Midway City Council
1 December 2020
Regular Meeting

Huntleigh Woods Subdivision /
Final Approval

Midway

CITY COUNCIL MEETING STAFF REPORT

DATE OF MEETING: December 1, 2020

NAME OF PROJECT: Huntleigh Woods

NAME OF APPLICANT: David Johnson

OWNER OF RECORD: Sally P. Brinton

AGENDA ITEM: Final Approval

LOCATION OF ITEM: 885 North Pine Canyon Road

ZONING DESIGNATION: R-1-15

ITEM: 8

David Johnson, agent for Sally P. Brinton, is proposing final approval of a large-scale subdivision that will be known as Huntleigh Woods Subdivision. The proposal contains nine lots on 8.1 acres. The property is located at 885 North Pine Canyon Road and is in the R-1-15 zone.

BACKGROUND:

This request is for preliminary approval of a large-scale subdivision on 8.1 acres that will contain nine lots. The nine lots will obtain frontage along a new road built within the subdivision. The property is in the R-1-15 zone and all the proposed lots comply with the requirements of the code regarding frontage and acreage. The proposed subdivision covers five parcels (OMI-0224-1, OMI-0222-0, OMI-0221-0, OMI-0222-1, and OMI-0221-1). The existing land uses on the property include agricultural land and The Homestead Golf Course. There is a Midway Irrigation Company ditch the runs along the

Pine Canyon Road frontage of the property. Snake Creek, with its associated floodplain, runs along the western boundary of the property. The property is adjacent on the south with Midway Village PUD and on the north with Meadow Estates PUD.

LAND USE SUMMARY:

- 8.1-acres
- R-1-15 zoning
- Proposal contains nine lots
- Access from Pine Canyon Road
- Public trail along Pine Canyon Road
- Sensitive lands include floodplain
- The lots will connect to the Midway Sanitation District sewer, Midway City's culinary water line, and Midway Irrigation Company's secondary water line

ANALYSIS:

Access – Access will be from Pine Canyon Road. A second access is not required because the cul-de-sac is less than 1,300' in length and there are not more than 11 lots in the subdivision. The new road will create a three-way intersection on Pine Canyon Road.

Geotechnical Study – A Geotechnical Study was required and has been submitted to the City. This is a standard requirement whenever any new roads are built in a development.

Sensitive lands – There are FEMA floodplain areas in the proposed subdivision area. The proposal includes FEMA flood zone areas including Zone AE (1% annual flood) which requires a 50' setback. The entirety of the Zone AE is in the proposed open space. The proposed lots in the subdivision are more than 50' from the Zone AE so there will be no added restrictions on the proposed lots because of the floodplain.

Also, there is area in the subdivision that is designated Zone X which is area of the 500-year flood (0.2% annual chance flood) and is considered a low risk area but there is flooding potential. No structures will be in this area because the Zone X area is entirely located in the proposed open space area.

Water Connection – The lots will connect to water lines that will be built by the developer and connect to the City's water line along Pine Canyon Road.

Existing culinary water line – There is an existing City culinary water line that crosses the property that supplies water to The Homestead maintenance building. A plan has been presented that will continue to supply water to the facility.

Sewer Connection – The lots will connect to Midway Sanitation District's sewer lines located in the area.

Secondary Water Connection – The lots will connect to Midway Irrigation Company's secondary water system which is already servicing the property. Laterals will be created for all seven lots. Secondary water meters are required for each lateral.

Trails – The City has asked to extend the existing detached public trail from Midway Village from the south along the frontage of the proposed development to the north boundary.

Public Street – The developer will build the proposed road that will create access and frontage for the development. The right-of-way will be 56' wide except where it will extend at the bulb of the cul-de-sac. The street will be 30', with modified curb, 5' park strips, and 5' sidewalks.

Open Space – The property is greater than six acres so 15% open space is required. 1.22 acres are required, and the developer has proposed 2.01 acres. This area will be dedicated on the plat as open space and no further development will be allowed in the open space area. The open space area is currently part of The Homestead Golf Course. This area also contains FEMA floodplain that include Zones AE and X. The application has the 2.01 acres labeled as open space. This allows the open space to be owned by an individual or entity. If the area is labeled as common area on the plat, then the nine lot owners will own the area in common. Either way, the area will not be developable.

100' Setback Requirement – The subdivision code requires a 100' setback from the edge of the right-of-way for Pine Canyon Road for any structures. The setback line will be noted on the plat so no structures, including accessory structures, are placed in this area. The detached public trail will be located in the 100' setback and will be noted on the plat as a public trail easement.

WATER BOARD RECOMMENDATION:

The Water Board has recommended that 23.49-acre feet are tendered to the City before the recording of the plat. The Water Board also required secondary water meters are installed on each lot.

PLANNING COMMISSION RECOMMENDATION:

Motion: Commissioner Simons: I make a motion that we recommend approve final approval of a large-scale subdivision that will be known as Huntleigh Woods Subdivision. The proposal contains nine lots on 8.1 acres. The property is located at 885 North Pine Canyon Road and is in the R-1-15 zone. We accept findings in the staff report with a condition of the water that is needed for the Homestead will be resolved.

Seconded: Commissioner Whitney
Chairman Nicholas: Any discussion on the motion?
Chairman Nicholas: All in favor.
Ayes: Commissioners: Garland, Whitney, Simons and Cliften
Nays: Crawford
Motion: Passed

POSSIBLE FINDINGS:

- The proposal does meet the intent of the General Plan for the R-1-15 zone
- The proposal does comply with the land use requirements of the R-1-15 zone
- A public trail will be built as part of the subdivision that will benefit members of the community
- 2.01 acres of permanent open space will be created as part of the development

ALTERNATIVE ACTIONS:

1. Approval (conditional). This action can be taken if the City Council finds the application complies with the land use ordinance of if any conditions placed on the approval can resolve any outstanding issues.

    a. Accept staff report
    b. List accepted findings
    c. Place condition(s)

2. Continuance. This action can be taken if the City Council finds that there are unresolved issues.

   a. Accept staff report
   b. List accepted findings
   c. Reasons for continuance
      i. Unresolved issues that must be addressed
   d. Date when the item will be heard again

3. Denial. This action can be taken if the City Council finds that the request does not comply with the ordinance.

   a. Accept staff report
   b. List accepted findings
   c. Reasons for denial

PROPOSED CONDITIONS:

There are no proposed conditions.

HORROCKS
ENGINEERS

728 West 100 South
Heber, UT 84032
435-654-2226
www.horrocks.com

November 10, 2020

Midway City
Attn: Michael Henke
75 North 100 West
Midway, Utah 84049

Subject: Huntleigh Woods Final Approval

Dear Michael:

Horrocks Engineers recently reviewed the above development plans for Final Approval. The following items should be addressed.

General Comments

- The plans propose to develop 9 lots on approximately 8.10 acres near 700 North Pine Canyon Road.
- All redline comments within the final plans should be addressed before final approval of City Council.
- Provide a PUE adjacent to each lot on the Plat.
- All utilities within the subdivision will be public.

Water

- The proposed development will be served from the Gerber Mahogany Springs zone.
- The proposed development will connect to the existing 10" water line in Pine Canyon Road.
- Existing 12" transite water line that runs through the proposed subdivision will need to be removed and the Homestead maintenance shed water lateral be re-established.
- Developer must coordinate the relocation of the Homestead maintenance shed water lateral with the Homestead Owners.

Irrigation

- The proposed development will connect to existing irrigation in Pine Canyon Road and will need to install services with meters according to Midway Irrigation Company standards.

Roads

- The proposed road within the development will be a 56'public right-of-way, with a cul-de-sac at the west end of the development.
- Cross section for right-of-way will be 30' of asphalt, 2' curb and gutter, 5' park strip, and 5' sidewalk.

Trails:

- The proposed development will connect a trail onto the existing Midway Villages trail to the south and will end at the north end of the development.
- Trail easements need to be shown on the plat.

Storm Drain

- The storm water system within this development will be a public system. The storm water will be addressed through the use of storm drain pipe, sumps, and detention basins.

Please feel free to call our office with any questions.

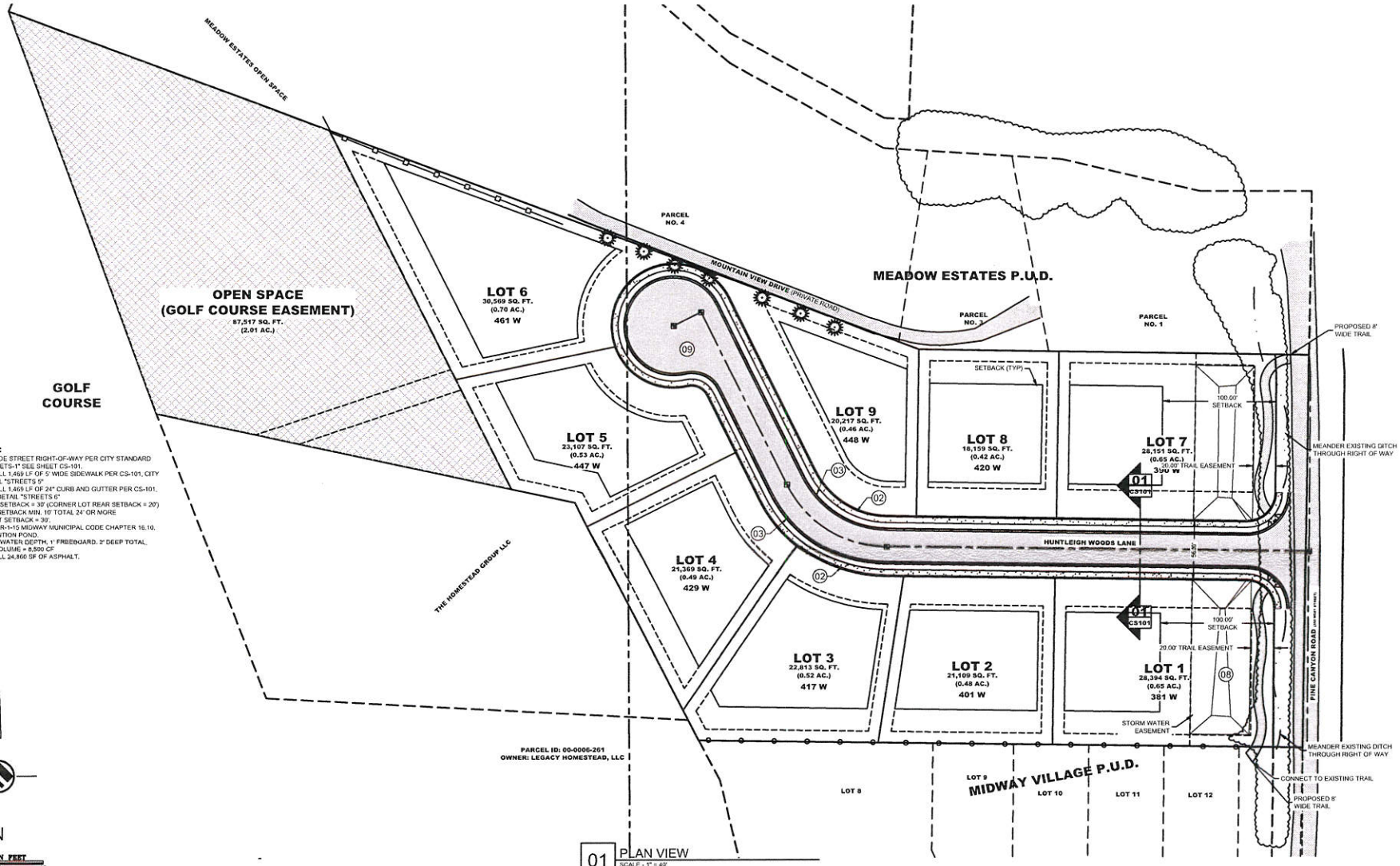
Sincerely,
HORROCKS ENGINEERS

Wesley Johnson, P.E.
Midway City Engineer

cc: David Johnson Johnson Engineering


W 1150 N
520 W
N 435 W
Springer View Dr
Canyon View Rd
Carl Ln
N Meadow Creek Way
Meadow Creek Ln
1050 N
Kimball Cir
975 N St
100 W
Mountain View Dr
350 W St
Swiss Farm Way
Swiss Farm Cir
W Augusta Dr
N Pinecrest Dr
Bluff Rd
Eagle Eagle Dr
Pine Canyon Rd
720 N


Meadow Creek Ln
Mountain View Dr
350 W St
Golden Eagle Dr



NOTES:

1. 56' WIDE STREET RIGHT-OF-WAY PER CITY STANDARD "STREETS-1" SEE SHEET CS-101.
2. INSTALL 1,469 LF OF 5' WIDE SIDEWALK PER CS-101, CITY DETAIL "STREETS 5"
3. INSTALL 1,469 LF OF 24" CURB AND GUTTER PER CS-101, CITY DETAIL "STREETS 6"
4. REAR SETBACK = 30' (CORNER LOT REAR SETBACK = 20')
5. SIDE SETBACK MIN. 10' TOTAL 24' OR MORE
6. FRONT SETBACK = 30'.
7. ZONE R-1-15 MIDWAY MUNICIPAL CODE CHAPTER 16.10.
8. RETENTION POND
   - 8.1. 1' WATER DEPTH, 1' FREEBOARD, 2' DEEP TOTAL.
   - 8.2. VOLUME = 8,500 CF
9. INSTALL 24,860 SF OF ASPHALT.

01 PLAN VIEW
SCALE - 1" = 40'

KNOW WHAT'S BELOW. CALL 811 BEFORE YOU DIG.
DRAWING IS NOT TO SCALE IF LESS THAN 24"x36". DIMENSIONS AND NOTES SUPERCEDE SCALE.

NO.	DATE	REVISION
5	-	-
4	-	-
3	10/13/20	FINAL
2	05/14/20	PRELIMINARY
1	04/22/20	CONCEPTUAL

REGISTERED PROFESSIONAL ENGINEER No. 5338869 DAVID B. JOHNSON STATE OF UTAH

CLIENT / OWNER INFORMATION:

GREGORY AND SALLY BRINTON
1714 E FORT DOUBLAS CIRCLE
SALT LAKE CITY, UTAH 84103
801-824-8300

ENGINEER / SURVEYOR INFORMATION:

JOHNSON ENGINEERING
4436 SOUTH 1025 EAST • SALT LAKE CITY, UTAH 84124
www.johnsonengineeringinc.com
Phone: 801-787-4569

SHEET INFORMATION:

SITE PLAN
HUNTLEIGH WOODS SUBDIVISION
MIDWAY, WASATCH COUNTY, UTAH

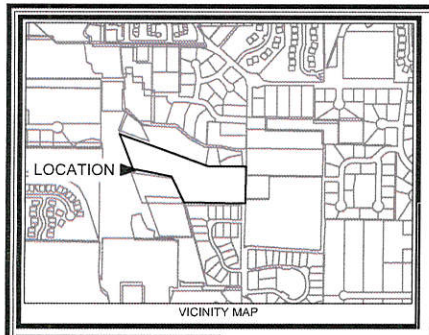
DRAWN BY:	CHECKED BY:	APPROVED BY:	SHEET:
DBJ	DBJ	DBJ	CS-100

PROJECT NO: 20-008
DATE: 10/13/20
SCALE: 1":40'

X:\Active Projects\2009\Brinton Subdivision\04 Design\Drawings\Design\Plot Sheets\CS-Civil Site Site Plan.dwg

HUNTLEIGH WOODS SUBDIVISION

LOCATED IN A PORTION OF THE SOUTHEAST QUARTER OF SECTION 227, TOWNSHIP 3 SOUTH, RANGE 4 EAST, S.L.B.M.
MIDWAY CITY, WASATCH COUNTY, UTAH



VICINITY MAP

LEGEND

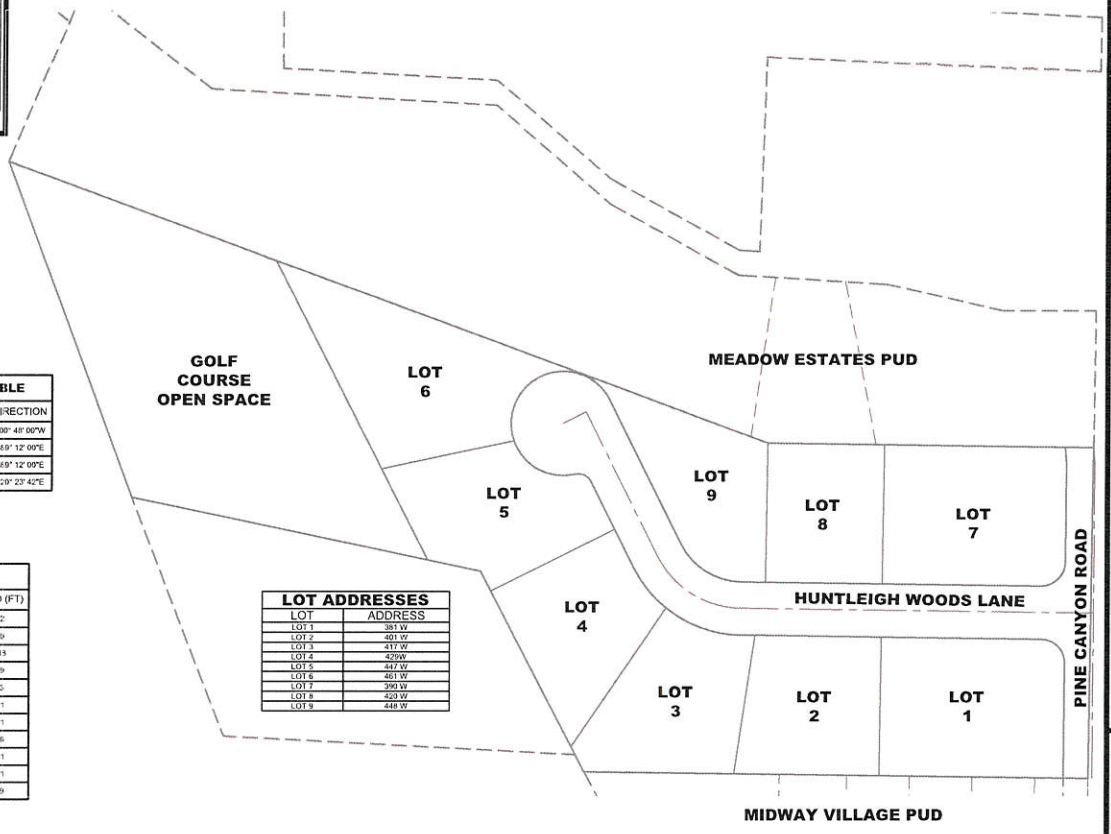
- STREET MONUMENT
- BENCHMARK
- CONTROL POINT
- PROPERTY CORNER FOUND
- PROPERTY CORNER PLACED (MARKED "JOHNSON 5338869")
- PROPERTY CORNER CALCULATED
- SECTION CORNER FOUND
- SECTION CORNER CALCULATED
- SECTION LINE
- STREET CENTER LINE
- TIE LINE
- BOUNDARY LINE
- ADJACENT BOUNDARY LINE
- EASEMENT LINE

PARCEL LINE TABLE

NUMBER	LENGTH (FT)	DIRECTION
L1	351.00	S00° 48' 00"W
L2	2.74	S89° 12' 00"E
L3	0.42	S89° 12' 00"E
L4	1.00	N29° 23' 42"E

PARCEL CURVE TABLE

CURVE #	LENGTH (FT)	RADIUS (FT)	DELTA (°)	DIRECTION	CHORD (FT)
C1	39.08	25.00	89°34'03.00"	N44°24'58"W	35.22
C2	85.05	128.00	38°04'19.83"	N70°09'50"W	83.50
C3	140.07	128.00	62°41'47.00"	N57°51'06"W	133.13
C4	55.01	128.00	24°37'27.17"	N38°48'53"W	54.59
C5	20.10	15.00	76°47'13.27"	N64°53'50"W	18.65
C6	80.37	55.00	83°43'22.50"	N61°25'45"W	73.41
C7	246.50	55.00	256°47'13.27"	N25°06'10"E	86.21
C8	124.76	55.00	129°57'45.78"	N45°24'49"E	99.66
C9	41.37	55.00	43°06'05.00"	S48°03'16"E	40.41
C10	78.79	72.00	62°41'47.00"	S57°51'06"E	74.91
C11	39.46	25.00	90°25'57.00"	N45°35'02"E	35.49



LOT ADDRESSES

LOT	ADDRESS
LOT 1	381 W
LOT 2	401 W
LOT 3	417 W
LOT 4	429W
LOT 5	447 W
LOT 6	461 W
LOT 7	390 W
LOT 8	429 W
LOT 9	448 W

GENERAL NOTES

SURVEYOR'S CERTIFICATE

I, DAVID B. JOHNSON, DO HEREBY CERTIFY THAT I AM A PROFESSIONAL LAND SURVEYOR AND DO HOLD LICENSE NO. 5338869 AS PRESCRIBED UNDER LAWS OF THE STATE OF UTAH. I FURTHER CERTIFY THAT BY AUTHORITY OF THE OWNERS, I HAVE MADE A SURVEY OF THE TRACT OF LAND SHOWN ON THIS PLAT AND DESCRIBED HEREON, AND HAVE SUBDIVIDED SAID TRACT OF LAND INTO LOTS, BLOCKS, STREETS, AND EASEMENTS AS SHOWN ON THIS PLAT, HEREAFTER TO BE KNOWN AS **HUNTLEIGH WOODS SUBDIVISION**. I FURTHER CERTIFY THAT THE SAME HAS BEEN CORRECTLY SURVEYED AND MONUMENTED ON THE GROUND AS SHOWN ON THIS PLAT.

BOUNDARY DESCRIPTION

AN ENTIRE TRACT OF LAND SITUATED IN THE SOUTHEAST QUARTER OF SECTION 27, TOWNSHIP 3 SOUTH, RANGE 4 EAST, S.L.B.M, SAID PARCEL BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE SOUTHEAST CORNER OF MEADOWS ESTATES SUBDIVISION WHICH IS RECORDED AS ENTRY NO. 162413 IN BOOK 247, PAGES 648-657 IN THE WASATCH COUNTY RECORDENS OFFICE. SAID POINT IS ALSO SOUTH A DISTANCE OF 38.30 FEET; THENCE SOUTH 62°55'00" EAST A DISTANCE OF 217.80 FEET; THENCE SOUTH 72°15'00" EAST A DISTANCE OF 171.60 FEET; THENCE SOUTH 57°16'00" EAST A DISTANCE OF 257.40 FEET; THENCE SOUTH 00°48'00" WEST A DISTANCE OF 573.72 FEET FROM THE NORTHEAST CORNER OF THE SOUTHWEST QUARTER OF SECTION 27, TOWNSHIP 3 SOUTH, RANGE 4 EAST, SALT LAKE BASE AND MERIDIAN; AND CONTINUING THENCE SOUTH 00°48'00" WEST A DISTANCE OF 349.69 FEET TO A POINT ON THE NORTHEAST CORNER OF MIDWAY VILLAGE P.U.D. PLAT "A" RECORDED AS ENTRY NO. 286739, BOOK 774, PAGES 347-356. THENCE ALONG THE NORTHERLY BOUNDARY OF SAID MIDWAY VILLAGE P.U.D. PLAT "A" NORTH 89°12'00" WEST A DISTANCE OF 535.91 FEET; THENCE LEAVING SAID NORTHERLY BOUNDARY NORTH 26°30'13" WEST A DISTANCE OF 235.81; THENCE NORTH 77°57'26" WEST A DISTANCE OF 376.70 FEET TO SNAKE CREEK; THENCE UP SNAKE CREEK NORTH 20°10'22" WEST A DISTANCE OF 378.77 FEET TO A POINT THE SOUTHWEST CORNER OF SAID MEADOWS ESTATES. THENCE ALONG THE SOUTHERLY BOUNDARY OF SAID MEADOWS ESTATES THE FOLLOWING TWO (2) COURSES; (1)(2) SOUTH 69°36'18" EAST A DISTANCE OF 855.67 FEET; THENCE (2) SOUTH 89°12'00" EAST A DISTANCE OF 343.01 FEET; TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS 352,836.01 SQUARE FEET (8.1002 ACRES) AND 9 LOTS.

PROFESSIONAL LAND SURVEYOR — DAVID B. JOHNSON — No. 5338869 — STATE OF UTAH

10/13/2020
DATE

DAVID B. JOHNSON
LICENSE NO. 5338869

OWNER'S DEDICATION

KNOW ALL MEN BY THESE PRESENTS THAT THE UNDERSIGNED ARE THE OWNER(S) OF THE ABOVE DESCRIBED TRACT OF LAND, AND HEREBY CAUSE THE SAME TO BE SUBDIVIDED INTO LOTS, PARCELS AND STREETS, TOGETHER WITH EASEMENT AS SET FORTH TO BE HEREAFTER KNOWN AS

HUNTLEIGH WOODS SUBDIVISION

DO HEREBY DEDICATE FOR PERPETUAL USE OF THE PUBLIC ALL ROADS AND OTHER AREAS SHOWN ON THIS PLAT AS INTENDED FOR PUBLIC USE. THE UNDERSIGNED OWNERS ALSO HEREBY CONVEY TO ANY AND ALL PUBLIC UTILITY COMPANIES A PERPETUAL, NON-EXCLUSIVE EASEMENT OVER THE PUBLIC UTILITY EASEMENTS SHOWN ON THIS PLANT THE SAME TO BE USED FOR THE INSTALLATION, MAINTENANCE AND OPERATION OF UTILITY LINES AND FACILITIES. THE UNDERSIGNED OWNERS ALSO HEREBY CONVEY ANY OTHER EASEMENT AS SHOWN ON THIS PLAT TO THE PARTIES INDICATED AND FOR THE PURPOSES SHOWN HEREON.

OWNER'S ACKNOWLEDGEMENT

STATE OF UTAH)
SS
COUNTY OF SALT LAKE)

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME THIS _____ BY OWNER(S).

OWNER: _____

OWNER: _____

NOTARY PUBLIC: _____

COMMISSION NUMBER: _____

MY COMMISSION EXPIRES: _____

DRAWN BY:	CHECKED BY:	APPROVED BY:	SHEET:	
DBJ	DBJ	DBJ	V-101	01 OF 02
PROJECT NO: 20-008				
DATE: 2020-10-13		03	FINAL	10/13/20
SCALE: 1":40'		02	PRELIMINARY	05/14/20
		NO.	REVISION	DATE

SIGNATURES

RECORD OF SURVEY

APPROVED THIS ____ DAY OF _____ A.D. 20___ BY THE WASATCH COUNTY SURVEYOR.

WASATCH COUNTY SURVEYOR — DATE

ROS NO._____

MIDWAY SANITATION DISTRICT

APPROVED THIS ____ DAY OF _____ A.D. 20___ BY THE MIDWAY SANITATION DISTRICT.

MIDWAY SANITATION DISTRICT — DATE

MIDWAY IRRIGATION COMPANY

APPROVED THIS ____ DAY OF _____ A.D. 20___ BY THE MIDWAY IRRIGATION COMPANY.

MIDWAY IRRIGATION COMPANY — DATE

ACCEPTANCE BY MIDWAY CITY

THE CITY COUNCIL OF MIDWAY CITY, WASATCH COUNTY, STATE OF UTAH, HEREBY APPROVES THIS SUBDIVISION AND ACCEPTS THE DEDICATION OF LOTS, EASEMENTS, HEREON SHOWN THIS _____ DAY OF _____, 20_____.

HORROCKS ENGINEER — DATE

CITY ATTORNEY — DATE

CLERK/RECORDER — DATE

MAYOR — DATE

PLANNING COMMISSION

APPROVED THIS ____ DAY OF _____ A.D. 20___ BY THE MIDWAY CITY PLANNING COMMISSION.

CHAIRMAN, PLANNING COMMISSION — DATE

PLANNING DIRECTOR — DATE

CLIENT / OWNER INFORMATION:

SALLY AND GREG BRINTON
1714 E FORT DOUGLAS CIRCLE
SALT LAKE CITY, UTAH 84103
(801) 824-8300

ENGINEER / SURVEYOR INFORMATION:

JOHNSON ENGINEERING
4436 SOUTH 1025 EAST • SALT LAKE CITY, UTAH 84124
www.johnsonengineeringinc.com
Phone: 801-787-4569

SHEET INFORMATION:

HUNTLEIGH WOODS SUBDIVISION

LOCATED IN A PORTION OF THE SOUTHEAST QUARTER OF SECTION 227, TOWNSHIP 3 SOUTH, RANGE 4 EAST, S.L.B.M. MIDWAY CITY, WASATCH COUNTY, UTAH.

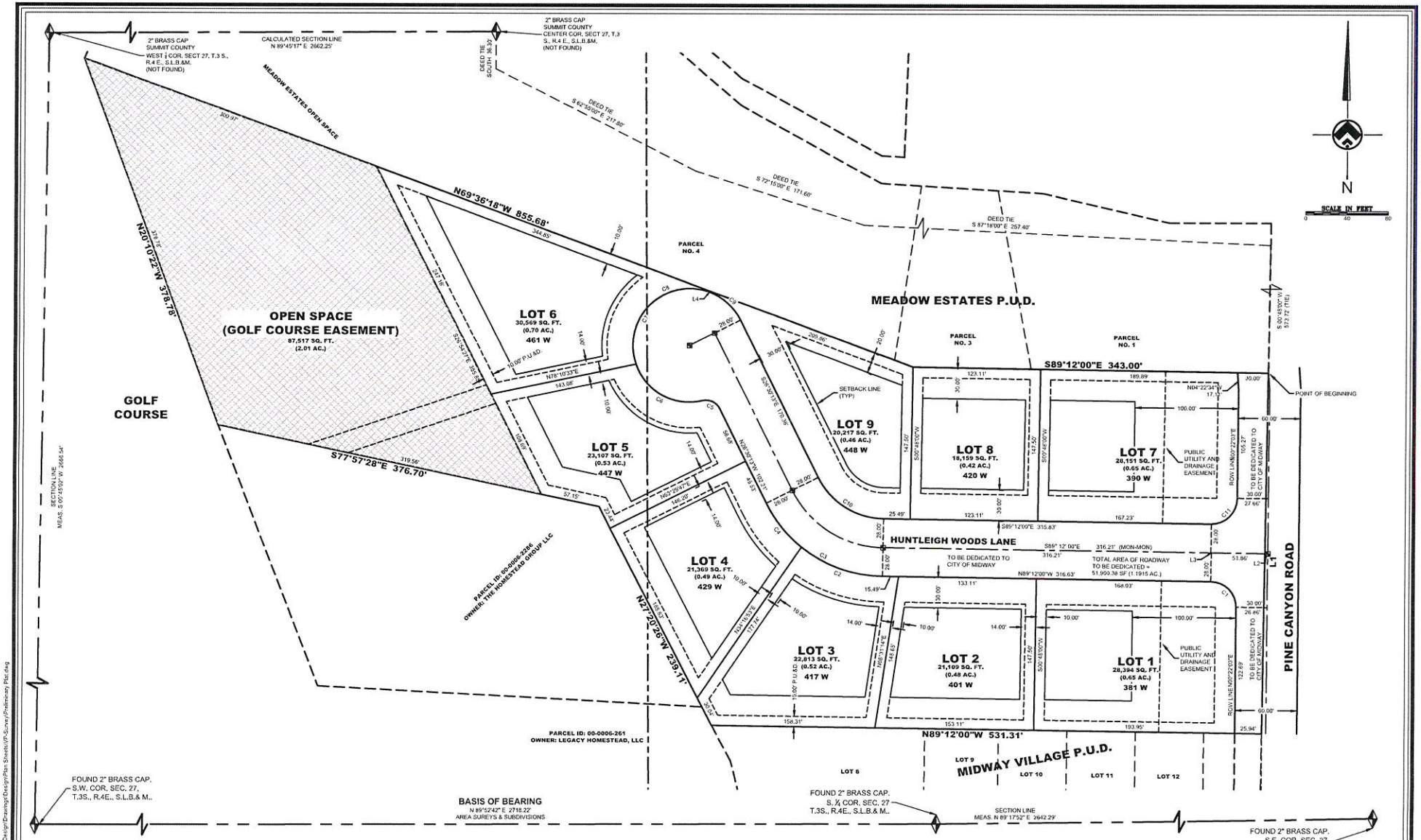
COUNTY RECORDER

RECORDED # _____
STATE OF UTAH, COUNTY OF WASATCH, RECORDED AND FILED AT THE REQUEST OF SALLY P. BRINTON

DATE: _____ TIME: _____
BOOK: _____ PAGE: _____

FEE $ _____ WASATCH COUNTY RECORDER

X:\Active Projects\2008 Brinton Subdivision\04 Design\Drawing\Design\Plan Sheets\VP-Survey\Preliminary Plat.dwg



KNOW WHAT'S BELOW. CALL 811 BEFORE YOU DIG.
DRAWING IS NOT TO SCALE IF LESS THAN 24"x36". DIMENSIONS AND NOTES SUPERCEDE SCALE.

NO.	DATE	REVISION
5	-	-
4	-	-
3	10/13/20	FINAL
2	05/14/20	PRELIMINARY
1	04/22/20	CONCEPTUAL

CLIENT / OWNER INFORMATION:

GREGORY AND SALLY BRINTON
1714 E FORT DOUBLAS CIRCLE
SALT LAKE CITY, UTAH 84103
801-824-8300

ENGINEER / SURVEYOR INFORMATION:
JOHNSON ENGINEERING
4436 SOUTH 1025 EAST • SALT LAKE CITY, UTAH 84124
www.johnsonengineeringinc.com
Phone: 801-787-4569

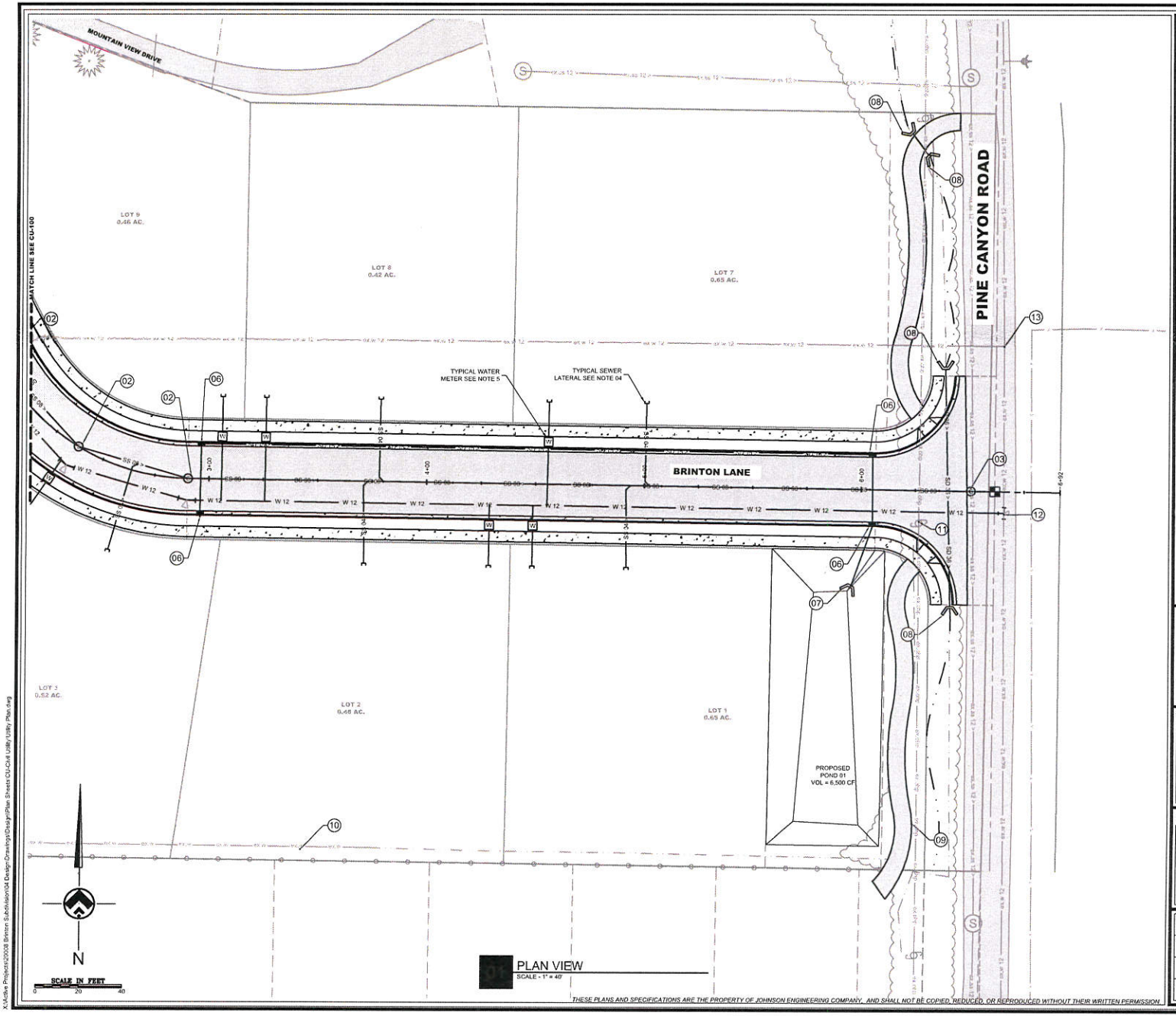
SHEET INFORMATION:

PRELIMINARY PLAT 2 OF 2
HUNTLEIGH WOODS SUBDIVISION
MIDWAY, WASATCH COUNTY, UTAH

DRAWN BY:	CHECKED BY:	APPROVED BY:	SHEET:
DBJ	DBJ	DBJ	VP-103

PROJECT NO: 20-008
DATE: 10/13/20
SCALE: 1":40'

X:\Active Projects-2020\8 Brinton S.dv\sion\04 Design\Drawings\Design\Plan Sheets\VP-Survey\Preliminary Plat.dwg



LEGEND AND GENERAL NOTES

NOTES:

1. INSTALL FIRE HYDRANT PER MIDWAY CITY STANDARDS SEE CU-103.
2. INSTALL 4' SEWER MANHOLE SEE DETAILS CU-102.
3. INSTALL 5' SEWER MANHOLE SEE DETAILS CU-102.
4. INSTALL 4" SANITARY SEWER LATERAL SEE DETAILS CU-102.
5. INSTALL ¾" WATER METER AND LATERAL. SEE DETAIL CU-103
6. INSTALL CURB INLETS PER MIDWAY CITY STANDARDS SEE CU-104.
7. INSTALL 15" CONCRETE FLARED END SECTION. SEE FLARED END SECTION CHART ON SHEET CU-104.
8. INSTALL 36" CONCRETE FLARED END SECTION. SEE FLARED END SECTION CHART ON SHEET CU-104.
9. INSTALL SPILLWAY ACROSS BIKE BATH
10. INSTALL 12" PERFORATED PIPE LAND DRAIN.
11. RELOCATED EXISTING POWER POLE.
12. HOT TAP TO EXISTING WATER LINE. TRENCH THROUGH ROADWAY PER CITY TRENCHING STANDARDS ON CU-103
13. PLUG AND ABANDON EXISTING 12" TRANSITE PIPE TO THE WEST.

KNOW WHAT'S BELOW. CALL 811 BEFORE YOU DIG.
DRAWING IS NOT TO SCALE IF LESS THAN 24"x36". DIMENSIONS AND NOTES SUPERCEDE SCALE.

REGISTERED PROFESSIONAL ENGINEER No. 5736049 DAVID B. JOHNSON STATE OF UTAH

ENGINEER / SURVEYOR INFORMATION:

JOHNSON ENGINEERING
4436 SOUTH 1025 EAST • SALT LAKE CITY, UTAH 84124
www.johnsonengineeringinc.com
Phone: 801-787-4569

CLIENT / OWNER INFORMATION:

GREGORY AND SALLY BRINTON
1714 E FOR DOUBLAS CIRCLE
SALT LAKE CITY, UTAH 84103
801-824-8300

SHEET INFORMATION:

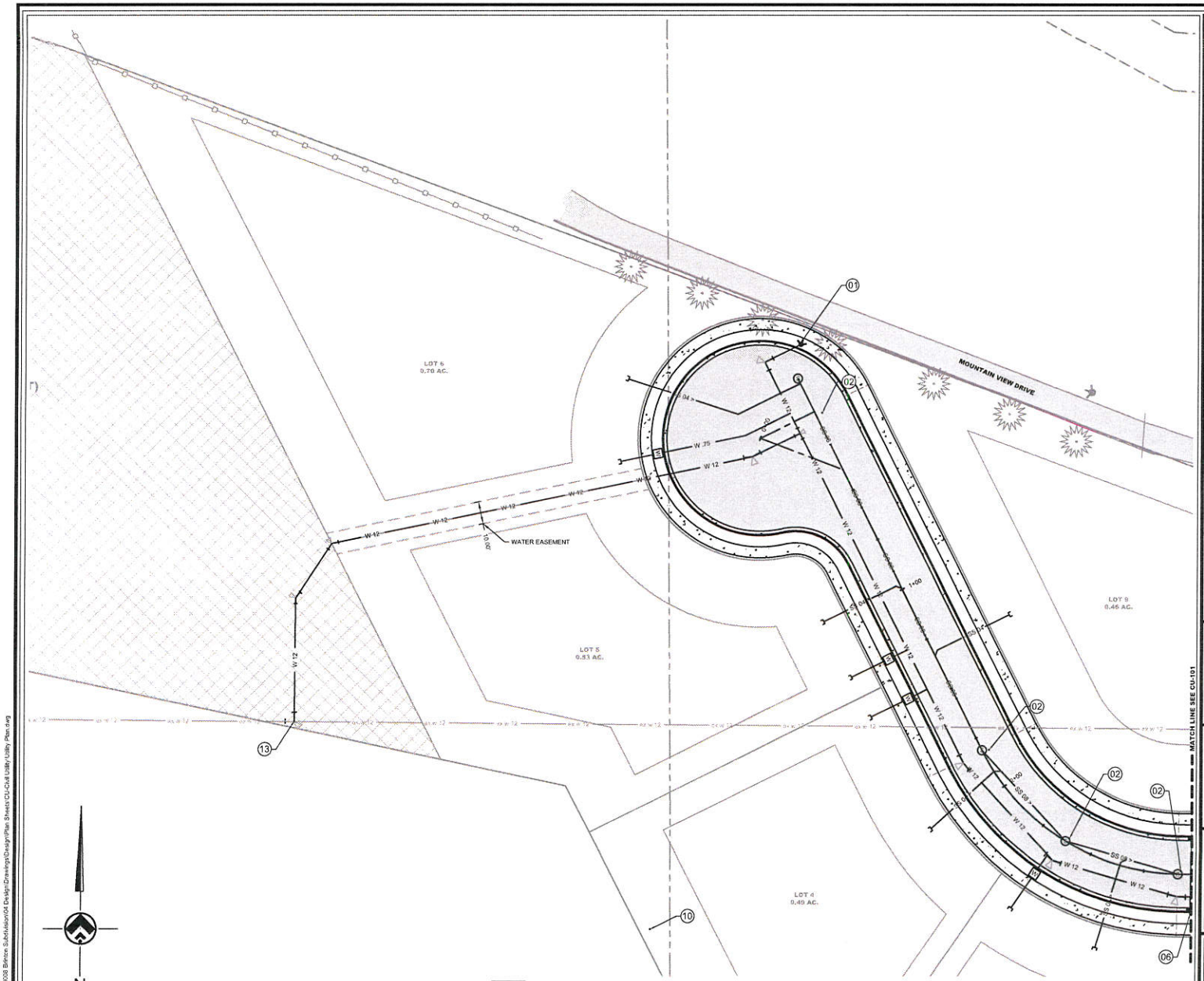
UTILITY PLAN
HUNTLEIGH WOODS SUBDIVISION
MIDWAY, WASATCH COUNTY, UTAH

DRAWN BY:	CHECKED BY:	APPROVED BY:	SHEET:
DBJ	DBJ	DBJ	CU-101

PROJECT NO: 20-008
DATE: 2020-07-23
SCALE: 1":20'

NO.	DATE	REVISION
02	05/14/20	CONCEPTUAL
01	04/22/20	CONCEPTUAL

X:\Active Projects\2008 Brinton Subdivision\04 Design\Drawings\Design\Plan Sheets CU-Civil Utility\Utility Plan.dwg



01 PLAN VIEW
SCALE - 1" = 40'

LEGEND AND GENERAL NOTES

NOTES:

1. INSTALL FIRE HYDRANT PER MIDWAY CITY STANDARDS SEE CU-103.
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5. INSTALL ¾" WATER METER AND LATERAL. SEE DETAIL CU-103
6. INSTALL CURB INLETS PER MIDWAY CITY STANDARDS SEE CU-104.
7. INSTALL 15" CONCRETE FLARED END SECTION. SEE FLARED END SECTION CHART ON SHEET CU-104.
8. INSTALL 36" CONCRETE FLARED END SECTION. SEE FLARED END SECTION CHART ON SHEET CU-104.
9. NA
10. INSTALL 12" PERFORATED PIPE LAND DRAIN.
11. RELOCATED EXISTING POWER POLE.
12. HOT TAP TO EXISTING WATER LINE. TRENCH THROUGH ROADWAY PER CITY TRENCHING STANDARDS ON CU-103
13. CONNECT TO EXISTING 12" TRANSITE PIPE.

KNOW WHAT'S BELOW. CALL 811 BEFORE YOU DIG.
DRAWING IS NOT TO SCALE IF LESS THAN 24"x36". DIMENSIONS AND NOTES SUPERCEDE SCALE.

REGISTERED PROFESSIONAL ENGINEER No. 5738049 DAVID B. JOHNSON STATE OF UTAH

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CLIENT / OWNER INFORMATION:

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1714 E FOR DOUBLAS CIRCLE
SALT LAKE CITY, UTAH 84103
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SHEET INFORMATION:

UTILITY PLAN
HUNTLEIGH WOODS SUBDIVISION
MIDWAY, WASATCH COUNTY, UTAH

DRAWN BY:	CHECKED BY:	APPROVED BY:	SHEET:
DBJ	DBJ	DBJ	CU-100

PROJECT NO: 20-008
DATE: 2020-07-23
SCALE: 1":20'

NO.	DATE	REVISION
02	05/14/20	CONCEPTUAL
01	04/22/20	CONCEPTUAL

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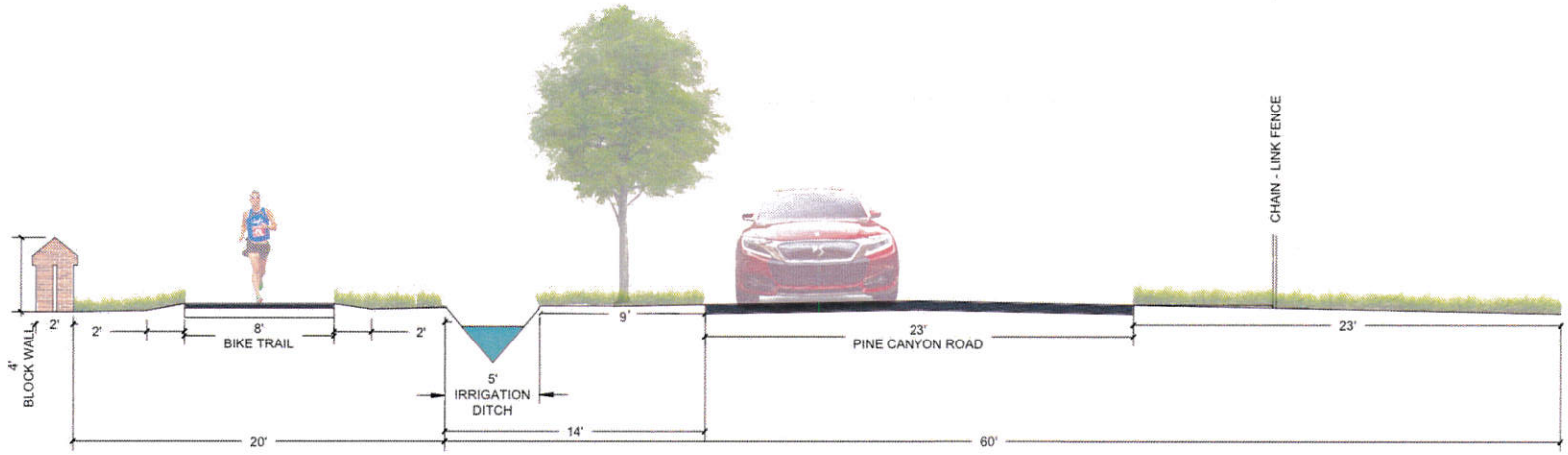
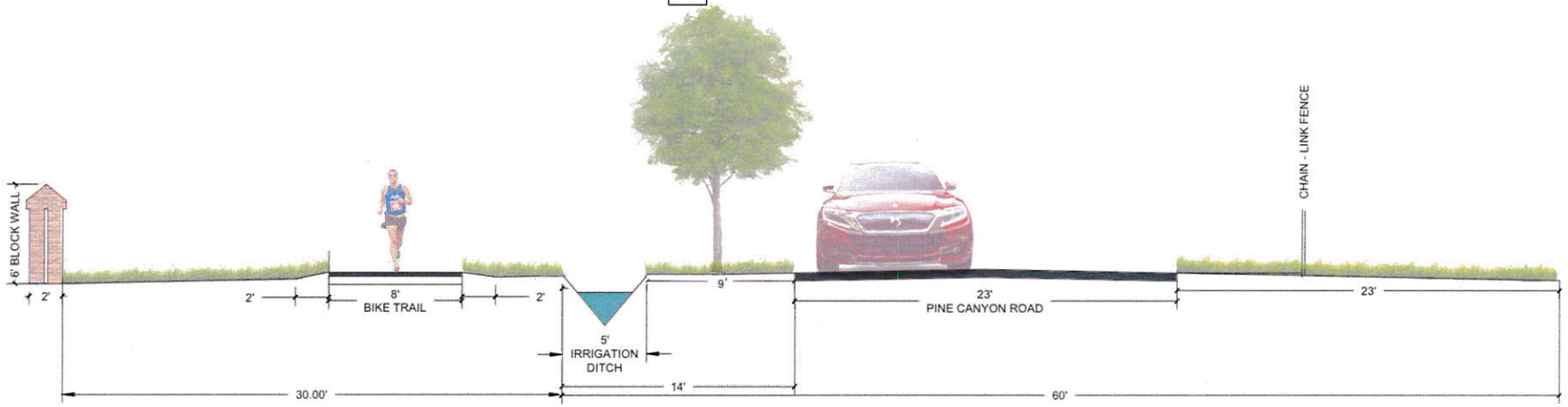


01 PINE CANYON ROAD X-SECTION OPTION A
NO SCALE



01 PINE CANYON ROAD X-SECTION OPTION B
NO SCALE

KNOW WHAT'S BELOW. CALL 811 BEFORE YOU DIG.
DRAWING IS NOT TO SCALE IF LESS THAN 24"x36". DIMENSIONS AND NOTES SUPERCEDE SCALE.

NO.	DATE	REVISION
5	-	-
4	-	-
3	-	-
2	05/14/20	PRELIMINARY
1	04/22/20	CONCEPTUAL

REGISTERED PROFESSIONAL ENGINEER No. 5138069 DAVID B. JOHNSON STATE OF UTAH

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PINE CANYON ROAD CROSS SECTIONS
HUNTLEIGH WOODS SUBDIVISION
MIDWAY, WASATCH COUNTY, UTAH

DRAWN BY:	CHECKED BY:	APPROVED BY:	SHEET:
DBJ	DBJ	DBJ	CS-102

PROJECT NO: 20-008
DATE: 05/14/20
SCALE: 1":40'

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Wasatch County Web Map

Wasatch County Online Map
Printed: 7/14/2020

The boundary lines shown here have been generated for the internal use of Wasatch County and should only be used for general reference purposes.

Questions concerning ownership boundary locations should be directed to a title company, attorney, or licensed land surveyor. Wasatch County makes no warranty as to the accuracy or usefulness of this information. The end user of this information assumes all responsibility concerning this information's appropriate use.

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REPORT
GEOTECHNICAL STUDY
PROPOSED HUNTLEIGH WOODS SUBDIVISION
PINE CANYON ROAD
MIDWAY, UTAH

Submitted To:

Ms. Sally Brinton
1714 East Fort Douglas Circle
Salt Lake City, Utah 84103

Submitted By:

GSH Geotechnical, Inc.
473 West 4800 South
Salt Lake City, Utah 84123

August 3, 2020

Job No. 3112-001-20

August 3, 2020
Job No. 3112-001-20

Ms. Sally Brinton
1714 East Fort Douglas Circle
Salt Lake City, Utah 84103

Ms. Brinton:

Re: Report
Geotechnical Study
Proposed Huntleigh Woods Subdivision
Pine Canyon Road
Midway, Utah

1. INTRODUCTION

1.1 GENERAL

This report presents the results of our geotechnical study performed at the site of the proposed Huntleigh Woods Subdivision to be located at Pine Canyon Road in Midway, Utah. The general location of the site with respect to existing roadways, as of 2020, is presented on Figure 1, Vicinity Map. A more detailed layout of the site showing proposed facilities, existing roadways, and the test pits excavated in conjunction with this study is presented on Figure 2, Site Plan.

1.2 OBJECTIVES AND SCOPE

The objectives and scope of the study were planned in discussions between Ms. Sally Brinton and Mr. Alan Spilker of GSH Geotechnical, Inc. (GSH).

In general, the objectives of this study were to:

1. Define and evaluate the subsurface soil and groundwater conditions across the site.

2. Provide appropriate foundation, earthwork, pavement, and geoseismic recommendations to be utilized in the design and construction of the proposed facilities.

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In accomplishing these objectives, our scope has included the following:

1. A field program consisting of the excavating, logging, and sampling of 5 exploration test pits.

2. A laboratory testing program.

3. An office program consisting of the correlation of available data, engineering analysis, and the preparation of this summary report.

1.3 AUTHORIZATION

Authorization was provided by returning a signed copy of the Professional Services Agreement No. 20-0449 dated April 29, 2020.

1.4 PROFESSIONAL STATEMENTS

Supporting data upon which our recommendations are based are presented in subsequent sections of this report. Recommendations presented herein are governed by the physical properties of the soils encountered in the exploration test pits, projected groundwater conditions, and the layout and design data discussed in Section 2, Proposed Construction. If subsurface conditions other than those described in this report are encountered and/or if design and layout changes are implemented, GSH must be informed so that our recommendations can be reviewed and amended, if necessary.

Our professional services have been performed, our findings developed, and our recommendations prepared in accordance with generally accepted engineering principles and practices in this area at this time.

2. PROPOSED CONSTRUCTION

The project is to consist of the construction of a 9-lot residential development and associated pavements. The structures are anticipated to be 1 to 2 stories above grade with full- or partial-depth basements supported upon conventional spread and continuous wall footings.

Maximum real column and wall loads are anticipated to be on the order of 20 to 40 kips and 2 to 3 kips per lineal foot, respectively. Real loads are defined as the total of all dead plus frequently applied (reduced) live loads.

Paved roadways and a cul-de-sac are planned to service the structures. Projected traffic in these areas is anticipated to consist of a light volume of automobiles and light trucks, occasional medium-weight trucks, and no heavyweight trucks.

Site development will require some earthwork in the form of minor cutting and filling. At this time, we anticipate that maximum site grading cuts and fills, excluding utilities, will be on the order of 1 to 3 feet.

3. SITE INVESTIGATIONS

3.1 GENERAL

Subsurface conditions in unexplored locations or at other times may vary from those encountered at specific test pit locations. If such variations are noted during construction or if project development plans are changed, GSH must review the changes and amend our recommendations, if necessary.

Test pit locations were established by estimating distances and angles from site landmarks. If increased accuracy is desired by the client, we recommend that the test pit locations and elevations be surveyed.

3.2 FIELD PROGRAM

To define and evaluate the subsurface soil and groundwater conditions across the site, 5 test pits were excavated within the accessible areas. These test pits were completed to depths ranging from 8 to 13 feet with a moderate-sized rubber track-mounted excavator. Excavation refusal within very dense granular soils terminated Test Pits TP-1 and TP-5. The approximate locations of the test pits are presented on Figure 2.

The field portion of our study was under the direct control and continual supervision of an experienced member of our geotechnical staff. During the course of the drilling operations, a continuous log of the subsurface conditions encountered was maintained. In addition, samples of the typical soils encountered were obtained for subsequent laboratory testing and examination. The soils were classified in the field based upon visual and textural examination. These classifications were supplemented by subsequent inspection and testing in our laboratory. Graphical representation of the subsurface conditions encountered is presented on Figures 3A through 3E, Test Pit Logs. Soils were classified in accordance with the nomenclature described on Figure 4, Key to Test Pit Log (USCS).

A 2.42-inch inside diameter thin-wall drive sampler was utilized at select locations and depths within the test pit excavations to collect soil samples for further examination and laboratory testing.

Following completion of excavation operations, 1.25-inch diameter slotted PVC pipe was installed in each test pit except Test Pit TP-3 to provide a means of monitoring the groundwater fluctuations. The test pits were then backfilled. Although an effort was made to compact the backfill with the backhoe, backfill was not placed in uniform lifts and compacted to a specific density. Consequently, settlement of the backfill with time is likely to occur.

3.3 LABORATORY TESTING

3.3.1 General

To provide data necessary for our engineering analysis, a laboratory testing program was performed. This program included moisture, density, partial gradation, consolidation, CBR, and chemical tests. The following paragraphs describe the tests and summarize the test data.

3.3.2 Moisture and Density Tests

To provide index parameters and to correlate other test data, moisture and density tests were performed on selected samples. The results of these tests are presented on the test pit logs, Figures 3A through 3E.

3.3.3 Partial Gradation Tests

To aid in classifying the granular soils, partial gradation tests were performed. Results of the tests are tabulated below and presented on the test pit logs, Figures 3A through 3E.

Test Pit No.	Depth (feet)	Percent Passing No. 200 Sieve	Moisture Content Percent	Soil Classification
TP-2	2.5	35.6	12.4	SM/SC
TP-3	5.0	36.1	11.0	GM

3.3.4 Consolidation Test

To provide data necessary for our settlement analysis, consolidation testing was performed on a representative sample of the natural fine-grained clay soils encountered at the site. The results of the test indicate that the sample tested was moderately over-consolidated and will exhibit moderate strength and compressibility characteristics under the anticipated loading. Detailed results of the test are maintained within our files and can be transmitted to you, upon your request.

3.3.5 California Bearing Ratio (CBR) Test

A California Bearing Ratio (CBR) test was performed on the representative sample of clay fill soils obtained from the site. The test was performed in accordance with the Utah Department of Transportation Procedure 8-9-22 "California Bearing Ratio Soil" as presented in the Utah State Department of Highways Manual of Instruction, Part 8, Materials. The results of the CBR test are presented on the following page.

Soil Classification	SM/SC		
Before Soaking	Dry Density	108.9	pcf
	Moisture Content	15.6	percent
After Soaking	Dry Density	111.0	pcf
	Moisture Content (Upper 1" of Sample)	19.3	percent
	Surcharge	10	lbs
	Swell	0.70	percent
CBR	Surcharge	10	lbs
	At 0.1" penetration	32.3	percent
	At 0.2" penetration	45.7	percent

3.3.6 Chemical Tests

To determine if the site soils will react detrimentally with concrete, chemical tests were performed on a representative sample of the near-surface soil encountered at the site. The results of the chemical tests are tabulated below:

Test Pit No.	Depth (feet)	Soil Classification	pH	Total Water Soluble Sulfate (mg/kg-dry)
TP-1	2.5	SM/SC	8.59	52.8

4. SITE CONDITIONS

4.1 SURFACE

The site is located at Pine Canyon Road in Midway, Utah. The site is currently vacant/undeveloped brush/grass land. The topography of the site is relatively flat, grading down to the southeast with a total relief of approximately 11 to 13 feet. Site vegetation consists of various weeds and brush/grass land with mature trees and shrubs on the eastern border of the site.

The site is bounded to the north by Mountain View Drive along with a single-family residential structure and vacant/undeveloped brush/grass land; to the east by 350 West Street followed by similar vacant/undeveloped brush/grass land; to the south by single-family residential structures; and to the west by a recreational golf course.

4.2 SUBSURFACE SOIL

The following paragraphs provide generalized descriptions of the subsurface profiles and soil conditions encountered within the test pits conducted during this study. As previously noted, soil conditions may vary in unexplored locations.

The test pits were excavated to depths ranging from 8 to 12 feet. The soil conditions encountered in each of the test pits, to the depths explored, were generally similar across the test pit locations.

- Approximately 4 to 8 inches of topsoil was encountered in each test pit. Topsoil thickness is frequently erratic and thicker zones of topsoil should be anticipated.

- Natural soils were encountered below the non-engineered fill or the ground surface in each test pit. The natural soils consisted primarily of clay with varying silt and sand content, sand with varying clay, silt, and gravel content, and gravel with silt, sand, and cobble content.

- Materials causing excavation refusal were encountered within the dense natural soils in Test Pits TP-1 and TP-5 at depths of 8 feet below the existing ground surface.

The natural clay soils were soft to stiff, moist to saturated, brown in color, and moderately over-consolidated. The natural clay soils are anticipated to exhibit moderate strength and compressibility characteristics under the anticipated loading.

The natural sand soils were loose to medium dense, moist to saturated, and gray and brown in color. The natural sand soils are anticipated to exhibit moderately high strength and moderately low compressibility characteristics under the anticipated load range.

For a more descriptive interpretation of subsurface conditions, please refer to Figures 3A through 3E, Test Pit Logs. The lines designating the interface between soil types on the test pit logs generally represent approximate boundaries. In situ, the transition between soil types may be gradual.

4.3 GROUNDWATER

On July 30, 2020 (9 days following drilling), groundwater was measured within the PVC pipes installed as tabulated on the following page.

Boring No.	Groundwater Depth (feet)
	July 30, 2020
TP-1	6.5
TP-2	9.0
TP-4	8.0

Groundwater levels vary with changes in season and rainfall, construction activity, irrigation, snow melt, surface water run-off, and other site-specific factors.

5. DISCUSSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF FINDINGS

The proposed structures may be supported upon conventional spread and continuous wall foundations supported upon suitable natural soils and/or structural fill extending to suitable natural soils.

The most significant geotechnical aspects at the site are:

1. The existing topsoil and vegetation across much of the site.

2. The relatively shallow depth to groundwater.

3. The shallow depth to excavation refusal in Test Pits TP-1 and TP-5.

Prior to proceeding with construction, removal of any existing debris, surface vegetation, root systems, topsoil, non-engineered fill (if encountered), and any deleterious materials from beneath an area extending out at least 5 feet from the perimeter of the proposed structure footprint and 3 feet beyond pavements and exterior flatwork areas will be required. All existing utility locations should be reviewed to assess their impact on the proposed construction and abandoned and/or relocated as appropriate.

Due to the developed nature of the surrounding area, non-engineered fills may exist in unexplored areas of the site. Based on our experience, non-engineered fills are frequently erratic in composition and consistency. All surficial loose/disturbed soils and non-engineered fills must be removed below all footings, floor slabs, and pavements.

Groundwater was measured as shallow as 6.5 feet below the ground surface. GSH recommends placing floor slabs no closer than 4 feet from the highest groundwater elevation or 1.5 feet if a foundation subdrain system is utilized. Foundation subdrain recommendations are discussed in Section 5.3.1, Subdrains.

Proof rolling of the natural clay subgrade must not be completed if cuts extend to within 1 foot of the groundwater surface. In areas where cuts are to extend to within 1 foot of the groundwater surface, stabilization must be anticipated.

The dense natural soils encountered at the refusal depths may require larger excavating equipment to achieve design excavation depths and should be considered in the design and bidding process.

Detailed discussions pertaining to earthwork, foundations, pavements, and the geoseismic setting of the site are presented in the following sections.

5.2 EARTHWORK

5.2.1 Site Preparation

Initial site preparation will consist of the removal of any existing debris, non-engineered fills (if encountered), surface vegetation, root systems, topsoil, and any deleterious materials from beneath an area extending out at least 5 feet from the perimeter of the proposed structure footprint and 3 feet beyond pavements and exterior flatwork areas. All existing utility locations should be reviewed to assess their impact on the proposed construction and abandoned and/or relocated as appropriate.

Subsequent to stripping and prior to the placement of floor slabs, foundations, structural site grading fills, exterior flatwork, and pavements, the exposed subgrade must be proof rolled by passing moderate-weight rubber tire-mounted construction equipment over the surface at least twice. If excessively soft or otherwise unsuitable soils are encountered beneath footings, they must be completely removed. If removal depth required is greater than 2 feet below footings, GSH must be notified to provide further recommendations. In pavement, floor slab, and outside flatwork areas, unsuitable natural soils should be removed to a maximum depth of 2 feet and replaced with compacted granular structural fill.

Subgrade preparation as described must be completed prior to placing overlying structural site grading fills.

Due to the relatively high groundwater, site grading cuts should be kept to a minimum. Cuts extending to within 1 foot of the groundwater elevation will likely disturb the natural clay soils and proof rolling must not be completed. Stabilization must be anticipated in areas where cuts are to extend to within 1 foot of the groundwater surface.

GSH must be notified prior to the placement of structural site grading fills, floor slabs, footings, and pavements to verify that all loose/disturbed soils and non-engineered fills (if encountered) have been completely removed and/or properly prepared.

5.2.2 Temporary Excavations

Temporary excavations up to 8 feet deep in fine-grained cohesive soils, above or below the water table, may be constructed with sideslopes no steeper than one-half horizontal to one vertical (0.5H:1.0V). Excavations deeper than 8 feet are not anticipated at the site.

For granular (cohesionless) soils, construction excavations above the water table, not exceeding 4 feet, should be no steeper than one-half horizontal to one vertical (0.5H:1.0V). For excavations up to 8 feet, in granular soils and above the water table, the slopes should be no steeper than one horizontal to one vertical (1H:1V). Excavations encountering saturated cohesionless soils will be very difficult and will require very flat sideslopes and/or shoring, bracing, and dewatering.

The static groundwater table was encountered as shallow as 6.5 feet below the existing surface and may be shallower with seasonal fluctuations. Consideration for dewatering of utility trenches, excavations for the removal of non-engineered fill, and other excavations below this level should be incorporated into the design and bidding process.

Due to the relatively shallow excavation refusal depths, difficult excavation should be anticipated within deeper excavations such as those for construction of utilities and large excavating equipment will likely be required to achieve design depths.

All excavations must be inspected periodically by qualified personnel. If any signs of instability or excessive sloughing are noted, immediate remedial action must be initiated.

5.2.3 Structural Fill

Structural fill is defined as all fill which will ultimately be subjected to structural loadings, such as imposed by footings, floor slabs, pavements, etc. Structural fill will be required as backfill over foundations and utilities, as site grading fill, and as replacement fill below footings. All structural fill must be free of surface vegetation, root systems, rubbish, topsoil, frozen soil, and other deleterious materials.

Structural site grading fill is defined as structural fill placed over relatively large open areas to raise the overall grade. For structural site grading fill, the maximum particle size shall not exceed 4 inches; although, occasional larger particles, not exceeding 8 inches in diameter, may be incorporated if placed randomly in a manner such that "honeycombing" does not occur and the desired degree of compaction can be achieved. The maximum particle size within structural fill placed within confined areas shall be restricted to 2 inches.

On-site soils may be re-utilized as structural site grading fill if they do not contain construction debris or deleterious material and meet the requirements of structural fill. Fine-grained soils will require very close moisture control and may be very difficult, if not impossible, to properly place and compact during wet and cold periods of the year.

Imported structural fill below foundations and floor slabs shall consist of a well graded sand and gravel mixture with less than 30 percent retained on the three-quarter-inch sieve and less than 20 percent passing the No. 200 Sieve (clays and silts).

To stabilize soft subgrade conditions (if encountered) or where structural fill is required to be placed closer than 2.0 feet above the water table at the time of construction, a mixture of coarse angular gravels and cobbles and/or 1.5- to 2.0-inch gravel (stabilizing fill) should be utilized. It may also help to utilize a stabilization fabric, such as Mirafi 600X or equivalent, placed on the natural ground if 1.5- to 2.0-inch gravel is used as stabilizing fill.

5.2.4 Fill Placement and Compaction

All structural fill shall be placed in lifts not exceeding 8 inches in loose thickness. Structural fills shall be compacted in accordance with the percent of the maximum dry density as determined by the AASHTO[1] T180 (ASTM[2] D1557) compaction criteria in accordance with the following table:

Location	Total Fill Thickness (feet)	Minimum Percentage of Maximum Dry Density
Beneath an area extending at least 5 feet beyond the perimeter of the structure	0 to 10	95
Site grading fills outside area defined above	0 to 5	90
Site grading fills outside area defined above	5 to 10	95
Utility trenches within structural areas	--	96
Road base	--	96

Structural fills greater than 10 feet thick are not anticipated at the site.

Subsequent to stripping and prior to the placement of structural site grading fill, the subgrade shall be prepared as discussed in Section 5.2.1, Site Preparation, of this report. In confined areas, subgrade preparation should consist of the removal of all loose or disturbed soils.

Coarse angular gravel and cobble mixtures (stabilizing fill), if utilized, shall be end dumped, spread to a maximum loose lift thickness of 15 inches, and compacted by dropping a backhoe bucket onto the surface continuously at least twice. As an alternative, the stabilizing fill may be compacted by passing moderately heavy construction equipment or large self-propelled compaction equipment at least twice. Subsequent fill material placed over the coarse gravels and cobbles shall be

1 American Association of State Highway and Transportation Officials
2 American Society for Testing and Materials

adequately compacted so that the "fines" are "worked into" the voids in the underlying coarser gravels and cobbles. Where soil fill materials are to be placed directly over more than about 18 inches of clean gravel, a separation geofabric, such as Mirafi 140N or equivalent, is recommended to be placed between the gravel and subsequent soil fills.

Non-structural fill may be placed in lifts not exceeding 12 inches in loose thickness and compacted by passing construction, spreading, or hauling equipment over the surface at least twice.

5.2.5 Utility Trenches

All utility trench backfill material below structurally loaded facilities (footings, floor slabs, flatwork, pavements, etc.) shall be placed at the same density requirements established for structural fill. If the surface of the backfill becomes disturbed during the course of construction, the backfill shall be proof rolled and/or properly compacted prior to the construction of any exterior flatwork over a backfilled trench. Proof rolling shall be performed by passing moderately loaded rubber tire-mounted construction equipment uniformly over the surface at least twice. If excessively loose or soft areas are encountered during proof rolling, they shall be removed to a maximum depth of 2 feet below design finish grade and replaced with structural fill.

Many utility companies and City-County governments are now requiring that Type A-1a or A-1b (AASHTO Designation – granular soils with limited fines) soils be used as backfill over utilities. These organizations are also requiring that in public roadways, the backfill over major utilities be compacted over the full depth of fill to at least 96 percent of the maximum dry density as determined by the AASHTO T180 (ASTM D1557) method of compaction. GSH recommends that as the major utilities continue onto the site that these compaction specifications are followed.

Fine-grained soils, such as silts and clays, are not recommended for utility trench backfill in structural areas.

The static groundwater table was encountered as shallow as 7 feet below the existing surface and may be shallower with seasonal fluctuations. Dewatering of utility trenches and other excavations below this level should be anticipated.

Due to the relatively shallow excavation refusal depths, difficult excavation should be anticipated within deeper excavations such as those for construction of utilities and large excavating equipment will likely be required to achieve design depths.

5.3 GROUNDWATER

On July 30, 2020 (9 days following drilling), groundwater was measured within the PVC pipes installed as tabulated on the following page.

Boring No.	Groundwater Depth (feet)
	July 30, 2020
TP-1	6.5
TP-2	9.0
TP-4	8.0

Based on the anticipated cuts necessary to reach design subgrades, we anticipate temporary and permanent dewatering may be necessary. Floor slabs must be placed a minimum of 4 feet from the stabilized groundwater elevation or 1.5 feet if a perimeter subdrain system is utilized. Foundation subdrain recommendations are discussed in Section 5.3.1, Subdrains.

The groundwater measurements presented are conditions at the time of the field exploration and may not be representative of other times or locations. Groundwater levels may vary seasonally and with precipitation, as well as other factors including irrigation. Evaluation of these factors is beyond the scope of this study. Groundwater levels may, therefore, be at shallower or deeper depths than those measured during this study, including during construction and over the life of the structure.

The extent and nature of any dewatering required during construction will be dependent on the actual groundwater conditions prevalent at the time of construction and the effectiveness of construction drainage to prevent run-off into open excavations.

5.3.1 Subdrains

A subdrain system, if utilized, should consist of a perimeter foundation/chimney subdrain and an under-slab subdrain. The perimeter subdrain would consist of a 4-inch diameter slotted or perforated PVC or other durable material pipe installed with an invert at least 18 inches below the top of the lowest adjacent slab. The drainpipe should slope at least 0.25 percent to a suitable point of gravity discharge, such as an inside or outside sump. The 4-inch diameter slotted PVC pipe should be encased in a one-half to three-quarter-inch clean gap-graded gravel extending 2 inches below laterally and continuously up at least 12 inches above the top of the lowest adjacent slab. The gravels must be separated from the adjacent soils with a geotextile fabric, such as Mirafi 140N or equivalent. Extending up from the top of the foundation subdrain to within 1 foot of final grade should be a synthetic drain board or a zone of "free-draining" permeable fill, also separated from all adjacent soils with a geotextile fabric. Prior to the placement of the perimeter foundation subdrain, the outside subgrade walls should be appropriately waterproofed.

In addition to the perimeter foundation/chimney subdrain, an under-slab drain is recommended. This should consist of a minimum of 8 inches of "free-draining" one-half to three-quarter-inch minus clean gap-graded gravel placed over properly prepared suitable natural subgrade soils and/or structural fill extending to suitable natural soil. The "free-draining" gravel shall be hydraulically

connected to the perimeter drain. In addition, we recommend 4-inch diameter slotted PVC pipes be installed laterally and spaced approximately 50 feet apart beneath the below-grade level slab of the structure with an invert elevation of at least 12 inches below the top of the lowest adjacent slab. This subdrain would be similarly encased in the one-half- to three-quarter-inch clean gap-graded gravel, separated from the natural soils with a geotextile fabric, extending up to the 6-inch layer of gravel underneath the at-grade slab. This subdrain line would discharge to the perimeter subdrain.

GSH also recommends that a minimum of 10.0 inches of free-draining gravel material be placed below the floor slab and that this gravel be hydraulically tied to the perimeter foundation drain. This may be accomplished by placing footings on a minimum of 6.0 inches of similar free-draining gravel material. Lateral drains must also be placed approximately every 50 feet and tied to the subdrain system.

Water collected by the subdrain system would be gravity discharged or pumped to a suitable discharge point such as area subdrains, storm drains, or other suitable down-gradient location (see attached Figure 5, Typical Foundation/Chimney Subdrain Detail 18"). A back-up power and back-up pump would need to be incorporated against failure if a suitable gravity discharge system is unavailable.

5.4 SPREAD AND CONTINUOUS WALL FOUNDATIONS

5.4.1 Design Data

The results of our analysis indicate that the proposed structures may be supported upon conventional spread and continuous wall foundations established upon suitable natural soils and/or structural fill extending to suitable natural soils. Under no circumstances shall foundations be established over non-engineered fills, loose or disturbed soils, topsoil, surface vegetation, root systems, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water. For design, the following parameters are provided:

Minimum Recommended Depth of Embedment for Frost Protection	- 30 inches
Minimum Recommended Depth of Embedment for Non-frost Conditions	- 15 inches
Recommended Minimum Width for Continuous Wall Footings	- 18 inches
Minimum Recommended Width for Isolated Spread Footings	- 24 inches

Recommended Net Bearing Capacity for Real Load Conditions	- 2,500 pounds per square foot
Bearing Capacity Increase for Seismic Loading	- 50 percent

The term "net bearing capacity" refers to the allowable pressure imposed by the portion of the structure located above lowest adjacent final grade. Therefore, the weight of the footing and backfill to lowest adjacent final grade need not be considered. Real loads are defined as the total of all dead plus frequently applied live loads. Total load includes all dead and live loads, including seismic and wind.

5.4.2 Installation

Under no circumstances shall the footings be installed upon non-engineered fills, loose or disturbed soils, topsoil, surface vegetation, root systems, rubbish, construction debris, or other deleterious materials. If unsuitable soils are encountered, they must be removed and replaced with compacted granular fill. If granular soils become loose or disturbed, they must be recompacted prior to pouring the concrete.

The width of structural replacement fill below footings should be equal to the width of the footing plus one foot for each foot of fill thickness.

5.4.3 Settlements

Based on column loadings, soil bearing capacities, and the foundation recommendations as discussed above, we expect primary total settlement beneath individual foundations to be less than one inch.

The amount of differential settlement is difficult to predict because the subsurface and foundation loading conditions can vary considerably across the site. However, we anticipate differential settlement between adjacent foundations could vary from 0.5 to 0.75 inch. The final deflected shape of the structure will be dependent on actual foundation locations and loading.

5.5 LATERAL RESISTANCE

Lateral loads imposed upon foundations due to wind or seismic forces may be resisted by the development of passive earth pressures and friction between the base of the footings and the supporting soils. In determining frictional resistance, a coefficient of friction of 0.35 may be utilized for the footing interface with the in situ natural clay soils and 0.40 for footing interface with natural granular soils or granular structural fill. Passive resistance provided by properly placed and compacted granular structural fill above the water table may be considered equivalent to a fluid with a density of 300 pounds per cubic foot. Below the water table, this granular soil should be considered equivalent to a fluid with a density of 150 pounds per cubic foot.

A combination of passive earth resistance and friction may be utilized provided that the friction component of the total is divided by 1.5.

5.6 LATERAL PRESSURES

Parameters, as presented within this section, are for backfills which will consist of drained soil placed and compacted in accordance with the recommendations presented herein.

The lateral pressures imposed upon subgrade facilities will, therefore, be basically dependent upon the relative rigidity and movement of the backfilled structure. For active walls, such as retaining walls which can move outward (away from the backfill), drained backfill may be considered equivalent to a fluid with a density of 40 pounds per cubic foot in computing lateral pressures. For more rigid subgrade walls that are not more than 10 inches thick, granular backfill may be considered equivalent to a fluid with a density of 50 pounds per cubic foot. For very rigid non-yielding walls, granular backfill should be considered equivalent to a fluid with a density of at least 60 pounds per cubic foot. The above values assume that the surface of the soils slope behind the wall is horizontal and that the granular fill within 3 feet of the wall will be compacted with hand-operated compacting equipment.

For seismic loading of below-grade walls, the uniform lateral pressures below, in pounds per square foot (psf), should be added based on wall depth and wall case:

Uniform Lateral Pressures			
Wall Height (Feet)	**Active Pressure Case (psf)**	**Moderately Yielding Case (psf)**	**At Rest/Non-Yielding Case (psf)**
4	15	35	55
6	20	55	85
8	30	70	110
10	35	90	140

5.7 FLOOR SLABS

Floor slabs may be established upon suitable natural subgrade soils or structural fill extending to suitable natural soils. Under no circumstances shall floor slabs be established directly over non-engineered fills, loose or disturbed soils, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water.

Additionally, GSH recommends that floor slabs be constructed a minimum of 4.0 feet from the stabilized groundwater elevation or 1.5 feet if a foundation subdrain system is utilized. A design for a foundation subdrain system will be provided, upon request. As an alternative, site grading fill

may be utilized to raise the overall grade to achieve the required separation between the floor slab and the highest groundwater elevation.

To facilitate curing of the concrete and to provide a capillary moisture break, it is recommended that floor slabs be directly underlain by at least 4 inches of "free-draining" fill, such as "pea" gravel or three-quarters to one-inch minus clean gap-graded gravel.

Settlement of lightly loaded floor slabs designed according to previous recommendations (average uniform pressure of 200 pounds per square foot or less) is anticipated to be less than one-quarter of an inch.

5.8 PAVEMENTS

The natural clay soils will exhibit poor pavement support characteristics when saturated. All pavement areas must be prepared as previously discussed (see Section 5.2.1, Site Preparation). Under no circumstances shall pavements be established over non-engineered fills, loose or disturbed soils, topsoil, surface vegetation, root systems, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water. With the subgrade soils and the projected traffic as discussed in Section 2, Proposed Construction, the following pavement sections are recommended:

Paved Areas

(Light Volume of Automobiles and Light Trucks,
Occasional Medium-Weight Trucks,
and No Heavyweight Trucks)
[1-3 equivalent 18-kip axle loads per day]

Flexible Pavements:
(Asphalt Concrete)

3.0 inches	Asphalt concrete
8.0 inches	Aggregate base
Over	Properly prepared natural subgrade soils and/or structural site grading fill extending to properly prepared natural subgrade soils

Rigid Pavements:
(Non-reinforced Concrete)

5.0 inches	Portland cement concrete (non-reinforced)

5.0 inches	Aggregate base
Over	Properly prepared natural subgrade soils, and/or structural site grading fill extending to properly prepared natural subgrade soils

For dumpster pads, we recommend a pavement section consisting of 6.5 inches of Portland cement concrete, 5.0 inches of aggregate base, over properly prepared natural subgrade or site grading structural fills. Dumpster pads should not be constructed overlying non-engineered fills under any circumstances.

These above rigid pavement sections are for non-reinforced Portland cement concrete. Concrete should be designed in accordance with the American Concrete Institute (ACI) and joint details should conform to the Portland Cement Association (PCA) guidelines. The concrete should have a minimum 28-day unconfined compressive strength of 4,000 pounds per square inch and contain 6 percent ±1 percent air-entrainment.

The crushed stone should conform to applicable sections of the current Utah Department of Transportation (UDOT) Standard Specifications. All asphalt material and paving operations should meet applicable specifications of the Asphalt Institute and UDOT. A GSH technician shall observe placement and perform density testing of the base course material and asphalt.

Please note that the recommended pavement section is based on estimated post-construction traffic loading. If the pavement is to be constructed and utilized by construction traffic, the above pavement section may prove insufficient for heavy truck traffic, such as concrete trucks or tractor-trailers used for construction delivery. Unexpected distress, reduced pavement life, and/or premature failure of the pavement section could result if subjected to heavy construction traffic and the owner should be made aware of this risk. If the estimated traffic loading stated herein is not correct, GSH must review actual pavement loading conditions to determine if revisions to these recommendations are warranted.

5.9 CEMENT TYPES

The laboratory tests indicate that the natural soils tested contain a negligible amount of sulfates. Based on our test results, concrete in contact with the on-site soil will have a low potential for sulfate reaction (ACI 318, Table 4.3.1). Therefore, all concrete which will be in contact with the site soils may be prepared using Type I or IA cement.

5.10 GEOSEISMIC SETTING

5.10.1 General

Utah municipalities have adopted the International Building Code (IBC) 2018. The IBC 2018 code refers to ASCE 7-16 Minimum Design Loads and Associated Criteria for Buildings and Other

Structures (ASCE 7-16) determines the seismic hazard for a site based upon mapping of bedrock accelerations prepared by the United States Geologic Survey (USGS) and the soil site class. The USGS values are presented on maps incorporated into the IBC code and are also available based on latitude and longitude coordinates (grid points).

5.10.2 Faulting

Based on our review of available literature, no active faults pass through or immediately adjacent to the site. The nearest active mapped fault consists of the Provo Section of the Wasatch Fault, located about 14.4 miles to the southwest of the site.

5.10.3 Soil Class

For dynamic structural analysis, the Site Class D – Default Soil Profile as defined in Chapter 20 of ASCE 7-16 (per Section 1613.3.2, Site Class Definitions, of IBC 2018) can be utilized. If a measured site class is desired based on the project structural engineer's evaluation and recommendations, additional testing and analysis can be completed by GSH to determine the measured site class. Please contact GSH for additional information.

5.10.4 Ground Motions

The IBC 2018 code is based on USGS mapping, which provides values of short and long period accelerations for average bedrock values for the Western United States and must be corrected for local soil conditions. The table on the following page summarizes the peak ground and short and long period accelerations for the MCE event and incorporates the appropriate soil amplification factor for a Site Class D – Default* Soil Profile. Based on the site latitude and longitude (40.5264 degrees north and 111.4806 degrees west, respectively), the values for this site are tabulated on the following page.

Spectral Acceleration Value, T	Bedrock Boundary [mapped values] (% g)	Site Coefficient	Site Class D - Default* [adjusted for site class effects] (% g)	Design Values** (% g)
Peak Ground Acceleration	26.3	F_a = 1.324	35.1	23.4
0.2 Seconds (Short Period Acceleration)	S_S = 59.5	F_a = 1.324	S_{MS} = 78.8	S_{DS} = 52.5
1.0 Second (Long Period Acceleration)	S_1 = 21.2	F_v = 2.176	S_{M1} = 46.1	S_{D1} = 30.7

* If a measured site class in accordance with IBC 2018/ ASCE 7-16 is beneficial based on the project structural engineers review, please contact GSH for additional options for obtaining this measured site class.

**IBC 2018/ASCE 7-16 may require a site-specific study based on the project structural engineer's evaluation and recommendations. If needed, GSH can provide additional information and analysis including a complete site-specific study.

5.10.5 Liquefaction

Liquefaction is defined as the condition when saturated, loose, granular soils lose their support capabilities because of excessive pore water pressure, which develops during a seismic event. Clayey soils, even if saturated, will generally not liquefy during a major seismic event.

Liquefaction was not included in the scope of this study and would require a deeper (30+ foot) boring for engineering analysis.

5.11 SITE VISITS

GSH must verify that all topsoil/disturbed soils and any other unsuitable soils have been removed, that non-engineered fills (if encountered) have been removed and/or properly prepared, and that suitable soils have been encountered prior to placing site grading fills, footings, slabs, and pavements. Additionally, GSH must observe fill placement and verify in-place moisture content and density of fill materials placed at the site.

5.12 CLOSURE

If you have any questions or would like to discuss these items further, please feel free to contact us at (801) 685-9190.

Respectfully submitted,

GSH Geotechnical, Inc.

Robert A. Gifford
Staff Engineer/Geologist

Reviewed by:

Alan D. Spilker, P.E.
State of Utah No. 334228
President/Senior Geotechnical Engineer

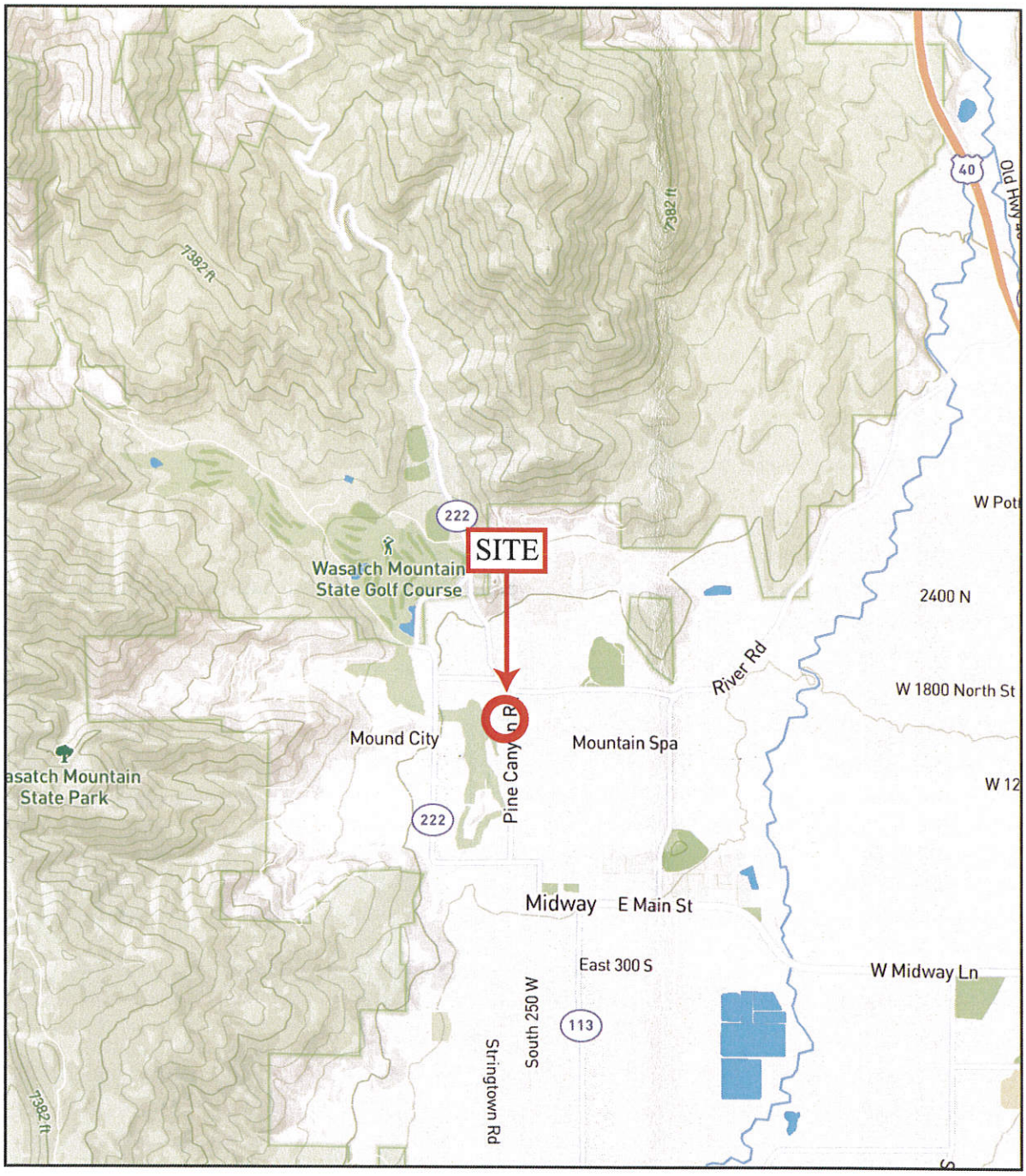
REGISTERED PROFESSIONAL ENGINEER
No. 334228
ALAN D. SPILKER
STATE OF UTAH

RAG/ADS:jlh

Encl. Figure 1, Vicinity Map
Figure 2, Site Plan
Figures 3A through 3E, Log of Test Pits
Figure 4, Key to Test Pit Log (USCS)
Figure 5, Typical Foundation Chimney Subdrain Detail 18"

Addressee (email)

MS. SALLY BRINTON
JOB NO. 3112-001-20



1 0 1 2 KM 3

0.5 0 0.5 1 1.5 2 MI

FIGURE 1
VICINITY MAP

REFERENCE:
ALL TRAILS - NATIONAL GEOGRAPHIC TERRAIN
DATED 2020

GSH

MS. SALLY BRINTON
JOB NO. 3112-001-20

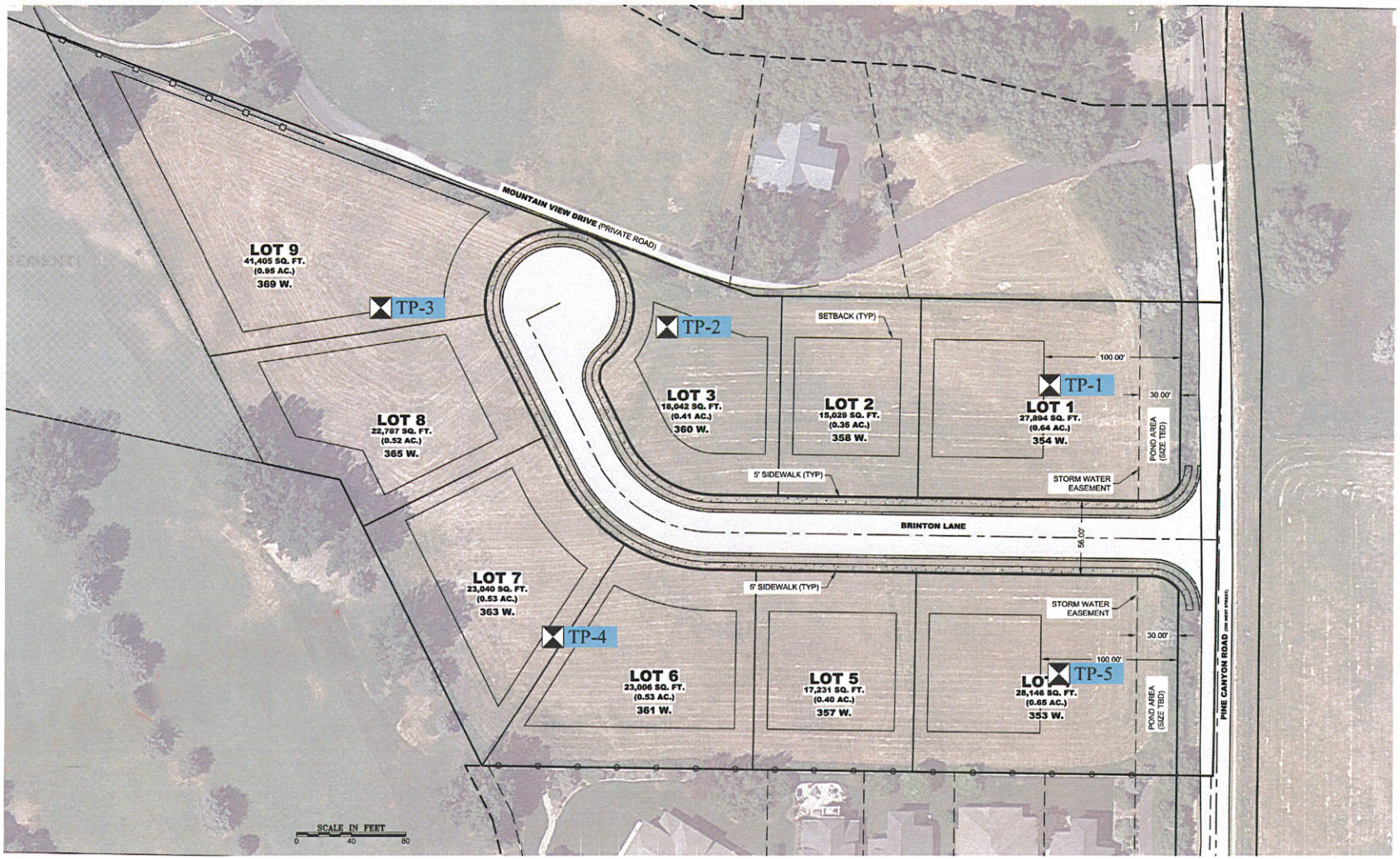


FIGURE 2
SITE PLAN

GSH

REFERENCE:
ADAPTED FROM DRAWING ENTITLED
"SITE PLAN, HUNTLEIGH WOODS SUBDIVIDION, CS-100"
BY JOHNSON ENGINEERING, DATED 04/22/20

GSH — TEST PIT LOG

Page: 1 of 1

TEST PIT: TP-1

CLIENT: Ms. Sally Brinton — PROJECT NUMBER: 3112-001-20

PROJECT: Proposed Huntleigh Woods Subdivision — DATE STARTED: 7/21/20 — DATE FINISHED: 7/21/20

LOCATION: Pine Canyon Road, Midway, Utah — GSH FIELD REP.: DAO

EXCAVATING METHOD/EQUIPMENT: 6-ton Kubota

GROUNDWATER DEPTH: 6.5' (7/30/20) — ELEVATION: ---

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		Ground Surface	0							
	SM/SC	SILTY/CLAYEY SAND with major roots (topsoil) to 8"; brown								very moist dense
					18.5	95				
	GP	FINE TO COARSE SANDY FINE AND COARSE GRAVEL brown	5		19.5	111				very moist very dense
▼										saturated
		Refusal at 8.0' on very dense natural soil. No significant sidewall caving. Installed 1.25" diameter slotted PVC pipe to 8.0'.	10							
			15							
			20							
			25							

See Subsurface Conditions section in the report for additional information.

FIGURE 3A

GSH — TEST PIT LOG

Page: 1 of 1

TEST PIT: TP-2

CLIENT: Ms. Sally Brinton — PROJECT NUMBER: 3112-001-20

PROJECT: Proposed Huntleigh Woods Subdivision — DATE STARTED: 7/21/20 — DATE FINISHED: 7/21/20

LOCATION: Pine Canyon Road, Midway, Utah — GSH FIELD REP.: DAO

EXCAVATING METHOD/EQUIPMENT: 6-ton Kubota

GROUNDWATER DEPTH: 9.0' (7/30/20) — ELEVATION: ---

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		Ground Surface	0							
	SM/SC	SILTY/CLAYEY FINE SAND with major roots (topsoil) to 8"; brown								moist medium dense
					12.4		35.6			
	SP	FINE GRAVELLY FINE TO COARSE SAND brown	5							moist medium dense
▽	GP	FINE TO COARSE SANDY FINE AND COARSE GRAVEL with cobbles; brown	10							moist dense saturated
		End of exploration at 12.0'. No significant sidewall caving. Installed 1.25" diameter slotted PVC pipe to 12.0'.	15 20 25							

See Subsurface Conditions section in the report for additional information.

FIGURE 3B

GSH TEST PIT LOG

Page: 1 of 1

TEST PIT: TP-3

CLIENT: Ms. Sally Brinton
PROJECT NUMBER: 3112-001-20

PROJECT: Proposed Huntleigh Woods Subdivision
DATE STARTED: 7/21/20 DATE FINISHED: 7/21/20

LOCATION: Pine Canyon Road, Midway, Utah
GSH FIELD REP.: DAO

EXCAVATING METHOD/EQUIPMENT: 6-ton Kubota

GROUNDWATER DEPTH: Not Encountered (7/21/20)
ELEVATION: ---

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		Ground Surface	0							
	SM/ SC	SILTY/CLAYEY FINE SAND with major roots (topsoil) to 6"; brown								dry medium dense
	GM	SILTY FINE AND COARSE GRAVEL with fine to coarse sand; brown	5		11.0		36.1			dry very dense
	SM	SILTY FINE SAND light brown								moist medium dense
	GP	FINE TO COARSE SANDY FINE AND COARSE GRAVEL with cobbles; brown	10							moist dense
		End of exploration at 13.0'. No significant sidewall caving. No groundwater encountered at time of excavation.	15							very moist
			20							
			25							

See Subsurface Conditions section in the report for additional information.

FIGURE 3C

GSH

TEST PIT LOG

Page: 1 of 1

TEST PIT: TP-4

CLIENT: Ms. Sally Brinton | PROJECT NUMBER: 3112-001-20

PROJECT: Proposed Huntleigh Woods Subdivision | DATE STARTED: 7/21/20 | DATE FINISHED: 7/21/20

LOCATION: Pine Canyon Road, Midway, Utah | GSH FIELD REP.: DAO

EXCAVATING METHOD/EQUIPMENT: 6-ton Kubota

GROUNDWATER DEPTH: 8.0' (7/30/20) | ELEVATION: ---

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		Ground Surface	0							
	CL	FINE SANDY CLAY with silt; major roots (topsoil) to 4"; brown								slightly moist medium stiff
					8.2	83				
	GP/GM	FINE TO COARSE SANDY FINE AND COARSE GRAVEL with silt and cobbles; brown and gray	5							moist medium dense
▼										saturated
	GP	FINE TO COARSE SANDY FINE AND COARSE GRAVEL with cobbles and trace silt; brown	10							saturated saturated medium dense
		End of exploration at 11.0'. No significant sidewall caving. Installed 1.25" diameter slotted PVC pipe to 11.0'.	15							
			20							
			25							

See Subsurface Conditions section in the report for additional information.

FIGURE 3D

GSH

TEST PIT LOG

Page: 1 of 1

TEST PIT: TP-5

CLIENT: Ms. Sally Brinton | PROJECT NUMBER: 3112-001-20

PROJECT: Proposed Huntleigh Woods Subdivision | DATE STARTED: 7/21/20 | DATE FINISHED: 7/21/20

LOCATION: Pine Canyon Road, Midway, Utah | GSH FIELD REP.: DAO

EXCAVATING METHOD/EQUIPMENT: 6-ton Kubota

GROUNDWATER DEPTH: Not Encountered (7/21/20) | ELEVATION: ---

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
		Ground Surface	0							
	CL	FINE SANDY CLAY with silt; major roots (topsoil) to 4"; brown								moist medium stiff
			5							
	GP/GM	FINE TO COARSE SANDY FINE AND COARSE GRAVEL with silt; moderately cemented; brown								slightly moist dense very moist very dense
		Refusal at 8.0' on very dense cemented gravel. No significant sidewall caving. No groundwater encountered at time of excavation. Installed 1.25" diameter slotted PVC pipe to 8.0'.	10							
			15							
			20							
			25							

See Subsurface Conditions section in the report for additional information.

FIGURE 3E

CLIENT: Ms. Sally Brinton
PROJECT: Proposed Huntleigh Woods Subdivision
PROJECT NUMBER: 3112-001-20

KEY TO TEST PIT LOG

WATER LEVEL	USCS	DESCRIPTION	DEPTH (FT.)	SAMPLE SYMBOL	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTICITY INDEX	REMARKS
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪

COLUMN DESCRIPTIONS

① **Water Level:** Depth to measured groundwater table. See symbol below.

② **USCS:** (Unified Soil Classification System) Description of soils encountered; typical symbols are explained below.

③ **Description:** Description of material encountered; may include color, moisture, grain size, density/consistency,

④ **Depth (ft.):** Depth in feet below the ground surface.

⑤ **Sample Symbol:** Type of soil sample collected at depth interval shown; sampler symbols are explained below.

⑥ **Moisture (%):** Water content of soil sample measured in laboratory; expressed as percentage of dryweight of

⑦ **Dry Density (pcf):** The density of a soil measured in laboratory; expressed in pounds per cubic foot.

⑧ **% Passing 200:** Fines content of soils sample passing a No. 200 sieve; expressed as a percentage.

⑨ **Liquid Limit (%):** Water content at which a soil changes from plastic to liquid behavior.

⑩ **Plasticity Index (%):** Range of water content at which a soil exhibits plastic properties.

⑪ **Remarks:** Comments and observations regarding drilling or sampling made by driller or field personnel. May include other field and laboratory test results using the following abbreviations:

CEMENTATION:

Weakly: 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.

MODIFIERS:

Trace <5%

Some 5-12%

With > 12%

MOISTURE CONTENT (FIELD TEST):

Dry: Absence of moisture, dusty, dry to the touch.

Moist: Damp but no visible water.

Saturated: Visible water, usually soil below water table.

Descriptions and stratum lines are interpretive; field descriptions may have been modified to reflect lab test results. Descriptions on the logs apply only at the specific boring locations and at the time the borings were advanced; they are not warranted to be representative of subsurface conditions at other locations or times.

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISIONS			USCS SYMBOLS	TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS More than 50% of material is larger than No. 200 sieve size.	GRAVELS More than 50% of coarse fraction retained on No. 4 sieve.	CLEAN GRAVELS (little or no fines)	GW	Well-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines
			GP	Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines
		GRAVELS WITH FINES (appreciable amount of fines)	GM	Silty Gravels, Gravel-Sand-Silt Mixtures
			GC	Clayey Gravels, Gravel-Sand-Clay Mixtures
	SANDS More than 50% of coarse fraction passing through No. 4 sieve.	CLEAN SANDS (little or no fines)	SW	Well-Graded Sands, Gravelly Sands, Little or No Fines
			SP	Poorly-Graded Sands, Gravelly Sands, Little or No Fines
		SANDS WITH FINES (appreciable amount of fines)	SM	Silty Sands, Sand-Silt Mixtures
			SC	Clayey Sands, Sand-Clay Mixtures
FINE-GRAINED SOILS More than 50% of material is smaller than No. 200 sieve size.	SILTS AND CLAYS Liquid Limit less than 50%		ML	Inorganic Silts and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sands or Clayey Silts with Slight Plasticity
			CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays
			OL	Organic Silts and Organic Silty Clays o f Low Plasticity
	SILTS AND CLAYS Liquid Limit greater than 50%		MH	Inorganic Silts, Micacious or Diatomacious Fine Sand or Silty Soils
			CH	Inorganic Clays of High Plasticity, Fat Clays
			OH	Organic Silts and Organic Clays of Medium to High Plasticity
HIGHLY ORGANIC SOILS			PT	Peat, Humus, Swamp Soils with High Organic Contents

Note: Dual Symbols are used to indicate borderline soil classifications.

STRATIFICATION:

DESCRIPTION	THICKNESS
Seam	up to 1/8"
Layer	1/8" to 12"
Occasional:	One or less per 6" of thickness
Numerous;	More than one per 6" of thickness

TYPICAL SAMPLER GRAPHIC SYMBOLS

- Bulk/Bag Sample
- Standard Penetration Split Spoon Sampler
- Rock Core
- No Recovery
- 3.25" OD, 2.42" ID D&M Sampler
- 3.0" OD, 2.42" ID D&M Sampler
- California Sampler
- Thin Wall

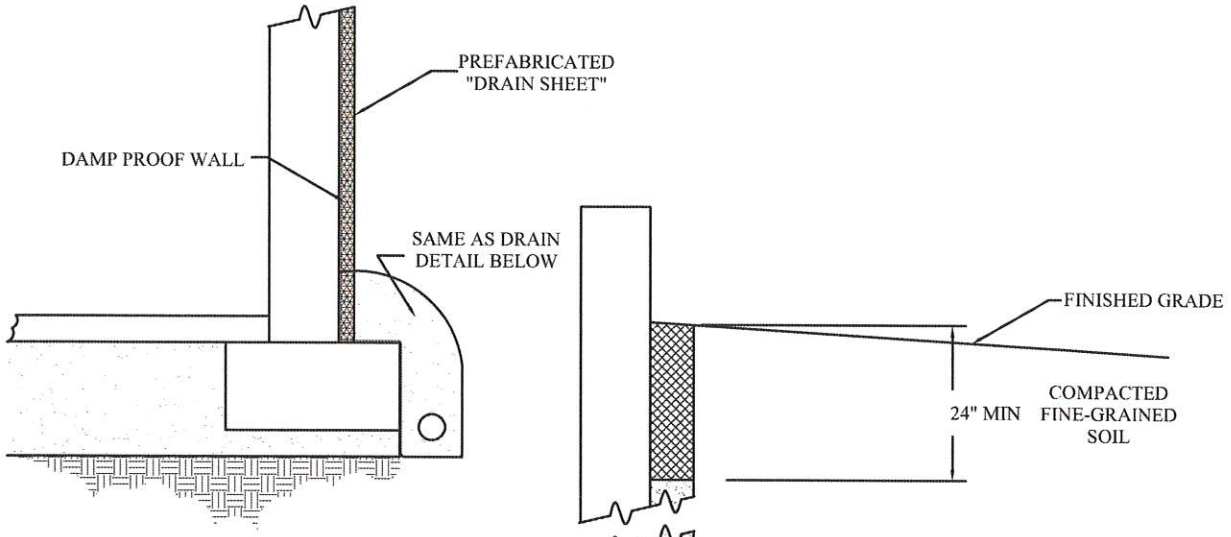
WATER SYMBOL

Water Level

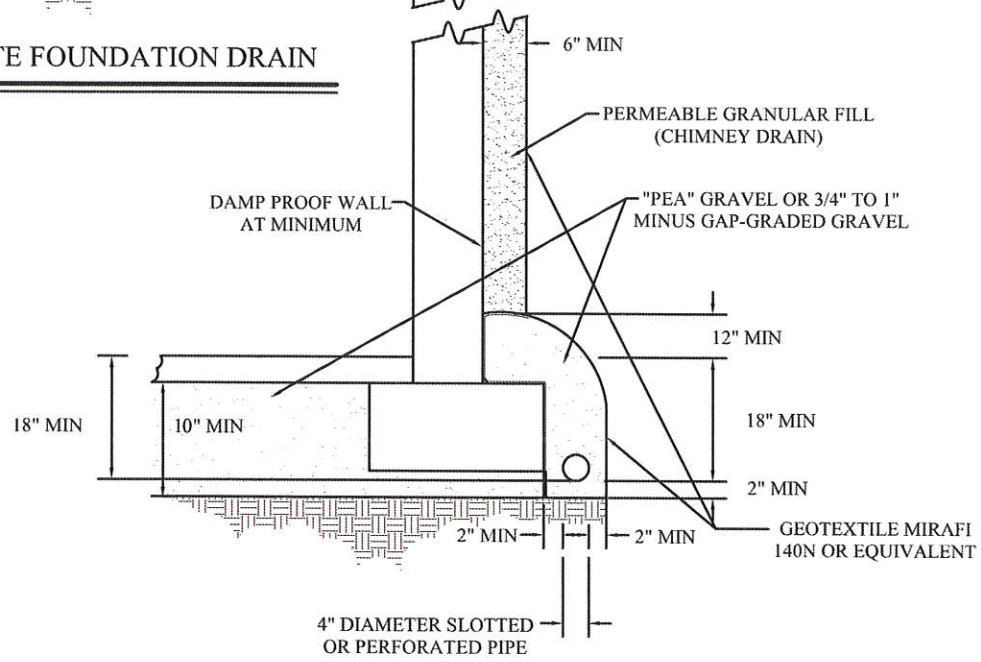
FIGURE 4

GSH

TYPICAL FOUNDATION/CHIMNEY SUBDRAIN DETAIL



ALTERNATE FOUNDATION DRAIN



TYPICAL FOUNDATION DRAIN

(NOT TO SCALE)

GSH

FIGURE 5