NOTICE AND AGENDA
MIDWAY WATER ADVISORY BOARD
MONDAY, May 4, 2020

Notice is hereby given that the Midway Water Advisory Board will hold their regular meeting Monday, May 4, 2020 at 6:00 p.m. in the Midway City Office Building at 75 North 100 West Midway, Utah. Notice of the meeting and agenda was posted in the Midway City Office Building, Main Street Station and 7-Eleven, a copy was sent to each of the Trustees and a copy posted on the Utah Meeting Notice Web Site.

The agenda shall be as follows:

1. **General Consent Calendar**
    a. **Approve Agenda for May 4, 2020**
    b. **Approve Meeting Minutes February 3, 2020**
2. **Change Application Jack Zenger – Midway City/Midway Vistas**
    a. **Discussion on water change application**
    b. **Possible Recommendation to City Council**
3. **Midway Vistas – 275 Luzern Road**
    a. **Discussion on water requirement for subdivision**
    b. **Possible Recommendation to City Council**
4. **Dent Residence – 101 West 100 South**
    a. **Discussion on water requirement for property**
    b. **Possible Recommendation to City Council**
5. **Creekside Estates – 515 Cari Lane**
    a. **Discussion on water requirement for property**
    b. **Possible Recommendation to City Council**
6. **New/Old Business - No motions or recommendations given**
7. **Adjourn**

General Consent Calendar

MIDWAY WATER ADVISORY BOARD
MONDAY February 3, 2020
MEETING MINUTES

Minutes of the Midway Water Advisory Board meeting held February 3, 2020 at 6:00 p.m. in the Midway City Office Building, 75 North 100 West, Midway, UT.

Roll Call

Irrigation Members: Irrigation President/Chairman Steve Farrell, Mike Lundin, Brent Kelly; Midway City: Mayor/Co-Chairman Celeste Johnson, City Councilman Steven Dougherty, City Councilman Jeff Drury, Wes Johnson, City Engineer, Michael Henke, City Planner and Jennifer Sweat, Treasurer/Water Advisory Board Secretary was excused from the meeting due to illness.

General Consent Calendar

Chairman Steve Farrell asked for approval of the General Consent Calendar which consisted of:

a. Approval of the Agenda for February 3, 2020

b. Approval of the minutes for January 6, 2020

Motion: Mayor/Co-Chairman Celeste Johnson made a motion n to approve the General Consent Calendar, Midway Irrigation Member Brent Kelly 2nd the motion.

Chairman Steve Farrell asked if there were further questions regarding this item? There was not

Motion was carried unanimously.

Scotch Fields Phase 4 and 5 amended Master Plan

Michael Henke, City Planner stated this subdivision had come before the Water Advisory previously for Master Plan approval, however since then they had decided to do additional phasing and were required to come back to the water board. Planner Henke presented the following regarding this property

- **RA-1-43**
- **20.98 acres**
- **Planned Unit Development**
- **Proposal contains 48 building pads**
    - **Phase 3 – 4.43 acres – 11 Units**
    - **Phase 4 – 13.69 acre – 29 Units**
    - **Phase 5 – 2.86 acres – 8 Units**

The board reviewed the property via google earth, and new plat maps showing the phasing of the project. The board discussed the secondary water irrigation and what was required. Planner Henke presented the following as the water calculations per phase

- Phase 3

  11 Units (11 x 0.8 = 8.8-acre feet)

  2.7 irrigated acres (2.7 x 3 = 8.1-acre feet)

  Phase 3 total: 16.9-acre feet

- Phase 4

  29 Units (29 x 0.8 = 23.2-acre feet)

  7.5 irrigated acres (7.5 x 3 = 22.5-acre feet)

  Phase 4 total: 45.7-acre feet

- Phase 5

  8 Units (8 x 0.8 = 6.4-acre feet)

  1.18 irrigated acres (1.18 x 3 = 3.54-acre feet)

  Phase 5 total: 9.94-acre feet

There was discussion regarding the secondary water and how it would be connected to the development. Chairman Farrell understood that from the previous approval for the development the irrigation company would purchase the pipe, and that the developer would install it. Wes Johnson asked Paul Berg, engineer for the project if that was put on the plat. Mr. Berg stated that the developer, Bill Probst felt it wasn't fair to be asked to do that, and so there was a discussion with Mike Kohler, and discussion at the pre-construction meeting regarding this. But after that Mr. Berg isn't sure what happened with it. Chairman Farrell and Wes Johnson both thought that in the end it was decided the irrigation company would purchase the pipe, and the developer would install. Wes Johnson stated he would look at the plans.

Chairman Steve Farrell if there were further discussion? There was not.

Motion: Midway Mayor Celeste Johnson made the motion to recommend that for Scotch Fields Phase 3,4 & 5 to accept staff's calculations for each phase, and that it be recorded on each plat what water requirement should be to City Council that the water requirements are Phase 3, 16.9 acre feet, Phase 4, 45.7 acre feet and Phase 5 , 9.94 acre feet. City Councilman Steve Dougherty 2nd the motion.

Chairman Farrell stated that he would like Wes Johnson to check on the Pressurized Irrigation to see if it did go in, because if it didn't the irrigation company would need to make adjustments. Mr. Johnson agreed to check into this and get back to the irrigation company.

Chairman Steve Farrell asked if there were further questions regarding this item? There was not

Motion was carried unanimously.

Revise Water Requirements (Discussion Only)

Planner Henke stated that at the previous Water Advisory Board meeting there was discussion on perhaps revising the water requirements regarding certain situations. In the past there has been a way that wetlands, FEMA etc.

has been treated, and it was suggested that perhaps a code or policy be put into place for these types of things. Planner Henke presented the different situations he could think of:

- **Wetlands**

Wetlands that never had water rights

Wetlands that have historically had water rights

- **FEMA floodplain**

Floodplain that never has had water rights

Floodplain that has historically had water rights

- **Sloped areas**
- **Pot rock areas**
- **Areas not historically irrigated**

Area that the city anticipates will be irrigated once the land use changes to residential

The board discussed these items at length and brainstormed on how to come up with a policy or code for these items. Planner Henke stated that he could get something written up for this and bring it back to the board for action. He would take all the discussion tonight and put it all together. Then the next time the board had a meeting, Planner Henke will present it and the board could make adjustments, recommend approval to City Council. It sounded as if the board would like it to be part of the water code, and again it would go to City Council for final approval, but this board will see it before that for recommendation to council.

Chairman Steve Farrell asked if there were further questions regarding this item?

New/Old Business

- **Discussed Whitaker Farms wetlands**

Chairman Steve Farrell asked if there were further New or Old Business? There was not.

Mayor Celeste Johnson moved to adjourn. It was carried unanimously. Meeting adjourned at 7:00 p.m.

Change Application Jack Zenger
Midway City/Midway Vistas

APPLICATION FOR PERMANENT CHANGE OF WATER

Rec. by _____

Fee Amt. $250.00

Receipt # _____

STATE OF UTAH

For the purpose of obtaining permission to make a permanent change of water in the State of Utah, application is hereby made to the State Engineer, based upon the following showing of facts, submitted in accordance with the requirements of Section 73-3-3 Utah Code Annotated 1953, as amended.

CHANGE APPLICATION NUMBER: WATER RIGHT NUMBER: 55-4295

(c16872WKNIGHT)

****

This Change Application proposes to change the POINT(S) OF DIVERSION, PLACE OF USE, and NATURE OF USE.

****

1. OWNERSHIP INFORMATION.

A. NAME: Midway City Corporation
ADDRESS: 75 North 100 West
PO Box 277
Midway UT 84049
INTEREST: 0%
REMARKS: Interested Party

NAME: Zenger-Malmrose Family LLC
ADDRESS: 3805 Forestglen Drive
La Crescenta CA 91214

B. PRIORITY OF CHANGE: FILING DATE:

C. EVIDENCED BY: 55-4295 (D2214), 55-8768 (D6350)

DESCRIPTION OF CURRENT WATER RIGHT:

2. SOURCE INFORMATION.

A. QUANTITY OF WATER: 8.0 cfs

B. SOURCE: Pine Creek COUNTY: Wasatch

C. POINT(S) OF DIVERSION.

POINTS OF DIVERSION -- SURFACE:
(1) N 373 feet E 554 feet from SW corner, Section 15, T 3S, R 4E, SLBM
(2) N 554 feet E 373 feet from SW corner, Section 15, T 3S, R 4E, SLBM

3. WATER USE INFORMATION.

IRRIGATION: from Apr 1 to Oct 31. Acres: 31.9200.

STOCKWATERING: from Jan 1 to Dec 31. Sole Supply: 500.0000 Total Stock: 500.0000

4. PLACE OF USE.

(Which includes all or part of the following legal subdivisions:)

BASE	TOWN	RANG	SEC	NORTH-WEST¼					NORTH-EAST¼					SOUTH-WEST¼					SOUTH-EAST¼				
				NW	NE	SW	SE		NW	NE	SW	SE		NW	NE	SW	SE		NW	NE	SW	SE	
SL	3S	4E	22					***					***					***					X
			23					***					***			X		***				
			26	X				***					***					***				
			27					***		X			***					***				

THE FOLLOWING CHANGES ARE PROPOSED:

5. SOURCE INFORMATION.

A. QUANTITY OF WATER: 109.76 acre-feet

B. SOURCE: Underground Water Well (existing) COUNTY: Wasatch

C. POINT(S) OF DIVERSION. Changed as Follows:

POINT OF DIVERSION -- UNDERGROUND:
(1) S 1,710 feet E 471 feet from N¼ corner, Section 33, T 3S, R 4E, SLBM
WELL DIAMETER: 10 inches WELL DEPTH: 1,010 feet
COMMENT: Alpenhof Weber Well

D. COMMON DESCRIPTION: Midway

6. WATER USE INFORMATION. Changed as Follows:

MUNICIPAL: from Jan 1 to Dec 31. Midway.

7. PLACE OF USE. Changed as Follows:

The Service Area of Midway

8. SIGNATURE OF APPLICANT(S).

The undersigned hereby acknowledges that even though he/she/they may have been assisted in the preparation of the above-numbered application through the courtesy of the employees of the Division of Water Rights, all responsibility for the accuracy of the information contained herein including maps and other documents attached, at the time of filing, rests with the applicant(s).

Midway City Corporation

Zenger-Malmrose Family LLC

Midway Vistas
275 Luzern Road

MIDWAY CITY
Planning Office

75 North 100 West
Midway, Utah 84049

Phone: 435-654-3223 x105
Fax: 435-654-2830
mhenke@midwaycityut.org

Midway Water Advisory Application

Applicant or Authorized Representative:

Name: Kirk Malmrose Phone: 213-215-0124 Fax: _____

Mailing Address: 3805 Forestglen Drive City: Lacrescenta State: CA Zip: 91214

E-mail Address: kirk.malmrose@gmail.com

Project Name: Midway Vistas

Location: 275 Luzern Road

Total Acreage: 83.19 Number of Units: 49 Historically Irrigated Area: _____

Existing Water Connections: None

Comments:
Please see the attached water right estimate spreadsheet.
Attached is a copy of the Pine Ditch change application.
45 Midway Irrigation shares historically on the property.
Property owner has purchased 3 additional Midway Irrigation shares.

Please submit with application Site Plans, Plat Maps, Drawings or any information that pertains to water calculations.

Please read and sign before application submittal

I declare under penalty of perjury that I am the owner or authorized agent of the property subject to this request and the foregoing statements, answers and attached documents are true and correct. As the applicant for this proposal, I understand that my application is not deemed complete until the Planning Office has reviewed the application. I further understand I will be notified when my application has been deemed complete. At that time, I expect that my application will be processed within a reasonable time.

Signature of Owner or Agent: _____ Date: 4-14-2020

FOR OFFICE USE ONLY

STAFF:
Date Received: _____
Received By: _____
Fee Paid: _____

Application Number: _____
Zone: _____
Tax ID Number: _____

PLANNER:
Complete / Incomplete
Date: _____ Reviewed by: _____

Water Right Estimate for Zenger Subdivision per Master Plan April 8, 2020

Lot	Water Rights for Inside Use (acre-feet)	Total Area (acres)	Estimated Impervious Area (acres)	Irrigated Area (acres)	Irrigation Requirement (acre-feet/acre)	Water Rights for Irrigation (acre-feet)
1	0.80	0.85	0.18	0.67	3.00	2.01
2	0.80	0.85	0.18	0.67	3.00	2.01
3	0.80	0.85	0.18	0.67	3.00	2.01
4	0.80	0.85	0.18	0.67	3.00	2.01
5	0.80	0.85	0.18	0.67	3.00	2.01
6	0.80	0.85	0.18	0.67	3.00	2.01
7	0.80	0.85	0.18	0.67	3.00	2.01
8	0.80	0.92	0.18	0.74	3.00	2.22
9	0.80	0.87	0.18	0.69	3.00	2.07
10	0.80	1.12	0.18	0.94	3.00	2.82
11	0.80	1.31	0.18	1.13	3.00	3.39
12	0.80	1.34	0.18	1.16	3.00	3.48
13	0.80	0.89	0.18	0.71	3.00	2.13
14	0.80	1.01	0.18	0.83	3.00	2.49
15	0.80	1.17	0.18	0.99	3.00	2.97
16	0.80	0.89	0.18	0.71	3.00	2.13
17	0.80	0.87	0.18	0.69	3.00	2.07
18	0.80	0.90	0.18	0.72	3.00	2.16
19	0.80	0.86	0.18	0.68	3.00	2.04
20	0.80	0.85	0.18	0.67	3.00	2.01
21	0.80	0.85	0.18	0.67	3.00	2.01
22	0.80	0.90	0.18	0.72	3.00	2.16
23	0.80	0.89	0.18	0.71	3.00	2.13
24	0.80	0.85	0.18	0.67	3.00	2.01
25	0.80	0.86	0.18	0.68	3.00	2.04
26	0.80	0.85	0.18	0.67	3.00	2.01
27	0.80	1.01	0.18	0.83	3.00	2.49
28	0.80	1.00	0.18	0.82	3.00	2.46
29	0.80	1.00	0.18	0.82	3.00	2.46
30	0.80	3.87	2.24	1.63	3.00	4.89
31	0.80	1.03	0.18	0.85	3.00	2.55
32	0.80	0.96	0.18	0.78	3.00	2.34
33	0.80	0.86	0.18	0.68	3.00	2.04
34	0.80	0.88	0.18	0.70	3.00	2.10
35	0.80	0.86	0.18	0.68	3.00	2.04
36	0.80	0.85	0.18	0.67	3.00	2.01
37	0.80	0.98	0.18	0.80	3.00	2.40
38	0.80	1.08	0.18	0.90	3.00	2.70
39	0.80	0.95	0.18	0.77	3.00	2.31
40	0.80	0.85	0.18	0.67	3.00	2.01
41	0.80	0.92	0.18	0.74	3.00	2.22
42	0.80	0.87	0.18	0.69	3.00	2.07
43	0.80	0.87	0.18	0.69	3.00	2.07
44	0.80	0.93	0.18	0.75	3.00	2.25
45	0.80	0.97	0.18	0.79	3.00	2.37
46	0.80	1.05	0.18	0.87	3.00	2.61
47	0.80	0.86	0.18	0.68	3.00	2.04
48	0.80	0.85	0.18	0.67	3.00	2.01
49	0.80	0.85	0.18	0.67	3.00	2.01
Road Parkstrips	0.00	1.91	0.00	1.91	3.00	5.73
Common Area (irrigated)	0.00	12.03	0.88	11.15	3.00	33.45
Common Area (non-irrigated)	0.00	13.36	13.36	0.00	3.00	0.00
Subtotals	39.2					152.04

Total Required Water Rights = 39.2 for inside use + 152.04 for irrigation 191.24

Total Shares Required = 63.75

APPLICATION FOR PERMANENT CHANGE OF WATER

STATE OF UTAH

Rec. by _____

Fee Amt. $250.00

Receipt # _____

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REMARKS: Interested Party

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B. PRIORITY OF CHANGE: FILING DATE:

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				NW	NE	SW	SE		NW	NE	SW	SE		NW	NE	SW	SE		NW	NE	SW	SE	
SL	3S	4E	22					***					***					***				X
			23					***					***			X		***				
			26	X				***					***					***				
			27					***		X			***					***				

THE FOLLOWING CHANGES ARE PROPOSED:

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7. PLACE OF USE. Changed as Follows:

The Service Area of Midway

8. SIGNATURE OF APPLICANT(S).

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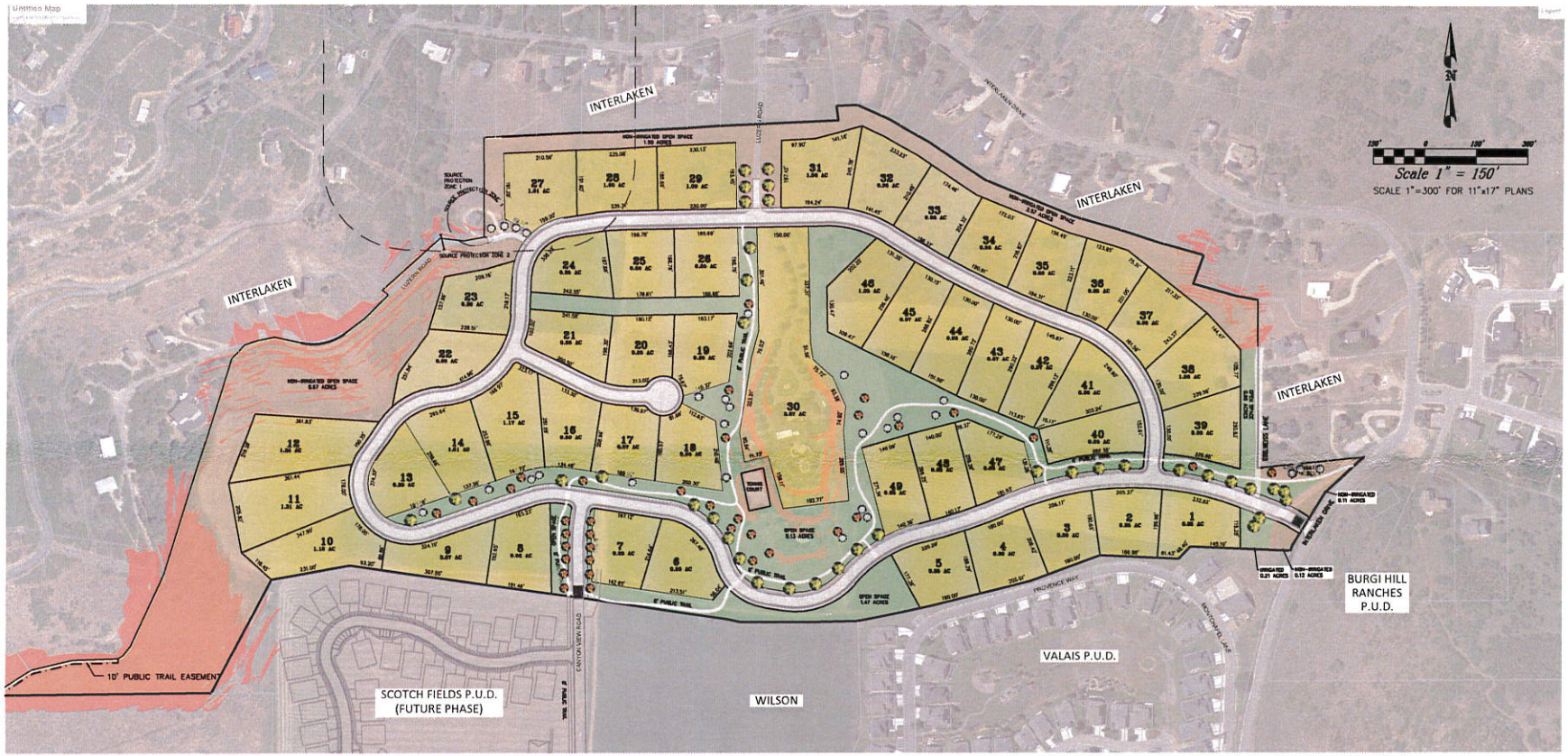
Midway City Corporation

Zenger-Malmrose Family LLC



ALLOWED LOT SIZE

LOT SIZE AND FRONTAGE MAY BE REDUCED 15% DUE TO THE EXTRA 15% OPEN SPACE THAT IS BEING DEDICATED FOR THIS SUBDIVISION.
ALLOWED MINIMUM LOT SIZE 0.85 ACRES
ALLOWED MINIMUM FRONTAGE 127.50 FEET

LOT 30:
IRRIGATED AREA = 1.63 ACRES
NON-IRRIGATED AREA = 1.24 ACRES
IMPERVIOUS AREA = 1.00 ACRES

ROAD ROW IRRIGATED AREA FOR SWALES = 1.91 ACRES

LUZERN ROAD NOTE:
LUZERN ROAD WILL BE ABANDONED THROUGH LOTS 27-29. LUZERN ROAD WILL CONNECT TO THE NEW ROAD IN THE SUBDIVISION BETWEEN THE WELL PUMP HOUSE AND LOT 27 TO CONNECT TO THE NEW ROAD IN THE SUBDIVISION.

LEGEND

- COMMON AREA WITH TRAILS & TENNIS COURT (12.03 ACRES) IRRIGATED COMMON AREA (11.15 ACRES)
- NON-IRRIGATED COMMON AREA/OPEN SPACE (13.36 ACRES)
- LOTS
- PUBLIC TRAILS (4,717 LF)
- SLOPES GREATER THAN 25%

LAND USE TABLE

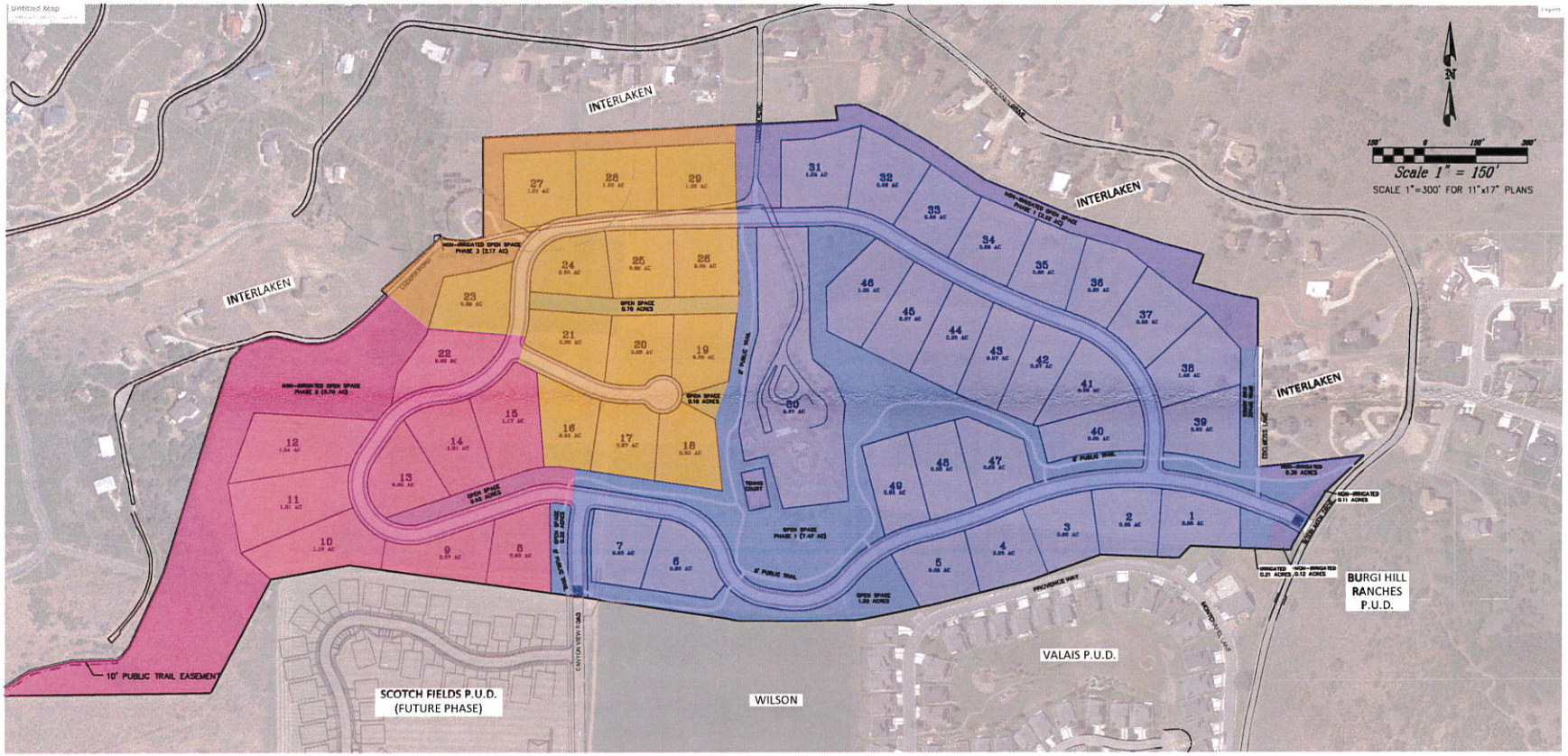
TOTAL AREA	83.19 AC
OPEN SPACE REQUIREMENT	12.48 AC (15.00%)
OPEN SPACE (PROPOSED)	25.39 AC (30.52%)
NUMBER OF LOTS	48 NEW LOTS 1 ZENGER LOT 49 TOTAL LOTS

NUMBER OF LOTS MATCHES ANNEXATION AGREEMENT.

KIRK MALMROSE
MIDWAY VISTAS
MASTER SITE PLAN

BERG ENGINEERING
380 E Main St. Suite 204
Midway, Ut 84049
ph 435.657.9749

DESIGN BY: CNB
DRAWN BY: CNB
DATE: 15 APR 2020
REV:
SHEET 3



PHASE	TOTAL LOTS	LOTS#	TOTAL AREA	OPEN SPACE IN PHASE	OPEN SPACE %	CUMULATIVE OPEN SPACE % IN PROJECT	NON-IRRIGATED OPEN SPACE
1	27	1-7, 30-49	46.89 AC	13.63 AC	29.06%	29.06%	3.36 AC
2	9	8-15, 22	19.66 AC	8.32 AC	43.90%	32.98%	7.70 AC
3	13	16-21, 24-29	16.64 AC	3.05 AC	18.33%	30.05%	2.17 AC
			83.19 AC				

NOTES:
15% REQUIRED PER CITY ORDINANCE.
30% REQUIRED FOR REDUCE LOT SIZES PROPOSED WITH THIS PROJECT.

LEGEND
- PHASE 1
- PHASE 2
- PHASE 3

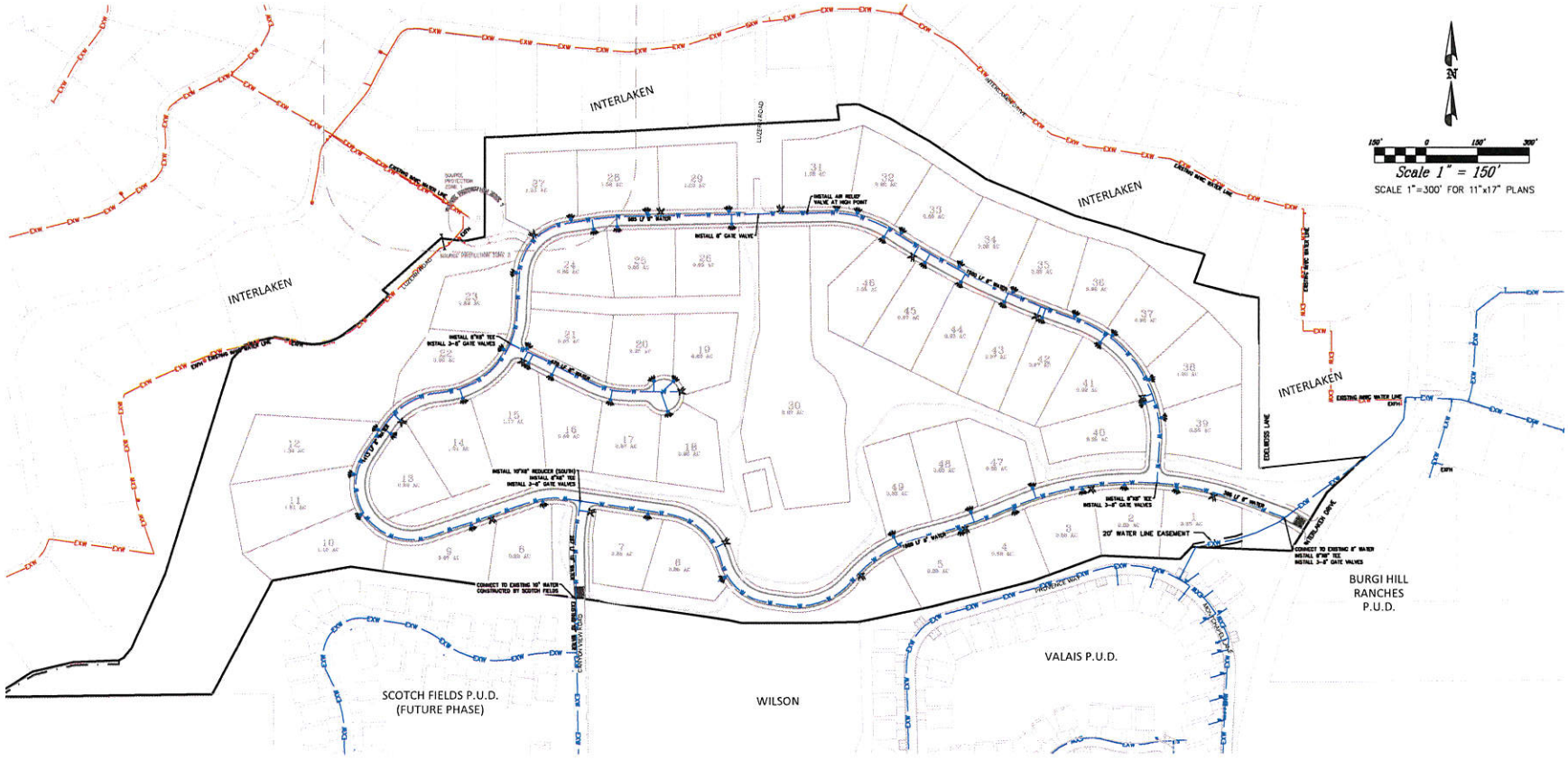
LAND USE TABLE

TOTAL AREA	83.19 AC
OPEN SPACE REQUIREMENT	12.48 AC (15.00%)
OPEN SPACE (PROPOSED)	25.39 AC (30.52%)
NUMBER OF LOTS	48 NEW LOTS 1 ZENGER LOT 49 TOTAL LOTS
NUMBER OF LOTS MATCHES ANNEXATION AGREEMENT.	

KIRK MALMROSE
MIDWAY VISTAS
PHASING PLAN

BERG ENGINEERING
380 E Main St. Suite 204
Midway, UT 84049
ph 435.657.9749

DESIGN BY: CNB
DRAWN BY: CNB
DATE: 15 APR 2020
REV:
SHEET 4



LEGEND:

- PROPOSED 8" WATER
- EXISTING WATER (MIDWAY)
- EXISTING WATER (INTERLAKEN)
- FIRE HYDRANT
- WATER METER

CULINARY WATER NOTES:

- ALL CULINARY WATER IMPROVEMENTS SHALL MEET MIDWAY CITY STANDARDS AND SPECIFICATIONS.
- ALL CULINARY WATER MAIN SHALL BE AWWA C900 DR18 BLUE PIPE.

BLUE STAKE NOTE:

- LOCATION OF EXISTING UTILITIES SHOWN ON PLAN ARE APPROXIMATE AND MAY BE INCOMPLETE. CONTRACTOR IS RESPONSIBLE FOR BLUE STAKING OF UTILITIES.

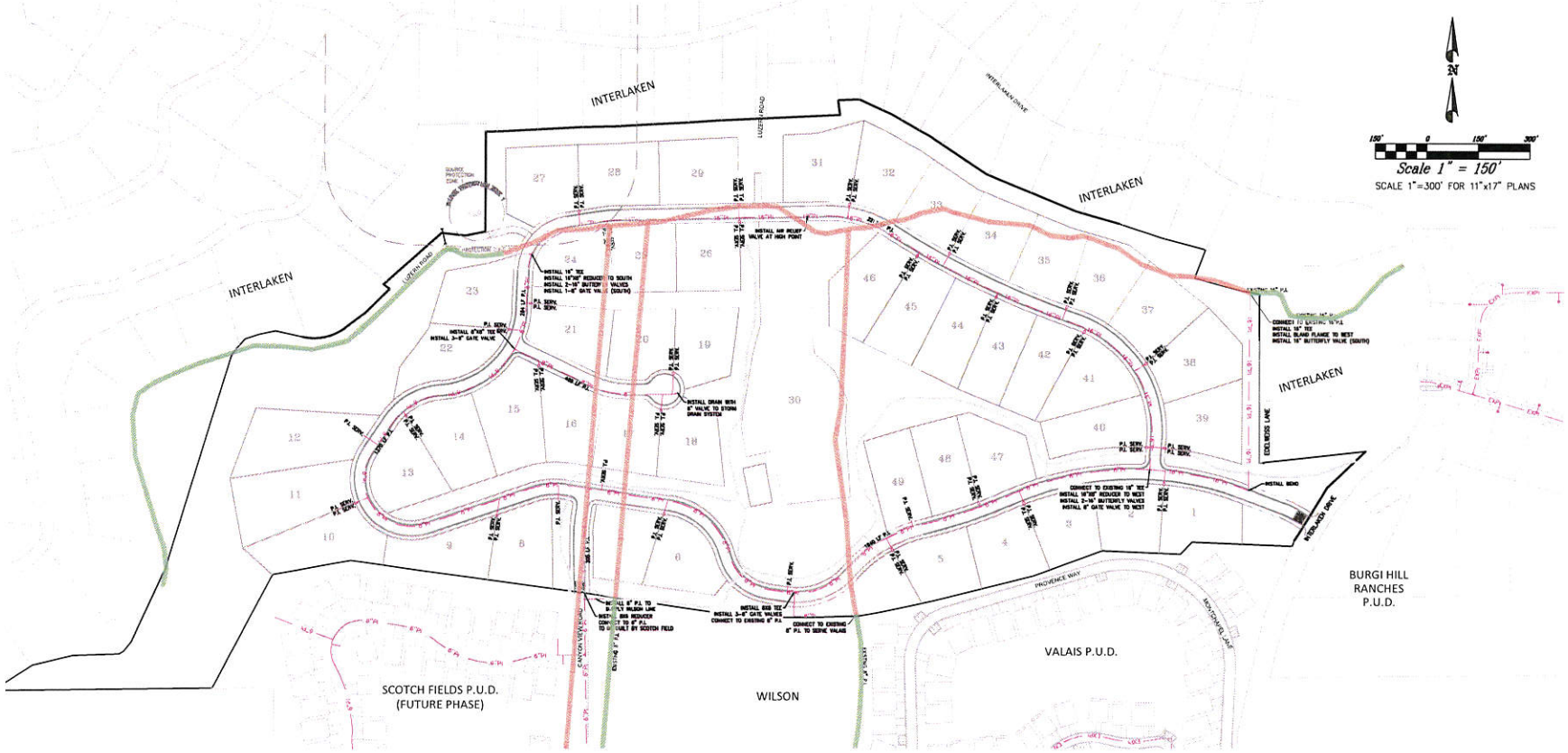
THIS DOCUMENT IS RELEASED FOR REVIEW ONLY. IT IS NOT INTENDED FOR CONSTRUCTION UNLESS SIGNED AND SEALED.

PAUL D. BERG P.E.
SERIAL NO. 295585
DATE: 15 APR 2020

KIRK MALMROSE
MIDWAY VISTAS
WATER MASTER PLAN

BERG ENGINEERING
380 E Main St. Suite 204
Midway, Ut 84049
ph 435.657.9749

DESIGN BY: CNB
DRAWN BY: CNB
DATE: 15 APR 2020
REV:
SHEET 6



LEGEND:

- EXISTING PRESSURIZED IRRIGATION TO REMAIN
- EXISTING PRESSURIZED IRRIGATION TO BE ABANDONED
- PROPOSED 8" PRESSURIZED IRRIGATION
- PROPOSED 16" PRESSURIZED IRRIGATION

PRESSURIZED IRRIGATION NOTES:

- ALL PRESSURIZED IRRIGATION IMPROVEMENTS SHALL MEET MIDWAY IRRIGATION COMPANY STANDARDS AND SPECIFICATIONS
- ALL PRESSURIZED IRRIGATION MAIN SHALL BE AWWA C900 DR18 PURPLE PIPE.

BLUE STAKE NOTE:

- LOCATION OF EXISTING UTILITIES SHOWN ON PLAN ARE APPROXIMATE AND MAY BE INCOMPLETE. CONTRACTOR IS RESPONSIBLE FOR BLUE STAKING OF UTILITIES.

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PAUL D. BERG P.E.
SERIAL NO. 293385
DATE: 15 APR 2020

KIRK MALMROSE
MIDWAY VISTAS
PRESSURIZED IRRIGATION MASTER PLAN

BERG ENGINEERING
380 E Main St. Suite 204
Midway, UT 84049
ph 435.657.9749

DESIGN BY: CNB	DATE: 15 APR 2020	SHEET
DRAWN BY: CNB	REV:	7

Dent Residence
101 West 100 South

Jennifer Sweat

From: Doug Dent <fddent@gmail.com>
Sent: Thursday, April 16, 2020 12:35 PM
To: Jennifer Sweat
Subject: Dent - Midway Water Advisory Board, May 4 Agenda
Attachments: Midway Water Advisory Board Layout_Dent_101 W 100 S.pdf; Midway Water Advisory Board Application_Dent_101 W 100 S.pdf

Hi Jennifer,

Attached you'll find our application to transfer a portion of our water for culinary hookup. I've talked to Mike Henke and Brent Kelly about our plans so some of this info may already sound familiar. For further help, I've also included an attachment showing the layout of the new home. Please let me know if you have any questions with what I've submitted.

Lastly, please note, I've talked to Mike Kohler about verification of our 1 Midway water share. With the current circumstances and COVID restrictions, obtaining a copy of our share is delayed. He mentioned he'd talk to Mike Henke about this and confirm our possession of the one share.

Thanks again for your help...it's been a great experience working with Midway City.

Frank D Dent (Doug)
(435)315-8454

MIDWAY CITY
Planning Office

75 North 100 West
Midway, Utah 84049

Phone: 435-654-3223 x105
Fax: 435-654-2830
mhenke@midwaycityut.org

Midway Water Advisory Application

Applicant or Authorized Representative:

Name: FRANK D. DENT Phone: (435)315-8454 Fax: _____

Mailing Address: 101 W. 100 S. City: MIDWAY State: UT Zip: 84049

E-mail Address: fddent@gmail.com

Project Name: DENT RESIDENCE

Location: 101 W 100 S MIDWAY, UT 84049

Total Acreage: 1.21 Number of Units: 1 Historically Irrigated Area: YES

Existing Water Connections: 1

Comments:
WE ARE BUILDING ANOTHER HOME ON WEST PROPERTY. WE ARE REQUESTING THE EXCHANGE OF SOME PORTION FOR CULINARY WATER, LEAVING SHARE(S) OR PORTION TO IRRIGATE THE PASTURE.
THANK YOU FOR YOUR HELP!

Please submit with application Site Plans, Plat Maps, Drawings or any information that pertains to water calculations.

Please read and sign before application submittal

I declare under penalty of perjury that I am the owner or authorized agent of the property subject to this request and the foregoing statements, answers and attached documents are true and correct. As the applicant for this proposal, I understand that my application is not deemed complete until the Planning Office has reviewed the application. I further understand I will be notified when my application has been deemed complete. At that time, I expect that my application will be processed within a reasonable time.

Signature of Owner or Agent: Frank D Dent Date: 4/7/2020

FOR OFFICE USE ONLY

STAFF:
Date Received: _____
Received By: _____
Fee Paid: _____

Application Number: _____
Zone: _____
Tax ID Number: _____

PLANNER:
Complete / Incomplete
Date: _____ Reviewed by: _____

Parcel #: 00-0006-4068

Acreage: 1.21

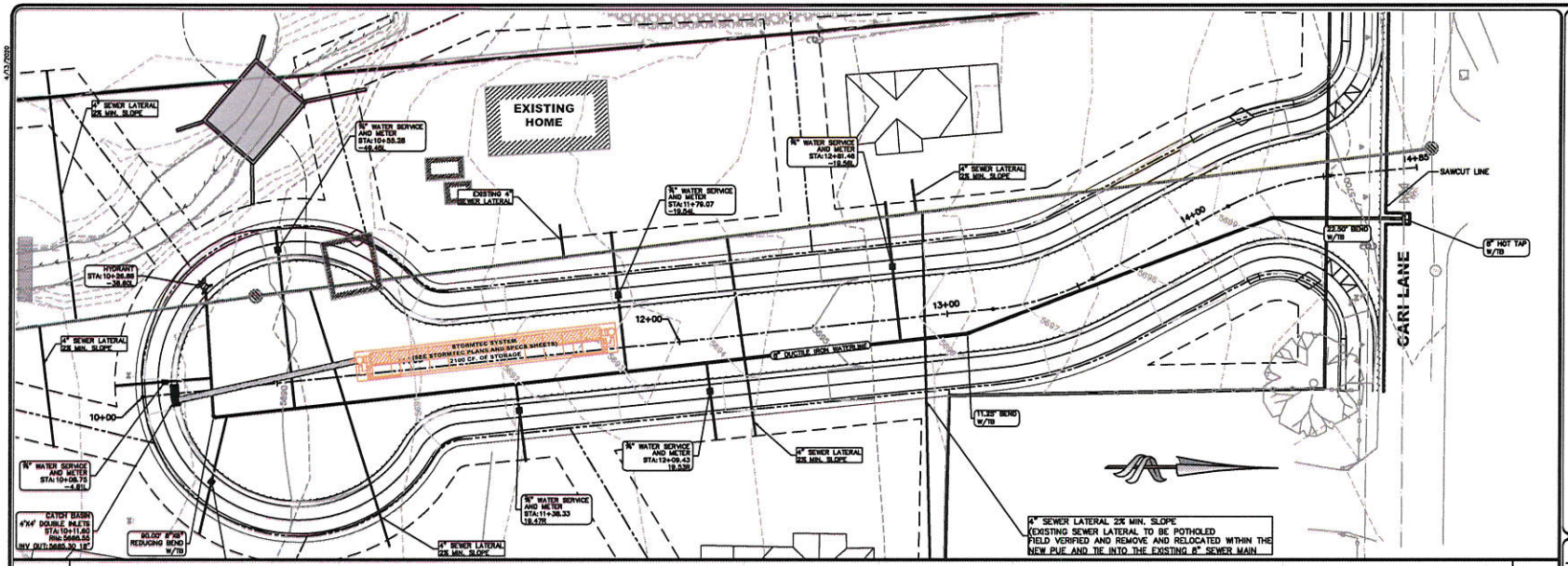
Existing home: 753 sqft

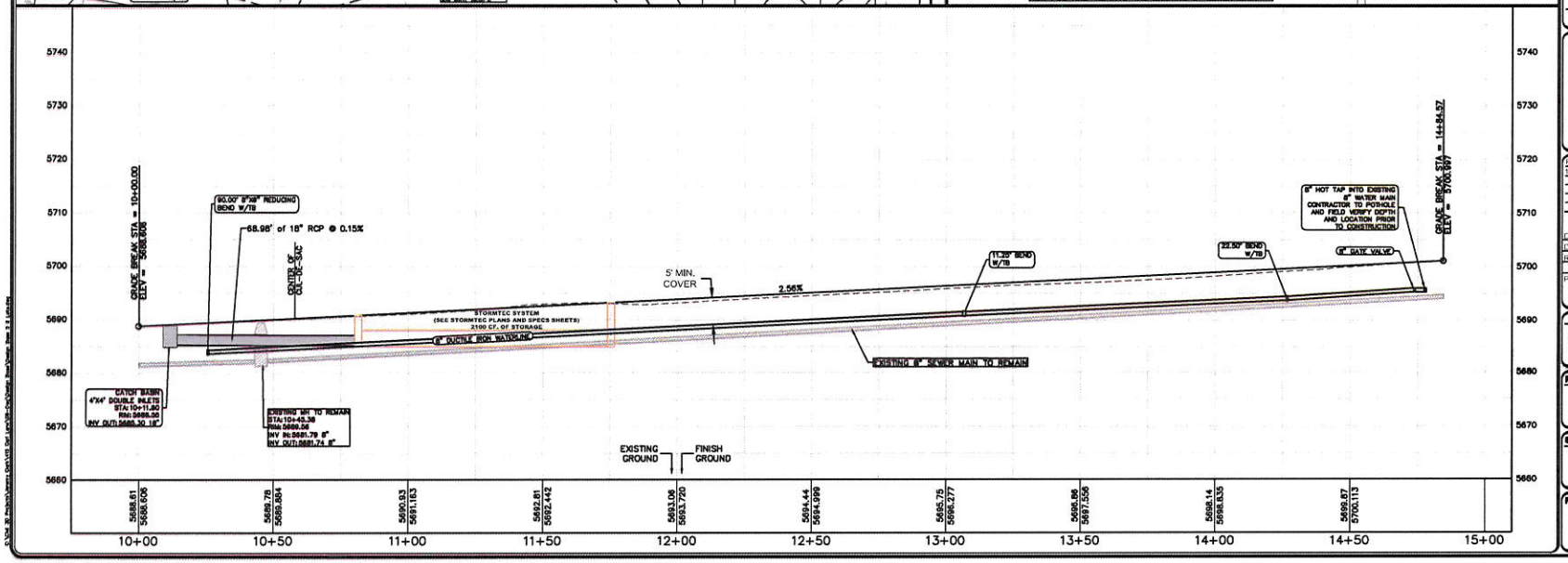
New home: ~3000 sqft

Future barn: ~ 1500 sqft

Creekside Estates

515 Cari Lane





CONSTRUCTION NOTES

1. CONTRACTOR TO FOLLOW MIDWAY CITY STANDARDS AND SPECIFICATIONS IN THE EVENT MIDWAY DOES NOT HAVE A SPECIFIC STANDARD APWA STANDARDS SHALL BE FOLLOWED.
2. CONTRACTOR TO MAINTAIN 10' HORIZONTAL SEPARATION BETWEEN SEWER AND WATER AND 1' VERTICAL SEPARATION.
3. CONTRACTOR TO POTHOLE AND FIELD VERIFY ALL EXISTING UTILITIES LOCATIONS AND DEPTHS AND COORDINATE ANY DISCREPANCIES WITH THE ENGINEER PRIOR TO ANY CONSTRUCTION TO AVOID ANY CONFLICTS OR CHANGE ORDERS.
4. CONTRACTOR TO COORDINATE AND SCHEDULE ALL CONSTRUCTION WITH ALL PRIVATE, PUBLIC OR CITY OWNED UTILITIES.
5. POWER TO BE DESIGNED BY OTHERS

WARNING
CALL BLUE STAKES

epic ENGINEERING

REVISIONS
-

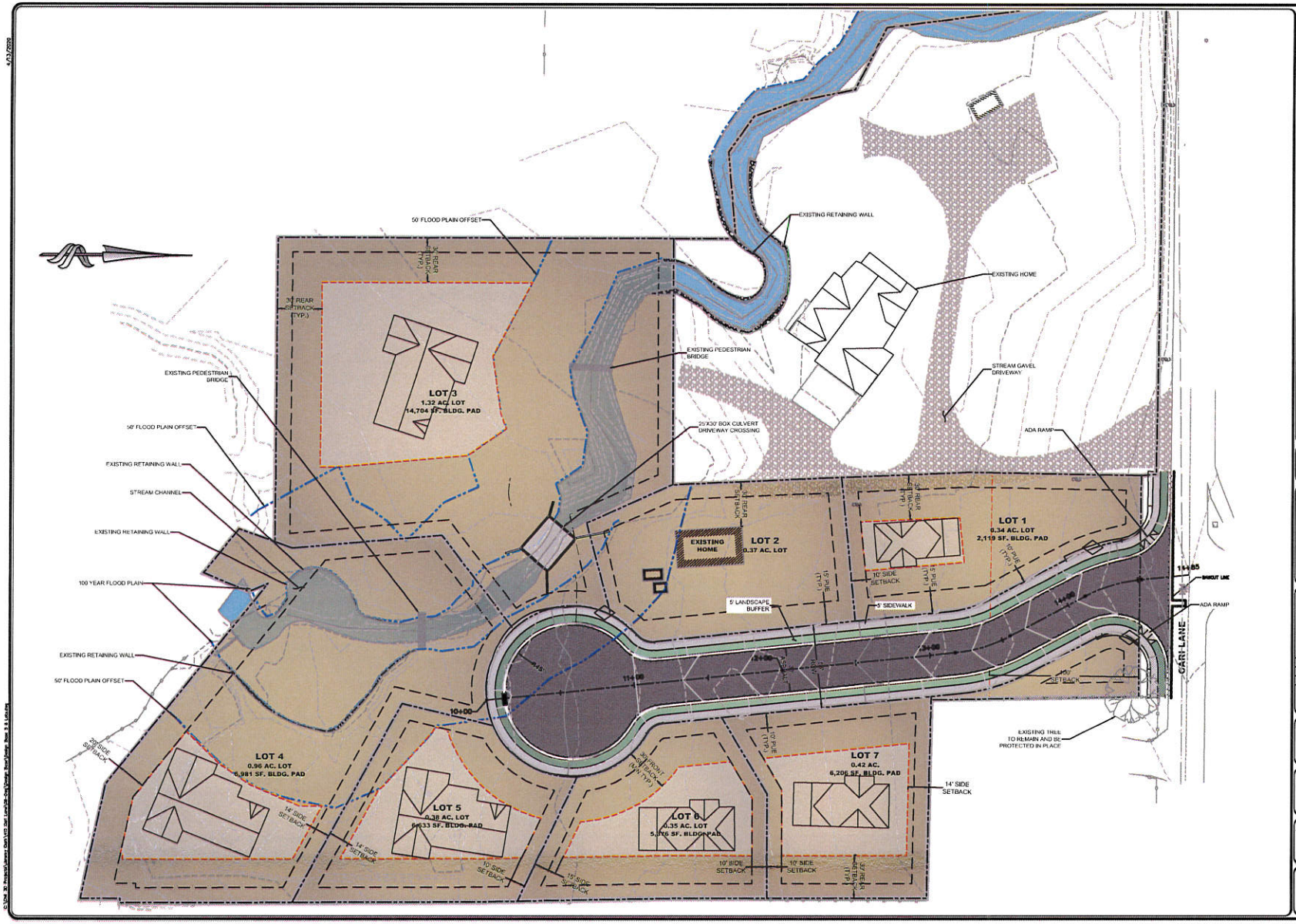
DRAWN: RJM
DESIGNER: RJM
REVIEWED: JNS
PROJECT #
-

SCALES
HORIZ: 1"=20'
VERT: 1"=10'
(24" x 36" SHEET)

PROJECT NAME
CARI LANE ESTATES

SHEET TITLE
PLAN & PROFILE

PLAN SET: PRELIM
SHEET: 3.0



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2. CONTRACTOR TO COORDINATE AND SCHEDULE ALL CONSTRUCTION WITH ALL PRIVATE, PUBLIC OR CITY OWNED UTILITIES.

WARNING
CALL BLUE STAKES

epic ENGINEERING

REVISIONS:
1.

DRAWN	R.J.M.
DESIGNER	R.J.M.
REVIEWED	J.N.S.
PROJECT #	

SCALES

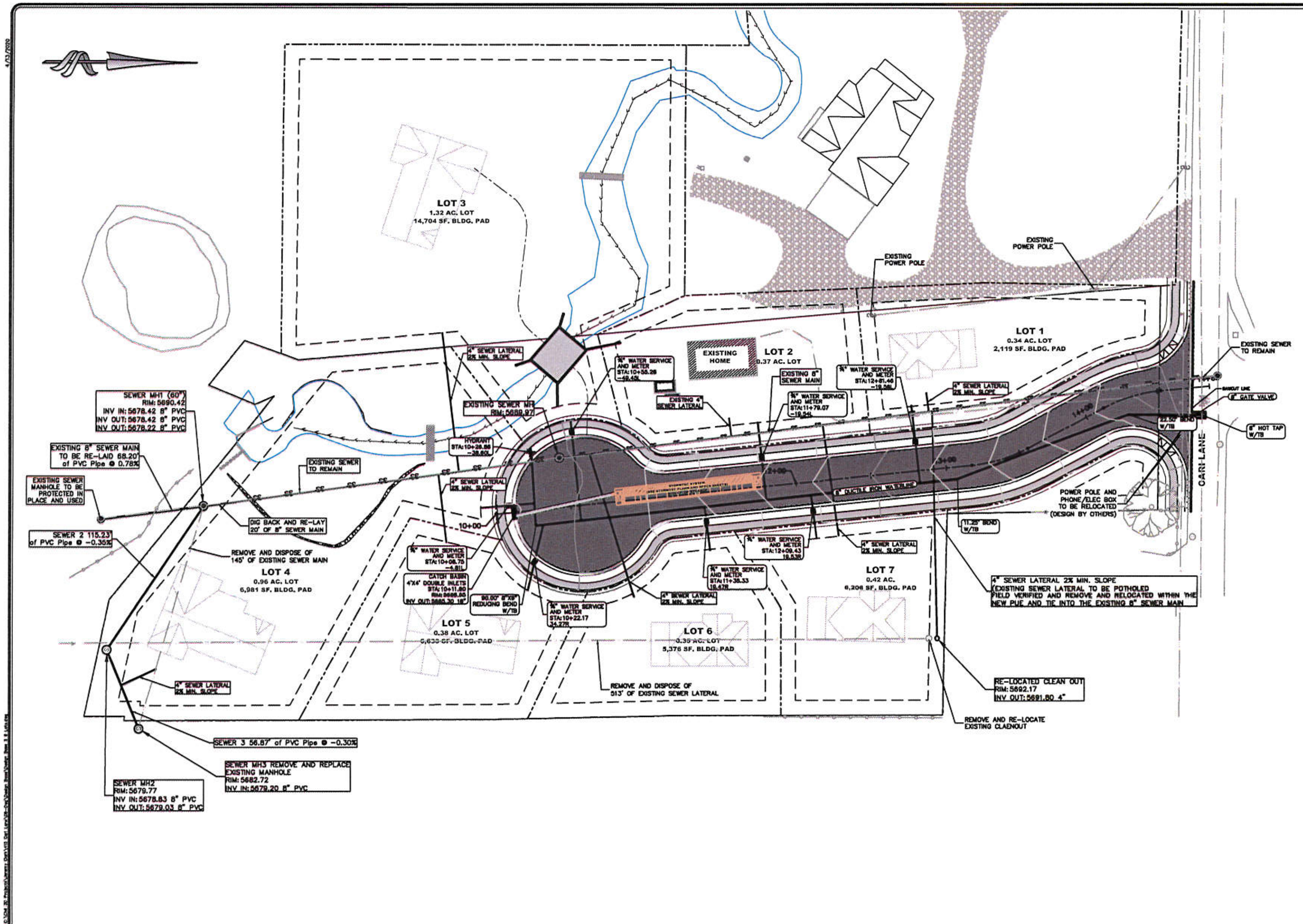
HORIZ. 1"=30'
VERT. N/A
(24" x 36" SHEET)

0 1"
SAID SCALE MEASURES 1" ON A FULL SIZE SHEET. ADJUST FOR A HALF SIZE SHEET.

PROJECT NAME
CARI LANE ESTATES

SHEET TITLE
SITE PLAN

PLAN SET	SHEET
PRELIM	2.0



CONSTRUCTION NOTES

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5. POWER TO BE DESIGNED BY OTHERS

WARNING

CALL BLUE STAKES

epic ENGINEERING

REVISIONS

DRAWN	RJM
DESIGNER	RJM
REVIEWED	JNS
PROJECT #	

SCALES

HORIZ: 1"=20'
VERT: N/A
(24" x 36" SHEET)

PROJECT NAME

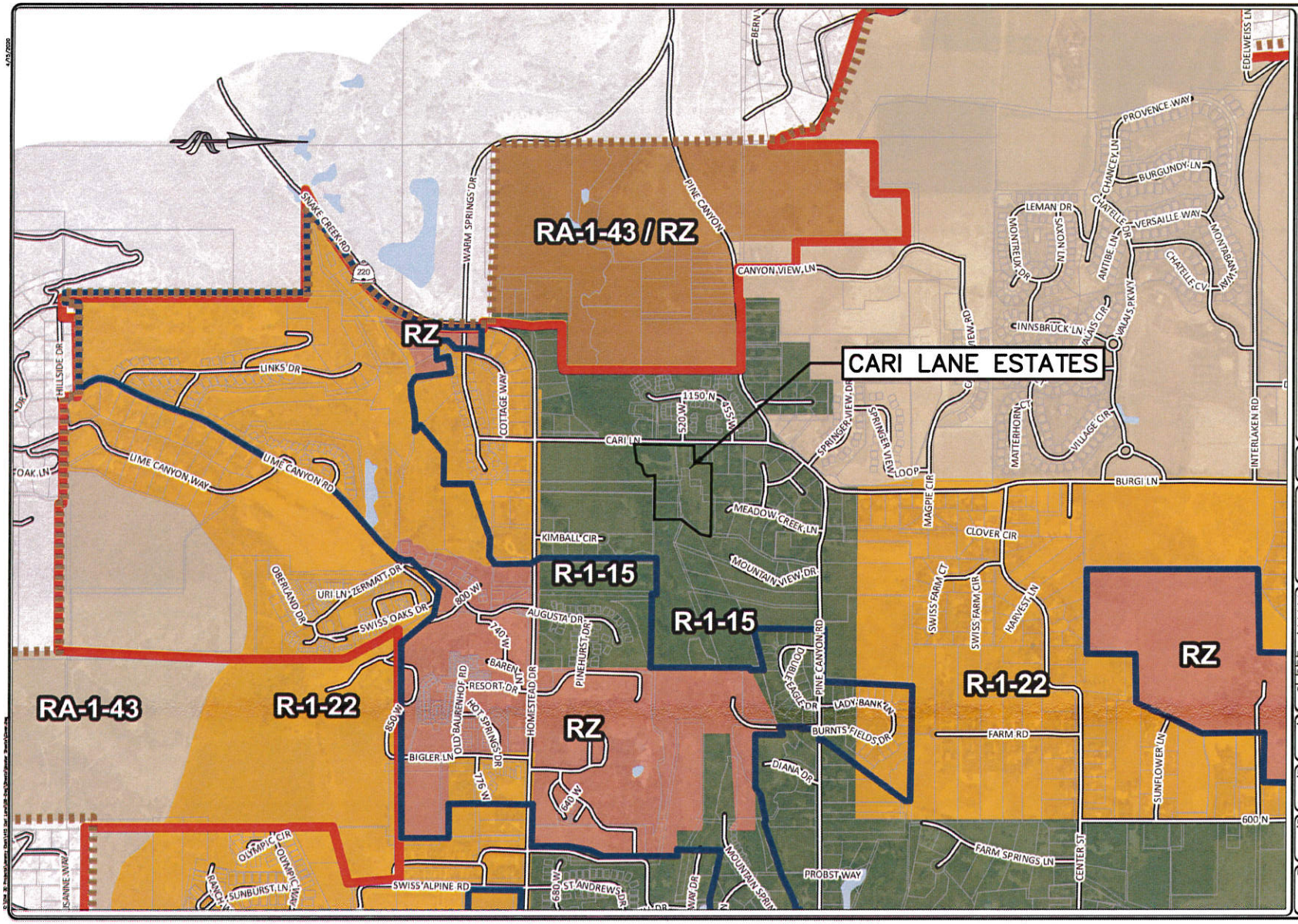
CARI LANE ESTATES

SHEET TITLE

UTILITIES

PLAN SET: PRELIM

SHEET: 1.2


CARI LANE ESTATES
RA-1-43 / RZ
RZ
R-1-15
R-1-15
RA-1-43
R-1-22
RZ
R-1-22
RZ
CONSTRUCTION NOTES
WARNING
CALL BLUE STAKES
epic ENGINEERING
REVISIONS
1.
DRAWN RJM
DESIGNER RJM
REVIEWED JNS
PROJECT #
SCALES
HORIZ 1"=40'
VERT: N/A
(24" x 36" SHEET)
PROJECT NAME
CARI LANE ESTATES
SHEET TITLE
ZONE MAP
PLAN SET
PRELIM
SHEET
1.3

GORDON
GEOTECHNICAL
ENGINEERING, INC.

REPORT
GEOTECHNICAL STUDY
PROPOSED CREEKSIDE ESTATES
515 CARI LANE
MIDWAY, UTAH

February 27, 2020

Job No. 609-004-20

Prepared for:
Construction Services Consulting
PO Box 571363
Murray, Utah 84157

Prepared by:
Gordon Geotechnical Engineering, Inc.
4426 South Century Drive, Suite 100
Salt Lake City, Utah 84123
Tel: 801-327-9600
Fax: 801-327-9601
www.gordongeotech.com

February 27, 2020
Job No. 609-004-20

Construction Services Consulting
PO Box 571363
Murray, Utah 84157

Attention: Mr. Pete Skolmoski

Ladies and Gentlemen:

Re: Report
Geotechnical Study
Proposed Creekside Estates
515 Cari Lane
Midway, Utah

1. INTRODUCTION

1.1 GENERAL

This report presents the results of our geotechnical study performed at the site of the proposed Creekside Estates which is located at 515 Cari Lane in Midway, Utah. The general location of the site with respect to major topographic features and existing facilities, as of 1998 and 1999, is presented on Figure 1, Vicinity Map. A detailed location of the site showing existing roadways and surrounding facilities, on an air photograph base, is presented on Figure 2, Area Map. The locations and alignments of photographs taken of the site during the field portion of study are also shown on Figure 2. A more detailed layout of the site showing the proposed lot boundaries and building footprints is presented on Figure 3, Site Plan. The locations of the test pits excavated in conjunction with this study are also presented on Figure 3.

1.2 OBJECTIVES AND SCOPE

The objectives and scope of our study were planned in discussions between Mr. Pete Skolmoski of Construction Services Consulting and Mr. Patrick Emery of Gordon Geotechnical Engineering, Inc. (G^2).

In general, the objectives of this study were to:

1. Accurately 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 development.

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

1. A field program consisting of the excavating, logging, and sampling of five test pits at the site.

2. A laboratory testing program.

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

1.3 AUTHORIZATION

Authorization was provided by returning a signed copy of our professional services agreement No. 20-0102 dated January 2, 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, measured and projected groundwater conditions, and the layout and design data discussed in Section 2., Proposed Construction, of this report. If subsurface conditions other than those described in this report are encountered and/or if design and layout changes are implemented, G^2 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

A seven-lot single-family residential subdivision is planned for the three and one-half-acre site. The proposed structures are anticipated to be two to three levels above grade with a partial- to full-depth basement level. Construction will be of reinforced concrete below grade and wood-

frame construction above grade. Maximum column and wall loads are projected to be on the order of 40 to 60 kips and 2 to 3 kips per lineal foot, respectively.

Site development will require a minor amount of earthwork in the form of site grading. It is estimated that maximum cuts and fills to achieve design grades will be on the order of three to four feet.

A 435-foot long at-grade roadway terminating in a cul-de-sac will provide access to the lots. Traffic over the pavement will consist of a light to moderate volume of automobiles and light trucks, and some medium-weight trucks.

3. INVESTIGATIONS

3.1 FIELD PROGRAM

In order to define and evaluate the subsurface soil and groundwater conditions across the site, five test pits were excavated to a depths ranging from two to eight and one-half feet below existing grade. It should be noted that excavation refusal was encountered on hard hot spring deposits (tufa) at all test pits except for Test Pit TP-5. The limited depth of Test Pit TP-5 was due to saturated granular soils flowing into the test pit. Locations of the test pits are presented on Figure 3.

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 excavation operations, a continuous log of the subsurface conditions encountered was maintained. In addition, relatively undisturbed and small disturbed 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 have been supplemented by subsequent inspection and testing in our laboratory. Detailed graphical representation of the subsurface conditions encountered is presented on Figures 4A through 4E, Log of Test Pits. Soils were classified in accordance with the nomenclature described on Figure 5, Unified Soil Classification System.

Disturbed bag samples were collected from the soils brought up by the backhoe bucket. Additionally, relatively undisturbed samples were obtained utilizing thin-walled hand sampling equipment.

Following completion of excavating and logging, each test pit was backfilled. The backfill was not placed in uniform lifts and compacted to a specific density. Consequently, settlement of the backfill with time is likely to occur.

3.2 LABORATORY TESTING

3.2.1 General

In order to provide data necessary for our engineering analyses, a laboratory testing program was performed. The program included collapse-consolidation tests, partial gradation, and chemical tests. The following paragraphs describe the tests and summarize the test data.

3.2.2 Collapse-Consolidation Tests

In order to assess moisture sensitivity and load deformation characteristics, two collapse-consolidation tests were performed on representative samples of the relatively fine-grained silty sand and sandy silt soil encountered in Test Pits TP-1 and TP-2. The collapse test was performed as follows:

1. Load sample at in-situ moisture content to specific axial pressure.
2. Measure and record axial deflection.
3. Saturate sample.
4. Measure and record resulting collapse.

The test results are tabulated below:

Test Pit No.	Depth (feet)	Soil Classification	Natural Dry Density (pcf)	Natural Moisture Content (percent)	Axial Load When Saturated (psf)	Collapse (percent)
TP-1	3.0	SM	95	10.8	800	0.54*
TP-2	2.5	ML	96	8.2	1,600	1.38*

* Some of the measured collapse is due to sample disturbance.

The results of the tests indicate that the silty sand and sandy silt soils encountered at the site to depths of two to six and one-half feet are slightly moisture sensitive and exhibit a slight collapse potential when saturated or nearly saturated. Some of the measured collapse is attributable to disturbance of the soil during the sampling process.

Following the collapse portion of the test, normal consolidation loading was applied. The results of the test indicate that the silty sand and sandy silt soils encountered are moderately over-

consolidated and exhibit moderately low compressibility and moderate strength characteristics when loaded below the preconsolidation pressure. Results of the test are maintained within our files and can be provided upon request.

3.2.3 Partial Gradation Tests

To aid in classifying the soils and to provide general index parameters, a partial gradation test was performed upon four representative samples of the soils encountered in the exploration test pits. The results of the test are tabulated below:

Test Pit No.	Depth (feet)	Sieve Percent Passing		Soil Classification
		No. 4	No. 200	
TP-1	5.0	58.6	4.0	SP/GP
TP-2	2.5	--	63.6	ML
TP-4	6.0	--	31.6	SM
TP-5	7.0	44.8	2.5	SP/GP

3.2.4 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 fine-grained soils encountered. 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-3	3.0	CL	8.31	< 5.35

4. SITE CONDITIONS

4.1 SURFACE

The overall site is irregular in shape and contains one existing single-family residential structure established slab-on-grade. The remainder of the site consists of vacant/undeveloped land. The site was covered with four to six inches of snow at the time of our field work. Topography across the site slopes gently down to the south with up to approximately 20 feet of overall relief. Snake Creek flows to the south on the southwestern portion of the site. A stacked rock

retaining wall and numerous piles of end-dumped fill material were observed to be raising the grade of the southern portion of the site. The observed fills have not been properly placed and compacted and are considered non-engineered.

The site is bordered by Cari Lane to the north, and single-family residential structures to the east, south, and west.

Representative photographs of the site area are shown on Figure 6, Photographs.

4.2 SUBSURFACE SOIL

The soil conditions encountered in each of the test pits, to the depths penetrated were relatively similar. At the surface in Test Pits TP-4 and TP-5, clayey fine to coarse sand and gravel fill was encountered extending to depths of one and one-half to two and one-half feet below the ground surface. The fill was observed to be loosely end-dumped and without documentation and compaction testing results, the fill must be considered non-engineered. Non-engineered fills will exhibit variable and most likely poor engineering characteristics. This non-engineered fill may be re-utilized as structural fill; however, due to the clay content, the on-site non-engineered fill will require close moisture control and will be difficult during wet and cold periods of the year.

Below the fill Test Pits TP-4 and TP-5, and from the ground surface in the remainder of the test pits, natural soils were encountered to the maximum explored depths, two to eighth and one-half feet below existing grade. The natural soils consist of silty fine sand (SM), fine sandy silt (ML), and fine to coarse sand and gravel with trace silt (SP/GP). Collapse-consolidation tests indicate that the silty sand (SM) and sandy silt (ML) soils are slightly moisture sensitive and exhibit a slight collapse potential when saturated or nearly saturated.

The natural sands and gravels (SP/GP) are slightly moist to saturated, loose to medium dense, and are projected to exhibit high strength and low compressibility characteristics under the anticipated loading range.

Excavation refusal was encountered on hard rock comprised of hot spring deposits calcareous tufa. The tufa is white to light brown in color, moderately closely fractured, porous, hard, and relatively unweathered.

The upper three inches of the soil profile contains major roots and is classified as topsoil.

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

Groundwater was encountered in Test Pit TP-5, at the lowest portion of the site, at a depth of three feet below existing grade. Very moist soils were encountered in Test Pit TP-4 at a depth of eight feet below existing grade, possibly due to infiltration of water from the nearby creek. Seasonal fluctuations of the groundwater table on the order of one to two feet are expected, with the highest levels occurring during the late spring and early summer months.

5. DISCUSSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF FINDINGS

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

The most significant geotechnical aspects of the site are:

1. The non-engineered fill encountered to depths of one and one-half to two and one-half feet at Test Pits TP-4 and TP-5 as well as end-dumped fills observed on the southern portion of the site. Non-engineered fills must be completely removed from beneath the building footprint and rigid pavement areas. Due to the variable nature of the non-engineered fills encountered, a qualified geotechnical engineer from our staff must aid in verifying that all non-engineered fills have been completely removed prior to the placement of structural site grading fills, footings, or foundations.

2. Excavation on refusal on hard tufa at depths of two to eight and one-half feet below existing grade. Deeper excavations into the tufa will be difficult in confined areas. However, in our experience, mass excavations for building footprints are typically feasible with standard excavation equipment. There have been instances in Midway where rock trenching machines were required for utility installation. Due to the porosity of the tufa, rock breakers are typically ineffective.

3. The relatively shallow groundwater encountered at a depth of three feet at Test Pit TP-5. For design groundwater recommendations see Section 5.9, Design Water Table. Groundwater was encountered in Test Pit TP-5 at a depth of three feet below the ground surface at the lowest area of the site. However, it is projected that site grading fill will be utilized to raise the overall grade of the southern portion of the site, where the numerous end-dumped fill piles are currently positioned. For design groundwater recommendations see Section 5.9, Design Water Table.

4. Slightly collapsible soils encountered to depths of two to six and one-half feet at Test Pits TP-1 through TP-4. The silty sand and sandy silt soils encountered at the site are slightly moisture sensitive and exhibit a slight collapse potential when saturated or nearly saturated. Ideally, potentially collapsible soils should be completely removed from below foundations where feasible. However, due to the limited thickness of the slightly collapsible soils encountered, and the relatively low collapse potential, additional settlement upon saturation of the subgrade soils will be within the tolerable range for structures of this type. Therefore, footings may be established directly on undisturbed natural soils utilizing a reduced bearing pressure. See Section 5.3.1, Design Data for details.

5. Potential for "perched" groundwater conditions. Due to the potential for "perched" groundwater conditions, foundation subdrains are recommended around below-grade portions of structures.

Detailed discussions pertaining to earthwork, foundations, floor slabs, lateral resistance, pavement, and the geoseismic setting of the site are discussed in the following sections.

5.2 EARTHWORK

5.2.1 Site Preparation

Preparation of the site must consist of the removal of all non-engineered fills, vegetation, loose surficial soils, topsoil, debris, and other deleterious materials from beneath an area extending at least three feet beyond the perimeter of the proposed building, rigid pavement, and exterior flatwork areas.

Non-engineered fills may remain in flexible pavement areas as long as they are properly prepared. Proper preparation will consist of scarifying and moisture conditioning the upper eight inches and recompacting to the requirements of structural fill. However, it should be noted that compaction of fine-grained soils (clays and silts) as structural site grading fill will be very difficult, if not impossible, during wet and cold periods of the year. As an option for proper preparation and recompaction, the upper eight inches of the non-engineered fills may be removed and replaced with granular subbase over proofrolled subgrade. Even with proper preparation, flexible pavements established on non-engineered fills may experience some long-term movements. If the possibility of these movements is not acceptable, these non-engineered fills must be completely removed.

Subsequent to the above operations and prior to the placement of footings, structural site grading fill, or floor slabs, the exposed natural subgrade must be proofrolled by passing moderate-weight rubber tire-mounted construction equipment over the surface at least twice. If any loose, soft, or disturbed zones are encountered, they must be completely removed in footing and floor slab areas and replaced with granular structural fill. If removal depth required

is greater than two feet, G² must be notified to provide further recommendations. In pavement areas, unsuitable soils encountered during recompaction and proofrolling must be removed to a maximum depth of two feet and replaced with compacted granular structural fill.

5.2.2 Excavations

Groundwater is anticipated to be encountered only in the lowest area of the site at a depth of three feet below existing grade. Temporary construction excavations not exceeding four feet in depth may be constructed with near-vertical sideslopes. If cohesionless granular soils and groundwater are encountered, flatter sideslopes may be required. This condition is anticipated in the area of Test Pit TP-5. Deeper excavations are not anticipated at the site.

Utility trench excavations must be constructed in accordance with OSHA trench safety guidelines.

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 in some areas, as replacement fill below footings. All structural fill must be free of sod, rubbish, topsoil, frozen soil, and other deleterious materials. Structural site grading fill is defined as fill placed over fairly large open areas to raise the overall site grade. For structural site grading fill, the maximum particle size should generally not exceed four inches; although, occasional larger particles, not exceeding six 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 should generally be restricted to two inches.

The on-site natural silty sand, sandy silt, and non-engineered fill soils may be utilized as structural site grading fill. However, it should be noted that compaction of silty and clayey soils will require close moisture control and will be very difficult if not impossible during wet and cold periods of the year.

To stabilize soft subgrade conditions or where structural fill is required to be placed below a level one foot above the water table at the time of construction, a mixture of coarse gravels and cobbles and/or one and one-half- to two-inch gravel (stabilizing fill) should be utilized. Stabilizing fill may be required in the lowest area of the site.

Non-structural site grading fill is defined as all fill material not designated as structural fill and may consist of any cohesive or granular soils not containing excessive amounts of degradable material.

5.2.4 Fill Placement and Compaction

Structural fill shall be placed in lifts not exceeding eight 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] T-180 (ASTM[2] D-1557) compaction criteria in accordance with the table below:

Location	Total Fill Thickness (feet)	Minimum Percentage of Maximum Dry Density
Beneath an area extending at least 3 feet beyond the perimeter of the structures	0 to 8	95
Outside area defined above	0 to 6	90
Outside area defined above	6 to 8	92
Road base	-	96

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

Subsequent to stripping and prior to the placement of structural site grading fill, the subgrade must 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.

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.

Coarse 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 fill may be compacted by passing moderately heavy construction equipment or large self-propelled compaction equipment over the surface at least twice. Subsequent fill material placed over the coarse gravels and cobbles shall be adequately placed so that the "fines" are "worked into" the voids in the underlying coarser gravels and cobbles.

---

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

5.2.5 Utility Trenches

All utility trench backfill material below structurally loaded facilities (flatwork, floor slabs, roads, etc.) should 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 should be proofrolled and/or properly compacted prior to the construction of any exterior flatwork over a backfilled trench. Proofrolling may 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 proofrolling, they should be removed to a maximum depth of two feet below design finish grade and replaced with structural fill.

Most utility companies and City-County governments are now requiring that Type A-1 or A-1-a (AASHTO Designation – basically 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 T-180 (ASTM D-1557) method of compaction. We recommend that as the major utilities continue onto the site that these compaction specifications are followed.

The on-site silty sand and sandy silt soils are not recommended for use as utility trench backfill. Some of the non-engineered fill may be utilized for utility trench backfill provided it meets the requirements stated above.

5.3 SPREAD AND CONTINUOUS WALL FOUNDATIONS

5.3.1 Design Data

The proposed structures may be supported upon conventional spread and continuous wall foundations established upon suitable natural soils or tufa and/or structural fill extending to suitable natural soils or tufa. Under no circumstances shall footings be placed overlying non-engineered fills.

For design, the following parameters are provided with respect to the projected loading discussed in Section 2., Proposed Construction, of this report:

Minimum Recommended Depth of Embedment for Frost Protection	- 42 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 Pressure for Real Load Conditions	
For footings on suitable natural soils and/or structural fill extending to suitable natural soils	- 1,500 pounds per square foot
For footings established entirely on tufa and/or Structural fill extending to tufa	- 2,500 pounds per square foot
Bearing Pressure Increase for Seismic Loading	- 50 percent*

* Not applicable for edge bearing pressure when the footings are established upon granular soil. Use 25 percent for overturning or other inclined loading.

The term "net bearing pressure" refers to the pressure imposed by the portion of the structure located above lowest adjacent final grade. Therefore, the weight of the footing and backfill to the 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.

5.3.2 Installation

Under no circumstances shall the footings be established upon non-engineered fills, loose or disturbed soils, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water. If unsuitable soils are encountered, they must be completely removed and replaced with compacted structural fill.

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.

5.3.3 Settlements

Settlements of foundations designed and installed in accordance with the above recommendations and supporting maximum projected structural loads are anticipated to be on the order of one-half of an inch or less. Settlements are expected to occur rapidly with approximately 60 to 70 percent of the settlements occurring during construction.

5.4 FOUNDATION SUBDRAINS

Due to the potential for "perched" groundwater conditions, and to provide additional protection, we recommend the installation of foundation subdrains around footings in partial- and full-depth basement areas.

Foundation subdrains should consist of a four-inch diameter perforated or slotted plastic or PVC pipe enclosed in clean gravel. The invert of a subdrain should be at least two feet below the top of the lowest adjacent floor slab. The gravel portion of the drain should extend two inches laterally and below the perforated pipe and at least one foot above the top of the lowest adjacent floor slab. The gravel zone must be installed immediately adjacent to the perimeter footings and the foundation walls. To reduce the possibility of plugging, the gravel must be wrapped with a geotextile, such as Mirafi 140N or equivalent. Above the subdrain, a minimum four-inch-wide zone of "free-draining" sand and gravel should be placed adjacent to the foundation walls and extend to within two feet of final grade. The upper two feet of soils should consist of a compacted clayey cap to reduce surface water infiltration into the drain. As an alternative to the zone of permeable sand and a prefabricated "drainage board," such as Miradrain or equivalent, may be placed adjacent to the exterior below grade walls. Prior to the installation of the footing subdrain, the below-grade walls should be dampproofed. The slope of the subdrain should be at least 0.3 percent. The gravel placed around the drain pipe should be clean three-quarters to one-inch minus gap-graded gravel and/or "pea" gravel. The foundation subdrains can be discharged into the area subdrains, storm drains, or other suitable down-gradient location.

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 on fine-grained soils, a coefficient of 0.40 should be utilized. In determining frictional resistance on granular soils, a coefficient of 0.45 should be utilized. 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 FLOOR SLABS

Floor slabs may be established upon suitable undisturbed natural soils, and/or upon structural fill extending to suitable natural soils. Non-engineered fills and topsoil are not considered suitable. To provide a capillary break, it is recommended that floor slabs be directly underlain by at least four inches of "free-draining" fill, such as "pea" gravel or three-quarters- to one-inch minus clean gap-graded gravel. Settlements of lightly to moderately loaded floor slabs are anticipated to be minor.

5.7 PAVEMENTS

The properly prepared non-engineered fills will exhibit poor engineering characteristics when saturated or nearly saturated. Non-engineered fills and collapsible soils may remain in flexible pavement areas if properly prepared, as stated previously in this report. Rigid pavements shall not be placed overlying non-engineered fills, even if properly prepared. Considering the existing non-engineered fill and sandy silt as the pavement subgrade and the projected traffic, the following pavement sections are recommended:

Primary Roadway Area

(Moderate Volume of Automobiles and Light Trucks,
Light Volume of Medium-Weight Trucks,
and Occasional Heavy-Weight Trucks)
[5 equivalent 18-kip axle loads per day]

Flexible:

3.0 inches	Asphalt concrete
8.0 inches	Aggregate base
Over	Properly prepared natural soils, properly prepared non-engineered fills, and/or structural site grading fill extending to suitable stabilized natural soils.

Rigid:

5.5 inches	Portland cement concrete (non-reinforced)
5.0 inches	Aggregate base
Over	Properly prepared natural soils, and/or structural site grading fill extending to suitable stabilized natural soils.*

* Rigid pavements shall not be placed over non-engineered fills, even if properly prepared.

For dumpster pads, we recommend a pavement section consisting of six and one-half inches of Portland cement concrete, four inches of aggregate base, over properly prepared natural stabilized subgrade or site grading structural fills.

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.

5.8 GEOSEISMIC SETTING

5.8.1 General

In July 2019, the State of Utah adopted the International Building Code (IBC) 2018 but is still using the International Residential Code (IRC) 2015. The IRC 2015 code includes provisions for seismic design under the IBC 2015 code. The IBC 2015 code determines the seismic hazard for a site based upon 2008 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).

The structures must be designed in accordance with the procedure presented in Section 1613, Earthquake Loads, of the IBC 2015 edition.

5.8.2 Faulting

Based on our review of available literature, no active faults pass through or immediately adjacent to the site.

5.8.3 Soil Class

Based on our experience in the area, for dynamic structural analysis, the Site Class D - Stiff Soil Profile as defined in Table 20.3-1, Site Classification, of ASCE 7-10 can be utilized.

5.8.4 Ground Motions

The IBC 2015 code is based on 2008 USGS mapping, which provides values of short and long period accelerations for the Site Class B boundary for the Maximum Considered Earthquake (MCE). This Site Class B boundary represents a hypothetical sandstone bedrock surface and must be corrected for local soil conditions. The following table summarizes the peak ground and short and long period accelerations for a MCE event and incorporates a soil amplification factor for a Site Class D soil profile in the second column. Based on the site latitude and longitude (40.5292 degrees north and -111.4830 degrees west, respectively), the values for this site are tabulated below:

Spectral Acceleration Value, T Seconds	Site Class B-C Boundary [mapped values] (% g)	Site Class D [adjusted for site class effects] (% g)
Peak Ground Acceleration (Geo-Mean)	25.7	33.1
0.2 Seconds (Short Period Acceleration)	S_S = 64.2	S_{MS} = 82.6
1.0 Seconds (Long Period Acceleration)	S_1 = 21.4	S_{M1} = 42.2

The IBC 2015 code design accelerations (S_{DS} and S_{D1}) are based on multiplying the above accelerations (S_{MS} and S_{M1}) for the MCE event by two-thirds (⅔).

5.8.5 Liquefaction

The site is located in an area that has been identified by the Utah Geological Survey as having "very low" liquefaction potential. Liquefaction is defined as the condition when saturated, loose, finer-grained sand-type soils lose their support capabilities because of excessive pore water pressure which develops during a seismic event.

Due to the non-liquefiable tufa encountered at the test pit locations, and the coarse nature of the saturated granular soils encountered at Test Pit TP-5, the likelihood of liquefaction at the site during the design seismic event is very low.

5.9 CEMENT TYPES

Laboratory tests indicate that the site soils contain negligible amounts of water-soluble sulfates. Therefore, all concrete which will be in contact with the site soils may be prepared using Type I or IA cement.

5.10 SITE OBSERVATIONS

As stated previously, due to the variable nature of the non-engineered fills encountered, a qualified geotechnical engineer from our staff must aid in verifying that all non-engineered fills have been completely removed prior to the placement of structural site grading fills, footings, or foundations.

5.11 DESIGN INFILTRATION RATE

A conservative design infiltration rate of 30 minutes per inch is recommended for retention basins terminating in the natural silty sand and sandy silt soils encountered. A higher rate may potentially be utilized if infiltration testing is performed in the proposed basin location.

5.12 DESIGN WATER TABLE

The water table of our study was measured at a depth of three feet below existing grade at the lowest portion of the site (Test Pit TP-5). Considering seasonal and long-term groundwater fluctuations, we recommend that a design groundwater table of one foot below existing grade at Test Pit TP-5 be utilized in the design for the structures. Based on the provided topographic survey, this design water table corresponds to an elevation of approximately 5,683 feet. We recommend that all habitable floor slabs be established a minimum of two feet above the design water table.

We appreciate the opportunity of providing this service for you. If you have any questions or require additional information, please do not hesitate to contact us.

Respectfully submitted,

Gordon Geotechnical Engineering, Inc.

Jordan K. Culp, State of Utah No. 10975604
Professional Engineer

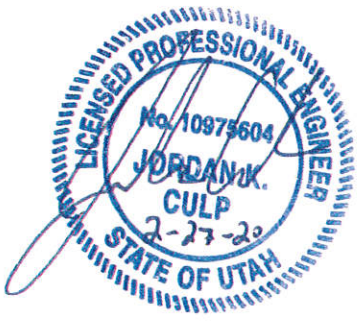
Reviewed By:

Patrick R. Emery, State of Utah No. 7941710
Professional Engineer

JKC/PRE:sn

Encl. Figure 1, Vicinity Map
Figure 2, Area Map
Figure 3, Site Plan
Figures 4A through 4E, Log of Test Pits
Figure 5, Unified Soil Classification System
Figure 6, Photographs

Addressee (3 + email)



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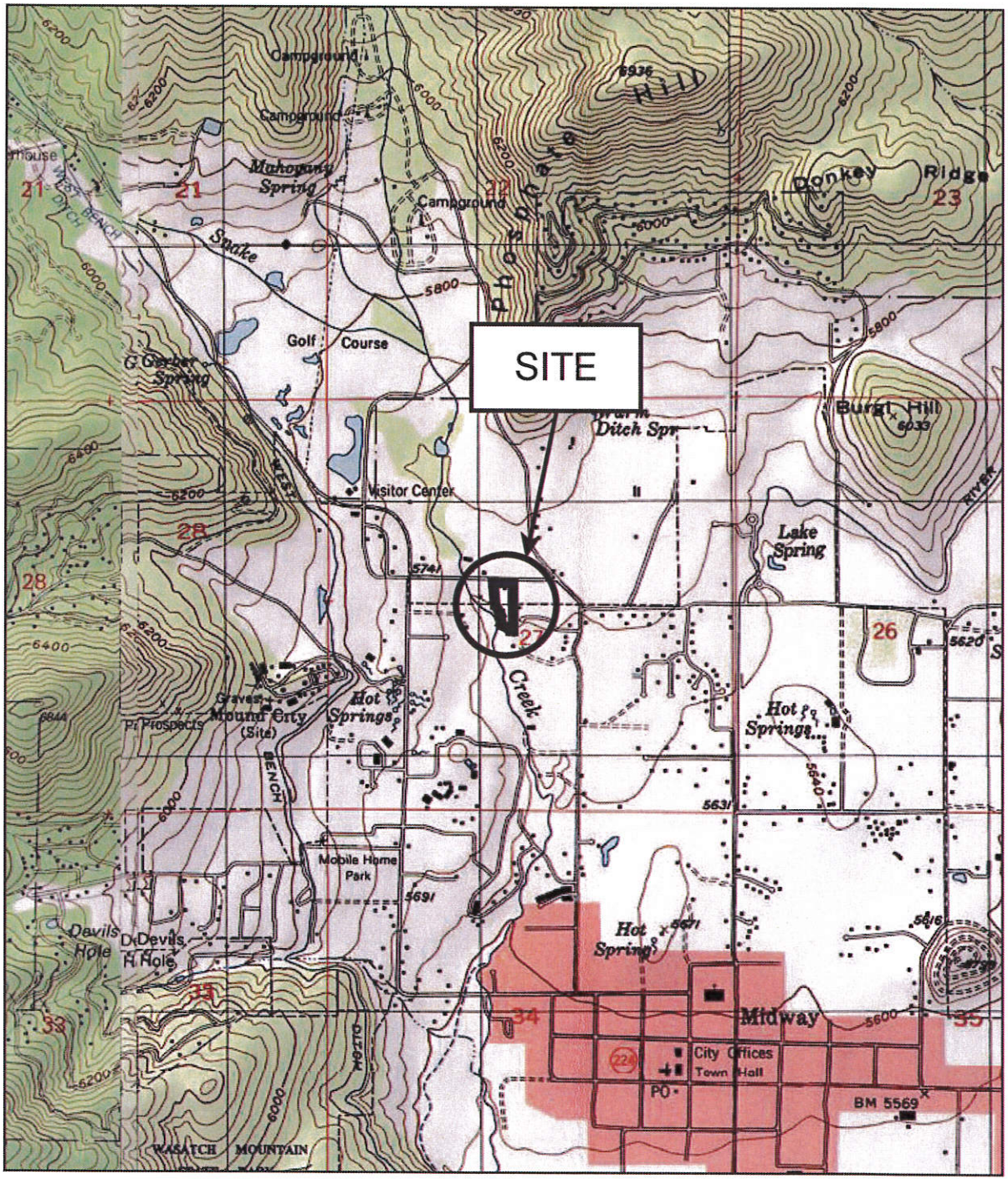
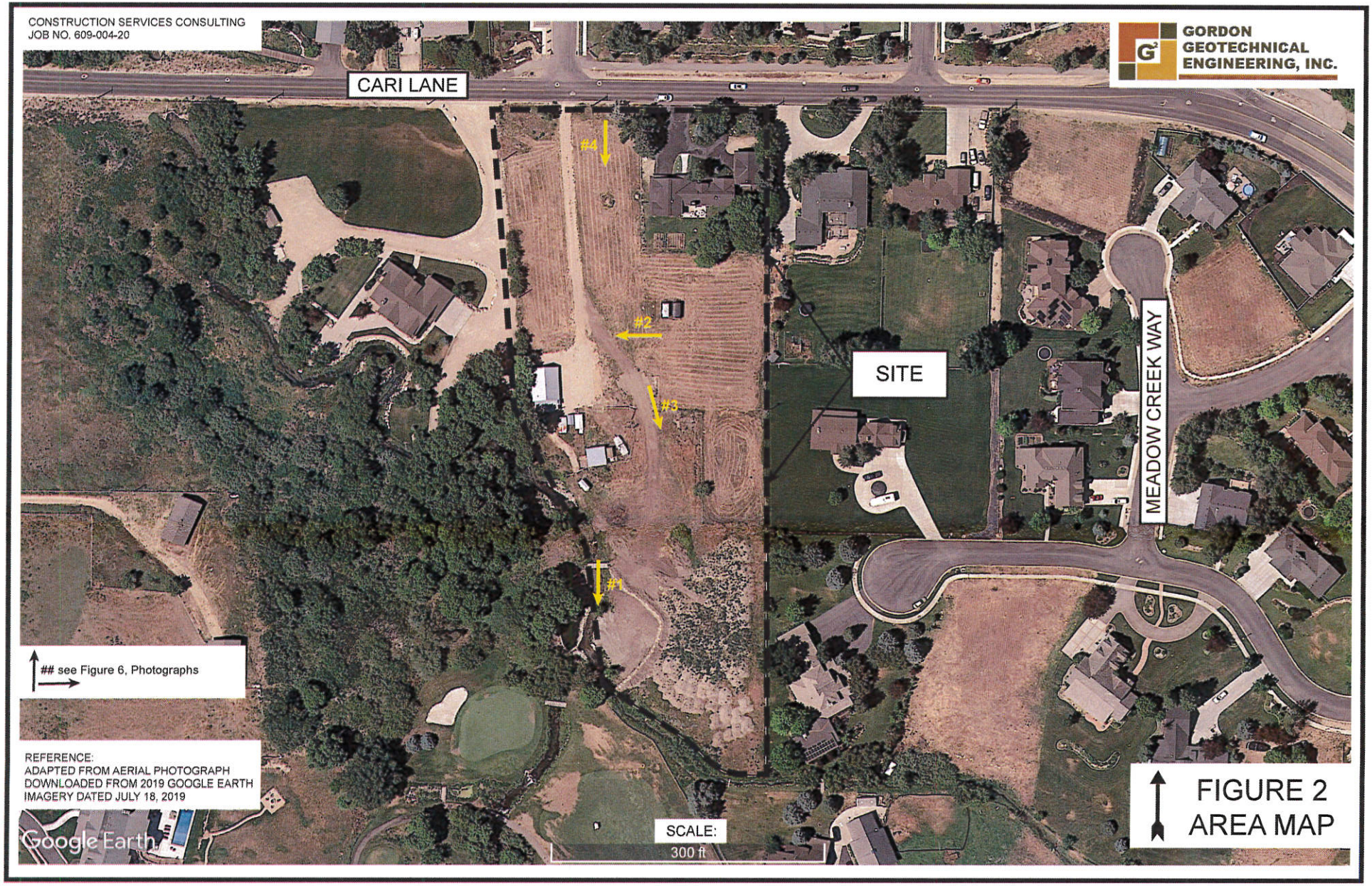


SCALE IN FEET
1000 0 1000 2000

REFERENCE:
USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE MAPS
TITLED "HEBER CITY, UTAH", DATED 1999 AND
"BRIGHTON, UTAH", DATED 1998

FIGURE 1
VICINITY MAP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CARI LANE
#4
#2
#3
#1
SITE
MEADOW CREEK WAY
see Figure 6, Photographs
REFERENCE:
ADAPTED FROM AERIAL PHOTOGRAPH
DOWNLOADED FROM 2019 GOOGLE EARTH
IMAGERY DATED JULY 18, 2019
Google Earth
SCALE:
300 ft
FIGURE 2
AREA MAP

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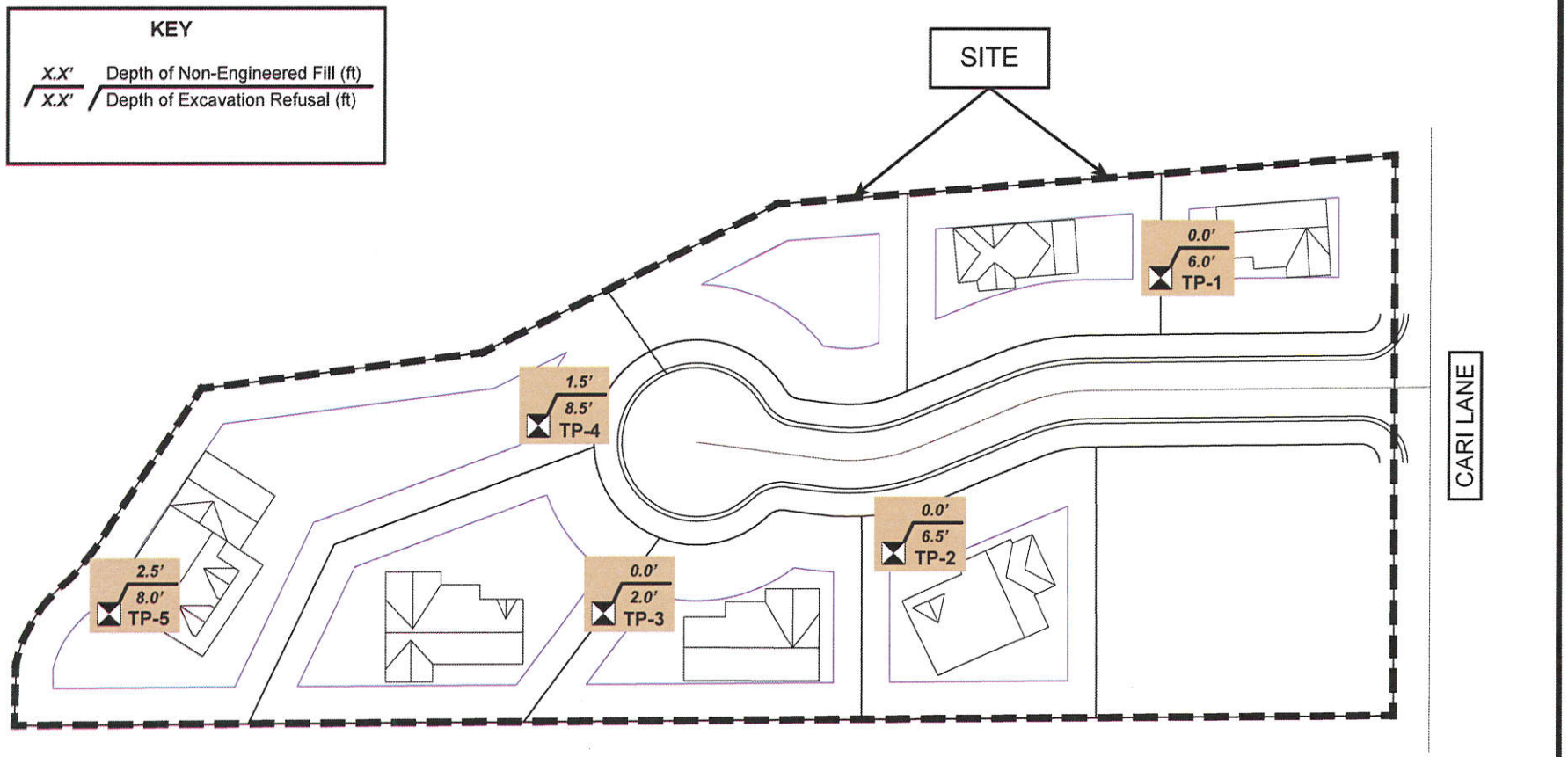

FIGURE 3
SITE PLAN

REFERENCE:
ADAPTED FROM DRAWING PROVIDED
BY CLIENT, NOT DATED

NOT TO SCALE

Gordon Geotechnical Engineering, Inc.
4426 South Century Drive, Suite 100
Salt Lake City, Utah 84123

TEST PIT TP-1

Project Name: Proposed Creekside Estates
Project No.: 609-004-20
Location: 515 Cari Lane, Midway, Utah
Client: Construction Services Consulting
Excavating Method: Kubota KX057
Date Excavated: 01-28-20
Elevation: ---
Water Level: No groundwater encountered.
Remarks:

DESCRIPTION	GRAPHIC LOG	WATER LEVEL	DEPTH (FT.)	SAMPLE SYMBOL	SAMPLE TYPE	BLOWS/FT.	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	REMARKS
SILTY FINE SAND major roots (topsoil) to 3"; light brown (SM)					TW		10.8	95				slightly moist "medium dense"
FINE TO COARSE SAND AND FINE AND COARSE GRAVEL with trace silt; light brown (SP/GP)			5		B				4.0			slgithly moist "medium dense"
Excavation refusal at 6.0' on hard tufa. Stopped sampling at 5.5'. No groundwater encountered at time of excavating. No significant sidewall caving.			10 15 20 25									

The discussion in the text under the section titled, SUBSURFACE CONDITIONS, is necessary for a proper understanding of the nature of the subsurface material.

FIGURE 4A

Gordon Geotechnical Engineering, Inc.
4426 South Century Drive, Suite 100
Salt Lake City, Utah 84123

TEST PIT TP-2

Project Name: Proposed Creekside Estates
Project No.: 609-004-20
Location: 515 Cari Lane, Midway, Utah
Client: Construction Services Consulting
Excavating Method: Kubota KX057
Date Excavated: 01-28-20
Elevation: ---
Water Level: No groundwater encountered.
Remarks:

DESCRIPTION	GRAPHIC LOG	WATER LEVEL	DEPTH (FT.)	SAMPLE SYMBOL	SAMPLE TYPE	BLOWS/FT.	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	REMARKS
FINE SANDY SILT major roots (topsoil) to 3"; light brown (ML)					TW		8.3	96	63.6			slightly moist "stiff"/"medium dense"
Excavation refusal at 6.5' on hard tufa. Stopped sampling at 3.0'. No groundwater encountered at time of excavating. No significant sidewall caving.			5 10 15 20 25									

The discussion in the text under the section titled, SUBSURFACE CONDITIONS, is necessary for a proper understanding of the nature of the subsurface material.

FIGURE 4B

Gordon Geotechnical Engineering, Inc.
4426 South Century Drive, Suite 100
Salt Lake City, Utah 84123

TEST PIT TP-3

Project Name: Proposed Creekside Estates
Project No.: 609-004-20
Location: 515 Cari Lane, Midway, Utah
Client: Construction Services Consulting
Excavating Method: Kubota KX057
Date Excavated: 01-28-20
Elevation: ---
Water Level: No groundwater encountered.
Remarks:

DESCRIPTION	GRAPHIC LOG	WATER LEVEL	DEPTH (FT.)	SAMPLE SYMBOL	SAMPLE TYPE	BLOWS/FT.	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	REMARKS
SILTY FINE SAND with chunks of tufa; major roots (topsoil) to 3"; brown (SM)					B							
Excavation refusal at 2.0' on hard tufa. Stopped sampling at 1.5'. No groundwater encountered at time of excavating. No significant sidewall caving.			5 10 15 20 25									

The discussion in the text under the section titled, SUBSURFACE CONDITIONS, is necessary for a proper understanding of the nature of the subsurface material.

FIGURE 4C

Gordon Geotechnical Engineering, Inc.
4426 South Century Drive, Suite 100
Salt Lake City, Utah 84123

TEST PIT TP-4

Project Name: Proposed Creekside Estates
Project No.: 609-004-20
Location: 515 Cari Lane, Midway, Utah
Client: Construction Services Consulting
Excavating Method: Kubota KX057
Date Excavated: 01-28-20
Elevation: ---
Water Level: No groundwater encountered.
Remarks:

DESCRIPTION	GRAPHIC LOG	WATER LEVEL	DEPTH (FT.)	SAMPLE SYMBOL	SAMPLE TYPE	BLOWS/FT.	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	REMARKS
CLAYEY FINE TO COARSE SAND AND FINE AND COARSE GRAVEL, FILL dark brown (SC/GC-FILL)					B							slightly moist "loose"
SILTY FINE SAND brown (SM)			5		B				31.6			moist "medium dense" very moist
Excavation refusal at 8.5' on hard tufa. Very moist soils possibly due to infiltration from adjacent creek. Stopped sampling at 6.5'. No groundwater encountered at time of excavating. No significant sidewall caving.			10 15 20 25									

The discussion in the text under the section titled, SUBSURFACE CONDITIONS, is necessary for a proper understanding of the nature of the subsurface material.

FIGURE 4D

Gordon Geotechnical Engineering, Inc.
4426 South Century Drive, Suite 100
Salt Lake City, Utah 84123

TEST PIT TP-5

Project Name: Proposed Creekside Estates
Project No.: 609-004-20
Location: 515 Cari Lane, Midway, Utah
Client: Construction Services Consulting
Excavating Method: Kubota KX057
Date Excavated: 01-28-20
Elevation: ---
Water Level: 3.0' (01-28-20)
Remarks:

DESCRIPTION	GRAPHIC LOG	WATER LEVEL	DEPTH (FT.)	SAMPLE SYMBOL	SAMPLE TYPE	BLOWS/FT.	MOISTURE (%)	DRY DENSITY (PCF)	% PASSING 200	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	REMARKS
CLAYEY FINE TO COARSE SAND AND FINE AND COARSE GRAVEL, FILL dark brown (SC/GC-FILL)												moist "loose"
FINE TO COARSE SAND AND FINE AND COARSE GRAVEL with trace silt; light brown (SP/GP)		▽	5		B				2.5			saturated "loose"
Excavation refusal at 8.0' due to saturated cohesionless granular soil flowing into test pit. Stopped sampling at 7.5'. Major sidewall caving.			10 15 20 25									

The discussion in the text under the section titled, SUBSURFACE CONDITIONS, is necessary for a proper understanding of the nature of the subsurface material.

FIGURE 4E

GORDON GEOTECHNICAL ENGINEERING, INC.

UNIFIED SOIL CLASSIFICATION SYSTEM

FIELD IDENTIFICATION PROCEDURES				GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS: More than half of material is larger than No. 200 sieve size. [1] (The No. 200 sieve size is about the smallest particle visible to the naked eye)	GRAVELS: More than half of coarse fraction is larger than No. 4 sieve size. (For visual classifications the 1/4" size may be used as equivalent to the No. 4 sieve size.)	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes		GW	Well graded gravels, gravel-sand mixtures little or no fines
			Predominantly one size or a range of sizes with some intermediate sizes missing.		GP	Poorly graded gravels, gravel-sand mixtures little or no fines
		GRAVELS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below)		GM	Silty gravels, poorly graded gravel-sand-silt mixtures.
			Plastic fines (for identification procedures see CL below).		GC	Clayey gravels, poorly graded gravel-sand-clay mixtures
	SANDS: More than half of coarse fraction is smaller than No. 4 sieve size. (For visual classifications the 1/4" size may be used as equivalent to the No. 4 sieve size.)	CLEAN SANDS (Little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate particle sizes		SW	Well graded sands, gravelly sands, little or no fines.
			Predominantly one size or a range of sizes with some intermediate sizes missing.		SP	Poorly graded sands, gravelly sands little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).		SM	Silty sands, poorly graded sand-silt mixtures.
			Plastic fines (for identification procedures see CL below).		SC	Clayey sands, poorly graded sand-clay mixtures.
FINE GRAINED SOILS: More than half of material is smaller than No. 200 sieve size. (The No. 200 sieve size is about the smallest particle visible to the naked eye)	IDENTIFICATION PROCEDURES ON FRACTION SMALLER THAN No. 40 SIEVE SIZE	DRY STRENGTH (CRUSHING CHARACTERISTICS)	DILATANCY (REACTION TO SHAKING)	TOUGHNESS (CONSISTENCY NEAR PLASTIC LIMIT)		
	SILTS AND CLAYS: Liquid limit less than 50	None to slight	Quick to slow	None	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sand with slight plasticity.
		Medium to high	None to very slow	Medium	CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		Slight to medium	Slow	Slight	OL	Organic silts and organic silt-clays of low plasticity.
	SILTS AND CLAYS: Liquid limit greater than 50	Slight to medium	Slow to none	Slight to medium	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		High to very high	None	High	CH	Inorganic clays of high plasticity, fat clays.
		Medium to high	None to very slow	Slight to medium	OH	Organic clays of medium to high plasticity
HIGHLY ORGANIC SOILS		Readily identified by color, odor, spongy feel and frequently by fibrous texture.			Pt	Peat and other highly organic soils.

[1] Boundary classifications: Soils possessing characteristics of two groups are designated by combinations of group symbols. For example GW-GC, well graded gravel-sand mixture with clay binder.
[2] All sieve sizes on this chart are U.S. standard.

GENERAL NOTES

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

FINE - GRAINED SOIL

CONSISTENCY	SPT (blows/ft)	TORVANE POCKET PENETROMETER: UNDRAINED SHEAR STRENGTH (tsf)	TORVANE POCKET PENETROMETER: UNCONFINED COMPRESSIVE STRENGTH (tsf)	FIELD TEST
Very Soft	<2	<0.125	<0.25	Easily penetrated several inches by Thumb. Squeezes through fingers.
Soft	2 - 4	0.125 - 0.25	0.25 - 0.5	Easily penetrated 1 " by Thumb , Molded by light finger pressure.
Medium Stiff	4 - 8	0.25 - 0.5	0.5 - 1.0	Penetrated over 1/2 " by Thumb with moerate effort. Molded by strong finger pressure.
Stiff	8 - 15	0.5 - 1.0	1.0 - 2.0	Indented about 1/2 " 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

LOG KEY SYMBOLS

Bulk - Bag Sample
Standard Penetration Split Spoon Sampler
Rock Core
Water Level
Thin Wall
No Recovery
3-3/4" ID D&M Sampler
3" ID D&M Sampler
California Sampler

COARSE -GRAINDE SOIL

APPERENT DENSITY	SPT (blows ft)	RELATIVE DENSITY (%)	FIELD TEST
Very Loose	<4	0 - 15	Easily penetrated with 1/2 " reinforcing rod pushed by hand
Loose	4 - 10	15 - 35	Difficult to penetrated with 1/2 " reinforcing rod pushed by hand
Medium Dense	10 - 30	35 - 65	Easily penetrated a foot with 1/2 " reinforcing rod driven with 5-lb hammer
Dense	30 - 50	65 - 85	Difficult to penetrated a foot with 1/2 " reinforcing rod driven with 5-lb hammer
Very Dense	>50	85 - 100	Penetrated only a few inches with 1/2 " reinforcing rod driven with 5-lb hammer

STRATIFICATION

DESCRIPTION	THICKNESS
SEAM	1/16 - 1/2 "
LAYER	1/2 - 12 "

DESCRIPTION	THICKNESS
Occasional	One or less per foot of thickness
Frequent	More than on per foot of thichness

CEMENTATION

DESCRIPTION	DESCRIPTION
Weakly	Crumbles or breaks with handling of slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumbles or breaks with finger pressure

MODIFIERS

DESCRIPTION	%
Trace	<5
Some	5 - 12
With	>12

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible water, usually soil below Water Table

FIGURE 5

CONSTRUCTION SERVICES CONSULTING
JOB NO. 609-004-20

GORDON GEOTECHNICAL ENGINEERING, INC.

#1 Looking south along stream.

#2 Looking west.

#3 Looking southeast.

#4 Looking south.

Locations and direction, see Figure 2, Area Map

FIGURE 6
PHOTOGRAPHS

New/Old Business

Adjourn