ALPINE CITY PLANNING COMMISSION MEETING

NOTICE is hereby given that the **PLANNING COMMISSION** of Alpine City, Utah will hold a **Public Meeting** on **Tuesday, July 20, 2021 at 7:00 pm at City Hall, 20 North Main Street, Alpine, Utah.**

The public may attend the meeting in person or view the meeting via the **Alpine City YouTube Channel**. A direct link to the channel can be found on the home page of the Alpine City website: **alpinecity.org**

I. GENERAL BUSINESS

A. Welcome and Roll Call: Jane Griener
B. Prayer/Opening Comments: Alan MacDonald
C. Pledge of Allegiance: Ed Bush

II. PUBLIC COMMENT

Any person wishing to comment on any item not on the agenda may address the Planning Commission. Comments may be given in person at the meeting.

III. ACTION ITEMS

A. Final Plat – Fort Creek Landing Subdivision (Formerly Koroem Court)
The Planning Commission will hold a public hearing, review the proposed final plat, and make a recommendation to the City Council.

B. Final Plat – Alpine Layton Subdivision (Formerly Whitby Woodlands Plat I)
The Planning Commission will hold a public hearing, review the proposed final plat, and make a recommendation to the City Council.

C. Public Hearing – Ordinance 2021-15 Storm Water Detention and Retention Basins
The Planning Commission will hold a public hearing, review the proposed ordinance, and make a recommendation to the City Council.

IV. COMMUNICATIONS

V. APPROVAL OF PLANNING COMMISSION MINUTES: June 15, 2021

ADJOURN

Chair Jane Griener
July 16, 2021

THE PUBLIC IS INVITED TO ATTEND ALL PLANNING COMMISSION MEETINGS. If you need a special accommodation to participate in the meeting, please call the City Recorder's Office at 801-756-6347 ext. 5.

CERTIFICATION OF POSTING. The undersigned duly appointed recorder does hereby certify that the above agenda notice was posted at Alpine City Hall, 20 North Main, Alpine, UT. It was also sent by e-mail to The Daily Herald located in Provo, UT a local newspaper circulated in Alpine, UT. This agenda is also available on the City's web site at www.alpinecity.org and on the Utah Public Meeting Notices website at www.utah.gov/pmn/index.html.

PUBLIC MEETING AND PUBLIC HEARING ETIQUETTE

Please remember all public meetings and public hearings are now recorded.

- All comments **must** be recognized by the Chairperson and addressed through the microphone.
- When speaking to the Planning Commission, please stand, speak slowly and clearly into the microphone, and state your name and address for the recorded record.
- Be respectful to others and refrain from disruptions during the meeting. Please refrain from conversation with others in the audience as the microphones are very sensitive and can pick up whispers in the back of the room.
- Keep comments constructive and not disruptive.
- Avoid verbal approval or dissatisfaction of the ongoing discussion (i.e., booing or applauding).
- Exhibits (photos, petitions, etc.) given to the City become the property of the City.
- Please silence all cellular phones, beepers, pagers or other noise making devices.
- Be considerate of others who wish to speak by limiting your comments to a reasonable length, and avoiding repetition of what has already been said. Individuals may be limited to two minutes and group representatives may be limited to five minutes.
- Refrain from congregating near the doors or in the lobby area outside the council room to talk as it can be very noisy and disruptive. If you must carry on conversation in this area, please be as quiet as possible. (The doors must remain open during a public meeting/hearing.)

Public Hearing vs. Public Meeting

If the meeting is a **public hearing**, the public may participate during that time and may present opinions and evidence for the issue for which the hearing is being held. In a public hearing there may be some restrictions on participation such as time limits.

Anyone can observe a **public meeting**, but there is no right to speak or be heard there - the public participates in presenting opinions and evidence at the pleasure of the body conducting the meeting.

ALPINE PLANNING COMMISSION AGENDA

SUBJECT: Final Plat – Fort Creek Landing Subdivision (Formerly Koroem Court)

FOR CONSIDERATION ON: 20 July 2021

PETITIONER: Brian Hansen with Heritage Custom Homes

ACTION REQUESTED BY PETITIONER: Approve the proposed Final Plat.

BACKGROUND INFORMATION:

The Koroem Court Subdivision consists of 3 lots on 8.44 aces, with lots ranging in size from 1.56 acres to 4.37 acres. The development is located in the CR-20,000 zone at approximately 662 North Whitby Woodlands Drive. Applicant is seeking approval of the Final Plat.

STAFF RECOMMENDATION:
Review the staff report and determine if the proposed subdivision should be approved.

SAMPLE MOTION TO APPROVE:
I move to recommend approval of the proposed final plans with the following conditions:

- Prior to recording, the developer:
  - meets the water policy;
  - provides a construction cost estimate;
  - provides roadway preservation funds;
  - provides signed offsite utility easement documents.

SAMPLE MOTION TO TABLE/DENY:
I move to recommend that the proposed plans be tabled (or denied) based on the following:

- ** INSERT FINDING**

ALPINE CITY
STAFF REPORT
July 16, 2021

To: Alpine City Planning Commission

From: Staff

Prepared By: Austin Roy, City Planner
Planning & Zoning Department

Jed Muhlestein, City Engineer
Engineering & Public Works Department

Re: **Fort Creek Landing (aka - Koroem Court) - FINAL**

Applicant:	Brian Hansen with Heritage Custom Homes
Project Location:	662 North Whitby Woodlands Drive
Zoning:	CR-20,000 Zone
Acreage:	Approximately 8.44 Acres
Lot Number & Size:	3 lots range from 1.56 acres to 4.37 acres
Request:	Approve the Final Plat

SUMMARY

The proposed Koroem Court Subdivision consists of 3 lots on 8.44 aces, with lots ranging in size from 1.56 acres to 4.37 acres. The development is located in the CR-20,000 zone at approximately 662 North Whitby Woodlands Drive. Applicant is seeking approval of the Final Plat.

BACKGROUND

Proposed development is located on previously undeveloped land. Staff has been working with the developer to make sure plans will meet ordinance. Developer has worked with Horrocks Engineering to resolve potential issues with the culinary water.

ANALYSIS

Lot Width and Area

Per the requirements of the CR-20,000 zone lots with greater amounts of slope have increased area requirements. See table below:

3.03.040 Density, Lot Area And Width Requirements - Single Family Dwellings

1. The minimum area and width requirements of a zoning lot shall be determined upon the average slope of the lot and the following schedule:

Average Slope of Lot*	Minimum Area (in square feet)	Minimum Width (at min. front setback)
0-9.9%	20,000 (.46 ac)	110 ft.
10-14.9%	30,000 (.68 ac)	110 ft.
15-19.9%	40,000 (.92 ac)	110 ft.
20-24.9%	60,000 (1.37 ac)	110 ft.
25%+	Not Buildable	Not Buildable

The proposed lots all exceed the minimum requirements for area, with the smallest lot being 68,059 square feet in size.

Lot width requirements for the CR-20,000 zone are 110 feet for a standard lot as measured at the 30 foot front setback line, and 80 feet for a cul-de-sac lot located on a curve as measured at the right of way line, and 110 feet as measured at the 30 foot front setback line. All proposed lots appear to meet the width requirement.

Two of the lots do not meet the definition of a lot, which is: "Lots shall be generally rectangular in nature, and shall have **no more than five sides without an exception** being recommended by the Planning Commission and approved by the City Council; the front of a property, located at the front right of way, does not count against this requirement." (DC 3.01.110 Lots) The City Council granted an exception to allow more than five sides on November 24, 2020.

Buildable Area
The proposed plat meets the buildable area requirements outlined in code.

Use
The developer is proposing that the lots be used for single-unit detached dwellings, which is consistent with the permitted uses of the CR-20,000 zone.

Sensitive Lands (Wildland Urban Interface)
The property is in areas identified on the City hazard maps. Applicant has submitted a Geotechnical report which is covered in the engineering review below. See Lone Peak Fire Department review for Wildland Urban Interface requirements.

Trails
The City has no planned trails through this area.

General Plan
Proposed subdivision is compatible with the City's General Plan.

REVIEWS

PLANNING AND ZONING DEPARTMENT REVIEW

The analysis section in the body of this report serves as the Planning and Zoning Department review.

ENGINEERING AND PUBLIC WORKS DEPARTMENT REVIEW
This section constitutes the engineering review for the Final application of Fort Creek Landing, previously known as Koroem Court. Typically, the Final Engineering review of any development is less extensive on the engineering side of things as Preliminary submittals require complete constructions sets and are reviewed at that time. At Final, Engineering is reviewing the final plat for completeness and calculating water rights and bonds. The Final Plat has been reviewed and appears to be complete. The remaining portions of this review were provided at Preliminary and discussed at length at that time. If any sections have changed, they will be in bold lettering for discussion.

Streets
The application shows the appropriate right of way dedication for the new cul-de-sac street with street grades that meet code. Frontage improvements (curb, gutter, sidewalk) are shown along all newly proposed frontages and are shown connecting to existing improvements along Whitby Woodlands Drive.

Utilities
Culinary Water and Pressurized Irrigation.
Water infrastructure exists at the end of Whitby Woodlands Drive and are available to be extended to serve the development. Having said that, Horrocks Engineers maintains the water models for the city. Horrocks reviews plans to make sure a proposed development fits within the master plans. The culinary and pressurized irrigation systems were found to require offsite improvements to meet the minimum fire flows and pressures for the development. The plans propose to connect both systems to Main Street via Nathan Terry's property (717 N Main St.). Connecting the waterlines to Main Street and Whitby Woodlands Drive creates a "looped" water system. Looped water systems provide water to the development from more than one connection point and are the preferred way of providing supply to any given area. The developer will need to provide access and maintenance easements for the water systems where they are not located in a public right-of-way. The easements are to be provided prior to construction or recorded with the Final Plat (prior to construction). **Easements for offsite waterlines was provided with the Final application.** The applicant will be required to acquire a Utah Stream Alteration Permit for any work near Fort Creek as well as an Alpine City Flood Plain Permit for work within the flood plain. New services are shown for each lot.

Storm Water.
Westfield ditch runs along the easterly side of the proposed development. This ditch is shown to be piped though the development, which follows DC 4.07.190 requirements. The alignment of the piped ditch works out well for access and maintenance, being close to a proposed driveway. Piping the ditch will also help alleviate issues such as dumping of trash and yard waste the City sees on open ditches throughout the city. A 20-foot wide easement for said ditch/pipe is shown on the preliminary plat.

An existing drainage easement resides on the property for stormwater runoff generated by a

ravine on the west side of the property, which extends further west off the property. This easement was intended to provide a route for stormwater flows to drain to Westfield Ditch or Fort Creek. The plans show vacating this easement and propose a new alignment and easement for these flows. Engineering has reviewed and approved the proposed alignment.

The plans show a retention pond on the south side of Lot 1. This pond handles the stormwater flows from the development and appears to follow city codes as it pertains to design. An access road for maintenance, along with easements for access are also shown. There is a small retaining wall on the upper west side of the retention pond; the Developer will be required to provide a design of the retaining wall prior to Final submittal. **The Developer has provided details on the retaining walls.**

Sewer.
Sewer is shown to connect to the main line in Whitby Woodlands Drive and extend to serve the development. New sewer laterals are shown for each lot.

Geologic Hazards
The site is situated within areas of potential geologic hazards as identified on Alpine City hazard maps and as thus, was required to investigate earthquake, rockfall, debris flow, flooding, and slide hazards for the site. Gordon Geotechnical Engineering, Inc. (G^2) performed the study and no issues of concern on any of the studied items were brought forward.

Alpine City Construction Standard Specifications require a California Bearing Ratio (CBR) value to be obtained and reported in the geotechnical report for roadway design**.** This value was provided, and an appropriate roadway design was chosen based on this information.

Other
Developer is requesting cash in leu of water rights. This can be approved now (at the City Council level) or later when they have a final plat ready for approval. For properties historically irrigated with Alpine Company Irrigation shares (which this property was), the city typically requires Alpine Irrigation Company shares be turned in to serve the development. Accepting cash in leu of water rights requires the developer to pay 125% of the current market value of the water rights. (DC 4.07.230.3.e) **Recent discussions with the developer show they intend to meet the water policy with Alpine Irrigation Company water shares.**

There are redlines on the plat and construction drawings to be corrected prior to Final submittal. **All redlines from Preliminary review have been corrected.**

The Developer needs to provide a construction cost estimate for bonding purposes.

Alpine City specifications require escrow funds for a roadway preservation coat (See Alpine City Construction Standard Specifications 300.030 & 600.020). The amount for this requirement will be calculated based on current preservation coat costs at the time of recording. The escrow funds for this roadway preservation coat will be required of the Developer prior to recording.

LONE PEAK FIRE DEPARTMENT REVIEW
See the attached review from the Lone Peak Fire Department.

HORROCKS ENGINEERING REVIEW
See the attached review from Horrocks Engineers.

NOTICING
Notice has been properly issued in the manner outlined in City and State Code

STAFF RECOMMENDATION

Review staff report and findings and either recommend approval, table, or deny the proposed subdivision. Findings are outlined below.

Findings for a Positive Motion:

A. the proposed plan meets city ordinances in terms design, frontage, lot size, and infrastructure improvements;
B. City Council granted an exception to the number of sides a lot can have;
C. there are no geologic hazard issues mentioned in the geologic hazard report for the area;
D. the developer has provided a design which coincides with ordinances and master plans.

Findings for Negative Motion:

A. **INSERT FINDING**

MODEL MOTIONS

SAMPLE MOTION TO APPROVE

I move to recommend approval of the proposed final plans with the following conditions:

- Prior to recording, the developer:
    - meets the water policy;
    - provides a construction cost estimate;
    - provides roadway preservation funds;
    - provides signed offsite utility easement documents.

SAMPLE MOTION TO DENY/TABLE

I move to recommend that the proposed plans be tabled (or denied) based on the following:

- **INSERT FINDING**

July 15, 2021

Austin Roy
Alpine City Planner
20 North Main
Alpine, Utah 84004

Subject: Fort Creek Landing Road Preservation Coat Cost

Dear Austin:

I have reviewed the **Fort Creek Landing** plans and recommend the following be required in cash prior to recording. These are non-refundable funds required by ordinance or development agreement:

ROADWAY IMPROVEMENTS

Asphalt Roadway Preservation Coat Cost*	12,312 SF	@	$ 0.25	$3,078.00
	TOTAL CASH REQUIRED:			**$3,078.00**

**Square footages obtained from project AutoCAD files*

Per Alpine City Construction Standard Specifications, adopted November 19, 2019, Section 600.020, the Developer is required to provide funds for a roadway preservation coat prior to recording the development. Alpine City received a quote from Holbrook Asphalt for such costs April 14, 2020 (quote good through 2022) in the amount of 25 cents per square foot of HA5 material installed. This unit price will be used on all development projects through the year 2022, at which time the costs will be reevaluated.

Sincerely,
ALPINE CITY

Jed Muhlestein, P.E.
City Engineer

cc: File

LONE PEAK FIRE DISTRICT
5582 PARKWAY WEST DRIVE
HIGHLAND, UTAH 84003
(801) 763-5365
WWW.LONEPEAKFIRE.COM

REED M. THOMPSON, FIRE CHIEF

MEMORANDUM

DATE: 27 October 2020

TO: Jed Muhlestein, City Engineer, Alpine City
CC: Austin Roy, City Planner, Alpine City

FROM: Reed M. Thompson, Fire Chief

SUBJECT: KOROEM COURT SUBDIVISION 3-LOT CONCEPT PLAN

In review of the proposed site development concept plan for "Koroem Court 3-Lot Concept", dated 3 September 2020, and located at 662 North Whitby Woodlands Drive, please note:

- The distance of the proposed building footprint on Lot 78 exceeds the distance allowed for fire access, when coming off of the cul-de-sac. All portions of the building are to be within 150 feet of the access road. An exception can be met if one or both of the following conditions are met:
  - Residential fire sprinklers are installed. (Note: This may be required as a result of the location in the WUI.)
  - A 20-foot-wide fire access road is constructed within 150 feet of the furthest point of the structure. The said access road needs to meet structural standards established in the currently approved International Fire Code. Access roads in excess of 150 feet require an approved turnaround.
- A fire hydrant is required within 250 feet of all structures.
- Fire flows need to be in accordance with the currently approved International Fire Code.

If you have further questions regarding this information, please contact me directly.

HORROCKS ENGINEERS

To: **Jed Muhlestein**
Alpine City

From: **John E. Schiess, P.E.**

Date: May 14, 2021 **Memorandum**

Subject: **Koroem Court Hydraulic Modeling Results and Recommendations Update 3**

The proposed Korem Court development consist of 3 single family homes located at 662 North Whitby Woodlands Dr. Development is right at the upper edge of the lower culinary and PI pressure zones. This version of the proposed development proposes to install a loop from the north end of the cul-de-sac east to Main Street through an easement.

The development proposes 3 culinary ERC's, 5.21 irrigated acres, and 3 sanitary sewer ERU's. The current master plan anticipated 16.11 culinary ERC's, 4.66 irrigated acres, and 16.11 sanitary sewer ERU's. Proposed connections fall well within the current master plans for culinary and sewer but are slightly more than anticipated for PI in this area. It is estimated that 66 percent of the total lot area will be irrigated although this may not be the case given the topography and number of lots.

The proposed culinary water improvements have been modeled in both the current and buildout models. The proposed improvements fit well within the City's culinary water master plan and modeling shows them to be adequate. The plan as it stands will provide approximately 2,000 gpm fire flow. This analysis assumes the highest home elevation was 5040 feet in elevation. The following comments and recommendations are noted for the proposed culinary water system. There would be adequate pressures and fire flows for homes under 6,200 sf without fire sprinklers. If fire sprinklers were installed, then homes up to 23,300 sf could be constructed. A note similar to the following should be considered on this plat. "Culinary water pressures as designed meet the State of Utah Division of Drinking Water minimum standards at the water main. Individual homes within this plat may need to adjust their internal plumbing to account for minimal pressures. Individual home booster pumps are not allowed unless approved by the City and the Division of Drinking Water."

The proposed pressurized irrigation improvements have been modeled in both the current and buildout models under both wet and dry year supply conditions. The proposed improvements fit within the City's pressurized irrigation master plan and modeling shows them to be adequate in the current system. The following comments and recommendations are noted for the proposed pressurized irrigation system. A note similar to the proposed culinary note is recommended for the PI system as well.

The proposed sanitary sewer improvements have been modeled in both the current and buildout models. The proposed improvements fit well within the City's sanitary sewer master plan and modeling shows them to be adequate.

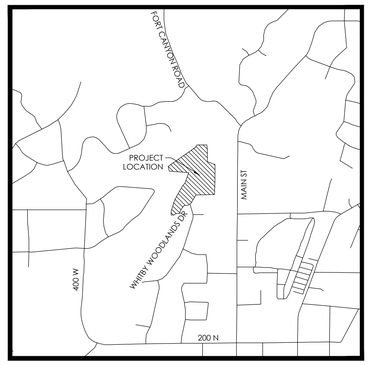
FORT CREEK LANDING

PREPARED FOR:

HERITAGE CUSTOM HOMES

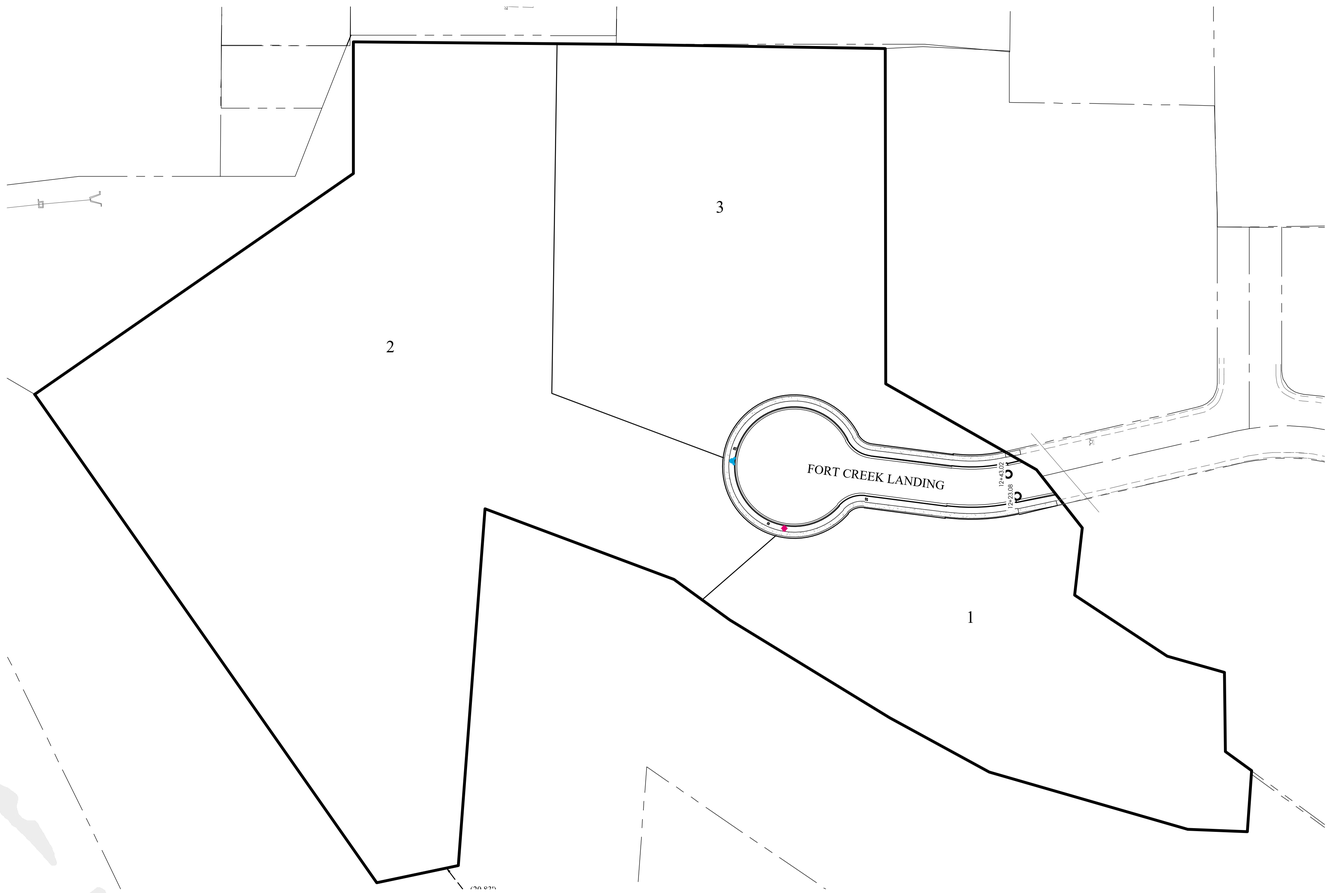
LOCATED IN:

ALPINE CITY, UTAH COUNTY, UTAH



VICINITY MAP

NTS



SITE MAP

GRAPHIC SCALE

60 0 30 60 120 240

(IN FEET)

1 inch = 60 ft.

Sheet List Table

Sheet Number	Sheet Title
C1	COVER SHEET
C2	PLAT
C3	SITE AND UTILITY PLAN
C3.1	BUILDABLE AREA PLAN
C3.2	BUILDABLE AREA SLOPE ANALYSIS PLAN
C4	GRADING AND DRAINAGE PLAN
C5.1	OFF-SITE DRAINAGE AREA
C5.2	SITE DRAINAGE AREA
C6	OFF SITE WATER
PP01	FORT CREEK LANDING
PP02	STORM DRAIN
PP03	OFFSITE WATER
PP04	OFFSITE WATER
PP05	IRRIGATION LINE
,PP06	,PP06
D1	DETAILS

GENERAL NOTES

1. CONTRACTOR TO FIELD VERIFY HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION, AND REPORT ANY DISCREPANCIES TO THE ENGINEER.

2. ANY AND ALL DISCREPANCIES IN THESE PLANS ARE TO BE BROUGHT TO THE ENGINEER'S ATTENTION PRIOR TO COMMENCEMENT OF CONSTRUCTION.

3. ALL CONSTRUCTION SHALL ADHERE TO ALPINE CITY STANDARD PLANS AND SPECIFICATIONS.

4. ALL UTILITIES AND ROAD IMPROVEMENTS SHOWN ON THE PLANS HEREIN SHALL BE CONSTRUCTED USING REFERENCE TO SURVEY CONSTRUCTION STAKES PLACED UNDER THE SUPERVISION OF A PROFESSIONAL LICENSED SURVEYOR WITH A CURRENT LICENSE ISSUED BY THE STATE OF UTAH. ANY IMPROVEMENTS INSTALLED BY ANY OTHER VERTICAL OR HORIZONTAL REFERENCE WILL NOT BE ACCEPTED OR CERTIFIED BY THE ENGINEER OF RECORD.

5. THIS DRAWING SET IS SCALED TO BE PRINTED ON A 24" X 36" SIZE OF PAPER (ARCH. D). IF PRINTED ON A SMALLER PAPER SIZE, THE DRAWING WILL NOT BE TO SCALE AND SHOULD NOT BE USED TO SCALE MEASUREMENTS FROM THE PAPER DRAWING. ALSO USE CAUTION, AS THERE MAY BE TEXT OR DETAIL THAT MAY BE OVERLOOKED DUE TO THE SMALL SIZE OF THE DRAWING.

NOTICE

BEFORE PROCEEDING WITH THIS WORK, THE CONTRACTOR SHALL CAREFULLY CHECK AND VERIFY ALL CONDITIONS, QUANTITIES, DIMENSIONS, AND GRADE ELEVATIONS, AND SHALL REPORT ALL DISCREPANCIES TO THE ENGINEER.

ENGINEER'S NOTES TO CONTRACTOR

1. THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES, CONDUITS OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS, TO THE BEST OF OUR KNOWLEDGE, THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN ON THESE DRAWINGS. THE CONTRACTOR FURTHER ASSUMES ALL LIABILITY AND RESPONSIBILITY FOR THE UTILITY PIPES, CONDUITS OR STRUCTURES SHOWN OR NOT SHOWN ON THESE DRAWINGS. IF UTILITY LINES ARE ENCOUNTERED DURING CONSTRUCTION THAT ARE NOT IDENTIFIED BY THESE PLANS, CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY.

2. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE CITY, THE OWNER, AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR THE ENGINEER.

3. UNAUTHORIZED CHANGES & USES: THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS.

4. ALL CONTOUR LINES SHOWN ON THE PLANS ARE AN INTERPRETATION BY CAD SOFTWARE OF FIELD SURVEY WORK PERFORMED BY A LICENSED SURVEYOR. DUE TO THE POTENTIAL DIFFERENCES IN INTERPRETATION OF CONTOURS BY VARIOUS TYPES OF GRADING SOFTWARE BY OTHER ENGINEERS OR CONTRACTORS, FOCUS DOES NOT GUARANTEE OR WARRANTY THE ACCURACY OF SUCH LINEWORK. FOR THIS REASON, FOCUS WILL NOT PROVIDE ANY GRADING CONTOURS IN CAD FOR ANY TYPE OF USE BY THE CONTRACTOR. SPOT ELEVATIONS AND PROFILE ELEVATIONS SHOWN IN THE DESIGN DRAWINGS GOVERN ALL DESIGN INFORMATION ILLUSTRATED ON THE APPROVED CONSTRUCTION SET. CONSTRUCTION EXPERTISE AND JUDGMENT BY THE CONTRACTOR IS ANTICIPATED BY THE ENGINEER TO COMPLETE BUILD-OUT OF THE INTENDED IMPROVEMENTS.

CONTACTS

ENGINEER & SURVEYOR
FOCUS ENGINEERING & SURVEYING, LLC
6949 S. HIGH TECH DRIVE SUITE 200
MIDVALE, UTAH 84047
(801) 352-0075
PROJECT MANAGER: MATHEW WANGSGAARD, PE
SURVEY MANAGER: SPENCER LLEWELYN, PLS

OWNER/DEVELOPER
HERITAGE CUSTOM HOMES
623 NORTH PATTERSON LANE
ALPINE ,UTAH 84004
(801) 694-9125
CONTACT: BRIAN HANSEN

Know what's below. Call 811 before you dig.

FLOOD ZONE

PORTIONS OF THE SUBJECT PROPERTY LIE WITHIN A REGULATORY FLOODWAYAND FLOOD HAZARD AREAS ZONE AE & UNSHADED ZONE X ACCORDING TO FEMA (FEDERAL EMERGENCY MANAGEMENT AGENCY) FIRM (FLOOD INSURANCE RATE MAP) #49049C0159F MAP REVISION DATE: JUNE 19, 2020 (TO REFLECT LOMR)

BENCHMARK

NORTHEAST CORNER OF SECTION 13
TOWNSHIP 4 SOUTH, RANGE 1 EAST
SALT LAKE BASE AND MERIDIAN
ELEV: 5036.49
DATUM: NGVD 29

FOCUS©
ENGINEERING AND SURVEYING, LLC
6949 S. HIGH TECH DRIVE SUITE 200
MIDVALE, UTAH 84047 PH: (801) 352-0075
www.focusutah.com

FOR REVIEW ONLY

FORT CREEK LANDING
ALPINE CITY, UTAH COUNTY, UTAH
COVER SHEET

REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

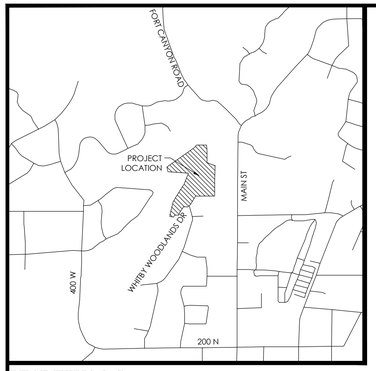
COVER SHEET

Scale: 1"=60' | Drawn: MHW

Date: 07/09/21 | Job #: 19-0487

Sheet: C1

Z:_2019\19-0487 Koroem Court\design\19-0487\dwg\sheets\C1 - COVER SHEET.dwg

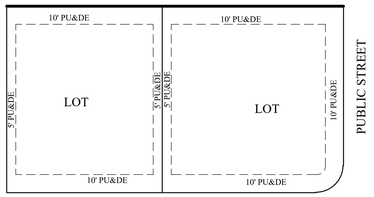


VICINITY MAP

N.T.S

LEGEND

- BOUNDARY
- SECTION LINE
- EASEMENT
- RIGHT-OF-WAY LINE
- BUILDABLE AREA
- EXISTING PROPERTY LINE
- SECTION MONUMENT (FOUND)
- STREET MONUMENT (TO BE SET)
- BOUNDARY MARKERS
- FEMA REGULATORY FLOODWAY
- FEMA SPECIAL FLOOD HAZARD AREA ZONE AE



PUBLIC STREET

TYPICAL PUBLIC UTILITY AND DRAINAGE EASEMENTS

N.T.S.

NOTES

1. #5 X 24" REBAR & CAP (FOCUS ENG) TO BE SET AT ALL LOT CORNERS. NAILS OR PLUGS TO BE SET IN TOP BACK OF CURB AT EXTENSION OF SIDE LOT LINES, IN LIEU OF REBAR AND CAPS AT FRONT LOT CORNERS.

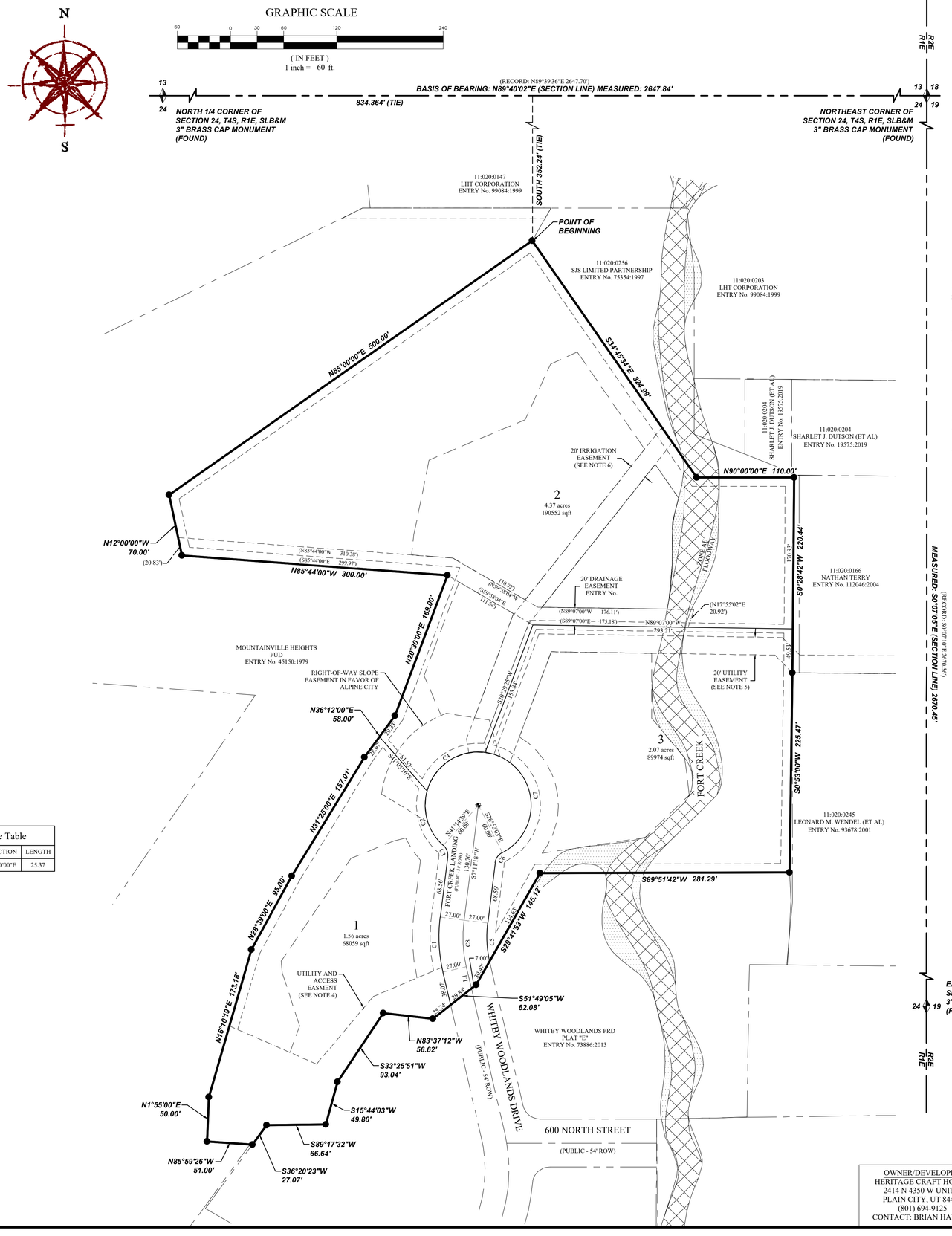
2. LOTS 2 AND 3 CANNOT HAVE OPENINGS TO A BASEMENT LOWER THAN THE NEAREST BASE FLOOD ELEVATION.

FLOOD ZONE

PORTIONS OF THE SUBJECT PROPERTY LIE WITHIN A REGULATORY FLOODWAYAND FLOOD HAZARD AREAS ZONE AE & UNSHADED ZONE X ACCORDING TO FEMA (FEDERAL EMERGENCY MANAGEMENT AGENCY) FIRM (FLOOD INSURANCE RATE MAP) #49049C0159F MAP REVISION DATE: JUNE 19, 2020 (TO REFLECT LOMR)

Curve Table					
CURVE	RADIUS	DELTA	LENGTH	CHORD DIRECTION	CHORD LENGTH
C1	177.00	20°11'18"	62.37	S02°54'21"E	62.04
C2	60.00	64°00'31"	67.03	S16°45'06"E	63.60
C3	15.00	55°56'39"	14.65	S20°47'02"E	14.07
C4	60.00	81°59'24"	85.86	S56°14'52"W	78.72
C5	123.00	20°11'17"	43.34	N02°54'20"W	43.11
C6	15.00	55°56'39"	14.65	N35°09'38"E	14.07
C7	60.00	145°53'23"	152.78	N09°48'44"W	114.72
C8	150.00	20°11'18"	52.85	S02°54'21"E	52.58

Line Table		
LINE	DIRECTION	LENGTH
L1	S13°00'00"E	25.37



ADDRESS TABLE

LOT	ADDRESS
1	655 NORTH FORT CREEK LANDING
2	751 NORTH FORT CREEK LANDING
3	692 NORTH FORT CREEK LANDING

NOTES

1. FIRE HYDRANT REQUIRED WITHIN 250' OF ANY PROPOSED HOME.

2. HOMES BUILT FURTHER THAN 150' FROM A PUBLIC STREET MUST PROVIDE FIRE ACCESS ROAD TO BE APPROVED BY THE LONE PEAK FIRE DEPARTMENT

3. THIS PLAT CONTAINS PROPERTIES SITUATED WITHIN THE WILDLAND/URBAN INTERFACE. HOMES WITHIN THIS AREA MAY BE REQUIRED TO INSTALL FIRE SPRINKLERS

4. A PORTION OF LOT 1 CONTAINS AN EASEMENT IN FAVOR OF ALPINE CITY CORPORATION FOR THE PURPOSE OF STORM WATER COLLECTION. THE CITY RESERVES THE RIGHT TO ENTER THE PROPERTY FOR MAINTENANCE, REPAIR, AND INSPECTION. THE OWNER CANNOT MODIFY THE EASEMENT AREA IN ANY WAY WITHOUT APPROVAL OF THE CITY ENGINEER AND CITY ADMINISTRATOR.

5. A PORTION OF LOT 3 CONTAINS AN EASEMENT IN FAVOR OF ALPINE CITY CORPORATION FOR THE PURPOSE OF PRESSURIZED IRRIGATION AND CULINARY WATER. THE CITY RESERVES THE RIGHT TO ENTER THE PROPERTY FOR MAINTENANCE, REPAIR, AND INSPECTION. THE OWNER CANNOT MODIFY THE EASEMENT AREA IN ANY WAY WITHOUT APPROVAL OF THE CITY ENGINEER AND CITY ADMINISTRATOR.

6. A PORTION OF LOT 2 CONTAINS AN EASEMENT IN FAVOR OF ALPINE CITY CORPORATION FOR THE WESTFIELD DITCH. THE CITY RESERVES THE RIGHT TO ENTER THE PROPERTY FOR MAINTENANCE, REPAIR, AND INSPECTION. THE OWNER CANNOT MODIFY THE EASEMENT AREA IN ANY WAY WITHOUT APPROVAL OF THE CITY ENGINEER AND CITY ADMINISTRATOR.

SURVEYOR'S CERTIFICATE

I, Evan J. Wood, do hereby certify that I am a Professional Land Surveyor, and that I hold License No. 183395 in accordance with Title 58, Chapter 22 of Utah State Code. I further certify by authority of the owners(s) that I have completed a Survey of the property described on this Plat in accordance with Section 17-23-17 of said Code, and have subdivided said tract of land into lots, blocks, streets, and easements, and the same has, or will be correctly surveyed, staked and monumented on the ground as shown on this Plat, and that this Plat is true and correct.

FOR REVEIW ONLY

Evan J. Wood — Date
Professional Land Surveyor
License No. 183395

BOUNDARY DESCRIPTION

Commencing North 89°40'02" East 834.364 feet along the Section line and South 352.24 feet from the North one-quarter corner of Section 24, Township 4 South, Range 1 East, Salt Lake Base and Meridian; thence South 34°45'34" East 324.994 feet; thence East 110.00 feet; thence along an existing fence South 0°28'42" West 220.442 feet to the North line of Wendel property as described in Warranty Deed Entry 15831.1995; thence South 0°53' West 225.472 feet along said deed/fence line and BLA of Entry 2547:1982; thence along Whitby Woodlands PRD Plats C & E boundaries (same as existing fence line) as follows: South 89°51'42" West 281.288 feet; thence South 29°41'53" West 145.12 feet; thence South 51°49'05" West 62.08 feet; thence North 83°37'12" West 56.62 feet; thence South 33°25'51" West 93.043 feet; thence South 15°44'03" West 49.798 feet; thence South 89°17'32" West 66.64 feet; thence South 36°20'23" West 27.065 feet; thence along Mountainville Heights PUD Subdivision boundary as follows; North 85°59'26" West 51.00 feet; thence North 1°55' East 50.00 feet; thence North 16°10'19" East 173.18 feet; thence North 28°39' East 95.00 feet; thence North 31°25' East 157.01 feet; thence North 36°12' East 58.00 feet; thence North 20°30' East 169.00 feet; thence North 85°44' West 300.00 feet; thence North 12°00' West 70.00 feet; thence North 55°00' East 500.00 feet to the point of beginning.

OWNER'S DEDICATION

KNOW ALL MEN BY THESE PRESENT THAT WE, ALL OF THE UNDERSIGNED OWNERS OF ALL OF THE PROPERTY DESCRIBED IN THE SURVEYOR'S CERTIFICATE HEREON AND SHOWN ON THIS MAP, HAVE CAUSED THE SAME TO BE SUBDIVIDED INTO LOTS, BLOCKS, STREETS AND EASEMENTS AND DO HEREBY DEDICATE ANY PUBLIC STREETS AND OTHER PUBLIC AREAS AS INDICATED HEREON FOR PERPETUAL USE OF THE PUBLIC.

IN WITNESS WHEREOF WE HAVE HEREUNTO SET OUR HANDS THIS _____ DAY OF _____ A.D. 20____

BY: _____
(PRINTED NAME)

ITS: _____

CORPORATE ACKNOWLEDGMENT

STATE OF UTAH
S.S.
COUNTY OF _____

ON THE ____ DAY OF _____ A.D. 20____ PERSONALLY APPEARED BEFORE ME , THE UNDERSIGNED NOTARY PUBLIC, IN AND FOR THE COUNTY OF _____, IN SAID STATE OF UTAH, _____ WHO AFTER BEING DULY SWORN, ACKNOWLEDGED TO ME THAT HE IS THE _____ OF _____ A UTAH INC. AND THAT HE SIGNED THE OWNERS DEDICATION FREELY AND VOLUNTARILY FOR AND IN BEHALF OF SAID COMPANY FOR THE PURPOSES THEREIN MENTIONED.

MY COMMISSION EXPIRES: _____ _____
A NOTARY PUBLIC COMMISSIONED IN UTAH RESIDING IN _____ COUNTY

MY COMMISSION No. _____ _____
PRINTED FULL NAME OF NOTARY

ACCEPTANCE BY LEGISLATIVE BODY

THE CITY COUNCIL OF ALPINE CITY, COUNTY OF UTAH, APPROVES THIS SUBDIVISION AND HEREBY ACCEPTS THE DEDICATION OF ALL STREETS; EASEMENTS AND OTHER PARCELS OF LAND INTENDED FOR PUBLIC PURPOSES FOR THE PERPETUAL USE OF THE PUBLIC THIS _____ DAY OF _____, A.D. 20____.

_____ _____
APPROVED BY MAYOR — ATTEST: CITY RECORDER

_____ _____
APPROVED BY CITY ENGINEER

PLANNING COMMISSION APPROVAL

APPROVED THIS ____ DAY OF _____, A.D. 20____ BY THE ALPINE CITY PLANNING COMMISSION.

_____ _____
DIRECTOR - SECRETARY — CHAIRMAN, PLANNING COMMISSION

APPROVAL AS TO FORM

APPROVED AS TO FORM THIS ____ DAY OF _____, A.D 20____

CITY ATTORNEY: _____

FORT CREEK LANDING

SUBDIVISION
LOCATED IN THE NE 1/4 OF SECTION 24, T4S, R1E,
SALT LAKE BASE & MERIDIAN
ALPINE CITY, UTAH COUNTY, UTAH

SURVEYOR'S SEAL	NOTARY PUBLIC SEAL	ALPINE CITY ENGINEER SEAL	ALPINE CITY RECORDER SEAL

FOR REVEIW ONLY

OWNER/DEVELOPER
HERITAGE CRAFT HOMES
2414 N 4350 W UNIT B
PLAIN CITY, UT 84404
(801) 694-9125
CONTACT: BRIAN HANSEN

FOCUS©
ENGINEERING AND SURVEYING, LLC
6949 HIGH TECH DRIVE
MIDVALE, UTAH 84047 PH: (801) 352-0075
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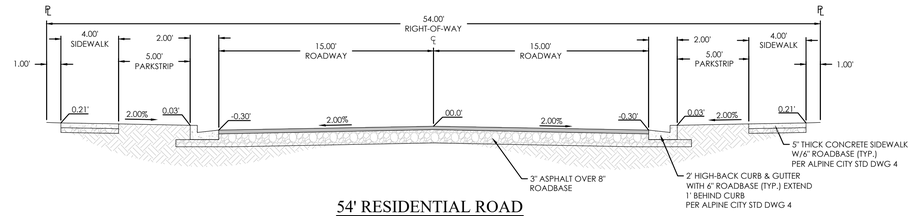

54' RESIDENTIAL ROAD

N.T.S.

MATCHLINE
SEE SHEET C6

45 BEND
6" PVC C900 L=36.27'±
45 BEND
8" PVC C900 L=30.59'±
45 BEND
45 BEND
INSTALL GATE IN EXISTING FENCE
4.0' WIDE 6" DEEP ROADBASE WALKWAY
EXISTING DITCH TO REMAIN
PI DRAIN DAYLIGHTS TO FORT CREEK
EXISTING STREAM TO REMAIN INTACT AND UNALTERED
EXISTING DITCH TO REMAIN
EXISTING DITCH TO BE PIPED
EXISTING DITCH TO BE PIPED
6" PVC C900 L=173.76'±
22.5 BEND
8" PVC C900 L=14.82'±
22.5 BEND
8" PVC C900 L=10.98'±
45 BEND
AIR-VAC PER ALPINE CITY STNDS.
8" PVC C900 L=165.64'±
11.25 BEND
FIRE HYDRANT #1 PER ALPINE CITY STND DRAWING 23
3/4" SEC. WATER SERVICE (TYP.)
4" PVC SEWER LATERAL (TYP.)
45 BEND
AIR-VAC PER ALPINE CITY STNDS. PER STND. DWG. 26
6" PVC C900 L=240.22'±
SSMH #2 RIM=5013.11 INV. OUT=4997.02 (S) PER ALPINE CITY STND DRAWING 17
1" CULINARY WATER SERVICE (TYP.) PER STND. DWG. 27
STREET LIGHT #1 PER ALPINE STND DRAWING 31
8" SDR-35 SEWER L=181.69' S=3.13%
11.25 BEND
6" PVC C900 L=92.75'±
SSMH #1 RIM=5004.84 INV. OUT=4991.34 (S) INV. IN=4991.34 (N) PER ALPINE CITY STND DRAWING 17
22.5 BEND
6" PVC C900 L=61.83'±
8" SDR-35 SEWER L=63.05' S=3.00%
EX. FENCES TO BE REMOVED
EXISTING FIRE HYDRANT
ASPHALT CUT AND REPLACE PER APWA 255 (DETAIL ON SHEET D1)
EX 36" RCP CULVERT
8" PVC C900 L=88.46'±
CONNECT TO EXISTING WATER
8" PVC C900 L=171.18'±
11.25 BEND
EX 36" RCP CULVERT
EXIST. SSMH #1 RIM=5002.10 INV. IN=4989.45 (N) INV. OUT=4989.25 (S) CONNECT TO EXIST. SS PER ALPINE STNDS.
CONNECT TO EXIST. SW PER ALPINE STNDS.
EXISTING TEMPORARY TURN-AROUND TO BE REMOVED
20' POND ACCESS ROAD AND UTILITY EASEMENT
OVERFLOW SPILLWAY
RETENTION POND
4' RETAINING WALL

1
2
3

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

LEGEND

- BOUNDARY
- ROW
- CENTERLINE
- LOT LINE
- EASEMENT
- 15" STORM DRAIN
- 8" SANITARY SEWER
- 8" CULINARY WATER
- 6" SECONDARY WATER
- CONTOUR MAJOR
- CONTOUR MINOR
- EXIST. STORM DRAIN
- EXIST. SANITARY SEWER
- EXIST. CULINARY WATER
- EXIST. FENCE
- EXIST. CONTOUR MAJOR
- EXIST. CONTOUR MINOR
- SIGN
- STREET LIGHT
- SD MH, INLET, AND COMBO
- SEWER MANHOLE
- VALVE, TEE & BEND
- WATER BLOW-OFF
- FIRE HYDRANT
- STREET MONUMENT (TO BE SET)
- EXIST. STREET MONUMENT
- EXIST. SD INLET & MH
- EXIST. SEWER MH
- EXIST. VALVE, TEE, & BEND
- EXIST. FIRE HYDRANT
- SPOT ELEVATION
- FEMA REGULATORY FLOODWAY
- FEMA SPECIAL FLOOD HAZARD AREA ZONE AE

Know what's below. Call 811 before you dig.

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FOR REVIEW ONLY

FORT CREEK LANDING

ALPINE CITY, UTAH COUNTY, UTAH

SITE AND UTILITY PLAN

REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

SITE AND UTILITY PLAN

Scale: 1"=40' | Drawn: MHW
Date: 07/09/21 | Job #: 19-0487
Sheet: C3

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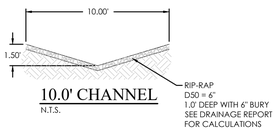
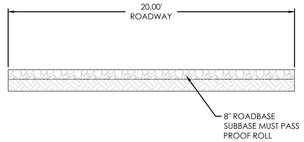
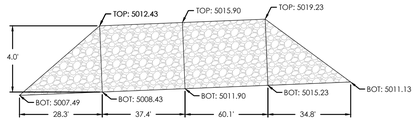


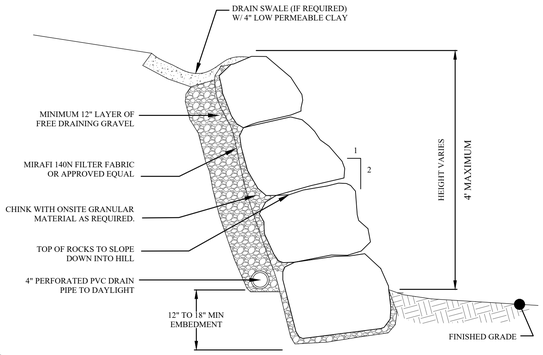
10.0' CHANNEL
N.T.S.



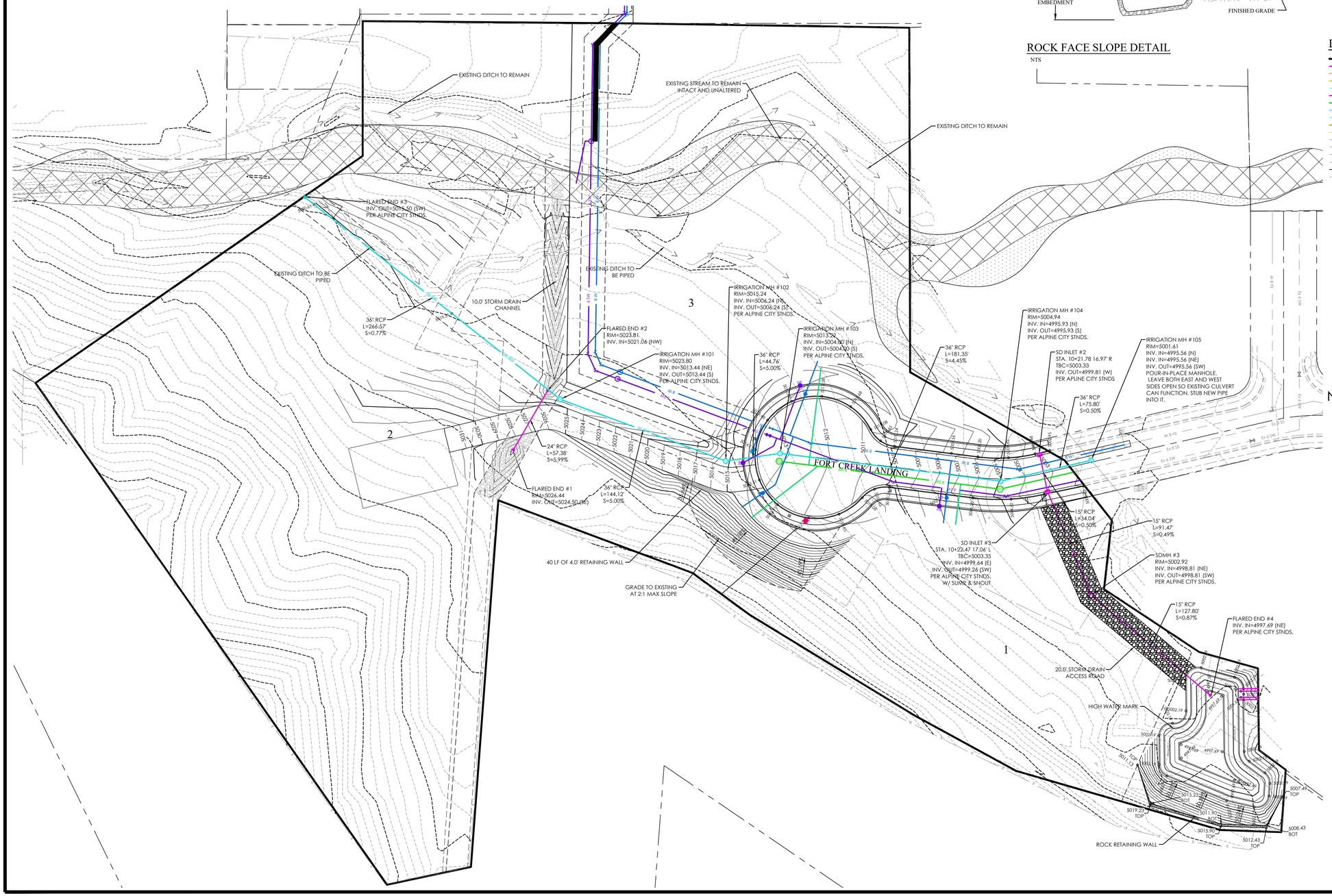
STORM DRAIN ACCESS ROAD
N.T.S.



ROCK RETAINING WALL
N.T.S.



ROCK FACE SLOPE DETAIL
NTS



GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

LEGEND

- BOUNDARY
- ROW
- CENTERLINE
- LOT LINE
- EASEMENT
- 15" STORM DRAIN
- 8" SANITARY SEWER
- 8" CULINARY WATER
- 6" SECONDARY WATER
- CONTOUR MAJOR
- CONTOUR MINOR
- EXIST. STORM DRAIN
- EXIST. SANITARY SEWER
- EXIST. CULINARY WATER
- EXIST. FENCE
- EXIST. CONTOUR MAJOR
- EXIST. CONTOUR MINOR
- SIGN
- STREET LIGHT
- SD MH, INLET, AND COMBO
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- EXIST. VALVE, TEE, & BEND
- EXIST. FIRE HYDRANT
- SPOT ELEVATION
- FEMA REGULATORY FLOODWAY
- FEMA SPECIAL FLOOD HAZARD AREA ZONE AE

NOTES:

1. EACH LOT TO HAVE A RETENTION BASIN AT BUILDING PERMIT STAGE.
2. THIS PROJECT HAS A CBR VALUE OF 15 PER THE GEOTECH REPORT PROVIDED BY GORDON GEOTECHNICAL ENGINEERING, INC PROJECT # 660-003-20

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KOROEM COURT

ALPINE CITY, UTAH COUNTY, UTAH

GRADING AND DRAINAGE PLAN

REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

GRADING AND DRAINAGE PLAN

Scale:	1"=40'	Drawn:	MHW
Date:	06/09/21	Job #:	19-0487
Sheet:	C4		

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FORT CREEK LANDING

ALPINE CITY, UTAH COUNTY, UTAH

BUILDABLE AREA PLAN

REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

BUILDABLE AREA PLAN

Scale: 1"=40' | Drawn: MHW
Date: 07/09/21 | Job #: 19-0487
Sheet: C3.1

Know what's below. Call 811 before you dig.

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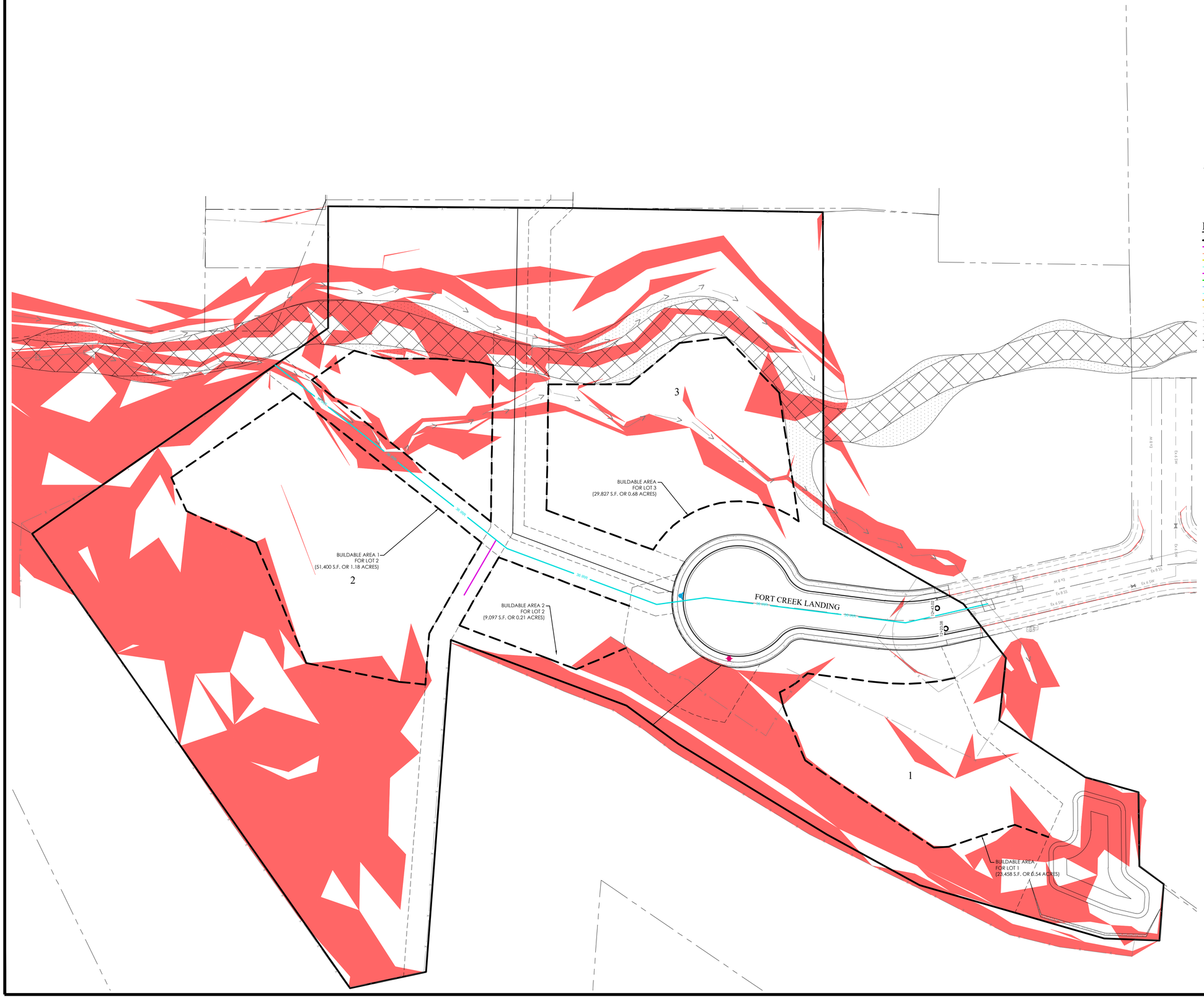

N

S

GRAPHIC SCALE

40 0 20 40 80 160

(IN FEET)
1 inch = 40 ft.

LEGEND

- BOUNDARY
- ROW
- CENTERLINE
- LOT LINE
- EASEMENT
- 15" STORM DRAIN
- 8" SANITARY SEWER
- 8" CULINARY WATER
- 6" SECONDARY WATER
- CONTOUR MAJOR
- CONTOUR MINOR
- EXIST. STORM DRAIN
- EXIST. SANITARY SEWER
- EXIST. CULINARY WATER
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- EXIST. STREET MONUMENT
- EXIST. SD INLET & MH
- EXIST. SEWER MH
- EXIST. VALVE, TEE, & BEND
- EXIST. FIRE HYDRANT
- SPOT ELEVATION
- FEMA REGULATORY FLOODWAY
- FEMA SPECIAL FLOOD HAZARD AREA ZONE AE
- SLOPES >20%

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FORT CREEK LANDING

ALPINE CITY, UTAH COUNTY, UTAH

BUILDABLE AREA SLOPE ANALYSIS PLAN

REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

BUILDABLE AREA SLOPE ANALYSIS PLAN

Scale:	1"=40'	Drawn:	MHW
Date:	07/09/21	Job #:	19-0487
Sheet:	C3.2		

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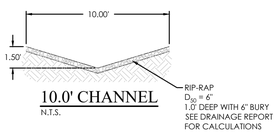
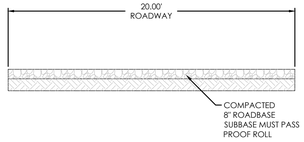
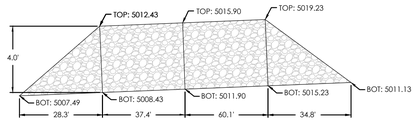


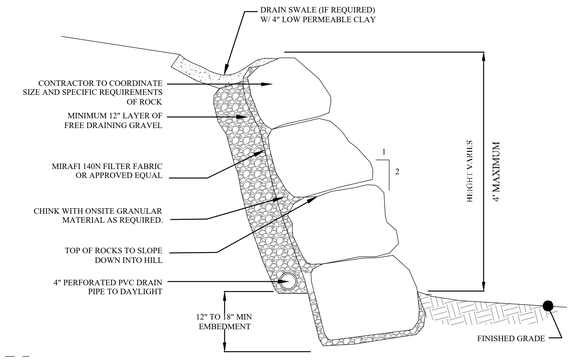
10.0' CHANNEL
N.T.S.



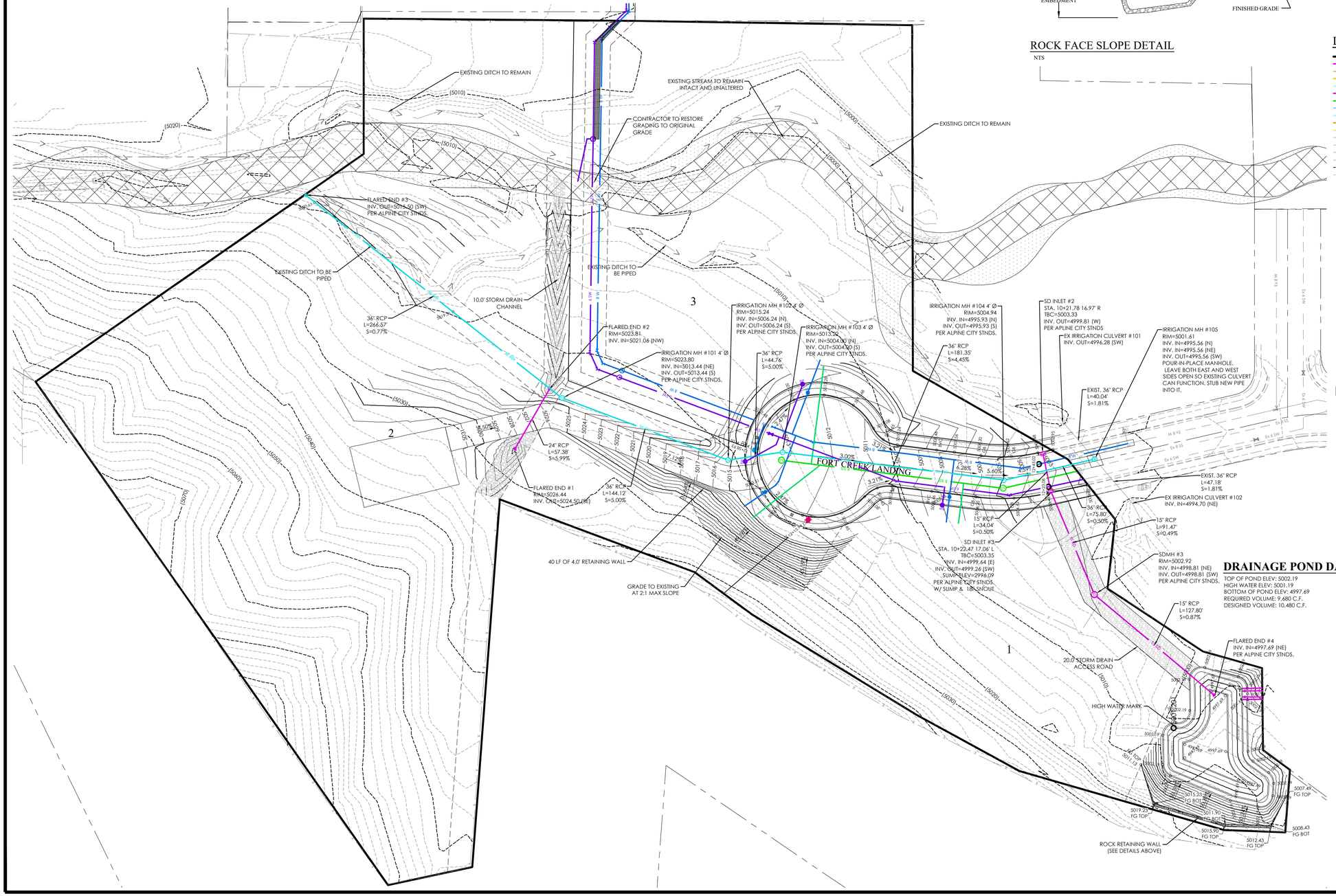
STORM DRAIN ACCESS ROAD
N.T.S.



ROCK RETAINING WALL
N.T.S.



ROCK FACE SLOPE DETAIL
NTS

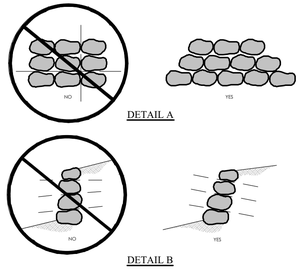


DRAINAGE POND DATA:

TOP OF POND ELEV: 5002.19
HIGH WATER ELEV: 5001.19
BOTTOM OF POND ELEV: 4997.69
REQUIRED VOLUME: 9,680 C.F.
DESIGNED VOLUME: 10,480 C.F.

ROCK STACKING CONSTRUCTION GUIDELINES:

ROCKS SHOULD BE STACKED IN GENERAL ACCORDANCE WITH THE FOLLOWING GUIDELINES:
1. ROCKS SHOULD BE PLACED SO THAT THERE ARE NO CONTINUOUS JOINT PLANES IN EITHER THE VERTICAL OR LATERAL DIRECTION (SEE DETAIL A).
2. ROCKS SHOULD BE STAGGERED SUCH THAT EACH ROCK BEARS ON THE TWO ROCKS BELOW IT.
3. THE UPPER PLANE OF EACH ROCK BETWEEN COURSES (THE TOP SURFACE OF ROCK), SHOULD SLOPE BACK TOWARDS THE SLOPE FACE AND AWAY FORM THE FACE OF THE ROCK WALL (SEE DETAIL B).



NOTES:
1. EACH LOT TO HAVE A RETENTION BASIN AT BUILDING PERMIT STAGE.
2. THIS PROJECT HAS A CBR VALUE OF 15 PER THE GEOTECH REPORT PROVIDED BY GORDON GEOTECHNICAL ENGINEERING, INC PROJECT # 660-003-20

GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

LEGEND

- BOUNDARY
- ROW
- CENTERLINE
- LOT LINE
- EASEMENT
- 15" STORM DRAIN
- 8" SANITARY SEWER
- 8" CULINARY WATER
- 6" SECONDARY WATER
- CONTOUR MAJOR
- CONTOUR MINOR
- EXIST. STORM DRAIN
- EXIST. SANITARY SEWER
- EXIST. CULINARY WATER
- EXIST. FENCE
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- STREET MONUMENT (TO BE SET)
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- EXIST. FIRE HYDRANT
- SPOT ELEVATION
- FEMA REGULATORY FLOODWAY
- FEMA SPECIAL FLOOD HAZARD AREA ZONE AE

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FOR REVIEW ONLY

FORT CREEK LANDING

ALPINE CITY, UTAH COUNTY, UTAH

GRADING AND DRAINAGE PLAN

REVISION BLOCK

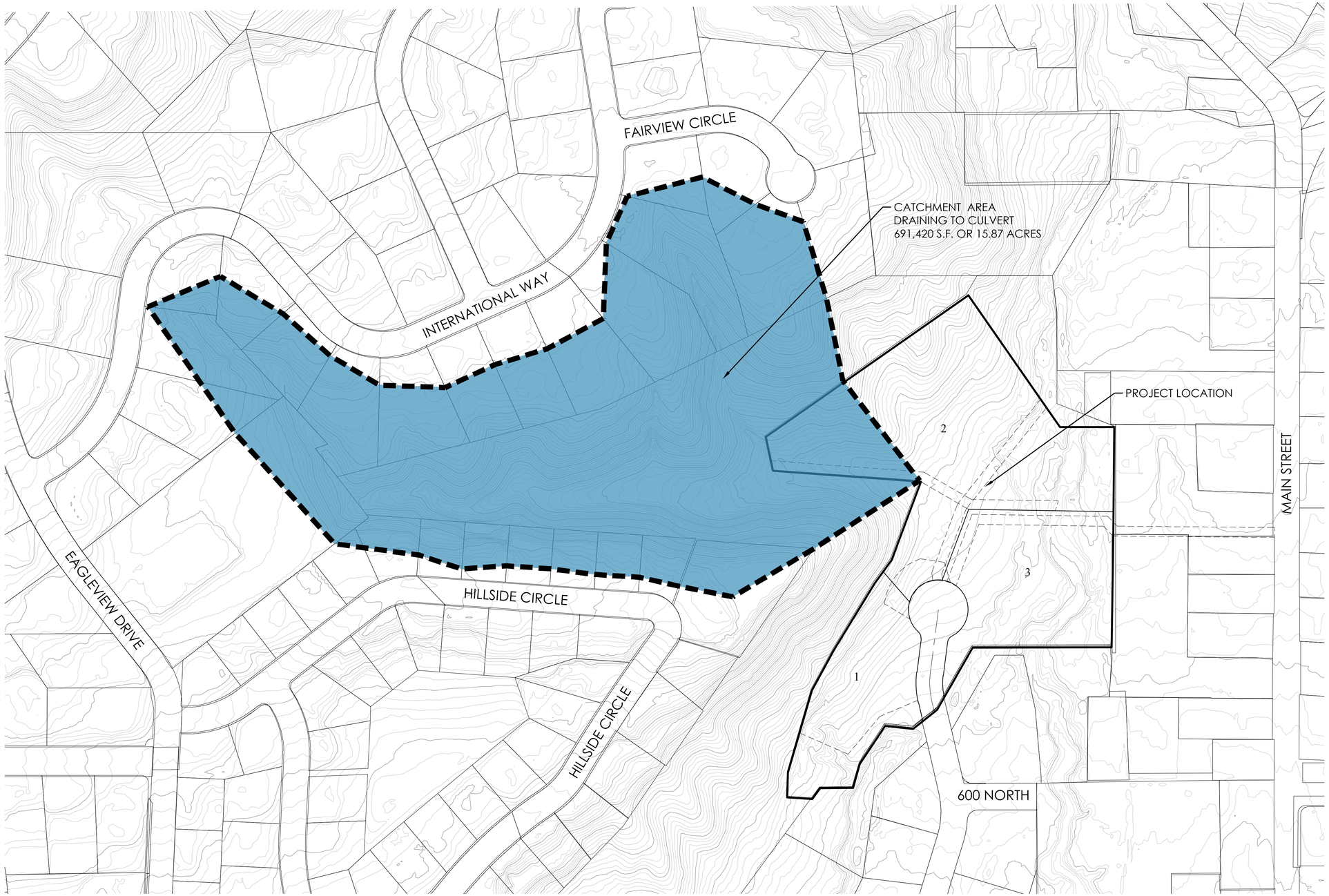
#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

GRADING AND DRAINAGE PLAN

Scale:	1"=40'	Drawn:	MHW
Date:	07/09/21	Job #:	19-0487
Sheet:	C4		

Z:_2019\19-0487 Kokeem Court\design 19-0487\dwg\sheets\C4 - GRADING AND DRAINAGE PLAN.dwg

NOTES:
1. SEE DRAINAGE REPORT FOR FULL CULVERT FLOW CALCULATIONS AND CAPACITY.



N

S

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100ft.

Know what's below. Call 811 before you dig.

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MIDVALE, UTAH 84047 PH: (801) 352-0075
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FOR REVIEW ONLY

FORT CREEK LANDING

ALPINE CITY, UTAH COUNTY, UTAH

OFF-SITE DRAINAGE AREA

REVISION BLOCK

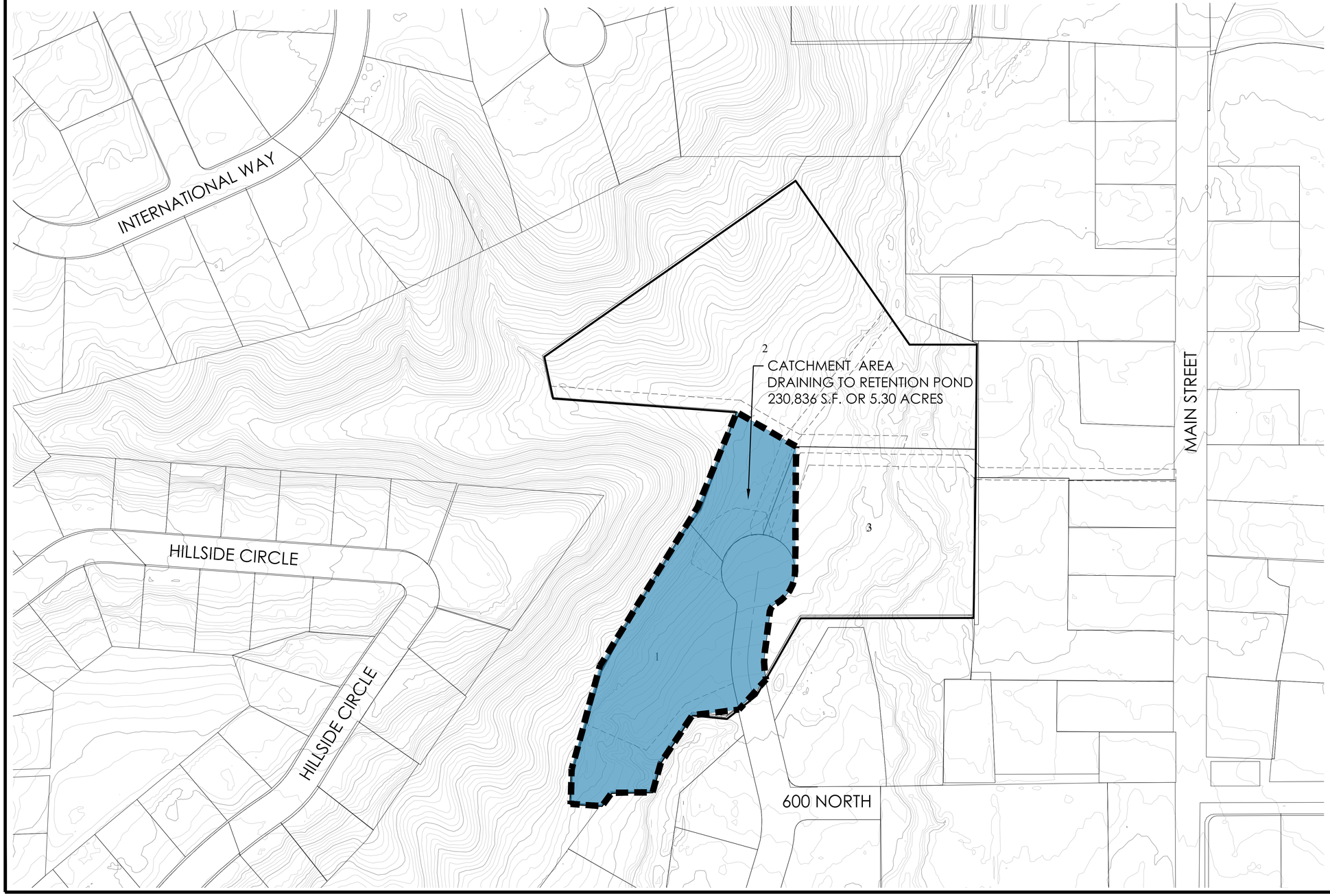
#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

OFF-SITE DRAINAGE AREA

Scale:	1"=100'	Drawn:	MHW
Date:	07/09/21	Job #:	19-0487
Sheet:	C5.1		

Z:_2019\19-0487 Fonoem Court\design 19-0487\dwg\sheets\C5.1 - OFF-SITE DRAINAGE AREA.dwg

NOTES:
1. SEE DRAINAGE REPORT FOR FULL RETENTION POND CALCULATIONS AND CAPACITY.



N

S

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

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FORT CREEK LANDING

ALPINE CITY, UTAH COUNTY, UTAH

SITE DRAINAGE AREA

REVISION BLOCK

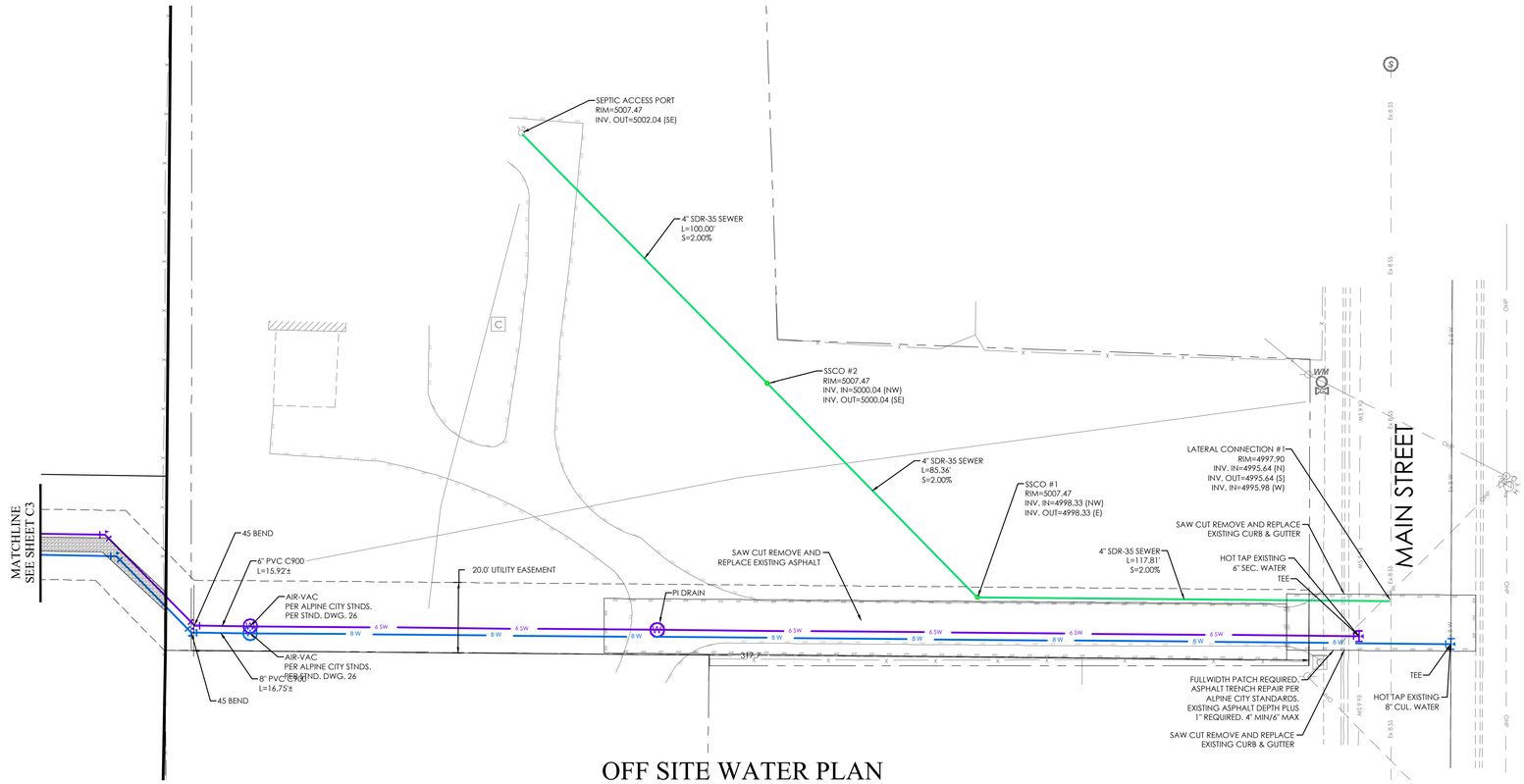
#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

SITE DRAINAGE AREA

Scale: 1"=80' | Drawn: MHW
Date: 07/09/21 | Job #: 19-0487
Sheet: C5.2

Know what's below. Call 811 before you dig.

Z:_2019\19-0487 Forcem Court\design 19-0487\dwg\sheets\C5.2 - SITE DRAINAGE AREA.dwg



OFF SITE WATER PLAN

SEE SHEET PP04 FOR PROFILE

N

S

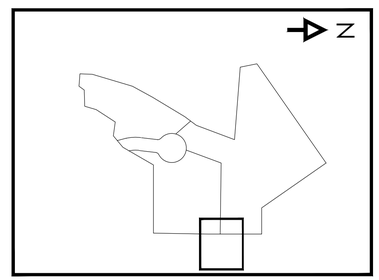
GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LEGEND

- BOUNDARY
- ROW
- CENTERLINE
- LOT LINE
- EASEMENT
- 15"SD — 15" STORM DRAIN
- 8"SS — 8" SANITARY SEWER
- 8"W — 8" CULINARY WATER
- 6"SW — 6" SECONDARY WATER
- XXXX — CONTOUR MAJOR
- XXXX — CONTOUR MINOR
- Ex.SD — EXIST. STORM DRAIN
- Ex.SS — EXIST. SANITARY SEWER
- Ex.W — EXIST. CULINARY WATER
- X — EXIST. FENCE
- (XXXX) — EXIST. CONTOUR MAJOR
- (XXXX) — EXIST. CONTOUR MINOR
- SIGN
- STREET LIGHT
- SD MH, INLET, AND COMBO
- SEWER MANHOLE
- VALVE, TEE & BEND
- WATER BLOW-OFF
- FIRE HYDRANT
- STREET MONUMENT (TO BE SET)
- EXIST. STREET MONUMENT
- EXIST. SD INLET & MH
- EXIST. SEWER MH
- EXIST. VALVE, TEE, & BEND
- EXIST. FIRE HYDRANT
- o XXXX.XX — SPOT ELEVATION
- FEMA REGULATORY FLOODWAY
- FEMA SPECIAL FLOOD HAZARD AREA ZONE AE



KEY MAP
N.T.S

Know what's below. Call 811 before you dig.

BENCHMARK

NORTHEAST CORNER OF SECTION 13
TOWNSHIP 4 SOUTH, RANGE 1 EAST
SALT LAKE BASE AND MERIDIAN
ELEV: 5036.49
DATUM: NGVD 29

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FORT CREEK LANDING

ALPINE CITY, UTAH COUNTY, UTAH

OFF SITE WATER

REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
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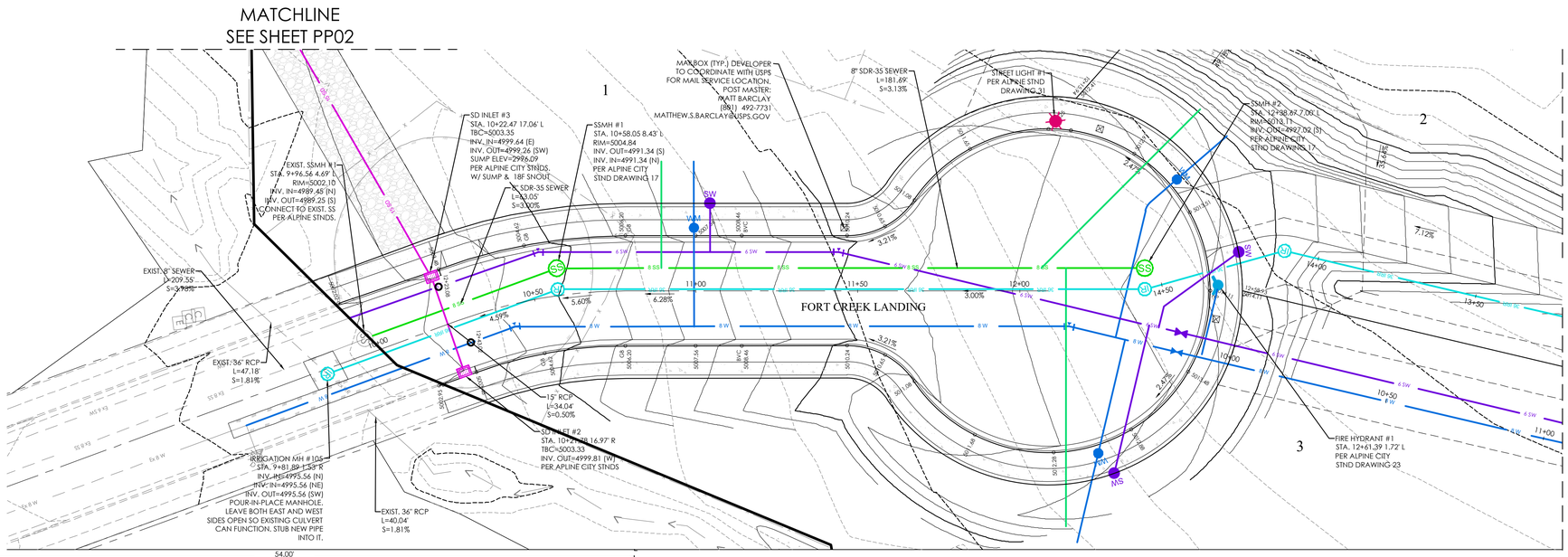
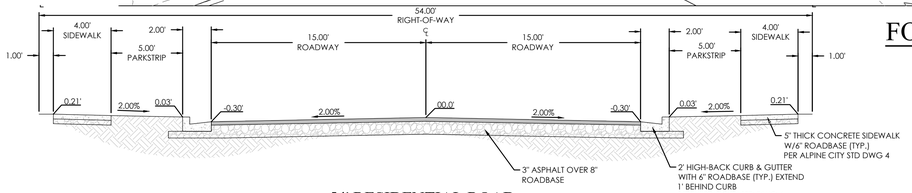
5	----	----
6	----	----

OFF SITE WATER

Scale: 1"=20' | Drawn: MHW
Date: 07/09/21 | Job #: 19-0487
Sheet: C6

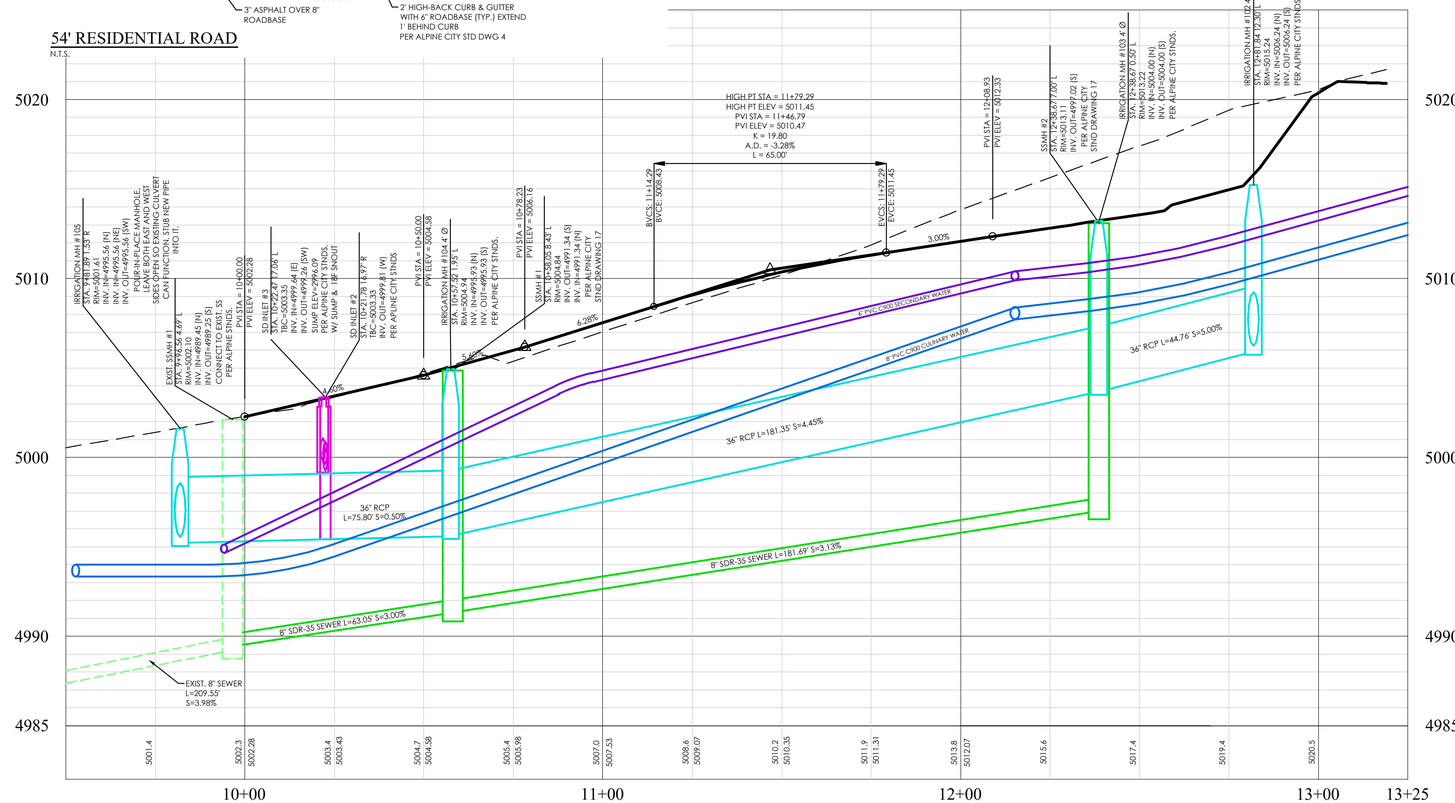
Z:_2019\19-0487 Koreem Court\design 19-0487\dwg\sheets\C6- OFF SITE WATER.dwg





54' RESIDENTIAL ROAD

N.T.S.



FORT CREEK LANDING PROFILE

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GRAPHIC SCALE

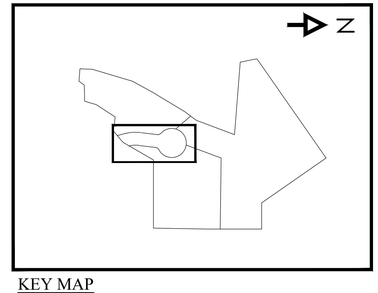
20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

FOR REVIEW ONLY

LEGEND

- BOUNDARY
- ROW
- CENTERLINE
- LOT LINE
- EASEMENT
- 15" STORM DRAIN
- 8" SANITARY SEWER
- 8" CULINARY WATER
- 6" SECONDARY WATER
- CONTOUR MAJOR
- CONTOUR MINOR
- EXIST. STORM DRAIN
- EXIST. SANITARY SEWER
- EXIST. CULINARY WATER
- EXIST. FENCE
- EXIST. CONTOUR MAJOR
- EXIST. CONTOUR MINOR
- SIGN
- STREET LIGHT
- SD MH, INLET, AND COMBO
- SEWER MANHOLE
- VALVE, TEE & BEND
- WATER BLOW-OFF
- FIRE HYDRANT
- STREET MONUMENT (TO BE SET)
- EXIST. STREET MONUMENT
- EXIST. SD INLET & MH
- EXIST. SEWER MH
- EXIST. VALVE, TEE, & BEND
- EXIST. FIRE HYDRANT
- SPOT ELEVATION
- FEMA REGULATORY FLOODWAY
- FEMA SPECIAL FLOOD HAZARD AREA ZONE AE



KEY MAP
N.T.S

Know what's below. Call 811 before you dig.

BENCHMARK

NORTHEAST CORNER OF SECTION 13
TOWNSHIP 4 SOUTH, RANGE 1 EAST
SALT LAKE BASE AND MERIDIAN
ELEV: 5036.49
DATUM: NGVD 29

FORT CREEK LANDING

ALPINE CITY, UTAH COUNTY, UTAH

FORT CREEK LANDING

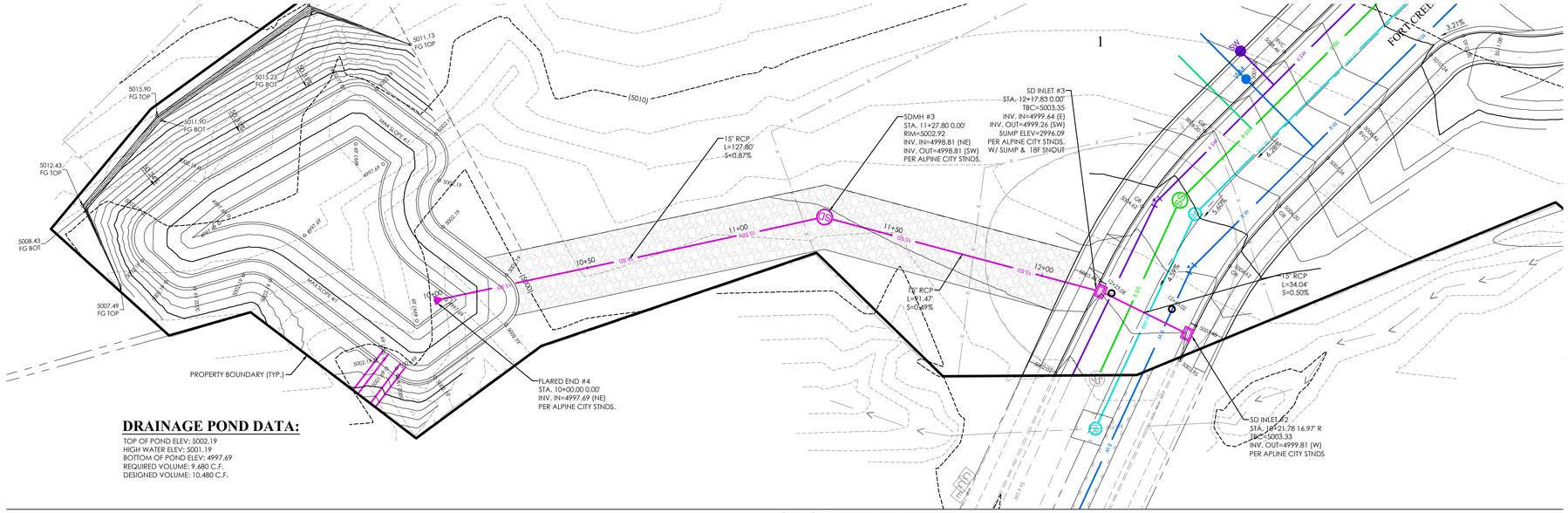
REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

FORT CREEK LANDING

Scale: 1"=20' | Drawn: MHW
Date: 07/09/21 | Job #: 19-0487
Sheet: PP01

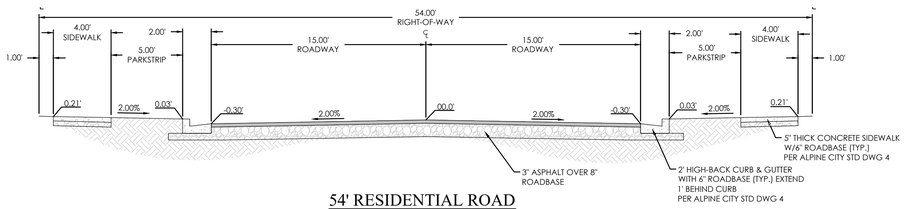
Z:_2019\19-0487 Kolcem Court\design 19-0487\dwg\sheets\PP01 - WHITBY WOODLANDS DRIVE.dwg



DRAINAGE POND DATA:

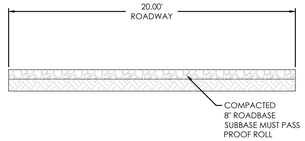
TOP OF POND ELEV: 5002.19
HIGH WATER ELEV: 5001.19
BOTTOM OF POND ELEV: 4997.69
REQUIRED VOLUME: 9,680 C.F.
DESIGNED VOLUME: 10,480 C.F.

STORM DRAIN PLAN



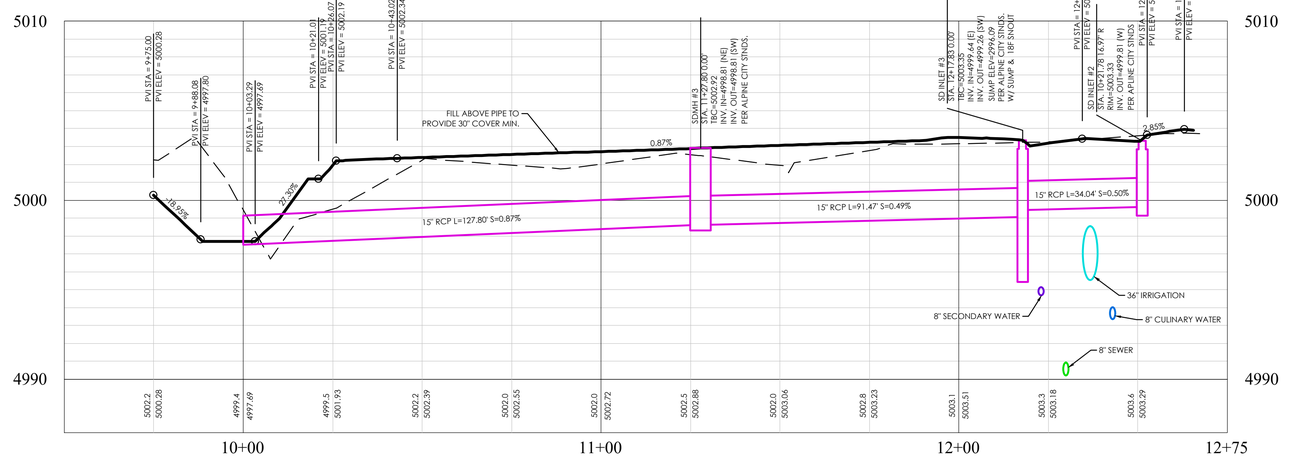
54' RESIDENTIAL ROAD

N.T.S.



STORM DRAIN ACCESS ROAD

N.T.S.



STORM DRAIN PROFILE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LEGEND

- BOUNDARY
- ROW
- CENTERLINE
- LOT LINE
- EASEMENT
- 15" STORM DRAIN
- 8" SANITARY SEWER
- 8" CULINARY WATER
- 6" SECONDARY WATER
- CONTOUR MAJOR
- CONTOUR MINOR
- EXIST. STORM DRAIN
- EXIST. SANITARY SEWER
- EXIST. CULINARY WATER
- EXIST. FENCE
- EXIST. CONTOUR MAJOR
- EXIST. CONTOUR MINOR
- SIGN
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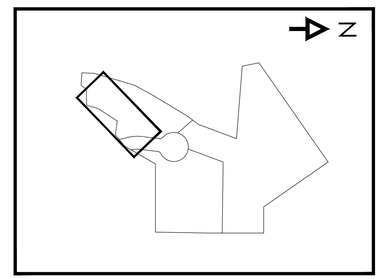
- WATER BLOW-OFF
- FIRE HYDRANT
- STREET MONUMENT (TO BE SET)
- EXIST. STREET MONUMENT
- EXIST. SD INLET & MH
- EXIST. SEWER MH
- EXIST. VALVE, TEE, & BEND
- EXIST. FIRE HYDRANT
- SPOT ELEVATION
- FEMA REGULATORY FLOODWAY
- FEMA SPECIAL FLOOD HAZARD AREA ZONE AE



KEY MAP

N.T.S

Know what's below. Call 811 before you dig.

BENCHMARK

NORTHEAST CORNER OF SECTION 13
TOWNSHIP 4 SOUTH, RANGE 1 EAST
SALT LAKE BASE AND MERIDIAN
ELEV: 5036.49
DATUM: NGVD 29

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ALPINE CITY, UTAH COUNTY, UTAH

STORM DRAIN

REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

STORM DRAIN

Scale: 1"=20' | Drawn: MHW
Date: 07/09/21 | Job #: 19-0487
Sheet:

PP02

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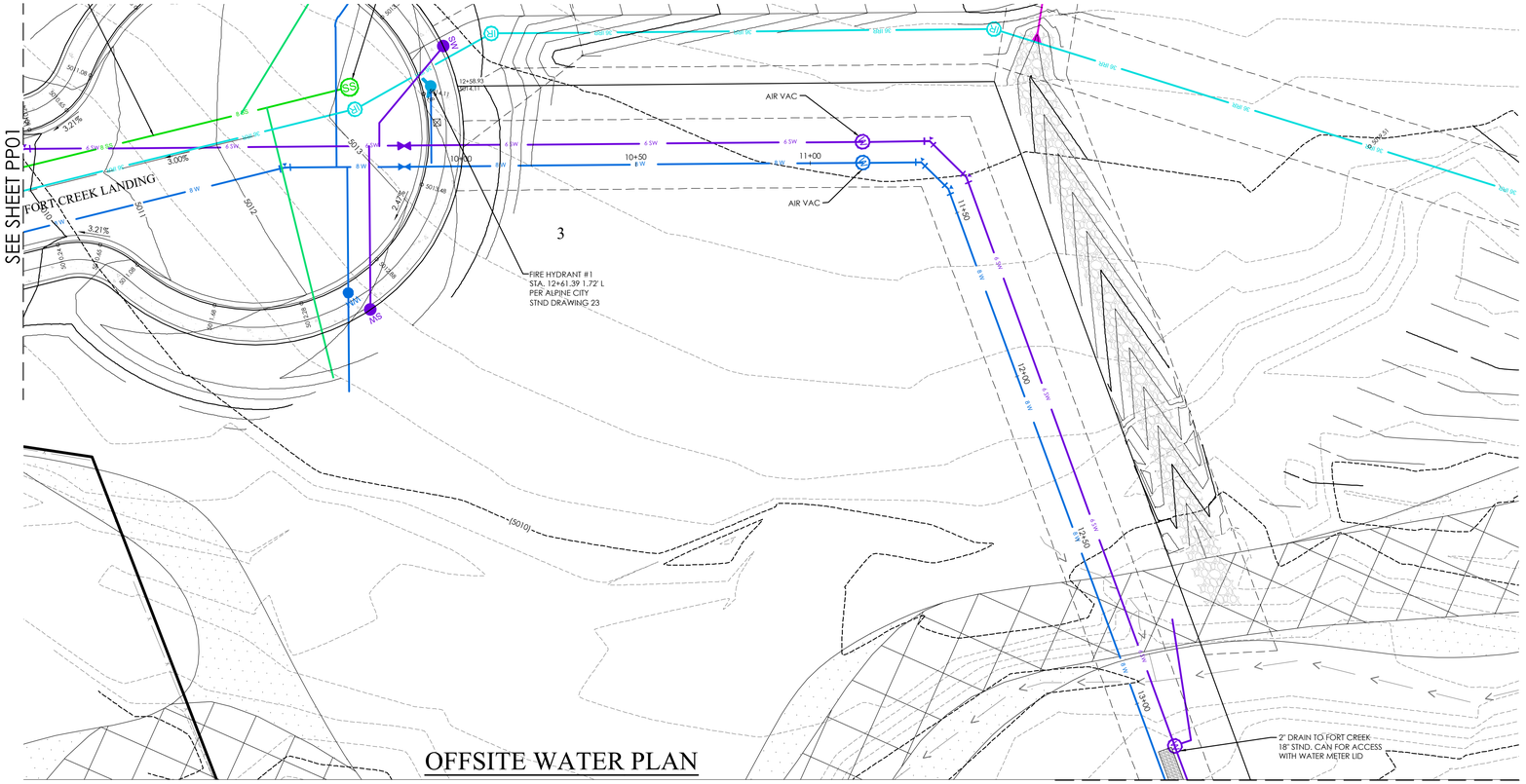
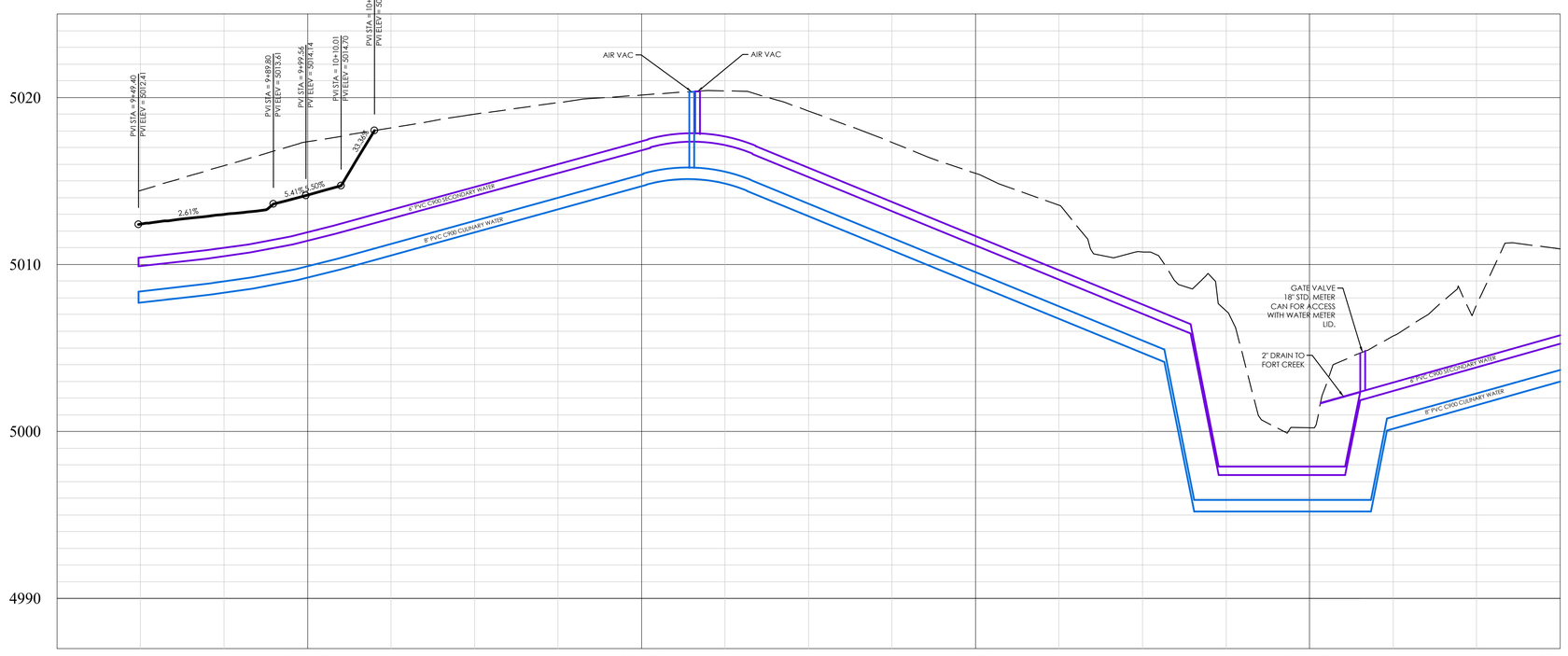
MATCHLINE
SEE SHEET PP01



OFFSITE WATER PLAN

MATCHLINE
SEE SHEET PP04



WATER LINES PROFILE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LEGEND

- BOUNDARY
- ROW
- CENTERLINE
- LOT LINE
- EASEMENT
- 15" STORM DRAIN
- 8" SANITARY SEWER
- 8" CULINARY WATER
- 6" SECONDARY WATER
- CONTOUR MAJOR
- CONTOUR MINOR
- EXIST. STORM DRAIN
- EXIST. SANITARY SEWER
- EXIST. CULINARY WATER
- EXIST. FENCE
- EXIST. CONTOUR MAJOR
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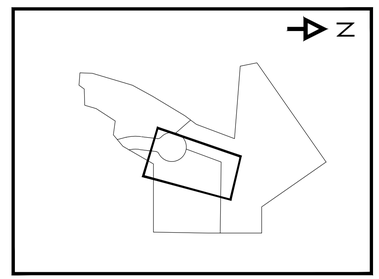
- EXIST. FIRE HYDRANT
- SPOT ELEVATION
- FEMA REGULATORY FLOODWAY
- FEMA SPECIAL FLOOD HAZARD AREA ZONE AE



KEY MAP
N.T.S

Know what's below.
Call 811 before you dig.

BENCHMARK

NORTHEAST CORNER OF SECTION 13
TOWNSHIP 4 SOUTH, RANGE 1 EAST
SALT LAKE BASE AND MERIDIAN
ELEV: 5036.49
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FORT CREEK LANDING

ALPINE CITY, UTAH COUNTY, UTAH

OFFSITE WATER

REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
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OFFSITE WATER

Scale: 1"=20'
Drawn: MHW
Date: 07/09/21
Job #: 19-0487
Sheet: PP03

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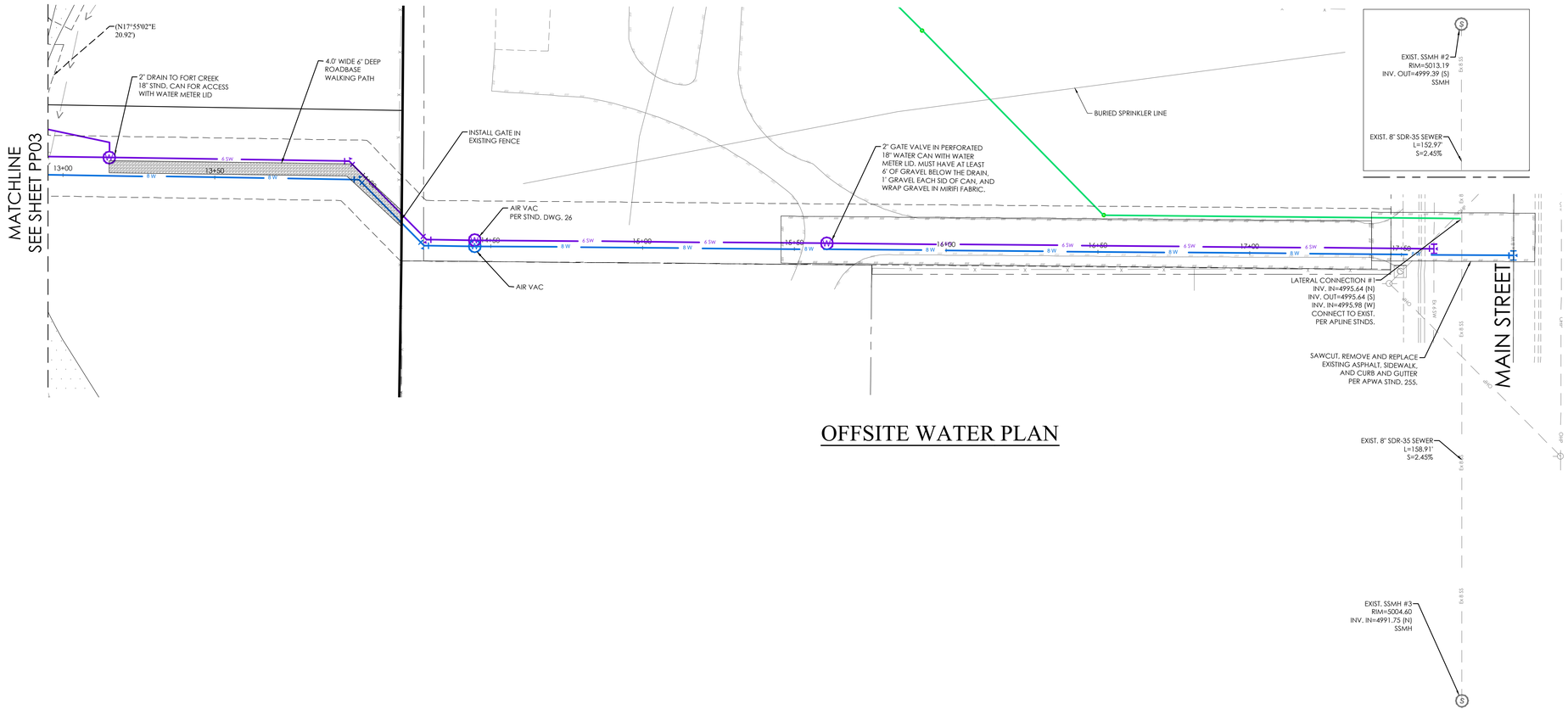
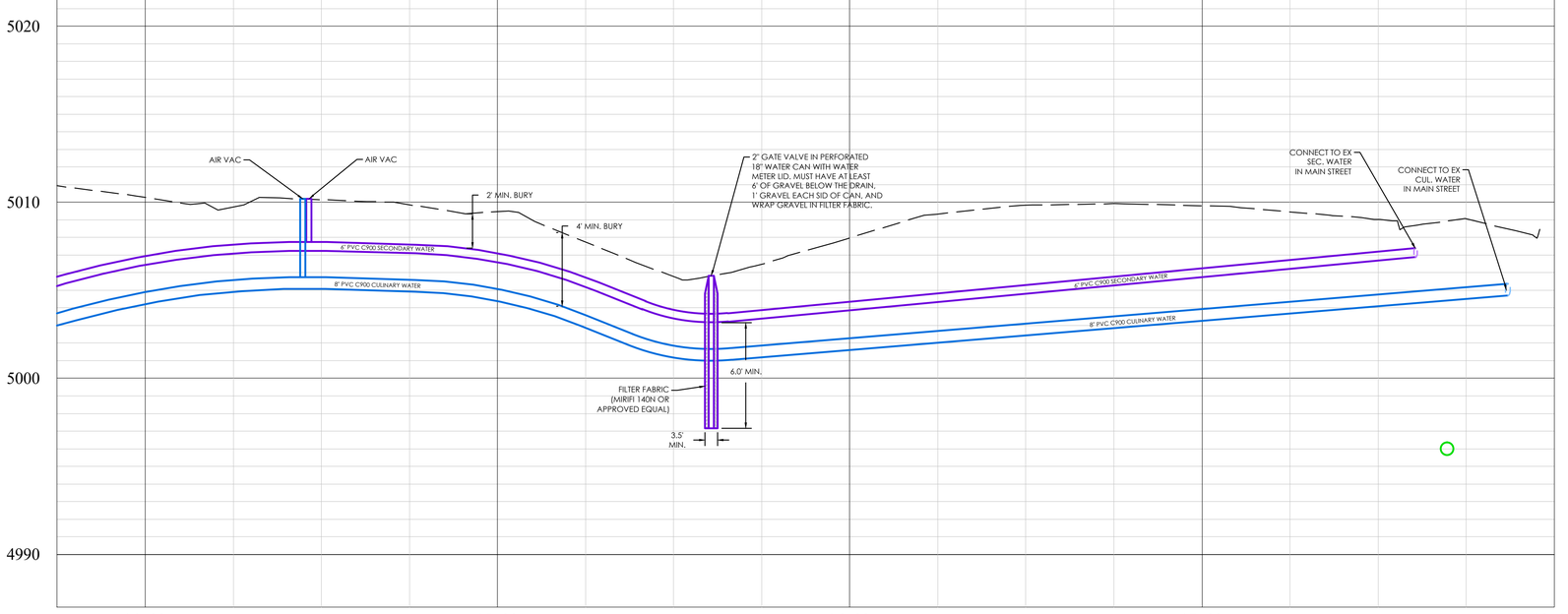
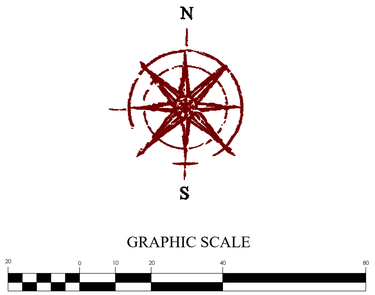


OFFSITE WATER PLAN



WATER LINES PROFILE



LEGEND

- BOUNDARY
- ROW
- CENTERLINE
- LOT LINE
- EASEMENT
- 15" STORM DRAIN
- 8" SANITARY SEWER
- 8" CULINARY WATER
- 6" SECONDARY WATER
- CONTOUR MAJOR
- CONTOUR MINOR
- EXIST. STORM DRAIN
- EXIST. SANITARY SEWER
- EXIST. CULINARY WATER
- EXIST. FENCE
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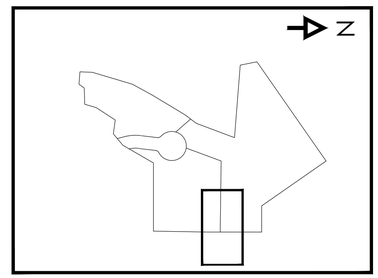
- EXIST. FIRE HYDRANT
- SPOT ELEVATION
- FEMA REGULATORY FLOODWAY
- FEMA SPECIAL FLOOD HAZARD AREA ZONE AE



KEY MAP
N.T.S

Know what's below.
Call 811 before you dig.

BENCHMARK

NORTHEAST CORNER OF SECTION 13
TOWNSHIP 4 SOUTH, RANGE 1 EAST
SALT LAKE BASE AND MERIDIAN
ELEV: 5036.49
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FORT CREEK LANDING

ALPINE CITY, UTAH COUNTY, UTAH

OFFSITE WATER

REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

OFFSITE WATER

Scale:	1"=20'	Drawn:	MHW
Date:	07/09/21	Job #:	19-0487
Sheet:	PP04		

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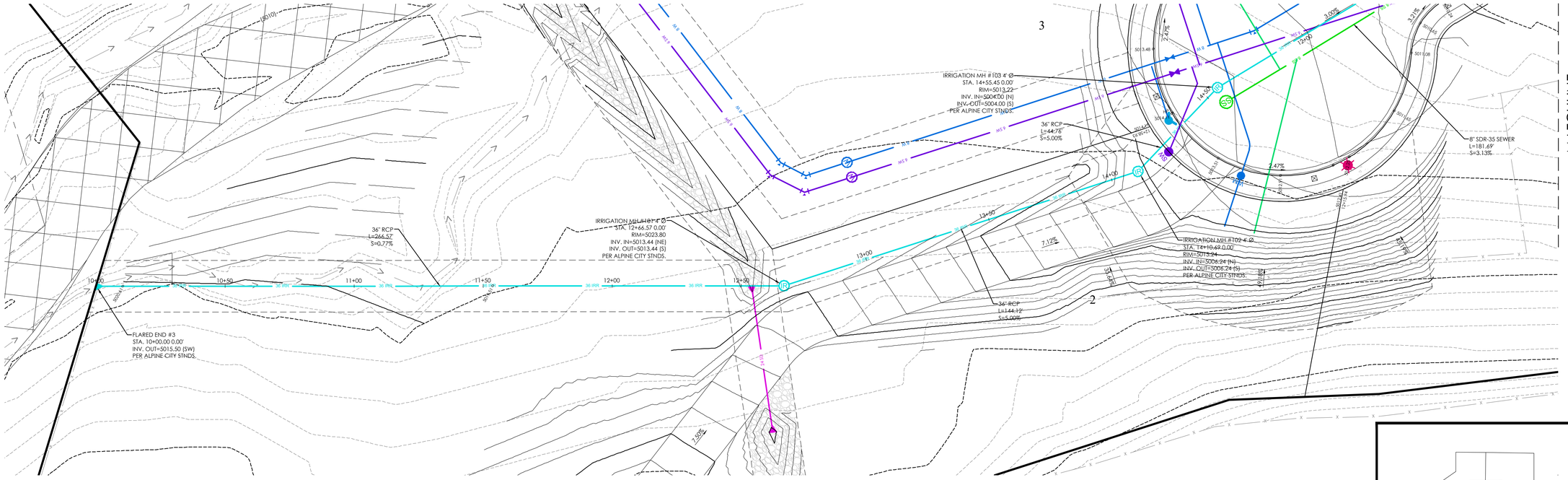
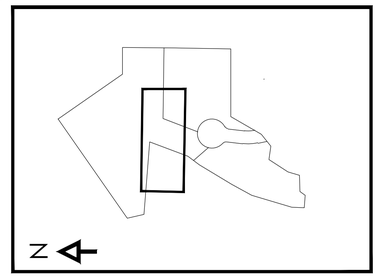
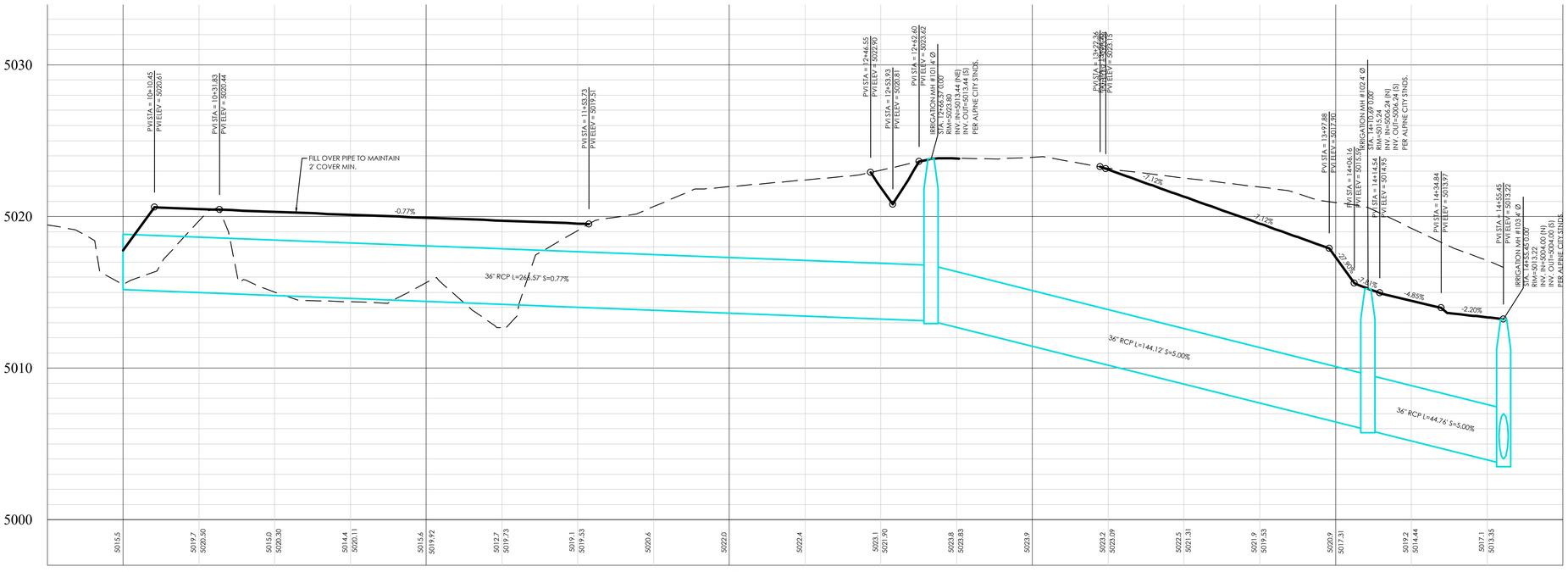


IRRIGATION LINE PLAN



KEY MAP
N.T.S



IRRIGATION LINE PROFILE

LEGEND

- BOUNDARY
- ROW
- CENTERLINE
- LOT LINE
- EASEMENT
- 15" STORM DRAIN
- 8" SANITARY SEWER
- 8" CULINARY WATER
- 6" SECONDARY WATER
- CONTOUR MAJOR
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- EXIST. STORM DRAIN
- EXIST. SANITARY SEWER
- EXIST. CULINARY WATER
- EXIST. FENCE
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- WATER BLOW-OFF
- FIRE HYDRANT
- STREET MONUMENT (TO BE SET)
- EXIST. STREET MONUMENT
- EXIST. SD INLET & MH
- EXIST. SEWER MH
- EXIST. VALVE, TEE, & BEND
- EXIST. FIRE HYDRANT
- SPOT ELEVATION
- FEMA REGULATORY FLOODWAY
- FEMA SPECIAL FLOOD HAZARD AREA ZONE AE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

Know what's below. Call 811 before you dig.

BENCHMARK

NORTHEAST CORNER OF SECTION 13
TOWNSHIP 4 SOUTH, RANGE 1 EAST
SALT LAKE BASE AND MERIDIAN
ELEV: 5036.49
DATUM: NGVD 29

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FORT CREEK LANDING

ALPINE CITY, UTAH COUNTY, UTAH

IRRIGATION LINE

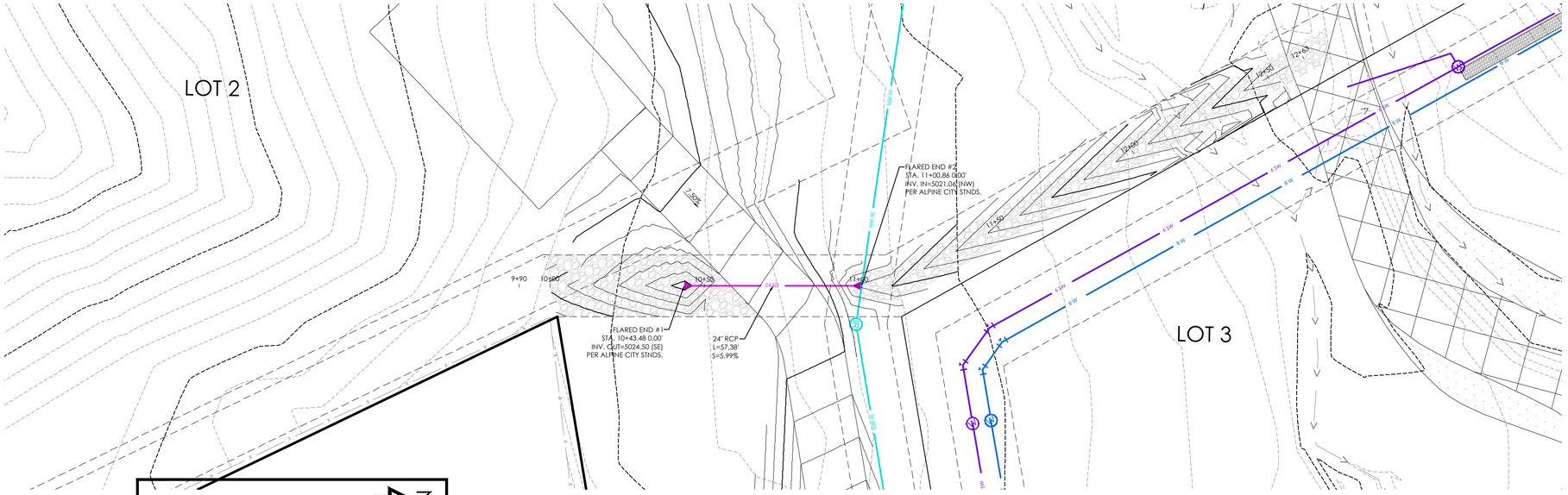
REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

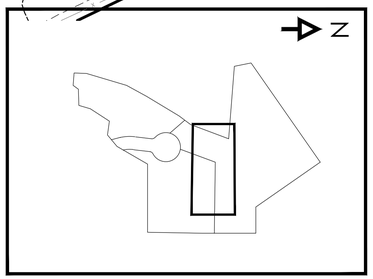
IRRIGATION LINE

Scale:	1"=20'	Drawn:	MHW
Date:	07/09/21	Job #:	19-0487
Sheet:	PP05		

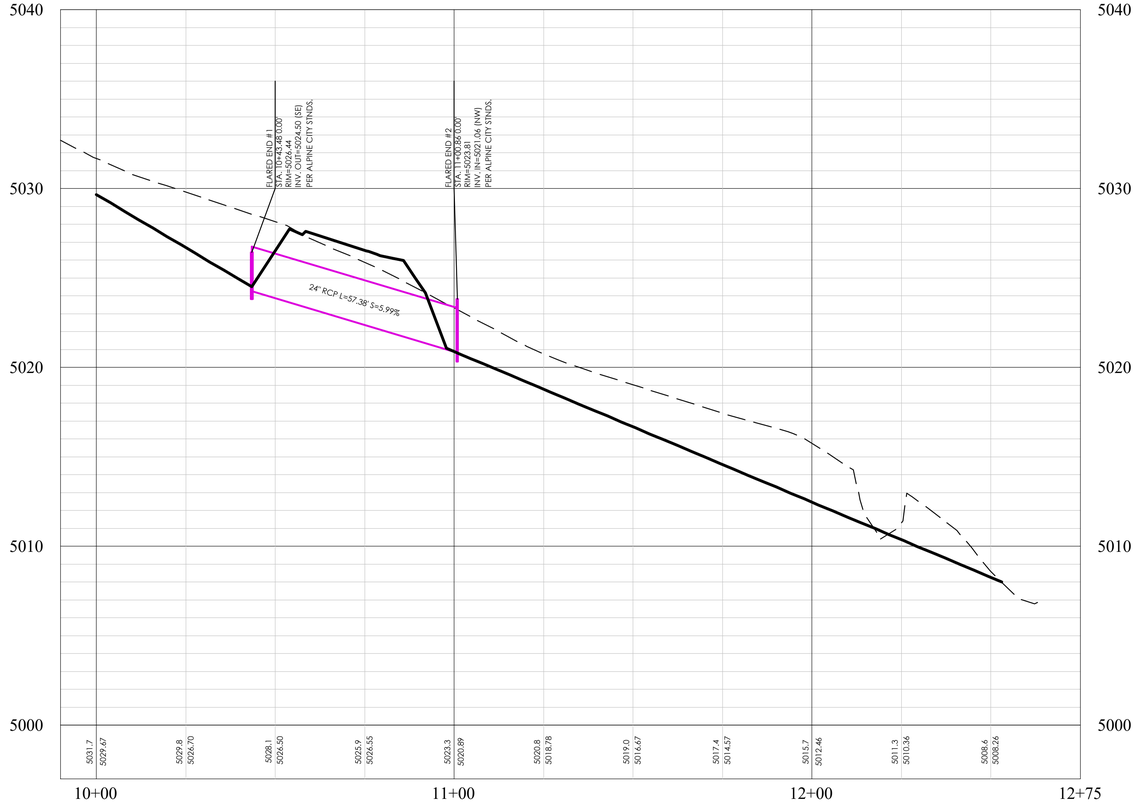
Z:_2019\19-0487 Koroem Court\design 19-0487\dwg\sheets\PP05 - IRRIGATION LINE.dwg



STORM DRAIN CROSSING #1 PLAN



KEY MAP
N.T.S



STORM DRAIN CROSSING #1 PROFILE

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

LEGEND

- BOUNDARY
- ROW
- CENTERLINE
- LOT LINE
- EASEMENT
- 15 SD — 15" STORM DRAIN
- 8 SS — 8" SANITARY SEWER
- 8 W — 8" CULINARY WATER
- 6 SW — 6" SECONDARY WATER
- XXXX — CONTOUR MAJOR
- XXXX — CONTOUR MINOR
- Ex SD — EXIST. STORM DRAIN
- Ex SS — EXIST. SANITARY SEWER
- Ex W — EXIST. CULINARY WATER
- X — EXIST. FENCE
- (XXXX) — EXIST. CONTOUR MAJOR
- (XXXX) — EXIST. CONTOUR MINOR
- SIGN
- STREET LIGHT
- SD MH, INLET, AND COMBO
- SEWER MANHOLE
- VALVE, TEE & BEND
- WATER BLOW-OFF
- FIRE HYDRANT
- STREET MONUMENT (TO BE SET)
- EXIST. STREET MONUMENT
- EXIST. SD INLET & MH
- EXIST. SEWER MH
- EXIST. VALVE, TEE, & BEND
- EXIST. FIRE HYDRANT
- o XXXX.XX — SPOT ELEVATION
- FEMA REGULATORY FLOODWAY
- FEMA SPECIAL FLOOD HAZARD AREA ZONE AE

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FOR REVIEW ONLY

FORT CREEK LANDING

ALPINE CITY, UTAH COUNTY, UTAH

STORM DRAIN CROSSING #1

REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

Know what's below. Call 811 before you dig.

BENCHMARK

NORTHEAST CORNER OF SECTION 13
TOWNSHIP 4 SOUTH, RANGE 1 EAST
SALT LAKE BASE AND MERIDIAN
ELEV.: 5036.49
DATUM: NGVD 29

STORM DRAIN CROSSING #1

Scale:	1"=20'	Drawn:	MHW
Date:	07/09/21	Job #:	19-0487
Sheet:	PP06		

Z:\...\2019\19-0487 Koroem Court\design 19-0487\dwg\sheets\PP06 - STORM DRAIN CROSSING #1.dwg

Asphalt concrete T-patch

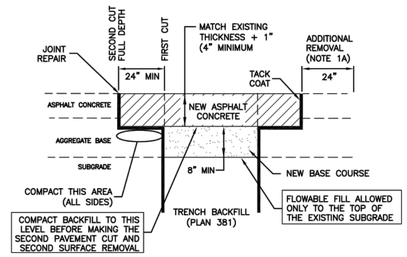
1. **GENERAL**
   A. If a saw cut in the direction of vehicular travel is in a wheel path, consult ENGINEER for directions on removing additional pavement other than the amount shown on the drawing.

2. **PRODUCTS**
   A. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.
   B. Flowable Fill: Target is 60 psi in 28 days with 90 psi maximum in 28 days, APWA Section 31 05 15. It must flow easily requiring no vibration for consolidation.
   C. Reinforcement. No. 5, Galvanized or epoxy coated, deformed, 60 ksi yield grade steel, ASTM A 615.
   D. Concrete: Class 4000, APWA Section 03 30 04.
   E. Tack Coat: APWA Section 32 12 13.13.
   F. Asphalt Concrete. APWA Section 32 12 05.
      1) Warm Weather Patch: AC-20-DM-1/2, unless indicated otherwise.
      2) Cold Weather Patch: Modified MC-250-FM-1 as indicated in APWA Section 33 05 25.

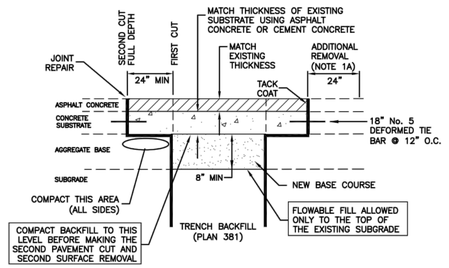
3. **EXECUTION**
   A. Base Course Placement: APWA Section 32 05 10. Maximum lift thickness before compaction is 8-inches when using riding equipment or 6-inches when using hand held equipment. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26
   B. Flowable Fill: Cure to initial set before placing aggregate base or asphalt pavement. Use in excavations that are too narrow to receive compaction equipment.
   C. Tack Coat. Clean all horizontal and vertical surfaces. Apply full coverage.
   D. Asphalt Pavement. Match existing thickness plus 1 inch but not More than 6-inches in residential thoroughfares or 8-inches non residential thoroughfares. Install in lifts no greater than 3-inches after compaction. Compact to 94 percent of ASTM D 2041 (Rice density) plus or minus 2 percent. If asphalt pavement is substituted for concrete substrate, omit rebar and provide 1.25 inches of pavement for each 1 inch of concrete substrate substituted.
   E. Reinforcement. Required if thickness of existing Portland-cement concrete substrate is 6-inches or greater. Not required if (1) less than 6-inches thick, (2) if existing concrete is deteriorating, (3) if excavation is less than 3 feet square, or (4) if asphalt pavement is substituted for Portland-cement concrete substrate.
   F. Concrete Substrate. Cure to initial set before placing new asphalt concrete patch.
   G. Joint Repair: If a crack occurs at a connection to an existing pavement or at any street fixture, flush seal the crack per Plan 265.
   H. Patch Repair: Repair patch if any of the following conditions within the patch occur.
      1) Pavement surface distortion exceeds 1/4-inch deviation in 10 feet. Repair option: Plane off surface distortions. Coat planed surfaces with a cationic or anionic emulsion that complies with APWA Section 32 12 03.
      2) Cracks at least 1-foot long and 1/4-inch wide occur more often than 1 in 10 square feet. Repair option: Crack seal.
      3) Asphalt raveling is greater than 1 square foot per 100 square feet. Repair option: Mill and inlay.

SHALLOW EXCAVATION

(LESS THAN 48 INCHES FROM PAVEMENT SURFACE TO BOTTOM OF EXCAVATION)



ASPHALT RESTORATION



COMPOSITE RESTORATION

December 2010

Asphalt concrete T-patch

Plan
255
Sheet 1 of 2

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FOR REVIEW ONLY

FORT CREEK LANDING

ALPINE CITY, UTAH COUNTY, UTAH

DETAILS

REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

DETAILS

Scale:	NONE	Drawn:	MHW
Date:	07/09/21	Job #:	19-0487
Sheet:	D1		

Know what's below. Call 811 before you dig.

Z:_2019\19-0487 Koroem Court\design 19-0487\dwg\sheets\D1 - DETAILS.dwg

WHEN RECORDED, MAIL TO:
Alpine City
20 North Main Street
Alpine, Utah 84004

GRANT OF EASEMENT

The undersigned Nathan Terry, herein after referred to as Grantor(s), of 717 North Main St., City of Alpine, County of Utah, State of Utah, in consideration of Ten Dollars ($10) and other consideration, receipt of which is acknowledged, do hereby convey and grant to Alpine City, a permanent twenty (20) foot wide easement for the location, construction and maintenance of culinary water and pressurized irrigation water public facilities, hereinafter more particularly designated and described, over and across lands owned by Grantor(s) and situated in the Northeast Quarter of Section 24, Township 4 South, Range 1 East, Salt Lake Base & Meridian, Alpine City, Utah County, Utah, being more particularly described as follows:

Beginning at a point on the westerly right-of-way line of Alpine Main Street, said point located S00°07'05"E 830.66 feet along the Section line and S89°52'55"W 1,195.81 feet from the Northeast Corner of Section 24, T4S, R1E, SLB&M; running thence along said westerly right-of-way line S00°12'59"W 20.00 feet; thence N89°29'14"W 325.83 feet to an established fence line and Boundary Line Agreement on file in the Office of the Utah County Recorder as Entry No. 2547:1982; thence along said fence line and Boundary Line Agreement N00°28'42"E 27.93 feet; thence S44°29'16"E 11.22 feet; thence S89°29'16"E 317.82 feet to the point of beginning.

Contains: 6,547 square feet+/-

IN WITNESS WHEREOF, we have hereunto set out hands this _____ day of _____, 20__.

GRANTOR(s):

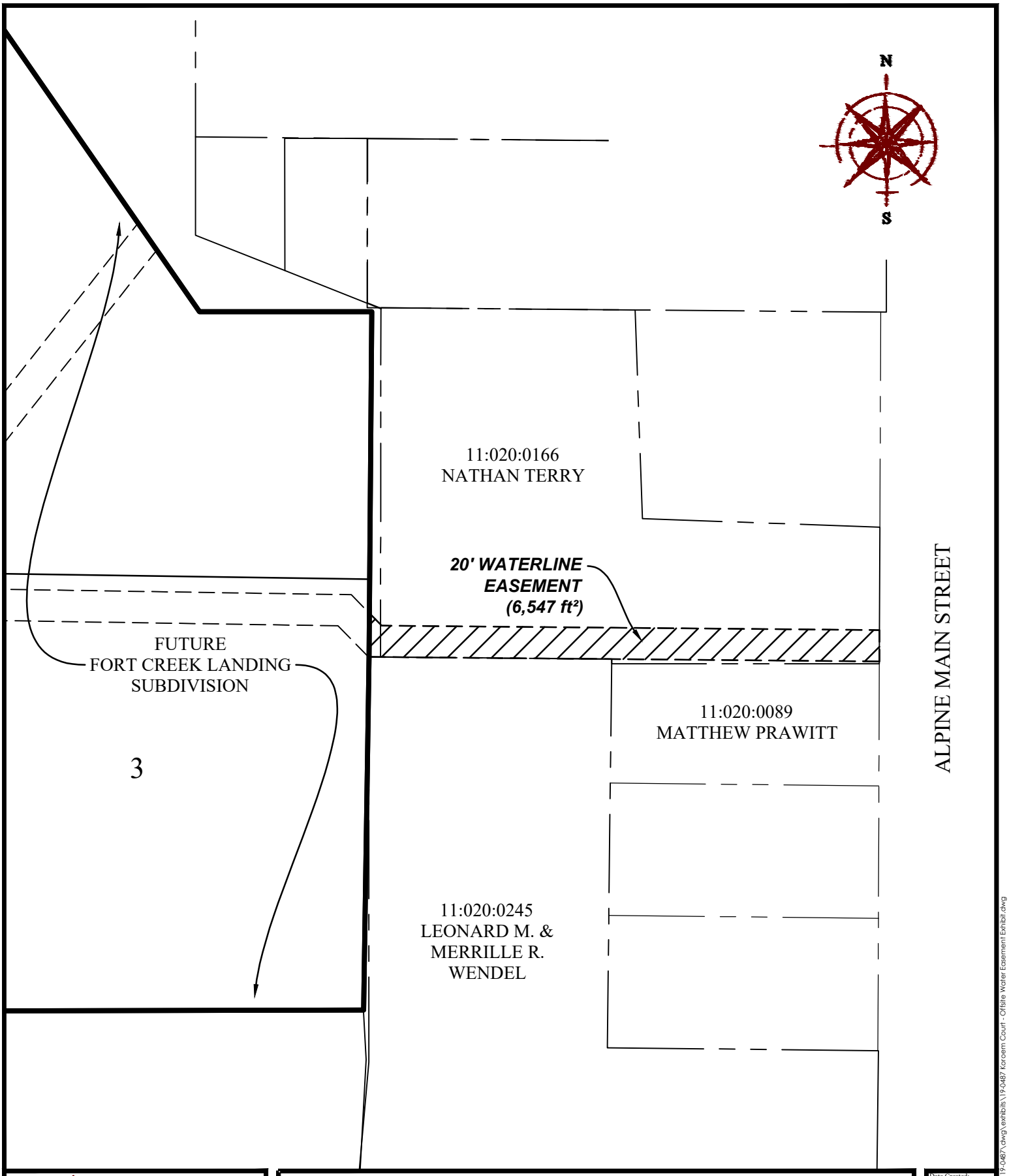
By: _____
Nathan Terry

STATE OF UTAH)
) ss.
COUNTY OF UTAH)

On this _____ day of _____, 20___, personally appeared before me _____ and _____, the signers of the within instrument, who duly acknowledged to me that they executed the same.

_____
Notary Public

Residing at: _____



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FORT CREEK LANDING
OFFSITE WATER EASEMENT

Date Created:	07/12/21
Scale:	N.T.S.
Drawn:	BCD
Job:	19-0487
Sheet:	EXHIBIT

Z:_2019\19-0487 Korcem Court\design\19-0487\dwg\exhibits\19-0487 Korcem Court - Offsite Water Easement Exhibit.dwg

LEGAL DESCRIPTION
PREPARED FOR
KOROEM COURT
ALPINE CITY, UTAH
(July 12, 2021)
19-0487

OFFSITE WATERLINE EASEMENT DESCRIPTION

A 20’ wide easement located in the Northeast Quarter of Section 24, Township 4 South, Range 1 East, Salt Lake Base & Meridian, Alpine City, Utah County, Utah, being more particularly described as follows:

Beginning at a point on the westerly right-of-way line of Alpine Main Street, said point located S00°07'05"E 830.66 feet along the Section line and S89°52'55"W 1,195.81 feet from the Northeast Corner of Section 13, T4S, R1E, SLB&M; running thence along said westerly right-of-way line S00°12'59"W 20.00 feet; thence N89°29'14"W 325.83 feet to an established fence line and Boundary Line Agreement on file in the Office of the Utah County Recorder as Entry No. 2547:1982; thence along said fence line and Boundary Line Agreement N00°28'42"E 27.93 feet; thence S44°29'16"E 11.22 feet; thence S89°29'16"E 317.82 feet to the point of beginning.

Contains: 6,547 square feet+/-

GORDON GEOTECHNICAL ENGINEERING, INC.

March 30, 2021
Job No. 660-003-20

Brian Hansen
623 North Patterson Lane
Alpine, Utah 84004

Attention: Mr. Brian Hansen

Re: California Bearing Ratio, Revision 1
Proposed Koroem Court Subdivision
North of 662 North Whitby Woodlands Drive
Alpine, Utah

At the request of Mr. Brian Hansen, Gordon Geotechnical Engineering was asked to provide a California Bearing Ratio (CBR) for the subgrade at the Proposed Koroem Court Subdivision, located in Alpine, Utah. G² previously performed a geotechnical study at the site dated July 15, 2020[1]. Underlying the topsoil, silty fine sand was encountered. Based on our experience with similar soils, G² recommends a CBR value of 15 for the existing subgrade.

If you have any questions or require additional information, please do not hesitate to contact us.

Respectfully submitted,

Gordon Geotechnical Engineering, Inc.

LICENSED PROFESSIONAL ENGINEER
3.30.21
No. 10899969
RYAN W. LITTLE
STATE OF UTAH

Ryan Little, State of Utah No. 10899969
Professional Engineer

Reviewed By:

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

RL/PRE:nc

Addressee (email only)

---

[1] "Report, Geological Hazard Reconnaissance and Geotechnical Study, Proposed Koroem Court Subdivision, North of 662 North Whitby Woodlands Drive, Alpine, Utah," G² Job No. 660-003-20, Dated July 15, 2020.

KOROEM COURT SUBDIVISION

05/07/21

Prepared for:

HERITAGE CUSTOM HOMES

Prepared by:

MAT WANGSGAARD, PE

FOCUS
ENGINEERING & SURVEYING

6949 S. High Tech Drive Suite 200
Midvale, UT 84047
Phone: 801-352-0075
Web: www.focusutah.com

Table of Contents

APPENDICES

I. GENERAL LOCATION AND DESCRIPTION

The proposed project is located in the NE 1/4 of section 24, T4S, R1E, just north of the intersection of Whitby Woodlands Drive and 600 North and is 8.44 acres, with approximately 23% being disturbed with construction. The current use is an open field and the proposed use will be single family residential consisting of 3 lots and a roadway. The property slopes from north-west to south-east at slopes between 30.0% and 3.0%

There are three (3) existing water features that run through the site. The first is an open ditch that runs along the eastern lots of the project. This is included in a known FEMA flood zone. The second is an active irrigation ditch on the west side of the open ditch that includes a FEMA flood zone. The third is an existing drainage path for and open area to the west of this project that does not have a currently well-defined path. There is an existing easement on the property to provide a path for the off-site flows. This easement is being re-aligned with the proposed lot lines and a similar easement is being created to maintain the intent of the original easement.

A CBR report has been prepared by Gordon Geotechnical Engineering, INC dated December 23, 2020. Based on information from Web Soil Survey the soil consists mainly of cleverly gravelly fine sandy loam and Hillfield-Layton complex.

II. DRAINAGE BASIN

The current drainage on the site is the natural slope down into the existing open ditch along the east side of the project. There are no current existing drainage structures on the site.

The property resides in flood zone AE and Unshaded zone X per FEMA FIRM panel number 49049C0159F.

III. PROPOSED DRAINAGE PLAN

A drainage plan has been developed per Alpine City standards. The onsite system will consist of buried pipes, catch basins, ditches, and a retention pond sized to hold the 100-year storm event. The proposed storm drain system will collect water from the ROW and convey the water to a Retention pond on the south-west corner of the project.

The NOAA data supplied by the Storm Water Drainage Design Manual from Alpine City was used as well as the rational method. The retention requirement from the same document have been used to size the pond for this project.

An overflow path from the retention pond will flow into an existing irrigation ditch just south of this project.

IV. STORMWATER QUALITY

A storm water pollution prevention plan will be developed for the construction of the project and submitted for review.

A snouts and sump will be installed in the last box in the public ROW before flowing out to the retention pond. With this site having a retention basin for the project, all water will be retained on site and therefore meets the LID requirements of retaining the 90th percentile storm.

V. ANALYSIS

Hydrology:

The design storm required is the 100-year event for retention and the rainfall intensity information was obtained from the NOAA Data in the Storm Water Drainage Design Manual from Alpine City.

The rational method (Q=CIA) was used to determine storm drain runoff flows. A weighted "C" value of 0.30, a variable rainfall intensity (from NOAA data), and the project drainage area of 2.64 acres were used to size the retention pond. The runoff calculations resulted in a maximum retention volume of 9,680 cubic feet. See the appendix for retention pond sizing calculations.

Hydraulics:

The design storm required is the 100-year, 3-hour event for pipe capacity. The pipes were sized using Manning's equation for uniform flow $Q = VA = \left(\frac{1.49}{n}\right) AR^{\frac{2}{3}}S^{\frac{1}{2}}$ with a Manning's n value of 0.013. See the appendix for pipe sizing calculations.

Storm drain inlets have been placed at all low points in the road and as needed to minimize the amount of storm water runoff that bypasses catch basins. Inlets have also been spaced no more than 400 feet apart for ease of maintenance.

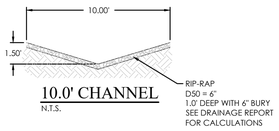
This project is the extension of and existing road ending in a cul-de-sac. The storm water from the site will either flow into the ROW, the retention pond, or the existing open ditch on the east side of the project. The retention pond has an overflow plat to spill into and existing irrigation ditch on the south side of the pond, directing the flow away from homes.

VI. CONCLUSION

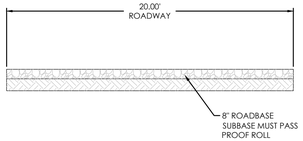
It is concluded that the project is in compliance with city standards and design guidelines.

Sincerely,

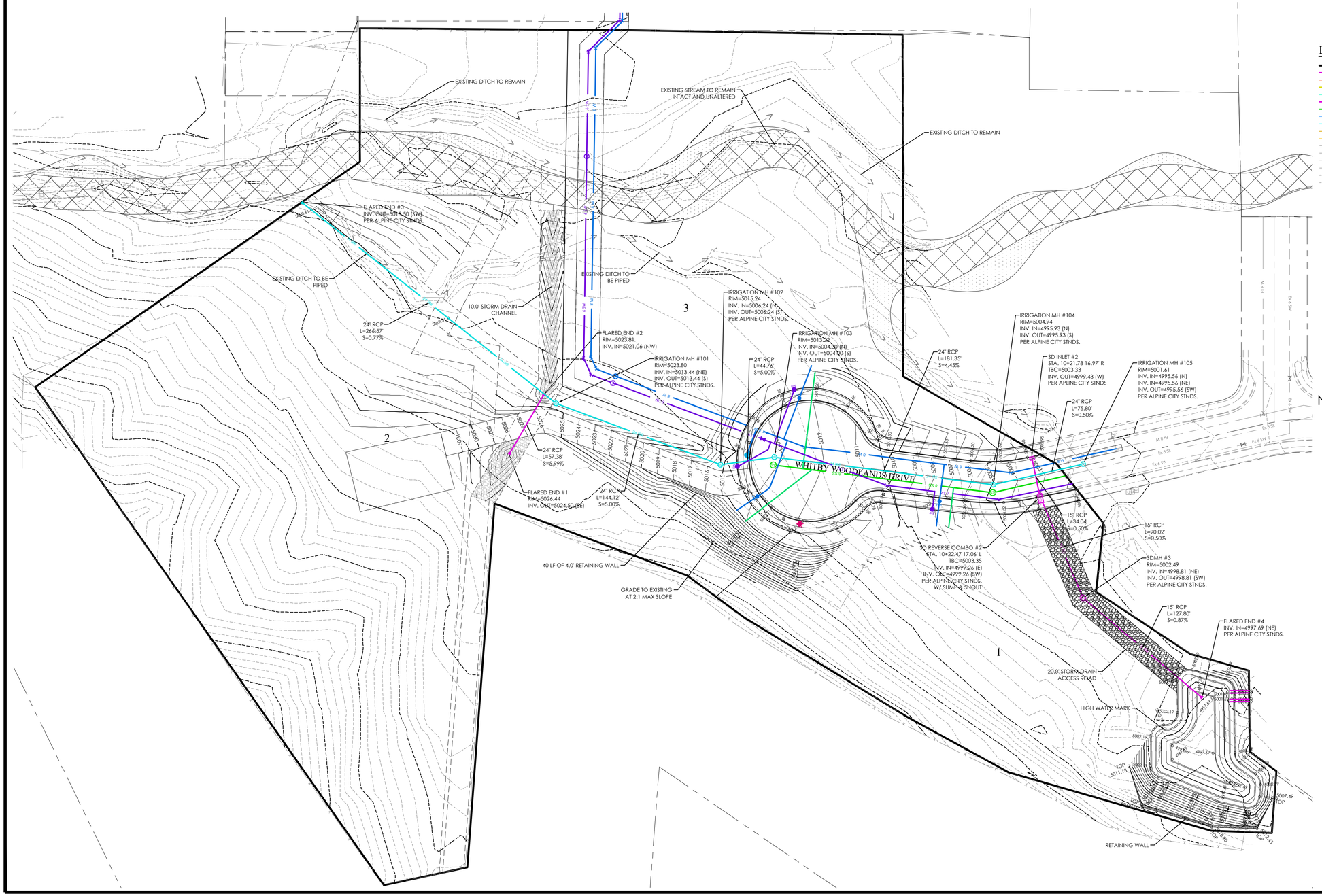
Mathew Wangsgaard, PE
Project Manager
FOCUS Engineering & Surveying



10.0' CHANNEL
N.T.S.



STORM DRAIN ACCESS ROAD
N.T.S.



GRAPHIC SCALE

(IN FEET)
1 inch = 40 ft.

LEGEND

- BOUNDARY
- ROW
- CENTERLINE
- LOT LINE
- EASEMENT
- 15" STORM DRAIN
- 8" SANITARY SEWER
- 8" CULINARY WATER
- 6" SECONDARY WATER
- CONTOUR MAJOR
- CONTOUR MINOR
- EXIST. STORM DRAIN
- EXIST. SANITARY SEWER
- EXIST. CULINARY WATER
- EXIST. FENCE
- EXIST. CONTOUR MAJOR
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- EXIST. VALVE, TEE, & BEND
- EXIST. FIRE HYDRANT
- SPOT ELEVATION
- FEMA REGULATORY FLOODWAY
- FEMA SPECIAL FLOOD HAZARD AREA ZONE AE

NOTES:

1. EACH LOT TO HAVE A RETENTION BASIN AT BUILDING PERMIT STAGE.
2. THIS PROJECT HAS A CBR VALUE OF 15 PER THE GEOTECH REPORT PROVIDED BY GORDON GEOTECHNICAL ENGINEERING, INC PROJECT # 660-003-20

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FOR REVIEW ONLY

KOROEM COURT PRELIMINARY

ALPINE CITY, UTAH COUNTY, UTAH

GRADING AND DRAINAGE PLAN

REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

GRADING AND DRAINAGE PLAN

Scale:	1"=40'	Drawn:	MHW
Date:	05/07/21	Job #:	19-0487
Sheet:	C4		

Know what's below. Call 811 before you dig.

Z:_2019\19-0487 Koroem Court\design 19-0487.dwg\sheet\\C4 - GRADING AND DRAINAGE PLAN.dwg

GORDON GEOTECHNICAL ENGINEERING, INC.

December 23, 2020
Job No. 660-003-20

Brian Hansen
623 North Patterson Lane
Alpine, Utah 84004

Attention: Mr. Brian Hansen

Re: California Bearing Ratio
Proposed Koroem Court Subdivision
North of 662 North Whitby Woodlands Drive
Alpine, Utah

At the request of Mr. Brian Hansen, Gordon Geotechnical Engineering was asked to provide a California Bearing Ratio (CBR) for the subgrade at the Proposed Koroem Court Subdivision, located in Alpine, Utah. G² previously performed a geotechnical study at the site dated July 15, 2020[1]. Underlying the topsoil, silty fine sand was encountered. Based on our experience with similar soils, G² recommends a CBR value of 15 be used for asphalt design.

If you have any questions or require additional information, please do not hesitate to contact us.

Respectfully submitted,

Gordon Geotechnical Engineering, Inc.

LICENSED PROFESSIONAL ENGINEER
12-23-20
No. 10899969
RYAN W. LITTLE
STATE OF UTAH

Ryan Little, State of Utah No. 10899969
Professional Engineer

Reviewed By:

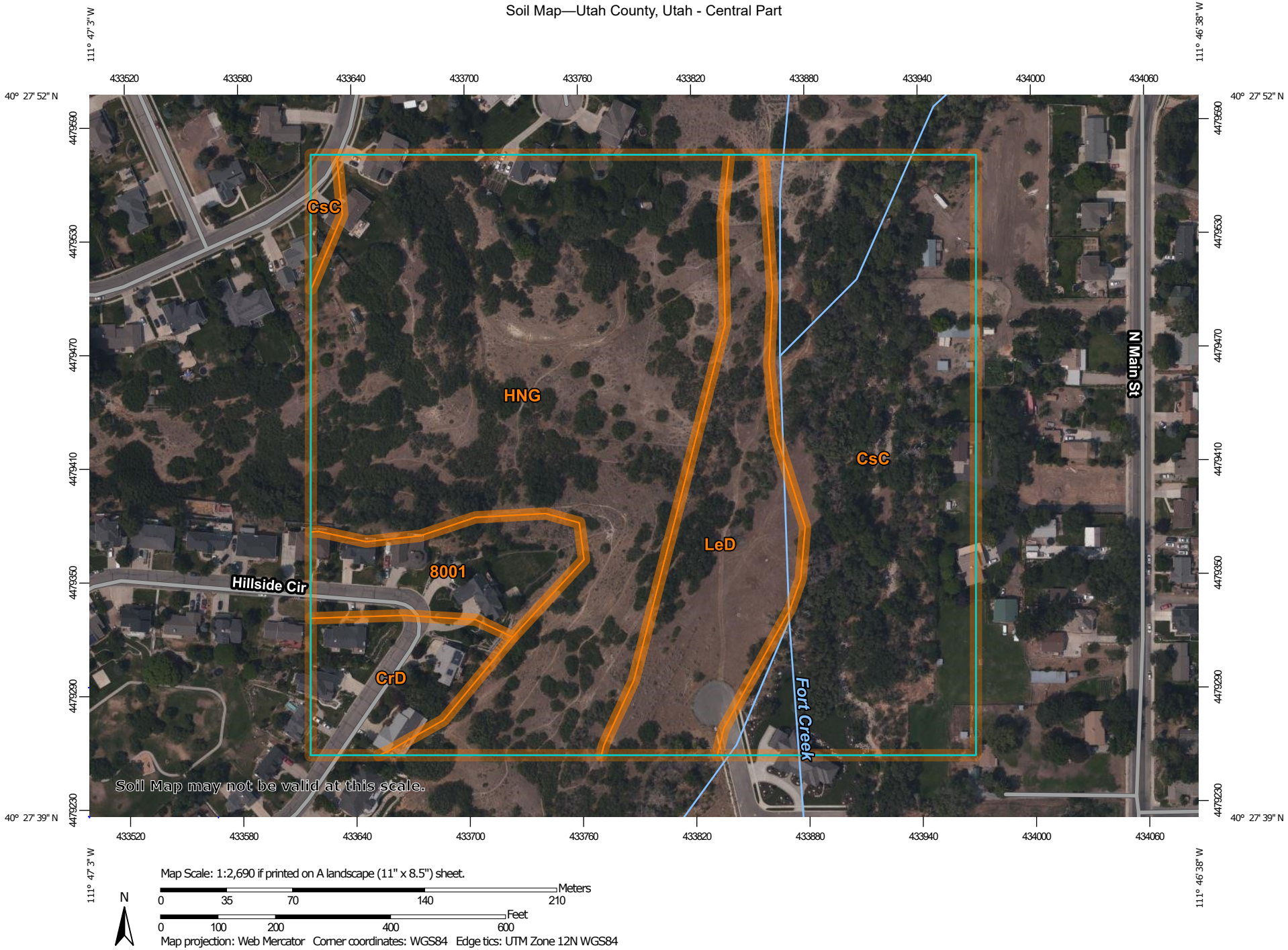
Patrick R. Emery, State of Utah No. 7941710
Professional Engineer

RL/PRE:nc

Addressee (email only)

---

[1] "Report, Geological Hazard Reconnaissance and Geotechnical Study, Proposed Koroem Court Subdivision, North of 662 North Whitby Woodlands Drive, Alpine, Utah," G² Job No. 660-003-20, Dated July 15, 2020.



Map Scale: 1:2,690 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Utah County, Utah - Central Part
Survey Area Data: Version 13, Jun 8, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 30, 2018—Aug 29, 2018

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
8001	Bingham gravelly loam, 1 to 3 percent slopes	1.6	5.9%
CrD	Cleverly cobbly sandy loam, 6 to 15 percent slopes	1.5	5.3%
CsC	Cleverly gravelly fine sandy loam, 3 to 6 percent slopes	8.7	31.3%
HNG	Hillfield-Layton complex, 30 to 60 percent slopes	12.3	44.2%
LeD	Layton loamy fine sand, 6 to 15 percent slopes	3.7	13.2%
Totals for Area of Interest		**27.7**	**100.0%**

Retention Pond

Project: Koroem Court
Location Alpine, Utah
Date: 5/4/2021
Designer: Mat Wangsgaard

100-Year Retention Sizing

Design Criteria

Intensity Table: Per NOAA Atlas 14
Return Period: **100 year**
Allowable Discharge: **0.00 cfs/acre**

Allowable Discharges

Storm Drain Discharge: 0.00 cfs
Other Discharge: 0.00 cfs Source:
Total Discharge: **0 cfs**

Weighted "C" Value

Surface Type	*Area (sf)*	*"C" Value*	*C*A*
Homes (rooftops)	4,880	0.79	3,855
Drives	3,442	0.75	2,582
Roadway and Sidewalk	19,144	0.80	15,315
Landscape	87,379	0.15	13,107
Totals	114,845		34,858.75
Weighted "C" Value		**0.30**	

Drainage Calculations

Duration	Intensity	Runoff C	Area	Rainfall	Accumulated Flow	Allowable Discharge	Discharge	Required Storage
min	*in/hr*		*Ac*	*cfs*	*cf*	*cfs*	*cf*	*cf*
15.0	4.38	0.30	2.64	3.51	3,155	0.00	0	3,155
30.0	2.95	0.30	2.64	2.36	4,249	0.00	0	4,249
60.0	1.82	0.30	2.64	1.46	5,243	0.00	0	5,243
120.0	1.02	0.30	2.64	0.82	5,877	0.00	0	5,877
180.0	0.71	0.30	2.64	0.57	6,136	0.00	0	6,136
360.0	0.41	0.30	2.64	0.33	7,087	0.00	0	7,087
720.0	0.26	0.30	2.64	0.21	8,988	0.00	0	8,988
1440.0	0.14	0.30	2.64	0.11	9,680	0.00	0	9,680

Maximum Storage Requirement: ***9,680***
Maximum Storage Requirement (ac-ft): 0.22

24" Culvert Flow Calculation

Flow Calculation Equation:	Q=CIA		
C Value:	0.30		
Intensity Value (I):	0.71	*in/hr*	(100-year, 3-hour)
Catchment Area (A):	15.87	*Acres*	(see sheet C5.1 for area delineation)
Culvert Required Capacity (Q):	**3.42**	**CFS**	

ROW Pipe Flow Calculation

Flow Calculation Equation:	Q=CIA		
C Value:	0.30		
Intensity Value (I):	0.71	*in/hr*	(100-year, 3-hour)
Catchment Area (A):	2.64	*Acres*	(see sheet C5.2 for area delineation)
Culvert Required Capacity (Q):	**0.57**	**CFS**	

Rip-Rap Calculations

Project: Koroem Court
Location Alpine, Utah
Date: 5/4/2021
Designer: Mat Wangsgaard

D50 Rip-Rap Calculations

INPUT		
Q=	3.5	cfs
D=	2	ft
TW=	0.8	ft
g=	32.2	ft/s²

OUTPUT		
D50 =	0.05209	ft
	0.625079	in

$$D_{50} = 0.2\, D \left(\frac{Q}{\sqrt{g} D^{2.5}} \right)^{4/3} \left(\frac{D}{TW} \right)$$

where,

- D_{50} = riprap size, m (ft)
- Q = design discharge, m^3/s (ft^3/s)
- D = culvert diameter (circular), m (ft)
- TW = tailwater depth, m (ft)
- g = acceleration due to gravity, 9.81 m/s^2 (32.2 ft/s^2)

Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, May 4 2021

19-0487 KOROEM COURT 15-INCH PIPE CAPACITY

Circular

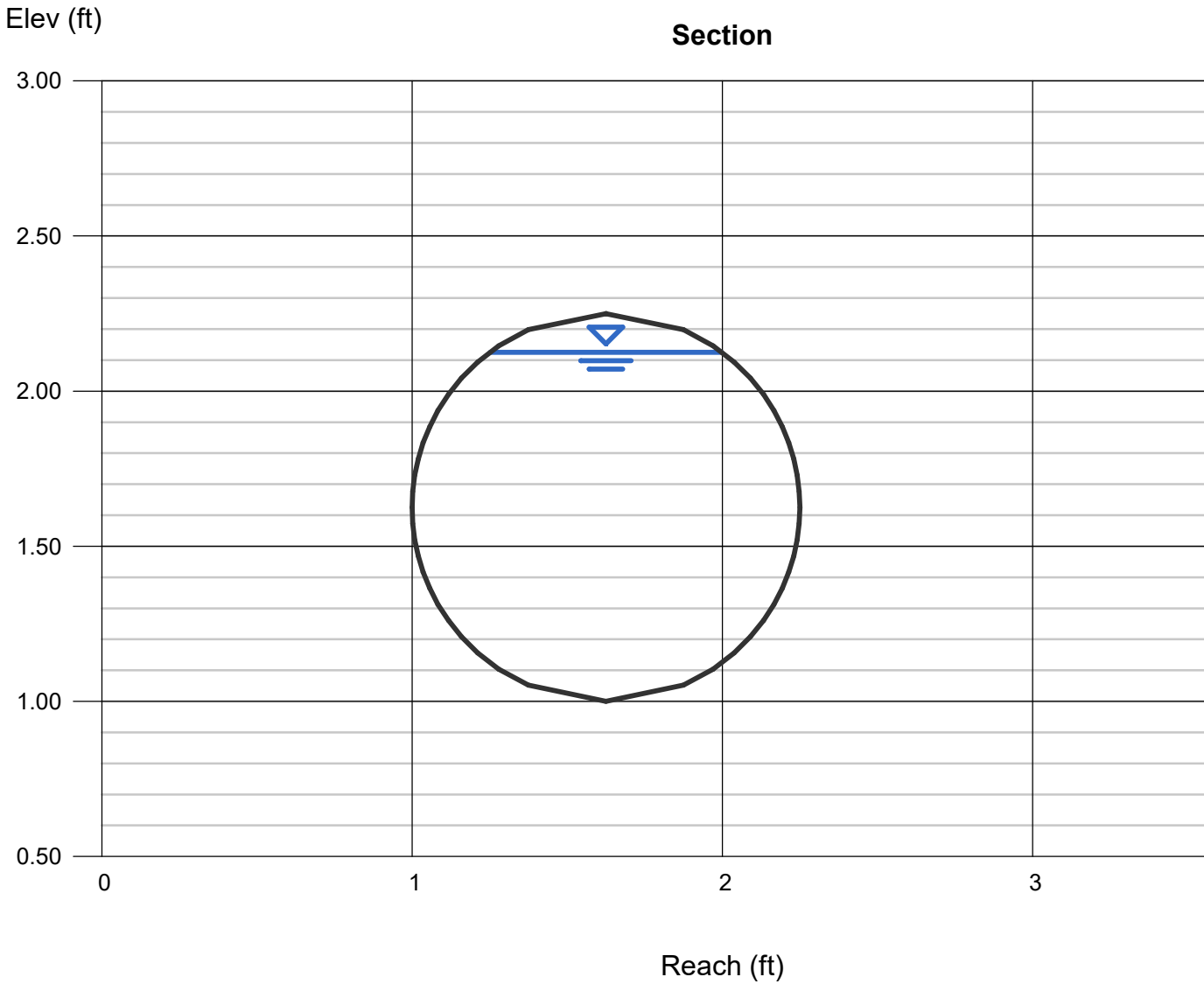
Diameter (ft)	= 1.25
Invert Elev (ft)	= 1.00
Slope (%)	= 0.50
N-Value	= 0.013

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 1.13
Q (cfs)	= 4.868
Area (sqft)	= 1.16
Velocity (ft/s)	= 4.18
Wetted Perim (ft)	= 3.13
Crit Depth, Yc (ft)	= 0.90
Top Width (ft)	= 0.75
EGL (ft)	= 1.40



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, May 4 2021

19-0487 KOROEM COURT 24-INCH CULVERT CAPACITY

Circular

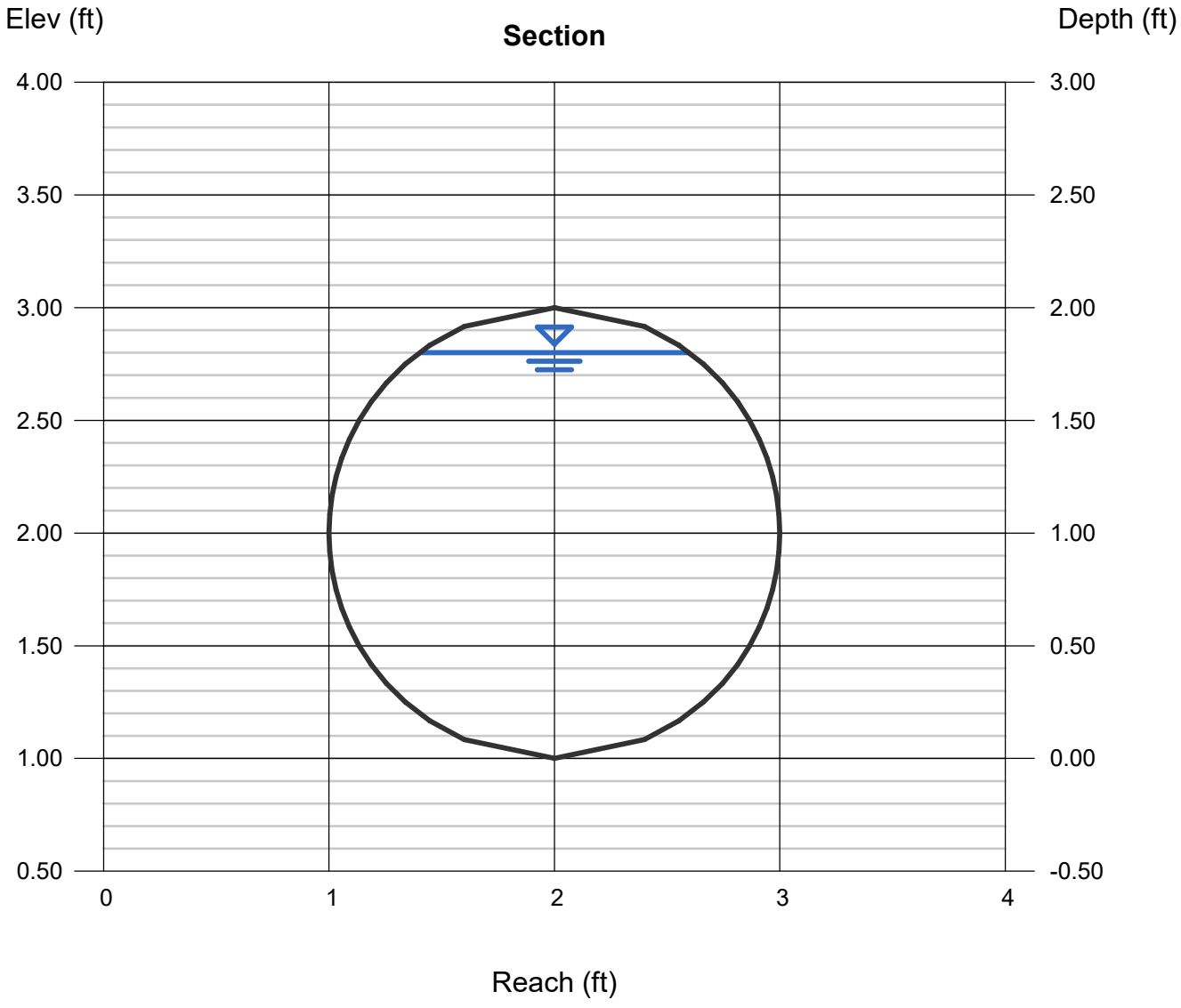
Diameter (ft)	= 2.00
Invert Elev (ft)	= 1.00
Slope (%)	= 5.99
N-Value	= 0.013

Calculations

Compute by:	Q vs Depth
No. Increments	= 10

Highlighted

Depth (ft)	= 1.80
Q (cfs)	= 59.02
Area (sqft)	= 2.98
Velocity (ft/s)	= 19.81
Wetted Perim (ft)	= 5.00
Crit Depth, Yc (ft)	= 1.99
Top Width (ft)	= 1.20
EGL (ft)	= 7.90



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, May 4 2021

19-0487 KOROEM COURT OPEN CHANNEL FLOW

Triangular

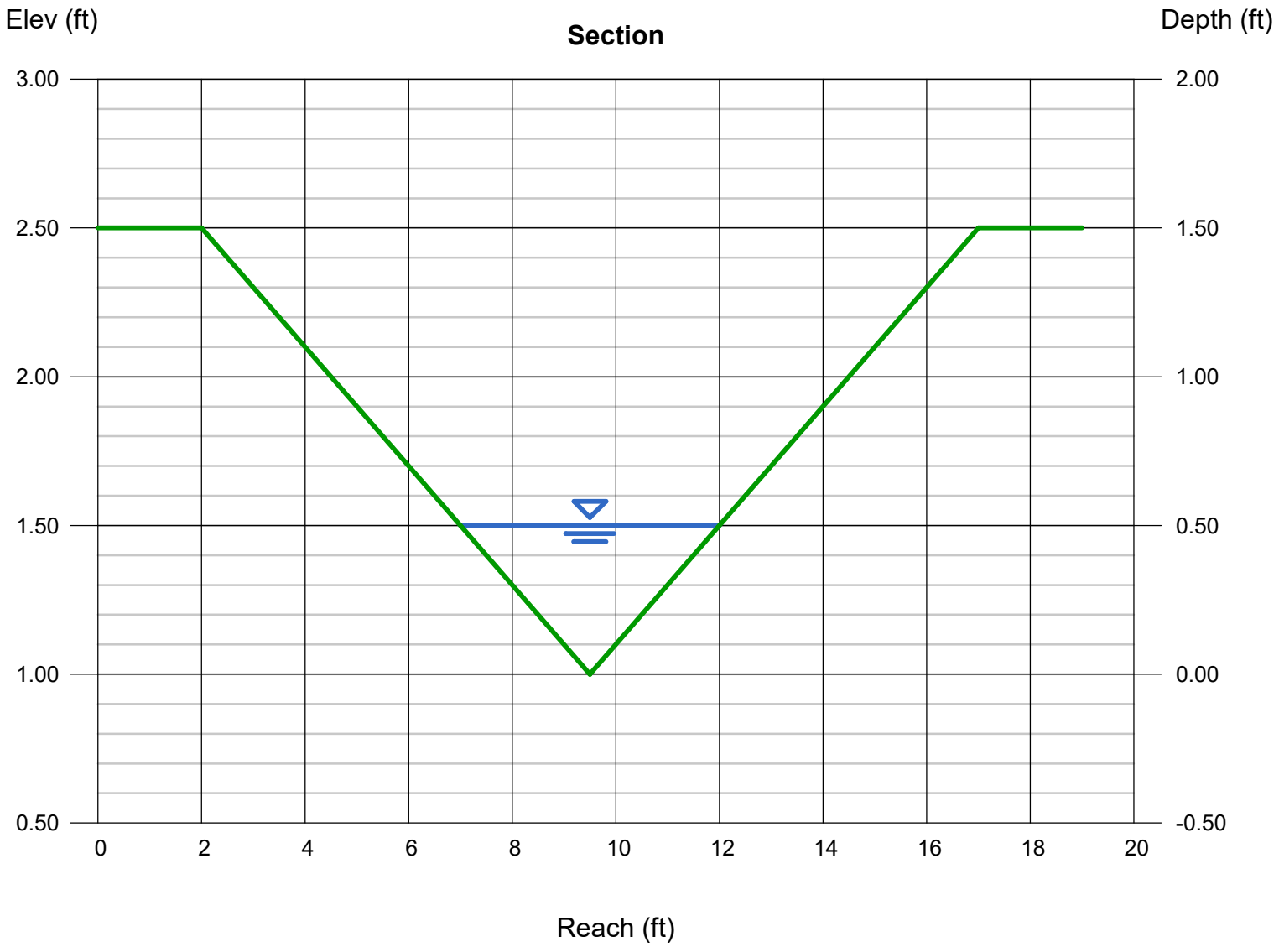
Side Slopes (z:1)	= 5.00, 5.00
Total Depth (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 8.00
N-Value	= 0.030

Calculations

Compute by:	Q vs Depth
No. Increments	= 15

Highlighted

Depth (ft)	= 0.50
Q (cfs)	= 6.856
Area (sqft)	= 1.25
Velocity (ft/s)	= 5.49
Wetted Perim (ft)	= 5.10
Crit Depth, Yc (ft)	= 0.66
Top Width (ft)	= 5.00
EGL (ft)	= 0.97



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, May 4 2021

19-0487 KOROEM COURT OPEN CHANNEL FLOW

Triangular

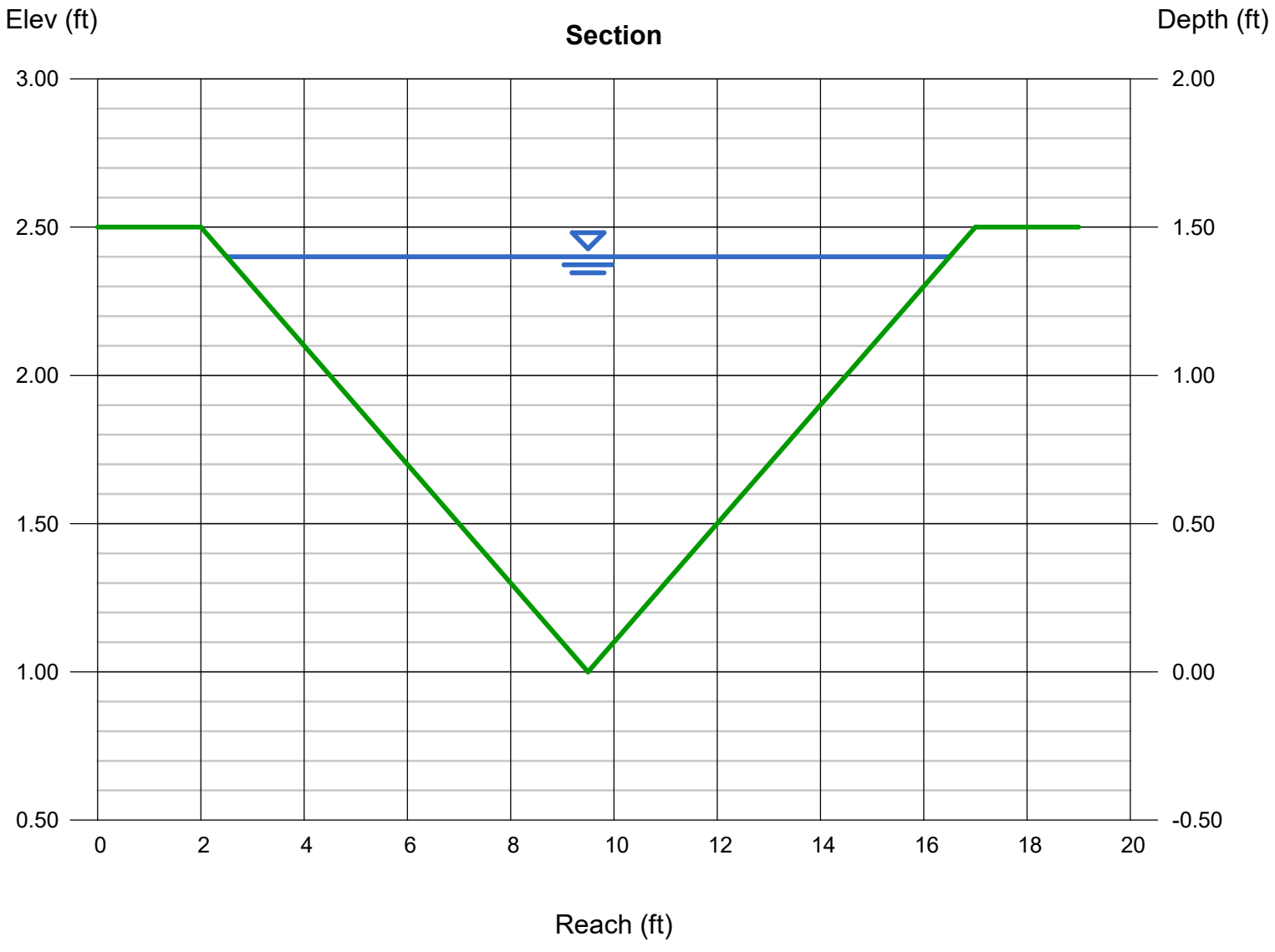
Side Slopes (z:1)	= 5.00, 5.00
Total Depth (ft)	= 1.50
Invert Elev (ft)	= 1.00
Slope (%)	= 8.00
N-Value	= 0.030

Calculations

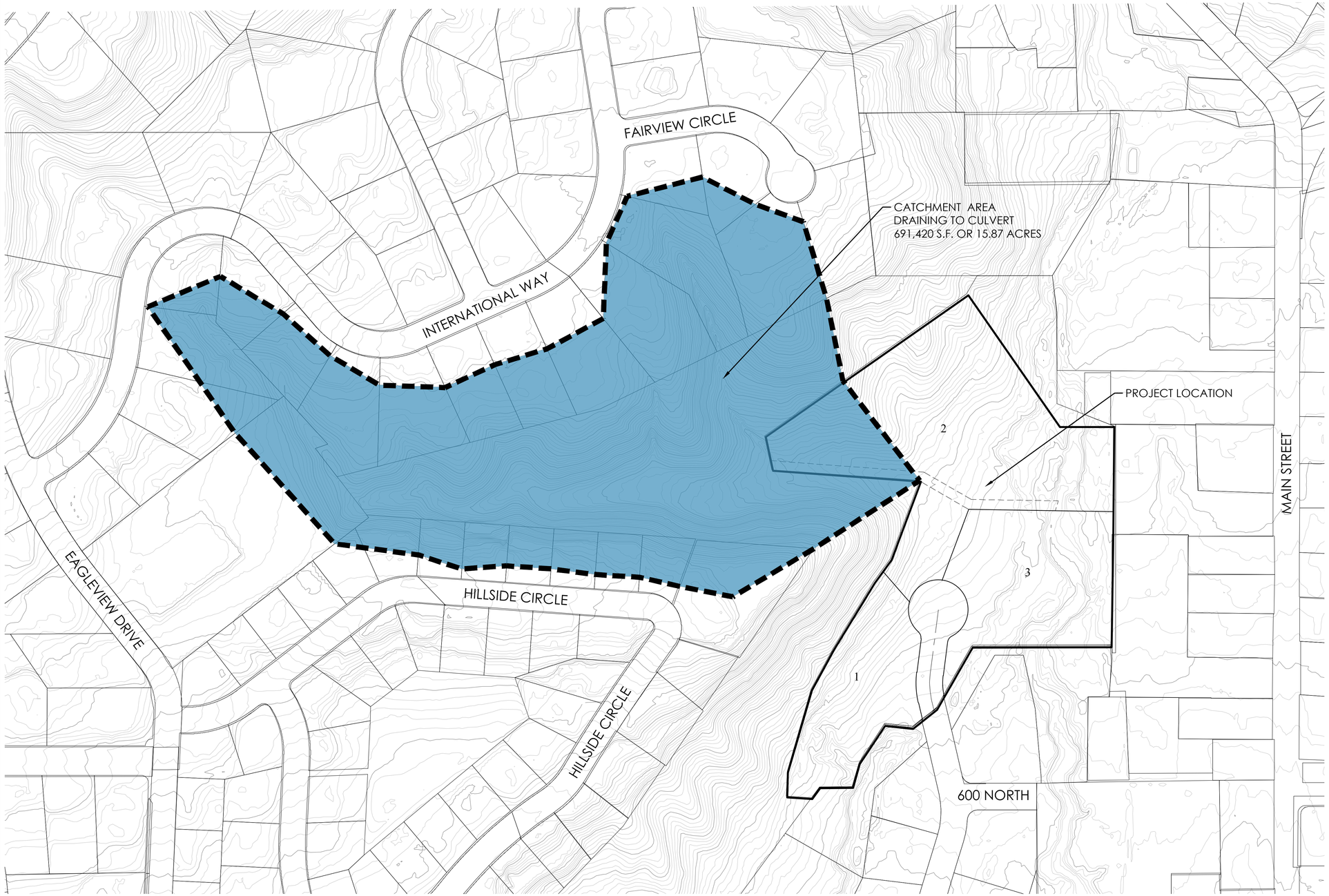
Compute by:	Q vs Depth
No. Increments	= 15

Highlighted

Depth (ft)	= 1.40
Q (cfs)	= 106.82
Area (sqft)	= 9.80
Velocity (ft/s)	= 10.90
Wetted Perim (ft)	= 14.28
Crit Depth, Yc (ft)	= 1.50
Top Width (ft)	= 14.00
EGL (ft)	= 3.25



NOTES:
1. SEE DRAINAGE REPORT FOR FULL CULVERT FLOW CALCULATIONS AND CAPACITY.



N

S

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100ft.

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FOR REVIEW ONLY

KOROEM COURT PRELIMINARY

ALPINE CITY, UTAH COUNTY, UTAH

OFF-SITE DRAINAGE AREA

REVISION BLOCK

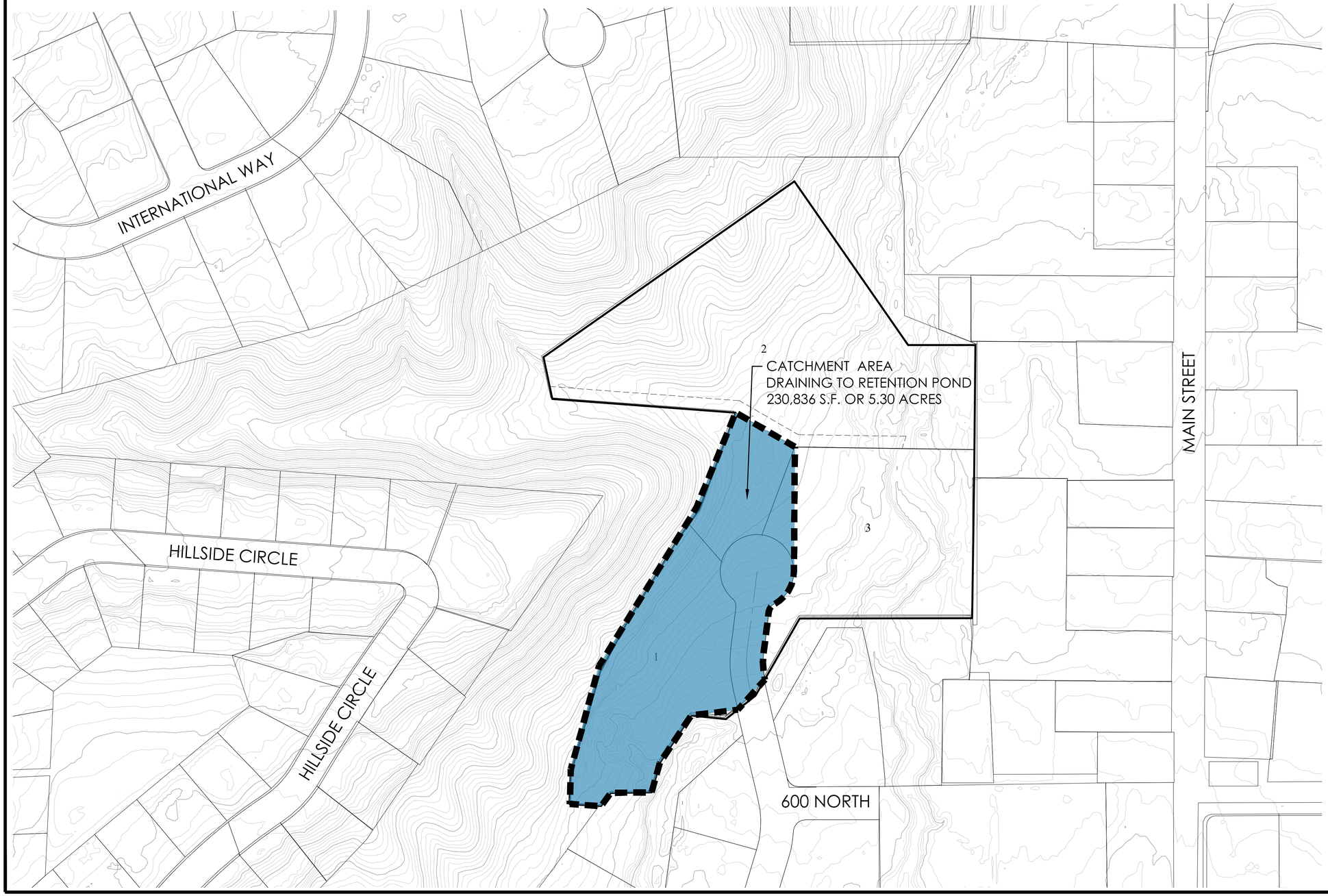
#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

OFF-SITE DRAINAGE AREA

Scale:	1"=100'	Drawn:	MHW
Date:	05/04/21	Job #:	19-0487
Sheet:	C5.1		

Z:_2019\19-0487 Koroem Court\design 19-0487\dwg\sheets\C5.1 - OFF-SITE DRAINAGE AREA.dwg

NOTES:
1. SEE DRAINAGE REPORT FOR FULL RETENTION POND CALCULATIONS AND CAPACITY.



N

S

GRAPHIC SCALE

80 0 40 80 160 320

(IN FEET)
1 inch = 80 ft.

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FOR REVIEW ONLY

KOROEM COURT PRELIMINARY
ALPINE CITY, UTAH COUNTY, UTAH
SITE DRAINAGE AREA

REVISION BLOCK

#	DATE	DESCRIPTION
1	----	----
2	----	----
3	----	----
4	----	----
5	----	----
6	----	----

SITE DRAINAGE AREA

Scale:	1"=80'	Drawn:	MHW
Date:	05/04/21	Job #:	19-0487
Sheet:	C5.2		

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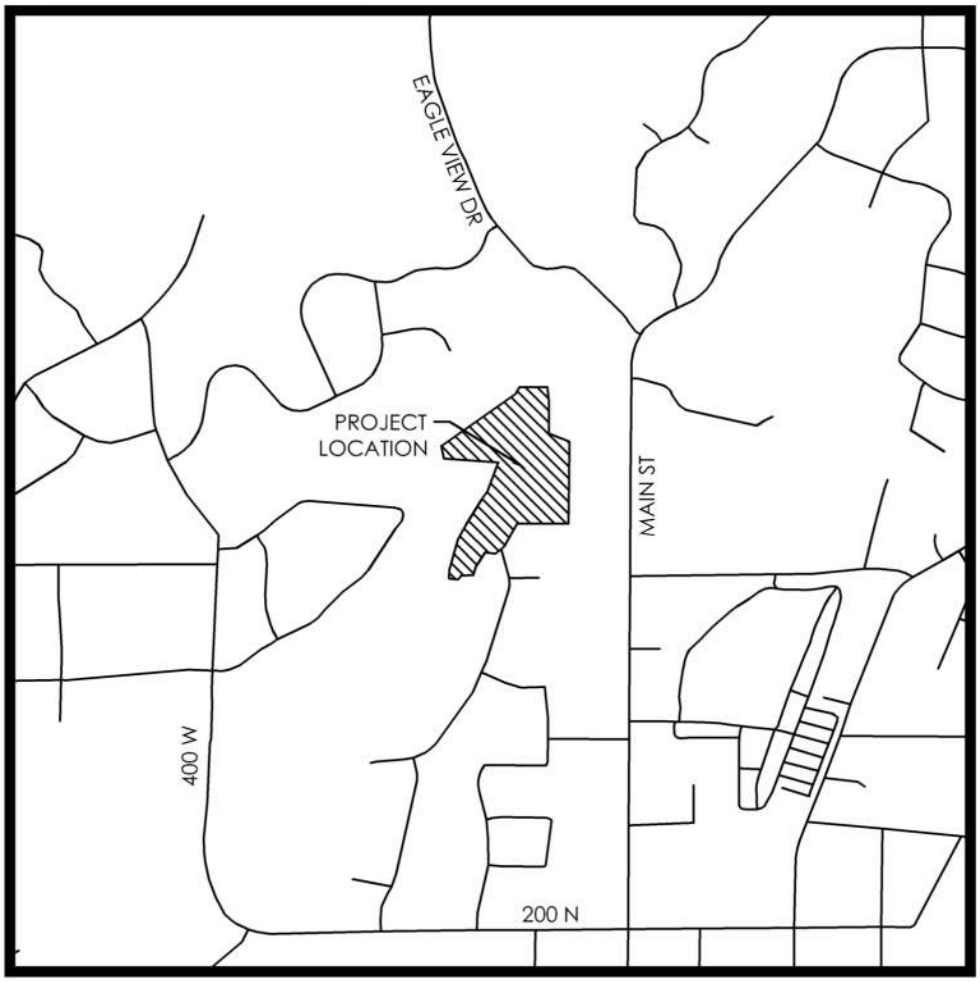
Z:_2019\19-0487 Koroem Court\design 19-0487\dwg\sheets\C5.2 - SITE DRAINAGE AREA.dwg



VICINITY MAP

N.T.S

GORDON GEOTECHNICAL ENGINEERING, INC.

REPORT
GEOLOGICAL HAZARD RECONNAISSANCE AND GEOTECHNICAL STUDY PROPOSED KOROEM COURT SUBDIVISION NORTH OF 662 NORTH WHITBY WOODLANDS DRIVE ALPINE, UTAH

July 15, 2020

Job No. 660-003-20

Prepared for:
Brian Hansen
623 North Patterson Lane
Alpine, Utah 84004

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

July 15, 2020
Job No. 660-003-20

Brian Hansen
623 North Patterson Lane
Alpine, Utah 84004

Attention: Mr. Brian Hansen

Ladies and Gentlemen:

Re: Report
Geological Hazard Reconnaissance and Geotechnical Study
Proposed Koroem Court Subdivision
North of 662 North Whitby Woodlands Drive
Alpine, Utah

1. INTRODUCTION

1.1 GENERAL

This report presents the results of our geological hazard reconnaissance and geotechnical study performed at the site of the proposed Koroem Court Subdivision which is located north of 662 North Whitby Woodlands Drive in Alpine City, Utah. A four-lot single family residential subdivision is planned for the approximately 8.4-acre site. The subject parcel is located as shown on attached Figure 1, Vicinity Map, and Figure 2, Site Plan, provides aerial coverage of the site and detail of the current (2018) layout of the site vicinity. As shown on Figure 2, the property parcel consists of an area that is currently vacant and undeveloped. The layout of the four lots proposed for the subdivision are also shown on Figure 2.

1.2 OBJECTIVES AND SCOPE

The objectives and scope of our studies were planned in discussions between Mr. Brian Hansen and Mr. Ryan Little of Gordon Geotechnical Engineering, Inc. (G^2).

The objectives and scope of our studies are two-fold, being a geological hazard reconnaissance study and a geotechnical engineering study, and the results of both studies are combined herein with this reporting.

In general, the **objectives** of this study were to:

1. To perform a Geologic Hazard Reconnaissance Study in accordance to Alpine City Development Code 3.12.060. The purpose of the reconnaissance studies is to evaluate if the proposed development is outside or within areas identified as Geologic Hazards Overlay areas, and if within a hazard area, to recommend appropriate additional studies that comply with the purpose and intent of the Alpine City Development Code. These hazards include, but are not limited to: Surface Fault Rupture, Debris Flows, Landslide, Rock Fall, Liquefaction Areas, Flood, or other Hazardous Areas.

2. To perform a geotechnical study to define and evaluate the subsurface soils and provide slope stability, earthwork, foundation, floor slab, geoseismic, and pavement parameters and recommendations to be used in the design and construction of the proposed structures.

The Geologic Hazard Reconnaissance Study **scope** included:

1. Perform a site reconnaissance to study and/or identify any potential geologic hazards.

2. Perform a desk study involving the review of geologic maps, topographic maps, Lidar, and previous geologic hazard reports.

3. Preparation of a geologic letter identifying any found geologic hazards and recommend any appropriate additional studies that comply with the purpose and intent of the Alpine City Development Code.

It should be noted the site is mapped within the Geologic Slope Hazards of “debris”, “rock”, “slide”, and “flood zone” on the Alpine City Hazard maps (Alpine City, 2006).

The Geotechnical Engineering Study **scope** included:

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

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 Mr. Brian Hansen by returning a signed copy of our Professional Services Agreement No. 20-0609 dated and executed on June 11, 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, 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 single-family residential subdivision is planned for the approximately 8.4-acre site. It is our understanding that the site will be subdivided into four lots. It is anticipated that the structures will be up to three levels above grade with a partial- to full-depth basement level.

Maximum column and wall loads are anticipated to be on the order of 40 to 60 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. Floor slab loads will be relatively light, on the order of 200 pounds per square foot or less.

Site development will require a minor amount of earthwork in the form of site grading. Maximum cuts and fills on the order of five to eight feet are projected.

Paved access roadways will also be a part of the overall development. Traffic over the pavements will consist of a light to moderately light volume of automobiles and light trucks, and some medium-weight trucks.

3. GEOLOGIC HAZARD RECONNAISSANCE INVESTIGATION

As part of the Alpine City Sensitive Land Ordinance - Geologic Hazards Overlay 3.12.060, studies are required to *minimize the adverse effects of geologic hazards* (Alpine City, 2006). *The geologic hazard overlay includes surface fault rupture, landslide, debris flow, rockfall, and soil liquefaction.* Because parts of the proposed subdivision site are located within identified as

potentially hazardous area as shown on the Alpine City Hazard maps as geologic hazards, this reconnaissance investigation is required prior to development.

3.1 LITERATURE REVIEW AND ANALYSIS

Our review of existing information and mapping for the subject site has included aforementioned previous reports and documentation and previous Utah Geological Survey (UGS) maps, reports, and data (Biek, 2005; Christenson and Shaw, 2008; FEMA, 2020; Utah County GIS, 2020). The geologic mapping of the site vicinity by Biek (2005) is presented on Figure 3, Geologic Mapping. In addition to the previewed reports, maps, and literature, our review has included an analysis of vertical and stereoscopic aerial photography for the site including a historical 1946 1:20,000 stereoscopic sequence (frames AAL-1B-73 and AAL-1B-74), a contemporary 2012 5.0-inch digital color HRO orthoimagery coverage, and 2018 0.6-meter digital color NAIP orthoimagery coverage of the site, as shown on Figure 2.

A GIS analysis and data integration for the site evaluation was conducted using the QGIS® GIS platform to geoprocess and analyze 2014 0.5-meter LiDAR digital elevation data made available for the site by the Utah Automated Geographic Reference Center (AGRC), and presented on Figure 4, LiDAR Analysis. The GIS analysis includes using the QGIS® platform Geospatial Data Abstraction Library (GDAL) Contour, and the GRASS® (Geographic Resources Analysis Support System) r.slope and r.shaded.relief modules. The GIS platform was used to integrate terrain layers, geologic mapping, photogrametric details, available digital vector and raster data, and field GPS details collected during our field program, and for graphical presentation of our study findings herein.

3.2 SITE GEOLOGY

The geology of the site was interpreted through an integrated compilation of data analyses, including a review of literature and mapping from our previous studies conducted in the area; geologic mapping by (Biek, 2005) as shown on Figure 3; photogeologic analyses of the historical and contemporary imagery as shown on Figure 2; GIS analyses of elevation and geoprocessed 2014 LiDAR terrain data as shown on Figure 4, and available GIS hazards information provided by the Utah Automated Geographic Reference Center (AGRC at: http://gis.utah.gov/) and Utah County GIS (2020); and field reconnaissance of the general site area, and the interpretation of the test pit exposures excavated at the site as part of our field program, which are discussed in Section 5.2, Subsurface Soil, of this report. Seismic hazards information was developed from United States Geologic Survey (USGS) databases (Peterson and others, 2008).

The site is located on the south side of the Traverse Mountain Salient on the north end of Utah Valley, which is within the Basin and Range Physiographic Province. This province is characterized by approximately north-south trending valleys and mountain ranges that have been formed by extensional tectonics and displacement along normal faults. The province

extends from the Wasatch Range on the east to the Sierra Nevada Range on the west (Hunt, 1967). Conversely, the Traverse Mountain Salient is an east-to-west structural ridge comprised largely of Tertiary volcanics and Paleozoic sedimentary rocks (Biek, 2005), that is flanked by the Wasatch Range on the east and the Utah Valley on the west. The salient extends approximately 7.0 miles east-to-west and 3.5 miles north-to-south.

The surface of the site consists of foothill margin ground, with the west side of the site consisting of moderately steep to steep slopes extending beyond the west boundary of the site, and near level floodplain surfaces comprising the center and east side of the site adjacent to Fort Creek which flows from north-to-south along the east side of the site.

Figure 3 shows the location of the site relative to GIS overlays and geological mapping drawn by Biek (2005). A paraphrased summary of the geological mapping of the site vicinity by Biek (2005) is provided as follows:

> **Qaly-** Young alluvial deposits (Holocene to Upper Pleistocene) − Moderately sorted sand, silt, clay, and pebble to boulder gravel deposited in river channels and flood plains; incised by active stream channels, and locally include small alluvial-fan and colluvial deposits…
>
> **Qaf_1 -** Modern alluvial-fan deposits (Holocene) − Poorly to moderately sorted, non-stratified, clay- to boulder-size sediment deposited principally by debris flows at the mouths of active drainages; upper parts typically characterized by abundant boulders and debris-flow levees…
>
> **Qafy-** Younger undifferentiated alluvial-fan deposits (Holocene to Upper Pleistocene) − Poorly to moderately sorted, clay- to boulder-size sediment deposited principally by debris flows…
>
> **Qafp-** Alluvial-fan deposits related to the Provo phase of the Bonneville lake cycle (Upper Pleistocene) − Poorly to moderately sorted, clay- to cobble-size sediment…deposited by streams associated with the Bonneville (transgressive) phase...
>
> **Qafo-** Older alluvial-fan deposits (Upper Pleistocene) − Similar to younger undifferentiated alluvial-fan deposits (Qafy)…predating, the Bonneville shoreline...
>
> **Qalp-** Alluvial deposits related to the Provo phase of the Bonneville lake cycle (Upper Pleistocene) − Moderately to well-sorted sand, silt, and pebble gravel deposited principally in river channels; coarsens upgradient and includes boulder-size clasts…
>
> **Qalpo-** Older alluvial deposits related to the Provo phase of the Bonneville lake cycle (Upper Pleistocene) − Moderately to well-sorted sand, silt, and pebble to boulder gravel…that is about 30 feet (9 m) above adjacent Qalp deposits…

> **Qlgb -** Lacustrine gravel and sand (Upper Pleistocene) − Moderately to well-sorted, moderately to well-rounded clast-supported, pebble to cobble gravel and pebbly sand; thin to thick bedded…Qlgb deposited at and below highest Bonneville shoreline…
>
> **Qlsb -** Lacustrine sand and silt (Upper Pleistocene) − Fine- to coarse-grained lacustrine sand and silt with minor gravel; typically thick bedded and well sorted; gastropods locally common…Qlsb deposited at and below highest Bonneville shoreline but above the Provo shoreline...
>
> **Qlag -** Lacustrine and alluvial coarse-grained deposits (Pleistocene) − Poorly to moderately sorted, clay- to boulder-size sediment...

The near-surface geology of the subject site consists of upper Pleistocene age lacustrine and alluvial deposits, and Holocene alluvial deposits (Beik, 2005). The moderately steep to steep slopes extending beyond the west boundary are mapped as ***Qlsb -*** *Lacustrine sand and silt (Upper Pleistocene) − Fine- to coarse-grained lacustrine sand and silt with minor gravel*, with a foot-slope buttress comprised of ***Qafy-*** *Younger undifferentiated alluvial-fan deposits (Holocene to Upper Pleistocene) − Poorly to moderately sorted, clay- to boulder-size sediment* deposits. The near level floodplain surfaces comprising the center and east side of the site adjacent to Fort Creek are mapped as ancient ***Qafp-*** *Alluvial-fan deposits related to the Provo phase of the Bonneville lake cycle (Upper Pleistocene) − Poorly to moderately sorted, clay- to cobble-size sediment*, and more recently deposited ***Qaly-*** *Young alluvial deposits (Holocene to Upper Pleistocene) − Moderately sorted sand, silt, clay, and pebble to boulder gravel deposited in river channels and flood plains.*

3.3 GEOLOGIC/NATURAL HAZARDS

The Alpine City geologic hazard overlay requires an assessment of *surface fault rupture, landslide, debris flow, rockfall, and soil liquefaction*. Included with these geologic hazards we also assess exposure to flood hazards, and steep slope limitations for site development. Figure 5, Geologic Hazards Site Evaluation, shows the proposed subdivision layout relative to geologic hazards study areas layers, FEMA flood risk zone layers, and steep slope limitations layers. Our site-specific review of the geologic and natural hazards and recommendations pertaining to the hazards are summarized in the following sections:

3.3.1 Seismic Hazards: Surface Fault Rupture Hazards, Strong Earthquake Ground Motion and Liquefaction:

3.3.1.1 Surface Fault Rupture Hazards

The nearest active (Holocene) earthquake fault to the site is the Provo segment of the Wasatch fault zone (UT2351G) which is located 1.45 miles east of the site (Black and others, 2004).

Accordingly, fault rupture hazards are not considered present on the site. The site is located well outside the surface fault rupture hazard special studies zone, which includes a zone of 500 feet on both sides of the mapped fault trace; thus, a surface fault rupture hazard study and trenching is not required for the proposed subdivision site.

3.3.1.2 Strong Earthquake Ground Motion

Regional strong ground motion originating from the Wasatch fault or other near-by seismic sources is capable of impacting the site and surrounding areas. The Wasatch fault zone is considered active and capable of generating earthquakes as large as magnitude 7.3 (Arabasz and others, 1992). Based on probabilistic estimates (Peterson, and others, 2008) queried for the site, the expected peak horizontal ground acceleration on rock from a large earthquake with a 10-percent probability of exceedance in 50 years is as high as 0.17*g,* and for a two-percent probability of exceedance in 50 years is as high as 0.53*g* for the site.

The 10-percent probability of exceedance in 50 years event has a return period of 475 years, and the 0.17*g* acceleration for this event corresponds “strong” perceived shaking with “light” potential damage based on instrument intensity correlations. The 2-percent probability of exceedance in 50 years event has a return period of 2475 years, and the 0.53*g* acceleration for this event corresponds “severe” perceived shaking with “moderate to heavy” potential damage based on instrument intensity correlations (Wald and others, 1999).

Future ground accelerations greater than these are possible but will have a lower probability of occurrence. For IBC motions see Section 6.9.3, Site Seismic Response.

3.3.1.3 Liquefaction Potential Hazards

In conjunction with strong earthquake ground motion potential of large magnitude seismic events as discussed previously, certain soil units may also possess a potential for liquefaction during a large magnitude event. Liquefaction is a phenomenon whereby loose, saturated, granular soil units lose a significant portion of their shear strength due to excess pore water pressure buildup resulting from dynamic loading, such as that caused by an earthquake. Among other effects, liquefaction can result in densification of such deposits causing settlements of overlying layers after an earthquake as excess pore water pressures are dissipated. Horizontally continuous liquefied layers may also have a potential to spread laterally where sufficient slope or free-face conditions exist. The primary factors affecting liquefaction potential of a soil deposit are: (1) magnitude and duration of seismic ground motions; (2) soil type and consistency; and (3) occurrence and depth to groundwater.

Liquefaction potential hazard mapping for Utah County by Anderson and others (1994) classifies the site location as within a “Very Low” Liquefaction Potential area, and an area where liquefaction potential hazard studies are not required.

3.3.2 Landsliding

On the basis of mapping by Biek (2005), the nearest potentially active landslide units are mapped as **Qmsy** (younger landslide deposits) that are located approximately 1.5 miles north of the site (not shown on Figure 3). Figure 5 shows the sloping areas on the west side of the site as within the landslide study area as delimited by Alpine City (2006) and Utah County GIS (2020)[1]. On the basis of our analysis of the aerial photography, the LiDAR imagery, and our site reconnaissance, no landslide features or morphology (Varnes, 1978) was observed on the site or on properties adjacent to the site. It is our opinion no active landsliding is present on the site.

3.3.3 Alluvial Fan - Debris Flow Processes

Alluvial fans are landforms that form where upland drainages exit onto unconfined valley or basin surfaces, whereupon stream flow energy is reduced and sediment is deposited. With successive flood events over time, the fan-shaped morphology will develop as distributary channels work and rework the sediments originating at the fan head (apex) and moving the sediments down-fan and distributing the sediments to the distal margins of the landform. Sediments introduced to the fan head may arrive in the form of stream flood to debris flow process events (Bull, 1977).

The nearest alluvial fan and potential debris flow process deposits to the site, are mapped as **Qafy,** and occur sloping areas on the west side of the site as shown on Figure 3. On the basis of our analysis of the aerial photography, the LiDAR imagery, our site reconnaissance and our interpretation of the test pit exposures excavated at the site as part of our field program (see Section 5.2, Subsurface Soil, of this report); we have determined that the **Qafy** deposits mapped on the site are not comprised of coarse alluvium deposited by debris flow processes, but are of finer-grained sediments of silt (ML) and sand (SM and SP), with some gravel particles, likely deposited by sheet-flow and slope-wash processes originating from **Qlsb** deposits (fine- to coarse-grained lacustrine sand and silt with minor gravel) that are located on the slopes on and above the west side of the site.

Alluvial fan deposits and potential debris flow hazards associated with Fort Creek, are mapped as **Qaf_1** (modern alluvial-fan deposits - poorly to moderately sorted, non-stratified, clay- to boulder-size sediment). These deposits occur approximately 1700 feet upstream and north from the site.

On the basis of our on-site analysis and observations, we do not believe debris flow hazards are present on the site.

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1 The Alpine City (2006) and Utah County GIS (2020) delimited Landslide Study Area, Debris Flow Study Area, and Rockfall Study Area overlays shown on Figure 5 occupy the same areas on the site and site vicinity for the three hazard study areas.

3.3.4 Rockfall Hazards

Lund and Knudsen (2016) have found that *rockfalls occur where a source of rock exists above a slope steep enough to allow rapid downslope movement of dislodged rocks by falling, rolling, bouncing, and sliding…Rockfall sources include bedrock outcrops or boulders on steep mountainsides or near the edges of escarpments such as cliffs, bluffs, and terraces*. Although the slopes on the west side of the site are moderately steep to steep slopes that extend beyond the west boundary of the site, no bedrock outcrops or latent boulders were observed on these slopes. Because source outcrops or boulders are not expected on the **Qlgb** (lacustrine gravel and sand) and **Qlsb** (lacustrine sand and silt) deposits mapped to the west of the site, we believe that rockfall hazards are not present on the site.

3.3.5 Flooding

The Alpine City Flood Damage Prevention Overlay ordinance Section 3.12.080, defines the Area of Special Flood Hazard - *is the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. The area may be designated as Zone A on the Flood Hazard Boundary Map…Zone A usually is refined into Zones A, AE*… These flood risk zones that are affiliated with Fort Creek are shown on Figure 5 as FEMA Flood Risk Zones A and AE and are based upon mapping by FEMA prepared June of 2020 (FEMA, 2020). The flood risk A – AE Zone is shown to cross parts of the proposed Lots #2, #3, and #4.

Because of the implied flood hazards *on the Zones A, AE* shown on Figure 5, we recommend that these areas as shown on Figure 5 be avoided for general site development and structure placement, unless the site development plans are approved through a *Development Permit* approved by the *Floodplain Administrator* (City Engineer) as outlined in the Alpine City ordinance section Flood Damage Prevention Overlay: 3.12.080.7.c. Permit Procedures (Alpine City, 2006).

3.3.6 Sloping Surfaces

The site vicinity slopes developed from our LiDAR analysis range from level to well over 50-percent as shown on Figure 4. As shown on Figure 4, the site slopes on west side of the site consist of moderately steep to steep slopes extending beyond the west boundary, and slope downward to the southeast, becoming near level near Fort Creek. Elevations on the site range from 4994 feet on the southeast side of the site, to 5090 feet on the northwest side of the site.

The average slopes for the subdivision parcel and the four proposed development lots are summarized on the following page.

Parcel	Area Acres	Slope Percent
Lot #1	1.7	24.22
Lot #2	3.42	22.35
Lot #3	1.39	18.97
Lot #4	1.39	20.47
Subdivision Parcel	8.45	21.45

The threshold gradient for slope development considerations and "Buildable Area" definition according to the Alpine City Geologic Hazards Overlay 3.12.060 includes slopes greater than 20-percent (Alpine City, 2006). The steep slope areas, in excess of 20-percent, for the site are shown on Figure 5.

3.3.7 Site Reconnaissance

The site was reconnoitered on June 16, 2020, and the geotechnical engineering field program and tests pits were excavated on June 17, 2020. The site is an irregular-shaped property occupying area approximately 1120 feet north-south, and 720 feet east-west in maximum plan dimensions. From the south property frontage on the end of Whitby Woodlands Drive, the site surface slopes gently upward to the north, with steeper slopes rising to the northwest. On the east side of the parcel, the Fort Creek stream channel was observed to be entrenched roughly 6 to 8 feet below the surface. A lesser channel that appears to be an irrigation conveyance was observed approximately 50 to 100 feet west of the Fort Creek channel. The lesser channel was also entrenched roughly 5 to 6 feet below the surface. Cover on the east side of the site in the vicinity of Fort Creek and the lesser channel consisted of densely wooded cover with cottonwood, box elder, and alder trees, with an understory of grasses and weeds. The center of the property was open with a cover of tall bunch grasses, weeds, and sagebrush. The sloping areas on the west side of the site were covered with a dense oak and maple brush, with open areas of sagebrush and grass.

The surficial soils on the site appeared to consist of sandy silts with sub-rounded cobble and boulder sized particles exposed along the Fork Creek channel.

Recently constructed and established single-family homesites were observed on near-by and adjacent properties.

During the reconnaissance, no conditions of imminent geologic hazards were observed at the subject parcel.

4. GEOTECHNICAL ENGINEERING INVESTIGATIONS

4.1 FIELD PROGRAM

In order to define and evaluate the subsurface soil and groundwater conditions across the site, 4 test pits were excavated to depths of 12 to 15 feet. It should be noted that refusal was encountered on boulders during excavating operations at Test Pit TP-3 at a depth of 12 feet. The approximate locations of the test pits from this study are presented on Figure 5.

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 excavating 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 have been supplemented by subsequent inspection and testing in our laboratory. Detailed graphical representation of the subsurface conditions encountered is presented on Figures 6A through 6D, Log of Test Pits. Soils were classified in accordance with the nomenclature described on Figure 7, Unified Soil Classification System.

Disturbed bag samples were collected from the soils brought up by the backhoe bucket.

Following completion of excavating and logging, each test pit was 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. Additionally, some caving of the test pit sidewalls was observed during excavating operations.

4.2 LABORATORY TESTING

4.2.1 General

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

4.2.2 Moisture and Density Tests

To aid in classifying the soils and to help 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 6A through 6D.

4.2.3 Partial Gradation Tests

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

Test Pits No.	Depth (feet)	Percent Passing No. 4 Sieve	Percent Passing No. 200 Sieve	Soil Classification
TP-1	2.5	90.4	32.2	SM
TP-1	10.0	83.6	15.3	SM
TP-2	3.0	88.1	36.8	SM
TP-2	9.0	-	77.8	ML
TP-3	4.0	70.7	13.6	SM
TP-4	3.0	83.4	15.5	SM

4.2.4 Consolidation Tests

To provide data necessary for our settlement analyses, a consolidation test was performed on one representative sample of the fine-grained soils encountered in the exploration test pits. The data available indicates that the soils are moderately over-consolidated and when loaded below the preconsolidation pressure the soils will exhibit moderate compressibility characteristics. Detailed results of the tests are maintained within our files and can be transmitted to you, at your request.

5. SITE CONDITIONS

5.1 SURFACE

The site consists of an 8.4-acre, irregular-shaped parcel containing undeveloped land covered by grasses, shrubs, and large trees.

The site is bordered by similar undeveloped land to the north, and residential structures to the east, south and west.

The topography of the site slopes gently to the southeast with an overall relief on the order of 50 to 100 feet. The average slope of the four lots varied from 18.97 to 24.22 percent.

5.2 SUBSURFACE SOIL

The soil conditions encountered in each of the test pits, to the depths excavated, were relatively similar. In general, from the ground surface at Test Pits TP-1 through TP-4 and extending to the depths explored of 12 to 15 feet, natural sand with varying amounts of silt and gravel was encountered. The sands are medium dense, slightly moist, brown, and will exhibit relatively high strength and low compressibility characteristics. Additionally, the upper three to six inches contain major roots and are loose. It should be noted that some layers of clayey silt were encountered in Test Pits TP-1 and TP-2. As stated previously, refusal was encountered on boulders during excavating operations at Test Pit TP-3 at a depth of 12 feet.

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.

5.3 GROUNDWATER

Groundwater was not encountered in the test pits to the depths explored, 12 to 15 feet, during excavation operations. Groundwater is anticipated to be at a depth greater than 20 feet at the site.

Seasonal and longer-term groundwater fluctuations of one to two feet should be anticipated. The highest seasonal levels will generally occur during the late spring and summer months.

6. DISCUSSIONS AND RECOMMENDATIONS

6.1 SUMMARY OF FINDINGS

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.

The most significant geotechnical aspects of the site are:

1. The loose, surficial soils in the upper three to six inches of the natural granular soils encountered. Loose, surficial soils must be completely removed from below the building footprint.

2. Excavation refusal due to boulders at a dept of 12 feet in Test Pit TP-3. Basement excavations may be difficult due to boulders.

Due to the variable nature of the loose, surficial soils, a qualified geotechnical engineer from our staff must aid in verifying that all loose, surficial soils have been completely removed prior to the placement of structural site grading fills, footings, or foundations.

Due to possible "perched" groundwater conditions and to minimize variations in the moisture content of the supporting soils, subdrains will be required around subgrade levels and behind retaining structures.

The natural sands and gravels may be suitable for re-use provided they meet the requirements of structural fill specified in Section 5.2.3, Structural Fill.

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

6.2 EARTHWORK

6.2.1 Site Preparation

Preparation of the site must consist of the removal of all loose surficial soils, non-engineered fills (if encountered), 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.

The loose, surficial soils 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 (if encountered) 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 loose, surficial soils may be removed and replaced with granular subbase over proofrolled subgrade. Even with proper preparation, flexible pavements established on loose, surficial soils may experience some long-term movements. If the possibility of these movements is not acceptable, these loose, surficial soils 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, G^2 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.

6.2.2 Temporary Excavations

Temporary construction excavations in cohesive soil, not exceeding four feet in depth, may be constructed with near-vertical sideslopes. Temporary excavations up to 12 feet deep in

granular soils (sands) may be constructed with sideslopes no steeper than one horizontal to one vertical (1.0H:1.0V). Temporary excavations up to 12 feet deep in fine-grained cohesive soils (not anticipated) may be constructed with sideslopes no steeper than one half horizontal to one vertical (0.5H:1.0V).

Utility trench excavations must conform within Occupational Safety and Health (OSHA) guidelines for trench safety.

As stated previously, refusal was encountered on boulders during excavating operations at Test Pit TP-3 at a depth of 12 feet. Deeper excavations may be difficult in areas.

Excavations encountering loose and/or saturated cohesionless soils will be very difficult and will require very flat sideslopes and/or shoring, bracing, and dewatering as these soils will tend to flow into the excavation.

Excavations deeper than 12 feet are not anticipated at the site.

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.

6.2.3 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 possibly 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 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 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 shall be restricted to two inches.

The non-engineered fills (if encountered), natural fine-grained and underlying granular soils may be utilized as structural site grading fill. It should be noted that unless moisture control is maintained, utilization of fine-grained soils as structural site grading fill will be very difficult, if not impossible, during wet and cold periods of the year. Only granular soils are recommended as structural fill in confined areas, such as around foundations and within utility trenches.

All imported granular structural fills should consist of a fairly well-graded mixture of sand and gravel containing less than 18 percent fines (percent by weight of material passing the No. 200 sieve).

To stabilize soft subgrade conditions (if needed), a mixture of coarse gravels and cobbles (stabilizing fill) should be utilized. A layer of stabilizing fill approximately 12 to 18 inches thick is typically sufficient to stabilize most soft/disturbed areas.

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.

6.2.4 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[2] T-180 (ASTM[3] D-1557) 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 3 feet beyond the perimeter of the structure	0 to 8	95
Outside area defined above	0 to 5	90
Outside area defined above	5 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 6.2.1, 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

[2] American Association of State Highway and Transportation Officials
[3] American Society for Testing and Materials

moderately heavy construction equipment or large self-propelled compaction equipment over the area 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.

6.2.5 Utility Trenches

All utility trench backfill material below structurally loaded facilities (flatwork, floor slabs, roads, 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 proofrolled and/or properly compacted prior to the construction of any exterior flatwork over a backfilled trench. Proofrolling 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 proofrolling, they shall 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-1a or A-1b (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 natural sands may be suitable for re-use as trench backfill provided they meet the requirements of A-1a or A-1b material.

6.3 SPREAD AND CONTINUOUS WALL FOUNDATIONS

6.3.1 Design Data

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 footings be placed overlying loose, surficial soils.

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	- 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 Pressure for Real Load Conditions	
For footings on suitable natural soils and/or structural fill extending to suitable natural soils	- 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.

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.

6.3.2 Installation

Under no circumstances shall the footings be established upon loose or disturbed soils, non-engineered fills (if encountered), 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.

6.3.3 Settlements

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

6.4 SUBDRAINS

A permanent foundation/chimney subdrain system will be required around the outside of all subgrade walls.

The perimeter subdrain pipe should consist of a minimum of four-inch diameter, slotted or perforated pipe with the invert established at least 18 inches below the top of the lowest adjacent slab. The pipe should be encased in a one-half- to one-inch minus clean gap-graded crushed gravel extending two inches below, laterally, and up continuously at least 12 inches above the top of the lowest adjacent slab. The same granular material could be utilized as the chimney drain against the subgrade walls. The gravel chimney drain must be continuous and at least six inches wide. In all cases, the gravels must be separated from natural soils or backfill with a geotextile fabric, such as Mirafi 140N or equivalent. As an alternate, a synthetic drain board, such as Miradrain or equivalent, can be used for the chimney subdrain. The slope of the pipe should be at least 0.25 percent to a suitable point of gravity discharge, such as a sump within or outside the perimeter of the below-grade portion of the structure or by gravity down-gradient. Prior to installing the gravels, we recommend that the outside walls adjacent to habitable areas be appropriately waterproofed. If the areas are mechanical areas, dampproofing should be adequate.

6.5 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 0.45 should be utilized for the natural granular soils. In determining frictional resistance, a coefficient of 0.40 should be utilized for the natural fine-grained soils. 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.

6.6 LATERAL PRESSURES

The lateral pressure parameters, as presented within this section, assume that the backfill extending at least five feet from the back of the wall be properly placed and compacted granular soil. 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), granular backfill may be considered equivalent to a fluid with a density of 35 pounds per cubic foot in computing lateral pressures. For more rigid basement walls, granular backfill may be considered equivalent to a fluid with a density of 45 pounds per cubic foot. For very rigid non-yielding walls, granular backfill should be considered equivalent to a fluid with a density with at least 55 pounds per cubic foot. The above values assume that the surface of the soils slope behind the wall is horizontal, that the granular fill has been placed and lightly compacted, not as structural fill. If the fill is placed as a structural fill the values should be increased to 45 pounds per cubic foot, 60 pounds per cubic foot, and 120 pounds per cubic foot, respectively.

Recommended average lateral uniform pressure for various height walls are tabulated below and assume a granular wall backfill with a horizontal grade above the wall. It should be noted that the lateral pressures as quoted assume that the backfill materials will not become saturated. If the backfill becomes saturated, the above values may be decreased by one-half; however, full hydrostatic water pressures will have to be included.

Wall Height (feet)	Uniform Seismic Lateral Pressure*, ** (psf)
4	88
8	176
12	265

* Maximum short-term pressures, they are not sustained loads.
** For intermediate height wall, the lateral pressure will be developed based upon a straightline interpolated between the pressures at the specific height.

Note that the pressures presented in this section do not include surcharge loadings, such as floor slabs, adjacent footings, etc.

6.7 FLOOR SLABS

Floor slabs may be established directly upon suitable natural soils and/or structural fill extending to suitable natural soils. Loose, surficial soils are not considered suitable. To provide a “working mat”, it is recommended that floor slabs are directly underlain by a minimum of four

inches of aggregate base material. Settlements of lightly to moderately loaded floor slabs are anticipated to be minor.

6.8 PAVEMENTS

The properly prepared loose, surficial soils will exhibit poor engineering characteristics when saturated or nearly saturated. Loose, surficial soils may remain in flexible pavement areas if properly prepared, as stated previously in this report. Rigid pavements shall not be placed overlying loose, surficial soils, even if properly prepared. Considering the existing loose, surficial soils as the subgrade soils and the projected traffic, the following pavement sections are recommended:

Subdivision Roadways

(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 existing loose, surficial soils, 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 loose, surficial soils, even if properly prepared.

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.

6.9 GEOSEISMIC SETTING

6.9.1 General

In July 2019, the State of Utah adopted the 2018 International Building Code (IBC) and the 2015 International Residential Code (IRC). The IRC 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 being Site Class D. The USGS values are presented on maps incorporated into the building code and are available based on latitude and longitude coordinates (grid points).

The single-family residential structures should be designed in accordance with the procedures presented in Section R301.2.2, Seismic Provisions of the 2015 IRC.

6.9.2 Soil Class

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.

6.9.3 Site Seismic Response

The IRC 2015 code is based on 2008 USGS mapping, which provides peak values of short and long period accelerations (S_S, S_1) for the Site Class B-C boundary for the Maximum Considered Earthquake (MCE). This Site Class B-C boundary represents a hypothetical bedrock surface and must be corrected for local soil conditions. The following table summarizes the peak ground and short and long period accelerations for this site 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 (40.4622 degrees north and -111.7803 degrees west, respectively), the values for this site are tabulated on the following page.

Spectral Acceleration Value, T Seconds	Site Class B Boundary [mapped values] (% g)	Site Class D [adjusted for site class effects] (% g)
Peak Ground Acceleration	49.4	49.7
0.2 Seconds (Short Period Acceleration)	S_S = 123.4	S_{MS} = 124.2
1.0 Seconds (Long Period Acceleration)	S_1 = 45.7	S_{M1} = 70.5

The IBC design accelerations (S_{DS} and S_{D1}) are based on multiplying the above accelerations (adjusted for site class effects) for the MCE event by two-thirds.

6.10 SITE OBSERVATIONS

As stated previously, due to the potential for encountering loose, surficial soils at foundation depth, a qualified geotechnical engineer from our staff must aid in verifying that all loose, surficial soils have been completely removed prior to the placement of structural site grading fills, footings, or foundations.

GORDON GEOTECHNICAL ENGINEERING, INC.

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,

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Encl. Figure 1, Vicinity Map
Figure 2, Site Plan
Figure 3, Geologic Mapping
Figure 4, LiDAR Analysis
Figure 5, Geologic Hazards Site Evaluation
Figures 6A through 6D, Log of Test Pits
Figure 7, Unified Soil Classification

Addressee (3 + email)

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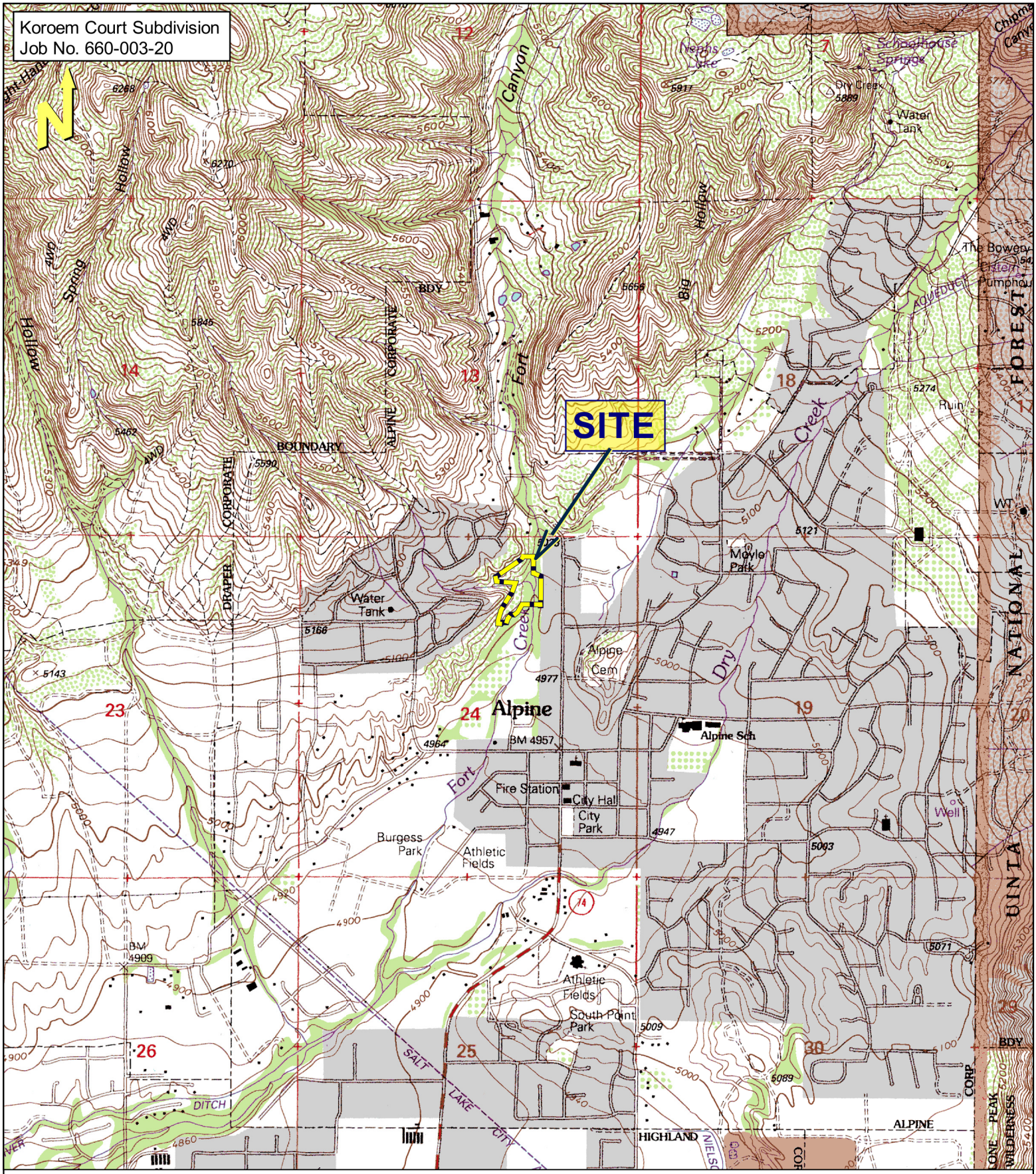


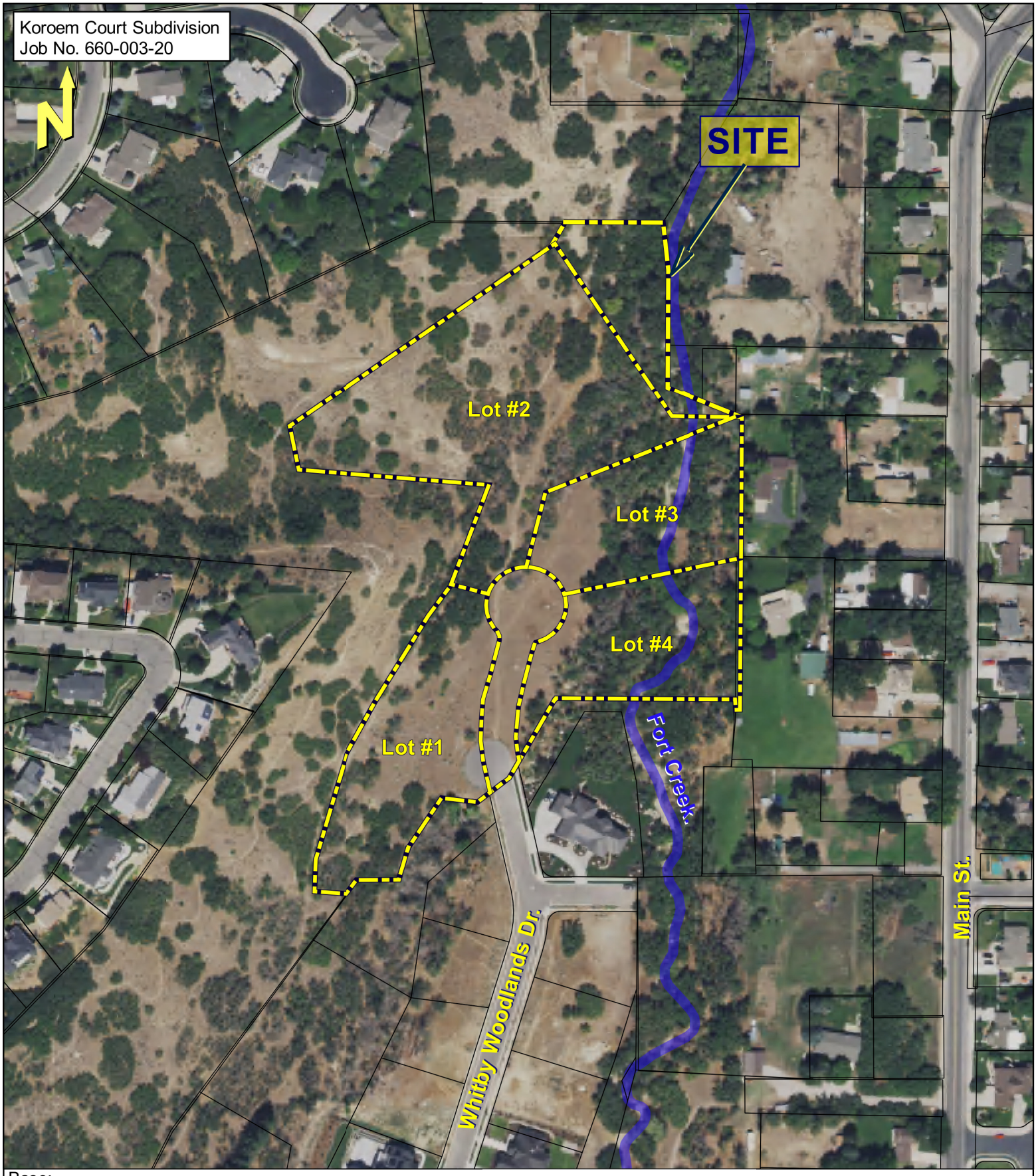
Base:
1998 USGS 7.5 Minute topographic map titled "Lehi, Utah" from Utah AGRC; http://gis.utah.gov/

0 200 400 ft

1:24,000

FIGURE 1
VICINITY MAP

GORDON GEOTECHNICAL ENGINEERING, INC.



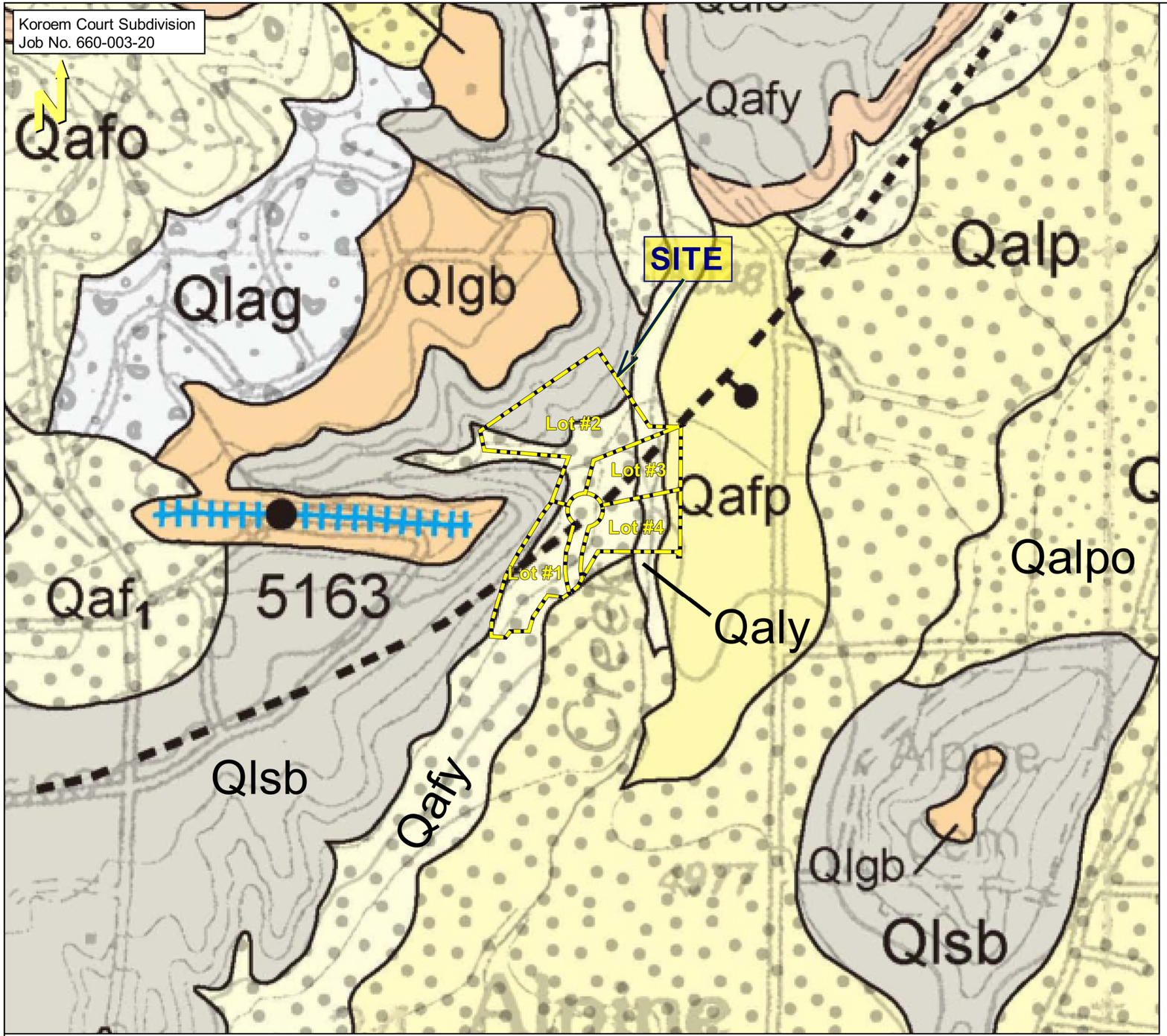
Base:
2018 0.6m NAIP Color Orthoimagery,
from Utah AGRC; http://gis.utah.gov/

0 200 400 ft

1:2,400

FIGURE 2
SITE PLAN

GORDON GEOTECHNICAL ENGINEERING, INC.



Explanation

(Geology after Beik, 2005)

Qaly — **Qaly** - Young alluvial deposits (Holocene to Upper Pleistocene) − Moderately sorted sand, silt, clay, and pebble to boulder gravel deposited in river channels and flood plains; incised by active stream channels, and locally include small alluvial-fan and colluvial deposits…

Qaf_1 — **Qaf_1** - Modern alluvial-fan deposits (Holocene) − Poorly to moderately sorted, non-stratified, clay- to boulder-size sediment deposited principally by debris flows at the mouths of active drainages; upper parts typically characterized by abundant boulders and debris-flow levees…

Qafy — **Qafy** - Younger undifferentiated alluvial-fan deposits (Holocene to Upper Pleistocene) − Poorly to moderately sorted, clay- to boulder-size sediment deposited principally by debris flows…

Qafp — **Qafp** - Alluvial-fan deposits related to the Provo phase of the Bonneville lake cycle (Upper Pleistocene) − Poorly to moderately sorted, clay- to cobble-size sediment… deposited by streams associated with the Bonneville (transgressive) phase...

Qafo — **Qafo** - Older alluvial-fan deposits (Upper Pleistocene) − Similar to younger undifferentiated alluvial-fan deposits (Qafy)…predating, the Bonneville shoreline...

Qalp — **Qalp** - Alluvial deposits related to the Provo phase of the Bonneville lake cycle (Upper Pleistocene) − Moderately to well-sorted sand, silt, and pebble gravel deposited principally in river channels; coarsens upgradient and includes boulder-size clasts…

Qalpo — **Qalpo** - Older alluvial deposits related to the Provo phase of the Bonneville lake cycle (Upper Pleistocene) − Moderately to well-sorted sand, silt, and pebble to boulder gravel…that is about 30 feet (9 m) above adjacent Qalp deposits…

Qlgb — **Qlgb** - Lacustrine gravel and sand (Upper Pleistocene) − Moderately to well-sorted, moderately to well-rounded ,clast-supported, pebble to cobble gravel and pebbly sand; thin to thick bedded…Qlgb deposited at and below highest Bonneville shoreline…

Qlsb — **Qlsb** - Lacustrine sand and silt (Upper Pleistocene) − Fine- to coarse-grained lacustrine sand and silt with minor gravel; typically thick bedded and well sorted; gastropods locally common…Qlsb deposited at and below highest Bonneville shoreline but above the Provo shoreline...

Qlag — **Qlag** - Lacustrine and alluvial coarse-grained deposits (Pleistocene) − Poorly to moderately sorted, clay- to boulder-size sediment...

Normal fault, dashed where approximately located, dotted where concealed and approximately located...

B — **Lake Bonneville Shoreline**

Crest of Lake Bonneville offshore bar or spit

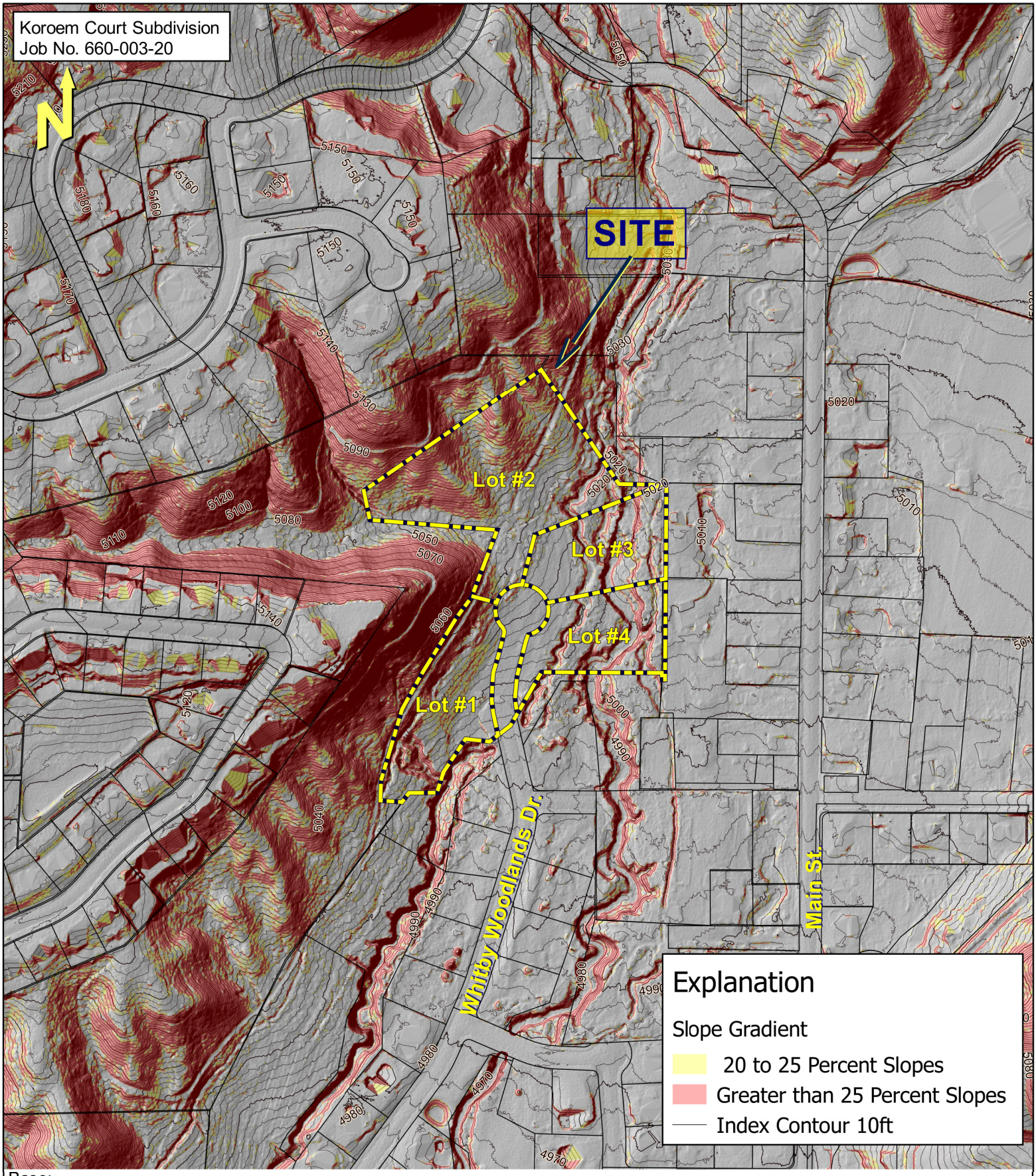
Base:
Biek, R.F., 2005, Geologic map of the Lehi quadrangle and part of the Timpanogos Cave quadrangle, Salt Lake and Utah Counties, Utah: 2 pl. 2005 Utah Geological Survey, scale 1:24,000

0 200 400 ft

1:4,800

FIGURE 3
GEOLOGIC MAPPING

GORDON GEOTECHNICAL ENGINEERING, INC.



Base:
2014 0.5m LiDAR Imagery,
from Utah AGRC; http://gis.utah.gov/

0 300 600 ft

1:3,600

FIGURE 4
LiDAR ANALYSYS

GORDON GEOTECHNICAL ENGINEERING, INC.

Koroem Court Subdivision
Job No. 660-003-20

N

SITE

TP-1

TP-2

TP-3

TP-4

Lot #1

Lot #2

Lot #3

Lot #4

5140 5110 5100 5090 5080 5070 5060 5050 5040 5030 5020 5010 5000 4990 5120 5130

Base:
2018 0.6m NAIP Color Orthoimagery,
from Utah AGRC; http://gis.utah.gov/

0 120 240 ft

1:1,440

Explanation

Geologic Hazard Study Areas (Alpine City, 2006; Utah County, 2020)*

- Landslide Study Area
- Debris Flow Study Area
- Rock Fall Study Area

*The Alpine City (2006) and Utah County GIS (2020) delimited Landslide Study Area, Debris Flow Study Area, and Rockfall Study Area overlays occupy the same areas on the site and site vicinity for the three hazard study areas.

FEMA (2020) - Alpine City (2006) Flood Risk Zones

- Zone A and AE: Areas subject to inundation by the 1-percent -annual-chance flood event generally determined using approximate methodologies...Mandatory flood insurance purchase requirements and floodplain management standards apply.

Slope Limitation Areas

- Greater than 20 Percent Slopes
- Index Contour 10ft

- Test Pit Locations

FIGURE 5
GEOLOGIC HAZARDS
SITE EVALUATION

GORDON GEOTECHNICAL ENGINEERING, INC.

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

TEST PIT TP-1

Project Name: Proposed Koroem Court Subdivision
Project No.: 660-003-20
Location: North of 662 North Whitby Woodlands Dr, Alpine, Utah
Client: Brian Hansen
Excavating Method: JCB 4CX Backhoe
Date Excavated: 06-17-20
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 trace fine gravel; numerous undecomposed roots and root casts; major roots (topsoil) to 2"; brown grading light brown (SM)					TW		6.6		32.2			slightly moist "medium dense"
CLAYEY SILT with some fine sand; occasional undecomposed roots and root casts; light brown (ML) gradesz with zones containing medium to coarse sand			5		TW		16.6	85				slightly moist "stiff"
FINE SAND with some silt; light brown (SP-SM) grades with medium to coare sand and fine gravel			10		B		2.5		15.3			slightly moist "medium dense"
			15		B							
Stopped excavating at 15.0'. Stopped sampling at 15.0'. No signficant sidewall caving.			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 6A

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

TEST PIT TP-2

Project Name: Proposed Koroem Court Subdivision
Project No.: 660-003-20
Location: North of 662 North Whitby Woodlands Dr, Alpine, Utah
Client: Brian Hansen
Excavating Method: JCB 4CX Backhoe
Date Excavated: 06-17-20
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 fine and coarse gravel; occasional large cobbes; numerous undecomposed roots and root casts; major roots (topsoil) to 2"; brown (SM)					B		6.8		36.8			slightly moist "medium dense"
FINE TO COARSE SAND with some silt; with fine and coarse gravel and occasional cobbles; light brown (SP-SM)			5									slightly moist "medium dense"
CLAYEY SILT with some fine sand; occasional root casts; brown (ML)					B		13.4		77.8			slightly moist "stiff"
FINE SAND with some silt; some fine and coarse gravel; undecomposed roots; brown (SP-SM)			10									slightly moist "medium dense"
					B							
Stopped excavating at 15.0'. Stopped sampling at 14.5'. No signficant sidewall caving.			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 6B

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

TEST PIT TP-3

Project Name: Proposed Koroem Court Subdivision
Project No.: 660-003-20
Location: North of 662 North Whitby Woodlands Dr, Alpine, Utah
Client: Brian Hansen
Excavating Method: JCB 4CX Backhoe
Date Excavated: 06-17-20
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 TO COARSE SAND with fine and coarse gravel; numerous undecomposed and decomposed roots and root casts; major roots (topsoil) to 2"; brown (SM)												slightly moist "medium dense"
					B		5.1		13.6			
grades with zones of cleaner sand and fine gravel			5									
3.0' boulder at 11.0'			10									
Excavating refusal at 12.0' on boulders. Stopped sampling at 4.5'. No signficant sidewall caving.			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 6C

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

TEST PIT TP-4

Project Name: Proposed Koroem Court Subdivision
Project No.: 660-003-20
Location: North of 662 North Whitby Woodlands Dr, Alpine, Utah
Client: Brian Hansen
Excavating Method: JCB 4CX Backhoe
Date Excavated: 06-17-20
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 trace fine gravel; major roots (topsoil) to 2"; brown (SM)					B		4.7		15.5			slightly moist "medium dense"
grades with increasing fine gravel content and occasional coarse gravel			5		B							
Stopped excavating at 15.0'. Stopped sampling at 8.5'. No signficant 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 6D

GORDON GEOTECHNICAL ENGINEERING, INC.

UNIFIED SOIL CLASSIFICATION SYSTEM

FIELD IDENTIFICATION PROCEDURES				GRAPH SYMBOL	LETTER SYMBOL [1]	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS More than half of material is larger than No. 200 sieve size. [2] (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.
	IDENTIFICATION PROCEDURES ON FRACTION SMALLER THAN No. 40 SIEVE SIZE					
		DRY STRENGTH (CRUSHING CHARACTERISTICS)	DILATANCY (REACTION TO SHAKING)	TOUGHNESS (CONSISTENCY NEAR PLASTIC LIMIT)		
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)	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 rore, 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 UNDRAINED SHEAR STRENGTH (tsf)	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
Weakely	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 7

July 15, 2021

Austin Roy, City Planner
Alpine City
20 North Main
Alpine, Utah 84004

Subject: **Fort Creek Landing**
3 lots on 8.44 acres

Dear Austin:

The water requirement for **Fort Creek Landing** has been calculated. The subdivision consists of **3 lots on 8.44 acres**. The developer will be required to provide **14.63** acre-feet of water to meet the water policy for the development.

Please contact me if you have any questions.

Sincerely,
ALPINE CITY

Jed Muhlestein, P.E.
City Engineer

cc: File
Developer

Water Requirements
Fort Creek Landing
July 15, 2021

Lot	Area (sf)	Indoor Requirement (0.45 ac-ft per home)	Outdoor Requirement (1.66 ac-ft/acre)	Total (ac-ft)
1	68,059	0.45	2.59	3.04
2	190,552	0.45	7.26	7.71
3	89,974	0.45	3.43	3.88
			Total required	**14.63**

Jed Muhlestein, P.E.
City Engineer

cc: file/developer

ALPINE PLANNING COMMISSION AGENDA

SUBJECT: Final Plat – Alpine Layton Subdivision Plat A (Revised Preliminary and Final)

FOR CONSIDERATION ON: 20 July 2021

PETITIONER: Will Jones representing Alpine Layton Development LLC.

ACTION REQUESTED BY PETITIONER: Review and approve the final plat.

BACKGROUND INFORMATION:

The Alpine Layton Subdivision consists of 5 lots on 9.7 acres, with lots ranging from 0.94 acres to 4.76 acres in size. The development is located at approximately 200 North 400 West, and in the CR 20,000 zone. The Alpine Layton Subdivision Plat A is the final plat of the final phase of the Whitby Woodlands Development.

STAFF RECOMMENDATION:
Review staff report and findings and make a recommendation to City Council to either approve or deny the proposed subdivision.

SAMPLE MOTION TO APPROVE WITH CONDITIONS:
I motion to recommend approval of the proposed The Alpine Layton Subdivision Plat A with the following conditions:

- An exception be granted for grading beyond the 50-foot clear zone
- Prior to recording the Developer:
  - Meet the water policy and provide escrow funds for a roadway preservation coat;
  - Provide a cost estimate for development;
  - Address the redlines on the plat and plans.
- **Insert Finding**

SAMPLE MOTION TO TABLE/DENY:
I motion to table the Alpine Layton Subdivision Plat A subdivision based on the following:

- **Insert finding**

ALPINE CITY
STAFF REPORT
July 16, 2021

To: Alpine City Planning Commission & City Council

From: Staff

Prepared By: Austin Roy, City Planner
Planning & Zoning Department

Jed Muhlestein, City Engineer
Engineering & Public Works Department

Re: **Alpine Layton Subdivision Plat A – REVISED PRELIMINARY/FINAL**

Applicant:	Will Jones, representing Alpine Layton Development, LLC
Project Location:	Approximately 200 North 400 West
Zoning:	CR-20,000 Zone
Acreage:	9.7 Acres
Lot Number & Size:	5 lots ranging from 0.94 acres to 4.76 acres
Request:	Recommend approval of and approve the Final Plat & Plans

SUMMARY

The Alpine Layton Subdivision consists of 5 lots on 9.7 acres, with lots ranging from 0.94 acres to 4.76 acres in size. The development is located at approximately 200 North 400 West, and in the CR 20,000 zone. The Alpine Layton Subdivision Plat A is the final plat of the final phase of the Whitby Woodlands Development.

BACKGROUND

In 2007 Alpine City granted approval of the Preliminary Plat of the Whitby Woodlands Subdivision, and an agreement was recorded between Alpine City and Roger Whitby, which granted the City right of way at 200 North and 400 West and in exchange gave Roger Whitby fifteen years to complete the development by extending approval of the preliminary plans throughout that time.

ANALYSIS

PRD Status and Requirements

The Whitby Woodlands subdivision was granted Planned Residential Development (PRD) status at Concept and the approved Preliminary Plat also reflected this. However, it is proposed that the

Alpine Layton Subdivision be developed as a standard subdivision with no additional PRD requirements.

Lot Width and Area
Per the requirements of the CR-20,000 zone lots with greater amounts of slope have increased area requirements. See table below:

3.03.040 Density, Lot Area And Width Requirements - Single Family Dwellings

1. The minimum area and width requirements of a zoning lot shall be determined upon the average slope of the lot and the following schedule:

Average Slope of Lot*	Minimum Area (in square feet)	Minimum Width (at min. front setback)
0-9.9%	20,000 (.46 ac)	110 ft.
10-14.9%	30,000 (.68 ac)	110 ft.
15-19.9%	40,000 (.92 ac)	110 ft.
20-24.9%	60,000 (1.37 ac)	110 ft.
25%+	Not Buildable	Not Buildable

The proposed lots all exceed the minimum requirements for area, with the smallest lot being 41,050 square feet in size.

Lot width requirements for the CR-20,000 zone are 110 feet for a standard lot as measured at the 30 foot front setback line, and 80 feet for a cul-de-sac lot located on a curve as measured at the right of way line, and 110 feet as measured at the 30 foot front setback line. All proposed lots appear to meet the width requirement.

Use
The developer is proposing that the lots be used for single-unit detached dwellings, which is consistent with the permitted uses for the CR-20,000 zone.

Sensitive Lands (Wildland Urban Interface)
See the Engineering and Public Works, and the Lone Peak Fire Department Reviews below for further comments on sensitive lands requirements.

Trails
The City Trail Master Plan shows no trails within the development area. Thus, trails are not a requirement for this subdivision.

General Plan
As part of the City General Plan, the Street Master Plan, shows a connection between Whitby Woodlands Drive and 200 North Street. The proposed plan fulfills this planned connection.

Other
None.

REVIEWS

PLANNING AND ZONING DEPARTMENT REVIEW
The analysis section in the body of this report serves as the Planning and Zoning Department review.

ENGINEERING AND PUBLIC WORKS DEPARTMENT REVIEW

This section constitutes the engineering review for the revised preliminary/final application for what used to be Whitby Woodlands Plat J; the last phase of the Whitby Woodlands development project. This last phase was bought by another developer and modified slightly from the original. The original approved proposal had more lots but the roadway alignment is the same as what was submitted. At Final, Engineering reviews previous redline comments on the construction drawings and reviews the final plat. Most of the comments have been corrected and are approved. There are a few minor remaining redline comments for both the construction drawings and plat that need corrected and approved by Staff prior to recording.

Streets
The plans show connecting Whitby Woodlands Drive to 200 North. This connection is reflected on the Transportation Master Plan. The road meets ordinance regarding width, length, grade, and curvature.

Frontage Improvements. The plans show frontage improvements along all sections of existing and proposed roadways (including 400 W). Frontage improvements consist of streets, curb and gutter, and sidewalk. The sidewalk improvements will connect Whitby Woodlands Drive to both 200 N and 400 W.

Traffic Study. In 2011 a traffic study was performed (attached) at this intersection to investigate the need for a 3-way stop scenario, which was currently installed and in operation at that time. The study found that a 3-way stop was not warranted at that time, but when the fourth leg of the intersection was built, it would be warranted. The 3-way stop was removed in 2011. Now that the fourth leg of the intersection is going to be constructed, a 4-way stop intersection is warranted and is reflected on the plans to be built as such during construction.

Grading. There is one small section of roadway excavation that extends beyond the 50-foot clear zone allowed by City standard details. A developer is allowed 50-feet of area beyond the right-of-way to grade the land to construct roadways. If the grading cannot be within this area, retaining walls are required to keep the disturbance within this area. As can be noted on sheet 5, Grading & Drainage, the amount of area required beyond the 50-foot clear zone is minimal, approximately 10 more feet. **An exception to the 50-foot clear zone grading rule would need to be granted for the plans as currently drawn.** Engineering would be in favor of an exception to the 50-foot clear zone grading rule in this situation for the following reasons: 1) If the developer is required to build a retaining wall, the retaining wall will become property of the city who is then responsible for the maintenance and operation of the wall in the future. 2) Adding a retaining wall on the edge of the road, in this location, is in the middle of a curbed section of

roadway. Adding a retaining wall at this location will reduce driver sight distance as they travel the road.

The Fire Chief has approved road grades and design. His report is attached.

Lots

Lots, and slopes on lots, were reviewed and buildable areas have been defined on lots 1 and 5 where steep slopes exist. All other lots have no restrictions in terms of buildable areas. Each lot contains the appropriate amount of space and frontage for the zone, based on the average slope of the lot as defined in section 3.03.040 of the Development Code.

Utilities

A detailed utility plan has been submitted and reviewed. The subdivision has been accounted for within the utility master plans. Horrocks Engineers has modeled each utility system and has given recommendations regarding line sizing. That letter is attached and the plans reflect the recommendations.

Sewer System. 8-inch sewer mains exist in both Whitby Woodlands Dr. and 200 North which can serve the development. 8-inch mains and 4-inch sewer laterals would be required and are shown for each new lot. There are no existing services to terminate or reuse on the property.

Culinary Water System. The subdivision is well below the 5350-foot elevation, which is the highest elevation the existing water system can serve and still provide a minimum 40 psi required by ordinance. There are currently 8-inch waterlines stubbed into the property from both 200 N and Whitby Woodlands Drive which would serve the development. The plans show connection to these lines with 8-inch lines throughout the development. 1-inch water service laterals with ¾-inch meters would be required. New laterals are shown to be constructed for each lot. The Fire Chief has approved the location of proposed fire hydrants. There are no existing services to terminate or reuse on the property.

Pressurized Irrigation System. Similar to the culinary, there is currently 6-inch and 12-inch pressurized irrigation lines in both 200 N and Whitby Woodlands Drive which would serve the development. The plans show connection to these lines with 6-inch lines throughout the development. 1-inch laterals are shown to be constructed for each new lot. There are no existing services to terminate or reuse on the property.

Storm Water Drainage System. The development shows a storm drain system that meets City Standards. The storm drain system report is attached for reference. In general, one detention pond is proposed on the south side of lot 4. The pond retains the 80th percentile storm with a sump and detains all storms larger, up to the 100-yr event storm. The larger storms are released at a controlled rate to the existing system in 200 North.

A storm water pollution prevention plan (SWPPP) was submitted with the plans. A City Land Disturbance permit will be obtained prior to construction which incorporates the SWPPP and requires a state storm water permit as well. The contractor will be required to follow erosion and control guidelines during construction to prevent erosion, dust, and downstream pollution.

Natural Hazards

Sensitive Lands. The proposed development falls within the Geologic Hazards Overlay Zone which has areas identified as having the potential for rockfall, slide, and debris flows. Rockfall, debris flow, and slides were reviewed and, in each instance, were shown to have a low risk for such an event. Buildable areas have been restricted where steeper slopes reside.

Flood Plain. The property is situated away from the mapped flood plains of Fort and Dry Creek.

Irrigation Ditches. Westfield Ditch runs along the east side of the development. Ditches are typically required to be piped when development occurs (Dev. Code 4.07.190) but this section of ditch (Westfield Ditch, north of 200 North) is specifically required to be left open per agreement with Alpine Irrigation Company. The plans reflect this and an easement is shown for the ditch on the plat.

Other

There are some minor redlines to correct on the plans and plat.

Alpine City specifications require escrow funds for a roadway preservation coat (See Alpine City Construction Standard Specifications 300.030 & 600.020). The amount for this requirement will be calculated based on current preservation coat costs at the time of recording. The escrow funds for this roadway preservation coat will be required of the Developer prior to recording.

The water policy will need to be met for this development.

An engineer's cost estimate will be required for bonding purposes.

LONE PEAK FIRE DEPARTMENT REVIEW

See the attached review from the Lone Peak Fire Department.

HORROCKS ENGINEER'S REVIEW

See the attached review from Horrocks Engineering.

NOTICING

Notice has been properly issued in the manner outlined in City and State Code

STAFF RECOMMENDATION

Review staff report and findings and make a motion to approve or table the proposed subdivision. Findings are outlined below.

Findings for a Positive Motion:

A. The streets and lot layout meet ordinance;
B. The complies with the General Plan and Street Master Plan, showing a local street connecting Whitby Woodlands Drive to Westfield Road.
C. There are no major hazards of concern mentioned in the geotechnical reports.

Findings for a Motion to Table:

A. The grading plan does not adhere to ordinance and requires an exception.

MODEL MOTIONS

SAMPLE MOTION TO APPROVE

I motion to recommend approval of the Alpine Layton Subdivision Plat A development with the following conditions:

- An exception be granted for grading beyond the 50-foot clear zone
- Prior to recording the Developer:
    - Meet the water policy and provide escrow funds for a roadway preservation coat;
    - Provide a cost estimate for development;
    - Address the redlines on the plat and plans.

SAMPLE MOTION TO TABLE

I motion to table the Alpine Layton Subdivision Plat A subdivision based on the following:

- **INSERT FINDING**

LONE PEAK FIRE DISTRICT
5582 PARKWAY WEST DRIVE
HIGHLAND, UTAH 84003
(801) 763-5365
WWW.LONEPEAKFIRE.COM

BRIAN PATTEN, DEPUTY CHIEF

Date: 6/1/21

To: Alpine City

Address:

I have reviewed and approve: Whitby Woodlands Layton subdivision Plat A

Recommendations: Follow city spec for hydrants and setbacks

All Structures within approved subdivisions are subject to individual sprinkler requirements based on location and size (above 10,000 sq ft).

If you have any further questions, please contact me directly.

Brian Patten
Deputy Chief
Lone Peak Fire District

HORROCKS ENGINEERS

To: **Jed Muhlestein**
Alpine City

From: **John E. Schiess, P.E.**

Date: May 28, 2021 **Memorandum**

Subject: **Layton Sub Plat A Hydraulic Modeling Results and Recommendations**

The proposed subdivision is a single family residential development on the northeast corner of 200 South and 400 West.

The development proposes 5 culinary ERC's, 3.3 irrigated acres, and 5 sanitary sewer ERU's. The current master plan anticipated 17.6 culinary ERC's, 5.1 irrigated acres, and 17.6 sanitary sewer ERU's. Proposed connections fall well within the current master plans.

The proposed culinary water improvements have been modeled in both the current and buildout models. The proposed improvements fit well within the City's culinary water master plan and modeling shows them to be adequate.

The proposed pressurized irrigation improvements have been modeled in both the current and buildout models under both wet and dry year supply conditions. The proposed improvements fit well within the City's pressurized irrigation master plan and modeling shows them to be adequate. The following comments and recommendations are noted for the proposed pressurized irrigation system.

The proposed sanitary sewer improvements have been modeled in both the current and buildout models. The proposed improvements fit well within the City's sanitary sewer master plan and modeling shows them to be adequate.

Recommendations:

1. 6 inch pressurized irrigation line should tie into the 12 inch in 200 South. This is primarily because the current master plan calls for upsizing the existing 6 inch to 12 inch in 400 West for buildout.

Comments:

2. Fire flow available in the area surrounding the proposed improvements should be over 2,500 gallons per minute at 20 psi for the proposed lines.

ALPINE LAYTON SUBDIVISION PLAT A

JUNE 2021

GENERAL

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS AND/OR REQUIREMENTS OF THE ALPINE CITY PUBLIC WORKS DEPARTMENT.
2. A PRE CONSTRUCTION CONFERENCE WILL BE HELD A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO START OF WORK. ALL CONTRACTORS, SUBCONTRACTORS AND/OR UTILITY CONTRACTORS, ALPINE CITY PUBLIC WORKS AND CITY'S ENGINEER SHOULD BE PRESENT.
3. ALL LOT DIMENSIONS, EASEMENTS AND CERTAIN OFF SITE EASEMENTS ARE TO BE TAKEN FROM THE PLAT OF ALPINE VIEW ESTATES SUBDIVISION.
4. ALL CONSTRUCTION STAKES MUST BE REQUESTED A MINIMUM OF THREE (3) WORKING DAYS PRIOR TO PLANNED USE.
5. CERTAIN CONTROL POINTS WILL BE SET BY THE ENGINEER, OR HIS REPRESENTATIVE, WHICH ARE CRITICAL TO THE CONSTRUCTION STAKING OF THE PROJECT. THESE POINTS WILL BE DESIGNATED AT THE TIME THEY ARE SET AND THE CONTRACTOR SHALL BE NOTIFIED. DESTRUCTION OF THESE POINTS BY THE CONTRACTOR OR HIS SUBCONTRACTORS SHALL BE GROUNDS FOR CHARGING THE CONTRACTOR FOR REESTABLISHING SAID POINTS.
6. ALL CUT & FILL SLOPES SOT INCLUDED IN LOTS TO BE REVEGITATED WITH BROADCAST SEEDS TO MEET CITY STANDARDS UNLESS NOTED OTHERWISE.

ROADWAY/STORM DRAIN

1. ALL ROADWAY CONSTRUCTION SHALL MEET THE MINIMUM REQUIREMENTS OF ALPINE CITY'S TECHNICAL SPECIFICATIONS OR AS APPROVED IN THE PLANS HEREIN.
2. WHEN DISCREPANCIES OCCUR BETWEEN PLANS AND SPECIFICATIONS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER. UNTIMELY NOTIFICATION SHALL NEGATE ANY CONTRACTORS CLAIM FOR ADDITIONAL COMPENSATION.
3. ALL STORM DRAIN PIPES TO BE RCP CLASS V OR APPROVED EQUAL UNLESS OTHERWISE NOTED.

CONDITIONS OF APPROVAL

–INDEX OF PLAN SHEETS–

SEWER

1. ALL WORK SHALL BE DONE INACCORDANCE WITH THE LATEST ALPINE CITY DESIGN STANDARDS & PUBLIC IMPROVEMENT SPECIFICATIONS DRAWINGS OF ALPINE CITY.
2. FINAL APPROVAL AND ACCEPTANCE OF ALL SEWER CONSTRUCTION WILL BE BY ALPINE CITY.
3. UPON THE COMPLETION OF WORK, THE CONTRACTOR SHALL SUBMIT 3 SETS OF AS–BUILT PLANS TO ALPINE CITY & (1) SET TO NORTHERN ENGINEERING, INC.
4. HORIZONTAL AND VERTICAL SEPARATION OF CULINARY WATER AND SEWER SHALL BE IN COMPLIANCE WITH ALPINE CITY STANDARDS

WATER

1. THE WATER SYSTEM SHALL BE CONSTRUCTED TO CONFORM WITH THE STANDARDS SET FORTH IN THE "UTAH REGULATIONS FOR PUBLIC DRINKING WATER SYSTEMS", AND THE ALPINE CITY PUBLIC WORKS DEPARTMENT STANDARD SPECIFICATIONS AND DRAWINGS.
2. CONTRACTOR SHALL NOTIFY NORTHERN ENGINEERING, INC. THREE (3) WORKING DAYS BEFORE INITIAL CONSTRUCTION BEGINS AND SHALL ALSO REQUEST ALPINE CITY WATER DEPARTMENT INSPECTION OF WATER LINES AND APPURTENANCES TWENTY–FOUR (24) HOURS IN ADVANCE OF BACKFILLING.
3. CONTRACTOR TO FIELD VERIFY ALL VALVE BOX LID ELEVATIONS TO ASSURE THAT SAID LID ELEVATIONS MATCH FINAL STREET GRADE, AND ALL METER LID ELEVATIONS TO MATCH AN EXTENSION OF THE SIDEWALK GRADE.
4. UPON THE COMPLETION OF WORK, THE CONTRACTOR SHALL SUBMIT 3 SETS OF AS–BUILT PLANS TO ALPINE CITY & (1) SET TO NORTHERN ENGINEERING, INC.
5. WATER VALVE LIDS ARE TO BE LABELED "WATER" FOR CULINARY VALVES
6. HORIZONTAL AND VERTICAL SEPARATION OF CULINARY WATER AND SEWER SHALL BE IN COMPLIANCE WITH WITH ALPINE CITY STANDARDS
7. WATERLINES TO BE BEDDED IN GRANULAR MATERIAL. A MIN. OF 8" COVER OVER TOPS OF PIPE IS REQUIRED TO AVOID PENETRATION OF SUB BASE FROM ABOVE.

VICINITY MAP
–NTS–

REGISTERED PROFESSIONAL ENGINEER
KYLE M. SPENCER
No. 276243
06-30-21
STATE OF UTAH

Northern ENGINEERING INC
ENGINEERING–LAND PLANNING
CONSTRUCTION MANAGEMENT

1040 E. 800 N.
OREM, UTAH 84097
(801) 802–8992

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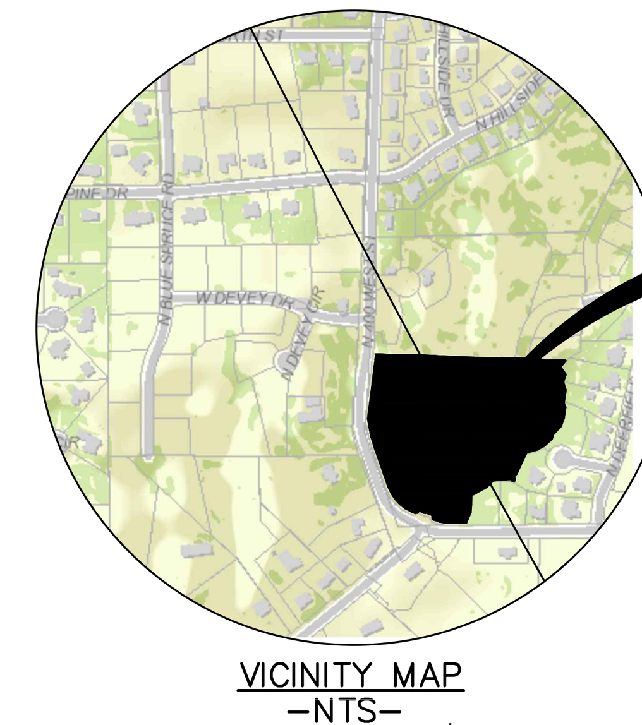
ALPINE LAYTON SUBDIVISION – PLAT A

LOCATED IN THE WEST HALF SECTION 24, TOWNSHIP 4 SOUTH,
RANGE 2 EAST, SALT LAKE BASE AND MERIDIAN

WHITBY WOODLAND PRD PLAT J

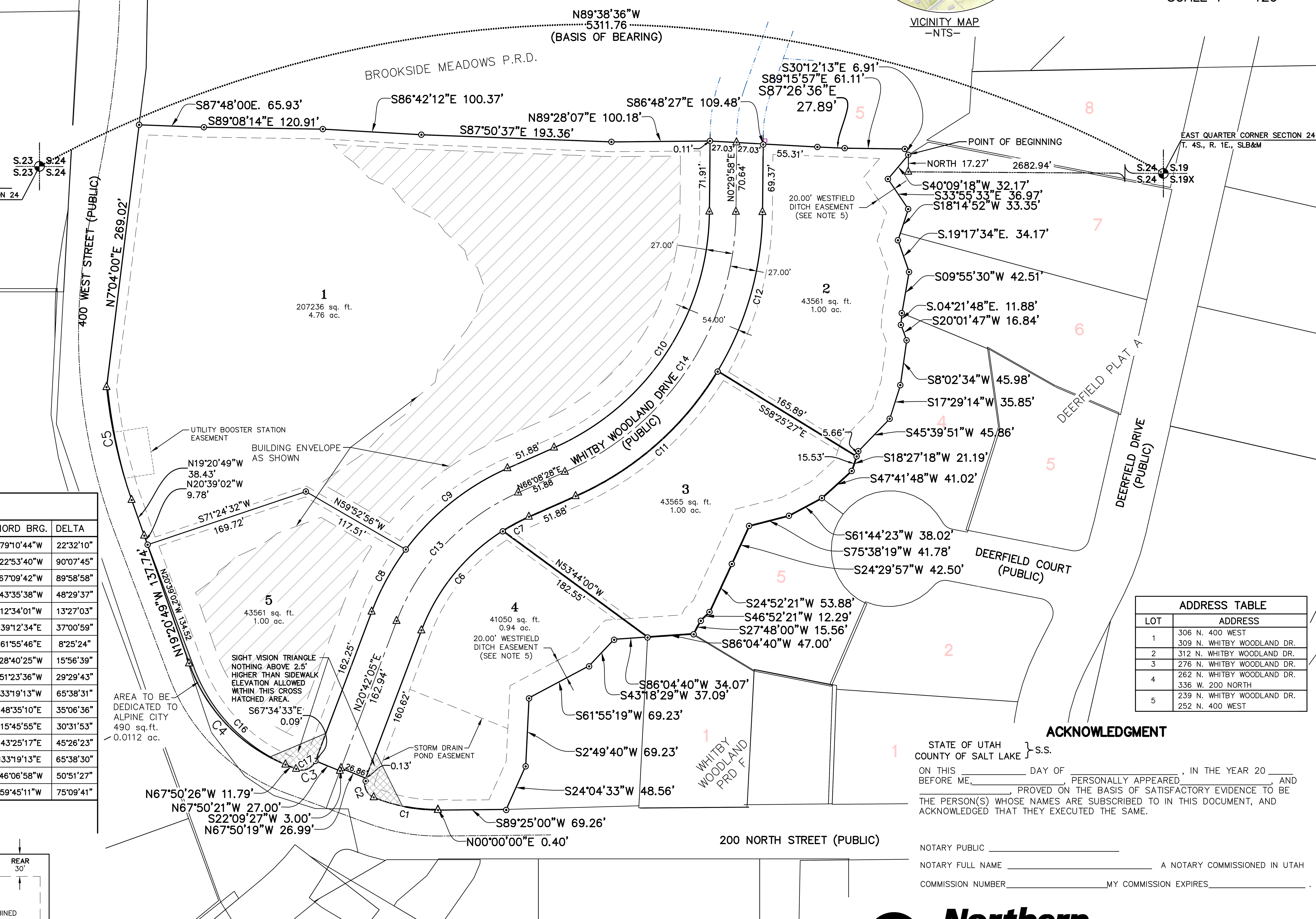
LEGEND

- FOUND BRASS CAP
- SET 5/8" IRON PIN
- CALCULATED POINT, NOT SET
- PROPERTY BOUNDARY
- CENTERLINE
- RIGHT-OF-WAY LINE
- LOT LINE
- SECTION LINE
- EASEMENT
- EXISTING DEED LINE



N W E S

(24"x36")
SCALE 1" = 60'
(11"x17")
SCALE 1" = 120'



CURVE TABLE					
CURVE	LENGTH	RADIUS	CHORD DIST.	CHORD BRG.	DELTA
C1	66.87'	170.00'	66.44'	N79°10'44"W	22°32'10"
C2	23.60'	15.00'	21.24'	N22°53'40"W	90°07'45"
C3	23.56'	15.00'	21.21'	S67°09'42"W	89°58'58"
C4	146.42'	173.00'	142.09'	N43°35'38"W	48°29'37"
C5	117.85'	502.00'	117.58'	N12°34'01"W	13°27'03"
C6	133.09'	206.00'	130.78'	N39°12'34"E	37°00'59"
C7	30.29'	206.00'	30.26'	N61°55'46"E	8°25'24"
C8	72.35'	260.00'	72.12'	S28°40'25"W	15°56'39"
C9	133.85'	260.00'	132.37'	S51°23'36"W	29°29'43"
C10	303.60'	265.00'	287.27'	S33°19'13"W	65°38'31"
C11	195.48'	319.00'	192.44'	N48°35'10"E	35°06'36"
C12	169.99'	319.00'	167.98'	N15°45'55"E	30°31'53"
C13	184.79'	233.00'	179.98'	N43°25'17"E	45°26'23"
C14	334.53'	292.00'	316.54'	N33°19'13"E	65°38'30"
C15	154.00'	173.50'	149.00'	N46°06'58"W	50°51'27"
C16	19.68'	15.00'	18.30'	S59°45'11"W	75°09'41"

REAR 30' / 30' / FRONT 30' — REAR 30' / 12' MIN. / 30' COMBINED / FRONT 30'

* UNLESS OTHERWISE SHOWN
SETBACKS ARE AS FOLLOWS
FRONT & REAR = 30',
SIDES = 30' COMBINED W/12' MIN. ON ONE SIDE

GENERAL NOTES:

1. THERE EXISTS A 10.00 –FT PUBLIC UTILITY AND DRAINAGE EASEMENT ALONG ALL STREET SIDE PROPERTY LINES AND ALONG ALL EXTERIOR PROPERTY LINES, AND A 5.00–FT PUBLIC UTILITY AND DRAINAGE EASEMENT ALONG ALL INTERIOR PROPERTY LINES UNLESS OTHERWISE NOTED.
2. SETBACKS SHALL BE PER THE CR 40,000 ZONE WHICH ARE 30–FT FRONT AND REAR, SIDE YARD SETBACKS TO BE AN AGGREGATE OF 30–FT WITH 12–FT BEING MINIMUM, UNLESS SHOWN OTHERWISE.
3. NO DWELLING OR STRUCTURE ALLOWED IN PUBLIC UTILITY EASEMENTS WITHOUT WRITTEN CONSENT FROM ALL UTILITY PROVIDERS AND OBTAINING A BUILDING PERMIT.
4. ALL STREETS SHOWN ON THIS PLAT ARE PUBLIC RIGHT OF WAY, DEDICATED TO ALPINE CITY.
5. A 20–FOOT EASEMENT EXISTS AS SHOWN ON LOTS 2. 3. & 4, FOR THE OPERATION AND MAINTENANCE OF WESTFIELD DITCH. FENCES ARE NOT ALLOWED IN THE EASEMENT. NO ALTERATION OF DITCH BANKS OR CHANNEL. NO DUMPING OF ANY MATERIAL ALLOWED.

K:\3-21-006-00 Whitby\CAD\Final\Final Plat\FINAL PLAT.dwg 6/30/2021 4:25 PM

ADDRESS TABLE	
LOT	ADDRESS
1	306 N. 400 WEST 309 N. WHITBY WOODLAND DR.
2	312 N. WHITBY WOODLAND DR.
3	276 N. WHITBY WOODLAND DR.
4	262 N. WHITBY WOODLAND DR. 336 W. 200 NORTH
5	239 N. WHITBY WOODLAND DR. 252 N. 400 WEST

ACKNOWLEDGMENT

STATE OF UTAH
COUNTY OF SALT LAKE } S.S.

ON THIS ________ DAY OF ____________, IN THE YEAR 20____ BEFORE ME, ____________, PERSONALLY APPEARED ____________, AND ____________, PROVED ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAMES ARE SUBSCRIBED TO IN THIS DOCUMENT, AND ACKNOWLEDGED THAT THEY EXECUTED THE SAME.

NOTARY PUBLIC ____________

NOTARY FULL NAME ____________ A NOTARY COMMISSIONED IN UTAH

COMMISSION NUMBER ____________ MY COMMISSION EXPIRES ____________.

Northern ENGINEERING INC
ENGINEERING–LAND PLANNING
CONSTRUCTION MANAGEMENT
1040 E. 800 N.
OREM, UTAH 84097
(801) 802–8992

SURVEYOR'S CERTIFICATE

I, KENNETH E. BARNEY, DO HEREBY CERTIFY THAT I AM A REGISTERED LAND SURVEYOR, AND THAT I HOLD A LICENSE IN ACCORDANCE WITH TITLE 58, CHAPTER 22, PROFESSIONAL ENGINEERS AND LAND SURVEYORS LICENSING ACT, UTAH CODE ANNOTATED, 1953 AS AMENDED, CERTIFICATE NO. 172762. 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 BELOW, HAVE SUBDIVIDED SAID TRACT OF LAND INTO LOTS, STREETS, AND EASEMENTS, HAVE COMPLETED A SURVEY OF THE PROPERTY DESCRIBED ON THIS PLAT IN ACCORDANCE WITH SECTION 17–23–17, UTAH CODE ANNOTATED, 1953 AS AMENDED, HAVE VERIFIED ALL MEASUREMENTS, AND HAVE PLACED MONUMENTS AS REPRESENTED ON THE PLAT. I FURTHER CERTIFY THAT EVERY EXISTING RIGHT–OF–WAY AND EASEMENT GRANT OF RECORD FOR UNDERGROUND FACILITIES, AS DEFINED IN SECTION 54–8a–2, UTAH CODE ANNOTATED,1953 AS AMENDED, AND FOR OTHER UTILITY FACILITIES, IS ACCURATELY DESCRIBED ON THIS PLAT, AND THAT THIS PLAT IS TRUE AND CORRECT.

DATE ____________ KENNETH E. BARNEY, P.L.S.

BOUNDARY DESCRIPTION

A PARCEL OF LAND LYING WITHIN THE WEST 1/2 OF SECTION 24, TOWNSHIP 4 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN, UTAH COUNTY, UTAH MORE PARTICULARLY DESCRIBED AS:

COMMENCING AT A BRASS CAP MONUMENT MARKING THE EAST QUARTER CORNER OF SAID SECTION 24, THENCE N.89°38'36"W. ALONG THE 1/4 SECTION LINE FOR A DISTANCE OF 2682.94 FEET; THENCE NORTH A DISTANCE OF 17.27 FEET TO THE SOUTH EAST CORNER OF LOT 5 OF BROOKSIDE MEADOWS P.R.D. RECORDED SEPTEMBER 21, 2020 AS ENTRY NO. 143856:2020 AS MAP NO. 17272 TO THE REAL POINT OF BEGINNING.

AND RUNNING THENCE ALONG THE WESTERLY BOUNDARY OF DEERFIELD PLAT "A" RECORDED SEPTEMBER 10, 2003 AS ENTRY NO. 148639:2003 AS MAP NO. 10153 THE FOLLOWING SEVENTEEN (17) COURSES: 1) S.40°09'18"W. A DISTANCE OF 32.17 FEET; 2) THENCE S.33°55'33"E. A DISTANCE OF 36.97 FEET; 3) THENCE S.18°14'52"W. A DISTANCE OF 33.35 FEET; 4) THENCE S.19°17'34"E. A DISTANCE OF 34.17 FEET; 5) THENCE S.09°55'30"W. A DISTANCE OF 42.51 FEET; 6) THENCE S.04°21'48"W. A DISTANCE OF 11.88 FEET; 7) THENCE S.20°01'47"E. A DISTANCE OF 16.84 FEET; 8) THENCE S.08°02'33"W. A DISTANCE OF 45.98 FEET; 9) THENCE S.17°29'14"W. A DISTANCE OF 35.85 FEET; 10) THENCE S.43°59'31"W. A DISTANCE OF 45.86 FEET; 11) THENCE S.18°27'18"W. A DISTANCE OF 21.19 FEET; 12) THENCE S.47°41'48"W. A DISTANCE OF 41.02 FEET; 13) THENCE S.61°44'23"W. A DISTANCE OF 38.02 FEET; 14) THENCE S.75°38'19"W. A DISTANCE OF 41.78 FEET; 15) THENCE S.24°29'57"W. A DISTANCE OF 42.50 FEET; 16) THENCE S.24°52'21"W. A DISTANCE OF 53.88 FEET; 17) THENCE S.46°52'21"W. A DISTANCE OF 12.29 FEET; THENCE S.27°48'00"W. A DISTANCE OF 15.56 FEET; MORE OR LESS TO THE NORTH LINE OF WHITBY WOODLANDS PRD PLAT "F" RECORDED FEBRUARY 27, 2014 AS ENTRY NO. 13353:2014 AS MAP NO. 14163; THENCE S.86°04'40"W. A DISTANCE OF 47.00 FEET; THENCE S.86°04'40"W. A DISTANCE OF 34.07 FEET; THENCE S.43°18'29"W. A DISTANCE OF 37.09 FEET; THENCE S.61°55'19"W. A DISTANCE OF 69.23 FEET; THENCE S.02°49'40"W. A DISTANCE OF 69.23 FEET; THENCE S.24°04'33"W. A DISTANCE OF 48.56 FEET; MORE OR LESS TO THE NORTH RIGHT OF WAY LINE OF 200 NORTH STREET; THENCE RUNNING ALONG THE NORTH AND EAST RIGHT OF WAY LINE OF SAID 200 NORTH AND 400 WEST STREET THE FOLLOWING THIRTEEN (13) COURSES 1) THENCE S.89°25'00"W. A DISTANCE OF 69.26 FEET; 2) THENCE N.00°00'00"E. A DISTANCE OF 0.40 FEET TO A POINT OF CURVATURE OF A 170.00–FOOT RADIUS NON–TANGENT CURVE TO THE RIGHT; 3) THENCE NORTHWESTERLY ALONG THE ARC OF SAID CURVE, 66.87 FEET, HAVING A CENTRAL ANGLE OF 22°32'10" AND A CHORD THAT BEARS N.79°10'44"W. A DISTANCE OF 66.44 FEET TO A POINT OF CURVATURE OF A 15.00–FOOT RADIUS TANGENT CURVE TO THE RIGHT; 4) THENCE NORTHWESTERLY ALONG THE ARC OF SAID CURVE, 23.60 FEET, HAVING A CENTRAL ANGLE OF 90°07'45" AND A CHORD THAT BEARS N.22°53'40"W. A DISTANCE OF 21.24 FEET; 5) THENCE N.67°50'19"W. A DISTANCE OF 26.99 FEET; 6) THENCE S.22°09'27"W. A DISTANCE OF 3.00 FEET; 7) THENCE N.67°50'21"W. A DISTANCE OF 27.00 FEET TO A POINT OF CURVATURE OF A 15.00–FOOT RADIUS NON–TANGENT CURVE TO THE RIGHT; 8) THENCE SOUTHWESTERLY ALONG THE ARC OF SAID CURVE, 23.56 FEET, HAVING A CENTRAL ANGLE OF 89°58'58" AND A CHORD THAT BEARS S.67°09'42"W. A DISTANCE OF 21.21 FEET; 9) THENCE N.67°50'26"W. A DISTANCE OF 11.79 FEET TO A POINT OF CURVATURE OF A 173.00–FOOT RADIUS TANGENT CURVE TO THE RIGHT; 10) THENCE NORTHWESTERLY ALONG THE ARC OF SAID CURVE, 146.42 FEET, HAVING A CENTRAL ANGLE OF 48°29'37" AND A CHORD THAT BEARS N.43°35'38"W. A DISTANCE OF 142.09 FEET; 11) THENCE N.19°20'49"W. A DISTANCE OF 176.17 FEET TO A POINT OF CURVATURE OF A 502.00–FOOT RADIUS TANGENT CURVE TO THE RIGHT; 12) THENCE NORTHWESTERLY ALONG THE ARC OF SAID CURVE, 117.85 FEET, HAVING A CENTRAL ANGLE OF 13°27'03" AND A CHORD THAT BEARS N.12°34'01"W. A DISTANCE OF 117.58 FEET; 13) THENCE N.07°04'00"E. A DISTANCE OF 269.02 FEET MORE OR LESS TO THE SOUTH LINE OF ABOVEMENTIONED BROOKSIDE MEADOWS PRD; AND RUNNING THENCE ALONG THE SOUTH LINE OF SAID BROOKSIDE MEADOWS THE FOLLOWING NINE (9) COURSES 1) S.87°48'00"E. A DISTANCE OF 65.93 FEET; 2) THENCE S.89°08'14"E. A DISTANCE OF 120.91 FEET; 3) THENCE S.86°42'12"E. A DISTANCE OF 100.37 FEET; 4) THENCE S.87°50'37"E. A DISTANCE OF 193.36 FEET; 5) THENCE N.89°28'07"E. A DISTANCE OF 100.18 FEET; 6) THENCE S.86°48'27"E. A DISTANCE OF 109.48 FEET; 7) THENCE S.87°26'36"E. A DISTANCE OF 27.89 FEET; 8) THENCE S.89°15'56"E. A DISTANCE OF 61.10 FEET; 9) THENCE S.30°16'09"E. A DISTANCE OF 6.91 FEET TO REAL POINT OF BEGINNING.

CONTAINS 422,894 sq.ft. OR 9.71 ACRES OF LAND MORE OR LESS.

OWNER'S DEDICATION

KNOW ALL MEN BY THESE PRESENTS THAT WE, ALL OF THE UNDERSIGNED OWNERS OF ALL THE PROPERTY DESCRIBED IN THE SURVEYOR'S CERTIFICATE HEREON AND SHOWN ON THIS MAP, HAVE CAUSED THE SAME TO BE SUBDIVIDED INTO LOTS, STREETS, AND EASEMENTS AND DO HEREBY DEDICATE THE STREETS AND OTHER PUBLIC AREAS AS INDICATED HEREON FOR PERPETUAL USE OF THE PUBLIC.

IN WITNESS HEREOF WE HAVE HEREUNTO SET OUR HANDS THIS DAY OF ____________. A.D. 20____.

____

BY: ____________

ACCEPTANCE BY LEGISLATIVE BODY

THE CITY COUNCIL OF ALPINE, COUNTY OF UTAH, APPROVES THIS SUBDIVISION AND HEREBY APPROVES THE DEDICATION OF ALL STREETS, EASEMENTS, AND OTHER PARCELS OF LAND INTENDED FOR PUBLIC PURPOSES FOR THE PERPETUAL USE OF THE PUBLIC THIS ____ DAY OF ________ A.D. 20____.

APPROVED ____________ CITY ENGINEER (SEE SEAL) ATTEST ____________ CITY RECORDER (SEE SEAL)

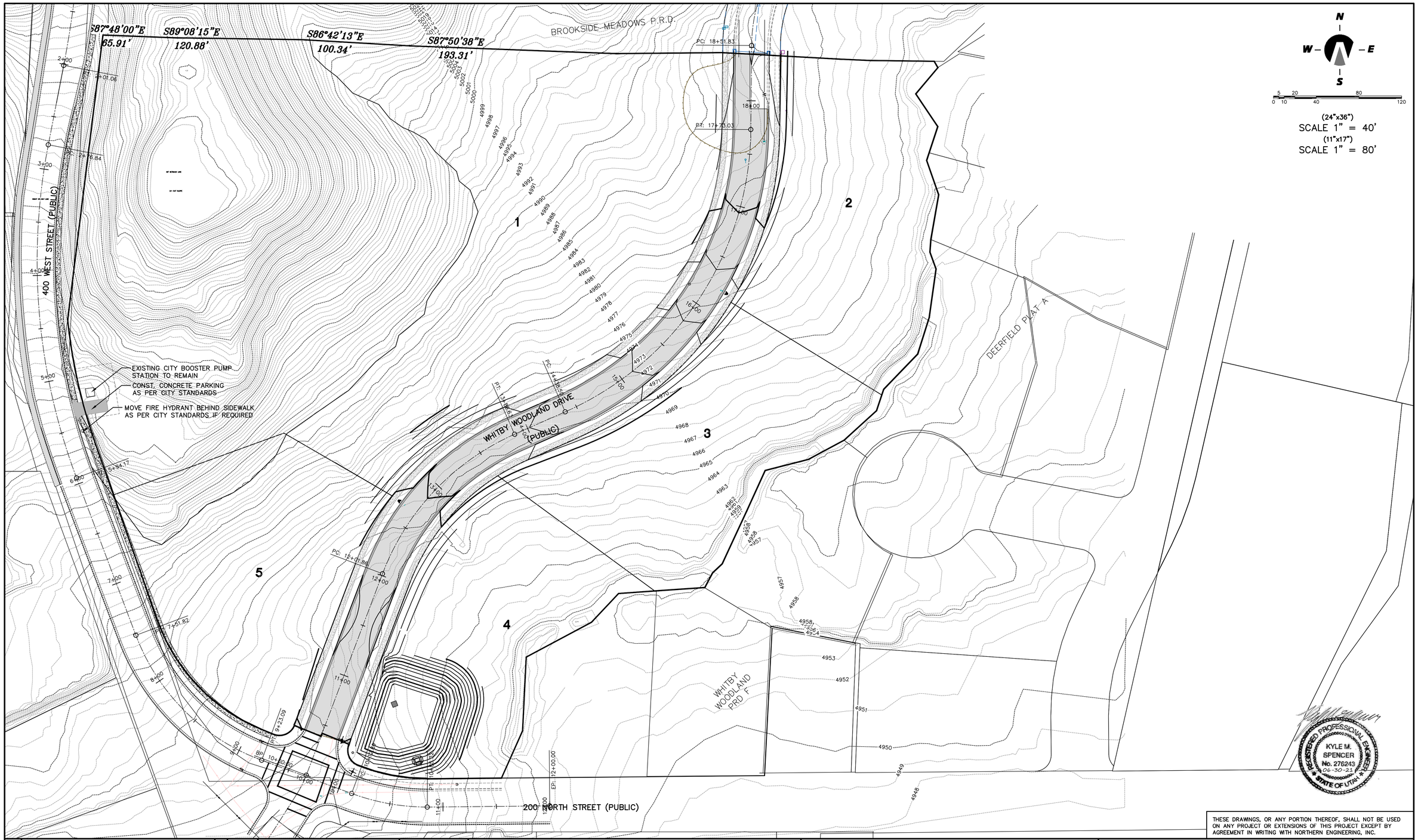
ALPINE LAYTON SUBDIVISION PLAT A

LOCATED IN THE WEST HALF SECTION 24, TOWNSHIP 4 SOUTH, RANGE 2 EAST, SALT LAKE BASE AND MERIDIAN

ALPINE ____________ UTAH COUNTY, UTAH

SCALE: 1" = 60 FEET

SURVEYOR'S SEAL	NOTARY PUBLIC SEAL	CITY-COUNTY ENGINEER SEAL	CLERK-RECORDER SEAL
PROFESSIONAL LAND SURVEYOR No. 172762 Kenneth E. Barney STATE OF UTAH			



N
W – E
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0 5 10 20 40 80 120

(24"x36")
SCALE 1" = 40'
(11"x17")
SCALE 1" = 80'

REGISTERED PROFESSIONAL ENGINEER
KYLE M. SPENCER
No. 276243
06-30-21
STATE OF UTAH

NO.	REVISIONS	BY	DATE
5			
4			
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DRAWN BY:	DATE:
CHECKED BY:	DATE:
APPROVED:	DATE:
COGO FILE:	DATE:
REV. COGO FILE:	DATE:

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Northern ENGINEERING INC
ENGINEERING–LAND PLANNING
CONSTRUCTION MANAGEMENT
1040 E. 800 N.
OREM, UTAH 84097
(801) 802-8992

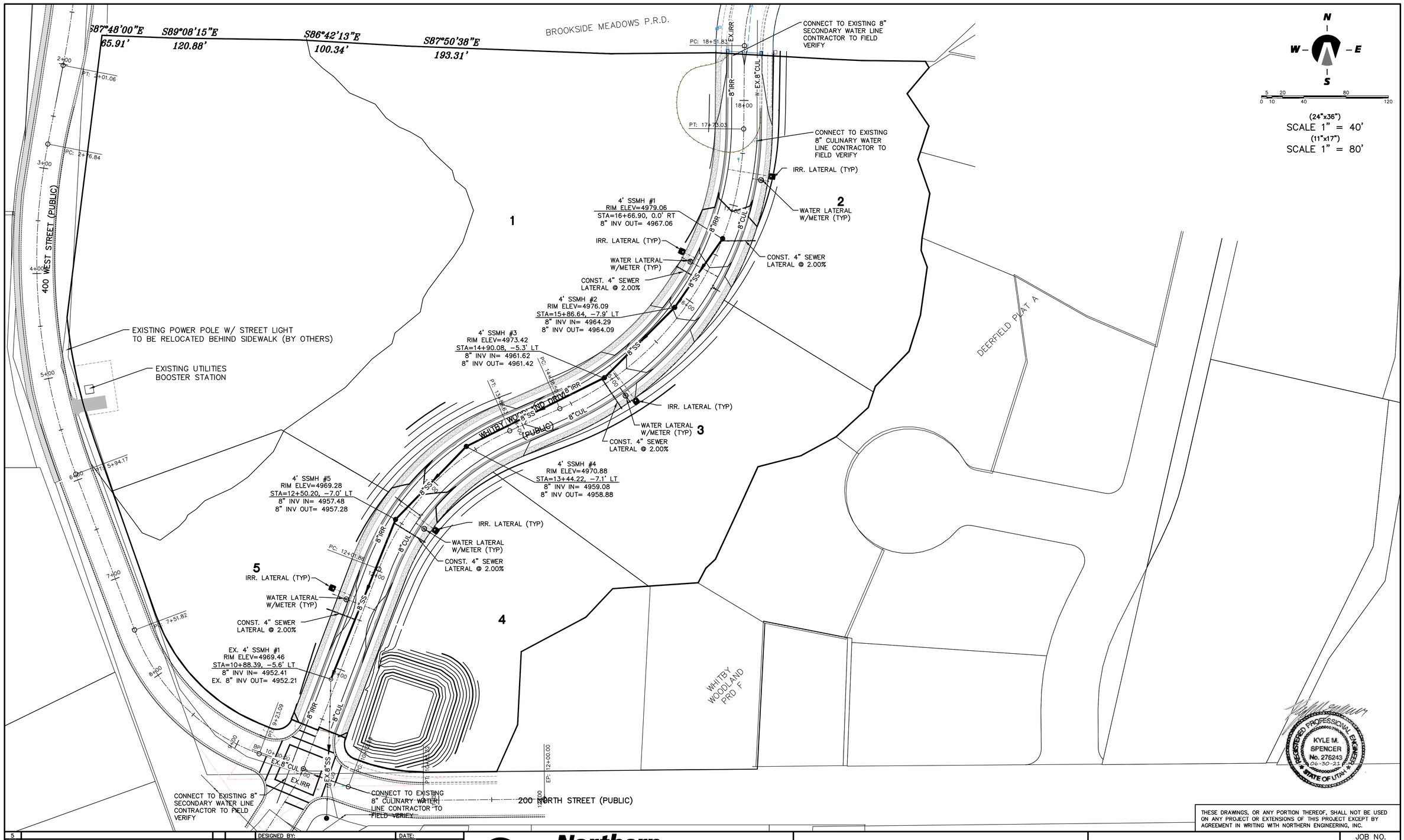
ALPINE LAYTON SUBDIVISION PLAT A

SITE PLAN

ALPINE CITY, UTAH

JOB NO. 3-21-006

SHEET NO. 3



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Northern ENGINEERING INC
ENGINEERING–LAND PLANNING
CONSTRUCTION MANAGEMENT
1040 E. 800 N.
OREM, UTAH 84097
(801) 802-8992

ALPINE LAYTON SUBDIVISION PLAT A

UTILITY PLAN

ALPINE CITY, UTAH

JOB NO. 3-21-006

SHEET NO. 4

S87°48'00"E 65.91'
S89°08'15"E 120.88'
S86°42'13"E 100.34'
S87°50'38"E 193.31'
BROOKSIDE MEADOWS P.R.D.
400 WEST STREET (PUBLIC)
50.00'
GRADING W/ EROSION CONTROL BLANKETS AS PER CITY STANDARDS
MOVE FIRE HYDRANT BEHIND SIDEWALK AS PER CITY STANDARDS IF REQUIRED
PC: 18+51.83
PT: 17+75.03
18+00
1
2
3
4
5
5' SDMH #1
RIM ELEV=4977.30
STA=16+17.43, 1.2' RT
15" INV= 4971.30
SD INLET BOX #1
GRATE ELEV=4976.36
15" INV= 4971.47
SD INLET BOX #2
GRATE ELEV=4976.36
15" INV= 4971.45
4' SDMH #2
RIM ELEV=4973.32
STA=14+83.67, 3.8' RT
15" INV= 4967.32
SD INLET BOX #3
GRATE ELEV=4970.40
15" INV= 4965.04
5' SDMH #3
RIM ELEV=4970.87
STA=13+35.87, 1.6' RT
15" INV= 4964.87
WHITBY WOODLAND DRIVE (PUBLIC)
15" SD
SD INLET BOX #2
GRATE ELEV=4970.40
15" INV= 4965.01
4' SDMH #4
RIM ELEV=4969.46
STA=12+54.89, 2.0' RT
15" INV= 4963.46
SD INLET BOX #5
GRATE ELEV=4967.20
15" INV= 4962.31
PRE-TREATMENT
5' SDMH #5
RIM ELEV=4968.13
STA=11+54.00, 2.0' RT
15" INV= 4962.13
BOTTOM= 4959.13
4' SDMH #6
RIM ELEV=4968.21
STA=11+34.00, 1.9' RT
15" INV= 4962.03
SD INLET BOX #2
GRATE ELEV=4967.20
15" INV= 4961.99
TOTAL STORAGE PROVIDED
(SUMP & BASIN)= 9,205 C.F.
REQUIRED STORAGE= 8,799 C.F.
SUMP #1
GRATE ELEV=4963.00
STA=10+91.57, 53.6' RT
INV= 4959.75
BOTTOM= 4953.75
DEPTH=9.25'
OVERFLOW BOX #1
GRATE ELEV=4967.00
WIERWALL ELEV= 4966.00
(N) INV IN= 4959.46
(S) INV OUT= 4959.46
DEPTH=7.54'
5" ORIFICE PLATE
SPILL WAY
5' SDMH #7
RIM ELEV=4963.34
STA=10+31.79, 109.7' RT
INV= 4959.34
CONNECT TO EXIST. STORM DRAIN LINE MATCH EXISTING FL.
200 NORTH STREET (PUBLIC)
DEERFIELD PLAT A
WHITBY WOODLAND PRD F
N
W – E
S
0 5 10 20 40 80 120
(24"x36")
SCALE 1" = 40'
(11"x17")
SCALE 1" = 80'
EXISTING GROUND
EXISTING 400 WEST STREET
EXIST. C&G TO REMAIN
PROPOSED 5' SIDEWALK W/6" ROAD BASE
PROPOSED 5'
PLACE PROPEX LANDLOCK TRM OR PYRAMAT 25 TRM (OR APPROVED EQUIVALENT) WITH DUAL LAYER OF HYDROSEED ON CUT SLOPE AS REQUIRED.
SECTION A–A
REGISTERED PROFESSIONAL ENGINEER
KYLE M. SPENCER
No. 276243
07-12-21
STATE OF UTAH
THESE DRAWINGS, OR ANY PORTION THEREOF, SHALL NOT BE USED ON ANY PROJECT OR EXTENSIONS OF THIS PROJECT EXCEPT BY AGREEMENT IN WRITING WITH NORTHERN ENGINEERING, INC.

NO.	REVISIONS	BY	DATE
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DRAWN BY: DATE:
CHECKED BY: DATE:
APPROVED: DATE:
COGO FILE: DATE:
REV. COGO FILE: DATE:

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Northern ENGINEERING INC
ENGINEERING–LAND PLANNING CONSTRUCTION MANAGEMENT
1040 E. 800 N.
OREM, UTAH 84097
(801) 802-8992

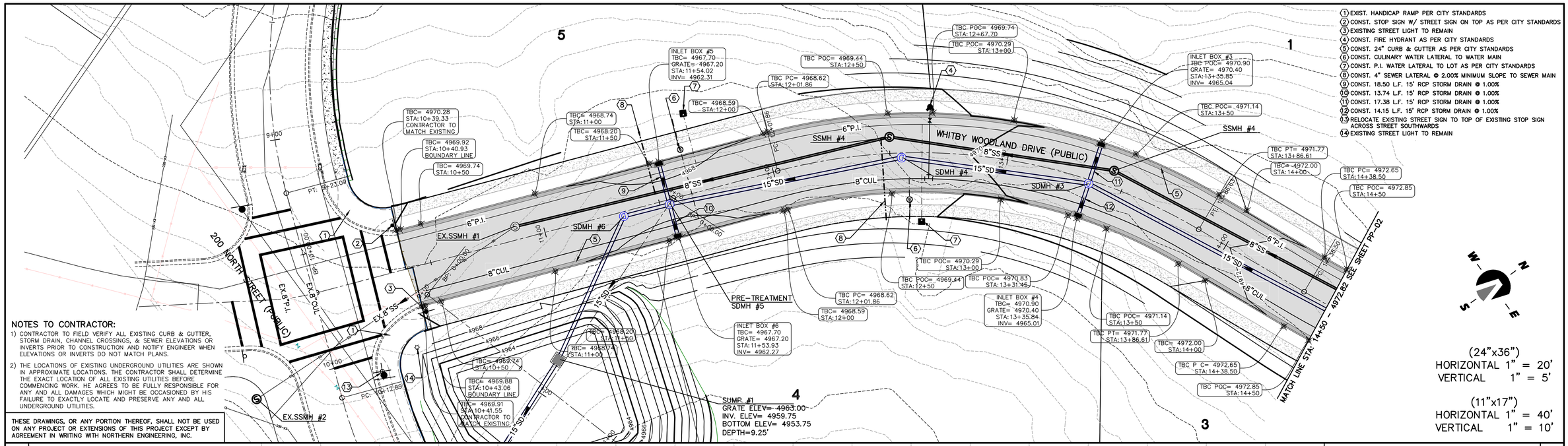
ALPINE LAYTON SUBDIVISION PLAT A

GRADING & DRAINAGE

ALPINE CITY, UTAH

JOB NO. 3-21-006

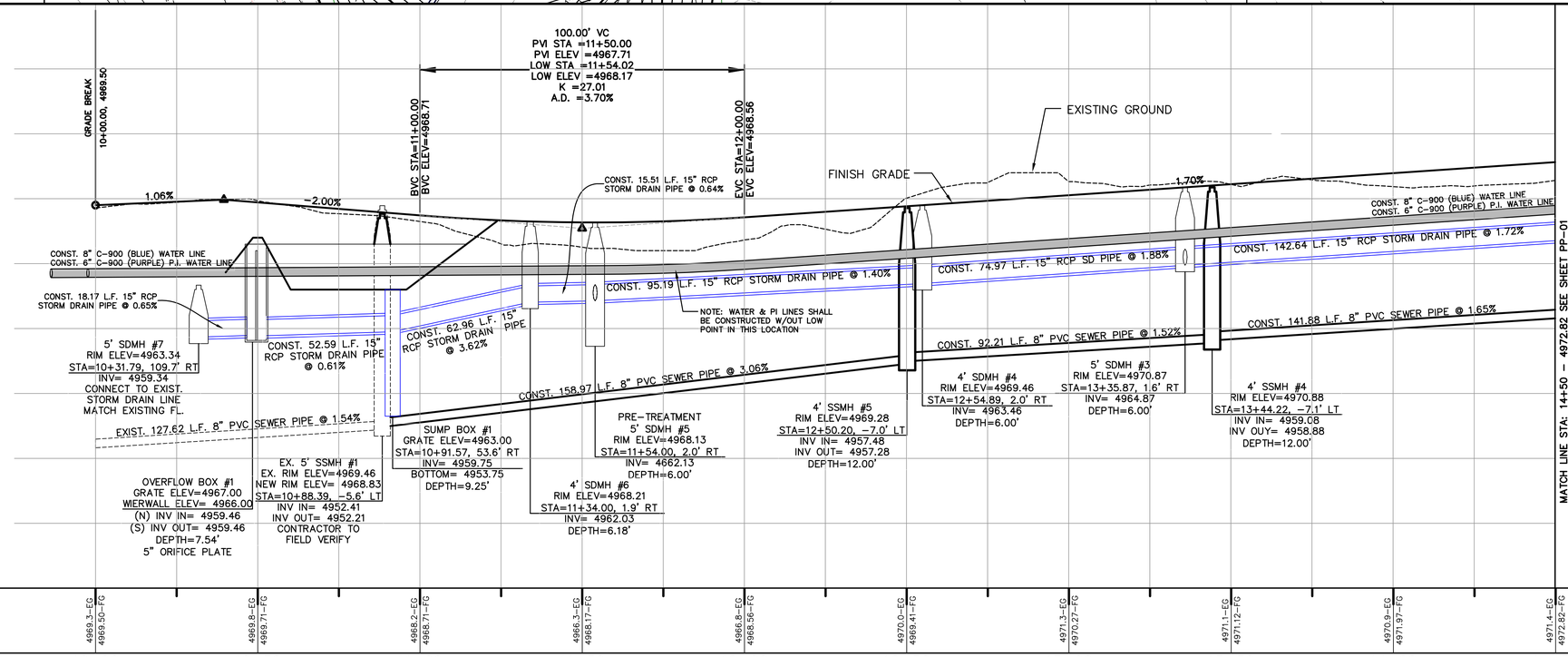
SHEET NO. 5



NOTES TO CONTRACTOR:

1) CONTRACTOR TO FIELD VERIFY ALL EXISTING CURB & GUTTER, STORM DRAIN, CHANNEL CROSSINGS, & SEWER ELEVATIONS OR INVERTS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER WHEN ELEVATIONS OR INVERTS DO NOT MATCH PLANS.

2) THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.



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3				CHECKED BY:	DATE:
2				APPROVED:	DATE:
1				COGO FILE:	DATE:
NO.	REVISIONS	BY	DATE	REV. COGO FILE:	DATE:

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Northern ENGINEERING INC
ENGINEERING–LAND PLANNING
CONSTRUCTION MANAGEMENT
1040 E. 800 N.
OREM, UTAH 84097
(801) 802-8992

KYLE M. SPENCER No. 276243 06-30-21 REGISTERED PROFESSIONAL ENGINEER STATE OF UTAH

ALPINE LAYTON SUBDIVISION PLAT A

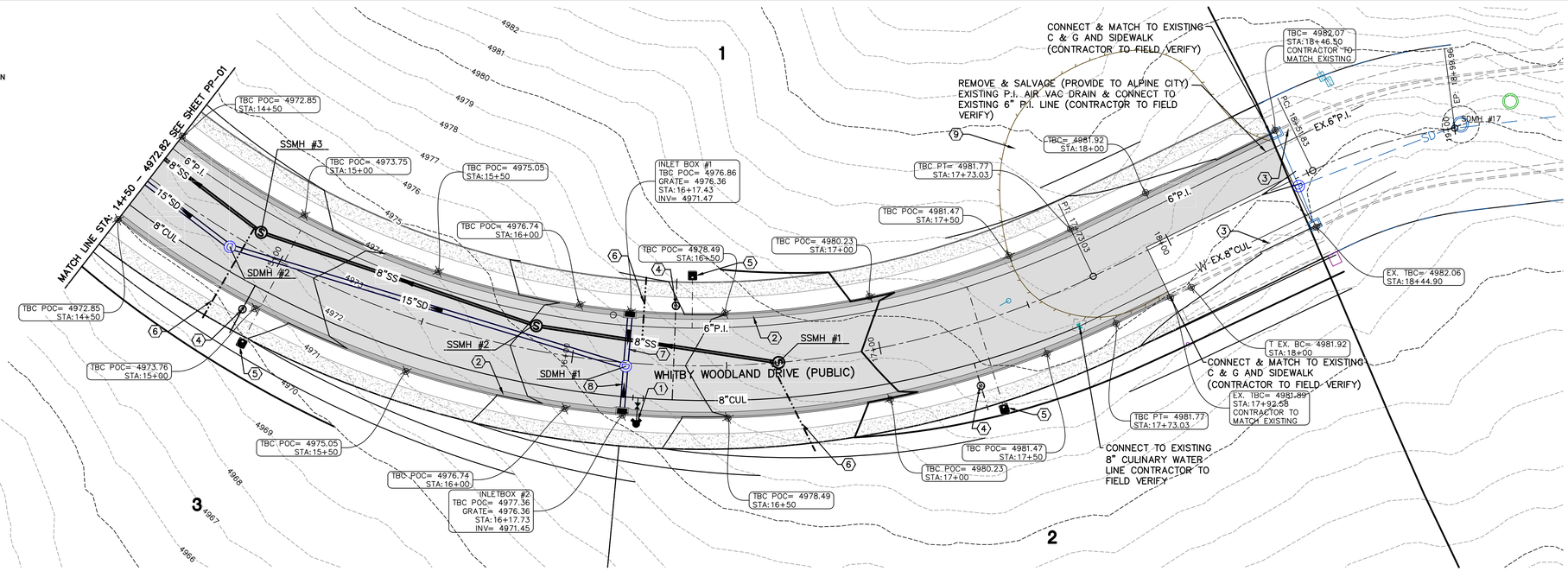
WHITBY WOODLAND DRIVE
STA: 10+00 – 14+50

PLAN & PROFILE

JOB NO. 3-21-006

SHEET NO. PP-01

1. CONST. FIRE HYDRANT AS PER CITY STANDARDS
2. CONST. 24" CURB & GUTTER AS PER CITY STANDARDS
3. EXIST. 24" CURB & GUTTER AS PER CITY STANDARDS
4. CONST. CULINARY WATER LATERAL TO WATER MAIN
5. CONST. P.I. WATER LATERAL TO LOT AS PER CITY STANDARDS
6. CONST. 4" SEWER LATERAL @ 2.00% MINIMUM SLOPE TO SEWER MAIN
7. CONST. 16.75 L.F. 15" RCP STORM DRAIN @ 1.00%
8. CONST. 14.55 L.F. 15" RCP STORM DRAIN @ 1.00%
9. CONTRACTOR TO REMOVE & DISPOSE OFF-SITE EXISTING ASPHALT TEMPORARY TURN AROUND.



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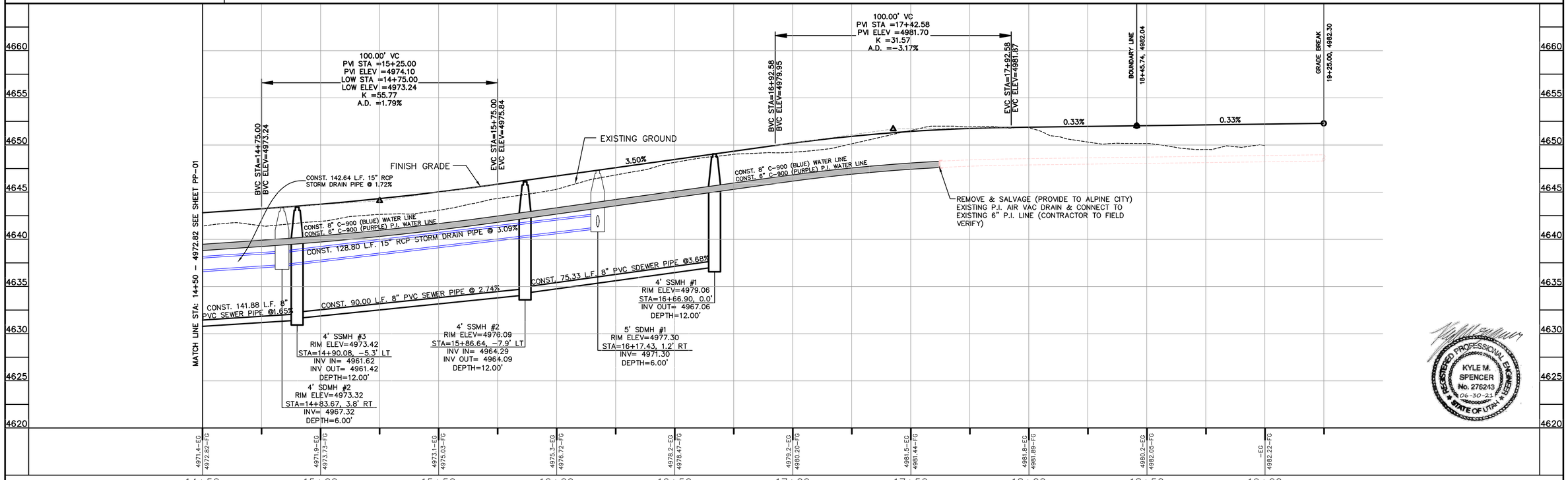
2) THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

(24"x36")
HORIZONTAL 1" = 20'
VERTICAL 1" = 5'

(11"x17")
HORIZONTAL 1" = 40'
VERTICAL 1" = 10'



REGISTERED PROFESSIONAL ENGINEER
KYLE M. SPENCER
No. 276243
06-30-21
STATE OF UTAH

NO.	REVISIONS	BY	DATE
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APPROVED: DATE:
COGO FILE: DATE:
REV. COGO FILE: DATE:

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Northern ENGINEERING INC
ENGINEERING-LAND PLANNING CONSTRUCTION MANAGEMENT
1040 E. 800 N.
OREM, UTAH 84097
(801) 802-8992

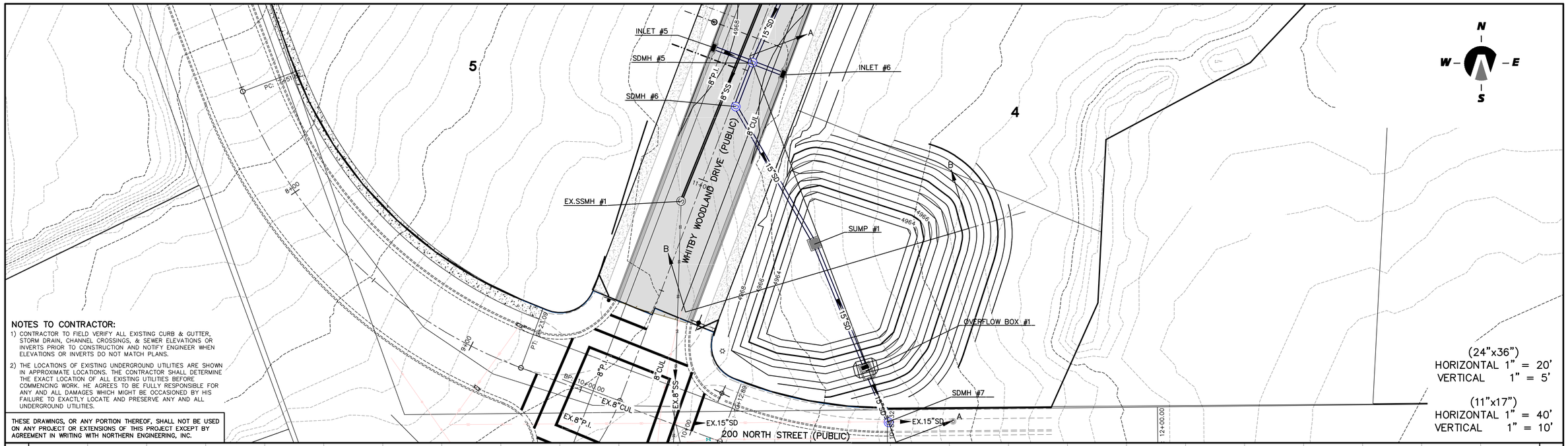
ALPINE LAYTON SUBDIVISION PLAT A

WHITBY WOODLAND DRIVE
STA: 14+50 - 18+45.74

PLAN & PROFILE

JOB NO. 3-21-006

SHEET NO. PP-02



NOTES TO CONTRACTOR:

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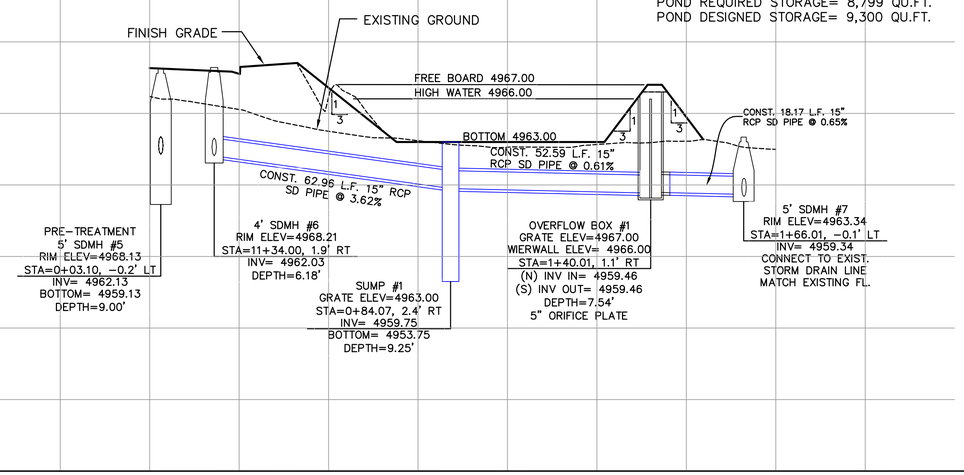
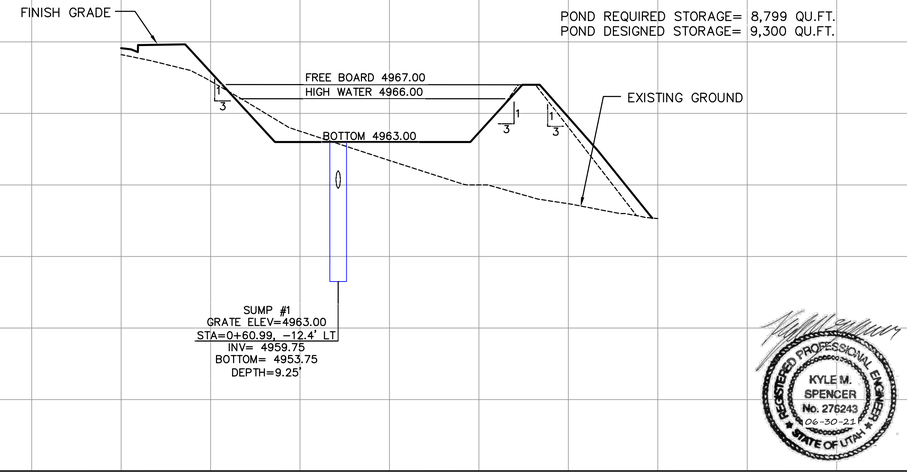
(24"x36")
HORIZONTAL 1" = 20'
VERTICAL 1" = 5'

(11"x17")
HORIZONTAL 1" = 40'
VERTICAL 1" = 10'



SECTION A–A



SECTION B–B

REGISTERED PROFESSIONAL ENGINEER
KYLE M. SPENCER
No. 276243
06-30-21
STATE OF UTAH

NO.	REVISIONS	BY	DATE
5			
4			
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DESIGNED BY: DATE:
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REV. COGO FILE: DATE:

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Northern ENGINEERING INC
ENGINEERING–LAND PLANNING
CONSTRUCTION MANAGEMENT
1040 E. 800 N.
OREM, UTAH 84097
(801) 802-8992

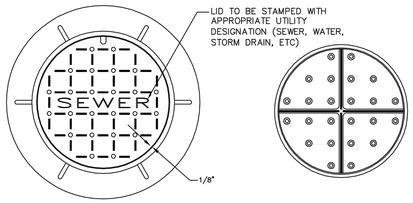
ALPINE LAYTON SUBDIVISION PLAT A

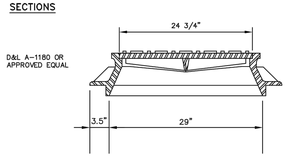
DETENTION POND

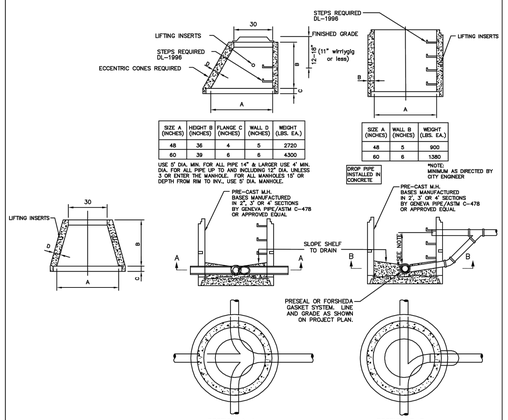
PLAN & PROFILE

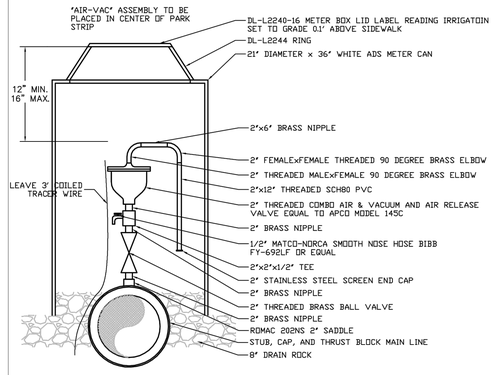
JOB NO. 3-21-006

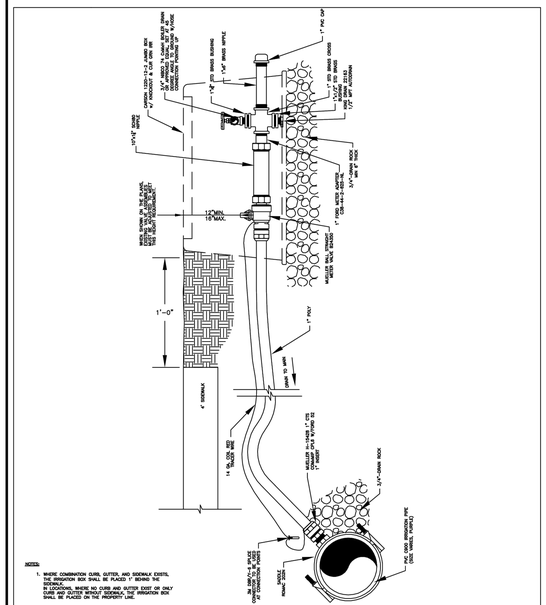
SHEET NO. PND–1











HEAVY DUTY, 400 LB. MINIMUM, MANHOLE RING AND COVER

N.T.S.

REVISION

NO.		BY	APRL.	DATE

ALPINE CITY
ESTABLISHED 1850

CAD FILE: D:\ENGINEERING\STANDARD DRAWINGS\2015 UPDATED\16 TYPICAL MANHOLE RING & COVER

MANHOLE RING & COVER (typical)

ALPINE CITY
20 NORTH MAIN
ALPINE, UT 84004

STANDARD DRAWING NUMBER:	16
PLOT SCALE:	N.T.S.
DRAWN BY:	WJM
DESIGN BY:	
CHECKED BY:	
ADOPTED DATE:	4/14/04

SIZE A (INCHES)	HEIGHT B (INCHES)	FLANGE C (INCHES)	WALL D (INCHES)	WEIGHT (LBS. EA.)
48	36	4	5	2720
60	39	6	6	4300

USE 5' DIA. MIN. FOR ALL PIPE 14" & LARGER USE 4' MIN. DIA. FOR ALL PIPE UP TO AND INCLUDING 12" DIA. UNLESS 3 OR ENTER THE MANHOLE. FOR ALL MANHOLES 15' OR DEPTH FROM RIM TO INV., USE 5' DIA. MANHOLE.

SIZE A (INCHES)	WALL B (INCHES)	WEIGHT (LBS. EA.)
48	5	900
60	6	1380

*NOTE:
MINIMUM AS DIRECTED BY CITY ENGINEER

TYPICAL JUNCTION MANHOLE

N.T.S.

TYPICAL DROP MANHOLE

N.T.S.

NOTE: USE OF DROP MANHOLES REQUIRES APPROVAL OF CITY ENGINEER AND PUBLIC WORKS DIRECTOR. FOR ALL OTHER SPECIFICATIONS, SEE APWA.

REVISION

NO.		BY	APRL.	DATE

ALPINE CITY
ESTABLISHED 1850

CAD FILE: E:\ENGINEERING\STANDARD DRAWINGS\2015 UPDATED (CURRENT)\17 SEWER TYPICAL MANHOLES

SEWER MANHOLE (TYPICAL)

ALPINE CITY
20 NORTH MAIN
ALPINE, UT 84004

STANDARD DRAWING NUMBER:	17
PLOT SCALE:	N.T.S.
DRAWN BY:	WJM
DESIGN BY:	
CHECKED BY:	
ADOPTED DATE:	4/14/04

REVISION

NO.		BY	APRL.	DATE

ALPINE CITY
ESTABLISHED 1850

CAD FILE: E:\ENGINEERING\STANDARD DRAWINGS\2015 UPDATED (CURRENT)\26 PI AIRVAC

SECONDARY WATER AIR-VAC ASSEMBLY

ALPINE CITY
20 NORTH MAIN
ALPINE, UT 84004

STANDARD DRAWING NUMBER:	26
PLOT SCALE:	N.T.S.
DRAWN BY:	WJM
DESIGN BY:	
CHECKED BY:	
ADOPTED DATE:	12/7/18

NOTES:

1. WHERE COMBINATION CURB, GUTTER, AND SIDEWALK EXISTS, THE IRRIGATION BOX SHALL BE PLACED 1' BEHIND THE SIDEWALK.
   IN LOCATIONS, WHERE NO CURB AND GUTTER EXIST OR ONLY CURB AND GUTTER WITHOUT SIDEWALK, THE IRRIGATION BOX SHALL BE PLACED ON THE PROPERTY LINE.

REVISION

NO.		BY	APRL.	DATE

ALPINE CITY
ESTABLISHED 1850

CAD FILE: \Engineering\Standard Drawings\2015\PI CONNECTION 08.dwg

Pressurized Irrigation Distribution System

ALPINE CITY
20 NORTH MAIN
ALPINE, UT 84004

STANDARD DRAWING NUMBER:	24
PLOT SCALE:	N.T.S.
DRAWN BY:	B.D.B.
DESIGN BY:	
CHECKED BY:	
ADOPTED DATE:	8/10/05

NOTE: METER BOX, COVER, COPPERSETTER, CORPORATION STOP, & SERVICE LINES TO BE FURNISHED AND INSTALLED BY DEVELOPER.

1" WATER SERVICE CONNECTION

N.T.S.

NOTE: METER BOX, COVER, COPPERSETTER, CORPORATION STOP, & SERVICE LINES TO BE FURNISHED AND INSTALLED BY DEVELOPER.

NOTE: FOR 1.5" SERVICES: ALL PARTS SHOWN ABOVE ARE THE SAME EXCEPT THE SERVICE LINE AND SETTER, WHICH WOULD BOTH BE CHANGED TO 1.5"

1.5" & 2" WATER SERVICE CONNECTIONS

N.T.S.

REVISION

NO.		BY	APRL.	DATE

ALPINE CITY
ESTABLISHED 1850

CAD FILE: E:\ENGINEERING\STANDARD SPECIFICATIONS AND DRAWINGS\2020 CITY SPEC AND DETAILS (PROPOSED)\CITY DETAILS\27 WATER SERVICES

WATER SERVICE CONNECTION DETAIL

ALPINE CITY
20 NORTH MAIN
ALPINE, UT 84004

STANDARD DRAWING NUMBER:	27
PLOT SCALE:	N.T.S.
DRAWN BY:	WJM
DESIGN BY:	
CHECKED BY:	
ADOPTED DATE:	4/14/04

NOTE: RAISE VALVE BOX TO GRADE AFTER PAVING OPERATIONS ARE COMPLETED.

VALVE BOX COLLAR DETAIL

N.T.S.

REVISION

NO.		BY	APRL.	DATE

ALPINE CITY
ESTABLISHED 1850

CAD FILE: E:\ENGINEERING\STANDARD DRAWINGS\2015 UPDATED (CURRENT)\27A VALVE BOX

VALVE BOX DETAIL

ALPINE CITY
20 NORTH MAIN
ALPINE, UT 84004

STANDARD DRAWING NUMBER:	27a
PLOT SCALE:	N.T.S.
DRAWN BY:	WJM
DESIGN BY:	
CHECKED BY:	
ADOPTED DATE:	4/14/04

NOTES:

1. WATER VALVES AND 5-INCH VALVE OPENING MUELLER FIRE HYDRANTS SHALL BE LOCATED AS APPROVED.
2. NO WATER LINE SMALLER THAN 8-INCH DIA. SHALL BE INSTALLED WITHOUT APPROVAL OF CITY COUNCIL.
3. SUBGRADE DEPTHS VARY DEPENDING ON CBR VALUE OF THE AREA, SEE ALPINE CITY STANDARD SPECIFICATIONS
4. CULINARY WATER MAINS SHALL BE ON THE NORTH AND EAST SIDES OF THE STREET.
   PRESSURIZED IRRIGATION AND SEWER LINES SHALL BE ON THE SOUTH AND WEST SIDES OF THE STREET.

KYLE M.
SPENCER
No. 276243
06-24-21

THESE DRAWINGS, OR ANY PORTION THEREOF, SHALL NOT BE USED ON ANY PROJECT OR EXTENSIONS OF THIS PROJECT EXCEPT BY AGREEMENT IN WRITING WITH NORTHERN ENGINEERING, INC.

NO.	REVISIONS	BY	DATE		
5				DESIGNED BY:	DATE:
4				DRAWN BY:	DATE:
3				CHECKED BY:	DATE:
2				APPROVED:	DATE:
1				COGO FILE:	DATE:
				REV. COGO FILE:	DATE:

Northern
ENGINEERING INC
ENGINEERING-LAND PLANNING
CONSTRUCTION MANAGEMENT

1040 E. 800 N.
OREM, UTAH 84097
(801) 802-8992

ALPINE LAYTON SUBDIVISION PLAT A

DETAILS

ALPINE, UTAH

JOB NO.
3-21-006

SHEET NO.
DT-01

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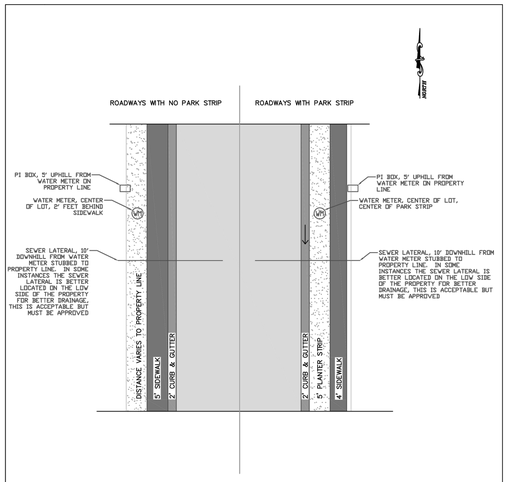
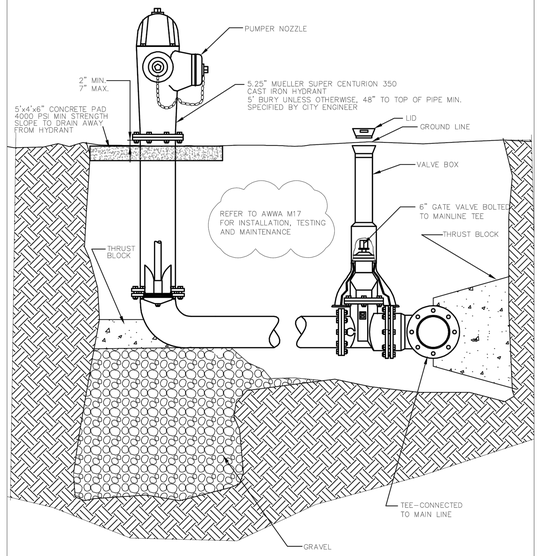


STANDARD LOT UTILITY LOCATIONS

N.T.S.



STANDARD FIRE HYDRANT DETAIL

N.T.S.

STATEMENT OF USE	THIS DOCUMENT AND ANY ILLUSTRATIONS HEREON ARE PROVIDED AS STANDARD CONSTRUCTION DETAILS WITHIN ALPINE CITY. DEVIATION FROM THIS DOCUMENT REQUIRES APPROVAL OF ALPINE CITY. ALPINE CITY CORPORATION CAN NOT BE HELD LIABLE FOR MISSUSE OR CHANGES REGARDING THIS DOCUMENT.
REVISION	NO. / BY / APRV. / DATE
ALPINE CITY ESTABLISHED 1850	
STANDARD LOT UTILITY LOCATIONS	STANDARD DRAWING NUMBER: 12
ALPINE CITY 20 NORTH MAIN ALPINE, UT 84004	PLOT SCALE: N.T.S. DRAWN BY: MJM DESIGN BY: CHECKED BY: ADOPTED DATE: 10/1/08

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TYPICAL FIRE HYDRANT	STANDARD DRAWING NUMBER: 23
ALPINE CITY 20 NORTH MAIN ALPINE, UT 84004	PLOT SCALE: N.T.S. DRAWN BY: MJM DESIGN BY: CHECKED BY: ADOPTED DATE: 6/1/04

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ENGINEERING—LAND PLANNING
CONSTRUCTION MANAGEMENT
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OREM, UTAH 84097
(801) 802-8992

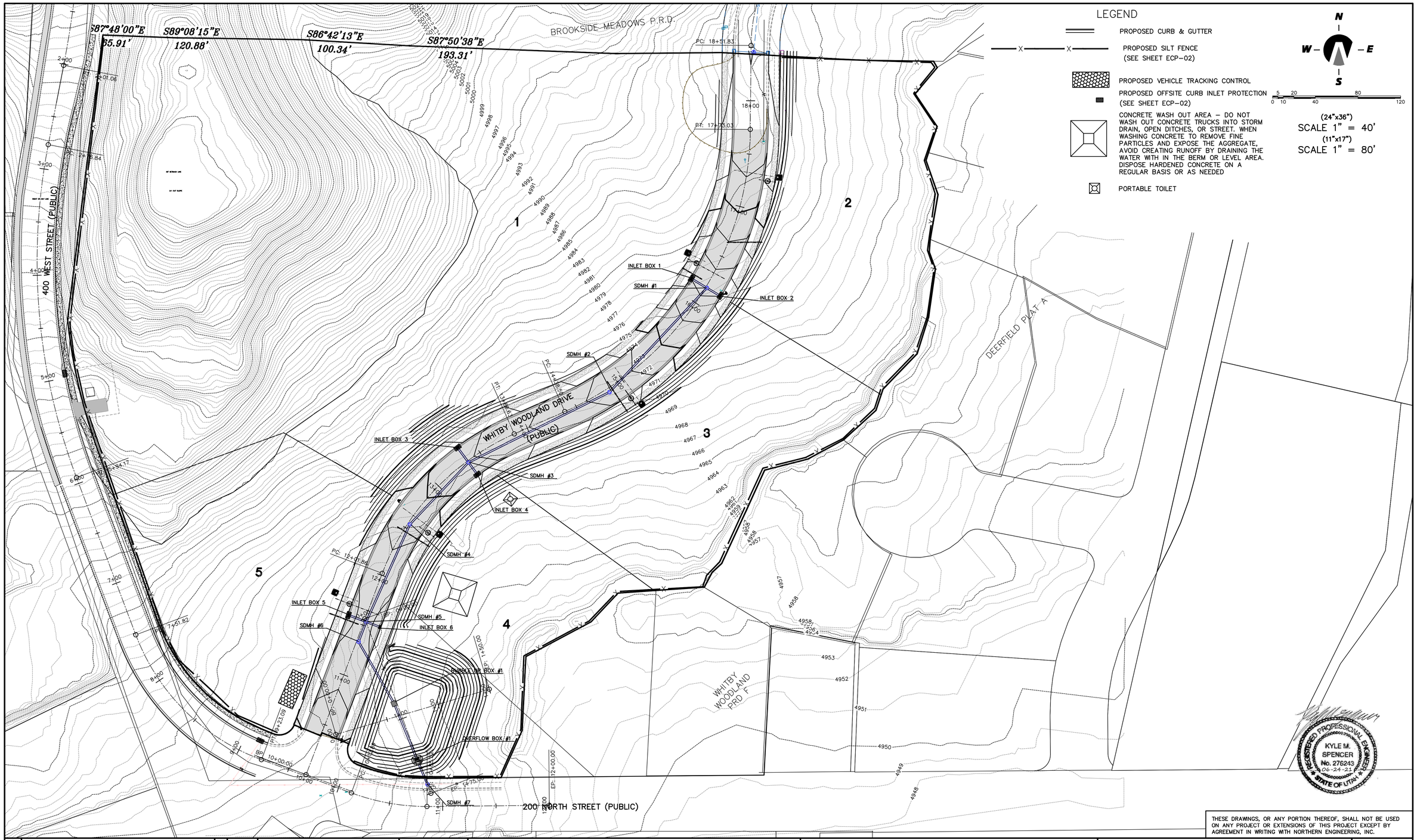
ALPINE LAYTON SUBDIVISION
PLAT A

DETAILS

ALPINE, UTAH

JOB NO. 3-21-006

SHEET NO. DT-02



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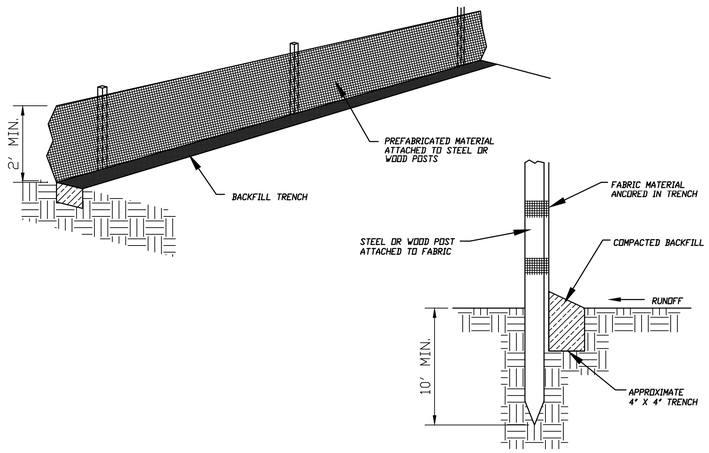
ALPINE LAYTON SUBDIVISION PLAT A

EROSION CONTROL PLAN

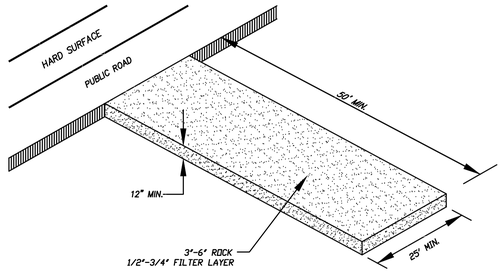
ALPINE CITY, UTAH

JOB NO. 3-20-030

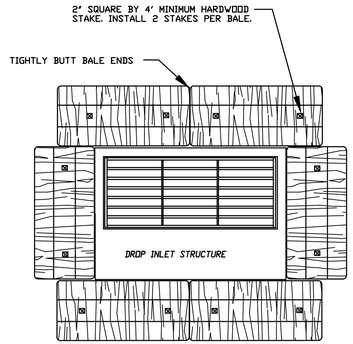
SHEET NO. ECP-1



SILT FENCE DETAIL
-NTS-

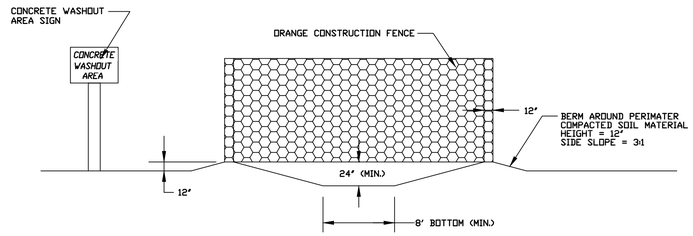


VEHICLE TRACKING DETAIL
NOT TO SCALE

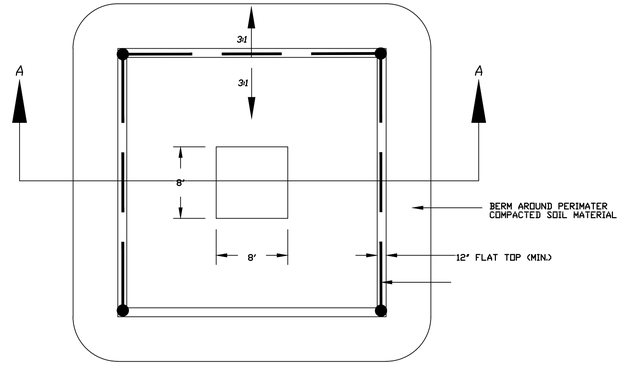


PLAN VIEW

NOTES:
1. KEY-IN BALES IN AN EXCAVATED TRENCH AROUND THE PERIMETER OF THE DROP INLET STRUCTURE THAT IS 6" DEEP BY A BALES WIDTH WIDE.
2. OVERLAP ON CORNERS MUST BE AT LEAST HALF A BALE WIDE.
3. DEPENDING ON THE SIZE OF THE INLET STRUCTURE, MORE BALES THAN SHOWN MAY BE REQUIRED.
4. IN MEDIAN AREAS, CONSTRUCT SO THAT THE TOPS OF THE BALES ARE NOT HIGHER THAN THE ADJACENT ROADWAY.
5. MAINTAIN A PROPERLY FUNCTIONING SEDIMENT BARRIER THROUGHOUT CONSTRUCTION OR UNTIL DISTURBED AREAS CONTRIBUTING TO THE INLET HAVE BEEN PAVED OR VEGETATED.
6. REMOVE SEDIMENT AS IT ACCUMULATES AND PLACE IT IN A STABLE AREA APPROVED BY THE ENGINEER.



SECTION A-A



CONCRETE WASHOUT PIT
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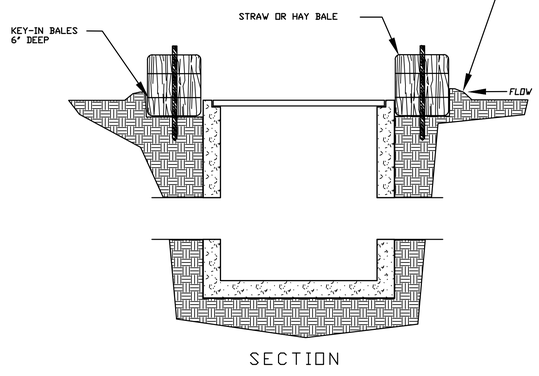

SECTION

STRAW BALE DROP INLET PROTECTION DETAIL
-NTS-

GENERAL NOTES:

1. AT ALL TIMES DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREVENTING AND CONTROLLING ONSITE EROSION DUE TO WIND AND RUNOFF. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR MAINTAINING EROSION CONTROL FACILITIES SHOWN.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING DRAINAGE AND EROSION CONTROL FACILITIES AS REQUIRED. STREETS SHALL BE KEPT CLEAN OF DEBRIS FROM SITE TRAFFIC.
3. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED DUE TO UNFORESEEN PROBLEMS OR IF THE PLAN DOES NOT FUNCTION AS INTENDED. A REPRESENTATIVE OF THE CITY OR COUNTY PUBLIC WORKS DEPARTMENT MAY REQUIRE ADDITIONAL CONTROL DEVICES UPON INSPECTION OF PROPOSED FACILITIES.
4. CONTRACTOR SHALL USE VEHICLE TRACKING CONTROL AT ALL LOCATIONS WHERE VEHICLES WILL ENTER OR EXIT THE SITE. CONTROL FACILITIES WILL BE MAINTAINED WHILE CONSTRUCTION IS IN PROGRESS, MOVED WHEN NECESSARY, AND REMOVED WHEN THE SITE IS PAVED.
5. ALL SWPPP DRAINAGE SYSTEMS USING A GEOTECHNICAL FABRIC FOR INLET GRATE PROTECTION MUST HAVE FABRIC REGULARLY CLEANED (14 DAY INTERVAL MAX, MORE FREQUENTLY IF NEEDED) TO INSURE THAT SILT DOES NOT FORM IMPERMEABLE BARRIER OVER INLET.

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ALPINE LAYTON SUBDIVISION PLAT A

EROSION CONTROL DETAILS

ALPINE, UTAH

JOB NO. 3-21-006

SHEET NO. ECP-02

DRAINAGE REPORT

for

Alpine Whitby Layton Estates

May 21, 2021

Prepared by:
Kyle Spencer P.E.
Northern Engineering, Inc.
1040 East 800 North
Orem, Utah 84097
(801) 802-8992

INTRODUCTION & PURPOSE

The Whitby Layton Estates Subdivision residential development project is a 9.71-acre located North of the intersection of 200 North and Westfield Road in Alpine, Utah. Development of the site will yield higher storm-water runoff than it did in its native state. The purpose of this report is to demonstrate that the proposed development and its storm drainage system will:

1. Be capable of capturing, conveying, and retaining the storm water runoff generated by development of the site, thus preventing the flooding of buildings and properties both within and down gradient of the project.
2. Compensate for the increased hard surfaced areas, by providing ample storm water retention/detention and infiltrate at an assumed rate.

HYDROLOGIC CRITERIA

The climate in Alpine is semi-arid and characterized by low precipitation, low humidity, and extreme variations in temperature. The greatest potential for flooding and erosion is caused by spring and summer thunderstorms. These extreme runoff events are caused by cloudburst type storms that are characterized by short periods of high intensity rainfall.

Estimates of rainfall for engineering (design) applications are based on the probability of a storm event with a certain magnitude occurring within a return period (or period of time). The storm depths of accumulation used was found in the *Alpine City Storm Water Drainage Manual,* dated February 2010; the precipitation estimates used were derived from the NOAA Atlas 14, Volume 1, Version 4. These values were used for defining the precipitation estimates used in the analysis described herein.

The analysis for the storm drain pipe drainage system was based on the 10-year storm event and the 100-year storm event for the injection sumps and retention/detention basins as per the City of Alpine and standards of practice. More specifically, Alpine City Ordinances require storage volume design requirements for the 1-hour and 3-hour mark. A percolation rate of 2.00 min/inch was used for the sump designs.

METHODOLOGY

The Rational Method was used to determine expected storm water flows. The Rational Method (Q=CIA) defines storm discharge flows as the product of the runoff coefficient (C), the rainfall intensity (I), and the drainage study area (A).

A weighted average analysis was done to determine the appropriate post-development runoff coefficient (C). This analysis incorporated using proposed roof areas, landscaped areas, and hard surface areas, including the curb and gutter, and sidewalks.

The runoff coefficient for the post-development condition for the entire subdivision was calculated to be 0.25. These coefficients are within the typical range of residential developments of this type (Please see the runoff coefficient calculations as shown on the attached sheets).

COLLECTION & RETENTION/DETENTION SYSTEMS

The storm water runoff will be collected by inlet boxes at low elevations along the edge of the ROW. Once collected by the inlet boxes, the runoff will be conveyed towards a sump within a basin or by an injection sump depending on the sub-basin section area, as mention in the *Methodology* section (Please reference the storage volume requirement calculations and sump design parameters in the Appendix section below).

Results for the proposed Detention / Sump basin:

The Detention Basin has Sump #1 within the basin. This basin will work as a detention system. The historical release rate will be 0.20 cfs/acre. The sump design storage is 723 cubic feet with a release rate of 0.42 cfs. With the drainage area of Whitby Woodland Drive Road (including R.O.W./Hard-surface and landscaping) and the area included in the entire subdivision, the release rate within the Alpine Subdivision is 1.94 cfs. Alpine Layton was measured to be 9.71-acres, with a release rate of 1.94 cfs. Therefore, the total release rate used to design the orifice plate diameter was 2.37 cfs.

Sump #1 will act as both a sump and a bubble up box. The Sump will connect to a control box through a 15-inch diameter pipe to eliminate the overland flow of all storm water. This control box will have a weir wall and a grate the top of the box. A 5-inch diameter orifice plate will be implemented in the weir wall. The top of weir wall will be set at the high-water elevation of the detention basin at an elevation of 4966.00. The grate elevation will be set at freeboard elevation of the Basin at an elevation of 4967.00. Any storm greater than the 100-year storm will over top the weir wall and flow into the existing storm drain line in 200 North Street.

The **pond storage capacity design is 8,482 cubic feet**. Combining the pond and the sump storage, the total storage is 9,205 cubic feet. The **required storage volume for this drainage area is 8,799 cubic feet** at minute 30. Therefore, the storage provided by the basin with the sump is adequate in handling the 100-year storm event and meets and exceeds the Alpine City ordinance.

CONCLUSION

The proposed storm drainage system will be capable of capturing and conveying expected flows produced by the 100-year storm events. The 100-year storm event has been controlled and flooding has been mitigated. This shall prevent the flooding of properties both within and down gradient of the project.

APPENDIX

Appendix A – Runoff Coefficient Calculations and Rainfall Intensities
Appendix B – Results for Basin/Orifice Plate Sizing
Appendix C – Results for Sump and Pond volumes
Appendix D – Site Map Exhibit

Layton Estates- Runoff Coefficient Calculations
Proposed Development-Storm Drainage Calculations
Design Criteria: 5/24/2021

Method: Rational Method
Intensity Table: Alpine City Standards
Return Period: 100 year storm event

Subdivision Parameters and Drainage Areas

Subdivision:	**Layton Estates- Runoff Coefficient Calculations**		
Number of Lots	5		
Total Right of Way Area/Hardsurface/Street	43379	sq. ft. =	1.00 acre
Total Lot Area	379515	sq. ft. =	8.71 acre
Total Subdivision Area	422894	sq. ft. =	9.71 acre
Average Roof Area per Lot	4000	sq.ft.	
Average Driveway & Hard Surface Area per Lot	1500	sq.ft.	

Weighted Runoff Coefficient "C" Calculation			
Surface Type	**Area**	**"C"**	**C*A**
Roofs	20,000	0.92	18,400
Driveways & Hard Surface	7,500	0.92	6,900
ROW Section w/ 5' Planter/5' Curb&Gutter	43,379	0.90	39,041
Lot Landscaped Area	352,015	0.12	42,242
Totals	422,894		106,583

Weighted Runoff Coefficient "C" = (Total C*A)/(Total Area) **0.25**

Hydrologic Analysis:

For Pipe Design:

10-year storm event		
Duration	**Storm Intensity**	
(min)	**(in/hr)**	**(in)**
5	3.60	0.30
10	2.70	0.45
15	2.24	0.56
30	1.52	0.76
60	0.94	0.94
120	0.55	1.09
180	0.40	1.21
360	0.26	1.55
720	0.17	2.02
1440	0.10	2.37

25-year storm event		
Duration	**Storm Intensity**	
(min)	**(in/hr)**	**in**
5	4.54	0.38
10	3.45	0.58
15	2.85	0.71
30	1.92	0.96
60	1.19	1.19
120	0.68	1.35
180	0.48	1.43
360	0.28	1.70
720	0.18	2.12
1440	0.09	2.19

For Flood Control:

100-year storm event		
Duration	**Storm Intensity**	
(min)	**(in/hr)**	**in**
5	6.96	0.58
10	5.28	0.88
15	4.36	1.09
30	2.94	1.47
60	1.82	1.82
120	1.03	2.05
180	0.71	2.14
360	0.41	2.44
720	0.26	3.08
1440	0.14	3.40

Hydrologic Analysis & Storage Volume Requirements:

Contributing Drainage Lot Areas for Detention:	9.71	acres =	422894 sq.ft
Allowable Release Rate	0.20	cfs/acre	
Release Flow	1.94	cfs	
Infiltration rate	0.42		
Total Release Rate	2.37		
Flood Route 100-Year 72 hour storm	8,799	cu.ft.	

100-year storm event									
Duration	Total Precipitation	Storm Intensity	Runoff Coefficient	Drainage Area	Stormwater Flow	Accum. Flow	Release Rate	Release Volume	Required Storage
(min)	(in)	(in/hr)	"C"	(ft^2)	(cfs)	(cf)	(cfs)	(cf)	(cf)
5	0.58	6.96	0.25	422894	17.17	5,152	2.37	710	4,442
10	0.88	5.28	0.25	422894	13.03	7,816	2.37	1,419	6,397
15	1.09	4.36	0.25	422894	10.76	9,681	2.37	2,129	7,553
30	1.47	2.94	0.25	422894	7.25	13,056	2.37	4,257	8,799
60	1.82	1.82	0.25	422894	4.49	16,165	2.37	8,514	7,651
120	2.05	1.03	0.25	422894	2.53	18,208	2.37	17,028	1,180
180	2.14	0.71	0.25	422894	1.76	19,007	2.37	25,542	0
360	2.44	0.41	0.25	422894	1.00	21,672	2.37	51,085	0
720	3.08	0.26	0.25	422894	0.63	27,356	2.37	102,170	0
1440	3.40	0.14	0.25	422894	0.35	30,198	2.37	204,340	0

ORIFICE PLATE SIZING:

- USING ORIFICE EQUATION-

Q = C*A (2*g*h)^(1/2) A = Q/C(2gh)^(1/2)

Q = Allowable release rate based on acreage	1.94	cfs
Top of pond water surface (@ High Water Elevation)	4966	ft
Center of Orifice Elevation	4959.5	ft
h = (highwater - center of orifice) ft	6.50	ft
C =	0.7	
g =	32.2	ft/sec^2
A = Area of Orifice	0.136	sq.ft.
Calculated Orifice Diameter = (4*(Area)/PI)^1/2 =	4.99	in

Use 5.00 Inch Diameter Orifice

Sump Design Parameters:

Percolation Rate (min/inch)	2.00
Void ratio	0.40
Height of top cone section (ft):	1.0
Height of manhole section (ft):	4.0
Diameter of manhole section (ft):	5.0
Thickness of section (in):	3.00
Number of manhole sections:	3
Excavation beyond outside of manhole (ft):	3.00
Bottom of manhole section to bottom of rock (ft):	2.00
Depth to top of drain rock (ft):	1.00
Depth to bottom of sections (ft):	13.00
Depth to bottom of drain rock (ft):	15.00
Height of drain rock (ft):	14.00
Excavation Radius (ft)	5.75
Area available for percolation (ft^2):	610
Calculated Percolation Capacity (ft^3/sec):	0.42
Storage in Manhole Sections (ft^3):	236
Storage in drain rock voids (ft^3):	487

Hydrologic Analysis & Storage Volume Requirements:

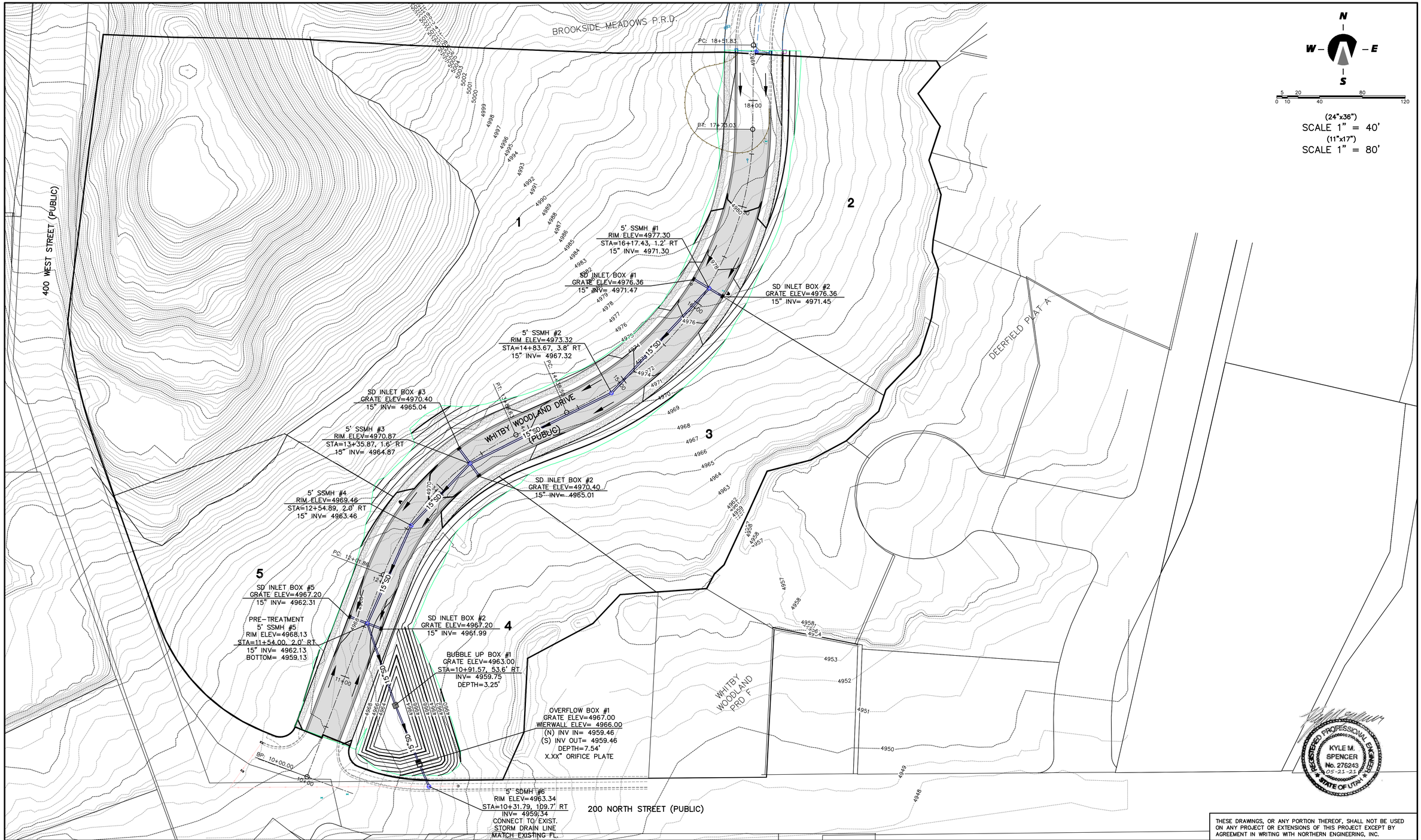
Required Storage Summary:

Minimum Detention Requirement	**8,799**	**cu. ft.**
Number of Sumps	1	
Total Proposed Sump Storage	**723**	**cu. ft.**
Pond Capacity	**8,482**	**cu. ft.**
Pond + Sump Capacity	**9,205**	**cu. ft.**
Therefore,	Basin and sump design is adequate	

Pond Volume Calculator

Where Pond Volume is given by the equation: V=H/3[A1+A2+(A1A2)1/2]

1 CONTOUR ELEV. (ft.)	2 CONTOUR AREA (A) (ft2)	3 A1+A2 (ft2)	4 (A1*A2)1/2 (ft2)	5 3+4 (ft2)	6 H (ft.)	7 H/3 (ft.)	8 VOLUME 7X5 (ft3)	9 ACCUM. VOLUME Σ ç (ft3)	
4963.0	1,573								Pond Bottom Elev.
4964.0	2,462	4,035	1,968	6,003	1.00	0.33	2,001	2,001	
4965.0	3,249	5,711	2,828	8,539	1.00	0.33	2,846	4,847	
4966.0	4,035	7,284	3,621	10,905	1.00	0.33	3,635	8,482	Design Elev.
4967.0	4,819	8,854	4,410	13,264	1.00	0.33	4,421	12,904	Top of Embankment



REGISTERED PROFESSIONAL ENGINEER
KYLE M. SPENCER
No. 276243
05-21-21
STATE OF UTAH

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ALPINE LAYTON SUBDIVISION PLAT A

GRADING & DRAINAGE

ALPINE CITY, UTAH

JOB NO. 3-21-006

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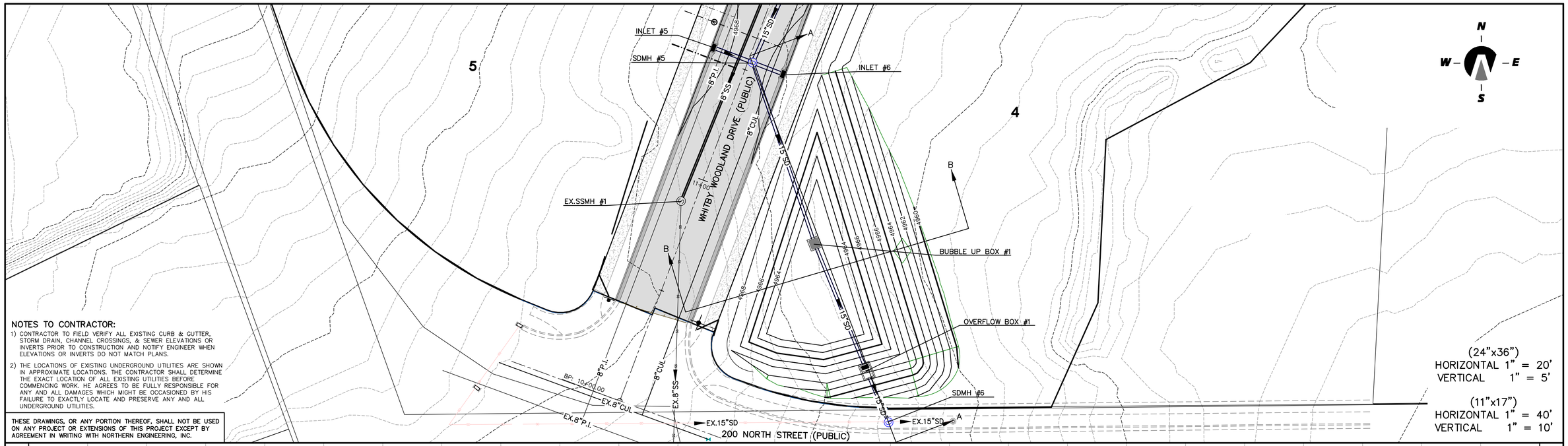


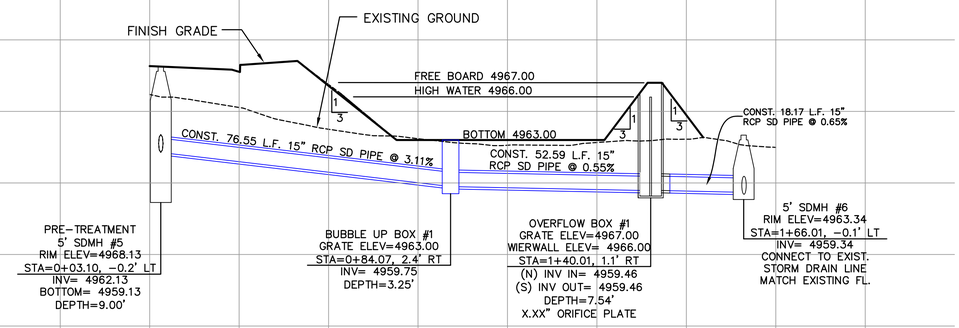
NOTES TO CONTRACTOR:

1) CONTRACTOR TO FIELD VERIFY ALL EXISTING CURB & GUTTER, STORM DRAIN, CHANNEL CROSSINGS, & SEWER ELEVATIONS OR INVERTS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER WHEN ELEVATIONS OR INVERTS DO NOT MATCH PLANS.

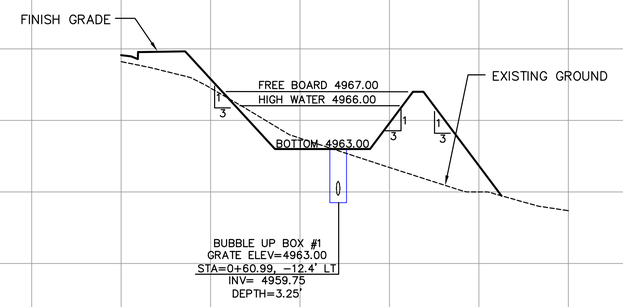
2) THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

(24"x36")
HORIZONTAL 1" = 20'
VERTICAL 1" = 5'

(11"x17")
HORIZONTAL 1" = 40'
VERTICAL 1" = 10'



SECTION A–A



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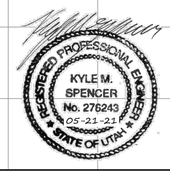

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ALPINE LAYTON SUBDIVISION PLAT A

DETENTION POND

PLAN & PROFILE

JOB NO. 3-21-006

SHEET NO. PND–1

AGREEMENT

This Agreement is made and entered into this 17th day of April, 2007 by and between Roger Whitby (hereinafter referred to as Land Owner) and Alpine City, a Utah municipal corporation (the "City").

RECITALS

Whereas, Land Owner has obtained Preliminary Plat approval from the Planning Commission of the City for a subdivision of the property known as Whitby Woodlands consisting of approximately 40.4 acres located at approximately 200 North and 400 West in Alpine City, Utah County, Utah. (The Subdivision). The Preliminary Plat is attached as Exhibit A

Whereas, the Subdivision is planned to be developed into 7 phases:

Plat A	3	lots	2.0109	acres
Plat B	8	lots	5.077	acres
Plat C	15	lots	9.4166	acres
Plat D	5	lots	3.6839	acres
Plat E	10	lots	7.7007	acres
Plat F	15	lots	10.79	acres
Plat G	3	lots	1.7339	acres

Whereas the Land Owner has obtained final plat approval for all phases of the subdivision and is entitled at his request to record the plats subject only to the payment of appropriate fees and the posting of appropriate improvement bonds.

Whereas, the City desires to obtain the dedication of a portion of a road which is known as 400 West and 200 North.

Whereas this portion of 400 West and 200 North Road would normally been dedicated to the City at the time of plat recordation and improved by the Land Owner as part of his development.

Whereas the City has determined that the proposed final plats for all phases of the subdivision are consistent with the preliminary plat approval and City ordinance.

Whereas the Land Owner, if he so desired could immediately record final plats for all phases of the subdivision.

Whereas the Land Owner does not want to record plats for all phases of the subdivision with the Utah County Recorder at this time for personal and market reasons.

Whereas the City is planning to do a road improvement project on Westfield Road and desires to have the portion of 400 West and 200 North as part of that project.

Whereas the City engineer has estimated that the reasonable cost of improving the portion of 400 West and 200 North is $103,000.

Whereas, the parties desire to memorialize other terms of their relationship.

Now, therefore, in consideration of the foregoing recitals and the following mutual promises, the receipt of sufficiency of which are hereby acknowledged, the parties agree to the following:

TERMS

1. Dedication of Right of Way—Land Owner shall provide a deed which dedicates to the City that portion of 400 West and 200 North that is adjacent to Whitby Woodlands Subdivision as more fully described in Exhibit B.

2. Development of the Subdivision— The Land Owner has already caused the City to record Plats A, B, and C. The City expressly agrees that final Plats D, E, F, and G, have been approved by the City Planning Commission and City Council and could be recorded by the City with the Office of the County Recorder only with the permission of the Land Owner. The City agrees that the approval currently given for these final plats shall be good for Fifteen (15) years from the date of the execution of this agreement. The City agrees that at anytime within Fifteen (15) years from the date of this agreement, if the Land Owner requests any or all of the approved unrecorded plats to be submitted to the Office of the Utah County Recorder, that the City shall record the plats requested to be recorded, subject only to the payment of appropriate fees and the bonding for the construction of infrastructure as may be required by City ordinances in existence at the time the plats are requested to be recorded. In addition, prior to recording Plat D, the Land Owner shall obtain written permission from the adjacent property owner to the west to allow grading for the street to extend onto his property, or the Land Owner shall provide an alternate street design, acceptable to the City, that will allow the street to be constructed entirely on the Land Owner's property. The City hereby expressly agrees to waive any requirements in current City ordinances that would otherwise require an approved plat to be recorded within a particular time period from the date of approval, and expressly waives any provision of City ordinance, or Utah State laws, that would provide that the approvals of the final plats for phases D, E, F, and G, could lapse for the Land Owner's failure to develop, construct or record within the next Fifteen (15) years.

3. The 400 West and 200 North right of way shall be dedicated to the City by the execution of the Attached deed (Exhibit C) at the time of signing this agreement.

4. Special Improvements: The Land Owner will not be required to construct sidewalk in Plat F along 400 West on the frontage of lot 1 and the open space parcel 101F. In addition, the Land Owner will be allowed to construct a 4-foot combination sidewalk in Plat G. along the west side of lots 1-3 as necessary to protect the existing trees.

5. Compliance with Ordinances/Vested rights. In developing the Subdivision, Land Owner shall comply with and be vested in the ordinances of the City in effect as the date of this Agreement, except as may be set forth in this agreement.

6. Impact and development Fees—Impact and development Fees for the development of Subdivision shall be those Fees that are In effect at the time of recordation of each plat.

7. Reimbursement of Road Construction costs—Land Owner shall reimburse City for Land Owner's portion of the Road Construction costs. Those costs are $103,000 which shall be payable to the City at the time of signing this agreement.

8. Open Space and Streams— Regardless of any changes that may be made in future city ordinances or policies, all open space contained in Plats D, E, F, and G shall be private rather than public, and Land Owner shall not be required to pipe or otherwise contain the Westfield Ditch except as required for street crossings or as mutually agreed by the parties.

9. Assignment. The Land Owner may assign this Agreement or any rights or interests herein without the prior written consent of the City.

10. Attorney's Fees. In the event of any lawsuit between the parties hereto arising out of or related to this Agreement, or any of the documents provided for herein, the prevailing party or parties shall be entitled in addition to the remedies and damages, if any, awarded in such proceeding, to recover their costs and a reasonable attorney's fee.

11. Integration. This Agreement, together with the Exhibits hereto, integrates all of the terms and conditions pertaining to the subject matter hereof and supersedes all prior negotiations, representations, promises, inducements or previous agreements between the parties, whether oral or written with respect to the subject matter hereof. Any amendments hereto must be in writing and signed by the respective parties hereto.

12. Headings. The headings contained in this Agreement are intended for convenience only and are in no way to be used to construe or limit the text herein.

13. Binding Effect. This Agreement shall inure to the benefit of, and be binding upon, the parties hereto and their respective heirs, representatives, officers, agents, employees, members, successors and assigns (if any assignments are allowed as provided herein).

14. No Third Party Rights. The obligations of Land Owner set forth herein shall not create any rights in and/or obligations to any persons or parties other than the City. The City alone shall be entitled to enforce or waive any provisions of this Agreement.

15. Termination. Notwithstanding anything in this Agreement to the contrary, it is agreed by the parties hereto that in the event all phases of this Subdivision are not recorded within Fifteen (15) years from date of this Agreement, or in the event the Land Owner does not comply with the General Plan, development Ordinances of the City in existence at the execution of this agreement and the provisions of this Agreement, the City shall have the right, but not the obligation at the sole discretion of the City to withhold all further approvals, licenses, permits or other rights associated with any Subdivision or development described in this Agreement until such default has been cured. Termination may be effected by the City by giving written notice of intent to terminate to the Land Owner at the address of the Land Owner set forth herein. Whereupon the Land Owner shall have sixty (60) days during which the Land Owner shall be given an opportunity to correct any alleged deficiencies and to take appropriate steps to complete the Subdivision or phases thereof.

16. Notices. Any notices, requests and demands required or desired to be given hereunder shall be in writing and shall be served personally upon the party for whom intended, or if mailed, by certified mail, return receipt requested, postage prepaid, to such party at its address shown below:

To the Land Owner:
Roger Whitby
536 E. 3125 North
Provo, UT 84604

To the City:
City Administrator
20 North Main Street
Alpine City, UT 84004

Made and entered into as of the date specified above.

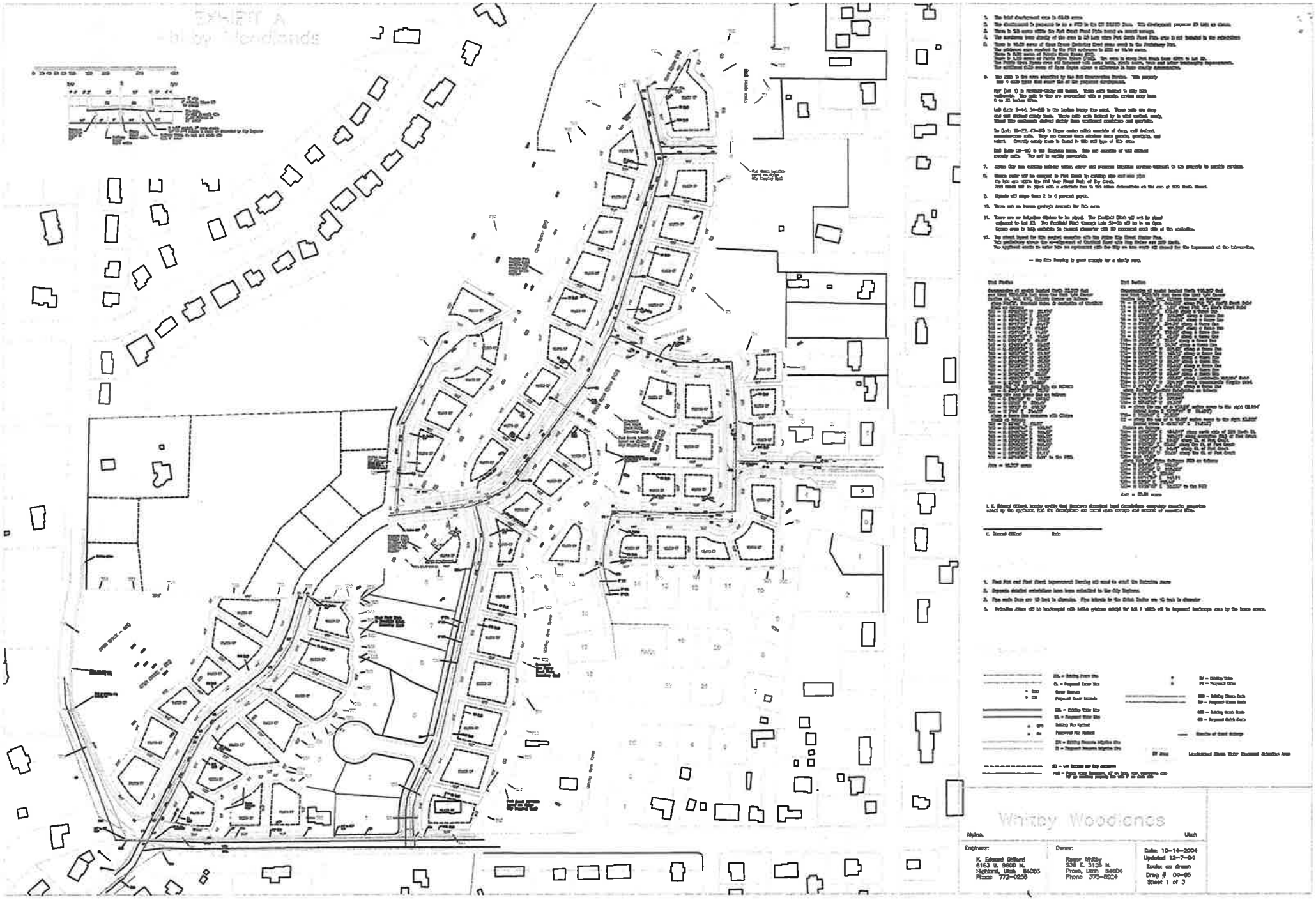
Hunt Willoughby, Mayor

ATTEST:
Janis H. Williams, City Recorder

Alpine City CORPORATE SEAL Utah County, Utah

Roger m. Whitby

Roger Whitby, Land Owner



1. The total development area is 43.69 acres.
2. The development is proposed to be a PUD in the RI 20,000 Zone. This development proposes 29 lots as shown.
3. There is 2.5 acres within the Park Strip Road Park Strip based on street acreage.
4. The maximum base density of the area is 29 lots since Park Strip Road Park area is not included in the calculations
5. There is 43.69 acres of Open Space Including Road areas used in the Preliminary Plat.
The maximum area required for the PUD ordinance is 20% or 8.74 acres.
There is 9.96 acres of Private Open Space (23%).
There is 2.5 acres of Park Strip Road Park (6%). The area is along Park Strip Road open to Lot 29.
The Public Open Space area of Boulevard (3.26 acres) is for the entry, landscaping, and water technology improvements.
The combined total areas of Open Space where a conservation is done exactly are accomplished.

6. The Soils in the area classified by the SCS Conservation Service. This property has 4 soils types that occur that of the proposed development.

Rpf (Lot 9 & Portion-Valley fill Loams. These soils formed in silty lake sediments. The soils in this are permeated with a gravelly, cobble clay loam 0 to 25 inches thick.

LnD (Lots 2-14, 24-28) is the higher knoby hill areas. These soils are deep and well drained sandy loams. These soils were formed by in wind worked, sandy alluvial fans sediments derived mainly from weathered sandstone and quartzite.

Ta (Lots 15-23, 47-49) is Hogar series which consists of deep, well drained, moderately soils. They are formed from alluvium from granite, quartzite, and schist. Generally sandy loam is found in this soil type of this area.

TnD (Lots 29-46) is the Hogback loams. This soil consists of well drained gravelly soils. The soil is rapidly permeable.

7. Alpine City has existing culinary water, sewer and pressure irrigation services adjacent to the property to provide services.
8. Storm water will be managed in Park Strip by existing pipe and new pipe
The lots are within the 100 Year Flood Path of Dry Creek.
Park Strip will be piped with a concrete box to the inlet detention on the east at 320 South Street.
9. Signals will range from 2 to 4 percent grade.
10. There are no known geologic hazards for this area.
11. There are no irrigation ditches to be piped. The Smithfield Ditch will not be piped adjacent to Lot 23. The Smithfield Ditch through Lots 29-28 will be in an Open Space area to help maintain the natural channels with 20 recovered area side of the centerline.
12. The street layout for this project coordite with the Alpine City Street Master Plan.
The preliminary shows the development of Overlook Road with Dry Creek over 200 feet.
The typical roads in order have an agreement with the City on how much will shared for the improvement of the intersection.

— the 60± Detailed is good enough for a single map.

I, K. Edward Gifford, hereby certify that Standard described legal descriptions accurately describe properties owned by the applicant, that the development and total open acreage and amount of requested units.

K. Edward Gifford — Date

1. Red Fir and Park Strip Improvement Detailing will need to match the Detention Area
2. Separate detailed subdivision have been submitted to the City Engineer.
3. Five mail Drive are 28 feet in diameter. Five islands in the Cities Center are 40 feet in diameter
4. Detention Areas will be landscaped with native grasses except for Lot 1 which will be improved landscape area by the home owner.

EX = Existing Power Line
PL = Proposed Power Line
Power Stations
Proposed Power Controls
EW = Existing Water Line
PW = Proposed Water Line
Existing Fire Hydrant
Proposed Fire Hydrant
EFH = Existing Pressure Irrigation Line
PI = Proposed Pressure Irrigation Line
ESD = Existing Storm Drain
PSD = Proposed Storm Drain
ESS = Existing Sewer Main
PSS = Proposed Sewer Main
Boundary of Plant Acreage
Landscaped Storm Water Detention Detention Area
SD = Lot Outlook for City Collector
PSS = Septic tanks Necessary, 4K or less, use conventional with 24" or shallow property for well 2' or more min

Whitby Woodlands

Alpine, Utah

Engineer:
K. Edward Gifford
6163 W. 9600 N.
Highland, Utah 84003
Phone 772-0255

Owner:
Roger Whitby
538 E. 3125 N.
Provo, Utah 84604
Phone 375-8824

Date: 10-14-2004
Updated 12-7-04
Scale: as shown
Dwg # 04-05
Sheet 1 of 3

EXHIBIT B

Whitby Legal Descriptions
Street Dedication for 200 North and 400 West
March 29, 2007

Commencing at a point located N 89°38'36" W 2845.243 feet along the 1/4 section and South 647.303 feet from the East one-quarter corner of Section 24, Township 4 South, Range 1 East, Salt Lake Base and Meridian (said point of beginning also located North 2044.229 feet and West 197.816 feet from the South one-quarter corner of said Section 24);
thence South 89°25' West 520.398 feet along Whitby title;
thence North 19°39' West 410.94 feet along Whitby title;
thence North 7°04' East 46.646 fee along Whitby title;
thence 118.509 feet along the arc of a 498.00 foot radius curve to the left (central angle equals 13°38'05", chord bears South 12°31'20" East 118.559 feet);
thence South 19°20'22" East 176.172 feet;
thence 146.419 feet along the arc of a 173.00 foot radius curve to the left (central angle equals 48°29'33", chord bears South 43°35'09" East 142.088 feet);
thence South 67°49'55" East 11.79 feet;
thence 23.562 feet along the arc of a 15.00 foot radius curve to the left (central angle equals 90°00', chord bears North 67°10'05" East 21.213 feet);
thence South 67°49'55" East 27.00 feet;
thence North 22°10'05' East 3.00 feet;
thence South 67°49'55" East 27.00 feet;
thence 23.581 feet along the arc of a 15.00 foot radius curve to the left (central angle equals 90°04'17", chord bears South 22°52'03" East 21.226 feet) to a point of compound curve;
thence 66.865 feet along the arc of a 170.00 foot radius curve to the left (central angle equals 22°32'09", chord bears S 79°10'16" East 66.435 feet) to the point of beginning. Area = 0.2559 acres.

Whitby Street Dedication
for
200 N. & 400 W.

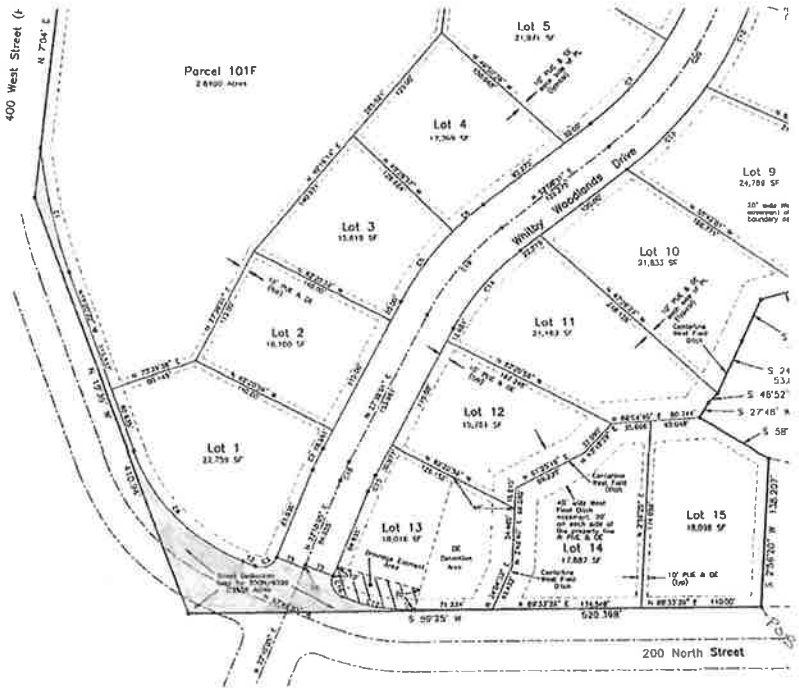


Exhibit C

SELECT TITLE
INSURANCE AGENCY, INC.

PHONE (801) 492-5020 FAX (801) 492-5021
456 E STATE RD STE 1800, AMERICAN FORK UT 84003

ST#

Warranty Deed

Sandra A. Whitby, Grantor,

of Provo, County of Utah , State of UTAH, hereby CONVEYS AND WARRANTS to

Alpine City, A Municipal Corporation, Grantee,

of 20 North Main Street, Alpine, Utah 84004 for the sum of TEN DOLLARS ($10.00) and other good and valuable consideration, on the following described tract of land in UTAH County, State of Utah:

See Exhibit "A" attached hereto and by this reference made a part hereof.

SUBJECT TO easements, restrictions, reservations, and rights of way of record and general property taxes for the year 2007. and thereafter.

TOGETHER WITH all the appurtenances, rights, and privileges thereunto belonging.

For reference purposes only: Tax I.D. No.

WITNESS, the hand of said Grantor, this _____ day of April, 2007.

_____
Sandra A. Whitby

STATE OF UTAH
SS:
COUNTY OF UTAH

On this _____ day of April, 2007, personally appeared before me Sandra A. Whitby, proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed on this instrument, and acknowledged that he/she/they executed the same.

_____
NOTARY PUBLIC

Exhibit "A"

Street Dedication for 200 North and 400 West

Commencing at a point located N 89°38'36" W 2845.243 feet along the 1/4 section and South 647.303 feet from the East one-quarter corner of Section 24, Township 4 South, Range 1 East, Salt Lake Base and Meridian (said point of beginning also located North 2044.229 feet and West 197.816 feet from the South one-quarter corner of said Section 24);
thence South 89°25' West 520.398 feet along Whitby title;
thence North 19°39' West 410.94 feet along Whitby title;
thence North 7°04' East 46.646 fee along Whitby title;
thence 118.509 feet along the arc of a 498.00 foot radius curve to the left (central angle equals 13°38'05", chord bears South 12°31'20" East 118.559 feet);
thence South 19°20'22" East 176.172 feet;
thence 146.419 feet along the arc of a 173.00 foot radius curve to the left (central angle equals 48°29'33", chord bears South 43°35'09" East 142.088 feet);
thence South 67°49'55" East 11.79 feet;
thence 23.562 feet along the arc of a 15.00 foot radius curve to the left (central angle equals 90°00', chord bears North 67°10'05" East 21.213 feet);
thence South 67°49'55" East 27.00 feet;
thence North 22°10'05' East 3.00 feet;
thence South 67°49'55" East 27.00 feet;
thence 23.581 feet along the arc of a 15.00 foot radius curve to the left (central angle equals 90°04'17", chord bears South 22°52'03" East 21.226 feet) to a point of compound curve;
thence 66.865 feet along the arc of a 170.00 foot radius curve to the left (central angle equals 22°32'09", chord bears S 79°10'16" East 66.435 feet) to the point of beginning.

Area = 0.2559 acre

ALPINE PLANNING COMMISSION AGENDA

SUBJECT: **Public Hearing – Ordinance 2021-15 Storm Water Detention and Retention Basins**

FOR CONSIDERATION ON: **20 July 2021**

PETITIONER: **Staff**

ACTION REQUESTED BY PETITIONER: **Approve the proposed amendment to the Development Code.**

BACKGROUND INFORMATION:

With the development of the Alpine West Meadows Subdivision staff have noticed that every lot with a storm water pond easement has had issues with placing a home on the lot and driveway access design difficulties. The lots with storm water pond easements have less lot area to work with and as a result design issues are common. Staff would recommend that storm water pond easements located on a lot do not count towards the lot area, in the same way that flood plain areas currently do not count towards the minimum area of a lot.

The Planning Commission unanimously recommended approval of the proposed amendments at the June 15, 2021, meeting.

On June 22, 2021, the City Council briefly discussed this item, and it was decided that the amendment should be redrafted and moved to a different section within the Development Code. The City Council tabled the item and asked that staff with the make the identified corrections and that the Planning Commission hold a public hearing and make a recommendation based on the changes.

STAFF RECOMMENDATION:
Recommend approval of the amendments as proposed.

SAMPLE MOTION TO APPROVE:
I move to recommend that Ordinance 2021-15 be adopted as proposed.

SAMPLE MOTION TO TABLE/DENY:
I move to recommend that Ordinance 2021-15 be tabled (or denied) based on the following:

- ***Insert Finding***

ALPINE CITY
ORDINANCE 2021-15

AN ORDINANCE ADOPTING AMENDMENTS TO ARTICLE 3.02.040, 3.03.040, 3.04.040, 3.07.040 AND 3.09.060 OF THE ALPINE CITY DEVELOPMENT CODE PERTAINING TO LOT AREA OUTSIDE OF STORM WATER DETENTION AND RETENTION BASINS.

WHEREAS, The Planning Commission held a public hearing on June 15, 2021, regarding proposed amendments to the Development Code; and

WHEREAS, on June 22, 2021, the Alpine City Council has deemed it in the best interest of Alpine City to amend the Development Code; and

WHEREAS, the Alpine City Planning Commission has reviewed the proposed Amendments to the Development Code, held a public hearing, and has forwarded a recommendation to the City Council; and

WHEREAS, the Alpine City Council has reviewed the proposed Amendments to the Development Code:

NOW THEREFORE, be it ordained by the Council of the Alpine City, in the State of Utah, as follows: The amendments to Article 3.02.040, 3.03.040, 3.04.040, 3.07.040 and 3.09.060 will supersede Article 3.02.040, 3.03.040, 3.04.040, 3.07.040 and 3.09.060 as previously adopted. This ordinance shall take effect upon posting.

SECTION 1: **AMENDMENT** "3.03.040 Density, Lot Area And Width Requirements - Single Family Dwellings" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.03.040 Density, Lot Area And Width Requirements - Single Family Dwellings

1. The minimum area and width requirements of a zoning lot shall be determined upon the average slope of the lot and shall conform to the following schedule:

Average Slope of Lot*	Minimum Area (in square feet)	Minimum Width (at min. front setback)
0-9.9%	20,000 (.46 ac)	110 ft.
10-14.9%	30,000 (.68 ac)	110 ft.
15-19.9%	40,000 (.92 ac)	110 ft.
20-24.9%	60,000 (1.37 ac)	110 ft.
25%+	Not Buildable	Not Buildable

*Average Slope of Lot shall be determined in accordance with the provisions of ADC Section 3.01.110 "Average Slope of Lot."

2. The zoning lot shall contain a minimum of 20,000 square feet of area outside the mapped 100 year flood plain areas and any storm water detention or retention basins.
3. The City Council may, with a recommendation from the Planning Commission and with input from the applicant, modify lot lines to reduce angles, corners, and odd configurations when:
    a. A concept plan has been provided which meets the criteria set forth in this Section Part 1.
    b. The modified concept plan does not have any more or less lots than were shown in the concept plan;
    c. The modified concept plan does not contain any lots which have less than 110 feet of frontage or 20,000 square feet in total area;
    d. ~~The lots within the modified concept plan each contain a minimum of 20,000 square feet of area outside the mapped 100-year flood plain areas.~~

(Ord. 95-24, 11/14/95; Ord. 2014-11, 6/24/14)

SECTION 2: **AMENDMENT** "3.04.040 Density, Lot Area And Width Requirements - Single Family Dwellings" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.04.040 Density, Lot Area And Width Requirements - Single Family Dwellings

1. The minimum area and width requirements of a zoning lot shall be determined upon the average slope of the lot and shall conform to the following schedule:

Average Slope of Lot*	Minimum Area (in square feet)	Minimum Width (at min. front setback)
0-9.9%	40,000 (.92 ac)	110 ft.
10-14.9%	60,000 (1.36 ac)	150 ft.
15-19.9%	80,000 (1.84 ac)	200 ft.
20-24.9%	120,000 (2.76 ac)	250 ft.
25%+	Not Buildable	Not Buildable

*Average Slope of Lot shall be determined in accordance with the provisions of ADC 3.01.110 "Average Slope of Lot."

2. The zoning lot shall contain a minimum of 40,000 square feet of area outside the mapped 100 year flood plain areas and any storm water detention or retention basins.
3. The City Council may, with a recommendation from the Planning Commission and with input from the applicant, modify lot lines to reduce angles, corners, and odd configurations when:
    a. A concept plan has been provided which meets the criteria set forth in Part 1 of this Section;

b. The modified concept plan does not have any more or less lots than were shown in the concept plan;
c. The modified concept plan does not contain any lots which have less than 110 feet of frontage or 40,000 square feet in total area;
d. ~~The lots within the modified concept plan each contain a minimum of 40,000 square feet of area outside the mapped 100-year flood plain areas.~~

(CR-1 Created by Ord. 91-01, 4/9/91 and amended by Ord. 95-04, 2/3/95; Ord. 2014-11, 6/24/14)

SECTION 3: **AMENDMENT** "3.02.040 Density And Regulations" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.02.040 Density And Regulations

1. Lot Size. The minimum lot area for a single-unit dwelling shall be 10,000 square feet ~~(Amended by Ord. 94-06).~~ Each lot shall contain a minimum of 10,000 square feet of area outside the mapped 100-year flood plain areas and any storm water detention or retention basins.
2. Lot Coverage. No lot within the T-R District may have more than fifty (50) percent of its land area covered by buildings or other impervious material.
3. Lot Width. The minimum width of any lot for a dwelling shall be ninety (90) feet, measured at the required front yard set back line.

(Ord. 2015-02, 02/10/15)

SECTION 4: **AMENDMENT** "3.07.040 Area And Width Requirements" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.07.040 Area And Width Requirements

1. **Lot Occupied by a Dwelling Structure**
   a. Lot Size. The minimum lot area for a single-unit dwelling shall be 10,000 square feet. ~~(Amended by Ord. 94-06)~~ Each lot shall contain a minimum of 10,000 square feet of area outside the mapped 100-year flood plain areas and any storm water detention or retention basins.
   b. Lot Coverage. No lot within the BC Zone may have more than fifty (50) percent of its land area covered by buildings or other impervious material.
   c. Lot Width. The minimum width of any lot for a dwelling shall be ninety (90) feet, measured at the required front yard set back line.
2. **Lot Occupied by an Office and Commercial Structure**. There shall be no minimum

lot area or width requirements except that an area sufficient to accommodate the structure, landscaped areas, minimum setback, required off-street parking, loading and unloading, vehicular ingress and egress shall be provided and maintained.

(Ord. 95-22, 8/22/95 and Ord. 2002-13, Amended by Ord. 2011-09, 5/10/11; Ord. 2014-04, 3/25/14)

SECTION 5: **AMENDMENT** "3.09.060 Dwelling Clusters; Lot Size; Buildable Area; Setback" of the Alpine City Development Code is hereby *amended* as follows:

AMENDMENT

3.09.060 Dwelling Clusters; Lot Size; Buildable Area; Setback

1. All lots shall be located within a designated Dwelling Cluster. A project may contain more than one Dwelling Cluster. Each cluster shall contain not less than three (3) separate lots (except for developments having fewer than 3 lots for the entire development). Where a project contains land located within and outside the Sensitive Lands Overlay Zone, Dwelling Clusters will be located outside of the Sensitive Lands Overlay Zone, to the maximum extent possible. No portion of lots within a PRD shall be located on lands which are required to be designated as open space.
2. (Ord. 97-23: 9/24/97) The size of each individual lot shall conform to the following:

   Minimum Lot Size

Zone District	Minimum Lot Size
CR-20,000	10,000 square feet*
CR-40,000	20,000 square feet*
CE-5	20,000 square feet*
CE-50	N/A

   * Each zoning lot shall contain a minimum area outside the mapped 100 year flood plain areas and any storm water detention or retention basins that is equal to the minimum lot size.
3. (Ord 97-02, 2/25/97). Each individual lot shall contain at least one Designated Buildable Area of not less than five-thousand (5,000) square feet. All dwellings and other habitable structures and accessory buildings shall be located within the Designated Buildable Area.
   a. Each Designated Buildable Area shall conform to the criteria for qualification as a "buildable area" as defined in this ordinance. Except that the Planning Commission may approve or require the placement of the Designated Buildable Area in a location within the lot which does not conform to one or more of the criteria for buildable area, upon a finding that the proposed

Designated Buildable Area:

i. will more adequately accommodate subsequent development of the lot,
ii. will not constitute a potential hazard to life or property, and
iii. will serve to diminish the negative impact of subsequent development upon the lot or community (i.e. extraordinary construction of driveway access, mitigate visual intrusion of structure on ridge line).

b. The location of each Designated Buildable Area shall be designated upon the preliminary plan and shall also be identified and described on the final recorded plat, together with a notation to the effect that all main and accessory buildings shall be located within the Designated Buildable Area. Where a Designated Buildable Area is shown on a lot, the boundary of said area shall constitute the Designated Setback envelope applicable to the lot. Where an entire lot area qualifies as a Buildable Area no designation on the final plat shall be required.
c. Except as permitted pursuant to Part 3,a, any portion of a lot which has been graded to produce a percent of slope to qualify under the Buildable Area criteria shall be excluded from consideration as part of the Designated Buildable Area.
d. The Designated Buildable Area may be amended by the City Planner and City Engineer as long as the minimum setback requirements of the underlying zone are met. (Ord. 2004-13, 9/28/04)

4. Each dwelling in the project shall be setback from the property line in accordance with the setback lines as shown on the approved plat (Designated Setback Envelope). The Designated Setback Envelope shall be established in accordance with the following (setbacks are measured from the property line to the nearest foundation):
    a. Front Yard. The minimum front yard setback shall be thirty (30) feet.
    b. Side Yard - Corner Lots. On corner lots, the side that faces onto a public street shall be not less than thirty (30) feet.
    c. Side Yard – Interior Lots. The minimum side yard setbacks for interior lots shall be an aggregate of thirty (30) feet with no less than twelve (12) feet on a side.
    d. Rear Yard. The minimum rear yard setback shall be thirty (30) feet.

    Subject to the prior recommendation of the Planning Commission, the City Council may approve an exception to the Designated Setback Envelope standards above for one or more lots within a PRD project, upon a finding that such exception is appropriate for the proper development of the lot and that the exception will not result in the establishment of a hazardous condition.

    Where no designated building envelope is provided, the setbacks shall be the same as the minimum requirements within the underlying zone.
5. The maximum height of any dwelling or other main building shall be thirty-four (34) feet, as determined in accordance with the provisions of DCA 3.21.080, (Ord. 96-15, 12/18/96) except in the CE-50 zone the height shall not exceed 25 feet. (See DCA 3.06.070 Part 1)

(Ord. No. 95-04, 2/28/95; Amended Ord. No. 95-28, 11/28/95; Ord No. 2001-10, 4/10/01; Ord. No. 2004-13, 9/28/04; Ord. No. 2011-04, 01/11/11; Ord. No. 2012-10, 12/11/12; Ord. No. 2014-14, 09/09/14; Ord. No. 2015-11, 07/28/15)

PASSED AND ADOPTED BY THE ALPINE CITY COUNCIL
_____.

	AYE	**NAY**	**ABSENT**	**ABSTAIN**
Lon Lott	_____	_____	_____	_____
Gregory Gordon	_____	_____	_____	_____
Jason Thelin	_____	_____	_____	_____
Jessica Smuin	_____	_____	_____	_____
Carla Merrill	_____	_____	_____	_____

Presiding Officer

_____
Troy Stout, Mayor, Alpine City

Attest

_____
Bonnie Cooper, City Recorder Alpine City

ALPINE PLANNING COMMISSION AGENDA

SUBJECT: Planning Commission Minutes June 15, 2021

FOR CONSIDERATION ON: 20 July 2021

PETITIONER: Staff

ACTION REQUESTED BY PETITIONER: Approve Minutes

BACKGROUND INFORMATION:

Minutes from the June 15, 2021, Planning Commission Meeting.

STAFF RECOMMENDATION:

Review and approve the Planning Commission Minutes.

ALPINE CITY PLANNING COMMISSION MEETING
Alpine City Hall, 20 North Main, Alpine, UT
June 15, 2021

I. GENERAL BUSINESS

A. Welcome and Roll Call: The meeting was called to order at 7:00 p.m. by Chairwoman Jane Griener. The following were present and constituted a quorum:

Chairwoman: Jane Griener
Commission Members: Alan MacDonald, John MacKay, Ethan Allen, Ed Bush, Troy Slade, Sylvia Christiansen
Excused:
Staff: Austin Roy, Jed Muhlestein, Marla Fox

B. Prayer/Opening Comments: Troy Slade
C. Pledge of Allegiance: Sylvia Christiansen

II. PUBLIC COMMENT

Allen and Lisa Daily expressed appreciation for the improvements being done to the pickle ball courts. They were asking the City to change a couple of the tennis courts at Creekside court to pickle ball courts, as they believed they would be used more than tennis courts.

Adam Dee said he would like to see Lambert Park preserved as a wilderness recreational area and requested that the City maintain its current state.

Jane Griener asked Austin Roy to forward these comments on to the City Council.

III. ACTION ITEMS

A. Conditional Use – Farmers Market 195 East 200 North

City Planner Austin Roy explained that the Seasonal sales of produce or other goods may be permitted as a conditional use in the Business Commercial Zone upon approval of the Planning Commission. If approved, a business license from Alpine City is required (see Article 3.07.030.8 & 3.23.030).

The applicant was proposing to host a farmer's market at the Balance Studio property located at 195 East 200 North. The event would be held on the second and fourth Saturdays of July and August 2021 from 8:00 AM to 2:00 PM. It was anticipated that between five to 10 vendors would participate with booths located in the parking lot. Parking was proposed on street and residents would be encouraged to walk to the event. Items to be sold would include fresh produce, jams, honey, handmade items, and other food vendors. Restrooms would be available at Balance Studio. Mr. Roy noted that Balance Studio had general liability insurance which would cover the event. It was anticipated attendance would be approximately 50-60 people at any given time. Impact on neighborhood, streets, clean-up, and suitability of the site should be considered in the decision to approve the conditional use for the proposed event.

Austin Roy said the applicant held this event last year and there were no issues. He said the applicant would need to get a permit to hold the event again this year.

Jane Griener said the difference this year was that Snoasis was in that location with additional traffic and people. Paula Nielson, applicant, said Snoasis was there last year as well.

MOTION: Commission Member Ed Bush moved to approve the Farmers Market at Balance Studio with the condition to get a permit. Sylvia Christiansen seconded the motion. There were 7 Ayes and 0 Nays (recorded below). The motion passed.

Ayes:	**Nays:**
Ed Bush	None
Alan MacDonald	
Ethan Allen	
John MacKay	
Jane Griener	
Troy Slade	
Sylvia Christiansen	

B. Setback Exception – Brookside Meadows PRD Lot 9

Austin Roy presented the staff report and explained that an exception was being requested for the setbacks for Lot 9 of the Brookside Meadows PRD. Specifically, the petitioner was seeking an exception for the side setback on the north side of the lot. Article 3.01.110 of the Alpine City Development Code defined a Side Yard as:

> *"A yard that is neither a front yard nor a rear yard. The depth (or setback) of the side yard is the minimum distance between the side lot line and the nearest part of the primary structure of the nearest main building at the foundation level. (Primary structure includes overhangs, porches and decks)."*

Brookside Meadows was a Planned Residential Development (PRD), and as such, the City Council may grant exceptions for setbacks following a recommendation from Planning Commission and

> "…*upon a finding that such exception is appropriate for the proper development of the lot and that the exception will not result in the establishment of a hazardous condition"* (3.09.060.4.d).

The lot in question bordered open space to the north, meaning a reduced setback would not directly impact a neighboring resident. The open space to the north of the lot was not part of the Brookside Meadows Subdivision but it was land that was dedicated as part of another PRD. Also, the proposed exception would not result in the establishment of a hazardous condition.

Austin Roy explained that the City could grant an exception in a subdivision with a PRD because of the terrain. He said a typical standard setback would be a combination of 30 feet with one side not less than 12 feet. The applicant was asking for a seven-foot side setback. The applicant said this would help to get a flatter area for the driveway and it wouldn't infringe on another homeowner.

Jane Griener asked about the easements. Jeff Dong, applicant, said the easements would not be on that side.

Ed Bush said it looked like the applicant just wanted to build a larger home than the lot would allow, rather than accommodating a better driveway. Jeff Dong said they were trying to fit the home the homeowner wanted on the lot.

MOTION: Commission Member Sylvia Christiansen moved to recommend approval for a seven-foot north side setback exception for Lot 9 in Brookside Meadows. John Mackay seconded the motion. There were 7 Ayes and 0 Nays (recorded below). The motion passed.

Ayes:	**Nays:**
Jane Griener	None
Alan MacDonald	
John MacKay	
Ethan Allen	
Ed Bush	
Troy Slade	
Sylvia Christiansen	

C. Public Hearing – Ordinance 2021 -15 Storm Water Pond Easement

Jed Muhlestein said with the development of the Alpine West Meadows Subdivision staff had noticed that every lot with a storm water pond easement had issues with placing a home on the lot and driveway access design difficulties. The lots with storm water pond easements had less lot area to work with and as a result design issues were common. Staff would recommend that storm water pond easements located on a lot did not count towards the lot area, in the same way that flood plain areas currently did not count towards the minimum area of a lot.

Jed Muhlestein said the flood plain verbiage was only listed in the CR-20,000 and the CR –40,000 zones and it should be listed in all zones.

Jane Griener opened the Public Hearing. There were no comments and Jane Griener closed the Public Hearing.

Ethan Allen asked about the detention pond. Austin Roy said it had to stay in the yard and be part of the landscape. Jane Griener stated that a detention pond would not affect the buildable part of the lot.

MOTION: Commission Member Ed Bush moved to recommend that Ordinance 2021-15 Storm Water Easement be adopted as proposed with the exception of changing the language of storm drain and flood plain for all zones. Troy Slade seconded the motion. There were 7 Ayes and 0 Nays (recorded below). The motion passed.

Ayes:	**Nays:**
Jane Griener	None
Alan MacDonald	
John MacKay	
Ethan Allen	
Ed Bush	
Troy Slade	
Sylvia Christiansen	

IV. COMMUNICATIONS

Jed Muhlestein said Alpine City was approaching build out. He said the portions left were the most difficult lots and he would like to see the City work with the applicants and give exceptions where needed.

Jane Griener went over the summer calendar for Planning Commission meetings. She said there won't be a meeting the first week of July but will be a meeting on July 20th. There would be two meetings in August on the 3rd and the 17th.

Jane Griener reminded Austin Roy to let the Mayor there was an open spot on the Planning Commission.

Austin Roy read the list of names for who is running for office for next year.

V. APPROVAL OF PLANNING COMMISSION MINUTES: June 1, 2021

MOTION: John MacKay moved to approve the minutes for June 1, 2021, as written. Ethan Allen seconded the motion. There were 7 Ayes and 0 Nays (recorded below). The motion passed unanimously.

Ayes:	**Nays:**
Jane Griener	None
Alan MacDonald	
Ed Bush	
John MacKay	
Ethan Allen	
Troy Slade	
Sylvia Christiansen	

MOTION: Ethan Allen moved to adjourn the meeting.

Ed Bush seconded the motion. There were 7 Ayes and 0 Nays (recorded below). The motion passed unanimously.

Ayes:	**Nays:**
Jane Griener	None
Alan MacDonald	
Ed Bush	
Ethan Allen	
Troy Slade	
John MacKay	
Sylvia Christiansen	

The meeting was adjourned at 7:47 p.m.