



**PLANNING COMMISSION MEETING
OF THE CITY OF CEDAR HILLS
Tuesday, March 25, 2025 6:00 p.m.**

Notice is hereby given that the Planning Commission of the City of Cedar Hills, Utah, will hold a **Planning Commission Meeting on Tuesday, March 25, 2025 beginning at 6:00 p.m.** at the Community Recreation Center, 10640 N Clubhouse Drive, Cedar Hills, Utah. This is a public meeting, and anyone is invited to attend.

PLANNING COMMISSION MEETING

1. Call to Order
2. Public Comment: Time has been set aside for the public to express their ideas, concerns, and comments (comments limited to 3 minutes per person with a total of 30 minutes for this item)

SCHEDULED ITEMS & PUBLIC HEARINGS

3. Approval of the minutes from the February 25, 2025 Planning Commission meeting
4. Review/Recommendation and Public Hearing on Preliminary Plan approval for Milkshake Madness, Lot 6 Plat C Phase II Cedar Hills Gateway Subdivision located in the SC-1 Commercial Zone
5. Review/Recommendation and Public Hearing on Concept and Preliminary Plan approval for a Commercial Development at 4773 W Cedar Hills Drive, located in the Cedar Hills Retail Center Subdivision

ADJOURNMENT

6. Adjourn.

Posted this 21st day of March, 2025.

/s/ Colleen A. Mulvey, City Recorder

Supporting documentation for this agenda is posted on the city website at www.cedarhillsutah.gov.

In accordance with the Americans with Disabilities Act, the City of Cedar Hills will make reasonable accommodations to participate in the meeting. Requests for assistance can be made by contacting the City Recorder at 801-785-9668 at least 48 hours in advance of the meeting to be held.

The order of agenda items may change to accommodate the needs of the Planning Commission, the staff, and the public. This meeting may be held electronically to permit one or more of the commission members or staff to participate.



PUBLIC MEETING AND PUBLIC HEARING ETIQUETTE

Please remember all public meetings and public hearings are recorded

- All comments **must** be recognized by the Chairperson and addressed through the microphone.
- Please do not approach the Council/Commission dais without permission from the Chairperson.
- When speaking to the Council / 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, electronic devices 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 three minutes and group representatives may be limited to five minutes.
- Refrain from congregating near the doors or in the 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 v. Public Meeting:

If the agenda item 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.



The City of Cedar Hills

TO:	Planning Commission
FROM:	Chandler Goodwin
DATE:	March 25, 2025

SUBJECT:	Review/Recommendation and Public Hearing on Preliminary Plan approval for a commercial development for Milkshake Madness, Lot 6 Plat C Phase II Cedar Hills Gateway Subdivision located in the SC-1 Commercial Zone.
APPLICANT PRESENTATION:	
STAFF PRESENTATION:	Chandler Goodwin, City Manager/Planner

BACKGROUND AND FINDINGS:

Overall Project Summary

The Cedar Hills Retail project is a new commercial development located at 4700 West & 9930 South in Cedar Hills, Utah. The project consists of a 5,000 square foot retail building that will house a drive-thru tenant ("Milkshake Madness") and two retail tenants on a 0.566-acre (24,671 SF) lot. The site is zoned SC-1 (Shopping Center).

Site Details:

Total lot area: 24,671 SF (0.566 acres)

Building area: 5,000 SF (20.3% of lot)

Hard surface/impervious area: 15,183 SF (61.5%)

Landscape area: 4,488 SF (18.2%)

Parking: 22 total stalls, including 2 ADA stalls (1 standard ADA + 1 van accessible)

Drive-Thru and Traffic Analysis

The project will be accessible from 9930 North, 9980 North, and 4700 West

The drive-thru is designed to accommodate 9 vehicles in queue before backing into the on-site parking lot. An additional 5 vehicle spaces are available in the parking lot, for a total queue capacity of 14 vehicles. This is more than double the capacity of nearby similar businesses (which can accommodate a maximum of 6 vehicles). The drive-thru tenant expects a maximum of 34 drive-thru vehicles during the PM peak hour. The service rate is one car every 132 seconds (2.2 minutes). Based on this service rate, the maximum expected queue is 7 vehicles. The traffic analysis concludes that the proposed development will not cause backups or impact nearby traffic circulation.

Building and Architecture

The "Milkshake Madness" building features:

A modern design with multiple exterior materials including brick (to match the Cafe Rio building), black EIFS, and CMU base, metal canopies on all sides. Building height varies with three parapet levels: 21', 22', and 25'. The building includes a patio area. Exterior walls feature

architectural sconces with cutoff distribution and clear frosted acrylic lenses

Landscaping

Three distinct landscaped areas totaling 4,488 SF (18.2% of the site)

Areas of approximately 2,506 SF, 1,230 SF, and 1,264 SF

Various plantings and irrigation infrastructure

A defined patio area

Site Utilities and Stormwater Management

The project includes comprehensive utility planning:

New water service connections

Sanitary sewer system with grease trap and sampling manhole

Stormwater management system including catch basins and detention

A StormTech system for water retention with:

Required storage: 2,436 cubic feet

Provided storage: 2,812 cubic feet

Lighting

-Two types of pole-mounted LED area lights (20' mounting height)

-16 downlights at 8.5' mounting height

-13 wall-mounted architectural sconces at 7' mounting height

-Lighting levels meet standards for all areas including the walkways, parking, drive lanes, and patio

This comprehensive development project is designed to comply with all local standards and requirements while providing an attractive retail space with efficient traffic flow and suitable amenities.

PREVIOUS LEGISLATIVE ACTION:

City Council gave conceptual approval during the February meeting

FISCAL IMPACT:

N/A

SUPPORTING DOCUMENTS:

Site plan, engineering, landscaping plan, stormwater plan, and all other engineering documents

RECOMMENDATION:

Staff recommends that the Planning Commission approve the preliminary plans, subject to any changes required for final approval

MOTION:

To recommend/not recommend the preliminary plans for the commercial development, Milkshake Madness, Lot 6, Plat C, Phase II of the Cedar Hills Gateway Subdivision to the City Council for approval, subject to the following conditions: {LIST ANY CONDITIONS NECESSARY FOR APPROVAL}

-Final engineering review

-Final zoning review, including compliance with 10-6A and a landscaping plan review

-Verification of water rights conveyed to the City

-{LIST ANY OTHER CONDITIONS NECESSARY FOR APPROVAL}

CEDAR HILLS, UT

CEDAR HILLS RETAIL

CIVIL CONSTRUCTION SET

SHEET INDEX

CL00	COVER SHEET
CL10	GENERAL NOTES, LEGEND & ABBREVI.
CL20	SITE DEMOLITION PLAN
CL30	PROPOSED SITE PLAN
CL31	CITY DETAILS
CL32	CITY DETAILS
CL33	CITY DETAILS
CL34	CITY DETAILS
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CL100	CITY DETAILS

DEVELOPMENT SUMMARY

LOCATION:	CEDAR HILLS, UTAH COUNTY
ZONING:	SC-1, SHOPPING CENTER
INTENDED USE:	RETAIL
PROPERTY SIZE:	24,671 SF / 0.566 ACRES
BUILDING FOOTPRINT:	5,000 SF (20.3%)
HARD SURFACE AREA:	15,183 SF (61.2%)
LANDSCAPE AREA:	4,488 SF (18.2%)
PARKING:	22 PARKING STALLS PROVIDED
	2 ADA STALL PROVIDED (1 ADA + VAN)
	22 TOTAL PARKING STALLS PROVIDED

SITE DATA

AFFECTED PARCEL NO.: 92-659-006
FLOOD INFORMATION:
FLOOD ZONE DESIGN UNSHARED ZONE "X", AREA DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN. REFERENCE TO THE 0.2% ANNUAL CHANCE FLOODPLAIN, COMMUNITY PANEL NUMBER 4949C0167, DATED 06/19/2020.
BENCHMARK INFORMATION:
FOUND BENCHMARK CAP, 15312775, ELEV = 4,862.67'
VERTICAL DATUM: NAVD83
AS-SURVEYED DESCRIPTION:
ALSO SEE 92-659-006, CEDAR HILLS GATEWAY PHASE 2 SUBDIVISION, CEDAR HILLS, UTAH COUNTY, UTAH.

PROJECT TEAM

DEVELOPER:
ATKINS LOGAN JOHNSON
1178 W LEGACY CROSSING BLVD
CENTREVILLE, UT 84014
PH: (801) 649-9798
SURVEYOR:
LAYTON SURVEYS
ATTN: WILLIS D. LONG
10346 N CANYON ROAD
CEDAR HILLS, UT 84002
PH: (801) 785-9668 EXT. 101
ENGINEER:
TYPANOGOS SPECIAL
SERVICES DISTRICT
MAILING: PO BOX 923
AMERICAN FORK, UT 84003
PH: (801) 735-5231
FIRE DEPARTMENT:
AMERICAN FORK FIRE & RESCUE
3445 ANTELOPE DRIVE
SYRACUSE, UT 84075
PH: (801) 664-1724
ARCHITECT:
ENVISION ARCHITECTURAL GROUP
ATTN: GONZALO CALQUIN
10346 N CANYON ROAD
CENTREVILLE, UT 84014
PH: (801) 510-2504

AGENCY / UTILITY CONTACTS

POWER COMPANIES:
UTAH POWER & LIGHT
CEDAR HILLS, UT 84002
PHONE: (801) 469-3981
SAS SERVICE:
SAS SERVICE
10346 N CANYON ROAD
CEDAR HILLS, UT 84002
PHONE: (801) 785-9668 EXT. 101
SEWER:
TYPANOGOS SPECIAL
SERVICES DISTRICT
MAILING: PO BOX 923
AMERICAN FORK, UT 84003
PH: (801) 735-5231
FIRE DEPARTMENT:
AMERICAN FORK FIRE & RESCUE
3445 ANTELOPE DRIVE
SYRACUSE, UT 84075
PH: (801) 664-1724

NOTICE TO CONTRACTORS

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED FROM AVAILABLE INFORMATION PROVIDED BY THE SURVEYOR OR CITY AND SHALL BE CONFIRMED IN THE FIELD BY THE CONTRACTOR. SO THAT ANY NECESSARY ADJUSTMENT CAN BE MADE. IF ANY CONFLICT/DISCREPANCIES ARISE, PLEASE CONTACT THE ENGINEER OF RECORD IMMEDIATELY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE UTILITY COMPANIES AND TAKE PRECAUTIONARY MEASURES TO PROTECT ANY UTILITIES SHOWN OR NOT SHOWN ON THESE PLANS.

VICINITY MAP



CEDAR HILLS RETAIL
4700 WEST & 9930 SOUTH
CEDAR HILLS, UT
LOCATED IN THE QUARTER OF SECTION 6,
TOWNSHIP 35S, RANGE 2E, 5E, EAST AND MERIDIAN 6E.

REV.	DATE	DESCRIPTION
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VERIFY SCALES
HAS BEEN DONE ON ALL DRAWINGS
IF NOT THE ENGINEER ON THIS SHEET ADJUST
SCALE ACCORDINGLY
PROJECT INFO:
Engineer: T. Hunt
Date: 02/01/2025
Proj. No.: 102-460
SHEET TITLE

COVER SHEET

SHEET NO. C0.00



CEDAR HILLS RETAIL
4700 WEST & 9930 SOUTH
CEDAR HILLS, UT
LOCATED IN THE NW QUARTER OF SECTION 6,
TOWNSHIP 5S, RANGE 2E, S1 BASE AND MERIDIAN

PROJECT TITLE

REV. DATE	DESCRIPTION	BY
0 02/10/25	INITIAL SUBMITTAL	RM

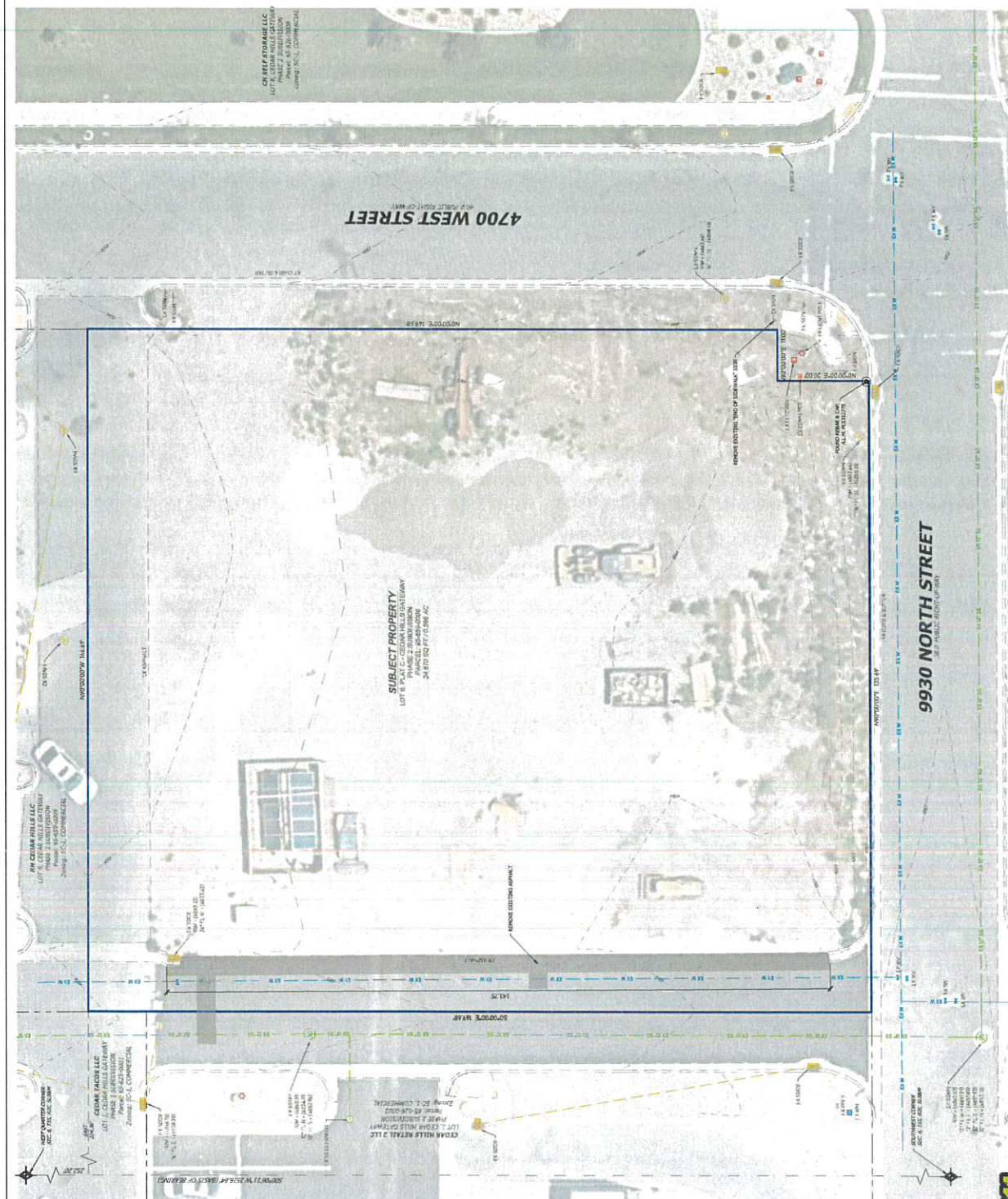


VERIFY SCALES
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 0 1"
 IF NOT ONE INCH ON THIS SHEET, ADJUST

PROJECT INFO.	Engineer: T. Hunt
	Drawn: R. Halffield
	Date: 03 / 06 / 2025
	Proj. No. 102 - 60
SHEET TITLE	

**SITE
DEMOLITION
PLAN**

ET NO. C0.20



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



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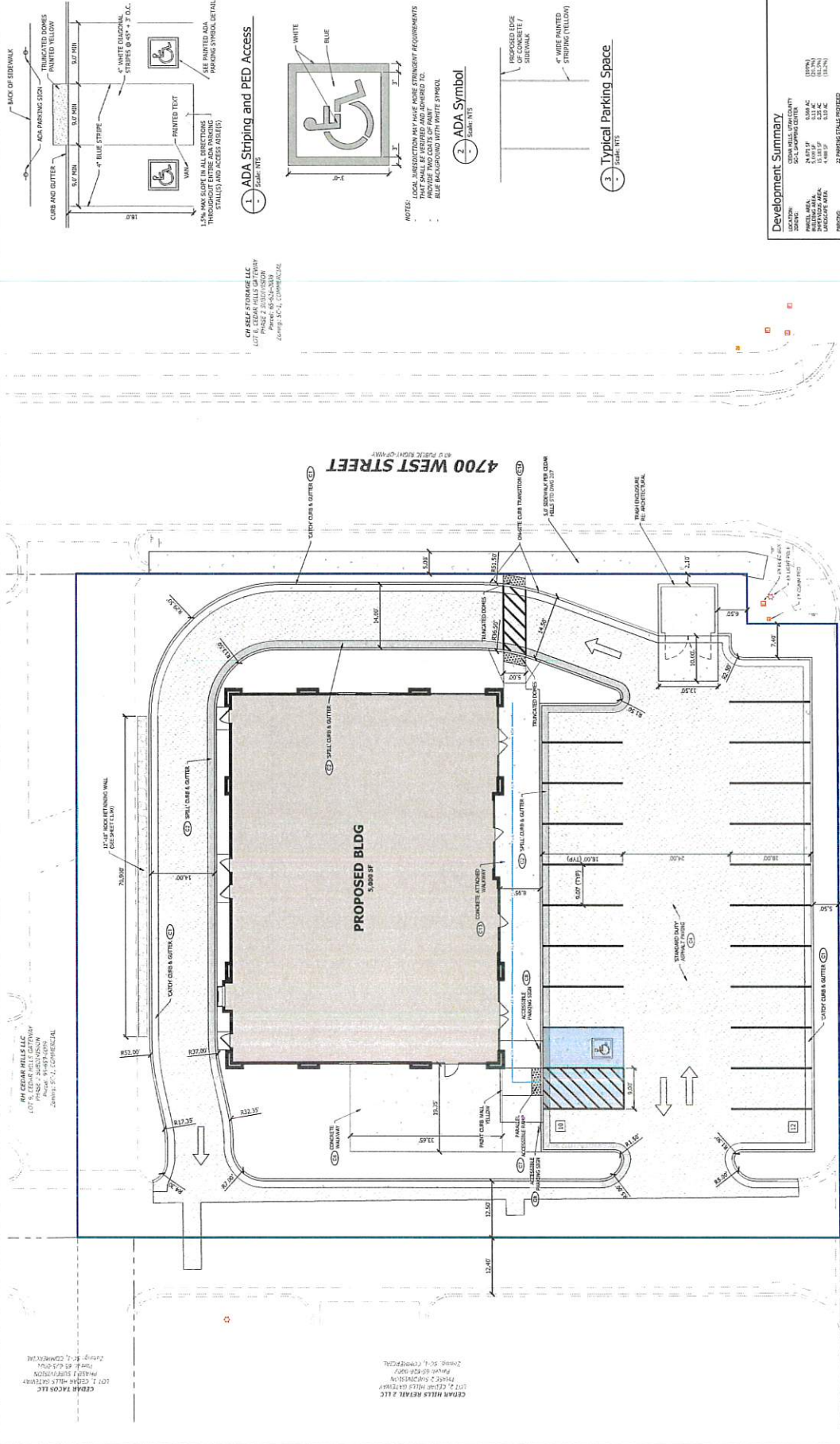


VERIFY SCALES
IF ANY DIMENSIONS ARE SHOWN IN RED, THEY ARE TO BE VERIFIED.
IF ANY DIMENSIONS ARE SHOWN IN GREEN, THEY ARE TO BE VERIFIED.
IF ANY DIMENSIONS ARE SHOWN IN BLUE, THEY ARE TO BE VERIFIED.

PROJECT INFO:
Project Name: Cedar Hills Retail
Owner: Cedar Hills LLC
Date: 03/10/2025
Proj. No.: 100-000
SHEET TITLE: PROPOSED SITE PLAN

PROPOSED SITE PLAN

SHEET NO. **C1.00**



REV.	DATE	DESCRIPTION
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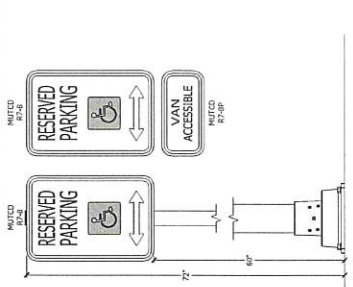


VERIFY SCALES N/A IS ONE OF THE ORIGINAL DRAWINGS IF NOT ONE OF THE ORIGINAL DRAWINGS SCALE IS AS SHOWN
PROJECT INFO: Engineer: T. Hunt Firm: Hunt • Day Date: 03/16/2025 Proj. No.: 102-450 SHEET TITLE

SITE CIVIL DETAILS

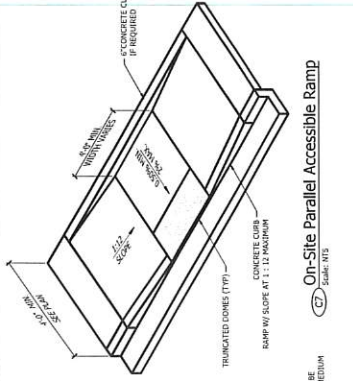
SHEET NO. **C1.90**

(REFER TO THE SITE SPECIFIC GEOTECHNICAL REPORT TO GOVERN & CONTROL)



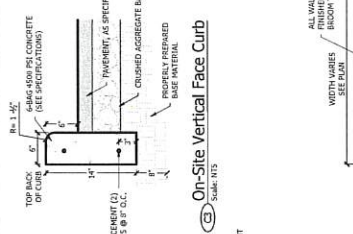
On-Site Accessible Parking Signs
Scale: NTS

NOTES:
1) THESE SIGNS SHALL BE INSTALLED ON SIGNAGE WITH DIMENSIONS AS SHOWN.
2) SIGNS SHALL BE MOUNTED BELOW THE 5'0" TO 5'6" DIMENSION.
3) SIGNS SHALL BE MOUNTED A MINIMUM OF 6" FROM BOTTOM OF SIGN TO TOP OF SIGN.
4) SIGNS SHALL BE MOUNTED TO MEET ALL STATE AND LOCAL REGULATIONS.



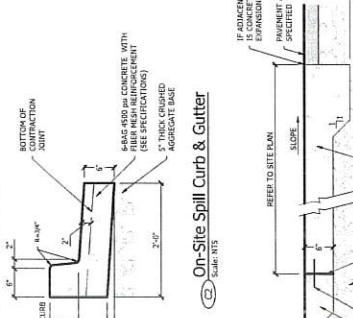
On-Site Parallel Accessible Ramp
Scale: NTS

NOTES:
1) RAMP SHALL BE 48" WIDE.
2) RAMP SHALL BE 48" HIGH.
3) RAMP SHALL BE 1:12 MAXIMUM SLOPE.
4) RAMP SHALL BE CONCRETE CURB WITH 1:12 MAXIMUM SLOPE.
5) RAMP SHALL BE TRUNCATED DOME (TYPICAL).
6) RAMP SHALL BE FINISHED WITH A MEDIUM BROOM TEXTURE.



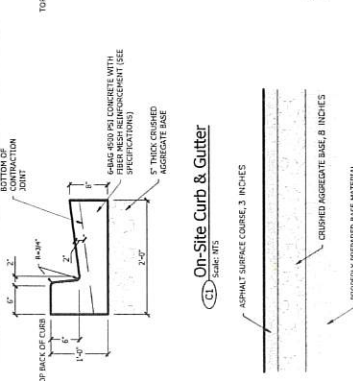
On-Site Vertical Face Curb
Scale: NTS

NOTES:
1) CURB SHALL BE 4" THICK CONCRETE.
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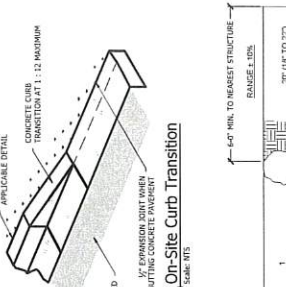
On-Site Spill Curb & Gutter
Scale: NTS

NOTES:
1) CURB SHALL BE 4" THICK CONCRETE.
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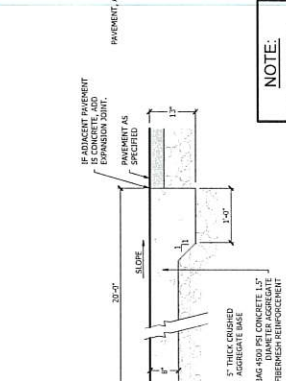
On-Site Standard Duty Asphalt Pavement
Scale: NTS

NOTES:
1) PAVEMENT SHALL BE 4" THICK CONCRETE.
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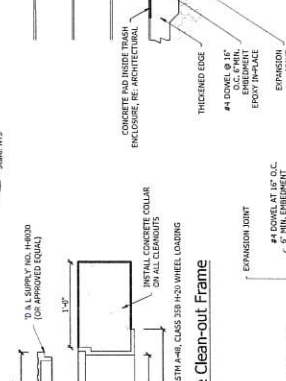
On-Site Curb Transition
Scale: NTS

NOTES:
1) CURB SHALL BE 4" THICK CONCRETE.
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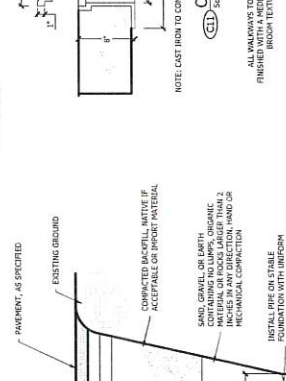
On-Site Trash Access Pad
Scale: NTS

NOTES:
1) PAD SHALL BE 4" THICK CONCRETE.
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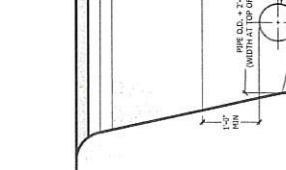
On-Site Concrete Walkway
Scale: NTS

NOTES:
1) WALKWAY SHALL BE 4" THICK CONCRETE.
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On-Site Clean-out Frame
Scale: NTS

NOTES:
1) FRAME SHALL BE 4" THICK CONCRETE.
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On-Site Pipe Bed
Scale: NTS

NOTES:
1) BED SHALL BE 4" THICK CONCRETE.
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BOULDER DIMENSION CHART				
BOULDER DEPTH	ALLOWABLE BOULDER LENGTH		ALLOWABLE BOULDER WIDTH	
	MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
18"	12"	27"	12"	27"
22"	15"	33"	15"	33"
26"	19"	42"	19"	42"
30"	24"	54"	24"	54"
44"	29"	67"	29"	67"
55"	37"	83"	37"	83"



CDAR HILLS RETAIL
4700 WEST & 9930 SOUTH
CEDAR HILLS, UT
LOCATED IN THE NW QUARTER OF SECTION 6,
TOWNSHIP 5S, RANGE 2E, 5E BASE AND MERIDIAN 6.

REV. DATE	DESCRIPTION	BY
0 03/10/25	INITIAL SUBMITTAL	RH

REVISIONS



VERIFY SCALES

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PROJECT INFO.

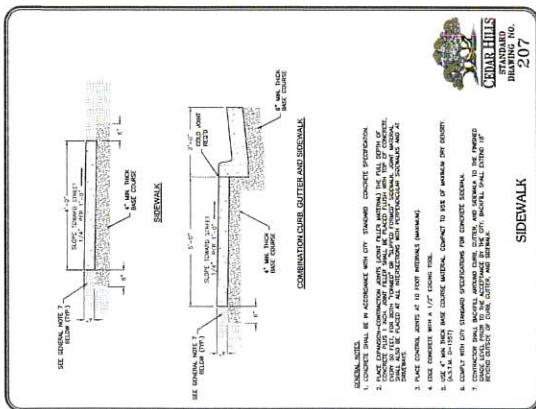
Engineer: T. Hunt
 Drawn: R. Hatfield
 Date: 03 / 05 / 2025
 Proj. No. 102 - 63

SHEET TITLE

CITY
DETAILS

SHEET NO. C1.91

(REFER TO THE SITE SPECIFIC GEOTECHNICAL REPORT, GEOTECHNICAL REPORT TO GOVERN & CONTROL.)



[illegible]



CEDAR HILLS, UT

FULL DEXOS®

REV.	DATE	DESCRIPTION	BY
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REVISIONS



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SCALES ACCORDINGLY

PROJECT INFO.	Engineer: T. Hunt
	Drawn: R. Hatfield
	Date: 03 / 06 / 2025
	Proj. No. 102 - 60
SHEET TITLE	

ND.
C3.00

SHEET



1. REFERENCE SHEET C2.10 FOR ADDITIONAL REQUIRED STORM DRAIN CALCULATIONS.
2. REFERENCE ARCHITECTURAL DRAWINGS FOR PROVIDED ROOF DRAIN LOCATIONS. CONNECT ALL ROOF DRAINING TO THE PROPOSED STORM DRAIN SYSTEM.
3. CITY REQUIRED UTILITY MINIMUM BURY DEPTH / COVER, AS FOLLOWS:

GENIVA

1. PROVIDE HOME CARS OR NO MECHANICAL XENTS OF EITHER UTILITY WITHIN 10.0' HORIZONTALLY OF PROCEEDING OR BACKYARD. ENCLOSE 1" MINIMUM VERTICAL CLEARANCE.

51. SANITARY SEWER CLEANOUT FRAME. SEE DETAIL C-11 / SHEET 1.50.

52. SANITARY MANHOLE PER THOMPSONS SPECIAL SERVICES DISTRICT STD DWG D-6.

53. SANITARY MANHOLE PER THOMPSONS SPECIAL SERVICES DISTRICT STD DWG D-6.

54. 1:50 GULLER GELIDE TRAP PER THOMPSONS SPECIAL SERVICES DISTRICT STD DWG D-62.

55. 4" SLOPER LATERAL PER THOMPSONS SPECIAL SERVICES DISTRICT STANDARD, 2.0% MINIMUM SLOPE.

56. INSTANT MANHOLE ON EXISTING PIPE PER THOMPSONS SPECIAL SERVICES DISTRICT STD

REMARKS

SIZE IN INCHES (SMALL END)
SIZE IN INCHES (LARGE END)

100 x 10 x 5

100 mm

10 mm

5 mm

100 x 10 x 5

SIZE IN INCHES (BRANCH)
SIZE IN INCHES (THRU PIPE)
FITTING DESIGNATION (TEE)

RENO

 1.900 RENO
 1.900 RENO

TYPE OF RIND (SEE LEGEND)
SIZE IN INCHES
FITTING DESIGNATION (RIND)

























NOTE: NOT ALL FITTINGS ARE SHOWN, AND PROVIDED FOR REFERENCE ONLY. CONTRACTOR SHALL INSTALL ALL FITTINGS REQUIRED TO FOLLOW THE ALIGNMENT PROVIDED IN THE DRAWINGS.

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CEDAR HILLS RETAIL
4700 WEST & 9930 SOUTH
CEDAR HILLS, UT
LOCATED IN THE NW QUARTER OF SECTION 6,
TOWNSHIP 55, RANGE 2E, 3E, BASE AND MERIDIAN

Full Article

REV. DATE	DESCRIPTION	BY
03/10/05	INITIAL SUBMITTAL	RM

SEAL



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 NOT ONE INCH ON THIS SHEET, ADJUST
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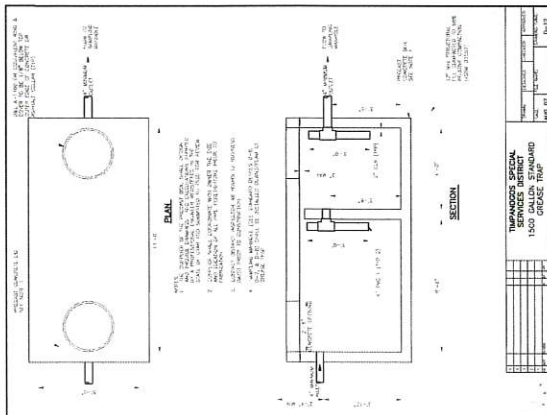
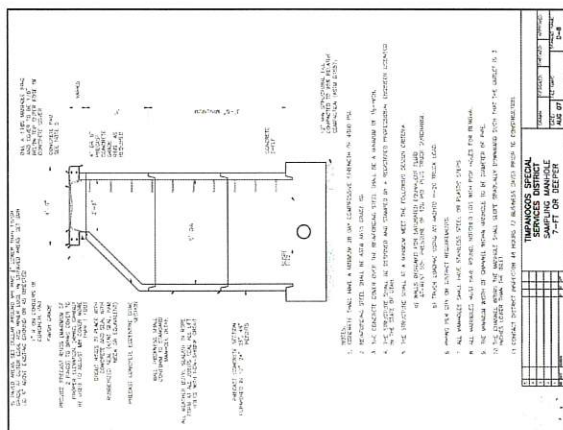
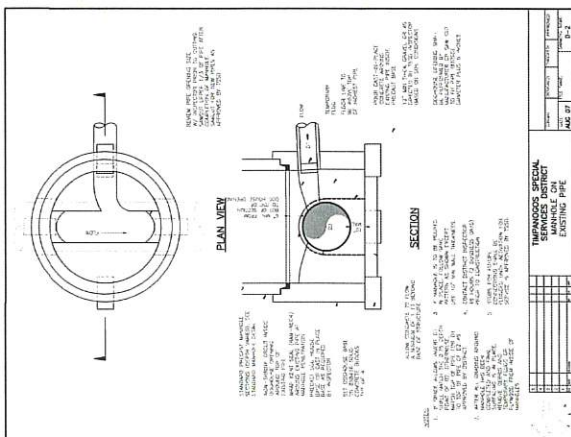
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	DRAWN BY: R. Hatfield
	DATE: 03 / 06 / 2025
	Proj. No. 102 - 50
SHEET TITLE	

SITE
UTILITY
DETAILS

MEET NO.

03.90

REFER TO THE SITE SPECIFIC GEOTECHNICAL REPORT, GEOTECHNICAL REPORT TO GOVERN & CONTROL)





4700 WEST & 9930 SOUTH
CEDAR HILLS, UT
LOCATED IN THE NW QUARTER OF SECTION 6,
TOWNSHIP 35, RANGE 2E, S1 BASE AND MERIDIAN

REV. DATE	DESCRIPTION	BY
0 03/10/25	INITIAL SUBMITTAL	RH

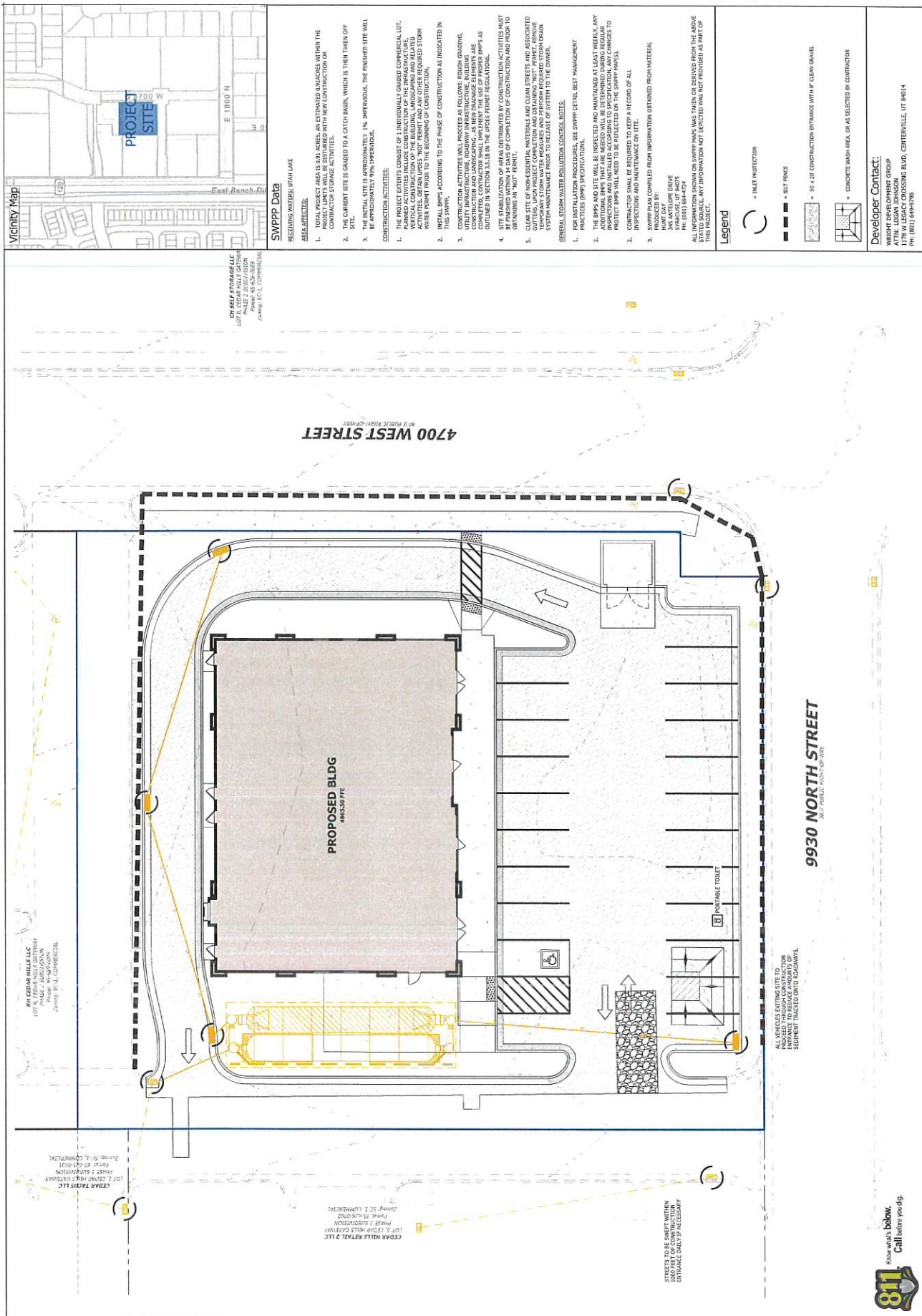


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PROJECT INFO.	Engineer: T. Hunt
	DRAWN BY: R. Hatfield
	DATE: 03 / 06 / 2025
	Proj. No. 102 - 60
SHEET TITLE	

EROSION
CONTROL
PLAN

MEET NO. C4.00





CEDAR HILLS RET
4700 WEST & 9930 SOUTH
CEDAR HILLS, UT
LOCATED IN THE NW QUARTER OF SECTION 6,
TOWNSHIP 55, RANGE 2E, 5L BASE AND MERIDIAN

REV.	DATE	DESCRIPTION
0	03/10/25	INITIAL SUBMITTAL



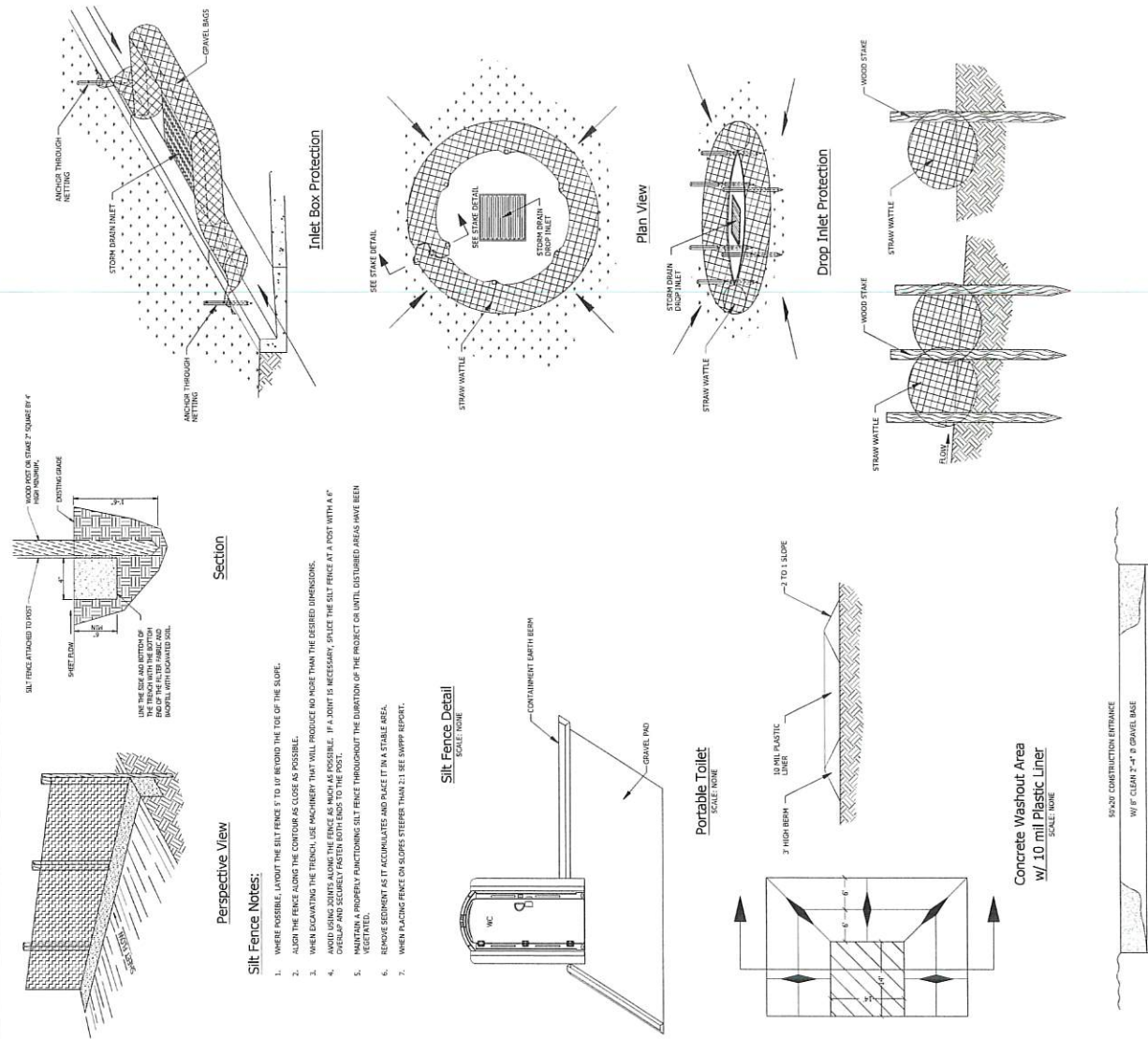
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**EROSION
CONTROL
DETAILS**

C4.90

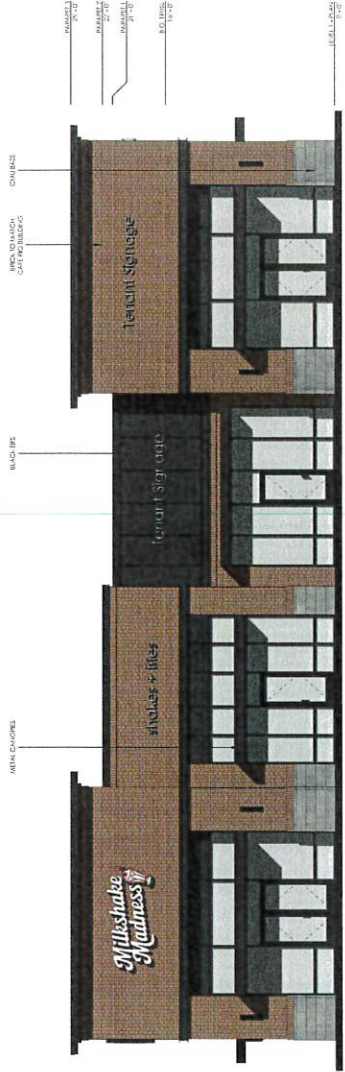
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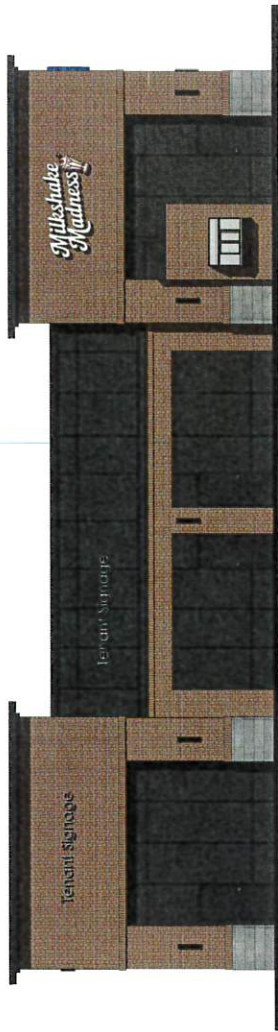


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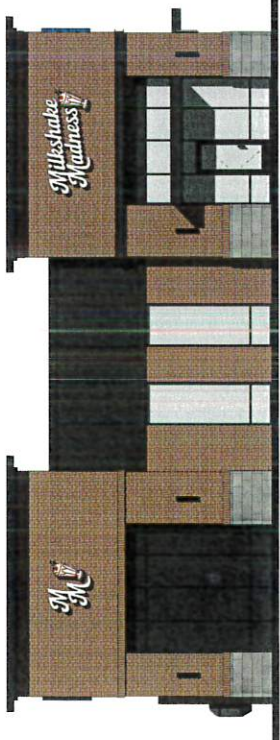
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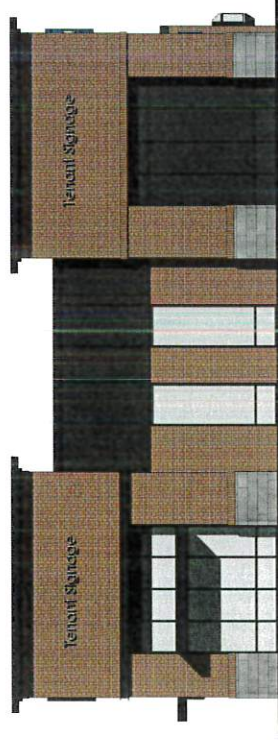
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WEST ELEVATION
8'0" x 14'4"



2
NORTH ELEVATION
8'0" x 14'4"



3
WEST ELEVATION
8'0" x 14'4"



4
EAST ELEVATION
8'0" x 14'4"



MILKSHAKE MADNESS RETAIL

RENDERING | 3
 4051 LAND WEST CEDAR HILL, UT
 FEBRUARY 28, 2022



ENDORCH ARCHITECTURAL GROUP



MILKSHAKE MADNESS RETAIL

RENDERING | 4
1818 N HWY 100, CEDAR HILLS, UT
FEBRUARY 21, 2025





MILKSHAKE MADNESS RETAIL

DESIGNED BY EAGLE ARCHITECTURAL GROUP

RENDERING | 5
MILKSHAKE MADNESS RETAIL
FEBRUARY 21, 2025

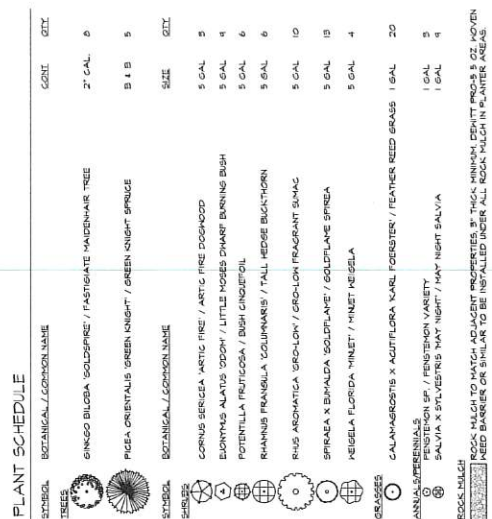
EAG
EAGLE ARCHITECTURAL GROUP

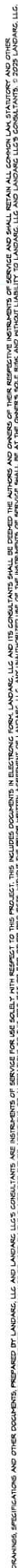


MILKSHAKE MADNESS RETAIL

RENDERING | 6
 1000 N. 1000 E. COLUMBIA, UT
 FEBRUARY 21, 2025

EAG
 ENVIRONMENTAL ARCHITECTURAL GROUP

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2/19/2025

MILKSHAKE MADNESS
CEDAR HILLS, UT

CEDAR HILLS, UT

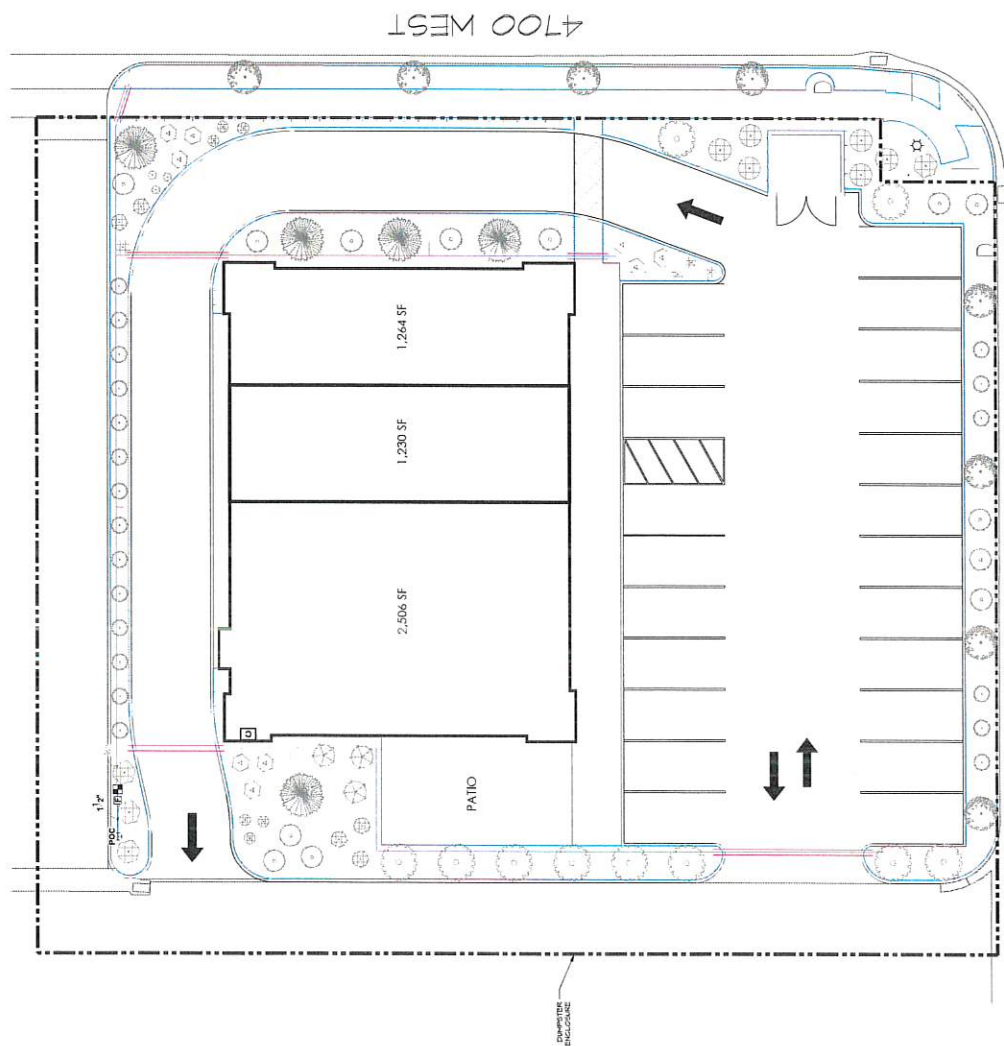


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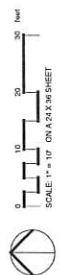
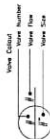
IRRIGATION PLAN

WEST VA.

202



IRRIGATION SCHEDULE

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SCALE: 1" = 10' ON A 24 X 36 SHEET

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CEDAR HILLS, UT

[illegible]

703

THE WATER SOURCE FOR THIS PROJECT IS PRESSURIZED IRRIGATION WATER. CONTRACTOR TO MAKE CONNECTIONS TO P.O.D.'S AS SHOWN IN THE PLAN.

CRITICAL ANALYSIS

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CEDAR HILLS RETAIL
4700 WEST & 9930 SOUTH
CEDAR HILLS, UTAH

STAMP

REVISIONS



PROJECT #	250323
DRAWN BY	AP
CHECKED BY	AP
DATE	3/20/2023
AMP ELECTRICAL ENGINEERING, LLC - 2023	
SHEET TITLE	

SITE PHOTOMETRIC
SPEC SHEETS

ES002

Project	Category	Type	CD1
Proposed By	Notes		

Lumark
Prevail Discrete LED



Area / Site Luminaire

Product Features

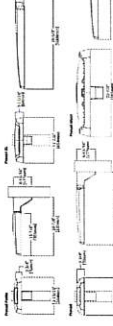
Product Certifications

Interactive Menu

Quick Facts

Connected Systems

Dimensional Details



COOPER

Project	Category	Type	CD1
Proposed By	Notes		

HALO Commercial
HCC | HM6 | 61161PS



6-inch LED downlight and wall wash

Product Features

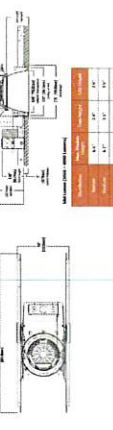
Product Certifications

Interactive Menu

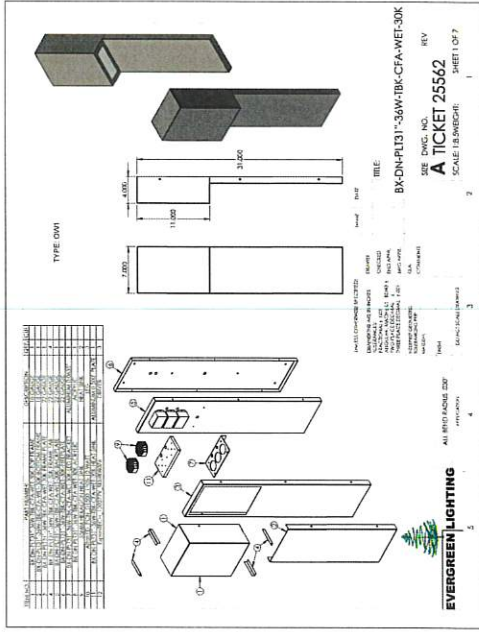
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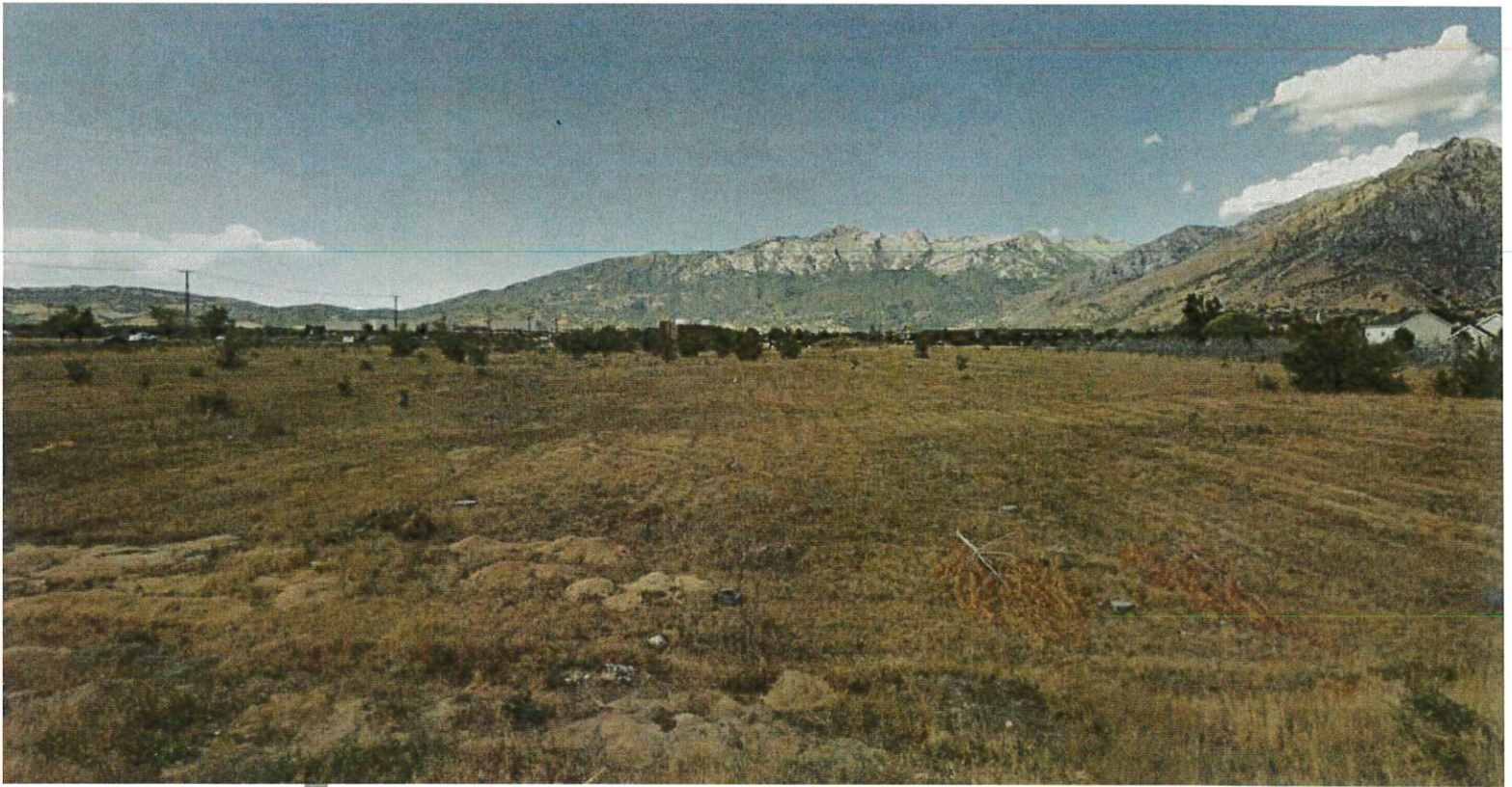
Connected Systems

Dimensional Details



COOPER





Engineering
Geology
Environmental (ESA I & II)
Organic Chemistry
Materials Testing
Special Inspections

GEOTECHNICAL ENGINEERING STUDY

Cedar Hills Gateway

1800 N. North County Boulevard
Cedar Hills, Utah

Prepared For:

Mr. Charles Openshaw
Openshaw Properties
2230 North University Parkway, Suite 6D
Provo, Utah 84604

CMT Project No. 11162
May 1, 2018

CMT ENGINEERING LABORATORIES

May 1, 2018

Mr. Charles Openshaw
Openshaw Properties
2230 North University Parkway, Suite 6D
Provo, UT 84604

Subject: Geotechnical Engineering Study
Cedar Hills Gateway
1800 N. North County Boulevard
Cedar Hills, Utah
CMT Project Number: 11162

Mr. Openshaw:

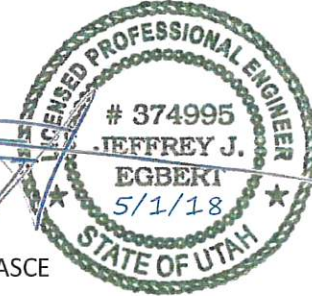
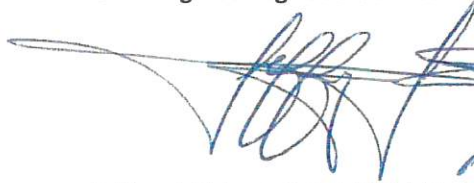
Submitted herewith is the report of our geotechnical engineering study for the subject site. This report contains the results of our findings and an engineering interpretation of the results with respect to the available project characteristics. It also contains recommendations to aid in the design and construction of the earth related phases of this project.

On April 23, 2018, a CMT Engineering Laboratories (CMT) geologist was on-site and supervised the excavation of 5 test pits extending to depths of about 11 to 11.5 feet below the existing ground surface. Soil samples were obtained during the field operations and subsequently transported to our laboratory for further testing and observation.

Conventional spread and/or continuous footings may be utilized to support the proposed structures, provided the recommendations in this report are followed. A detailed discussion of design and construction criteria is presented in this report.

We appreciate the opportunity to work with you at this stage of the project. CMT offers a full range of Geotechnical Engineering, Geological, Material Testing, Special Inspection services, and Phase I and II Environmental Site Assessments. With offices throughout Northern Utah and Arizona, our staff is capable of efficiently serving your project needs. If we can be of further assistance or if you have any questions regarding this project, please do not hesitate to contact us at (801) 492-4132.

Sincerely,
CMT Engineering Laboratories



Jeffrey J. Egbert, P.E., LEED A.P., M. ASCE
Senior Geotechnical Engineer

Reviewed by:



William G. Turner, P.E., M. ASCE
Senior Geotechnical Engineer

ENGINEERING • ENVIRONMENTAL (ESA I & II) • MATERIALS TESTING • SPECIAL INSPECTIONS • ORGANIC CHEMISTRY

LOGAN OFFICE: 2005 NORTH 600 WEST, SUITE A, LOGAN, UTAH 84321 • TEL: (435) 753-6815 • FAX: (435) 787-4983
OGDEN OFFICE: 707 24th STREET, SUITE 1A, OGDEN, UTAH 84401 • TEL: (801) 870-6730
SALT LAKE CITY OFFICE: 2796 S. REDWOOD ROAD, SALT LAKE CITY, UTAH 84119 • TEL: (801) 908-5954 • FAX: (801) 972-9075
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EMAIL = cmt@cmtlaboratories.com

CMTENGINEERING LABORATORIES

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APPENDIX

Figure 1: Site Plan

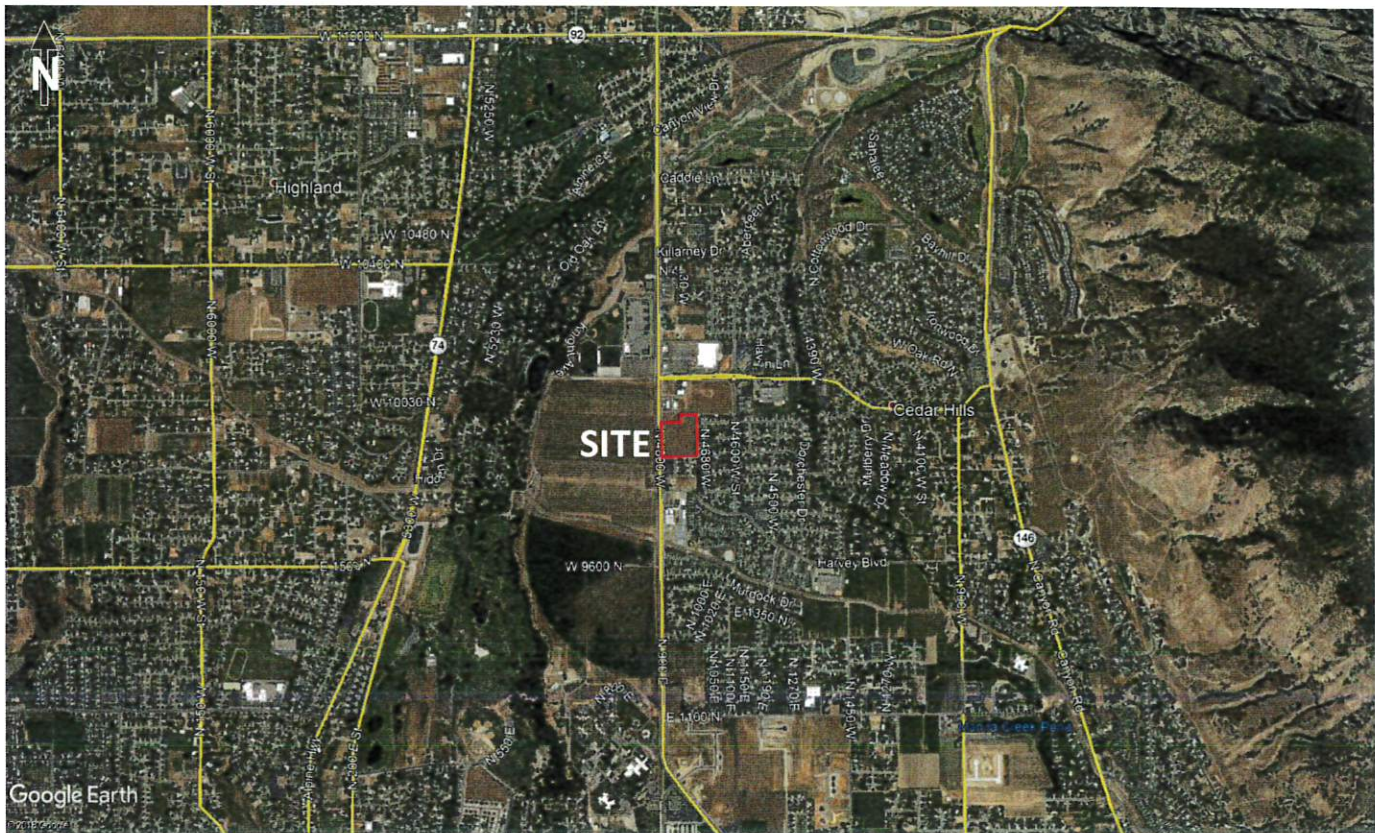
Figures 2 -6: Test Pit Logs

Figure7: Key to Symbols

1.0 INTRODUCTION

1.1 General

CMT Engineering Laboratories (CMT) was retained to conduct a geotechnical subsurface study for the proposed development of approximately 9 acres with commercial buildings. The parcel is situated on the east side of North County Boulevard and the north side of 1800 North Street in Cedar Hills, Utah, as shown outlined in red on the **Vicinity Map** below.



Vicinity Map

1.2 Objectives, Scope and Authorization

The objectives and scope of our study were planned in discussions between Mr. Mark Greenwood of ALM & Associates, Inc., and Mr. Jeffrey Egbert of CMT Engineering Laboratories (CMT). In general, the objectives of this study were to define and evaluate the subsurface soil and groundwater conditions at the site, and provide appropriate foundation, earthwork, pavement and seismic recommendations to be utilized in the design and construction of the proposed development.

In accomplishing these objectives, our scope of work has included performing field exploration, which consisted of the excavating/logging/sampling of 5 test pits, performing laboratory testing on representative samples, and

conducting an office program, which consisted of correlating available data, performing engineering analyses, and preparing this summary report. This scope of work was authorized by returning a signed copy of our proposal dated March 26, 2018 and executed on April 11, 2018.

1.3 Description of Proposed Construction

We understand that the proposed structures will be commercial buildings for office and retail space which we project will be of wood or light steel frame construction. We project that maximum loads for the structures will be on the order of 10,000 pounds per lineal foot for walls and 100,000 pounds for columns. Floor slab loads are anticipated to be relatively light, with an average uniform loading not exceeding 200 pounds per square foot. If the loading conditions are different than we have projected, please notify us so that any appropriate modifications to our conclusions and recommendations contained herein can be made.

We anticipate that asphalt-paved driveways and parking areas will be constructed as part of the development. Traffic is projected to consist of a moderate volume of automobiles and pickup trucks, a few medium-weight delivery trucks, a weekly garbage truck, and an occasional fire truck.

Site development will require some earthwork in the form of minor cutting and filling. A site grading plan was not available at the time of this report, but we project that maximum cuts and fills may be on the order of 3 to 4 feet. If deeper cuts or fills are planned, CMT should be notified to provide additional recommendations, if needed.

1.4 Executive Summary

The most significant geotechnical aspects regarding site development include the following:

1. Up to about 1 foot of sandy topsoil blankets the site, which will require removal beneath structures and pavements;
2. Natural granular soils (sand and gravel) were encountered in the test pits; and
3. No groundwater was encountered in any of the test pits.

Our evaluation indicates that proposed structures can be supported upon conventional spread and continuous wall foundations established upon suitable, undisturbed, uniform natural soils and/or upon structural fill extending to suitable natural soils. Structures should not be placed on undocumented fill, or topsoil, which otherwise could translate to additional settlement.

CMT must assess that topsoil, undocumented fills, debris, and disturbed or unsuitable soils have been removed and that suitable soils have been encountered prior to placing site grading fills, footings, slabs, and pavements.

In the following sections, detailed discussions pertaining to the site and subsurface descriptions, geologic/seismic setting, earthwork, foundations, lateral resistance, lateral pressure, floor slabs, and pavements are provided.

2.0 FIELD EXPLORATION

2.1 General

In order to define and evaluate the subsurface soil and groundwater conditions at the site, five test pits were excavated with a backhoe throughout the site to depths of approximately 11 to 11.5 feet below the existing ground surface. Locations of the test pits are presented on **Figure 1, Site Plan**, included in the Appendix. The field exploration was performed under the supervision of an experienced member of our geotechnical staff.

Representative soil samples were collected by obtaining disturbed "grab" samples from within each test pit and from the soils brought up by the backhoe bucket. The samples were placed in sealed plastic bags for transport to the laboratory.

The subsurface soils encountered in the test pits were logged and described in general accordance with ASTM¹ D-2488. Soil samples were collected as described above, and were classified in the field based upon visual and textural examination. These field classifications were supplemented by subsequent examination and testing of select samples in our laboratory. Graphical representations of the subsurface conditions encountered are presented on each individual Test Pit Log, **Figures 2 through 6**, included in the Appendix. A Key to Symbols defining the terms and symbols used on the logs, is provided as **Figure 7** in the Appendix.

When backfilling the test pits, only minimal effort was made to compact the backfill and no compaction testing was performed. Thus, settlement of the backfill in the test pits over time should be anticipated.

2.2 Infiltration Testing

An infiltration test was performed as part of our field exploration by digging a small hole using a shovel within test pit TP-1 at a depth of approximately 4 feet below the existing ground surface. The hole was filled with water, and the rate of water drop within the small hole over a certain time period (i.e. 10 minutes) was measured. This process was repeated multiple times until subsequent readings were the same. The results of this test indicate that the natural soils at this site have an infiltration rate of about 2 minutes per inch. To account for potential siltation, we recommend designing using a rate of 5 minutes per inch.

3.0 LABORATORY TESTING

Selected samples of the subsurface soils were subjected to various laboratory tests to assess pertinent engineering properties, as follows:

1. Moisture Content, ASTM D-2216, Percent moisture representative of field conditions
2. Gradation Analysis, ASTM D-1140/C-117, Grain Size Analysis

¹American Society for Testing and Materials

Laboratory test results are presented on the test pit logs (Figures 2 through 6) and in the following Lab Summary table:

Lab Summary Table

Test Pit	Depth (feet)	Soil Class	Sample Type	Moisture Content (%)	Dry Density (pcf)	Gradation			Atterberg Limits			Collapse (-) or Expansion (+)
						Grav	Sand	Fines	LL	PL	PI	
TP-1	2.5	GP-GM	Bag	2.9		71	22	7				
TP-2	6.5	GP	Bag	2.0		86	11	3				
TP-3	9	GP	Bag	1.5		78	18	4				
TP-4	9.5	GP	Bag	2.3		66	30	4				
TP-5	2.5	GP	Bag	2.6		84	13	3				

4.0 GEOLOGIC & SEISMIC CONDITIONS

4.1 Geologic Setting

The subject site is located in the northeast portion of Utah Valley in north-central Utah at an elevation of approximately 4,865 feet above sea level. Utah Valley is a deep, sediment-filled basin that is part of the Basin and Range Physiographic Province. The valley was formed by extensional tectonic processes during the Tertiary and Quaternary geologic time periods. The valley is bordered by the Wasatch Mountain Range on the east and Lake Mountain and West Mountain on the west. Utah Valley is located within the Intermountain Seismic Belt, a zone of active tectonism and seismic activity extending from southwestern Montana to southwestern Utah. The active (evidence of movement within the past 10,000 years) Wasatch Fault Zone is part of the Intermountain Seismic Belt and extends from southeastern Idaho to central Utah along the western base of the Wasatch Mountain Range.

Much of northwestern Utah, including Utah Valley, was also previously covered by the Pleistocene age Lake Bonneville. Utah Lake, which currently occupies much of the western portion of the valley, is a remnant of this ancient fresh water lake. Lake Bonneville reached a high-stand elevation of between approximately 5,100 and 5,200 feet above sea level at between 18,500 and 17,400 years ago. Approximately 17,400 years ago, the lake breached its basin in southeastern Idaho and dropped by almost 300 feet relatively fast as water drained into the Snake River. Following this catastrophic release, the lake level continued to drop slowly over time, primarily driven by drier climatic conditions, until reaching the current levels of Utah Lake and the larger Great Salt Lake to the north. Shoreline terraces formed at the high-stand elevation of the lake and several subsequent lower lake levels are visible in places on the mountain slopes surrounding the valley. Much of the sediment within Utah Valley was deposited as lacustrine sediments during both the transgressive (rise) and regressive (fall) phases of Lake Bonneville.

The geology of the USGS 7.5 Lehi, Utah Quadrangle, including the location of the subject site, has been mapped by Biek². The surficial geology at the location of the subject site and adjacent properties is mapped as "Alluvial

² Biek, R.F., 2005, Geologic Map of the Lehi Quadrangle and Part of the Timpanogos Cave Quadrangle, Salt Lake and Utah Counties, Utah; Utah Geological Survey Map 210, Scale 1:24,000.

The geological map displays several units: Qalp (yellow), Qat1 (light grey), Qat2 (dotted grey), Qat3 (light yellow), Qf (dark grey), Qal1 (white), Qal2 (dotted white), Qal3 (dotted white), Qalb (orange), Qld (dark grey), Qldb (light orange), Qaly (green), and Qafy (light yellow). A red square labeled 'SITE' is located in the center of the map. A scale bar indicates 0 to 1 km. A north arrow is present in the top right corner. A circular inset in the top right corner shows a larger map of the study area with a red square indicating the location of the study site.

4.2 Faulting

CMT ENGINEERING
LABORATORIES

The Wasatch Fault is considered a “normal” fault because movement along the fault is typically vertical. The east side of the fault, or the mountain block, typically moves upward relative to the valley block on the west side of the fault. The fault generally dips to the west below the valleys. In an earthquake, the point where the fault initially ruptures is called the “focus” and generally occurs about 10 miles below the surface. The point on the surface directly above the focus, the epicenter, typically out in the valley, is usually where the strongest ground shaking occurs. The Wasatch Fault is one of the longest and most active normal faults in the world.

4.3 Seismicity

4.3.1 Site Class

Utah has adopted the International Building Code (IBC) 2015. IBC 2015 determines the seismic hazard for a site based upon 2008 mapping of bedrock accelerations prepared by the United States Geologic Survey (USGS) and the soil site class. The USGS values are presented on maps incorporated into the IBC code and are also available based on latitude and longitude coordinates (grid points). For site class definitions, IBC 2015 (Section 1613.3.2) refers to Chapter 20, Site Classification Procedure for Seismic Design, of ASCE³ 7. Given the subsurface soils at the site, including our projection of soils within the upper 100 feet of the soil profile, it is our opinion the site best fits Site Class D – Stiff Soil Profile, which we recommend for seismic structural design.

4.3.2 Ground Motions

The 2008 USGS mapping utilized by the IBC provides values of peak ground, short period and long period accelerations for the Site Class B boundary and the Maximum Considered Earthquake (MCE). This Site Class B boundary represents average bedrock values for the Western United States and must be corrected for local soil conditions. The following table summarizes the peak ground, short period and long period accelerations for the MCE event, and incorporates the appropriate soil correction factor for a Site Class D soil profile at site grid coordinates of 40.41427 degrees north latitude and -111.7721 degrees west longitude:

Spectral Acceleration Value, T	Site Class B Boundary [mapped values] (g)	Site Coefficient	Site Class D [adjusted for site class effects] (g)	Design Values (g)
Peak Ground Acceleration	0.481	$F_a = 1.019$	0.490	0.327
Short Period Acceleration (0.2 Seconds)	$S_S = 1.203$	$F_a = 1.019$	$S_{MS} = 1.226$	$S_{DS} = 0.817$
Short Period Acceleration (1.0 Second)	$S_1 = 0.438$	$F_v = 1.562$	$S_{M1} = 0.684$	$S_{D1} = 0.456$

³ American Society of Civil Engineers

4.3.3 Liquefaction

The site is located within an area designated by the Utah Geologic Survey⁴ as having “Very Low” liquefaction potential. Liquefaction is defined as the condition when saturated, loose, sandy soils lose their support capabilities because of excessive pore water pressure which develops during a seismic event. Clayey soils, even if saturated, will generally not liquefy during a major seismic event.

A special liquefaction study was not performed for this site. We encountered unsaturated, medium dense to dense sand and gravel soils within the depths we explored. In our opinion, the soils we encountered support the mapped very low liquefaction potential designation.

4.4 Other Geologic Hazards

No landslide deposits or features, including lateral spread deposits, are mapped on or adjacent to the site. The site is not located within a currently known or mapped potential debris flow, stream flooding, or rock fall hazard area.

5.0 SITE CONDITIONS

5.1 Surface Conditions

At the time the test pits were excavated the site consisted of undeveloped land with a moderate growth of grasses, weeds, some brush, and trees. The site grade is relatively level. Based upon aerial photos readily available online dating back to 1993, portions of the site appear to have been orchards up until sometime before 2010 when most of the trees appear to have been removed. The site is bounded on the north by undeveloped land with commercial development beyond, on the south by 1800 North Street, on the east by residential development, and on the west by North County Boulevard (see **Vicinity Map** in **Section 1.1** above).

5.2 Subsurface Soils

At the locations of the test pits we encountered approximately 12 inches of sandy soil with roots and organic material (topsoil) on the surface. Natural granular soils were observed beneath the topsoil consisting of brown to gray mostly Poorly Graded GRAVEL (GP, GP-GM) with varying amounts of cobbles, sand, and silt, with a few layers of Silty GRAVEL (GM) and Poorly Graded to Silty SAND (SP, SP-SM, SM) extending to the bottom of the test pits. These soils were slightly moist to moist, and estimated to be in a medium dense to very dense state. Some of the gravel soil layers were cemented.

For a more descriptive interpretation of subsurface conditions, please refer to the test pit logs, **Figures 2 through 6**, which graphically represent the subsurface conditions encountered. The lines designating the interface

⁴ Utah Geological Survey, "Liquefaction-Potential Map for a Part of Utah County, Utah," Utah Geological Survey Public Information Series 28, August 1994. <https://geology.utah.gov/hazards/earthquakes-faults/liquefaction/#tab-id-2>

between soil types on the 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 at the time of our field exploration.

Groundwater levels can fluctuate as much as 1.5 to 2 feet seasonally. Numerous other factors such as heavy precipitation, irrigation of neighboring land, and other unforeseen factors, may also influence ground water elevations at the site. The detailed evaluation of these and other factors, which may be responsible for ground water fluctuations, is beyond the scope of this study. We do not anticipate that groundwater will be encountered within excavations at this site.

5.4 Site Subsurface Variations

Based on the results of the subsurface explorations and our experience, variations in the continuity and nature of subsurface conditions should be anticipated. Due to the heterogeneous characteristics of natural soils, care should be taken in interpolating or extrapolating subsurface conditions between or beyond the exploratory locations.

Also, when logging and sampling of the test pits was completed, the test pits were backfilled with the excavated soils but minimal to no effort was made to compact these soils. Thus, settlement of the backfill in the test pits over time should be anticipated.

6.0 SITE PREPARATION AND GRADING

6.1 General

All deleterious materials should be stripped from the site prior to commencement of construction activities. This includes loose and disturbed soils, topsoil, vegetation, etc. Based upon the conditions observed in the test pits there is topsoil on the surface of the site which we estimated to be about 1 foot in thickness. When stripping and grubbing, topsoil should be distinguished by the apparent organic content and not solely by color; thus we estimate that topsoil stripping will need to include the upper 4 inches. However, given the past agricultural uses of the site, the upper 12 to 15 inches may have been disturbed during farming or tree removal.

The site should be examined by a CMT geotechnical engineer to assess that suitable natural soils have been exposed and any deleterious materials, loose and/or disturbed soils have been removed, prior to placing site grading fills, footings, slabs, and pavements.

Fill placed over large areas to raise overall site grades can induce settlements in the underlying natural soils. If more than 5 feet of site grading fill is anticipated over the natural ground surface, we should be notified to assess potential settlements and provide additional recommendations as needed. These recommendations may

include placement of the site grading fill far in advance to allow potential settlements to occur prior to construction.

6.2 Temporary Excavations

For cohesionless (sandy/gravelly) soils, temporary construction excavations not exceeding 4 feet in depth should be no steeper than one-half horizontal to one vertical (0.5H:1V). For excavations up to 8 feet and above groundwater, side slopes should be no steeper than one horizontal to one vertical (1H:1V). Excavations encountering saturated cohesionless soils will be very difficult to maintain, and will require very flat side slopes and/or shoring, bracing and dewatering.

In cohesive (clayey) soils (if encountered), temporary construction excavations not exceeding 4 feet in depth may be constructed with near-vertical side slopes. Temporary excavations up to 8 feet deep, above or below groundwater, may be constructed with side slopes no steeper than one-half horizontal to one vertical (0.5H:1V). Excavations deeper than 8 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. All excavations should be made following OSHA safety guidelines.

6.3 Fill Material

Following are our recommendations for the various fill types we anticipate will be used at this site:

Fill Material Type	Description/Recommended Specification
Structural Fill	Placed below structures, flatwork and pavement. Well-graded sand/gravel mixture, with maximum particle size of 4 inches, a minimum 70% passing 3/4-inch sieve, a maximum 20% passing the No. 200 sieve, and a maximum Plasticity Index of 10.
Site Grading Fill	Placed over larger areas to raise the site grade. Sandy to gravelly soil, with a maximum particle size of 6 inches, a minimum 70% passing 3/4-inch sieve, and a maximum 50% passing No. 200 sieve.
Non-Structural Fill	Placed below non-structural areas, such as landscaping. On-site soils or imported soils, with a maximum particle size of 8 inches, including silt/clay soils not containing excessive amounts of degradable/organic material (see discussion below).
Stabilization Fill	Placed to stabilize soft areas prior to placing structural fill and/or site grading fill. Coarse angular gravels and cobbles 1 inch to 8 inches in size. May also use 1.5- to 2.0-inch gravel placed on stabilization fabric, such as Mirafi RS280i or 600X, or equivalent (see Section 6.6).

On-site sand and gravel soils may be suitable for use as structural fill, if processed to meet the requirements given above, and may also be used in site grading fill and non-structural fill situations.

All fill material should be approved by a CMT geotechnical engineer prior to placement.

6.4 Fill Placement and Compaction

The various types of compaction equipment available have their limitations as to the maximum lift thickness that can be compacted. For example, hand operated equipment is limited to lifts of about 4 inches and most “trench compactors” have a maximum, consistent compaction depth of about 6 inches. Large rollers, depending on soil and moisture conditions, can achieve compaction at 8 to 12 inches. The full thickness of each lift should be compacted to at least the following percentages of the maximum dry density as determined by ASTM D-1557 (or AASHTO⁵ T-180) in accordance with the following recommendations:

Location	Total Fill Thickness (feet)	Minimum Percentage of Maximum Dry Density
Beneath an area extending at least 3 feet beyond the perimeter of structures, and below flatwork and pavement (applies to structural fill and site grading fill)	0 to 5	95
	5 to 8	98
Site grading fill outside area defined above	0 to 5	92
	5 to 8	95
Utility trenches within structural areas	--	96
Roadbase and subbase	-	96
Non-structural fill	0 to 5	90
	5 to 8	92

Structural fills greater than 8 feet thick are not anticipated at the site. For best compaction results, we recommend that the moisture content for structural fill/backfill be within 2% of optimum. Field density tests should be performed on each lift as necessary to verify that proper compaction is being achieved.

6.5 Utility Trenches

For the bedding zone around the utility, we recommend utilizing sand bedding fill material that meets current APWA⁶ requirements.

All utility trench backfill material below structurally loaded facilities (foundations, floor slabs, flatwork, parking lots/drive areas, etc.) shall be placed at the same density requirements established for structural fill in the previous section.

Most utility companies and local governments are requiring Type A-1a or A-1b (AASHTO Designation) soils (sand/gravel soils with limited fines) be used as backfill over utilities within public rights of way, and the backfill be compacted over the full depth above the bedding zone to at least 96% of the maximum dry density as determined by AASHTO T-180 (ASTM D-1557). The natural sand and gravel soils at this site may meet these specifications.

⁵ American Association of State Highway and Transportation Officials

⁶ American Public Works Association

Where the utility does not underlie structurally loaded facilities and public rights of way, natural soils (except topsoil) may be utilized as trench backfill above the bedding layer, provided they are properly moisture conditioned and compacted to the minimum requirements stated above in **Section 6.4**.

6.6 Stabilization

The likelihood of disturbance or rutting and/or pumping of the existing natural soils is a function of the load applied to the surface, as well as the frequency of the load. Consequently, rutting and pumping can be minimized by avoiding concentrated traffic, minimizing the load applied to the surface by using lighter equipment and/or partial loads, by working in drier times of the year, or by providing a working surface for the equipment. Rubber-tired equipment particularly, because of high pressures, promotes instability in moist/wet, soft soils.

If rutting or pumping occurs, traffic should be stopped and the disturbed soils should be removed and replaced with stabilization material. Typically, a minimum of 18 inches of the disturbed soils must be removed to be effective. However, deeper removal is sometimes required.

To stabilize soft subgrade conditions (if encountered), a mixture of coarse, clean, angular gravels and cobbles and/or 1.5- to 2.0-inch clean gravel should be utilized, as indicated above in **Section 6.3**. Often the amount of gravelly material can be reduced with the use of a geotextile fabric such as Mirafi RS280i or equivalent. Its use will also help avoid mixing of the subgrade soils with the gravelly material. After excavating the soft/disturbed soils, the fabric should be spread across the bottom of the excavation and up the sides a minimum of 18 inches. Otherwise, it should be placed in accordance with the manufacturer's recommendation, including proper overlaps. The gravel material can then be placed over the fabric in compacted lifts as described above.

7.0 FOUNDATION RECOMMENDATIONS

The following recommendations have been developed on the basis of the previously described project characteristics, the subsurface conditions observed in the field and the laboratory test data, as well as common geotechnical engineering practice.

7.1 Foundation Recommendations

Based on our geotechnical engineering analyses, the proposed commercial structures may be supported upon conventional spread and/or continuous wall foundations placed on suitable, undisturbed natural granular soils and/or on structural fill extending to suitable natural granular soils. Footings may be designed using a net bearing pressure of 2,500 psf if placed on suitable, undisturbed, natural soils or on structural fill extending to natural soils. The term "net bearing pressure" refers to the pressure imposed by the portion of the structure located above lowest adjacent final grade, thus the weight of the footing and backfill to lowest adjacent final grade need not be considered. The allowable bearing pressure may be increased by 1/3 for temporary loads such as wind and seismic forces.

We also recommend the following:

1. Exterior footings subject to frost should be placed at least 30 inches below final grade.
2. Interior footings not subject to frost should be placed at least 16 inches below grade.
3. Continuous footing widths should be maintained at a minimum of 18 inches.
4. Spot footings should be a minimum of 24 inches wide.

7.2 Installation

Foundations shall not be placed on topsoil with organics or undocumented fill, nor should they be placed on rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water.

Deep, large roots may be encountered where trees and larger bushes once occupied portions of the site; such large roots should be removed. If unsuitable soils are encountered, they must be completely removed and replaced with properly compacted structural fill. Excavation bottoms should be examined by a qualified geotechnical engineer to confirm that suitable bearing soils have been exposed.

All structural fill should meet the requirements for such, and should be placed and compacted in accordance with **Section 6** above. The width of structural replacement fill below footings should be equal to the width of the footing plus 1 foot for each foot of fill thickness. For instance, if the footing width is 2 feet and the structural fill depth beneath the footing is 2 feet, the fill replacement width should be 4 feet, centered beneath the footing.

The minimum thickness of structural fill below footings should be equivalent to one-third the thickness of structural fill below any other portion of the foundations. For example, if footings will cross over an area where an old basement was backfilled, and the maximum depth of structural fill used for the backfill is 6 feet, all footings for the new structure should be underlain by a minimum 2 feet of structural fill.

7.3 Estimated Settlement

Foundations designed and constructed in accordance with our recommendations could experience some settlement, but we anticipate that total settlements of footings founded as recommended above will not exceed 1 inch, with differential settlements on the order of 0.5 inches over a distance of 25 feet. We expect approximately 50% of the total settlement to initially take place during construction.

7.4 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 0.40 for the natural granular soils or structural fill, may be utilized for design. Passive resistance provided by properly placed and compacted structural fill above the water table may be considered equivalent to a fluid with a density of 440 pcf. A combination of passive earth resistance and friction may be utilized if the friction component of the total is divided by 1.5.

8.0 LATERAL EARTH PRESSURES

We project that subgrade walls not exceeding 4 feet will be constructed at this site. The lateral earth pressure values given below are for a backfill material that will consist of drained sand/gravel soils (less than 10% passing No. 200 sieve) placed and compacted in accordance with the recommendations presented herein. If other soil types will be used as backfill, we should be notified so that appropriate modifications to these values can be provided, as needed.

The lateral pressures imposed upon subgrade facilities will depend upon the relative rigidity and movement of the backfilled structure. For rigid basement walls that are not more than 10 inches thick, sand/gravel backfill may be designed using an at-rest equivalent fluid pressure of 55 pcf (psf/ft). This value assumes that the soil surface behind the wall is horizontal and that the backfill within 3 feet of the wall will be compacted with hand-operated compacting equipment.

9.0 FLOOR SLABS

Floor slabs may be established upon suitable, undisturbed, natural soils and/or on structural fill extending to suitable natural soils (same as for foundations). Under no circumstances shall floor slabs be established on any topsoil, non-engineered fills, loose or disturbed soils, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water.

In order to facilitate curing of the concrete, we recommend that floor slabs be directly underlain by at least 4 inches of "free-draining" fill, such as "pea" gravel or 3/4-inch quarters to 1-inch minus, clean, gap-graded gravel. To help control normal shrinkage and stress cracking, the floor slabs should have the following features:

1. Adequate reinforcement for the anticipated floor loads with the reinforcement continuous through interior floor joints;
2. Frequent crack control joints; and
3. Non-rigid attachment of the slabs to foundation walls and bearing slabs.

10.0 DRAINAGE RECOMMENDATIONS

It is important to the long-term performance of foundations and floor slabs that water not be allowed to collect near the foundation walls and infiltrate into the underlying soils. We recommend the following:

1. All areas around each structure should be sloped to provide drainage away from the foundations. We recommend a minimum slope of 4 inches in the first 10 feet away from the structure. This slope should be maintained throughout the lifetime of the structure.
2. All roof drainage should be collected in rain gutters with downspouts designed to discharge at least 10 feet from the foundation walls or well beyond the backfill limits, whichever is greater.

3. Adequate compaction of the foundation backfill should be provided. We suggest a minimum of 90% of the maximum laboratory density as determined by ASTM D-1557. Water consolidation methods should not be used under any circumstances.
4. Landscape sprinklers should be aimed away from the foundation walls. The sprinkling systems should be designed with proper drainage and be well-maintained. Over watering should be avoided.
5. Other precautions that may become evident during construction.

11.0 PAVEMENTS

We anticipate the natural gravel and sand soils will exhibit good pavement support characteristics when saturated or nearly saturated. Based on our laboratory testing experience with similar soils, our pavement design utilized a California Bearing Ratio (CBR) of 10 for the natural sand/gravel soils.

All pavement areas must be prepared as discussed above in **Section 6.1**. Under no circumstances shall pavements be established over topsoil, non-engineered fills (if encountered), loose or disturbed soils, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water.

In pavement areas, subsequent to stripping and prior to the placement of pavement materials, the exposed subgrade must be proof rolled by passing moderate-weight rubber tire-mounted construction equipment over the surface at least twice. If excessively soft or otherwise unsuitable soils are encountered, we recommend they be removed to a minimum of 18 inches below the subgrade level and replaced with structural fill.

Given the projected traffic as discussed above in **Section 1.3**, the following pavement sections are recommended for the given ESAL's (18-kip equivalent single-axle loads) per day:

Material	Pavement Section Thickness (inches)					
	Parking Areas (3 ESAL's per day)			Drive Areas (8 ESAL's per day)		
Asphalt	3	3	---	3	3	---
Concrete	---	--	5	---	---	6
Road-Base	7	4	5	10	5	5
Subbase	0	6	0	0	8	0
Total Thickness	10	13	10	13	16	11

Untreated base course (UTBC) should conform to city specifications, or to 1-inch-minus UDOT specifications for A-1-a/NP, and have a minimum CBR value of 70%. Material meeting our specification for structural fill can be used for subbase, as long as the fines content (percent passing No. 200 sieve) does not exceed 15%. Roadbase and subbase material should be compacted as recommended above in **Section 6.4**. Asphalt material generally should conform to APWA requirements, having a ½-inch maximum aggregate size, a 75-gyraton Superpave mix containing no more than 15% of recycled asphalt (RAP) and a PG58-28 binder. Concrete pavement should typically

have a minimum 28-day strength of 3,000 psi, and should be saw-cut at appropriate intervals and at the proper time to control the locations of shrinkage cracking.

12.0 QUALITY CONTROL

We recommend that CMT be retained to as part of a comprehensive quality control testing and observation program. With CMT on-site we can help facilitate implementation of our recommendations and address, in a timely manner, any subsurface conditions encountered which vary from those described in this report. Without such a program CMT cannot be responsible for application of our recommendations to subsurface conditions which may vary from those described herein. This program may include, but not necessarily be limited to, the following:

12.1 Field Observations

Observations should be completed during all phases of construction such as site preparation, foundation excavation, structural fill placement and concrete placement.

12.2 Fill Compaction

Compaction testing by CMT is required for all structural supporting fill materials. Maximum Dry Density (Modified Proctor, ASTM D-1557) tests should be requested by the contractor immediately after delivery of any fill materials. The maximum density information should then be used for field density tests on each lift as necessary to ensure that the required compaction is being achieved.

12.3 Excavations

All excavation procedures and processes should be observed by a geotechnical engineer from CMT or their representative. In addition, for the recommendations in this report to be valid, all backfill and structural fill placed in trenches and all pavements should be density tested by CMT. We recommend that freshly mixed concrete be tested by CMT in accordance with ASTM designations.

12.4 Vibration Monitoring

Construction activities, particularly site grading and fill placement, can induce vibrations in existing structures adjacent to the site. Such vibrations can cause damage to adjacent buildings, depending on the building composition and underlying soils. It can be prudent to monitor vibrations from construction activities to maintain records that vibrations did not exceed a pre-defined threshold known to potentially cause damage. CMT can provide this monitoring if desired.

13.0 LIMITATIONS

The recommendations provided herein were developed by evaluating the information obtained from the subsurface explorations and soils encountered therein. The exploration logs reflect the subsurface conditions only at the specific location at the particular time designated on the logs. Soil and ground water conditions may differ from conditions encountered at the actual exploration locations. The nature and extent of any variation in the explorations may not become evident until during the course of construction. If variations do appear, it may become necessary to re-evaluate the recommendations of this report after we have observed the variation.

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

We appreciate the opportunity to be of service to you on this project. If we can be of further assistance or if you have any questions regarding this project, please do not hesitate to contact us at (801) 492-4132. To schedule materials testing, please call (801) 381-5141.

Appendix

Cedar Hills Gateway

1800 N. North County Boulevard, Cedar Hills, UT



Site Plan

Date:	1-May-18
Job #	11162

Figure:

1

Cedar Hills Gateway

Test Pit Log

TP-1

1800 N. North county Boulevard, Cedar Hills, UT

Equipment: Rubber Tire Backhoe

Total Depth: 11.5'

Date: 4/23/18

Surface Elev. (approx):

Water Depth: (see Remarks)

Job #: 11162

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
							Gravel %	Sand %	Fines %	LL	PL	PI
0		TOPSOIL: Sandy silt with gravel, roots, organics, slightly moist, brown										
1		Poorly Graded GRAVEL with silt (GP-GM), sand, cobbles, dense (estimated), slightly moist, brown										
2		Poorly Graded GRAVEL (GP) with sand, medium dense (estimated), moist, light brown										
3		Poorly Graded GRAVEL (GP) with sand, medium dense (estimated), moist, light brown		1	2.9		71	22	7			
4		Poorly Graded GRAVEL (GP) with sand, medium dense (estimated), moist, light brown										
5		Poorly Graded GRAVEL (GP) with sand, medium dense (estimated), moist, light brown		2								
6		Silty SAND (SM) with gravel, medium dense (estimated), moist, light brown										
7		Silty SAND (SM) with gravel, medium dense (estimated), moist, light brown										
8		Silty SAND (SM) with gravel, medium dense (estimated), moist, light brown										
9		Poorly Graded GRAVEL (GP) with sand, medium dense (estimated), moist, light brown										
10		Poorly Graded GRAVEL (GP) with sand, medium dense (estimated), moist, light brown		3								
11		Poorly Graded SAND with silt (SP-SM), gravel, medium dense (estimated), moist, light brown to gray										
12		END AT 11.5 FEET										
13												
14												

Remarks: Groundwater not encountered during excavation.

Figure:

2

Cedar Hills Gateway

Test Pit Log

TP-2

1800 N. North county Boulevard, Cedar Hills, UT

Equipment: Rubber Tire Backhoe
Surface Elev. (approx):

Total Depth: 11.5'
Water Depth: (see Remarks)

Date: 4/23/18
Job #: 11162

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Moisture (%)	Dry Density (pcf)	Gradation			Atterberg		
							Gravel %	Sand %	Fines %	LL	PL	PI
0		TOPSOIL: Sandy silt with gravel, roots, organics, slightly moist, brown										
1		Poorly Graded GRAVEL (GP) with sand, trace silt, dense to very dense (estimated), weakly cemented, slightly moist, light brown to gray										
2				4								
3												
4												
5												
6												
7				5	2		86	11	3			
8		Poorly Graded SAND with silt (SP-SM), gravel, medium dense (estimated), moist, gray to light brown										
9		Poorly Graded GRAVEL (GP) with sand, cobbles, dense (estimated), moist, gray										
10												
11												
12		END AT 11.5 FEET										
13												
14												

Remarks: Groundwater not encountered during excavation.

Figure:

3

Cedar Hills Gateway

Test Pit Log

TP-3

1800 N. North county Boulevard, Cedar Hills, UT

Equipment: Rubber Tire Backhoe

Total Depth: 10.5'

Date: 4/23/18

Surface Elev. (approx):

Water Depth: (see Remarks)

Job #: 11162

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Moisture (%)	Dry Density (pcf)	Gradation			Atterberg		
							Gravel %	Sand %	Fines %	LL	PL	PI
0		TOPSOIL: Sandy silt with gravel, roots, organics, slightly moist, brown										
1		Silty GRAVEL (GM) with sand, cobbles, medium dense to dense (estimated), slightly moist, light brown										
2												
3				6								
4												
5		Poorly Graded SAND (SP) with gravel, medium dense (estimated), slightly moist, gray										
6		Poorly Graded GRAVEL (GP) with sand, medium dense to dense (estimated), slightly moist, light brown										
7												
8												
9				7	1.5		78	18	4			
10												
11		END AT 10.5 FEET										
12												
13												
14												

Remarks: Groundwater not encountered during excavation.

Figure:

CMT ENGINEERING
LABORATORIES

Excavated By:

Hone Excavating

Logged By:

Sterling Howell

Page: 1 of 1

4

Cedar Hills Gateway

Test Pit Log

TP-4

1800 N. North county Boulevard, Cedar Hills, UT

Equipment: Rubber Tire Backhoe
Surface Elev. (approx):

Total Depth: 11'
Water Depth: (see Remarks)

Date: 4/23/18
Job #: 11162

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Moisture (%)	Dry Density (pcf)	Gradation			Atterberg		
							Gravel %	Sand %	Fines %	LL	PL	PI
0		TOPSOIL: Sandy silt with gravel, roots, organics, slightly moist, brown										
1		Poorly Graded GRAVEL (GP) with sand, cobbles, trace silt, dense to very dense (estimated), heavily cemented in upper 4 to 5 feet, slightly moist, light gray to light brown										
2												
3				8								
4												
5		grades with more sand										
6				9								
7												
8												
9												
10				10	2.3		66	30	4			
11		END AT 11.0 FEET										
12												
13												
14												

Remarks: Groundwater not encountered during excavation.

Figure:

5

Cedar Hills Gateway

Test Pit Log

TP-5

1800 N. North county Boulevard, Cedar Hills, UT

Equipment: Rubber Tire Backhoe
Surface Elev. (approx):

Total Depth: 11'
Water Depth: (see Remarks)

Date: 4/23/18
Job #: 11162

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Moisture (%)	Dry Density (pcf)	Gradation			Atterberg		
							Gravel %	Sand %	Fines %	LL	PL	PI
0		TOPSOIL: Sandy silt with gravel, roots, organics, slightly moist, brown										
1		Poorly Graded GRAVEL (GP) with sand, cobbles, heavily cemented in the upper 4 to 5 feet, dense to very dense (estimated), slightly moist to moist, light brown										
2		grades with cobbles greater than 1 foot in nominal diameter										
3				11	2.6		84	13	3			
4												
5												
6				12								
7												
8												
9												
10				13								
11		END AT 11.0 FEET										
12												
13												
14												

Remarks: Groundwater not encountered during excavation.

Figure:

CMT ENGINEERING
LABORATORIES

Excavated By: Hone Excavating
Logged By: Sterling Howell
Page: 1 of 1

6

Cedar Hills Gateway

1800 N. North county Boulevard, Cedar Hills, UT

Key to Symbols

Date: 4/23/18

Job #: 11162

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Moisture (%)	Dry Density(pcf)	Gradation			Atterberg																																																	
							Gravel %	Sand %	Fines %	LL	PL	PI																																															
COLUMN DESCRIPTIONS																																																											
Depth (ft.): Depth (feet) below the ground surface (including groundwater depth - see water symbol below). Graphic Log: Graphic depicting type of soil encountered (see below). Soil Description: Description of soils encountered, including Unified Soil Classification Symbol (see below). Sample Type: Type of soil sample collected at depth interval shown; sampler symbols are explained below-right. Sample #: Consecutive numbering of soil samples collected during field exploration. Moisture (%): Water content of soil sample measured in laboratory (percentage of dry weight of sample). Dry Density (pcf): The dry density of a soil measured in laboratory (pounds per cubic foot). Gradation: Percentages of Gravel, Sand and Fines (Silt/Clay), obtained from lab test results of soil passing the No. 4 and No. 200 sieves. Atterberg: Individual descriptions of Atterberg Tests are as follows: LL = Liquid Limit (%): Water content at which a soil changes from plastic to liquid behavior. PL = Plastic Limit (%): Water content at which a soil changes from liquid to plastic behavior. PI = Plasticity Index (%): Range of water content at which a soil exhibits plastic properties (= Liquid Limit - Plastic Limit).																																																											
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SAMPLER SYMBOLS - Block Sample - Bulk/Bag Sample - Modified California Sampler 3.5" OD, 2.42" ID D&M Sampler - Rock Core - Standard Penetration Split Spoon Sampler - Thin Wall (Shelby Tube) WATER SYMBOL - Encountered Water Level - Measured Water Level (see Remarks on Logs)																																																											

Note: Dual Symbols are used to indicate borderline soil classifications (i.e. GP-GM, SC-SM, etc.).

- The results of laboratory tests on the samples collected are shown on the logs at the respective sample depths.
- The subsurface conditions represented on the logs are for the locations specified. Caution should be exercised if interpolating between or extrapolating beyond the exploration locations.
- The information presented on each log is subject to the limitations, conclusions, and recommendations presented in this report.

Figure:

7

Cedar Hills Retail

Storm Drainage Report Storm Drainage Basin Pond Sizing

Prepared for:

Wright Development Group
Spencer Wright
1178 W. Legacy Crossing Blvd Suite 100
Centerville, UT
801.773.7339



Prepared by:

Hunt Day Engineering
3445 Antelope Drive, St 200
Syracuse, UT 84075
801.664.4724
Thomas Hunt, PE



March 10, 2025

March 10, 2025

Cedar Hills Public Works
10246 N Canyon Road
Cedar Hills, UT 84062
(801) 785-9968

Subject: Storm Drainage Report

1 - General Site Information

Wright Development Group is planning on developing parcel 95-659-0006 located on the northwest corner of 9930 North 4700 West in Cedar Hills, UT. The area that is to be developed is 0.566 acres in size. The development will be a multi-tenant retail building with 3 tenant spaces and asphalt surface parking. The parcel will be developed in one phase.

The site is currently undeveloped and consists mostly of dry weeds and grasses.

This drainage report covers the design to construct a new detention basin that will be subsurface in a stormtech chamber system. The stormwater basin has been sized to accommodate the entirety of the new development per the Cedar Hills Section 2 Design Standards.

2- Onsite Storm Drainage Generation

The new development has been designed to surface flow the rainfall via curb and gutter to strategically located inlet boxes spread throughout the development. The storm drain inlets, pipes and detention basin are sized to collect and convey storm runoff flows generated by the 100-year storm event. The design storm intensities are from the IDF Curve from the Design Standards for Cedar Hills City for the 100-year storm.

Duration (min)	100-Yr Storm Intensity (in/hr)
10	5.02
15	4.14
30	2.79
60	1.73
120	0.95
180	0.65
360	0.36
720	0.22
1440	0.12

The storm drainage analysis is completed using the rational method, using the rational formula:

$$Q = C * i * A$$

Where;

Q = Design flow in cubic feet per second (cfs)

C = Rational coefficient.

i = Rainfall intensity in inches per hour (in/hr)

A = Drainage area in acres (Ac)

3 – Runoff Coefficients

Runoff coefficients in the Rational Equation (C) represent the percentage of water generated from the design storm event precipitation that will contribute to the runoff from a specific type of ground cover. This means that impermeable surfaces such as asphalt streets and concrete driveways contribute a larger percent of storm precipitation as runoff than do grass area or gravel roads.

The proposed development is divided into 3 surface types and their proposed C values are shown below:

Paved Areas – 0.90		15,183 SF
Roof Areas – 0.90		5,000 SF
Grass/Landscape Areas – 0.20		4,488 SF

This gives a development C-Value of 0.77.

4- Detention

Based upon the runoff coefficient and the 100-year storm event mentioned above and using the rational method, the volume of water has been calculated. Using a release rate of 0.2 cfs/acre against the volume of water generated, the amount of stormwater that is required to be detained has been calculated. The volume of water is 2,436 cubic feet. The designed stormtech system will hold a capacity of 2,812 cubic feet which is greater than the required amount.

The type of detention system is utilizing a subsurface stormtech system. Its details and operation and maintenance processes are found in the appendix.

Calculations and details are included below in the Appendix.

5- LID Measures

The Stormtech system utilizes an Isolator Row as a treatment system. The isolator row and fabric are placed between the stone and chambers. The woven geotextile provides a media for the stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during the cleaning process.

6- Conclusion

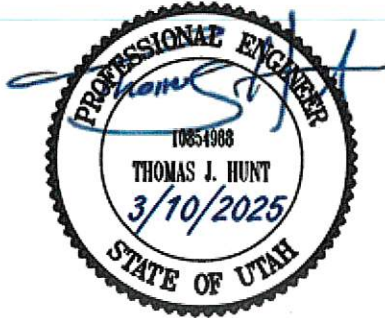
In conclusion, I hereby certify that this report for the onsite drainage of this development was prepared by me (or under my direct supervision) in accordance with the provisions of the Cedar Hills City Standard Specifications and Drawings and was designed to comply with the provisions thereof. I understand that the City assumes no responsibility or liability whatsoever for this report.

Sincerely,

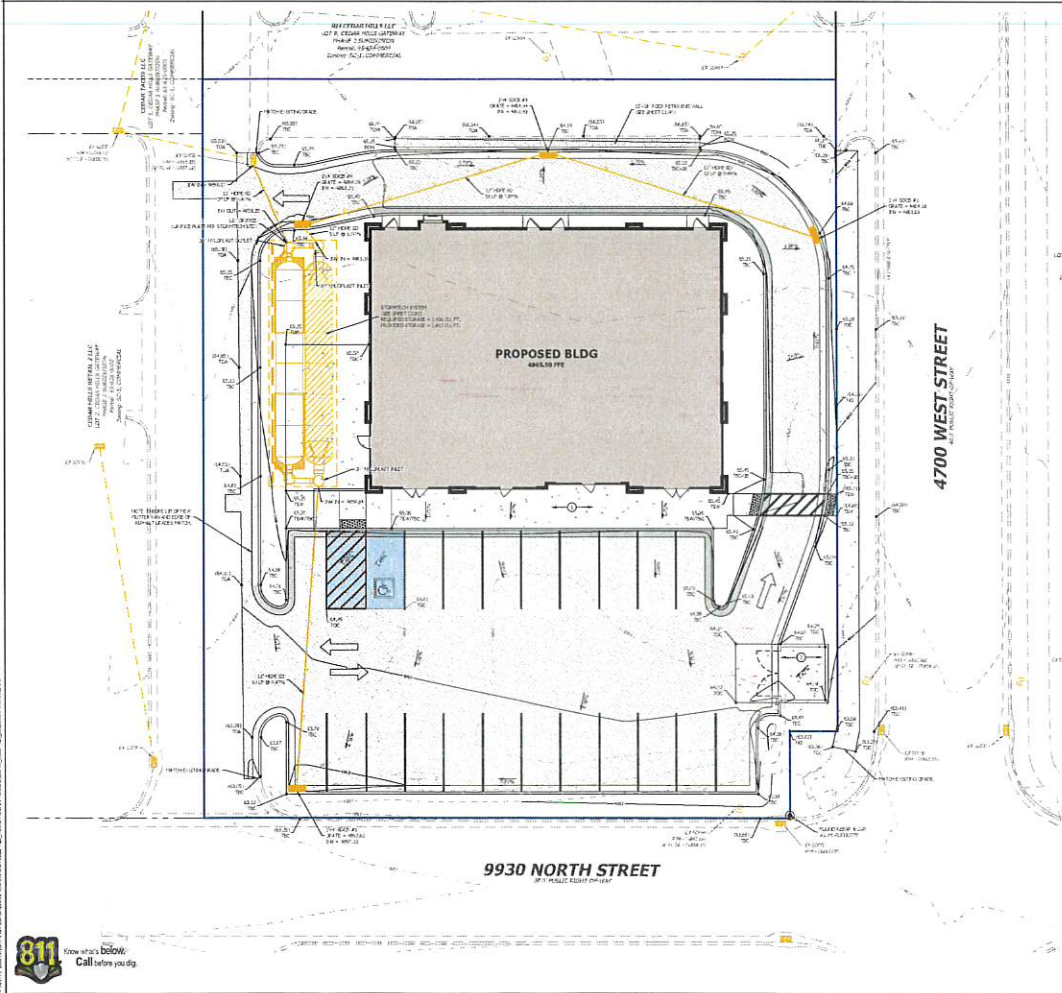
Thomas Hunt, PE



Hunt Day Engineer
3445 Antelope Drive, St 200
Syracuse, UT 84075
801.664.4724



APPENDIX



Storm Runoff Calculations

Cedar Hills (Multi-Tenure Bldg)

The following runoff calculations are based on the Rational, SCS, and SCS-TR-55 methods for the Cedar Hills, UT area. The Cedar Hills area is located in the Cedar Hills area, which is a 10-year return period storm event. The Cedar Hills area is located in the Cedar Hills area, which is a 10-year return period storm event.

The following are the results of the calculations:

Runoff Area	Runoff Coefficient	Runoff Volume (cu ft)	Runoff Rate (cfs)
4700 West Street	0.50	10,000	1.0
9930 North Street	0.50	10,000	1.0
Proposed Bldg	0.50	10,000	1.0

General Notes

1. THE INFORMATION CONTAINED HEREIN IS FOR INFORMATIONAL PURPOSES ONLY AND DOES NOT CONSTITUTE A CONTRACT.
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Benchmark and Basis of Bearing

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Flood Zone

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Development Summary

Item	Description	Quantity
1	Proposed Bldg	10,000 sq ft
2	Parking Area	10,000 sq ft
3	Driveway	10,000 sq ft

Legend

- 1. PROPOSED BLDG
- 2. PARKING AREA
- 3. DRIVEWAY

Notice To Contractors

THE INFORMATION CONTAINED HEREIN IS FOR INFORMATIONAL PURPOSES ONLY AND DOES NOT CONSTITUTE A CONTRACT.

HUNT & DAY
2445 Ashbury Drive, St. 200
St. Louis, MO 63114
PH: 631.664.4774
FAX: 631.664.4775

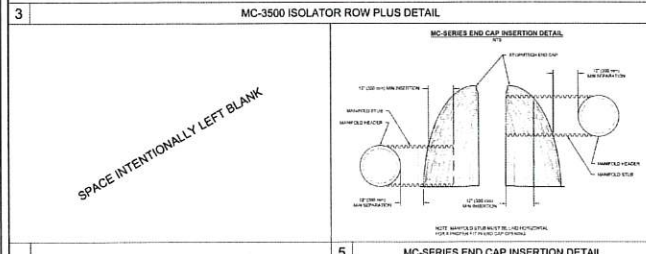
CEDAR HILLS RETAIL
4700 WEST & 9930 SOUTH
CEDAR HILLS, UT
LOCATED IN THE MID-LEVELS OF CEDAR HILLS, UT
DESIGNED BY HUNT & DAY FOR THE DEVELOPER

SITE GRADING PLAN

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

[illegible]

2	MC-3500 CHAMBER SYSTEMS	
	ASPHO MATERIAL CLASSIFICATIONS NONE GRADES OF ASPHALT GRADE 3.5 TO 4.0 AND 5.0 TO 6.0 (1.5 TO 2.5) TO 6.0 TO 8.0	COMPACTION DENSITY REQUIREMENT APPROVED BY STATE DEPARTMENT OF TRANSPORTATION AND FEDERAL HIGHWAY ADMINISTRATION DETERMINED BY STATE DEPARTMENT OF TRANSPORTATION AND FEDERAL HIGHWAY ADMINISTRATION FOR PROPOSED TYPE OF ASPHALT AND PROPOSED TYPE OF ASPHALT AND PROPOSED TYPE OF ASPHALT
	3.5 TO 4.0 AND 5.0 TO 6.0 (1.5 TO 2.5) TO 6.0 TO 8.0 3.5 TO 4.0 AND 5.0 TO 6.0 (1.5 TO 2.5) TO 6.0 TO 8.0 3.5 TO 4.0 AND 5.0 TO 6.0 (1.5 TO 2.5) TO 6.0 TO 8.0	NOT CONTAINED HEREIN STATE DEPARTMENT OF TRANSPORTATION AND FEDERAL HIGHWAY ADMINISTRATION



(REFER TO THE SITE SPECIFIC GEOTECHNICAL REPORT, GEOTECHNICAL

[illegible]

Storm Runoff Calculations

Cedar Hills | Multi Tenant Bldg

3/7/2025 KHH

The following runoff calculations are based on the Rainfall - Intensity - Duration Frequency Curve for the Cedar Hills, UT area taken from the Cedar Hills Design Manual and Specifications, using a 100-year storm for detention, and a 10-year storm for pipe conveyance. Storm water runoff has been calculated for a fully developed site and limited to a release rate of 0.2 cfs/acre.

The calculations are as follows:

Drainage Area:

Total Area =	0.57 acre or	24,671 ft ²	
Runoff Coefficients			
Paved Area	15,183	C = 0.9	
Landscaped Area	4,488	C = 0.2	
Roof	5,000	C = 0.9	
Weighted Runoff Coefficient		C = 0.77	

Rainfall Intensities:

10-yr intensity for a 10 minute TOC - Pipe Capacity	2.57	in/hr
---	------	-------

Peak Run-off:

Runoff Coefficient	C =	0.77
Rainfall Intensity	i =	2.57 IN./HR.
Acreage	A =	0.57 ACRES
Q	Q =	1.12 cfs

Volume of Run-off for 100-year Storm Event:

C =	0.77					
I =	See Below in/hr					
A =	24671.00 ft ²					
Q(out) =	0.11 ft ³ /s	(0.2 cfs per acre)				
time (min)	time (sec)	i (in./hr.)	Q (cfs)	Vol. in (cf)	Vol. out (cf)	Difference (cf)
0	0	0.00	0.00	0	0	0
5	300	6.82	3.01	903	34	869
10	600	5.18	2.29	1371	68	1303
15	900	4.28	1.89	1700	102	1598
30	1800	2.89	1.28	2295	204	2092
60	3600	1.79	0.79	2843	408	2436
120	7200	1.00	0.44	3174	816	2358
180	10800	0.68	0.30	3255	1223	2032
360	21600	0.37	0.16	3546	2447	1099
720	43200	0.22	0.10	4251	4893	-643
1440	86400	0.12	0.05	4689	9787	-5098

Orifice Sizing

Given:	Q =	0.11	cfs
	2g =	64.4	ft/s ²
	H =	3.00	ft
	Cd =	0.62	for circular openings
	R =	SQRT(Q/pi/(0.7*(64.4*H)^0.5))	
	R =	0.06 feet	
		0.78 inches	
	D =	1.55 inches	
	A =	1.89 inches ^2	0.0132 ft ^2

Pipe Sizing

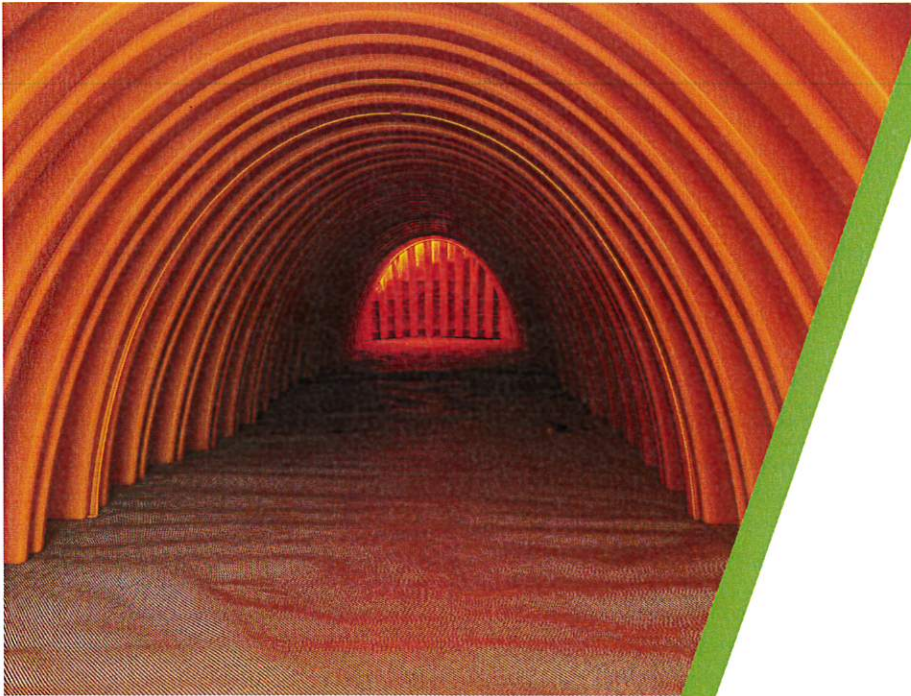
Description	Pipe Size	Slope	Cap. (cfs)	Req. Cap.
12" ADS	12	0.20%	1.61	1.12

SUMMARY:

The required storage volume is	2,436	cubic feet
Orifice size is	1.6	inches

Isolator[®] Row Plus

O&M Manual



ADS
StormTech

The Isolator® Row Plus

Introduction

An important component of any Stormwater Pollution Prevention Plan is inspection and maintenance. The StormTech Isolator Row Plus is a technique to inexpensively enhance Total Suspended Solids (TSS), Total Phosphorus (TP), Total Petroleum Hydrocarbons (TPH) and Total Nitrogen (TN) removal with easy access for inspection and maintenance.

The Isolator Row Plus

The Isolator Row Plus is a row of StormTech chambers, either SC-160, SC-310, SC-310-3, SC-740, DC-780, SC-800, MC-3500, MC-4500 or MC-7200 models, are lined with filter fabric and connected to a closely located manhole for easy access. The fabric lined chambers provide for sediment settling and filtration as stormwater rises in the Isolator Row Plus and passes through the filter fabric. The open bottom chambers allow stormwater to flow vertically out of the chambers. Sediments are captured in the Isolator Row Plus protecting the adjacent stone and chambers storage areas from sediment accumulation.

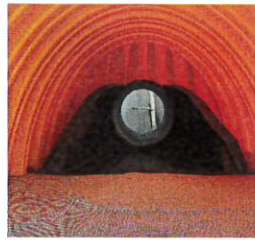
ADS Isolator Row and Plus fabric are placed between the stone and the Isolator Row Plus chambers. The woven geotextile provides a media for stormwater filtration, a durable surface for maintenance, prevents scour of the underlying stone and remains intact during high pressure jetting.

The Isolator Row Plus is designed to capture the "first flush" runoff and offers the versatility to be sized on a volume basis or a flow-rate basis. An upstream manhole provides access to the Isolator Row Plus and includes a high/low concept such that stormwater flow rates or volumes that exceed the capacity of the Isolator Row Plus bypass through a manifold to the other chambers. This is achieved with an elevated bypass manifold or a high-flow weir. This creates a differential between the Isolator Row Plus row of chambers and the manifold to the rest of the system, thus allowing for settlement time in the Isolator Row Plus. After Stormwater flows through the Isolator Row Plus and into the rest of the chamber system it is either exfiltrated into the soils below or passed at a controlled rate through an outlet manifold and outlet control structure.

The Isolator Row Plus Flamp™ is a flared end ramp apparatus attached to the inlet pipe on the inside of the chamber end cap. The FLAMP provides a smooth transition from pipe invert to fabric bottom. It is configured to improve chamber function performance by enhancing outflow of solid debris that would otherwise collect at the chamber's end, or more difficult to remove and require confined space entry into the chamber area. It also serves to improve the fluid and solid flow into the access pipe during maintenance and cleaning and to guide cleaning and inspection equipment back into the inlet pipe when complete.

The Isolator Row Plus may be part of a treatment train system. The treatment train design and pretreatment device selection by the design engineer is often driven by regulatory requirements. Whether pretreatment is used or not, StormTech recommend using the Isolator Row Plus to minimize maintenance requirements and maintenance costs.

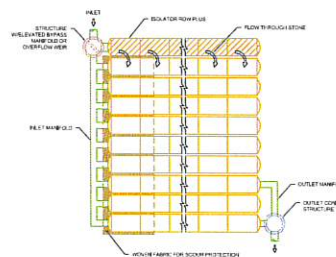
Note: See the StormTech Design Manual for detailed information on designing inlets for a StormTech system, including the Isolator Row Plus.



Looking down the Isolator Row Plus from the manhole opening, ADS Plus fabric is shown between the chamber and stone base.



StormTech Isolator Row Plus with Overflow Structure (not to scale)



Isolator Row Plus Inspection/Maintenance

Inspection

The frequency of inspection and maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, residential), anticipated pollutant load, percent imperviousness, climate, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row Plus should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row Plus incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

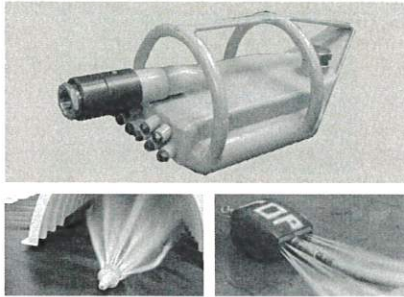
If upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3" (75 mm) throughout the length of the Isolator Row Plus, clean-out should be performed.

Maintenance

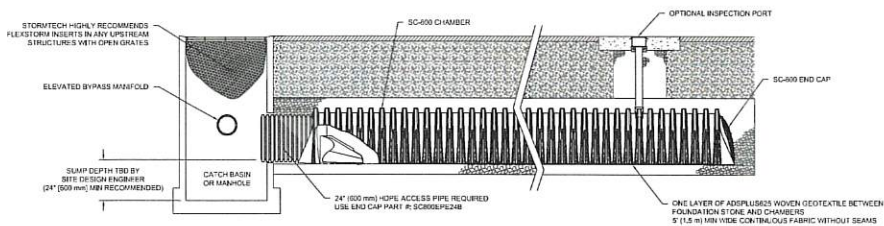
The Isolator Row Plus was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided

via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entry.

Maintenance is accomplished with the JetVac process. The JetVac process utilizes a high pressure water nozzle to propel itself down the Isolator Row Plus while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/JetVac combination vehicles. Selection of an appropriate JetVac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45° are best. StormTech recommends a maximum nozzle pressure of 2000 psi be utilized during cleaning. JetVac reels can vary in length. For ease of maintenance, ADS recommends Isolator Row Plus lengths up to 200' (61 m). **The JetVac process shall only be performed on StormTech Isolator Row Plus that have ADS Plus Fabric (as specified by StormTech) over their angular base stone.**



StormTech Isolator Row Plus (not to scale)



Isolator Row Plus Step By Step Maintenance Procedures

Step 1

Inspect Isolator Row Plus for sediment.

- A) Inspection ports (if present)
 - i. Remove lid from floor box frame
 - ii. Remove cap from inspection riser
 - iii. Using a flashlight and stadia rod, measure depth of sediment and record results on maintenance log.
 - iv. If sediment is at or above 3 inch depth, proceed to Step 2. If not, proceed to Step 3.
- B) All Isolator Row Plus
 - i. Remove cover from manhole at upstream end of Isolator Row Plus
 - ii. Using a flashlight, inspect down Isolator Row Plus through outlet pipe
 1. Mirrors on poles or cameras may be used to avoid a confined space entry
 2. Follow OSHA regulations for confined space entry if entering manhole
 - iii. If sediment is at or above the lower row of sidewall holes (approximately 3 inches), proceed to Step 2.
 2. If not, proceed to Step 3.

Step 2

Clean out Isolator Row Plus using the JetVac process.

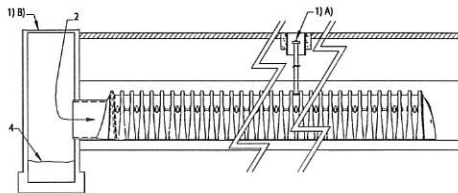
- A) A fixed floor cleaning nozzle with rear facing nozzle spread of 45 inches or more is preferable
- B) Apply multiple passes of JetVac until backflush water is clean
- C) Vacuum manhole sump as required

Step 3

Replace all caps, lids and covers, record observations and actions.

Step 4

Inspect & clean catch basins and manholes upstream of the StormTech system.



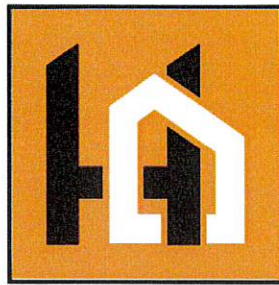
Sample Maintenance Log

Date	Stadia Rod Readings		Sediment Depth (1)-(2)	Observations/Actions	Inspector
	Fixed point to chamber bottom (1)	Fixed point to top of sediment (2)			
3/15/11	6.3 ft	none		New installation, Fixed point is CI frame at grade	DCM
9/24/11		6.2	0.1 ft	Some grit felt	SM
6/20/13		5.8	0.5 ft	Mucky feel, debris visible in manhole and in Isolator Row Plus, maintenance due	NV
7/7/13	6.3 ft		0	System jetted and vacuumed	DCM

ADS "Terms and Conditions of Sale" are available on the ADS website, www.adspipe.com
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StormTech® and the Isolator® Row Plus are registered trademarks of StormTech, Inc.
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adspipe.com
800-821-6710

ADS
StormTech



Cedar Hills Retail

Traffic Memo

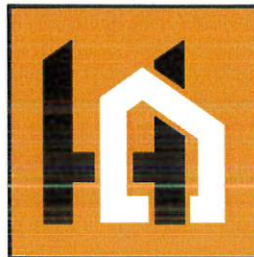
Prepared for:

Wright Development Group
Spencer Wright
1178 W. Legacy Crossing Blvd Suite 100
Centerville, UT
801.773.7339



Prepared by:

Hunt Day Engineering
3445 Antelope Drive, St 200
Syracuse, UT 84075
801.664.4724
Thomas Hunt, PE



March 10, 2025

March 10, 2025

Cedar Hills Public Works
10246 N Canyon Road
Cedar Hills, UT 84062
(801) 785-9968

Subject: Traffic Memo

This Traffic Memo has been prepared to discuss the onsite traffic flow and circulation to ensure that there is sufficient stacking length for the drive thru and proper site circulation.

The project will be accessible from 9930 North, 9980 North and 4700 West. The three access points will provide multiple points of access to/from major collector roadways to help offset traffic impact to any/all direct intersections.

The retail building will consist of one drive-thru tenant and two retail tenants. The drive-thru is designed to accommodate 9 vehicles that can be in queue before it backs into the on-site parking lot. It has an additional 5 vehicles spaces that can be accounted for in the parking lot (totaling 14 vehicles) that can be in queue before the drive-thru stacking would potentially back up and impact off-site traffic circulation.

Nearby businesses can offer a maximum of 6 vehicles in queue before they start impact off-site traffic circulation. So this project will have more than double the stacking length than nearby similar projects.

In addition, the drive-thru tenant is expecting to have a maximum of 34 drive thru vehicles during the PM Peak Hour. The service rate of the drive-thru tenant is to service one car every 132 seconds – or every 2.2 minutes. Based on this service rate, the maximum number of cars in queue will be 7 vehicle.

Based on the information above, the proposed development will not back-up or impact the nearby traffic circulation. If there are any questions or concerns, please let us know.

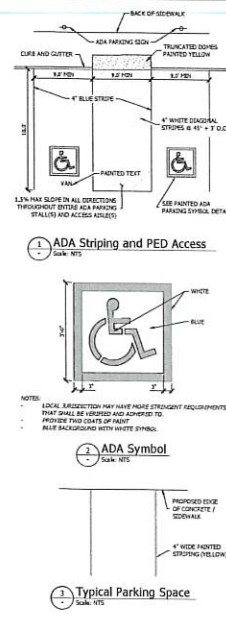
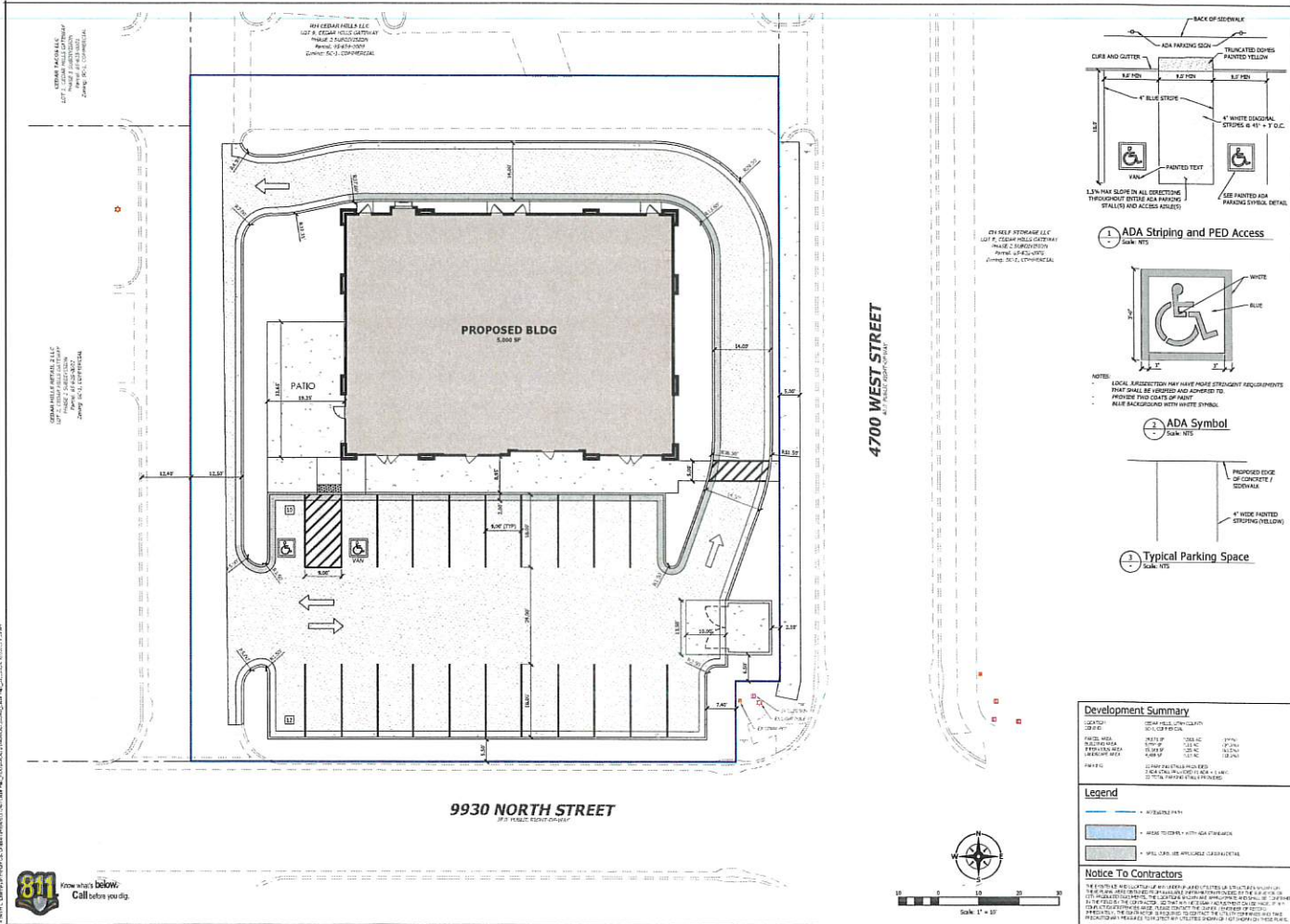
Sincerely,

Thomas Hunt, PE



Hunt Day Engineer
3445 Antelope Drive, St 200
Syracuse, UT 84075
801.664.4724





Development Summary

LOCATION	OWNER	DESIGNER
4700 WEST & 9930 SOUTH	CEAR HILLS RETAIL	HUNT & DAY
PROJECT NO.	1000-001	DATE
DATE	03/06/2023	BY
BY	03/06/2023	DATE

Legend

- WALKWAY
- WALKWAY WITH ADA STRIPING
- WALKWAY WITH ADA STRIPING

Notice To Contractors

THE DESIGNER HAS CONDUCTED A VISUAL SURVEY OF THE SITE AND HAS FOUND NO OBSTACLES TO THE PROPOSED DEVELOPMENT. THE DESIGNER HAS CONDUCTED A VISUAL SURVEY OF THE SITE AND HAS FOUND NO OBSTACLES TO THE PROPOSED DEVELOPMENT. THE DESIGNER HAS CONDUCTED A VISUAL SURVEY OF THE SITE AND HAS FOUND NO OBSTACLES TO THE PROPOSED DEVELOPMENT.

HUNT & DAY
1415 Arapahoe Drive, Ste. 200
Salt Lake City, UT 84119
Tel: 313.664.4724
EM: Thomas@HuntDay.co

CEDAR HILLS RETAIL
4700 WEST & 9930 SOUTH
CEDAR HILLS, UT
LOCATED IN THE NEW QUARTERS OF CEDAR HILLS
THROUGHOUT THE HILLS OF CEDAR HILLS

PROPOSED SITE PLAN

SHEET NO.
C1.00



The City of Cedar Hills

TO:	Planning Commission
FROM:	Chandler Goodwin
DATE:	March 25, 2025

SUBJECT:	Review/Recommendation and Public Hearing on Conceptual and Preliminary Plan approval for a commercial development at 4773 W Cedar Hills Drive, located in the Cedar Hills Retail Center Subdivision
APPLICANT PRESENTATION:	
STAFF PRESENTATION:	Chandler Goodwin, City Manager/Planner

BACKGROUND AND FINDINGS:

Project Overview

The project involves constructing a new 1,025-square-foot Dutch Bros Coffee shop with a drive-through service window at 4773 West Cedar Hills Drive in Cedar Hills, Utah. The site is approximately 1.477 acres (64,331 square feet) in a Commercial (SC-1) zone.

Building Design

- 1,025-square-foot coffee shop with drive-through and walk-up windows
- Modern design with variety of high-quality building materials and bold colors
- Features vertical and horizontal façade breaks, modulation, and a tower element
- Canopy awnings over all entrances, including a large 300-square-foot canopy over the customer walk-up window
- Proposed outdoor patio seating area with weather protection
- Dutch Bros Coffee logos and signs on all sides of the building
- Service window located on the northwestern building façade
- Finished floor elevation of 4878.70 feet

Landscaping:

Interior and perimeter landscaping included in the site design

Various plant species identified in the landscaping plan (LP-1), including:

Juniper (Jun), Karl Foerster grass (KF), Fountain grass (FG), Barberry (Bg), Boxwood (BB)
Spirea (Sc)

4"x6" concrete mow strip planned along property boundaries

The site will be 67% impervious and 33% pervious surface (23% landscaping)

Landscaping buffers on the north, west, and east sides, with scattered landscape islands throughout

Traffic and Site Circulation:

- Dual drive-through lanes with stacking for up to 16 vehicles (approximately 350 feet)

- Bypass/exit lane for quicker service
- ADA-accessible pedestrian path to the northeast connecting to the right-of-way
- No speaker boxes for ordering; staff takes orders in person using handheld devices
- "Runner system" for increased efficiency where employees take orders from vehicles in line
- Site designed for optimal traffic flow to minimize queue spillover
- Three to four staff dedicated to managing traffic flow during operation
- Operational tactics to maximize queue efficiency and prevent traffic backups
- Service time target of 30-45 seconds per customer at the window
- Typical business hours include 24-hour operation (unless restricted)
- Staffing of 7-8 employees per shift, with 3-4 total shifts
- Site is accessible via existing access from West Cedar Hills Drive

Site Engineering:

- Stormwater drainage designed to sheet flow south toward proposed storm drain inlets
- Underground stormwater chamber system for the overall development
- Site divided into three sub-drainage basins (A-1, A-2, A-3)
- Geotechnical testing shows natural soils consisting of sand and gravel layers extending to depths of 12.5-16.5 feet
- No groundwater encountered in bore holes
- Footings recommended at minimum 30 inches below final grade for exterior foundations
- Recommended pavement sections vary for parking areas vs. drive areas

This Dutch Bros Coffee development is part of a larger commercial development that currently includes a Dollar Tree, Great Clips, and a pizza restaurant, with a Jack in the Box planned nearby.

PREVIOUS LEGISLATIVE ACTION:

N/A

FISCAL IMPACT:

N/A

SUPPORTING DOCUMENTS:

Site plan, engineering, landscaping plan, stormwater plan, and all other engineering documents

RECOMMENDATION:

Staff recommends that the Planning Commission approve the concept plan and preliminary plans, subject to any changes required for final approval

MOTION:

To recommend/not recommend the preliminary plans for the commercial development at 4773 W Cedar Hills Drive, Dutch Bro's Coffeeshop, to the City Council for approval, subject to the following conditions: {LIST ANY CONDITIONS NECESSARY FOR APPROVAL}

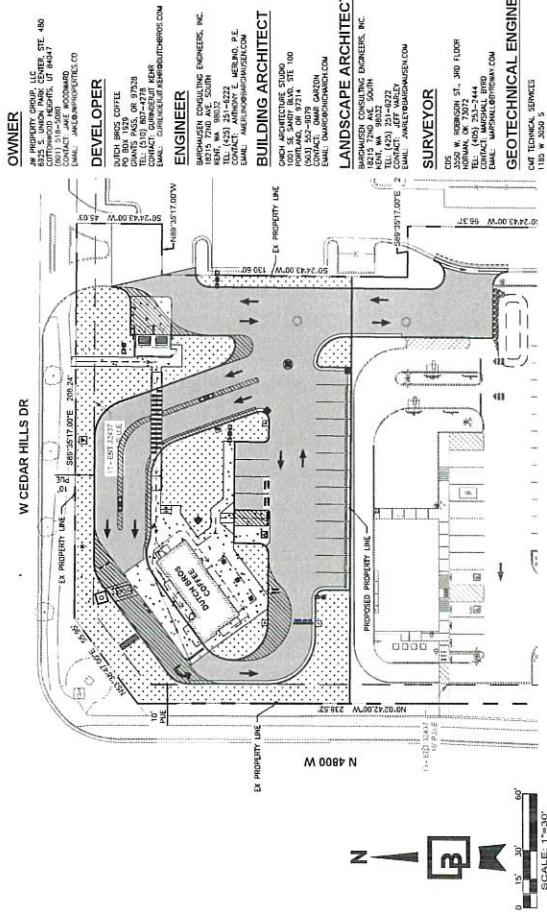
- Final engineering review
- Final zoning review, including compliance with 10-6A and a landscaping plan review
- Verification of water rights conveyed to the City
- {LIST ANY OTHER CONDITIONS NECESSARY FOR APPROVAL}



GENERAL SITE NOTES:

1. THE CONTRACTOR SHALL OBTAIN AND HAVE AVAILABLE COPIES OF THE APPLICABLE GOVERNING AGENCY STANDARDS AT THE JOB SITE DURING THE RELATED CONSTRUCTION OPERATIONS.
2. CONSTRUCTION SHALL INSURE THAT ALL NECESSARY PERMITS HAVE BEEN OBTAINED PRIOR TO COMMENCING WORK.
3. CONSTRUCTION SHALL BE RESPONSIBLE FOR OBTAINING THE NECESSARY PERMITS AND FOR OBTAINING ALL NECESSARY UTILITIES PRIOR TO CONSTRUCTION. WHEN WORKING IN THESE AREAS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR OBTAINING ALL NECESSARY UTILITIES PRIOR TO CONSTRUCTION. WHEN WORKING IN THESE AREAS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR OBTAINING ALL NECESSARY UTILITIES PRIOR TO CONSTRUCTION.
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DUTCH BROS COFFEE UT0901
4773 W. CEDAR HILLS DR., CEDAR HILLS, UT



OWNER
DUTCH BROS COFFEE, LLC
4773 W. CEDAR HILLS DR., UT 84062
CONTACT: JEFF KOSMAN
EMAIL: JEFF@DUTCHBROS.COM

DEVELOPER
DUTCH BROS COFFEE
4773 W. CEDAR HILLS DR., UT 84062
CONTACT: JEFF KOSMAN
EMAIL: JEFF@DUTCHBROS.COM

ENGINEER
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FAX: (801) 555-4339
CONTACT: JEFF KOSMAN
EMAIL: JEFF@BARGHAUSEN.COM

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LANDSCAPE ARCHITECT
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CONTACT: JEFF KOSMAN
EMAIL: JEFF@BARGHAUSEN.COM

SURVEYOR
CUT TECHNICAL SERVICES
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TEL: (801) 555-4339
FAX: (801) 555-4339
CONTACT: JEFF KOSMAN
EMAIL: JEFF@CUTTECHNICAL.COM

GEOTECHNICAL ENGINEER
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1001 S. 3000 W., SUITE 100
SALT LAKE CITY, UT 84119
TEL: (801) 555-4339
FAX: (801) 555-4339
CONTACT: JEFF KOSMAN
EMAIL: JEFF@BARGHAUSEN.COM

LEGAL DESCRIPTION:

LOT 1, CEDAR HILLS RETAIL CENTER SUBDIVISION, ACCORDING TO THE OFFICIAL PLAT OF CEDAR HILLS RETAIL CENTER SUBDIVISION, RECORDED IN THE OFFICE OF THE STATE ENGINEER, STATE OF UTAH.

BASIS OF BEARINGS:

THE BASIS OF BEARINGS IS NORTH 47°W BETWEEN THE WEST QUARTER CORNER AND THE SOUTHWEST CORNER OF SECTION 6, TOWNSHIP 5 SOUTH, RANGE 2 WEST, 1ST 6N, 10E, AND NEARBY.

FLOOD ZONE:

THE FLOOD ZONE DESIGNATION FOR THE SUBJECT PROPERTY IS ZONE "X" PER THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP, MAP NUMBER 4806020167, DATED JUNE 16, 2000.

GEOTECHNICAL REPORT NOTES:

1. THE FOLLOWING GEOTECHNICAL REPORT FOR THE SITE SHALL BE CONSIDERED PART OF THESE CONSTRUCTION DOCUMENTS:
GEOTECHNICAL ENGINEERING SURVEY
DUTCH BROS COFFEE UT0901
CEDAR HILLS, UT 84062
PROJECT NO. 23874
DATE: MARCH 6, 2025
CUT TECHNICAL SERVICES
DOZEN, UT 84061
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL PROVISIONS OF THE SOILS REPORT FOR THE SITE BE OBSERVED AND COMPLIED WITH. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR OBTAINING ALL NECESSARY UTILITIES PRIOR TO CONSTRUCTION.
3. ANY PROVISIONS OF THE SOILS REPORT WHICH CONFLICT WITH INFORMATION SHOWN ELSEWHERE ON THESE DRAWINGS, OR WHICH REQUIRE FURTHER CLARIFICATION, SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER FOR DETERMINATION.
4. A PRELIMINARY SOILS REPORT WAS OBTAINED FROM THE UTILITY COMPANY TO OBTAIN THE SOILS INFORMATION AND TO VERIFY FIELD CONDITIONS AS WORK PROCEEDS. THE SOILS ENGINEER SHALL SUBMIT FIELD REPORTS TO THE ARCHITECT/ENGINEER FOR REVIEW AND APPROVAL. THE SOILS ENGINEER SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR OBTAINING ALL NECESSARY UTILITIES PRIOR TO CONSTRUCTION.
5. THE SOILS ENGINEER SHOULD BE NOTIFIED AT LEAST FIVE (5) WORKING DAYS PRIOR TO ANY SITE CLEARING OR GRADING.

EXISTING TOPOGRAPHY / SURVEY INFORMATION NOTE:

AN ALTA BOUNDARY SURVEY DATED SEPTEMBER 3, 2024, PERFORMED BY CUTS HAS BEEN PROVIDED TO BARGHAUSEN CONSULTING ENGINEERS, INC. FOR REVIEW AND APPROVAL. THE SURVEY INFORMATION IS BASED ON THE ALTA BOUNDARY SURVEY AND THE INFORMATION PROVIDED TO BARGHAUSEN CONSULTING ENGINEERS, INC. FOR REVIEW AND APPROVAL. THE SURVEY INFORMATION IS BASED ON THE ALTA BOUNDARY SURVEY AND THE INFORMATION PROVIDED TO BARGHAUSEN CONSULTING ENGINEERS, INC. FOR REVIEW AND APPROVAL.

HORIZONTAL CONTROL NOTE:

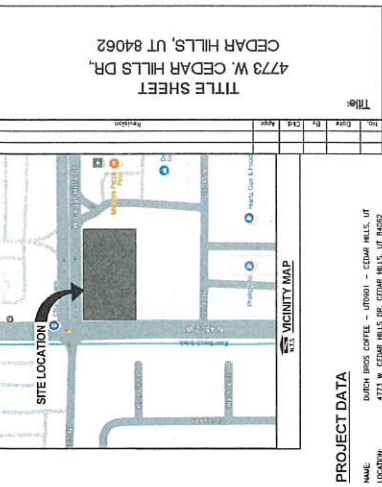
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UTILITY CONFLICT NOTE:

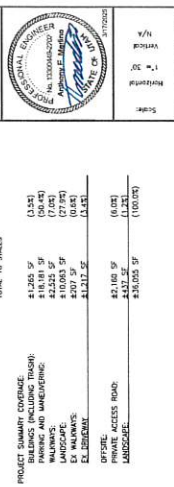
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MONUMENT PROTECTION NOTE:

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PROJECT DATA
NAME: DUTCH BROS COFFEE - UT0901 - CEDAR HILLS, UT
LOCATION: 4773 W. CEDAR HILLS DR., CEDAR HILLS, UT 84062
APN #: 55-14-0001
EXISTING USE: UNDEVELOPED/VALENT LAND
PROPOSED USE: DRIVE THROUGH COFFEE SHOP
EXISTING ZONING: SC-1 COMMERCIAL
PROPOSED ZONING: SC-1 COMMERCIAL
PROJECT AREA: 33,458 SF (0.77 AC)
SPOTS PROJECT AREA: 30,055 SF (0.69 AC)
PARKING AREA: 1,403 SF (0.03 AC)
PROPOSED BUILDING INFORMATION:
BUILDING TYPE: 1
BUILDING STORIES: 1
BUILDING HEIGHT: 25 FT
SETBACKS: FRONT SETBACK: N/A
SIDE SETBACK: N/A
REAR SETBACK: N/A
MINIMUM SOIL DEPTH: N/A
MINIMUM FLOOR: 25 FT
MINIMUM FLOOR AREA: 100 SF
SPOTS FLOOR AREA: 100 SF
PARKING SPACES REQUIRED: 4 SPACES
PARKING SPACES PROVIDED: 11 REGULAR SPACES
TOTAL 18 TOTALS
PROJECT SUMMARY COVERAGE:
BUILDINGS INCLUDING THOSE: 11,265 SF (0.26 AC)
LANDSCAPE: 11,265 SF (0.26 AC)
TOTAL: 22,530 SF (0.52 AC)
LANDSCAPE: 11,265 SF (0.26 AC)
TOTAL: 22,530 SF (0.52 AC)
PRIVATE ACCESS ROAD: 43,116 SF (0.99 AC)
LANDSCAPE: 23,025 SF (0.53 AC)



Sheet Number	Sheet Title
C1.0	TITLE SHEET
C1.1	ALTA-MAPS AND TITLE SURVEY
C1.2	EXISTING TOPOGRAPHY AND EROSION CONTROL PLAN
C1.3	EROSION CONTROL DETAILS
C1.4	SOILS REPORT
C1.5	MINORUTIAL CONTROL PLAN
C1.6	GRADING PLAN
C1.7	SWANSON PLAN
C1.8	UTILITY PLAN
C1.9	SOIL DETAILS
C2.0	AGENCY DETAILS

Barghausen Consulting Engineers, LLC
1825 72nd Avenue South
Kent, WA 98032
425.251.7222
barghausen.com

Job Number: 23689
Sheet: C1.0
Title: 23689

Date: 03/21/25
Approved: [Signature]
Checked: [Signature]
Drawn: [Signature]
Designed: [Signature]

DUTCH BROS COFFEE UT0901
4773 W. CEDAR HILLS DR., CEDAR HILLS, UT



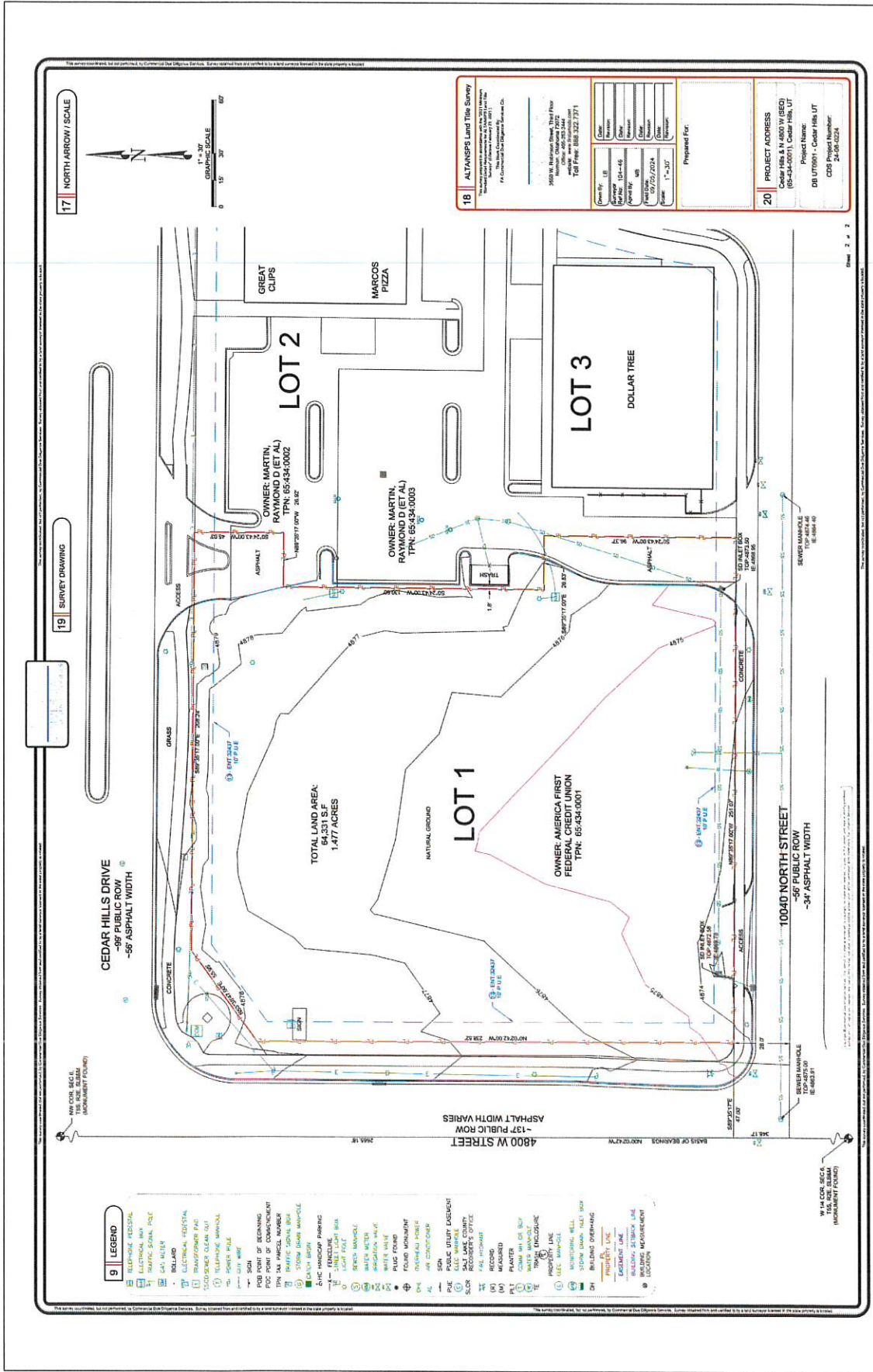
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18215 72nd Avenue South
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barghausen.com

23689
C1.2

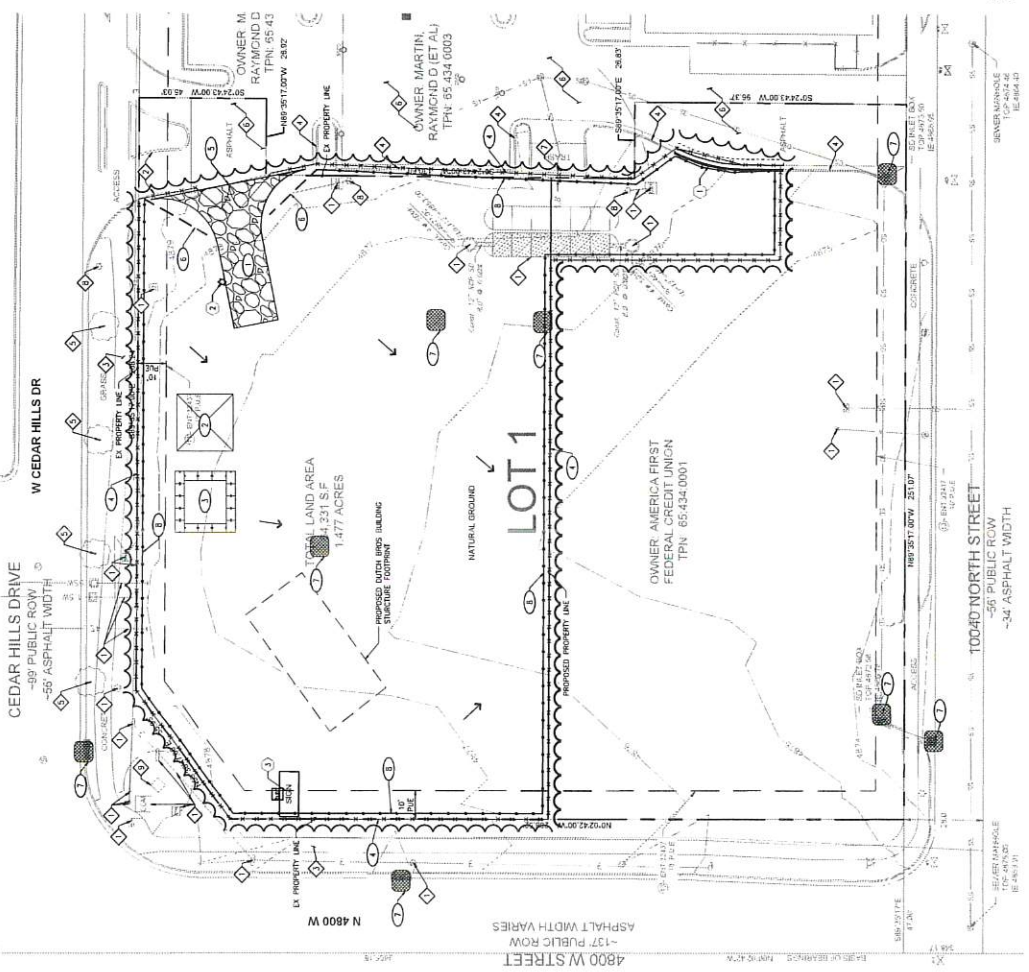
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DEMOLITION NOTES

1. DEMOLISH EXISTING CURB AND GUTTER, TYPICAL.
2. DEMOLISH AND RELOCATE EXISTING SIDE LIGHT, TYPICAL.
3. DEMOLISH AND REPAIR EXISTING FLOW.

 SPECIAL PROTECTION NOTES

1. PROJECT EXISTING UTILITY BOXES, MANHOLES, CLEANOUTS, FEEDSTOCK, HYDRAULIC AND ASSOCIATED UNDERGROUND UTILITIES, LINE FROM DAMAGE DURING CONSTRUCTION. PROVIDE ADEQUATE PROTECTION TO CORRESPONDING LOCATION OF EXISTING UTILITY. PROVIDE ADEQUATE PROTECTION TO EXISTING UTILITY.
2. PROJECT EXISTING CURB FROM DAMAGE DURING CONSTRUCTION.
3. PROJECT EXISTING SIDEWALK FROM DAMAGE DURING CONSTRUCTION.
4. PROJECT EXISTING CURB AND PROTECTED FROM DAMAGE DURING CONSTRUCTION.
5. EXISTING TREE TO BE CUTTER FROM DAMAGE DURING CONSTRUCTION.
6. PROJECT EXISTING PAVEMENT FROM DAMAGE DURING CONSTRUCTION.
7. PROJECT EXISTING TRASH ENCLOSURE FROM DAMAGE DURING CONSTRUCTION.
8. PROJECT EXISTING LIGHT FROM DAMAGE DURING CONSTRUCTION.
9. PROJECT EXISTING MONUMENT SIGN FROM DAMAGE DURING CONSTRUCTION.

① EROSION CONTROL NOTES:

- [illegible]

TEMPORARY WORK EASEMENT NOTE

CONTRACTOR TO OBTAIN TEMPORARY WORK PERMITS, DOCUMENTATION AND COORDINATE WITH ADJACENT PROPERTY OWNER, PRIOR TO COMMENCING ANY OFF-SITE CONSTRUCTION ACTIVITIES.

UTILITY CONFLICT NOTE

THE UTILITIES AND UTILITIES WHETHER SHOWN ON THESE PLANS OR NOT BY POTHOLES, THE UTILITIES SURVEYING THE HORIZONTAL AND VERTICAL LOCATION PRIOR TO CONSTRUCTION. THIS SHALL INCLUDE CALLING UTILITY LOCATE AT 811 AND THEN POTHOLES ALL OF THE EXISTING UTILITIES AT LOCATIONS OF NEW UTILITY CROSSINGS TO PHYSICALLY VERIFY WHETHER OR NOT CONTACTS EXISTED PRIOR TO CONSTRUCTION. CONTRACTORS SHALL BE RESPONSIBLE FOR CONTACTS EXISTING PRIOR TO CONSTRUCTION. ALL UTILITIES ARE SUBJECT TO VARIATION. IF CONFLICTS SHOULD OCCUR, THE CONTRACTOR SHALL NOTIFY BAIGRAMAN CONSULTING ENGINEERS, INC. TO RESOLVE ALL PROBLEMS PRIOR TO PROCEEDING WITH CONSTRUCTION.

UTILITY COORDINATION NOTE

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES PRIOR TO PERFORMING ANY DEMOLITION ACTIVITIES TO ENSURE PROPER PROTECTION AND DISCONNECTION

UTILITY PROTECTION NOTE:

APPROXIMATE LOCATION OF EXISTING GAS SERVICE IS SHOWN ON THESE PLANS. CONTRACTOR TO COORDINATE WITH PURVEYOR AND USE EXTREME CAUTION WHEN EXCAVATING ON-SITE. UNTIL EXISTING GAS AND POWER SERVICE LOCATIONS ARE CONFIRMED, CONTRACTOR TO ORDER INDEPENDENT UTILITY LOCATES (INCLUDING GAS AND POWER) FOR THE FULL SCOPE OF WORK PRIOR TO CONSTRUCTION OF ANY GROUND DISTURBING ACTIVITIES.

WET WEATHER NOTE:

CONJUNCTION WITH HYDROSEEDING DURING THE WET SEASON FOR THE TEMPORARY PROTECTION OF DISTURBED SOIL. HYDROSEEDING MAY BE USED ALONE ONLY IF THERE IS SUFFICIENT TIME TO ENSURE ADEQUATE VEGETATION ESTABLISHMENT BEFORE THE START OF THE RAINY SEASON.

STREET CLEANING NOTE:

ALL LOOSE SOIL AND DEBRIS SHALL BE REMOVED FROM THE ACCESS DRIVE UPON STARTING OPERATIONS AND DAILY THEREAFTER OR AS DIRECTED BY THE INSPECTOR. THE SITE SHALL BE MAINTAINED SO AS TO MINIMIZE SEDIMENT LAIDEN RUNOFF TO ANY STORM DRAIN SYSTEM.

INLET PROTECTION NOTE

GENERAL CONTRACTOR SHALL PROVIDE RILEY PROTECTION AT ALL EXISTING AND PROPOSED CATCH BASINS AS NECESSARY TO PREVENT SILT-LOADED WATER FROM ENTERING STORM DRAINAGE SYSTEM. COORDINATE PLACEMENT WITH PROPERTY OWNERS AND AS DIRECTED BY CITY INSPECTOR. SEE DETAIL EN 4/SHT C1.4

EXPOSED SOILS NOTE

PRIOR TO A RAIN EVENT, OR IF ANY AREA WILL NOT BE ACTIVELY WORKED ON WITHIN 14 DAYS, ALL DISTURBED OR EXPOSED SOILS SHALL BE PROTECTED, AT A MINIMUM, WITH STRAW MULCH AND TACKIFIER APPLICATION. APPLY TACKIFIER ON STRAW MULCH TO HOLD MULCH IN PLACE. THIS IS A MINIMUM REQUIREMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING AND INSTALLING THE APPROPRIATE LEVEL OF EROSION AND SEDIMENT CONTROL.

EROSION AND SEDIMENT CONTROL NOTES:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE EROSION AND SEDIMENT CONTROL MANUAL, 2007 EDITION, PUBLISHED BY THE ARIZONA DEPARTMENT OF WATER RESOURCES, DIVISION OF WATER CONSERVATION, 1000 NORTH CENTRAL AVENUE, SUITE 100, PHOENIX, ARIZONA 85004.
2. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH THE EROSION AND SEDIMENT CONTROL MANUAL, 2007 EDITION, PUBLISHED BY THE ARIZONA DEPARTMENT OF WATER RESOURCES, DIVISION OF WATER CONSERVATION, 1000 NORTH CENTRAL AVENUE, SUITE 100, PHOENIX, ARIZONA 85004.
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STORMWATER QUALITY CONTROL NOTES:

- [illegible]

TEMPORARY DUST CONTROL MEASURES:

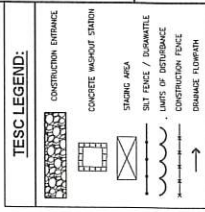
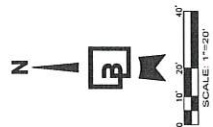
1. THE CONTRACTOR SHALL MAINTAIN A SUFFICIENT NUMBER OF WATER TRUCKS AT THE SITE TO SPRAY THE GRADED OR CURBED SIDE WITH WATER AS REQUIRED TO CONTROL DUST.
2. THE CONTRACTOR SHALL CONDUCT ALL OPERATIONS SO THAT DUSTATION, EROSION, AND IMPORTED MATERIAL IS SPINNED WITH WATER DURING GRADING OPERATIONS.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DUST CONTROL DURING CONSTRUCTION AND SHALL FOLLOW THE CONSTRUCTION METHODS ESTABLISHED BY THE CITY OF CEDAR HILLS AND UTAH DEPARTMENT OF TRANSPORTATION (UDOT).

BMP MAINTENANCE NOTES:

1. ALL CONTAMINATED AREAS NOT BEING WORKED ON FOR 14 DAYS.
2. TEMPORARY EMISSION CONTROLS SHOULD NOT BE REMOVED BEFORE PERMANENT EMISSION CONTROLS ARE IN-PLACE AND ESTABLISHED.
3. ALL MEASURES TO CONTROL EMISSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY SAFETY WORKING OPERATIONS ARE INITIATED.
4. ALL TEMPORARY EMISSION CONTROL MEASURES SHALL BE CHECKED AND UPDATED, AS

INSPECTION AND MAINTENANCE:

1. THE CONTRACTOR SHALL INSPECT AND CLEAN BARRIERS DURING AND AFTER EACH STORM AND REMOVE STORMWATER FROM THE BARRIERS AND THE STRUCTURE AFTER EACH STORM.
2. ANY SEDIMENT AND GRAVEL SHALL BE IMMEDIATELY REMOVED FROM THE TRAVELLED WAY OF ROADS.
3. THE REMOVED SEDIMENT SHALL BE PLACED WHERE IT CANNOT ENTER A STORM DRAIN, STREAM, OR BE TRANSPORTED OFF SITE.
4. IF THE GRAVEL BECOMES CLOGGED WITH SEDIMENT IT MUST BE REMOVED FROM THE INLET AND/OR REPLACED WITH NEW GRAVEL.
5. IT IS URGENT THAT EROSION CONTROL MEASURES ARE IN PLACE AT THE SOURCE IN ADDITION TO PROTECTING THE CATCH BASINS AND CATCH BASINS DOWNSIDE.



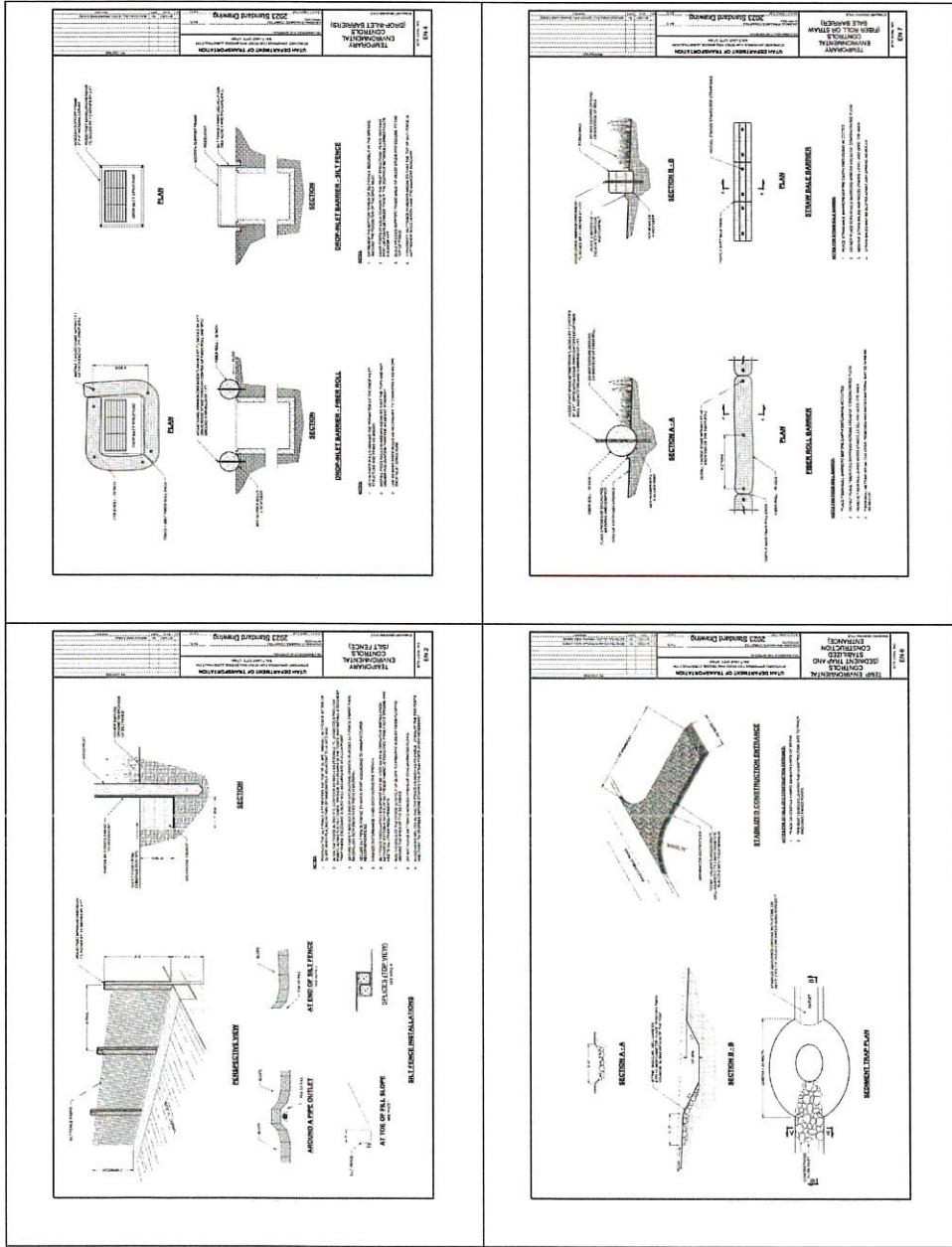
Sheet C1.3		Barghausen Consulting Engineers, LLC. 1825 72nd Avenue South Kent, WA 98032 425.251.6222 barghausen.com	Date: 5/17/2025 5:16 PM User: V:\20004\123889\mcmcm\123889-NC.dwg
Job Number 23689	Title DEMOLITION AND EROSION CONTROL PLAN	Scale As Shown Orientation North Date 5/17/2025 Author JTB Appr'd JTB Ver'd JTB	For 



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Job Number
23689



Barghausen
Consulting Engineers, LLC
10215 72nd Avenue South
Kent, WA 98032
barghausen.com
425.251.6222

Drawn: JLM
Checked: JLM
Approved: JLM
Date: 03/13/23
Scale: N/A
Vertical: N/A
Horizontal: N/A

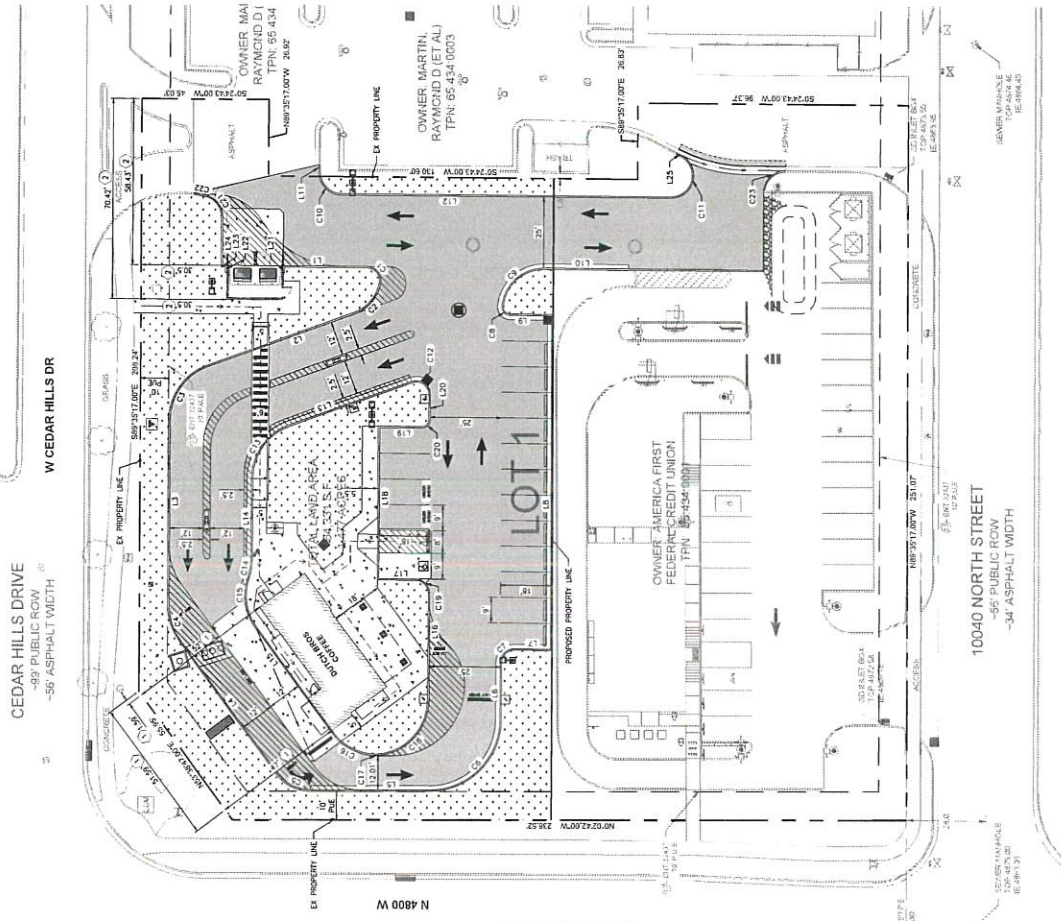


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Dutch Bros
Coffee

Table
Erosion Control Details
4773 W. CEDAR HILLS DR.,
CEDAR HILLS, UT 84062



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4773 W. CEDAR HILLS DR., CEDAR HILLS, UT

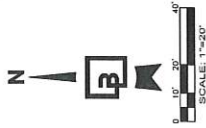


HORIZONTAL CONTROL NOTE:
CONTRACTOR SHALL HAVE ALL PROPERTY LINES, CURB, SIDEWALK, STRUCTURES, UTILITIES, AND SURVEY MONUMENTS RECONSTRUCTED PRIOR TO CONSTRUCTION. THE SURVEYOR SHALL STAKE ALL TIE LINES USING COORDINATE GEOMETRY (RECTIFIED) TO THE EXISTING MONUMENTS. THE SURVEYOR SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE TIE LINES. THE SURVEYOR SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE TIE LINES. THE SURVEYOR SHALL BE RESPONSIBLE FOR THE ACCURACY OF THE TIE LINES.

HORIZONTAL CONTROL NOTES:
1. HORIZONTAL CONTROL DIMENSIONS FOR THE BUILDING ARE SHOWN FROM THE BUILDING CORNER TO THE TIE LINE. THE BUILDING CORNER IS PARALLEL TO THE TIE LINE.
2. HORIZONTAL CONTROL DIMENSIONS FOR THE TIE LINE ENCLOSURE ARE SHOWN FROM THE TIE LINE CORNER TO THE TIE LINE. THE TIE LINE CORNER IS PARALLEL TO THE TIE LINE.

LINE TABLE			
Line #	Length	Direction	
L1	29.36	S 27° 24' 35.15" W	
L2	54.88	N 17° 30' 17.00" W	
L3	84.20	N 87° 30' 17.00" W	
L4	57.79	S 52° 38' 47.00" W	
L5	41.63	S 02° 02' 42.00" E	
L6	19.85	S 87° 30' 17.00" E	
L7	13.00	S 27° 24' 43.00" W	
L8	117.00	S 87° 30' 17.00" E	
L9	14.53	N 87° 24' 43.00" E	
L10	29.34	S 27° 24' 43.00" W	
L11	2.50	N 87° 22' 55.79" W	
L12	118.70	S 27° 24' 43.00" W	
L13	48.04	S 17° 30' 17.00" E	
L14	28.40	S 87° 30' 17.00" E	
L15	44.99	N 63° 38' 46.85" E	
L16	37.17	N 87° 30' 17.00" W	
L17	13.00	S 27° 24' 43.00" W	
L18	53.00	N 87° 30' 17.00" W	
L19	15.00	N 87° 22' 55.79" E	
L20	8.62	N 87° 30' 17.00" W	
L21	2.50	S 87° 30' 17.00" E	
L22	1.50	S 27° 24' 43.00" W	
L23	1.50	S 27° 24' 43.00" W	
L24	18.85	N 87° 30' 17.00" W	
L25	1.55	N 02° 17' 24.87" E	

CURVE TABLE			
Curve #	Length	Radius	Delta
C1	8.96	5.00	102.02
C2	15.02	15.00	57.28
C3	24.43	20.00	70.00
C4	13.78	20.18	39.15
C5	14.06	15.00	53.69
C6	39.07	25.00	89.54
C7	7.85	5.00	90.00
C8	15.00	15.00	90.00
C9	21.50	15.00	93.14
C10	12.50	8.00	90.19
C11	21.62	8.00	104.85
C12	9.60	5.00	110.00
C13	24.43	20.00	70.00
C14	8.35	20.15	18.06
C15	19.20	20.04	54.89
C16	15.11	20.00	43.28
C17	5.45	15.00	20.63
C18	27.62	20.00	79.13
C19	7.85	5.00	90.00
C20	4.71	5.00	89.97
C21	10.71	8.00	76.72
C22	4.31	37.05	6.66
C23	11.43	7.88	85.02



Job Number

23689

Sheet

C2.1

Project

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Client

Barghausen Consulting Engineers, LLC.

Design

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LEW

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LEW

Date

03/13/23

Scale

N/A

Vehicle

N/A

Horizontal

1" = 20'

Vertical

N/A

Professional Engineer

1330040022

Professional Surveyor

1330040022

For

Dutch Bros

Horizontal Control Plan

4773 W. CEDAR HILLS DR.,
CEDAR HILLS, UT 84062

Project

18215 72nd Avenue South
Kent, WA 98032

Client

Barghausen Consulting Engineers, LLC.

Design

LEW

Check

LEW

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Scale

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1" = 20'

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Professional Engineer

1330040022

Professional Surveyor

1330040022

For

Dutch Bros

Horizontal Control Plan

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GRADING GENERAL NOTES:

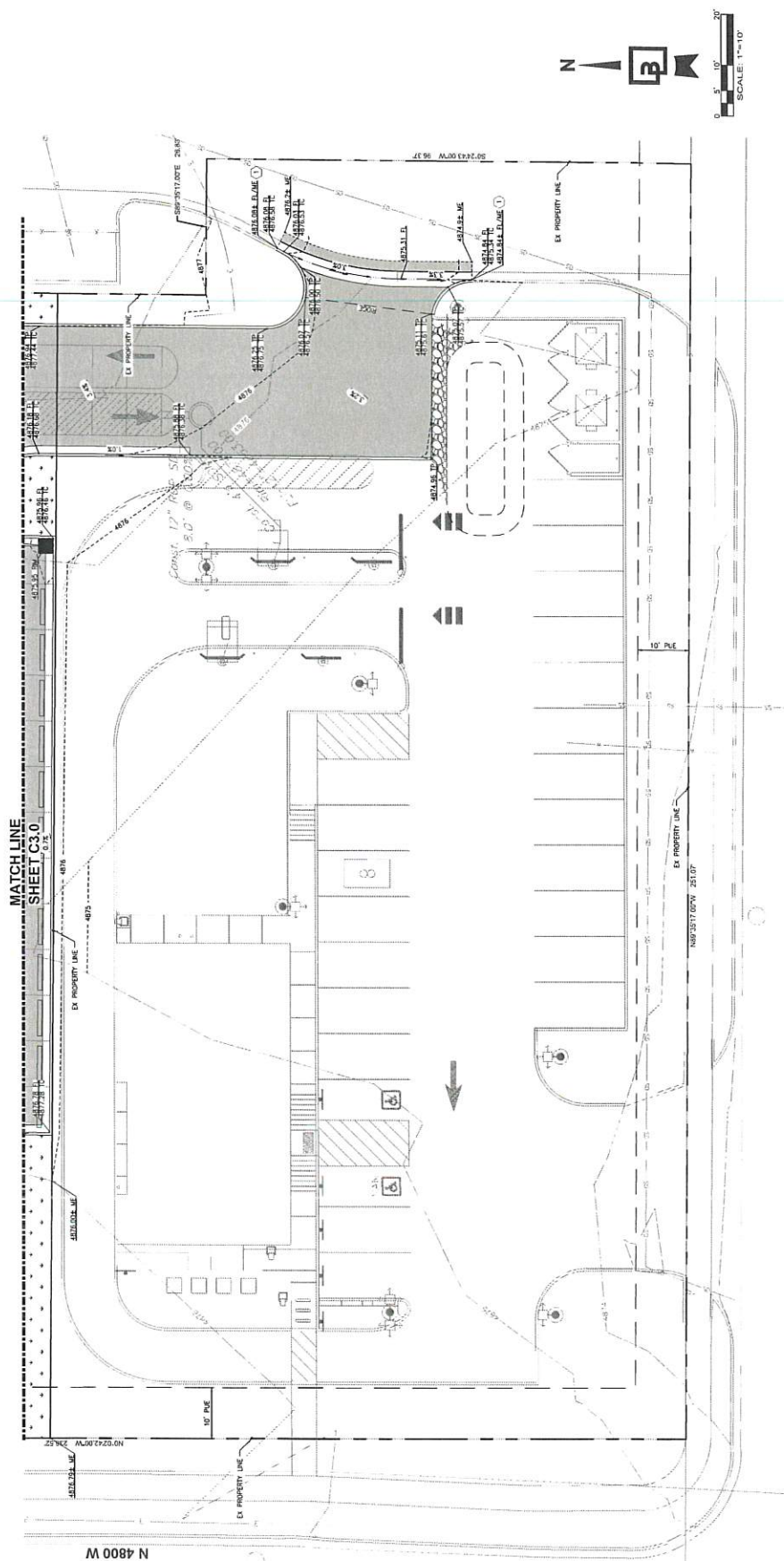
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GRADING ABBREVIATIONS

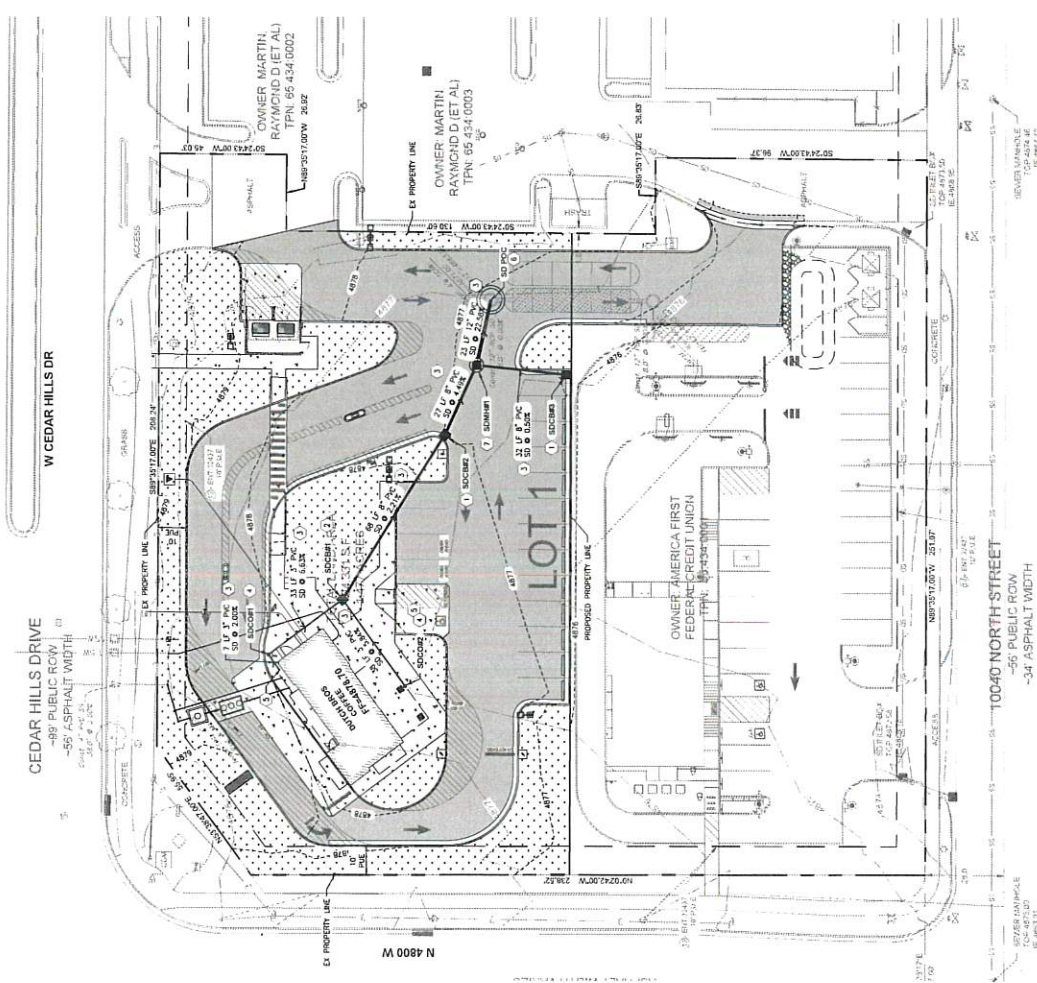
- | | | |
|-----|---|------------------|
| CB | = | GRADE BREAK |
| FS | = | FINISH SURFACE |
| FSH | = | FLUSH |
| FF | = | FINISH FLOOR |
| FC | = | TOP OF GRADE/F/F |
| FL | = | FLOWLINE |
| LIP | = | LIP OF CUTTER |
| ME | = | MATCH EXISTING |
| SW | = | TOP OF SIDEWALK |
| TC | = | TOP OF CURB |
| TP | = | TOP OF PAVEMENT |

7 CONSTRUCTION NOTES

1. CONTRACTOR TO MATCH EXISTING GRADES & FLOW LINE
2. CONTRACTOR TO GRADE AREA TO DRAIN
3. CANOPY COLUMNS. SEE ARCHITECTURAL PLANS FOR ADDITIONAL INFORMATION



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[illegible]

STORM DRAIN GENERAL NOTES:

- [illegible]

① STORM DRAIN CONSTRUCTION NOTES:

1. INSTALL 3" X 24" PRECAST CATCH BASIN WITH GRADED LID PER DETAIL 7/90T. PROVIDE 1/2" MIN. SLOPE TO THE CLEANOUT AND CLEANOUT TO WASTE IN THE STRUCTURE PALE.
2. INSTALL 24" X 24" PRECAST CATCH BASIN PER DETAIL 7/90T C.S.I. WITH BEDDING GRADED UP PER DETAIL R-1450 OF EQUIVALENT
3. INSTALL STORM DRAIN PIPING, SLOPE AND CLEANOUTS PER PLAN.
4. INSTALL STORM CLEANOUT PER DETAIL 8/90T C.S.I.
5. CONNECT CATCH BASIN TO STORM DRAIN.
6. VERIFY LOCATION OF STORM DRAIN, CLEANOUTS, CONVEYORS IN PARALLEL AND VERIFY LOCATION OF FLOW TO COLLECTION REPORT RESULTS TO ENGINEER PRIOR TO CONSTRUCTION.
7. INSTALL STORM DRAIN WALKWAY WITH GRADED LID. LID SHALL BE IMPACT RATED.

UTILITY CROSSING NOTE:

UTILITY CROSSING NOTE:
CONTRACTOR SHALL MAINTAIN MINIMUM VERTICAL SEPARATION BETWEEN UTILITIES AS REQUIRED BY JURISDICTION HAVING AUTHORITY. CONTRACTOR TO VERIFY SEPARATION REQUIREMENTS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.

UTILITY PROTECTION NOTE

UTILITY PROTECTION NOTE
APPROXIMATE LOCATION OF EXISTING GAS SERVICE IS SHOWN ON THESE PLANS. CONTRACTOR SHALL COORDINATE WITH PURVEYOR AND USE EXTREME CAUTION WHEN EXCAVATING ON-SITE UNTIL EXISTING GAS SERVICE LOCATION HAS BEEN CONFIRMED. CONTRACTOR SHALL HAVE ALL GAS AND POWER SERVICES LOCATED PRIOR TO CONSTRUCTION.

UTILITY POTHOLING NOTE

UTILITY POTHOLING NOTE
THE CIRCLED LOCATIONS ARE REQUIRED TO BE POTHOLED TO VERIFY VERTICAL AND HORIZONTAL LOCATION OF EXISTING UTILITY AND/OR POTENTIAL CONFLICTS WITH EXISTING UTILITIES. POTHOLING SHALL BE PERFORMED PRIOR TO INSTALLING ANY PROPOSED UTILITIES. CONTRACTOR SHALL NOTIFY BACHHAUSEN CONSULTING ENGINEERS, INC. OF ANY CONFLICTS.

WATER CONNECTION NOTE:

UTILITY LOCATION NOTE:
WATER LINES, CONDUITS FOR ELECTRICAL, OR OTHER UTILITIES SHALL BE

UTILITY CONFLICT NOTE:

CONTRACTOR SHALL POT-HOLE AND VERIFY STUB PIER TO PERFORMING ANY WORK IN THE RIGHT-OF-WAY. CONTRACTOR TO OBTAIN ENCROACHMENT PERMIT TO MAIN LINE CONNECTION.

STREETS AND PARKING LOTS.

UTILITY CROSSING NOTE.

OF ALL EXISTING UTILITIES WHETHER SHOWING ON THESE PLANS OR NOT BY FOTOLING UTILITIES AND SURVEYING THE HORIZONTAL AND VERTICAL LOCATION PRIOR TO CONSTRUCTION OF THE NEW UTILITY CROSSINGS TO PHYSICALLY VERIFY WHETHER OR NOT THE EXISTING UTILITIES LOCATE ☐ ALL AND THEN FOTOLING ALL OF THE EXISTING UTILITIES AT LOCATIONS OF NEW UTILITY CROSSINGS TO PHYSICALLY VERIFY WHETHER OR NOT THE EXISTING UTILITIES LOCATE ☐ ALL

SEWER CONNECTION NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE SANITARY SEWER CONNECTION EXISTS. IF NOT CONTRACTOR SHALL CONNECT TO EXISTING SEWER MAIN LINE PER CITY STANDARDS. CONTRACTOR TO OBTAIN ENCROACHMENT PERMIT TO MAIN LINE CONNECTION.

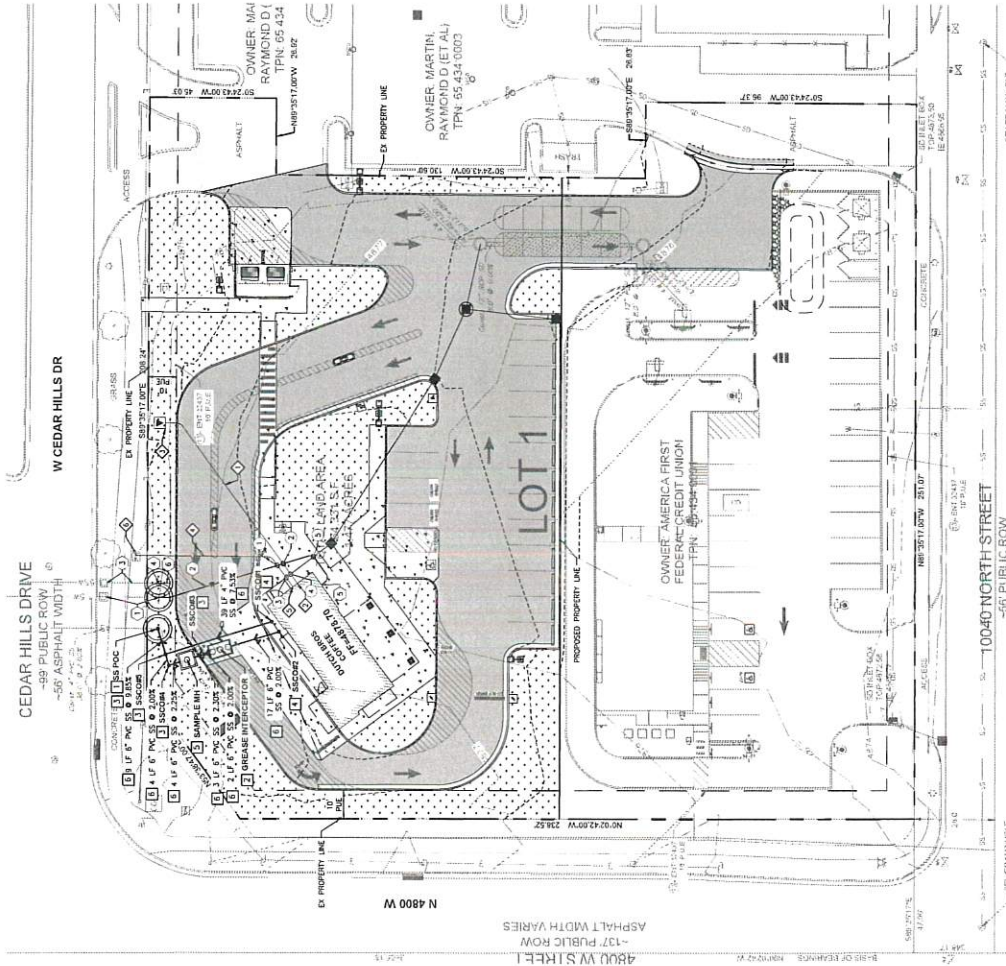
UTILITY CROSSING:
CONTRACTOR SHALL MAINTAIN MINIMUM SEPARATION BETWEEN UTILITIES AS REQUIRED BY JURISDICTIONS HAVING AUTHORITY. CONTRACTOR TO VERIFY SEPARATION REQUIREMENTS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER ANY DISCREPANCIES.

UNLIEPUBED PUBLIC INFORMATION AND ARE SUBJECT TO VARIATION. IF CONFLICTS OR PROBLEMS PRIOR TO PROCEEDING WITH CONSTRUCTION.

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DUTCH BROS COFFEE UT0901 4773 W. CEDAR HILLS DR., CEDAR HILLS, UT



UTILITY PROTECTION NOTE
THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, DEPTH, AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND COORDINATING WITH ALL UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND COORDINATING WITH ALL UTILITIES.

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UTILITY CONFLICT NOTE:
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UTILITY CROSSING NOTE:
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SEWER CONNECTION NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, DEPTH, AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND COORDINATING WITH ALL UTILITIES.

WATER CONNECTION NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, DEPTH, AND DEPTH OF ALL EXISTING UTILITIES PRIOR TO ANY CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND COORDINATING WITH ALL UTILITIES.

GENERAL UTILITY NOTES

- ALL UTILITIES SHOWN ARE TO BE LOCATED AT THE SURFACE OF THE GROUND OR TOP OF CONCRETE STRUCTURE, UNLESS OTHERWISE NOTED.
- ALL UTILITY STRUCTURES EXPOSED TO TRAFFIC SHALL BE TRAFFIC RATED INCLUDING STRUCTURE, CURB, AND SIDEWALK.
- ALL UTILITY STRUCTURES SHALL BE CONSTRUCTED TO MEET THE REQUIREMENTS OF THE APPLICABLE STANDARD SPECIFICATIONS FOR UTILITY CONSTRUCTION.
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UTILITY CROSSING TABLE			
UTILITY	TOP	TOP UTILITY	INVERT
1. DOMESTIC WATER	42575.50	TEL/DAN/COM	42577.50
2. DOMESTIC WATER	42575.50	ELECTRONIC	42577.50
3. DOMESTIC WATER	42575.50	ELECTRONIC	42577.50
4. DOMESTIC WATER	42575.50	ELECTRONIC	42577.50
5. DOMESTIC WATER	42575.50	ELECTRONIC	42577.50

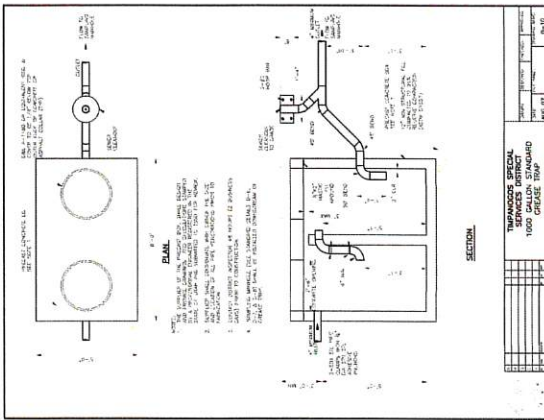
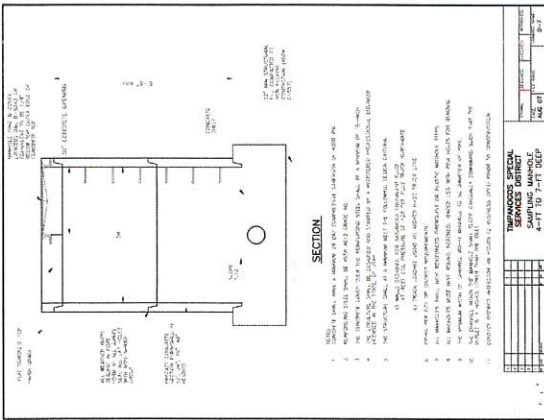
UTILITY CROSSING NOTE

CONTRACTOR SHALL MAINTAIN MINIMUM VERTICAL SEPARATION BETWEEN ALL UTILITIES. SEPARATION REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR UTILITY CONSTRUCTION.

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DUTCH BROS COFFEE UT0901
4773 W. CEDAR HILLS DR., CEDAR HILLS, UT



No.	Date	By	Chk	Acct	Signature

AGENCY DETAILS
 4773 W CEDAR HILLS DR,
 CEDAR HILLS, UT 84062



DUTCH BROS

40



Designed ECU	Scale:	Horizontal	Vertical	N/A	Date 03/13/20
Drawn ECU					
Checked ECU					
Approved ECU					

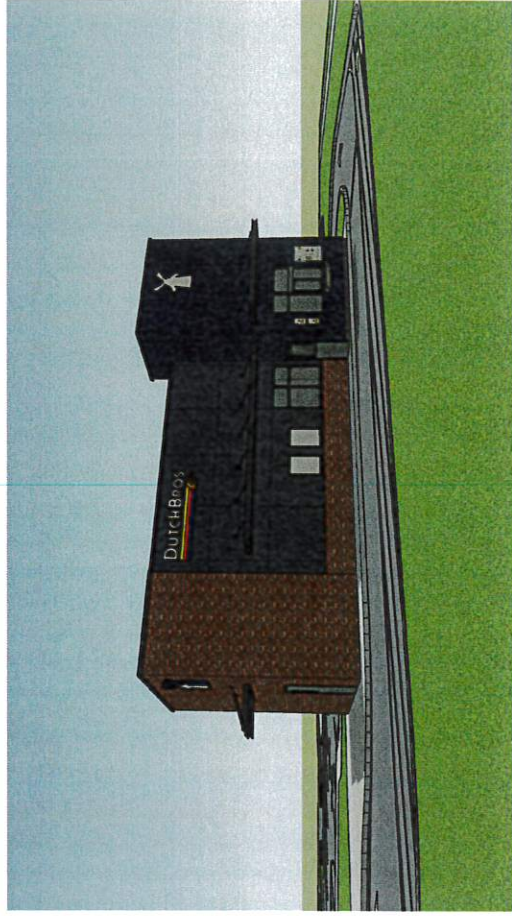
Barghausen Consulting Engineers, LLC.
18215 72nd Avenue South
Kent, WA 98032
425.251.6222
barghausen.com



23689



LOOKING EAST



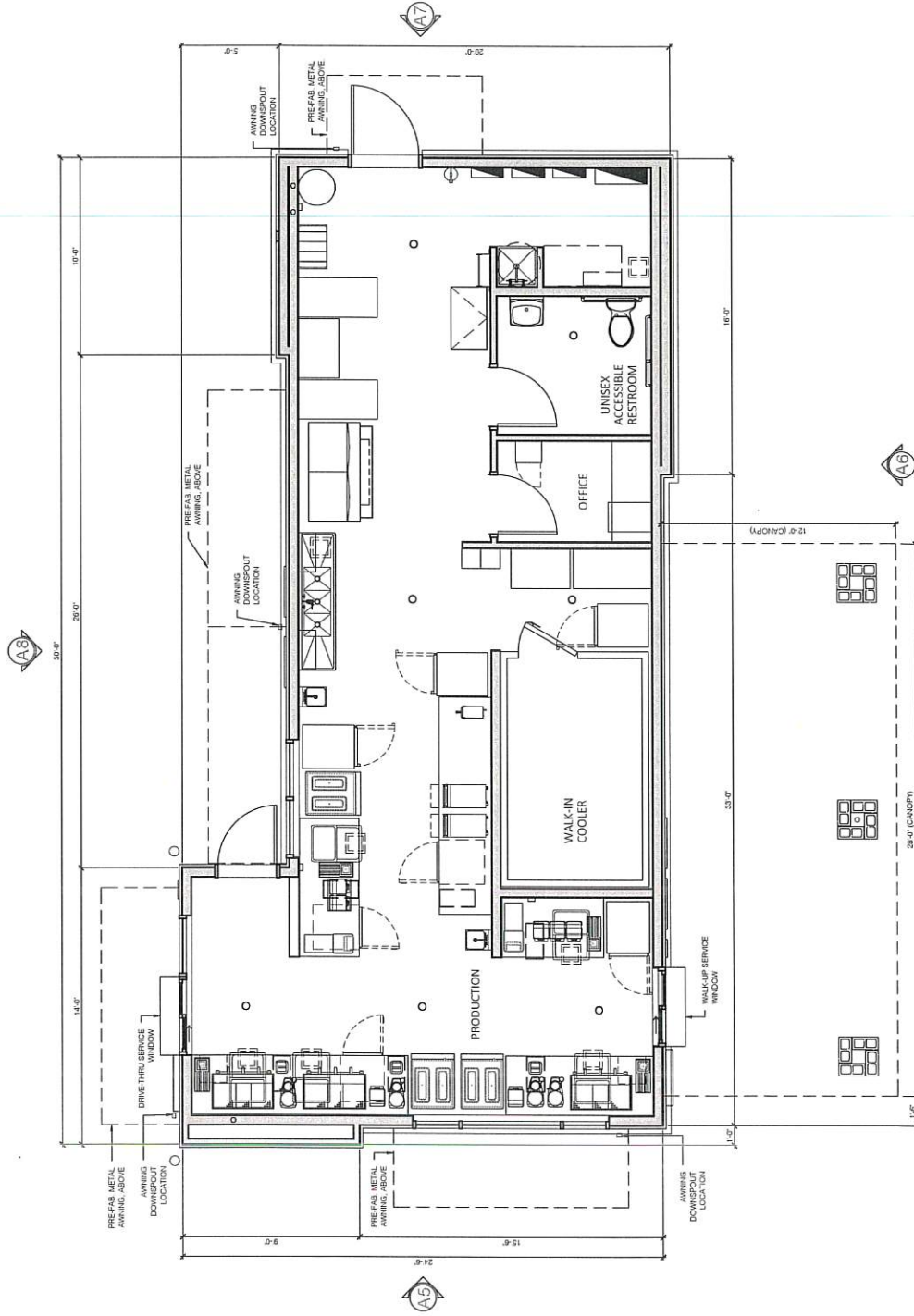
LOOKING SOUTH



LOOKING WEST



LOOKING NORTH





SCALE: 3/8" = 1'-0"



PRE-FINISHED PARAPET
CAP FLASHING,
COLOR TO MATCH

SIDING SYSTEM

PRE-FINISHED PARAPET
CAP FLASHING
& CORNICE

SIDING SYSTEM

LIGHTED SIGN
INSTALLED BY SIGN CONTRACTOR,
COORD. W/ ELECTRICAL J-BOX
AND BLOCKING REQUIREMENTS

ADDRESS NUMBERS
PROVIDED BY SIGN VENDOR;
COORD. W/ AHJ REQUIREMENTS
PROVIDE HIGH CONTRAST
W/ BACKGROUND

CANOPY FASCIA

CANOPY SOFFIT

CANOPY COLUMNS

**DOWNSPOUTS TO
STORM DRAIN OR
TRENCH DRAIN & DAYLIGHT
TO NEAREST LANDSCAPE**

SIDING SYSTEM

LIGHTED SIGN
INSTALLED BY SIGN CONTRACTOR,
COORD. W/ ELECTRICAL J-BOX
AND BLOCKING REQUIREMENTS

**PRE-FAB
METAL AWNING,
BY OTHERS**

**B.O. AWNING/
FIN. CANOPY**

**AWNING DOWNSPOUT;
DAYLIGHT TO DRIVE AISLE**

**ROOF
OVERFLOW
DOWNSPOUT**

**STOREFRONT SILL
+3'-2"**

**SERVICE
WINDOW SILL +2'-10"**

**6" STEEL PIPE BOLLARD
W/ PLASTIC SLEEVE**

**T.O. PARAPET 3
+24'-0"**

**T.O. PARAPET 2
+20'-10 1/2"**

**T.O. SLAB
+0'-0"**

**DRIVE AISLE
+0'-6"**

NOTES:

1. AWNING AND CANOPY CONTRACTOR.
2. AWNING AND CANOPY CONTRACTOR.
3. AWNING AND CANOPY CONTRACTOR.
4. AWNING AND CANOPY CONTRACTOR.
5. AWNING AND CANOPY CONTRACTOR.
6. AWNING AND CANOPY CONTRACTOR.
7. AWNING AND CANOPY CONTRACTOR.

WEST ELEVATION

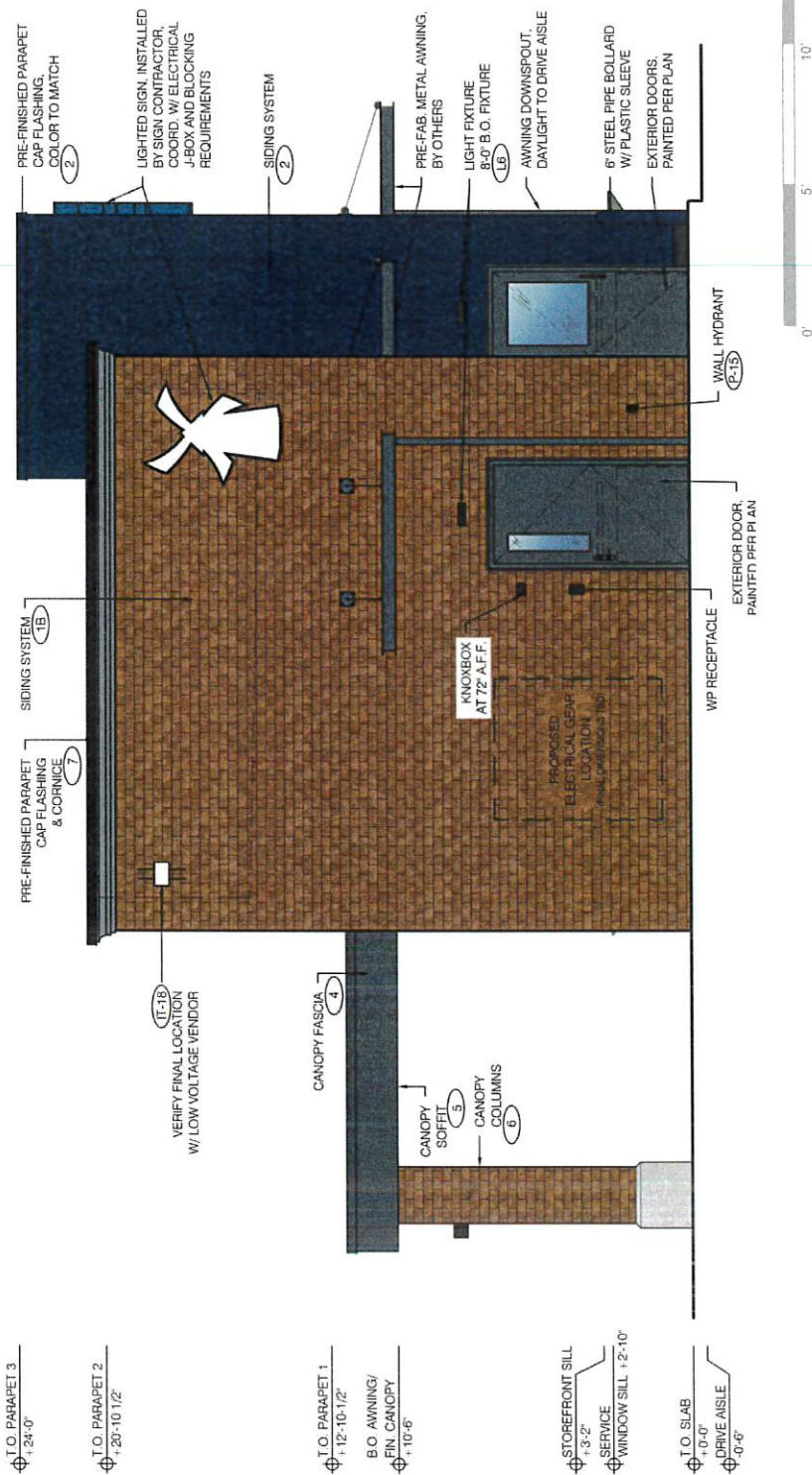
PAGE A5

EXTERIOR FINISH SCHEDULE - ALTERNATE W/ CANOPY			
ID TAG	MATERIAL	MANUFACTURER	REMARKS
ZONE 1 (BODY)			
1A	STUCCO	DRYKIT	CC-4 SYSTEM, SANDSIBLE FINE F FINISH, REVEALS AS SHOWN
1B	BRICK	COMMERCIAL BRICK CONCRETE	STANDARD SIZE BRICK - WEATHERED
ZONE 2 (TOWER)			
2	FRESH CEMENT SIBING	NOBOMA	ILLUMINATION AND 1818 W/ FACTORY PANEL CHANNEL
ZONE 3 (BASE)			
3	BRICK	COMMERCIAL BRICK CONCRETE	STANDARD SIZE BRICK - WEATHERED
ZONE 4 (FRAMED CANOPY)			
4	FASCIA	WESTERN STATES METAL ROOFING	3 BEND, COLOR: BLACK D3 DARK GRAY
5	SCOFFIT	HEAVY ELEMENTS	1/2" TYP. 1/8" RETAIL
6	BRICK	COMMERCIAL BRICK CONCRETE	THICKBROCK - WEATHERED COLOR: PER MR.
MISC.			
7	PARAPET CAPS	WESTERN STATES METAL ROOFING	COLOR: WHITE BLACK
8	STORM DRAIN	QUANTITE FOR DR.	COLOR: DARK BRONZE
NOTE: GO TO PRODUCE FOR ANNOTATED DOWNSPOUTS AND ALL NECESSARY ANNOTATIONS AT AWNING AND CANOPY LOCATIONS. COLOR: BLACK D3 DARK GRAY			



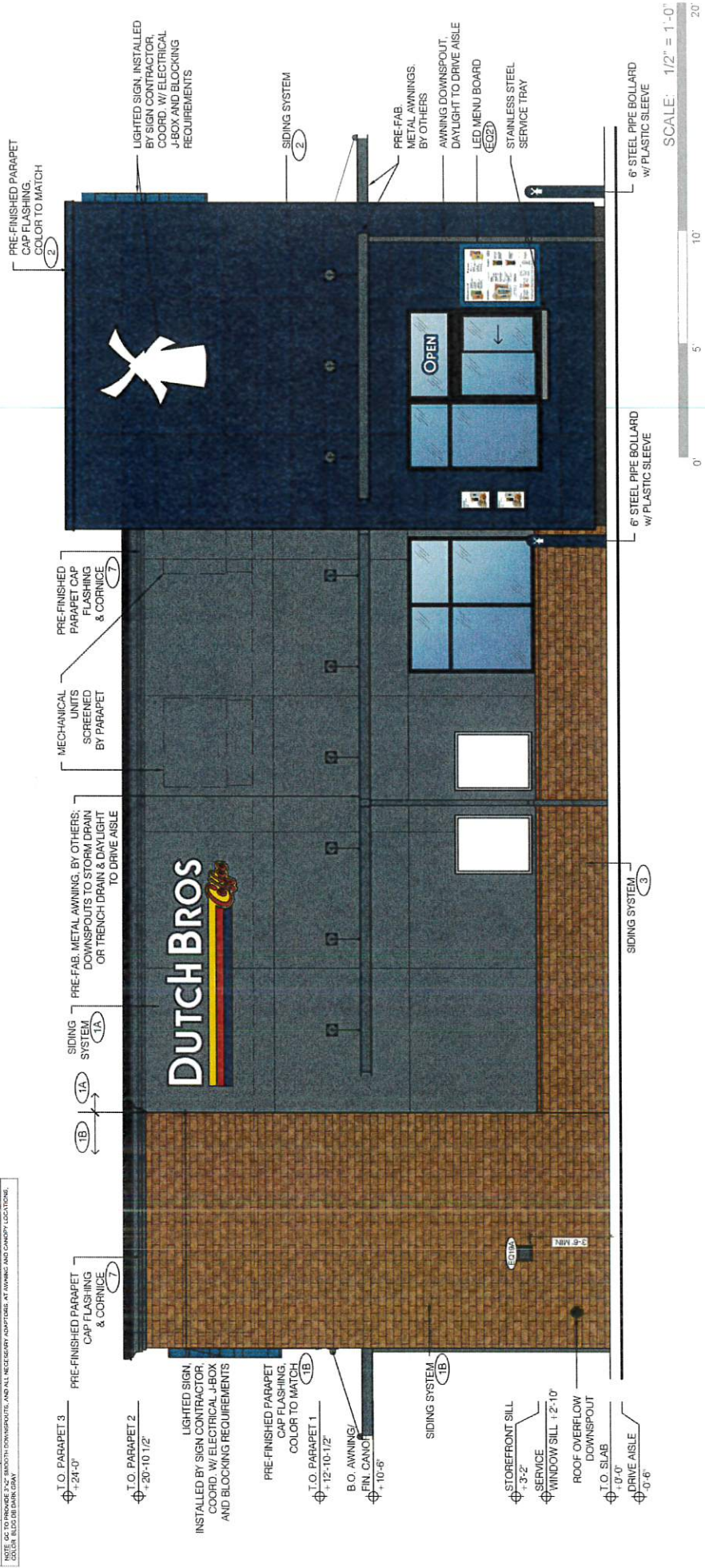


EXTERIOR FINISH SCHEDULE - ALTERNATE w/ CANOPY						
ID TAG	MATERIAL	MANUFACTURER	MODEL	REMARKS		
ZONE 1 (BROCK)						
14	STUCCO	DRYVIT	CO-2 SYSTEM, SANDPAPER FIN F FRESH, REVEALS AS SHOWN	PAINTED COLOR: BLACK IN DARK GRAY		
15	BRICK	COMMERCIAL BRICK CORPORATION	WEATHERED, 8" X 4" WEATHERED	COLOR: FEI MFR		
ZONE 2 (TOWERS)						
2	FLOOR CEILING	HIGHBA	ILLUMINATION, 4000 K, 18" W FLUORESCENT, 4' X 8'	COLOR: BLDG DB BLUE		
ZONE 3 (JAMES)						
3	BRICK	COMMERCIAL BRICK CORPORATION	STANDARD UNGLAZED BRICK, WEATHERED	COLOR: FEI MFR		
4	BRICK GULL	COMMERCIAL BRICK CORPORATION	STANDARD UNGLAZED BRICK, WEATHERED	COLOR: FEI MFR		
ZONE 4 (FARMED CAMP)						
4	PASCOA	WESTERN STATES	T-6000E, 12"	COLOR: BLDG DB		
5	SOFFIT	HIGH ELEMENTS	NATURAL, NOT PAINTED	NB TAG: 10' PERISHAL		
6	BRICK	COMMERCIAL BRICK CORPORATION	THIN BRICK, WEATHERED	COLOR: FEI MFR		
MISC						
7	PARAMET CAPS INTERFERENCE	WESTERN STATES METAL ROOFING	*	COLOR: WHITE IN BLACK		
8	NOTE: DO TO PROVIDE 150' X 20' CANOPY DOWNPOUNDER, AND ALL NECESSARY ADJUSTS, AT WINNERS, AND SHOWN BENEATH	HARNETT, OR IMA		COLOR: DARK BROWN		



SCALE: 1/2" = 1'-0" 20'

EXTERIOR FINISH SCHEDULE - ALTERNATE w/ CANOPY			
ID TAG	MATERIAL	MANUFACTURER	MODEL
ZONE 1 (BOOTH)			
1A	STUCCO	DRYVIT	OSP 4 SYSTEM SANDPABLE FINE
1B	BRICK	COMMERCIAL BRICK CORPORATION	STANDARD RINGSIZE BRICK
ZONE 2 (TOWER)			
2	PIERRE CEMENT BRICK	NOCHWA	ILLUMINATION AND NEW w/ FACILITY PANELS (SUNSHINE)
ZONE 3 (BASE)			
3	BRICK	COMMERCIAL BRICK CORPORATION	STANDARD RINGSIZE BRICK
4	BRICK SILL	COMMERCIAL BRICK CORPORATION	WEATHERFORD BRICK
ZONE 4 (FRAMED CANOPY)			
4	PAVING	WESTERN STATES	TURBOVUE 10"
5	ROFFT	WESTERN STATES	NATURAL NORTHWESTERN
6	BRICK	COMMERCIAL BRICK CORPORATION	THIN BRICK - WEATHERFORD
MISC.			
7	PARAPET CAPS	WESTERN STATES	WEATHERFORD
8	STONE FLIGHT	WESTERN STATES	WEATHERFORD
NOTE: GO TO PROVIDE 1/2" SMOOTH DOWNSPOUTS, AND ALL NECESSARY ADAPTORS AT FINISHING AND CANOPY LOCATIONS. COLOR BLEND TO DARK GRAY			



5 TRASH ENCLOSURE SIDE ELEVATION
SCALE 1/2" = 1'-0"



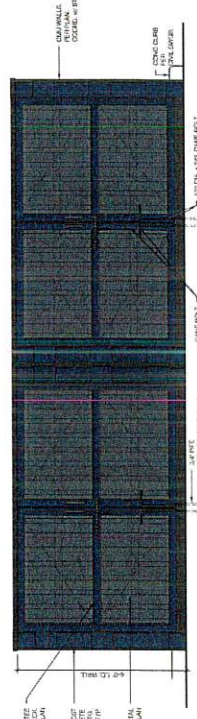
4 TRASH ENCLOSURE SIDE ELEVATION
SCALE 1/2" = 1'-0"



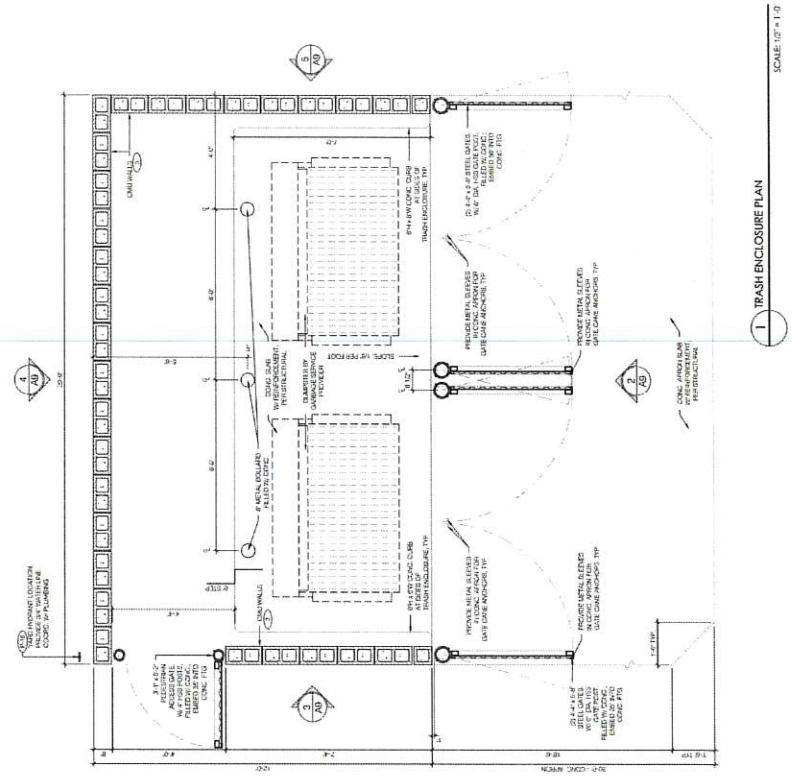
3 TRASH ENCLOSURE SIDE ELEVATION
SCALE 1/2" = 1'-0"



2 TRASH ENCLOSURE FRONT ELEVATION
SCALE 1/2" = 1'-0"



TRASH ENCLOSURE MATERIALS				
ID	MATERIAL	MANUFACTURER	COLOR	NOTES
1	DAK BOLD	DAK BOLD	DAK BOLD	DAK BOLD
2	DAK BOLD	DAK BOLD	DAK BOLD	DAK BOLD
3	DAK BOLD	DAK BOLD	DAK BOLD	DAK BOLD
4	DAK BOLD	DAK BOLD	DAK BOLD	DAK BOLD
5	DAK BOLD	DAK BOLD	DAK BOLD	DAK BOLD
6	DAK BOLD	DAK BOLD	DAK BOLD	DAK BOLD
7	DAK BOLD	DAK BOLD	DAK BOLD	DAK BOLD
8	DAK BOLD	DAK BOLD	DAK BOLD	DAK BOLD
9	DAK BOLD	DAK BOLD	DAK BOLD	DAK BOLD
10	DAK BOLD	DAK BOLD	DAK BOLD	DAK BOLD



1 TRASH ENCLOSURE PLAN
SCALE 1/2" = 1'-0"



FIBER CEMENT BOARD
MANUFACTURER: NICHHA
PROFILE: ILLUMINATION
COLOR: BLDG DB BLUE



STUCCO SYSTEM
MANUFACTURER: DRYVIT
PROFILE: CCP-2 SYSTEM,
SANDPEBBLE FINE E FINISH
COLOR: PAINTED, BLDG DB GRAY DARK



BRICK - FULL
MANUFACTURER: COMMERCIAL BRICK
CORPORATION
COLOR: WEATHERFORD



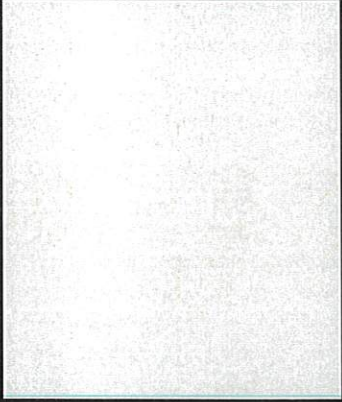
BRICK - THIN
MANUFACTURER: COMMERCIAL BRICK
CORPORATION
COLOR: WEATHERFORD



CANOPY SOFFIT
MANUFACTURER: HEWN
PROFILE: NW SPRUCE
NATURAL & SEALED
COLOR: PER MFR.



AWNINGS & DOORS - PAINT
MANUFACTURER: SHERWIN-WILLIAMS
COLOR: BLDG DB GRAY DARK



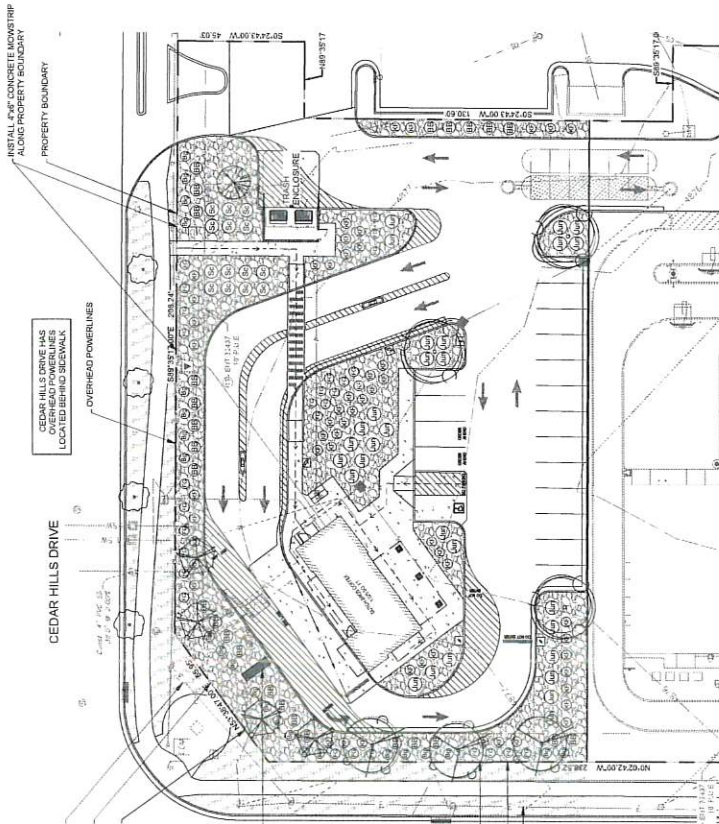
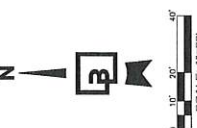
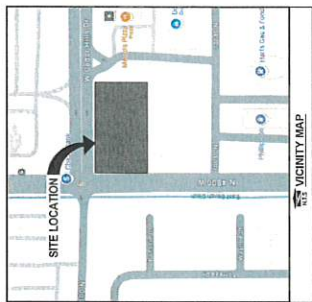
ROOFING MATERIAL
MANUFACTURER: DURO-LAST
DL-60 - 60 MIL
COLOR: WHITE

[illegible]

- 3 TRENCHING DETAIL
0.01 SCALE: N.T.S.

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DUTCH BROS COFFEE UT0901
4773 W. CEDAR HILLS DR., CEDAR HILLS, UT

[illegible]

LANDSCAPE REQUIREMENTS

30% OF THE SITE REQUIRED TO BE LANDSCAPED
PROJECT AREA: 33,458 SF x 30% = 10,037 SF LANDSCAPE AREA REQUIRED
10,037 SF LANDSCAPE AREA PROVIDED

PLANT SCHEDULE				STILES	TERMINAL / CORNER PICES	FEED	SIZE	CONDITION	SPACING	QUANTITY	REMARKS
  	  										
	  										
	  										
	  										
	  										
	  										
	  										
	  										
	  										
	  										
	  										
	  										



GEOTECHNICAL ENGINEERING STUDY

Dutch Bros. Coffee-UT0901

4773 West Cedar Hills Drive
Cedar Hills, Utah

CMT PROJECT NO. 23874

FOR:

Dutch Bros., LLC

P.O. Box 1929

Grants Pass, Oregon 97528

March 6, 2025

ENGINEERING • GEOTECHNICAL • ENVIRONMENTAL (ESA I & II) •
MATERIALS TESTING • SPECIAL INSPECTIONS •
ORGANIC CHEMISTRY • PAVEMENT
DESIGN • GEOLOGY

March 6, 2025

Ms. Gurinderjit Kehr
Dutch Bros., LLC
P.O. Box 1929
Grants Pass, Oregon 97528

Subject: Geotechnical Engineering Study
Dutch Bros. Coffee-UT0901
4773 West Cedar Hills Drive
Cedar Hills, Utah
CMT Project Number: 23874

Mr. Kehr:

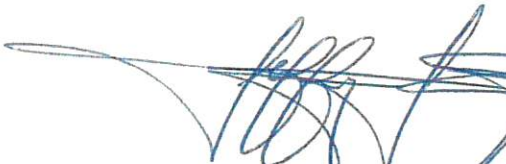
CMT Technical Services (CMT) submits herewith this geotechnical engineering study report for the subject site. This report contains the results of our findings and an engineering interpretation of the results with respect to the available project characteristics. It also contains geotechnical engineering recommendations to aid in the design and construction of the earth related phases of this project.

On February 25, 2025, a CMT staff professional was on-site and observed the drilling of 5 bore holes extending to depths of about 12.5 to 16.5 feet below the existing ground surface. Samples of the subsurface soils were obtained from the bore holes during the field operations and subsequently transported to our laboratory for further observation and testing of select samples.

Conventional spread and/or continuous footings may be utilized to support the proposed structure, provided the recommendations in this report are followed. This report presents detailed discussions of design and construction criteria for this site.

We appreciate the opportunity to work with you at this stage of the project. CMT offers a full range of Geotechnical Engineering, Geological, Material Testing, Special Inspection services, and Phase I and II Environmental Site Assessments. With offices throughout Utah, Idaho, Arizona, Colorado and Texas, our staff is capable of efficiently serving your project needs. If we can be of further assistance or if you have any questions regarding this project, please do not hesitate to contact us at 801-590-0394.

Sincerely,
CMT Technical Services



Jeffrey J. Egbert, P.E., LEED A.P., M. ASCE
Senior Geotechnical Engineer

Reviewed by:



Bryan N. Roberts, P.E.
Senior Geotechnical Engineer

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- Figure 1: Site Map
- Figures 2-6: Bore Hole Logs
- Figure 7: Key to Symbols

1.0 INTRODUCTION

1.1 General

CMT Technical Services (CMT) was retained to conduct a geotechnical subsurface study for the proposed Dutch Bros. Coffee-UT0901. The site is situated at the southeast corner of the intersection of Cedar Hills Drive and North County Boulevard in Cedar Hills, Utah, as shown in **Exhibit 1 - Vicinity Map** below.



EXHIBIT 1 - VICINITY MAP

1.2 Objectives, Scope and Authorization

The objectives and scope of our study were planned in discussions among Ms. Cassie Thompson of Barghausen Consulting Engineers, Ms. Sarah Montelongo of Dutch Bros. Coffee, and Mr. Andrew Harris of CMT. In general, the objectives of this study were to define and evaluate the subsurface soil and groundwater conditions at the site, and provide appropriate foundation, earthwork, pavement and seismic recommendations to be utilized in the design and construction of the proposed development.

In accomplishing these objectives, our scope of work has included performing field exploration, which consisted of the logging and sampling of 5 bore holes, performing infiltration testing at two locations within the area of proposed underground detention basin, performing laboratory testing on representative samples of the

subsurface soils collected in the bore holes, and conducting an office program, which consisted of correlating available data, performing engineering analyses, and preparing this summary report. This scope of work was authorized by returning a signed copy of our proposal dated September 30, 2024, and executed on October 11, 2024.

1.3 Description of Proposed Construction

We understand that the proposed construction consists of retail coffee building with a footprint of approximately 1,025 square feet. We project that wall loads will not exceed 4,000 pounds per linear foot and column loads will not exceed 40,000 pounds. Floor slab loads are anticipated to be relatively light, with an average uniform loading not exceeding 150 pounds per square foot. If the structural loading conditions are different than we have projected, please notify us so that any appropriate modifications to our conclusions and recommendations contained herein can be made.

We also understand that pavements at the site will include a parking lot and drive-thru lanes, which we anticipate will utilize both asphalt and concrete pavement. Traffic is projected to consist of mostly automobiles and light trucks, a daily medium-weight delivery truck, a weekly garbage truck, and an occasional fire truck.

Site development will require some earthwork in the form of minor cutting and filling. A site grading plan was not available at the time of this report, but we project that maximum cuts and fills may be on the order of 3 to 4 feet. If deeper cuts or fills are planned, CMT should be notified to provide additional recommendations, if needed.

1.4 Executive Summary

The most significant geotechnical aspects regarding site development include the following:

1. Topsoil approximately 6 inches in thickness, and underlying fill soils extending up to approximately 3.5 feet below the surface encountered in some of the bore holes. These soils will require removal from structural areas.
2. Subsurface natural soils encountered consisted of SAND (SC) and GRAVEL (GC, GP-GC) layers extending to the maximum depth explored of approximately 16.5 feet below the existing ground surface.
3. Groundwater was not encountered in the bore holes.
4. Foundations and floor slabs may be constructed on suitable undisturbed natural sand/gravel soils, or on structural/engineered fill which extends to undisturbed natural soils.

CMT must assess that topsoil, undocumented fills, debris, disturbed or unsuitable soils have been removed and that suitable soils have been encountered prior to placing site grading fills, footings, slabs, and pavements.

In the following sections, detailed discussions pertaining to the site are provided, including subsurface descriptions, geologic setting, seismicity, earthwork, foundations, lateral resistance, lateral pressure, floor slabs, and pavements.

2.0 FIELD EXPLORATION

2.1 General

To define and evaluate the subsurface soil and groundwater conditions, 5 bore holes were drilled at the site to depths of approximately 12.5 to 16.5 feet below the existing ground surface. The bore holes were logged and sampled by an experienced member of our geotechnical staff. The approximate locations of the bore holes are shown on **Figure 1, Site Plan**, included in the Appendix.

Disturbed samples of the subsurface soils encountered in the bore holes were collected at varying depths through the hollow stem drill augers utilizing a standard split spoon sampler that was driven 18 inches into the soils below the drill augers using a 140-pound hammer free-falling a distance of 30 inches. The number of hammer blows needed for each 6-inch interval was recorded. The sum of the hammer blows for the final 12 inches of penetration is known as a standard penetration test and this 'blow count' was recorded on the bore hole logs. Where more than 50 blows occurred before the 6-inch interval was achieved, the sampling was terminated and the number of blows and inches penetrated by the sampler were recorded. The blow count provides an approximation of the relative density of granular soils, but only a limited indication of the relative consistency of silt/clay soils because the consistency of these soils is significantly influenced by the moisture content.

The samples of the subsurface soils retrieved from the bore holes were classified in the field based upon visual and textural examination, logged and described in general accordance with ASTM¹ D-2488. These field classifications were supplemented by subsequent examination and testing of select samples in our laboratory. Logs of the bore holes, including a description of the soil strata encountered, is presented on each individual Bore Hole Log, **Figures 2 through 6**, included in the Appendix. Sampling information and other pertinent data and observations are also included on the logs. In addition, a Key to Symbols defining the terms and symbols used on the logs is provided as **Figure 7** in the Appendix.

Following completion of drilling operations, the bore holes were backfilled with auger cuttings.

2.2 Infiltration Testing

CMT performed two falling head infiltration tests (I-1, I-2) on the site at the approximate locations shown on the attached **Figure 1**. Each infiltration test was performed at a depth of approximately 8 feet below the existing ground surface.

To perform the tests, a bore hole was drilled to the approximate depth specified, a solid PVC pipe was inserted into the hole through the hollow stem drill augers prior to withdrawing the augers. The pipe was then filled with water, and the water level drop with time was measured and recorded until subsequent readings were reasonably consistent. The soils at the test depth, based upon the retrieved samples, consisted of Clayey GRAVEL (GC) with sand.

¹ American Society for Testing and Materials

At the location of I-1 the final measured infiltration rate was approximately 2.2 minutes per inch. At the location of I-2 the final measured rate was approximately 9 minutes per inch. These rates could increase (become slower) over time due to siltation, thus we recommend an appropriate factor of safety be applied for design.

3.0 LABORATORY TESTING

Selected samples of the subsurface soils were subjected to various laboratory tests to assess the following pertinent engineering properties:

1. Moisture Content, ASTM D-2216, Percent moisture representative of field conditions
2. Atterberg Limits, ASTM D-4318, Plasticity and workability
3. Gradation Analysis, ASTM D-1140/C-117, Grain Size Analysis

Laboratory test results are presented on the bore hole logs (**Figures 2 through 6**) and in the following **Lab Summary Table**:

LAB SUMMARY TABLE

BORE HOLE	DEPTH (feet)	SOIL CLASS	SAMPLE TYPE	MOISTURE CONTENT(%)	GRADATION			ATTERBERG LIMITS		
					GRAV.	SAND	FINES	LL	PL	PI
B-1	5	GC	SPT	3	44	43	13			
B-1	10	GP-GC	SPT	2	50	40	10			
B-2	2.5	GC	SPT	4	48	38	14			
B-2	7.5	GC	SPT	2	48	39	13			
B-2	15	GC	SPT	2	49	39	12			
B-3	0.5	SC/CL	SPT	17	21	29	50			
B-3	2.5	SC	SPT	4	39	43	18			
B-3	5	GC	SPT	2	52	37	11			
B-4	2.5	FILL (SC)	SPT	16	19	46	35	33	20	13
B-4	3.5	GC	SPT	4	51	28	21			
B-4	10	SC	SPT	2	43	44	13			
B-5	2.5	GC	SPT	3	41	41	48			
B-5	7.5	GP-GC	SPT	2	59	30	11			
B-5	15	GC	SPT	2	45	43	12			
I-1	2.5	GC	SPT	3	48	36	16			
I-1	7.5	GC	SPT	5	49	39	12			
I-2	5	GC	SPT	2	46	40	14			
I-2	7.5	GC	SPT	8	45	34	21			

4.0 GEOLOGIC & SEISMIC CONDITIONS

4.1 Geologic Setting

The subject site is in the northeastern portion of the Utah Valley in north-central Utah and sits at an elevation of approximately 4,882 feet above sea level. Utah Valley is a deep, sediment-filled basin that is part of the Basin and Range Physiographic Province. The valley was formed by extensional tectonic processes during the Tertiary and Quaternary geologic time periods. The valley is bordered by the Wasatch Mountain Range on the east and Lake Mountain and West Mountain on the west. Utah Valley is located within the Intermountain Seismic Belt, a zone of active tectonism and seismic activity extending from southwestern Montana to southwestern Utah. The active (evidence of movement within the last 10,000 years) Wasatch Fault Zone is part of the Intermountain Seismic Belt and extends from southeastern Idaho to central Utah along the western base of the Wasatch Mountain Range.

Much of northwestern Utah, including Utah Valley, was also previously covered by the Pleistocene age Lake Bonneville. Utah Lake, which currently occupies much of the western portion of the valley, is a remnant of this ancient freshwater lake. Lake Bonneville reached a high-stand elevation between approximately 5,160 and 5,200 feet above sea level at between 18,500 and 17,400 years ago. Approximately 17,400 years ago, the lake breached its basin in southeastern Idaho and dropped by almost 300 feet relatively fast as water drained into the Snake River. Following this catastrophic release, the lake level continued to drop slowly over time, primarily driven by drier climatic conditions, until reaching the current levels of Utah Lake and the larger Great Salt Lake to the north. Shoreline terraces formed at the high-stand elevation of the lake and several subsequent lower lake levels are visible in places on the mountain slopes surrounding the valley. Much of the sediment within Utah Valley was deposited as lacustrine sediments during both the transgressive (rise) and regressive (fall) phases of Lake Bonneville, as well as several older, pre-Bonneville lakes that previously occupied the basin.

The geology of the USGS 7.5 Minute Lehi, Utah Quadrangle, including the location of the subject site, has been mapped by Biek². The surficial geology at the site and adjacent properties is mapped as "Alluvial deposits relate to the Provo phase of the Bonneville lake cycle" (Map Unit Qalp) dated upper Pleistocene. Unit Qalp is described in the referenced map as "Moderately to well-sorted sand, silt, and pebble gravel deposited principally in river channels; coarsens upgradient and includes boulder-size clasts in the upper reaches of Dry Creek; locally includes veneer of fine-grained eolian sand and silt, and may include loess veneer; large deposits in south-central part of quadrangle are mostly fluvial topset beds that grade into Provo-level deltaic deposits (Qldp) derived from American Fork and Dry Creek Canyons; generally 5 to 20 feet (2-6 m) thick." No fill has been mapped at the location of the site on the geologic map. Refer to **Exhibit 2 - Geologic Map**, shown on the following page.

²Biek, R.F., 2005, Geologic Map of the Lehi Quadrangle and Part of the Timpanogos Cave Quadrangle, Salt Lake and Utah Counties, Utah; Utah Geological Survey Map 210, Scale 1:24,000.



No surface fault traces are shown on the referenced geologic map crossing, adjacent to, or projecting toward the subject site. The nearest mapped Holocene active (last 10,000 years) fault is the Provo Segment of the Wasatch Fault Zone approximately 0.65 miles to the north.

4.3.1 Site Class

Utah has adopted the International Building Code (IBC) 2021, which determines the seismic hazard for a site based upon 2014 mapping of bedrock accelerations prepared by the United States Geologic Survey (USGS) and the soil site class. The USGS values are presented on maps incorporated into the IBC code and are also available

based on latitude and longitude coordinates (grid points). For site class definitions, IBC 2021 Section 1613.2.2 refers to Chapter 20, *Site Classification Procedure for Seismic Design*, of ASCE³ 7, which stipulates that the weighted average values of shear wave velocity, blow count and/or shear strength within the upper 100 feet (30 meters) be utilized to determine seismic site class.

Based on average shear wave velocity data within the upper 30 meters ($V_{s,30}$) published by McDonald and Ashland⁴, the subject site is located within unit description Q02U, which has a log-mean $V_{s,30}$ of 294 meters per second (964 feet per second). Thus, it is our opinion the site best fits Site Class D – Stiff Soil (with data), which we recommend for seismic structural design.

4.3.2 Ground Motions

The 2014 USGS mapping utilized by the IBC provides values of peak ground, short period and long period spectral accelerations for the Site Class B/C boundary and the Risk-Targeted Maximum Considered Earthquake (MCE_R). This Site Class B/C boundary represents average bedrock values for the Western United States and must be corrected for local soil conditions. The table and response spectra on the following page summarize the peak ground, short period and long period accelerations for the MCE_R event, and incorporates appropriate soil correction factors for a Site Class D (with data) soil profile at site grid coordinates of 40.4152 degrees north latitude and -111.7728 degrees west longitude:

³ American Society of Civil Engineers

⁴ McDonald, G.N. and Ashland, F.X., 2008, "Earthquake Site-Conditions Map for the Wasatch Front Urban Corridor, Utah," Utah Geological Survey Special Study 125, 41 pp.

SPECTRAL ACCELERATION PERIOD, T	SITE CLASS B/C BOUNDARY [mapped values] (g)	SITE COEFFICIENT	SITE CLASS D* [adjusted for site class effects] (g)	MULTIPLIER	DESIGN VALUES (g)
Peak Ground Acceleration	PGA = 0.617	$F_{pga} = 1.100$	PGA _M = 0.679	1.000	PGA _M = 0.679
0.2 Seconds (Long Period Acceleration)	S _s = 1.358	F _a = 1.000	S _{MS} = 1.358	0.667	S _{DS} = 0.905
	(no exceptions needed)	F _a = (N/A)	S _{MS} = (N/A)	0.667	S _{DS} = (N/A)
1.0 Second (Long Period Acceleration)	S ₁ = 0.504	F _v = N/A	S _{M1} = N/A	0.667	S _{D1} = N/A
	(Exception 2:)	F _v = (1.796)	S _{M1} = (0.905)	0.667	S _{D1} = (0.603)

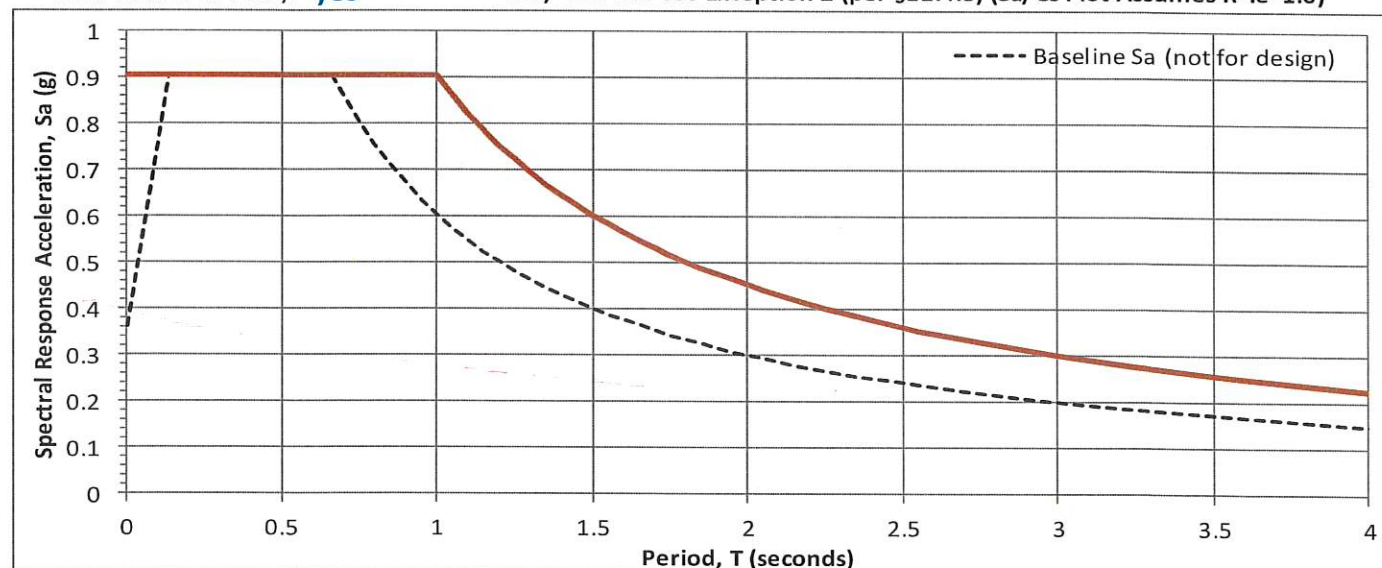
NOTES: 1. TL (seconds): **8**

* Site Class D With Data

2. Site Class: **D**

4. ASCE 7-16 Requires Site-Specific Ground Motion Hazard Analysis (Since $S_1 \geq 0.2$ sec) - OR Can Use Exception 2 (per §11.4.8) (Sa/Cs Plot Assumes $R=1.0$)

3. Have data to verify? **yes**



As indicated in the above table, S_1 is greater than 0.2 seconds and a site-specific ground motion hazard analysis (GMHA) is required for the site unless the Exception 2 values shown are used for seismic design. If a site-specific GMHA is desired instead of using the higher exception values for design, please contact CMT for a proposal to perform the GMHA.

4.3.3 Liquefaction

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

The site is located within an area designated by the Utah Geologic Survey⁵ as having "Very Low" liquefaction potential. This is defined as a less than 5% probability that within a 100-year period an earthquake strong enough to cause liquefaction will occur.

⁵ Utah Geological Survey, "Liquefaction-Potential Map for a Part of Utah County, Utah," Utah Geological Survey Public Information Series 28, August 1994. https://ugspub.nr.utah.gov/publications/public_information/pi-28.pdf

In our opinion, the subsurface conditions we encountered support the "Very Low" liquefaction potential designation.

4.4 Other Geologic Hazards

No landslide deposits or features, including lateral spread deposits, are mapped on or adjacent to the site. The site is not located within a known or mapped potential debris flow, stream flooding, or rock fall hazard area.

5.0 SITE CONDITIONS

5.1 Surface Conditions

At the time the bore holes were drilled the site consisted of a vacant lot. The site grade was relatively flat. Based upon aerial photos dating back to 1993 that are readily available on the internet, the site appears to have been vacant since at least that time. The site is bordered on the north by Cedar Hills Drive, on the south by a similar vacant lot, on the east by a paved parking lot, and on the west by North County Boulevard (see **Vicinity Map** in **Section 1.1** above).

5.2 Subsurface Soils

At the locations of the bore holes B-3, B-4, and B-5, we encountered approximately 6 inches of topsoil at the surface. Immediately underlying the topsoil in B-4 and B-5 we encountered sandy/gravelly soil with debris, considered to be undocumented/non-engineered fill, extending to approximately 4.5 feet and 1.5 feet below the ground surface, respectively. In B-3, immediately below the topsoil, a layer of dark brown Clayey SAND (SC)/Sandy CLAY (CL) was encountered which extended to approximately 2.5 feet below the surface. This layer did not appear to contain debris but given that it is similar in appearance to the fill soils, it may also possibly be fill. Topsoil was not noted at the surface of B-1 or B-2.

The natural soils encountered predominately consisted of brown, slightly moist, Clayey SAND (SC) with gravel, and GRAVEL with varying amounts of clay (GC, GP-GC) and sand, extending to the maximum depths explored of approximately 12.5 feet (where refusal occurred in B-3) to 16.5 feet below the ground surface. Based upon the blow counts the natural sand and gravel soils predominately have dense to very dense relative density. These soils are projected to exhibit high bearing strength and very low compressibility.

For a more descriptive interpretation of subsurface conditions, please refer to the bore hole logs, **Figures 2 through 6**, which graphically represent the subsurface conditions encountered. The lines designating the interface between soil types on the logs generally represent approximate boundaries; in situ, the transition between soil types may be gradual.

5.3 Groundwater

Groundwater was not encountered at the time of our field explorations to the maximum depth explored of about 16.5 feet below the existing ground surface. Groundwater is not anticipated to be encountered during construction.

Groundwater levels can fluctuate seasonally. Numerous other factors such as heavy precipitation, irrigation of neighboring land, and other unforeseen factors, may also influence ground water elevations at the site. The detailed evaluation of these and other factors, which may be responsible for ground water fluctuations, and the magnitude of potential fluctuations, is beyond the scope of this study.

5.4 Site Subsurface Variations

Based on the results of the subsurface explorations and our experience, variations in the continuity and nature of subsurface conditions should be anticipated. Due to the heterogeneous characteristics of natural soils, care should be taken in interpolating or extrapolating subsurface conditions between or beyond the exploratory locations. Surficial fill soils should also be expected to vary in depth and lateral extent.

6.0 SITE PREPARATION AND GRADING

6.1 General

All deleterious materials should be stripped from the site prior to commencement of construction activities. This includes vegetation, topsoil, loose and disturbed soils, etc.

Based upon the conditions observed in the bore holes there is topsoil on the surface of portions of the site which we estimated to be about 6 inches in thickness. When stripping and grubbing, topsoil should be distinguished by the apparent organic content and not solely by color; thus we estimate that topsoil stripping will need to include the upper 4 to 6 inches.

In bore holes B-4 and B-5 sandy/gravelly fill soils with debris, considered undocumented/non-engineered, were encountered below the topsoil extending to approximately 1.5 to 3.5 feet below the surface. The dark brown sandy/clayey soil just below the topsoil in B-3, which extended to approximately 2.5 feet below the surface, did not appear to contain debris, but appears to be similar fill soil. All undocumented fill shall be removed from beneath floor slab and foundation areas, but may remain beneath exterior flatwork and pavements, provided they are properly prepared and the owner understands that even with proper surficial preparation, undocumented fill soils have a potential to consolidation/settle over time and additional maintenance or surfaces constructed over them may be required. Outside of building footprints, proper preparation of undocumented fill and disturbed soils shall consist of removing the upper 12 inches, scarifying to a minimum depth of 8 inches, moisture conditioning as needed, removing any debris encountered (particularly degradable debris) and recompacting the scarified soils in place to the requirements specified in **Section 6.4**. The 12 inches removed, if free of debris, organics, or other deleterious material, may then be replaced in similarly compacted

lifts. Prior to placement of pavement support materials the exposed subgrade must be proofrolled by passing moderate-weight rubber tire-mounted construction equipment over the surface at least twice. If soft or loose soils are encountered, they must be removed (up to a maximum depth of 2 feet) and replaced with structural fill.

Following clearing and grubbing, and prior to other subgrade preparations, the subgrade should be observed by a CMT geotechnical engineer to assess that suitable soils have been exposed and any deleterious materials, loose and/or disturbed soils have been removed/properly prepared, prior to placing site grading fills, footings, slabs, and pavements.

Fill placed over large areas to raise overall site grades can induce settlements in the underlying natural soils. If more than 4 feet of site grading fill is anticipated over the natural ground surface, we should be notified to assess potential settlements and provide additional recommendations as needed. These recommendations may include placement of the site grading fill far in advance to allow potential settlements to occur prior to construction.

6.2 Temporary Excavations

Excavations deeper than 8 feet are not anticipated at the site. Groundwater was not encountered within the depths explored, about 12.5 to 16.5 feet, at the time of our field explorations, and thus is not anticipated to be encountered in excavations.

The natural soils encountered at this site predominantly consisted of sand/gravel. For sandy/gravelly (cohesionless) soils, temporary construction excavations not exceeding 4 feet in depth should be no steeper than one-half horizontal to one vertical (0.5H:1V). For excavations up to 8 feet and above groundwater, side slopes should be no steeper than one horizontal to one vertical (1H:1V). Excavations encountering saturated cohesionless soils will be very difficult to maintain and will require very flat side slopes and/or shoring, bracing and dewatering.

In clayey (cohesive) soils, temporary construction excavations not exceeding 4 feet in depth may be constructed with near-vertical side slopes. Temporary excavations up to 8 feet deep, above or below groundwater, may be constructed with side slopes no steeper than one-half horizontal to one vertical (0.5H:1V).

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. All excavations should be made following OSHA safety guidelines.

6.3 Fill Material

Structural fill is defined as fill that will ultimately be subjected to structural loads imposed by footings, floor slabs, pavements, etc. Structural fill will be required as backfill over foundations and utilities, as site grading fill, and potentially as replacement fill below footings. All structural fill must be free of sod, rubbish, topsoil, frozen

soil, and other deleterious materials. The following are our recommendations for the various fill types we anticipate will be used at this site:

FILL MATERIAL TYPE	DESCRIPTION RECOMMENDED SPECIFICATION
Structural Fill	Placed below structures, flatwork and pavement. Well-graded sand/gravel mixture, with maximum particle size of 4 inches, a minimum 70% passing 3/4-inch sieve, approximately 30% to 70% passing the No. 4 sieve, a maximum 20% passing the No. 200 sieve, and a maximum Plasticity Index of 10.
Site Grading Fill	Placed over large areas to raise the site grade. Sandy to gravelly soil, with a maximum particle size of 6 inches, a minimum 70% passing 3/4-inch sieve, a maximum 50% passing No. 200 sieve, and a maximum Plasticity Index of 15.
Non-Structural Fill	Placed below non-structural areas, such as landscaping. On-site soils or imported soils, with a maximum particle size of 8 inches, including silt/clay soils not containing excessive amounts of degradable/organic material (see discussion below).
Stabilization Fill	Placed to stabilize soft areas prior to placing structural fill and/or site grading fill. Coarse angular gravels and cobbles 1 inch to 8 inches in size. May also use 1.5- to 2.0-inch gravel placed on stabilization fabric, such as Mirafi RS280i, or equivalent (see Section 6.6).

On-site natural sand and gravel soils may be suitable for use as structural fill, if processed to meet the requirements given above, and may also be used in site grading fill and non-structural fill situations.

All fill material should be approved by a CMT geotechnical engineer prior to placement.

6.4 Fill Placement and Compaction

The various types of compaction equipment available have their limitations as to the maximum lift thickness that can be compacted. For example, hand operated equipment is limited to lifts of about 4 inches and most "trench compactors" have a maximum, consistent compaction depth of about 6 inches. Large rollers, depending on soil and moisture conditions, can achieve compaction at 8 to 12 inches. The full thickness of each lift should be compacted to at least the following percentages of the maximum dry density as determined by ASTM D-1557 (or AASHTO⁶ T-180) in accordance with the following recommendations:

LOCATION	TOTAL FILL THICKNESS (FEET)	MINIMUM PERCENTAGE OF MAXIMUM DRY DENSITY
Beneath an area extending at least 4 feet beyond the perimeter of structures, and below flatwork and pavement (applies to structural fill and site grading fill) extending at least 2 feet beyond the perimeter	0 to 5	95
	5 to 8	98
Site grading fill outside area defined above	0 to 5	92
	5 to 8	95
Utility trenches within structural areas	--	96

⁶ American Association of State Highway and Transportation Officials

LOCATION	TOTAL FILL THICKNESS (FEET)	MINIMUM PERCENTAGE OF MAXIMUM DRY DENSITY
Roadbase and subbase	-	96
Non-structural fill	0 to 5	90
	5 to 8	92

Structural fills greater than 8 feet thick are not anticipated at the site. For best compaction results, we recommend that the moisture content for structural fill/backfill be within 2% of optimum. Field density tests should be performed on each lift as necessary to verify that proper compaction is being achieved.

6.5 Utility Trenches

For the bedding zone around the utility, we recommend utilizing sand bedding fill material that meets current APWA⁷ requirements.

All utility trench backfill material below structurally loaded facilities (foundations, floor slabs, flatwork, parking lots/drive areas, etc.) should be placed at the same density requirements established for structural fill in the previous section.

Most utility companies and local governments are requiring Type A-1a or A-1b (AASHTO Designation) soils (sand/gravel soils with limited fines) be used as backfill over utilities within public rights of way, and the backfill be compacted over the full depth above the bedding zone to at least 96% of the maximum dry density as determined by AASHTO T-180 (ASTM D-1557).

Where the utility does not underlie structurally loaded facilities and public rights of way, on-site fill (if free of debris, etc.) and natural soils may be utilized as trench backfill above the bedding layer, provided they are properly moisture conditioned and compacted to the minimum requirements stated above in **Section 6.4**.

6.6 Stabilization

If rutting or pumping occurs, traffic should be stopped, and the disturbed soils should be removed and replaced with stabilization material. Typically, a minimum of 18 inches of the disturbed soils must be removed to be effective. However, deeper removal is sometimes required.

To stabilize soft subgrade conditions (if encountered), a mixture of coarse, clean, angular gravels and cobbles and/or 1.5- to 2.0-inch clean gravel should be utilized. This coarse material may be placed and worked into the soft soils until firm and non-yielding or the soft soils removed an additional, minimum of 18 inches, and backfilled with the clean stabilizing fill. A test area should be implemented to achieve a proper stabilization strategy. Often the amount of gravelly material can be reduced with the use of a geotextile fabric such as Mirafi RS280i, or equivalent. Its use will also help avoid mixing of the subgrade soils with the gravelly material. After

⁷ American Public Works Association

excavating the soft/disturbed soils, the fabric should be spread across the bottom of the excavation and up the sides a minimum of 18 inches. Otherwise, it should be placed in accordance with the manufacturer's recommendation, including proper overlaps. The gravel material can then be placed over the fabric in compacted lifts as described above.

7.0 FOUNDATION RECOMMENDATIONS

The following recommendations have been developed based on the previously described project characteristics, the subsurface conditions observed in the field and the laboratory test data, as well as common geotechnical engineering practice.

7.1 Continuous/Spread Footings

Based on our geotechnical engineering analyses, the proposed structure may be supported upon conventional spread and/or continuous wall foundations placed on suitable, undisturbed natural sand/gravel soils and/or on structural fill extending to suitable natural soils. Footings may be designed using a net bearing pressure of 2,500 psf. The allowable bearing pressure may be increased by 1/3 for temporary loads such as wind and seismic forces.

We also recommend the following:

1. Exterior footings subject to frost should be placed at least 30 inches below final grade.
2. Interior footings not subject to frost should be placed at least 12 inches below grade.
3. Continuous footing widths should be maintained at a minimum of 18 inches.
4. Isolated footings should be a minimum of 24 inches wide.

7.2 Installation

Under no circumstances shall foundations be placed on undocumented fill, topsoil with organics, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water. If these or other unsuitable soils are encountered, they must be completely removed and replaced with properly compacted structural fill.

Deep, large roots may be encountered where trees and larger bushes are located or were previously located at the site; such large roots should be removed. The base of footing excavations should be observed by a CMT geotechnical engineer to assess if suitable bearing soils have been exposed.

All structural fill placed immediately below footings should meet the requirements for such and should be placed and compacted in accordance with **Sections 6.3 and 6.4** above. The width of structural replacement fill below footings should be equal to the width of the footing plus 1 foot for each foot of fill thickness. For instance, if the footing width is 2 feet and the structural fill depth beneath the footing is 2 feet, the fill replacement width should be 4 feet, centered beneath the footing.

The minimum thickness of structural fill below footings should be equivalent to one-third the thickness of structural fill below any other portion of the foundations. For example, if the maximum depth of structural fill is 6 feet, all footings for the new structure should be underlain by a minimum 2 feet of structural fill.

7.3 Estimated Settlement

Foundations designed and constructed in accordance with our recommendations could experience settlement, but we anticipate that total settlements of footings founded as recommended above will not exceed 1 inch, with differential settlements on the order of 0.5 inches over a distance of 25 feet. We expect approximately 50% of the total settlement to initially take place during construction.

7.4 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 0.40 for natural sand/gravel soils and structural fill, may be utilized for design. Passive resistance provided by properly placed and compacted natural sand/gravel soils or structural fill above the water table may be considered equivalent to a fluid with a density of 425 pcf. A combination of passive earth resistance and friction may be utilized if the passive resistance component of the total is divided by 1.5. Note that frictional resistance is mobilized as soon as any movement occurs, while full passive pressure is typically achieved after a small amount of movement occurs (approximately 0.5% of the footing height).

8.0 LATERAL EARTH PRESSURES

We anticipate that below-grade walls up to 4 feet high might be constructed at this site. The lateral earth pressure values given below are for a backfill material that will consist of drained sand/gravel soils (less than 20% passing No. 200 sieve) placed and compacted in accordance with the recommendations presented herein. If other soil types will be used as backfill, we should be notified so that appropriate modifications to these values can be provided, as needed.

The lateral pressures imposed upon subgrade facilities will depend upon the relative rigidity and movement of the backfilled structure. The following are the recommended lateral pressure values, which also assume that the soil surface behind the wall is horizontal and that the backfill within 3 feet of the wall will be compacted with hand-operated compacting equipment. For subgrade walls less than 12 feet high, employing a seismic at-rest lateral earth pressure for design is not needed.

CONDITION	STATIC (psf/ft)*	SEISMIC (psf/ft)**
Active Pressure (wall is allowed to yield, i.e. move away from the soil, with a minimum 0.001H movement/rotation at the top of the wall, where "H" is the total height of the wall)	35	35
At-Rest Pressure (wall is not allowed to yield)	55	N/A
Passive Pressure (wall moves into the soil)	425	235

*Equivalent Fluid Pressure (applied at 1/3 Height of Wall)

**Equivalent Fluid Pressure (added to static and applied at 1/3 Height of Wall)

9.0 FLOOR SLABS

Properly engineered floor slabs should be established upon uniform, compacted bearing soils comprised of suitable, undisturbed, uniform natural sand/gravel soils and/or on structural fill extending to suitable natural soils (same as for foundations). Under no circumstances shall floor slabs be established directly on any topsoil, undocumented fills, loose or disturbed soils, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water. Floor slabs should be properly designed by a structural engineer to accommodate anticipated loads.

To facilitate curing of the concrete, we recommend that floor slabs be directly underlain by at least 4 inches of moist aggregate base or bedding material, or "free-draining" fill such as "pea" gravel or 1-inch minus, clean, gap-graded gravel. To help control normal shrinkage and stress cracking, the floor slab thickness and joint layout should be designed by a qualified structural engineer. Design provisions should address the following features:

1. Adequate reinforcement for the anticipated floor loads;
2. Using smooth bar reinforcement for load transfer through interior floor joints;
3. Portland cement concrete mix design selection to minimize shrinkage concerns;
4. Joint layout and spacing in accordance with ACI⁸ or other local standards recommendations; and
5. Properly isolate floor slabs from foundations and other structural elements per recommendations provided by ACI 302 (Guide to Concrete Floor and Slab Construction).

10.0 DRAINAGE RECOMMENDATIONS

It is important to the long-term performance of foundations and floor slabs that water is not allowed to collect near the foundation walls and infiltrate into the underlying soils. We recommend the following:

⁸ American Concrete Institute

1. All areas around the structure should be sloped to provide drainage away from the foundations. We recommend a minimum slope of 4 inches in the first 10 feet away from the structure. This slope should be maintained throughout the lifetime of the structure.
2. All roof drainage should be collected in rain gutters with downspouts designed to discharge at least 10 feet from the foundation walls or well beyond the backfill limits, whichever is greater.
3. Adequate compaction of the foundation backfill should be provided. We suggest a minimum of 90% of the maximum laboratory density as determined by ASTM D-1557. Water consolidation methods should not be used under any circumstances.
4. Landscape sprinklers should be aimed away from the foundation walls. The sprinkling systems should be designed with proper drainage and be well-maintained. Overwatering should be avoided.
5. Other precautions that may become evident during construction.

11.0 PAVEMENTS

All pavement areas must be prepared as discussed above in **Section 6.1**. Under no circumstances shall pavements be established over topsoil, undocumented fills (if encountered), loose or disturbed soils, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water.

In pavement areas, subsequent to stripping and prior to the placement of pavement materials, the exposed subgrade must be proof rolled by passing moderate-weight rubber tire-mounted construction equipment over the surface at least twice. If soft or otherwise unsuitable soils are encountered, we recommend they be removed to a minimum of 18 inches below the subgrade level and replaced with structural fill.

We anticipate the natural sand/gravel soils and reworked surficial sand fill soils will exhibit fair to good pavement support characteristics when saturated or nearly saturated. Based on our laboratory testing experience with similar soils, our pavement design is based upon a California Bearing Ratio (CBR) of 10 for the natural sand/gravel soils. Given the projected traffic as discussed above in **Section 1.3**, the following pavement sections are recommended for the given ESAL's (18-kip equivalent single-axle loads) per day:

MATERIAL	PAVEMENT SECTION THICKNESS (inches)					
	PARKING AREAS			DRIVE AREAS		
	(1 ESAL per day)			(3 ESAL'S per day)		
Asphalt	3	3	---	3.5	3.5	---
Concrete	---	--	5	---	---	6
Road-Base (UTBC)	7	4	5	8	4	5
Subbase	0	4	0	0	6	0
Total Thickness	10	11	10	11.5	13.5	11

Untreated base course (UTBC), typically known as road-base, should conform to city specifications, or to 1-inch-minus UDOT specifications for A-1-a/NP, and have a minimum CBR value of 70%. Material having a minimum CBR of 40% may be used for subbase, as long as the fines content (percent passing No. 200 sieve) does not exceed 15%. Roadbase and subbase material should be compacted as recommended above in **Section 6.4**. Asphalt material generally should conform to APWA requirements, having a ½-inch maximum aggregate size, a 75-gradation Superpave mix containing no more than 15% of recycled asphalt (RAP) and a PG58-28 binder.

The rigid pavement sections recommended above 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 4,500 pounds per square inch and contain 6% ±1% air-entrainment.

For dumpster pads, we recommend a pavement section consisting of 6.5 inches of Portland cement concrete and 6 inches of aggregate base over properly prepared suitable natural subgrade or site grading structural fills extending to suitable natural soils. Dumpster pads constructed overlying undocumented fills must be avoided or heavily reinforced.

12.0 QUALITY CONTROL

We recommend that CMT be retained as part of a comprehensive quality control testing and observation program. With CMT onsite we can help facilitate implementation of our recommendations and address, in a timely manner, any subsurface conditions encountered which vary from those described in this report. Without such a program CMT cannot be responsible for application of our recommendations to subsurface conditions which may vary from those described herein. This program may include, but not necessarily be limited to, the following:

12.1 Field Observations

Observations should be completed during all phases of construction such as site preparation, foundation excavation, structural fill placement and concrete placement.

12.2 Fill Compaction

Compaction testing by CMT is required for all structural supporting fill materials. Maximum Dry Density (Modified Proctor, ASTM D-1557) tests should be requested by the contractor immediately after delivery of any fill materials. The maximum density information should then be used for field density tests on each lift as necessary to verify that the required compaction is being achieved.

12.3 Excavations

All excavation procedures and processes should be observed by a geotechnical engineer from CMT or his representative. In addition, for the recommendations in this report to be valid, all backfill and structural fill placed

in trenches and all pavements should be density tested by CMT. We recommend that freshly mixed concrete be tested by CMT in accordance with ASTM designations.

13.0 LIMITATIONS

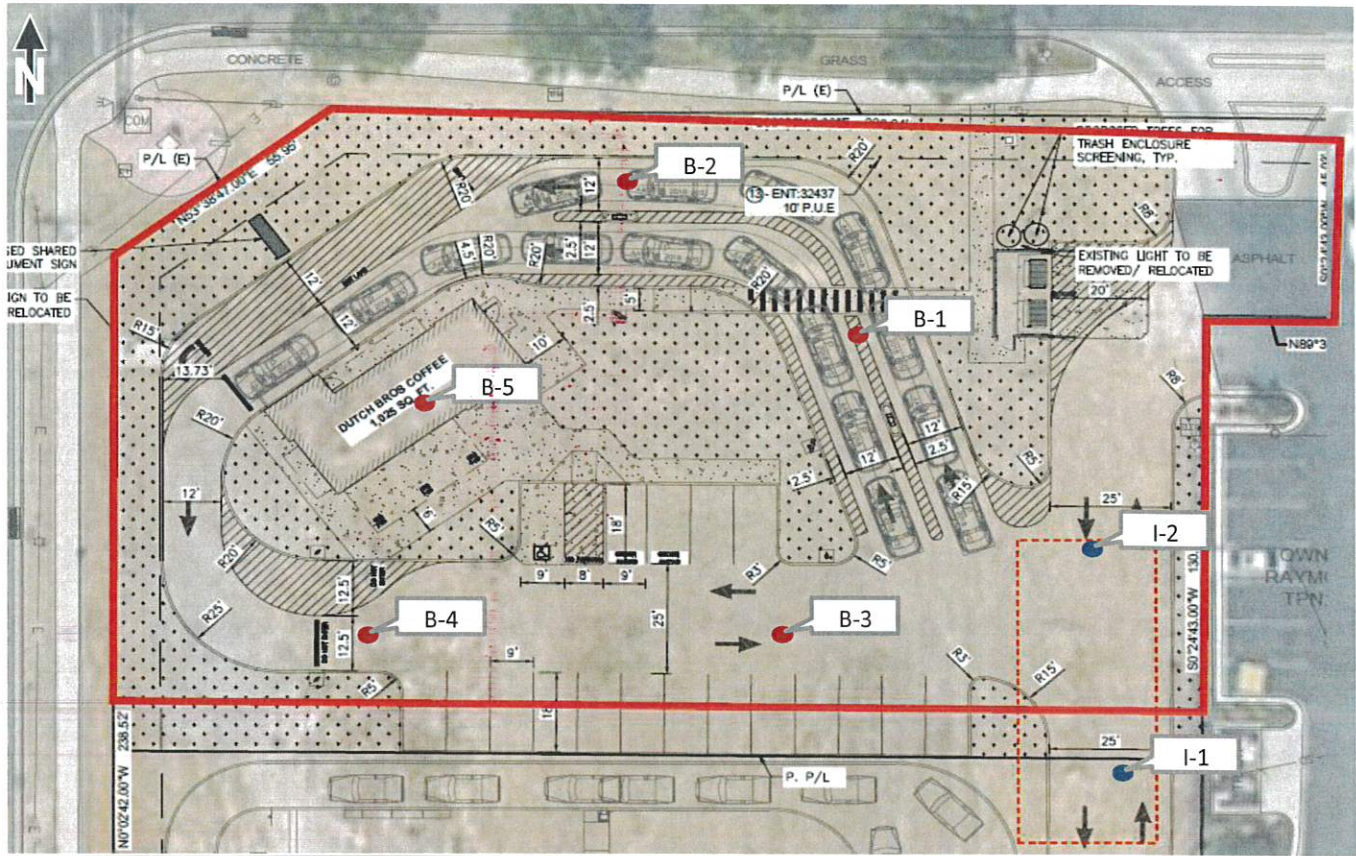
The recommendations provided herein were developed by evaluating the information obtained from the subsurface explorations and soils encountered therein. The exploration logs reflect the subsurface conditions only at the specific location at the particular time designated on the logs. Soil and ground water conditions may differ from conditions encountered at the actual exploration locations. The nature and extent of any variation in the explorations may not become evident until during the course of construction. If variations do appear, it may become necessary to re-evaluate the recommendations of this report after we have observed the variation.

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. This warranty is in lieu of all other warranties, either expressed or implied.

We appreciate the opportunity to be of service to you on this project. If we can be of further assistance or if you have any questions regarding this project, please do not hesitate to contact us at 801-590-0394. To schedule materials testing, please call 801-381-5141.

APPENDIX

SUPPORTING DOCUMENTATION



CMT TECHNICAL SERVICES

Dutch Bros. Coffee - UT0901
4773 West Cedar Hills Dr., Cedar Hills, UT

SITE MAP

Date: 25-Feb-2025
CMT No.: 23874

Figure:
1

Dutch Bros Coffee - UT0901

4773 West Cedar Hills Dr., Cedar Hills, UT

Bore Hole Log

B-1

Total Depth: 15.5'

Water Depth: (see Remarks)

Date: 2/25/25

Job #: 23874

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
					Total				Gravel %	Sand %	Fines %	LL	PL	PI
0		Brown Clayey GRAVEL (GC) with sand, slightly moist very dense												
				1	50/5"									
4				2	16 50/5"		3		44	43	13			
8				3	16 25 24	49								
		Brown Poorly Graded GRAVEL with clay (GP-GC), slightly moist dense												
				4	14 23 16	39	2		50	40	10			
12														
				5	18 50/5"									
16														
		REFUSAL AT 15.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.4152242°, -111.7726758°

Surface Elev. (approx): Not Given

CMT TECHNICAL
SERVICES

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Spencer Moon

Page: 1 of 1

Figure:

2

Dutch Bros Coffee - UT0901

4773 West Cedar Hills Dr., Cedar Hills, UT

Bore Hole Log

B-2

Total Depth: 16.5'

Date: 2/25/25

Water Depth: (see Remarks)

Job #: 23874

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
					Total				Gravel %	Sand %	Fines %	LL	PL	PI
0		Brown Clayey GRAVEL (GC) with sand, slightly moist												
		very dense		6	41	50/4"	4		48	38	14			
4														
				7	32	50/4"								
8				8	8	20	51	2	48	39	13			
					31									
		dense		9	21	18	36							
					18									
12														
		very dense		10	15	28	51	2	49	39	12			
16					23									
		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.4152909°, -111.7728266°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Spencer Moon

Page: 1 of 1

Figure:

3

CMT TECHNICAL
SERVICES

Dutch Bros Coffee - UT0901

4773 West Cedar Hills Dr., Cedar Hills, UT

Bore Hole Log

B-3

Total Depth: 12.5'

Date: 2/25/25

Water Depth: (see Remarks)

Job #: 23874

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
					Total				Gravel %	Sand %	Fines %	LL	PL	PI
0		Topsoil												
		Dark Brown Clayey SAND (SC)/Sandy CLAY (CL) with gravel, roots, moist		11	2 3 5	8	17		21	29	50			
		Brown Clayey SAND (SC) with gravel, slightly moist	very dense	12	31 50/5"		4		39	43	18			
4														
		Brown Clayey GRAVEL (GC) with sand, slightly moist	very dense	13	19 28 38	66	2		52	37	11			
8				14	19 22 29	51								
				15	24 33 35	68								
12		REFUSAL AT 12.5'												
16														
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.415027°, -111.772721°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Trevor Durrant

Page: 1 of 1

Figure:

4

CMT TECHNICAL SERVICES

Dutch Bros Coffee - UT0901

4773 West Cedar Hills Dr., Cedar Hills, UT

Bore Hole Log

B-4

Total Depth: 16.5'

Date: 2/25/25

Water Depth: (see Remarks)

Job #: 23874

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Sample #	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
					Total				Gravel %	Sand %	Fines %	LL	PL	PI
0		Topsoil												
		Fill: Dark brown clayey sand with gravel, debris												
				16	2 9	11	16		19	46	35	33	20	13
4		Brown Clayey GRAVEL (GC) with sand, slightly moist dense		17	34	34	4		51	28	21			
		very dense		18	15 36 23	59								
				19	11 20 31	51								
8				20	25 50/4"		2		43	44	13			
		Brown Clayey SAND (SC) with gravel, slightly moist very dense												
12				21	6 14 18	32								
		Brown Clayey GRAVEL (GC) with sand, slightly moist dense												
16		END AT 16.5'												
20														
24														
28														

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.415031°, -111.773019°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Trevor Durrant

Page: 1 of 1

Figure:

5

CMT TECHNICAL SERVICES

Dutch Bros Coffee - UT0901

4773 West Cedar Hills Dr., Cedar Hills, UT

Bore Hole Log

B-5

Total Depth: 16.5'

Date: 2/25/25

Water Depth: (see Remarks)

Job #: 23874

Depth (ft)	GRAPHIC LOG	Soil Description	Sample Type	Blows (N)		Moisture (%)	Dry Density(pcf)	Gradation			Atterberg		
				Sample #	Total			Gravel %	Sand %	Fines %	LL	PL	PI
0		Topsoil											
		Fill: Dark brown clayey sand with gravel, debris											
		Brown Clayey GRAVEL (GC) with sand, slightly moist											
		very dense		22	28	3		41	41	18			
4					50/5"								
				23	20								
				39	62								
				23									
8		Brown Poorly Graded GRAVEL with clay (GP-GC), slightly moist											
		very dense		24	18								
					26	55	2	59	30	11			
					29								
		grades less silt											
		dense		25	20								
					23	43							
					20								
12													
16		Brown Clayey GRAVEL (GC) with sand, slightly moist											
		dense		26	37								
					23	37	2	45	43	12			
					14								
		END AT 16.5'											
20													
24													
28													

Remarks: Groundwater not encountered during drilling.

Coordinates: 40.415182°, -111.772979°

Surface Elev. (approx): Not Given

Equipment: Hollow-Stem Auger

Automatic Hammer, Wt=140 lbs, Drop=30"

Excavated By: Direct Push

Logged By: Trevor Durrant

Page: 1 of 1

Figure:

6

CMT TECHNICAL
SERVICES

① Depth (ft)	② GRAPHIC LOG	③ Soil Description	④ Sample Type	⑤ Sample #	⑥ Blows(N)	⑦ Total	⑧ Moisture (%)	⑨ Dry Density(pcf)	⑩ Gradation	⑪ Atterberg
									Gravel % Sand % Fines %	LL PL PI

COLUMN DESCRIPTIONS

- ① **Depth (ft.):** Depth (feet) below the ground surface (including groundwater depth - see below right).
- ② **Graphic Log:** Graphic depicting type of soil encountered (see ② below).
- ③ **Soil Description:** Description of soils, including Unified Soil Classification Symbol (see below).
- ④ **Sample Type:** Type of soil sample collected; sampler symbols are explained below-right.
- ⑤ **Sample #:** Consecutive numbering of soil samples collected during field exploration.
- ⑥ **Blows:** Number of blows to advance sampler in 6" increments, using a 140-lb hammer with 30" drop.
- ⑦ **Total Blows:** Number of blows to advance sampler the 2nd and 3rd 6" increments.
- ⑧ **Moisture (%):** Water content of soil sample measured in laboratory (percentage of dry weight).
- ⑨ **Dry Density (pcf):** The dry density of a soil measured in laboratory (pounds per cubic foot).
- ⑩ **Gradation:** Percentages of Gravel, Sand and Fines (Silt/Clay), from lab test results of soil passing No. 4 and No. 200 sieves.
- ⑪ **Atterberg:** Individual descriptions of Atterberg Tests are as follows:

- LL = Liquid Limit (%):** Water content at which a soil changes from plastic to liquid behavior.
- PL = Plastic Limit (%):** Water content at which a soil changes from liquid to plastic behavior.
- PI = Plasticity Index (%):** Range of water content at which a soil exhibits plastic properties (= Liquid Limit - Plastic Limit).

STRATIFICATION		MODIFIERS	MOISTURE CONTENT
Description	Thickness	Trace	Dry: Absence of moisture, dusty, dry to the touch.
Seam	Up to ½ inch	<5%	
Lense	Up to 12 inches	Some	Moist: Damp / moist to the touch, but no visible water.
Layer	Greater than 12 in.	5-12%	
Occasional	1 or less per foot	With	Saturated: Visible water, usually soil below groundwater.
Frequent	More than 1 per foot	> 12%	

MAJOR DIVISIONS			USCS SYMBOLS	②	TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS More than 50% of material is larger than No. 200 sieve size.	GRAVELS The coarse fraction retained on No. 4 sieve.	CLEAN GRAVELS ($< 5\%$ fines)	GW		Well-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines
		GRAVELS WITH FINES ($\geq 12\%$ fines)	GP		Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines
			GM		Silty Gravels, Gravel-Sand-Silt Mixtures
		GC		Clayey Gravels, Gravel-Sand-Clay Mixtures	
	SANDS The coarse fraction passing through No. 4 sieve.	CLEAN SANDS ($< 5\%$ fines)	SW		Well-Graded Sands, Gravelly Sands, Little or No Fines
		SANDS WITH FINES ($\geq 12\%$ fines)	SP		Poorly-Graded Sands, Gravelly Sands, Little or No Fines
			SM		Silty Sands, Sand-Silt Mixtures
			SC		Clayey Sands, Sand-Clay Mixtures
FINE-GRAINED SOILS More than 50% of material is smaller than No. 200 sieve size.	SILTS AND CLAYS Liquid Limit less than 50%	ML		Inorganic Silts and Very Fine Sands, Silty or Clayey Fine Sands or Clayey Silts with Slight	
		CL		Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean	
		OL		Organic Silts and Organic Silty Clays of Low Plasticity	
	SILTS AND CLAYS Liquid Limit greater than 50%	MH		Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Soils with Plasticity (Elastic Silts)	
		CH		Inorganic Clays of High Plasticity, Fat Clays	
		OH		Organic Silts and Organic Clays of Medium to High Plasticity	
HIGHLY ORGANIC SOILS		PT		Peat, Humus, Swamp Soils with High Organic Contents	

SAMPLER SYMBOLS

- Block Sample
- Bulk/Bag Sample
- Modified California Sampler
- 3.5" OD, 2.42" ID
- D&M Sampler
- Rock Core
- Standard
- Penetration Split Spoon Sampler
- Thin Wall
- (Shelby Tube)

WATER SYMBOL

- Encountered Water Level
- Measured Water Level
- (see Remarks on Logs)

Note: Dual Symbols are used to indicate borderline soil classifications (i.e. GP-GM, SC-SM, etc.).

- The results of laboratory tests on the samples collected are shown on the logs at the respective sample depths.
- The subsurface conditions represented on the logs are for the locations specified. Caution should be exercised if interpolating between or extrapolating beyond the exploration locations.
- The information presented on each log is subject to the limitations, conclusions, and recommendations presented in this report.



BARGHAUSEN
A DIVISION OF CORE STATES GROUP

**CORE
STATES**

Project Narrative Site Plan Review

Dutch Bros Coffee (UT0901)

PREPARED BY

Barghausen Consulting
Engineers, LLC

PREPARED FOR

Dutch Bros, LLC

CLIENT ADDRESS

P.O. Box 1929
Grants Pass, OR 97528

SITE ADDRESS

4773 West Cedar Hills
Drive, Cedar Hills, Utah

PROJECT NO.

23689

DATE

03/12/2025

JURISDICTION

City of Cedar Hills

Project Overview

The project proposes construction of a new 1,025-square-foot Dutch Bros Coffee with a drive-through service window. Site improvements include dual drive-through lanes with stacking for up to 16 vehicles, a bypass/exit lane, a trash and recycling enclosure, and interior and perimeter landscaping. The building will include a customer walk-up window on the opposite side of the drive-through with a large canopy awning above for weather protection. An ADA-accessible pedestrian path to the right-of-way is located to the northeast of the site, directing foot traffic directly to the customer service walk-up window.

The project site is approximately 64,331 square feet (1.477 acres) in area. The property is zoned Commercial (SC-1). Eating and drinking establishments are a permitted use in the SC-1 zone subject to Site Plan Review approval.

Dutch Bros Coffee Characteristics

Dutch Bros Coffee, known for their upbeat baristas and genuinely caring service, is a growing drive-through coffee company with more than 900 locations in 17 states and over 16,000 employees. Dutch Bros Coffee's three main values include speed, quality, and service. All Dutch Bros Coffee locations serve Private Reserve Coffee, White Coffee, and Decaf Coffee as espresso options, all roasted in Grants Pass, Oregon. Along with coffee, the menu includes a variety of Dutch Bros Blue Rebel energy drinks, lemonade, and tea. Limited packaged food items will be provided such as muffin tops and granola bars.

Queuing and Stacking

Approximately 350 feet of stacking space is available behind the drive-through window to provide queuing for up to 16 vehicles. Dutch Bros Coffee will implement a runner system at the proposed facility that is designed to increase speed and efficiency in serving drive-through customers. Dutch Bros Coffee employees travel from vehicle to vehicle to greet customers and take orders. These "runners" utilize a handheld device to transmit customers' orders to the multiple drink stations inside the building. Additionally, runners will charge individuals while in line, so by the time they arrive at the service window, they may pick up their order and be on their way. This system decreases wait times, while allowing the runners to have a more personal face-to-face interaction with customers.

The drive-through will not include any speaker boxes. All customer orders are taken in person either at the window or with a runner that carries a handheld device to transmit orders to the kitchen. This ordering process minimizes noise impacts and decreases the amount of vehicle idling at menu boards that are common at traditional drive-through facilities.

Operational Measures

The Dutch Bros Coffee site is proposing an extensive directional sign package that will direct customers throughout the site. In addition, the layout of the site was designed to create the best possible flow and the maximum queuing possible to reduce spillover onto neighboring properties or the public roads.

All staff are required to attend a monthly shop meeting to discuss traffic plans in detail. In addition, the staff will gather before each shift to ensure the traffic strategy is set.

Approximately three (3) or four (4) staff will be dedicated to the parking area throughout the day to take orders and receive payments. In addition, one (1) person's sole responsibility will be traffic control. Tactics will include instructing all vehicles to pull forward as close as possible to utilize the maximum queuing available, directing cars into the waiting area or the escape lane if needed, and ensuring no cars are blocking the road or areas they are not allowed to block.

These measures, in addition to implementing the runner system described above, will reduce customers' time at the window to 30 to 45 seconds. If customers are taking longer than that timeframe, the drink runners will bring drinks to the customers in line behind the window to allow those customers to exit via the bypass/exit lane. This means that customers are not required to reach the drive-through window to receive

their order and to exit the site. These measures significantly minimize the potential for queuing spillover outside of the dedicated drive-through lanes.

The typical business hours for Dutch Bros Coffee include a 24-hour operation unless restrictions apply. Dutch Bros Coffee will employ and schedule seven (7) to eight (8) people per shift, with three (3) to four (4) total shifts.

Site Design and Orientation

The project site is approximately 64,331 square feet in size and is located on an undeveloped parcel that is part of an overall development, off of West Cedar Hills Drive. The overall development currently consists of a Dollar Tree, Great Clips, and a pizza restaurant. A Jack in the Box restaurant with a drive-through is proposed on the overall development, north of the Dutch Bros Coffee site under a separate application.

There is an existing access to the north of the site off West Cedar Hills Drive. Two (2) additional accesses to the overall development exist off 10040 North Street and North 4700 West. Another access is proposed off 10040 North Street, further west and providing direct access to the future Jack in the Box for the overall development.

Entering from the existing northern shared access off West Cedar Hills Drive, customers head south then northwest to enter the drive-through. The drive-through leads customers westward and wraps around the building towards the southwest until it reaches the drive-through service window on the northwestern building façade.

Architecture

The proposed building is visually interesting. It will be constructed with a variety of high-quality building materials and painted with simple, bold colors. Vertical and horizontal façade breaks, building massing, and modulation have all been incorporated into the design of the building. Canopy awnings are provided over all entrances and service doors, including a large 300-square-foot canopy over the customer walk-up service window providing weather protection for the proposed patio area with outdoor seating. The building features modulation with a tower element, building wall articulation, and building materials that are aesthetically pleasing. Colorful and visually interesting wall signs depicting the Dutch Bros Coffee logos will be installed on all sides of the building.

Signs and Lighting

Signs proposed for use at the project site will conform to the City of Cedar Hills Zoning Code. The signs proposed to be installed at the project site include wall, menu, drive-through, parking lot, and directional signs. The signs will be constructed with high-quality materials and will be installed under separate permits.

Site lighting will be implemented for the safety and security of all customers, pedestrians, and employees. Outdoor lighting and illumination at the site will include parking lot security lighting and pedestrian scale lighting within the patio space and along the pedestrian pathway. Exterior building lighting will be installed on the building façade. The drive-through area will be provided with security lighting. All lights will include shields to direct light toward the project site and to keep glare away from the adjacent land uses and rights-of-way.

Conclusion

The proposed Dutch Bros Coffee will enhance the commercial character of the Commercial (SC-1) district. Dutch Bros Coffee is a successful business that will promote improvement of the existing commercial area. Dutch Bros Coffee locations are known to be clean and well maintained, providing quick service from friendly staff. The proposed coffee shop will provide excellent products and service, along with enhanced landscaping areas, lighting, and pedestrian open space at the project site that will benefit all customers and users in the immediate vicinity and the surrounding areas. The above narrative demonstrates how the proposal will increase the overall quality of the project site and positively impact the citizens and businesses of the surrounding community and the City of Cedar Hills.



BARGHAUSEN
A DIVISION OF CORE STATES GROUP

**CORE
STATES**



Drainage Conformance Letter

Dutch Bros Coffee (UT0901)

PREPARED BY

Barghausen Consulting
Engineers, LLC

PREPARED FOR

Dutch Bros Coffee

CLIENT ADDRESS

P.O. Box 1929
Grants Pass, OR 97528

SITE ADDRESS

4773 W. Cedar Hills Dr.
Cedar Hills, UT 84062

PROJECT NO.

23689

DATE

03/12/25

JURISDICTION

City of Cedar Hills

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1.0	INTRODUCTION/GENERAL INFORMATION
2.0	EXISTING CONDITIONS
3.0	DEVELOPED CONDITIONS
4.0	DESIGN ASSUMPTIONS
5.0	CONFORMANCE
6.0	CONCLUSION

APPENDICES

APPENDIX A Proposed Drainage Map

APPENDIX B Drainage Analysis for JW Properties by AWA

1.0 INTRODUCTION/GENERAL INFORMATION

The following stormwater control plan has been prepared for the proposed commercial development project located at the southwest intersection of W. Cedar Hills Drive and N 4800 W, in the City of Cedar Hills, Utah. The proposed design has been developed in conformance with the City of Cedar Hills and Utah County Standards. The proposed development will consist of a 1,025 square foot Dutch Brothers Coffee building, along with vehicular parking and maneuvering areas, and pedestrian and landscaped areas

2.0 EXISTING CONDITIONS

The project site is located at the southwest intersection of W. Cedar Hills Drive and N 4800 W, in the City of Cedar Hills, Utah (Figure 1) and is bounded to the east by a shared private access road for existing commercial development, to the north by W. Cedar Hills Drive, to the south future commercial development, and to the west N 4800 W. The project site is currently designated as Shopping Center (SC-1) zone. The existing site is currently a vacant undeveloped lot.

The existing site is relatively flat and generally sheet flows to the south towards N 10040. There are existing drainage inlets near the existing driveway on 10040 N.

According to the Federal Emergency Management Agency Flood Insurance Rate Map, Panel No. 090049C0167F, dated June 16, 2020, the site is located in Zone X. Zone X is defined as areas of 0.2% annual chance of flood; areas of 1% annual change flood with average depths of less than 1 foot for with drainage areas less than 1 sq. mile.

3.0 DEVELOPED CONDITIONS

The project proposes a 0.80 acre development consisting of a Dutch Brothers Coffee commercial building with an 1,025 SF footprint within a large proposed commercial development. A major portion of the site is proposed to be paved vehicular parking and drive areas with landscaping buffers on the north, west, and east, and as well as scattered landscape area islands. The proposed conditions focus on reducing impervious areas to the maximum extent feasible, while increasing pervious areas in an effort to reduce generated stormwater runoff. The proposed development contains one drainage area.

The site is designed to sheet flow stormwater runoff to proposed curb and gutter where runoff will be collected by proposed drainage inlets and conveyed to an existing underground stormwater chamber system by the overall development.

The site consists of three sub-drainage basins, Basin A-1, A-2, and A-3.

Basin A-1 consists of majority of the Dutch Bros site, which includes the building, landscape, hardscape, parking, and drive aisles. Runoff from Basin A-1 sheet flows south towards south and will be collected via curb and gutter towards proposed storm drain inlets and conveyed via storm drains to an underground storm chamber system by the overall development.

Basin A-2 sheet flows south, which consists of drive aisles. Runoff from Basin A-2 will be collected by the future site south of the site, which is also tributary to the same underground storm chamber system as the Dutch Bros site.

Basin A-3 sheet flows south, which consisting of landscaping. Runoff from Basin A-3 will sheet flow south.

Refer to Appendix A for the Proposed Drainage Map.

4.0 DESIGN ASSUMPTION

The following assumptions were utilized as part of the hydrologic and hydraulic analysis for the project:

- Retention and treatment will be provided by an existing underground chamber system for the overall development for the 100-year
- Runoff coefficient for Impervious Areas were assumed to be 0.10 for landscape, 0.85 for roof, and 0.9 for impervious surfaces.

5.0 CONFORMANCE

A Drainage Analysis by AWA, "Storm Water Analysis – JW Properties – Cedar Hills", dated February 14, 2025 provided a drainage analysis for the overall development. The overall development accounts for the Dutch Bros site Lot 3 in their Drainage Analysis. Refer to Appendix B for the Drainage Analysis for the overall development.

The overall development assumes the Dutch Bros site has weighted coefficient of 0.69 and 0.77 acres.

The Dutch Bros site is 0.77 acres and is 67% impervious. The proposed site has a weighted runoff coefficient of 0.65, which is less than the assumed runoff coefficient by the overall development.

5.1 Proposed Conditions Runoff Coefficient

SITE:

Total = 0.77 acres

Pervious = 0.23 acres

Roof = 0.02 acres

Impervious = 0.52 acres

$$C = \frac{A_1 C_1 + A_2 C_2}{\sum Areas} = \frac{(0.23 AC)(0.10) + (0.02 AC)(0.85) + (0.52 AC)(0.90)}{0.77 AC} = 0.65$$

6.0 CONCLUSION

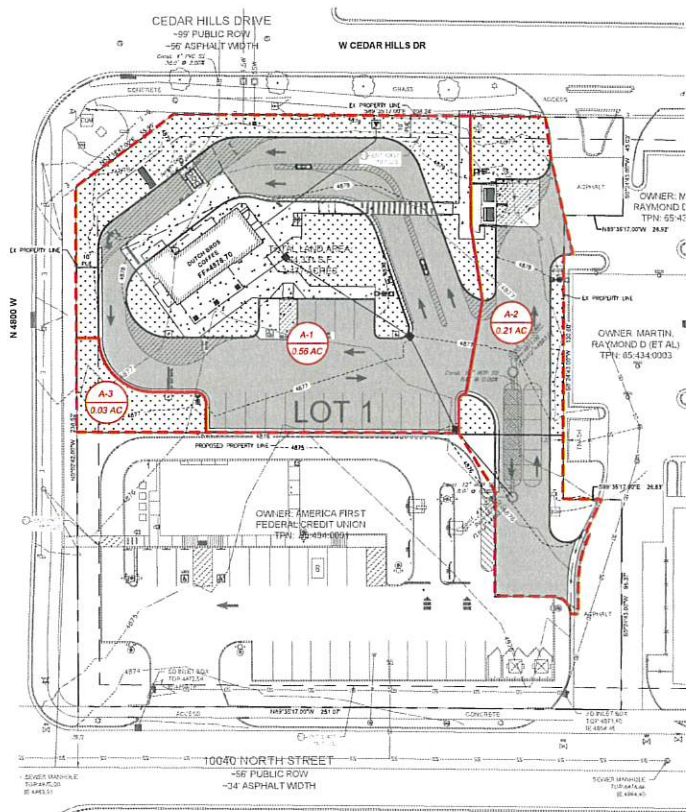
The project site is designed to sheet flow towards the south and will be collected by a series of curb and gutter and drainage inlets. The runoff will be conveyed to an underground system by the overall development. The Dutch Bros site has a weighted runoff of 0.64, which is less than the 0.69 assumed by the overall development. Therefore, the Dutch Bros site is in conformance with the drainage study by the overall development.

APPENDIX A: PROPOSED DRAINAGE MAP



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

DUTCH BROS COFFEE UT0901
4773 W. CEDAR HILLS DR., CEDAR HILLS, UT



PROPOSED 100-YEAR DRAINAGE SUMMARY									
BASIN	TOTAL AREA (AC)	IMPERV (AC)	PERV (AC)	RUNOFF, c	PEAK				
					To (min)	(100-YR) (in/hr)	PEAK Q ₁₀₀ (cfs)	To (min)	(100-YR) (in/hr)
A-1	0.56 AC	0.15	0.41	0.55	5	3.45	1.33	1440	3.125
A-2	0.21 AC	0.06	0.15	0.57	5	3.45	0.49	1440	3.125
A-3	0.03 AC	0	0.03	0.10	5	3.45	0.01	1440	3.125

NOTE:
1. RAINFALL INTENSITY PER CITY OF CEDAR HILLS AND DURATION USED IN THE DRAINAGE ANALYSIS FOR 20
PROPERTIES - CEDAR HILLS, UT JANUARY 14, 2025.



Title
PROPOSED DRAINAGE CONDITIONS
4773 W. CEDAR HILLS DR.,
CEDAR HILLS, UT 84092



Scale
Horizontal
Vertical

Horizontal
Vertical

Horizontal
Vertical

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Vertical

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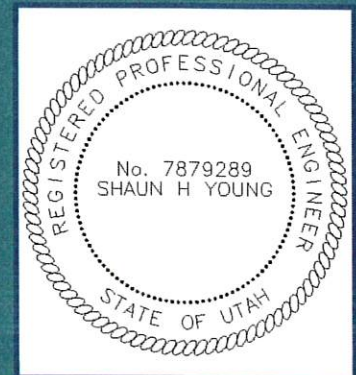
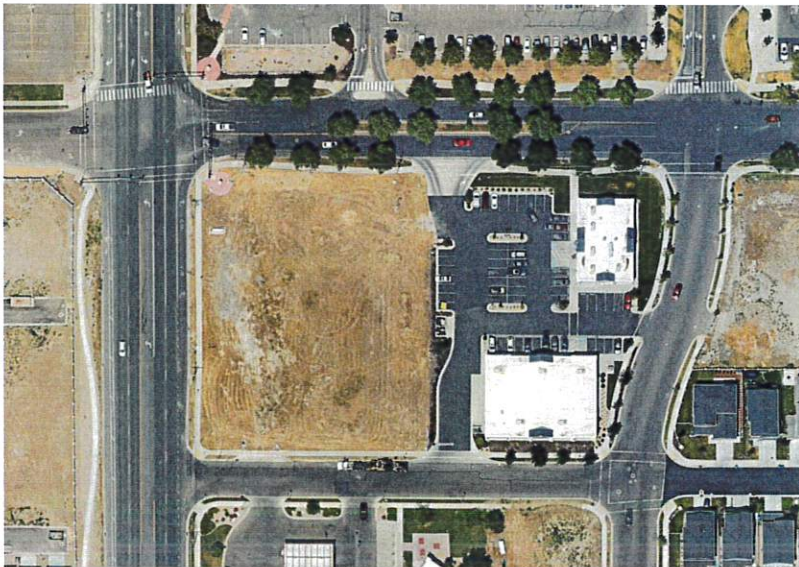
**APPENDIX B: DRAINAGE ANALYSIS FOR JW PROPERTIES
BY AWA, DATED FEBRUARY 14, 2025**



JW Properties – Cedar Hills

4773 West Cedar Hills Drive
Cedar Hills, Utah

Storm Water Analysis



Prepared For:

JW Properties
6925 S. Union Park Center Ste: 480
Cottonwood Heights, Utah 84047

Anderson, Wahlen & Associates, Inc.

2010 North Redwood Road

Salt Lake City, Utah 84116

Phone: (801) 521-8529

Fax: (801) 521-9551

Revised Date: February 14, 2025

Job #: 24-090

Prepared By: Kevin Fong

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Appendices

- ❖ Vicinity Map
- ❖ Rational Calculations
- ❖ Cedar Hills Storm Water Management Program – IDF Curve Table
- ❖ Basin Map

INTRODUCTION

JW Properties is proposing a new commercial development within the Cedar Hills Retail Center. The construction of this development will involve improvements to approximately 1.48 acres of land that is currently undeveloped and located at the corner of North County Boulevard and Cedar Hills Drive. The developer is responsible for providing Pad ready Lots for future clients. Pad ready Lots include future utilities such as Storm Drain, Sanitary Sewer, and Water connections.

The purpose of this report is to examine the following:

- Determine the flows that will be generated by the proposed development
- Determine the required retention volume for the storm water runoff generated based on rainfall intensities provided by the City of Cedar Hills
- Storm Water Treatment
- Discuss Low Impact Development (LID)

LOCATION

The proposed commercial development will be located on Parcel ID: 65:434:0001 of the Cedar Hills Retail Center Subdivision.

METHODOLOGY

Rainfall intensities were provided by the City of Cedar Hills. The 100-year intensities were utilized in this analysis. The rational method was used to determine the storage volume required for on-site improvements. The site was divided into two basins. Each basin was broken down into one of three categories (landscape, roof, and impervious) for use in the rational method and in determining a composite runoff coefficient. Individual runoff coefficients of 0.1, 0.85, and 0.9 were used for landscape, roof, and impervious surfaces respectively.

ANALYSIS

All storm water will be retained on-site in a shared underground storage chamber. Storm water treatment is accomplished by having storm water runoff pass through an isolator row, which is wrapped in filter fabric. The filter fabric will capture sediment and prohibit the migration of fines into the stone bedding.

An on-site geotechnical field investigation was conducted by GSH Geotechnical, Inc. in 2014. GSH conducted a field test and determined a percolation rate of 1 minute/inch; however, as a factor of safety, 5 minutes/inch was used for this evaluation. No major earthwork has occurred since the time of the report. Using this value, a release rate was determined based on the footprint of the storage chambers. The total required retention volume is 3,471 cu. ft. StormTech underground storage chambers will be utilized and will provide 4,122 cu. ft. with a surplus of 651 cu. ft.

CONCLUSION

Adequate storage will be provided for the proposed commercial development to retain storm water runoff generated by the 100-year storm. The underground storage chambers will provide a total of 4,122 cu. ft. with a surplus of 651 cu. ft. The proposed retention system meets the State's Low Impact Development (LID) guidelines as LID requires to retain the 80% percentile precipitation depth. The proposed development will retain 100% of storm water runoff generated by the future development.

Vicinity Map



Cedar Hills Retail Center:

4773 West Cedar Hills Drive
Cedar Hills, Utah 84062

Storm Water Calculations - Lot 3

Job Name: JW Properties - Cedar Hills

Date: 2/14/2025

Prepared By: KF

Reviewed By:

Methodology: Modified Rational

Developed Conditions

Area Type	Area (ft ²)	C
Roof	1025	0.85
Hard Surfaces	22,370	0.9
Landscape	10,063	0.2
Subtotal=	33,458	
Total=	0.77	acres
C average=	0.69	

Percolation Rate **0.000278** ft/s
 Retention Area **671** sq. ft.
 Release Rate (cfs)= **0.187** cfs

Frequency: 100 yr

Time (min)	Intensity (in/hr)	Acc.Vol (ft ³)	Rel.Vol (ft ³)	Req. Stor. (ft ³)
5	3.480	552	56	496
10	2.700	856	112	744
15	2.320	1103	168	935
30	1.600	1522	336	1186
60	1.010	1921	672	1250
120	0.620	2359	1343	1016
180	0.490	2796	2015	782
360	0.330	3766	4029	-263
720	0.210	4794	8058	-3265
1440	0.120	5478	16117	-10638

Storm Water Calculations - Lot 4

Job Name: JW Properties - Cedar Hills

Date: 2/14/2025

Prepared By: KF

Reviewed By:

Methodology: Modified Rational

Developed Conditions

Area Type	Area (ft ²)	C
Roof	2000	0.85
Hard Surfaces	20,949	0.9
Landscape	7,924	0.2
Subtotal=	30,873	
Total=	0.71	acres
C average=	0.72	

Percolation Rate **0.000278** ft/s
Retention Area **671** sq. ft.
Release Rate (cfs)= **0.187** cfs

Frequency: 100 yr

Time (min)	Intensity (in/hr)	Acc.Vol (ft ³)	Rel.Vol (ft ³)	Req. Stor. (ft ³)
5	3.480	531	56	475
10	2.700	823	112	711
15	2.320	1061	168	893
30	1.600	1464	336	1128
60	1.010	1848	672	1176
120	0.620	2269	1343	926
180	0.490	2690	2015	675
360	0.330	3623	4029	-406
720	0.210	4611	8058	-3448
1440	0.120	5269	16117	-10847

Storm Water Calculations - Combined

Job Name: JW Properties - Cedar Hills

Date: 2/14/2025

Prepared By: KF

Reviewed By:

Methodology: Modified Rational

Developed Conditions

Area Type	Area (ft ²)	C
Roof	3025	0.85
Hard Surfaces	43,319	0.9
Landscape	17,987	0.2
Subtotal=	64,331	
Total=	1.477	acres
C average=	0.70	

Percolation Rate **0.000278** ft/s
Retention Area **671** sq. ft.
Release Rate (cfs)= **0.187** cfs

Frequency: 100 yr

Time (min)	Intensity (in/hr)	Acc.Vol (ft ³)	Rel.Vol (ft ³)	Req. Stor. (ft ³)
5	3.480	1082	56	1026
10	2.700	1679	112	1567
15	2.320	2164	168	1997
30	1.600	2986	336	2650
60	1.010	3769	672	3098
120	0.620	4628	1343	3284
180	0.490	5486	2015	3471
360	0.330	7389	4029	3360
720	0.210	9404	8058	1346
1440	0.120	10748	16117	-5369

7. Intensity-Duration-Frequency (IDF) Curve

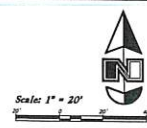
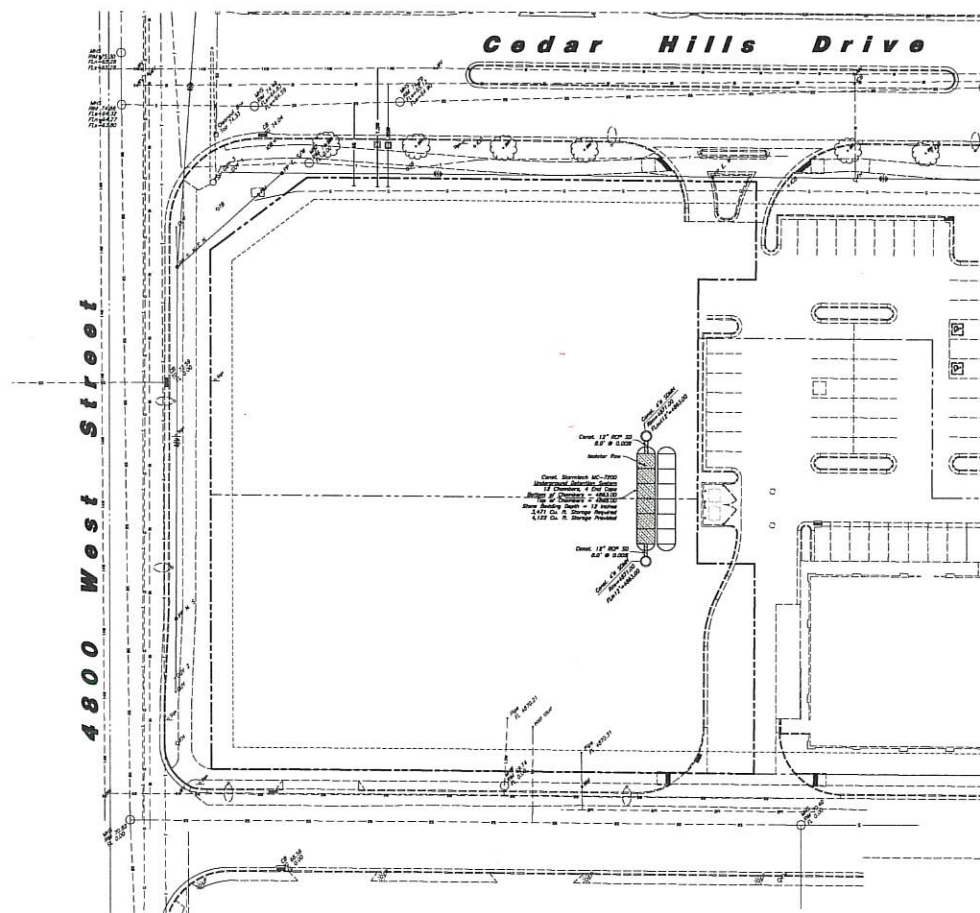
The Intensity Duration Frequency (IDF) curve shown below shall be used for storm drainage calculations in Cedar Hills City.

Design Rainfall Depths (Inches) for the Given Duration

Duration	10 Year	25 Year	50 Year	100 Year
5 min	0.20	0.23	0.26	0.29
10 min	0.31	0.36	0.41	0.45
15 min	0.39	0.46	0.52	0.58
30 min	0.55	0.63	0.72	0.80
60 min	0.69	0.80	0.91	1.01
2 hours	0.84	0.98	1.11	1.24
3 hours	0.98	1.16	1.31	1.46
6 hours	1.33	1.59	1.80	2.00
12 hours	1.64	1.98	2.24	2.49
24 hours	1.97	2.38	2.69	2.99

Design Rainfall Intensities (inches per hour) for the Given Duration

Duration	10 Year	25 Year	50 Year	100 Year
5 min	2.40	2.76	3.12	3.48
10 min	1.86	2.16	2.46	2.70
15 min	1.56	1.84	2.08	2.32
30 min	1.10	1.26	1.44	1.60
60 min	0.69	0.80	0.91	1.01
2 hours	0.42	0.49	0.56	0.62
3 hours	0.33	0.39	0.44	0.49
6 hours	0.22	0.27	0.30	0.33
12 hours	0.14	0.17	0.19	0.21
24 hours	0.08	0.10	0.11	0.12



FINAL REPORT



DUTCH BROS COFFEE PROJECT TRAFFIC IMPACT STUDY

Prepared for
DUTCH BROS COFFEE
OF GRANTS PASS, OR

by **LARSON Engineering, Kurt G. Larson, PE, PTOE**



Kurt G. Larson

Professional Engineer in Utah
Civil Engineer (C.E.)
License No. 170897

November 16, 2022



9071 Quail Run Drive, Sandy, UT 84093 801-694-6554
www.larson-engineering.com

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Introduction

The intent of this traffic study is to establish and analyze existing and expected levels of traffic for proposed development of the property known as "Dutch Bros Coffee, Spanish Fork". This traffic study determines the traffic impacts of the project on the existing street system for existing conditions. This study utilized traffic counts taken by Larson Engineering during the AM peak hour on Thursday, November 10, 2022. The impact of the project on the intersection of 1000 North at 200 East in the project vicinity was analyzed.

Project Description

The proposed project includes the development of the following:

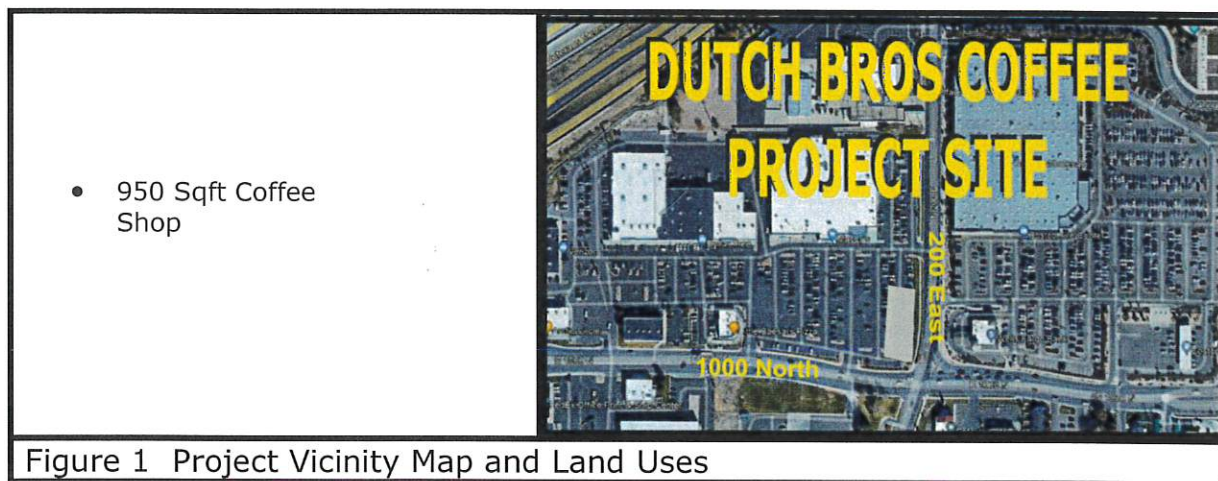
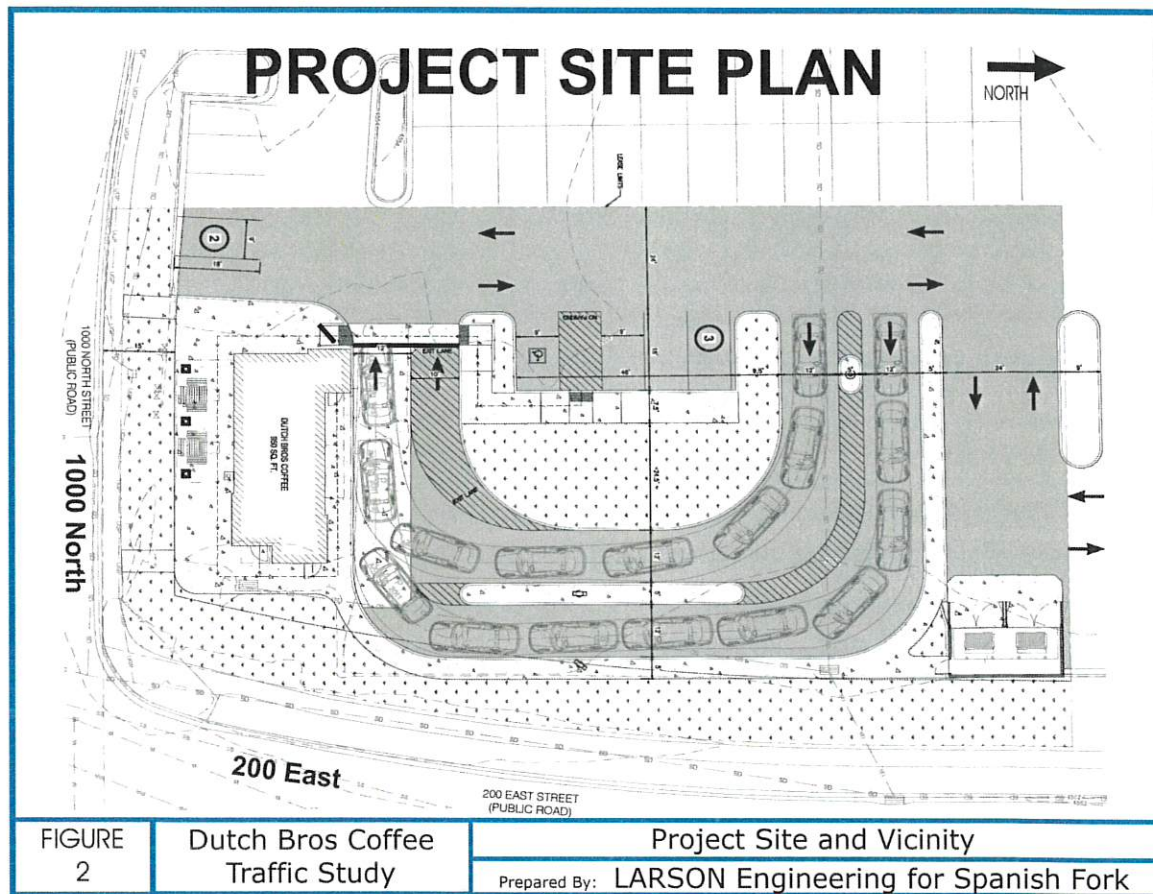


Figure 1 Project Vicinity Map and Land Uses

The Dutch Bros Coffee project will have connective roadway access to 200 East and to 1000 North for the 950 sqft. Coffee Shop. 1000 North is designated with a arterial classification and 200 East is classified as a collector roadway. The specific land use being proposed and project site are defined in Figure 1, which is a summary of the trip generation characteristics of the project, as well as the size of building proposed for construction. The proposed project site layout and vicinity map are shown in Figure 2.



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Project Trip Generation and Distribution

A trip is defined as a one-way vehicular movement with either the origin or destination within the proposed development. The most complete reference of expected trip information for new developments is based on average rates found in "Trip Generation", Ninth Edition, developed by the Institute of Transportation Engineers (ITE). We have used the ITE Coffee Shop (Land Use-938) data to calculate the project trips for this report.

Traffic generated by the Dutch Bros Coffee project is shown in Table 1 which reflects the conditions found in the City of Spanish Fork.

Table 1
Trip Generation for Dutch Bros Coffee Project

Land Use	Quantity	Average Daily Trip Rate	Average Daily Trips	AM Peak Hour Trip Rate	AM Peak Hour Trips
Coffee Shop	1 KSF	1800	1800	300	300
PM Peak Hour Total >>>			1800		300

Source: Trip Generation Manual, Ninth Addition
LARSON Engineering

The time when greatest traffic impacts take place is typically the midweek AM peak hour between 7:00-9:00 AM. The project's trip generation during the AM peak hour of an average midweek day is the focus of this analysis, as this is the critical period.

The table shows approximately 1800 trips will be generated each weekday by the proposed project. When building construction is completed, 150 vehicles are expected to enter, and 150 vehicles are expected to exit the Dutch Bros Coffee development during the AM peak hour.

Because of the location of this development and the direction that customers will desire to travel, each weekday, approximately 810 daily trips will enter and leave the area via 1000 North to Eastern destinations, 810 daily trips will enter and leave the area via 1000 North to Western destinations, and 180 daily trips will enter and leave the area via 200 East to Southern destinations.



The intersection capacity analysis found in the Appendix shows the existing roadway capacity for the signalized controlled intersection of 1000 North at 200 East. The intersection of 1000 North at 200 East currently operates at Level of Service "A" with an average vehicular delay of 7.3 seconds per vehicle during the AM peak hour.

Larson Engineering counts taken on November 10, 2022 indicate approximately 950 vehicles per day use 200 East, North of 1000 North, 920 vehicles per day use 200 East, South of 1000 North. Also, approximately 4830 vehicles per day use 1000 North, West of 200 East and approximately 5220 vehicles per day use 1000 North, East of 200 East in the project vicinity.

Queuing Analysis

Our queuing analysis was performed on August 12th, 2021 during the AM peak hour (7:00 AM to 9:00 AM) at the Dutch Bros Coffee located at 3843 W. 7800 S., in West Jordan, Utah. This location was chosen because it is one of the first Dutch Bros Coffee locations in the Salt Lake Valley and currently has a strong sales history.

During the AM peak hour period, vehicular queues were found to vary from 3 to 5 vehicles for most of the study period. The maximum queue was 9 vehicles at approximately 7:45 AM and for about a 10-minute period varied between 5 and 8 vehicles just before 8:00 AM. Projecting these queues to the Spanish Fork City site shows the queue lengths will be nicely accommodated with-in the Dutch Bros Coffee project site as currently designed.

Product Delivery Analysis

Dutch Bros Coffee has a somewhat unique order collection and product delivery system. All customer orders are taken in person either at the window or with a runner that carries a mobile handheld device that takes payments and transmits orders to product preparation stations inside the building. The design is such that by the time the customer arrives at the service window their order is ready for picked up.

Our observations found most of the time runners were delivering orders to the vehicles that were 2, 3 & 4 cars back from the pick-up window allowing them to use the escape lane for immediate exit. This process dissipates the queue in a quick and orderly fashion. Runners are also trained to keep vehicles moving forward so queue gaps are continually minimized. This



keeps the overall queue length as short as possible. Our studies found peak queues were never longer than 13 vehicles.

Conclusions and Recommendations

1. The proposed 950 square foot Dutch Bros Coffee located at approximately 190 E 1000 North will generate approximately 1800 trips each weekday. After the coffee shop is constructed, 45% or about 810 trips are expected to use 1000 North to the West, 45% or about 810 trips are expected to use 1000 North to the East, and 180 trips are expected to use 200 East to the South of the project site each day.
2. The intersection of 1000 North at East is currently operating at a Level of Service "A" with an intersection delay of 7.3 seconds per vehicle during the PM peak hour. After construction of the project the intersection Level of Service will remain at Level of Service "A" and the delay will be 8.9 seconds per vehicle.
3. The access provided for the proposed project is adequate for trip entrance and exit of the project. There are 3 existing access points that will be used with one connection to 200 East and 2 connections to 1000 North.
4. The queues to the Spanish Fork site shows the anticipated queue lengths will be nicely accommodated with-in the Dutch Bros Coffee project site as currently designed.
5. The projects projected 300 AM peak hour trips will have no significant impact to the existing intersection capacities in the vicinity of the project.

APPENDIX



Level of Service (Existing Conditions)

HCM Signalized Intersection Capacity Analysis

1: 1000 North & 200 East

11/14/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↰↱		↰	↰↱	↰	↰	↰		↰	↰↱	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.91		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3511		1770	3539	1583	1770	1687		1770	1681	
Flt Permitted	0.91	1.00		0.91	1.00	1.00	0.74	1.00		0.73	1.00	
Satd. Flow (perm)	1693	3511		1693	3539	1583	1386	1687		1368	1681	
Volume (vph)	15	215	12	25	212	35	17	12	20	15	6	12
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	234	13	27	230	38	18	13	22	16	7	13
RTOR Reduction (vph)	0	10	0	0	0	31	0	12	0	0	7	0
Lane Group Flow (vph)	16	237	0	27	230	7	18	23	0	16	13	0
Turn Type	Perm			Perm		Perm	Perm			Perm		
Protected Phases	4			8		8	2			6		
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	4.4	4.4		4.4	4.4	4.4	10.0	10.0		10.0	10.0	
Effective Green, g (s)	4.4	4.4		4.4	4.4	4.4	10.0	10.0		10.0	10.0	
Actuated g/C Ratio	0.20	0.20		0.20	0.20	0.20	0.45	0.45		0.45	0.45	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	333	690		333	695	311	619	753		611	750	
v/s Ratio Prot		c0.07			0.06			c0.02			0.01	
v/s Ratio Perm	0.01			0.02		0.02	0.01			0.01		
v/c Ratio	0.05	0.34		0.08	0.33	0.02	0.03	0.03		0.03	0.02	
Uniform Delay, d1	7.3	7.8		7.3	7.7	7.3	3.5	3.5		3.5	3.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.3		0.1	0.3	0.0	0.0	0.0		0.0	0.0	
Delay (s)	7.4	8.1		7.5	8.0	7.3	3.5	3.5		3.5	3.5	
Level of Service	A	A		A	A	A	A	A		A	A	
Approach Delay (s)		8.0			7.9			3.5			3.5	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	7.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.14		
Actuated Cycle Length (s)	22.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	27.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Dutch Bros Coffee Spanish Fork UT 7:30 am 1/10/2022 Existing Conditions

Synchro 6 Report



Level of Service (Existing + Project Conditions)

HCM Signalized Intersection Capacity Analysis

1: 1000 North & 200 East

11/14/2022

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱	↲	↰	↱	↲	↰	↱	↲	↰	↱	↲
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Flt Protected	1.00	0.99		1.00	1.00	0.85	1.00	0.92		1.00	0.87	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	3511		1770	3539	1583	1770	1716		1770	1618	
Satd. Flow (perm)	0.55	1.00		0.60	1.00	1.00	0.69	1.00		0.73	1.00	
Satd. Flow (perm)	1032	3511		1115	3539	1583	1283	1716		1359	1618	
Volume (vph)	55	215	12	25	212	109	17	18	20	55	12	86
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	234	13	27	230	118	18	20	22	60	13	93
RTOR Reduction (vph)	0	9	0	0	0	91	0	14	0	0	61	0
Lane Group Flow (vph)	60	238	0	27	230	27	18	28	0	60	45	0
Turn Type	pm+pt			pm+pt		Perm	Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	9.1	7.8		7.7	7.1	7.1	10.6	10.6		10.6	10.6	
Effective Green, g (s)	9.1	7.8		7.7	7.1	7.1	10.6	10.6		10.6	10.6	
Actuated g/C Ratio	0.29	0.25		0.25	0.23	0.23	0.34	0.34		0.34	0.34	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	334	883		290	811	363	439	587		465	553	
v/s Ratio Prot	c0.01	0.07		0.00	0.06			0.02			c0.07	
v/s Ratio Perm	0.05			0.02		0.07	0.01			0.04		
v/c Ratio	0.18	0.27		0.09	0.28	0.07	0.04	0.05		0.13	0.08	
Uniform Delay, d1	8.0	9.3		8.9	9.9	9.4	6.8	6.8		7.0	6.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.2		0.1	0.2	0.1	0.0	0.0		0.1	0.1	
Delay (s)	8.3	9.5		9.0	10.0	9.5	6.8	6.9		7.1	7.0	
Level of Service	A	A		A	B	A	A	A		A	A	
Approach Delay (s)		9.2			9.8			6.9			7.0	
Approach LOS		A			A			A			A	

Intersection Summary

HCM Average Control Delay	8.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	31.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	29.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Dutch Bro Coffee Spanish Fork UT 7:30 am 11/10/2022 Existing + Project Conditions

Synchro 6 Report

