITIONS

The subsurface soil conditions were explored at the subject property by excavating six test pits to a depth of 6 to 13 feet below the existing site grade. Photos of the field investigation are provided in Appendix A (Figure A-3). Subsurface soil conditions were logged at the time of our exploration and are included in Appendix A (Figures A-4 to A-9). Descriptions of the subsurface conditions observed as a part of this study are presented in the following paragraphs.

3.4.1 Soils

Based on the observations made while logging the test pits, there are two main soil layers: topsoil, and alluvial fan deposits. Below is a summary of each of the soil layers.

Topsoil

Topsoil/Organic CLAY was observed across the majority of the site extending down 2 to 3 feet below existing grade. The topsoil was classified as Lean CLAY with sand (CL) with an increase in organics between 1 to 2 feet below grade. This unit was observed to be soft, moist to wet, dark brown to black, and having frequent organics and root matter. In some areas this earth material displays characteristics of peat[2].

Alluvial Fan Deposits

Below the topsoil, native alluvial deposits that classified as Clayey GRAVEL with sand (GC), Silty SAND with gravel (SM), Clayey SAND with gravel (SC), and Lean CLAY (CL) were observed. This soil unit was observed as deep as 13 feet below existing grade. This soil was described as soft in the Clay and medium dense in the sand/gravel. Moisture in the soil increased with depth, especially within the vicinity of groundwater.

Refer to the boring and test pit logs in Appendix A for more detailed information on the soil profile observed in the explorations (Figures A-4 to A-10).

3.4.2 Groundwater

Groundwater was encountered at depths ranging from 3½ feet to 12½ feet below existing grade, summarized in Table 3.4.2, but was typically observed at depths of seven feet or less below existing grade. The surface elevation of the water in the pond is most likely the best representation of groundwater elevation for this site. Seasonal fluctuations in precipitation, surface runoff from adjacent properties, or other on or offsite sources such as irrigation or other utilities may increase moisture conditions or create a perched groundwater condition. Based on the observations from this investigation, groundwater will likely impact construction of the project. If groundwater is encountered, sump pumps may be used in local low points to remove groundwater from the excavation and discharge it away and downslope from the trench(es). IGES may be contracted to provide further dewatering recommendations, if needed.

There is a fairly wide range of groundwater elevations measured across the site (a 13.8-foot range). We understand there is an active water well used for agriculture on the south side of the pond (located about 65 feet east of TP-5) – this well is currently in use and will continue to be in use after the warehouse is completed. It is likely that this well creates a localized cone of depression, which lowers the groundwater near the well (e.g. TP-01 and TP-05, both closest to the well and both showing the lowest groundwater); other test pits (particularly TP-6) may show locally elevated groundwater due to irrigation of adjacent

[2] Peat – An unconsolidated deposit of semicarbonized plant remains in a water-saturated environment such as a bog, of persistently high moisture content (Bates & Jackson, 1979).

agriculture. Away from the well, the groundwater elevation appears to be relatively consistent, around el. 4,543 to 4,544 ft. msl.

Table 3.4.2
Groundwater Elevation Summary

Location	Elevation (ft., msl)
TP-1	4,536.5
TP-2	4,544.2
TP-3	4,544.5
TP-4	4,543.0
TP-5	4,540.9
TP-6	4,550.3

Based upon this data, IGES recommends that the representative high groundwater table should be taken as el. 4,544 ft, with the understanding that, due to the presence of the water well and nearby agriculture, locally the groundwater may be higher or lower, particularly in the vicinity of the water well.

3.4.3 Compressible Soils

Two Consolidation Tests were completed on relatively undisturbed samples of clayey soil. Based on the lab testing results the soils tested are anticipated to be *moderately* compressible. A summary of the test results is presented below in Table 3.4.3.

Table 3.4.3
Summary of Consolidation Test Results

Location	Depth	OCR	Cc	Cr
TP-4	4.5	4.2	0.166	0.034
TP-5	3.0	2.9	0.183	0.021

3.4.4 Strength of Earth Materials

Two Unconsolidated Undrained Triaxial Compression test were completed on relatively undisturbed samples from TP-2 and TP-5 at a depth of 4.0 feet and 5.5 feet, respectively. Based on the test results the prevailing clayey soil has an undrained shear strength of 700 psf, indicating fairly soft soil with modest strength characteristics.

3.4.5 Chemical Testing

Chemical testing was completed as a part of this investigation on a representative sample of the near-surface soils. The test results indicated that the sample tested has a minimum

resistivity of 1,785 OHM-cm, soluble chloride content of 7.79 ppm, soluble sulfate content of 77.4 ppm and a pH of approximately 8.22.

3.4.6 Frost-Susceptible Soils

Frost-susceptible soils can freeze during the winter months, creating ice lenses that expand and cause the soil to swell; this phenomenon is referred to as *frost heave*. Soils particularly susceptible to frost heave generally consist of clays and silts due to their inherent high moisture content when wet; coarse, granular soils are less susceptible to frost heave. Many agencies classify soil as being frost susceptible if the fines content is greater than 10 percent and/or more than 3 percent passes the 0.02mm sieve. Since the footings will be founded on a minimum of 30 inches of structural fill, presumed to be granular in nature, we expect the foundation soils to have a low susceptibility to frost heave. To reduce the risk of foundations being damaged by frost heave a minimum foundation burial is usually prescribed (see Section 4.3, *Foundations*).

The finish grade on the outside of the warehouse will be at an approximate elevation ranging from 4,550 to 4,553 ft msl. Assuming the footings will be founded approximately 30 inches below nearest adjacent grade, and the high groundwater level is about 4,544 ft., we do not anticipate the footings will be within groundwater.

3.5 GEOLOGIC HAZARDS

Geologic hazards can be defined as naturally occurring geologic conditions or processes that could present a danger to human life and property. These hazards must be considered before development of the site. There are several hazards in addition to seismicity and faulting that, if present at the site, should be considered in the design of roads and critical facilities such as structures designed for human occupancy. IGES has assessed the potential for the presence of other geologic hazards; based on the observed site conditions, there is the potential for liquefaction to impact the site.

3.5.1 Liquefaction

Certain areas within the Intermountain region possess a potential for liquefaction during seismic events. Liquefaction is a phenomenon whereby loose, saturated, granular soil deposits lose a significant portion of their shear strength due to excess pore water pressure buildup resulting from dynamic loading, such as that caused by an earthquake. Among other effects, liquefaction can result in densification of such deposits causing settlement of overlying layers after an earthquake as excess pore water pressures are dissipated. The primary factors affecting liquefaction potential of a soil deposit are: (1) level and duration of seismic ground motions; (2) soil type and consistency; and (3) depth to groundwater.

Referring to the *Liquefaction Special Study Areas along the Wasatch Front* published by the Utah Geological Survey, the site is located in an area mapped as having a "high" potential for liquefaction, see Figure D-3, *Liquefaction Map*. Accordingly, the liquefaction potential for this site was assessed in general accordance with procedures detailed by Youd et al. (2001), and *Recommended Procedures for Implementation of CDMG Special Publication 117* (Martin and Lew, 1999) IGES assessed the potential for liquefaction triggering and liquefaction-induced settlement utilizing the soils data from Boring B-1, attached. Finish floor of the warehouse is 4,553ft. msl, groundwater is about 4,544 ft. msl; thus, groundwater can reasonably be expected to be about 9 feet below finish floor. For our analysis however, we have conservatively assumed groundwater will be about 5 feet below finish floor. It should be noted that the depth to groundwater during sampling was 3.5 feet, and the elevation of the boring location was about 4,549 feet msl (thus, groundwater was about 4,545.5 feet at the time of drilling, or about 7.5 feet below finish floor).

Our liquefaction model incorporates the PGA corresponding to the 2PE50 ground motion (the probabilistic ground motion having a 2 percent probability of exceedance in 50 years, see Section 3.3). The PGA is estimated to be 0.708g.

Liquefaction analysis also considers the *deaggregated* moment magnitude for a site (the moment magnitude that has the highest contribution to the hazard for the ground motion under consideration). Based on the 2008 interactive hazard deaggregation utility available on the USGS website, the deaggregated moment magnitude corresponding to the 2PE50 event is 7.0 Mw with the source located about 5 km from the site (output file is presented in Appendix D).

Parameters for our analyses include Standard Penetration Test (SPT) corrected blow counts and laboratory-derived soil properties (laboratory test results are attached). For the purpose of our analysis, we have used a factor-of-safety against liquefaction of 1.4 to differentiate between potentially liquefiable and non-liquefiable soils (a factor-of-safety below 1.1 is considered liquefiable, between 1.1 and 1.4 *may* liquefy, and greater than 1.4 is considered to not liquefy). Potential dynamic settlement was evaluated using the methods developed by Tokimatsu and Seed (1987). A summary of the calculated liquefaction settlement is presented in Table 3.5.1. A detailed summary of our liquefaction hazard analysis is attached.

Our analysis indicates there is a sandy layer (clayey sand, SC) from about 5 to 10 feet that is potentially susceptible to liquefaction. In addition, a thinner, isolated lens of poorly graded sand with clay (SP-SC) located at a depth of about 25 feet, being about 2½ feet thick, is also potentially susceptible to liquefaction. Total settlement due to liquefaction is calculated to

be approximately 2 inches; sample calculations are attached. Upon review of the Ishihara damage curve (see Figure D-1 in Appendix D), the deeper 25-foot layer is considered unlikely to contribute to surface manifestation of liquefaction (including settlement); hence, total liquefaction settlement at the surface would reasonably be expected to be on the order of 1½ to 2 inches.

Table 3.5.1
Liquefaction Analysis Results

Boring	Liquefiable Layer (ft.)	Layer Thickness (ft.)	Soil Type	Total Predicted Settlement (in.)
B-1	5 to 9¾	4.75	SC	1.7
	24¾ to 27¼	2.5	SP-SC	0.4

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 GENERAL CONCLUSIONS

Based on the subsurface conditions encountered at the site, it is our judgment that the subject site is suitable for the proposed development provided that the recommendations presented in this report are incorporated into the design and construction of the project. We recommend that as part of the site grading process any topsoil/organics/peat or otherwise unsuitable soils currently present at the site be removed from beneath proposed footings, or that footings be deepened to extend below the unsuitable soils. There is a fairly thick sequence of topsoil (peat) on the near-surface; it is critical that this material be removed below all planned improvements. We also recommend that soft soils be properly stabilized before constructing foundations or pavement. We recommend IGES be on site at key points during construction to document whether the recommendations presented in this report have been implemented. In recognition that at least part of the warehouse structure will be supported on 6 to 8 feet of structural fill arising from the pond in-fill, shallow spread or continuous wall footings should be established *entirely* on a minimum of 2½ feet of structural fill. The client should closely follow the moisture protection and surface drainage recommendations presented in Section 4.5 of this report to minimize the potential for water to infiltrate into underlying soils.

The following sub-sections present our recommendations for general site grading, design of foundations, slabs-on-grade, lateral earth pressures, pavement design, moisture protection and preliminary soil corrosion.

4.2 EARTHWORK

Prior to the placement of foundations, general site grading is recommended to provide proper support for foundations, exterior concrete flatwork, and concrete slabs-on-grade. Site grading is also recommended to provide proper drainage and moisture control on the subject property.

4.2.1 General Site Preparation

Within the areas to be graded (below proposed structures, fill sections, concrete flatwork, or pavement sections), any existing surface vegetation, debris, or undocumented fill should be removed. Topsoil was observed across the site with thicknesses of up to 36 inches. Insufficient removal of the topsoil/organic soil may result in undesired settlement. Any existing utilities should be re-routed or protected in-place before completing nearby excavations. The exposed native soils should then be proof-rolled with heavy rubber-tired equipment such as a loader. If soft soils are encountered, they should be mitigated following the recommendations presented in Section 4.2.5. Any soft/loose areas

identified during proof-rolling should be removed and replaced with structural fill, see Section 4.2.4. An IGES representative should observe the site preparation and grading operations to assess whether the recommendations presented in this report have been complied with.

4.2.2 Excavations

Undocumented fill, topsoil (peat), soft, porous, or otherwise unsuitable soils beneath foundations or concrete flatwork may need to be over-excavated and replaced with structural fill. The excavations should extend a minimum of ½-foot laterally for every foot of depth of over-excavation. Excavations should extend laterally at least two feet beyond slabs-on-grade. Structural fill recommendations are presented in this report (Section 4.2.4).

4.2.3 Excavation Stability

The contractor is responsible for site safety, including all temporary slopes and trenches excavated at the site and design of any required temporary shoring. The contractor is responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Soil types are expected to consist of *Type C* soils (sand/gravel and/or clay soils with unconfined compressive strengths less than 0.5 tsf) in the top 10 feet.

Based on Occupational Safety and Health (OSHA) guidelines for excavation safety, trenches with vertical walls up to 5 feet in depth may be occupied. Where very moist soil conditions or groundwater is encountered, or when the trench is deeper than 5 feet, we recommend a trench-shield or shoring be used as a protective system to workers in the trench. Sloping of the sides at 1.5H:1V (34 degrees) in *Type C* soils may be used as an alternative to shoring or shielding.

4.2.4 Structural Fill and Compaction

All fill placed for the support of structures, flatwork or pavements, should consist of structural fill. Structural fill may consist of the on-site native soils or an IGES-approved imported material. However, it is our experience that it may be difficult to achieve the specified compaction criteria with clayey soils, however, the onsite native coarse-grained soils should prove easier to work with. Consideration should be given to using an imported material in areas where structural fill is needed, especially where needed below the footings. Structural fill should be free of vegetation and debris and contain no rocks larger than 4 inches in nominal size (6 inches in greatest dimension). It is critical that topsoil (peat) must not be used as structural fill and must not be allowed to be mixed-in

with soils intended to be used as structural fill; this material must be kept segregated from other soils intended to be used as structural fill.

All structural fill should be placed in maximum 6-inch loose lifts if compacted by small hand-operated compaction equipment, maximum 8-inch loose lifts if compacted by light-duty rollers, and maximum 12-inch loose lifts if compacted by heavy duty compaction equipment that is capable of efficiently compacting the entire thickness of the lift. These values are *maximums*; the Contractor should be aware that thinner lifts may be necessary to achieve the required compaction criteria. We recommend that all structural fill be compacted on a horizontal plane, unless otherwise approved by IGES. Structural fill placed beneath footings and pavements should be compacted to at least 95 percent of the maximum dry density (MDD) as determined by ASTM D-1557. The moisture content should be at or slightly above the optimum moisture content (OMC) for all structural fill – compacting dry of optimum is discouraged. Any imported fill materials should be approved by IGES prior to importing. Also, prior to placing any fill, the excavations should be observed by IGES to confirm that unsuitable materials have been removed. In addition, proper grading should precede placement of fill, as described in the General Site Preparation subsection of this report.

All utility trenches backfilled below pavement sections, curb and gutter and concrete flatwork, should be backfilled with structural fill compacted to at least 95 percent of the MDD as determined by ASTM D-1557. All other trenches, including landscape areas, should be backfilled and compacted to a minimum of 90 percent of the MDD (ASTM D-1557).

Specifications from governing authorities having their own precedence for backfill and compaction should be followed where applicable.

4.2.5 Soft Soil Stabilization

Soft soils may be encountered at the site due to the presence of fine-grained soils (clay) and shallow groundwater (identified at depths ranging from 3½ to 7½ feet below existing grade). The presence of saturated clay soils may cause equipment mobility problems and may make it difficult to place and properly compact structural fill overlying these soils; conditions can be worsened following precipitation and/or during colder wetter seasons. If encountered, we recommend stabilizing these soils prior to placing structural fill, constructing pavement sections or foundation elements such as footings.

Stabilization can be accomplished by placing a woven geotextile over the soft subgrade; seams should be overlapped a minimum of 18 inches or as recommended by the manufacturer. The geotextile should be covered with a minimum of 18 inches of crushed,

angular ¾- to 4-inch diameter drain rock. Structural fill (Section 4.2.4) may then be placed and compacted as recommended in this report. The woven geotextile may consist of TenCate Mirafi HP570 or an approved equivalent. The geotextile should be placed to cover the entire excavation bottom. A lightweight 6-oz non-woven geotextile should be placed over the crushed rock If fine-grained soils (clays) are used as structural fill over the zone of stabilization.

Alternatively, stabilization of soft or pumping subgrade can be accomplished using a clean, coarse angular material worked into the soft subgrade. We recommend the material be greater than 3 inches in nominal diameter, but less than 6 inches. The stabilization material should be worked (pushed) into the soft subgrade soils until a relatively firm and unyielding surface is established. Once a relatively firm and unyielding surface is achieved, the area may be brought to final design grade using structural fill. Other earth materials not meeting aforementioned criteria may also be suitable; however, such material should be evaluated on a case-by-case basis and should be approved by IGES prior to use. The area should be wheel-rolled with heavy equipment to evaluate whether a firm working surface has been achieved and that soft/pumping soils have been "bridged" to the greatest extent reasonably possible based on existing subsurface conditions. An IGES representative should be present during this evaluation.

The area of stabilization should extend a minimum of 3 feet beyond the footings of the structure and at least 5 feet beyond the observed soft spot if in a paved area.

4.2.6 Pond In-Fill Recommendations

It is understood that the pond located in the southern third of the project site will be backfilled and the filled area will, in part, support the new warehouse. Based on our field measurements the pond is understood to be about 6 feet deep with 2 to 3 feet of standing water. Local dewatering will likely be required to facilitate over-excavation of the pond area and placement of structural fill. Dewatering would typically be accomplished by excavating a low point at one end of the excavation, stabilizing the low point with gravel and/or geotextiles as needed, installing a sump pump in the low area, and discharging water to an approved location. A detailed dewatering plan can be provided by IGES upon request, although a dewatering plan would typically be provided by the Contractor.

After dewatering, the bottom two feet of the pond should be over-excavated (this is presumed to consist of soft unconsolidated sediments or 'muck'). This dredged material may not be used as structural fill and should be segregated from any earth materials intended to be used as structural fill. Additional over-excavation may be necessary depending on the condition of the exposed subgrade. Prior to placing structural fill in the

pond area, the soil will likely need to be *stabilized*, see Section 4.2.5 (Soft Soil Stabilization). After the exposed subgrade has been stabilized (become a firm working surface), structural fill may then be placed until the desired grade has been reached, see Section 4.2.4 (Structural Fill and Compaction).

IGES should observe and document that the pond over-excavation has reached sufficient depth and that the exposed subgrade has been sufficiently stabilized prior to placement of structural fill. Furthermore, the sides of the pond should be stepped or 'benched' as structural fill is placed.

4.2.7 Infiltration Rate of Soil

A double-ring infiltrometer test was performed onsite; this test was detailed in a previous submittal (IGES, 2021b). For convenience, this letter has been attached in Appendix F.

4.3 FOUNDATIONS

Bearing capacity values were calculated using Meyerhof and others' modifications to Terzaghi's original bearing capacity formula. A factor of safety of 3 is generally used in developing allowable bearing values; however, additional reduction of allowable bearing is typically warranted to account for static settlement and inconsistent construction practices. Detailed calculations for allowable bearing capacity with respect to both shear and settlement are presented in Appendix E.

Based on our field observations and our analysis, and in recognition that at least some of the warehouse structure will be supported on structural fill as a result of the pond being filled in, we recommend that the footings for the proposed structure be founded *entirely* on a minimum of 2½ feet of structural fill extending to native soils. Prior to placement of structural fill, if the exposed native subgrade appears to be soft or pumping, the subgrade should be stabilized (Section 4.2.5) prior to placing structural fill for footings.

Structural fill should be placed and compacted in accordance with our recommendations presented in Sections 4.2.4 and 4.2.5 of this report. Shallow spread or continuous wall footings constructed on structural fill having a minimum thickness of 30 inches and extending to competent and/or stabilized native soils, as described previously, may be proportioned using a maximum net allowable bearing pressure of **2,000 pounds per square foot (psf)**. The net allowable bearing value presented above is for dead load plus live load conditions. A one-third increase may be used for transient loads such as wind or seismic. Strip and isolated spread footings should have a minimum width of 18 inches and 36 inches, respectively.

All foundations exposed to the full effects of frost should be established at a minimum depth of 30 inches below the lowest adjacent final grade. Interior footings, not subjected to the full effects of frost (i.e., a continuously heated structure), may be established at higher elevations, however, a minimum depth of embedment of 12 inches is recommended for confinement purposes.

4.4 SETTLEMENT

4.4.1 Static Settlement

Static settlement of properly designed and constructed conventional foundations, founded as described above, are anticipated to be on the order of 1 inch or less. Differential settlement is expected to be half of the total settlement over a distance of 30 feet. Detailed settlement calculations are presented in Appendix E.

4.4.2 Dynamic Settlement

Dynamic settlement (or seismically-induced settlement) consists of dry dynamic settlement of unsaturated soils (above groundwater) and liquefaction-induced settlement (below groundwater). During a strong seismic event, seismically-induced settlement can occur within loose to moderately dense sandy soil due to reduction in volume during, and shortly after a seismic event. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement.

Based on our liquefaction analysis detailed in Section 3.5.1, IGES recommends the structural engineer design the warehouse to accommodate 1 inch of differential settlement over a distance of 40 feet arising from a design-level seismic event.

4.5 MOISTURE PROTECTION

4.5.1 Surface Drainage

Moisture should not be allowed to infiltrate into the soils in the vicinity of the foundations. The following construction practices should be implemented to minimize water ponding and infiltration in areas adjacent to the proposed building:

- Rain gutters and downspouts should be installed to collect and discharge all roof runoff a minimum of 10 feet from the foundation elements.
- The ground surface within 10 feet of the foundations should be sloped a minimum of 5 percent to drain away from the structures or 2 percent if the area is paved.
- Pavement sections should be constructed to adequately divert water into storm water disposal systems.

- Areas around the pavement should be constructed and maintained to prevent infiltration of water underneath the pavements.

4.5.2 Groundwater

Based upon current groundwater data (see Section 3.4.2), IGES recommends that the representative high groundwater table should be taken as el. 4,544 ft, with the understanding that, due to the presence of the water well and nearby agriculture, locally the groundwater may be higher or lower, particularly in the vicinity of the water well.

4.6 EARTH PRESSURES AND LATERAL RESISTANCE

Lateral forces imposed upon conventional foundations due to wind or seismic forces may be resisted by the development of passive earth pressures and friction between the base of the footing and the supporting soils. In determining the frictional resistance, when bearing on granular structural fill a coefficient of friction of 0.45 may be used.

Based on an estimated internal angle of friction of 30 degrees, the ultimate lateral earth pressures for native fine-grained soils acting against buried structures may be computed from the lateral pressure coefficients or equivalent fluid densities presented in Table 4.6:

These values should be used with an appropriate factor of safety against overturning and sliding. A value of 1.5 is typically used. Additionally, if passive resistance is calculated in conjunction with frictional resistance, the passive resistance should be reduced by ½.

Table 4.6
Recommended Lateral Earth Pressure Coefficients for Static Conditions

Condition	Lateral Pressure Coefficient	Equivalent Fluid Density (pounds per cubic foot)
Active*	0.33	40
At-rest**	0.50	60
Passive*	3.00	360

* Based on Coulomb's equation

** Based on Jaky

The coefficients and densities presented in the table above assume no buildup of hydrostatic pressures, a vertical wall face and flat back slope. The force of the water should be added to the presented values if hydrostatic pressures are anticipated. Proper grading and other drainage recommendations provided previously in this report will help to reduce the potential for buildup of hydrostatic pressures if implemented.

Clayey soils drain poorly and may swell upon wetting, thereby greatly increasing lateral pressures acting on earth retaining structures; therefore, clayey soils with a potential for swelling should not be used as retaining wall backfill. Backfill should consist of soil with an Expansion Index (EI) less than 20.

Sample calculations for lateral earth pressure are presented in Appendix E.

4.7 CONCRETE SLAB-ON-GRADE CONSTRUCTION

To minimize settlement and cracking of slabs, and to aid in drainage beneath the concrete floor slabs, all concrete slabs should be founded on a minimum 4-inch layer of clean gravel overlying properly prepared subgrade, see section 4.2.1 and 4.2.5. If undocumented fill soils or topsoil is encountered below areas of slab-on-grade construction, they should be removed and replaced with structural fill as recommended in Section 4.2.4. Before structural fill is placed, the exposed subgrade should be stabilized per Section 4.2.5 if the soils are soft or pumping. The 4-inch layer of gravel should consist of free-draining gravel with no more than 5 percent passing the No. 200 mesh sieve that should be vibrated in place for densification.

All concrete slabs should be designed to minimize cracking as a result of shrinkage. Consideration should be given to reinforcing the slab with a welded wire fabric, re-bar, or fiber mesh. Slab reinforcement should be designed by the structural engineer; however, as a minimum, slab reinforcement should consist of 4" × 4" (W4.0×W4.0) welded wire mesh within the middle third of the slab. We recommend that concrete be tested to assess that the slump and/or air content are in compliance with the plans and specifications. We recommend that concrete be placed in general accordance with the requirements of the American Concrete Institute (ACI). A Modulus of Subgrade Reaction of **125 psi/inch** may be used for design.

Our experience indicates that use of reinforcement in slabs and foundations can generally reduce the potential for cracking resulting from drying and shrinkage. However, some cracking can be expected as the concrete cures. Minor cracking is considered normal; however, it is often aggravated by a high water/cement ratio, high concrete temperature at the time of placement, small nominal aggregate size, and rapid moisture loss due to hot, dry, and/or windy weather conditions during placement and curing. Cracking due to temperature and moisture fluctuations can also be expected. The use of low slump concrete can reduce the potential for shrinkage cracking; saw cuts in the concrete at strategic locations can help to control and reduce undesirable shrinkage cracks.

4.8 PAVEMENT

Based on our experience and observations of the native onsite soils, IGES has assumed a CBR value of 3 for the pavement design. Anticipated traffic volumes were not available at the time this report was prepared, however, for the parking areas around the facility and loading docks IGES has assumed an equivalent single axle load (ESAL) of 150,000 over a 30-year design life. Based on these assumptions and our analysis, IGES recommends the following pavement section be used to support anticipated traffic loads for the parking lot, summarized in the following table. If soft or pumping soils are encountered at the bottom of the road base elevation the Soft Soil Stabilization recommendations from Section 4.2.5 should be applied, prior to placing road base.

Table 4.8
Flexible (Asphalt) Pavement Section

Asphalt (in.)	Road Base (in.)
3	11

Asphalt has been assumed to be a high stability plant mix, base course material should be composed of crushed stone with a minimum CBR of 70 Asphalt should be compacted to a minimum density of 96% of the Marshall value; base course and all structural fill placed below pavement should be compacted to at least 95% of the MDD as determined by ASTM D-1557.

It is our experience that pavement in areas where vehicles frequently turn around, stop, backup, load and unload, entrance and exit areas, delivery/dock areas and drive thru lanes often experience more distress. If the owner wishes to prolong the life of the pavement in these areas, consideration should be given to using a Portland cement concrete (rigid) pavement in these areas. IGES recommends that the follow pavement section be used for the high traffic areas:

For the rigid pavement section design, IGES has assumed a flexural strength of the concrete at 28 days of at least 600 psi, road base with a minimum CBR value of 70 and a load transfer coefficient of 2.7 for doweled joints with edge support. If a rigid pavement section is used, IGES recommends that the concrete have a minimum thickness of 5 inches over road base with a minimum thickness of 10 inches.

Road base should be placed in maximum 6-inch loose lifts and compacted to a minimum of 95 percent of the maximum dry density (MDD) and within 2 percent of the optimum moisture content (OMC) based on the modified Proctor (ASTM D1557). If soft soils are exposed in the subgrade below proposed roadway improvements, they should be

removed or compacted to 95 percent of MDD *at or wet of* OMC prior to placement of granular borrow or road base. Proof rolling with heavy rubber-tired equipment should be used to assess the exposed subgrade for soft soils; soft soils should be stabilized as recommended in Section 4.2.5.

The pavement section presented in Table 4.8 assumes that there is no mixing over time between the road base and the underlying clayey subgrade. In order to prevent mixing or fines migration, and thereby prolong the life of the pavement section, we recommend that the owner give consideration to placing a non-woven filter fabric between the native soils and the road base, such as the Mirafi 140N or an IGES-approved equivalent.

IGES also recommends that the contractor review and become familiar with the minimum recommendations and guidelines contained in American Fork City's Public Works minimum guidelines before bidding and constructing.

4.9 PRELIMINARY SOIL CORROSION POTENTIAL

As a part of this investigation chemical testing was completed on a representative sample of the near-surface soils. The test results are discussed in Section 3.4.6 of this report and are presented in Appendix B. Based on the test results; the following recommendations are made:

- Site soils are expected to exhibit *severe corrosivity* with respect to steel in direct contact with site soils. Consideration should be given to retaining the services of a qualified corrosion engineer to provide an assessment of any metal that will be in contact with native soils.

- Site soils are expected to exhibit *low corrosivity* with respect to concrete in direct contact with site soils. Conventional Type I/II Portland cement should be used for all concrete in contact with site soils.

5.0 CLOSURE

5.1 LIMITATIONS

The concept of risk is a significant consideration of geotechnical analyses. The analytical means and methods used in performing geotechnical analyses and development of resulting recommendations do not constitute an exact science. Analytical tools used by geotechnical engineers are based on limited data, empirical correlations, engineering judgment and experience. As such the solutions and resulting recommendations presented in this report cannot be considered risk-free and constitute IGES's best professional opinions and recommendations based on the available data and other design information available at the time they were developed. IGES has developed the preceding analyses, recommendations and designs, at a minimum, in accordance with generally accepted professional geotechnical engineering practices and care being exercised in the project area at the time our services were performed. No warrantees, guarantees or other representations are made.

The information contained in this report is based on limited field testing and understanding of the project. The subsurface data used in the preparation of this report were obtained largely from the explorations made for this project. It is very likely that variations in the soil, rock, and groundwater conditions exist between and beyond the points explored. The nature and extent of the variations may not be evident until construction occurs and additional explorations are completed. If any conditions are encountered at this site that are different from those described in this report, IGES must be immediately notified so that we may make any necessary revisions to recommendations contained in this report. In addition, if the scope of the proposed construction or grading changes from those described in this report, our firm must also be notified.

This report was prepared for our client's exclusive use on the project identified in the foregoing. Use of the data, recommendations or design information contained herein for any other project or development of the site not as specifically described in this report is at the user's sole risk and without the approval of IGES, Inc. It is the client's responsibility to see that all parties to the project including the designer, contractor, subcontractors, etc. are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk.

5.2 ADDITIONAL SERVICES

We recommend that IGES be retained to review the final design plans, grading plans and specifications to determine if our engineering recommendations have been properly incorporated in the project development documents. We also recommend that IGES be retained to evaluate construction performance and other geotechnical aspects of the projects as construction initiates and progresses through its completion.

6.0 REFERENCES CITED

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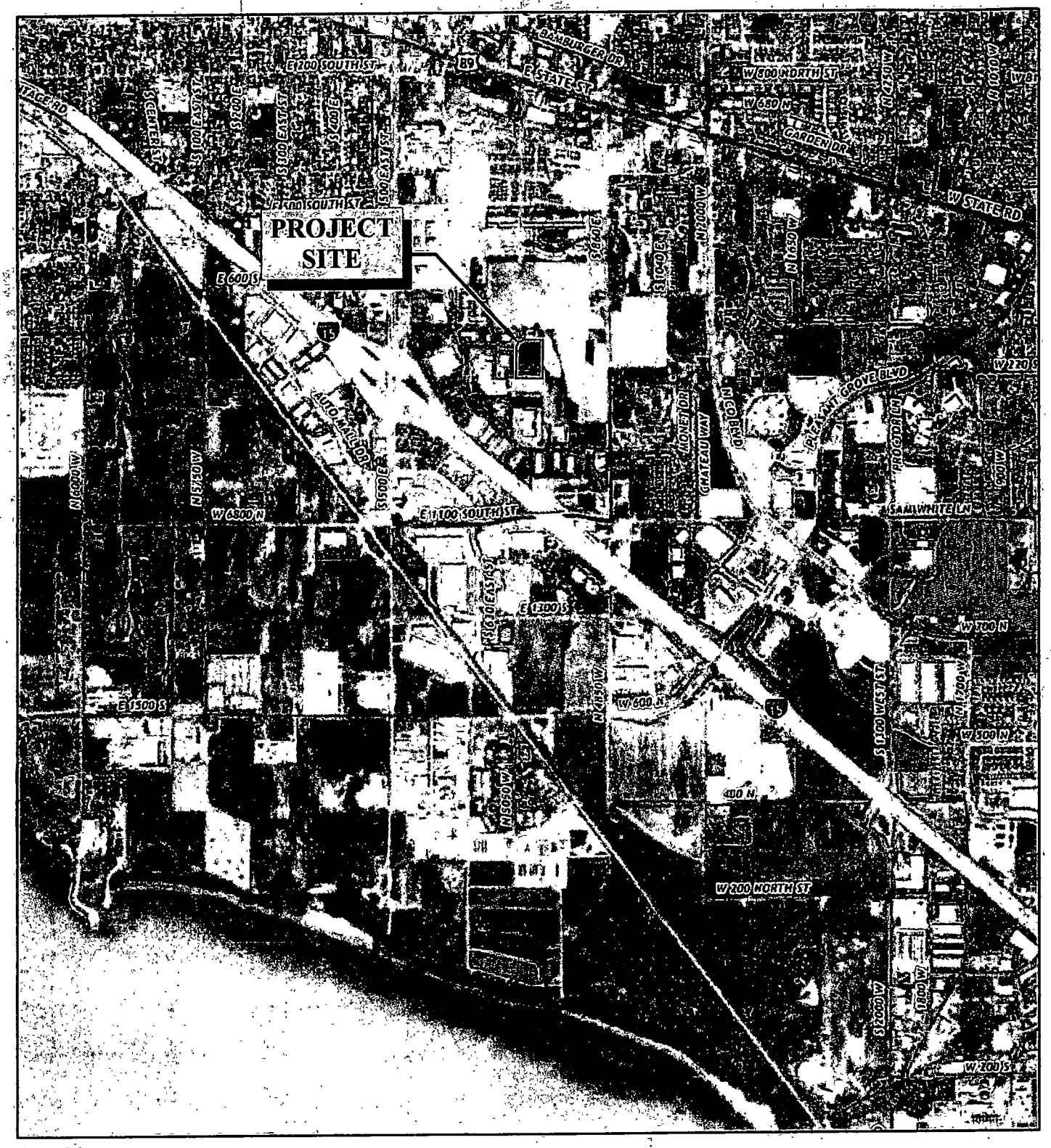
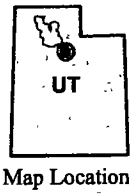
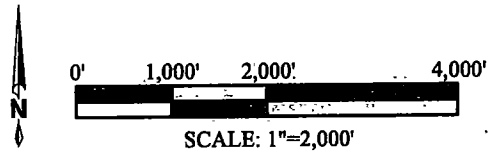
APPENDIX A



Base Map:
USGS *Pelican Point, UT*
7.5-Minute Quadrangle (2020)



Map Location



IGES

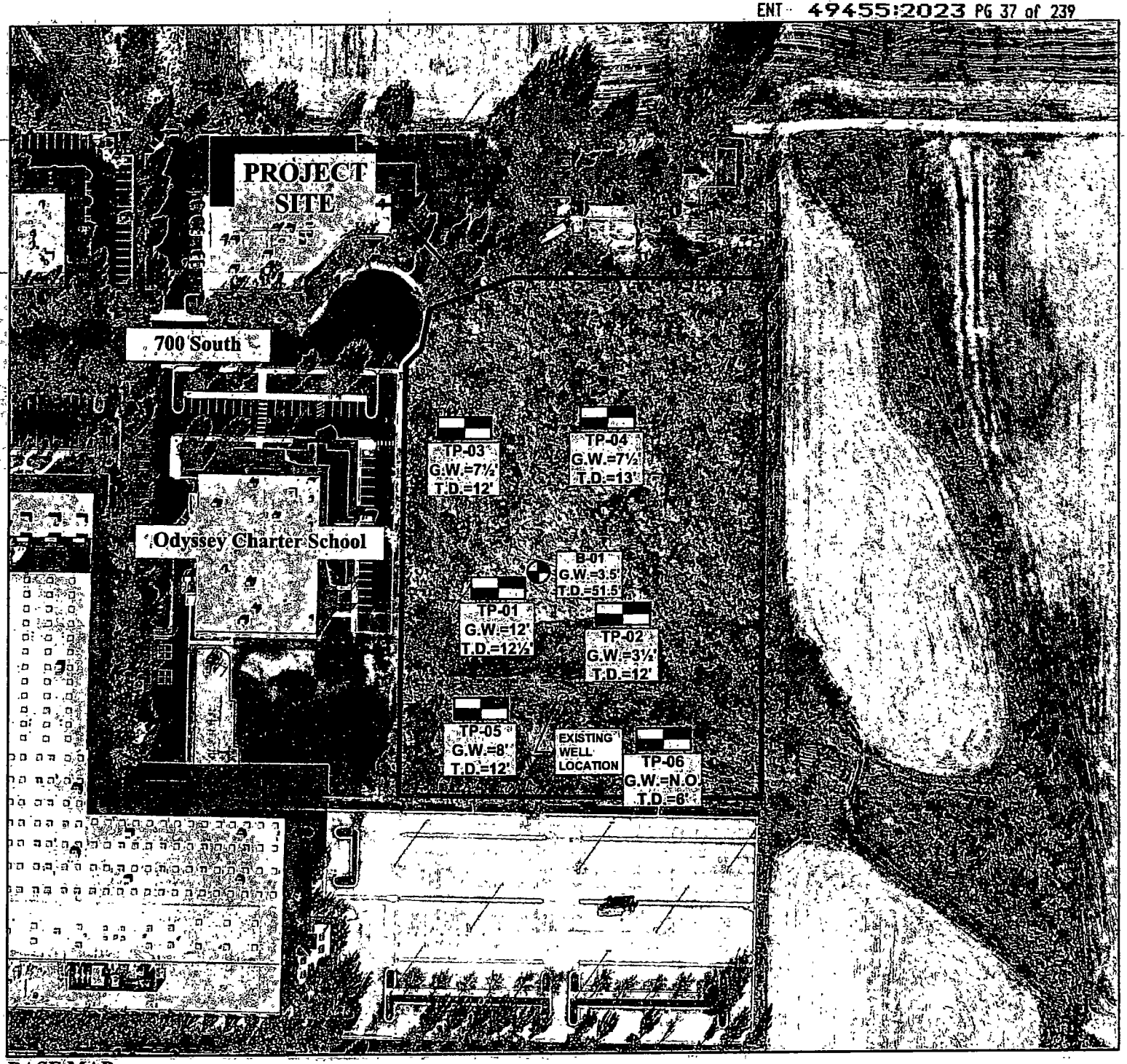
Project No. 03638-001

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork, Utah

SITE VICINITY MAP

Figure

A-1



BASE MAP

Google Earth imagery dated September 2020

LEGEND

APPROXIMATE BORING LOCATION

APPROXIMATE TEST PIT LOCATION

T.D. = 12' TOTAL DEPTH EXPLORED

G.W.= 9' DEPTH TO GROUNDWATER

N

0' 75' 150' 300'

SCALE: 1"=150'

IGES

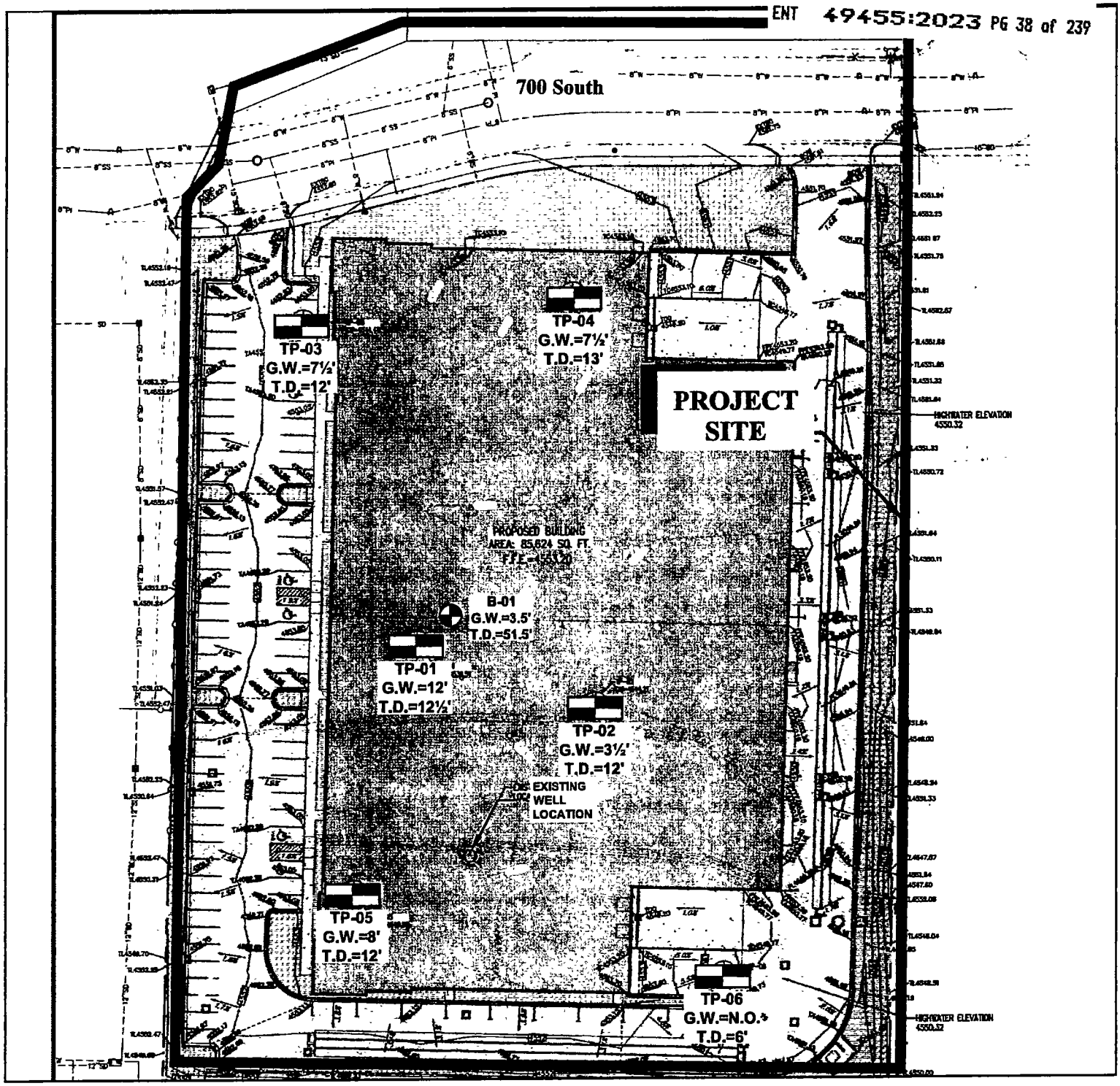
Project No. 03638-003

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork, Utah

GEOTECHNICAL MAP

Figure

A-2a



BASE MAP

Background image from Civil Engineering+Surveying (CIR), Utah Valley Buisness Park, 752 East Quality Drive, American Fork, Utah, Grading Plan, Sheet C2.0, Project No. H1022-01, Date 3/22/21

LEGEND

APPROXIMATE INFILTRATION TEST LOCATION

G.W.= N.O.' DEPTH TO GROUNDWATER

T.D. = 12' TOTAL DEPTH EXPLORED

N

0' 75' 150'

SCALE: 1"=75'

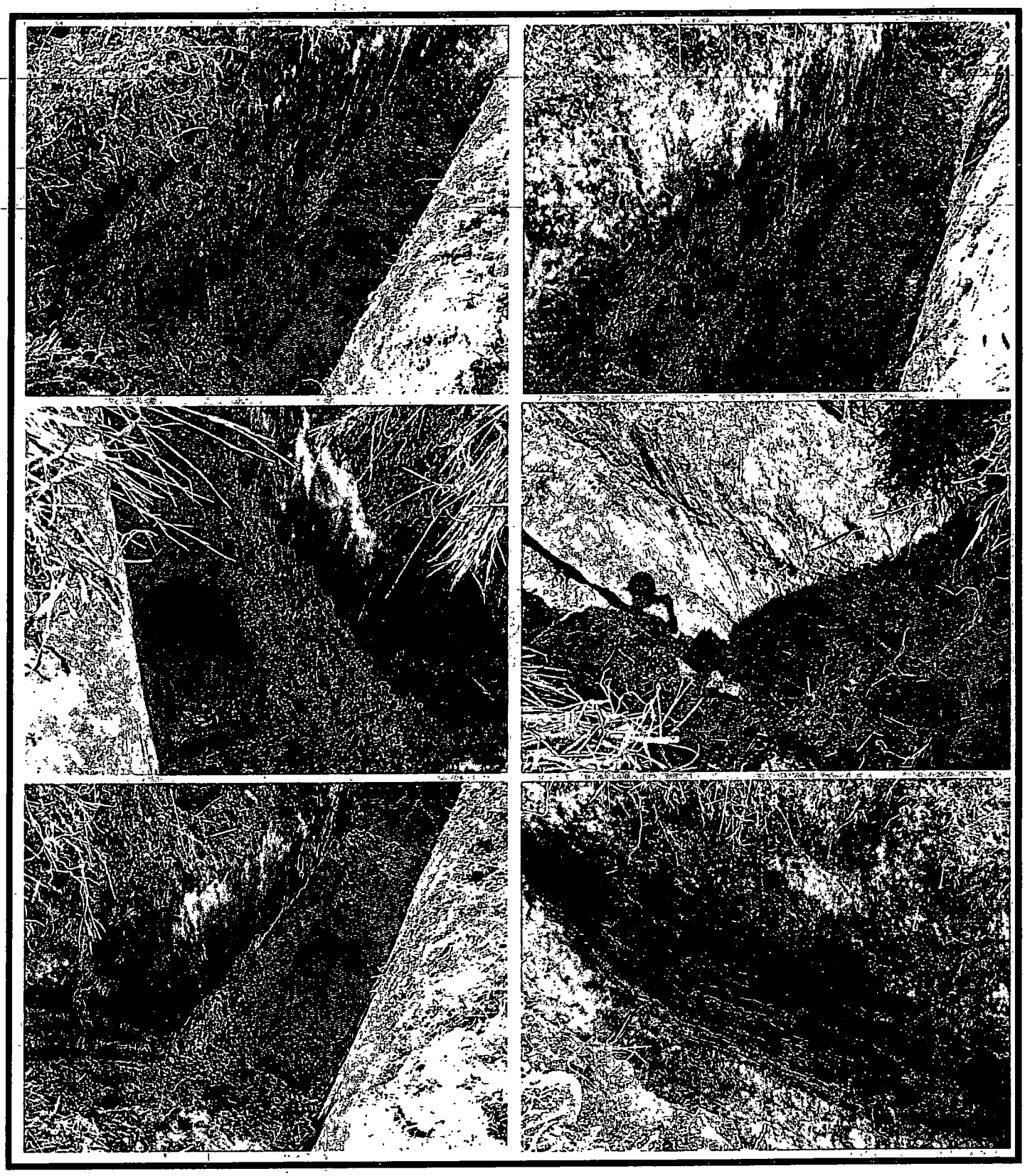
Project No. 03638-001

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork, Utah

GEOTECHNICAL MAP

Figure

A-2b



Photos Taken on March 19, 2021

IGES Project Number 03638-001	Geotechnical Investigation Flex Warehouse 748 East Quality Drive American Fork, Utah **Site Photos**	**FIGURE** **A-3**

DATE: STARTED: 7/19/21 | COMPLETED: 7/19/21 | BACKFILLED: 7/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork Utah
IGES Project Number: 03638-001

IGES Rep: DJS
Rig Type: CME 75
Boring Type: HSA

BORING NO: B-1
Sheet 1 of 3

LOCATION
LATITUDE 40.36161 LONGITUDE -111.77855 ELEVATION (above m.s.l) 4,549 feet

DEPTH ELEVATION	DEPTH FEET	SAMPLES	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	N	Water Level	Dry Density(pcf)	Moisture Content (%)	Percent minus 200	Liquid Limit	Plasticity Index
					Topsoil - Lean CLAY with sand, medium stiff, moist, dark brown moderate amounts of organic material							
				SC	**Native** - Clayey SAND, medium dense, moist, moderate brown fine grained sand							
4545												
	5				Clayey SAND with gravel, very loose, wet, moderate brown, fine grained sand	0 2 1			19	28		
					with gravel, 1 to 2 inch typical diameter, sub-rounded							
					Clayey SAND, very loose, wet, moderate brown, fine grained sand	1 2 1			24	35		
4540												
	10			CL	Well Graded Sandy Lean CLAY, soft, saturated, moderate brown fine grained sand	1 1 2			29	63		
				GP	Poorly Graded GRAVEL with sand, medium dense, wet, light to moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter fine to medium grained sand	6 8 10						
4535												
	15			SP-SC	Poorly Graded SAND with clay and trace gravel, dense, wet, moderate brown medium grained sand	8 18 17			27	9		
				SC	Clayey SAND, medium dense, wet, moderate brown fine grained sand	2 4 14			22	31		
4530												
	20			SP-SC	Poorly Graded SAND with clay and gravel, dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter medium grained sand	12 23 18			14	9		
				GP	Poorly Graded GRAVEL with sand, dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 1 inch diameter medium grained sand	13 20 22						

Moisture Content and Atterberg Limits
Plastic Limit | Moisture Content | Liquid Limit
10 20 30 40 50 60 70 80 90

N - OBSERVED BLOW COUNT PER 6 INCHES

SAMPLE TYPE
- 2" O.D./1.38" I.D. Split Spoon Sampler
- 3.25" O.D./2.42" I.D. 'U' Sampler
- 3" O.D. Thin-Walled Shelby Sampler
- Grab Sample
- California Sampler
- Sample from Auger Cuttings

BORING LOG

NOTES:
Location and elevation are approximate

WATER LEVEL
▼ - MEASURED ▽ - ESTIMATED

FIGURE A - 4a

LOG OF BORING (A) DAG V 3.01 03638-001 BORING LOGS.GPJ IGES.GDT 8/16/21

DATE: STARTED: 7/19/21 | COMPLETED: 7/19/21 | BACKFILLED: 7/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork Utah
IGES Project Number: 03638-001

IGES Rep: DJS
Rig Type: CME 75
Boring Type: HSA

BORING NO: **B-1**
Sheet 2 of 3

LOCATION
LATITUDE 40.36161 LONGITUDE -111.77855 ELEVATION 4,549 feet (above m.s.l)

ELEVATION	FEET	SAMPLES	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	N	Water Level	Dry Density(pcf)	Moisture Content (%)	Percent minus 200	Liquid Limit	Plasticity Index
	25			SP-SC	Poorly Graded SAND with clay and trace gravel, medium dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter medium grained sand, 4 inch seam of Lean CLAY in bottom of sample	18 11 4			13	8		
4520				GP GP	Poorly Graded GRAVEL with sand, dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 1 inch diameter fine to medium grained sand	15 22 16						
	30			SP-SC	Poorly Graded SAND with clay and trace gravel, dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter medium grained sand	15 22 20			11	10		
4515					Poorly Graded SAND with gravel, very dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter medium grained sand	18 25 30						
	35				Poorly Graded SAND with clay and trace gravel, very dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter medium to course grained sand	20 33 49			13	7		
4510					Poorly Graded SAND with gravel, dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter medium to course grained sand, 1 inch piece of gravel blocking mouth of sampler	19 19 13						
	40				Poorly Graded SAND with clay and trace gravel grading to Silty Clayey SAND, medium dense, wet, moderate brown medium to course grained sand	6						
				CL-ML	Silty CLAY with trace fine sands, stiff, saturated, light brown to dark grey	13 12			19 26	16 70	25	5
4505					Silt Clay with fine sand, very stiff, saturated, dark grey	5 9 11			28	75	26	5
	45			SC	Clayey SAND with lean clay seams, medium dense, wet, dark grey fine to medium grained sand	8 11 11			25	38		
				CL	Lean CLAY with fine sands, very stiff, saturated, dark grey	5						

Moisture Content and Atterberg Limits
Plastic Limit — Moisture Content — Liquid Limit
10 20 30 40 50 60 70 80 90

N - OBSERVED BLOW COUNT PER 6 INCHES

SAMPLE TYPE
- 2" O.D./1.38" I.D. Split Spoon Sampler
- 3.25" O.D./2.42" I.D. 'U' Sampler
- 3" O.D. Thin-Walled Shelby Sampler
- Grab Sample
- California Sampler
- Sample from Auger Cuttings

BORING LOG

NOTES:
Location and elevation are approximate

WATER LEVEL
▼ - MEASURED ▽ - ESTIMATED

FIGURE A - 4b

LOG OF BORING (A) DAG V 3.01 03638-001 BORING LOGS.GPJ IGES.GDT 8/16/21

DATE: STARTED. 7/19/21; COMPLETED: 7/19/21; BACKFILLED: 7/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork Utah
IGES Project Number: 03638-001

IGES Rep: DJS
Rig Type: CME 75
Boring Type: HSA

BORING NO: B-1
Sheet 3 of 3

LOCATION
LATITUDE 40.36161 LONGITUDE -111.77855 ELEVATION (above m.s.l) 4,549 feet

ELEVATION	FEET	SAMPLES	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	N	Water Level	Dry Density(pcf)	Moisture Content (%)	Percent minus 200	Liquid Limit	Plasticity Index
4500	50				Lean CLAY with trace fine sands, stiff, saturated, dark grey	8 9 2 6 8			28 28	85 91	32 40	9 21
					Groundwater observed at 3.5 feet Bottom of Boring @ 51.5 Feet							
4495	55											
4490	60											
4485	65											
4480	70											

Moisture Content and Atterberg Limits
Plastic Limit — Moisture Content — Liquid Limit
10 20 30 40 50 60 70 80 90

N - OBSERVED BLOW COUNT PER 6 INCHES

SAMPLE TYPE
- 2" O.D./1.38" I.D. Split Spoon Sampler
- 3.25" O.D./2.42" I.D. 'U' Sampler
- 3" O.D. Thin-Walled Shelby Sampler
- Grab Sample
- California Sampler
- Sample from Auger Cuttings

BORING LOG

NOTES:
Location and elevation are approximate

WATER LEVEL
▼ - MEASURED ▽ - ESTIMATED

FIGURE A - 4c

LOG OF BORING (A) DAG V 3.01 03638-001 BORING LOGS.GPJ IGES.GDT 8/16/21

DATE
STARTED: 3/19/21
COMPLETED: 3/19/21
BACKFILLED: 3/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork,, Utah
Project Number 03638-001

IGES Rep. BF
Rig Type: JCB-4CX

TEST PIT NO:
TP- 1
Sheet 1 of 1

LOCATION
LATITUDE 40.36140 LONGITUDE -111.77875 ELEVATION 4,549

ELEVATION	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
	0				CL	**Topsoil** - Lean CLAY with sand and occasional gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics					
	1				OL	Organic Clay, soft, highly saturated, black, low dry unit weight, predomantly organic material					
	2										
	3				CL	Lean CLAY with sand and occasional gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics					
4545	4				GC	**Alluvium (Qa)** - Clayey GRAVEL with sand, medium dense, moist, moderate brown gray, rounded, occasional root matter		0.3	18.5		
	5										
	6				SM	Silty SAND with gravel, medium dense, moist, moderate brown, gravel decreases in size and quantitiy with depth	86.3	35.3			
	7										
4540	8										
	9										
	10				GC	Clayey GRAVEL with sand, medium dense, moist, moderate brown gray, rounded					
	11										
	12		▼								
	13					Groundwater observed at 12½ feet					
4535	14										

Moisture Content and Atterberg Limits
Plastic Limit | Moisture Content | Liquid Limit
10 20 30 40 50 60 70 80 90

SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
▼ - MEASURED
▽ - ESTIMATED

NOTES:
Location is approximate with elevation based on the grading plan by CIR

Figure A-5

LOG OF TEST PITS - 4 LINE HEADER W ELEV 03638-001.GPJ IGES.GDT 8/16/21

DATE
STARTED: 3/19/21
COMPLETED: 3/19/21
BACKFILLED: 3/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork,, Utah Project Number 03638-001

IGES Rep: BF
Rig Type: JCB-4CX

TEST PIT NO:
TP- 2
Sheet 1 of 1

LOCATION
LATITUDE 40.36132 LONGITUDE -111.77826 ELEVATION 4,548

DEPTH FEET	ELEVATION	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
0					CL	Topsoil - Lean CLAY with sand and occasional gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics					
1					OL	Organic Clay, soft, highly saturated, black, low dry unit weight, predomantly organic material					
2	4545						15.3	333.9			
3					CL	Lean CLAY with sand and occasional gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics					
					GC	Alluvium (Qa) - Clayey GRAVEL with sand, medium dense, moist, moderate brown gray, rounded, occasional root matter					
4							95.9	29.8	40.7		
5											
6											
7	4540				SM	Silty SAND with gravel, medium dense, moist, moderate brown, gravel decreases in size and quantitiy with depth					
8											
9											
10					GC	Clayey GRAVEL with sand, medium dense, moist, moderate brown gray, rounded					
11											
12	4535										
13						Groundwater observed at 3½ feet					
14											

Moisture Content and Atterberg Limits

Plastic Limit | Moisture Content | Liquid Limit

10 20 30 40 50 60 70 80 90

333.9

SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
- MEASURED
- ESTIMATED

NOTES:
Location is approximate with elevation based on the grading plan by CIR

Figure A-6

LOG OF TEST PITS - 4 LINE HEADER W ELEV 03638-001.GPJ IGES.GDT 8/16/21

DATE
STARTED: 3/19/21
COMPLETED: 3/19/21
BACKFILLED: 3/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork,, Utah
Project Number 03638-001

IGES Rep: BF
Rig Type: JCB-4CX

TEST PIT NO:
TP- 3
Sheet 1 of 1

LOCATION
LATITUDE 40.36185 LONGITUDE -111.77885 ELEVATION 4,552

ELEVATION	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
	0				CL	**Topsoil** - Lean CLAY with sand and occasional gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics					
	1				OL	Organic Clay, soft, highly saturated, black, low dry unit weight, predomantly organic material					
4550	2				CL	Lean CLAY with sand and occasional gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics	72.5	36.3			
	3				GC	**Alluvium (Qa)** - Clayey GRAVEL with sand, medium dense, moist, moderate brown gray, rounded, occasional root matter					
	4										
	5										
	6										
4545	7		▼		SC	Clayey SAND with gravel, medium dense, moist, moderate brown, gravel decreases in size and quantitiy with depth					
	8										
	9										
	10										
	11										
4540	12										
	13					Groundwater observed at 7½ feet					
	14										

Moisture Content and Atterberg Limits
Plastic Limit — Moisture Content — Liquid Limit
10 20 30 40 50 60 70 80 90

SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
▼ - MEASURED
▽ - ESTIMATED

NOTES:
Location is approximate with elevation based on the grading plan by CIR

Figure A-7

LOG OF TEST PITS - 4 LINE HEADER W ELEV 03638-001.GPJ IGES.GDT 8/16/21

DATE
STARTED: 3/19/21
COMPLETED: 3/19/21
BACKFILLED: 3/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork,, Utah Project Number 03638-001

IGES Rep: BF
Rig Type: JCB-4CX

TEST PIT NO: **TP-4**
Sheet 1 of 1

LOCATION
LATITUDE 40.36191 LONGITUDE -111.77829 ELEVATION 4,551

DEPTH FEET	ELEVATION	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
0	4550				CL	**Topsoil** - Lean CLAY with gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics					
1					OL	Organic Clay, soft, highly saturated, black, low dry unit weight, predomantly organic material					
2					GC	**Alluvium (Qa)** - Clayey GRAVEL, loose to medium dense, moist to wet, gray, rounded, occasional root matter					
3											
4					CL	Lean CLAY, stiff, moist to wet, gray to moderate brown, frequent roots and decaying organics					
5	4545						90.2	24.4		45	23
6							85.9	35.4			
7											
8					GC	Clayey GRAVEL with sand, loose to medium dense, wet, moderate brown to gray					
9											
10	4540										
11											
12					SC	Clayey SAND, medium dense, wet, moderate grayish brown					
13						Groundwater observed at 7½ feet					
14											

Moisture Content and Atterberg Limits
Plastic Limit | Moisture Content | Liquid Limit
10 20 30 40 50 60 70 80 90

SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
- MEASURED
- ESTIMATED

NOTES:
Location is approximate with elevation based on the grading plan by CIR

Figure A-8

LOG OF TEST PITS - 4 LINE HEADER W ELEV 03638-001.GPJ IGES.GDT 8/16/21

DATE	
STARTED:	3/19/21
COMPLETED:	3/19/21
BACKFILLED:	3/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork,, Utah Project Number 03638-001

IGES Rep. BF
Rig Type: JCB-4CX

TEST PIT NO: **TP-5**
Sheet 1 of 1

LOCATION
LATITUDE 40.36100 LONGITUDE -111.77877 ELEVATION 4,549

DEPTH FEET	ELEVATION	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
0					GC	**Alluvium (Qa)** - Clayey GRAVEL with sand, medium dense to dense, moist, dark brown to moderate brown, 3-4 in. gravel typ., roots and organics are common					
1											
2											
3	4545						71.4	45.6			
4											
5											
6					SC	Clayey SAND with gravel, loose to medium dense, moderate gray to moderate brown, moist to wet	91.1	34.5			
7											
8			▼								
9	4540										
10											
11											
12						Groundwater observed at 8 feet below existing grade					
13											
14	4535										

Moisture Content and Atterberg Limits

Plastic Limit — Moisture Content — Liquid Limit

10 20 30 40 50 60 70 80 90

LOG OF TEST PITS - 4 LINE HEADER W ELEV 03638-001.GPJ IGES.GDT 8/16/21

SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
▼ - MEASURED
▽ - ESTIMATED

NOTES:
Location is approximate with elevation based on the grading plan by CIR

Figure A-9

DATE
STARTED: 3/19/21
COMPLETED: 3/19/21
BACKFILLED: 3/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork,, Utah Project Number 03638-001

IGES Rep: BF
Rig Type: JCB-4CX

TEST PIT NO: **TP-6**
Sheet 1 of 1

LOCATION
LATITUDE 40.36095 LONGITUDE -111.77818 ELEVATION 4,548

DEPTH FEET	ELEVATION	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
0						**Undocumneted Fill** - Broken Concrete					
1					CL	**Alluvium (Qa)** - Gravelly CLAY with sand, loose to medium dense, moist, moderate brown					
2											
3	4545										
4					SC	Clayey SAND with gravel, medium dense to dense, moist, moderate brown					
5						Well cemented, frequent iron oxidation Very hard digging					
6						Groundwater not observed Refusal at 6 feet					
7											
8	4540										
9											
10											
11											
12											
13	4535										
14											

Moisture Content and Atterberg Limits
Plastic Limit — Moisture Content — Liquid Limit
10 20 30 40 50 60 70 80 90

SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
- MEASURED
- ESTIMATED

NOTES:
Location is approximate with elevation based on the grading plan by CIR

Figure A-10

LOG OF TEST PITS - 4 LINE HEADER W ELEV 03638-001.GPJ IGES.GDT 8/16/21

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			USCS SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (More than half of material is larger than the #200 sieve)	GRAVELS (More than half coarse fraction is larger than the #4 sieve)	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS (More than half coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES
			SC	CLAYEY SANDS SAND-GRAVEL-CLAY MIXTURES
FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid limit less than 50)		ML	INORGANIC SILTS & VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (Liquid limit greater than 50)		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

LOG KEY SYMBOLS

- BORING SAMPLE LOCATION
- TEST-PIT SAMPLE LOCATION
- WATER LEVEL (level after completion)
- WATER LEVEL (level where first encountered)

CEMENTATION

DESCRIPTION	DESCRIPTION
WEAKELY	CRUMBLES OR BREAKS WITH HANDLING OR SLIGHT FINGER PRESSURE
MODERATELY	CRUMBLES OR BREAKS WITH CONSIDERABLE FINGER PRESSURE
STRONGLY	WILL NOT CRUMBLE OR BREAK WITH FINGER PRESSURE

OTHER TESTS KEY

C	CONSOLIDATION	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	DS	DIRECT SHEAR
UC	UNCONFINED COMPRESSION	T	TRIAXIAL
S	SOLUBILITY	R	RESISTIVITY
O	ORGANIC CONTENT	RV	R-VALUE
CBR	CALIFORNIA BEARING RATIO	SU	SOLUBLE SULFATES
COMP	MOISTURE/DENSITY RELATIONSHIP	PM	PERMEABILITY
CI	CALIFORNIA IMPACT	-200	% FINER THAN #200
COL	COLLAPSE POTENTIAL	Gs	SPECIFIC GRAVITY
SS	SHRINK SWELL	SL	SWELL LOAD

MODIFIERS

DESCRIPTION	%
TRACE	<5
SOME	5 - 12
WITH	>12

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
DRY	ABSENCE OF MOISTURE, DUSTY, DRY TO THE TOUCH
SLIGHTLY MOIST	CONTAINING A MINIMAL AMOUNT OF MOISTURE, NOT DRY OR DAMP
MOIST	DAMP BUT NO VISIBLE WATER
WET	VISIBLE FREE WATER, USUALLY SOIL BELOW WATER TABLE

STRATIFICATION

DESCRIPTION	THICKNESS	DESCRIPTION	THICKNESS
SEAM	1/16-1/2"	OCCASIONAL	ONE OR LESS PER FOOT OF THICKNESS
LAYER	1/2-12"	FREQUENT	MORE THAN ONE PER FOOT OF THICKNESS

GENERAL NOTES

1. Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual.
2. No warranty is provided as to the continuity of soil conditions between individual sample locations.
3. Logs represent general soil conditions observed at the point of exploration on the date indicated.
4. In general, Unified Soil Classification designations presented on the logs were evaluated by visual methods only. Therefore, actual designations (based on laboratory tests) may vary.

APPARENT / RELATIVE DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	SPT (blows/ft)	MODIFIED CA. SAMPLER (blows/ft)	CALIFORNIA SAMPLER (blows/ft)	RELATIVE DENSITY (%)	FIELD TEST
VERY LOOSE	<4	<4	<5	0 - 15	EASILY PENETRATED WITH 1/2-INCH REINFORCING ROD PUSHED BY HAND
LOOSE	4 - 10	5 - 12	5 - 15	15 - 35	DIFFICULT TO PENETRATE WITH 1/2-INCH REINFORCING ROD PUSHED BY HAND
MEDIUM DENSE	10 - 30	12 - 35	15 - 40	35 - 65	EASILY PENETRATED A FOOT WITH 1/2-INCH REINFORCING ROD DRIVEN WITH 5-LB HAMMER
DENSE	30 - 50	35 - 60	40 - 70	65 - 85	DIFFICULT TO PENETRATE 12" WITH 1/2-INCH REINFORCING ROD DRIVEN WITH 5-LB HAMMER
VERY DENSE	>50	>60	>70	85 - 100	PENETRATED ONLY FEW INCHES WITH 1/2-INCH REINFORCING ROD DRIVEN WITH 5-LB HAMMER

CONSISTENCY - FINE-GRAINED SOIL		TORVANE	POCKET PENETROMETER	FIELD TEST
CONSISTENCY	SPT (blows/ft)	UNTRAINED SHEAR STRENGTH (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	
VERY SOFT	<2	<0.125	<0.25	EASILY PENETRATED SEVERAL INCHES BY THUMB. EXUDES BETWEEN THUMB AND FINGERS WHEN SQUEEZED BY HAND.
SOFT	2 - 4	0.125 - 0.25	0.25 - 0.5	EASILY PENETRATED ONE INCH BY THUMB. MOLDED BY LIGHT FINGER PRESSURE.
MEDIUM STIFF	4 - 8	0.25 - 0.5	0.5 - 1.0	PENETRATED OVER 1/2 INCH BY THUMB WITH MODERATE EFFORT. MOLDED BY STRONG FINGER PRESSURE.
STIFF	8 - 15	0.5 - 1.0	1.0 - 2.0	INDENTED ABOUT 1/2 INCH BY THUMB BUT PENETRATED ONLY WITH GREAT EFFORT.
VERY STIFF	15 - 30	1.0 - 2.0	2.0 - 4.0	READILY INDENTED BY THUMBNAIL.
HARD	>30	>2.0	>4.0	INDENTED WITH DIFFICULTY BY THUMBNAIL.

ATTACHMENT D

WELL DRILLER REPORTS

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			USCS SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (More than half of material is larger than the #200 sieve)	GRAVELS (More than half coarse fraction is larger than the #4 sieve)	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		GRAVELS WITH OVER 12% FINES	GM	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SANDS (More than half coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		SANDS WITH OVER 12% FINES	SM	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES
			SC	CLAYEY SANDS SAND-GRAVEL-CLAY MIXTURES
FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid limit less than 50)		ML	INORGANIC SILTS & VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (Liquid limit greater than 50)		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

LOG KEY SYMBOLS

- BORING SAMPLE LOCATION
- TEST-PIT SAMPLE LOCATION
- WATER LEVEL (level after completion)
- WATER LEVEL (level where first encountered)

CEMENTATION

DESCRIPTION	DESCRIPTION
WEAKELY	CRUMBLES OR BREAKS WITH HANDLING OR SLIGHT FINGER PRESSURE
MODERATELY	CRUMBLES OR BREAKS WITH CONSIDERABLE FINGER PRESSURE
STRONGLY	WILL NOT CRUMBLE OR BREAK WITH FINGER PRESSURE

OTHER TESTS KEY

C	CONSOLIDATION	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	DS	DIRECT SHEAR
UC	UNCONFINED COMPRESSION	T	TRIAXIAL
S	SOLUBILITY	R	RESISTIVITY
O	ORGANIC CONTENT	RV	R-VALUE
CBR	CALIFORNIA BEARING RATIO	SU	SOLUBLE SULFATES
COMP	MOISTURE/DENSITY RELATIONSHIP	PM	PERMEABILITY
CI	CALIFORNIA IMPACT	-200	% FINER THAN #200
COL	COLLAPSE POTENTIAL	Gs	SPECIFIC GRAVITY
SS	SHRINK SWELL	SL	SWELL LOAD

MODIFIERS

DESCRIPTION	%
TRACE	<5
SOME	5 - 12
WITH	>12

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
DRY	ABSENCE OF MOISTURE, DUSTY, DRY TO THE TOUCH
SLIGHTLY MOIST	CONTAINING A MINIMAL AMOUNT OF MOISTURE, NOT DRY OR DAMP
MOIST	DAMP BUT NO VISIBLE WATER
WET	VISIBLE FREE WATER, USUALLY SOIL BELOW WATER TABLE

STRATIFICATION

DESCRIPTION	THICKNESS	DESCRIPTION	THICKNESS
SEAM	1/16-1/2"	OCCASIONAL	ONE OR LESS PER FOOT OF THICKNESS
LAYER	1/2-12"	FREQUENT	MORE THAN ONE PER FOOT OF THICKNESS

GENERAL NOTES

1. Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual.
2. No warranty is provided as to the continuity of soil conditions between individual sample locations.
3. Logs represent general soil conditions observed at the point of exploration on the date indicated.
4. In general, Unified Soil Classification designations presented on the logs were evaluated by visual methods only. Therefore, actual designations (based on laboratory tests) may vary.

APPARENT / RELATIVE DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	SPT (blows/ft)	MODIFIED CA. SAMPLER (blows/ft)	CALIFORNIA SAMPLER (blows/ft)	RELATIVE DENSITY (%)	FIELD TEST
VERY LOOSE	<4	<4	<5	0 - 15	EASILY PENETRATED WITH 1/2-INCH REINFORCING ROD PUSHED BY HAND
LOOSE	4 - 10	5 - 12	5 - 15	15 - 35	DIFFICULT TO PENETRATE WITH 1/2-INCH REINFORCING ROD PUSHED BY HAND
MEDIUM DENSE	10 - 30	12 - 35	15 - 40	35 - 65	EASILY PENETRATED A FOOT WITH 1/2-INCH REINFORCING ROD DRIVEN WITH 5-LB HAMMER
DENSE	30 - 50	35 - 60	40 - 70	65 - 85	DIFFICULT TO PENETRATE 12" WITH 1/2-INCH REINFORCING ROD DRIVEN WITH 5-LB HAMMER
VERY DENSE	>50	>60	>70	85 - 100	PENETRATED ONLY FEW INCHES WITH 1/2-INCH REINFORCING ROD DRIVEN WITH 5-LB HAMMER

CONSISTENCY - FINE-GRAINED SOIL		TORVANE	POCKET PENETROMETER	FIELD TEST
CONSISTENCY	SPT (blows/ft)	UNTRAINED SHEAR STRENGTH (tsf)	UNCONFINED COMPRESSIVE STRENGTH (tsf)	
VERY SOFT	<2	<0.125	<0.25	EASILY PENETRATED SEVERAL INCHES BY THUMB. EXUDES BETWEEN THUMB AND FINGERS WHEN SQUEEZED BY HAND.
SOFT	2 - 4	0.125 - 0.25	0.25 - 0.5	EASILY PENETRATED ONE INCH BY THUMB. MOLDED BY LIGHT FINGER PRESSURE.
MEDIUM STIFF	4 - 8	0.25 - 0.5	0.5 - 1.0	PENETRATED OVER 1/2 INCH BY THUMB WITH MODERATE EFFORT. MOLDED BY STRONG FINGER PRESSURE.
STIFF	8 - 15	0.5 - 1.0	1.0 - 2.0	INDENTED ABOUT 1/2 INCH BY THUMB BUT PENETRATED ONLY WITH GREAT EFFORT.
VERY STIFF	15 - 30	1.0 - 2.0	2.0 - 4.0	READILY INDENTED BY THUMBNAIL.
HARD	>30	>2.0	>4.0	INDENTED WITH DIFFICULTY BY THUMBNAIL.

APPENDIX B

Water Content and Unit Weight of Soil

(In General Accordance with ASTM D7263 Method B and D2216)

Project: Flex Warehouse
No: 03638-001
Location: American Fork, Utah
Date: 3/26/2021
By: BSS/JAB/JDF

Sample Info.	Boring No.	TP-1	TP-2	TP-3	TP-4	TP-5			
	Sample								
	Depth	6.0'	2.0'	2.0'	5.5'	5.5'			
	Split	No	No	No	No	No			
	Split sieve								
Total sample (g)									
Moist coarse fraction (g)									
Moist split fraction (g)									
Unit Weight Data	Sample height, H (in)	5.351	5.038	5.670	5.469	5.214			
	Sample diameter, D (in)	2.406	2.416	2.404	2.413	2.421			
	Mass rings + wet soil (g)	983.07	636.92	917.61	1002.37	1053.77			
	Mass rings/tare (g)	237.47	235.62	250.13	238.98	281.34			
	Moist unit wt., γ_m (pcf)	116.8	66.2	98.8	116.3	122.6			
	Wet soil + tare (g)								
	Dry soil + tare (g)								
	Tare (g)								
	Water content (%)								
Water Content Data	Wet soil + tare (g)	967.55	616.46	745.38	679.17	170.71			
	Dry soil + tare (g)	773.08	307.80	580.05	534.81	159.97			
	Tare (g)	221.95	215.35	124.09	127.55	128.87			
	Water content (%)	35.3	333.9	36.3	35.4	34.5			
Water Content, w (%)		**35.3**	**333.9**	**36.3**	**35.4**	**34.5**			
Dry Unit Wt., γ_d (pcf)		**86.3**	**15.3**	**72.5**	**85.9**	**91.1**			

Comments: Test specimen consists of highly organic material.

Entered by:_____

Reviewed:_____

Water Content and Unit Weight of Soil

(In General Accordance with ASTM D7263 Method B and D2216)

Project: Flex Warehouse
No: 03638-002
Location: American Fork, UT
Date: 7/29/2021
By: RT/KB

Sample Info.	Boring No.	B-1	B-1	B-1	B-1				
	Sample								
	Depth	41.0'	42.5'	47.5'	50.0'				
	Split	No	No	No	No				
	Split sieve								
Total sample (g)									
Moist coarse fraction (g)									
Moist split fraction (g)									
	Sample height, H (in)								
	Sample diameter, D (in)								
	Mass rings + wet soil (g)								
	Mass rings/tare (g)								
	Moist unit wt., γ_m (pcf)								
	Wet soil + tare (g)								
	Dry soil + tare (g)								
	Tare (g)								
	Water content (%)								
Water Content Data	Wet soil + tare (g)	349.83	292.15	337.62	327.32				
	Dry soil + tare (g)	302.02	255.51	289.73	282.91				
	Tare (g)	120.45	124.39	120.83	121.42				
	Water content (%)	26.3	27.9	28.4	27.5				
Water Content, w (%)		**26.3**	**27.9**	**28.4**	**27.5**				
Dry Unit Wt., γ_d (pcf)									

Entered by:_____

Reviewed:_____

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Flex Warehouse
No: 03638-001
Location: Americam Fork, Utah
Date: 3/27/2021
By: BRR
Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Boring No.: TP-4
Sample:
Depth: 4.5'
Description: Brown lean clay

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: No
Larger particles removed: Not required
Approximate maximum grain size: No.20
Estimated percent retained on No.40: Not requested
As-received water content (%): Not requested

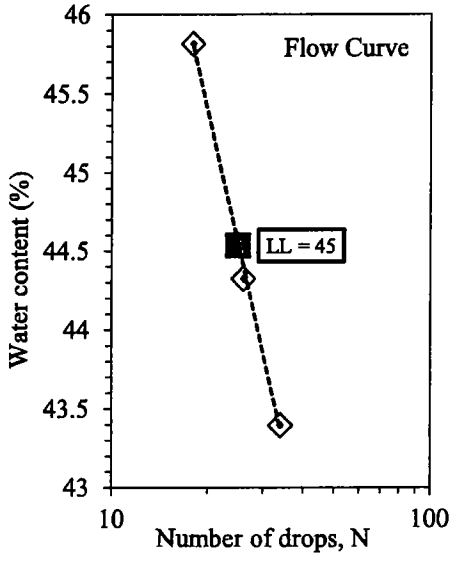
Plastic Limit

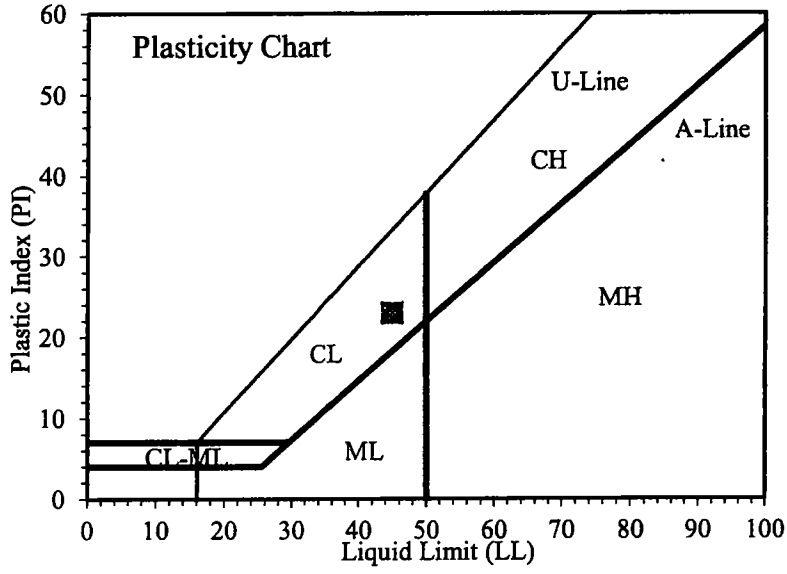
Determination No	1	2				
Wet Soil + Tare (g)	14.36	13.77				
Dry Soil + Tare (g)	13.04	12.56				
Water Loss (g)	1.32	1.21				
Tare (g)	7.06	7.05				
Dry Soil (g)	5.98	5.51				
Water Content, w (%)	22.07	21.96				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	34	26	18			
Wet Soil + Tare (g)	15.14	14.69	14.97			
Dry Soil + Tare (g)	12.84	12.62	12.67			
Water Loss (g)	2.30	2.07	2.30			
Tare (g)	7.54	7.95	7.65			
Dry Soil (g)	5.30	4.67	5.02			
Water Content, w (%)	43.40	44.33	45.82			
One-Point LL (%)		45				

Liquid Limit, LL (%)	**45**
Plastic Limit, PL (%)	**22**
Plasticity Index, PI (%)	**23**





Entered by:_____
Reviewed:_____

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Flex Warehouse
No: 03638-002
Location: American Fork, UT
Date: 8/3/2021
By: BRR
Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Boring No.: B-1
Sample:
Depth: 41.0'
Description: **Dark grey silty clay**

Preparation method: **Wet**
Liquid limit test method: **Multipoint**
Screened over No.40: **Yes**
Larger particles removed: **Wet sieved**
Approximate maximum grain size: **No.10**
Estimated percent retained on No.40: **Not requested**
As-received water content (%): **26.3**

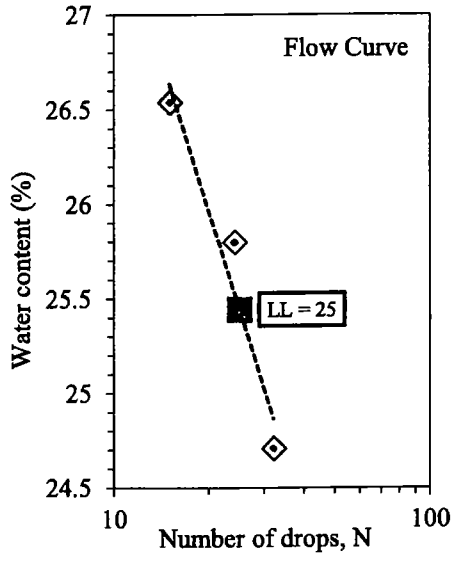
Plastic Limit

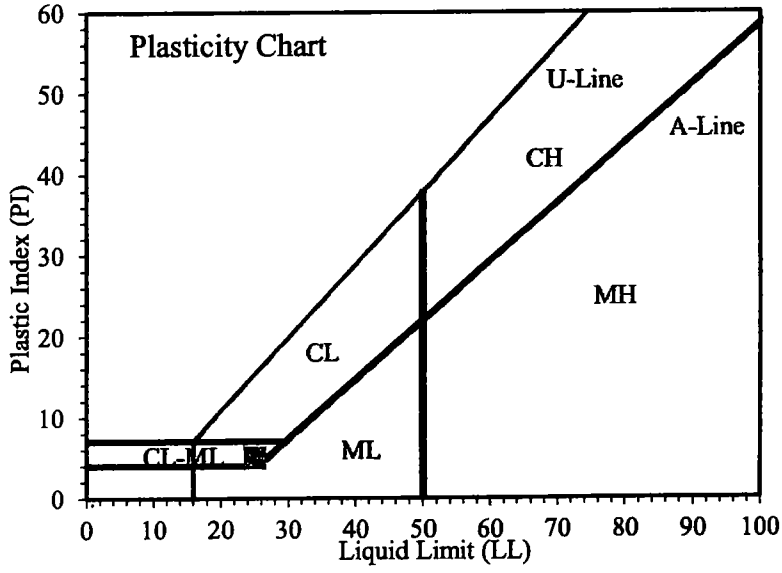
Determination No	1	2				
Wet Soil + Tare (g)	14.13	14.91				
Dry Soil + Tare (g)	12.96	13.61				
Water Loss (g)	1.17	1.30				
Tare (g)	7.00	7.04				
Dry Soil (g)	5.96	6.57				
Water Content, w (%)	19.63	19.79				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	32	24	15			
Wet Soil + Tare (g)	15.65	18.10	16.47			
Dry Soil + Tare (g)	13.96	15.99	14.57			
Water Loss (g)	1.69	2.11	1.90			
Tare (g)	7.12	7.81	7.41			
Dry Soil (g)	6.84	8.18	7.16			
Water Content, w (%)	24.71	25.79	26.54			
One-Point LL (%)		26				

Liquid Limit, LL (%)	**25**
Plastic Limit, PL (%)	**20**
Plasticity Index, PI (%)	**5**





Entered by:_____
Reviewed:_____

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Flex Warehouse
No: 03638-002
Location: American Fork, UT
Date: 8/3/2021
By: BRR
Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Boring No.: B-1
Sample:
Depth: 42.5'
Description: Grey silty clay

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.4
Estimated percent retained on No.40: See Particle Size Distribution
As-received water content (%): 27.9

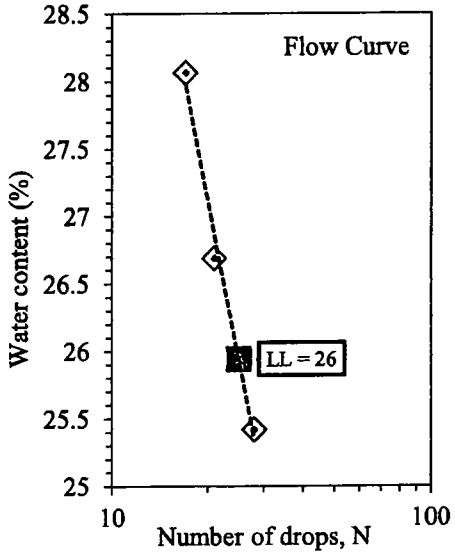
Plastic Limit

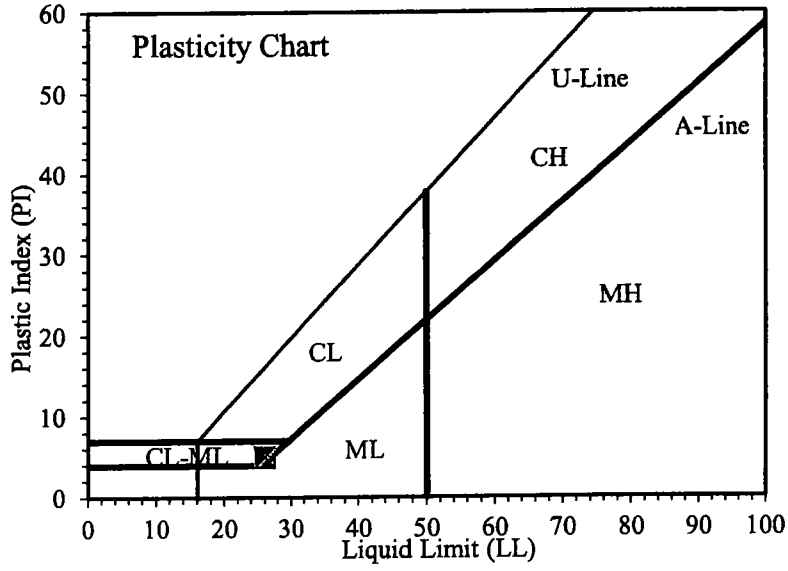
Determination No	1	2				
Wet Soil + Tare (g)	13.58	13.22				
Dry Soil + Tare (g)	12.45	12.17				
Water Loss (g)	1.13	1.05				
Tare (g)	7.02	7.11				
Dry Soil (g)	5.43	5.06				
Water Content, w (%)	20.81	20.75				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	28	21	17			
Wet Soil + Tare (g)	15.25	14.88	16.35			
Dry Soil + Tare (g)	13.58	13.38	14.38			
Water Loss (g)	1.67	1.50	1.97			
Tare (g)	7.01	7.76	7.36			
Dry Soil (g)	6.57	5.62	7.02			
Water Content, w (%)	25.42	26.69	28.06			
One-Point LL (%)	26	26				

Liquid Limit, LL (%)	**26**
Plastic Limit, PL (%)	**21**
Plasticity Index, PI (%)	**5**





Entered by:_____
Reviewed:_____

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Flex Warehouse
No: 03638-002
Location: American Fork, UT
Date: 8/3/2021
By: BRR
Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Boring No.: B-1
Sample:
Depth: 47.5'
Description: **Brown lean clay**

Preparation method: **Wet**
Liquid limit test method: **Multipoint**
Screened over No.40: **Yes**
Larger particles removed: **Wet sieved**
Approximate maximum grain size: **No.10**
Estimated percent retained on No.40: **See Particle Size Distribution**
As-received water content (%): **28.4**

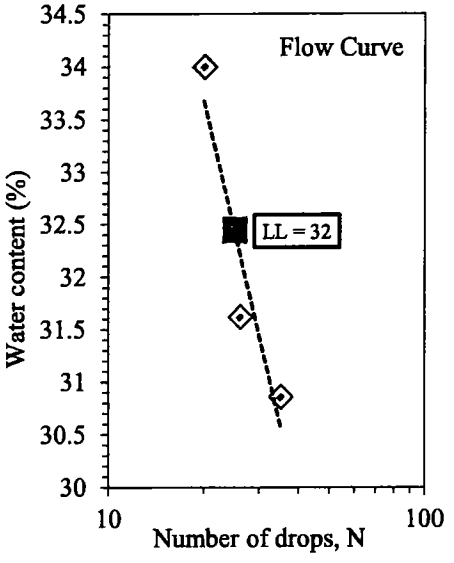
Plastic Limit

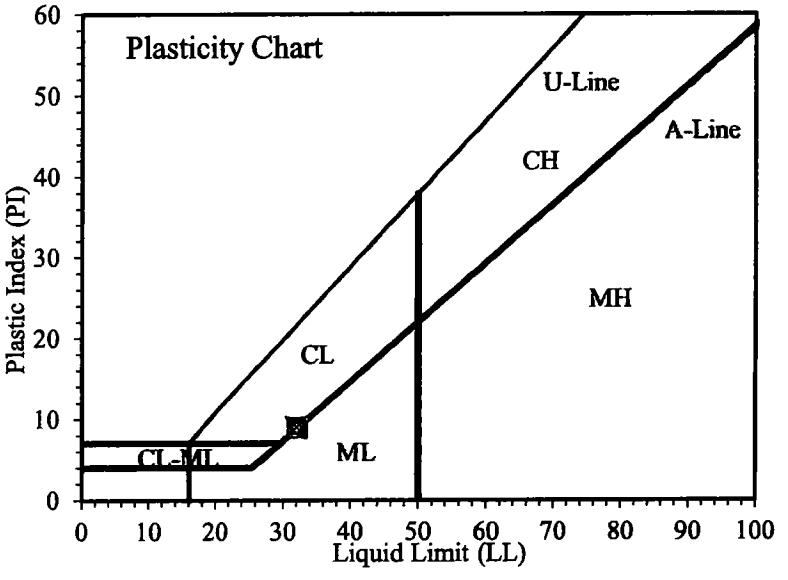
Determination No	1	2				
Wet Soil + Tare (g)	14.31	13.81				
Dry Soil + Tare (g)	12.98	12.56				
Water Loss (g)	1.33	1.25				
Tare (g)	7.09	7.07				
Dry Soil (g)	5.89	5.49				
Water Content, w (%)	22.58	22.77				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	35	26	20			
Wet Soil + Tare (g)	17.04	16.26	16.42			
Dry Soil + Tare (g)	14.80	14.05	14.19			
Water Loss (g)	2.24	2.21	2.23			
Tare (g)	7.54	7.06	7.63			
Dry Soil (g)	7.26	6.99	6.56			
Water Content, w (%)	30.85	31.62	33.99			
One-Point LL (%)		32	33			

Liquid Limit, LL (%)	**32**
Plastic Limit, PL (%)	**23**
Plasticity Index, PI (%)	**9**





Entered by:_____
Reviewed:_____

Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)

Project: Flex Warehouse
No: 03638-002
Location: American Fork, UT
Date: 8/3/2021
By: BRR
Grooving tool type: Plastic
Liquid limit device: Mechanical
Rolling method: Hand

Boring No.: B-1
Sample:
Depth: 50.0'
Description: Grey lean clay

Preparation method: Wet
Liquid limit test method: Multipoint
Screened over No.40: Yes
Larger particles removed: Wet sieved
Approximate maximum grain size: No.10
Estimated percent retained on No.40: Not requested
As-received water content (%): 27.5

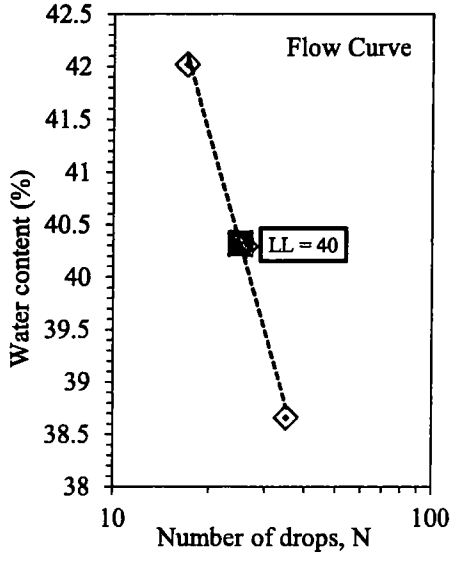
Plastic Limit

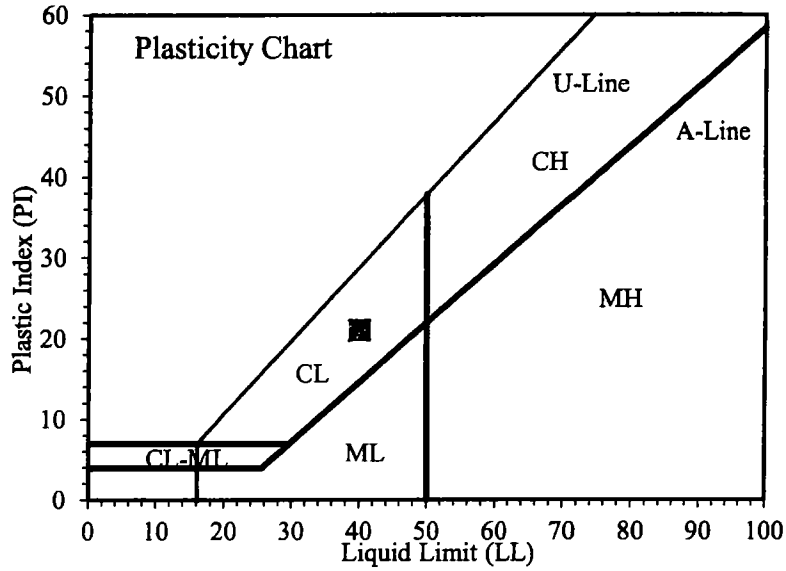
Determination No	1	2				
Wet Soil + Tare (g)	14.45	14.96				
Dry Soil + Tare (g)	13.26	13.77				
Water Loss (g)	1.19	1.19				
Tare (g)	7.06	7.55				
Dry Soil (g)	6.20	6.22				
Water Content, w (%)	19.19	19.13				

Liquid Limit

Determination No	1	2	3			
Number of Drops, N	35	26	17			
Wet Soil + Tare (g)	13.46	15.81	15.54			
Dry Soil + Tare (g)	11.67	13.32	13.17			
Water Loss (g)	1.79	2.49	2.37			
Tare (g)	7.04	7.14	7.53			
Dry Soil (g)	4.63	6.18	5.64			
Water Content, w (%)	38.66	40.29	42.02			
One-Point LL (%)		40				

Liquid Limit, LL (%)	**40**
Plastic Limit, PL (%)	**19**
Plasticity Index, PI (%)	**21**





Entered by:_____
Reviewed:_____

Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Flex Warehouse
No: 03638-002
Location: American Fork, UT
Date: 8/3/2021
By: BRR

Boring No.: B-1
Sample:
Depth: 5.0'
Description: **Brown clayey sand with gravel**

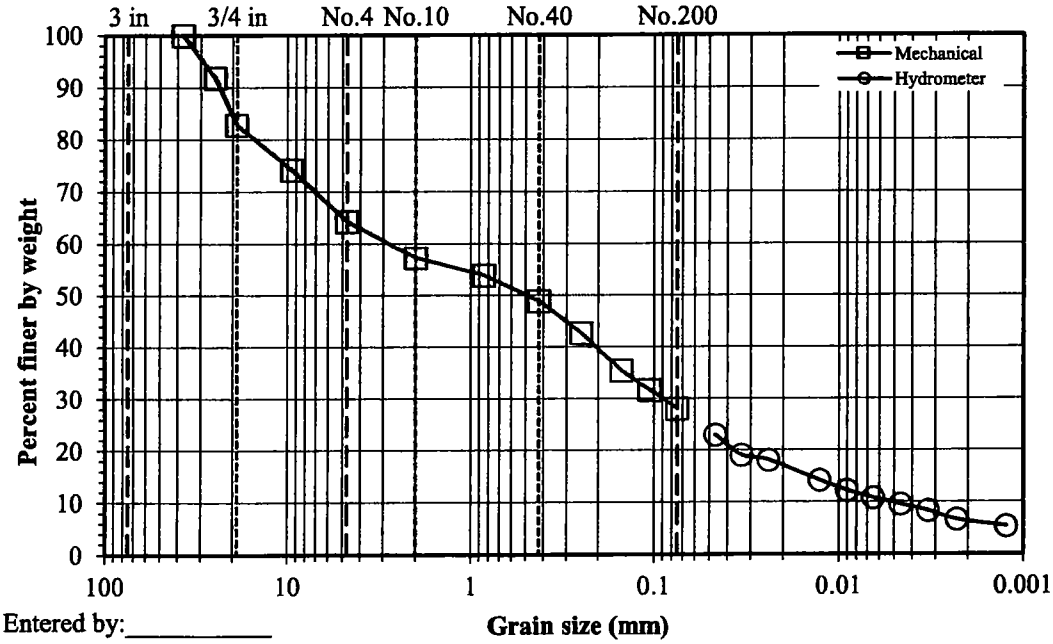
ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	No.10	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	261.52	220.56
No.10 Coarse fraction (g):	102.59	94.51
-No.10 Split fraction (g):	73.24	58.09
Hydrometer fraction (g):	73.24	58.09
First Split fraction:	0.571	

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	100.0	
1"	18.07	25	91.8	
3/4"	37.94	19	82.8	
3/8"	57.02	9.5	74.1	
No.4	79.03	4.75	64.2	
No.10	94.51	2	57.1	<=1st Split
No.20	3.42	0.85	53.8	
No.40	8.49	0.425	48.8	
No.60	14.82	0.25	42.6	
No.100	22.05	0.15	35.5	
No.140	25.83	0.106	31.7	
No.200	29.52	0.075	28.1	

Water content data	C.F.1(+No.10)	S.F.1(-No.10)	Hyd.(-No.10)
Moist soil + tare (g):	254.94	67.55	67.55
Dry soil + tare (g):	244.94	58.46	58.46
Tare (g):	127.94	23.62	23.62
Water content (%):	8.55	26.09	26.09

Hydrometer data			
Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	7	Hyd. fraction:	57.15
Cylinder ID:	N33	Dispersion device:	Air-jet

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22.5	28	0.0468	23.00
2	22.5	24	0.0340	19.10
4	22.5	23	0.0242	18.13
15	22.5	19	0.0128	14.24
30	22.5	17	0.0092	12.29
60	22.5	15.5	0.0065	10.83
120	22.4	14.25	0.0047	9.58
240	22.4	13	0.0033	8.37
500	22.4	11.25	0.0023	6.66
1748	22.2	10	0.0012	5.38



Gravel (%): 35.8
Sand (%): 36.1
Fines (%): 28.1

Comments:
These results are in nonconformance with ASTM D6913 and ASTM D7928 because the minimum dry mass was not met.

Entered by:_____
Reviewed:_____

Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Flex Warehouse — **Boring No.: B-1**
No: 03638-002 — **Sample:**
Location: American Fork, UT — **Depth: 10.0'**
Date: 8/3/2021 — Description: Brown sandy clay
By: BRR

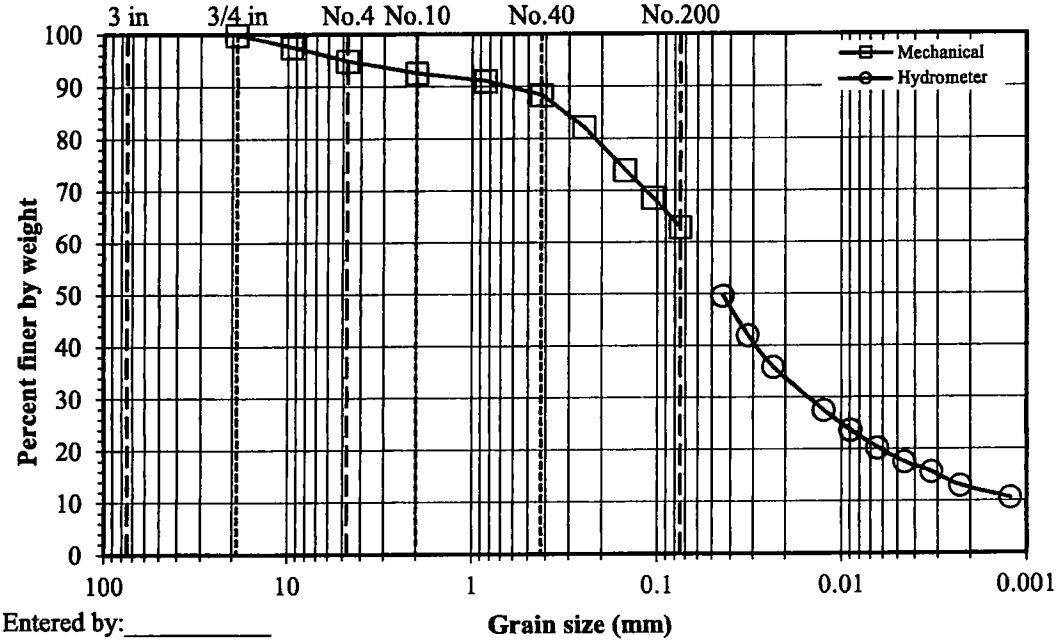
ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	No.10	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	268.31	208.22
No.10 Coarse fraction (g):	16.99	15.50
-No.10 Split fraction (g):	90.37	69.30
Hydrometer fraction (g):	77.86	60.16
First Split fraction:	0.926	

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	100.0	
3/8"	4.92	9.5	97.6	
No.4	10.57	4.75	94.9	
No.10	15.50	2	92.6	<=1st Split
No.20	1.08	0.85	91.1	
No.40	3.11	0.425	88.4	
No.60	7.69	0.25	82.3	
No.100	13.87	0.15	74.0	
No.140	17.90	0.106	68.6	
No.200	22.18	0.075	62.9	

Water content data	C.F.1(+No.10)	S.F.1(-No.10)	Hyd.(-No.10)
Moist soil + tare (g):	146.73	217.55	90.30
Dry soil + tare (g):	144.63	196.48	75.17
Tare (g):	122.82	127.18	23.74
Water content (%):	9.63	30.40	29.42

Hydrometer data			
Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	7	Hyd. fraction:	92.56
Cylinder ID:	N10	Dispersion device:	Air-jet

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22.5	37	0.0439	49.65
2	22.5	32	0.0323	42.04
4	22.5	28	0.0234	35.96
15	22.5	22.5	0.0126	27.59
30	22.5	20	0.0090	23.79
60	22.5	17.75	0.0065	20.36
120	22.4	16	0.0046	17.65
240	22.4	14.75	0.0033	15.74
500	22.4	13	0.0023	13.08
1753	22.2	11.5	0.0012	10.69



Gravel (%): 5.1
Sand (%): 32.0
Fines (%): 62.9

Comments:
These results are in nonconformance with ASTM D6913 and ASTM D7928 because the minimum dry mass was not met.

Entered by:_____
Reviewed:_____

Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Flex Warehouse
No: 03638-002
Location: American Fork, UT
Date: 8/3/2021
By: BRR

Boring No.: B-1
Sample:
Depth: 42.5'
Description: Grey silty clay with sand

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	No.10	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	639.32	499.27
No.10 Coarse fraction (g):	3.39	3.17
-No.10 Split fraction (g):	94.91	74.04
Hydrometer fraction (g):	76.13	59.27
First Split fraction:	0.994	

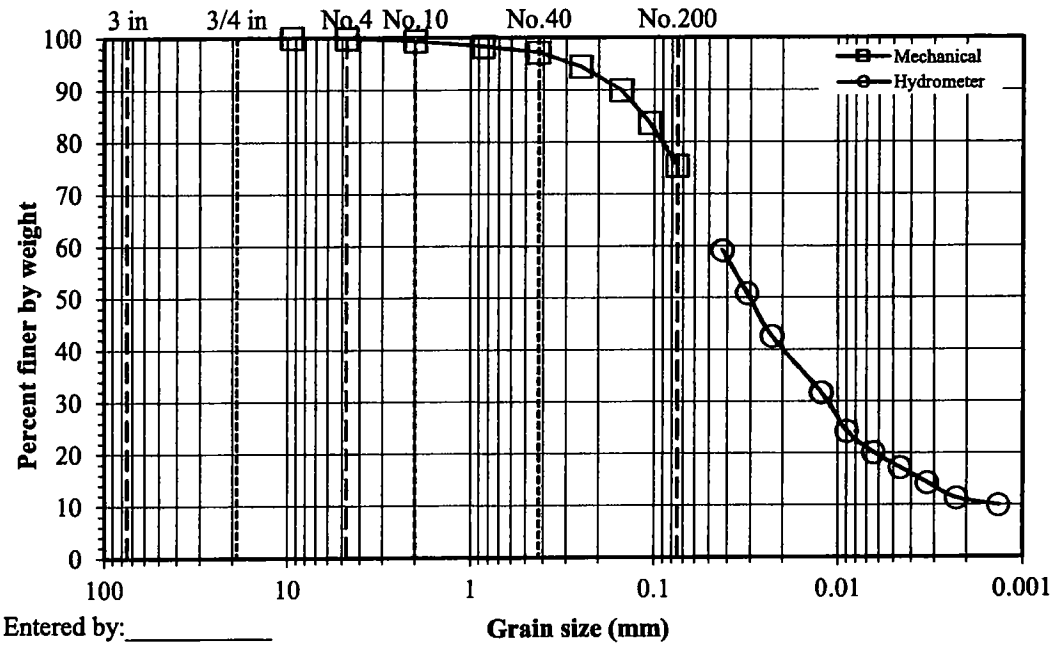
Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	-	
3/8"		9.5	100.0	
No.4	0.76	4.75	99.8	
No.10	3.17	2	99.4	<=1st Split
No.20	0.83	0.85	98.3	
No.40	1.68	0.425	97.1	
No.60	3.70	0.25	94.4	
No.100	7.07	0.15	89.9	
No.140	11.83	0.106	83.5	
No.200	17.94	0.075	75.3	

Water content data	C.F.1(+No.10)	S.F.1(-No.10)	Hyd.(-No.10)
Moist soil + tare (g):	186.73	317.42	74.40
Dry soil + tare (g):	186.44	296.55	63.14
Tare (g):	182.19	222.51	23.55
Water content (%):	6.82	28.19	28.44

Hydrometer data
Hyd. split: No.10
Gs: 2.7 Assumed
Bulb No. 7 Hyd. fraction: 99.37
Cylinder ID: T6 Dispersion device: Air-jet

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22.5	40	0.0429	59.07
2	22.5	35	0.0315	50.78
4	22.5	30	0.0231	42.50
15	22.5	23.5	0.0125	31.72
30	22.5	19	0.0091	24.26
60	22.5	16.5	0.0065	20.12
120	22.4	14.75	0.0046	17.16
240	22.4	13	0.0033	14.25
500	22.3	11.25	0.0023	11.29
1457	22.1	10.5	0.0014	9.93

Gravel (%): 0.2
Sand (%): 24.6
Fines (%): 75.3



Entered by:_____
Reviewed:_____

Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis

(In general accordance with ASTM D6913 and ASTM D7928)

Project: Flex Warehouse
No: 03638-002
Location: American Fork, UT
Date: 8/3/2021
By: BRR

Boring No.: B-1
Sample:
Depth: 47.5'
Description: Brown clay with sand

ASTM Standard(s)	ASTM D6913 and ASTM D7928	
Split:	Yes	
First Split sieve:	No.10	
Second split:	No	
	Moist	Dry
Total sample wt. (g):	733.58	577.14
No.10 Coarse fraction (g):	0.15	0.15
-No.10 Split fraction (g):	103.14	81.14
Hydrometer fraction (g):	77.77	60.81
First Split fraction:	1.000	

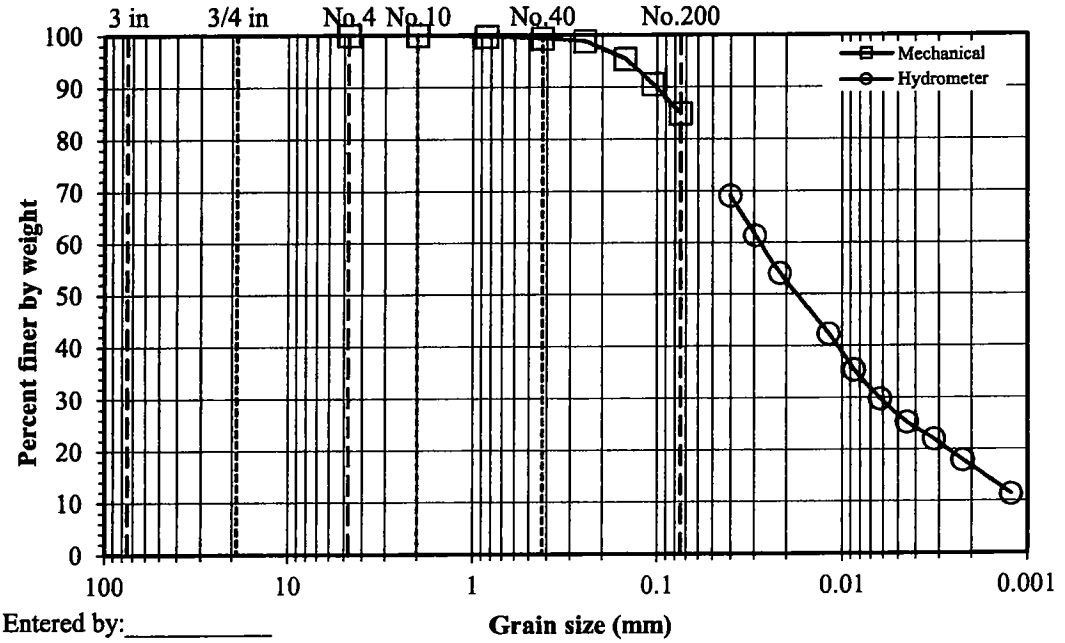
Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	
6"		150	-	
4"		100	-	
3"		75	-	
1.5"		37.5	-	
1"		25	-	
3/4"		19	-	
3/8"		9.5	-	
No.4		4.75	100.0	
No.10	0.15	2	100.0	<=1st Split
No.20	0.22	0.85	99.7	
No.40	0.48	0.425	99.4	
No.60	0.98	0.25	98.8	
No.100	3.71	0.15	95.4	
No.140	7.65	0.106	90.5	
No.200	12.23	0.075	84.9	

Water content data	C.F.1(+No.10)	S.F.1(-No.10)	Hyd.(-No.10)
Moist soil + tare (g):	37.43	324.04	76.11
Dry soil + tare (g):	37.43	302.04	64.65
Tare (g):	37.28	220.90	23.57
Water content (%):	0.00	27.11	27.90

Hydrometer data			
Hyd. split:	No.10		
Gs:	2.7	Assumed	
Bulb No.	7	Hyd. fraction:	99.97
Cylinder ID:	11	Dispersion device:	Air-jet

Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
1	22.4	47	0.0404	69.26
2	22.4	42.25	0.0298	61.53
4	22.4	37.75	0.0218	54.22
15	22.4	30.5	0.0119	42.43
30	22.4	26.25	0.0087	35.52
60	22.5	22.75	0.0063	29.89
120	22.4	20	0.0045	25.36
240	22.3	18	0.0032	22.05
500	22.3	15.5	0.0023	17.98
1761	22.2	11.5	0.0012	11.42

Gravel (%): 0.0
Sand (%): 15.1
Fines (%): 84.9



Entered by:_____
Reviewed:_____

Amount of Material in Soil Finer than the No. 200 (75µm) Sieve

(ASTM D1140)

Project: Flex Warehouse
No: 03638-001
Location: American Fork, Utah
Date: 3/29/2021
By: BSS/JDF

Sample Info.	Boring No.	TP-1	TP-2						
	Sample								
	Depth	4.0'	4.0'						
	Split	Yes	No						
	Split Sieve*	3/8"							
	Method	B	B						
Specimen soak time (min)		180	310						
Moist total sample wt. (g)		4101.91	388.28						
Moist coarse fraction (g)		1708.29							
Moist split fraction + tare (g)		388.13							
Split fraction tare (g)		128.46							
Dry split fraction (g)		258.68							
Dry retained No. 200 + tare (g)		305.26	300.60						
Wash tare (g)		128.46	123.28						
No. 200 Dry wt. retained (g)		176.80	177.32						
Split sieve* Dry wt. retained (g)		1706.36							
Dry total sample wt. (g)		4090.85	299.15						
Coarse Fraction	Moist soil + tare (g)	1931.11							
	Dry soil + tare (g)	1929.18							
	Tare (g)	223.51							
	Water content (%)	0.11							
Split Fraction	Moist soil + tare (g)	388.13	511.56						
	Dry soil + tare (g)	387.14	422.43						
	Tare (g)	128.46	123.28						
	Water content (%)	0.38	29.79						
Percent passing split sieve* (%)		**58.3**							
Percent passing No. 200 sieve (%)		**18.5**	**40.7**						

Comments: These results are in nonconformance with Method D1140 because the minimum dry mass was not met.

Entered by:_____

Reviewed:_____

Amount of Material in Soil Finer than the No. 200 (75µm) Sieve

(ASTM D1140)

Project: Flex Warehouse
No: 03638-002
Location: American Fork, UT
Date: 7/30/2021
By: BSS/RT

Sample Info.	Boring No.	B-1	B-1	B-1	B-1	B-1	B-1	B-1	B-1
	Sample								
	Depth	7.5'	15.0'	17.5'	20.0'	25.0'	30.0'	35.0'	40.0'
	Split	No	No	No	Yes	No	No	No	No
	Split Sieve*				3/8"				
	Method	B	B	B	B	B	B	B	B
Specimen soak time (min)		350	350	340	400	350	380	350	380
Moist total sample wt. (g)		305.96	355.47	455.71	751.15	459.11	479.70	496.70	308.07
Moist coarse fraction (g)					175.76				
Moist split fraction + tare (g)					478.70				
Split fraction tare (g)					127.10				
Dry split fraction (g)					309.72				
Dry retained No. 200 + tare (g)		340.08	479.56	385.47	397.70	501.42	520.13	533.24	345.64
Wash tare (g)		179.74	224.06	127.15	127.10	127.01	128.50	124.51	127.93
No. 200 Dry wt. retained (g)		160.34	255.50	258.32	270.60	374.41	391.63	408.73	217.71
Split sieve* Dry wt. retained (g)					171.28				
Dry total sample wt. (g)		246.47	280.19	373.14	678.14	407.88	433.91	438.27	259.04
Coarse Fraction	Moist soil + tare (g)				315.36				
	Dry soil + tare (g)				310.46				
	Tare (g)				122.95				
	Water content (%)				2.61				
Split Fraction	Moist soil + tare (g)	485.70	579.53	582.86	478.70	586.12	608.20	621.21	436.00
	Dry soil + tare (g)	426.21	504.25	500.29	436.82	534.89	562.41	562.78	386.97
	Tare (g)	179.74	224.06	127.15	127.10	127.01	128.50	124.51	127.93
	Water content (%)	24.14	26.87	22.13	13.52	12.56	10.55	13.33	18.93
Percent passing split sieve* (%)					**74.7**				
Percent passing No. 200 sieve (%)		**34.9**	**8.8**	**30.8**	**9.4**	**8.2**	**9.7**	**6.7**	**16.0**

Comments:

These results are in nonconformance with Method D1140 because the minimum dry mass was not met.	These results are in nonconformance with Method D1140 because the minimum dry mass was not met.	These results are in nonconformance with Method D1140 because the minimum dry mass was not met.	These results are in nonconformance with Method D1140 because the minimum dry mass was not met.	These results are in nonconformance with Method D1140 because the minimum dry mass was not met.	These results are in nonconformance with Method D1140 because the minimum dry mass was not met.	These results are in nonconformance with Method D1140 because the minimum dry mass was not met.

Entered by:_____

Reviewed:_____

Amount of Material in Soil Finer than the No. 200 (75µm) Sieve

(ASTM D1140)

Project: Flex Warehouse
No: 03638-002
Location: American Fork, UT
Date: 7/30/2021
By: KB/RT

Sample Info.	Boring No.	B-1	B-1	B-1					
	Sample								
	Depth	41.0'	45.0'	50.0'					
	Split	No	No	No					
	Split Sieve*								
	Method	B	B	B					
Specimen soak time (min)		370	390	240					
Moist total sample wt. (g)		229.38	326.96	205.90					
Moist coarse fraction (g)									
Moist split fraction + tare (g)									
Split fraction tare (g)									
Dry split fraction (g)									
Dry retained No. 200 + tare (g)		174.45	290.98	135.32					
Wash tare (g)		120.45	128.08	121.42					
No. 200 Dry wt. retained (g)		54.00	162.90	13.90					
Split sieve* Dry wt. retained (g)									
Dry total sample wt. (g)		181.57	262.06	161.49					
Coarse Fraction	Moist soil + tare (g)								
	Dry soil + tare (g)								
	Tare (g)								
	Water content (%)								
Split Fraction	Moist soil + tare (g)	349.83	455.04	327.32					
	Dry soil + tare (g)	302.02	390.14	282.91					
	Tare (g)	120.45	128.08	121.42					
	Water content (%)	26.33	24.77	27.50					
Percent passing split sieve* (%)									
Percent passing No. 200 sieve (%)		**70.3**	**37.8**	**91.4**					

Entered by:_____

Reviewed:_____

One-Dimensional Consolidation Properties of Soils

(ASTM D2435)

Project: Flex Warehouse
No: 03638-001
Location: American Fork, Utah
Date: 3/29/2021
By: EH/JAB

Boring No.: TP-4
Sample:
Depth: 4.5'
Sample Description: Brownish grey silt
Engineering Classification: Not requested
Sample type: Undisturbed-trimmed from thin-wall

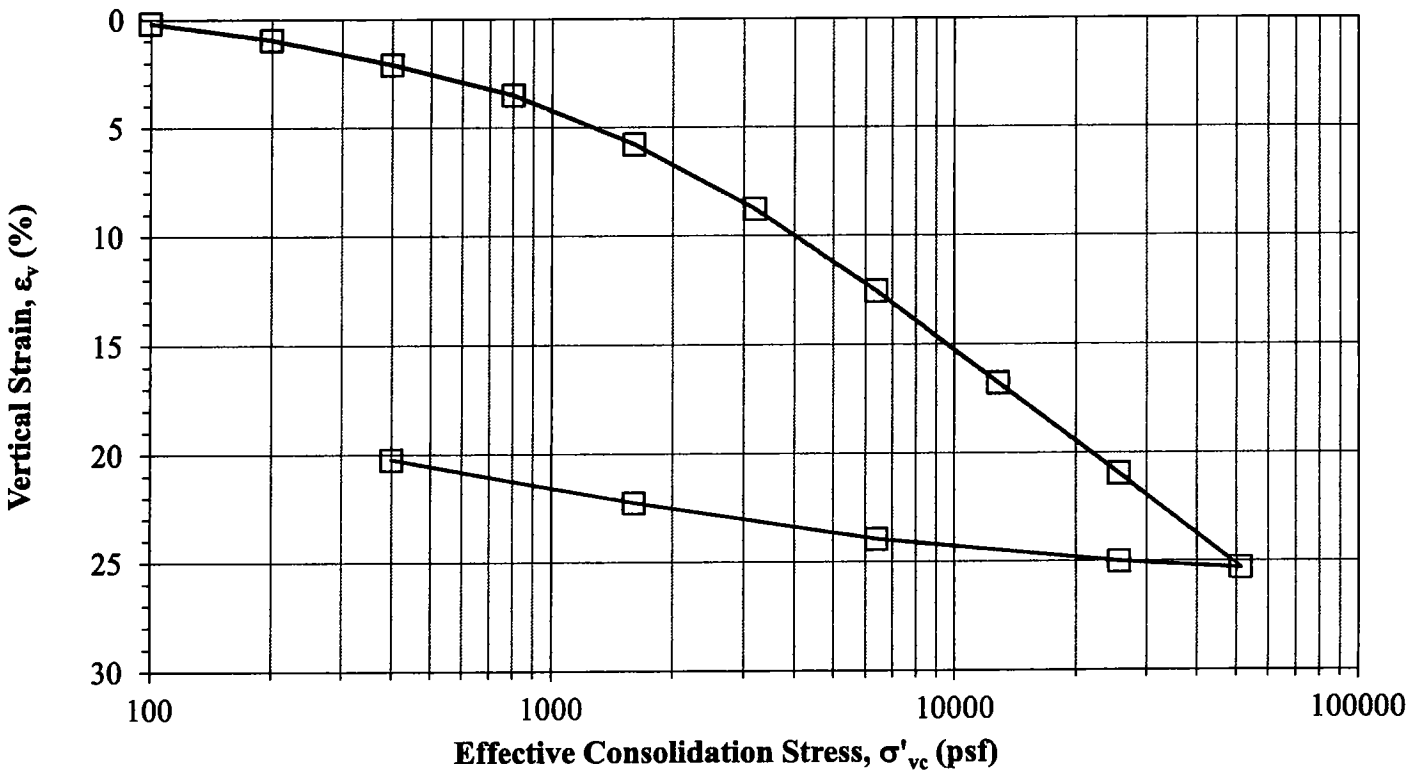
Test method:	A	
Inundation stress (psf), timing:	100	Beginning
Specific gravity, G_s	2.70	Assumed

Water type used for inundation Tap

	Initial (o)	Final (f)
Sample height, H (in.)	0.917	0.732
Sample diameter, D (in.)	2.413	2.413
Wt. rings + wet soil (g)	167.61	169.28
Wt. rings/tare (g)	44.10	44.10
Moist unit wt., γ_m (pcf)	112.2	142.55
Wet soil + tare (g)	155.43	239.42
Dry soil + tare (g)	149.20	216.31
Tare (g)	123.63	127.57
Water content, w (%)	24.4	26.0
Dry unit wt., γ_d (pcf)	90.2	113.1
Saturation	0.76	1.00

*Note: C_v, C_c, C_r, and σ_p' to be determined by Geotechnical Engineer.

Stress (psf)	Dial (in.)	1-D ε_v (%)	H_c (in.)	e
Seating	0.0000	0.00	0.9170	0.8682
100	0.0015	0.17	0.9155	0.8651
200	0.0087	0.95	0.9083	0.8505
400	0.0191	2.09	0.8979	0.8293
800	0.0321	3.50	0.8849	0.8028
1600	0.0530	5.77	0.8641	0.7604
3200	0.0803	8.75	0.8367	0.7047
6400	0.1148	12.52	0.8022	0.6344
12800	0.1538	16.77	0.7632	0.5549
25600	0.1922	20.96	0.7248	0.4767
51200	0.2322	25.32	0.6848	0.3952
25600	0.2294	25.02	0.6876	0.4009
6400	0.2196	23.95	0.6974	0.4208
1600	0.2039	22.24	0.7131	0.4528
400	0.1855	20.23	0.7315	0.4903



Comments: Test specimen contains roots.

Entered: _____
Reviewed:

One-Dimensional Consolidation Properties of Soils

(ASTM D2435)

Project: Flex Warehouse
No: 03638-001
Location: **American Fork, Utah**
Date: **3/29/2021**
By: **EH/JAB**

Boring No.: TP-5
Sample:
Depth: 3.0'
Sample Description: **Dark brown sandy clay**
Engineering Classification: **Not requested**
Sample type: **Undisturbed-trimmed from thin-wall**

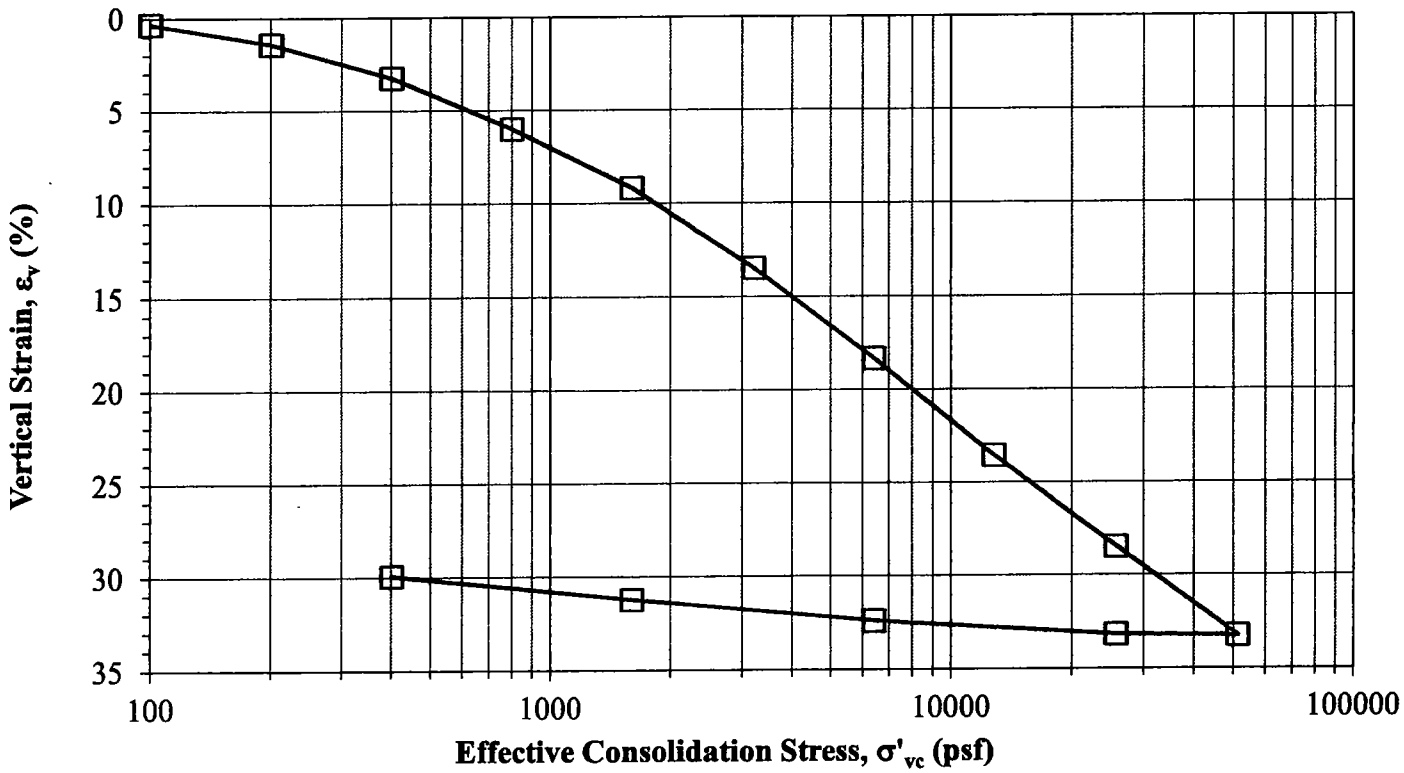
Test method:	A	
Inundation stress (psf), timing:	100	Beginning
Specific gravity, G_s	2.70	Assumed

Water type used for inundation Tap

	Initial (o)	Final (f)
Sample height, H (in.)	0.918	0.643
Sample diameter, D (in.)	2.412	2.412
Wt. rings + wet soil (g)	159.28	145.72
Wt. rings/tare (g)	44.81	44.81
Moist unit wt., γ_m (pcf)	104.0	130.84
Wet soil + tare (g)	435.52	224.72
Dry soil + tare (g)	339.01	203.12
Tare (g)	127.22	126.86
Water content, w (%)	45.6	28.3
Dry unit wt., γ_d (pcf)	71.4	102.0
Saturation	0.90	1.00

*Note: C_v, C_c, C_r, and σ_p' to be determined by Geotechnical Engineer.

Stress (psf)	Dial (in.)	1-D ε_v (%)	H_c (in.)	e
Seating	0.0000	0.00	0.9180	1.3601
100	0.0034	0.37	0.9146	1.3514
200	0.0134	1.46	0.9046	1.3257
400	0.0301	3.28	0.8879	1.2827
800	0.0553	6.03	0.8627	1.2179
1600	0.0846	9.21	0.8335	1.1427
3200	0.1241	13.52	0.7939	1.0410
6400	0.1685	18.36	0.7495	0.9269
12800	0.2164	23.57	0.7016	0.8037
25600	0.2616	28.50	0.6564	0.6875
51200	0.3054	33.27	0.6126	0.5749
25600	0.3047	33.19	0.6133	0.5767
6400	0.2977	32.43	0.6203	0.5947
1600	0.2869	31.25	0.6311	0.6225
400	0.2750	29.96	0.6430	0.6531



Entered: _____
Reviewed: _____

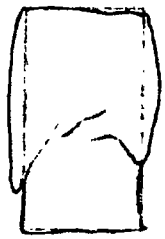
Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils

(ASTM D2850)

Project: Flex Warehouse
No: 03638-001
Location: American Fork, Utah
Date: 3/26/2021
By: JDF

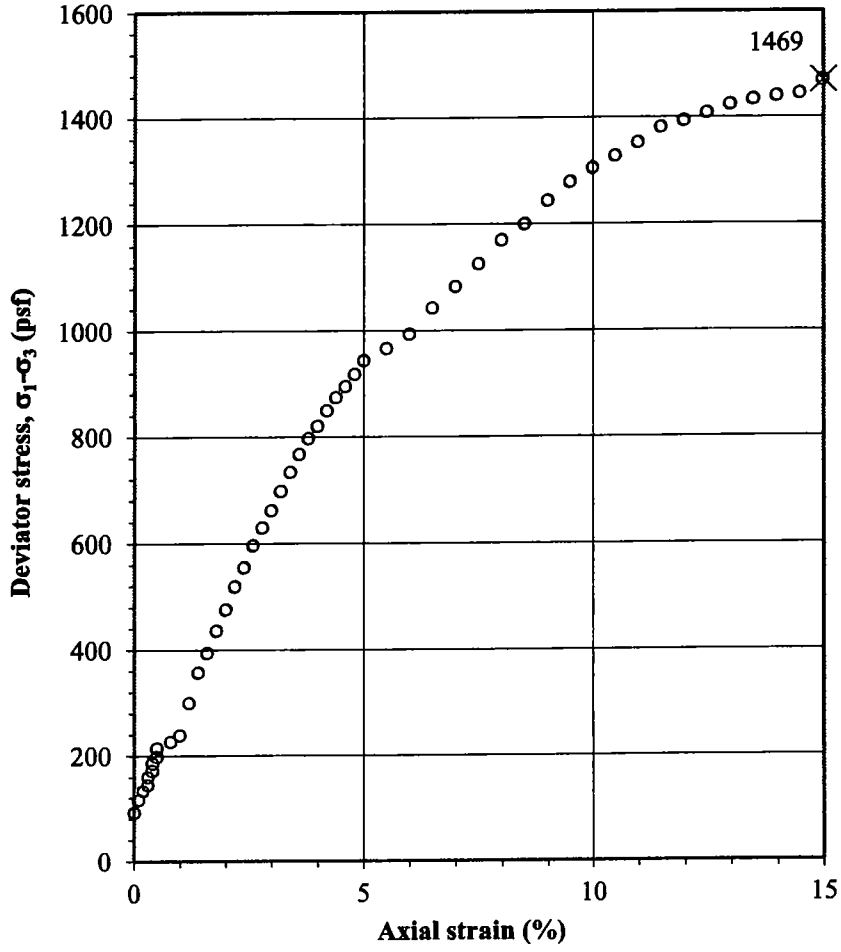
Boring No.: TP-2
Sample:
Depth: 4.0'
Sample Description: Brown silty sand
Sample type: Undisturbed-trimmed from thin-wall

Specific gravity, Gs	2.75	Assumed
Sample height, H (in.)	5.238	
Sample diameter, D (in.)	2.401	
Sample volume, V (ft^3)	0.0137	
Wt. rings + wet soil (g)	1056.16	
Wt. rings/tare (g)	281.37	
Moist soil, Ws (g)	774.79	
Moist unit wt., γ_m (pcf)	124.5	
Dry unit wt., γ_d (pcf)	**95.9**	
Saturation (%)	100.0	
Void ratio, *e*	0.79	



Wet soil + tare (g)	511.56
Dry soil + tare (g)	422.43
Tare (g)	123.28
Water content, w (%)	**29.8**
Confining stress, σ_3 (psf)	188
Shear rate (in/min)	0.0157
Strain at failure, ε_f (%)	15.00
Deviator stress at failure, $(\sigma_1-\sigma_3)_f$ (psf)	1469
Shear stress at failure, $q_f = (\sigma_1-\sigma_3)_f/2$ (psf)	734

Axial Strain	σ_d $\sigma_1-\sigma_3$	Q 1/2 σ_d
0.00	92.5	46.2
0.10	116.6	58.3
0.20	134.1	67.0
0.30	145.4	72.7
0.30	160.7	80.4
0.40	172.4	86.2
0.40	186.2	93.1
0.50	198.8	99.4
0.50	214.5	107.3
0.80	226.3	113.2
1.00	239.0	119.5
1.20	299.3	149.6
1.40	356.4	178.2
1.60	393.4	196.7
1.80	435.6	217.8
2.00	474.8	237.4
2.20	518.2	259.1
2.40	554.7	277.3
2.60	595.8	297.9
2.80	628.6	314.3
3.00	661.2	330.6
3.20	697.2	348.6
3.40	733.0	366.5
3.60	766.5	383.3
3.80	796.2	398.1
4.00	819.5	409.7
4.20	848.6	424.3
4.40	872 9	436.4
4.60	893.9	447.0
4.80	917.1	458.5
5.00	942.5	471 3
5.50	965.1	482.5
6.00	992.3	496.2
6.50	1041.6	520.8
7.00	1081.7	540.9
7.50	1124.7	562.3
8.00	1168.8	584 4
8.50	1199.1	599.6
9.00	1242.6	621.3
9.50	1277.5	638.7
10.00	1303.7	651.9
10.50	1326.3	663.2
11.00	1351.4	675.7
11.50	1380.0	690.0
12.00	1392.7	696 3
12.50	1407.1	703.5
13.00	1422.9	711.5
13.50	1432.8	716.4
14.00	1438.8	719.4
14.50	1443.9	722.0
15.00	1468.8	734.4



Entered by:_____

Reviewed:_____

Unconsolidated-Undrained Triaxial Compression Test on Cohesive Soils

(ASTM D2850)

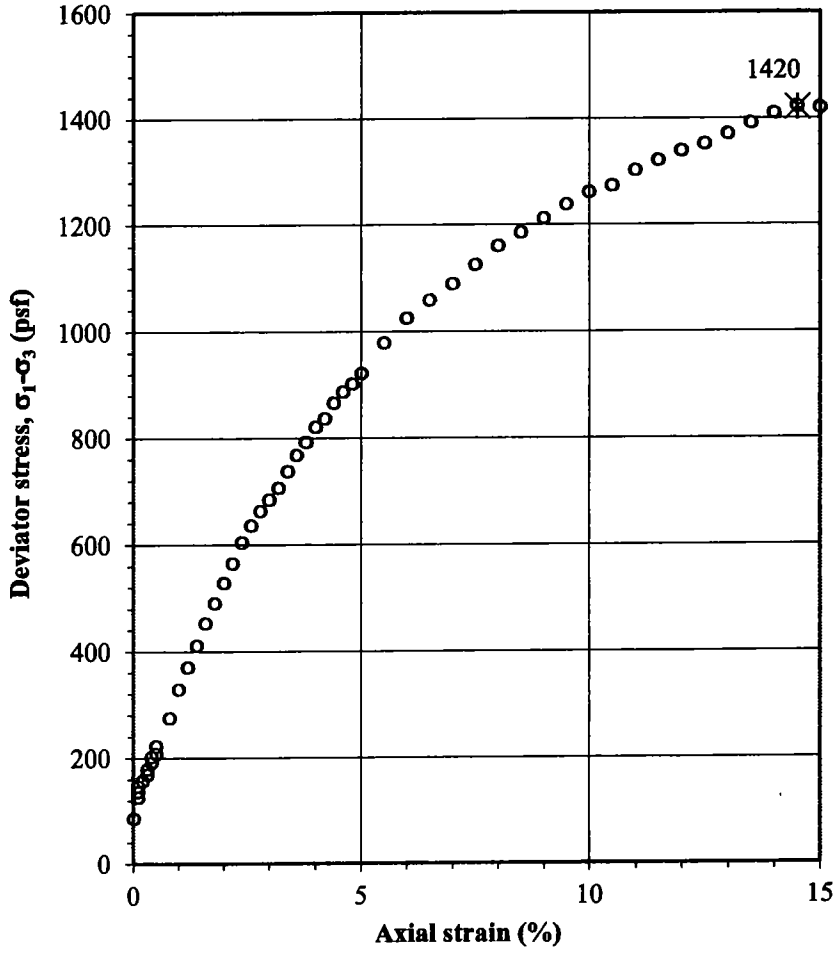
Project: Flex Warehouse
No: 03638-001
Location: American Fork, Utah
Date: 3/26/2021
By: JDF

Boring No.: TP-5
Sample:
Depth: 5.5'
Sample Description: **Brown sandy clay**
Sample type: **Undisturbed-trimmed from thin-wall**

Specific gravity, Gs	2.75	Assumed
Sample height, H (in.)	5.214	
Sample diameter, D (in.)	2.421	
Sample volume, V (ft^3)	0.0139	
Wt. rings + wet soil (g)	1053.77	
Wt. rings/tare (g)	281.34	
Moist soil, Ws (g)	772.43	
Moist unit wt., γ_m (pcf)	122.6	
Dry unit wt., γ_d (pcf)	91.1	
Saturation (%)	100.0	
Void ratio, *e*	0.89	

Wet soil + tare (g)	170.71
Dry soil + tare (g)	159.97
Tare (g)	128.87
Water content, w (%)	34.5
Confining stress, σ_3 (psf)	297
Shear rate (in/min)	0.0156
Strain at failure, ε_f (%)	14.50
Deviator stress at failure, $(\sigma_1-\sigma_3)_f$ (psf)	1420
Shear stress at failure, $q_f = (\sigma_1-\sigma_3)_f/2$ (psf)	710

Axial Strain	σ_d $\sigma_1-\sigma_3$	Q 1/2 σ_d
0.00	83.6	41.8
0.10	123.9	61.9
0.10	134.8	67.4
0.10	145.4	72.7
0.20	155.0	77.5
0.30	166.7	83.3
0.30	176.9	88.4
0.40	189.8	94.9
0.40	200.5	100.3
0.50	206.1	103.0
0.50	220.8	110.4
0.80	273.3	136.6
1.00	326.5	163.2
1.20	368.3	184.2
1.40	409.2	204 6
1.60	451.1	225.6
1.80	489.1	244.6
2.00	527.1	263.5
2.20	563.3	281.6
2.40	602 5	301.3
2.60	633.6	316 8
2.80	660.5	330.3
3.00	682.2	341 1
3.20	704.2	352.1
3.40	734 9	367 4
3.60	765.5	382.8
3.80	789.8	394.9
4.00	818.1	409.0
4.20	833.7	416.9
4.40	863.2	431.6
4.60	884.1	442.1
4.80	899.0	449.5
5.00	918.9	459.4
5.50	976.2	488.1
6.00	1022 9	511.4
6.50	1056.7	528.3
7.00	1087.0	543.5
7.50	1123.3	561.7
8.00	1158.6	579.3
8.50	1183.8	591.9
9.00	1209.8	604.9
9.50	1236.3	618.1
10.00	1259.6	629.8
10.50	1271.6	635.8
11.00	1300.2	650.1
11.50	1319.0	659.5
12.00	1336.9	668.4
12.50	1349.5	674.7
13.00	1368.5	684.3
13.50	1388.5	694.3
14.00	1407.2	703.6
14.50	1419.7	709.8
15.00	1417.7	708.9



Entered by:_____

Reviewed:_____

Minimum Laboratory Soil Resistivity, pH of Soil for Use in Corrosion Testing, and Ions in Water by Chemically Suppressed Ion Chromatography *(AASHTO T 288, T 289, ASTM D4327, and C1580)*

Project: Flex Warehouse
No: 03638-001
Location: American Fork, Utah
Date: 3/30/2021
By: DKS

Sample info.	Boring No.	TP-4							
	Sample								
	Depth	4.5'							
Water content data	Wet soil + tare (g)	46.56							
	Dry soil + tare (g)	44.20							
	Tare (g)	23.24							
	Water content (%)	11.3							
Chem. data	pH*	8.22							
	Soluble chloride* (ppm)	7.79							
	Soluble sulfate** (ppm)	77.4							
Resistivity data	Pin method	2							
	Soil box	Miller Small							
		Approximate Soil condition (%)	Resistance Reading (Ω)	Soil Box Multiplier (cm)	Resistivity (Ω-cm)	Approximate Soil condition (%)	Resistance Reading (Ω)	Soil Box Multiplier (cm)	Resistivity (Ω-cm)
		As-Is	17770	0.67	11906				
		+3	11270	0.67	7551				
		+6	6688	0.67	4481				
		+9	4309	0.67	2887				
		+12	2725	0.67	1826				
		+15	2669	0.67	1788				
		+18	2664	0.67	1785				
		+21	2772	0.67	1857				
	Minimum resistivity (Ω-cm)	**1785**							

* Performed by AWAL using EPA 300.0

** Performed by AWAL using ASTM C1580

Entered by:_____
Reviewed:_____

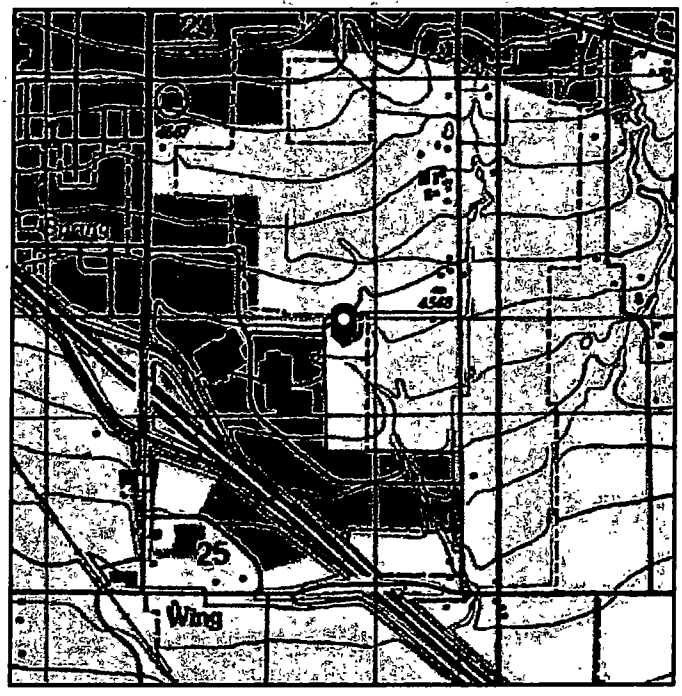
APPENDIX C

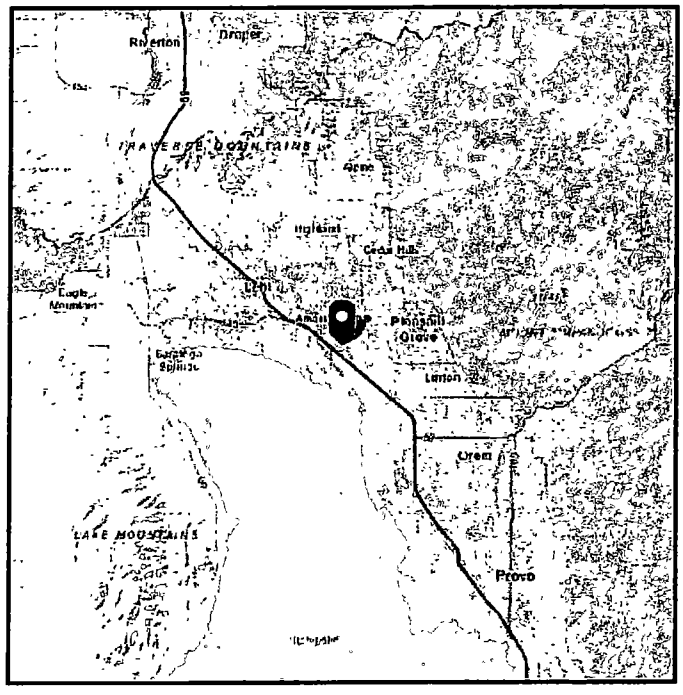
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 4550.3 ft (NAVD 88)
Latitude: 40.361746
Longitude: -111.778412





ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Seismic

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	1.304	S_{D1} :	N/A
S_1 :	0.476	T_L :	8
F_a :	1.2	PGA :	0.59
F_v :	N/A	PGA_M :	0.708
S_{MS} :	1.565	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.043	C_v :	1.361

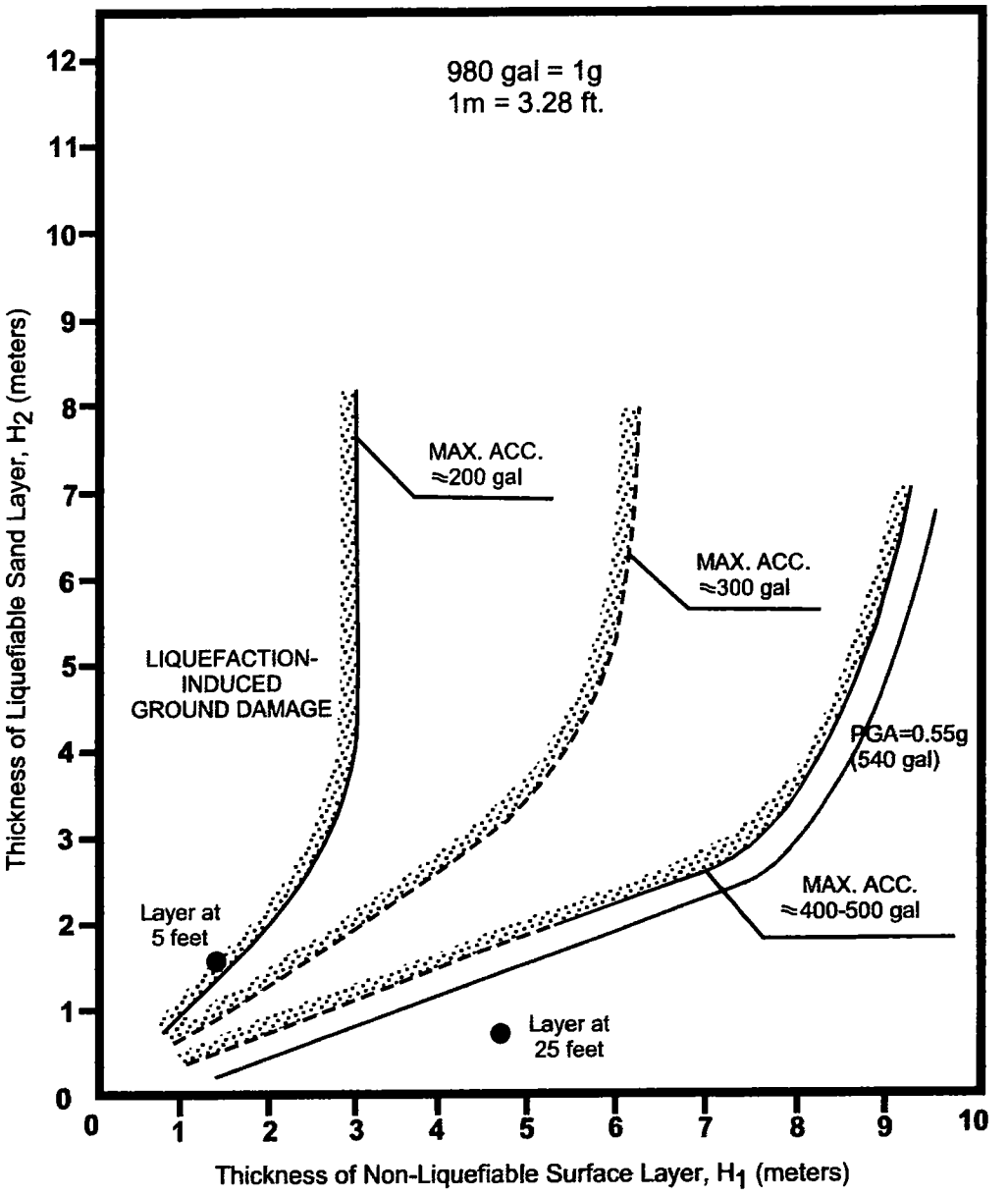
Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Mon Mar 15 2021

Date Source: USGS Seismic Design Maps

APPENDIX D

PROPOSED BOUNDARY CURVES FOR LIQUEFACTION-INDUCED DAMAGE



Estimated PGA for MCE event: 0.708g
Deaggregation indicates a 7.0Mw earthquake has highest contribution to the hazard
MSF applied for 7.5Mw earthquake: PGA/MSF — 0.708/1.19 = 0.59g
To obtain PGA normalized for a 7.7Mw earthquake, multiply result by MSF=0.93
PGA for 7.7Mw earthquake = 0.55g

$$MSF=\frac{10^{2.24}}{Mw^{2.56}}$$

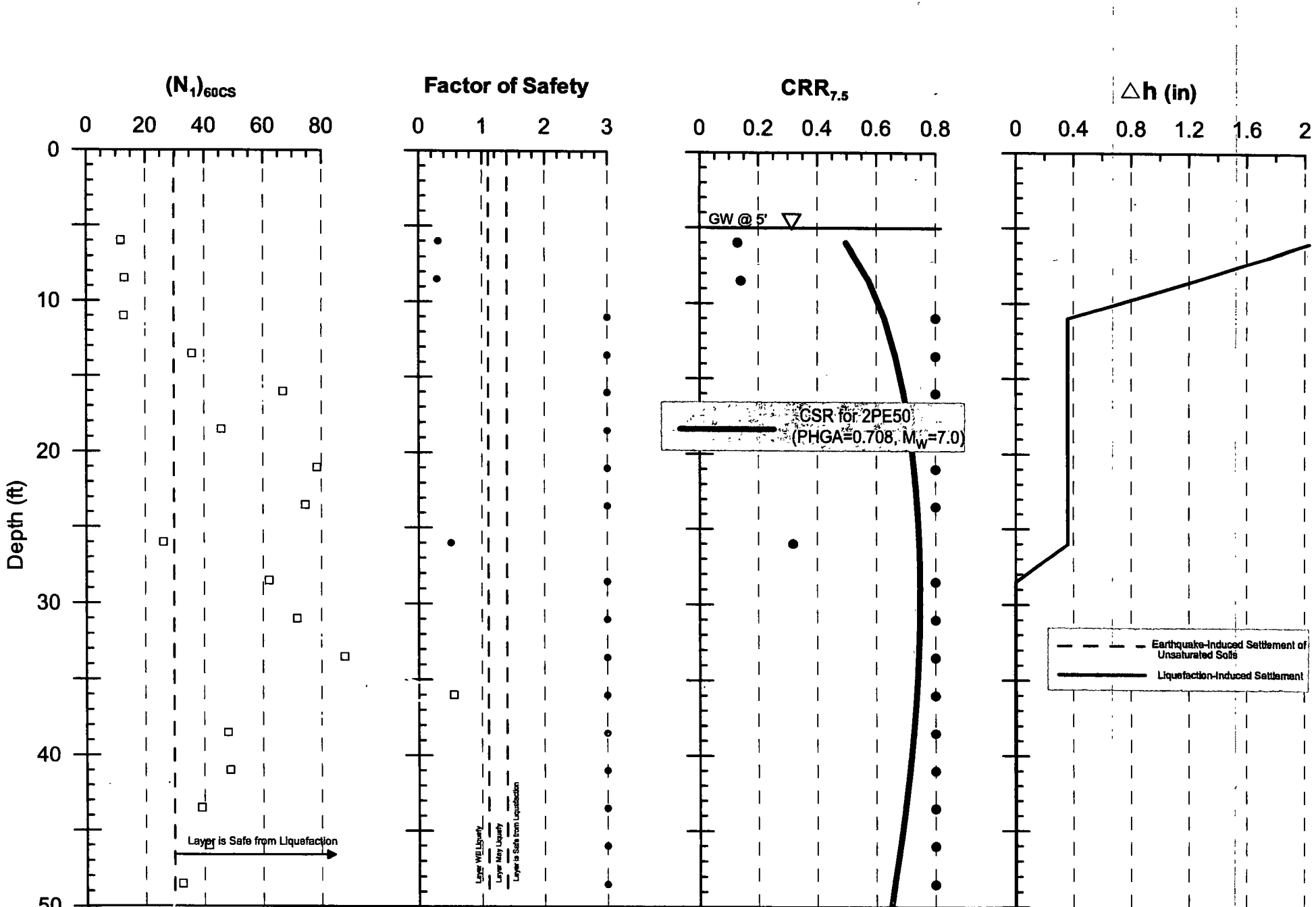
Chart from Ishihara, 1985

IGES

Project No. 03638-002

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork, Utah

Figure D-1



NOTE:
CRR plot is truncated at 0.8.
△h includes liquefaction-induced settlement and earthquake-induced settlement of unsaturated soils.

American Fork Flex Warehouse
748 East Quality Drive
American Fork, Utah
Liquefaction Analysis of
B1 Boring Data

Project: QDAF/Quality Drive
Project No. 03638-002

Figure D-2

Intermountain GeoEnvironmental Services, Inc.

Table D-1
Liquefaction Analysis Calculations for Boring B-1

Project Name	Flex Warehouse
Project No.	03656-001
Boring No.	B-1
Date of Excavation	7/19/2021
Depth to Groundwater During Sampling (ft)	3.5
Estimated Depth to Historic High Groundwater (ft)	5
***PHGA (g)**	0.708
***Moment Magnitude (Mw)**	7
Depth of Fill (ft)	0
Hole Diameter (inches)	8
Energy Ratio (ER, %)	72
Magnitude Scaling Factor MSF	1.19
Boring Diameter Correction Factory, C_B	1.15

Liquefaction-Induced Settlement 2.03 T&S

automatic hammer

MSF = $10^{2.24}/M_w^{2.56}$

***Probabilistic Values**

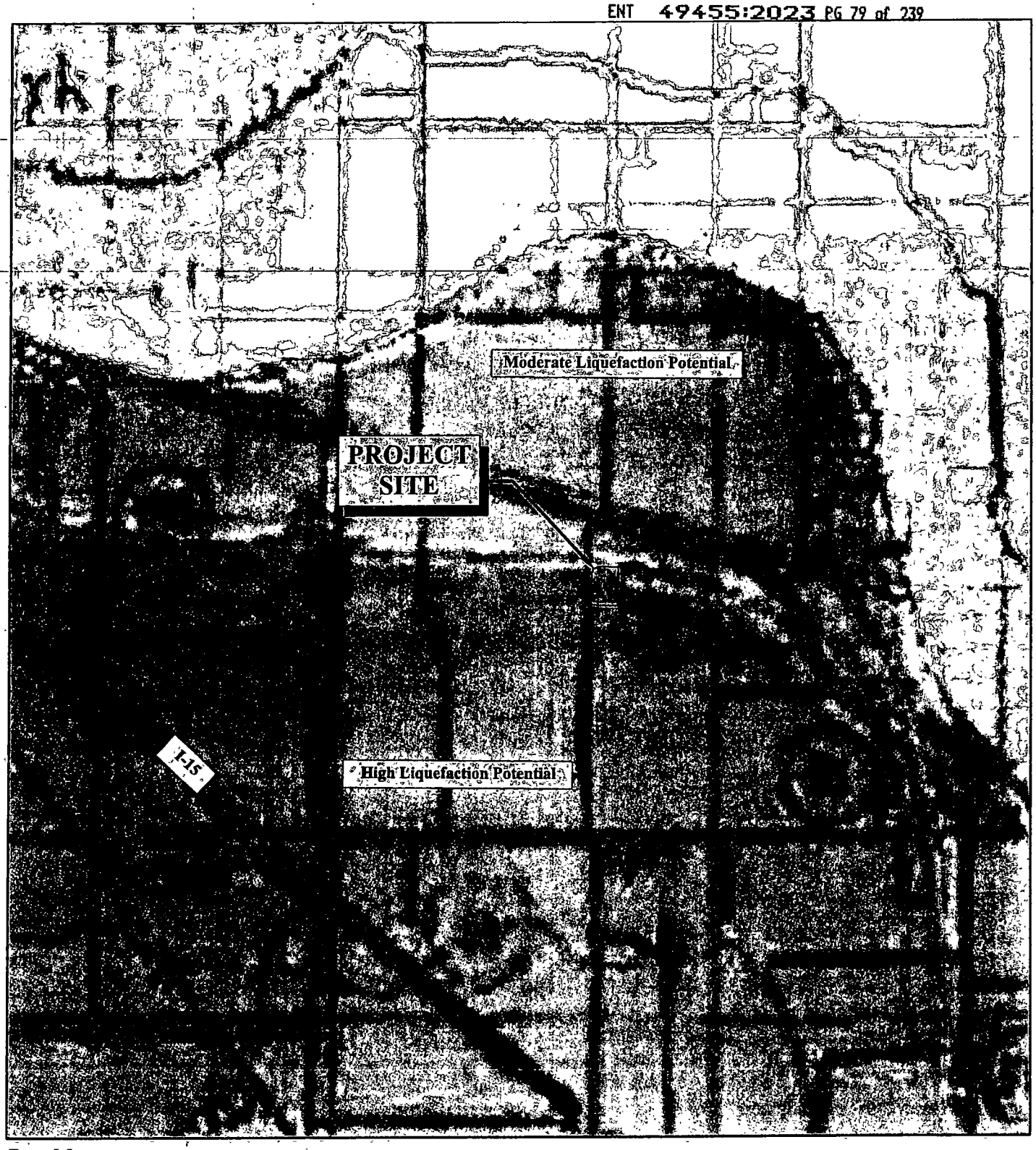
Cs: Sampling Method Correcton Factor
Cs=1.2 for standard sampler without liner
CS=1.0 for standard sampler with liner
Cs=0.6 for Cal Mod Sampler
Alternative: set Cs to 1.0 and apply sampling method correction factor directly to raw field blowcount data

Chinese Criteria:
clay < 15% by weight
LL < 35%
W% > 0.9*LL
Clay is <=0.005 mm

Stress Reduction Coefficie

r_d = (1-0.4113*z0.5+0.04052*z+0.
(1-0.4177*z0.5+0.05729*z-0.00620

layer #	Depth to Midlayer depth (ft)	Raw Field N (blows/ft)	unit wt.(pcf)	Fines %	Cs	% clay	W%	LL	Interval (ft.)		Layer thickness (ft)	At Midlayer During: Sampling σ_v psf	Liquefaction σ_v' psf	σ_v' psf	C_N	rod depth (m)	rod length (m)	C_R	N_{60}	$(N_1)_{60}$	f=0.75 α	B
1	6.0	3	120	28.1	1.2	11			5	7.3	2.3	720	564	658	1.7	1.8	2.8	0.75	3.6	6.3	4.57	1.14
2	8.5	8	120	34.9	1.2				7.3	9.8	2.5	1,020	708	802	1.7	2.6	3.6	0.80	3.6	6.7	4.97	1.20
3	11.0	5	120	62.9	1.2	20			9.8	12.3	2.5	1,320	852	948	1.5	3.4	4.4	0.85	3.6	6.5	5.00	1.20
4	13.5	19	120		1.2				12.3	14.8	2.5	1,620	996	1,090	1.4	4.1	5.1	0.85	21.6	35.9		1.00
5	16.0	35	120	8.8	1.2				14.8	17.3	2.5	1,920	1,140	1,234	1.3	4.9	5.9	0.85	42.0	65.3	0.50	1.02
6	18.5	18	120	30.8	1.2				17.3	19.8	2.5	2,220	1,284	1,378	1.2	5.6	6.6	0.95	21.6	35.3	4.76	1.16
7	21.0	41	120	9.4	1.2				19.8	22.3	2.5	2,520	1,428	1,522	1.2	6.4	7.4	0.95	49.2	76.3	0.68	1.02
8	23.5	22	120		1.2				22.3	24.8	2.5	2,820	1,572	1,666	1.1	7.2	8.2	0.95	50.4	74.5		1.00
9	26.0	35	120	8.2	1.2				24.8	27.3	2.5	3,120	1,716	1,810	1.1	7.9	8.9	0.95	18.0	25.5	0.34	1.01
10	28.5	36	120		1.2				27.3	29.8	2.5	3,420	1,860	1,954	1.0	8.7	9.7	0.95	45.6	62.0		1.00
11	31.0	42	120	9.7	1.2				29.8	32.3	2.5	3,720	2,004	2,098	1.0	9.4	10.4	1.00	50.4	69.5	0.77	1.02
12	33.5	55	120		1.2				32.3	34.8	2.5	4,020	2,148	2,242	1.0	10.2	11.2	1.00	66.0	87.9		1.00
13	36.0	80	120	6.7	1.2				34.8	37.3	2.5	4,320	2,292	2,386	0.9	11.0	12.0	1.00	96.0	123.8	0.08	1.01
14	38.5	92	120		1.2				37.3	39.8	2.5	4,620	2,436	2,530	0.9	11.7	12.7	1.00	38.4	48.0		1.00
15	41.0	26	120	70.3	1.2		26.3	25	39.8	42.3	2.5	4,920	2,580	2,674	0.9	12.5	13.5	1.00	30.0	36.5	5.00	1.20
16	43.5	20	120	75.3	1.2	19	27.9	28	42.3	44.8	2.5	5,220	2,724	2,818	0.9	13.3	14.3	1.00	24.0	28.4	5.00	1.20
17	46.0	22	120	37.8	1.2				44.8	47.3	2.5	5,520	2,868	2,962	0.8	14.0	15.0	1.00	26.4	30.4	5.00	1.20
18	48.5	17	120	84.9	1.2	29	29.4	32	47.3	49.8	2.5	5,820	3,012	3,106	0.8	14.8	15.8	1.00	20.4	22.9	5.00	1.20



Base Map:
Liquefaction Special Study Areas, Wasatch Front and Nearby Areas, Utah, 2008, U.G.S., G.E. Christenson and L.M. Shaw

N

0' 1,000' 2,000' 4,000'

SCALE: 1"=2,000'

IGES

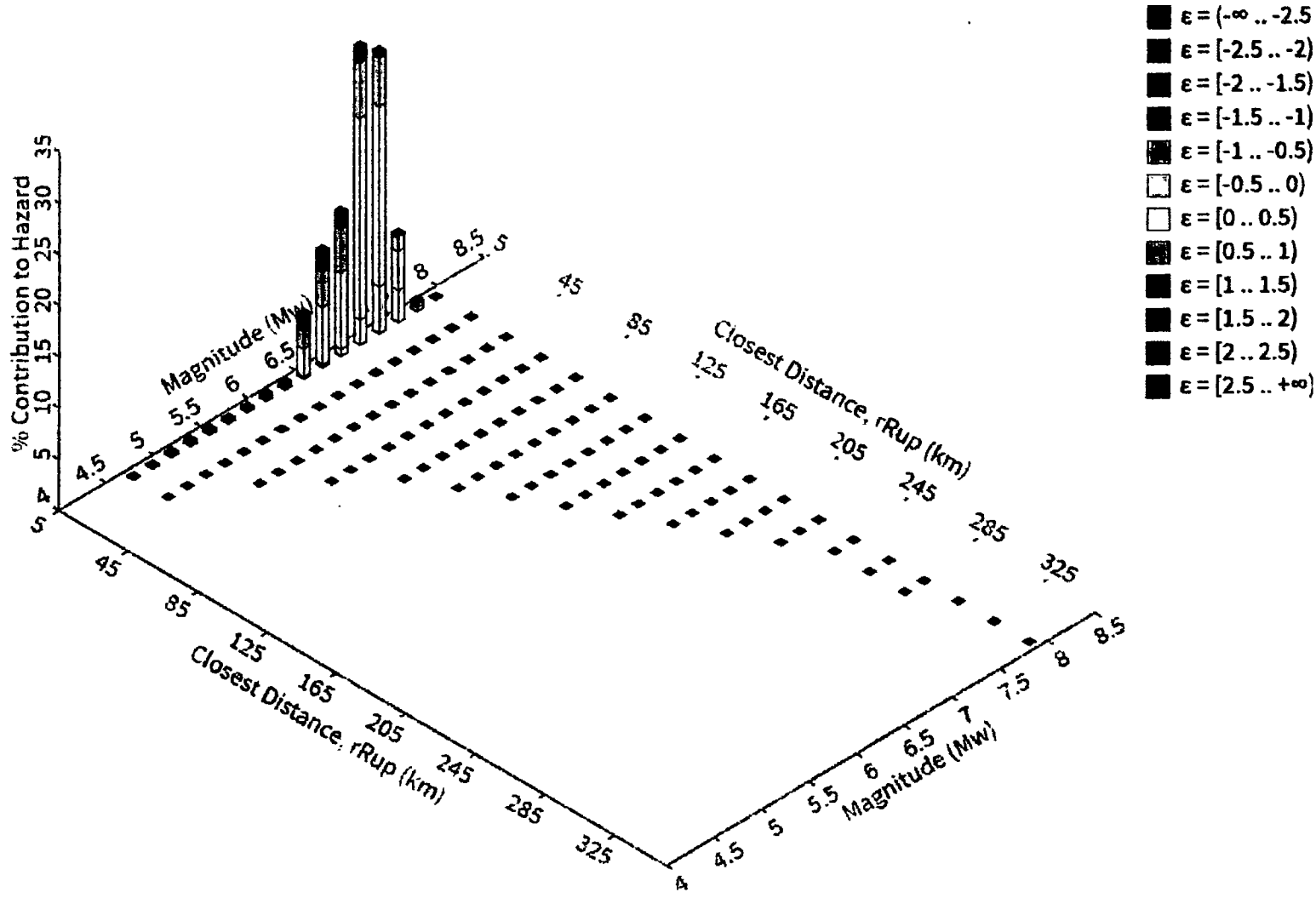
Project No. 03638-001

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork, Utah

LIQUEFACTION MAP

Figure

D-3



Download Deaggregation Report

Summary statistics for, Deaggregation: Total

Deaggregation targets

Return period: 2475 yrs
Exceedance rate: 0.0004040404 yr^{-1}
PGA ground motion: 0.61956677 g

Recovered targets

Return period: 2544.3914 yrs
Exceedance rate: 0.0003930213 yr^{-1}

Totals

Binned: 100 %
Residual: 0 %
Trace: 0.37 %

Mean (over all sources)

m: 7.04
r: 5.03 km
ε: 0.44 σ

Mode (largest m-r bin)

m: 7.09
r: 4.72 km
ε: 0.38 σ
Contribution: 28.87 %

Mode (largest m-r-ε bin)

m: 7.09
r: 4.34 km
ε: 0.21 σ
Contribution: 19.68 %

Discretization

r: min = 0.0, max = 1000.0, Δ = 20.0 km
m: min = 4.4, max = 9.4, Δ = 0.2
ε: min = -3.0, max = 3.0, Δ = 0.5 σ

Epsilon keys

ε0: [-∞ .. -2.5)
ε1: [-2.5 .. -2.0)
ε2: [-2.0 .. -1.5)
ε3: [-1.5 .. -1.0)
ε4: [-1.0 .. -0.5)
ε5: [-0.5 .. 0.0)
ε6: [0.0 .. 0.5)
ε7: [0.5 .. 1.0)
ε8: [1.0 .. 1.5)
ε9: [1.5 .. 2.0)
ε10: [2.0 .. 2.5)
ε11: [2.5 .. +∞]

APPENDIX E

Calculation Summary

Bearing capacity values were calculated using Meyerhof and others' modifications to Terzaghi's original bearing capacity formula. In recognition that at least part of the building will be founded on structural fill, our report recommends that all footings be founded on a minimum of 2½ feet of structural fill extending to native soils; based upon the test pit logs, the near-surface native soils will generally consist of medium-dense clayey gravel (GC).

The entire buildable area will be brought up in grade approximately 1 to 3 feet above existing grade; thus, the structural fill underlying the footings can reasonably be expected to consist of imported fill. The borrow source for the imported fill is not known at this time; however, based on our experience with similar projects in this area we would expect imported fill to consist of a coarse granular material, likely derived from crushed rock and having few fines and sourced from a nearby commercial pit. Thus, a reasonable estimate for the strength of imported structural fill may be taken as having a friction angle of 33 degrees and a cohesion of zero, with a moist unit weight of 125 pcf.

Using these estimated soil parameters, and adopting a minimum factor of safety of 3.0, the allowable bearing capacity *with respect to shear* can be taken as 5,350 psf for 20-inch-wide continuous wall footings and 8,600 psf for a spot footing (a 6x6 ft footing assumed for this exercise). Utilizing the Simplified Schmertmann method for estimating static settlement of granular soils under a foundation load, total settlement under the continuous wall footing is estimated to be about 0.5 inches and total settlement under a spot footing (again, 6x6 footing assumed) is estimated to be about 2.1 inches. To reduce the total settlement under the spot footing to 1 inch (generally taken as the maximum allowable total settlement for most ordinary structures), the allowable bearing capacity must be reduced to 4,650 psf.

For geotechnical practice some additional reduction of allowable bearing capacity is often warranted to account for uncertainty with respect to subsurface conditions and inconsistent construction practices; such reductions are typically qualitative in nature and judgement-based. Thus, based on our assessment of the uncertainties associated with this project, for design of foundations an allowable bearing capacity of **2,000 psf** is recommend.

Lateral earth pressures have been assessed using conventional Coulomb theory; sample calculations are attached. For these calculations, and noting that excessive compaction against a retaining wall is discouraged, we have conservatively assumed a granular backfill material with a friction angle of 30 degrees and a moist unit weight of 120 pcf.

Allowable Bearing Capacity Calculations

Modified Meyerhof (1963)

IGES Project No.: 03638-002
Date: 8/13/2021

c	0	psf
ϕ	33	deg.
γ	125	pcf
B	1.67	ft.
D	3	ft.
L	100	ft.
β	0	deg.
FS	3	
FS_{shear}	1.5	

c cohesion
ϕ friction angle
γ wet unit weight of soil
B width of footing
D depth of footing
β inclination of the load on the foundation with respect to the vertical
L length of footing

Note[1]: if round footing, L=B=diameter of footing
Note[2]: you may want to neglect depth factors for shallow foundations

Bearing Capacity Factors

Nq	26.1	(Reissner, 1924)
Nc	38.6	(Prandtl, 1921)
Ny	35.2	(Vesic, 1973)

Modified Bearing Capacity Factors (Shear)

c_d	0	psf
ϕ_d	23.4	deg.
Nq'	9.0	
Nc'	18.6	
Ny'	8.7	

Shape Factors (De Beer, 1970)

F_{cs}	1.0
F_{qs}	1.0
F_{ys}	0.99

Depth Factors (Hansen, 1970)

F_{cd}	1.4
F_{qd}	1.3
F_{yd}	1

Incliniation Factors (Meyerhof 1963; Hanna and Meyerhof 1981)

F_{ci}	1.00
F_{qi}	1.00
F_{yi}	1.00

Bearing Capacity (psf)

gross			net		
q_u	q_{all}	$q_{all(shear)}$	q_u	q_{all}	$q_{all(shear)}$
16,370	5,457	5,306	15,995	5,332	4,931

$q_u = cNcF_{cs}F_{cd}F_{ci} + \gamma DNqF_{qs}F_{qd}F_{qi} + 0.5\gamma BNyF_{ys}F_{yd}F_{yi}$

$q_{all} = qu/FS$

$q_{all(shear)} = c_dNc'F_{cs}F_{cd}F_{ci} + \gamma DNq'F_{qs}F_{qd}F_{qi} + 0.5\gamma BNy'F_{ys}F_{yd}F_{yi}$ where $c_d = c/FS_{shear}$ and $\phi_d = \tan^{-1}(\tan(\phi/FS_{shear}))$

Note: net values do not take into account removal of existing overburden ($D\gamma$)

Figure E-1

Allowable Bearing Capacity Calculations

Modified Meyerhof (1963)

IGES Project No.: 03638-002
Date: 8/13/2021

c	0	psf
ϕ	33	deg.
γ	125	pcf
B	6	ft.
D	3	ft.
L	6	ft.
β	0	deg.
FS	3	
FS_{shear}	1.5	

c cohesion
ϕ friction angle
γ wet unit weight of soil
B width of footing
D depth of footing
β inclination of the load on the foundation with respect to the vertical
L length of footing

Note[1]: if round footing, L=B=diameter of footing
Note[4]: you may want to neglect depth factors for shallow foundations

Bearing Capacity Factors

Nq	26.1	(Reissner, 1924)
Nc	38.6	(Prandtl, 1921)
Ny	35.2	(Vesic, 1973)

Modified Bearing Capacity Factors (Shear)

c_d	0	psf
ϕ_d	23.4	deg.
Nq'	9.0	
Nc'	18.6	
Ny'	8.7	

Shape Factors (De Beer, 1970)

F_{cs}	1.7
F_{qs}	1.6
F_{ys}	0.60

Depth Factors (Hansen, 1970)

F_{cd}	1.2
F_{qd}	1.1
F_{yd}	1

Incliniation Factors (Meyerhof 1963; Hanna and Meyerhof 1981)

F_{ci}	1.00
F_{qi}	1.00
F_{yi}	1.00

Bearing Capacity (psf)

gross			net		
q_u	q_{all}	$q_{all(shear)}$	q_u	q_{all}	$q_{all(shear)}$
26,229	8,743	8,295	25,854	8,618	7,920

$q_u = cNcF_{cs}F_{cd}F_{ci} + \gamma DNqF_{qs}F_{qd}F_{qi} + 0.5\gamma BNyF_{ys}F_{yd}F_{yi}$

$q_{all} = qu/FS$

$q_{all(shear)} = c_dNc'F_{cs}F_{cd}F_{ci} + \gamma DNq'F_{qs}F_{qd}F_{qi} + 0.5\gamma BNy'F_{ys}F_{yd}F_{yi}$ where $c_d = c/FS_{shear}$ and $\phi_d = \tan^{-1}(\tan(\phi/FS_{shear}))$

Note: net values do not take into account removal of existing overburden ($D\gamma$)

Figure E-2

Static Settlement Calculations
Simplified Schmertmann Method

For continuous footings (L/B≥10)

$$\delta = \frac{C_1 C_2 C_3 (q - \sigma'_{zD})(2I_{\epsilon p} + 0.1)B}{E_s}$$

For square and circular foundations (L/B=1)

$$\delta = \frac{C_1 C_2 C_3 (q - \sigma'_{zD})(I_{\epsilon p} + 0.025)B}{E_s}$$

$$C_1 = 1 - 0.5\left(\frac{\sigma'_{zD}}{q - \sigma'_{zD}}\right)$$

$$C_2 = 1 + 0.2 \log\left(\frac{t}{0.1}\right)$$

$$C_3 = 1.03 - \frac{0.03L}{B} \geq 0.73$$

$$I_{\epsilon p} = 0.5 + 0.1\sqrt{\frac{q - \sigma'_{zD}}{\sigma'_{zp}}}$$

where...

- δ = total static settlement (inches)
- q = bearing pressure (psf)
- D = depth to bottom of footing measured from original grade (ft)
- σ'_{zD} = vertical effective stress at depth D below the ground surface (psf)
- σ'_{zp} = initial vertical effective stress at depth of peak strain influence factor*
- $I_{\epsilon p}$ = peak strain influence factor (no units)
- B = width of footing (ft)
- L = length of footing (ft)
- E_s = equivalent modulus of elasticity in soil layer (ksf)
- C_1 = depth factor
- C_2 = secondary creep factor
- C_3 = shape factor (equals 1 for square and circular foundations)
- t = time since application of load (yr, typically taken as a 50-year design life)

*(for square and circular foundations, compute at a depth of D+B/2 below the ground surface; for continuous footings (L/B>10), compute at a depth of D+B)

Input:

q =	5,350	psf
D =	3	ft (assume zero for engineered fill)
B =	1.67	ft
L =	100	ft
E_s =	400	ksf (conservative estimate for medium dense sand/gravel)
t =	50	years
Y' =	125	unit weight, pcf

Calculated Values:

σ'_{zD} =	0	psf
σ'_{zp} =	583.75	psf
C_1 =	1	
C_2 =	1.54	
C_3 =	0.73	
$I_{\epsilon p}$ =	0.80	

δ = **0.51** inches

Static Settlement Calculations
Simplified Schmertmann Method

For continuous footings (L/B≥10)

$$\delta = \frac{C_1 C_2 C_3 (q - \sigma'_{zD})(2I_{\epsilon p} + 0.1)B}{E_s}$$

For square and circular foundations (L/B=1)

$$\delta = \frac{C_1 C_2 C_3 (q - \sigma'_{zD})(I_{\epsilon p} + 0.025)B}{E_s}$$

$$C_1 = 1 - 0.5\left(\frac{\sigma'_{zD}}{q - \sigma'_{zD}}\right) \qquad C_2 = 1 + 0.2 \log\left(\frac{t}{0.1}\right) \qquad C_3 = 1.03 - \frac{0.03L}{B} \geq 0.73$$

$$I_{\epsilon p} = 0.5 + 0.1\sqrt{\frac{q - \sigma'_{zD}}{\sigma'_{zp}}}$$

where...

- δ = total static settlement (inches)
- q = bearing pressure (psf)
- D = depth to bottom of footing measured from original grade (ft)
- σ'_{zD} = vertical effective stress at depth D below the ground surface (psf)
- σ'_{zp} = initial vertical effective stress at depth of peak strain influence factor*
- $I_{\epsilon p}$ = peak strain influence factor (no units)
- B = width of footing (ft)
- L = length of footing (ft)
- E_s = equivalent modulus of elasticity in soil layer (ksf)
- C_1 = depth factor
- C_2 = secondary creep factor
- C_3 = shape factor (equals 1 for square and circular foundations)
- t = time since application of load (yr, typically taken as a 50-year design life)

*(for square and circular foundations, compute at a depth of D+B/2 below the ground surface; for continuous footings (L/B>10), compute at a depth of D+B)

Input:

q =	4,650	psf
D =	3	ft (assume zero for engineered fill)
B =	6	ft
L =	6	ft
E_s =	400	ksf (conservative estimate for medium dense sand/gravel)
t =	50	years
Y' =	125	unit weight, pcf

Calculated Values:

σ'_{zD} =	0	psf
σ'_{zp} =	750	psf
C_1 =	1	
C_2 =	1.54	
C_3 =	1.00	
I_{ep} =	0.75	

δ = **1.00** inches

Figure E-4

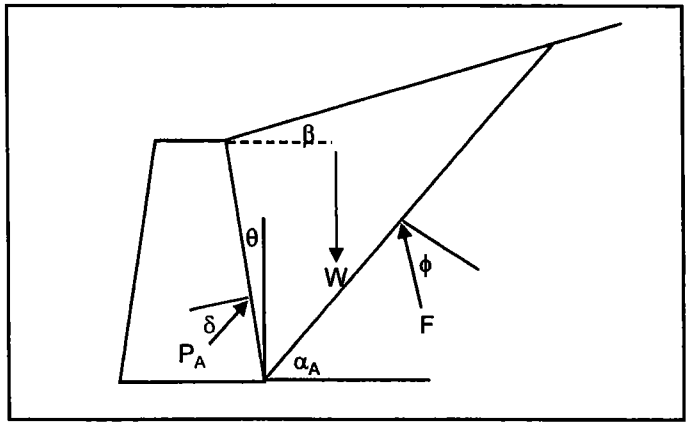
Lateral Earth Pressure Calculations (Coulomb Theory)

IGES Project No.: 03638-002
Date: 8/13/2021

2:1 slope			Flat Backfill			Flat Backfill		
Y	120	pcf	Y	120	pcf	Y	120	pcf
ϕ	30		ϕ	30		ϕ	30	
θ	0		θ	0		θ	0	
β	26.5		β	0		β	0	
δ	0		δ	0		δ	0	
K_A=	0.53		K_A=	0.33		K_P=	3.0	
EFP=	64	pcf	EFP=	40	pcf	EFP=	360	pcf

$$Ka = \frac{\cos^2(\phi - \theta)}{\cos^2\theta\cos(\delta + \varphi)\left[1 + \sqrt{\frac{\sin(\delta + \varphi)\sin(\phi - \beta)}{\cos(\delta + \varphi)\cos(\beta - \theta)}}\right]^2}$$

$$Kp = \frac{\cos^2(\phi + \theta)}{\cos^2\theta\cos(\delta + \varphi)\left[1 - \sqrt{\frac{\sin(\delta + \varphi)\sin(\phi + \beta)}{\cos(\delta - \varphi)\cos(\beta - \theta)}}\right]^2}$$



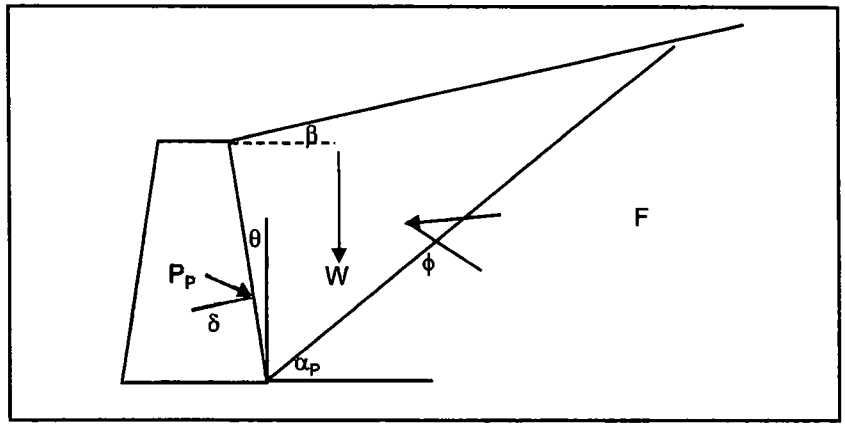


Figure E-5

APPENDIX F

Intermountain GeoEnvironmental Services, Inc.
12429 South 300 East, Ste 100, Draper, Utah 84020
~ T: (801) 748-4044 ~ F: (801) 748-4045

August 9, 2021

QDAF QOZB, LLC
c/o Mr. Tyson Williamson
881 W. State Road, #140-441
Pleasant Grove, Utah 84062

IGES Project No. 03638-003

Subject: Infiltration Testing Summary
Flex Warehouse
748 East Quality Drive
American Fork, Utah

Reference: IGES, Inc., 2021, Geotechnical Investigation, Flex Warehouse, 748 East Quality Drive, American Fork, Utah, Project No. 03638-001, dated April 7, 2021.

Mr. Willamson,

IGES has completed a double ring infiltrometer test for the proposed Flex Warehouse located at 748 East Quality Drive in American Fork, Utah. The purpose of our work was to provide representative infiltration rates for the on-site soils to provide a basis for the design of proposed below-grade detention galleries. The scope of work completed included an infiltration test and preparation of this letter. Our services were performed in accordance with our proposal dated July 19th, 2021.

Subsurface Conditions

Based on the excavation completed to reach a testing depth of 3.5 feet, subsurface soils at the site were visually classified as Clayey GRAVEL with sand (GC) being, dry, and light brown. Groundwater was not observed during the time of excavation but is reported to be at a depth of approximately 8 feet in the vicinity of where the test took place. The hand-excavated hole was located near the proposed location of the southern below grade detention gallery in the southern portion of the site, see Figure 1.

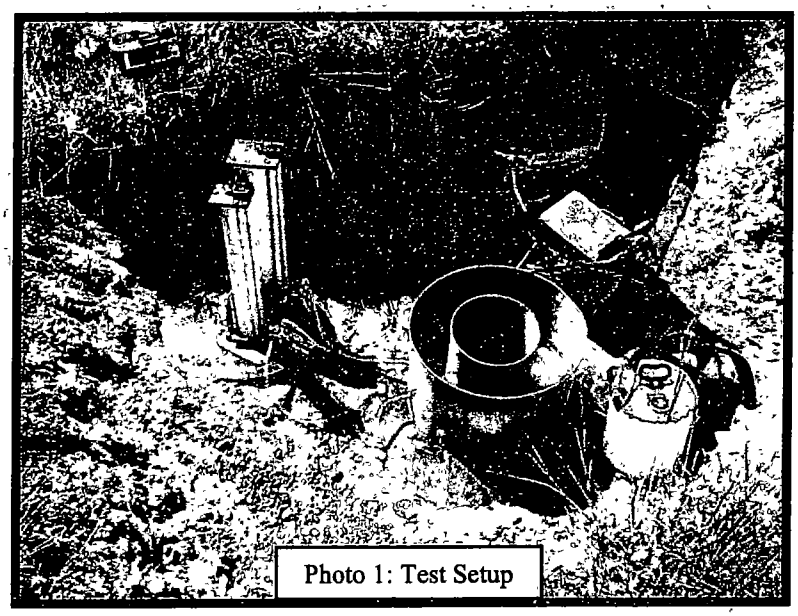


Photo 1: Test Setup

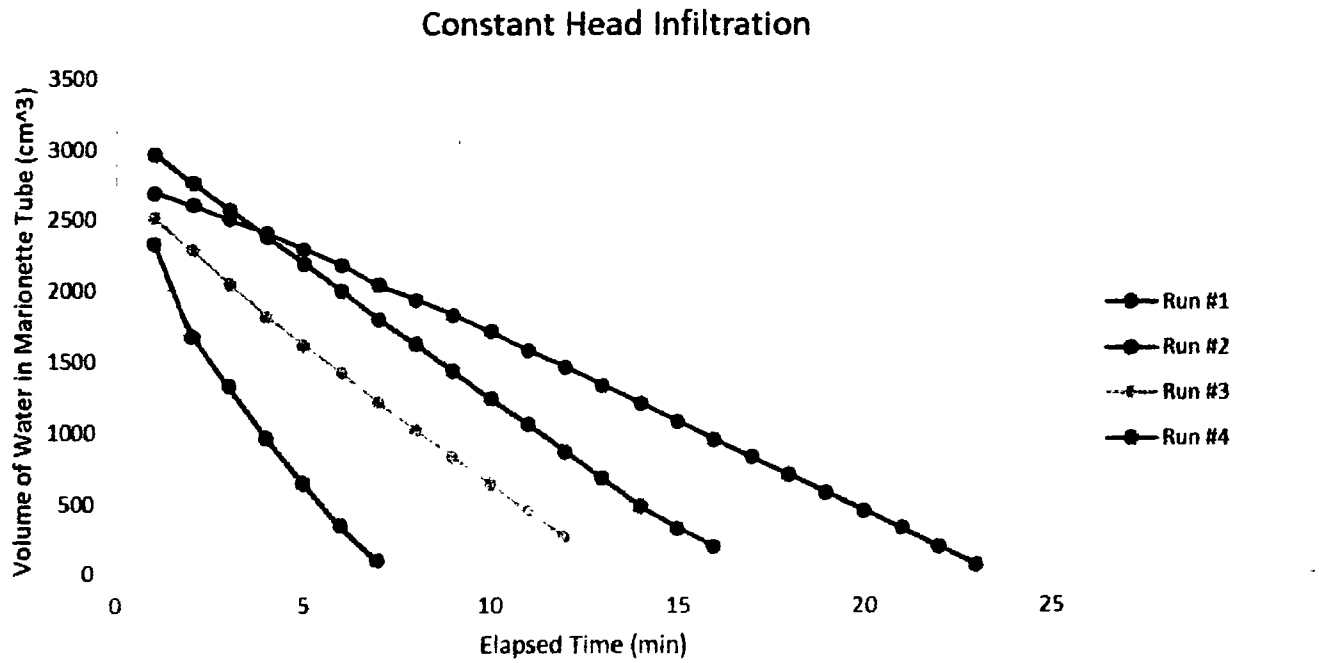
Test Procedure

The double-ring Infiltrometer test generally follows the procedure described in ASTM D3385-18 *Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer*. The double-ring infiltrometer method consists of installing two open cylinders, one inside the other, into the ground, partially filling the rings with water, and then maintaining the water at a constant level (thus maintaining a constant 'head' during the test). The volume of water added to the inner ring to maintain the water level contact is the measure of the volume of water that infiltrates the soil. The volume infiltrated during timed intervals is converted to an incremental infiltration velocity (or rate) by dividing by the area of the inner ring, usually expressed in centimeters per hours (or inch per hour) and plotted vs elapsed time. The maximum steady-state or average incremental infiltration rate is generally taken as the design infiltration rate.

The intent of the test is to measure *vertical* infiltration rates, as the vector of infiltration is important for certain applications (such as a broad, relatively shallow detention basin). Conducting an infiltration test with a single ring introduces some error to the calculated infiltration rate, since invariably some of the water infiltrating into the ground travels horizontally as well as vertically. The horizontal hydraulic conductivity of layered strata is often higher than the vertical hydraulic conductivity; thus, lateral flow of water can potentially introduce an unconservative bias in the infiltration data. The purpose of the outer ring is to promote one-dimensional, vertical flow beneath the inner ring; only the flow in the inner ring is measured, and the flow stemming from the outer ring (which inevitably includes some horizontal flow) is not considered in the final infiltration rate calculation.

The test was completed at a depth of 3½ feet below existing grade; based on the *Grading Plan* (Sheet 2.0) prepared by CIR Civil Engineers + Surveying (CIR), dated March 22, 2021 the surface elevation of the infiltration test location is approximate 4,549 feet (msl), thus the test elevation is about 4545.5 feet The test location is illustrated on Figure 1, attached. Based on information provided by CIR, it is understood that the bottom of the underground detention galleries will be at elevation 4545.5. After excavating down to the determined depth, the rings were pushed into the ground with approximately 4 inches of bury. Then water was poured into the outer and then the inner ring, pouring water on a square rubber pad to prevent erosion during pouring and inadvertently creating preferential flow paths. Then the marionette tubes were attached to the rings and to a reservoir of water, which automatically maintain the water level within the rings at a constant head. Prior to starting the test the water in the rings were allowed infiltrate (pre-soak) for approximately 45 minutes. Once water levels had equalized between the inner and the outer rings, readings were measured every minute until the water volume in the marionette tubes were low (less than about 375cc of water). The marionette tubes were re-filled, read, and emptied four times, for a total of 61 individual readings. A plot of the readings is presented on Graph 1.

Graph 1 - Infiltration Test Results



Findings

After plotting the data from the test, it became clear that the data from Run#2 was an outlier. It is possible that the water level in the inner ring dropped too low and the marionette tube was flowing to fill it back up to the constant head elevation. However, the results from Run #1, Run #3 and Run #4 are all relatively similar, with Run #3 and Run #4 being the most similar and consequently considered representative for the soils tested.

Table 1 – Summary of Infiltration Test Results

Run Number	Infiltration Rate – (min/in)	Infiltration Rate – (in/hr)
1	15.0	4.0
2	5.8	10.3
3	9.0	6.7
4	9.6	6.2

Based on the test results, IGES recommends a design infiltration rate of 10 min/in (6 in/hr)

Limitations and Closure

It should be noted that the infiltration rates provided were obtained in undisturbed soil with clean water and little to no sedimentation. Soils that have been saturated, clogged with oils, sediment, waste or organic materials will likely reduce infiltration rates. Infiltration rates may also vary due to grading/drainage, irrigation, temperature, precipitation and seasonal conditions. Therefore, IGES recommends the Civil Engineer apply an appropriate factor of safety to any stormwater infiltration design calculations. Additionally, standard routine maintenance to remove debris and sediment build up can help maintain the desired level of performance; or, in the case of underground galleries where access is limited, some form of filter at the inlet may desired.

We appreciate the opportunity to be of service on this project. Should you have any questions regarding this report or wish to discuss additional services, please contact us at your convenience (801) 748-4044.

Respectfully submitted,
IGES, Inc.

Reviewed by:

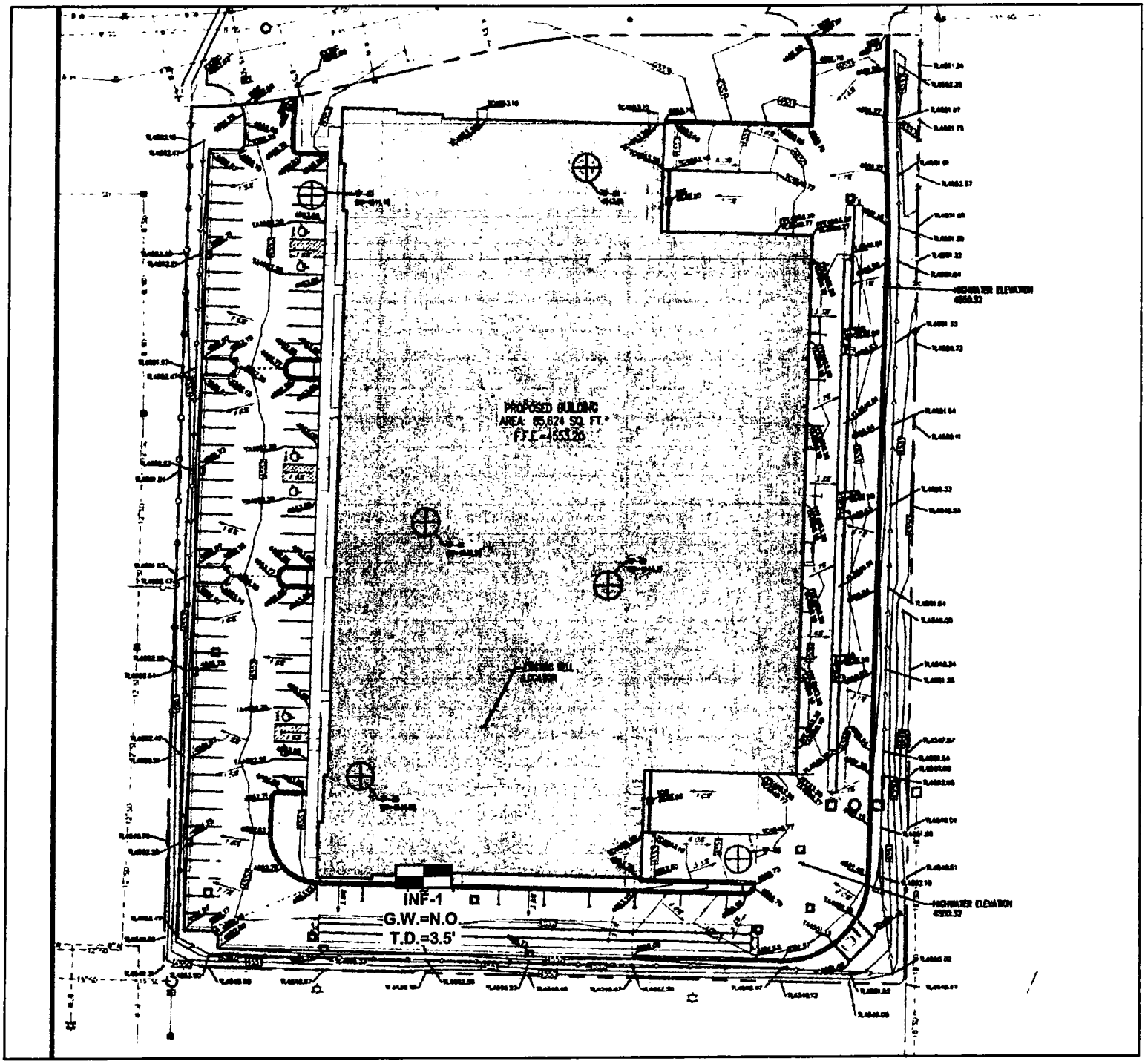
PROFESSIONAL ENGINEER
08-09-2021
11136480-2202
ERIK FJELDSTED
ELECTRONIC SEAL
STATE OF UTAH

Erik B. Fjeldsted, P.E.
Staff Engineer

David A. Glass, P.E.
Senior Geotechnical Engineer

Attachments: Figure 1 – Site Map
Infiltration Test Data

ideas for a changing world



BASE MAP

Background image from Civil Engineering+Surveying (CIR), Utah Valley Buisness Park, 752 East Quality Drive, American Fork, Utah, Grading Plan, Sheet C2.0, Project No. H1022-01, Date 3/22/21

LEGEND

APPROXIMATE INFILTRATION TEST LOCATION

G.W.= N.O.' DEPTH TO GROUNDWATER

T.D. = 12' TOTAL DEPTH EXPLORED

N

0' 75' 150'

SCALE: 1"=75'

IGES

Project No. 02200-007

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork, Utah

SITE MAP

Figure 1

Data Recorded By: Erik Fieldsted
Date Recorded: 8-5-2021
Project No.:03638-003

		cm		cm^3	cm^3	in^3/min	in/min
Reading	Time	Reading	Change (cm)	Change in Vol	Total Vol	Change in Vol	Inf Rate
1	11:12	54.0					
2	11:13	52.8	1.2	64.2	2,703	3.9	0.03
3	11:14	51.2	1.6	85.6	2,617	5.2	0.05
4	11:15	49.3	1.9	101.7	2,515	6.2	0.05
5	11:16	47.4	1.9	101.7	2,414	6.2	0.05
6	11:17	45.3	2.1	112.4	2,301	6.9	0.06
7	11:18	43.2	2.1	112.4	2,189	6.9	0.06
8	11:19	40.6	2.6	139.2	2,050	8.5	0.08
9	11:20	38.6	2.0	107.0	1,943	6.5	0.06
10	11:21	36.5	2.1	112.4	1,830	6.9	0.06
11	11:22	34.4	2.1	112.4	1,718	6.9	0.06
12	11:23	31.9	2.5	133.8	1,584	8.2	0.07
13	11:24	29.7	2.2	117.7	1,466	7.2	0.06
14	11:25	27.3	2.4	128.4	1,338	7.8	0.07
15	11:26	24.9	2.4	128.4	1,210	7.8	0.07
16	11:27	22.5	2.4	128.4	1,081	7.8	0.07
17	11:28	20.1	2.4	128.4	953	7.8	0.07
18	11:29	17.8	2.3	123.1	830	7.5	0.07
19	11:30	15.5	2.3	123.1	706	7.5	0.07
20	11:31	13.1	2.4	128.4	578	7.8	0.07
21	11:32	10.7	2.4	128.4	450	7.8	0.07
22	11:33	8.4	2.3	123.1	326	7.5	0.07
23	11:34	5.9	2.5	133.8	193	8.2	0.07
24	11:35	3.5	2.4	128.4	64	7.8	0.07
Average			2.31	123.66		7.55	0.07
	11:36	Refill					
1	11:37	50.0					
2	11:38	48.2	1.8	96.3	2,339	5.9	0.05
3	11:39	36.0	12.2	652.9	1,686	39.8	0.35
4	11:40	29.4	6.6	353.2	1,333	21.6	0.19
5	11:41	22.6	6.8	363.9	969	22.2	0.20
6	11:42	16.6	6.0	321.1	648	19.6	0.17
7	11:43	10.9	5.7	305.1	343	18.6	0.16
8	11:44	6.3	4.6	246.2	96	15.0	0.13
Average			5.9	317.9		19.4	0.17
	11:45	Refill					
1	11:46	51.9					
2	11:47	46.9	5	267.6	2,526	16.3	0.14
3	11:48	42.6	4.3	230.1	2,296	14.0	0.12
4	11:49	38.2	4.4	235.5	2,061	14.4	0.13
5	11:50	33.8	4.4	235.5	1,825	14.4	0.13
6	11:51	30.0	3.8	203.4	1,622	12.4	0.11
7	11:52	26.4	3.6	192.7	1,429	11.8	0.10

EXHIBIT C

Approved as to form: American Fork City Attorney

Intermountain GeoEnvironmental Services, Inc.
12429 South 300 East, Ste 100, Draper, Utah 84020
~ T: (801) 748-4044 ~ F: (801) 748-4045

October 11, 2021

QDAF QOZB, LLC
c/o Mr. Tyson Williamson
881 W. State Road, #140-441
Pleasant Grove, Utah 84062

IGES Project No. 03638-001

Subject: **Response to Additional Review Comments**
Flex Warehouse
748 East Quality Drive
American Fork, Utah

Submittal: IGES, 2021a, Geotechnical Investigation (Revision 1), Flex Warehouse, 748 East Quality Drive, American Fork, Utah, Project No. 03638-001, dated August 16, 2021.

References: IGES, 2021b, Response to Review Comments, Flex Warehouse, 748 East Quality Drive, American Fork, Utah, Project No. 03638-002, dated August 13, 2021.

IGES, 2021c, Addendum No. 1 – Seismic Criteria, Geotechnical Investigation, Flex Warehouse, American Fork, Utah, Project No. 03638-001, dated April 27, 2021.

Mr. Willamson,

As requested, IGES has prepared the following letter addressing a recent review comment pertaining to the geotechnical report prepared by IGES for the proposed Flex Warehouse to be constructed in American Fork, Utah, referenced above. The review comment was prepared by a representative of American Fork City (Mr. Ben Hunter), the comment forwarded to IGES in an email went by the Client on October 11, 2021. For ease of review, the review comment is presented first, followed by our response.

Comment No. 1

(*in reference to page 11 of the revised geotechnical report*) Due to the 1.7 inches of settlement, of the approximately 2 inches identified in the last paragraph does that constitute the need for mitigation? If so, identify the mitigation methods. If not, identify why there are no liquefaction mitigation measures needed.

Response to Comment No. 1

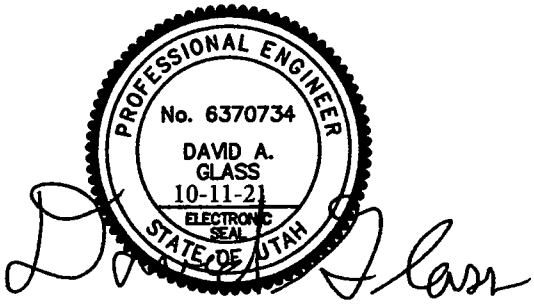
In this context, the mitigation of the effects of liquefaction (settlement) would be the structural engineer designing the building to tolerate half of total settlement over a distance of 40 feet (or, in this case, 1" of differential settlement over a distance of 40 feet, see **Section 4.4.2** of our report). This will effectively mitigate the liquefaction hazard (e.g. the structure will be designed to tolerate

the settlement). For a warehouse-type structure IGES presumes that such a structure could tolerate at least that much of differential settlement (and potentially more) without collapsing, however this determination should be made by the project structural engineer.

Closure

We appreciate the opportunity to be of service on this project. Should you have any questions regarding this report or wish to discuss additional services, please contact us at your convenience (801) 748-4044.

Respectfully submitted,
IGES, Inc.



David A. Glass, P.E.
Senior Geotechnical Engineer

CKR Engineers, Inc.

Structural Engineers

October 12, 2021

Mr. Marty Barber
Barco Construction
PO BOX 175
Lehi, Utah 84043

File: 21205

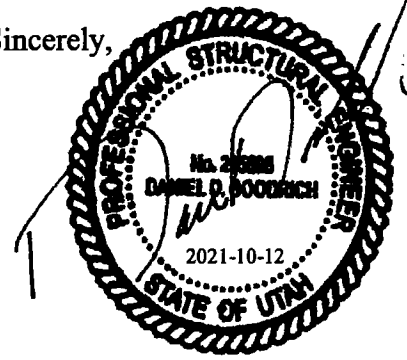
RE: H3 Warehouse – Plan Review Response
756 East Quality Drive
American Fork, Utah

Dear Marty:

You provided a letter from IGES dated October 11, 2021, regarding the liquefaction potential for the site. In the letter they respond to Comment No. 1 from American Fork City. The letter states that there is a potential of 1" of differential settlement over a distance of 40 ft. due to liquefaction. The structural building and foundation can tolerate this amount of movement. It is our opinion that mitigation of the liquefaction potential is not required.

Please call if you have further questions.

Sincerely,



Daniel D. Goodrich, S.E.

EXHIBIT D

Approved as to form: American Fork City Attorney

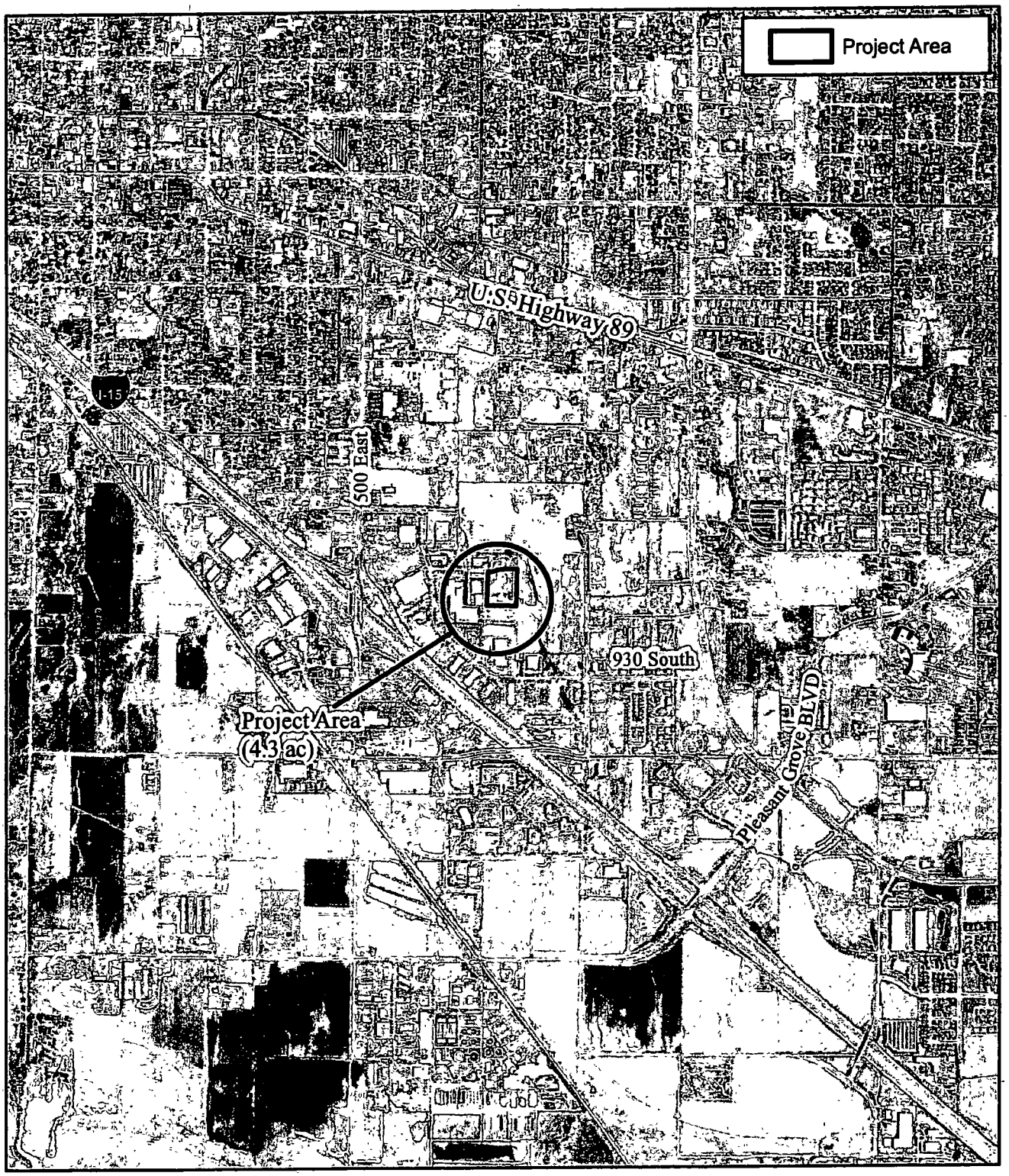


Figure 2b. Site Vicinity Map - 1:24,000 Scale Aerial

LEGEND

- (XXXX) EXIST. CONTOUR MAJOR
- (XXXX) EXIST. CONTOUR MINOR
- EXIST. STORM DRAIN
- X X EXIST. FENCE
- EXIST. SD INLET, MANHOLE & COMBO BOX
- EXIST. MONITORING WELL
- EXIST. IRRIGATION BOX
- EXIST. POWER POLE
- LIMITS OF ASPHALT PAVEMENT
- LIMITS OF STORM DRAIN EASEMENT
- LIMITS OF ORDINARY HIGH WATER MARK

NOTES

1) Vertical data (contours and spot elevations) shown hereon is based on the NGVD29 elevation of 4552.32 published by the Utah County Surveyor on the North 1/4 Corner of said Section 25.
2) Wetland boundaries delineated by Frontier Corporation USA, 221 N. Gateway Drive, Suite B, Providence, UT. 84332 435-753-9502

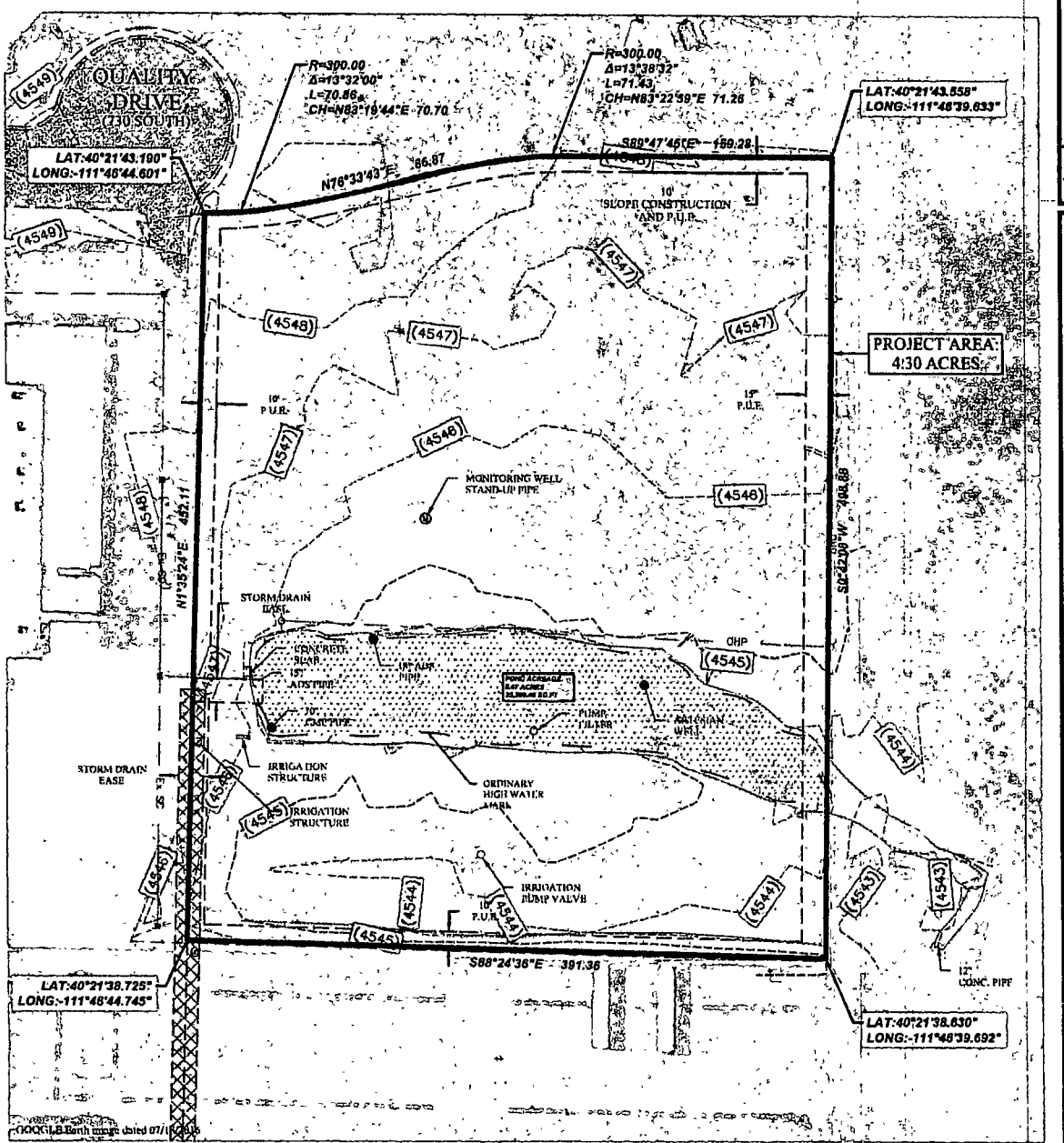
N

S

GRAPHIC SCALE

70 0 35 70 140

(IN FEET)
1 inch = 70 ft



GEOGILB Bench mark(s) dated 07/1[illegible]

FOCUS ENGINEERING AND SURVEYING, LLC
12 WEST CENTER STREET
MIDVALE, UTAH 84047 PH: (801) 352-0075

WATERS OF THE US SURVEY MAP

LOCATION: NORTHEAST 1/4 OF SECTION 25, T5S, R2E, SLB&M
AMERICAN FORK CITY, UTAH COUNTY, UTAH
PROPERTY OF: JL UTAH PROPERTY 2, LLC.
PREPARED FOR: HADCO CONSTRUCTION, LLC.

REVISION BLOCK

NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		
6		

1" = 70' | DATE: 8/24/17 | JOB NO.: 17-187

2 OF 3

ENT 49455:2023 PG 101 of 239

ENCLOSURE 2

U.S. ARMY CORPS OF ENGINEERS
REGULATORY PROGRAM
APPROVED JURISDICTIONAL DETERMINATION FORM (INTERIM)
NAVIGABLE WATERS PROTECTION RULE

I. ADMINISTRATIVE INFORMATION

Completion Date of Approved Jurisdictional Determination (AJD): August 18, 2021
ORM Number: SPK-2017-00549
Associated JDs: SPK-2017-00549 Preliminary JD issued for same water on July 12, 2020.
Review Area Location[1]:
State/Territory: UT City: American Fork County/Parish/Borough: Utah County
Center Coordinates of Review Area: Latitude 40.3612° Longitude -111.7784°

II. FINDINGS

A. Summary: Check all that apply. At least one box from the following list MUST be selected. Complete the corresponding sections/tables and summarize data sources.

- ☐ The review area is comprised entirely of dry land (i.e., there are no waters or water features, including wetlands, of any kind in the entire review area). Rationale: N/A or describe rationale.
- ☐ There are "navigable waters of the United States" within Rivers and Harbors Act jurisdiction within the review area (complete table in section II.B).
- ☐ There are "waters of the United States" within Clean Water Act jurisdiction within the review area (complete appropriate tables in section II.C).
- ☒ There are waters or water features excluded from Clean Water Act jurisdiction within the review area (complete table in section II.D).

B. Rivers and Harbors Act of 1899 Section 10 (§ 10)[2]

§ 10 Name	§ 10 Size	§ 10 Criteria	Rationale for § 10 Determination
N/A	N/A	N/A	N/A

C. Clean Water Act Section 404

Territorial Seas and Traditional Navigable Waters ((a)(1) waters)[3]

(a)(1) Name	(a)(1) Size	(a)(1) Criteria	Rationale for (a)(1) Determination
N/A	N/A	N/A	N/A

Tributaries ((a)(2) waters):

(a)(2) Name	(a)(2) Size	(a)(2) Criteria	Rationale for (a)(2) Determination
N/A	N/A	N/A	N/A

Lakes and ponds, and impoundments of jurisdictional waters ((a)(3) waters):

(a)(3) Name	(a)(3) Size	(a)(3) Criteria	Rationale for (a)(3) Determination
N/A	N/A	N/A	N/A

Adjacent wetlands ((a)(4) waters):

(a)(4) Name	(a)(4) Size	(a)(4) Criteria	Rationale for (a)(4) Determination
N/A	N/A	N/A	N/A

[1] Map(s)/Figure(s) are attached to the AJD provided to the requestor.
[2] If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.
[3] A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where independent upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD form.
[4] Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps Districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.
[5] Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.

U.S. ARMY CORPS OF ENGINEERS
REGULATORY PROGRAM
APPROVED JURISDICTIONAL DETERMINATION FORM (INTERIM)
NAVIGABLE WATERS PROTECTION RULE

D. Excluded Waters or Features

Excluded waters ((b)(1) – (b)(12))[4]:

Exclusion Name	Exclusion Size	Exclusion[5]	Rationale for Exclusion Determination
201700549-Pond	0.47 acres	(b)(8) Artificial lake/pond constructed or excavated in upland or a non-jurisdictional water, so long as the artificial lake or pond is not an impoundment of a jurisdictional water that meets (c)(6)	The pond within the review area was constructed between 1958 and 1965. This pond is fed by an artesian well that was constructed prior to the pond. The pond was not constructed within a wetland or is an impounded tributary. The pond flows to the east and south from the site and terminates at East Utah Valley Drive. This was confirmed in a jurisdictional determination for North Valley Investment Group (SPK-2006-50195) for a 3.2-acre site located directly north of East Valley Drive. No culvert was identified under this road which would connect these waters with a downstream tributary. Therefore, this pond is a (b)(8) water that is excluded from Section 404 of the Clean Water Act.

III. SUPPORTING INFORMATION

A. Select/enter all resources that were used to aid in this determination and attach data/maps to this document and/or references/citations in the administrative record, as appropriate.

_X_ Information submitted by, or on behalf of, the applicant/consultant: HADCO Quality Drive Property, Wetland Delineation Technical Report, June 2017.
This information is sufficient for purposes of this AJD.
Rationale: N/A.

___ Data sheets prepared by the Corps:

_X_ Photographs: Aerial: GoogleEarth 7.3.3.7692. (1993 August 13, 1997 September 11, 2005 July 11, 2010 June 17, 2011 October 20, 2013 June 4, 2015 June 16, 2017 June 17, 2019 July 18, 2020 May 31). American Fork, Utah. 40.3612° latitude, -111.7784° longitude, eye alt 4543 ft. Retrieved November 3, 2020, from *http://www.earth.google.com;* Historic Aerials by NETRonline. Aerials. 1958, 1965, 1972, 1983, 1993, 1997, 2011, and 2016. Retrieved November 3, 2020 from *https://www.historicaerials.com/viewer.*

___ Corps Site visit(s) conducted on:

_X_ Previous Jurisdictional Determinations (AJDs or PJDs): SPK-2017-00549 Preliminary JD issued for same water on July 12, 2020.

___ Antecedent Precipitation Tool: N/A.

___ USDA NRCS Soil Survey: N/A.

___ USFWS NWI maps: N/A.

___ USGS topographic maps: N/A.

Other data sources used to aid in this determination:

Data Source (select)	Name and/or date and other relevant information

[1] Map(s)/Figure(s) are attached to the AJD provided to the requestor.
[2] If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.
[3] A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where independent upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD form.
[4] Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps Districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.
[5] Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.

U.S. ARMY CORPS OF ENGINEERS
REGULATORY PROGRAM
APPROVED JURISDICTIONAL DETERMINATION FORM (INTERIM)
NAVIGABLE WATERS PROTECTION RULE

USGS Sources	N/A.
USDA Sources	N/A.
NOAA Sources	N/A.
USACE Sources	N/A.
State/Local/Tribal Sources	N/A.
Other Sources	N/A.

B. Typical year assessment(s): N/A.

C. Additional comments to support AJD: N/A.

[1] Map(s)/Figure(s) are attached to the AJD provided to the requestor.
[2] If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.
[3] A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where independent upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD form.
[4] Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps Districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.
[5] Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: HADCO Construction Company, Attn: Mr. Tyson Williamson	File No.: SPK-2017-00549	Date: August 18, 2021

Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
→	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at *http://www.usace.army.mil/cecw/pages/reg_materials.aspx* or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also, you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Hollis Jencks Project Manager, Utah-Nevada Branch Regulatory Division U.S. Army Corps of Engineers Phone: (801) 295-8380 ext. 8318 Email: Hollis.G.Jencks@usace.army.mil	Thomas J. Cavanaugh Administrative Appeal Review Officer U.S. Army Corps of Engineers South Pacific Division 1455 Market Street, 2052B San Francisco, California 94103-1399 Phone: 415-503-6574, FAX: 415-503-6646 Email: Thomas.J.Cavanaugh@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15-day notice of any site investigation and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

SPD version revised December 17, 2010

Enclosure 4

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

August 18, 2021

Regulatory Division (SPK-2017-00549)

HADCO Construction Company
Attn: Mr. Tyson Williamson
1450 West 1850 North
Lehi, Utah 84043
tyson@thewillgroup.us

Dear Mr. Williamson:

We are responding to your request for an approved jurisdictional determination for the HADCO Quality Drive site. The approximately 4.3-acre project site is located at approximately 738 East 700 South, Latitude 40.3612°, Longitude -111.7784°, American Fork, Utah County, Utah (enclosure 1).

Based on available information, we concur with your aquatic resources delineation for the site as depicted on the enclosed "HADCO Construction, Waters of the U.S. Survey" drawing, dated May 31, 2021, prepared by Focus Engineering and Surveying, LLC (enclosure 2). Approximately 0.47-acre of pond are present within the survey area. This letter verifies that the location and boundaries of aquatic resources were delineated consistent with the wetland definition at 33 CFR §328.3(c)(16), the 1987 Corps of Engineers Wetlands Delineation Manual (Wetlands Research Program Technical Report Y-87-1) and the applicable regional supplements; the location and boundaries of non-tidal waters conform with the ordinary high water mark definition at 33 CFR §328.3(c)(7), Regulatory Guidance Letter 05-05, and any applicable regional guide.

Of these aquatic resources, we have determined that the feature labeled as "Pond" totaling 0.47-acres is not a water of the United States regulated under Section 404 of the Clean Water Act or under Section 10 of the Rivers and Harbors Act.

We are enclosing a copy of the "Approved Jurisdictional Determination Form" for your site (enclosure 3).

This approved jurisdictional determination is valid for five years from the date of this letter unless new information warrants revision of the determination before the expiration date. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 Code of Federal Regulations (CFR) Part 331. A "Notification of Appeal Process (NAP) and Request for Appeal (RFA) Form" is enclosed (enclosure 4).

If you request to appeal this determination, you must submit a completed RFA form to the South Pacific Division Office at the following address: Administrative Appeal Review Officer, Army Corps of Engineers, South Pacific Division, CESPD-PDO, 1455 Market Street, 2052B, San Francisco, California 94103-1399, Telephone: 415-503-6574, FAX: 415-503-6646.

In order for an RFA to be accepted by the Corps, we must determine that the form is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that the form was received by the Division Office within 60 days of the date of the NAP. It is not necessary to submit an RFA form to the Division Office unless you object to the determination in this letter.

We recommend that you provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

The delineation included herein has been conducted to identify the location and extent of the aquatic resource boundaries and/or the jurisdictional status of aquatic resources for purposes of the Clean Water Act for the particular site identified in this request. This delineation and/or jurisdictional determination may not be valid for the Wetland Conservation Provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should discuss the applicability of a certified wetland determination with the local USDA service center, prior to starting work.

We appreciate feedback, especially about interaction with our staff and our processes.

Please refer to identification number SPK-2017-00549-UO in any correspondence concerning this project. If you have any questions, please contact Hollis Jencks at the Bountiful Regulatory Office, 533 West 2600 South, Suite 150, Bountiful, Utah 84010, by email at Hollis.G.Jencks@usace.army.mil, or telephone at (801) 295-8380 ext. 8318. For program information or to complete our Customer Survey, visit our website at www.spk.usace.army.mil/Missions/Regulatory.aspx.

Sincerely,

Nicole Fresard
Senior Project Manager
NV/UT Section

Enclosures

cc: Dennis Wenger, Frontier Corporation USA, dwenger@frontiercorp.net

EXHIBIT E

Approved as to form: American Fork City Attorney

Intermountain GeoEnvironmental Services, Inc.
12429 South 300 East, Suite 100, Draper, Utah 84020
T: (801) 748-4044, F: (801) 748-4045

March 1, 2022

JDH
1450 West 1850 North
Lehi, Utah 84004
Attn: Mr. John Hadfield

IGES Project No. 03023-003

RE: **Recommendations for Filling in Existing Pond**
752 East Quality Drive – American Fork, Utah

Mr. Hadfield:

IGES has observed the pond area for the Flex Warehouse planned for 752 East Quality Drive in American Fork, Utah. IGES originally completed a geotechnical report for the site dated August 16th, 2021, entitled *"Geotechnical Investigation (Rev. 1), Flex Warehouse, 748 Quality Drive, American Fork, Utah, IGES Project No. 03638-001"*. To support construction of the warehouse, IGES completed a site visit on October 8th 2021 to initially observe the grubbing being completed, as a significant amount of vegetation was present onsite. On October 19th, 2021 representatives from IGES visited the site to observe the pond area to assess the feasibility of filling in the pond; the current plan is to fill in the pond, maintain the flow of water downstream and accommodate the existing well and/or natural spring located within the pond. This letter summarizes our observations on October 8 and 19, and presents recommendations based on those observations.

OBSERVATIONS

On October 8, 2021, IGES was asked to visit the site and evaluate the grubbing and initial fill placement ongoing at the site. At the time of our visit the Contractor (Hadco) had been importing a small amount of granular fill to provide stable areas to bring in haul trucks to remove a large stockpile of organic material consisting mostly of trees and some topsoil. IGES was asked to assess whether the areas being filled had been properly grubbed and was suitable for placement of structural fill. IGES observed that most of the site had been properly grubbed but there were a few locations that still contained substantial roots in or just below the topsoil layer. IGES recommended these areas be excavated another 6 inches or more to remove the heavy organics and pointed these areas out to the excavator operator on site. Photos of the site at the time of our October 8 visit are presented in Figure 1.

Figure 1. Photos of the Site on October 8, 2021.

A second visit was completed on October 19, 2021 with several members of the development and design team in attendance. The purpose of the site visit was to discuss and establish procedures to fill in the pond while maintaining the flow of water from the natural spring within the pond and also preserve the existing well located on site. Photos of the pond outflow and existing well are presented in Figure 2. At the time of our visit, the location of the spring with the pond could not be determined.

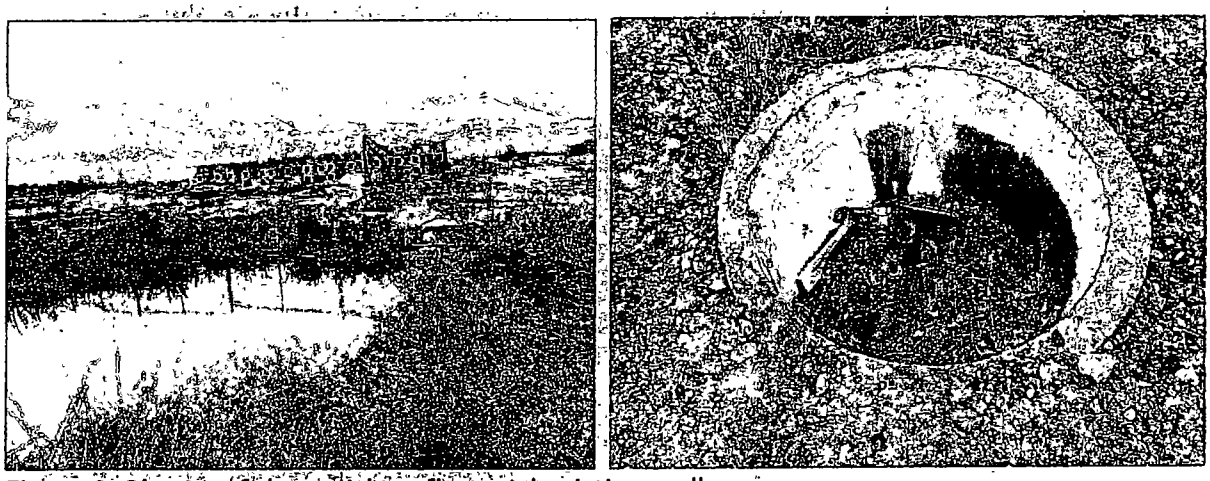


Figure 2. Photos of the pond outflow and existing well.

FINDINGS, CONCLUSIONS & RECOMMENDATIONS

Based on our observations, the pond water surface and subsequent localized groundwater elevation has been established by elevation of the outflow box installed on the neighboring property, which we understand has raised the pond elevation approximately two feet from historical levels. We further understand that the flow of water is dammed at certain times of the year by the down-stream user (when active irrigation is not required), which in the past has also raised the elevation of the water table and the elevation of the pond surface by approximately two feet. Thus, we are not sure how future damming of the water will impact the upstream sites in their current (or future) condition. Because of this uncertainty, and since the local groundwater has likely been raised due to the increased elevation of the new outflow

box, we recommend the water not be dammed so it will not adversely impact the upstream sites. Given the preceding recommendations, the flow of water should be maintained to the downstream properties, but the upstream properties should not be utilized to store any excess water the downstream properties do not want because the elevated groundwater would likely negatively impact currently proposed improvements. We recommend the downstream properties divert any excess or unwanted water into the City storm drain or another acceptable location.

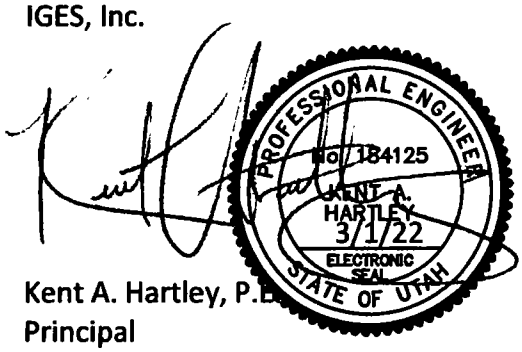
The well is located to the south of the pond; the well did not appear to be functioning or contributing to the water in the pond. Upon further historical investigation by members of the development and design team, it was established that there is a spring feeding the pond, which is believed to be within the pond, hence the exact location of the spring is not known with certainty. Based on this understanding, IGES developed the following recommendations to properly fill in the pond and maintain the flow of water downstream to the neighboring properties:

1. Pump out the water in the pond. This has been completed previously and it is known that it can be accomplished with reasonable effort.
2. Starting at the downstream end of the pond; remove all the debris, mud and heavy organics along the edges of the pond while creating benches with vertical sides no more than 3 feet in height. Extend the excavations down to the bottom of the pond exposing relatively solid native soils as the excavation proceeds. During this process IGES will be on-site to assess whether the excavation has removed enough material to allow proper stabilization and fill placement.
3. Cleaning out the pond should expose the documented spring. Therefore, the next step will be to capture the outflow from the spring with gravel and a non-woven filter fabric and tie that to the existing outflow using gravel and at least one and possibly two 12-inch diameter perforated HDPE corrugated pipes surrounded by gravel and fabric.
4. Stabilize the exposed subgrade prior to, or during the tie-in from the spring to the outflow box by placing a non-woven filter fabric over the exposed soil then pushing coarse, angular rock into the soft soil and fabric for 12- to 18-inches, thus creating a stable surface. Place another layer of non-woven filter fabric over the coarse angular rock and then place lifts of imported granular structural fill. The structural fill can be the same material that is being placed over the entire site. This structural fill should be placed in maximum 12-inch loose lifts and compacted to a minimum of 95 percent of ASTM D-1557 (Modified Proctor). The material should cover the entire pond area and the pipe(s) tying the spring to the existing outflow box.

A sketch graphically illustrating the proposed recommendations are attached for reference.

Regarding the well, it does not appear to be functioning or contributing to the water in the pond, and our current understanding is that the well is to be abandoned.

Respectfully Submitted,
IGES, Inc.



Kent A. Hartley, P.E.
Principal

Attachments: Sketch of Proposed Construction Recommendations

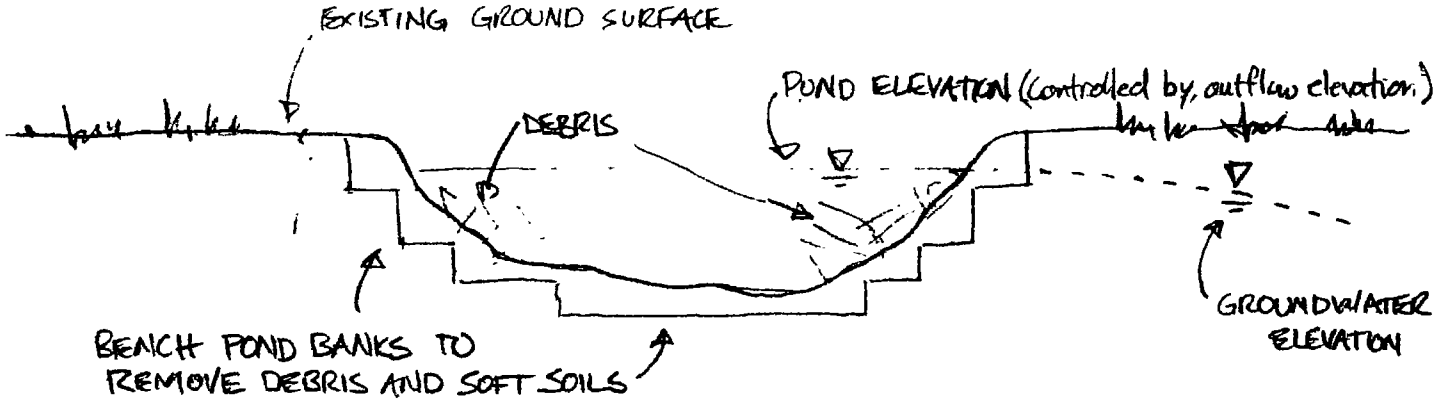
Project No. 03023-003

Date 10/25/21

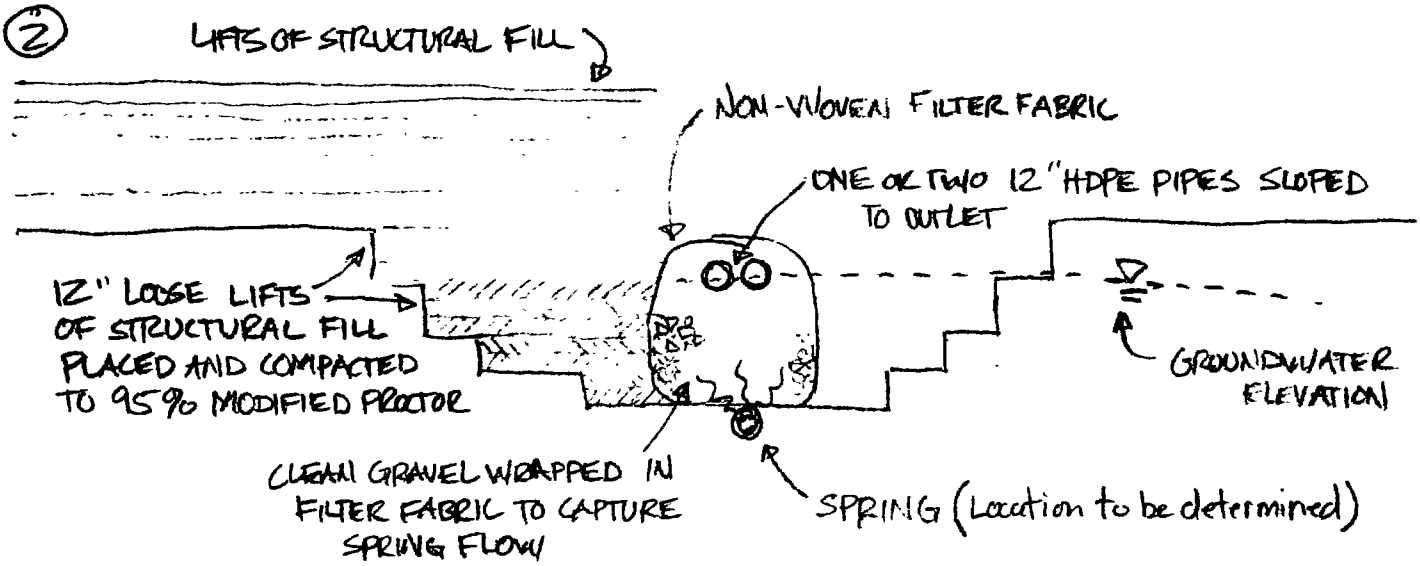
QUALITY DRIVE WAREHOUSE

Existing Pond Fill & Maintaining Downstream Flow

(1)



(2)



ONE SQUARE = 2 FT.

EXHIBIT F

Approved as to form: American Fork City Attorney

Intermountain GeoEnvironmental Services, Inc.
12429 South 300 East, Ste 100, Draper, Utah 84020
~ T: (801) 748-4044 ~ F: (801) 748-4045

March 1, 2022

JDH Development, LLC
1450 East 1850 North
Lehi, Utah 84004
Attn: Mr. John Hadfield

IGES Project No. 03023-003

Subject: Response to Review Comment – Pond and Spring Plan
Flex Warehouse
752 East Quality Drive
American Fork, Utah

Submittal: IGES, Inc., 2021, Recommendations for Filling in Existing Pond, 752 East Quality Drive, American Fork, Utah, Project No. 03023-003, dated October 25, 2021.

Mr. Hadfield,

As requested, IGES has prepared the following letter addressing review comments pertaining to the submittal prepared by IGES for the proposed Flex Warehouse to be constructed in American Fork, Utah, referenced above. The referenced submittal pertains to recommendations for filling in the existing pond on the Flex Warehouse property on Quality Drive in American Fork. The review comments were prepared by American Fork City, presented as blue-text mark-ups in a pdf, undated. For ease of review, the review comments are presented first, followed by our response.

Comment No. 1

Regarding the last paragraph of the letter (pp. 3-4): *"Typos. If the well is to be preserved, what if maintenance needs to be done on the well, or a deeper well dug. With it being placed within the structure wouldn't that inhibit the ability for maintenance?"*

Response to Comment No. 1

We understand that the well will be abandoned; hence, maintenance is not an issue for this project.

Comment No. 2

Regarding the attached Figure: *"With the pipes at the higher elevation in order to meet inverts to the outfall, will this be sufficient to actually get the water to the pipes? Will it infiltrate into the sides and into the structural fill distributing the flows instead of it being directed to the pipes?"*

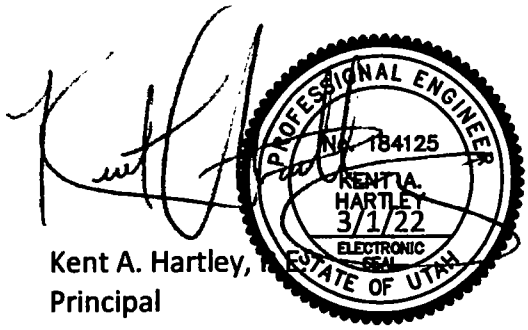
Response to Comment No. 2

We understand that the invert of the pipes are approximately two feet higher than previously established, which was necessitated by the recent development on the neighboring property to the east raising the grade of the outflow box. Ultimately, the increase in the elevation of the outflow will not impact the site once the spring is captured and the flow is directed into the outflow box (water currently flows at the current pipe elevation and is expected to continue to flow). Regarding the structural fill, the structural fill will be coarse, granular soils and will be well-drained; therefore, capillary effects drawing water up into the fill placed above the groundwater level (piezometric surface) will not impact the site. Fill placed into the pond will become saturated almost immediately, at which point there will be no impact to the surrounding soils and the main flow of water will follow the path of least resistance into the outflow box to the east.

Closure

We appreciate the opportunity to be of service on this project. Should you have any questions regarding this report or wish to discuss additional services, please contact us at your convenience (801) 748-4044.

Respectfully submitted,
IGES, Inc.



Kent A. Hartley, P.E.
Principal

Attachments: References (history of past IGES submittals)

References

IGES, Inc., 2021a, Geotechnical Investigation (Rev. 1), Flex Warehouse, 748 East Quality Drive, American Fork, Utah, Project No. 03638-001, dated August 16, 2021 (update of original report dated April 7, 2021).

IGES, Inc., 2021b, Addendum No. 1 – Seismic Criteria, Geotechnical Investigation, Flex Warehouse, American Fork, Utah, Project No. 03638-001, dated April 27, 2021.

IGES, Inc., 2021c, Response to Review Comments, Flex Warehouse, 748 East Quality Drive, American Fork, Utah, Project No. 03638-002, dated August 13, 2021 (primarily a liquefaction hazard assessment).

IGES, Inc., 2021d, Response to Additional Review Comments, Flex Warehouse, 748 East Quality Drive, American Fork, Utah, Project No. 03638-001, dated October 11, 2021 (update of original report dated April 7, 2021).

EXHIBIT G

Approved as to form: American Fork City Attorney

THE
WILL
GROUP

04-05-2022

Attn: Ben Hunter
American Fork City

RE: Hydrologic Evaluation
Sensitive Lands Ordinance 4-6-2

Ben,

We have prepared a Hydrologic Evaluation Report, according to the City's Sensitive Lands Ordinance. In an email you sent Nate Heaps (cc'd) on 11/29/2021, you said, "I did a little more looking into things. The section of code I was thinking is found in our sensitive lands ordinance, Section 2-7-2-7 which does identify that downstream and adjacent owners will need to approve as well as Section 4-6 that talks about water rights in a few places. The sensitive lands ordinance can be found online."

We have reviewed the AF City Sensitive Lands Ordinance section 2-7-2-7 and it says the following: "No development shall be approved that interferes with adjacent or down-stream water rights, water quality, water delivery and/or water levels, without eliminating any interference or obtaining approval from all stakeholders in said water rights." This gives us the option to either prove that we won't interfere with the flow of water OR we need to obtain approvals from the water rights stakeholders. Section 4-6 involves conducting a hydrologic evaluation to prove that we won't interfere with the flow of water for the water rights stakeholders.

As part of this submittal, we have completed the hydrologic evaluation found in Section 4-6-2, to comply with Section 2-7-2-7. Along with the report, attached as item number eight, is an indemnification agreement as referenced in Section 4-6, which will satisfy the City's concerns on this issue. Please see the hydrologic evaluation for our findings.

Sensitive Lands Ordinance 4-6-2

1. Provides a map of all water rights within 0.5 miles of the boundaries of the proposed development. The map shall identify owners, types, quantities, state identification reference.
2. Provides a map of all surface flow patterns including canals, sloughs, drainages and ditches. The map shall identify owners, type of water course (natural stream, slough, drainage ditch, etc.), historic flows and downstream users shall show the downstream water course and land ownership to the point of discharge.
3. Documents historical ground water levels including season variations.
4. Identifies methods of protecting water quality including identification of potential contamination sources, permanent and construction Best Management Practices ("BMP's") and proposed mitigation measures.
5. Provides a map of all existing underground draining networks.
6. Provides a map of all Springs and artesian water sources.

7. Storm Water Management Plan ("SWMP").
8. Provide a written agreement or other document, acceptable to the City, indemnifying the City against liability from water rights claims.

We have reason to believe that the water right holder does not have a valid water right associated with the property at issue. See letters from Graham Gilbert to better understand why we believe the Vest's don't own a current water right to the Singleton Spring or either well located on our parcel. Even though we believe this is the case, we still went ahead and completed the Hydrologic Evaluation in good faith to show that we will not interfere with downstream water users.

Thanks,

Tyson Williamson | *President*
The WILL Group
tyson@thewillgroup.us
801-786-9809

Nate Heaps | *Development Associate*
The WILL Group
nate@thewillgroup.us
801-362-1496

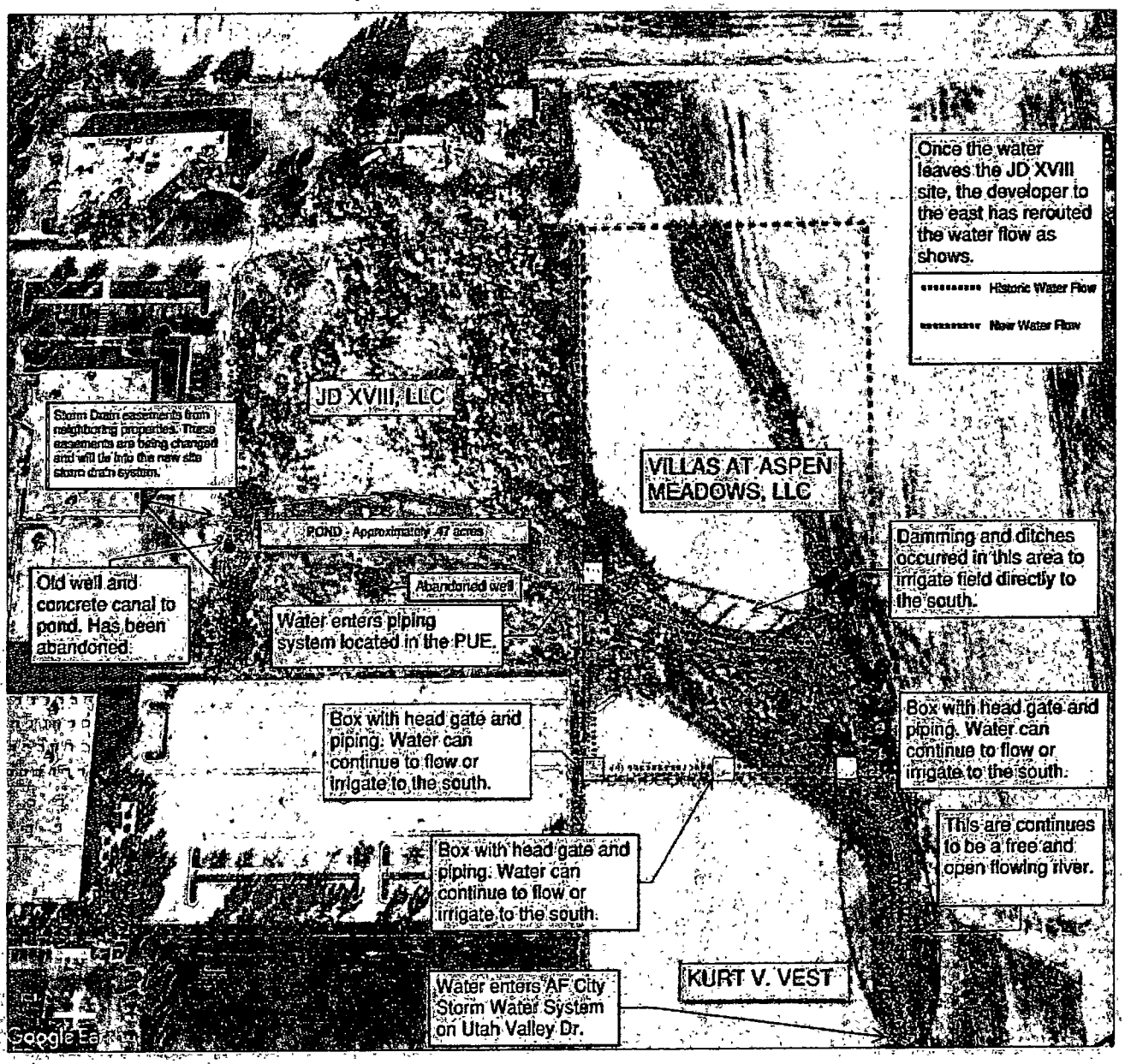
Sensitive Lands Ordinance 4-6-2.1

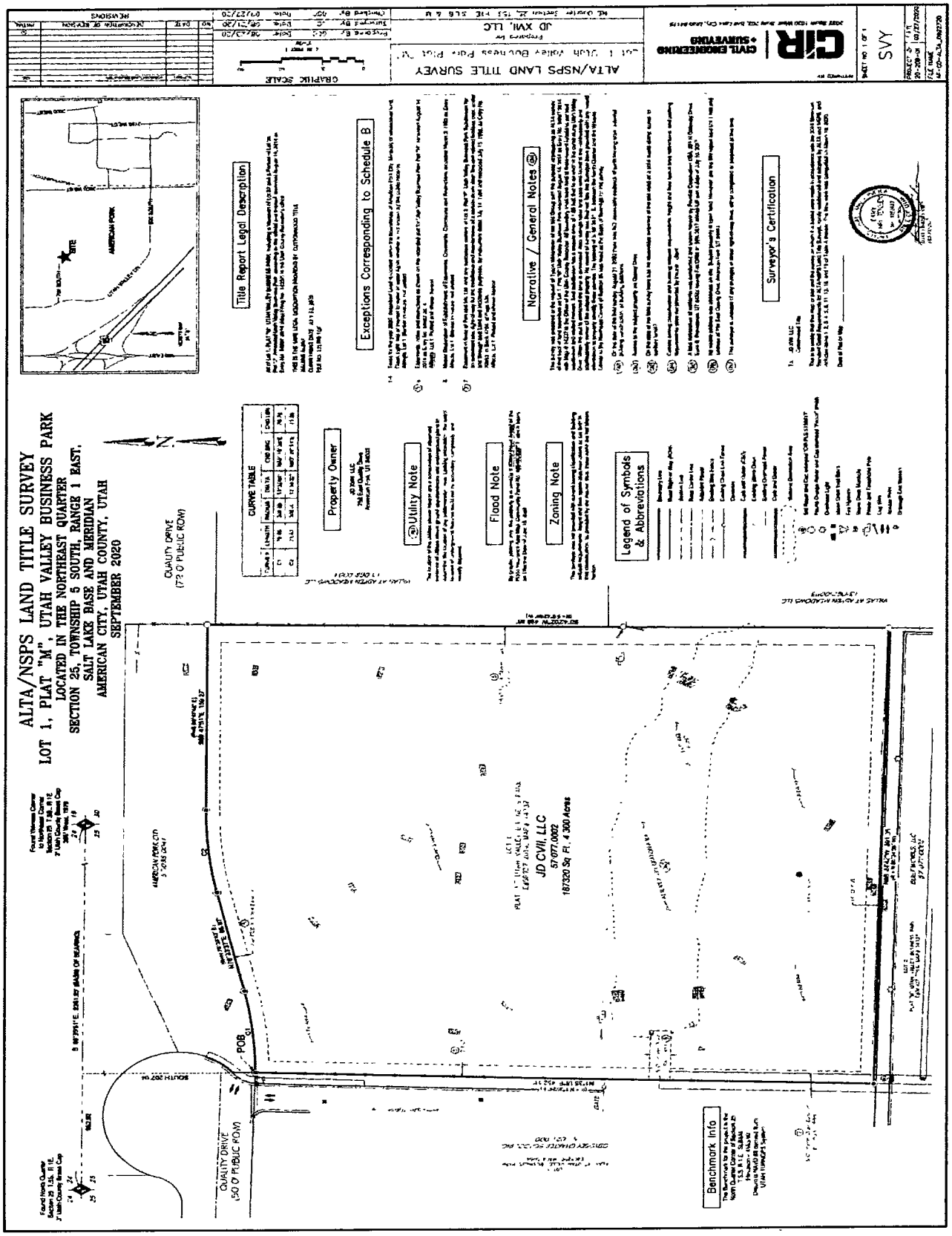
1. Provides a map of all water rights within 0.5 miles of the boundaries of the proposed development. The map shall identify owners, types, quantities, state identification reference.

**This has been included the attached report from Loughlin Water Associates.

Sensitive Lands Ordinance 4-6-2.2

1. Provides a map of all surface flow patterns including canals, sloughs, drainages, and ditches. The map shall identify owners, type of water course (natural stream, slough, drainage ditch, etc.), historic flows and downstream users shall show the downstream water course and land ownership to the point of discharge.




ALTA/NSPS LAND TITLE SURVEY
LOT 1, PLAT "M", UTAH VALLEY BUSINESS PARK
LOCATED IN THE NORTHEAST QUARTER
SECTION 25, TOWNSHIP 5 SOUTH, RANGE 1 EAST,
SALT LAKE BASE AND MERIDIAN
AMERICAN CITY, UTAH COUNTY, UTAH
SEPTEMBER 2020
JD XVII, LLC
Title Report Legal Description
Exceptions Corresponding to Schedule B
Narrative / General Notes
Surveyor's Certification
Property Owner
Utility Note
Flood Note
Zoning Note
Legend of Symbols & Abbreviations
Benchmark Info
QUALITY DRIVE (72.0' PUBLIC ROW)
QUALITY DRIVE (50.0' PUBLIC ROW)
AMERICAN FORK CITY
POB
JD CVII, LLC
57,077.0002
187320 Sq. Ft. 4.300 Acres

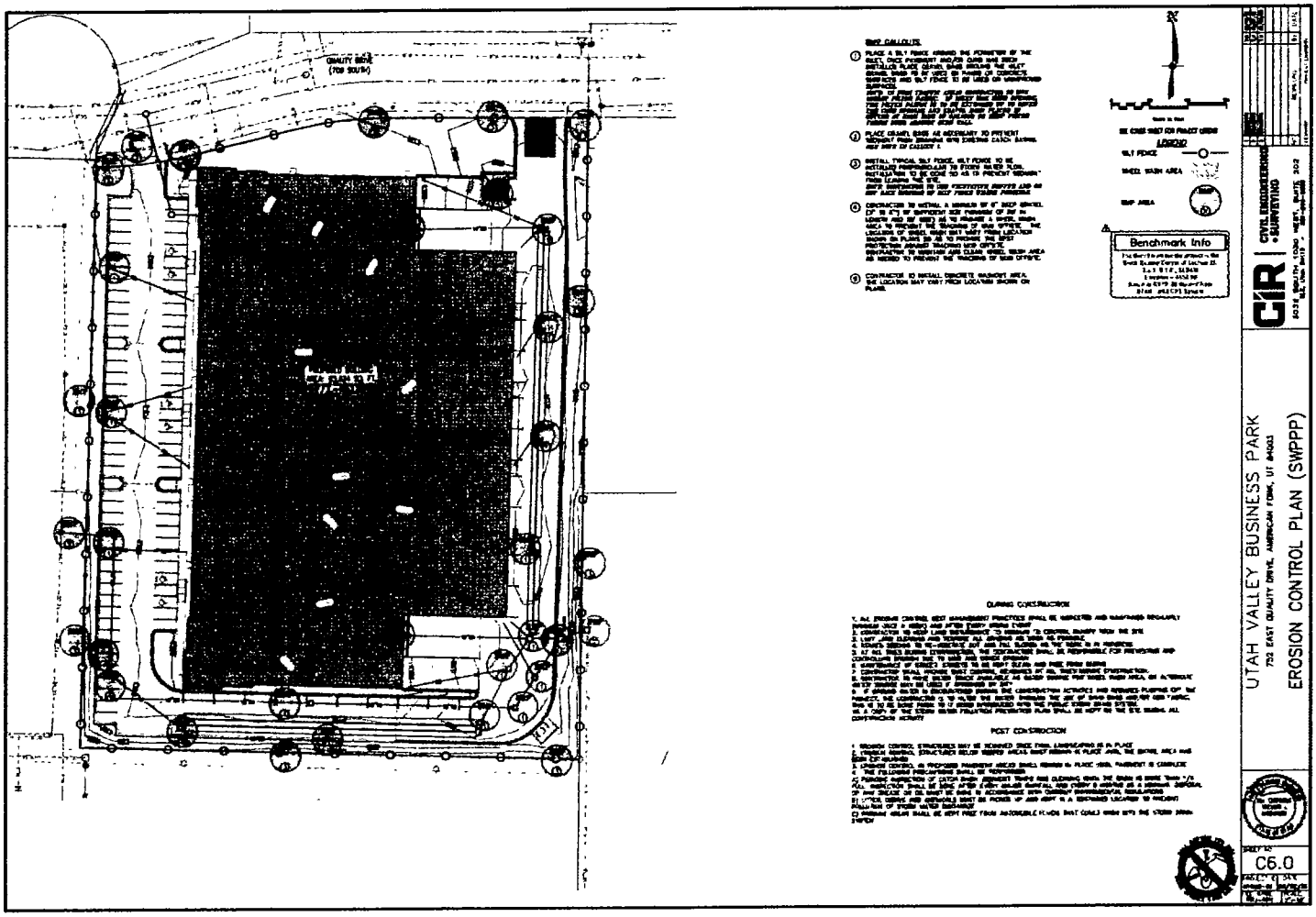
Sensitive Lands Ordinance 4-6-2.3

1. Documents historical ground water levels including season variations.

**This has been included the attached report from Loughlin Water Associates.

Sensitive Lands Ordinance 4-6-2.4

1. Identifies methods of protecting water quality including identification of potential contamination sources, permanent and construction Best Management Practices ("BMP's") and proposed mitigation measures.



Sensitive Lands Ordinance 4-6-2.5

1. Provides a map of all existing underground draining networks.

There is no historical map of the underground drainage networks. The data we have comes from the map found in Section 4-6-2.2 of this report and the ALTA Survey.

Sensitive Lands Ordinance 4-6-2.6

1. Provides a map of all Springs and artesian water sources.

**This has been included the attached report from Loughlin Water Associates.

Sensitive Lands Ordinance 4-6-2.7

1. Storm Water Management Plan ("SWMP").

Attached to this report is a SWMP created by Lavanta Consulting.

Sensitive Lands Ordinance 4-6-2.8

1. Provide a written agreement or other document, acceptable to the City, indemnifying the City against liability from water rights claims.

Attached is a signed indemnification agreement.

EXHIBIT H

Approved as to form: American Fork City Attorney

LOUGHLIN
WATER ASSOCIATES ♦ LLC

April 6, 2022

QDAF QOZB, LLC
c/o Nate Heaps of the Will Group
1450 West 1850 North
Lehi, UT 84043

Subject: **Hydrologic Evaluation**
Portions of Chapter 4-6 of the American Fork Sensitive Lands Ordinance
Utah County Parcel No. 57:077:001
752 East Quality Drive, American Fork, Utah
for QDAF QOZB, LLC

Dear Nate:

Loughlin Water Associates, LLC (Loughlin Water) is grateful for the opportunity to conduct a hydrologic evaluation of Parcel No. 57:077:001 (the Quality Drive Property) in in accordance with portions of Chapter 4-6 of the American Fork Sensitive Lands Ordinance. We conducted our evaluation in accordance with our proposal to QDAF QOZB, LLC (QDAF QOZB) dated March 7, 2022.

BACKGROUND

The street address of the Quality Drive Property is 752 East Quality Drive, American Fork, Utah. QDAF QOZB has applied to American Fork City for permission to construct a warehouse on the Quality Drive Property and engaged (1) The Will Group to assist with their planned development, (2) Intermountain GeoEnvironmental Services, Inc. (IGES) to conduct geotechnical investigations, (3) Graham Gilbert of Parsons Behle Latimer to provide water right consulting and legal services, and (4) others to assist with their planned development.

Attachment A provides a copy of Chapter 4-6, *Hydrologic Evaluation* of American Fork Ordinance 07-10-47, the Sensitive Lands Ordinance. QDAF QOZB seeks assistance in complying with Items 1, 3, and 6 of Chapter 4-6-2. We understand that others will assist in complying with Items 2, 4, 5, 7, and 8.

OBJECTIVE AND APPROACH

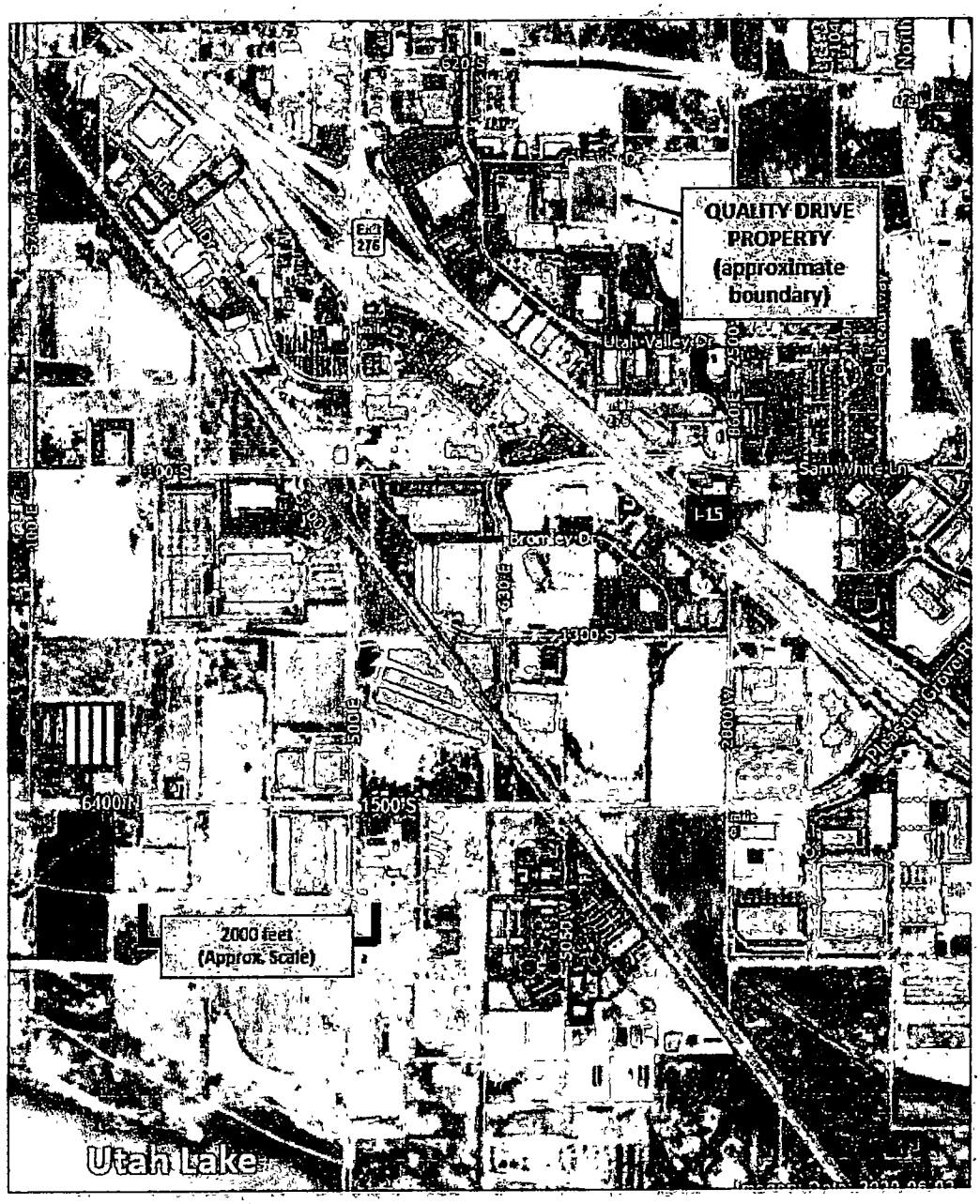
To help QDAF QOZB comply with Items 1, 3, and 6 of Chapter 4-6-2 of the Sensitive Lands Ordinance, we:

- Reviewed available information for the Quality Drive Property;

- Conducted a reconnaissance level site visit to the Quality Drive Property; and
- Prepared this letter report.

FINDINGS

We modified he following air photo from the Utah Division of Water Rights (DWRi) website, https://maps.waterrights.utah.gov/EsriMap/map.asp?layersToAdd=wellsearch, to show the location of the Quality Drive Property (the property).



Our report addresses the following items in Chapter 4-6-2 of the Sensitive Land Ordinance:

- Item 4-6-2.1 – *Provides a map of all water rights within 0.5 miles of the boundaries of the proposed development. The map shall identify owners, types, quantities, state identification reference.*

- Item 4-6-2.3 – *Documents historical ground water levels including seasonal variations*

- Item 4-6-2.6 – *Provides a map of all springs and artesian water sources*

ITEM 4-6-2.1 – WATER RIGHTS

Attachment B lists points of diversion (POD) and identifies owners, types, quantities, and DWRi water right numbers and provides a map of water rights that are within about 0.5 miles of the boundaries of the property. Note that there are more than 200 water rights and nearly 250 POD within about 0.5 miles of the property.

ITEM 4-6-2.3 – GROUNDWATER LEVELS

Groundwater is found at the property in a shallow unconfined aquifer and in deeper confined (artesian) aquifers. Groundwater levels in the shallow unconfined aquifer are below the ground surface. Groundwater levels in the deeper confined aquifers have been historically above the ground surface but have declined with time.

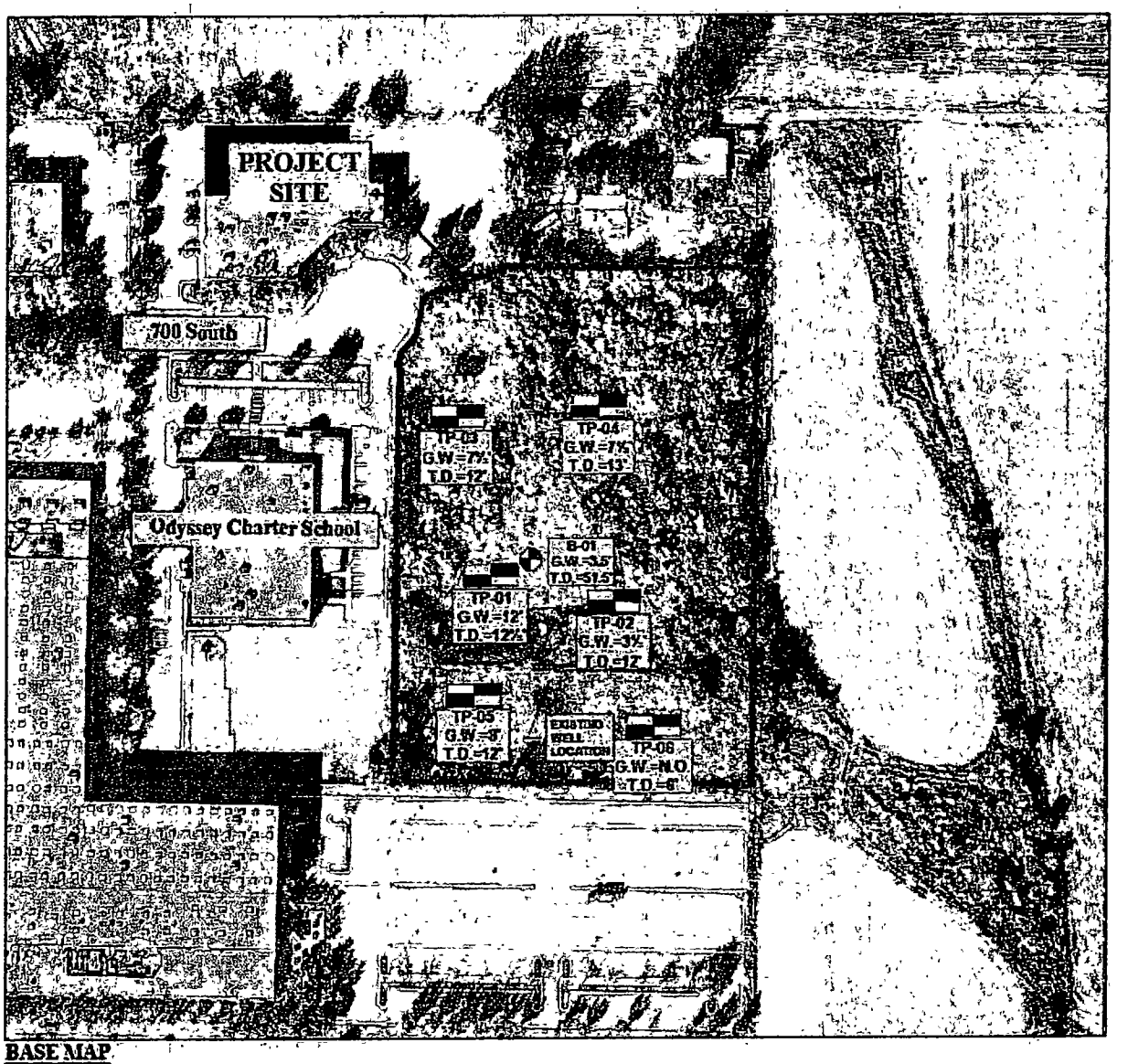
Aquifers in the area consist of higher-permeability units (layers) of sand and gravel. Confining units consist of lower-permeability layers of clay and silt. Hunt and others (1953), Clark (1984), Clark and Appel (1985), Thiros (2006), and Cederberg and others (2009) described the groundwater resources and aquifers and confining units of northern Utah Valley, including the Quality Drive Property area.

Shallow Unconfined Aquifer at Quality Drive Property

Geotechnical investigations conducted by IGES, (2021a, 2021b, and 2021c) show that during 2021, the depth to groundwater at the Quality Drive Property in the shallow unconfined aquifer ranged from about 3.5 to 8 feet.

IGES (2021c) excavated, logged, and measured the depth to groundwater in six test pits and drilled and logged a soil boring at the property. Five test pits were excavated to depths of 12 to 13 feet (TP-01 through TP-05) and one test pit (TP-06) was excavated to a depth of 6 feet. The soil boring (B-01) was drilled to a depth of 51.5 feet. The depth to water in five of the six test pits and the boring ranged from 3.5 to 8 feet. Groundwater was not encountered in TP-06 which was excavated to a depth of only 6 feet. The test pits were excavated in March 2021 and the boring was drilled in July 2021. Attachment C provides copies of the logs of the IGES test pits and boring.

The following is Figure A-2a from IGES (2021c) and shows the locations, excavated depths (T.D.), and depth to groundwater (G.W.) measured at the property.



BASE MAP
Google Earth imagery dated September 2020

LEGEND

APPROXIMATE BORING LOCATION

APPROXIMATE TEST PIT LOCATION

T.D. = 12' TOTAL DEPTH EXPLORED

G.W.= 9' DEPTH TO GROUNDWATER

N

0' 75' 150' 300'
SCALE 1"=150'

IGES Project No. 03638-003

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork, Utah

GEOTECHNICAL MAP

Figure A-2a

Deeper Confined Aquifer at Quality Drive Property

Table 1 lists and provides information, including water level measurements, and reported artesian flow rates for water supply wells within about 1200 feet of the property. Attachment D provides copies of the Well Driller Reports (well logs), water level measurement data, inspection reports, and abandonment logs for the wells listed in Table 1.

TABLE 1
WATER SUPPLY WELLS WITHIN ABOUT 1200 FEET OF THE PROPERTY [a]

WIN or WRNUM	Drilled Depth (feet)	Depth (-) to or Height (+) of Static Water Level (feet)/ Date	Depth of Completed Interval(s) (feet)	Lithologic Description of Completed Interval	Reported Artesian Flow Rate (gpm)/ Date	P&A? / Date
13415	149	NR [b]	143 to 149	Gravel with clay	75 6/08/1957	No [c]
a4891[d] (55-1555)	376	NR [b]	300 to 304 337 to 372	Sand, gravel Sand, gravel	400 9/16/1967	No [c]
429041	315	NR [b]	306 to 314	Sand, gravel	200 1/28/1961	No
13412	168	NR [b] -4[e] 3/02/2021	160 to 168	Gravel	250 10/14/1957	Yes 3/02/2021
13416	220	NR -12[e] 1/25/2021	212 to 220	Gravel, sand	100 5/01/1950	Yes 1/25/2021
438017	295	+16.8 8/25/1937	295 to 207	NR	350 9/1931	Yes 10/01/2014
13362	167	NR [b]	130 to 167	Gravel	200 9/13/1952	NR
429013	368	NR [b]	310 to 365	Sand, gravel	400 10/16/1961	NR
439155	308	+24.6 8/25/1937 -20[e] 12/27/2015	NR	NR	80 1934	Yes 12/27/2015
444032	320	+30 9/30/1942 -10[e] 6/15/2020	NR	NR	110 9/30/1942	Yes 6/15/2020

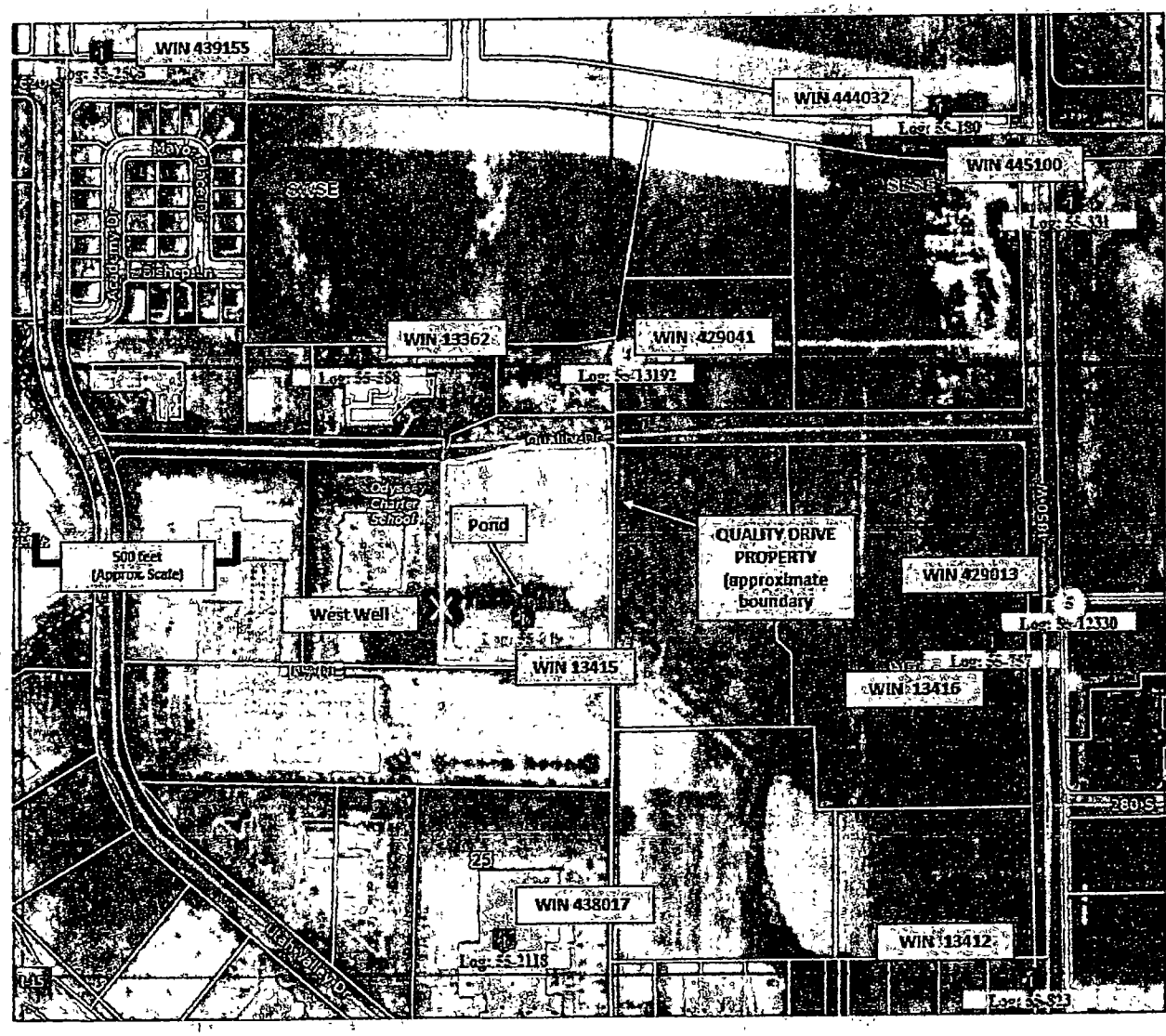
WIN = Well Identification Number; WRNUM = Water Right Number; NR = Not Reported; gpm = gallons per minute; P&A = Plugged and Abandoned.

[a] Copies of well logs and other information were obtained from the DWRi website: https://www.waterrights.utah.gov/wellInfo/wellInfo.asp

[b] Water level not measured or not reported at the time well was drilled.

[c] Assumed that well has not been plugged and abandoned because we (1) did not find abandonment log on DWRi website and (2) observed wellhead on ground surface.
[d] Water Right Number, did not find WIN on DWRi website, well is also known as "the West Well".
[e] Water level at time well was plugged and abandoned.

We modified the follow illustration from the DWRi website to show the locations of the wells listed in Table 1.



Note from Table 1 that and that:

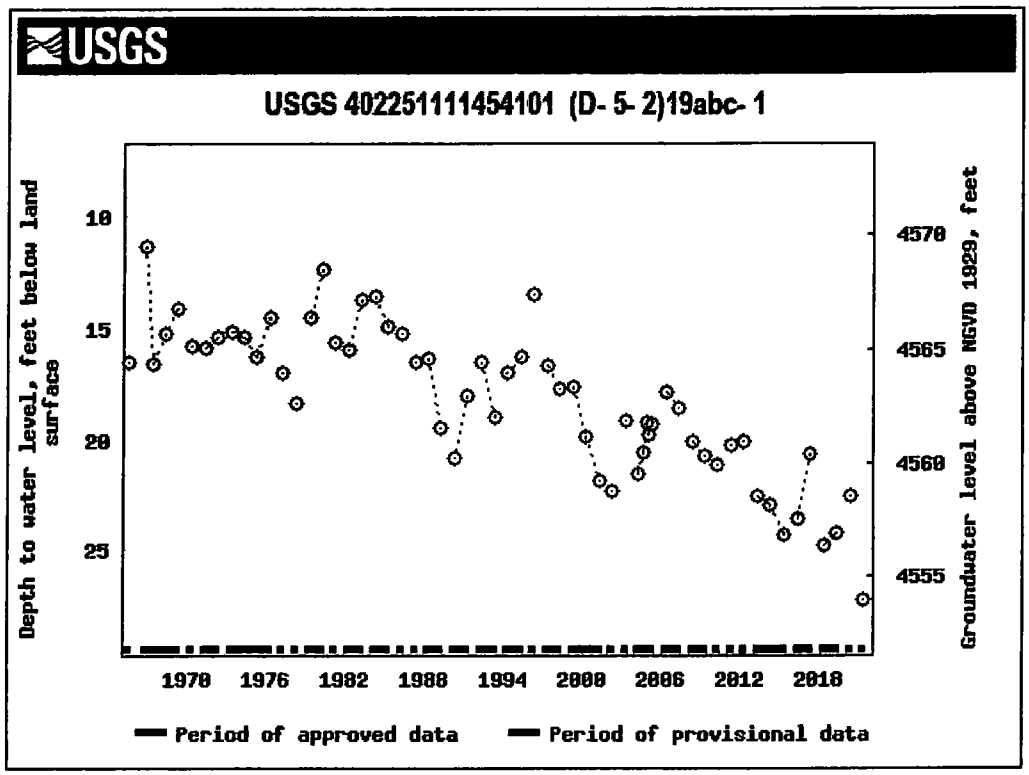
- We found records of ten wells located within about 1200 feet of the property.
- Only two of the ten wells are located on the property, including WIN 13415 and WR a4891 (55-1555), also known as the West Well.
- Drilled depths ranged from 149 to 368 feet.

- Water levels were all above the ground surface and the wells had artesian flows that ranged from 75 to 400 gpm at the time they were drilled (1930s to 1967).
- We found abandonment logs for five of the ten wells.
- Four of the five abandoned wells that were formerly flowing (groundwater levels above the ground surface) had water levels that were 4 to 20 feet below the ground surface at the time they were abandoned (2015 to 2021).
- One of the abandoned wells (WIN 438017) was still flowing when it was abandoned in 2014.

Regional Decline in Groundwater Levels

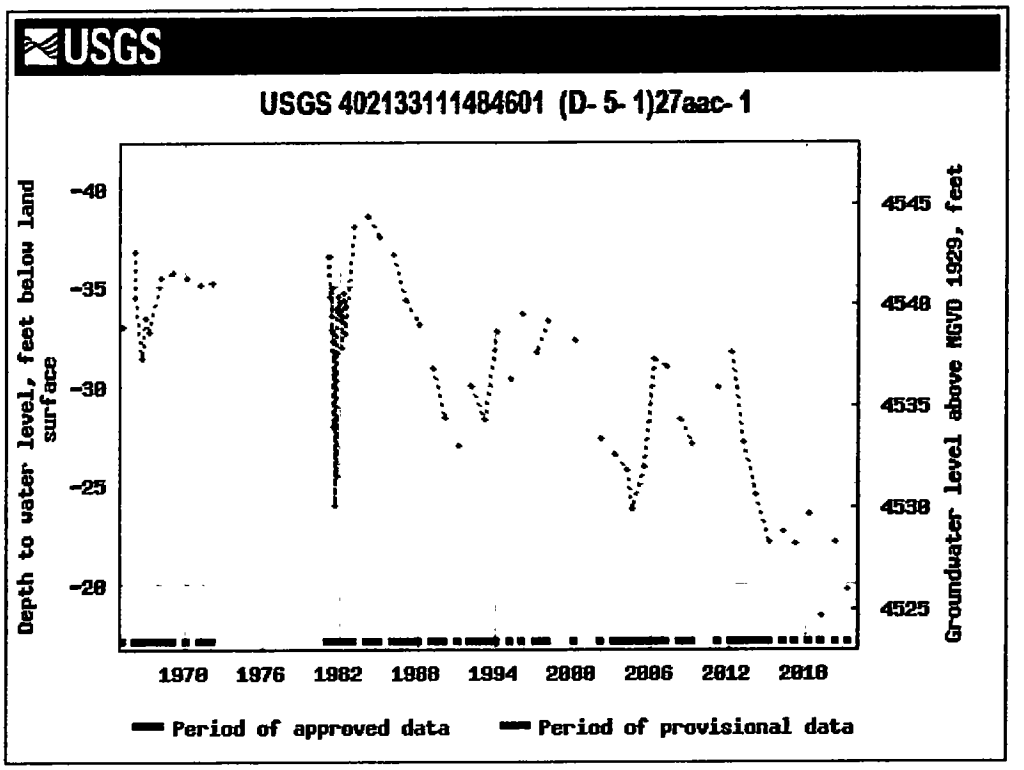
Cederberg and others (2009) report that groundwater levels declined in northern Utah Valley from the mid-1980s to the early 2000s due to reduced precipitation and increased pumping from wells. U.S. Geological Survey (USGS) observation wells in the area show the decline in the water levels in the shallow unconfined and deeper confined aquifer.

USGS 402251111454101 (D- 5- 2)19abc- 1 is completed in the shallow unconfined aquifer to a depth of 30 feet and is about 1.25 miles to the north of the property. The following graph is modified from the USGS website and shows that the water level has dropped from about 11 feet below the ground surface in March 1967 to about 27 feet below the ground surface in March 2021.



Water level and other data for this well can be found at: https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=402251111454101.

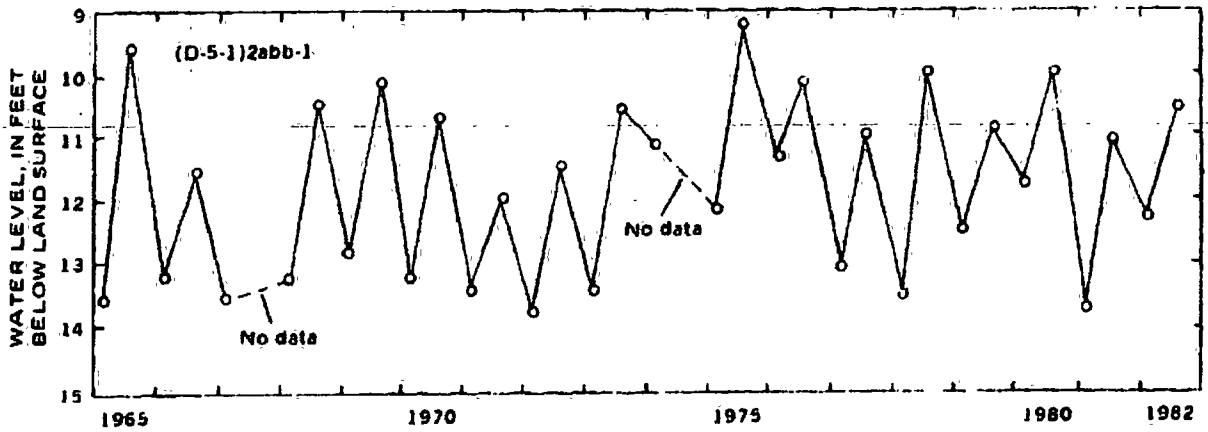
USGS 402133111484601 (D- 5- 1)27aac- 1 is completed in the deeper confined aquifer to a depth of 126 feet and is about 1.8 miles to the west of the property. The following graph is modified from the USGS website and shows that the water level has dropped from a high of about 39 feet above the ground surface in March 1984 to a low of about 18 feet above the ground surface in March 2019.



Water level and other data for this well can be found at: https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=402133111484601.

Seasonal Variations in Groundwater Levels

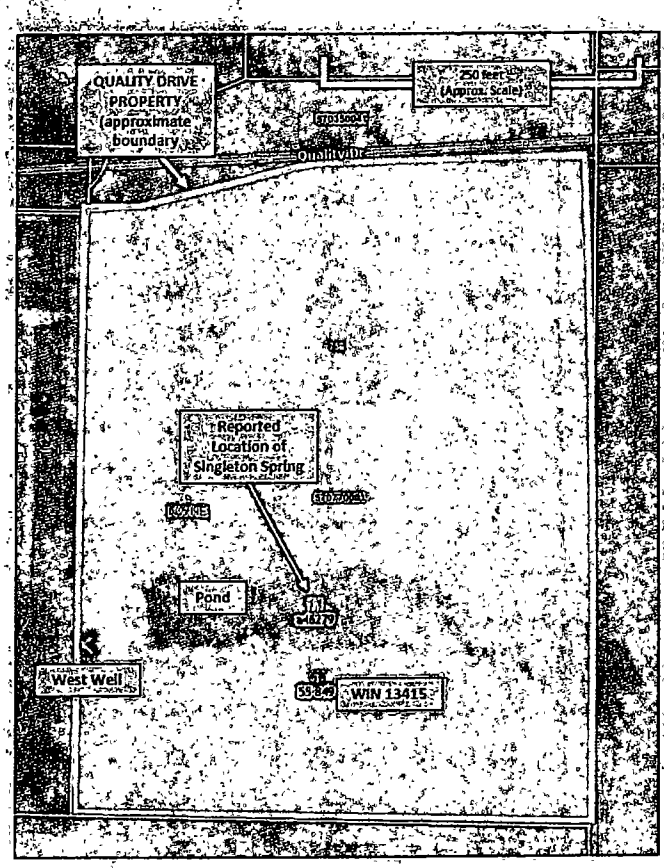
The principal sources of recharge to the shallow unconfined aquifer consists of unconsumed irrigation water (irrigation return), seepage from streams and unlined canals, and direct infiltration of precipitation; see Hunt and others (1953) and Clark and Appel (1985). The following illustration is modified from Figure 30 of Clark and Appel (1985) and shows seasonal fluctuations in the depth to groundwater in the shallow unconfined aquifer in a well located about 4 miles to the north of the property. Note that for the period from 1965 to 1982, the groundwater level varied seasonally from 2 to 4 feet with the peaks generally occurring during late summer/early fall and the lows generally occurring during winter.



Clark and others (1985) report that the primary cause of variations in groundwater levels in the shallow unconfined aquifer is seepage from applied irrigation. We expect that a similar seasonal variation in the groundwater level in the shallow unconfined aquifer occurs at the property.

ITEM 4-6-2.6 – MAP OF SPRINGS AND ARTESIAN WATER SOURCES

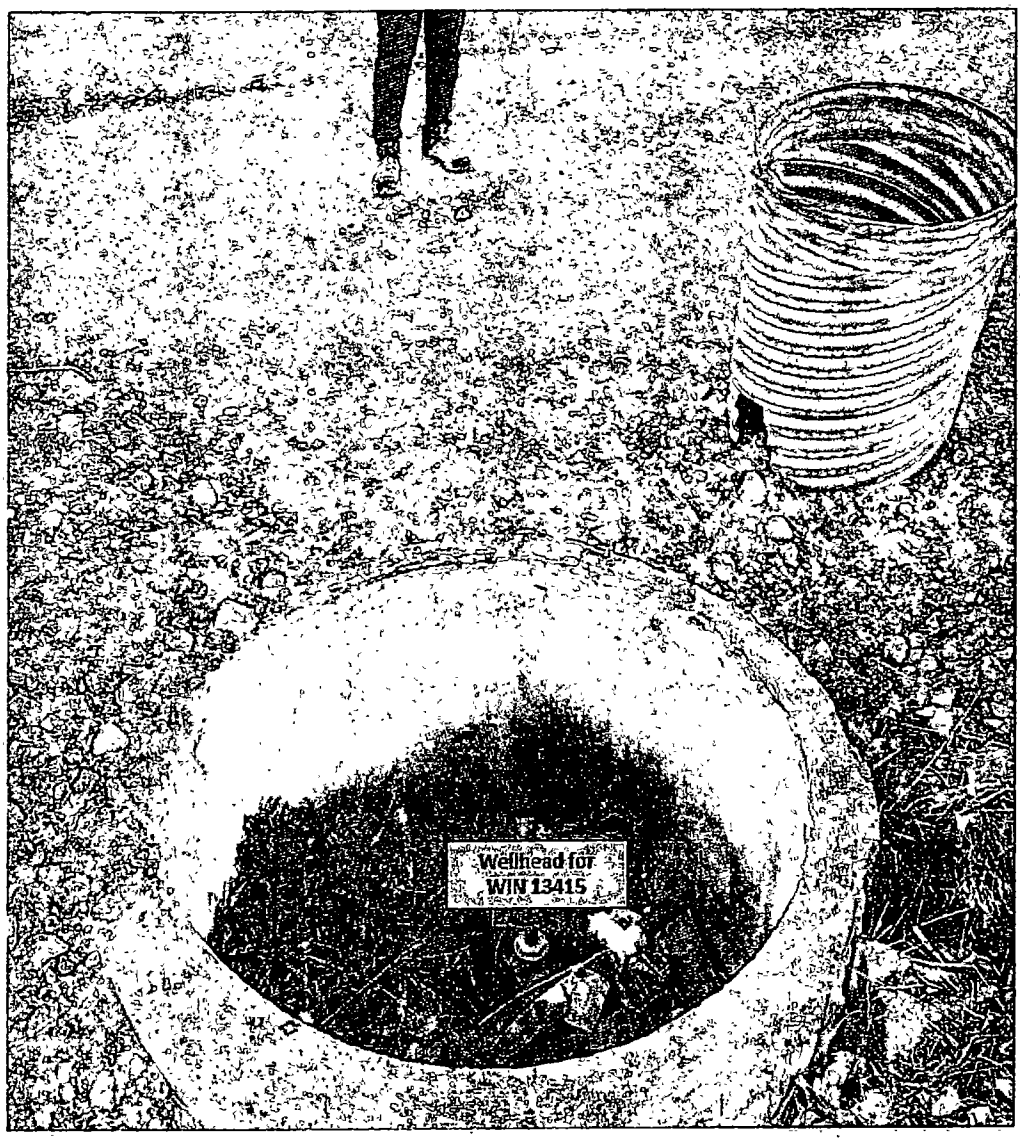
We modified the following illustration from the DWRi website to show the locations of the two artesian wells and spring on the property.



Artesian Wells on Property

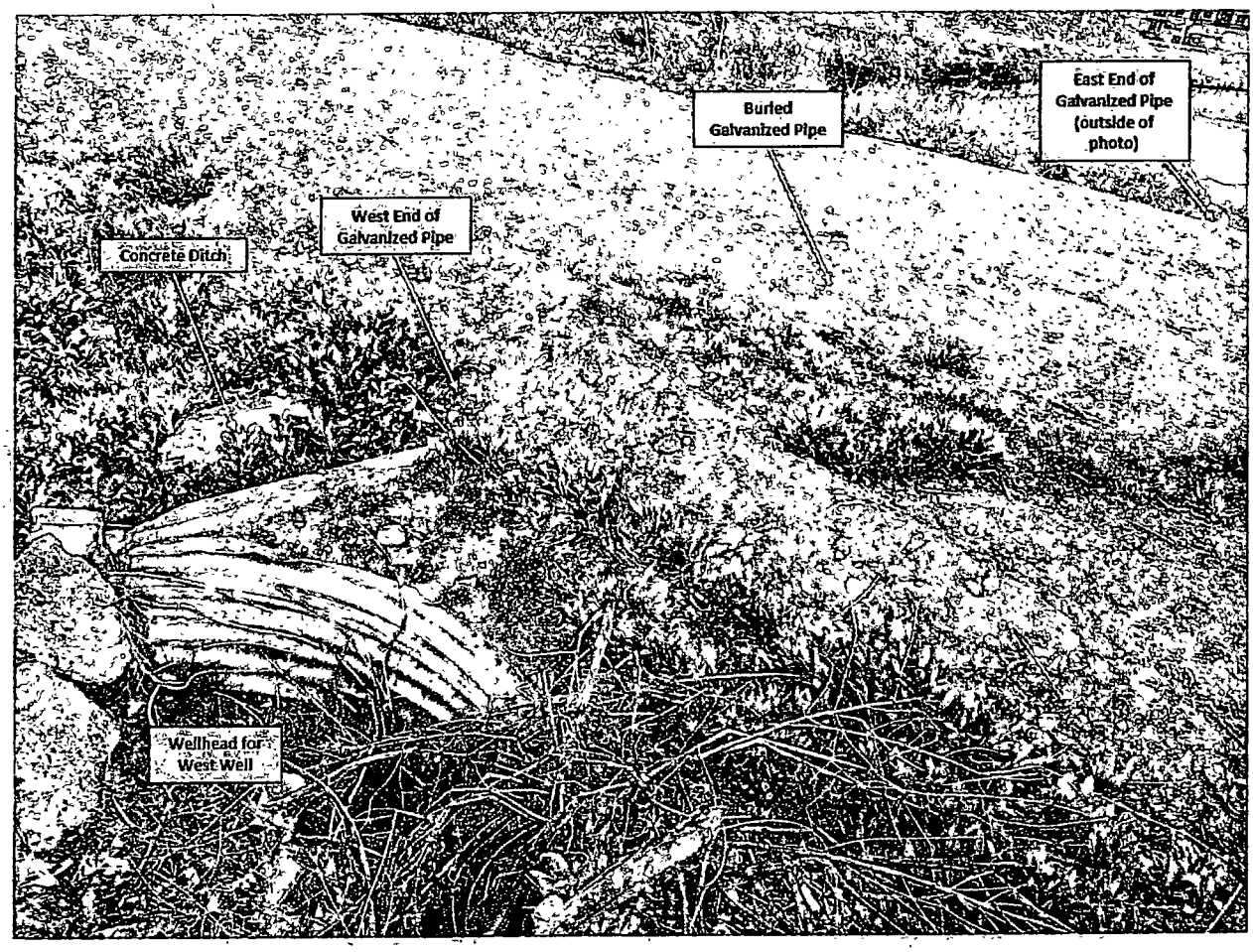
We did not identify any currently artesian wells (wells with water levels that are above the ground surface and flowing) on the property during our site visit on April 1, 2022. As indicated in Table 1, WIN 13415 had an artesian flow of 75 gpm in 1957 and the West Well had an artesian flow of 400 gpm in 1967. However, (1) nether well displayed evidence that they are currently artesian and (2) other nearby wells that were formerly artesian had groundwater levels that were below the ground surface when they were abandoned in recent years.

WIN 13415 is on the south side of the pond and we did not observe any water or dampness around the wellhead and valves during our site visit on April 1, 2022. The following photograph shows the wellhead of WIN 13415 on April 1, 2022:



The West Well, also known as WR a4891 (55-1555), is about 40 feet to the west of the west end of the pond. Valves, if present, are covered with debris. We did not observe any water or dampness around the wellhead during our site visit on April 1, 2022. The following photograph shows the wellhead of the West Well on April 1, 2022:

A concrete ditch on the north side of the wellhead feeds a buried 8-inch diameter galvanized pipe that passes under the road and daylights above the west end of the pond. See photo below:



It appears that the 400 gpm of artesian flow from the West Well was historically piped to the west end of the pond.

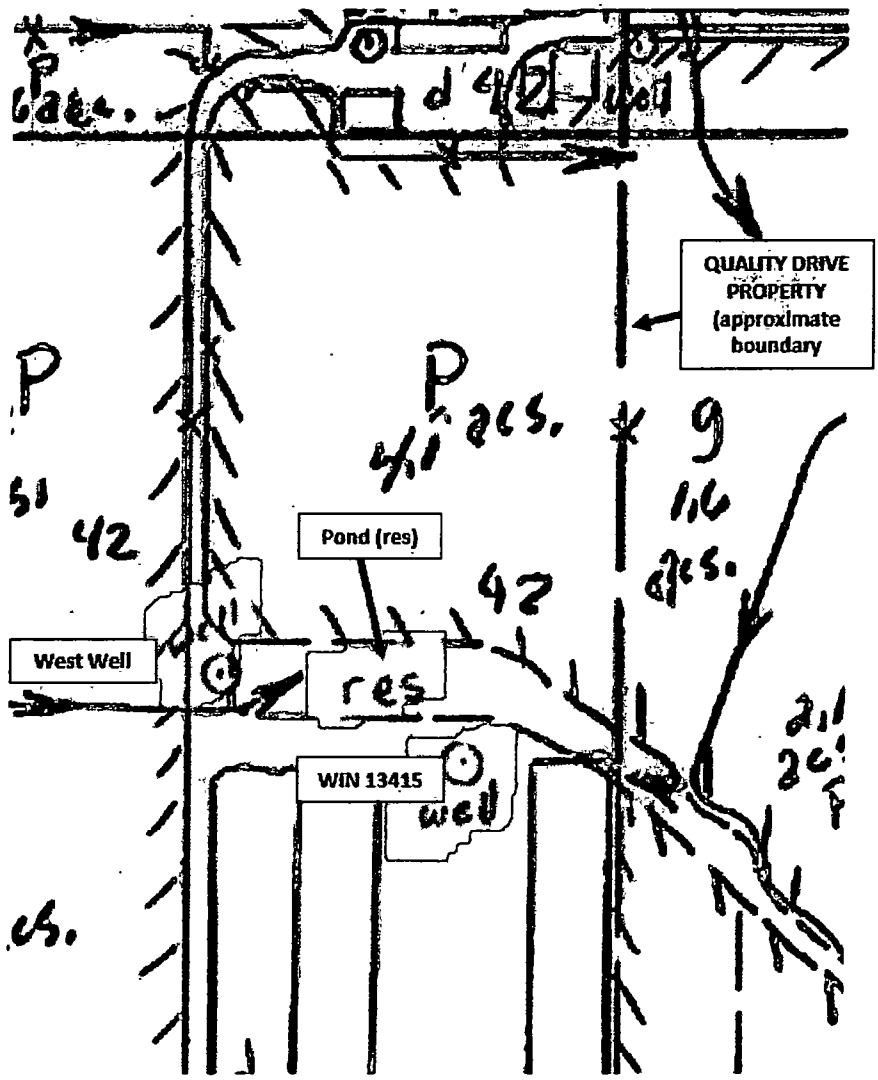
As noted previously, we did not find abandonment logs for WIN 13415 or the West Well on the DWRi website. To address the two wells, we recommend that a Utah-licensed Water Well Driller or Pump Installer be engaged to:

- Remove the debris from each wellhead.
- Open or remove the valves from each wellhead.
- Determine if each well has been plugged and abandoned.
- If a well has not been plugged and abandoned, then:
    - Measure the depth to water and total depth of the well and
    - Plug and abandon the well and file an Abandonment Report in accordance with DWRi rules and guidance.

Spring on Property

There is reported to be a spring beneath pond located on the south end of the property. We found no evidence of a spring in the historical record. The first reference to a spring is Water Right Change Application a46279 (55-890) that was filed in 2020. The pond is manmade, was constructed between 1958 and 1965, and was fed by the nearby formerly artesian wells.

The following is a portion of Sheet 91 of the Hydrographic Survey of Utah Lake & Jordan River by the DWRi. Note that the Hydrographic Survey Map shows WIN 13415 and the West Well but it does not show Singleton Spring or any spring in or near the pond.



We did not find any reference to a spring on the property in our review of USGS publications of the area. Water Right Change Application a46279 (55-890) was filed on October 5, 2020 and is the first reference to a spring that we found.

Attachment E provides a copy of a letter from the U.S. Army Corps of Engineers (USACOE) to HADCO Construction Company dated August 18, 2021. The USACOE (2021) reviewed the property and the pond and found that "*The pond within the review area was constructed between 1958 and 1965. This pond is fed by an artesian well that was constructed prior to the pond.*" See Attachment E.

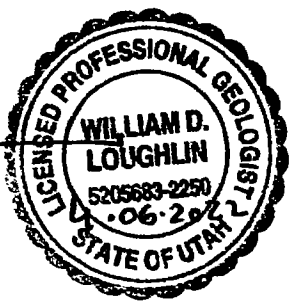
We did not observe any evidence of a spring in the pond during our site visit on April 1, 2022.The pond currently receives stormwater that is piped from surrounding properties. During our site visit on April 1, 2022, We observed about 10 to 20 gpm flowing out of the pond through a culvert on the east end.

In a letter dated October 25, 2021, IGES (2021d) provided recommendations "...*to fill in the pond, maintain the flow of water downstream and accommodate the existing well and/or natural spring located within the pond.*" Available information does not indicate that there is a spring associated with the pond. If a spring is encountered during construction, we concur that the IGES (2021d) recommendations should be followed.

If you have any questions or need more information, please do not hesitate to call me at (435) 649-4005 (office) or (435) 659-1752 (mobile).

Very truly yours,

Loughlin Water Associates, LLC



William D. Loughlin, P.G.
Manager, Principal Hydrogeologist

Table 1 – Water Supply Wells Within About 1200 Feet of Quality Drive Property

Attachment A – Chapter 4-6 of Sensitive Lands Ordinance of American Fork City,
Attachment B – List of Water Rights
Attachment C - IGES Test Pit and Boring Logs
Attachment D - Well Driller Reports
Attachment E - Letter from USACOE to HADCO, dated August 18, 2021

Cc: John David Hadfield – HADCO Construction
Tyson Williamson – The Will Group
Doug Farr - Buchalter
Graham Gilbert – Parsons Behle Latimer

REFERENCES CITED

Cederberg, J.R., Gardner, P.M., and Thiros, S.A., 2009, *Hydrology of Northern Utah Valley, Utah County, 1975-2005*: U.S. .Geological Survey Scientific Investigations Report 2008-5197, Version 2.0, February 2009, 128 p.

Clark, D.W., 1984, *The ground-water system and simulated effects of ground-water withdrawals in Northern Utah Valley, Utah*: U.S. Geological Survey Water-Resources Investigations Report 85-4007, 56 p.

Clark, D.W., and Appel, C.L., 1985, *Ground-water resources of Northern Utah Valley, Utah*: Utah Department of Natural Resources Technical Publication No. 80, 115 p.

Hunt, C.B., Varnes, H.D. and Thomas, H.E., 1953, *Lake Bonneville*: Geology of Northern Utah Valley, Utah: U.S. Geological Survey Professional Paper 257-A, 99 p.

Intermountain GeoEnvironmental Services, Inc. (IGES), 2021a, *Infiltration testing summary, Flex Warehouse, 748 East Quality Drive, American Fork, Utah, Project No. 03638-003:* Consultant report prepared by IGES for QDAF QOZB, LLC, dated August 9, 2021.

Intermountain GeoEnvironmental Services, Inc. (IGES), 2021b, *Response to review comments, Flex Warehouse, 748 East Quality Drive, American Fork, Utah, Project No. 03638-002:* Consultant report prepared by IGES for QDAF QOZB, LLC, dated August 13, 2021.

Intermountain GeoEnvironmental Services, Inc. (IGES), 2021c, *Geotechnical investigation (Rev. 1), Flex Warehouse, 748 East Quality Drive, American Fork, Utah, Project No. 03638-002:* Consultant report prepared by IGES for QDAF QOZB, LLC, dated August 16, 2021.

Intermountain GeoEnvironmental Services, Inc. (IGES), 2021d, *Recommendations for filling in existing pond, 752 East Quality Drive, American Fork, Utah, Project No. 03638-003:* Consultant report prepared by IGES for QDAF QOZB, LLC, dated October 25, 2021.

Thiros, S.A., 2006, *Evaluation of the ground-water flow model for Northern Utah Valley, Utah, updated to conditions through 2002*: U.S. Geological Survey Scientific Investigations Report 2006-5064.

U.S. Army Corps of Engineers (USACOE), 2021, HADCO Construction , Waters of the U.S. Survey: letter from USACOE to HADCO Construction Company, dated August 18, 2021.

ATTACHMENT A

CHAPTER 4-6
SENSITIVE LANDS ORDINANCE OF AMERICAN FORK CITY

4-6 HYDROLOGIC EVALUATION

4-6-1 Every development shall be required to demonstrate no impact to regional water resources Water resources include, but are not limited to:

1. Water rights
2. Historical surface flows in rivers, canals, sloughs and ditches and similar water courses
3. Subsurface water levels
4. Water Quality
5. Existing drainage networks

4-6-2 In order to demonstrate no impact, the developer shall submit a report that, at a minimum:

1. Provides a map of all water rights within 0.5 miles of the boundaries of the proposed development. The map shall identify owners, types, quantities, state identification reference.
2. Provides a map of all surface flow patterns including canals, sloughs, drainages and ditches. The map shall identify owners, type of water course (natural stream, slough, drainage ditch, etc.), historic flows and downstream users and shall show the downstream water course and land ownership to the point of discharge.
3. Documents historical ground water levels including seasonal variations.
4. Identifies methods of protecting water quality including identification of potential contamination sources, permanent and construction Best Management Practices ("BMP's") and proposed mitigation measures.
5. Provides a map of all existing underground drainage networks.
6. Provides a map of all springs and artesian water sources.
7. Storm Water Management Plan ("SWMP").
8. Provide a written agreement or other document, acceptable to the City, indemnifying the City against liability from water rights claims.

The developer's engineer shall demonstrate in the report that the development does not impact the areas water resources as identified above. In the case that impacts are identified, the developer's engineer shall develop mitigation measures that alleviate any adverse effects and receive approval from the City Engineer. In the case that mitigation measures cannot completely alleviate the adverse effects of the development to the water resources, the developer may pursue agreements with stakeholders of the potentially-affected water rights to allow development to proceed with accepted impacts. Any such agreement shall also include a written statement from the affected stakeholders indemnifying the City from liability against water rights claims.

4-7 ADDITIONAL STUDIES MAY BE REQUIRED

The City Engineer may require the submission of additional detail or reports on other reports in excess of those specifically identified under Section 4, where deemed appropriate and necessary to provide a more accurate understanding of conditions

ATTACHMENT B

LIST OF WATER RIGHTS

Water Right Number[b]	Type[c]	Location[d] (PLS)	Status[e]	Priority[f]	Uses[g]	CFS[h]	ACFT[h]	Owner Name
53-1408	SW	S850 W530 E4 24 5S 1E SL	P	19540708	I	0.000	8.437	Arlin Davis
55-1041	UG	N1440 E1324 W4 25 5S 1E SL	P	19610215	I	0.100	57.100	Adair W. And Margret G. Bromley
55-1068	UG	N479 W1833 S4 19 5S 2E SL	P	19610515	IS	0.380	0.000	Stan Norma Smith
55-107	UG	S1640 W1921 E4 24 5S 1E SL	P	19350520	I	0.034	7.296	American Fork City
55-1088	UG	S942 W2005 E4 24 5S 1E SL	U	19610529	I	2.000	0.000	Max Anita Graff
55-11983	UG	S262 E926 NW 25 5S 1E SL	P	1878	I	0.000	130.000	City Of American Fork
55-12066	UG	N1921 W341 E4 25 5S 1E SL	P	19510615	I	0.000	12.920	Lindon City
55-12755	SW	S650 W300 N4 25 5S 1E SL	P	19340816	I	0.000	40.000	American Fork City
55-12763	SW	N2144 W372 E4 25 5S 1E SL	P	1892	I	0.000	0.500	Wignall Asset Protection Trust
55-12763	SW	N1825 W368 E4 25 5S 1E SL	P	1892	I	0.000	0.500	Wignall Asset Protection Trust
55-12763	SW	N240 W349 E4 25 5S 1E SL	P	1892	I	0.000	0.500	Wignall Asset Protection Trust
55-12763	SW	N763 W342 E4 25 5S 1E SL	P	1892	I	0.000	0.500	Wignall Asset Protection Trust
55-12827	SW	N2144 W372 E4 25 5S 1E SL	P	1892	I	0.000	1.000	Cheri Clark Measom And Ronald J. Measom
55-12827	SW	N1825 W368 E4 25 5S 1E SL	P	1892	I	0.000	1.000	Cheri Clark Measom And Ronald J. Measom
55-12827	SW	N240 W349 E4 25 5S 1E SL	P	1892	I	0.000	1.000	Cheri Clark Measom And Ronald J. Measom
55-12827	SW	N763 W342 E4 25 5S 1E SL	P	1892	I	0.000	1.000	Cheri Clark Measom And Ronald J. Measom
55-12835	SW	N2144 W372 E4 25 5S 1E SL	P	1892	I	0.000	6.000	American Fork City Corporation
55-12515	UG	N994 E761 S4 24 5S 1E SL	P	193107	I	0.000	0.000	Trust For Floyd K. Vest
55-12516	UG	S1641 W1944 E4 24 5S 1E SL	P	19480205	IS	0.000	1.778	Trust For Floyd K. Vest
55-12552	UG	N700 E106 S4 24 5S 1E SL	P	1899	IS	0.312	22.140	American Fork City

Water Right Number[b]	Type[c]	Location[d] (PLS)	Status[e]	Priority[f]	Uses[g]	CFS[h]	ACFT[h]	Owner Name
55-12612	UG	N2574 E3156 SW 25 5S 1E SL	P	193107	I	0.000	20.254	American Fork City
55-12633	UG	N2570 W2140 SE 25 5S 1E SL	P	19340411	I	0.000	10.400	American Fork City
55-1273	SW	S40 W631 N4 25 5S 1E SL	P	1898	I	1.000	0.000	William W. Graff
55-1273	RD	N2636 E3108 SW 25 5S 1E SL	P	1898	I	1.000	0.000	William W. Graff
55-13190	UG	S1641 W1944 E4 24 5S 1E SL	P	19480205	IS	0.000	18.842	American Fork City
55-13192	UG	N39 W1300 SE 24 5S 1E SL	P	19580515	IS	0.040	0.000	American Fork City
55-12835	SW	N1825 W368 E4 25 5S 1E SL	P	1892	I	0.000	6.000	American Fork City Corporation
55-12835	SW	N240 W349 E4 25 5S 1E SL	P	1892	I	0.000	6.000	American Fork City Corporation
55-12835	SW	N763 W342 E4 25 5S 1E SL	P	1892	I	0.000	6.000	American Fork City Corporation
55-12845	SW	N2144 W372 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Brandon Truscott
55-12845	SW	N1825 W368 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Brandon Truscott
55-12845	SW	N240 W349 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Brandon Truscott
55-12845	SW	N763 W342 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Brandon Truscott
55-12855	SW	N2144 W372 E4 25 5S 1E SL	P	1892	I	0.000	41.250	Jay W Garlick
55-12855	SW	N1825 W368 E4 25 5S 1E SL	P	1892	I	0.000	41.250	Jay W Garlick
55-12855	SW	N240 W349 E4 25 5S 1E SL	P	1892	I	0.000	41.250	Jay W Garlick
55-12855	SW	N763 W342 E4 25 5S 1E SL	P	1892	I	0.000	41.250	Jay W Garlick
55-12862	SW	N2144 W372 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Paul Korth And Lorelei Korth
55-12862	SW	N1825 W368 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Paul Korth And Lorelei Korth
55-12862	SW	N240 W349 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Paul Korth And Lorelei Korth
55-12862	SW	N763 W342 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Paul Korth And Lorelei Korth
55-12863	SW	N2144 W372 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Paul Korth And Lorelei Korth
55-12863	SW	N1825 W368 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Paul Korth And Lorelei Korth
55-12863	SW	N240 W349 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Paul Korth And Lorelei Korth
55-12863	SW	N763 W342 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Paul Korth And Lorelei Korth

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Water Right Number[b]	Type[c]	Location[d] (PLS)	Status[e]	Priority[f]	Uses[g]	CFS[h]	ACFT[h]	Owner Name
55-12864	SW	N2144 W372 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Landes Associates Llc
55-12864	SW	N1825 W368 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Landes Associates Llc
55-12864	SW	N240 W349 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Landes Associates Llc
55-12864	SW	N763 W342 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Landes Associates Llc
55-12865	SW	N2144 W372 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Wharton Properties Llc
55-12865	SW	N1825 W368 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Wharton Properties Llc
55-12865	SW	N240 W349 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Wharton Properties Llc
55-12865	SW	N763 W342 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Wharton Properties Llc
55-12866	SW	N2144 W372 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Kirt S. Olson And Shauna L. Olson
55-12866	SW	N1825 W368 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Kirt S. Olson And Shauna L. Olson
55-12866	SW	N240 W349 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Kirt S. Olson And Shauna L. Olson
55-12866	SW	N763 W342 E4 25 5S 1E SL	P	1892	I	0.000	0.450	Kirt S. Olson And Shauna L. Olson
55-12899	SW	N1100 E540 W4 30 5S 2E SL	P	1899	I	0.034	0.000	Peter A Fife
55-12899	SW	N488 W1901 S4 19 5S 2E SL	P	1899	I	0.034	0.000	Peter A Fife
55-12899	SW	N1090 W1892 S4 19 5S 2E SL	P	1899	I	0.034	0.000	Peter A Fife
55-12899	SW	S720 W1650 N4 30 5S 2E SL	P	1899	I	0.034	0.000	Peter A Fife
55-12908	SW	N2144 W372 E4 25 5S 1E SL	P	1892	I	0.000	1.506	Hailstone Asset Protection Trust
55-13201	SW	N1100 E540 W4 30 5S 2E SL	P	1899	I	0.001	0.000	Lsc Real Estate Llc
55-13201	SW	N488 W1901 S4 19 5S 2E SL	P	1899	I	0.001	0.000	Lsc Real Estate Llc
55-13201	SW	N1090 W1892 S4 19 5S 2E SL	P	1899	I	0.001	0.000	Lsc Real Estate Llc
55-13201	SW	S720 W1650 N4 30 5S 2E SL	P	1899	I	0.001	0.000	Lsc Real Estate Llc
55-13439	SW	N506 W372 SE 24 5S 1E SL	P	1871	IS	0.310	0.000	Larry E. Vest
55-13439	SW	N103 W360 SE 24 5S 1E SL	P	1871	IS	0.310	0.000	Larry E. Vest
55-13448	SW	N1100 E540 W4 30 5S 2E SL	P	1899	I	0.014	0.000	Lsc Real Estate Llc

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Water Right Number[b]	Type[c]	Location[d] (PLS)	Status[e]	Priority[f]	Uses[g]	CFS[h]	ACFT[h]	Owner Name
55-13448	SW	N488 W1901 S4 19 5S 2E SL	P	1899	I	0.014	0.000	Lsc Real Estate Llc
55-13448	SW	N1090 W1892 S4 19 5S 2E SL	P	1899	I	0.014	0.000	Lsc Real Estate Llc
55-13448	SW	S720 W1650 N4 30 5S 2E SL	P	1899	I	0.014	0.000	Lsc Real Estate Llc
55-1405	SW	S410 W222 E4 24 5S 1E SL	P	1903	IS	1.000	0.000	John R. Larabee
55-1405	RD	S1233 W173 E4 24 5S 1E SL	P	1903	IS	1.000	0.000	John R. Larabee
55-1407	SW	S1233 W222 E4 24 5S 1E SL	P	1903	IS	1.000	0.000	Don J. Mcfate
55-1407	RD	S1233 W173 E4 24 5S 1E SL	P	1903	IS	1.000	0.000	Don J. Mcfate
55-1416	SW	N2641 E447 S4 25 5S 1E SL	P	1891	IS	1.500	45.680	Price/Prowswood Llc
55-1419	SW	N2144 W372 E4 25 5S 1E SL	P	1892	IS	0.000	29.950	William Dennis Jex
55-1419	SW	N1825 W368 E4 25 5S 1E SL	P	1892	IS	0.000	29.950	Kelly L. Stewart Family Revocable Trust
55-1419	SW	N240 W349 E4 25 5S 1E SL	P	1892	IS	0.000	29.950	Charles W. Stewart Family Revocable Trust
55-12908	SW	N1825 W368 E4 25 5S 1E SL	P	1892	I	0.000	1.506	Hailstone Asset Protection Trust
55-12908	SW	N240 W349 E4 25 5S 1E SL	P	1892	I	0.000	1.506	Hailstone Asset Protection Trust
55-12908	SW	N763 W342 E4 25 5S 1E SL	P	1892	I	0.000	1.506	Hailstone Asset Protection Trust
55-12909	SW	N2144 W372 E4 25 5S 1E SL	P	1892	I	0.000	1.494	Hailstone Asset Protection Trust
55-12909	SW	N1825 W368 E4 25 5S 1E SL	P	1892	I	0.000	1.494	Hailstone Asset Protection Trust
55-12909	SW	N240 W349 E4 25 5S 1E SL	P	1892	I	0.000	1.494	Hailstone Asset Protection Trust
55-12909	SW	N763 W342 E4 25 5S 1E SL	P	1892	I	0.000	1.494	Hailstone Asset Protection Trust
55-12926	SW	N1100 E540 W4 30 5S 2E SL	P	1899	I	0.034	0.000	Daniel And Esther Brophy
55-12926	SW	N488 W1901 S4 19 5S 2E SL	P	1899	I	0.034	0.000	Daniel And Esther Brophy
55-12926	SW	N1090 W1892 S4 19 5S 2E SL	P	1899	I	0.034	0.000	Daniel And Esther Brophy
55-12926	SW	S720 W1650 N4 30 5S 2E SL	P	1899	I	0.034	0.000	Daniel And Esther Brophy
55-12958	SW	N1100 E540 W4 30 5S 2E SL	P	1899	I	0.112	0.000	R. Neal Westwood

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Water Right Number[b]	Type[c]	Location[d] (PLS)	Status[e]	Priority[f]	Uses[g]	CFS[h]	ACFT[h]	Owner Name
55-12958	SW	N488 W1901 S4 19 5S 2E SL	P	1899	I	0.112	0.000	R. Neal Westwood
55-12958	SW	N1090 W1892 S4 19 5S 2E SL	P	1899	I	0.112	0.000	R. Neal Westwood
55-12958	SW	S720 W1650 N4 30 5S 2E SL	P	1899	I	0.112	0.000	R. Neal Westwood
55-13003	SW	N1100 E540 W4 30 5S 2E SL	P	1899	I	0.017	0.000	Ralph L. Westberg Revocable Trust
55-13003	SW	N488 W1901 S4 19 5S 2E SL	P	1899	I	0.017	0.000	Ralph L. Westberg Revocable Trust
55-13003	SW	N1090 W1892 S4 19 5S 2E SL	P	1899	I	0.017	0.000	Ralph L. Westberg Revocable Trust
55-1419	SW	N763 W342 E4 25 5S 1E SL	P	1892	IS	0.000	29.950	William Dennis Jex
55-1423	SW	N240 W349 E4 25 5S 1E SL	P	1870	IS	0.000	90.900	Scott Cooper And Julie A. Mclachlan
55-1424	SW	S2688 E486 N4 25 5S 1E SL	P	1870	IS	1.500	0.000	Highland City
55-1425	SW	S686 E25 N4 25 5S 1E SL	P	1884	I	1.500	0.000	E. Ray Gardner
55-1426	SW	N240 W349 E4 25 5S 1E SL	P	1892	I	2.000	0.000	Williamson Farms Llc
55-1432	SW	N2641 E447 S4 25 5S 1E SL	P	1891	IS	2.500	0.000	Roderick Enterprises
55-1435	SW	N1176 W355 E4 25 5S 1E SL	P	1892	IS	2.000	0.000	Arsena Robinson
55-1438	SW	S710 W1430 N4 25 5S 1E SL	P	1870	I	3.500	43.780	Jess W. - Richard G. - Michael F. Bromley
55-1438	SW	S1468 W1316 N4 25 5S 1E SL	P	1870	I	3.500	43.780	Carolyne B. Hill
55-1445	SW	N1100 E540 W4 30 5S 2E SL	P	1899	I	3.306	0.000	Arabian Park Llc
55-1445	SW	N488 W1901 S4 19 5S 2E SL	P	1899	I	3.306	0.000	Carl D. Smith
55-1445	SW	N1090 W1892 S4 19 5S 2E SL	P	1899	I	3.306	0.000	Jay W. Garlick
55-1445	SW	S720 W1650 N4 30 5S 2E SL	P	1899	I	3.306	0.000	Arabian Park Llc
55-1446	SW	N488 W1901 S4 19 5S 2E SL	P	1899	IS	4.000	0.000	Stan Norma Smith
55-1446	SW	N1090 W1892 S4 19 5S 2E SL	P	1899	IS	4.000	0.000	Kurt V. Vest Trust
55-1446	SW	S720 W1650 N4 30 5S 2E SL	P	1899	IS	4.000	0.000	Stan Norma Smith
55-1448	SW	N240 W349 E4 25 5S 1E SL	P	1870	IS	0.000	194.040	Scott And Julie Mclachlan

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Water Right Number[b]	Type[c]	Location[d] (PLS)	Status[e]	Priority[f]	Uses[g]	CFS[h]	ACFT[h]	Owner Name
55-1461	SW	N2641 E447 S4 25 5S 1E SL	P	1870	IS	1.500	0.000	Jerry Eastman
55-13003	SW	S720 W1650 N4 30 5S 2E SL	P	1899	I	0.017	0.000	Ralph L. Westberg Revocable Trust
55-13065	SW	N1100 E540 W4 30 5S 2E SL	P	1899	I	0.302	0.000	Adam Swalberg
55-13065	SW	N488 W1901 S4 19 5S 2E SL	P	1899	I	0.302	0.000	Adam Swalberg
55-13065	SW	N1090 W1892 S4 19 5S 2E SL	P	1899	I	0.302	0.000	Adam Swalberg
55-13065	SW	S720 W1650 N4 30 5S 2E SL	P	1899	I	0.302	0.000	Adam Swalberg
55-13078	SW	N1100 E540 W4 30 5S 2E SL	P	1899	I	0.033	0.000	Scott Unice
55-13078	SW	N488 W1901 S4 19 5S 2E SL	P	1899	I	0.033	0.000	Scott Unice
55-13078	SW	N1090 W1892 S4 19 5S 2E SL	P	1899	I	0.033	0.000	Scott Unice
55-13078	SW	S720 W1650 N4 30 5S 2E SL	P	1899	I	0.033	0.000	Scott Unice
55-13090	SW	N1100 E540 W4 30 5S 2E SL	P	1899	I	0.033	0.000	Scott Unice
55-13090	SW	N488 W1901 S4 19 5S 2E SL	P	1899	I	0.033	0.000	Scott Unice
55-13090	SW	N1090 W1892 S4 19 5S 2E SL	P	1899	I	0.033	0.000	Scott Unice
55-13090	SW	S720 W1650 N4 30 5S 2E SL	P	1899	I	0.033	0.000	Scott Unice
55-13094	SW	N1100 E540 W4 30 5S 2E SL	P	1899	I	0.038	0.000	Landes Associates Llc
55-13094	SW	N488 W1901 S4 19 5S 2E SL	P	1899	I	0.038	0.000	Landes Associates Llc
55-13094	SW	N1090 W1892 S4 19 5S 2E SL	P	1899	I	0.038	0.000	Landes Associates Llc
55-13094	SW	S720 W1650 N4 30 5S 2E SL	P	1899	I	0.038	0.000	Landes Associates Llc
55-13108	SW	N1100 E540 W4 30 5S 2E SL	P	1899	I	0.077	0.000	Craig And Vickey Clark
55-1469	SW	N293 W636 S4 24 5S 1E SL	P	1870	IS	0.476	0.000	Dorothy Steele
55-1469	SW	S483 W300 N4 25 5S 1E SL	P	1870	IS	0.476	0.000	Dorothy Steele
55-1469	SW	N668 W48 S4 24 5S 1E SL	P	1870	IS	0.476	0.000	Dorothy Steele

Water Right Number[b]	Type[c]	Location[d] (PLS)	Status[e]	Priority[f]	Uses[g]	CFS[h]	ACFT[h]	Owner Name
55-1541	UG	N2570 W2140 SE 25 5S 1E SL	P	19340411	I	0.743	52.080	Castendyck Castendyck L.L.C.
55-1542	UG	N1144 E1329 W4 25 5S 1E SL	P	19310720	IS	0.000	15.730	Jess W. - Richard G. - Michael F. Bromley
55-1544	UG	N3304 E2930 SW 25 5S 1E SL	P	19300803	I	0.223	0.000	James T. Gardner
55-1555	UG	N38 E627 S4 24 5S 1E SL	P	193109	I	0.000	72.700	Keith H. Jacobs
55-1559	UG	S521 W325 NE 25 5S 1E SL	P	193208	IS	0.000	1.520	American Fork City
55-159	UG	N769 W327 E4 25 5S 1E SL	P	19400925	I	1.000	0.000	Timpanogos Special Service District
55-1616	UG	S701 E2688 NW 25 5S 1E SL	P	19340928	I	0.178	0.000	American Fork City
55-1617	UG	S718 E2693 NW 25 5S 1E SL	P	193407	I	0.089	0.000	American Fork City
55-1621	UG	N1440 E1324 W4 25 5S 1E SL	P	19720831	I	0.045	0.000	Utah Department Of Transportation
55-1624	UG	N1346 E3489 SW 24 5S 1E SL	P	193402	DIS	0.178	0.000	American Fork City
55-305	UG	N1349 W1800 SE 24 5S 1E SL	P	19451101	I	0.345	0.000	American Fork City
55-307	UG	S1551 W577 N4 25 5S 1E SL	P	19451018	DI	0.015	0.000	Martha A. Driggs
55-3793	UG	S62 W473 E4 25 5S 1E SL	P	1900	DIS	0.089	0.000	H. I. Sager
55-3794	UG	N383 W324 E4 25 5S 1E SL	P	1900	DIS	0.000	10.910	American Fork City
55-382	SW	S650 W300 N4 25 5S 1E SL	P	19470405	I	0.000	26.344	American Fork City
55-13108	SW	N488 W1901 S4 19 5S 2E SL	P	1899	I	0.077	0.000	Craig And Vickey Clark
55-13108	SW	N1090 W1892 S4 19 5S 2E SL	P	1899	I	0.077	0.000	Craig And Vickey Clark
55-13108	SW	S720 W1650 N4 30 5S 2E SL	P	1899	I	0.077	0.000	Craig And Vickey Clark
55-13157	UG	N39 W1300 SE 24 5S 1E SL	P	19580515	IS	0.270	0.000	American Fork City
55-13158	UG	S1641 W1944 E4 24 5S 1E SL	P	19480205	IS	0.000	31.140	American Fork City
55-13159	UG	S1640 W1921 E4 24 5S 1E SL	P	19350520	I	0.188	40.064	American Fork City
55-1891	UG	N660 E2849 SW 24 5S 1E SL	P	19340701	IS	0.223	0.000	Elda Corney
55-2267	UG	N1181 W901 SE 24 5S 1E SL	P	1903	IS	0.125	0.000	Willard B. Ennis
55-2329	UG	N52 E4000 SW 24 5S 1E SL	P	1899	I	0.780	0.000	J. W. Shelton

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Water Right Number[b]	Type[c]	Location[d] (PLS)	Status[e]	Priority[f]	Uses[g]	CFS[h]	ACFT[h]	Owner Name
55-2496	UG	S376 E1686 NW 25 5S 1E SL	P	19340801	I	0.200	0.000	State Of Utah Board Of Water Resources
55-2502	SW	S650 W300 N4 25 5S 1E SL	P	19340816	I	0.000	80.000	Roderick Enterprises
55-2514	UG	S701 E2688 NW 25 5S 1E SL	P	19340919	I	0.178	0.000	E. R. Gardner
55-2627	UG	N2574 E3156 SW 25 5S 1E SL	P	193107	IS	0.200	28.858	American Fork City
55-2658	UG	N994 E761 S4 24 5S 1E SL	P	193107	I	0.101	9.672	Trust For Dorothy V. Taylor
55-4564	UG	N2562 E2147 SW 25 5S 1E SL	P	19711029	DS	0.015	0.000	American Fork City
55-4678	UG	S523 W957 E4 25 5S 1E SL	P	19721027	S	0.015	0.000	Highland City
55-4735	UG	N447 W1484 S4 19 5S 2E SL	P	18990312	DIS	0.015	0.000	Daniel S. Rosemary S. Thatcher
55-4796	UG	S1552 W286 E4 24 5S 1E SL	P	19730706	DIS	0.015	0.000	W. F. Graham
55-3921	UG	N495 W50 SE 24 5S 1E SL	P	1900	I	0.100	0.000	Larry E. Vest
55-4012	UG	N700 E106 S4 24 5S 1E SL	P	1899	IS	1.688	119.372	Elda Corney
55-4024	UG	N601 E1107 SW 24 5S 1E SL	P	1920	DIS	0.060	0.000	Boyde Glenn Willa Mae J. Williams
55-411	UG	S1641 W1944 E4 24 5S 1E SL	P	19480205	IS	0.335	0.280	Trust For Dorothy V. Taylor
55-4138	SW	N756 E526 S4 24 5S 1E SL	P	1870	IS	1.034	0.000	Trust For Dorothy V. Taylor
55-4138	SW	N531 E619 S4 24 5S 1E SL	P	1870	IS	1.034	0.000	Trust For Dorothy V. Taylor
55-4138	SW	N542 E1327 S4 24 5S 1E SL	P	1870	IS	1.034	0.000	Trust For Dorothy V. Taylor
55-4139	SW	N506 W372 SE 24 5S 1E SL	P	1871	IS	0.920	0.000	Elbert K. Vest
55-4139	SW	N103 W360 SE 24 5S 1E SL	P	1871	IS	0.920	0.000	Elbert K. Vest
55-4184	UG	S122 W1751 E4 25 5S 1E SL	P	19680412	DIS	0.015	0.000	Highland City
55-685	UG	N85 W10 E4 25 5S 1E SL	P	19540421	DIS	0.015	0.000	Pg Gateway Plaza Llc
55-691	SW	S850 W530 E4 24 5S 1E SL	P	19540708	IOS	0.000	28.309	American Fork City
55-8087	UG	N499 W246 SE 24 5S 1E SL	P	19900302	DIS	0.015	0.450	Larry E. Vest
55-817	UG	N324 E1909 W4 25 5S 1E SL	P	19560731	D	0.015	0.000	Earl Wagstaff
55-849	UG	S570 E1123 N4 25 5S 1E SL	P	19570509	S	0.015	0.000	American Fork City
55-8760	UG	S30 W1262 E4 24 5S 1E SL	P	19540708	IS	0.000	10.740	John L. Sandra S. Hansen
55-8760	SW	S850 W530 E4 24 5S 1E SL	P	19540708	IS	0.000	10.740	John L. Sandra S. Hansen

Water Right Number[b]	Type[c]	Location[d] (PLS)	Status[e]	Priority[f]	Uses[g]	CFS[h]	ACFT[h]	Owner Name
55-8761	UG	S30 W1262 E4 24 5S 1E SL	P	19540708	IOS	0.000	9.437	American Fork City
55-4798	UG	S485 W62 E4 24 5S 1E SL	P	19730709	DIS	0.015	0.000	American Fork City
55-557	UG	N1822 W340 E4 25 5S 1E SL	P	19501005	I	0.000	0.000	D. Lorraine Sager
55-583	UG	N1921 W341 E4 25 5S 1E SL	P	19510615	IS	0.000	0.000	D. Lorraine Sager
55-714	UG	N250 W40 SE 24 5S 1E SL	P	19541006	DIS	0.015	0.000	John R. Larrabee
55-758	UG	S498 W83 NE 25 5S 1E SL	P	19550408	D	0.015	0.000	Elbert Kay Vest
55-769	UG	S50 W1000 N4 25 5S 1E SL	P	19550608	D	0.015	0.000	George M. Moss
55-7741	UG	S47 W953 E4 25 5S 1E SL	P	19351210	I	0.550	0.000	Highland City
55-7742	UG	N1440 E1324 W4 25 5S 1E SL	P	19610215	I	0.000	34.540	Robert W. Kelshaw 1989 Trust
55-7743	SW	S710 W1430 N4 25 5S 1E SL	P	1870	IS	0.000	47.220	Robert W. Kelshaw 1989 Trust
55-7744	SW	S1488 W876 N4 25 5S 1E SL	P	1870	I	0.000	22.140	Robert W. Kelshaw 1989 Trust
55-7744	SW	S656 W876 N4 25 5S 1E SL	P	1870	I	0.000	22.140	Robert W. Kelshaw 1989 Trust
55-7814	UG	N2562 E2147 SW 25 5S 1E SL	P	193107	I	0.200	10.040	Turana D. Cameron
55-890	UG	N39 W1300 SE 24 5S 1E SL	P	19580515	IS	0.090	0.000	Kurt V. Vest Trust
55-897	UG	S1225 W240 E4 24 5S 1E SL	P	19580708	DO	0.015	0.000	E. Curtis And Charlotte J. Anderson
55-9053	SW	S850 W530 E4 24 5S 1E SL	P	19540708	IOS	0.000	17.000	Lehi City Corporation
55-9061	SW	S850 W530 E4 24 5S 1E SL	P	19540708	IOS	0.000	9.427	Autumn View Properties Limited Partnership
55-9064	UG	N1144 E1329 W4 25 5S 1E SL	P	19310720	DI	0.000	47.130	Alpine City
55-9089	UG	S30 W1262 E4 24 5S 1E SL	P	19540708	IM	0.000	16.000	Alpine City
55-9089	SW	S850 W530 E4 24 5S 1E SL	P	19540708	IM	0.000	16.000	Alpine City
55-9090	UG	S30 W1262 E4 24 5S 1E SL	P	19540708	IM	0.000	16.000	Alpine City
55-9090	SW	S850 W530 E4 24 5S 1E SL	P	19540708	IM	0.000	16.000	Alpine City
55-9091	UG	S30 W1262 E4 24 5S 1E SL	P	19540708	IM	0.000	16.000	Alpine City
55-9091	SW	S850 W530 E4 24 5S 1E SL	P	19540708	IM	0.000	16.000	Alpine City
55-9092	UG	S30 W1262 E4 24 5S 1E SL	P	19540708	IM	0.000	16.000	Alpine City
55-9092	SW	S850 W530 E4 24 5S 1E SL	P	19540708	IM	0.000	16.000	Alpine City
55-9093	UG	S30 W1262 E4 24 5S 1E SL	P	19540708	IM	0.000	16.000	Alpine City

Water Right Number[b]	Type[c]	Location[d] (PLS)	Status[e]	Priority[f]	Uses[g]	CFS[h]	ACFT[h]	Owner Name
55-9093	SW	S850 W530 E4 24 5S 1E SL	P	19540708	IM	0.000	16.000	Alpine City
55-925	UG	S948 W447 E4 24 5S 1E SL	P	19590213	DOS	0.015	0.000	American Fork City
55-9333	SW	N240 W349 E4 25 5S 1E SL	U	1895	I	0.000	13.333	Thyme Global Llc
55-9451	UG	N38 E627 S4 24 5S 1E SL	P	193109	I	0.000	2.740	KI Partners American Fork I Llc
a26334	SW	S1282 W17 N4 25 5S 1E SL	A	20020212	O	7.270	0.000	Central Utah Water Conservancy District
a31978	SW	S1282 W17 N4 25 5S 1E SL	A	20060925	M	2.090	0.000	Central Utah Water Conservancy District
a42059	SW	S1282 W17 N4 25 5S 1E SL	A	20160927	M	3.245	739.835	Central Utah Water Conservancy District
a42061	SW	S1282 W17 N4 25 5S 1E SL	A	20160927	M	3.513	0.000	Central Utah Water Conservancy District
a44420	SW	S1282 W17 N4 25 5S 1E SL	A	20190205	M	1.990	0.000	Central Utah Water Conservancy District
a46279	Spring	S516 E1122 N4 25 5S 1E SL	A	20201005	I	0.000	22.428	Kurt V. Vest Trust
55-8761	SW	S850 W530 E4 24 5S 1E SL	P	19540708	IOS	0.000	9.437	American Fork City
55-8792	SW	N756 E526 S4 24 5S 1E SL	P	1870	I	0.506	0.000	Trust For Larry E. Vest
55-8792	SW	N531 E619 S4 24 5S 1E SL	P	1870	I	0.506	0.000	Trust For Larry E. Vest
55-8792	SW	N542 E1327 S4 24 5S 1E SL	P	1870	I	0.506	0.000	Trust For Larry E. Vest
55-8796	UG	N994 E761 S4 24 5S 1E SL	P	193107	I	0.066	0.000	Trust For Larry E. Vest
55-8797	UG	S1641 W1944 E4 24 5S 1E SL	P	19480205	I	0.160	29.320	American Fork City
55-8798	UG	S1640 W1921 E4 24 5S 1E SL	P	19350520	I	0.178	18.040	American Fork City
55-9729	SW	S650 W300 N4 25 5S 1E SL	P	1870	I	0.000	44.856	American Fork City
a22392	UG	N2570 W2140 SE 25 5S 1E SL	A	19980720	M	0.000	52.080	Castendyck Castendyck L.L.C.
a22392	UG	S523 W957 E4 25 5S 1E SL	A	19980720	M	0.000	52.080	Castendyck Castendyck L.L.C.
a22392a	UG	N2570 W2140 SE 25 5S 1E SL	A	19980720	M	0.000	10.400	American Fork City
a22392a	UG	S523 W957 E4 25 5S 1E SL	A	19980720	M	0.000	10.400	American Fork City
a27300	UG	N1000 W700 SE 24 5S 1E SL	A	20021205	M	0.000	30.882	City Of Saratoga Springs

Loughlin Water Associates, LLC

Water Right Number[b]	Type[c]	Location[d] (PLS)	Status[e]	Priority[f]	Uses[g]	CFS[h]	ACFT[h]	Owner Name
a33361	SW	S1282 W17 N4 25 5S 1E SL	A	20070815	M	0.045	9.400	Central Utah Water Conservancy District
a46831	UG	S415 W1675 N4 30 5S 2E SL	A	20210302	M	0.000	47.840	Pleasant Grove City
a48147	UG	S521 W325 NE 25 5S 1E SL	U	20211201	DIS	0.000	58.110	Larry E. Vest
a48147	UG	N315 W317 SE 24 5S 1E SL	U	20211201	DIS	0.000	58.110	Larry E. Vest
a48147	UG	N503 W273 SE 24 5S 1E SL	U	20211201	DIS	0.000	58.110	Larry E. Vest
a46279	UG	N39 W1300 SE 24 5S 1E SL	A	20201005	I	0.000	22.428	Kurt V. Vest Trust
a48147	UG	N499 W246 SE 24 5S 1E SL	U	20211201	DIS	0.000	58.110	Larry E. Vest
a48176	SW	N506 W372 SE 24 5S 1E SL	U	20211201	IS	0.000	18.872	Larry E. Vest
a48176	SW	N343 W327 SE 24 5S 1E SL	U	20211201	IS	0.000	18.872	Larry E. Vest
a48176	UG	S521 W325 NE 25 5S 1E SL	U	20211201	IS	0.000	18.872	Larry E. Vest
a48176	UG	N315 W317 SE 24 5S 1E SL	U	20211201	IS	0.000	18.872	Larry E. Vest

[a] Water Right information obtained from Utah Division of Water Rights (DWRi) online Water Right Database https://maps.waterrights.utah.gov/asp/wrplatGE.asp

[b] Click on hyperlink to view water right.

[c] SW = Surface; UG = Underground; RD= Rediversion.

[d] S = South; N = North; E = East; W = West; N4 = North Quarter Corner; W4 = West Quarter Corner; S4 = South Quarter Corner; E4 = East Quarter Corner; SL = Salt Lake Base & Meridian.

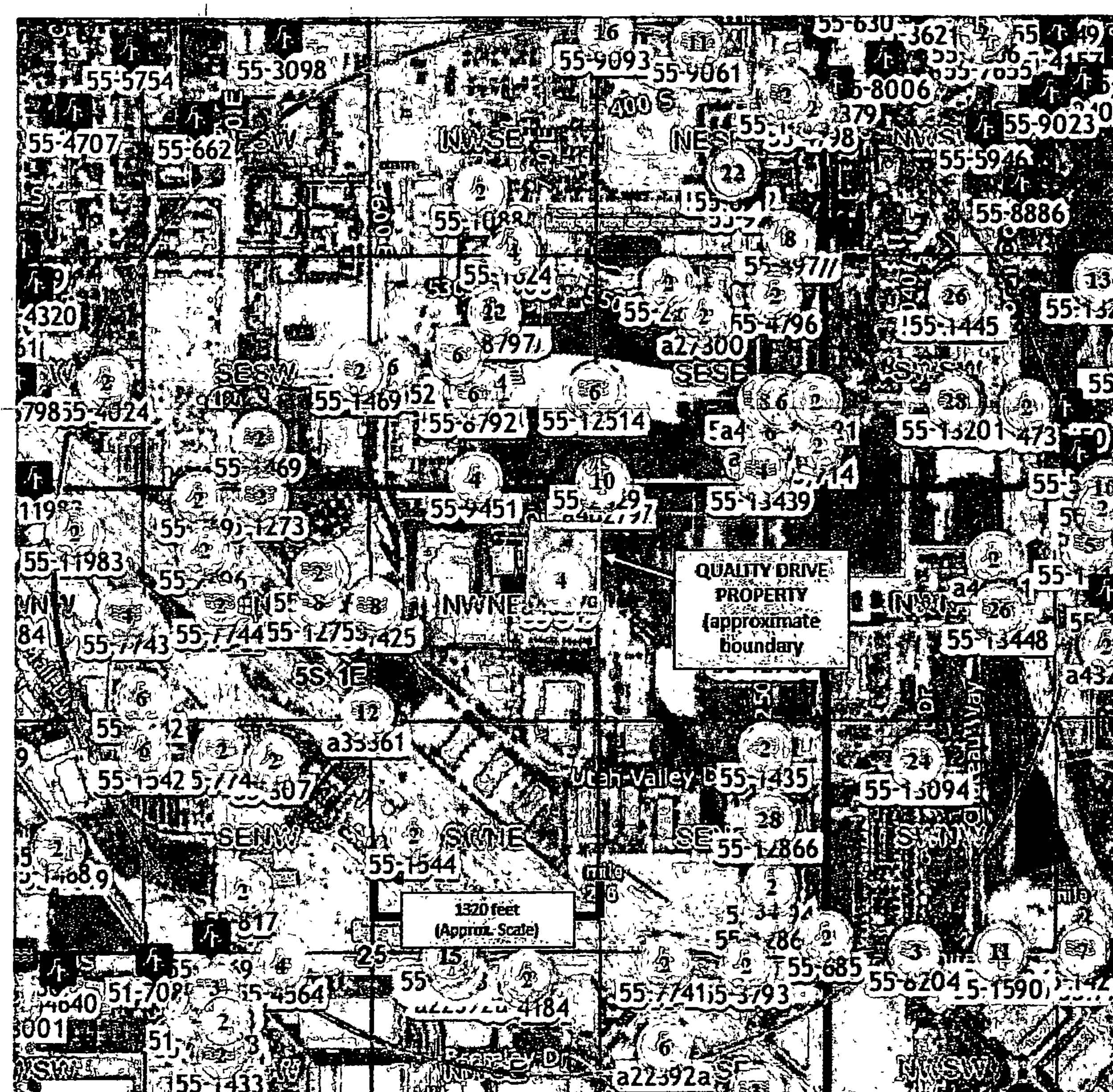
[e] Status is according to DWRi online Water Right Database on February 19, 2022; A = Approved; U = Unapproved; P = Certificated.

[f] Format for Priority is Year, Month, Day.

[g] I = Irrigation; S = Stock; D = Domestic; M = Municipal; O = Other, such as irrigation, stockwatering, municipal, recreation, power, fish & wildlife, etc.

[h] CFS = Cubic Feet per Second; ACFT = Acre Feet.

Loughlin Water Associates, LLC



Air photo map showing the locations of water rights within about one-half mile of the Quality Drive Property.

ATTACHMENT C

IGES TEST PIT AND BORING LOGS

DATE: STARTED: 7/19/21 | COMPLETED: 7/19/21 | BACKFILLED: 7/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork Utah
IGES Project Number: 03638-001

IGES Rep: DJS
Rig Type: CME 75
Boring Type: HSA

BORING NO: B-1
Sheet 1 of 3

LOCATION
LATITUDE 40.36161 LONGITUDE -111.77855 ELEVATION (above m.s.l) 4,549 feet

DEPTH	ELEVATION	SAMPLES	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	N	Water Level	Dry Density(pcf)	Moisture Content (%)	Percent minus 200	Liquid Limit	Plasticity Index
					Topsoil - Lean CLAY with sand, medium stiff, moist, dark brown moderate amounts of organic material							
				SC	**Native** - Clayey SAND, medium dense, moist, moderate brown fine grained sand							
	4545											
5					Clayey SAND with gravel, very loose, wet, moderate brown, fine grained sand	0 2 1			19	28		
					with gravel, 1 to 2 inch typical diameter, sub-rounded							
					Clayey SAND, very loose, wet, moderate brown, fine grained sand	1 2 1			24	35		
	4540											
10				CL	Well Graded Sandy Lean CLAY, soft, saturated, moderate brown fine grained sand	1 1 2			29	63		
				GP	Poorly Graded GRAVEL with sand, medium dense, wet, light to moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter fine to medium grained sand	6 8 10						
	4535											
15				SP-SC	Poorly Graded SAND with clay and trace gravel, dense, wet, moderate brown medium grained sand	8 18 17			27	9		
				SC	Clayey SAND, medium dense, wet, moderate brown fine grained sand	2 4 14			22	31		
	4530											
20				SP-SC	Poorly Graded SAND with clay and gravel, dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter medium grained sand	12 23 18			14	9		
				GP	Poorly Graded GRAVEL with sand, dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 1 inch diameter medium grained sand	13 20 22						

Moisture Content and Atterberg Limits
Plastic Limit | Moisture Content | Liquid Limit
10 20 30 40 50 60 70 80 90

N - OBSERVED BLOW COUNT PER 6 INCHES

SAMPLE TYPE
- 2" O.D./1.38" I.D. Split Spoon Sampler
- 3.25" O.D./2.42" I.D. 'U' Sampler
- 3" O.D. Thin-Walled Shelby Sampler
- Grab Sample
- California Sampler
- Sample from Auger Cuttings

BORING LOG

NOTES:
Location and elevation are approximate

WATER LEVEL
▼ - MEASURED ▽ - ESTIMATED

FIGURE A - 4a

LOG OF BORING (A).DAG V 3.01 03638-001 BORING LOGS.GPJ IGES.GDT 8/16/21

DATE
STARTED: 7/19/21
COMPLETED: 7/19/21
BACKFILLED: 7/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork Utah
IGES Project Number: 03638-001

IGES Rep: DJS
Rig Type: CME 75
Boring Type: HSA

BORING NO: **B-1**
Sheet 2 of 3

LOCATION
LATITUDE 40.36161 LONGITUDE -111.77855 ELEVATION 4,549 feet (above m.s.l)

DEPTH ELEVATION	DEPTH FEET	SAMPLES	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	N	Water Level	Dry Density(pcf)	Moisture Content (%)	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits (Plastic Limit / Moisture Content / Liquid Limit)
	25			SP-SC	Poorly Graded SAND with clay and trace gravel, medium dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter medium grained sand, 4 inch seam of Lean CLAY in bottom of sample	18 11 4			13	8			
4520				GP GP	Poorly Graded GRAVEL with sand, dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 1 inch diameter fine to medium grained sand	15 22 16							
	30			SP-SC	Poorly Graded SAND with clay and trace gravel, dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter medium grained sand	15 22 20			11	10			
4515					Poorly Graded SAND with gravel, very dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter medium grained sand	18 25 30							
	35				Poorly Graded SAND with clay and trace gravel, very dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter medium to course grained sand	20 33 49			13	7			
4510					Poorly Graded SAND with gravel, dense, wet, moderate brown less than 1 inch typical diameter, sub-angular, up to 3/4 inch diameter medium to course grained sand, 1 inch piece of gravel blocking mouth of sampler	19 19 13							
	40				Poorly Graded SAND with clay and trace gravel grading to Silty Clayey SAND, medium dense, wet, moderate brown medium to course grained sand	6							
				CL-ML	Silty CLAY with trace fine sands, stiff, saturated, light brown to dark grey	13 12			19 26	16 70	25	5	
					Silt Clay with fine sand, very stiff, saturated, dark grey	5 9 11			28	75	26	5	
4505	45			SC	Clayey SAND with lean clay seams, medium dense, wet, dark grey fine to medium grained sand	8 11 11			25	38			
				CL	Lean CLAY with fine sands, very stiff, saturated, dark grey	5							

N - OBSERVED BLOW COUNT PER 6 INCHES

LOG OF BORING (A) DAG V 3.01 03638-001 BORING LOGS.GPJ IGES.GDT 8/16/21

SAMPLE TYPE
- 2" O.D./1.38" I.D. Split Spoon Sampler
- 3.25" O.D./2.42" I.D. 'U' Sampler
- 3" O.D. Thin-Walled Shelby Sampler
- Grab Sample
- California Sampler
- Sample from Auger Cuttings

BORING LOG

NOTES:
Location and elevation are approximate

WATER LEVEL
▼ - MEASURED ▽ - ESTIMATED

FIGURE A - 4b

DATE: STARTED: 7/19/21 | COMPLETED: 7/19/21 | BACKFILLED: 7/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork Utah
IGES Project Number: 03638-001

IGES Rep: DJS
Rig Type: CME 75
Boring Type: HSA

BORING NO: B-1
Sheet 3 of 3

LOCATION
LATITUDE 40.36161 LONGITUDE -111.77855 ELEVATION 4,549 feet (above m.s.l)

ELEVATION	FEET	SAMPLES	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	N	Water Level	Dry Density(pcf)	Moisture Content (%)	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits (Plastic Limit / Moisture Content / Liquid Limit; 10 20 30 40 50 60 70 80 90)
4500	50				Lean CLAY with trace fine sands, stiff, saturated, dark grey	8 9 2 6 8			28 28	85 91	32 40	9 21	
					Groundwater observed at 3.5 feet Bottom of Boring @ 51.5 Feet								
4495	55												
4490	60												
4485	65												
4480	70												

N - OBSERVED BLOW COUNT PER 6 INCHES

SAMPLE TYPE
- 2" O.D./1.38" I.D. Split Spoon Sampler
- 3.25" O.D./2.42" I.D. 'U' Sampler
- 3" O.D. Thin-Walled Shelby Sampler
- Grab Sample
- California Sampler
- Sample from Auger Cuttings

BORING LOG

NOTES:
Location and elevation are approximate

WATER LEVEL
▼ - MEASURED ▽ - ESTIMATED

FIGURE A - 4c

LOG OF BORING (A) DAG V 3.01 03638-001 BORING LOGS.GPJ IGES.GDT 8/16/21

DATE
STARTED: 3/19/21
COMPLETED: 3/19/21
BACKFILLED: 3/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork,, Utah
Project Number 03638-001

IGES Rep: BF
Rig Type: JCB-4CX

TEST PIT NO: **TP- 1**
Sheet 1 of 1

LOCATION
LATITUDE 40.36140 LONGITUDE -111.77875 ELEVATION 4,549

DEPTH FEET	ELEVATION	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits (Plastic Limit / Moisture Content / Liquid Limit; 10 20 30 40 50 60 70 80 90)
0					CL	**Topsoil** - Lean CLAY with sand and occasional gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics						
1					OL	Organic Clay, soft, highly saturated, black, low dry unit weight, predomantly organic material						
2												
3	4545				CL	Lean CLAY with sand and occasional gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics						
4					GC	**Alluvium (Qa)** - Clayey GRAVEL with sand, medium dense, moist, moderate brown gray, rounded, occasional root matter		0.3	18.5			
5												
6					SM	Silty SAND with gravel, medium dense, moist, moderate brown, gravel decreases in size and quantitiy with depth	86.3	35.3				
7												
8	4540											
9												
10					GC	Clayey GRAVEL with sand, medium dense, moist, moderate brown gray, rounded						
11												
12			▼									
13	4535					Groundwater observed at 12½ feet						
14												

SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
▼ - MEASURED
▽ - ESTIMATED

NOTES:
Location is approximate with elevation based on the grading plan by CIR

Figure A-5

LOG OF TEST PITS - 4 LINE HEADER W ELEV 03638-001.GPJ IGES.GDT 8/16/21

DATE
STARTED: 3/19/21
COMPLETED: 3/19/21
BACKFILLED: 3/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork,, Utah Project Number 03638-001

IGES Rep: BF
Rig Type: JCB-4CX

TEST PIT NO: TP- 2
Sheet 1 of 1

LOCATION
LATITUDE 40.36132 LONGITUDE -111.77826 ELEVATION 4,548

DEPTH FEET	ELEVATION	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits (Plastic Limit / Moisture Content / Liquid Limit; 10 20 30 40 50 60 70 80 90)
0					CL	**Topsoil** - Lean CLAY with sand and occasional gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics						
1					OL	Organic Clay, soft, highly saturated, black, low dry unit weight, predomantly organic material						
2	4545						15.3	333.9				333.9
3					CL	Lean CLAY with sand and occasional gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics						
					GC	**Alluvium (Qa)** - Clayey GRAVEL with sand, medium dense, moist, moderate brown gray, rounded, occasional root matter						
4							95.9	29.8	40.7			
5												
6												
7	4540				SM	Silty SAND with gravel, medium dense, moist, moderate brown, gravel decreases in size and quantitiy with depth						
8												
9												
10					GC	Clayey GRAVEL with sand, medium dense, moist, moderate brown gray, rounded						
11												
12	4535											
13						Groundwater observed at 3½ feet						
14												

SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
- MEASURED
- ESTIMATED

NOTES:
Location is approximate with elevation based on the grading plan by CIR

Figure A-6

LOG OF TEST PITS - 4 LINE HEADER W ELEV 03638-001.GPJ IGES.GDT 8/16/21

DATE
STARTED: 3/19/21
COMPLETED: 3/19/21
BACKFILLED: 3/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork,, Utah
Project Number 03638-001

IGES Rep: BF
Rig Type: JCB-4CX

TEST PIT NO:
TP- 3
Sheet 1 of 1

LOCATION
LATITUDE 40.36185 LONGITUDE -111.77885 ELEVATION 4,552

ELEVATION	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
	0				CL	**Topsoil** - Lean CLAY with sand and occasional gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics					
	1				OL	Organic Clay, soft, highly saturated, black, low dry unit weight, predomantly organic material					
4550	2				CL	Lean CLAY with sand and occasional gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics	72.5	36.3			
	3				GC	**Alluvium (Qa)** - Clayey GRAVEL with sand, medium dense, moist, moderate brown gray, rounded, occasional root matter					
	4										
	5										
	6										
4545	7		▼		SC	Clayey SAND with gravel, medium dense, moist, moderate brown, gravel decreases in size and quantitiy with depth					
	8										
	9										
	10										
	11										
4540	12										
	13					Groundwater observed at 7½ feet					
	14										

Moisture Content and Atterberg Limits
Plastic Limit | Moisture Content | Liquid Limit
10 20 30 40 50 60 70 80 90

LOG OF TEST PITS - 4 LINE HEADER W ELEV 03638-001.GPJ IGES.GDT 8/16/21

SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
▼ - MEASURED
▽ - ESTIMATED

NOTES:
Location is approximate with elevation based on the grading plan by CIR

Figure A-7

DATE: STARTED: 3/19/21 | COMPLETED: 3/19/21 | BACKFILLED: 3/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork,, Utah Project Number 03638-001

IGES Rep: BF
Rig Type: JCB-4CX

TEST PIT NO: **TP-4**
Sheet 1 of 1

LOCATION
LATITUDE 40.36191 LONGITUDE -111.77829 ELEVATION 4,551

DEPTH FEET	ELEVATION	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
0	4550				CL	**Topsoil** - Lean CLAY with gravel, soft, moist, dark brown to black, very organic rich, abundant roots and organics					
1					OL	Organic Clay, soft, highly saturated, black, low dry unit weight, predomantly organic material					
2					GC	**Alluvium (Qa)** - Clayey GRAVEL, loose to medium dense, moist to wet, gray, rounded, occasional root matter					
3											
4					CL	Lean CLAY, stiff, moist to wet, gray to moderate brown, frequent roots and decaying organics					
5	4545						90.2	24.4		45	23
6							85.9	35.4			
7											
8					GC	Clayey GRAVEL with sand, loose to medium dense, wet, moderate brown to gray					
9											
10	4540										
11											
12					SC	Clayey SAND, medium dense, wet, moderate grayish brown					
13						Groundwater observed at 7½ feet					
14											

Moisture Content and Atterberg Limits
Plastic Limit | Moisture Content | Liquid Limit
10 20 30 40 50 60 70 80 90

SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
- MEASURED
- ESTIMATED

NOTES:
Location is approximate with elevation based on the grading plan by CIR

Figure A-8

LOG OF TEST PITS - 4 LINE HEADER W ELEV 03638-001.GPJ IGES.GDT 8/16/21

DATE
STARTED: 3/19/21
COMPLETED: 3/19/21
BACKFILLED: 3/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork,, Utah Project Number 03638-001

IGES Rep: BF
Rig Type JCB-4CX

TEST PIT NO:
TP-5
Sheet 1 of 1

LOCATION
LATITUDE 40.36100 LONGITUDE -111.77877 ELEVATION 4,549

ELEVATION	FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index
	0				GC	Alluvium (Qa) - Clayey GRAVEL with sand, medium dense to dense, moist, dark brown to moderate brown, 3-4 in. gravel typ., roots and organics are common					
	1										
	2										
	3						71.4	45.6			
4545	4										
	5										
	6				SC	Clayey SAND with gravel, loose to medium dense, moderate gray to moderate brown, moist to wet	91.1	34.5			
	7										
	8		▼								
4540	9										
	10										
	11										
	12					Groundwater observed at 8 feet below existing grade					
	13										
4535	14										

Moisture Content and Atterberg Limits
Plastic Limit | Moisture Content | Liquid Limit
10 20 30 40 50 60 70 80 90

SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
▼ - MEASURED
▽ - ESTIMATED

NOTES:
Location is approximate with elevation based on the grading plan by CIR

Figure
A-9

LOG OF TEST PITS - 4 LINE HEADER W ELEV 03638-001.GPJ IGES.GDT 8/16/21

DATE
STARTED: 3/19/21
COMPLETED: 3/19/21
BACKFILLED: 3/19/21

Geotechnical Investigation
Flex Warehouse
748 East Quality Drive
American Fork,, Utah Project Number 03638-001

IGES Rep: BF
Rig Type: JCB-4CX

TEST PIT NO: **TP-6**
Sheet 1 of 1

LOCATION
LATITUDE 40.36095 LONGITUDE -111.77818 ELEVATION 4,548

DEPTH ELEVATION	DEPTH FEET	SAMPLES	WATER LEVEL	GRAPHICAL LOG	UNIFIED SOIL CLASSIFICATION	MATERIAL DESCRIPTION	Dry Density(pcf)	Moisture Content %	Percent minus 200	Liquid Limit	Plasticity Index	Moisture Content and Atterberg Limits (Plastic Limit — Moisture Content — Liquid Limit; 10 20 30 40 50 60 70 80 90)
	0					**Undocumneted Fill** - Broken Concrete						
	1				CL	**Alluvium (Qa)** - Gravelly CLAY with sand, loose to medium dense, moist, moderate brown						
4545	2											
	3											
	4				SC	Clayey SAND with gravel, medium dense to dense, moist, moderate brown						
	5					Well cemented, frequent iron oxidation Very hard digging						
	6					Groundwater not observed Refusal at 6 feet						
4540	7											
	8											
	9											
	10											
	11											
	12											
4535	13											
	14											

SAMPLE TYPE
- GRAB SAMPLE
- 3" O.D. THIN-WALLED HAND SAMPLER

WATER LEVEL
- MEASURED
- ESTIMATED

NOTES:
Location is approximate with elevation based on the grading plan by CIR

Figure A-10

LOG OF TEST PITS - 4 LINE HEADER W ELEV 03638-001.GPJ IGES.GDT 8/16/21

FORM 111 2M 10-56

WIN 13415

ENT 49455:2023 PG 165 of 239

PHOTOSTATED
Copied VT 6-16-58
Exam. & Recorded JH 8-15-57
Exam. for filing mw 12-10-57
Final Copy checked
Indexed AF 3-13-58
Well No (D-5-1)25aba-1

PAGE (Leave Blank)

Report No. 19903
Filed July 6 1957
Rec. By mw
Ret'd

Report of Well and Tunnel Driller
STATE OF UTAH

(Separate report shall be filed for each well or tunnel)

GENERAL INFORMATION: S27-474

Report of well or tunnel driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of well or tunnel. Failure to file such reports constitutes a misdemeanor.)

1. Name and address of person, ~~company or corporation boring or~~ drilling well ~~or tunnel~~. (Strike words not needed)
Eldon Comer, Lehi, Utah TITLE CHANGE-SEE ABSTRACT

2. Name and address of owner of well ~~or tunnel~~ (Strike Words not needed) Frank S. Upright
American Fork, Utah

3. Source of supply is in American Fork, Utah County;
(Leave blank) drainage area; (Leave blank) artesian basin

4. The number of approved application to appropriate water is 29117

5. Location of well ~~or mouth of tunnel~~ is situated at a point
South 570.4 feet and East 1123.20 feet from the N¼ Cor Sec. 25, T5S, R1E, SLB&M.
(Describe by rectangular co-ordinates or by one course and distance with reference to U. S. Government Survey Corner — Copy description from well owner's approved application)

6. Date on which work on well ~~or tunnel~~ was begun (Strike words not needed) June 3, 1957

7. Date on which work on well ~~or tunnel~~ was completed ~~or abandoned~~ (Strike words not needed) June 8, 1957

8. Maximum quantity of water measured as flowing ~~pumped or~~ (Strike words not needed) on completion of well ~~or tunnel in sec. ft.~~; or in gals. per minute 75 Date JUne 8, 1957

DETAIL OF COLLECTING WORKS:

9. WELL: It is drilled, ~~dug~~, flowing ~~or pump~~ well. (Strike words not needed) Temperature of water ... °F.

(a) Total depth of well is 119 ft. below ground surface.

(b) If flowing well, give water pressure (hydrostatic head) above ground surface ... ft.

(c) If pump well, give depth from ground surface to water surface before pumping ...; during pumping ...

(d) Size and kind of casing 3 inch standard black pipe (If only partially cased, give details)

(e) Depth to water-bearing stratum 95 feet (If more than one stratum, give depth to each)

(f) If casing is perforated, give depth from ground surface to perforations 113 feet

(g) Log of well 1-3 Soil. 3-95 Clay with some Sand ...

a4891 (55-1555)

ENT 49455:2023 PG 166 of 239

Form 113—5M—12-60

Examined 12-4-67 V.L.C.

Recorded: B. C. 12-4-67 V.L.C. T. B. L.K.

Inspection Sheet 12-4-67 R.M.

Copied 12/8/67 Sue

REPORT OF WELL DRILLER
STATE OF UTAH

Application No.

Claim No. a 4891 (55-1555)

Coordinate No. (D-5-1)25 ab2

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.)

(1) WELL OWNER:

Name KEITH JACOBS

Address PLEASANT GROVE

(2) LOCATION OF WELL:

County UTAH Ground Water Basin (leave blank)

550 feet South, 1000 feet East from N¼ Corner

of Section 25, T 5 S, R 1 E SLBM (strike out words not needed)

(3) NATURE OF WORK (check):

New Well ☐ Replacement Well ☑ Deepening ☐ Repair ☐ Abandon ☐

If abandonment, describe material and procedure:

(4) NATURE OF USE (check):

Domestic ☐ Industrial ☐ Municipal ☐ Stockwater ☐

Irrigation ☑ Mining ☐ Other ☐ Test Well ☐

(5) TYPE OF CONSTRUCTION (check):

Rotary ☐ Dug ☐ Jetted ☐

Cable ☑ Driven ☐ Bored ☐

(6) CASING SCHEDULE:

Threaded ☐ Welded ☑

6 " Diam. from 0 feet to 376 feet Gage STD

" Diam. from feet to feet Gage

" Diam. from feet to feet Gage

New ☑ Reject ☐ Used ☐

(7) PERFORATIONS:

Perforated? Yes ☑ No ☐

Type of perforator used MILLS KNIFE

Size of perforations ¼ inches by 2 inches

20 perforations from 300 feet to 304 feet

175 perforations from 337 feet to 372 feet

perforations from feet to feet

perforations from feet to feet

perforations from feet to feet

(8) SCREENS:

Well screen installed? Yes ☐ No ☑

Manufacturer's Name

Type Model No.

Diam. Slot size Set from ft. to

Diam. Slot size Set from ft. to

(9) CONSTRUCTION:

Was well gravel packed? Yes ☐ No ☐ Size of gravel:

Gravel placed from feet to feet

Was a surface seal provided? Yes ☐ No ☐

To what depth? feet

Material used in seal:

Did any strata contain unusable water? Yes ☐ No ☐

Type of water: Depth of strata

(12) WELL TESTS:

Drawdown is the distance in feet the water level is lowered below static level.

Was a pump test made? Yes ☐ No ☐ If so, by whom?

Yield: gal./min. with feet drawdown after hours

" " " " "

" " " " "

Bailer test gal./min. with feet drawdown after hours

Arterian flow 400 g.p.m. Date SEPT 16 1967

Temperature of water Was a chemical analysis made? No ☐ Yes ☐

(13) WELL LOG:

Diameter of well 6 inches

Depth drilled 376 feet. Depth of completed well 376 feet.

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
0	3											SOIL
3	14	X										BLUE
14	22			X	X							
22	31			X								BROWN
31	40			X	X							
40	76			X	X							GRAVEL STRATIFIED
76	94	X										BLUE
94	213			X	X							
213	233	X		X								TAN
233	236			X	X							DIRTY
236	241	X		X	X							BROWN
241	267	X		X	X							BLUE
267	300	X										BLUE
300	304			X	X							
304	314	X		X								TAN
314	328	X		X	X							CLAY IN STREAKS
328	337	X		X								TAN
337	372			X	X							
372	376	X										TAN

ENT 49455:2023 PG 167 of 239

Form 168

WELL INSPECTION REPORT

Water Right Application No. a4891 (55-1555) Date 11/19/68

Owner's Name Keith Jacobs

Owner's Address Pleasant Grove, Utah

Well location (from application or claim) South 550 ft. and East 1000 ft. from NE Cor. of Sec. 25, T 5 S., R 1 E., SLB&M. County Utah

New Well ____ Repair ____ Clean ____ Deepen ____ Replace X

Diameter of Casing 6" New X Used ____

If "used" casing, was it inspected before being used? Yes

Replacement Well

New well is located ____ feet east or west and ____ feet north or south from old well.

Has old well been plugged? Yes By whom? Frank Jensen

Date plugged 11/19/68 Method of plugging Mud Jack

(Water rights Div.) State Engineer Sealed off two wells #1-5" well casing #2-4" well casing

Flowing Well

Type of control: Valve (X) Cap ( ) Other ( )

If other than commercial valve or cap, describe the type of control ____

Is the control effective? Yes

If not, explain why: ____

Does water leak around casing when control is closed? No

If so, what is the rate of leakage? ____

Was the well in use at time of inspection? Yes

Does the well yield sand? No Are there signs of caving? No

Non-Flowing Well

Was the well equipped with pump at time of inspection? ____

Does well pump sand? ____ Are there signs of caving? ____

Comments: ____

Nature of Use

Domestic ____ Stock ____ Irrigation X Municipal ____ Mining ____ Other ____

If "other" describe use ____

Rate of Discharge

Estimated ____ Measured ____ Method of Measurement: ____

(State whether g.p.m. or c.f.s.)

Tag placed on well Yes Tag already on well ____ Tag needs to be prepared ____

Comments: None

Inspection made by Frank Jensen

Form 113—5M—12-60

Examined 2-28-61 ACT

Recorded: B. C. 2-28-61 ACT T. B. ACT

Inspection Sheet Yes 3-14-61

Copied

REPORT OF WELL DRILLER
STATE OF UTAH
2-71-266

Application No. 2991

Claim No.

Coordinate No. (D-5-1)2

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with t
(This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Fa
reports constitutes a misdemeanor.)

(1) WELL OWNER:
Name FLOYD K VEST

Address AMERICAN FORK

(2) LOCATION OF WELL:
County UTAH Ground Water Basin (leave blank)

~~Minutes~~ 10 feet, ~~East~~ West 1313 feet from NE Corner

of Section 25, T 5 ~~N~~ S, R 1 E SLBM (strike out words not needed)

(3) NATURE OF WORK (check):
New Well ☑ Replacement Well ☐ Deepening ☐ Repair ☐ Abandon ☐

If abandonment, describe material and procedure:

(4) NATURE OF USE (check):
Domestic ☐ Industrial ☐ Municipal ☐ Stockwater ☐

Irrigation ☑ Mining ☐ Other ☐ Test Well ☐

(5) TYPE OF CONSTRUCTION (check):
Rotary ☐ Dug ☐ Jetted ☑

Cable ☐ Driven ☐ Bored ☐

(6) CASING SCHEDULE:
Threaded ☐ Welded ☐

4 " Diam. from 0 feet to 315 feet Gage STD

" Diam. from feet to feet Gage

" Diam. from feet to feet Gage

New ☐ Reject ☐ Used ☐

(7) PERFORATIONS:
Perforated? Yes ☑ No ☐

Type of perforator used BURNT SLOT

Size of perforations ⅛ inches by 1D inches

16 perforations from 306 feet to 314 feet

perforations from feet to feet

perforations from feet to feet

perforations from feet to feet

perforations from feet to feet

(8) SCREENS:
Well screen installed? Yes ☐ No ☑

Manufacturer's Name

Type Model No.

Diam. Slot size Set from ft. to

Diam. Slot size Set from ft. to

(9) CONSTRUCTION:
Was well gravel packed? Yes ☐ No ☑ Size of gravel:

Gravel placed from feet to feet

Was a surface seal provided? Yes ☐ No ☐

To what depth? feet

Material used in seal:

(12) WELL TESTS:
Drawdown is the distance in feet th
ered below static level.

Was a pump test made? Yes ☐ No ☑ If so, by whom?

Yield: gal./min. with feet drawdown after

" " " "

" " " "

Bailer test gal./min. with feet drawdown aft

Arterian flow 200 g.p.m. Date JAN

Temperature of water Was a chemical analysis made?

(13) WELL LOG:
Diameter of well 4"

Depth drilled 315 feet. Depth of completed well

NOTE: Place an "X" in the space or combination of spaces needed to
or combination of materials encountered in each depth interval. Under
desirable notes as to occurrence of water and the color, size, nature
countered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
0	4											SOIL
4	28	X										TAN
28	55			X	X							
55	91	X		X								BLUE
91	140			X	X							
140	147	X										TAN
147	168			X	X							
168	177	X										TAN
177	217			X	X							
217	225	X										TAN
225	244			X	X							
244	245	X										BLUE
245	257			X	X							
257	306	X										WATE
306	315			X	X							

WIN 13412

[redacted] nt 6-17-58
Exam. & Recorded 6-2-58 ACT
Exam. for filing 6-2-58 ACT
Final Copy checked
Indexed 10-5-2-57
Well No. (D-5-1)25ada-3

PAGE (Leave Blank)

Report No. 13150
Filed Nov. 8, 1957
Rec. By
Ret'd

Report of Well and Tunnel Driller
STATE OF UTAH

(Separate report shall be filed for each well or tunnel)

GENERAL INFORMATION: D62-10

Report of well or tunnel driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of well or tunnel. Failure to file such reports constitutes a misdemeanor.)

1. Name and address of person, ~~company or corporation boring or~~ drilling well ~~or tunnel~~. (Strike words not needed)

Elden Comer, Lehi, Utah

2. Name and address of owner of well ~~or tunnel~~ (Strike Words not needed) D. Moroni Shelley TITLE CHANGE-SEE ABSTRACT

Pleasant Grove, Utah

3. Source of supply is in American Fork, Utah County; ..... (Leave blank) drainage area; ..... (Leave blank) artesian basin

4. The number of approved application to appropriate water is 28503

5. Location of well ~~or mouth of tunnel~~ is situated at a point

N. 1318 ft. and West 417 ft. of the SE Cor. of NE¼ of Sec. 25, T5S, R1E, SLB&M.

(Describe by rectangular co-ordinates or by one course and distance with reference to U. S. Government Survey Corner — Copy description from well owner's approved application)

6. Date on which work on well ~~or tunnel~~ (Strike words not needed) was begun September 23, 1957

7. Date on which work on well ~~or tunnel~~ was completed ~~or abandoned~~ (Strike words not needed) October 14, 1957

8. Maximum quantity of water measured as flowing, pumped or ..... (Strike words not needed) on completion of well ~~or tunnel~~ in sec. ft. ....; or in gals. per minute 250 Date Oct. 14, 1957

DETAIL OF COLLECTING WORKS:

9. WELL: It is ~~drilled, dug~~, flowing ~~or pump~~ well. (Strike words not needed) Temperature of water ..... °F.

(a) Total depth of well is 168 ft. below ground surface.

(b) If flowing well, give water pressure (hydrostatic head) above ground surface ..... ft.

(c) If pump well, give depth from ground surface to water surface before pumping ..... ; during pumping .....

(d) Size and kind of casing 4 inch standard black pipe (If only partially cased, give details)

(e) Depth to water-bearing stratum 90 feet- 145 feet- 155 feet (If more than one stratum, give depth to each)

(f) If casing is perforated, give depth from ground surface to perforations 160 feet

(g) Log of well 1-63 Clay, 63-90 Clay and Sand, 90-107 Sand & Gravel, 107-145 Clay with some Sand, 145-150 Sand & Gravel, 150-155 Clay.

WELL ABANDONMENT REPORT

WIN 13412

State of Utah
Division of Water Rights

ENT 49455:2023 PG 170 of 239

Well Identification

Water Right: 55-823 WIN: 13412

Owner *Note any changes*

American Fork City
ATTN: Public Works Director
275 East 200 North
American Fork, UT 84003

Contact Person/Engineer: _____

Well Location *Note any changes*

N 1318 W 417 from the E4 corner of section 25, Township 5S, Range 1E, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Existing Well Details

Is a Well Driller's Report Available? ☐ Yes ☒ No

Well Depth 168' feet Well Diameter 4" inches

Nature of Use: ☒ Dom. ☐ Irr. ☐ Stock ☐ Industrial ☐ Commercial ☐ Municipal ☐ Monitor ☐ Other _____

Casing Type: ☒ Steel ☐ Stainless Steel ☐ PVC ☐ Fiberglass ☐ ABS ☐ SR ☐ Other _____

Openings: ☐ Screen ☐ Perforations ☐ Open Pipe Screen/Perforation Interval _____

Filter Pack? ☐ Yes ☐ No Depth of Surface Seal _____ feet

Static Water Level 4' feet Flowing Well? ☐ Yes ☒ No

Other Details (if known) _____

Abandonment Details

Date of Abandonment 2-24-21

Reason for Abandonment Developing Property

Method of Abandonment (Include a description of the seal placement and procedures, amount of casing/screen removed, pump/piping removal, termination of casing at the surface, problems encountered, and other pertinent information).

high Pressure grout until Full going to Cut of
Below Final grade

DEPTH (feet)		ABANDONMENT MATERIAL DETAILS		
FROM	TO	ABANDONMENT MATERIAL USED	Quantity of Material Used (e.g., cubic yards, lbs)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
+1	168'	Neat Cement grout	18 Bags	92lb bags/6gal mix

RECEIVED
MAR 04 2021
WATER RIGHTS
SALT LAKE
HP

Location of a new well (if present) is N/A ft north/south and N/A ft east/west from the abandoned well.

SCANNED LP

Well Driller Statement This well was abandoned under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name MILLER DRILLING INC (Person, Firm, or Corporation - Print or Type) License No. 292

Signature _____ (Licensed Well Driller) Date 3-2-21

10. **TUNNEL:** It is timbered, tiled, piped, open, bulkheaded, covered or.....
(Strike words not needed)

(a) Dimensions.....; total length.....; temperature of water.....

(b) Position of water bearing stratum or strata with reference to mouth of tunnel.....

.....

.....

(c) Log of tunnel.....

.....

.....

.....

11. **GENERAL REMARKS:** (Note any general or detailed information not covered above).

STATE OF UTAH,
COUNTY OF Salt Lake } ss.

I, Eldon Comer, being first duly sv

Telephone
Aug. 4.

Listed on well record
Listed by counties
Copied mjh 8-10-50
Exam. & Recorded M.V. 6-13-50
Exam. for filing
Final Copy checked mjh 8-8-50
Platted & No. Assigned
Indexed mjh 7-22-50
Engr. tied well
Engr. set BM
Well No. (D-5-1)25.aaa3

D-42-SP3 PAGE (Leave Blank)

Report No.
Filed Jan
Rec. By
Ret'd

Report of Well and Tunnel Driller
STATE OF UTAH

(Separate report shall be filed for each well or tunnel)

GENERAL INFORMATION:

Report of well or tunnel driller is hereby made and filed with the State Engineer with Sec. 100-3-22, Utah Code Annotated, 1943. (This report shall be filed with the within 30 days after the completion or abandonment of well or tunnel. Failure to constitutes a misdemeanor.)

1. Name and address of person, ~~company or corporation boring or~~ drilling well ~~or t~~ (Strike words not needed)
Elden Cowen Telu Ut

2. Name and address of owner of well ~~or tunnel~~ William C (Strike Words not needed)
Rt #1 American Fork

3. Source of supply is in American Fork. Ut
(Leave blank) drainage area; (Leave blank)

4. The number of approved application to appropriate water is 2152

5. Location of well ~~or mouth of tunnel~~ is situated at a point 1-26
S. 600.8 ft. W 496.9 ft from NE Cor Sec 25 T5S R1
(Describe by rectangular co-ordinates or by one course and distance with reference to U. S. Government Corner — Copy description from well owner's approved application)

6. Date on which work on well ~~or tunnel~~ was begun April 15
(Strike words not needed)

7. Date on which work on well ~~or tunnel~~ was completed ~~or abandoned~~ May
(Strike words not needed)

8. Maximum quantity of water measured as flowing, ~~pumped or~~
(Strike words not needed)
well ~~or tunnel in sec. ft.~~; or in gals. per minute 100

DETAIL OF COLLECTING WORKS:

9. WELL: It is drilled, ~~dug,~~ flowing ~~or pump~~ well. Temperature of water
(Strike words not needed)

(a) Total depth of well is 220' ft. below ground surface.

(b) If flowing well, give water pressure (hydrostatic head) above ground surf

(c) If pump well, give depth from ground surface to water surface before pum
; during pumping

(d) Size and kind of casing 4" Standard block
(If only partially cased, give details)

(e) Depth to water-bearing stratum 190'
(If more than one stratum, give depth to

(f) If casing is perforated, give depth from ground surface to perforations

(g) Log of well 1-2 Soil and gravel. 3-12 clay

WELL ABANDONMENT REPORT
State of Utah
Division of Water Rights

WIN 13416

Well Identification

Water Right: 55-757 WIN: 13416

Owner *Note any changes*

Elbert Kay Vest
RFD #1 Box 38
American Fork UT 84003

Contact Person/Engineer: _____

Well Location *Note any changes*

S 601 W 497 from the NE corner of section 25, Township 5S, Range 1E, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Existing Well Details

Is a Well Driller's Report Available? ☐Yes ☒No

Well Depth 160' feet Well Diameter 4" inches

Nature of Use: ☒Dom. ☒Irr. ☒Stock ☐Industrial ☐Commercial ☐Municipal ☐Monitor ☐Other _____

Casing Type: ☒Steel ☐Stainless Steel ☐PVC ☐Fiberglass ☐ABS ☐SR ☐Other _____

Openings: ☐Screen ☐Perforations ☒Open Pipe Screen/Perforation Interval _____

Filter Pack? ☐Yes ☐No Depth of Surface Seal _____ feet

Static Water Level 12' feet Flowing Well? ☐Yes ☒No

Other Details (if known) _____

Abandonment Details

Date of Abandonment 1-15-21

Reason for Abandonment IT'S in The way For new Development

Method of Abandonment (Include a description of the seal placement and procedures, amount of casing/screen removed, pump/piping removal, termination of casing at the surface, problems encountered, and other pertinent information)

High pressure grout until Full.

DEPTH (feet)		ABANDONMENT MATERIAL DETAILS		
FROM	TO	ABANDONMENT MATERIAL USED	Quantity of Material Used (e.g., cubic yards, lbs)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0	160	neat Cement grout	12/92lb Bags	6gal/sack

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JAN 27 2021 LI
WATER RIGHTS
SALT LAKE

Location of a new well (if present) is N/A ft north/south and N/A ft east/west from the abandoned well.

Well Driller Statement This well was abandoned under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief

Name MILLER DRILLING INC License No. 292

Signature _____ Date 1-25-21

Abandonment

Listed on well record ..
Listed by counties
Copied 4-15-36 (12-2-36) Hill
Exam. & returned
Exam. for final 6-11-36 Hall 12-11-36 C.H.B.
Final Corr. checked 2-15-37 V.B.T. T.C.
Platted & No. Assigned 2-11-37 E.E.P.
Indexed 2-11-37 E.E.P. M.G.
Engr. tied well
Engr. set BM
Well No.

PAGE
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Underground Water Claim
STATE OF UTAH

(Separate Claim shall be filed for each well, tunnel or drain)

Claim No. 4522
Filed Feb 25 1936
Rec. By Mail Dept
Rec. $2.50 Fee
55-2118

GENERAL INFORMATION:

Claim to underground water by right of use, prior to March 22, 1935, is hereby made and filed with the State Engineer, together with a filing fee of $2.50, and submitted in accordance with sections 100-5-12 and 100-2-14, Revised Statutes of Utah, 1933, as amended by Session Laws of 1935.

1. Name of claimant David E. Shirley, Silver Oak Limited Partnership
2. Post Office address of claimant American Fork, Utah.
3. Amount of water claimed and used each year for irrigation is 350.0 ~~sec. ft. or~~ g. p. m. (Strike words not needed)
   from April 1st (Month) (Day) to October 31st (Month) (Day) both incl.
   and 1.0 ~~sec. ft. or~~ g. p. m. (Strike words not needed) from January 1st (Month) (Day) to December 31st (Month) (Day) both incl.
   for ~~municipal~~, stockwatering, ~~domestic~~ or ____ purposes in Utah county. (Strike words not needed)
   U.A. & S.L. (Leave Blank) Drainage Area; ____ (Leave Blank) Artesian Basin
4. Water is supplied from flowing well, ~~pump well, tunnel, drain~~ (Strike words not needed) and is diverted at a point North 4017.0' and East 3755.3' from the Sec. corner common to Secs. 25, 26, 35 and 36, Township 5 South, Range 1 East, Salt Lake Base and Meridian.
   (Describe by course and distance or by rectangular co-ordinates with reference to a U. S. Gov't Survey Corner)

DETAILS OF COLLECTING WORKS:

5. WELL: It is a drilled, ~~dug~~, flowing, ~~or pump~~ (Strike words not needed) well. Temperature of water 54 °F
   (a) Elev. ground surface at well 4539.58'; (Ft. above sea level) total depth 205 feet (Ft. below ground surface); size 5"
   (b) Hydrostatic head in feet at ground surface if flowing well Not Known (When first drilled); ____ (At this date)
   (c) Depth from ground surface to upper and lower limits of each water bearing stratum 205 to 207. (If more than one stratum, give each)
   (d) Depth to water from ground surface if pump well ____ (When first drilled); ____ (At this date)
   (e) Well, if flowing, is controlled by ~~cap~~, valve, ~~or by~~ (Strike words not needed) ____
   (f) If pump well, give depth from ground surface to water surface before pumping ____; during pumping ____; h. p. of engine or motor ____ (Strike words not needed) pump is reciprocal, turbine, centrifugal, air lift, or ____ (Strike words not needed); size: intake ____ disch. ____.
   (g) Well is ~~curbed~~, cased, ~~lined~~, (Strike words not needed) with steel (If only partially cased, give details), inside diameter 5" inches.
   (h) If casing is perforated, give depth from ground surface to upper and lower limits of each set of perforations No information.
   (i) Log of well is: No information.

HISTORY OF DEVELOPMENT:

8. Give date when development work was first begun August, 1931; when work was completed Sept. 1931; when water was first used Sept. 1931. (Give month and year)

9. Maximum quantity of water diverted in ~~sec. ft.~~ or g. p. m. 350. Date Sept., 1931. (Strike words not needed)

10. Minimum quantity of water diverted in ~~sec. ft.~~ or g. p. m. 130.5 Date Nov. 1935. (Strike words not needed)

11. Quantity of water diverted as of this date in ~~sec. ft.~~ or g. p. m. 130.5 (Strike words not needed)

USE OF WATER:

12. Water is used for irrigation on { ¼ NE ¼ Sec. 25; T5S; R1E; SL M. / ¼ ¼ Sec. ; T ; R ; M.

13. Acres of land irrigated first year 18; acres irrigated each year thereafter with dates 18 each year thereafter until present; acres irrigated as of this date 18

14. If used for stock watering, give number and kind of stock watered 6 horses, 12 head of cattle.

15. Water is used for ~~Domestic~~ Stockwatering. Purposes on Lot Blk Plat Survey in NW ¼ NE ¼; Sec. 25 Tp. 5 S.; Rge 1 E.; SL M.

~~Number of persons supplied ; acres of gardens, laws, etc. irrigated.~~ (Not included in paragraph 13)

16. ~~If for municipal use give name of city or town~~ ; (Population Served)

17. ~~If for mining purposes, name mining district ; name of mine ; kind of ore or mineral mined ; particular purpose for which water is used~~

18. Bench mark on well having elevation of 4541.04 feet above sea level is described as follows Highest point on head of elbow.

19. **GENERAL REMARKS:** (Describe below in detail, the nature and extent of any use not listed, or give other explanatory information not heretofore covered. Use additional sheets if necessary).

Detail description of Bench Mark on Well:
Highest point on head of elbow.
Sea level elevation of Bench Mark: 4541.04'
Well tie, BM and elevation taken by Frank S. Allen.

STATE OF UTAH,

WELL RECORD SHEET

Claim No. 4522

Owner. David E. Shelley

Claim Application No. 4522 (D-5-1). Use Claimed Irrigation, Stockwatering

Well No. 25 abd-2. B.M. Elev. 4541.04. B.M. Description Highest point on head of elbow.

Note: **Elevations are mean sea level in feet; Hydrostatic water level from B.M. unless otherwise stated. *Plus indicates above B.M.; Minus indicates below B.M.

RECORD

Date & Time	Yield G.P.M.	*Hydro-static water level	*Piezo-metric elev.	Tem. °F	Use	Remarks	Observer
							W. H. Roberts
3-25-37	100	+ 16.8	4557.84	52	Irrigation Stockwatering		
2-9-37					Valve leaking	Valve control	" "
6/23/38	109.2				I.	27.1 Ac.ft.	" "
8/12/38	109.2				W.	3.1 "	" "
9/8/38	109.2						" "
1/10/39						Controlled by valve head on 5" Ell	Roberts
3/11/39		+18.0	4559.04		I 49.2 acft	5" outlet	Roberts
5-20-39	104.						"
6-14-39	111.						"
8-13-39	76.						J.M. Jr.
11/30/39						Controlled by valve	
8-5-40	78.	16.8	4557.84		I 32. acft	Found flowing	J.M Jr.
10-8-40	96.					Closed could not mea no 5" plug. Valve control	" "
					Well water only supply for irrigation.		
4-4-40	93.6	16.4	4557.44			Found closed	J.M Jr.
5-15-40	88.2	15.2	4556.24			" "	" "
9-6-40	91.8	14.8	4555.84			" "	" "
4-4-41	102.9	14.7	4556.74			" "	HWN

-Over-

WELL ABANDONMENT REPORT

WIN 438017

State of Utah ENT 49455:2023 PG 177 of 239
Division of Water Rights

Well Identification

Water Right: 55-2118 WIN: 438017

Owner *Note any changes*

American Fork City
31 North Church Street
American Fork UT 84003

Contact Person/Engineer: _____

Well Location *Note any changes*

N 4017 E 3755 from the SW corner of section 25, Township 5S, Range 1E, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation, local well #)

Existing Well Details Is a Well Driller's Report Available? ☐Yes ☐No

Well Depth 207 feet Well Diameter 5 inches

Nature of Use: ☐Dom. ☐Irr. ☒Stock ☐Industrial ☐Commercial ☐Municipal ☐Monitor ☐Other _____

Casing Type: ☐Steel ☐Stainless Steel ☐PVC ☐Fiberglass ☐ABS ☐SR ☐Other _____

Openings: ☐Screen ☐Perforations ☐Open Pipe Screen/Perforation Interval _____

Filter Pack? ☐Yes ☐No Depth of Surface Seal ? feet

Static Water Level Flowing feet Flowing Well? ☒Yes ☐No

Other Details (if known) _____

Abandonment Details Date of Abandonment 10-1-14

Reason for Abandonment Client Request

Method of Abandonment (Include a description of the seal placement and procedures, amount of casing/screen removed, pump/piping removal, termination of casing at the surface, problems encountered, and other pertinent information).

No pump in well - Trimmed from 207' to surface with grout.
Cut casing off 3' from surface

DEPTH (feet)		ABANDONMENT MATERIAL DETAILS		
FROM	TO	ABANDONMENT MATERIAL USED	Quantity of Material Used (e.g., cubic yards, lbs)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
207	30	Pure Gold Grout	1,150 LBS	18.4 Gal water
30	0	Portland I II	80 LBS	6.5 Gal water

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OCT 06 2014 JH
WATER RIGHTS
SALT LAKE

Location of a new well (if present) is _____ ft north/south and _____ ft east/west from the abandoned well.

Well Driller Statement This well was abandoned under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name EARTHCORE DRILLING INC (Person, Firm, or Corporation - Print or Type) License No. 575

Signature David Thibuet (Licensed Well Driller) Date 10-1-14 ✓

WIN 13362
ENT 49455:2023 PG 178 of 239
ENT 49455:2023 PG 178 of 239

Copied DN 11-17-52
Exam. & Recorded MW 11-7-52
Exam. for filing MW 11-7-52
Final Copy checked
Indexed DN 11-17-52
Well No (D-5-1) 24ded.2

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Report No. 9605
Filed Oct 15, 1952
Rec. By DN
Ret'd

Report of Well and Tunnel Driller
STATE OF UTAH

(Separate report shall be filed for each well or tunnel)

GENERAL INFORMATION:

Report of well or tunnel driller is hereby made and filed with the State Engineer, in compliance with Sec. 100-3-22, Utah Code Annotated, 1943. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of well or tunnel. Failure to file such report constitutes a misdemeanor.) 9-57 90 Apvd: June 4, 52

1. Name and address of person, ~~company or corporation boring or~~ drilling well ~~or tunnel~~ (Strike words not needed)
Elbon Corner, Lehi, Utah

2. Name and address of owner of well ~~or tunnel~~ (Strike words not needed) J. B. Evans,
~~845 A.O. Atlate, Provo~~ Rt 2, Box 111, Provo TITLE CHANGE - FEE & ABSTR

3. Source of supply is in ~~American Fork~~ Utah County;
(Leave blank) drainage area; (Leave blank) artesian basin

4. The number of approved application to appropriate water is 23209

5. Location of well ~~or mouth of tunnel~~ is situated at a point N. 45 ft. & W. 1891.2 ft. from SE Cor. Sec. 24, T5S, R1E, SLB&M.
(Describe by rectangular co-ordinates or by one course and distance with reference to U. S. Government Survey Corner — Copy description from well owner's approved application)

6. Date on which work on well ~~or tunnel~~ was begun (Strike words not needed) Sept 3-1952

7. Date on which work on well ~~or tunnel~~ was completed ~~or abandoned~~ (Strike words not needed) Sept 13-195[illegible]

8. Maximum quantity of water measured as flowing, ~~pumped or~~ (Strike words not needed) on completion of well ~~or tunnel in sec. ft.~~; or in gals. per minute 200. Date Sept.

DETAIL OF COLLECTING WORKS:

9. WELL: It is drilled, ~~dug~~, flowing ~~or pump~~ well. Temperature of water °F. (Strike words not needed)

(a) Total depth of well is 167 ft. below ground surface.

(b) If flowing well, give water pressure (hydrostatic head) above ground surface ft.

(c) If pump well, give depth from ground surface to water surface before pumping; during pumping

(d) Size and kind of casing 4" Standard black pipe (If only partially cased, give details)

(e) Depth to water-bearing stratum 95' (If more than one stratum, give depth to each)

(f) If casing is perforated, give depth from ground surface to perforations 130'

(g) Log of well 1-3 soil 3-13-23-33-43-53-6

10. **TUNNEL:** It is timbered, tiled, piped, open, bulkheaded, covered or.....
(Strike words not needed)

(a) Dimensions.....; total length.....; temperature of water.....°F.

(b) Position of water bearing stratum or strata with reference to mouth of tunnel.....

.....

.....

(c) Log of tunnel.....

.....

.....

.....

11. **GENERAL REMARKS:** (Note any general or detailed information not covered above).

RECEIVED
OCT 23 1952
STATE ENGINEER
COUNTER

STATE OF UTAH,
COUNTY OF Salt Lake } ss.

I, Eldon Comer being first duly sworn

Form 113–5M–12-60

Examined Nov. 15-1961 F.C.T.

Recorded: B. C. Nov. 15, 1961 F.C.T. T. B. F.C.T.

Inspection Sheet vg 11-20-61

Copied

REPORT OF WELL DRILLER
STATE OF UTAH

orig cor

Application No.

Claim No. 744

Coordinate No. (8-5-1)25 aaa

GENERAL STATEMENT: Report of well driller is hereby made and filed with the State Engineer, in accordance with the laws of Utah. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of the well. Failure to file such reports constitutes a misdemeanor.)

(1) WELL OWNER:

Name A CARROLL SAGER

Address AMERICAN FORK

(2) LOCATION OF WELL:

County UTAH Ground Water Basin (leave blank)

~~North~~ South 32°00' feet, ~~East~~ West 614 feet from NE Corner

of Section 25, T 5 ~~N~~ S, R 1 E SLBM (strike out words not needed)

(3) NATURE OF WORK (check):

New Well ☐ Replacement Well ☑ Deepening ☐ Repair ☐ Abandon ☐

If abandonment, describe material and procedure:

(4) NATURE OF USE (check):

Domestic ☐ Industrial ☐ Municipal ☐ Stockwater ☐

Irrigation ☑ Mining ☐ Other ☐ Test Well ☐

(5) TYPE OF CONSTRUCTION (check):

Rotary ☐ Dug ☐ Jetted ☐

Cable ☑ Driven ☐ Bored ☐

(6) CASING SCHEDULE:

Threaded ☐ Welded ☑

8 " Diam. from 0 feet to 368 feet Gage STD

" Diam. from feet to feet Gage

" Diam. from feet to feet Gage

New ☑ Reject ☐ Used ☐

(7) PERFORATIONS:

Perforated? Yes ☑ No ☐

Type of perforator used MILLS KNIFE

Size of perforations 3/8 inches by 2 inches

600 perforations from 310 feet to 365 feet

perforations from feet to feet

perforations from feet to feet

perforations from feet to feet

perforations from feet to feet

(8) SCREENS:

Well screen installed? Yes ☐ No ☑

Manufacturer's Name

Type Model No.

Diam. Slot size Set from ft. to

Diam. Slot size Set from ft. to

(9) CONSTRUCTION:

Was well gravel packed? Yes ☐ No ☑ Size of gravel:

Gravel placed from feet to feet

Was a surface seal provided? Yes ☐ No ☐

To what depth? feet

Material used in seal:

Did any strata contain unusable water? Yes ☐ No ☐

(12) WELL TESTS:

Drawdown is the distance in feet the water level is lowered below static level.

Was a pump test made? Yes ☐ No ☑ If so, by whom?

Yield: gal./min. with feet drawdown after hours

" " " " " "

" " " " " "

Bailer test gal./min. with feet drawdown after hours

Artesian flow 400 g.p.m. Date OCT 16-61

Temperature of water Was a chemical analysis made? No ☐ Yes ☐

(13) WELL LOG:

Diameter of well 8" inches

Depth drilled feet. Depth of completed well 368 feet.

NOTE: Place an "X" in the space or combination of spaces needed to designate the material or combination of materials encountered in each depth interval. Under REMARKS make any desirable notes as to occurrence of water and the color, size, nature, etc., of material encountered in each depth interval. Use additional sheet if needed.

DEPTH From	DEPTH To	Clay	Silt	Sand	Gravel	Cobbles	Boulders	Hardpan	Conglomerate	Bedrock	Other	REMARKS
0	4											TOP SOIL
4	21	X										TAN
21	52			X	X							TAN
52	82	X										BLUE
82	133			X	X							
133	140	X										TAN
140	157				X							
157	169	X										TAN
169	213				X							
213	239	X										TAN
239	253			X	X							
253	310	X		X								BLUE
310	368			X	X							

WELL ABANDONMENT REPORT

WIN 444032

State of Utah

Division of Water Rights

Well Identification

Water Right: 55-180 WIN: 444032

Owner *Note any changes*

DLF Vest, LLC
7277 North 4850 West
American Fork, UT 84003

Contact Person/Engineer: Steve Young / Millenial Development

Well Location *Note any changes*

N 508 E 4720 from the SW corner of section 24, Township 5S, Range 1E, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation,local well #)

Existing Well Details

Is a Well Driller's Report Available? ☑Yes ☐No

Well Depth 320 feet Well Diameter 3" & 2" inches

Nature of Use: ☐Dom. ☑Irr. ☑Stock ☐Industrial ☐Commercial ☐Municipal ☐Monitor ☐Other

Casing Type: ☐Steel ☐Stainless Steel ☐PVC ☐Fiberglass ☐ABS ☐SR ☐Other

Openings: ☐Screen ☐Perforations ☑Open Pipe Screen/Perforation Interval

Filter Pack? ☐Yes ☑No ; Depth of Surface Seal feet

Static Water Level 10 feet Flowing Well? ☐Yes ☑No

Other Details (if known) Well was cased TO 220'with 3" 320'with 2"

Abandonment Details

Date of Abandonment 6 - 10 - 2020

Reason for Abandonment New development construction

Method of Abandonment (Include a description of the seal placement and procedures, amount of casing/screen removed, pump/piping removal, termination of casing at the surface, problems encountered, and other pertinent information).

Pressure grouted Thru 2" pull A plug ON 3" Tee Pumped until Cement return OUT of 3" Reflug and Repressured 2" until Refusal 350 psi

DEPTH (feet) FROM	TO	ABANDONMENT MATERIAL DETAILS: ABANDONMENT MATERIAL USED	Quantity of Material Used (e.g., cubic yards, lbs)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0	320	portland Cement Neat	19 - 47lb Bags of portland Cement	1 - 10 Bag mix 1 - 9 Bag mix 3 gallons of water per Bag of Cement

RECEIVED
JUN 19 2020 TL
WATER RIGHTS
SALT LAKE

Location of a new well (if present) is _____ ft north/south and _____ ft east/west from the abandoned well.

Well Driller Statement This well was abandoned under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief

Name ZIMMERMAN, MIKE WELL SERVICE License No. 727

Signature John W. Z Date 6 - 15 - 2020

SCANNED L

Abandonment

ATTACHMENT E

LETTER FROM USACOE TO HADCO DATED AUGUST 21, 2021

WIN 439155

Listed on well record
Listed
Copied 8-19-36 LL
1-28-38 MB
9-15-38 MB
12-26-38 MB
Assigned 2-19-37 EED MA
2-19-37 EED MA
Engineer's Well
Engineer's Set BM
Well No.

PAGE (Leave Blank)

Claim No. 8303

Filed MAR. 19, 1936

Rec. By COUNTER

Rec. $2.50 Fee R.W.

55-2505

Underground Water Claim

STATE OF UTAH

Assigned to the State of Utah 2/3/38
(Separate claim shall be filed for each well, tunnel or drain)

Same as c#2962

GENERAL INFORMATION: Page 253 Book 24

Claim to underground water by right of use, prior to March 22, 1935, is hereby made and filed with the State Engineer, together with a filing fee of $2.50, and submitted in accordance with Sections 100-5-12 and 100-2-14, Revised Statutes of Utah, 1933, as amended by Session Laws of 1935.

1. Name and address of claimant State of Utah UTAH EMERGENCY RELIEF ADMINISTRATION, Capitol Bldg.

2. Name, ~~if any~~, of well, ~~tunnel, drain, etc.~~ from which water is claimed Proj. #174 well #13
(Strike words not needed)

3. Amount of water claimed in ~~Sec. ft.~~ or g. p. m. 80; ~~or Ac. ft.~~
(Strike words not needed)

4. Water is used each year from April 1 (Month) (Day) to Oct. 31 (Month) (Day)

5. Source of supply is in Utah County;

U. L. & J. R. (Leave Blank) Drainage Area; (Leave Blank) Artesian Basin

6. Water is supplied from flowing well, ~~pump well, tunnel, drain or~~
(Strike words not needed)

and is diverted at a point ~~12 ch. W. & 36 ch. W. of S.E. cor. sec. 24,~~ ~~T5S., R1E., S. L. B. & M.~~ N. 880 ft. and E. 2948 ft. from sec. cor. cont. to Sec's 23-24-25-26- T.5S. R.1E. S.L.B.&M.
(Describe by course and distance with reference to a U. S. Govt. Survey Corner)

DETAILS OF COLLECTING WORKS:

7. **WELL:** It is drilled, ~~dug~~, flowing, ~~or pump well~~. Temperature of water ° F.
(Strike words not needed)

(a) Elev. ground surface at well 4558.40 (Ft. above sea level); total depth 308 (Ft. below ground surface); size 4"

(b) Pressure lbs. per sq. inch at ground surface if flowing well (When first drilled); (At this date)

(c) Depth to water bearing stratum Omitted on log
(If more than one stratum, give depth to each)

(d) Depth to water from ground surface if pump well (When first drilled); (At this date)

(e) Well, if flowing, is controlled by ~~cap~~, valve, ~~or by~~
(Strike words not needed)

(f) If pump well, give depth from ground surface to water surface before pumping ; during pumping ; h. p. of engine or motor ;
(Strike words not needed)

size and kind of pump

(g) Size and kind of casing 265' of 4" threaded steel casing
(If only partially cased, give details)

(h) If casing is perforated, give depth from ground surface to perforations Not perforated

(i) Log of well Sheet attached

8. **TUNNEL:** It is timbered, tiled, piped, open, bulkheaded, caved or
(Strike words not needed)

HISTORY OF DEVELOPMENT:

10. Give date when development work was first begun June 1, 1934; when work was completed June 14, 1934 when water was first used June 1934 (Give month and year)

11. Maximum quantity of water diverted in ~~sec. ft.~~ or g. p. m. 80 Date 1934 (Strike words not needed)

12. Minimum quantity of water diverted in sec. ft. ..... or g. p. m. ..... Date ..... (Strike words not needed)

13. Quantity of water diverted as of this date in ~~sec. ft.~~ or g. p. m. 80 (Strike words not needed)

USE OF WATER:

14. Water is used for irrigation, ~~stock watering, domestic, municipal, mining or~~ (Strike words not needed)

15. Place of use Russel Thompson property (If for irrigation, give legal subdivisions)

16. Acres of land irrigated first year ..... ; acres irrigated each year thereafter with dates

..... ; acres irrigated as of this date .....

17. If used during non-irrigation season, give amount in ~~sec. ft.~~ or ~~g. p. m.~~ (Strike words not needed)

and nature of use .....

18. If used for stock watering, give number and kind of stock watered .....

19. If used for domestic purposes, give place of use ..... ;

number of persons supplied ..... ; acres of gardens, lawns, etc. irrigated .....

20. If for municipal use, give name of city or town ..... ; (Population Served)

21. If for mining purposes, name mining district ..... ; name of mine ..... ;

kind of ore or mineral mined ..... ; particular purpose for which water is used

.....

22. **GENERAL REMARKS:** (Describe below in detail, the nature and extent of any use not listed, or give other explanatory information not heretofore covered. Use additional sheets if necessary.)

Detail Description of Bench Mark on Well Uppermost point of bead on Ell

Sea level elevation of bench mark 4558.49

#13 of 27 wells drilled under Lower American Fork Artesian Project.

STATE OF UTAH,

COUNTY OF Salt Lake } ss.

FORM NO. 35

STATE OF UTAH
OFFICE OF STATE ENGINEER
WELL RECORD SHEET

Claim ~~xx~~ 1962
~~Application~~ No. 8303
Assigned to the State of Utah

Owner Utah Emergency Relief Administrat

Use Claimed Irrigation

Well No. (D-5-1)24dcc-1 B.M. Elev. 4558.49 B.M. Description: Uppermost point of bead on ell.

Note:***Elevations are mean sea level in feet; Hydrostatic water level from B.M. unless otherwise stated. *Plus (+) indicates above BM.;Minus(-) indicates below B.M.

RECORD

Date & Time	Yield G.P.M.	*Hydro-static water level	*Piezo-metric elev.	TEM. °F	Use	Remarks	Observer
8/25/37	100	+24.6	4583.09	52	Irrigation Stockwatering		William H. Roberts
6-15-38		+31.0	4589.49			Bead on 4" ell on vert. casing	L. Mangle
7-22-38	94.6				I 27.8 ac.ft	Waste 51.8 ac. ft	
8-12-38	103.2					controlled by woodenplug	" "
9-15-38	107.2						" "
							" "
						controlled by valve	Roberts
1-10-39						Bead on 4" ell	" "
3-11-39		+30.0	4588.49		I 69. ac.ft	controlled by valve	"
4-29-39	86.						"
6-13-39	92						"
9-14-39	87.5					controlled by valve	J. M. Jr.
12-19-39							
3-7-40	62.	26.6	4585.09			Found closed.	J M Jr
5-14-40	62.4	23.9	4582.39			" "	" "
8-12-40	76.					Found flowing	" "
9-6-40	78.8	22.0	4558.49			well water supply by Utah Valve Control	" "
10-1-40	76.				I 40. ac.ft flow from 1¼" pipe	Found flowing	" "
3-19-41	66.	25.2	4583.69			Found closed.	" "

Over-

WELL ABANDONMENT REPORT

WIN 439155

ENT 49455:2023 PG 186 of 239

State of Utah
Division of Water Rights

Well Identification

Water Right: 55-2505 WIN: 439155

Owner *Note any changes*

State of Utah Board of Water Resources
1594 West North Temple, Ste 310
Salt Lake City UT 84114-6201

Contact Person/Engineer: Field stone homes / Andy Hamm

Well Location *Note any changes*

N 660 E 2849 from the SW corner of section 24, Township 5S, Range 1E, SL B&M

Location Description: (address, proximity to buildings, landmarks, ground elevation, local well #)

Existing Well Details

Is a Well Driller's Report Available? ☒ Yes ☐ No

Well Depth 302' feet Well Diameter 4" inches

Nature of Use: ☒ Dom. ☐ Irr. ☐ Stock ☐ Industrial ☐ Commercial ☐ Municipal ☐ Monitor ☐ Other

Casing Type: ☒ Steel ☐ Stainless Steel ☐ PVC ☐ Fiberglass ☐ ABS ☐ SR ☐ Other

Openings: ☐ Screen ☐ Perforations ☐ Open Pipe Screen/Perforation Interval

Filter Pack? ☐ Yes ☐ No Depth of Surface Seal feet

Static Water Level 90' feet Flowing Well? ☐ Yes ☒ No

Other Details (if known)

Abandonment Details

Date of Abandonment 11/25/15

Reason for Abandonment Development

Method of Abandonment (Include a description of the seal placement and procedures, amount of casing/screen removed, pump/piping removal, termination of casing at the surface, problems encountered, and other pertinent information).

Sawcut 4" casing 200' Pressure pumped well, full of neat cement

DEPTH (feet) FROM	TO	ABANDONMENT MATERIAL USED	Quantity of Material Used (e.g., cubic yards, lbs)	GROUT DENSITY (lbs./gal., # bag mix, gal./sack etc.)
0	200	neat cement	66 Bags	70 lbs 4 gals water

RECEIVED
JAN 04 2016 JH
WATER RIGHTS
SALT LAKE

Location of a new well (if present) is — ft north/south and — ft east/west from the abandoned well.

Well Driller Statement This well was abandoned under my supervision, according to applicable rules and regulations, and this report is complete and correct to the best of my knowledge and belief.

Name ZIMMERMAN, MIKE WELL SERVICE (Person, Firm, or Corporation - Print or Type) License No. 527

Signature Mike Z (Licensed Well Driller) Date 12-27-15

Abandonment

WIN 444032

Report No. 278
Filed 11/24/42, 198
Rec. By Cassaties R.C.P.
Rec. $1.00 Fee

PAGE (Leave Blank)

l on well record
l by counties
ed P.C. 12-19-42
n. & Recorded N.J.Y. 11-25-42
n. for filing Jan 1-8-43
Copy checked MH. 1-11-43
ed & No. Assigned
xed MH. 1-11-43
. tied well
r. set BM
No.

Report of Well and Tunnel Driller
STATE OF UTAH

(Separate report shall be filed for each well or tunnel)

GENERAL INFORMATION:

Report of well or tunnel driller is hereby made and filed with the State Engineer, together with a filing fee of $1.00, submitted in accordance with Sections 100-3-22 and 100-2-14, Revised Statutes of Utah 1933, as amended by Session Laws of 1935. (This report shall be filed with the State Engineer within 30 days after the completion or abandonment of well or tunnel. Failure to file such report constitutes a misdemeanor.)

1. Name and address of person, ~~company or corporation~~ (Strike words not needed) boring or drilling well ~~or tunnel~~

Conrad Meag, Provo, Utah

2. Name and address of owner of well ~~or tunnel~~ (Strike words not needed) Elbert K. Vest, ~~American Fork, Utah~~

3. Source of supply is in Utah County; (Leave blank) artesian basin drainage area; (Leave blank)

4. The number of approved application to appropriate water is 14716

5. Location of well ~~or mouth of tunnel~~ is situated at a point N. 508 ft. + E. 4720 ft. from Sec. Cor. common to Secs. 23, 24, 25 & 26, T. 5 S., R. 1 E. (SW Cor. sec. 24) S. L. B. & M.
(Describe by course and distance with reference to U. S. Government Survey Corner — copy description from well owners' approved application)

6. Date on which work on well ~~or tunnel~~ (Strike words not needed) was begun May 28, 1942

7. Date on which work on well ~~or tunnel~~ (Strike words not needed) was completed ~~or abandoned~~ September 30, 1942

8. Maximum quantity of water flowing, ~~pumped or dipped~~ (Strike words not needed) on completion of well ~~or tunnel~~ in sec. ft.; or in gals. per minute 110; Date September 30, 1942

DETAIL OF COLLECTING WORKS:

9. **WELL:** It is a ~~drilled, dug~~, flowing ~~or pump~~ (Strike words not needed) well. Temperature of water 57 ° F.

(a) Total depth of well is 320 ft. below ground surface.

(b) Pressure in ~~lbs. per sq. inch~~ (hydrostatic head) at ground surface if flowing well 30 ft.

(c) If pump well, give depth from ground surface to water surface before pumping ; during pumping

(d) Size and kind of casing 3-in. to 220 ft. & 2-in. to 320 ft. (If only partially cased, give details)

(e) Depth to water bearing stratum 220 ft. (If more than one stratum, give depth to each)

10. **TUNNEL:** It is timbered, tiled, piped, open, bulkheaded, covered or.....
(Strike words not needed)

(a) Dimensions.....; total length.....; temperature of water.....° F.

(b) Position of water bearing stratum or strata with reference to mouth of tunnel.....

.....

.....

(c) Log of tunnel .....

.....

.....

.....

11. **GENERAL REMARKS:** (Note any general or detail information not covered above)

The well was drilled to a depth of 220 ft. with 3-in. casing. At this depth a hard pan was encountered and was not able to go further with 3-in. casing. The well was then telescoped with 2-in. casing and reached the final depth of 320 ft. At a depth of 220 ft., I obtained a flow of 50 g.p.m. From a depth of 320 ft. I got a flow of 50 g.p.m. The flow coming from the 220 ft. depth has a 12 foot static head and the flow from 320 has a static head of 30 ft.

STATE OF UTAH,
COUNTY OF Utah } ss.

I, Conrad Maag, being first duly sworn,

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SACRAMENTO DISTRICT
1325 J STREET
SACRAMENTO CA 95814-2922

August 18, 2021

Regulatory Division (SPK-2017-00549)

HADCO Construction Company
Attn: Mr. Tyson Williamson
1450 West 1850 North
Lehi, Utah 84043
tyson@thewillgroup.us

Dear Mr. Williamson:

We are responding to your request for an approved jurisdictional determination for the HADCO Quality Drive site. The approximately 4.3-acre project site is located at approximately 738 East 700 South, Latitude 40.3612°, Longitude -111.7784°, American Fork, Utah County, Utah (enclosure 1).

Based on available information, we concur with your aquatic resources delineation for the site as depicted on the enclosed "HADCO Construction, Waters of the U.S. Survey" drawing, dated May 31, 2021, prepared by Focus Engineering and Surveying, LLC (enclosure 2). Approximately 0.47-acre of pond are present within the survey area. This letter verifies that the location and boundaries of aquatic resources were delineated consistent with the wetland definition at 33 CFR §328.3(c)(16), the 1987 Corps of Engineers Wetlands Delineation Manual (Wetlands Research Program Technical Report Y-87-1) and the applicable regional supplements; the location and boundaries of non-tidal waters conform with the ordinary high water mark definition at 33 CFR §328.3(c)(7), Regulatory Guidance Letter 05-05, and any applicable regional guide.

Of these aquatic resources, we have determined that the feature labeled as "Pond" totaling 0.47-acres is not a water of the United States regulated under Section 404 of the Clean Water Act or under Section 10 of the Rivers and Harbors Act.

We are enclosing a copy of the "Approved Jurisdictional Determination Form" for your site (enclosure 3).

This approved jurisdictional determination is valid for five years from the date of this letter unless new information warrants revision of the determination before the expiration date. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 Code of Federal Regulations (CFR) Part 331. A "Notification of Appeal Process (NAP) and Request for Appeal (RFA) Form" is enclosed (enclosure 4).

If you request to appeal this determination, you must submit a completed RFA form to the South Pacific Division Office at the following address: Administrative Appeal Review Officer, Army Corps of Engineers, South Pacific Division, CESPD-PDO, 1455 Market Street, 2052B, San Francisco, California 94103-1399, Telephone: 415-503-6574, FAX: 415-503-6646.

In order for an RFA to be accepted by the Corps, we must determine that the form is complete, that it meets the criteria for appeal under 33 CFR Part 331.5, and that the form was received by the Division Office within 60 days of the date of the NAP. It is not necessary to submit an RFA form to the Division Office unless you object to the determination in this letter.

We recommend that you provide a copy of this letter and notice to all other affected parties, including any individual who has an identifiable and substantial legal interest in the property.

The delineation included herein has been conducted to identify the location and extent of the aquatic resource boundaries and/or the jurisdictional status of aquatic resources for purposes of the Clean Water Act for the particular site identified in this request. This delineation and/or jurisdictional determination may not be valid for the Wetland Conservation Provisions of the Food Security Act of 1985, as amended. If you or your tenant are USDA program participants, or anticipate participation in USDA programs, you should discuss the applicability of a certified wetland determination with the local USDA service center, prior to starting work.

We appreciate feedback, especially about interaction with our staff and our processes.

Please refer to identification number SPK-2017-00549-UO in any correspondence concerning this project. If you have any questions, please contact Hollis Jencks at the Bountiful Regulatory Office, 533 West 2600 South, Suite 150, Bountiful, Utah 84010, by email at Hollis.G.Jencks@usace.army.mil, or telephone at (801) 295-8380 ext. 8318. For program information or to complete our Customer Survey, visit our website at www.spk.usace.army.mil/Missions/Regulatory.aspx.

Sincerely,

Nicole Fresard
Senior Project Manager
NV/UT Section

Enclosures

cc: Dennis Wenger, Frontier Corporation USA, dwenger@frontiercorp.net

U.S. ARMY CORPS OF ENGINEERS
REGULATORY PROGRAM
APPROVED JURISDICTIONAL DETERMINATION FORM (INTERIM)
NAVIGABLE WATERS PROTECTION RULE

I. ADMINISTRATIVE INFORMATION

Completion Date of Approved Jurisdictional Determination (AJD): August 18, 2021
ORM Number: SPK-2017-00549
Associated JDs: SPK-2017-00549 Preliminary JD issued for same water on July 12, 2020.
Review Area Location[1]:
State/Territory: UT City: American Fork County/Parish/Borough: Utah County
Center Coordinates of Review Area: Latitude 40.3612° Longitude -111.7784°

II. FINDINGS

A. Summary: Check all that apply. At least one box from the following list MUST be selected. Complete the corresponding sections/tables and summarize data sources.

- ☐ The review area is comprised entirely of dry land (i.e., there are no waters or water features, including wetlands, of any kind in the entire review area). Rationale: N/A or describe rationale.
- ☐ There are "navigable waters of the United States" within Rivers and Harbors Act jurisdiction within the review area (complete table in section II.B).
- ☐ There are "waters of the United States" within Clean Water Act jurisdiction within the review area (complete appropriate tables in section II.C).
- ☒ There are waters or water features excluded from Clean Water Act jurisdiction within the review area (complete table in section II.D).

B. Rivers and Harbors Act of 1899 Section 10 (§ 10)[2]

§ 10 Name	§ 10 Size	§ 10 Criteria	Rationale for § 10 Determination
N/A	N/A	N/A	N/A

C. Clean Water Act Section 404

Territorial Seas and Traditional Navigable Waters ((a)(1) waters)[3]

(a)(1) Name	(a)(1) Size	(a)(1) Criteria	Rationale for (a)(1) Determination
N/A	N/A	N/A	N/A

Tributaries ((a)(2) waters):

(a)(2) Name	(a)(2) Size	(a)(2) Criteria	Rationale for (a)(2) Determination
N/A	N/A	N/A	N/A

Lakes and ponds, and impoundments of jurisdictional waters ((a)(3) waters):

(a)(3) Name	(a)(3) Size	(a)(3) Criteria	Rationale for (a)(3) Determination
N/A	N/A	N/A	N/A

Adjacent wetlands ((a)(4) waters):

(a)(4) Name	(a)(4) Size	(a)(4) Criteria	Rationale for (a)(4) Determination
N/A	N/A	N/A	N/A

[1] Map(s)/Figure(s) are attached to the AJD provided to the requestor.
[2] If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.
[3] A stand-alone TNW determination is completed independently of a request for an AJD. A stand-alone TNW determination is conducted for a specific segment of river or stream or other type of waterbody, such as a lake, where independent upstream or downstream limits or lake borders are established. A stand-alone TNW determination should be completed following applicable guidance and should NOT be documented on the AJD form.
[4] Some excluded waters, such as (b)(2) and (b)(4), may not be specifically identified on the AJD form unless a requestor specifically asks a Corps district to do so. Corps Districts may, in case-by-case instances, choose to identify some or all of these waters within the review area.
[5] Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.

D. Excluded Waters or Features

Excluded waters ((b)(1) – (b)(12))[4]:

Exclusion Name	Exclusion Size	Exclusion[5]	Rationale for Exclusion Determination
201700549-Pond	0.47 acres	(b)(8) Artificial lake/pond constructed or excavated in upland or a non-jurisdictional water, so long as the artificial lake or pond is not an impoundment of a jurisdictional water that meets (c)(6)	The pond within the review area was constructed between 1958 and 1965. This pond is fed by an artesian well that was constructed prior to the pond. The pond was not constructed within a wetland or is an impounded tributary. The pond flows to the east and south from the site and terminates at East Utah Valley Drive. This was confirmed in a jurisdictional determination for North Valley Investment Group (SPK-2006-50195) for a 3.2-acre site located directly north of East Valley Drive. No culvert was identified under this road which would connect these waters with a downstream tributary. Therefore, this pond is a (b)(8) water that is excluded from Section 404 of the Clean Water Act.

III. SUPPORTING INFORMATION

A. Select/enter all resources that were used to aid in this determination and attach data/maps to this document and/or references/citations in the administrative record, as appropriate.

_X_ Information submitted by, or on behalf of, the applicant/consultant: HADCO Quality Drive Property, Wetland Delineation Technical Report, June 2017.
This information is sufficient for purposes of this AJD.
Rationale: N/A.

___ Data sheets prepared by the Corps:

_X_ Photographs: Aerial: GoogleEarth 7.3.3.7692. (1993 August 13, 1997 September 11, 2005 July 11, 2010 June 17, 2011 October 20, 2013 June 4, 2015 June 16, 2017 June 17, 2019 July 18, 2020 May 31). American Fork, Utah. 40.3612° latitude, -111.7784° longitude, eye alt 4543 ft. Retrieved November 3, 2020, from *http://www.earth.google.com;* Historic Aerials by NETRonline. Aerials. 1958, 1965, 1972, 1983, 1993, 1997, 2011, and 2016. Retrieved November 3, 2020 from *https://www.historicaerials.com/viewer.*

___ Corps Site visit(s) conducted on:

_X_ Previous Jurisdictional Determinations (AJDs or PJDs): SPK-2017-00549 Preliminary JD issued for same water on July 12, 2020.

___ Antecedent Precipitation Tool: N/A.

___ USDA NRCS Soil Survey: N/A.

___ USFWS NWI maps: N/A.

___ USGS topographic maps: N/A.

Other data sources used to aid in this determination:

Data Source (select)	Name and/or date and other relevant information

[1] Map(s)/Figure(s) are attached to the AJD provided to the requestor.
[2] If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.
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[5] Because of the broad nature of the (b)(1) exclusion and in an effort to collect data on specific types of waters that would be covered by the (b)(1) exclusion, four sub-categories of (b)(1) exclusions were administratively created for the purposes of the AJD Form. These four sub-categories are not new exclusions but are simply administrative distinctions and remain (b)(1) exclusions as defined by the NWPR.

U.S. ARMY CORPS OF ENGINEERS
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USGS Sources	N/A.
USDA Sources	N/A.
NOAA Sources	N/A.
USACE Sources	N/A.
State/Local/Tribal Sources	N/A.
Other Sources	N/A.

B. Typical year assessment(s): N/A.

C. Additional comments to support AJD: N/A.

[1] Map(s)/Figure(s) are attached to the AJD provided to the requestor.
[2] If the navigable water is not subject to the ebb and flow of the tide or included on the District's list of Rivers and Harbors Act Section 10 navigable waters list, do NOT use this document to make the determination. The District must continue to follow the procedure outlined in 33 CFR part 329.14 to make a Rivers and Harbors Act Section 10 navigability determination.
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NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: HADCO Construction Company, Attn: Mr. Tyson Williamson	File No.: SPK-2017-00549	Date: August 18, 2021

Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
→	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at *http://www.usace.army.mil/cecw/pages/reg_materials.aspx* or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer (address on reverse). This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also, you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Hollis Jencks Project Manager, Utah-Nevada Branch Regulatory Division U.S. Army Corps of Engineers Phone: (801) 295-8380 ext. 8318 Email: Hollis.G.Jencks@usace.army.mil	Thomas J. Cavanaugh Administrative Appeal Review Officer U.S. Army Corps of Engineers South Pacific Division 1455 Market Street, 2052B San Francisco, California 94103-1399 Phone: 415-503-6574, FAX: 415-503-6646 Email: Thomas.J.Cavanaugh@usace.army.mil

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15-day notice of any site investigation and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

SPD version revised December 17, 2010

Enclosure 4

EXHIBIT I

Approved as to form: American Fork City Attorney

PARSONS BEHLE & LATIMER

201 South Main Street, Suite 1800
Salt Lake City, Utah 84111
Main 801.532.1234
Fax 801.536.6111

A Professional
Law Corporation

Graham J. Gilbert
Attorney at Law
Direct 801.536.6741
ggilbert@parsonsbehle.com

April 7, 2022

VIA EMAIL (bhunter@americanfork.gov)

Ben Hunter
Project Engineer (Developments)
American Fork City
275 East 200 North
American Fork, UT 84003

Re: Analysis of Water Rights Associated with Singleton Pond, 756 E. Quality Drive, American Fork, Utah

Dear Mr. Hunter:

This firm represents JD XVIII LLC ("**JD**"), in cooperation with Buchalter, as legal counsel. Since January 12, 2017, JD has owned the real property located at 756 E. Quality Drive, American Fork, Utah, which is also identified by Parcel No. 57:077:0001 (the "**JD Property**"). A pond – referred to as the Singleton Pond (the "**Pond**") – is located on the JD Property. JD is pursuing approval of development plans with the City. In the course of doing so, I understand that Kurt Vest, Larry Vest, or the Kurt V. Vest Trust (collectively, "**Vest**"), a neighboring property owner, has become involved. In particular, Vest claims that a spring – referred to as the "**Singleton Spring**" – fills the Pond. Vest also claims that JD must allow it to dam the Pond during each irrigation season to raise the Pond's water level and allow Vest to direct flow through a ditch system for irrigation purposes. I reviewed Vest's claim and conclude that the Singleton Spring is a misnomer because no spring appears to exist at the JD Property, Vest has no legal basis to access the JD Property, to beneficially use water from the Pond, to impound the Pond, or to receive flow in a particular manner from the Pond. These conclusions are detailed below.

1. Loughlin Water Associates Hydrologic Evaluation

Bill Loughlin of Loughlin Water Associates, LLC completed a Hydrologic Evaluation of the Property, dated April 6, 2022 ("**Loughlin Report**"). Mr. Loughlin reviewed historical studies and records related to groundwater in the vicinity of the JD Property and completed an April 1, 2022 site visit. Based on his investigation, Mr. Loughlin did not observe any evidence of Singleton Spring and did not find any historical record of Singleton Spring. The only evidence that Mr. Loughlin did find was Change Application No. a46279, which Vest filed in 2020 in an attempt to associate a water right with Singleton Spring.

The Loughlin Report identified two wells on the JD Property. The first, identified by Well Identification No. 13415, is associated with Water Right No. 55-849 ("**City Well**"). The second

well does not appear to have a well identification number; it is associated with Water Right No. 55-1555 ("**West Well**"). While the City Well and West Well were formerly artesian, Mr. Loughlin found during his field visit that the two wells do not currently exhibit artesian characteristics.

The Loughlin Report also includes a review of the Pond. In it, Mr. Loughlin concludes that the Pond is manmade, it was constructed between 1958 and 1965, and it is fed by the nearby, formerly artesian wells and stormwater. The Loughlin Report's key conclusions – that there is no evidence a spring exists on the JD Property and that the Pond was historically filled by nearby artesian wells – begs the question of what water rights Vest has, if any, to water from the West Well or City Well.

2. Analysis of Water Rights Located at the JD Property

I reviewed the Division of Water Rights records regarding approved water rights in the vicinity of the Pond and the JD Property. I identified three water rights, Water Right No. 55-849, Water Right No. 55-1555, and Change Application No. a46279. These water rights are discussed in detail below.

a. Water Right No. 55-849

Water Right No. 55-849 is a historic stock watering right. The City acquired this water right and moved its point of diversion to a new location through approved Change Application No. a42197. Water Right No. 55-849 is not approved for irrigation use, it is owned by the City, and it has been transferred away from the JD Property. In other words, Water Right No. 55-849 provides no basis for Vest to fill the Pond or irrigate from it.

b. Water Right No. 55-1555

Water Right No. 55-1555 is located west of the Pond and it is associated with the West Well. Keith H. Jacobs and K.L. Partners American Fork I, LLC ("**KL Partners**") are the record owners of Water Right No. 55-1555. The Utah State Engineer is conducting the Utah Lake and Jordan River General Water Rights Adjudication ("**General Adjudication**"). The General Adjudication is proceeding throughout the Wasatch Front. The JD Property – and Water Right No. 55-1555 – are located in the American Fork South Subdivision (Area 55, Book 5) of the General Adjudication. The State Engineer issued a July 5, 2019 Notice to File Statement of Water User's Claim to all water right owners and property owners within the Subdivision. Mr. Jacobs and KL Partners did not file Water User's Claims. As a result, the State Engineer placed Water Right No. 55-1555 on the "**List of Unclaimed Rights**." The time to object to the List of Unclaimed Rights expired on November 11, 2020. Neither Mr. Jacobs nor KL Partners filed an objection. The State Engineer filed a motion asking the Court to issue an order decreeing that the water rights on the List of Unclaimed Rights, including Water Right No. 55-1555, are abandoned. As a result, there

is no longer a valid water right to authorize diversions from the West Well. Even if Water Right No. 55-1555 remained valid, Vest has no ownership interest in it that would allow him to divert water from the West Well.

c. Change Application No. a46279

The third water right at the Property is Change Application No. a46279. Vest filed Change Application No. a46279 on October 5, 2020—over three and a half years after JD purchased the JD Property. In Utah, a change application is used to modify characteristics of an existing, "base" water right. The base water right for Vest's Change Application is Water Right No. 55-890. The base water right allowed diversions from a well located north of the Pond (and the JD Property) for irrigation and stock water uses. In filing Change Application No. a46279, Vest stated that "[t]his is being filed to add [Singleton Spring] to this water to be used along with the well." In other words, Change Application No. a46279 added Singleton Spring as a new point of diversion. The Change Application grants no rights to divert from the Pond, or receive deliveries from it.

The State Engineer approved Change Application No. a46279 on February 4, 2021. Consistent with all her orders related to change applications, the State Engineer's order for Change Application No. a46279 states "[t]his approval is limited to the rights to divert and beneficially use water and does not grant any rights of access to, or use of land or facilities not owned by the applicant." Vest does not own the JD Property, JD has not granted Vest access to the JD Property, and Vest has no preexisting easement. While Vest asserts that he and his friends and family have historically accessed the Pond and Singleton Spring (which does not appear to exist), they also acknowledge that their access was with permission. Because they had permission to access Singleton Spring and the Pond, Vest and his friends and family could not have established a prescriptive easement across the JD Property. In short, Vest does not have a right to access the JD Property, Singleton Spring, or the Pond.

It is also important to highlight the Loughlin Report's conclusion that there is no evidence of a spring at the Property. If no spring exists, Vest cannot divert from a spring under Change Application No. a46279. Based on a review of aerial photography, Vest does not appear to have diverted water for irrigation purposes since approval of Change Application No. a46279. This is consistent with the absence of a spring and Vest's lack of rights to use the Pond under Change Application No. a46279.

In summary, Change Application No. a46279 is a new water right associated with Singleton Spring. While Vest has this new water right, there is no actual spring to divert from and it doesn't grant any rights to divert from the Pond. In addition, Vest has no right to access the JD Property to divert from the Pond or Singleton Spring, if it exists.

d. Absence of Claims for Singleton Spring or the Pond in the General Adjudication

Vest asserts that he and his family have used Singleton Spring and the Pond for irrigation in the past. As described above, the Division of Water Rights does not have record of a historic water right at Singleton Spring or the Pond (i.e., a water right that existed prior to Change Application No. a46279). If Vest had such a historic water right, he should have claimed it in the ongoing General Adjudication. As described above, the State Engineer issued a July 5, 2019 Notice to File Statement of Water User's Claim to all water right owners and property owners within the American Fork South Subdivision. The Notice states "[f]ailure to file a claim within ninety (90) days of this notice will forever bar and estop you from subsequently asserting any unclaimed rights within the American Fork South Subdivision (Area 55, Book 5), and they shall be considered abandoned."

Vest knew of the Notice as he filed several timely Water User's Claims. Notably, he filed a Water User's Claim for Water Right No. 55-890. But none of Vest's filings claimed any right to divert from Singleton Spring and the Pond. Indeed, Vest had to file Change Application No. a46279 because he didn't have a historic claim to use Singleton Spring and the Pond. The time to file a Water User's Claim expired October 3, 2019, and Vest is foreclosed from filing a Water User's Claim for Singleton Spring and Pond now.

While Vest claims to have used water from Singleton Spring and the Pond in the past, Loughlin Water concludes that there is no evidence of a spring on the JD Property. Further, any diversions by Vest from the Pond were not made pursuant to an approved water right. Vest's unpermitted use of water does not give him a right to continue diverting, or to demand delivery of water from the JD Property in a certain manner. Indeed, section 73-3-1 of the Utah Code states that "[a] person may not acquire a right to the use of water either appropriated or unappropriated by adverse use or adverse possession."

3. Abandonment of the City Well and West Well

The City Well and West Well need to be abandoned because neither well is in service. The State Engineer requires well abandonment in circumstances like this. *See* Utah Admin. Code r. 655-4-14.1 to 14.2. Also, as a practical matter, it is important to properly abandon wells that are not in service, particularly when nearby construction is planned, to avoid contamination of the underlying aquifers. Consistent with these regulatory and practical considerations, the Loughlin Report recommends abandonment of the City Well and West Well.

In comments to civil engineering drawings for proposed development at the JD Property, the City asked JD how the City Well and West Well would be abandoned. JD plans to abandon the two wells in accordance with the Loughlin Report's recommendations. That is, JD plans to

hire a Utah-licensed water well driller to plug and abandon the City Well and West Well consistent with applicable regulations.

Conclusion

Based on the Loughlin Report, Singleton Spring does not appear to exist. In addition, based on my review, Vest does not have a historic water right recognized by the Division of Water Rights, or claimed in the General Adjudication, that would authorize him to divert water from Singleton Spring (if it existed), the Pond, the City Well, or the West Well. Moreover, Vest has no right to access the JD Property, Singleton Spring, or the Pond. Vest may have diverted from the Pond in the past. But this past, unpermitted use does not give Vest a right to make future diversions or demand that JD impound the Pond to deliver water in a manner consistent with Vest's historic irrigation practices.

While Vest has obtained approval under Change Application No. a46279 to divert from Singleton Spring, the spring does not appear to exist and the Change Application does not authorize diversions from the Pond. Further, Change Application No. a46279 does not give Vest the right to access Singleton Spring or the Pond. As described above, Vest has no express, implied, or constructive right of access. More importantly, Change Application No. a46279 adds Singleton Spring as a new point of diversion and no diversions have yet occurred under the Change Application. As a result, there is no historic delivery practice under Change Application No. a46279 that JD is obligated to maintain.

Please let me know should you have any questions.

Very truly yours,

PARSONS BEHLE & LATIMER

cc: Douglas P. Farr

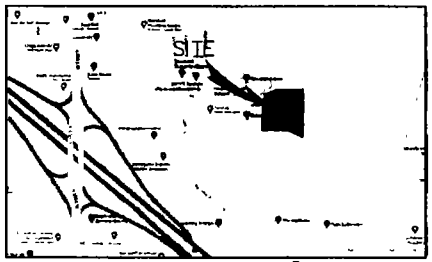
EXHIBIT J

Approved as to form: American Fork City Attorney

UTAH VALLEY BUSINESS PARK

752 EAST QUALITY DRIVE
AMERICAN FORK, UTAH 84003

MARCH 22, 2021
REVISED AUGUST 10, 2021
REVISED OCTOBER 27, 2021
REVISED MARCH 9, 2022
REVISED APRIL 11, 2022
REVISED JUNE 3, 2022
REVISED SEPTEMBER 23, 2022
REVISED JANUARY 9, 2023
REVISED JANUARY 16, 2023



VICINITY MAP
NOT TO SCALE

LEGEND

PROPERTY LINE		EXISTING FIRE HYDRANT	
EASEMENT LINE		PROPOSED FIRE HYDRANT	
4340.0 PROPOSED GRADE CONTOURS		EXISTING STREET LIGHT	
4340.0 EXISTING GRADE CONTOURS		PROPOSED STREET LIGHT	
EXISTING CURB		PROPOSED PARKING LOT LIGHT	
PROPOSED CURB AND GUTTER			
PROPOSED CURB WALL		EXISTING WATER METER	
REVERSE PAN CURB & GUTTER		EXISTING WATER VALVE	
EXISTING SEWER		EXISTING GATE VALVE	
PROPOSED SEWER		EXISTING OVERHEAD POWER POLE	
EXISTING WATER	TBC	TOP BACK CONCRETE	
PROPOSED WATER	FF	FINISHED FLOOR	
EXISTING FIRE LINE	HW	HIGH WATER	
PROPOSED FIRE LINE	TOG	TOP OF GRATE	
EXISTING STORM DRAIN	TOL	TOP OF LID	
PROPOSED STORM DRAIN	IE	INVERT ELEVATION	
PROPOSED ROOF DRAIN	EX	EXISTING	
EXISTING GAS	NG	NATURAL GROUND	
PROPOSED GAS	TA	TOP OF ASPHALT	
EXISTING OVERHEAD POWER	TC	TOP OF CONCRETE	
EXISTING UNDERGROUND POWER	EC	EDGE OF CONCRETE	
PROPOSED UNDERGROUND POWER	EA	EDGE OF ASPHALT	
EXISTING TELEPHONE LINE	TOW	TOP OF WALL	
PROPOSED TELEPHONE LINE	TG	TOP OF GRAVEL	
EXISTING FIBER OPTIC LINE	TL	TOP OF LANDSCAPING	
PROPOSED FIBER OPTIC LINE	TS	TOP OF SIDEWALK	
PROPOSED CONCRETE	PROP	PROPOSED	
PROPOSED ASPHALT		TBC CALLOUT UNLESS OTHERWISE DESIGNATED	
PROPOSED LANDSCAPING			

SHEET INDEX

PROJECT CONSTRUCTION NOTES:

1. CONTRACTOR TO NOTIFY BLUE STAKES PRIOR TO CONSTRUCTION, 1-800-662-4111.
2. CONTRACTOR TO VERIFY LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
3. SEE SOILS REPORT FOR PAVEMENT SECTION DETAILS, INSTALLATION SPECIFICATIONS AND ALL SITE EARTHWORK RECOMMENDATIONS.
4. IF ROFT SOILS ARE DISCOVERED DURING CONSTRUCTION ACTIVITIES, CONTRACTOR TO FOLLOW THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT TO REMEDIATE.
5. ALL CONSTRUCTION SHALL CONFORM TO CITY STANDARDS AND SPECIFICATIONS. IF A CONFLICT BETWEEN THESE PLANS AND THE CITY STANDARDS AND SPECIFICATIONS OCCURS, THE CITY STANDARDS AND SPECIFICATIONS SHALL GOVERN.
6. ALL HANDICAP PARKING STALLS TO BE INSTALLED PER ADA STANDARDS. SLOPE ON ANY ADA STALL IS TO BE LESS THAN 2% IN ALL DIRECTIONS.
7. CONTRACTOR TO VERIFY PRIOR TO ANY CONSTRUCTION THAT THE BUILDING AND BUILDING LOCATION SHOWN ON CIVIL DRAWINGS MATCHES THE ARCHITECTURAL PLANS.
8. CONTRACTOR TO VERIFY, WITH ARCHITECT, THAT F.F. ELEVATION SHOWN ON CIVIL PLANS EQUALS THE ARCHITECTS 100.0' ELEVATION.
9. CONTRACTOR TO REPLACE IN KIND ANY AREAS THAT ARE DAMAGED DURING CONSTRUCTION.
10. INSTALL ALL SIDEWALKS PER CITY STANDARDS OR APWA PLAN NO. 230, 235, AND 236 WHERE APPLICABLE.
11. INSTALL ALL CONCRETE PAVEMENT JOINTS PER CITY STANDARDS OR APWA PLAN NO. 255.
12. ALL SEWER, WATER AND STORM DRAIN PIPES SHALL BE BACKFILLED WITH SELECT GRANULAR FILL PER AMERICAN FORK CITY STANDARDS AND SPECIFICATIONS. SEE AMERICAN FORK CITY STANDARD PLAN NO. 18.2.2
13. ALL CATCH BASINS AND JUNCTION BOXES TO BE INSTALLED PER CITY STANDARDS.
14. ALL STORM DRAIN PIPING TO BE CUT OFF FLUSH WITH INSIDE WALL OF DRAINAGE BOX. INSIDE WALL TO BE SMOOTH SHOTCRETE WITH A NON-SHRINK GROUT.
15. FOR STORM DRAIN INLET BOXES AND MANHOLES THE I.E. IN AND I.E. OUT ELEVATIONS ARE THE SAME UNLESS OTHERWISE CALLED OUT ON THE PLANS
16. ALL UNDER LINES TO HAVE A MINIMUM 6" OF COVER WITH A MINIMUM VERTICAL CLEARANCE OF 1' OF COVER BETWEEN OTHER UTILITY LINES (1.5' VERTICAL SEPARATION WITH SEWER).
17. THRUST BLOCKS TO BE INSTALLED PER AMERICAN FORK CITY PLAN NO 13.21
18. CONTRACTOR SHALL COORDINATE CONSTRUCTION AND INSTALLATION OF ELECTRICAL, TELEPHONE, NATURAL GAS AND CABLE TV SERVICES WITH THE RESPECTIVE UTILITY COMPANY.
19. THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITY PIPES, LINES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED AND SHOWN FROM SURVEYED INFORMATION AND EXISTING UTILITY LOCATIONS PROVIDED BY OWNERS. THERE IS NO GUARANTEE THAT ALL EXISTING UTILITY INFORMATION IS SHOWN ON THESE PLANS. CONTRACTOR IS RESPONSIBLE FOR CONTACTING BLUE STAKES AND FIELD VERIFYING THE LOCATION AND ELEVATION OF ALL EXISTING UTILITY PIPES, LINES AND STRUCTURES, PRIOR TO CONSTRUCTION.
20. ANY OFF SITE DAMAGE TO EXISTING ASPHALT, CURB & GUTTER, LANDSCAPING AND ALL UTILITIES TO BE REPLACED IN KIND.
21. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL SITE DEMOLITION REQUIRED TO COMPLETE THIS PROJECT.

General Notes:

CONTRACTOR SHALL COORDINATE CONSTRUCTION AND INSTALLATION OF ELECTRICAL, TELEPHONE, NATURAL GAS AND CABLE TV SERVICES WITH THE RESPECTIVE UTILITY COMPANY.

ALL CONSTRUCTION SHALL CONFORM TO CITY STANDARDS AND SPECIFICATIONS. IF A CONFLICT BETWEEN THESE PLANS AND THE CITY STANDARDS AND SPECIFICATIONS OCCURS, THE CITY STANDARDS AND SPECIFICATIONS SHALL GOVERN.

THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITY PIPES, LINES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED AND SHOWN FROM SURVEYED INFORMATION AND EXISTING UTILITY LOCATIONS PROVIDED BY OWNERS. THERE IS NO GUARANTEE THAT ALL EXISTING UTILITY INFORMATION IS SHOWN ON THESE PLANS. CONTRACTOR IS RESPONSIBLE FOR CONTACTING BLUE STAKES AND FIELD VERIFYING THE LOCATION AND ELEVATION OF ALL EXISTING UTILITY PIPES, LINES AND STRUCTURES, PRIOR TO CONSTRUCTION.

PROJECT CONTACT INFORMATION

AF CITY CULINARY WATER	JAY BREMS	(801) 763 3060
AF PRESSURIZED IRRIGATION	JAY BREMS	(801) 763 3060
AF SANITARY SEWER	ASHTON HARDY	(801) 763 3060
AF STORM DRAIN SEWER	ASHTON HARDY	(801) 763 3060
AF FIRE MARSHALL	MAT SACCO	(801) 763 3040
AF CITY INSPECTOR	DEE HOWARD	(801) 763 3060
AF FIBER	KYLE PETERSEN	(801) 400 2833
AF FLOOD IRRIGATION COMPANY	ERNIE JOHN	(801) 471 6576
TIMPANOGOS SSD	DAVID BARLOW	(801) 756 5231
ROCKY MOUNTAIN POWER	TERIA WALKER	(801) 756 1310
COMCAST	ELYSIA VALDEZ	(801) 406 3017
CENTURY LINK	RYAN ALLRED	(385) 223 0084
DOMINION ENERGY	TRENT JOHNSON	(801) 853 6548

FEMA NOTE:
THIS PROJECT LIES IN A FEMA DESIGNATED FLOOD ZONE X WHICH IS DEFINED AS AREAS OF 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD.
PER MAP NO. 49049C0337F EFFECTIVE DATE: JULY 19, 2020 PANEL 337 OF 1450.

DEMOLITION NOTE:
CONTRACTOR TO VISIT SITE AND DETERMINE ALL NECESSARY DEMOLITION REQUIRED TO INSTALL PROPOSED IMPROVEMENTS AND TO FIELD VERIFY ALL NECESSARY DEMOLITION HAS BEEN COMPLETED PRIOR TO CONSTRUCTION.

Benchmark Info
The Benchmark for the project is the North Quarter Corner of Section 25, T.5.S. R.1 E SLB&M
Elevation= 4553.90'
Datum is NAVD 88 derived from UTAH TURNGPS System

CIVIL ENGINEER:
CIR
ENGINEERING, L.L.C.
10718 SOUTH BECKSTEAD LANE, STE. 103
SOUTH JORDAN, UT 84095 - PH. 801-949-8296

DEVELOPER
THE WILL GROUP
1780 NORTH 700 WEST SUITE 40
LINDON, UT 84042
CONTACT PERSON: TYSON WILLIAMSON
PH: (801) 310-0370

ARCHITECT:
AE URBIA
909 WEST SOUTH JORDAN PARKWAY
SOUTH JORDAN, UTAH 84095
CONTACT PERSON: SHAWN EATON
PH: (801) 748-0456

NO	REVISIONS	BY	DATE
1	ADDRESS	TJH	08/10/21
2	ADDRESS	TJH	10/27/21
3	ADDRESS	TJH	03/09/22
4	ADDRESS	TJH	04/11/22
5	ADDRESS	TJH	06/03/22
6	ADDRESS	TJH	09/23/22
7	ADDRESS	TJH	01/09/23
8	ADDRESS	TJH	01/16/23

DESIGNED: TJH PROJECT ENGINEER: TJH

CIR | CIVIL ENGINEERING + SURVEYING
10718 SOUTH BECKSTEAD LANE, STE. 103
SOUTH JORDAN, UT 84095 - 801-949-8296

UTAH VALLEY BUSINESS PARK
752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003
COVER SHEET

PROFESSIONAL ENGINEER No. 13672821 TREVOR L. HOBSON STATE OF UTAH

SHEET NO. CV
PROJECT ID: H1022-01 DATE: 03/22/21
FILE NAME: PRJ-AFH SCALE: 1" = 30'

GENERAL NOTES

1. City of American Fork, A.P.W.A. Utah Chapter and Utah Department of Transportation Construction and Material Specifications, current editions, and any supplements thereto (hereafter referred to as Standard Specifications), shall govern all construction items unless otherwise noted. If a conflict between specifications is found, the more strict specification will apply as decided by the City Engineer. Item Numbers listed refer to City of American Fork Item Numbers unless otherwise noted.
2. The City Engineer will not be responsible for means, methods, procedures, techniques, or sequences of construction that are not specified herein. The City Engineer will not be responsible for safety on the work site, or for failure by the Contractor to perform work according to contract documents.
3. The Developer or Contractor shall be responsible to obtain all necessary permits including but not limited to Road Cut Permits and Notices of Intent (NOI), Building Permits, etc.
4. The Contractor shall notify the City of American Fork, Public Works Department in writing at least 7 working days prior to beginning construction and request a pre-construction meeting. Bond for public improvements and inspection fees must be paid in full prior to requesting a pre-construction meeting.
5. The Contractor shall be solely responsible for complying with all federal, state and local safety requirements including the Occupational Safety and Health Act of 1970. The Contractor shall exercise precaution always for the protection of persons (including employees) and property. It shall also be the sole responsibility of the Contractor to initiate, maintain and supervise all safety requirements, precautions and programs in connection with the work, including the requirements for confined spaces per 29 CFR 1910.146.
6. Following completion of construction of the site improvements and before requesting occupancy, a proof survey shall be provided to the City of American Fork, Public Works Department, that documents "as - built" elevations, dimensions, slopes and alignments of all elements of this project. The proof survey shall be prepared, signed and submitted by the Professional Engineer who sealed the constructions drawings.
7. The Contractor shall restrict construction activity to public right-of-way and areas defined as permanent and/or temporary construction easements, unless otherwise authorized by the City Engineer
8. The Contractor shall carefully preserve benchmarks, property corners, reference points, stakes and other survey reference monuments or markers. In cases of willful or careless destruction, the Contractor shall be responsible for restorations. Resetting of markers shall be performed by a License Utah Professional Surveyor as approved by the City Engineer.
9. Non-rubber tired vehicles shall not be moved on or across public streets or highways without the written permission of the City Engineer.
10. The Contractor shall restore all disturbed areas to equal or better condition than existed before construction. Drainage ditches or watercourses that are disturbed by construction shall be restored to the grades and cross-sections that existed before construction.
11. Tracking or spilling mud, dirt, or debris upon streets, residential or commercial drives, sidewalks or bike paths is prohibited. Any such occurrences shall be cleaned up immediately by the Contractor at no cost to the City. If the Contractor fails to remove said mud, dirt, debris, or spillage, the City reserves the right to remove these materials and clean affected areas, the cost of which shall be the responsibility of the Contractor.
12. Disposal of excess excavation within Special Flood Hazard Areas (100-year floodplain) must be approved by the City Engineer.
13. All signs, landscaping, structures or other appurtenances within right-of-way disturbed or damaged during construction shall be replaced or repaired to the satisfaction of the City Engineer. The cost of this work shall be the responsibility of the Contractor.
14. All field tile broken or encountered during excavation shall be replaced or repaired and connected to the public storm sewer system as directed by the City Engineer. The cost of this work shall be the responsibility of the Contractor.
15. All precast concrete products shall be inspected at the location of manufacture. Approved precast concrete products will be stamped or have such identification noting that inspection has been conducted by the City of American Fork. Precast concrete products without proof of inspection shall not be approved for installation.
16. All trenches within public right-of-way shall be backfilled according to the approved construction drawings or securely plated during nonworking hours.
17. Trenches outside these areas shall be backfilled or shall be protected by approved temporary fencing or barricades during nonworking hours. Clean up shall follow closely behind the trenching operation.
18. All trees within the construction area not specifically designated for removal shall be preserved, whether shown or not shown on the approved construction drawings. Trees to be preserved shall be protected with high visibility fencing placed a minimum 15 feet from the tree trunk. Trees 6 - inches or greater at DBH (Diameter Breast Height) must be protected with fencing placed at the critical root zone or 15 feet, whichever is greater.
19. Trees not indicated on the approved construction drawings for removal may not be removed without prior approval of the Divisions of Engineering.
20. Permits to construct in the right-of-way of existing streets must be obtained from the City of American Fork, Public Works Department before commencing construction.
21. The Contractor shall be responsible for the condition of trenches within the right-of-way and public easements for a period of one year from the final acceptance of the work, and shall make any necessary repairs at no cost to the City.
22. Pavements shall be cut in neat, straight lines the full depth of the existing pavement, or as required by the City Engineer.
23. The replacement of driveways, handicapped ramps, sidewalks, bike paths, parking lot pavements, etc. shall be provided according to the approved construction drawings and the City of American Fork standard construction drawings.
24. Any modification to the work shown on drawings must have prior written approval by the City Engineer
25. Traffic control and other regulatory signs shall comply with the Utah Department of Transportation Traffic Control guidelines and MUTCD Manual, current edition
26. Public street signs shall meet all City of American Fork specifications with lettering colored in white displayed over a green background.
27. Private street signs shall meet all City of American Fork specifications with lettering colored in white displayed over a blue background

⚠ UTILITIES

1. The following utilities are known to be located within the limits of this project:

COMPANY	CONTACT	PHONE
AF CITY CULINARY WATER	JAY BREMS	(801) 763 3060
AF PRESSURIZED IRRIGATION	JAY BREMS	(801) 763 3060
AF SANITARY SEWER	ASHTON HARDY	(801) 763 3060
AF STORM DRAIN SEWER	ASHTON HARDY	(801) 763 3060
AF FIRE MARSHALL	MAT SACCO	(801) 763 3040
AF CITY INSPECTOR	DEE HOWARD	(801) 763 3060
AF FIBER	KYLE PETERSEN	(801) 400 2933
AF FLOOD IRRIGATION COMPANY	ERNIE JOHN	(801) 471 6376
TIMPANOGOS SID	DAVID BARLOW	(801) 756 5231
ROCKY MOUNTAIN POWER	TERIA WALKER	(801) 756 1310
COMCAST	ELYSIA VALDEZ	(801) 401 3017
CENTURY LINK	RYAN ALLRED	(385) 213 0084
DOMINION ENERGY	TREAT JOHNSON	(801) 853 6348

2. The Contractor shall give notice of intent to construct to Blue Stake (telephone number 800-662-4111) at least 2 working days before start of construction.
3. The identity and locations of existing underground utilities in the construction area have been shown on the approved construction drawings as accurately as provided by the owner of the underground utility. The City of American Fork and the City Engineer assumes no responsibility for the accuracy or depths of underground facilities shown on the approved construction drawings. If damage is caused, the Contractor shall be responsible for repair of the same and for any resulting contingent damage.
4. Location, support, protection and restoration of all existing utilities and appurtenances, whether shown or not shown on the approved construction drawings, shall be the responsibility of the Contractor.
5. When unknown or incorrectly located underground utilities are encountered during construction, the Contractor shall immediately notify the owner and the City Engineer.

TRAFFIC CONTROL

1. Traffic control shall be furnished, erected, maintained, and removed by the Contractor according to Utah Department Of Transportation, Traffic Control guidelines or Manual of Uniform Traffic Control Devices, current edition.
2. All traffic lanes of public roadways shall be fully open to traffic from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM unless authorized differently by the City Engineer.
3. At all other hours the Contractor shall maintain minimum one - lane two - way traffic. Traffic circulation must be supervised by a Certified Flagger.
4. Steady - burning, Type "C" lights shall be required on all barricades, drums, and similar traffic control devices in use at night.
5. Access from public roadways to all adjoining properties for existing residents or businesses shall be maintained throughout the duration of the project for mail, public water and sanitary sewer service, and emergency vehicles.
6. The Contractor shall provide a traffic control plan detailing the proposed maintenance of traffic procedures. The traffic control plan must incorporate any traffic control details contained herein.
7. The traffic control plan proposed by the Contractor must be approved by the City Engineer prior to construction.
8. Traffic Control requiring road closures and/ or detouring must be approved by the City Council.

EROSION AND SEDIMENT CONTROL

1. The Contractor or Developer is responsible for submitting a Notice of Intent (NOI) to be reviewed and approved by the Utah DWQ.
2. The NOI must be submitted to DWQ 45 days prior to the start of construction and may entitle coverage under the Utah DWQ General Permit for Storm Water Discharges associated with construction activity. A project location map must be submitted with the NOI.
3. A sediment and erosion control plan must be submitted to the City Engineer for approval if a sediment and erosion control plan has not already been included with the approved construction drawings. This plan must be made available at the project site at all times.
4. A UPDES Storm water Discharge Permit may be required. The Contractor shall be considered the Permittee.
5. The Contractor shall provide sediment control at all points where storm water runoff leaves the site, including waterways, overland sheet flow, and storm sewers.
6. Accepted methods of providing erosion/sediment control include but are not limited to: sediment basins, silt filter fence, aggregate check dams, and temporary ground cover. Hay or straw bales are not permitted
7. The Contractor shall provide adequate drainage of the work area at all times consistent with erosion control practices.
8. Disturbed areas that will remain un-worked for 30 days or more shall be seeded or protected within seven calendar days of the disturbance.
9. Other sediment controls that are installed shall be maintained until vegetative growth has been established. The Contractor shall be responsible for the removal of all temporary sediment devices at the conclusion of construction but not before growth of permanent ground cover.

WATER LINE

1. All water line materials shall be provided and installed according to current specifications of the City of American Fork, Water Department.
2. All public water pipe with a diameter 3 inches to 8 inches shall be Ductile Iron, Class 53. Public water pipe 12 inches in diameter or larger shall be Ductile Iron, Class 54.
3. Only fire hydrants conforming to City of American Fork standards will be approved for use.
4. Public water lines shall be disinfected by the City of American Fork, Water Department. Requests for water line chlorination shall be made through the City of American Fork, Water Department. The cost for chlorination shall be paid for by the Contractor
5. All water lines shall be disinfected according to City of American Fork Standard specifications. Special attention is directed to applicable sections of American Water Works Association specification C-651, particularly for flushing (Section 8) and for chlorinating valves and fire hydrants (Section 7).
6. Pressure testing shall be performed in accordance with the City of American Fork, Construction and Material Specifications. When water lines are ready for disinfection, the Contractor shall submit two (2) sets of "as-built" plans, and a letter stating that the water lines have been pressure tested and need to be disinfected, to the City of American Fork, Water Department.
7. The Contractor shall be responsible for all costs associated with the disinfection of all water lines construction per this plan. Pressure testing shall be performed in accordance with the City of American Fork, Construction and Material Specifications.
8. The Contractor shall paint all fire hydrants according to City of American Fork standards. The cost of painting fire hydrants shall be included in the contract unit price for fire hydrants.
9. No water taps or service connections (e.g., to curb stops or meter pits) may be issued until adjacent public water lines serving the construction site have been disinfected by the City of American Fork, Water Department and have been accepted by the Public Works Department.
10. The Contractor shall notify the City of American Fork, Water Department at (801) 763 3060 at least 24 hours before tapping into existing water lines.
11. All water main stationing shall be based on street centerline stationing.
12. All bends, joint deflections and fittings shall be backed with concrete per City of American Fork standards.
13. The Contractor shall give written notice to all affected property owners at least 1 working day but not more than 3 working days prior to any temporary interruption of water service. Interruption of water service shall be minimized and must be approved by the City Engineer.
14. All water lines shall be placed at a minimum depth of 4 feet measured from top of finished grade to top of water line. Water lines shall be set deeper at all points where necessary to clear existing or proposed utility lines or other underground restrictions by a minimum of 18 inches.

SANITARY SEWER

1. Sanitary sewage collection systems shall be constructed in accordance with the rules, regulations, standards and specifications of the City of American Fork, Public Works Department and the Utah Department of Health Code and Regulations.
2. The minimum requirements for sanitary sewer pipe with diameters 15 inches and smaller shall be reinforced concrete pipe ASTM C76 Class 3, or PVC sewer pipe ASTM D3034, SDR 35.
3. Pipe for 6-inch diameter house service lines shall be PVC pipe ASTM D3034, SDR 35. PVC pipe shall not be used at depths greater than 26 feet. Pipe materials and related structures shall be stop tested in accordance with City of American Fork Construction Inspection Division quality control requirements.
4. All manhole lids shall be provided with continuous self-sealing gaskets.
5. The approved construction drawings shall show where bolt-down lids are required.
6. Sanitary sewer manholes shall be precast concrete or as approved by the City Engineer and conform to the City of Americas Fork sanitary manhole standard drawing. Manhole lids shall include the word SEWER.
7. All PVC sewer pipes shall be deflection tested no less than 30 days after completion of backfilling operations.
7. At the determination of the City Engineer, the Contractor may be required to perform a TV inspection of the sanitary sewer system prior to final acceptance by the City. This work shall be completed by the Contractor at his expense.
8. Visible leaks or other defects observed or discovered during TV inspection shall be repaired to the satisfaction of the Engineer.
9. Roof drains, foundation drains, field tile or other clean water connections to the sanitary sewer system are strictly prohibited according to the American Fork Code of Ordinances.
10. All water lines shall be located at least 10 feet horizontally and 18 inches vertically, from sanitary sewers and storm sewers, to the greatest extent practicable.
11. Where sanitary sewers cross water mains or other sewers or other utilities, trench backfill shall be placed between the pipes crossing and shall be compacted granular material according to the city Standard Specifications. In the event that a water line must cross within 18 inches of a sanitary sewer, the sanitary sewer shall be concrete encased or consist of ductile iron pipe material.
12. Existing sanitary sewer flows shall be maintained at all times. Costs for pumping and bypassing shall be included in the Contractor's unit price bid for the related items.
13. The Contractor shall furnish all material, equipment, and labor to make connections to existing manholes.
14. All sewer lines shall be placed at a minimum depth of 4 feet measured from top of finished grade to top of sewer line.

STORM SEWER

1. All storm water detention and retention areas and major flood routing swales shall be constructed to finish grade and hydro - seeded and hydro - mulched according to the City of American Fork Standard Specifications.
2. Where private storm sewers connect to public storm sewers, the last run of private storm sewer connecting to the public storm sewer shall be Reinforced Concrete Pipe conforming to ASTM Designation C76, Wall B, Class IV for pipe diameters 12 inches to 15 inches, Class III for 18 inches to 24 inch pipes, and 27 inches and larger pipe shall be Class II, unless otherwise shown on the approved construction drawings.
3. Granular backfill shall be compacted granular material according to American Fork City Standard Specifications.
4. All public storm sewers shall be Reinforced Concrete Pipe conforming to ASTM Designation C76, Wall B, Class IV for pipe diameters 12 inches to 15 inches, Class III for 18 inches to 24 inch pipes, and 27 inches and larger pipe shall be Class II, unless otherwise shown on the approved construction drawings.
5. Headwalls and end walls shall be required at all storm sewer inlets or outlets to and from storm water management facilities. Natural stone and/or brick approved by the City Engineer shall be provided on all visible headwall and/or end walls surfaces.
6. Storm inlets or catch basins shall be channelized and have bicycle safe grates. Manhole lids shall include the word STORM.
7. Storm sewer outlets greater than 18 inches in diameter accessible from storm water management facilities or watercourses shall be provided with safety grates, as approved by the City Engineer.

STRIPING AND SIGNING

1. All striping must be done following Utah Department of Transportation guidelines and MUTCD Manual recommendations, current edition.
2. All signing must be done following MUTCD Manual recommendations, current edition.
3. Only sand-blasting is allowed for removal of existing striping.
4. Contractor is responsible for removal of conflicting existing striping.
5. Materials used for striping must comply with the Utah Department of Transportation standard specifications.

MAIL DELIVERY

1. The Contractor shall be responsible to ensure that US Mail delivery within the project limits is not disrupted by construction operations.
2. This responsibility is limited to relocation of mailboxes to a temporary location that will allow the completion of the work and shall also include the restoration of mailboxes to their original location or approved new location.
3. Any relocation of mailbox services must be first coordinated with the US Postal Service and the homeowner
4. Before relocating any mailboxes, the Contractor shall contact the U.S. Postal Service and relocate mailboxes according to the requirements of the Postal Service.

USE OF FIRE HYDRANTS

1. The Contractor shall make proper arrangements with the American Fork City, Water Department for the use of fire hydrants when used for work performed under this project's approval.

CIVIL ENGINEERING +SURVEYING
CIR
10718 SOUTH BECKSTEAD LANE, STE. 102
SOUTH JORDAN, UT 84095 - 801-446-4326

NO.	REVISIONS	BY	DATE
1	ADDRESS	LH	05/10/22
2	CELL UPDATE	LH	09/30/22
3	CONCRETE	LH	10/14/22
4	STORM DRAIN SERVICE	LH	10/24/22
5	STORM DRAIN EXISTING SERVICE	LH	10/25/22
6	STREET DESIGNED FLOW LINE	LH	10/26/22
#1		BY	DATE

DESIGNED TJH PROJECT ENGINEER TJH

UTAH VALLEY BUSINESS PARK

752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003

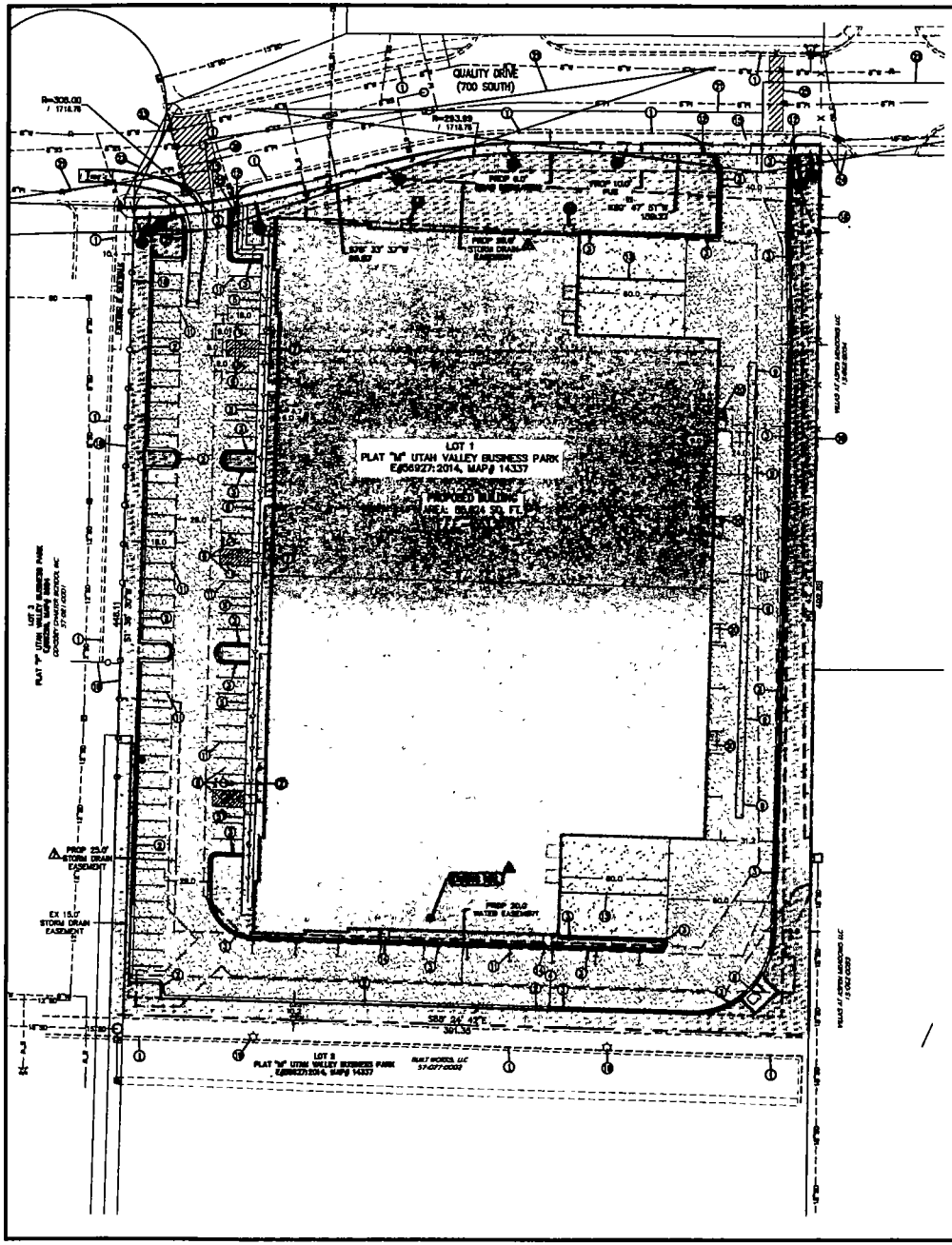
GENERAL NOTES

PROFESSIONAL ENGINEER
No. 12072803
TREVOR L. HODGSON
STATE OF UTAH

SHEET NO.
GN

PROJECT NO.	DATE
H1022-01	03/22/21
FILE NAME	SCALE
PBU-AFH	

UTAH VALLEY BUSINESS PARK
752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003
EXISTING SITE/DEMOLITION PLAN
CIVIL ENGINEERING +SURVEYING
10719 SOUTH BECKSTEAD LANE, STE. 102
SOUTH JORDAN, UT 84095 - 801-446-6286
SHEET NO. C0.1
PROJECT ID DATE 11022-01 08/29/23
FILE NAME PBL-XSEC
SCALE 1"=30'
Benchmark Info
The Benchmark for the project is the North Quarter Corner of Section 25, T 5 S., R 1 E., SLB&M.
Elevation = 4555.97
Datum is NAVD 88 derived from UTAH1133NGPS System
SEE COVER SHEET FOR PROJECT LEGEND
SHEET NOTES:
1. EXISTING POWER POLE AND POWER LINE TO BE REMOVED. CONTRACTOR TO COORDINATION WITH ROCKY MOUNTAIN POWER FOR REMOVAL/RELOCATION/BURIAL.
2. EXISTING STORM DRAIN PIPE AND STRUCTURE TO BE REMOVED. SEE SHEET C3.1 FOR NEW CONNECTION.
3. EXISTING WELL TO BE CAPPED BY DEVELOPER. CONTRACTOR TO FIELD VERIFY EXACT LOCATION PRIOR TO CONSTRUCTION.
4. EXISTING STORM DRAIN EASEMENT TO BE REMOVED. SEE SHEET C3.0 AND C3.1 FOR PROPOSED STORM DRAIN ALIGNMENT AND NEW STORM DRAIN EASEMENT.
5. EXISTING IRRIGATION PIPE AND IRRIGATION STRUCTURE TO BE REMOVED.
6. EXISTING FIRE HYDRANT TO BE RELOCATED. SEE SHEET C3.0 FOR NEW LOCATION.
7. REFER TO THE RECOMMENDATIONS FOR FILLING IN EXISTING POND WITHIN GEOTECHNICAL REPORT (PREPARED BY ROCKY MOUNTAIN GEO). FOR ALL MODIFICATIONS TO THE EXISTING POND. THERE IS NO EXISTING SPRING. NO EXISTED FLOWS AND PIPE CONVEYANCE CALCULATIONS ARE NEEDED.
QUALITY DRIVE (700 SOUTH)
EXISTING POND
EX 15.0' PIPE
EX 15.0' PIPE AND STORM DRAIN EASEMENT
EX 15.0' PIPE
EX 15.0' PIPE
EX 15.0' STORM DRAIN EASEMENT
POB
SOUTH 207.06'
S 89°35'51" E 2281.29' (BASIS OF BEARING)
952.92'
Found Witness Corner to Northwest Corner Section 25, T 5S., R 1E 3" Utah County Brass Cap 385' West, 1979
Found North Quarter Section 25, T 5S., R 1E 3" Utah County Brass Cap
NEW/DEMO TAN
PROJECT TAN
NO. REVISIONS BY DATE
1 ADJUST DRAINAGE PLAN AXIS TLH 08/29/23
2 STORM DRAIN EASEMENT UPDATE TLH 08/29/23
3 STORM DRAIN UPDATE TLH 08/29/23
4 COMMENTS TLH 08/29/23
5 ROAD UPDATE TLH 08/29/23
6 COMMENTS TLH 08/29/23
7 COMMENTS TLH 08/29/23



LOT AREAS:

		SQ. FT. / ACRES
LOT		161,970 SQ. FT. / 3.72 ACRES
	BUILDING FOOTPRINT	88,713 SQ. FT. / 2.04 ACRES
	ASPHALT	51,423 SQ. FT. / 1.18 ACRES
	LANDSCAPING	18,317 SQ. FT. / 0.42 ACRES
	CONCRETE	13,518 SQ. FT. / 0.31 ACRES

NOTE:
1. ALL AREA CALCULATIONS ARE APPROXIMATE AND CAN CHANGE DUE TO CONSTRUCTION TOLERANCES.

LOT PARKING REQUIREMENTS:

	SQ. FT.	QTY. REQ'D*
OFFICE	3,430 SQ. FT.	9 (1/400)
WAREHOUSE	87,988 SQ. FT.	67 (1/1,300)
TOTAL BUILDING		76
TOTAL PROVIDED		88
ACCESSIBLE SPACES		6 (4 REQ'D TO 75 TO 100)

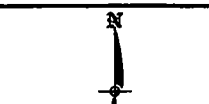
REFERENCE CODE:
* - OFF-STREET PARKING STANDARDS OF THE AMERICAN FORK CITY, UTAH CODE (FOR CITY RECOMMENDED)

NOTES:
1. ALL AREA CALCULATIONS ARE APPROXIMATE AND CAN CHANGE DUE TO CONSTRUCTION TOLERANCES.
2. ALL TYPICAL CONSTRUCTION TO COMPLY WITH AMERICAN FORK CITY STANDARDS. SEE AMERICAN FORK STANDARD DRAWINGS.

SITE PLAN NOTES:

1. EXISTING CURB & GUTTER
2. PROPOSED 24" CURB & GUTTER. SEE DETAIL 1/C4.0.
3. PROPOSED 24" REV PAN CURB & GUTTER. SEE DETAIL 3/C4.0.
4. PROVIDE A SMOOTH TRANSITION FROM CURB & GUTTER TO REV PAN CURB & GUTTER.
5. PROPOSED OPEN FACE SIDEWALK. SEE DETAIL 6/C4.0.
6. ALL HANDICAP STALLS SHALL HAVE SLOPES OF LESS THAN 2% IN ALL DIRECTIONS. SEE DETAIL 12/C4.0 AND 13/C4.0 FOR ADA SIGN DETAILS AND PLACEMENT
7. ADA RAMPS ARE TO BE INSTALLED PER CITY AND ADA STANDARDS AND SPECIFICATIONS. SEE DETAIL 4/C4.0.
8. PROPOSED TRASH ENCLOSURE. SEE DETAIL SHEET C5.1 FOR DETAILS.
9. PROPOSED 6" WIDE ROLL GUTTER. SEE DETAIL 5/C4.0.
10. PROPOSED 5' SIDEWALK PER APWA STD. 231. SEE DETAIL SHEET C4.0.
11. ALL PAVEMENT LOT STRIPING TO BE REFLECTIVE WHITE (TYP.) PER M.U.T.C.D. STANDARDS.
12. INSTALL DETECTABLE WARNING SURFACE PER APWA STANDARD PLAN NO. 238. SEE DETAIL SHEET C4.0.
13. PROPOSED DOCK WALL. SEE STRUCTURAL PLANS FOR DETAILS.
14. PROPOSED DOOR LANDING TO BE A MAX 2% SLOPE FOR A MINIMUM OF 5'x5' OUTSIDE OF DOOR. SEE SHEET C2.0 FOR GRADING.
15. INSTALL RADIUS DRIVE APPROACH PER APWA STANDARD PLAN 225. SEE DETAIL SHEET C5.1. SIDEWALK ACROSS DRIVE APPROACHES TO BE 6" (TYP.)
16. ADA RAMPS ARE TO BE INSTALLED PER CITY AND ADA STANDARDS AND SPECIFICATIONS. SEE DETAIL 11/C4.0.
17. NOT USED.
18. EXISTING FENCE.
19. EXISTING LIGHT POLE.
20. PROPOSED STAIRS. SEE ARCHITECTURAL PLANS FOR DETAILS.
21. SIGHT TRIANGLE.
22. INSTALL STOP SIGN PER MUTCD STANDARD R1-1

23. INSTALL CROSS WALK PER AMERICAN FORK STANDARDS.
24. EXTEND 5' SIDEWALK TO EXISTING DRIVE APPROACH AND INSTALL ADA RAMP PER AMERICAN FORK STANDARD 15.18 IF NOT ALREADY INSTALLED BY NEIGHBORING PROPERTY. SEE DETAIL SHEET C4.0.
25. SAW CUT EXISTING ASPHALT TO INSTALL LATERAL. WORK TO BE DONE PER AMERICAN FORK STANDARD 15.22. REPLACE ALL ASPHALT IN KIND PER AMERICAN FORK CITY CODE 12.08.040 E. ASPHALT T-PATCH TO BE LIP TO LIP OF CURB AND WIDTH TBD BY CITY INSPECTOR. RESTRIPE AS NECESSARY TO MATCH EXISTING.
26. SAW CUT EXISTING ASPHALT TO INSTALL LATERAL. WORK TO BE DONE PER AMERICAN FORK STANDARD 15.22. REPLACE ALL ASPHALT IN KIND PER AMERICAN FORK CITY CODE 12.08.040 E. ASPHALT T-PATCH TO BE LIP TO LIP OF CURB AND WIDTH TBD BY CITY INSPECTOR. RESTRIPE AS NECESSARY TO MATCH EXISTING. EXISTING CROSSWALK TO BE RECONSTRUCTED AS A SCHOOL CROSSWALK AFTER T-PATCH IS COMPLETED.



SEE COVER SHEET FOR PROJECT LEGEND

SHEET LEGEND

ADA ROUTE

Benchmark Info

The Benchmark for the project is the North Quarter Corner of Section 25 T 5 S R 1 E. SLB&M
Elevation= 4555.90'
Datum is NAVD 88 derived from UTAH TURNGPS System

NO.	REVISIONS	BY	DATE
1	COMMENTS	SM	03/09/21
2	CITY COMMENTS	SM	04/01/21
3	CITY COMMENTS	SM	04/15/21
4	SITE PLAN REVISIONS	SM	04/23/21
5	SITE PLAN REVISIONS	SM	05/03/21
6	FINAL SUBMITTAL	SM	05/10/21
7	FINAL DRAWINGS FOR APP.	SM	05/24/21
8	FINAL SUBMITTAL	SM	06/04/21

DESIGNED: TJH
PROJECT ENGINEER: TJH

CIR | CIVIL ENGINEERING + SURVEYING
10718 SOUTH BEGSTEAD LANE, STE. 102
SOUTH JORDAN, UT 84095 ~ 801-446-4288

UTAH VALLEY BUSINESS PARK

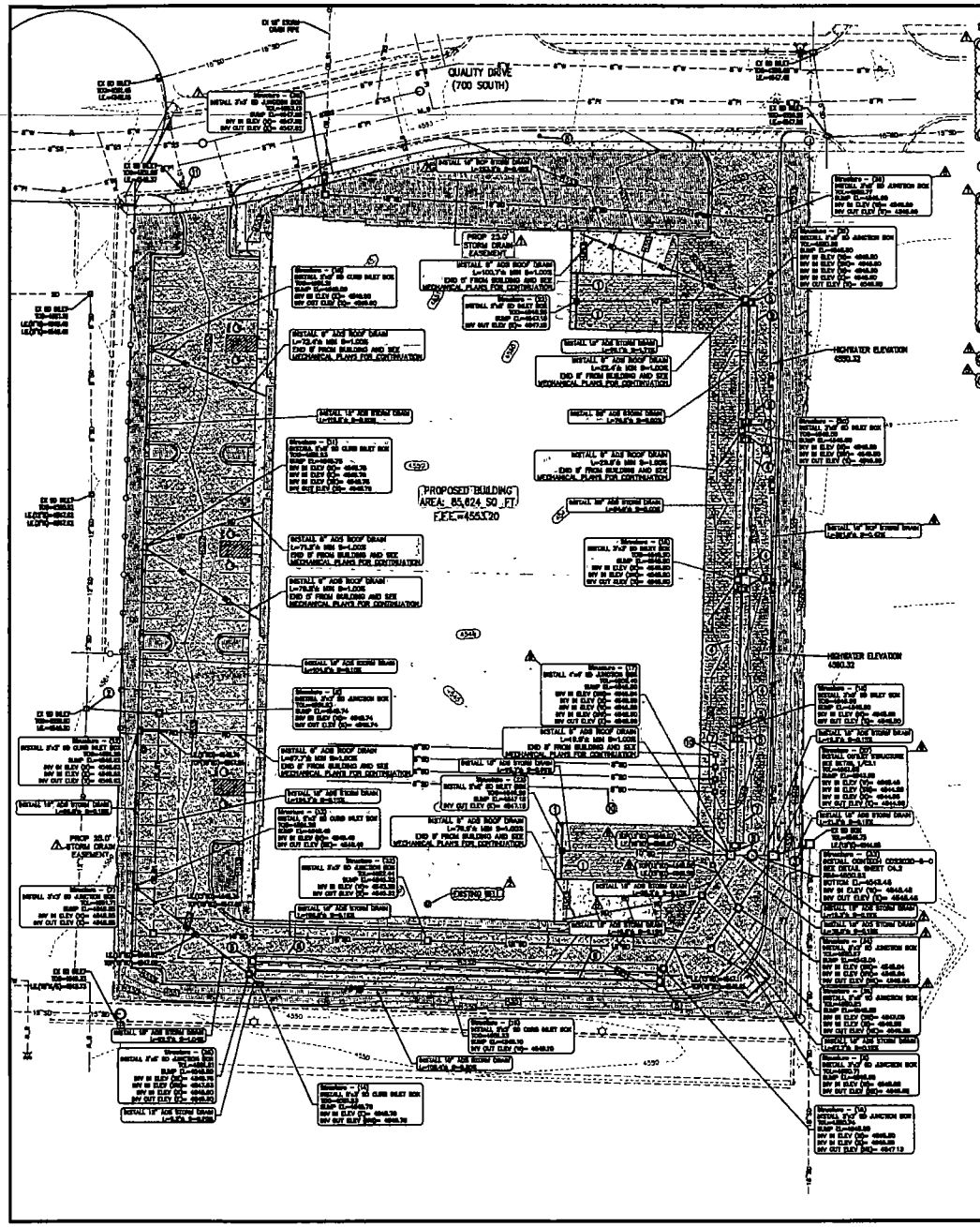
752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003

SITE PLAN

SHEET NO.
C1.0

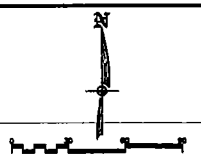
PROJECT ID: H1023-01
DATE: 03/23/21
FILE NAME: PRJ-AFH
SCALE: 1"=30'

UTAH VALLEY BUSINESS PARK
752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003
GRADING PLAN
CIVIL ENGINEERING + SURVEYING
10718 SOUTH BECKSTEAD LANE, STE. 102
SOUTH JORDAN, UT 84095 - 801-446-4294
REVISIONS
SHEET NO C2.0
PROJECT ID H1033-01
DATE 03/22/23
SCALE 1"=30'
FILE NAME PRJ-GPL
Benchmark Info
The Benchmark for the project is the North Quarter Corner of Section 25, T5S R1E SLB&M
Elevation = 4565.46
Datum NAVD 88 derived from UTAH FORWARD System
SHEET LEGEND
DETENTION AREA
SEE COVER SHEET FOR PROJECT LEGEND
SHEET NOTES:
INSTALL 3' DEEP BY 3' WIDE GRAVEL TRENCH TO INTERCEPT AND CONVEY WATER FROM WATER TABLE. TRENCH TO BE WRAPPED WITH MIRAFI DRAINAGE FABRIC TO WITHIN 6" OF FINISH GRADE. GRAVEL TO HAVE A MINIMUM POROSITY OF 0.40.
QUALITY DRIVE (700 SOUTH)
PROPOSED BUILDING AREA: 65,424 SQ. FT. F.F.E.=4553.00
DETENTION BASIN
EXISTING ELEVATION 4553.00



SHEET NOTES:

1. INSTALL ZURN Z886 TRENCH DRAIN WITH PR-DGE HEAVY DUTY GRATE. TOG=4548.30. SEE DETAIL 14/C4.0
2. CONNECT PROPOSED 18" STORM DRAIN PIPE TO EXISTING STORM DRAIN BOX AT I.E.=4544.30.
3. CONNECT PROPOSED 15" STORM DRAIN PIPE TO EXISTING 15" STORM DRAIN BOX AT I.E.=4544.83.
4. INSTALL STORMTECH SC-740 SUBSURFACE STORMWATER MANAGEMENT SYSTEM. INSTALLATION TO BE DONE PER MANUFACTURER SPECIFICATIONS. BOTTOM OF CHAMBERS TO BE SET AT ELEVATION 4545.50. CONTRACTOR TO INSTALL 2 LEGS OF 10 CHAMBERS. TOTAL CHAMBERS TO BE 20. SEE DETAIL SHEET C4.1
5. INSTALL 18" TEES (TYP.)
6. INSTALL STORMTECH SC-740 SUBSURFACE STORMWATER MANAGEMENT SYSTEM. INSTALLATION TO BE DONE PER MANUFACTURER SPECIFICATIONS. BOTTOM OF CHAMBERS TO BE SET AT ELEVATION 4545.50. CONTRACTOR TO INSTALL 3 LEGS OF 32 CHAMBERS. TOTAL CHAMBERS TO BE 128. SEE DETAIL SHEET C4.1.
7. INSTALL STORMTECH SC-740 SUBSURFACE STORMWATER MANAGEMENT SYSTEM. INSTALLATION TO BE DONE PER MANUFACTURER SPECIFICATIONS. BOTTOM OF CHAMBERS TO BE SET AT ELEVATION 4543.50. CONTRACTOR TO INSTALL 2 LEGS OF 9 CHAMBERS. TOTAL CHAMBERS TO BE 18. SEE DETAIL SHEET C4.1
8. INSTALL GROUNDWATER MONITORING WELL (W/PIEZOMETER). SEE DETAIL SHEET C4.1.
9. INSTALL STORMTECH SC-740 SUBSURFACE STORMWATER MANAGEMENT SYSTEM. INSTALLATION TO BE DONE PER MANUFACTURER SPECIFICATIONS. BOTTOM OF CHAMBERS TO BE SET AT ELEVATION 4545.50. CONTRACTOR TO INSTALL 2 LEGS OF 8 CHAMBERS. TOTAL CHAMBERS TO BE 16. SEE DETAIL SHEET C4.1
10. SEE SHEET C3.4 FOR ASSBUILT DRAINAGE PLANS.
11. EXISTING LID TO BE REPLACED WITH H-20 TRAFFIC RATED LID AND MODIFIED FROM CURB INLET TO GRATE.



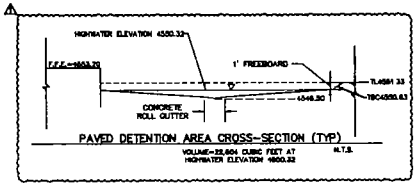
SEE COVER SHEET FOR PROJECT LEGEND

SHEET LEGEND

DETENTION AREA

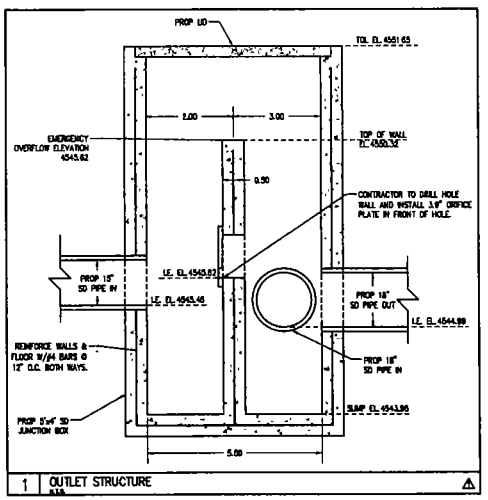
Benchmark Info

The Benchmark for the project is the North Quarter Corner of Section 25, T 5 S R 1 E SLB&M
Elevation= 4555.90'
Datum is NAVD 88 derived from UTAH TURNGPS System



PAVED DETENTION AREA CROSS-SECTION (TYP)

VOLUME=23,604 CUBIC FEET AT HIGHWATER ELEVATION 4550.32 — N.T.S.



1 OUTLET STRUCTURE

CALL BEFORE YOU DIG
BLUE STAKES 1-800-662-4111

NO.	REVISIONS	BY	DATE
1	COMMENTS	SM	08/04/23
2	WELL SPACE	SM	08/07/23
3	COMMENTS	SM	09/07/23
4	STORM DRAIN SPACE	SM	09/20/23
5	STORM DRAIN AS-BUILT UPDATE	SM	01/02/24
6	STREET DRAINAGE PLAN ADD	SM	01/09/24

DESIGNED: TLH | PROJECT ENGINEER: TLH

CIVIL ENGINEERING + SURVEYING

C1R

10715 SOUTH BECKSTEAD LANE, STE. 102
SOUTH JORDAN, UT 84095 - 801-446-4388

UTAH VALLEY BUSINESS PARK

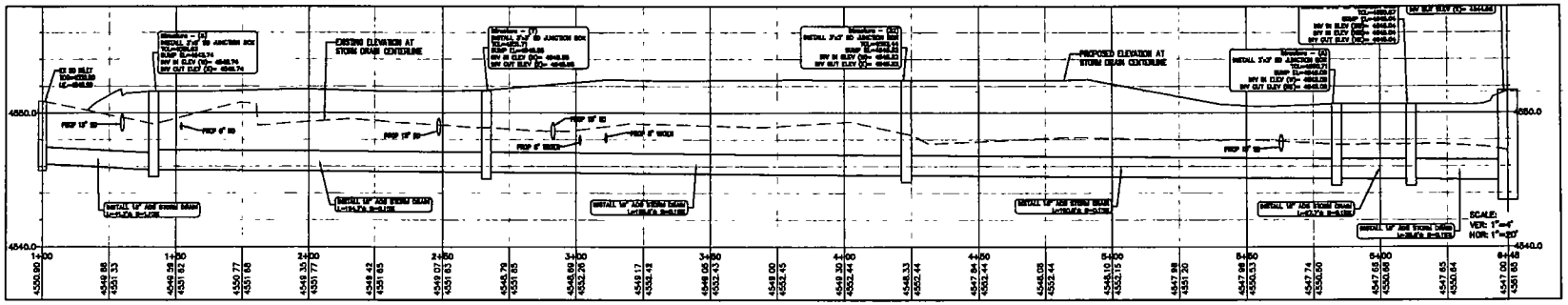
752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003

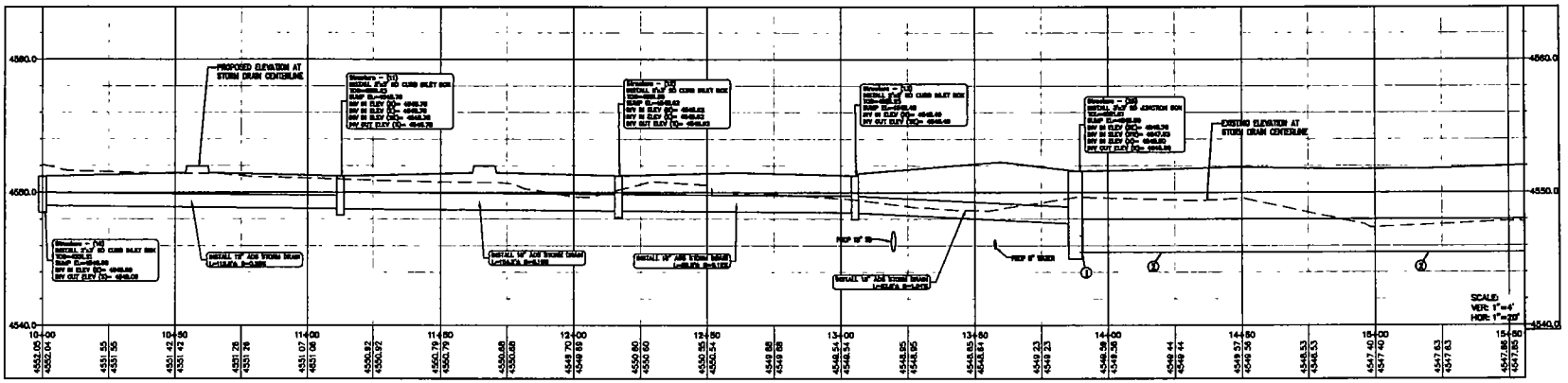
DRAINAGE PLAN

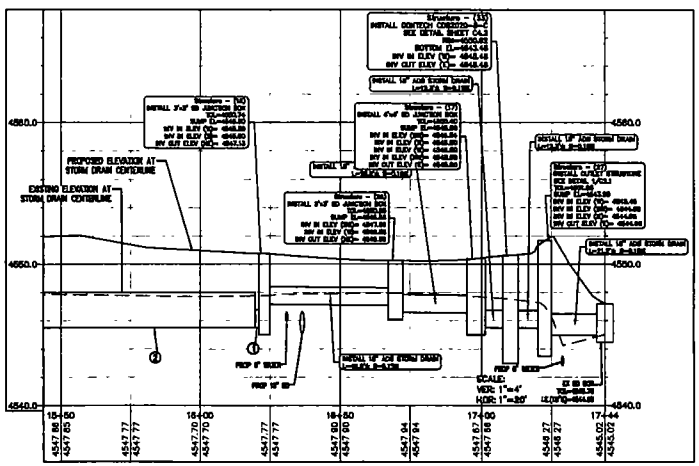
PROFESSIONAL ENGINEER
No. 13072803
TREVOR L HODGSON
STATE OF UTAH

SHEET NO
C2.1

PROJECT ID: H1033-01 | DATE: 01/23/24
FILE NAME: PRJ-AFH | SCALE: 1"=30'







SHEET NOTES:

① INSTALL 15" TEE® (TYP.)

② INSTALL STORMTECH SC-740 SUBSURFACE STORMWATER MANAGEMENT SYSTEM. INSTALLATION TO BE DONE PER MANUFACTURER SPECIFICATIONS. BOTTOM OF CHAMBERS TO BE SET AT ELEVATION 4545.50. CONTRACTOR TO INSTALL 3 LEGS OF 32 CHAMBERS. TOTAL CHAMBERS TO BE 128. SEE DETAIL SHEET C4.1.

Scale in Feet

SEE COVER SHEET FOR PROJECT LEGEND

Benchmark Info

The Benchmark for the project is the North Quarter Corner of Section 25 T5S R1E SLB&M
Elevation= 4555.90'
Datum is NAVD 88 derived from UTAH TURNGPS System

NO	REVISIONS	BY	DATE
1	COMMENTS	TJH	05/05/23
2	WELL SPACE	TJH	06/05/23
3	DETENTION SPACE	TJH	06/05/23
4	STORM DRAIN ADJUSTMENT/UPSIZE	TJH	06/05/23
5	ADDED DETENTION PUMP AND	TJH	06/05/23

DESIGNED: TJH PROJECT ENGINEER: TJH

CIR | CIVIL ENGINEERING + SURVEYING

10715 SOUTH BECKSTEAD LANE, STE. 102
SOUTH JORDAN, UT 84095 - 801-446-4286

UTAH VALLEY BUSINESS PARK

752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003

STORM DRAIN PROFILE

PROFESSIONAL ENGINEER
No. 13972623
TREVOR L. HODGSON
STATE OF UTAH

SHEET NO: C2.2

PROJECT ID: H1022-01 | DATE: 03/22/21
FILE NAME: PRJ-AFH | SCALE: 1"=20'

SHEET NOTES:

① INSTALL 15" TEES (TYP.)

② INSTALL STORMTECH SC-740 SUBSURFACE STORMWATER MANAGEMENT SYSTEM. INSTALLATION TO BE DONE PER MANUFACTURER SPECIFICATIONS. BOTTOM OF CHAMBERS TO BE SET AT ELEVATION 4546.00. CONTRACTOR TO INSTALL 2 LEGS OF 9 CHAMBERS. TOTAL CHAMBERS TO BE 18. SEE DETAIL SHEET C4.1.

③ INSTALL STORMTECH SC-740 SUBSURFACE STORMWATER MANAGEMENT SYSTEM. INSTALLATION TO BE DONE PER MANUFACTURER SPECIFICATIONS. BOTTOM OF CHAMBERS TO BE SET AT ELEVATION 4546.50. CONTRACTOR TO INSTALL 2 LEGS OF 10 CHAMBERS. TOTAL CHAMBERS TO BE 20. SEE DETAIL SHEET C4.1.

④ INSTALL STORMTECH SC-740 SUBSURFACE STORMWATER MANAGEMENT SYSTEM. INSTALLATION TO BE DONE PER MANUFACTURER SPECIFICATIONS. BOTTOM OF CHAMBERS TO BE SET AT ELEVATION 4546.00. CONTRACTOR TO INSTALL 2 LEGS OF 8 CHAMBERS. TOTAL CHAMBERS TO BE 16. SEE DETAIL SHEET C4.1.

Scale in Feet

SEE COVER SHEET FOR PROJECT LEGEND

Benchmark Info

The Benchmark for the project is the North Quarter Corner of Section 25
T.5 S R.1 E, SLB&M
Elevation= 4555.97
Datum is NAVD 88 derived from UTAH TURN GPS System

NO	REVISIONS	BY	DATE
3	COMMENTS	TLH	[illegible]
4	WELL UPDATE	TLH	[illegible]
5	COMMENTS	TLH	[illegible]
6	STORM DRAIN UPDATE	TLH	[illegible]
7	STORM DRAIN EASEMENT UPDATE	TLH	[illegible]
8	[illegible] DRAINAGE PLAN ADD	TLH	[illegible]

DESIGNER: TLH PROJECT ENGINEER: TLH

CIR | CIVIL ENGINEERING + SURVEYING

10718 SOUTH BECKSTEAD LANE, STE. 102
SOUTH JORDAN, UT 84095 - 801-949-6296

UTAH VALLEY BUSINESS PARK

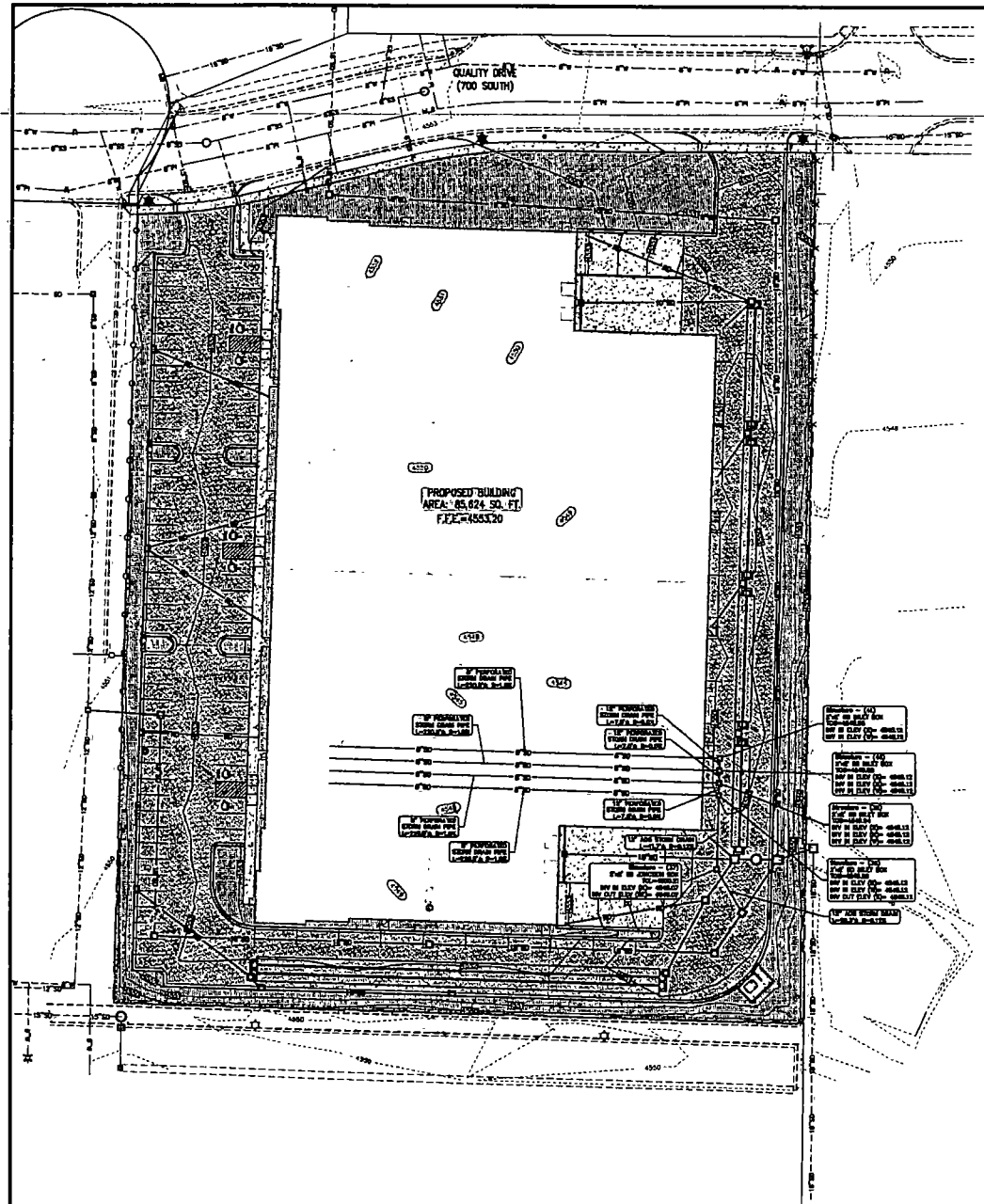
752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003

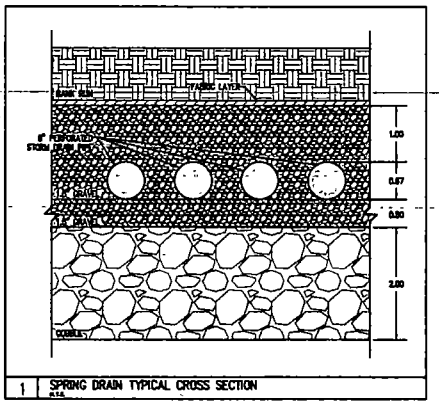
STORM DRAIN PROFILE

TREVOR L. HODGSON

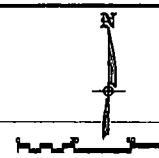
SHEET NO. C2.3

PROJECT ID: H1089-01
DATE: 03/22/21
FILE NAME: PRJ-AFH
SCALE: 1"=20'





1 SPRING DRAIN TYPICAL CROSS SECTION



Scale in Feet

SEE COVER SHEET FOR PROJECT LEGEND

Benchmark Info

The Benchmark for the project is the North Quarter Corner of Section 26, T 5 S R 1 E, SLB&M
Elevation = 4555.90'
Datum is NAVD 88 derived from UTAH TURNGPS System

NOTE:
1. REFER TO THE RECOMMENDATIONS FOR FILLING IN THE EXISTING POND REPORT BY KEN DARD MARCH 1, 2022 (PROJECT NO 53023-001).
2. THE PIPING AND STRUCTURES HANDLING FLOWS FROM THE EXISTING POND EVERY 3 YEARS OR AS NECESSARY PER THE STORM WATER MANAGEMENT PLAN.

NO.	REVISIONS	BY	DATE
1	ADDED DRAINAGE FLOW LINE	ELS	6/30/20
2	ADDED	ELS	6/30/20
3	ADDED	ELS	6/30/20
4	ADDED	ELS	6/30/20
5	ADDED	ELS	6/30/20
6	ADDED	ELS	6/30/20
7	ADDED	ELS	6/30/20

DESIGNED: TLH | PROJECT ENGINEER: TLH

CIR CIVIL ENGINEERING + SURVEYING
10718 SOUTH BECKSTEAD LANE, STE. 103
SOUTH JORDAN, UT 84095 • 801-446-4388

UTAH VALLEY BUSINESS PARK

752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003

ASBUILT DRAINAGE PLAN

PROFESSIONAL ENGINEER
No. 13372852
TREVOR L. HODGSON
STATE OF UTAH

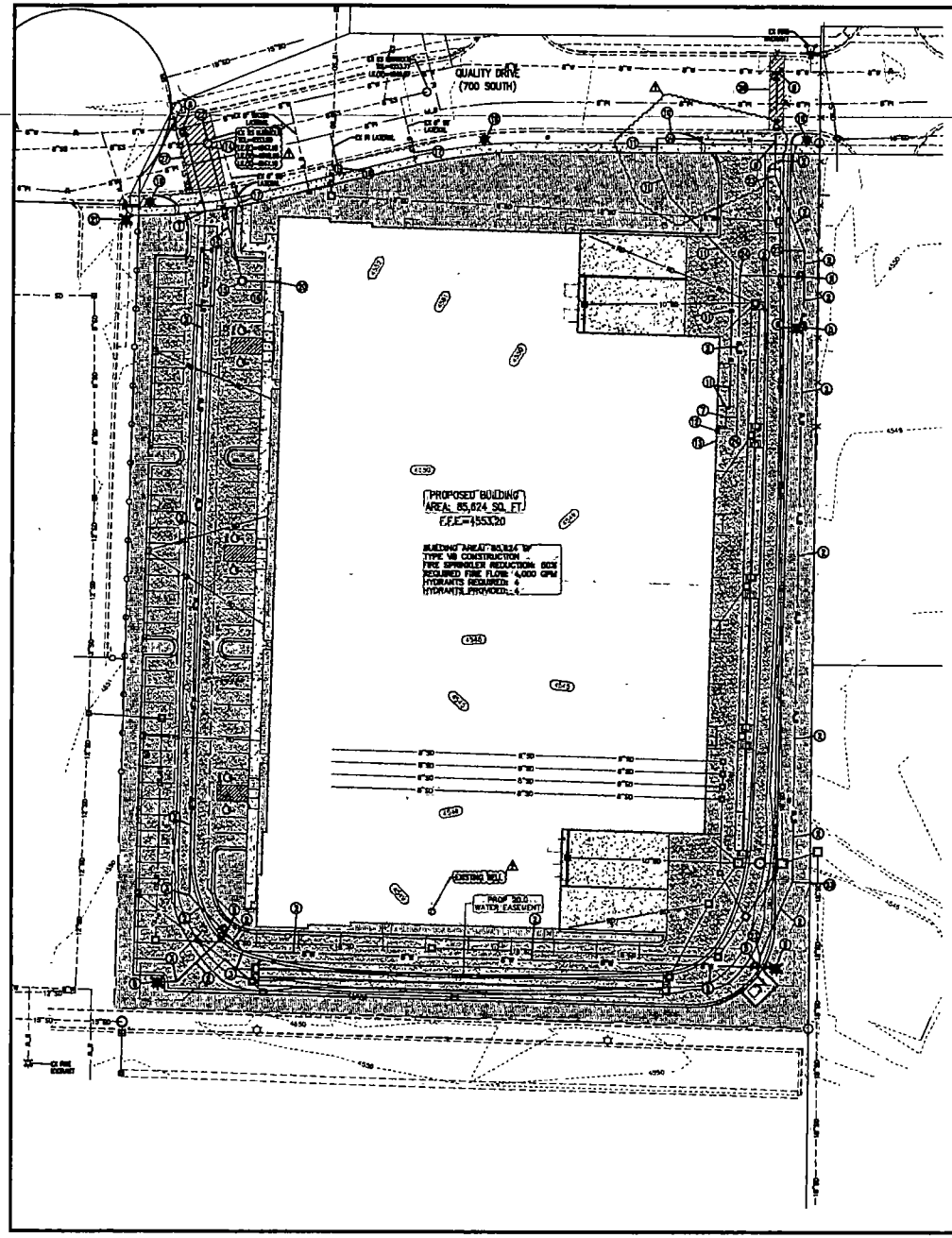
SHEET NO. C2.4

PROJECT ID	DATE
H1022-01	03/25/21
FILE NAME: PRJ-AFH	SCALE: 1"=30'

AS-BUILT SET

AS-BUILT INFORMATION PROVIDED BY CONTRACTOR

CALL BEFORE YOU DIG
BLUE STAKES OF UTAH



CITY SANITARY SEWER NOTE:
ALL SEWER MAINS AND LATERALS MUST BE INSPECTED AND APPROVED BY THE CITY OF AMERICAN FORK PUBLIC WORKS DEPARTMENT BEFORE BACKFILLING IS ACCOMPLISHED

SEWER/WATER CROSSING NOTE:
IN LOCATIONS WHERE THE WATER LINE AND SEWER LINE CROSS AND THE WATER LINE MUST BE INSTALLED BELOW THE SEWER LINE, REFER TO DETAIL 1/C3.1 FOR INSTALLATION GUIDELINES.

LATERAL NOTE:
ALL LATERAL CONNECTIONS SHALL INSERT-A-TEE OR WYE AT TEN O'CLOCK OR TWO O'CLOCK POSITIONING TO THE CENTER OF THE MAIN LINE AND SHALL BE ENCASED IN CONCRETE AFTER INSPECTION IS MADE.

ROADWAY NOTE:
ANY ROADWAY CUTS IN THE NEWLY CONSTRUCTED PORTIONS OF QUALITY DRIVE AS ALLOWED BY THE CITY ENGINEER SHALL FOLLOW THE ADDITIONAL REQUIREMENTS FOR NEW PAVEMENT AS OUTLINED IN SECTION 12.08.040 PAVEMENT PRESERVATION OF THE AMERICAN FORK CITY MUNICIPAL CODE.

WATER NOTE:
AREAS WHERE GROUNDWATER IS ENCOUNTERED, MECHANICAL RESTRAINTS ARE TO BE USED INSTEAD OF THRUST BLOCKS. SEE DETAIL SHEET C5.0.

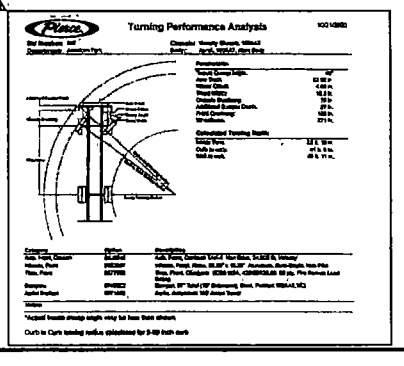
Scale in Feet

SEE COVER SHEET FOR PROJECT LEGEND

Benchmark Info

The Benchmark for the project is the North Quarter Corner of Section 25 T 5 S R 1 E, SLB&M
Elevation= 4555.97
Datum is NAVD 88 derived from UTAH TURNGPS System

1. INSTALL 6" 11.25° BEND W/THRUST BLOCKS.
2. INSTALL 8" PVC C-900 WATER LINE.
3. INSTALL 6" 45° BEND W/THRUST BLOCKS.
4. INSTALL 6" 33.75° BEND W/THRUST BLOCKS.
5. INSTALL 8" TEE W/THRUST BLOCKS AND GATE VALVES.
6. INSTALL FIRE HYDRANT PER AMERICAN FORK STD. 15.6. SEE DETAIL SHEET C5.0.
7. END 8" PVC C-900 WATER LINE 5' FROM BUILDING AND SEE FIRE SPRINKLER PLANS FOR CONTINUATION TO FIRE RISER.
8. CONNECT PROPOSED 8" PVC C-900 WATER LINE LATERAL TO EXISTING 8" WATER MAIN. ALL WORK TO BE DONE PER AMERICAN FORK STANDARDS AND SPECIFICATIONS. (HOT TAP)
9. INSTALL 8" POLY PIPE WATER LATERAL PER AMERICAN FORK CITY STANDARD PLAN NO. 15.3 AND 15.5. SEE DETAIL SHEET C5.0 AND C5.1.
10. INSTALL 2" WATER METER PER AMERICAN FORK CITY STANDARD PLAN NO. 15.9C. SEE DETAIL SHEET C5.1.
11. INSTALL 2" POLY PIPE WATER W/BENDS. END 5' FROM BUILDING AND SEE MECHANICAL PLANS FOR CONTINUATION TO BUILDING.
12. INSTALL WALL MOUNTED FDC.
13. INSTALL KNOX BOX 1650 OR 3200 SERIES KEY BOX FOR FIRE DEPARTMENT ACCESS.
14. CONNECT TO EXISTING SEWER MANHOLE AT I.E.=4547.18 AND INSTALL 78'± OF 8" PVC SEWER PIPE, S=0.4%.
15. INSTALL 4' DIA. SEWER MANHOLE PER AMERICAN FORK STD. 13.12. TOL=4552.34, I.E.(IN)=4547.70, I.E.(OUT)=4547.60. SEE DETAIL SHEET C5.1.
16. INSTALL 20'± OF 8" PVC SDR-35 SEWER PIPE, S=0.4%
17. EXISTING 6" SEWER LATERAL TO BE REMOVED AND KILLED AT THE MAIN.
18. CONNECT TO EXISTING PI LATERAL AND INSTALL 2" POLY PIPE PRESSURIZED IRRIGATION LATERAL PER AMERICAN FORK STD. PLAN NO. 15.6B AND NO-RISE SECONDARY METER COPPERSETTER W/21" FRAME & COVER (MANHOLE TYPE) PER 15.9E. SEE DETAIL SHEET C5.1 AND LANDSCAPE PLANS FOR CONTINUATION.
19. INSTALL STREET LIGHT PER AMERICAN FORK STANDARDS.
20. INSTALL 6" CLEANOUT WYE 5' FROM BUILDING, I.E.=4547.78 AND SEE MECHANICAL PLANS FOR CONTINUATION TO BUILDING.
21. EXISTING FIRE HYDRANT TO BE RELOCATED SUCH THAT THE 5' SIDEWALK CAN CONTINUE WEST.
22. EXISTING SEWER MANHOLE TO BE UPSIZED TO 5' DIAMETER PER AMERICAN FORK STANDARDS. RECONNECT TO EXISTING 8" SEWER MAIN AT I.E.(E)=4547.52, I.E.(N)=4548.88, I.E.(S)=4547.18
23. INSTALL 6" 22.5° BEND W/THRUST BLOCKS.
24. INSTALL 6" 90° BEND W/THRUST BLOCKS.
25. FIRE TRUCK TURNING RADII PER TOWER 61 TURNING SPEC. SEE DETAIL THIS SHEET.
26. SAW CUT EXISTING ASPHALT TO INSTALL LATERAL. WORK TO BE DONE PER AMERICAN FORK STANDARD 15.22. REPLACE ALL ASPHALT IN KIND PER AMERICAN FORK CITY CODE 12.08.040 E. ASPHALT T-PATCH TO BE LIP TO LIP OF CURB AND WIDTH TBD BY CITY INSPECTOR. RESTRIPE AS NECESSARY TO MATCH EXISTING.
27. SAW CUT EXISTING ASPHALT TO INSTALL LATERAL. WORK TO BE DONE PER AMERICAN FORK STANDARD 15.22. REPLACE ALL ASPHALT IN KIND PER AMERICAN FORK CITY CODE 12.08.040 E. ASPHALT T-PATCH TO BE LIP TO LIP OF CURB AND WIDTH TBD BY CITY INSPECTOR. RESTRIPE AS NECESSARY TO MATCH EXISTING. EXISTING CROSSWALK TO BE RECONSTRUCTED AS A SCHOOL CROSSWALK AFTER T-PATCH IS COMPLETED.



NO	DATE	REVISIONS
1	03/23/21	PROJECT SUBMITTAL TLH
2	04/15/21	PROJECT DRAWING SET UPDATE
3	05/14/21	CITY COMMENTS
4	06/24/21	CITY COMMENTS
5	07/26/21	CITY COMMENTS
6	08/24/21	REVISED SITE PLAN
7	09/24/21	PROJECT DRAWING PLANS ADD
8	10/26/21	STORM WATER SUPPLY UPDATE
9	11/24/21	CITY COMMENTS
10	12/28/21	CITY COMMENTS

DRAWN: TLH | PROJECT ENGINEER: TLH

CIR CIVIL ENGINEERING + SURVEYING
10718 SOUTH BECKSTEAD LANE, STE. 103
SOUTH JORDAN, UT 84095 | 801-446-2326

UTAH VALLEY BUSINESS PARK
752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003

UTILITY PLAN

PROFESSIONAL ENGINEER
No. 12072823
TREVOR L HODGSON
STATE OF UTAH

SHEET NO.
C3.0

PROJECT ID: H1022-01 | DATE: 03/23/21
FILE NAME: PR-ARH | SCALE: 1"=30'

CIVIL ENGINEERING
+SURVEYING
10719 SOUTH BECKSTEAD LANE, STE. 102
SOUTH JORDAN, UT 84095 - 801-949-0290

NO.	REVISIONS	BY	DATE
1	CONDITIONS	TJH	05/24/23
2	CONDITIONS	TJH	06/14/23
3	SHEET LAYOUT	TJH	06/14/23
4	CONDITIONS	TJH	06/14/23
5	CITY REVIEW COMMENTS	TJH	06/14/23
6	CITY REVIEW COMMENTS	TJH	06/14/23
7	CONDITIONS	TJH	06/14/23

CONNECTION TAN — PRELIMINARY CONNECTION TAN

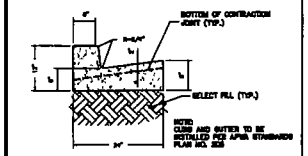
UTAH VALLEY BUSINESS PARK

752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003

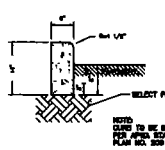
SEWER PROFILE

SHEET NO. C3.1

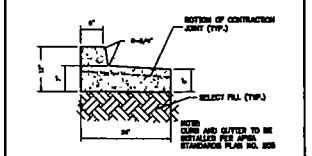
PROJECT ID: H11022-01
FILE NAME: PAL-SEW1
DATE: 05/22/23
SCALE: 1"=50'



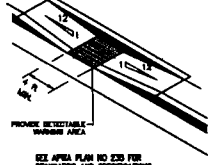
1 | 24" CURB & GUTTER



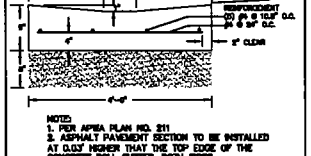
2 | 6" CURB WALL



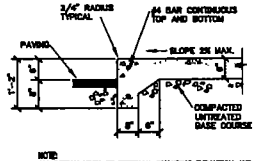
3 | 24" REVERSE PAN CURB & GUTTER



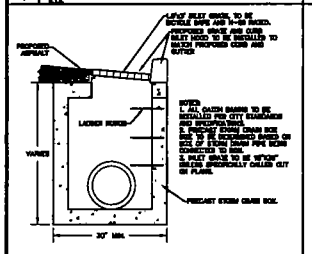
4 | ADA RAMP



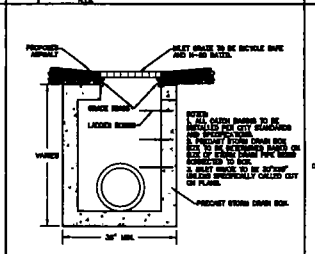
5 | 4'-0" ROLL GUTTER



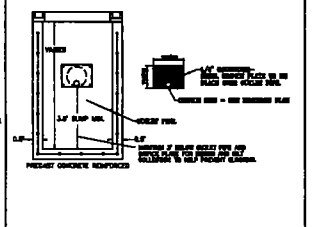
6 | OPEN FACE SIDEWALK



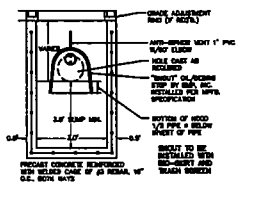
7 | STANDARD STORM DRAIN CURB INLET BOX



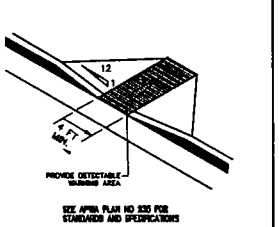
8 | STANDARD STORM DRAIN INLET BOX



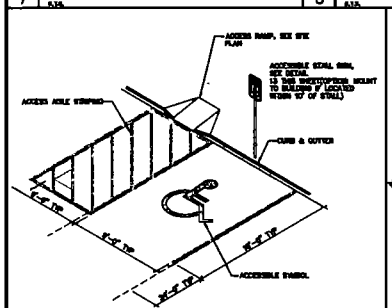
9 | ORIFICE PLATE



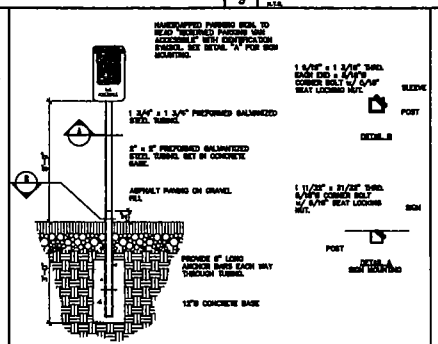
10 | SNOUT OIL & DEBRIS STOP



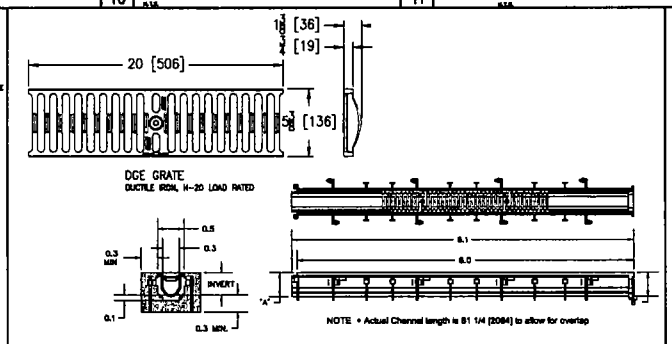
11 | ADA RAMP



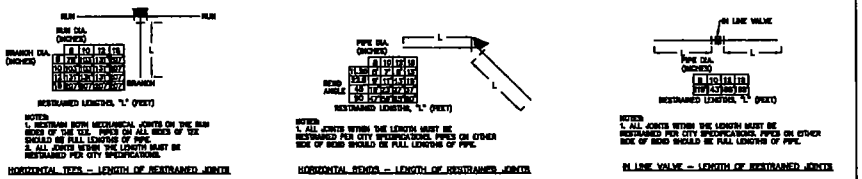
12 | ACCESSIBLE PARKING STALL



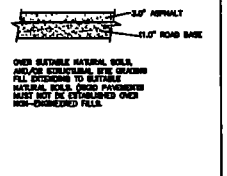
13 | HANDICAPPED PARKING SIGN



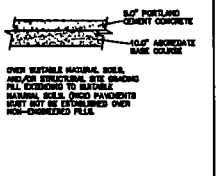
14 | ZURN Z886 TRENCH DRAIN SYSTEM



15 | RESTRAINED JOINT LENGTHS



16 | ASPHALT PAVEMENT SECTION △



17 | CONCRETE PAVEMENT SECTION △

NO	REVISIONS	BY	DATE
1	ADDED TRENCH DRAIN	TJH	03/22/21
2	ADDED TRENCH DRAIN	TJH	03/23/21
3	ADDED TRENCH DRAIN	TJH	03/24/21
4	ADDED TRENCH DRAIN	TJH	03/25/21
5	ADDED TRENCH DRAIN	TJH	03/26/21
6	ADDED TRENCH DRAIN	TJH	03/27/21
7	ADDED TRENCH DRAIN	TJH	03/28/21
8	ADDED TRENCH DRAIN	TJH	03/29/21
9	ADDED TRENCH DRAIN	TJH	03/30/21

DESIGNED: TJH
DRAWN: TJH
CHECKED: TJH
PROJECT ENGINEER: TJH

CIVIL ENGINEERING
SURVEYING
C|R
10715 SOUTH BECKSTEAD LANE, STE. 102
SOUTH JORDAN, UT 84095 - 801-446-4388

UTAH VALLEY BUSINESS PARK

752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003

DETAIL SHEET

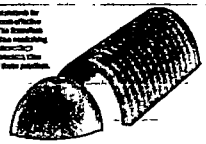
PROFESSIONAL ENGINEER
No. 13073823
TREVOR L HODSON
STATE OF UTAH

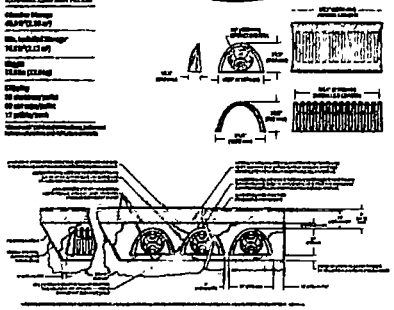
SHEET NO.
C4.0

PROJECT ID: H1022-01
DATE: 03/23/21
FILE NAME: RM-APH
SCALE:

StormTech ADS

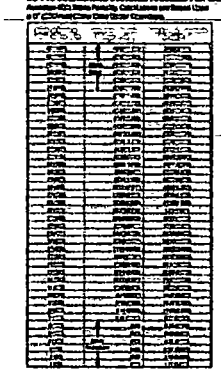
STORMTECH SC-740 CHAMBER

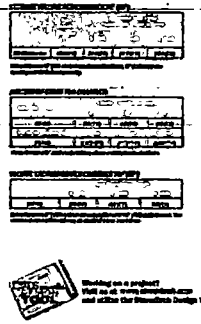


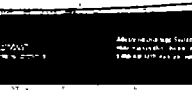


StormTech ADS

SC-740 CUMULATIVE STORAGE VOLUMES PER CHAMBER







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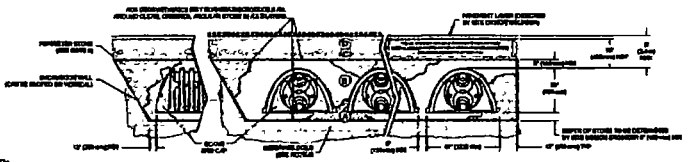
and utilize Our StormTech Design Tool

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
A	PAVEMENT AND UNDERLAYMENT FILL LAYER "A" FROM THE TOP OF THE SC-740 CHAMBER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THIS LAYER.	ANY SOIL/ROCK MATERIAL MEETING LOCAL OR PROJECT SPECIFIC REQUIREMENTS. MINIMUM REQUIREMENT PER STORMTECH.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED APPLICATIONS MAY REQUIRE COMPACTION TO ACHIEVE A STABLE SUBGRADE FOR PAVEMENT SUBBASE AND ASPHALT.
B	INITIAL FILL FOR HAUNCHING, FOR LAYER "B" STARTS FROM THE TOP OF THE CHAMBERS TO THE BOTTOM OF THE "A" LAYER.	AASHTO M145 SOIL CLASSIFICATIONS NOT ACCEPTABLE FOR CHAMBER APPLICATIONS. MINIMUM REQUIREMENTS, MATERIALS MAY BE LOCAL SOILS.	AASHTO M145 "A-1" SIMILAR OR ASTM D2487 "GW, GP, SW, SP" SIMILAR	MINIMUM COMPACTION OF FILL IS "A" MINIMUM OF 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCTOR DENSITY FOR POORLY GRADED MATERIALS. VOLUMES GREATER THAN 12" (300 mm) MAY REQUIRE SPECIAL COMPACTION TO ACHIEVE MINIMUM REQUIREMENTS.
C	EMBEDMENT STONE FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE TO THE SPRINGLINE OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 #3, #4, #357	NO COMPACTION REQUIRED.
D	FOUNDATION STONE FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE INVERT (BOTTOM) OF THE CHAMBERS.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43 #3, #4, #357, #5, #6	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.**

FLOOR NOTES:
* - THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. STONE SHALL ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A #4 STONE MEETS AASHTO M43, BUT A RECLAIMED CONCRETE AGGREGATE MEETS AASHTO M43 AS WELL BUT IS NOT ACCEPTABLE.
** - COMPACTION / DENSITY REQUIREMENT ARE MET WHEN FOUR PASSES OF A MINIMUM 10,000 LBF (44 kN) VIBRATORY COMPACTOR ARE MADE IN THE PARTICULAR PATTERN AND DIRECTION SPECIFIED BY THE MANUFACTURER. PROOF ROLLING BY AN EXCAVATOR OR DOZER IS NOT ACCEPTABLE. FOR SPECIAL LOAD DESIGNS, CONSULT STORMTECH AT 1-888-892-2694 OR SPECIFIC LOAD DESIGNS.

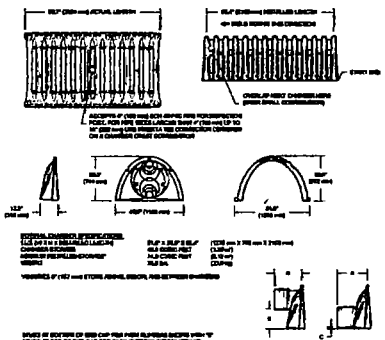


NOTES:

1. SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2418 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" SHALL MEAN THE FOLLOWING MATERIALS, LOCATIONS, DEPTHS OF FILL, AND COMPACTION REQUIREMENTS FOR FOUNDATION STONE, EMBEDMENT STONE, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE SPECIFIC SITE CONDITIONS AND LOADING CONDITIONS.
5. FOR INSTALLATIONS WITH LESS THAN 600 mm (24") OF STORMTECH SUPPORTED FILL OVER THE CHAMBERS, STORMTECH RECOMMENDS THAT HEAVY CONSTRUCTION EQUIPMENT DOES NOT OPERATE ON THE CHAMBERS. CONSTRUCTION EQUIPMENT SHOULD NOT EXCEED THE AASHTO H-20 LOADING SHOWN IN THE STORMTECH INSTALLATION INSTRUCTIONS.
6. FOR INSTALLATIONS WITH LESS THAN 600 mm (24") OF STORMTECH SUPPORTED FILL OVER THE CHAMBERS, STORMTECH RECOMMENDS THAT HEAVY CONSTRUCTION EQUIPMENT DOES NOT OPERATE ON THE CHAMBERS. CONSTRUCTION EQUIPMENT SHOULD NOT EXCEED THE AASHTO H-20 LOADING SHOWN IN THE STORMTECH INSTALLATION INSTRUCTIONS.
7. CHECK LOCAL REQUIREMENTS FOR PERMISSIBLE SOIL TYPES, REQUIRED COMPACTION LEVELS, AND MAXIMUM LIFT THICKNESSES.
8. THE USE OF GEOTEXTILE MATERIALS WILL NOT BE ALLOWED FOR WRAPPING ANY STONE LAYERS OR ANY PART OF THE STORMTECH CHAMBER SYSTEM.
9. THE USE OF GEOTEXTILE MATERIALS WILL NOT BE ALLOWED BETWEEN ANY LAYERS OF STONE OR BETWEEN THE STONE FOUNDATION AND THE NATIVE SOIL SUBGRADE.
10. THE USE OF GEOTEXTILE MATERIALS OVER EXCAVATION WALLS FOR SEPARATION FROM THE NATIVE SOIL IS ACCEPTABLE.

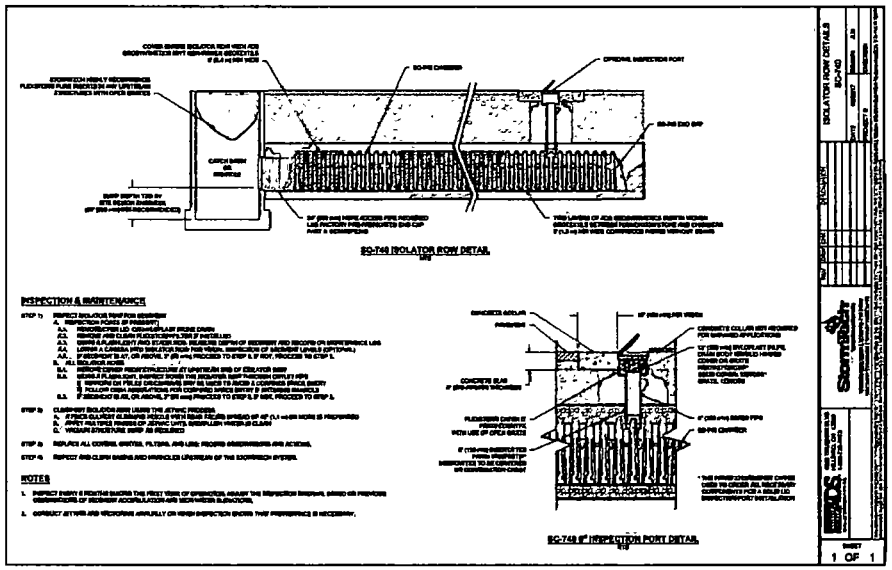
1 OF 1

SC-740 TECHNICAL SPECIFICATION



PART #	STUB	A	B	C
SCTHREE12 / SCTHREE12EC	6" (150 mm)	10.2" (260 mm)	10.2" (260 mm)	16.9" (430 mm)
SCTHREE15 / SCTHREE15EC	8" (200 mm)	12.2" (310 mm)	12.2" (310 mm)	22.9" (580 mm)
SCTHREE18 / SCTHREE18EC	10" (250 mm)	13.4" (340 mm)	14.8" (380 mm)	32.9" (840 mm)
SCTHREE21 / SCTHREE21EC	12" (300 mm)	14.7" (370 mm)	13.8" (350 mm)	—
SCTHREE24 / SCTHREE24EC	—	—	—	42.9" (1090 mm)
SCTHREE27 / SCTHREE27EC	14" (350 mm)	15.9" (400 mm)	—	13" (330 mm)
SCTHREE30 / SCTHREE30EC	16" (400 mm)	16.9" (430 mm)	3.4" (87 mm)	52.9" (1340 mm)
SCTHREE33 / SCTHREE33EC	18" (450 mm)	18.2" (460 mm)	—	62.9" (1600 mm)
SCTHREE36 / SCTHREE36EC	20" (500 mm)	19.3" (490 mm)	—	72.9" (1850 mm)

ALL STUBS, EXCEPT FOR THE SCTHREE12EC AND PLACED AT BOTTOM OF MFG CUT ENDS THAT HAS EMBOSS DESIGNS OF THE STUB IS FLUSH FROM THE BOTTOM OF THE END CAP. FOR ADDITIONAL ENGINEERING CURVES / DIMENSION OF



SC-740 ISOLATOR ROW DETAIL

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
A. INSPECTION PORTS (IF PRESENT)
A.1. REMOVE LID FROM ACCESS PORT
A.2. REMOVE AND CLEAN FLEXSTORM'S TEE (IF INSTALLED)
A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON INSPECTION LOG
A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
B. ALL ISOLATOR ROWS
B.1. REMOVE COVER FROM DOWNSTREAM END OF ISOLATOR ROW
B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW FOR DEBRIS AND SEDIMENT
B.3. IF DEBRIS AND/OR SEDIMENT IS PRESENT IN AMOUNTS THAT COULD IMPEDE FLOW, PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
B.4. USE APPROPRIATE MANUAL METHODS TO REMOVE DEBRIS AND/OR SEDIMENT
B.5. FLUSH ROW WITH WATER WHILE OBSERVING DOWNSTREAM MANHOLE OR STRUCTURE
B.6. REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
B.7. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 4.

STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETTING PROCEDURE
A. ATTACH QUALITY CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE TO PRESSURE WASHER HOSE RATED FOR 1,000 PSI (69 BARS) OR GREATER
B. APPLY MULTIPLE PASSES OF JETTING UNTIL SEDIMENT WASH BACK IS CLEAR
C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

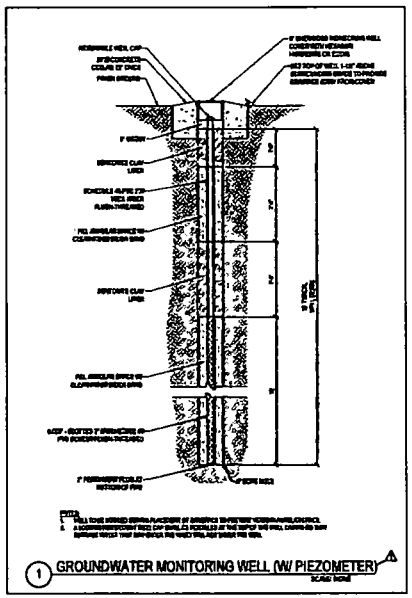
STEP 4) INSPECT AND CLEAN MANIFOLDS UPSTREAM OF THE ISOLATOR ROWS.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACUUMING ANNUALLY OR WHEN INSPECTION SHOWS THAT PREVENTATIVE IS NECESSARY.

SC-740 8" INSPECTION PORT DETAIL

SHEET 1 OF 1



1 GROUNDWATER MONITORING WELL (W/ PIEZOMETER)

1	03/04/21	TLH	ADDED GROUNDWATER MONITORING WELL
2	03/15/21	TLH	ADDED ISOLATOR ROW DETAIL
3	03/17/21	TLH	ADDED ACCEPTABLE FILL MATERIALS
4	03/19/21	TLH	ADDED STORMTECH NOTES
5	03/22/21	TLH	ADDED STORMTECH NOTES
NO.	REVISIONS	BY	DATE

DESIGNED - TLH
DRAWN - TLH
CHECKED - TLH
PROJECT ENGINEER - TLH

CIVIL ENGINEERING + SURVEYING
10718 SOUTH BECKSTEAD LANE, STE. 102
SOUTH JORDAN, UT 84095 - 801-446-4338

UTAH VALLEY BUSINESS PARK
752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003

DETAIL SHEET

TREVOR L. HODGSON
No. 12078203
STATE OF UTAH

SHEET NO.
C4.1

PROJECT ID: H1023-01
DATE: 03/22/21
FILE NAME: PRE-AFH
SCALE:

ENT 49455:2023 PG 215 of 239

TechData

FOAM CONTROL EPS

GEOFOAM

Foam-Control EPS Geofoam is a cellular plastic material that is strong, but has very low density (1% of traditional earth materials). It is a manufactured, closed cell rigid foam to ASTM D6817, "Standard Specification for Rigid Cellular Polystyrene Geofoam." Foam-Control EPS Geofoam is available in a range of Types to provide choices of structural integrity and cost effectiveness.

This information given is declared to be timely, accurate and reliable for the use of Foam-Control EPS Geofoam. Each product using Foam-Control EPS Geofoam should be designed for a predetermined purpose. The engineer or project specifications should be consulted to determine the ASTM D6817 Type required for your project loading conditions.

Foam-Control EPS Geofoam Properties

Property		ASTM D6817 EPS12	EPS15	EPS19	EPS22	EPS29	EPS39	EPS46
Density[1], min.	lb/ft³ (kg/m³)	0.70 (11.2)	0.90 (14.4)	1.15 (18.4)	1.35 (21.6)	1.80 (28.8)	2.40 (38.4)	2.85 (45.7)
Compressive Resistance[1,2] @ 1% deformation, min.	psi (kPa)	2.2 (15)	5.8 (20)	5.8 (40)	7.5 (50)	10.9 (75)	15.0 (103)	18.6 (128)
Elastic Modulus[1], min	psi (kPa)	220 (1500)	360 (2500)	580 (4000)	730 (5000)	1090 (7500)	1500 (10300)	1950 (12800)
Flexural Strength[1], min.	psi (kPa)	10.0 (69)	25.0 (172)	30.0 (207)	35.0 (240)	50.0 (345)	60.0 (414)	75.0 (517)
Water Absorption[1] by total immersion, max.	vol. %	4.0	4.0	3.0	3.0	2.0	2.0	2.0
Oxygen Index[1], min.	vol. %	24	24	24	24	24	24	24
Buoyancy Force	lb/ft³ (kg/m³)	61.7 (990)	61.8 (980)	61.3 (980)	61.1 (980)	60.6 (970)	60.0 (960)	58.5 (950)
Additional Properties for Compressible Applications								
Compressive Resistance[2] @ 5% deformation, min.	psi (kPa)	5.1 (35)	8.0 (55)	13.1 (90)	16.7 (115)	24.7 (170)	35.0 (241)	43.5 (300)
Compressive Resistance[2] @ 10% deformation, min.	psi (kPa)	5.8 (40)	10.2 (70)	16.0 (110)	19.6 (135)	29.0 (200)	40.0 (276)	50.0 (345)

[1] See ASTM D6817 Standard for test methods and complete information.
[2] Compliant flat end steel load sheets should not exceed the compressive resistance at 1% deformation.

WWW.GEOFOAM.COM

Tech Bulletin

FOAM CONTROL EPS

Geofoam No. 5004

Subject R-Values of EPS Geofoam

Date September 2007 (Revised February 2011)

Foam-Control EPS is manufactured in conformance to ASTM D6817, "Standard Specification for Rigid Cellular Polystyrene Geofoam." This standard covers the minimum properties and tests required for EPS Geofoam.

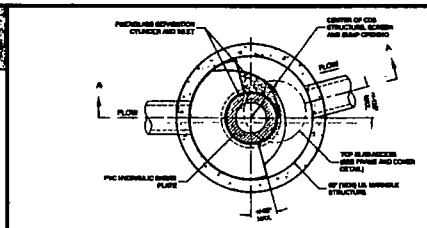
However, Foam-Control EPS Geofoam is often used in applications which require detailed information of the insulation performance, or R-value. The following table provides R-value information for Foam-Control EPS Geofoam. The values in the table are based on testing in accordance with ASTM C177 "Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus," or ASTM C518, "Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus."

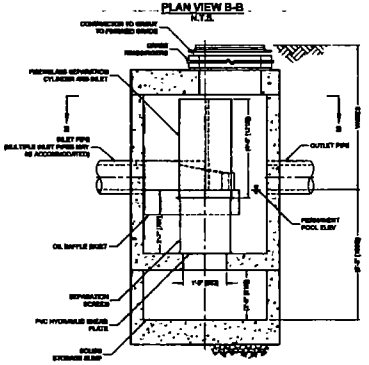
Foam-Control EPS Properties

Property		ASTM D6817 EPS12	EPS15	EPS19	EPS22	EPS29	EPS39	EPS46
Density[1], min.	lb/ft³ (kg/m³)	0.70 (12)	0.90 (15)	1.15 (18)	1.35 (22)	1.80 (29)	2.40 (38)	2.85 (46)
Thermal Resistance[1] min per 10 in. thickness	25°F	°F·ft²·h/Btu (°K·m²/W)	3.45 (0.61)	4.20 (0.74)	4.40 (0.77)	4.60 (0.81)	4.80 (0.84)	4.80 (0.84)	4.80 (0.84)
	40°F	°F·ft²·h/Btu (°K·m²/W)	3.30 (0.58)	4.00 (0.70)	4.20 (0.74)	4.40 (0.77)	4.60 (0.81)	4.60 (0.81)	4.70 (0.83)
	75°F	°F·ft²·h/Btu (°K·m²/W)	3.10 (0.55)	3.60 (0.63)	3.80 (0.67)	4.00 (0.70)	4.20 (0.74)	4.20 (0.74)	4.30 (0.76)

[1] See ASTM D6817 Standard for test methods and complete information.

FOAM CONTROL EPS www.gvtcom.com CONTROL. NOT COMPROMISE.





CDS2020-5-C DESIGN NOTES

CDS2020-5-C RATED TREATMENT CAPACITY IS 1.1 CFS (31.2 L/S) OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 100 CFS (2830 L/S). IF THE SITE CONDITIONS EXCEED 100 CFS (2830 L/S), AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

THE STANDARD CDS2020-5-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO MEET SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
STANDARD INLET ONLY (NO INLET PIPE)
STANDARD INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB/INLET WITH INLET PIPE OR PIPES
WITHOUT OIL BAFFLE (SINGLE INLET PIPE RECOMMENDED FOR THIS CONFIGURATION)
WITHOUT WEIR FOR WIDER / HIGHER CONFIGURING UNITS

FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID	
WATER QUALITY FLOW RATE (CFS OR L/s)	*
PEAK FLOW RATE (CFS OR L/s)	*
RETURN PERIOD OF PEAK FLOW (YRS)	*
SCREEN APERTURE (4.69 OR 9.39)	*

PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*

RIM ELEVATION	*
ANTI-FLOTATION BALLAST	WIDTH * / HEIGHT *

NOTES/SPECIAL REQUIREMENTS:

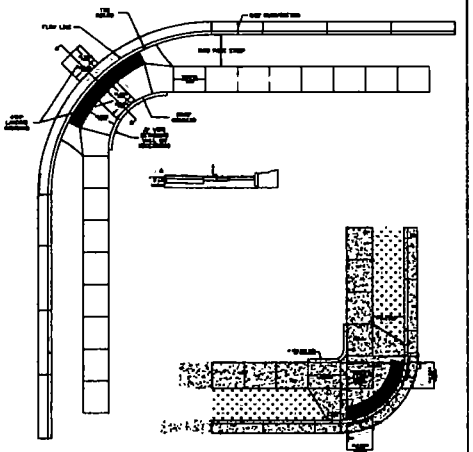
* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH [ ] ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH REPRESENTATIVE (NOT INCLUDED WITH THIS DRAWING).
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN NOTES AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET 2 MONTH HIGH AND DRY CRITERIA. SHALL MEET REQUIREMENT OF 5 MILE LOAD RATING, ASSUMING MEDIA/MEDIATOR ELEVATION AT OIL BAFFLE. THE OUTLET PIPE INVERT ELEVATION, SUBMISSION OF RECORD TO CONSTRUCTION, ENGINEER OF ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANOUT.

INSTALLATION NOTES
A. JOINT FOR SEALS, BACKFILL DEPTH, ANCHOR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CUTOUTS ARE PROVIDED).
C. CONTRACTOR TO ADD JOINT SEAL BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO REMOVE, INSTALL, AND GROUT PIPES. KNOCK PIPE SHEETS WITH CLEARANCE HOLES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, INCLUDING WATER TO PLUMBER RIGHT MINIMUM. IT IS RECOMMENDED THAT ALL JOINTS BELOW PIPE SHEETS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.contechES.com
800 Standard Pkwy., Suite 400, Westchester, OH 45069
(800) 338-1122 / (513) 645-7000 / FAX (513) 645-7993

CDS2020-5-C
INLINE CDS
STANDARD DETAIL



NOTES:
1. THE CURB STALL TO BE CONSTRUCTED UNDER CAST IRON FACTORY CURBED EAST TO ENSURE THE CURVED OF CURVE OR CURVE, AS APPROVED BY THE CITY ENGINEER.
2. PROVIDE DETECTABLE WARNING AREA PER APWA/PROJECT SPECIFICATIONS.
3. SEE APWA PLAN 235 FOR CURB RETURN CURVES, SLOPES, ETC.

DESIGNED: R.A.		AMERICAN FORK CITY	SIDEWALK RAMP	15 18
DRAWN: APR. 2013				
CHECKED:				

DIAL BEFORE YOU DIG — BLUE STAKES 1-800-662-4111

CIR CIVIL ENGINEERING + SURVEYING
10718 SOUTH BECKSTEAD LANE, STE. 102
SOUTH JORDAN, UT 84095 - 801-446-8388

NO.	DESCRIPTION	BY	DATE
1	ISSUED	TJH	05/06/20
2	ADD NOTES	TJH	05/20/20
3	ISSUED FOR BID	TJH	06/03/20
4	ISSUED FOR PERMIT	TJH	06/30/20
5	ISSUED FOR CONSTRUCTION	TJH	08/06/20
6	UPDATED DRAINAGE PLAN PER CITY COMMENTS	TJH	08/06/20
7	ISSUED FOR CONSTRUCTION	TJH	08/06/20

REVISIONS

DESIGNED: TJH PROJECT ENGINEER: TJH

UTAH VALLEY BUSINESS PARK
752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003

DETAIL SHEET

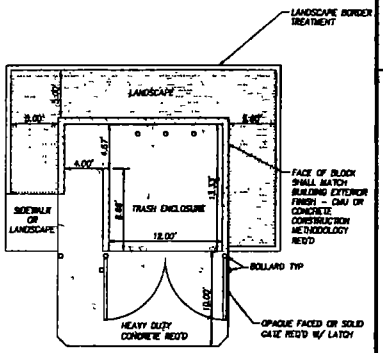
PROFESSIONAL ENGINEER No. 13972823 TREVOR L. HODSON STATE OF UTAH

SHEET NO. C4.2
PROJECT ID: H1022-01 DATE: 03/22/21
FILE NAME: PRJ-AFH SCALE:

ENT 49455:2023 PG 216 of 239

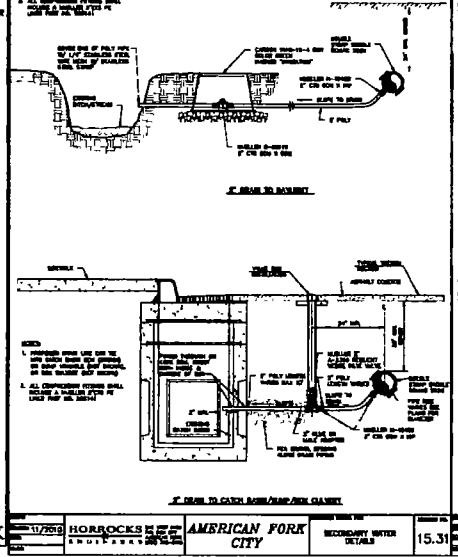
UTAH VALLEY BUSINESS PARK
752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003
DETAIL SHEET
C5.0
CIR
CIVIL ENGINEERING
+SURVEYING
10719 SOUTH BECKSTEAD LANE, STE. 102
SOUTH JORDAN, UT 84095 - 801-948-8288
REVISIONS
DESIGNER TLH
PROJECT MANAGER TLH
SPACING TABLE
SIZE SPACING
3/4" 7 1/2"
1" 10 3/4"
1 1/2" 4'
2" 4'
AMERICAN FORK CITY
Northern Geotechnical Services
JULY 2023

CITY STANDARD - DUMPSTER/ TRASH ENCLOSURE
STANDARD 17.5.121.B

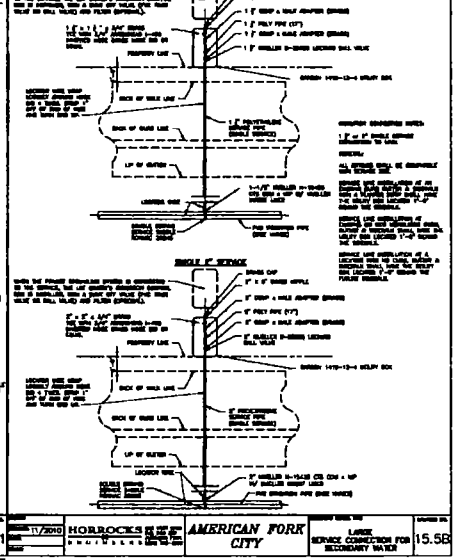


NOTES:
1. LANDSCAPE SHALL INCLUDE COMBINATION OF TREES AND SHRUBBERY TO CREATE A LANDSCAPE SCREEN FOR THE ENCLOSURE.
2. ENCLOSURE SHALL BE 6' TALL MIN.
3. ENCLOSURE EXTERIOR FINISH SHALL MATCH THE EXTERIOR OF THE BUILDING FOR WHICH IT SUPPORTS.
4. LANDSCAPE DIMENSIONS SHOWN ARE MINIMUMS.
5. ENCLOSURE DIMENSIONS MAY VARY DEPENDING UPON INTENDED USE, AS SUCH, CITY ENGINEER/CITY PLANNER SHALL HAVE THE ABILITY TO REVIEW AND RECOMMEND APPROPRIATE SIZE OF A GIVEN ENCLOSURE FOR A SPECIFIC USE.
6. A VARIANCE FROM THE REQUIREMENT OF AN ENCLOSURE CAN BE GRANTED BY THE LAND USE AUTHORITY FOR A GIVEN ZONE IF IT CAN BE DEMONSTRATED THAT THE USE FOR THE SITE DOES NOT REQUIRE MORE THAN A TRADITIONAL CURB SIDE PICK UP CONTAINER. CURB SIDE CONTAINER MUST BE AVAILABLE IN THAT AREA TO QUALIFY FOR THIS EXCEPTION.

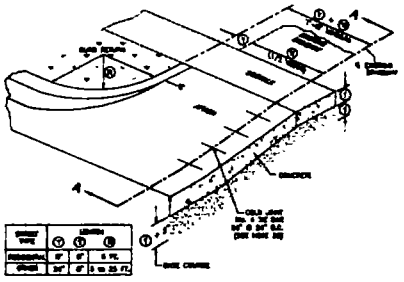
AMERICAN FORK



11/2010	HORROCKS ENGINEERS	AMERICAN FORK CITY	SECONDARY WATER DETAILS	15.31



11/2010	HORROCKS ENGINEERS	AMERICAN FORK CITY	LARGE SERVICE CONNECTION FOR SECONDARY WATER	15.5B



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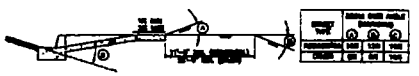
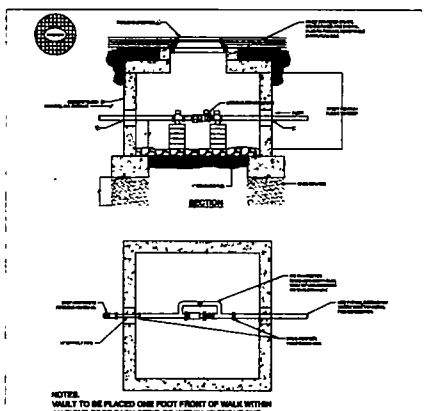


SECTION A-A - APPROACH REQUIRING SERVICE TRUCK ACCESS

SECTION A-A - TYPICAL DRIVEWAY APPROACH

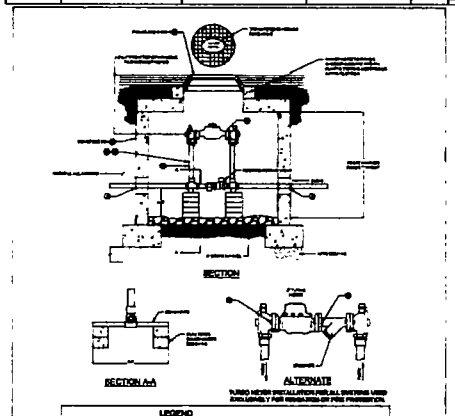
Open driveway approach — Plan 225



NOTES:
VAULT TO BE PLACED ONE FOOT FRONT OF WALK WITHIN AN EIGHT FOOT PARK STRIP OR WITHIN 10' FRONT PUE.

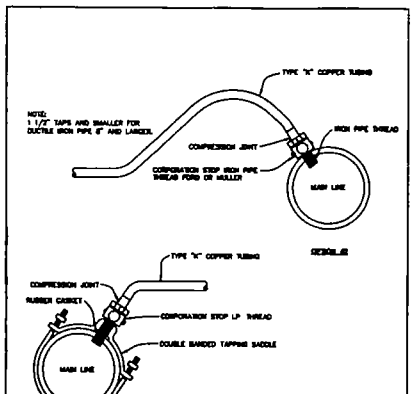
LEGEND

BYU	AMERICAN FORK CITY PUBLIC WORKS 275 EAST 300 NORTH (801) 763-5030	1-1/2" OR 2" PI METER PLACEMENT		15.5E

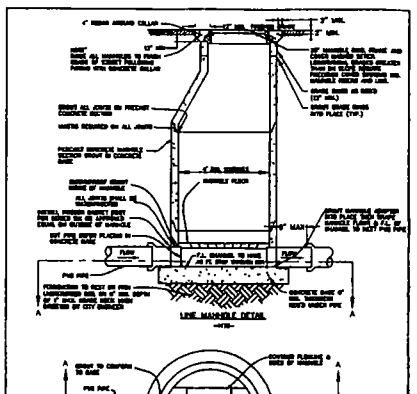


LEGEND

ASH	AMERICAN FORK CITY PUBLIC WORKS 275 EAST 300 NORTH (801) 763-5030	1-1/2" OR 2" METER PLACEMENT		15.5C



JAC	Northern Geotechnical	AMERICAN FORK CITY	TYPICAL WATERMAIN TAPS	15.3



JAC	Northern Geotechnical	AMERICAN FORK CITY	SANITARY SEWER LINE MANHOLE DETAIL	15 12

NO.	DESCRIPTION	DATE
5.0	CLIENT REVIEW	12/16/20
5.1	CLIENT REVIEW	04/21/21
5.2	CLIENT REVIEW	05/04/21
5.3	CLIENT REVIEW	05/19/21
5.4	CITY REVIEW COMMENTS	05/24/21
5.5	ADDED DRAINAGE FLAP ADD	06/30/21
NO.	REVISIONS	BY

DESIGNED: TJH PROJECT ENGINEER: TJH

CIR | CIVIL ENGINEERING + SURVEYING
10715 SOUTH BECKSTEAD LANE, STE. 103
SOUTH JORDAN, UT 84095 - 801-446-8266

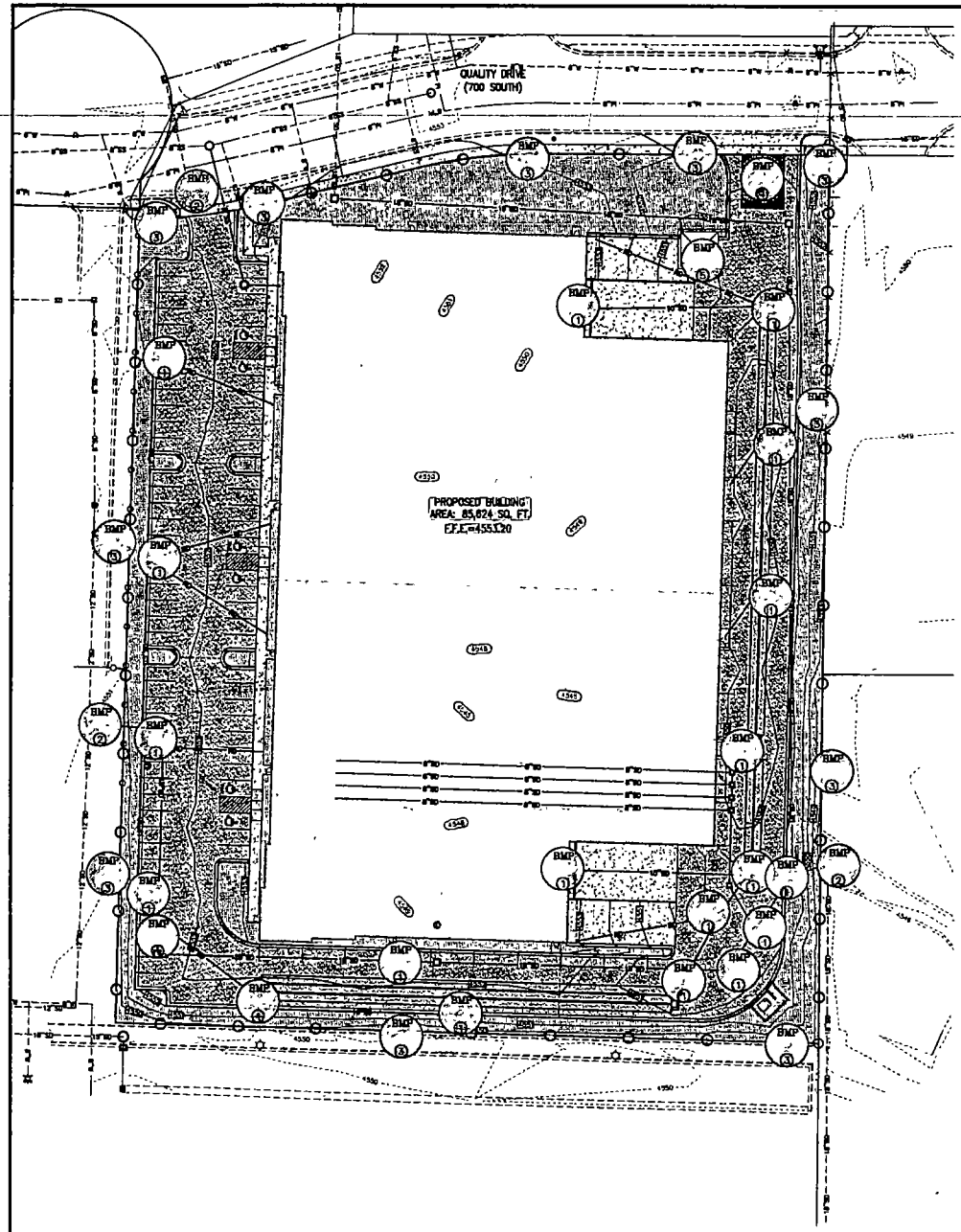
UTAH VALLEY BUSINESS PARK
752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003

DETAIL SHEET

PROFESSIONAL ENGINEER No. 10072803 TREVOR J. HODSON STATE OF UTAH

SHEET NO. C5.1
PROJECT ID: H1022-01 DATE: 03/23/21
FILE NAME: PRJ-AFH SCALE:

ENT 49455:2023 PG 218 of 239



BMP CALLOUTS

1. PLACE A SILT FENCE AROUND THE PERIMETER OF THE INLET, ONCE PAVEMENT AND/OR CURB HAS BEEN INSTALLED PLACE GRAVEL BAGS AROUND THE INLET GRAVEL BAGS TO BE USED ON PAVED OR CONCRETE SURFACES AND SILT FENCE TO BE USED ON UNIMPROVED SURFACES.
   NOTE: IN HIGH TRAFFIC AREAS CONTRACTOR TO USE INSERT FILTER FABRIC. IF INLET HAS CURB OPENING, THE FILTER FABRIC IS TO BE EXTENDED UP TO COVER THE CURB OPENING AND GRAVEL BAGS PLACED IN GUTTER AT EACH SIDE OF OPENING TO KEEP FILTER FABRIC HOOD AGAINST CURB WALL.
2. PLACE GRAVEL BAGS AS NECESSARY TO PREVENT SEDIMENT FROM DRAINING INTO EXISTING CATCH BASINS. *SEE NOTE IN CALLOUT 1.*
3. INSTALL TYPICAL SILT FENCE. SILT FENCE TO BE INSTALLED PERPENDICULAR TO STORM WATER FLOW. INSTALLATION TO BE DONE SO AS TO PREVENT SEDIMENT FROM LEAVING THE SITE.
   NOTE: CONTRACTOR TO USE VEGETATIVE BUFFER AND OR CUT BACK INSTEAD OF SILT FENCE WHERE POSSIBLE.
4. CONTRACTOR TO INSTALL A MINIMUM OF 6" DEEP GRAVEL (3" TO 6") OF SUFFICIENT SIZE (MINIMUM OF 50' IN LENGTH AND 30' WIDE) AS TO PROVIDE A WHEEL WASH AREA TO PREVENT THE TRACKING OF MUD OFFSITE. THE LOCATION OF WHEEL WASH MAY VARY FROM LOCATION SHOWN ON PLANS SO AS TO PROVIDE THE BEST PROTECTION AGAINST TRACKING MUD OFFSITE. CONTRACTOR TO MAINTAIN AND CLEAN WHEEL WASH AREA AS NEEDED TO PREVENT THE TRACKING OF MUD OFFSITE.
6. CONTRACTOR TO INSTALL CONCRETE WASHOUT AREA. THE LOCATION MAY VARY FROM LOCATION SHOWN ON PLANS.

Scale in Feet

SEE COVER SHEET FOR PROJECT LEGEND

LEGEND

SILT FENCE

WHEEL WASH AREA

BMP AREA

Benchmark Info

The Benchmark for the project is the North Quarter Corner of Section 25, T 5 S R 1 E., SLB&M
Elevation = 4555.90'
Datum is NAVD 88 derived from UTAH TURNGPS System

DURING CONSTRUCTION

1. ALL EROSION CONTROL BEST MANAGEMENT PRACTICES SHALL BE INSPECTED AND MAINTAINED REGULARLY (MINIMUM ONCE A WEEK) AND AFTER EVERY STORM EVENT
2. CONTRACTOR TO KEEP LAND DISTURBANCE TO MINIMUM TO CONTROL RUNOFF FROM THE SITE
3. LIMIT LAND CLEARING AND RESTORE ALL GRADING AS SOON AS POSSIBLE
4. STAGED SEEDING TO RE-VEGETATE CUT AND FILL SLOPES AS THE WORK IS IN PROGRESS
5. AT ALL TIMES DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING AND CONTROLLING EROSION DUE TO WIND AND OTHER EROSION
6. MAINTENANCE OF STREET, STREETS TO BE KEPT CLEAN AND FREE FROM DEBRIS
7. CONTRACTOR SHALL PROVIDE DUST CONTROL MEASURES AT ALL TIMES DURING CONSTRUCTION.
8. CONTRACTOR TO HAVE WATER TRUCK AVAILABLE AS WATER SOURCE FOR WHEEL WASH AREA, OR ALTERNATE WATER SOURCE MAY BE USED IF APPROVED BY CITY
9. IF GROUND WATER IS ENCOUNTERED DURING THE CONSTRUCTION ACTIVITIES AND REQUIRES PUMPING OFF THE PROJECT, THE CONTRACTOR IS TO FILTER THE WATER THROUGH THE USE OF SAND BAGS AND/OR GEO FABRIC. THIS IS TO BE DONE PRIOR TO IT BEING INTRODUCED INTO THE PUBLIC STORM DRAIN SYSTEM.
10. A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN SHALL BE KEPT ON THE SITE DURING ALL CONSTRUCTION ACTIVITY

POST CONSTRUCTION

1. EROSION CONTROL STRUCTURES MAY BE REMOVED ONCE FINAL LANDSCAPING IS IN PLACE
2. EROSION CONTROL STRUCTURES BELOW SEEDED AREAS MUST REMAIN IN PLACE UNTIL THE ENTIRE AREA HAS BEEN ESTABLISHED
3. EROSION CONTROL IN PROPOSED PAVEMENT AREAS SHALL REMAIN IN PLACE UNTIL PAVEMENT IS COMPLETE
4. THE FOLLOWING PRECAUTIONS SHALL BE PERFORMED:

A) PERIODIC INSPECTION OF CATCH BASIN SEDIMENT TRAPS AND CLEANING WHEN THE BASIN IS MORE THAN 1/4 FULL. INSPECTION SHALL BE DONE AFTER EVERY MAJOR RAINFALL AND EVERY 6 MONTHS AS A MINIMUM. DISPOSAL OF ANY GREASE OR OIL MUST BE DONE IN ACCORDANCE WITH CURRENT ENVIRONMENTAL REGULATIONS
B) LITTER, DEBRIS AND CHEMICALS MUST BE PICKED UP AND KEPT IN A CONTAINED LOCATION TO PREVENT POLLUTION OF STORM WATER DISCHARGE
C) PARKING AREAS SHALL BE KEPT FREE FROM AUTOMOBILE FLUIDS THAT COULD WASH INTO THE STORM DRAIN SYSTEM

CALL BEFORE YOU DIG — BLUE STAKES 1 800 662 4111

#	DESCRIPTION	BY	DATE
1	CITY COMMENTS	TLH	05/19/23
2	FINAL SUBMITTAL	TLH	06/12/23
3	CITY COMMENTS	TLH	08/21/23
4	CITY COMMENTS	TLH	09/19/23
5	CITY COMMENTS	TLH	10/19/23
6	CITY COMMENTS	TLH	11/9/23
7	CITY COMMENTS	TLH	12/19/23
8	CITY COMMENTS	TLH	01/9/24
NO.	REVISIONS	BY	DATE

DESIGNED: | PROJECT ENGINEER:

CIVIL ENGINEERING + SURVEYING

C/R

10716 SOUTH BECKSTEAD LANE, STE. 102
SOUTH JORDAN, UT 84095 · 801-446-5399

UTAH VALLEY BUSINESS PARK

752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003

EROSION CONTROL PLAN (SWPPP)

PROFESSIONAL ENGINEER
No. 12072803
TREVOR L. HODGSON
STATE OF UTAH

SHEET NO.
C6.0

PROJECT ID	DATE
H11022-01	03/22/21
FILE NAME	SCALE
PBU-AFH	1"=30'

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BMP: Inlet Protection - Excavated
BMP: Inlet Protection - Gravel
BMP: Inlet Protection - Silt Fence or Straw Bale
BMP: Inlet Protection - Silt Fence or Straw Bale
BMP: Catch Basin Cleaning
BMP: Silt Fence
UTAH VALLEY BUSINESS PARK
752 EAST QUALITY DRIVE, AMERICAN FORK, UT 84003
EROSION CONTROL DETAIL SHEET
CIVIL ENGINEERING +SURVEYING
SHEET NO. C6.1
PROJECT ID 03725.01
FILENAME
SCALE

CIR
Engineering, L.L.C.

UTAH VALLEY BUSINESS PARK PROJECT
756 EAST QUALITY DRIVE AMERICAN FORK CITY, UTAH 84003

DRAINAGE REPORT

Submitted to:

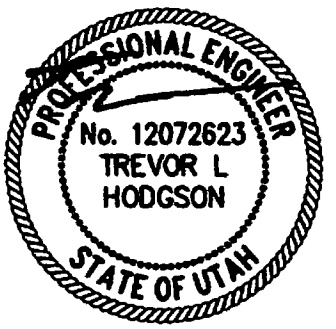
AMERICAN FORK CITY

Prepared for:

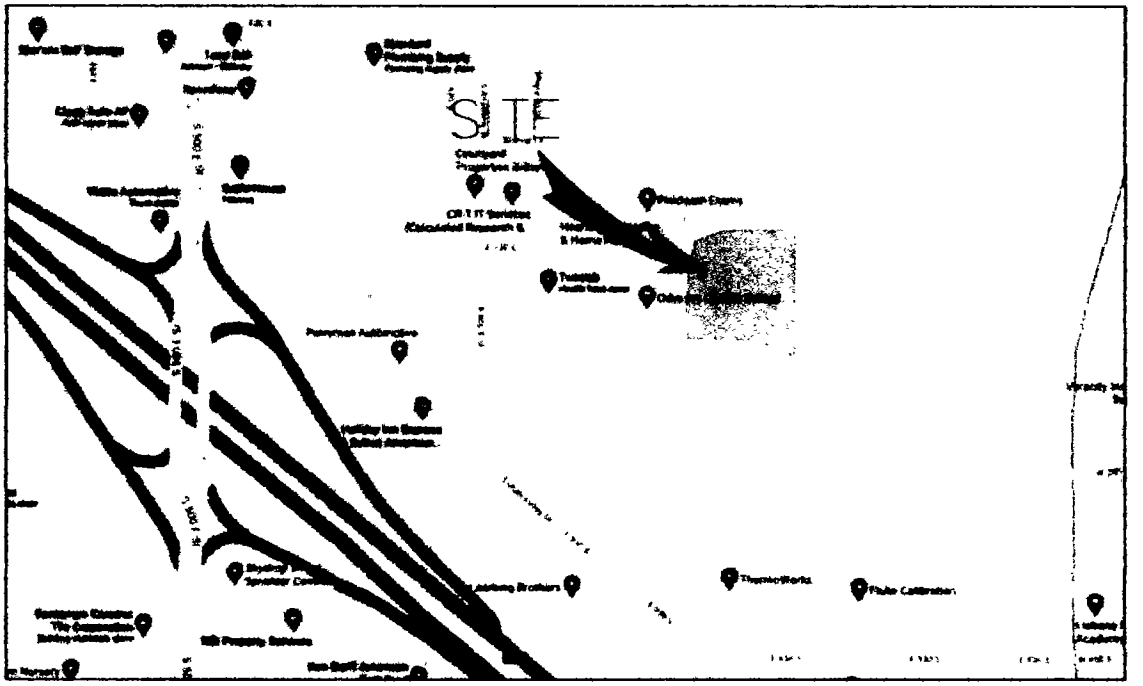
THE WILL GROUP

By:

CIR ENGINEERING
10718 SOUTH BECKSTEAD LANE. STE. 102
SOUTH JORDAN, UT 84095
801-949-6296



JANUARY 16, 2023



VICINITY MAP

General Location and Descriptions:

The drainage calculations in this report pertain to the capacities for the pipes installed to route water being produced by the existing spring installed for the Utah Valley Business Park project located at 756 East Quality Drive, American Fork, UT 84003.

The observed flow from the existing spring was found to be 20 gpm (0.0446 cfs). To handle this flow, a system of four 8" perforated pipes were installed to collect and direct this storm water to a proposed 12" storm drain pipe and discharging to an existing storm drain box to the east of the site.

Analysis:

The Hydraflow Express Extension for Autodesk Civil 3D was used to analyze the pipe capacities of the 8" perforated pipes and the 12" storm drain pipe that were installed as part of this project. This program utilizes the Manning's Equation to calculate flows at varying depths of flow. (See attached Appendix A)

An 8" pipe at a 1.0% slope has a maximum flow capacity of 640.03gpm (1.426 cfs) at a flow depth of 0.63 feet. Four of these pipes were installed for a combined flow capacity of 2560.13 gpm (5.704 cfs). A 12" pipe at 0.12% has a maximum flow capacity of 645.42 gpm (1.438 cfs). This is well above the required 20 gpm being produced by the spring.

APPENDIX A – Pipe Calculations

Channel Report

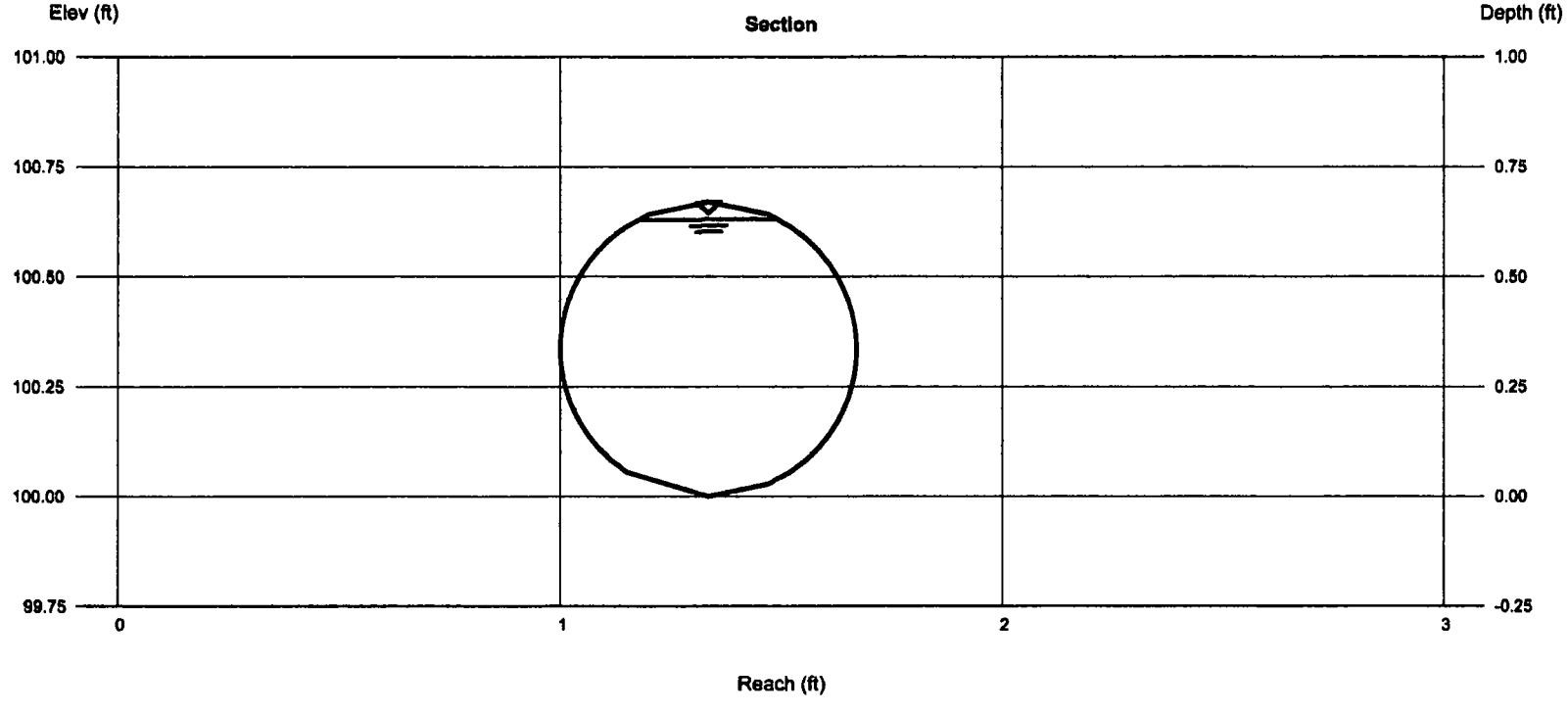
<Name>

Circular
Diameter (ft) = 0.67

Invert Elev (ft) = 100.00
Slope (%) = 1.00
N-Value = 0.012

Calculations
Compute by: Q vs Depth
No. Increments = 50

Highlighted
Depth (ft) = 0.63
Q (cfs) = 1.426
Area (sqft) = 0.34
Velocity (ft/s) = 4.14
Wetted Perim (ft) = 1.78
Crit Depth, Yc (ft) = 0.57
Top Width (ft) = 0.32
EGL (ft) = 0.90



Depth	Q	Area	Veloc
(ft)	(cfs)	(sqft)	(ft/s)
0.01	0.001	0.002	0.53
0.03	0.004	0.005	0.84
0.04	0.009	0.009	1.09
0.05	0.017	0.013	1.31
0.07	0.028	0.018	1.51
0.08	0.041	0.024	1.70
0.09	0.057	0.030	1.87
0.11	0.074	0.037	2.03
0.12	0.095	0.044	2.18
0.13	0.117	0.051	2.32
0.15	0.143	0.058	2.46
0.16	0.168	0.065	2.58
0.17	0.199	0.074	2.71
0.19	0.230	0.082	2.82
0.20	0.260	0.089	2.92
0.21	0.296	0.098	3.03
0.23	0.334	0.107	3.13
0.24	0.370	0.115	3.22
0.25	0.408	0.123	3.31
0.27	0.447	0.132	3.39
0.28	0.493	0.142	3.48
0.29	0.535	0.150	3.56

Depth	Q	Area	Veloc
(ft)	(cfs)	(sqft)	(ft/s)
0.31	0.579	0.159	3.63
0.32	0.623	0.168	3.70
0.34	0.668	0.177	3.77
0.35	0.713	0.186	3.83
0.36	0.758	0.195	3.89
0.38	0.804	0.204	3.94
0.39	0.849	0.213	3.99
0.40	0.894	0.221	4.04
0.42	0.938	0.230	4.08
0.43	0.981	0.238	4.12
0.44	1.028	0.248	4.15
0.46	1.069	0.255	4.18
0.47	1.113	0.264	4.21
0.48	1.154	0.272	4.24
0.50	1.193	0.280	4.26
0.51	1.229	0.288	4.27
0.52	1.266	0.296	4.28
0.54	1.297	0.302	4.29
0.55	1.329	0.310	4.29
0.56	1.355	0.316	4.28
0.58	1.378	0.323	4.27
0.59	1.398	0.329	4.25

Depth	Q	Area	Veloc
(ft)	(cfs)	(sqft)	(ft/s)
0.60	1.414	0.334	4.23
0.62	1.423	0.339	4.19
0.63	1.426	0.344	4.14
0.64	1.420	0.348	4.08
0.66	1.401	0.351	3.99
0.67	1.326	0.353	3.76

Wp	Yc	TopWidth	Energy
(ft)	(ft)	(ft)	(ft)
0.19	0.02	0.19	0.02
0.27	0.03	0.26	0.04
0.33	0.05	0.32	0.06
0.39	0.06	0.36	0.08
0.43	0.08	0.40	0.10
0.48	0.10	0.44	0.13
0.52	0.11	0.47	0.15
0.55	0.13	0.49	0.17
0.59	0.15	0.52	0.19
0.62	0.16	0.54	0.22
0.66	0.18	0.56	0.24
0.69	0.19	0.57	0.26
0.72	0.21	0.59	0.29
0.75	0.22	0.60	0.31
0.78	0.24	0.61	0.33
0.81	0.26	0.63	0.36
0.84	0.27	0.64	0.38
0.86	0.29	0.64	0.40
0.89	0.30	0.65	0.42
0.92	0.32	0.66	0.45
0.95	0.33	0.66	0.47
0.97	0.35	0.67	0.49

Wp	Yc	TopWidth	Energy
(ft)	(ft)	(ft)	(ft)
1.00	0.36	0.67	0.51
1.03	0.37	0.67	0.53
1.06	0.39	0.67	0.56
1.08	0.40	0.67	0.58
1.11	0.41	0.67	0.60
1.14	0.43	0.66	0.62
1.16	0.44	0.66	0.64
1.19	0.45	0.66	0.66
1.22	0.46	0.65	0.67
1.24	0.47	0.64	0.69
1.27	0.49	0.63	0.71
1.30	0.49	0.62	0.73
1.33	0.50	0.61	0.74
1.36	0.51	0.60	0.76
1.39	0.52	0.59	0.78
1.42	0.53	0.57	0.79
1.45	0.54	0.55	0.81
1.48	0.54	0.54	0.82
1.52	0.55	0.51	0.84
1.55	0.55	0.49	0.85
1.59	0.56	0.46	0.86
1.63	0.56	0.43	0.87

Wp	Yc	TopWidth	Energy
(ft)	(ft)	(ft)	(ft)
1.68	0.56	0.40	0.88
1.72	0.56	0.36	0.89
1.78	0.57	0.32	0.90
1.84	0.56	0.26	0.90
1.92	0.56	0.19	0.90
2.10	0.55	0.00	0.89

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Monday, Jan 16 2023

<Name>

Circular

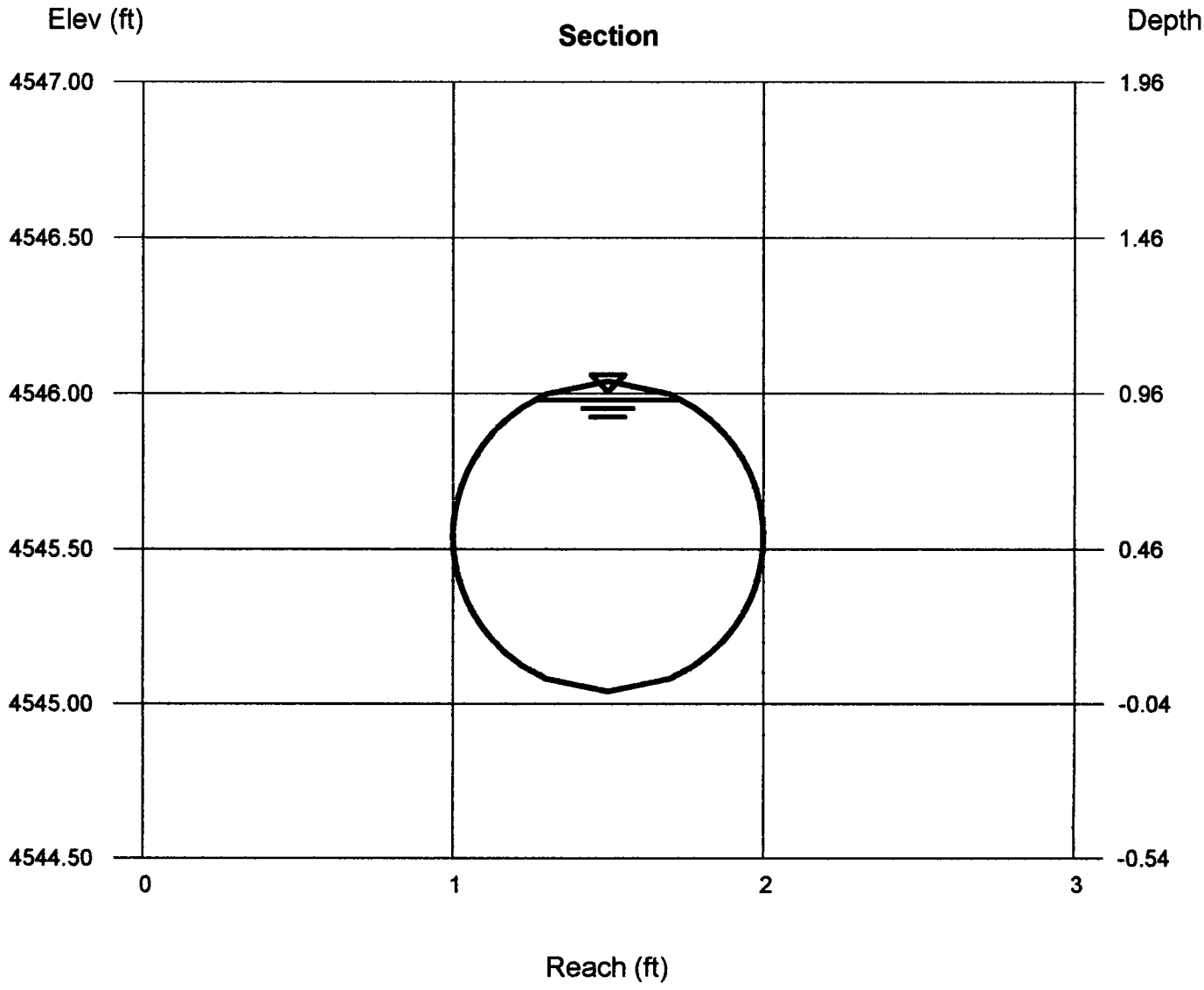
Diameter (ft)	= 1.00
Invert Elev (ft)	= 4545.04
Slope (%)	= 0.12
N-Value	= 0.012

Calculations

Compute by:	Q vs Depth
No. Increments	= 50

Highlighted

Depth (ft)	= 0.94
Q (cfs)	= 1.438
Area (sqft)	= 0.77
Velocity (ft/s)	= 1.88
Wetted Perim (ft)	= 2.65
Crit Depth, Yc (ft)	= 0.51
Top Width (ft)	= 0.47
EGL (ft)	= 0.99



Depth	Q	Area	Veloc
(ft)	(cfs)	(sqft)	(ft/s)
0.02	0.001	0.004	0.24
0.04	0.004	0.011	0.38
0.06	0.009	0.019	0.49
0.08	0.018	0.030	0.59
0.10	0.028	0.041	0.68
0.12	0.041	0.054	0.77
0.14	0.057	0.068	0.85
0.16	0.075	0.082	0.92
0.18	0.096	0.097	0.99
0.20	0.118	0.113	1.05
0.22	0.144	0.129	1.11
0.24	0.169	0.145	1.17
0.26	0.201	0.164	1.22
0.28	0.232	0.182	1.28
0.30	0.262	0.198	1.32
0.32	0.298	0.218	1.37
0.34	0.337	0.238	1.42
0.36	0.373	0.256	1.46
0.38	0.411	0.275	1.50
0.40	0.451	0.294	1.54
0.42	0.497	0.315	1.58
0.44	0.540	0.335	1.61

Depth	Q	Area	Veloc
(ft)	(cfs)	(sqft)	(ft/s)
0.46	0.583	0.355	1.64
0.48	0.628	0.375	1.68
0.50	0.673	0.395	1.70
0.52	0.719	0.415	1.73
0.54	0.764	0.435	1.76
0.56	0.810	0.454	1.78
0.58	0.856	0.474	1.81
0.60	0.901	0.493	1.83
0.62	0.946	0.512	1.85
0.64	0.989	0.531	1.86
0.66	1.037	0.551	1.88
0.68	1.077	0.569	1.89
0.70	1.122	0.588	1.91
0.72	1.163	0.607	1.92
0.74	1.203	0.624	1.93
0.76	1.239	0.641	1.93
0.78	1.276	0.659	1.94
0.80	1.307	0.674	1.94
0.82	1.340	0.691	1.94
0.84	1.365	0.705	1.94
0.86	1.389	0.719	1.93
0.88	1.409	0.732	1.92

Depth	Q	Area	Veloc
(ft)	(cfs)	(sqft)	(ft/s)
0.90	1.425	0.745	1.91
0.92	1.435	0.756	1.90
0.94	1.438	0.767	1.88
0.96	1.432	0.775	1.85
0.98	1.412	0.782	1.81
1.00	1.336	0.785	1.70

Wp	Yc	TopWidth	Energy
(ft)	(ft)	(ft)	(ft)
0.28	0.02	0.28	0.02
0.40	0.03	0.39	0.04
0.49	0.04	0.48	0.06
0.57	0.06	0.54	0.09
0.64	0.07	0.60	0.11
0.71	0.09	0.65	0.13
0.77	0.10	0.70	0.15
0.82	0.12	0.73	0.17
0.88	0.13	0.77	0.20
0.93	0.14	0.80	0.22
0.98	0.16	0.83	0.24
1.02	0.17	0.85	0.26
1.07	0.19	0.88	0.28
1 12	0.20	0.90	0.31
1.16	0.21	0.92	0.33
1.20	0.23	0.93	0.35
1.25	0.24	0.95	0.37
1.29	0.26	0.96	0.39
1.33	0.27	0.97	0.41
1.37	0.28	0.98	0.44
1.41	0.30	0.99	0.46
1.45	0.31	0.99	0.48

Wp	Yc	TopWidth	Energy
(ft)	(ft)	(ft)	(ft)
1.49	0.32	1.00	0.50
1.53	0.33	1.00	0.52
1.57	0.34	1.00	0.55
1.61	0.36	1.00	0.57
1.65	0.37	1.00	0.59
1.69	0.38	0.99	0.61
1.73	0.39	0.99	0.63
1.77	0.40	0.98	0.65
1.81	0.41	0.97	0.67
1.85	0.42	0.96	0.69
1.90	0.43	0.95	0.71
1.94	0.44	0.93	0.74
1.98	0.45	0.92	0.76
2.03	0.46	0.90	0.78
2.08	0.47	0.88	0.80
2.12	0.47	0.85	0.82
2.17	0.48	0.83	0.84
2.22	0.49	0.80	0.86
2.27	0.49	0.77	0.88
2.32	0.50	0.73	0.90
2.38	0.50	0.69	0.92
2.44	0.51	0.65	0.94

Wp	Yc	TopWidth	Energy
(ft)	(ft)	(ft)	(ft)
2.50	0.51	0.60	0.96
2.57	0.51	0.54	0.98
2.65	0.51	0.47	0.99
2.74	0.51	0.39	1.01
2.86	0.51	0.28	1.03
3.14	0.49	0.00	1.05

CKR Engineers, Inc.

Consulting Structural Engineers

January 12, 2023

Mr. Marty Barber
Barco Construction
PO BOX 175
Lehi, Utah

Emailed to: martybarber1@hotmail.com

Re: H3
756 East Quality Drive
American Fork, Utah

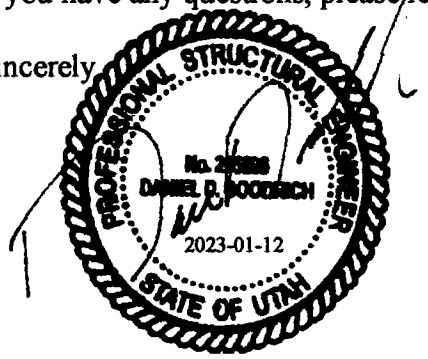
File: 21205

Dear Marty:

The foundation design for this project was based upon the soils report provided by IGES (Job #03638-001, dated April 7, 2021). See Item 1.C on sheet S5.3. The building's foundation and floor slab shall be placed on soil prepared per the requirements of this report.

If you have any questions, please let me know.

Sincerely,



Daniel D. Goodrich, S.E.

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801-222-0922, Fax 801-222-0902