**AMERICAN FORK CITY PLANNING COMMISSION**
**JANUARY 5, 2022**
**REGULAR SESSION**

Notice is hereby given that the American Fork City Planning Commission will meet in regular session on January 5, 2022, at the American Fork City Hall, 31 North Church Street, commencing at 7:00 p.m.

The agenda shall be as follows:

1. Hearing, review and action on a preliminary and final plat for Beck Hillside Estates consisting of 15 lots, located in the area of 760 North 200 East in the R-1-9,000 Residential zone

2. Hearing, review and action on a commercial site plan for Goldfish Swim School, located at 348 South 500 East, in the GC-2 General Commercial zone

3. Hearing, review and action on a site plan for Roderick Catalyst Business Park Building 4 located in the area of 346 East 1600 South, in the PI-1 Planned Industrial zone

4. Hearing, review and action on a site plan for Roderick Catalyst Business Park Building 5 located in the area of 268 East 1600 South, in the PI-1 Planned Industrial zone

5. Hearing, review and action on an ordinance creating Section 13.04.050 of the American Fork Municipal Code regarding utility services to property outside of city boundaries

6. Other Business

7. Site Plan Committee Report

8. Review and action on the minutes of the December 8, 2021 Planning Commission Regular Session

9. Adjournment

John H. Woffinden, P.G.

Planning Commission Chairman

*The order of agenda items may change to accommodate the needs of the commission, city staff and the public*

**AMERICAN FORK CITY** **MEETING DATE:** January 5th, 2022
**PLANNING COMMISSION** **STAFF:** Patrick O'Brien

**AGENDA TOPIC:** Hearing, review, and action on a preliminary and final plat for Beck Hillside Estates consisting of 15 lots, located in the area of 760 North 200 East in the R1-9000 zone.

| BACKGROUND INFORMATION | | | | | |
|---|---|---|---|---|---|
| Location: | | 760 North 200 East | | | |
| Applicants: | | Keaton Morton/Anderson Developers | | | |
| Existing Land Use: | | Residential Low Density | | | |
| Proposed Land Use: | | | | | |
| Surrounding Land Use: | North | Residential Low Density | | | |
| | South | Residential Low Density | | | |
| | East | Residential Low Density | | | |
| | West | Residential Low Density | | | |
| Existing Zoning: | | R1-9000 | | | |
| Proposed Zoning: | | | | | |
| Surrounding Zoning: | North | RA-1 | | | |
| | South | R1-7500 | | | |
| | East | R1-9000 | | | |
| | West | R1-9000 | | | |
| Land Use Plan Designation: | | Residential Low Density | | | |
| Zoning within Land Use Plan Designation? | | X | Yes | | No |

Background

Beck Hillside Estates is proposed as a 15-lot PUD (Planned Unit Development) on 5.49 acres, with an overall density of 2.7 du/ac. The property recently had a zone change and given a zone designation of R1-9,000.

Access to Greenwood Creek is provided off 200 East Access is provided from 200 East. The site is currently vacant. Adjacent parcels of land are mixed among low-density residential, and undeveloped land with a land use designation of residential low-density.

Consistency with the Land Use Plan

The Land Use Plan designates this area as Residential Low Density. The proposed plat and zoning comply with the Land Use Plan designation; therefore, the proposal is consistent with the Land Use Plan designation.

Section 17.8.211 of the Development Code

The Planning Commission may act to recommend approval of a final plat upon a finding that:

a. The final plat conforms with the terms of the preliminary plan approval.

b. The final plat complies with all City requirements and standards relating to Subdivisions.

c. The detailed engineering plans and materials comply with the City standards and policies.

d. The estimates of cost of constructing the required improvements are realistic.

e. The water rights conveyance documents have been provided.

**FINDINGS OF FACT**

After reviewing the application for final plat approval, the following findings of fact are offered for consideration:

1. The final plat submittal packet meets the requirements of Section 17.7.207 of Chapter 17.7 (Large Scale Development Overlay Zones), as required in Section 17.7.501(C) of the American Fork City Code.
2. The cul-de-sac length does not comply with Section 15.01.100 (E), as it exceeds the allowed limit of 400 feet
3. The proposal does not meet Section 17.7.501 (A) – intent, of the American Fork City Code.
4. The proposal does not meet 17.7.501(E)(2)(f) related to the provision of recreation vehicles parking.

POTENTIAL MOTIONS

2. The cul-de-sac length does not comply with Section 15.01.100 (E), as it exceeds the allowed limit of 400 feet
3. The proposal does not meet Section 17.7.501 (A) – intent, of the American Fork City Code.
4. The proposal does not meet 17.7.501(E)(2)(f) related to the provision of recreation vehicles parking.

POTENTIAL MOTIONS

FINAL PLAT

**APPROVAL**

Mr. Chairman, I move that we recommend approval of the final plat for the Beck Hillside Estates consisting, located in the area of 760 North 200 East with the findings listed in the staff report, and subject to any findings, conditions and modifications found in the engineering report.

**DENIAL**

FINAL PLAT

Mr. Chairman, I move that we deny the preliminary plan for the Beck Hillside Estates consisting, located in the area of 760 North 200 East.

**TABLE**

FINAL PLAT

Mr. Chairman, I move that we table action on the final plat for the Beck Hillside Estates consisting, located in the area of 760 North 200 East.

# AMERICAN FORK CITY ENGINEERING DIVISION
# STAFF REPORT

Planning Commission Meeting Date: 1/5/2022

This report is a summary of the American Fork City Engineering Division plan review comments regarding the subject plan as submitted by the applicant for American Fork City Land Use Authority approval:

Project Name: Beck Hillside Estates

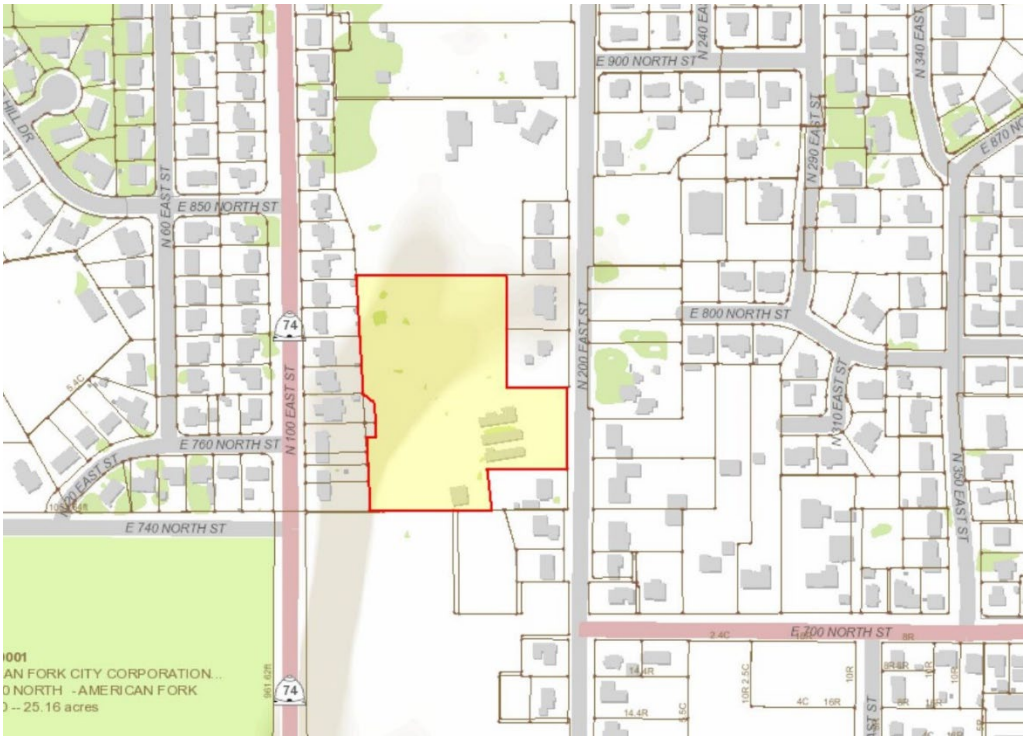
Project Address: 760 North 200 East

Developer / Applicant's Name: Keaton Morton/Anderson Development Services

Type of Application:

- ☒ Subdivision Final Plat
- ☒ Subdivision Preliminary Plan
- ☐ Annexation
- ☐ Code Text Amendment
- ☐ General Plan Amendment
- ☐ Zone Change
- ☐ Commercial Site Plan
- ☐ Residential Accessory Structure Site Plan

**Project Map:**




**Engineering Division Comments:** The plan set that the applicant provided to City Staff on October 7, 2021, have outstanding TRC comments that must be resolved in order to meet City Code requirements. As it relates to engineering items, these include complying with the cul-de-sac length requirements as found in Section 15.01.1430 and specifying existing overhead utilities along 200 East will be buried underground or providing documentation from Rocky Mountain Power indicating their size is equal to or above the 12,470 kV threshold.

## STANDARD CONDITIONS OF APPROVAL

**Standard Conditions of Approval:**

APPLICANT is responsible and shall submit/post/obtain all necessary documentation and evidence to comply with these Standard Conditions of Approval prior to any platting, permitting, or any other form of authorization by the City including plat recording or other property conveyance to the City and prior to scheduling a pre-construction meeting. All recording shall take place at the Utah County Recorder's Office.

1. **Title Report:** Submit an updated Title Report not older than 30 days or other type of appropriate verification that shows all dedications to the City are free and clear of encumbrances, taxes, or other assessments.
2. **Property Taxes and Liens:** Submit evidence that all the property taxes, for the current and/or previous years, liens, and agricultural land use roll over fees have been paid in full.
3. **Water Rights:** Submit evidence that all the required water rights have been conveyed to American Fork City.
4. **Performance Guarantee:** Post a performance guarantee for all required public and essential common improvements.
5. **Easements and Agreements:** Submit/record a long-term Storm Water Pollution Prevention Maintenance Agreement signed and dated by the property owner and any required easement documentation.
6. **Land Disturbance Permit:** Obtain a Land Disturbance Permit.
7. **Compliance with the Engineering Division Plan Review Comments:** All plans and documents shall comply with all the Technical Review Committee comments and the City Engineer's final review.
8. **Commercial Structure:** Record an Owner Acknowledgment and Utility Liability Indemnification if the proposed building is a multi-unit commercial structure served by a single utility service.
9. **Sensitive Lands:** Record all applicable documents required for compliance with the City's Sensitive Lands Ordinance.
10. **Utility Notification Form:** Submit a Subdivision Utility Notification Form.
11. **Professional Verification:** Submit final stamped construction documentation by all appropriate professionals.
12. **Fees:** Payment of all development, inspection, recording, streetlight, and other project related fees.
13. **Mylar:** Submit a Mylar. All plats will receive final verification of all formats, notes, conveyances, and other items contained on the plat by City staff (recorder, legal, engineer, GIS, planning).

**Plan Modifications Required:**

1. Outstanding TRC comments need to be addressed.

# BECK HILLSIDE ESTATES

ADDRESS: 757 NORTH 200 EAST

LOCATED IN SECTION 11,
TOWNSHIP 5 SOUTH, RANGE 1 EAST, SLB&M
AMERICAN FORK, UTAH

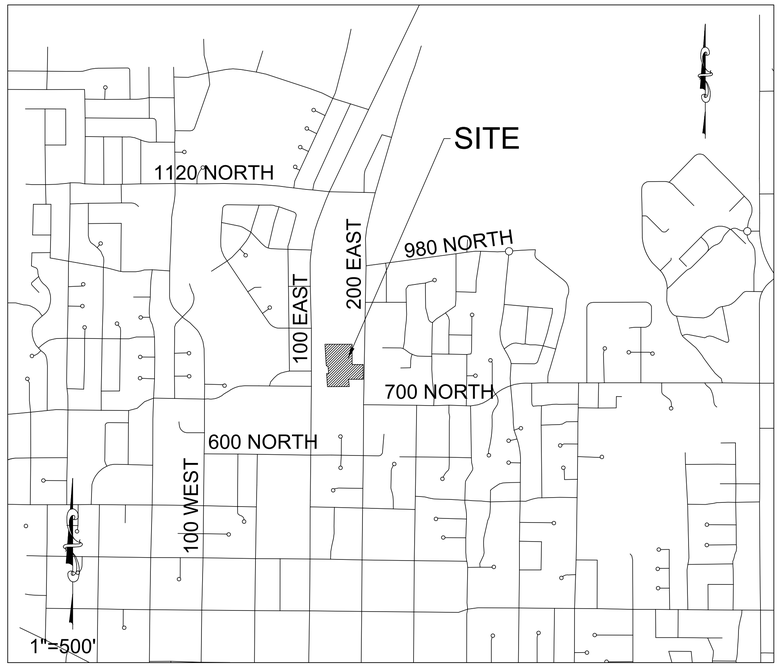
The cul-de-sac length is too long per Section 15.01.1430.

The cul-de-sac length does not comply with Section 15.01.100 (E), as it exceeds the allowed limit of 400 feet

The proposal does not meet Section 17.7.501 (A) – intent, of the American Fork City Code.

The proposal does not meet 17.7.501(E)(2)(f) related to the provision of recreation vehicles parking.

## VICINITY MAP




American Fork City
Technical Review Committee

Engineering Division
Revise & Resubmit
bhunter 12/30/2021

Fire Department
Revise & Resubmit

Planning and Zoning
Revise and resubmit
pobrien 12.30.2021

## SURVEYED DESCRIPTION

Beginning at a point located South 89°50'00" West along section line 484.55 feet from the Southeast Corner of Section 11, Township 5 South, Range 1 East, Salt Lake Base and Meridian; thence South 89°50'00" West 305.85 feet; thence North 03°16'25" West 184.96 feet; thence North 86°21'04" East 26.51 feet; thence North 03°38'57" West 89.49 feet; thence North 54°04'36" West 33.45 feet; thence North 03°16'25" West 297.37 feet; thence East 379.91 feet; thence along the boundary of Callalilly Place Plat "A" the following two courses and distances: 1) South 282.70 feet, and 2) East 153.88 feet; thence South 0°00'52" East 206.72 feet; thence North 89°50'22" West 204.20 feet; thence South 05°37'07" East 102.92 feet to the point of beginning.
Area = 5.49 Acres

## ABBREVIATION TABLE

| | |
|---|---|
| FFE | FINISHED FLOOR ELEV. |
| BOW | BACK OF WALK |
| GB | GRADE BREAK |
| TC | TOP OF CONCRETE |
| TBC | TOP BACK OF CURB |
| TA | TOP OF ASPHALT |
| EA | EDGE OF ASPHALT |
| RIM | RIM ELEVATION |
| FL | FLOWLINE |
| LP | LOW POINT |
| HP | HIGH POINT |
| EG | EXIST GROUND |
| FG | FINISHED GRADE |
| TW | TOP OF WALL |
| BW | BOTTOM OF WALL |
| SF | SQUARE FOOTAGE |
| P.U.E. | PUBLIC UTILITY EASEMENT |
| SLB&M | SALT LAKE BASE & MERIDIAN |
| COR | CORNER |
| N | NORTH |
| S | SOUTH |
| E | EAST |
| W | WEST |
| P.I. | PRESSURIZED IRRIGATION |
| SS | SANITARY SEWER |
| SD | STORM DRAIN |
| T | TOWNSHIP |
| R | RANGE |
| RCP | REINFORCED CONCRETE PIPE |
| WM | WATER METER |
| CB | CATCH BASIN |
| SDMH | STORM DRAIN MANHOLE |
| SSMH | SANITARY SEWER MANHOLE |
| FH | FIRE HYDRANT |
| L.F. | LINEAR FEET |
| S=% | SLOPE |
| IE | INVERT ELEVATION |
| C.O. | CLEAN OUT |
| SL | SEWER LATERAL |

## GENERAL SUBDIVISION NOTES

1. CURRENT ZONING = R1-9000
2. ALL CONSTRUCTION TO CONFORM TO AMERICAN FORK CITY STANDARDS AND SPECIFICATIONS.
3. FLOOD ZONE DESIGNATION: ZONE X, FIRM MAP PANEL #: 49049C0168F ADOPTION DATE: JUNE 19, 2020
4. THERE ARE NO EXISTING WELLS ON THIS PROPERTY. THERE ARE NO EXISTING WELLS WITHIN 100' OF THIS PROPERTY.
5. THE DEVELOPER PETITIONS THE PLANNING COMMISSION TO ALLOW THE OMISSION OF THE RV PARKING REQUIREMENT (17.7.501.E.F)

## CONTACT LIST:

| COMPANY | | CONTACT | PHONE |
|---|---|---|---|
| CENTURY LINK | – TELEPHONE | Bill Westfall | (435) 623 4252 |
| ROCKY MNT. POWER | – POWER | Teria Walker | (801) 756 1310 |
| COMCAST | – CABLE | Elysia Valdez | (801) 401 3017 |
| COMCAST | – FIBER TEL | Sade Christensen | (801) 369 7360 |
| QUESTAR GAS | – GAS (FOREMAN) | Wendy Edwards | (801) 853 8513 |
| QUESTAR GAS | – GAS (HP) | Gaylan Sorensen | (801) 370 6577 |
| DOMINION ENERGY | – GAS | Trent Johnson | (801) 853 6548 |
| AMERICAN FORK CITY | – WATER | Jay Brems | (801) 763 3060 |
| AMERICAN FORK CITY | – SEWER | Ashton Hardy | (801) 763 3060 |
| AMERICAN FORK CITY | – STORM | Ashton Hardy | (801) 763 3060 |
| AMERICAN FORK CITY | – SWPPP | Harlan Nielson | (801) 763 3060 |
| AMERICAN FORK CITY | – P.I. | Jay Brems | (801) 763 3060 |
| AMERICAN FORK CITY | – PLANNING | Adam Olsen | (801) 763 3060 |
| AMERICAN FORK CITY | – ENGINEERING | Ben Hunter | (801) 763 3060 |
| AMERICAN FORK CITY | – INSPECTOR | Dee Howard | (801) 763 3060 |
| FIRE MARSHALL | – FIRE DEPT | Mat Sacco | (801) 763 3045 |
| AF FIBER | | Kyle Petersen | (801) 400-2933 |
| AF FLOOD IRRIGATION COMPANY | | Ernie John | (801) 471 6576 |
| FIRE & RESCUE | | | 911 |
| TIMPANOGOS SPECIAL SERVICE DISTRICT | | David Barlow | (801) 756 5231 |

## SHEET INDEX


| | |
|---|---|
| C1 | COVER SHEET |
| C2 | SITE & STREET TREE PLAN |
| C3 | DEMOLITION PLAN |
| U1 | OVERALL UTILITY PLAN |
| G1 | OVERALL GRADING & DRAINAGE PLAN |
| PP1 | 150 EAST PLAN & PROFILE |
| PP2 | 760 NORTH PLAN & PROFILE |
| PP3 | 200 EAST & PROFILE |
| SWP1 | EROSION CONTROL PLAN |
| SWP2 | BMP DETAILS |
| SWP3 | BMP DETAILS |
| D1 | AMERICAN FORK STANDARD CONSTRUCTION NOTES |
| D2 | DETAILS |
| D3 | DETAILS |
| D4 | DETAILS |
| 1 OF 1 | ATLA / NSPS LAND TITLE SURVEY |


## LAND TABULATIONS:

TOTAL PROPERTY AREA = 239,299 S.F.
RIGHT OF WAY AREA = 48,353 S.F.
LOT AREA = 152,064 S.F.
PRIVATE OPEN SPACE = 32,923 S.F.
PUBLIC OPEN SPACE (TRAIL) = 5,959 S.F.
TOTAL OPEN SPACE AREA = 38,882 S.F.

## WATER, SEWER, & STORM DRAIN DETAILS:

SEE AMERICAN FORK STANDARD DRAWINGS FOR DETAILS ON CULINARY & SECONDARY WATER, SEWER, AND STORM DRAIN.

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

## DATUM ELEVATION NOTE:

NGVD29 BENCHMARK ELEVATION = 4730.99'
NAVD88 BENCHMARK ELEVATION = 4734.52'
THE DIFFERENCE IN ELEVATIONS=3.53'
THESE PLANS CAN BE ADJUSTED TO NAVD88 BY RAISING ALL ELEVATIONS +3.53'

REGISTERED PROFESSIONAL ENGINEER
10/1/21
No. 270393
DAVID W. PETERSON
STATE OF UTAH

LAND SURVEYOR:
AZTEC ENGINEERING INC.
732 N. 780 W.
AMERICAN FORK, UT. 84003
AZTECENGINEERING@GMAIL.COM

## BENCH MARK

EAST 1/4 CORNER, SECTION 11, TOWNSHIP 5 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN
ELEVATION = 4730.99' (NGVD29)
(FOUND BRASS CAP)

## REVISIONS

| Rev. | Date | Description |
|---|---|---|
| 1 | 08/19/21 | REVISED PER CITY COMMENTS |
| 2 | 10/07/21 | REVISED PER CITY COMMENTS |

Developer: ANDERSON DEV. SERVICES
Phone: 801-856-2478

EXCEL ENGINEERING
David W. Peterson, P.E., License #270393
12 West 100 North, Suite 201, American Fork, UT 84003
P: (801) 756-4504; david@excelcivil.com

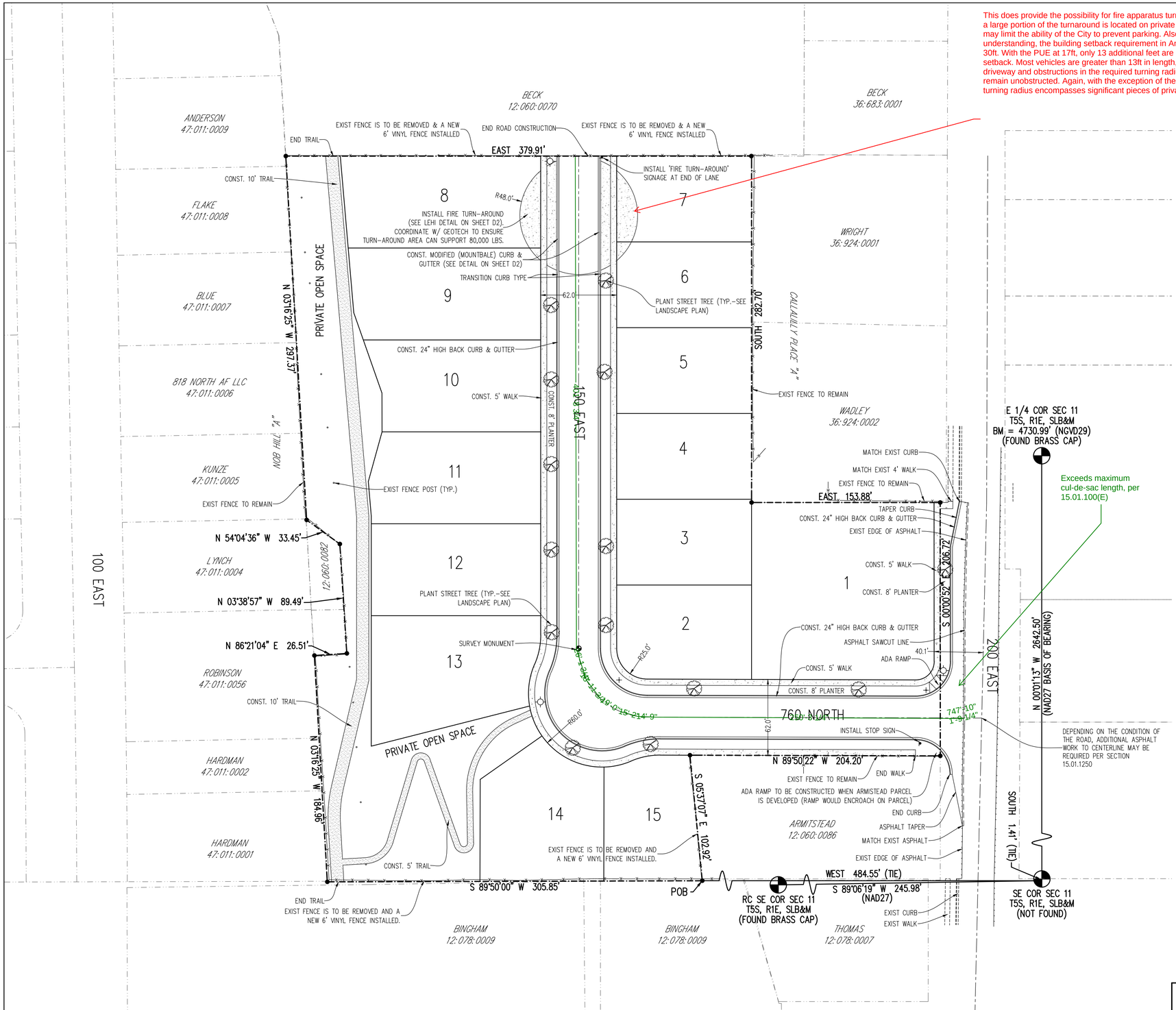
BECK HILLSIDE ESTATES
AMERICAN FORK UTAH

Drawn by: D.W.P.
Designed by: D.W.P.
Checked by: D.W.P.

COVER SHEET

Scale: 1"=40'
Date: 05/24/21
C1

This does provide the possibility for fire apparatus turnaround; however, a large portion of the turnaround is located on private property which may limit the ability of the City to prevent parking. Also, to my understanding, the building setback requirement in American Fork is 30ft. With the PUE at 17ft, only 13 additional feet are required for setback. Most vehicles are greater than 13ft in length, leaving a short driveway and obstructions in the required turning radius that should remain unobstructed. Again, with the exception of the road width the turning radius encompasses significant pieces of private property




## TREE NOTE:

SEE LANDSCAPE PLANS FOR ADDITIONAL TREES WITHIN STREET RIGHT-OF-WAY.
THE PURPOSE OF THIS PLAN IS TO ILLUSTRATE ONE STREET TREE PER LOT ALONG FRONTAGE.

## SITE LEGEND

- INSTALL STOP SIGN
- INSTALL STREET SIGN
- INSTALL STREET LIGHT
- SURVEY MONUMENT
- SECTION CORNER
- PROPERTY CORNER



The proposal does not meet Section 17.7.501 (A) – intent, of the American Fork City Code.

The proposal does not meet 17.7.501(E)(2)(f) related to the provision of recreation vehicles parking.

40 20 0 40 80 120

Scale 1" = 40'

Know what's below. Call before you dig.

REGISTERED PROFESSIONAL ENGINEER — 10/7/21 — No. 270393 — DAVID W. PETERSON — STATE OF UTAH

| BENCH MARK | REVISIONS | | |
|---|---|---|---|
| EAST 1/4 CORNER, SECTION 11, TOWNSHIP 5 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN ELEVATION = 4730.99' (NGVD29) (FOUND BRASS CAP) | Rev. | Date | Description |
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BECK HILLSIDE ESTATES
AMERICAN FORK UTAH

SITE & STREET TREE PLAN

| Drawn by: | Designed by: | Checked by: | Scale: | Date: |
|---|---|---|---|---|
| D.W.P. | D.W.P. | D.W.P. | 1"=40' | 05/24/21 |

C2

EXIST FENCE TO REMAIN
EXIST FILLED-IN SDMH
TOP OF 36"=4713.64
REMOVE EXIST LANDSCAPE IRR BOX
REMOVE EXIST LANDSCAPE IRR BOX
EXIST SSMH
TOP OF 36"=4713.54
EXIST P.P.
EXIST 36" IRRIGATION PIPE
EXIST 8" GROUND DRAIN
EXIST C.B.
EXIST SUMP RIM=4681.35 APPROX. 8" FL=4665.35
EXIST FENCE TO REMAIN
REMOVE EXIST LANDSCAPE IRR BOX
REMOVE EXIST LANDSCAPE IRR BOX
REMOVE EXIST LANDSCAPE IRR BOX
EXIST FENCE POST (TYP.)
EXIST FENCE TO REMAIN
EXIST FENCE TO REMAIN
ABANDONED 10" CUL. (ST) (APPROX. LOCATION)
EXIST 18" CUL (DIP) (APPROX. LOCATION)
ABANDONED 6" CUL. (DIP) (APPROX. LOCATION)
EXIST 42" P.I. (DIP) (APPROX. LOCATION)
EXIST 16" CUL. (DIP) (APPROX. LOCATION)
EXIST 6" P.I. (PVC)
TOP OF 36"=4712.64
REMOVE EXIST LANDSCAPE IRR BOX
EXIST P.I. SERVICE TO REMAIN
EXIST GAS (APPROX. LOCATION)
EXIST TEL (APPROX. LOCATION)
EXIST OVERHEAD POWER
RELOCATE & MODIFY EXIST P.P. INTO PLANTER STRIP PER RMP PLAN.
EXIST SSMH
EXIST SSMH RIM=4680.12 IE=4669.07
REMOVE EXIST FENCES
ASPHALT SAWCUT LINE
EXIST 24" CMP CULVERT PIPE TO BE ABANDONED
REMOVE EXIST BUILDING
REMOVE EXIST CONCRETE
REMOVE EXIST POWER
REMOVE EXIST ASPHALT DRIVE
REMOVE EXIST BUILDING
SHED
REMOVE EXIST IRR DIVERSION STRUCTURE
EXIST CUL. SERVICE TO REMAIN
REMOVE EXIST BUILDING
REMOVE EXIST ASPHALT SHOULDER
REMOVE EXIST LANDSCAPE IRR BOXES
REMOVE EXIST IRR PIPE
ASPHALT SAWCUT LINE
REMOVE EXIST CONCRETE DITCH
REMOVE EXIST FENCES
EXIST FENCE TO REMAIN
RELOCATE EXIST CUL. SERVICE, CAP EXIST SERVICE AT MAIN.
RELOCATE EXIST P.P. SOUTHWEST BEHIND CURB
EXIST S.M.H. RIM=4678.06 IE=4666.46
REMOVE EXIST BARN
REMOVE EXIST LANDSCAPE IRR BOX
EXIST FENCE TO REMAIN

30 15 0 30 60 90
Scale 1" = 30'

Know what's below. Call before you dig.

REGISTERED PROFESSIONAL ENGINEER
10/1/21
No. 270393
DAVID W. PETERSON
STATE OF UTAH

| BENCH MARK | REVISIONS | | |
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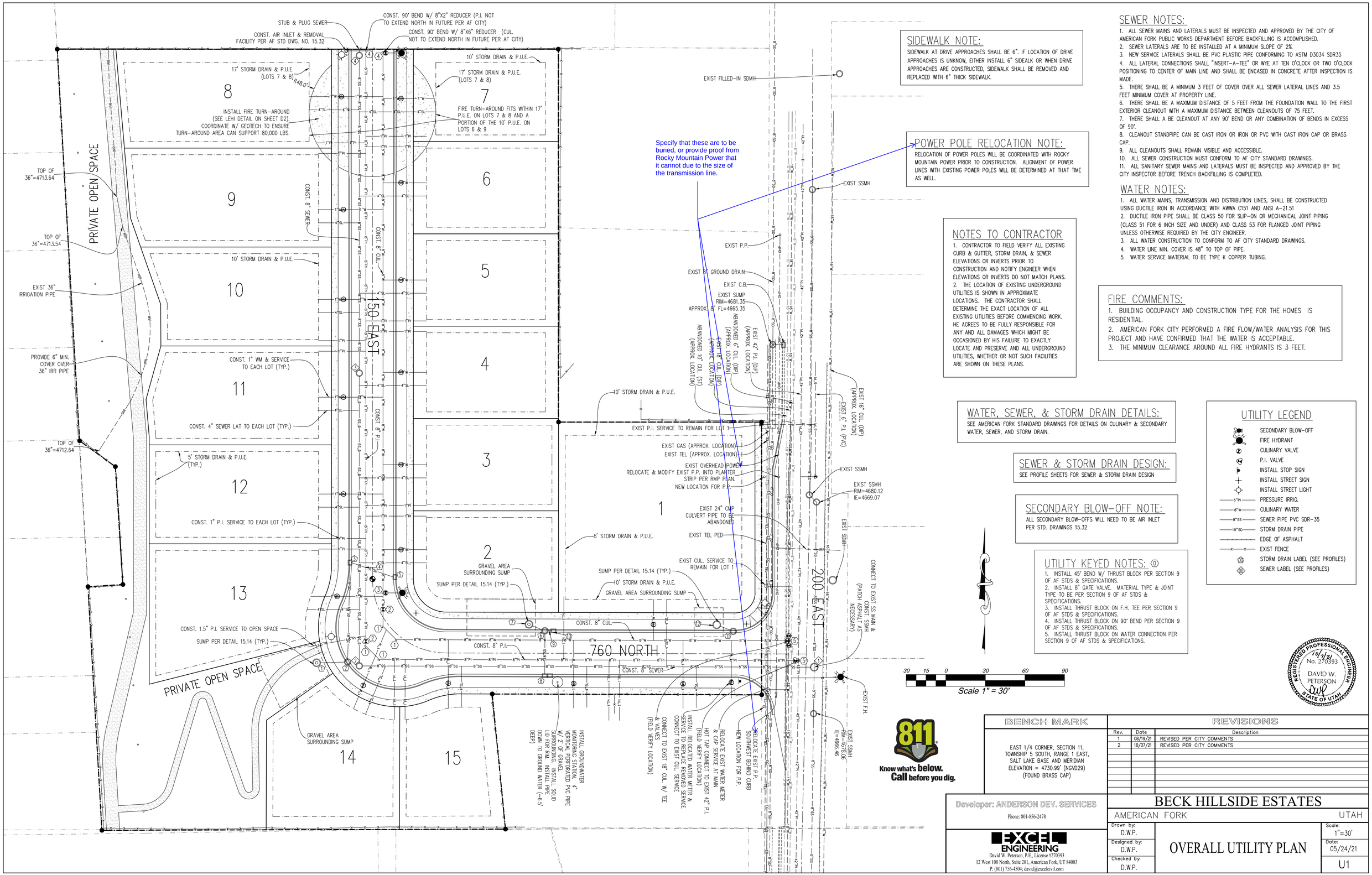
# BECK HILLSIDE ESTATES

AMERICAN FORK UTAH

Drawn by: D.W.P.
Designed by: D.W.P.
Checked by: D.W.P.

## DEMOLITION PLAN

Scale: 1"=30'
Date: 05/24/21
C3




## SIDEWALK NOTE:

SIDEWALK AT DRIVE APPROACHES SHALL BE 6". IF LOCATION OF DRIVE APPROACHES IS UNKNOW, EITHER INSTALL 6" SIDEALK OR WHEN DRIVE APPROACHES ARE CONSTRUCTED, SIDEWALK SHALL BE REMOVED AND REPLACED WITH 6" THICK SIDEWALK.

## POWER POLE RELOCATION NOTE:

RELOCATION OF POWER POLES WILL BE COORDINATED WITH ROCKY MOUNTAIN POWER PRIOR TO CONSTRUCTION. ALIGNMENT OF POWER LINES WITH EXISTING POWER POLES WILL BE DETERMINED AT THAT TIME AS WELL.

## NOTES TO CONTRACTOR

1. CONTRACTOR TO FIELD VERIFY ALL EXISTING CURB & GUTTER, STORM DRAIN, & SEWER ELEVATIONS OR INVERTS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER WHEN ELEVATIONS OR INVERTS DO NOT MATCH PLANS.
2. THE LOCATION OF EXISTING UNDERGROUND UTILITIES IS SHOWN IN APPROXIMATE LOCATIONS. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE AND ALL UNDERGROUND UTILITIES, WHETHER OR NOT SUCH FACILITIES ARE SHOWN ON THESE PLANS.

## SEWER NOTES:

1. ALL SEWER MAINS AND LATERALS MUST BE INSPECTED AND APPROVED BY THE CITY OF AMERICAN FORK PUBLIC WORKS DEPARTMENT BEFORE BACKFILLING IS ACCOMPLISHED.
2. SEWER LATERALS ARE TO BE INSTALLED AT A MINIMUM SLOPE OF 2%.
3. NEW SERVICE LATERALS SHALL BE PVC PLASTIC PIPE CONFORMING TO ASTM D3034 SDR35
4. ALL LATERAL CONNECTIONS SHALL "INSERT-A-TEE" OR WYE AT TEN O'CLOCK OR TWO O'CLOCK POSITIONING TO CENTER OF MAIN LINE AND SHALL BE ENCASED IN CONCRETE AFTER INSPECTION IS MADE.
5. THERE SHALL BE A MINIMUM 3 FEET OF COVER OVER ALL SEWER LATERAL LINES AND 3.5 FEET MINIMUM COVER AT PROPERTY LINE.
6. THERE SHALL BE A MAXIMUM DISTANCE OF 5 FEET FROM THE FOUNDATION WALL TO THE FIRST EXTERIOR CLEANOUT WITH A MAXIMUM DISTANCE BETWEEN CLEANOUTS OF 75 FEET.
7. THERE SHALL A BE CLEANOUT AT ANY 90° BEND OR ANY COMBINATION OF BENDS IN EXCESS OF 90°.
8. CLEANOUT STANDPIPE CAN BE CAST IRON OR IRON OR PVC WITH CAST IRON CAP OR BRASS CAP.
9. ALL CLEANOUTS SHALL REMAIN VISIBLE AND ACCESSIBLE.
10. ALL SEWER CONSTRUCTION MUST CONFORM TO AF CITY STANDARD DRAWINGS.
11. ALL SANITARY SEWER MAINS AND LATERALS MUST BE INSPECTED AND APPROVED BY THE CITY INSPECTOR BEFORE TRENCH BACKFILLING IS COMPLETED.

## WATER NOTES:

1. ALL WATER MAINS, TRANSMISSION AND DISTRIBUTION LINES, SHALL BE CONSTRUCTED USING DUCTILE IRON IN ACCORDANCE WITH AWWA C151 AND ANSI A-21.51
2. DUCTILE IRON PIPE SHALL BE CLASS 50 FOR SLIP-ON OR MECHANICAL JOINT PIPING (CLASS 51 FOR 6 INCH SIZE AND UNDER) AND CLASS 53 FOR FLANGED JOINT PIPING UNLESS OTHERWISE REQUIRED BY THE CITY ENGINEER.
3. ALL WATER CONSTRUCTION TO CONFORM TO AF CITY STANDARD DRAWINGS.
4. WATER LINE MIN. COVER IS 48" TO TOP OF PIPE.
5. WATER SERVICE MATERIAL TO BE TYPE K COPPER TUBING.

## FIRE COMMENTS:

1. BUILDING OCCUPANCY AND CONSTRUCTION TYPE FOR THE HOMES IS RESIDENTIAL.
2. AMERICAN FORK CITY PERFORMED A FIRE FLOW/WATER ANALYSIS FOR THIS PROJECT AND HAVE CONFIRMED THAT THE WATER IS ACCEPTABLE.
3. THE MINIMUM CLEARANCE AROUND ALL FIRE HYDRANTS IS 3 FEET.

## WATER, SEWER, & STORM DRAIN DETAILS:

SEE AMERICAN FORK STANDARD DRAWINGS FOR DETAILS ON CULINARY & SECONDARY WATER, SEWER, AND STORM DRAIN.

## SEWER & STORM DRAIN DESIGN:

SEE PROFILE SHEETS FOR SEWER & STORM DRAIN DESIGN

## SECONDARY BLOW-OFF NOTE:

ALL SECONDARY BLOW-OFFS WILL NEED TO BE AIR INLET PER STD. DRAWINGS 15.32

## UTILITY KEYED NOTES: ⓪

1. INSTALL 45° BEND W/ THRUST BLOCK PER SECTION 9 OF AF STDS & SPECIFICATIONS.
2. INSTALL 8" GATE VALVE. MATERIAL TYPE & JOINT TYPE TO BE PER SECTION 9 OF AF STDS & SPECIFICATIONS.
3. INSTALL THRUST BLOCK ON F.H. TEE PER SECTION 9 OF AF STDS & SPECIFICATIONS.
4. INSTALL THRUST BLOCK ON 90° BEND PER SECTION 9 OF AF STDS & SPECIFICATIONS.
5. INSTALL THRUST BLOCK ON WATER CONNECTION PER SECTION 9 OF AF STDS & SPECIFICATIONS.

## UTILITY LEGEND

- SECONDARY BLOW-OFF
- FIRE HYDRANT
- CULINARY VALVE
- P.I. VALVE
- INSTALL STOP SIGN
- INSTALL STREET SIGN
- INSTALL STREET LIGHT
- 6"PI — PRESSURE IRRIG.
- 8"W — CULINARY WATER
- 8"SS — SEWER PIPE PVC SDR-35
- 15"SD — STORM DRAIN PIPE
- EDGE OF ASPHALT
- X — X — EXIST FENCE
- ⓦ STORM DRAIN LABEL (SEE PROFILES)
- Ⓢ SEWER LABEL (SEE PROFILES)

REGISTERED PROFESSIONAL ENGINEER — 10/1/21 — No. 270393 — DAVID W. PETERSON — STATE OF UTAH

Know what's below. Call before you dig.

## BENCH MARK

EAST 1/4 CORNER, SECTION 11, TOWNSHIP 5 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN
ELEVATION = 4730.99' (NGVD29)
(FOUND BRASS CAP)

## REVISIONS

| Rev. | Date | Description |
|---|---|---|
| 1 | 08/19/21 | REVISED PER CITY COMMENTS |
| 2 | 10/07/21 | REVISED PER CITY COMMENTS |


Developer: ANDERSON DEV. SERVICES
Phone: 801-856-2478

EXCEL ENGINEERING
David W. Peterson, P.E., License #270393
12 West 100 North, Suite 201, American Fork, UT 84003
P: (801) 756-4504; david@excelcivil.com


# BECK HILLSIDE ESTATES

AMERICAN FORK UTAH

Drawn by: D.W.P.
Designed by: D.W.P.
Checked by: D.W.P.

## OVERALL UTILITY PLAN

Scale: 1"=30'
Date: 05/24/21
U1

END TRAIL
END ROAD CONSTRUCTION
CONST. MODIFIED (MOUNTBALE) CURB & GUTTER (SEE DETAIL ON SHEET D2)
CONST. 10' TRAIL
3:1 TIE-IN SLOPE
TOP OF 36"=4713.64
TOP OF 36"=4713.54
EXIST 36" IRRIGATION PIPE
PROVIDE 6" MIN. COVER OVER 36" IRR PIPE
TOP OF 36"=4712.64
CONST. 10' TRAIL
PRIVATE OPEN SPACE
17' STORM DRAIN & P.U.E. (LOTS 7 & 8)
INSTALL FIRE TURN-AROUND (SEE LEHI DETAIL ON SHEET D2). COORDINATE W/ GEOTECH TO ENSURE TURN-AROUND AREA CAN SUPPORT 80,000 LBS.
TRANSITION CURB TYPE
CONST. 24" HIGH BACK CURB & GUTTER
10' STORM DRAIN & P.U.E.
CONST. 5' WALK
CONST. 8' PLANTER
150 EAST
5' STORM DRAIN & P.U.E. (TYP.)
GRAVEL AREA SURROUNDING SUMP
SUMP PER DETAIL 15.14 (TYP.)
CONST. 5' TRAIL
MAX. PROPOSED SLOPE=3:1
EXIST SLOPE=~3:1
RUNOFF FROM TRAIL IS MINIMAL & WILL BE ABSORBED BY LANDSCAPING
INSTALL GROUNDWATER MONITORING STATION. 4" DIAMETER PERFORATED PVC PIPE W/ 2" OF PERFORATED SOLID SURROUNDING. INSTALL SOLID LID FOR RIM. INSTALL PIPE DOWN TO GROUND WATER (~6.5' DEEP)
EXIST FILLED-IN SDMH
EXIST 8" GROUND DRAIN
EXIST C.B.
EXIST SUMP RIM=4681.35 APPROX. 8" FL=4665.35
MATCH EXIST CURB
MATCH EXIST 4' WALK
CONST. 5' WALK
CURB TAPER
EXIST EDGE OF ASPHALT
EXIST 24" CMP CULVERT PIPE TO BE ABANDONED
ASPHALT SAWCUT LINE
ADA RAMP
760 NORTH
END WALK
END CURB & GUTTER
ASPHALT TAPER
ASPHALT SAWCUT LINE
MATCH EXIST ASPHALT
EXIST 4' WALK
EXIST CURB
200 EAST
EXIST SDMH

## SIDEWALK NOTE:

SIDEWALK AT DRIVE APPROACHES SHALL BE 6" THICK. IF LOCATION OF DRIVE APPROACHES IS UNKNOW, EITHER INSTALL 6" THICK SIDEWALK, OR WHEN DRIVE APPROACHES ARE CONSTRUCTED, SIDEWALK SHALL BE REMOVED AND REPLACED WITH 6" THICK SIDEWALK.

## STORM DRAIN KEYED NOTES:

1-3. SEE PROFILES
4. CONST. 33.8 L.F. 18" RCP @ S=1.0%
5. CONST. 2'X3' CATCH BASIN, TBC=4681.08, GRATE=4680.58, 18" IE OUT=4677.08
6-8. SEE PROFILES
9. CONST. 3.0 L.F. 18" RCP @ S=5.7%
10. CONST. 2'X3' CATCH BASIN, TBC=4676.02, GRATE=4675.52, 18" IE OUT=4672.02
11-12. SEE PROFILES

## GRADING LEGEND

| | |
|---|---|
| FFE | FINISHED FLOOR ELEV. |
| BOW | BACK OF WALK |
| GB | GRADE BREAK |
| TC | TOP OF CONCRETE |
| TBC | TOP BACK OF CURB |
| TA | TOP OF ASPHALT |
| EA | EDGE OF ASPHALT |
| RIM | RIM ELEVATION |
| FL | FLOWLINE |
| EG | EXIST GROUND |
| FG | FINISHED GRADE |
| TW | TOP OF WALL |
| BW | BOTTOM OF WALL |
| 4808 | EXISTING CONTOUR |
| 00 | PROPOSED CONTOUR |

## STORM DRAIN DESIGN:

SEE PROFILE SHEETS FOR STORM DRAIN DESIGN

30 15 0 30 60 90
Scale 1" = 30'

Know what's below. Call before you dig.

REGISTERED PROFESSIONAL ENGINEER — 10/7/21 — No. 270393 — DAVID W. PETERSON — STATE OF UTAH

## BENCH MARK

EAST 1/4 CORNER, SECTION 11, TOWNSHIP 5 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN
ELEVATION = 4730.99' (NGVD29)
(FOUND BRASS CAP)

## REVISIONS

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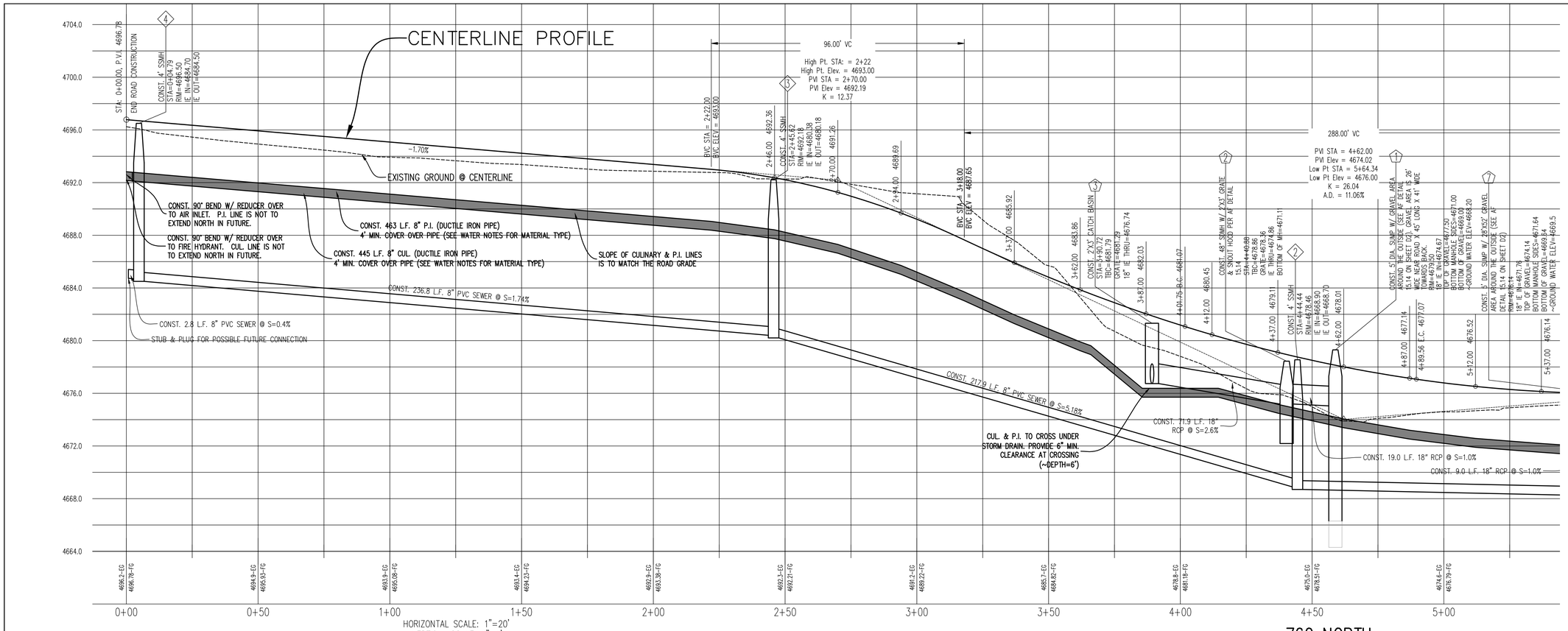
# BECK HILLSIDE ESTATES

AMERICAN FORK UTAH

Drawn by: D.W.P.
Designed by: D.W.P.
Checked by: D.W.P.

## OVERALL GRADING & DRAINAGE PLAN

Scale: 1"=30'
Date: 05/24/21
G1




## SEWER NOTES:

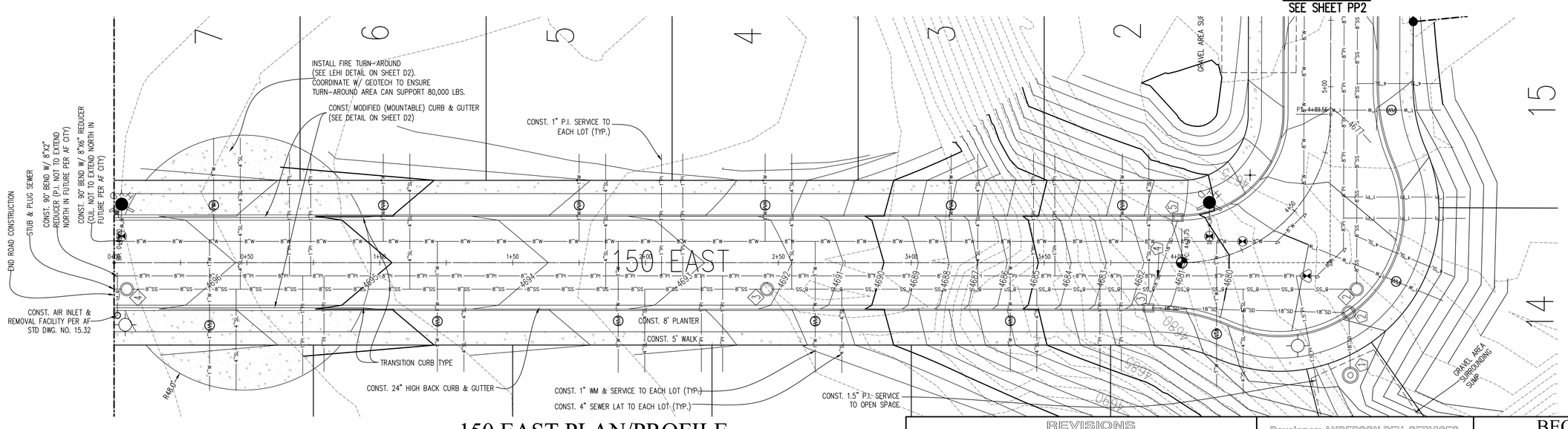
1. ALL SEWER MAINS AND LATERALS MUST BE INSPECTED AND APPROVED BY THE CITY OF AMERICAN FORK PUBLIC WORKS DEPARTMENT BEFORE BACKFILLING IS ACCOMPLISHED.
2. SEWER LATERALS ARE TO BE INSTALLED AT A MINIMUM SLOPE OF 2%.
3. NEW SERVICE LATERALS SHALL BE PVC PLASTIC PIPE CONFORMING TO ASTM D3034 SDR35
4. ALL LATERAL CONNECTIONS SHALL "INSERT-A-TEE" OR WYE AT TEN O'CLOCK OR TWO O'CLOCK POSITIONING TO CENTER OF MAIN LINE AND SHALL BE ENCASED IN CONCRETE AFTER INSPECTION IS MADE.
5. THERE SHALL BE A MINIMUM 3 FEET OF COVER OVER ALL SEWER LATERAL LINES AND 3.5 FEET MINIMUM COVER AT PROPERTY LINE.
6. THERE SHALL BE A MAXIMUM DISTANCE OF 5 FEET FROM THE FOUNDATION WALL TO THE FIRST EXTERIOR CLEANOUT WITH A MAXIMUM DISTANCE BETWEEN CLEANOUTS OF 75 FEET.
7. THERE SHALL A BE CLEANOUT AT ANY 90° BEND OR ANY COMBINATION OF BENDS IN EXCESS OF 90°.
8. CLEANOUT STANDPIPE CAN BE CAST IRON OR IRON OR PVC WITH CAST IRON CAP OR BRASS CAP.
9. ALL CLEANOUTS SHALL REMAIN VISIBLE AND ACCESSIBLE.
10. ALL SEWER CONSTRUCTION MUST CONFORM TO AF CITY STANDARD DRAWINGS.
11. ALL SANITARY SEWER MAINS AND LATERALS MUST BE INSPECTED AND APPROVED BY THE CITY INSPECTOR BEFORE TRENCH BACKFILLING IS COMPLETED.

## WATER NOTES:

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## STORM DRAIN KEYED NOTES: (00)

1-3. SEE PROFILES
4. CONST. 33.8 L.F. 18" RCP @ S=1.0%
5. CONST. 2'X3' CATCH BASIN, TBC=4681.08, GRATE=4680.58, 18" IE OUT=4677.08
6-8. SEE PROFILES
9. CONST. 3.0 L.F. 18" RCP @ S=5.7%
10. CONST. 2'X3' CATCH BASIN, TBC=4676.02, GRATE=4675.52, 18" IE OUT=4672.02
11-12. SEE PROFILES




## GRADING NOTE:

SEE GRADING PLAN FOR SPOT ELEVATIONS ALONG CURB.

REGISTERED PROFESSIONAL ENGINEER
No. 270393
10/7/21
DAVID W. PETERSON
STATE OF UTAH

20 10 0 20 40 60
Scale 1" = 20'

# 150 EAST PLAN/PROFILE

| REVISIONS | | |
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Developer: ANDERSON DEV. SERVICES
Phone: 801-856-2478

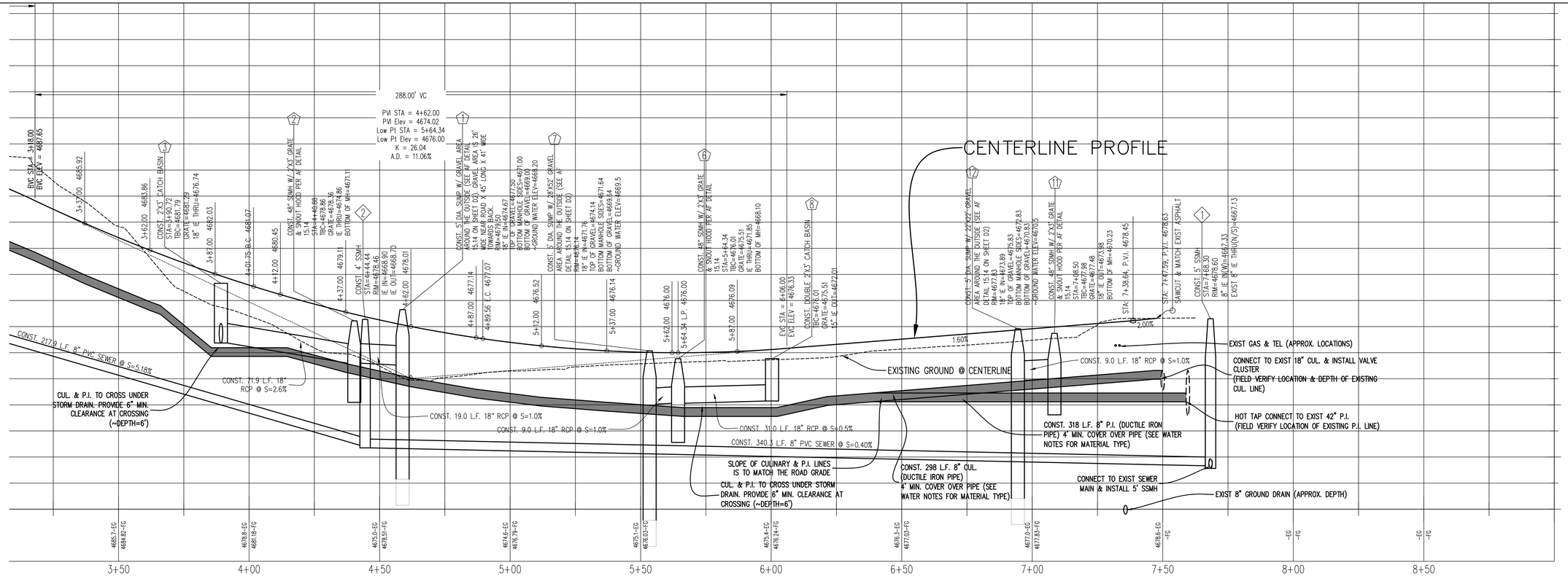
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BECK HILLSIDE ESTATES
AMERICAN FORK UTAH

| | |
|---|---|
| Drawn by: D.W.P. | Scale: 1"=40' |
| Designed by: D.W.P. | Date: 05/24/21 |
| Checked by: D.W.P. | PP1 |

150 EAST PLAN & PROFILE

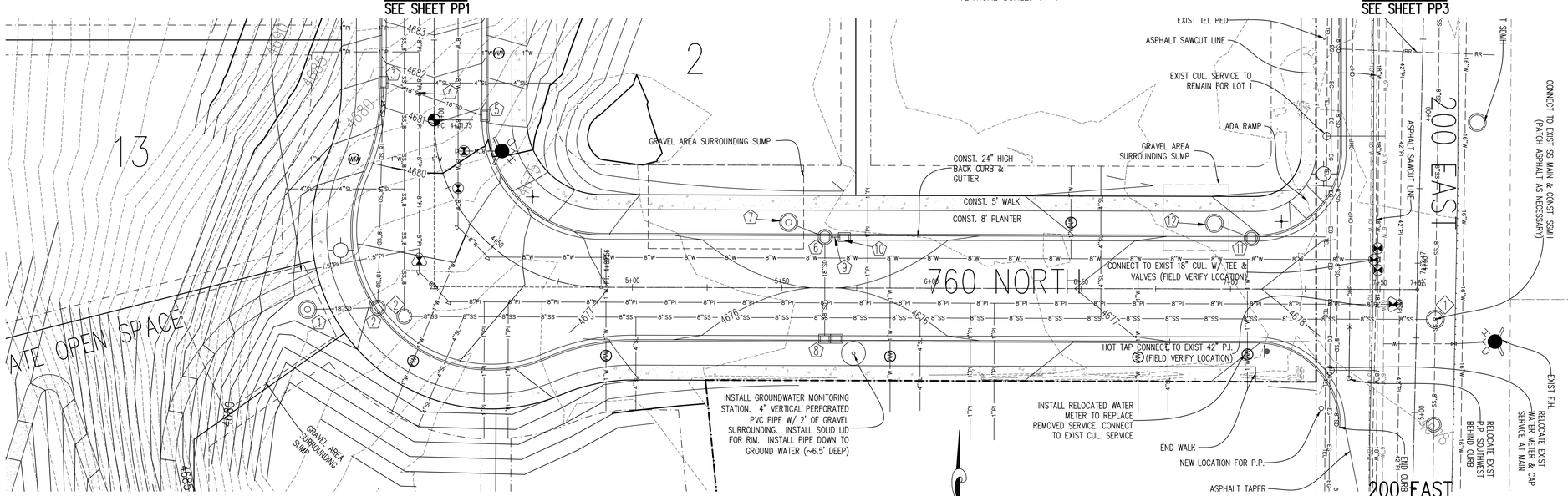
# CENTERLINE PROFILE




HORIZONTAL SCALE: 1"=20'
VERTICAL SCALE: 1"=4'

150 EAST
SEE SHEET PP1

200 EAST
SEE SHEET PP3




## STORM DRAIN KEYED NOTES:

1-3. SEE PROFILES
4. CONST. 33.8 L.F. 18" RCP @ S=1.0%
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4. ALL LATERAL CONNECTIONS SHALL "INSERT-A-TEE" OR WYE AT TEN O'CLOCK OR TWO O'CLOCK POSITIONING TO CENTER OF MAIN LINE AND SHALL BE ENCASED IN CONCRETE AFTER INSPECTION IS MADE.
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## WATER NOTES:

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3. ALL WATER CONSTRUCTION TO CONFORM TO AF CITY STANDARD DRAWINGS.
4. WATER LINE MIN. COVER IS 48" TO TOP OF PIPE.
5. WATER SERVICE MATERIAL TO BE TYPE K COPPER TUBING.

# 760 NORTH PLAN/PROFILE

20 10 0 20 40 60
Scale 1" = 20'

| REVISIONS | | |
|---|---|---|
| Rev. | Date | Description |
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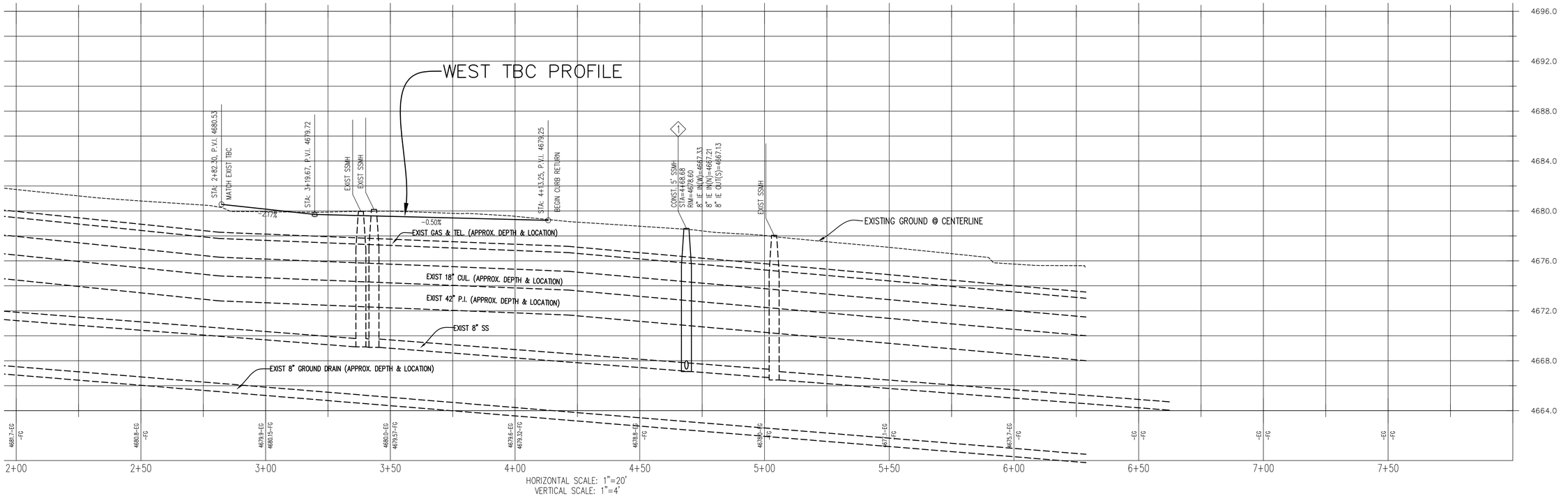
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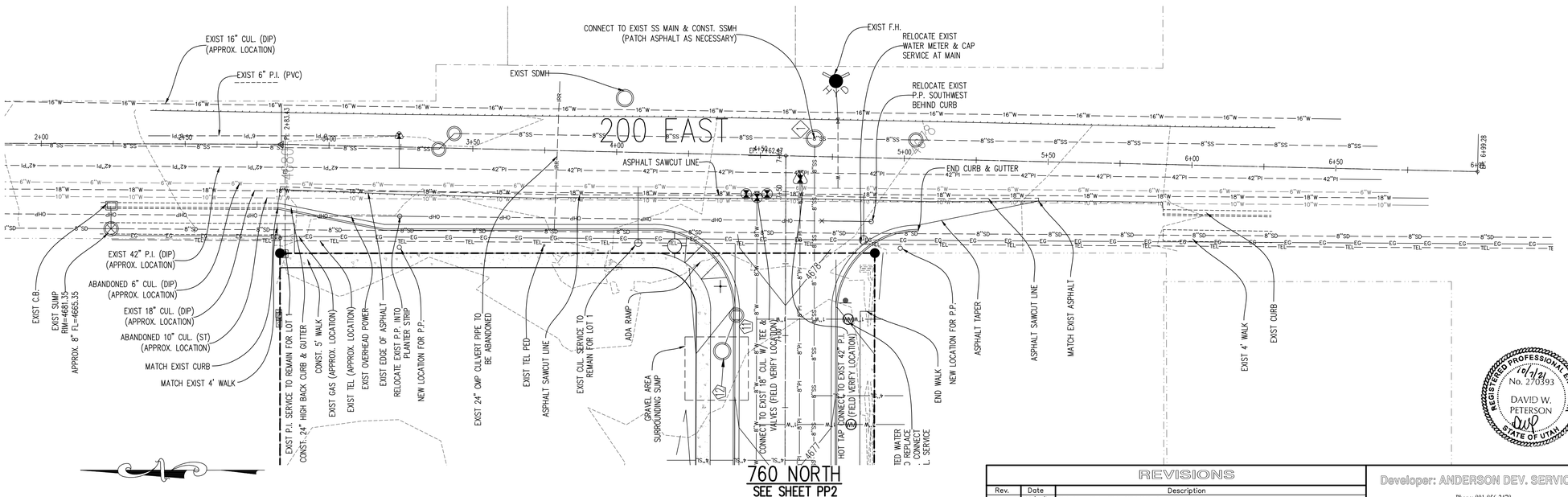
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BECK HILLSIDE ESTATES
AMERICAN FORK UTAH

| | | |
|---|---|---|
| Drawn by: D.W.P. | 760 NORTH PLAN & PROFILE | Scale: 1"=40' |
| Designed by: D.W.P. | | Date: 05/24/21 |
| Checked by: D.W.P. | | PP2 |

REGISTERED PROFESSIONAL ENGINEER
No. 270393
DAVID W. PETERSON
STATE OF UTAH
10/1/21




# 200 EAST PLAN/PROFILE

20 10 0 20 40 60
Scale 1" = 20'

GRADING NOTE:
SEE GRADING PLAN FOR SPOT ELEVATIONS ALONG CURB.

## SEWER NOTES:

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REGISTERED PROFESSIONAL ENGINEER
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STATE OF UTAH
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BECK HILLSIDE ESTATES
AMERICAN FORK UTAH

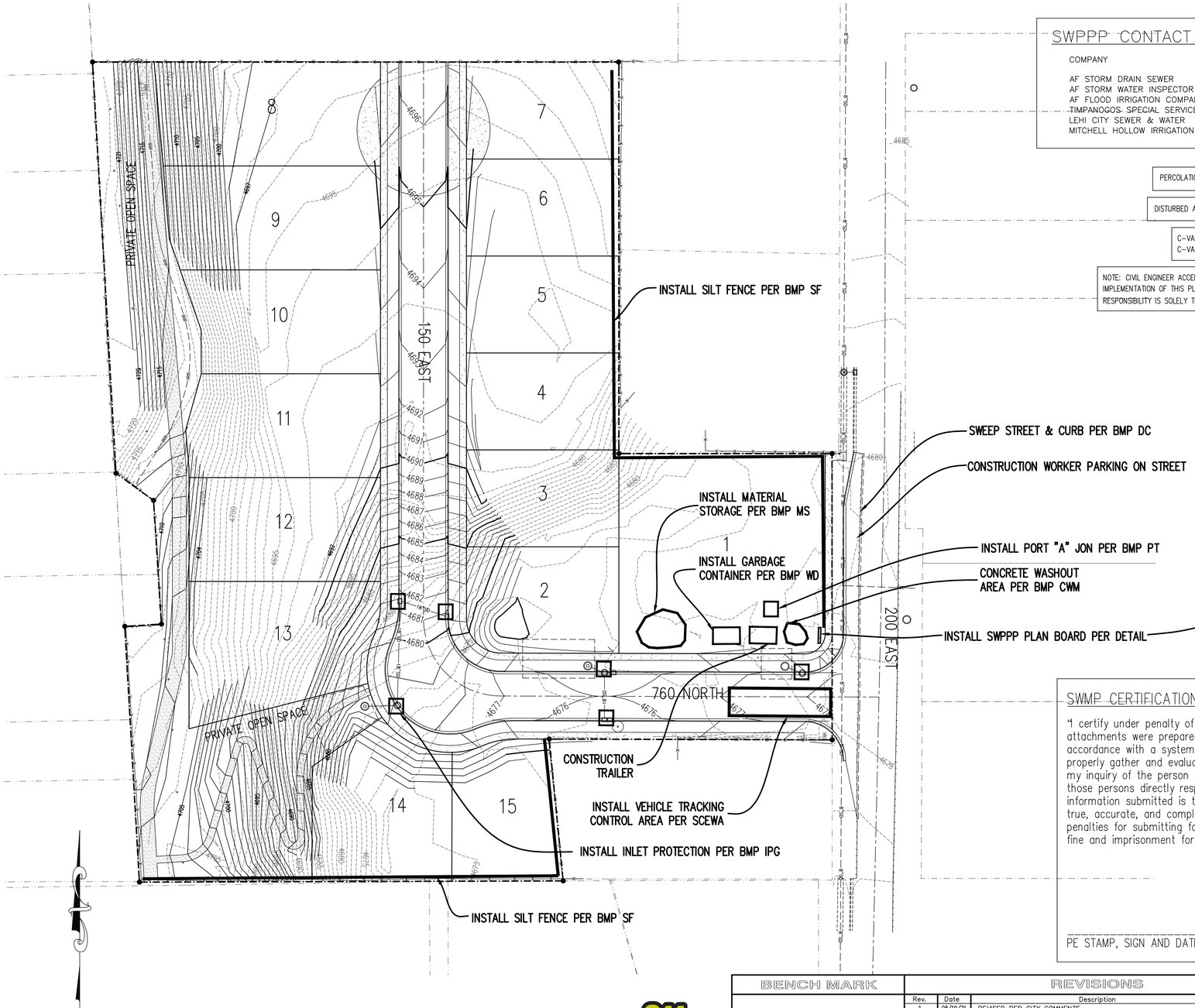
Drawn by: D.W.P.
Designed by: D.W.P.
Checked by: D.W.P.

200 EAST
PLAN & PROFILE

Scale: 1"=40'
Date: 05/24/21
PP3

# BECK HILLSIDE ESTATES

ADDRESS: 757 NORTH 200 EAST




40 20 0 40 80 120

Scale 1" = 40'

Know what's below. Call before you dig.

## SWPPP CONTACT LIST:

| COMPANY | CONTACT | PHONE |
|---|---|---|
| AF STORM DRAIN SEWER | Ashton Hardy | (801) 404 6162 |
| AF STORM WATER INSPECTOR | Harlan Nielson | (801) 404 6361 |
| AF FLOOD IRRIGATION COMPANY | Ernie Johns | (801) 756 6626 |
| TIMPANOGOS SPECIAL SERVICE DISTRICT | Jon Adams | (801) 756 5231 |
| LEHI CITY SEWER & WATER | Lee Barnes | (801) 836 1036 |
| MITCHELL HOLLOW IRRIGATION | Jeff Mitchell | (801) 367 9026 |

PERCOLATION RATE: 10 MINUTES PER INCH

DISTURBED AREA = 5.5 ACRES (ENTIRE SITE)

C-VALUE BEFORE CONSTRUCTION = 0.4
C-VALUE AFTER CONSTRUCTION = 0.50

NOTE: CIVIL ENGINEER ACCEPTS NO RESPONSIBILITY FOR THE IMPLEMENTATION OF THIS PLAN DURING CONSTRUCTION. SUCH RESPONSIBILITY IS SOLELY THE CONTRACTOR'S.

## VICINITY MAP




## SWPPP Storm Water Pollution Prevention Plan

A Utah Pollutant Discharge Elimination System (UPDES) permit covers this construction site, If any Non-Storm water discharge or severe vehicle tracking occurs please call 420-1272.

**Project Name: 123abc**

*minimum sign dimension 4'x4'*

**SWPPP Location: ABC Company Construction Trailer**
**100 W Center**

**SWPPP Contact: John Doe**
**XYZ Environmental**
**801-111-2233**

NOI 8.5"x 11"

NOI 8.5"x 11"

SWPPP Drawing 17"x 22"

## SWMP CERTIFICATION STATEMENT

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

REGISTERED PROFESSIONAL ENGINEER — No. 270393 — DAVID W. PETERSON — STATE OF UTAH — 7/1/21

PE STAMP, SIGN AND DATE

## SITE OPERATOR IS RESPONSIBLE FOR THE FOLLOWING:

1. SUBMITTING A NOTICE OF INTENT (NOI) TO THE UTAH STATE DIVISION OF WATER QUALITY. A COPY OF THE NOI MUST BE SUBMITTED TO AMERICAN FORK CITY.
2. SUBMITTING A SWPPP DOCUMENT TO AMERICAN FOR CITY FOR APPROVAL BEFORE CONSTRUCTION.
3. OBTAIN A LAND DISTURBANCE PERMIT FROM AMERICAN FORK CITY AT LEAST 15 DAYS PRIOR TO CONSTRUCTION.

## EROSION CONTROL NOTES:

1. CONSTRUCT A SILT FENCE AS SHOWN ON PLAN. SEE BMP SF.
2. INSTALL SEDIMENT TRAP IN FRONT OF ALL SILT FENCES. SEE BMP ST.
3. CONST. A 15'X50'X2' DEEP COBBLE VEHICLE TRACKING CONTROL AREA AS SHOWN ON PLAN. SEE BMP SCEWA
4. INSTALL CONCRETE WASH OUT AREA. SEE BMP CWM
5. INSTALL GARBAGE CONTAINER. SEE BMP WD
6. INSTALL PORTABLE TOILET. SEE BMP PT
7. INSTALL MATERIALS STORAGE AREA. SEE BMP MS
8. CONTRACTOR WILL BE RESPONSIBLE FOR THE IMPLEMENTATION AND MAINTENANCE OF BMP'S DURING CONSTRUCTION.
9. CONTRACTOR TO WATER SITE AT LEAST WEEKLY OR MORE FREQUENTLY AS NEEDED TO CONTROL DUST POLLUTION.
10. SWEEP STREET AND PARKING LOT. SEE BMPS DC & PLSV
11. INSTALL LANDSCAPING. SEE BMP TPS
12. THE CONTRACTOR WILL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE BMP'S. CONTACT DEVELOPER FOR CONTRACTOR INFORMATION.

**BENCH MARK**

EAST 1/4 CORNER, SECTION 11, TOWNSHIP 5 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN
ELEVATION = 4730.99' (NGVD29)
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Developer: ANDERSON DEV. SERVICES
Phone: 801-856-2478

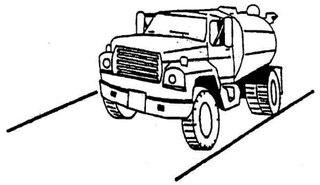
EXCEL ENGINEERING
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P: (801) 756-4504; david@excelcivil.com


BECK HILLSIDE ESTATES
AMERICAN FORK UTAH

| Drawn by: | Scale: |
|---|---|
| D.W.P. | 1"=40' |
| Designed by: D.W.P. | Date: 05/24/21 |
| Checked by: D.W.P. | SWP1 |

EROSION CONTROL PLAN

## BMP: Dust Controls — DC



**Description:**
Dust control measures are used to stabilize soil from wind erosion, and reduce dust by construction activities.

**Application:**
Dust control is useful in any process area, loading and unloading area, material handling areas, and transfer areas where dust is generated. Street sweeping is limited to areas that are paved.

**Installation/Application Criteria:**
- Two kinds of street sweepers are common: brush and vacuum. Vacuum sweepers are more efficient and work best when the area is dry.
- Mechanical equipment should be operated according to the manufacturers' recommendations and should be inspected regularly.
- Water may be sprayed on the ground surface to moisten dry soils, making it less susceptible to wind erosion.

**Limitations:**
- Street sweeping is labor and equipment intensive and may not be effective for all pollutants.
- Water sprayed from water trucks must be done at a rate such that the water is absorbed in the soil; if excessive amounts of water are used, it may run off, carrying soil with it.

**Maintenance:**
If excess water results from water spraying, dust-contaminated waters should not be allowed to run off site. Areas may need to be resprayed to keep dust from spreading.

**Objectives**
- ☒ Housekeeping Practices
- ☐ Contain Waste
- ☒ Minimize Disturbed Areas
- ☒ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Adapted from Salt Lake County BMP Fact Sheet

**Targeted Pollutants**
- ■ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ☒ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☒ Training

■ High ☒ Medium ☐ Low

## BMP: Parking Lot Sweeping/Vacuuming — PLSV



**Description:**
Reduce the discharges of pollutants to stormwater from parking lot surfaces by conducting parking lot cleaning on a regular basis.

**Approach:**
- Restrict parking prior to and during sweeping.
- Establish frequency of sweeping based on anticipated need and observations of debris or sediment accumulation
- Increase sweeping frequency just before the rainy season.
- Lots that generate greater amounts of debris or sediment must be swept more frequently. These include lots associated with or adjacent to recreational, commercial, or industrial areas, or other areas of high vehicle or pedestrian traffic.
- Manually remove debris from corners or other areas of the parking lot that equipment cannot reach
- Keep accurate operation logs to track programs.
- Equipment selection can be key for this particular BMP. There are two types used, the mechanical broom sweepers (more effective at picking up large debris and cleaning wet streets), and the vacuum sweepers (more effective at removing fine particles and associated heavy metals). It may be useful to have the ability to use both kinds.

**Limitations:**
- Conventional sweepers are not able to remove oil and grease.
- Mechanical sweepers are not effective at removing finer sediments.
- Effectiveness may also be limited by parking lot conditions, presence of parked vehicles, presence of construction projects, climatic conditions and condition of curbs.

**Maintenance:**
- Acquisition and maintenance of equipment is generally handled by the company hired to perform the sweeping/vacuuming.

**Program Elements**
- ☐ New Development
- ☐ Residential
- ☒ Commercial Activities
- ☒ Industrial Activities
- ☒ Municipal Facilities
- ☒ Illegal Discharges

**Targeted Pollutants**
- ■ Sediment
- ■ Nutrients
- ■ Heavy Metals
- ☒ Toxic Materials
- ■ Oxygen Demanding Substances
- ☐ Oil & Grease
- ☒ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ☐ Capital Costs
- ☒ O&M Costs
- ☐ Regulatory
- ☐ Training
- ☐ Staffing
- ☒ Administrative

■ High ☒ Medium ☐ Low

## BMP: Temporary and Permanent Seeding — TPS



**Definition:**
Temporary seeding - establishment of short term cover by application of rapidly germinating seed mix (alternatively hydroseeding may be utilized).
Permanent seeding - establishment of final term cover by application of perennial seed mix (alternatively sod may be utilized).

**Application:**
Disturbed areas that are at final grade and which will not be disturbed by continuing activities on site. Also areas that are not at final grade but which will be left untouched in excess of one year.

**Recommended Seed Mix:**
The recommended seed mix will be dependent on site specific information such as elevation, exposure, soils, water available and topography. Check with the County Extension Service for recommended mixes for site specific conditions:
Utah State University Extension Service
51 South University Avenue, Suite 206
Provo, Utah 84601
phone (801) 370-8460

**Limitations:**
- Limited to areas that will not be subject to traffic or high usage.
- May require irrigation and fertilizer which creates potential for impacting runoff quality.
- May only be applied during appropriate planting season, temporary cover required until that time.

**Installation:**
- Roughen soil to a depth of 2 inches. Add fertilizer, manure, topsoil as necessary.
- Evenly distribute seed using a commonly accepted method such as broadcast seeding, drilling or hydroseeding.
- Use a seed mix appropriate for soil and location that will provide rapid germination and growth. Check with County Extension Service for recommended mix and application rate.
- Cover area with mulch if required due to steep slopes or unsuitable weather conditions.

**Maintenance:**
- Provide irrigation as required to establish growth and to maintain plant cover through duration of project.
- Reseed as necessary to provide 75% coverage
- Remediate any areas damaged by erosion or traffic.
- When 75% coverage is achieved inspect monthly for damage and remediate as necessary.

**Objectives**
- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☒ Stabilize Disturbed Areas
- ☒ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Adapted from Salt Lake County BMP Fact Sheet

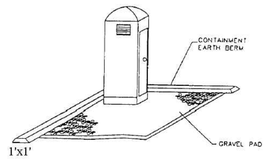
**Targeted Pollutants**
- ■ Sediment
- ■ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ☒ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

## BMP: Portable Toilets — PT




**Description:**
Temporary on-site sanitary facilities for construction personnel.

**Application:**
All sites with no permanent sanitary facilities or where permanent facility is too far from activities.

**Installation/Application Criteria:**
- Locate portable toilets in convenient locations throughout the site.
- Prepare level, gravel surface and provide clear access to the toilets for servicing and for on-site personnel.
- Construct earth berm perimeter (See Earth Berm Barrier Information Sheet), control for spill/protection leak.
- Stake toilets to prevent them from tipping.

**Limitations:**
No limitations.

**Maintenance:**
- Portable toilets should be maintained in good working order by licensed service with daily observation for leak detection.
- Regular waste collection should be arranged with licensed service.
- All waste should be deposited in sanitary sewer system for treatment with appropriate agency approval.

**Objectives**
- ☒ Housekeeping Practices
- ☒ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Adapted from Salt Lake County BMP Fact Sheet

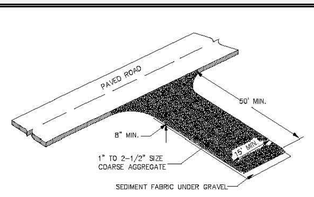
**Targeted Pollutants**
- ☐ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ■ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

## BMP: Stabilized Construction Entrance and Wash Area — SCEWA




**Description:**
A stabilized pad of crushed stone located where construction traffic enters or leaves the site from or to paved surface. The area can be used to spray off vehicles before they leave the site.

**Applications:**
At any point of ingress or egress at a construction site where adjacent traveled way is paved. Generally applies to sites over 2 acres unless special conditions exist.

**Installation/Application Criteria:**
- Clear and grub area and grade to provide maximum slope of 2%.
- Compact subgrade and place filter fabric if desired (recommended for entrances to remain for more than 3 months).
- Place coarse aggregate, 1 to 2-1/2 inches in size, to a minimum depth of 8 inches.
- Provide water to the area that can be used to spray off vehicles as needed to prevent the tracking of mud off of the construction site. This may not be needed during dry periods of work, but is needed when construction is proceeding under wet conditions.
- Provide berming as needed to prevent sediment laden wash water from entering storm water facilities or other water bodies, or leaving the site.

**Limitations:**
- Requires periodic top dressing with additional stones.
- Should be used in conjunction with street sweeping on adjacent public right-of-way.
- Must be situated such that waste water does not run off site.

**Maintenance:**
- Inspect daily for loss of gravel or sediment buildup.
- Inspect adjacent roadway for sediment deposit and clean by shoveling and sweeping.
- Repair entrance and replace gravel as required to maintain control in good working condition.
- Expand stabilized area as required to accommodate traffic and prevent erosion at driveways.

**Objectives**
- ☒ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☒ Control Site Perimeter
- ☐ Control Internal Erosion

Adapted from Salt Lake County BMP Fact Sheet

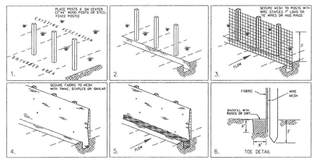
**Targeted Pollutants**
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- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

## BMP: Silt Fence — SF




**Description:**
A temporary sediment barrier consisting of entrenched filter fabric stretched across and secured to supporting posts.

**Application:**
- Perimeter control: place barrier at downgradient limits of disturbance
- Sediment barrier: place barrier at toe of slope or soil stockpile
- Protection of existing waterways: place barrier near top of stream bank
- Inlet protection: place fence surrounding catchbasins

**Installation/Application Criteria:**
- Place posts 6 feet apart on center along contour (or use preassembled unit) and drive 2 feet minimum into ground. Excavate an anchor trench immediately upgradient of posts.
- Secure wire mesh (14 gage min. With 6 inch openings) to upslope side of posts. Attach with heavy duty 1 inch long wire staples, tie wires or hog rings.
- Cut fabric to required width, unroll along length of barrier and drape over barrier. Secure fabric to mesh with twine, staples, or similar, with trailing edge extending into anchor trench.
- Backfill trench over filter fabric to anchor.

**Limitations:**
- Recommended maximum drainage area of 0.5 acre per 100 feet of fence
- Recommended maximum upgradient slope length of 150 feet
- Recommended maximum uphill grade of 2:1 (50%)
- Recommended maximum flow rate of 0.5 cfs
- Ponding should not be allowed behind fence

**Maintenance:**
- Inspect immediately after any rainfall and at least daily during prolonged rainfall.
- Look for runoff bypassing ends of barriers or undercutting barriers.
- Repair or replace damaged areas of the barrier and remove accumulated sediment.
- Reanchor fence as necessary to prevent shortcutting.
- Remove accumulated sediment when it reaches ½ the height of the fence.

**Objectives**
- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☒ Protect Slopes/Channels
- ☒ Control Site Perimeter
- ☒ Control Internal Erosion

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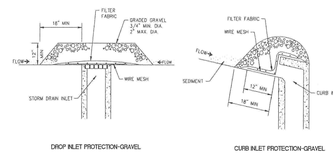
**Targeted Pollutants**
- ▪ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ▪ Capital Costs
- ▪ O&M Costs
- ▪ Maintenance
- ▫ Training

■ High ☒ Medium ☐ Low

## BMP: Inlet Protection - Gravel — IPG




**Description:**
Placement of gravel filter over inlet to storm drain to filter storm water runoff.

**Application:**
Construct at inlets in paved or unpaved areas where upgradient area is to be disturbed by construction activities.

**Installation/Application Criteria:**
- Place wire mesh (with ½ inch openings) over the inlet grate extending one foot past the grate in all directions.
- Place filter fabric over the mesh. Filter fabric should be selected based on soil type.
- Place graded gravel, to a minimum depth of 12-inches, over the filter fabric and extending 18-inches past the grate in all directions.

**Limitations:**
- Recommended for maximum drainage area of one acre.
- Excess flows may bypass the inlet requiring down gradient controls.
- Ponding will occur at inlet.

**Maintenance:**
- Inspect inlet protection after every large storm event and at a minimum of once monthly.
- Remove sediment accumulated when it reaches 4-inches in depth.
- Replace filter fabric and clean or replace gravel if clogging is apparent.

**Objectives**
- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☒ Control Site Perimeter
- ☒ Control Internal Erosion

ADAPTED FROM SALT LAKE COUNTY BMP FACTSHEET

**Targeted Pollutants**
- ▪ Sediment
- ▫ Nutrients
- ▫ Toxic Materials
- ▫ Oil & Grease
- ▪ Floatable Materials
- ▫ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ▪ Capital Costs
- ▫ O&M Costs
- ▪ Maintenance
- ▫ Training

■ High ☒ Medium ☐ Low

REGISTERED PROFESSIONAL ENGINEER
10/2/21
No. 270393
DAVID W. PETERSON
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Developer: ANDERSON DEV. SERVICES
Phone: 801-856-2478

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# BECK HILLSIDE ESTATES

AMERICAN FORK — UTAH

| Drawn by: | Designed by: | Checked by: | Scale: | Date: |
|---|---|---|---|---|
| D.W.P. | D.W.P. | D.W.P. | NTS | 05/24/21 |

## BMP DETAILS

SWP2

## BMP: Concrete Waste Management — CWM



**Description:**
Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout off-site, performing on-site washout in a designated area, and training employees and subcontractors.

**Applications:**
This technique is applicable to all types of sites.

**Installation/Application Criteria:**
- Store dry and wet materials under cover, away from drainage areas.
- Avoid mixing excess amounts of fresh concrete or cement on-site.
- Perform washout of concrete trucks off-site or in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on-site, except in designated areas.
- When washing concrete to remove fine particles and expose the aggregate, avoid creating runoff by draining the water within a bermed or level area. (See Earth Berm Barrier information sheet.)
- Train employees and subcontractors in proper concrete waste management.

**Limitations:**
- Off-site washout of concrete wastes may not always be possible.

**Maintenance:**
- Inspect subcontractors to ensure that concrete wastes are being properly managed.
- If using a temporary pit, dispose hardened concrete on a regular basis.

**Objectives**
- ☐ Housekeeping Practices
- ☒ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Adapted from Salt Lake County BMP Fact Sheet

**Targeted Pollutants**
- ☐ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☒ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ☐ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☒ Training

■ High ☒ Medium ☐ Low

## BMP: BMP Inspection and Maintenance — BMPIM



**Description:**
Inspect and maintain all structural BMP's (both existing and new) on a routine basis to remove pollutants from entering storm drain inlets. This includes the establishment of a schedule for inspections and maintenance.

**Approach:**
Regular maintenance of all structural BMP's is necessary to ensure their proper functionality.
- ➢ Annual inspections.
- ➢ Prioritize maintenance to clean, maintain, and repair or replace structures in areas beginning with the highest pollutant loading.
- ➢ Clean structural BMP's in high pollutant areas just before the wet season to remove sediments and debris accumulated during the summer and fall.
- ➢ Keep accurate logs of what structures were maintained and when they were maintained.
- ➢ Record the amount of waste collected.

**Limitations:**
- ➢ Availability of trained staff

**Applications**
- ☐ Manufacturing
- ☒ Material Handling
- ☒ Vehicle Maintenance
- ☐ Construction
- ☐ Commercial Activities
- ☐ Roadways
- ☒ Waste Containment
- ☒ Housekeeping Practices

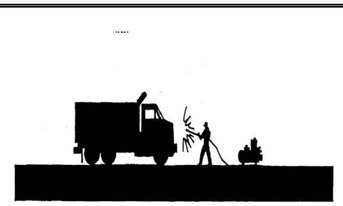
**Targeted Pollutants**
- ■ Sediment
- ■ Nutrients
- ☐ Heavy Metals
- ■ Toxic Materials
- ☐ Oxygen Demanding Substances
- ■ Oil & Grease
- ■ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ■ Capital Costs
- ■ O&M Costs
- ☒ Maintenance
- ☒ Staffing
- ☐ Training
- ☐ Administrative

■ High ☒ Medium ☐ Low

## BMP: Vehicle And Equipment Cleaning — VEC



**Description:**
Prevent or reduce the discharge of pollutants to storm water from vehicle and equipment cleaning by using off-site facilities, washing in designated, contained areas only, eliminating discharges to the storm drain by infiltrating or recycling the wash water, and/or training employees and subcontractors.

**Installation/Application:**
- Use off-site commercial washing businesses as much as possible. Washing vehicles and equipment outdoors or in areas where wash water flows onto paved surfaces or into drainage pathways can pollute storm water. If you wash a large number of vehicles or pieces of equipment, consider conducting this work at an off-site commercial business. These businesses are better equipped to handle and dispose of the wash waters properly. Performing this work off-site can also be economical by eliminating the need for a separate washing operation at your site.
- If washing must occur on-site, use designated, bermed wash areas to prevent wash water contact with storm water, creeks, rivers, and other water bodies. The wash area can be sloped for wash water collection and subsequent infiltration into the ground.
- Use as little water as possible to avoid having to install erosion and sediment controls for the wash area. Use phosphate-free biodegradable soaps. Educate employees and subcontractors on pollution prevention measures. Do not permit steam cleaning on-site. Steam cleaning can generate significant pollutant concentrations.

**Limitations:**
- Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades.
- Sending vehicles/equipment off-site should be done in conjunction with Stabilized Construction Entrance.

**Maintenance:**
- Minimal, some berm repair may be necessary.

**Objectives**
- ☒ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☒ Control Site Perimeter
- ☒ Control Internal Erosion

Adapted from Salt Lake County BMP Fact Sheet

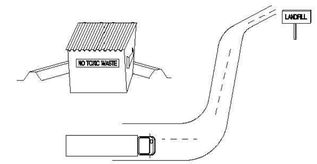
**Targeted Pollutants**
- ☐ Sediment
- ☐ Nutrients
- ☒ Toxic Materials
- ☒ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ☒ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☐ Training

■ High ☒ Medium ☐ Low

## BMP: Waste Disposal — WD




**Description:**
Controlled storage and disposal of solid waste generated by construction activities.

**Application:**
All construction sites.

**Installation:**
- Designate one or several waste collection areas with easy access for construction vehicles and personnel. Ensure no waterways or storm drainage inlets are located near the waste collection areas.
- Construct compacted earthen berm (See Earth Berm Barrier BMP Fact Sheet), or similar perimeter containment around collection area for impoundment in the case of spills and to trap any windblown trash.
- Use water tight containers with covers to remain closed when not in use. Provide separate containers for different waste types where appropriate and label clearly.
- Ensure all on site personnel are aware of and utilize designated waste collection area properly and for intended use only (e.g. all toxic, hazardous, or recyclable materials shall be properly disposed of separately from general construction waste).
- Arrange for periodic pickup, transfer and disposal of collected waste at an authorized disposal location. Include regular Porto-potty service in waste management activities.

**Limitations:**
- On-site personnel are responsible for correct disposal of waste.

**Maintenance:**
- Discuss waste management procedures at progress meetings.
- Collect site trash daily and deposit in covered containers at designated collection areas.
- Check containers for leakage or inadequate covers and replace as needed.
- Randomly check disposed materials for any unauthorized waste (e.g. toxic materials).
- During daily site inspections check that waste is not being incorrectly disposed of on-site (e.g. burial, burning, surface discharge, discharge to storm drain).

**Objectives**
- ☒ Housekeeping Practices
- ☒ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Adapted from Salt Lake City BMP Fact Sheet

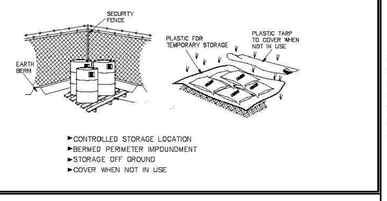
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- ☐ Nutrients
- ■ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ■ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ■ Capital Costs
- ■ O&M Costs
- ☒ Maintenance
- ■ Training

■ High ☒ Medium ☐ Low

## BMP: Materials Storage — MS




**Description:**
Controlled storage of on-site materials.

**Application:**
- Storage of hazardous, toxic, and all chemical substances.
- Any construction site with outside storage of materials.

**Installation/Application Criteria:**
- Designate a secured area with limited access as the storage location. Ensure no waterways or drainage paths are nearby.
- Construct compacted earthen berm (See Earth Berm Barrier Information Sheet), or similar perimeter containment around storage location for impoundment in the case of spills.
- Ensure all on-site personnel utilize designated storage area. Do not store excessive amounts of material that will not be utilized on site.
- For active use of materials away from the storage area ensure materials are not set directly on the ground and are covered when not in use. Protect storm drainage during use.

**Limitations:**
- Does not prevent contamination due to mishandling of products.
- Spill Prevention and Response Plan still required.
- Only effective if materials are actively stored in controlled location.

**Maintenance:**
- Inspect daily and repair any damage to perimeter impoundment or security fencing.
- Verify that materials are being correctly stored (i.e. standing upright, in labeled containers, tightly capped) and that no materials are being stored away from the designated location.

**Objectives**
- ☒ Housekeeping Practices
- ☒ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Adapted from Salt Lake City BMP Fact Sheet

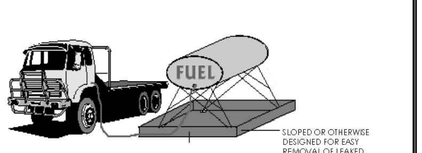
**Targeted Pollutants**
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- ☐ Nutrients
- ■ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☒ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ■ Training

■ High ☒ Medium ☐ Low

## BMP: Vehicle And Equipment Fueling — VEF




**Description:**
Prevent fuel spills and leaks, and reduce their impacts to storm water by using off-site facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors.

**Installation/Application:**
- Use off-site fueling stations as much as possible. Fueling vehicles and equipment outdoors or in areas where fuel may spill/leak onto paved surfaces or into drainage pathways can pollute storm water. If you fuel a large number of vehicles or pieces of equipment, consider using an off-site fueling station. These businesses are better equipped to handle fuel and spills properly. Performing this work off-site can also be economical by eliminating the need for a separate fueling area at your site.
- If fueling must occur on-site, use designated areas, located away from drainage courses, to prevent the runon of storm water and the runoff of spills. Discourage "topping-off" of fuel tanks.
- Always use secondary containment, such as a drain pan or drop cloth, when fueling to catch spills/leaks. Place a stockpile of spill clean-up materials where it will be readily accessible. Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Carry out all Federal and State requirements regarding stationary above ground storage tanks. (40 CF Sub. J) Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and perhaps forklifts, most vehicles should be able to travel to a designated area with little lost time. Train employees and subcontractors in proper fueling and clean-up procedures.

**Limitations:**
Sending vehicles/equipment off-site should be done in conjunction with Stabilized Construction Entrance.

**Maintenance:**
- Keep ample supplies of spill clean-up materials on-site.
- Inspect fueling areas and storage tanks on a regular schedule.

**Objectives**
- ☒ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Adapted from Salt Lake County BMP Fact Sheet

**Targeted Pollutants**
- ☐ Sediment
- ☐ Nutrients
- ☒ Toxic Materials
- ☒ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ☒ Capital Costs
- ☐ O&M Costs
- ☒ Maintenance
- ☒ Training

■ High ☒ Medium ☐ Low

## BMP: Spill Clean-Up — SCU



**Description:**
Practices to clean-up leakage/spillage of on-site materials that may be harmful to receiving waters.

**Application:**
All sites

**General:**
- Store controlled materials within a storage area.
- Educate personnel on prevention and clean-up techniques.
- Designate an Emergency Coordinator responsible for employing preventative practices and for providing spill response.
- Maintain a supply of clean-up equipment on-site and post a list of local response agencies with phone numbers.

**Methods:**
- Clean-up spills/leaks immediately and remediate cause.
- Use as little water as possible. NEVER HOSE DOWN OR BURY SPILL CONTAMINATED MATERIAL.
- Use rags or absorbent material for clean-up. Excavate contaminated soils. Dispose of clean-up material and soil as hazardous waste.
- Document all spills with date, location, substance, volume, actions taken and other pertinent data.
- Contact local Fire Department and State Division of Environmental Response and Remediation (Phone #801-536-4100) for any spill of reportable quantity.

**Objectives**
- ☒ Housekeeping Practices
- ☒ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Adapted from Salt Lake County BMP Fact Sheet

**Targeted Pollutants**
- ☐ Sediment
- ☐ Nutrients
- ■ Toxic Materials
- ☒ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ■ Training

■ High ☒ Medium ☐ Low

REGISTERED PROFESSIONAL ENGINEER
No. 270393
DAVID W. PETERSON
STATE OF UTAH
7/1/21

Developer: ANDERSON DEV. SERVICES
Phone: 801-856-2478

EXCEL ENGINEERING
David W. Peterson, P.E., License #270393
12 West 100 North, Suite 201, American Fork, UT 84003
P: (801) 756-4504; david@excelcivil.com

# BECK HILLSIDE ESTATES

AMERICAN FORK UTAH

| | | |
|---|---|---|
| Drawn by: D.W.P. | BMP DETAILS | Scale: NTS |
| Designed by: D.W.P. | | Date: 05/24/21 |
| Checked by: D.W.P. | | SWP3 |

## GENERAL NOTES

1. City of American Fork, A.P.W.A, Utah Chapter and Utah Department of Transportation Construction and Material Specifications, current editions, and any supplements thereto (hereafter referred to as Standard Specifications), shall govern all construction items unless otherwise noted. If a conflict between specifications is found, the more strict specification will apply as decided by the City Engineer. Item Numbers listed refer to City of American Fork Item Numbers unless otherwise noted.
2. The City Engineer will not be responsible for means, methods, procedures, techniques, or sequences of construction that are not specified herein. The City Engineer will not be responsible for safety on the work site, or for failure by the Contractor to perform work according to contract documents.
3. The Developer or Contractor shall be responsible to obtain all necessary permits including but not limited to Road Cut Permits and Notices of Intent (NOI), Building Permits, etc.
4. The Contractor shall notify the City of American Fork, Public Works Department in writing at least 7 working days prior to beginning construction and request a pre-construction meeting. Bond for public improvements and inspection fees must be paid in full prior to requesting a pre-construction meeting.
5. The Contractor shall be solely responsible for complying with all federal, state and local safety requirements including the Occupational Safety and Health Act of 1970. The Contractor shall exercise precaution always for the protection of persons (including employees) and property. It shall also be the sole responsibility of the Contractor to initiate, maintain and supervise all safety requirements, precautions and programs in connection with the work, including the requirements for confined spaces per 29 CFR 1910.146.
6. Following completion of construction of the site improvements and before requesting occupancy, a proof survey shall be provided to the City of American Fork, Public Works Department, that documents "as _ built" elevations, dimensions, slopes and alignments of all elements of this project. The proof survey shall be prepared, signed and submitted by the Professional Engineer who sealed the constructions drawings.
7. The Contractor shall restrict construction activity to public right_of_way and areas defined as permanent and/or temporary construction easements, unless otherwise authorized by the City Engineer.
8. The Contractor shall carefully preserve benchmarks, property corners, reference points, stakes and other survey reference monuments or markers. In cases of willful or careless destruction, the Contractor shall be responsible for restorations. Resetting of markers shall be performed by a License Utah Professional Surveyor as approved by the City Engineer.
9. Non_rubber tired vehicles shall not be moved on or across public streets or highways without the written permission of the City Engineer.
10. The Contractor shall restore all disturbed areas to equal or better condition than existed before construction. Drainage ditches or watercourses that are disturbed by construction shall be restored to the grades and cross_sections that existed before construction.
11. Tracking or spilling mud, dirt or debris upon streets, residential or commercial drives, sidewalks or bike paths is prohibited. Any such occurrence shall be cleaned up immediately by the Contractor at no cost to the City. If the Contractor fails to remove said mud, dirt, debris, or spillage, the City reserves the right to remove these materials and clean affected areas, the cost of which shall be the responsibility of the Contractor.
12. Disposal of excess excavation within Special Flood Hazard Areas (100-year floodplain) must be approved by the City Engineer.
13. All signs, landscaping, structures or other appurtenances within right-of-way disturbed or damaged during construction shall be replaced or repaired to the satisfaction of the City Engineer. The cost of this work shall be the responsibility of the Contractor.
14. All field tile broken or encountered during excavation shall be replaced or repaired and connected to the public storm sewer system as directed by the City Engineer. The cost of this work shall be the responsibility of the Contractor.
15. All precast concrete products shall be inspected at the location of manufacture. Approved precast concrete products will be stamped or have such identification noting that inspection has been conducted by the City of American Fork. Precast concrete products without proof of inspection shall not be approved for installation.
16. All trenches within public right-of-way shall be backfilled according to the approved construction drawings or securely plated during nonworking hours.
17. Trenches outside these areas shall be backfilled or shall be protected by approved temporary fencing or barricades during nonworking hours. Clean up shall follow closely behind the trenching operation.
18. All trees within the construction area not specifically designated for removal shall be preserved, whether shown or not shown on the approved construction drawings. Trees to be preserved shall be protected with high visibility fencing placed a minimum 15 feet from the tree trunk. Trees 6 – inches or greater at DBH (Diameter Breast Height) must be protected with fencing placed at the critical root zone or 15 feet, whichever is greater.
19. Trees not indicated on the approved construction drawings for removal may not be removed without prior approval of the Division of Engineering.
20. Permits to construct in the right-of-way of existing streets must be obtained from the City of American Fork, Public Works Department before commencing construction.
21. The Contractor shall be responsible for the condition of trenches within the right-of-way and public easements for a period of one year from the final acceptance of the work, and shall make any necessary repairs at no cost to the City.
22. Pavements shall be cut in neat, straight lines the full depth of the existing pavement, or as required by the City Engineer.
23. The replacement of driveways, handicapped ramps, sidewalks, bike paths, parking lot pavement, etc. shall be provided according to the approved construction drawings and the City of American Fork standard construction drawings.
24. Any modification to the work shown on drawings must have prior written approval by the City Engineer.
25. Traffic control and other regulatory signs shall comply with the Utah Department of Transportation Traffic Control guidelines and MUTCD Manual, current edition
26. Public street signs shall meet all City of American Fork specifications with lettering colored in white displayed over a green background.
27. Private street signs shall meet all City of American Fork specifications with lettering colored in white displayed over a blue background

## UTILITIES

1. The following utilities are known to be located within the limits of this project:

| COMPANY | | CONTACT | PHONE |
|---|---|---|---|
| CENTURY LINK | – TELEPHONE | BILL WESTFALL | (435) 623 4252 |
| ROCKY MNT. POWER | – POWER | TERIA WALKER | (801) 756 1310 |
| COMCAST | – CABLE | ELYSIA VALDEZ | (801) 401 3017 |
| COMCAST | – FIBER TEL | SADE CHRISTENSEN | (801) 369 7360 |
| QUESTAR GAS | – GAS (FOREMAN) | WENDY EDWARDS | (801) 853 8513 |
| QUESTAR GAS | – GAS (HP) | GAYLAN SORENSEN | (801) 370 6577 |
| DOMINION ENERGY | – GAS | TRENT JOHNSON | (801) 853 6548 |
| AMERICAN FORK CITY | – WATER | JAY BREMS | (801) 763 3060 |
| AMERICAN FORK CITY | – SEWER | ASHTON HARDY | (801) 763 3060 |
| AMERICAN FORK CITY | – STORM | ASHTON HARDY | (801) 763 3060 |
| AMERICAN FORK CITY | – SWPPP | HARLAN NIELSON | (801) 763 3060 |
| AMERICAN FORK CITY | – P.I. | JAY BREMS | (801) 763 3060 |
| AMERICAN FORK CITY | – PLANNING | ADAM OLSEN | (801) 763 3060 |
| AMERICAN FORK CITY | – ENGINEERING | BEN HUNTER | (801) 763 3060 |
| AMERICAN FORK CITY | – INSPECTOR | DEE HOWARD | (801) 763 3060 |
| FIRE MARSHALL | – FIRE DEPT | MAT SACCO | (801) 763 3045 |
| AF FIBER | | KYLE PETERSEN | (801) 400-2933 |
| AF FLOOD IRRIGATION COMPANY | | ERNIE JOHN | (801) 471 6576 |
| FIRE & RESCUE | | | 911 |
| TIMPANOGOS SPECIAL SERVICE DISTRICT | | DAVID BARLOW | (801) 756 5231 |

2. The Contractor shall give notice of intent to construct to Blue Stake (telephone number 800-662-4111) at least 2 working days before start of construction.
3. The identity and locations of existing underground utilities in the construction area have been shown on the approved construction drawings as accurately as provided by the owner of the underground utility. The City of American Fork and the City Engineer assumes no responsibility for the accuracy or depths of underground facilities shown on the approved construction drawings. If damage is caused, the Contractor shall be responsible for repair of the same and for any resulting contingent damage.
4. Location, support, protection and restoration of all existing utilities and appurtenances, whether shown or not shown on the approved construction drawings, shall be the responsibility of the Contractor.
5. When unknown or incorrectly located underground utilities are encountered during construction, the Contractor shall immediately notify the owner and the City Engineer.

## TRAFFIC CONTROL

1. Traffic control shall be furnished, erected, maintained, and removed by the Contractor according to Utah Department Of Transportation, Traffic Control guidelines or Manual of Uniform Traffic Control Devices, current edition.
2. All traffic lanes of public roadways shall be fully open to traffic from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM unless authorized differently by the City Engineer.
3. At all other hours the Contractor shall maintain minimum one _ lane two _ way traffic. Traffic circulation must be supervised by a Certified Flagger.
4. Steady _ burning, Type "C" lights shall be required on all barricades, drums, and similar traffic control devices in use at night.
5. Access from public roadways to all adjoining properties for existing residents or businesses shall be maintained throughout the duration of the project for mail, public water and sanitary sewer service, and emergency vehicles.
6. The Contractor shall provide a traffic control plan detailing the proposed maintenance of traffic procedures. The traffic control plan must incorporate any traffic control details contained herein.
7. The traffic control plan proposed by the Contractor must be approved by the City Engineer prior to construction.
8. Traffic Control requiring road closures and/ or detouring must be approved by the City Council.

## EROSION AND SEDIMENT CONTROL

1. The Contractor or Developer is responsible for submitting a Notice of Intent (NOI) to be reviewed and approved by the Utah DWQ.
2. The NOI must be submitted to DWQ 45 days prior to the start of construction and may entitle coverage under the Utah DWQ General Permit for Storm Water Discharges associated with construction activity. A project location map must be submitted with the NOI.
3. A sediment and erosion control plan must be submitted to the City Engineer for approval if a sediment and erosion control plan has not already been included with the approved construction drawings. This plan must be made available at the project site at all times.
4. A UPDES Storm water Discharge Permit may be required. The Contractor shall be considered the Permittee.
5. The Contractor shall provide sediment control at all points where storm water runoff leaves the site, including waterways, overland sheet flow, and storm sewers.
6. Accepted methods of providing erosion/sediment control include but are not limited to: sediment basins, silt filter fence, aggregate check dams, and temporary ground cover. Hay or straw bales are not permitted.
7. The Contractor shall provide adequate drainage of the work area at all times consistent with erosion control practices.
8. Disturbed areas that will remain un-worked for 30 days or more shall be seeded or protected within seven calendar days of the disturbance.
9. Other sediment controls that are installed shall be maintained until vegetative growth has been established. The Contractor shall be responsible for the removal of all temporary sediment devices at the conclusion of construction but not before growth of permanent ground cover.

## WATER LINE

1. All water line materials shall be provided and installed according to current specifications of the City of American Fork, Water Department.
2. All public water pipe with a diameter 3 inches to 8 inches shall be Ductile Iron, Class 53. Public water pipe 12 inches in diameter or larger shall be Ductile Iron, Class 54.
3. Only fire hydrants conforming to City of American Fork standards will be approved for use.
4. Public water lines shall be disinfected by the City of American Fork, Water Department. Requests for water line chlorination shall be made through the City of American Fork, Water Department. The cost for chlorination shall be paid for by the Contractor.
5. All water lines shall be disinfected according to City of American Fork Standard specifications. Special attention is directed to applicable sections of American Water Works Association specification C_651, particularly for flushing (Section 5) and for chlorinating valves and fire hydrants (Section 7).
6. Pressure testing shall be performed in accordance with the City of American Fork, Construction and Material Specifications. When water lines are ready for disinfection, the Contractor shall submit two (2) sets of "as-built" plans, and a letter stating that the water lines have been pressure tested and need to be disinfected, to the City of American Fork, Water Department.
7. The Contractor shall be responsible for all costs associated with the disinfection of all water lines construction per this plan. Pressure testing shall be performed in accordance with the City of American Fork, Construction and Material Specifications.
8. The Contractor shall paint all fire hydrants according to City of American Fork standards. The cost of painting fire hydrants shall be included in the contract unit price for fire hydrants.
9. No water taps or service connections (e.g., to curb stops or meter pits) may be issued until adjacent public water lines serving the construction site have been disinfected by the City of American Fork, Water Department and have been accepted by the Public Works Department.
10. The Contractor shall notify the City of American Fork, Water Department at (801) 763 3060 at least 24 hours before tapping into existing water lines.
11. All water main stationing shall be based on street centerline stationing.
12. All bends, joint deflections and fittings shall be backed with concrete per City of American Fork standards.
13. The Contractor shall give written notice to all affected property owners at least 1 working day but not more than 3 working days prior to any temporary interruption of water service. Interruption of water service shall be minimized and must be approved by the City Engineer.
14. All water lines shall be placed at a minimum depth of 4 feet measured from top of finished grade to top of water line. Water lines shall be set deeper at all points where necessary to clear existing or proposed utility lines or other underground restrictions by a minimum of 18 inches.

## SANITARY SEWER

1. Sanitary sewage collection systems shall be constructed in accordance with the rules, regulations, standards and specifications of the City of American Fork, Public Works Department and the Utah Department of Health Code and Regulations.
2. The minimum requirements for sanitary sewer pipe with diameters 15 inches and smaller shall be reinforced concrete pipe ASTM C76 Class 3, or PVC sewer pipe ASTM D3034, SDR 35.
3. Pipe for 6-inch diameter house service lines shall be PVC pipe ASTM D3034, SDR 35. PVC pipe shall not be used at depths greater than 28 feet. Pipe materials and related structures shall be shop tested in accordance with City of American Fork Construction Inspection Division quality control requirements.
4. All manhole lids shall be provided with continuous self_sealing gaskets.
5. The approved construction drawings shall show where bolt_down lids are required.
6. Sanitary sewer manholes shall be precast concrete or as approved by the City Engineer and conform to the City of American Fork sanitary manhole standard drawing. Manhole lids shall include the word SEWER.
7. All PVC sewer pipes shall be deflection tested no less than 60 days after completion of backfilling operations.
8. At the determination of the City Engineer, the Contractor may be required to perform a TV inspection of the sanitary sewer system prior to final acceptance by the City. This work shall be completed by the Contractor at his expense.
9. Visible leaks or other defects observed or discovered during TV inspection shall be repaired to the satisfaction of the Engineer.
10. Roof drains, foundation drains, field tile or other clean water connections to the sanitary sewer system are strictly prohibited according to the American Fork Code of Ordinances.
11. All water lines shall be located at least 10 feet horizontally and 18 inches vertically, from sanitary sewers and storm sewers, to the greatest extent practicable.
12. Where sanitary sewers cross water mains or other sewers or other utilities, trench backfill shall be placed between the pipes crossing and shall be compacted granular material according to the city Standard Specifications. In the event that a water line must cross within 18 inches of a sanitary sewer, the sanitary sewer shall be concrete encased or consist of ductile iron pipe material.
13. Existing sanitary sewer flows shall be maintained at all times. Costs for pumping and bypassing shall be included in the Contractor's unit price bid for the related items.
14. The Contractor shall furnish all material, equipment, and labor to make connections to existing manholes.
15. All sewer lines shall be placed at a minimum depth of 4 feet measured from top of finished grade to top of sewer line.

## STORM SEWER

1. All storm water detention and retention areas and major flood routing swales shall be constructed to finish grade and hydro _ seeded and hydro _ mulched according to the City of American Fork Standard Specifications.
2. Where private storm sewers connect to public storm sewers, the last run of private storm sewer connecting to the public storm sewer shall be Reinforced Concrete Pipe conforming to ASTM Designation C76, Wall B, Class IV for pipe diameters 12 inches to 15 inches, Class III for 18 inches to 24 inch pipes, and 27 inches and larger pipe shall be Class II, unless otherwise shown on the approved construction drawings.
3. Granular backfill shall be compacted granular material according to American Fork City Standard Specifications.
4. All public storm sewers shall be Reinforced Concrete Pipe conforming to ASTM Designation C76, Wall B, Class IV for pipe diameters 12 inches to 15 inches, Class III for 18 inches to 24 inch pipes, and 27 inches and larger pipe shall be Class II, unless otherwise shown on the approved construction drawings.
5. Headwalls and end walls shall be required at all storm sewer inlets or outlets to and from storm water management facilities. Natural stone and/or brick approved by the City Engineer shall be provided on all visible headwalls and/or end walls surfaces.
6. Storm inlets or catch basins shall be channelized and have bicycle safe grates. Manhole lids shall include the word STORM.
7. Storm sewer outlets greater than 18 inches in diameter accessible from storm water management facilities or watercourses shall be provided with safety grates, as approved by the City Engineer.

## STRIPING AND SIGNING

1. All striping must be done following Utah Department of Transportation guidelines and MUTCD Manual recommendations, current edition.
2. All signing must be done following MUTCD Manual recommendations, current edition.
3. Only sand-blasting is allowed for removal of existing striping.
4. Contractor is responsible for removal of conflicting existing striping.
5. Materials used for striping must comply with the Utah Department of Transportation standard specifications.

## MAIL DELIVERY

1. The Contractor shall be responsible to ensure that US Mail delivery within the project limits is not disrupted by construction operations.
2. This responsibility is limited to relocation of mailboxes to a temporary location that will allow the completion of the work and shall also include the restoration of mailboxes to their original location or approved new location.
3. Any relocation of mailbox services must be first coordinated with the US Postal Service and the homeowner.
4. Before relocating any mailboxes, the Contractor shall contact the U.S. Postal Service and relocate mailboxes according to the requirements of the Postal Service.

## USE OF FIRE HYDRANTS

1. The Contractor shall make proper arrangements with the American Fork City, Water Department for the use of fire hydrants when used for work performed under this project's approval.

## PRESSURIZED IRRIGATION LINE

1. All Pressurized irrigation line materials shall be provided and installed according to current specifications of the City of American Fork, PI Department.
2. All pressurized irrigation pipe with a diameter 3 inches to 12 inches shall be C900 PVC purple pipe.
3. Pressure testing shall be performed in accordance with the City of American Fork, Construction and Material Specifications. The Contractor shall submit two (2) sets of "as-built" plans, and a letter stating that the lines have been pressure tested addressed to the City of American Fork, PI Department.
4. The Contractor shall notify the City of American Fork, PI Department at (801) 404-6129 Jay Brems at least 24 hours before tapping into existing water lines.
5. All pressurized irrigation line stationing shall be based on street centerline stationing.
6. All bends, joint deflections and fittings shall be backed with concrete per City of American Fork standards.
7. The Contractor shall give written notice to all affected property owners at least 1 working day but not more than 3 working days prior to any temporary interruption of pressurized irrigation service. Interruption of pressurized irrigation service shall be minimized and must be approved by the City Engineer.
8. All water lines shall be placed at a minimum depth of 2 feet measured from top of finished grade to top of pressurized irrigation line. Pressurized irrigation lines shall be set deeper at all points where necessary to clear existing or proposed utility lines or other underground restrictions by a minimum of 18 inches.

REGISTERED PROFESSIONAL ENGINEER
10/7/21
No. 270393
DAVID W. PETERSON
STATE OF UTAH

| REVISIONS | | |
|---|---|---|
| Rev. | Date | Description |
| 1 | 08/19/21 | REVISED PER CITY COMMENTS |

Developer: ANDERSON DEV. SERVICES
Phone: 801-856-2478

EXCEL ENGINEERING
David W. Peterson, P.E., License #270393
12 West 100 North, Suite 201, American Fork, UT 84003
P: (801) 756-4504; david@excelcivil.com

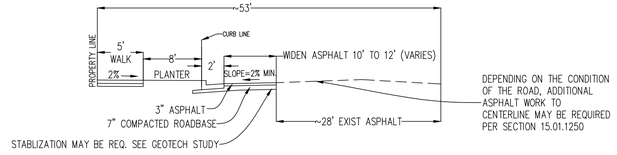
# BECK HILLSIDE ESTATES

AMERICAN FORK UTAH

Drawn by: D.W.P.
Designed by: D.W.P.
Checked by: D.W.P.

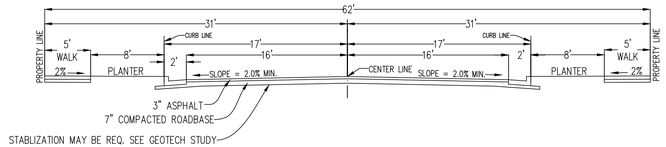
## AMERICAN FORK STANDARD CONSTRUCTION NOTES

Scale: NTS
Date: 05/24/21
D1




## 200 EAST HALF STREET SECTION

NOT TO SCALE

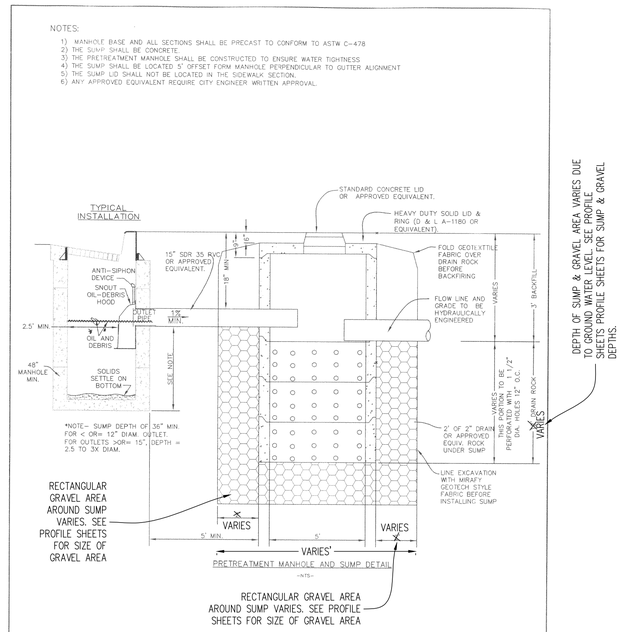



## 62' STREET SECTION

NOT TO SCALE

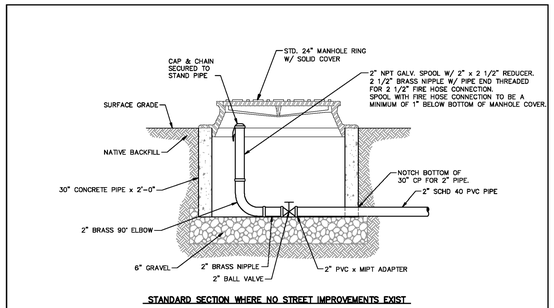
NOTES:

1) MANHOLE BASE AND ALL SECTIONS SHALL BE PRECAST TO CONFORM TO ASTM C-478
2) THE SUMP SHALL BE CONCRETE.
3) THE PRETREATMENT MANHOLE SHALL BE CONSTRUCTED TO ENSURE WATER TIGHTNESS
4) THE SUMP SHALL BE LOCATED 5' OFFSET FORM MANHOLE PERPENDICULAR TO GUTTER ALIGNMENT
5) THE SUMP LID SHALL NOT BE LOCATED IN THE SIDEWALK SECTION.
6) ANY APPROVED EQUIVALENT REQUIRE CITY ENGINEER WRITTEN APPROVAL.

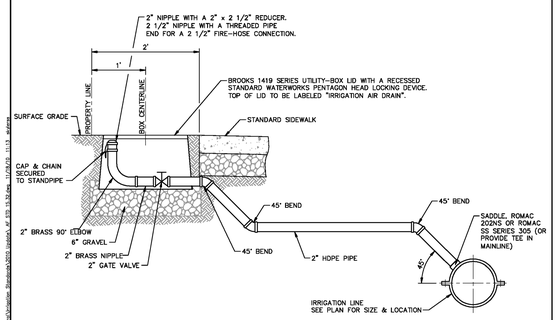



| | | | | |
|---|---|---|---|---|
| DRAWN: JRP | Northern ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT 1040 E. 800 N. OREM, UTAH 84057 (801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR: PRETREATMENT MANHOLE AND SUMP | DRAWING NO. 15.14 |
| REVISED: | | | | |
| DATE: MAY 2002 | | | | |
| SCALE: VARIES | | | | |

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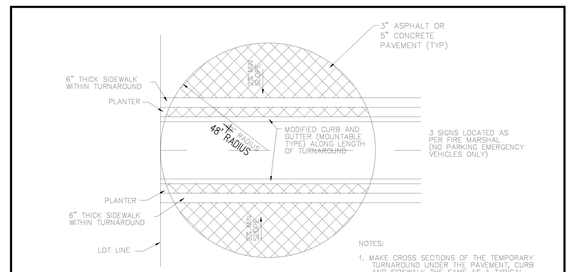

STANDARD SECTION WHERE NO STREET IMPROVEMENTS EXIST

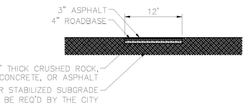



STANDARD SECTION WHERE STREET IMPROVEMENTS EXIST

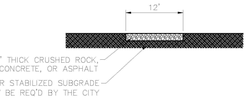
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|---|---|---|---|---|
| DRAWN: | HORROCKS ENGINEERS ONE WEST MAIN P.O. BOX 377 AMERICAN FORK (801) 763-5100 | AMERICAN FORK CITY | STANDARD DETAIL FOR: AIR INLET & REMOVAL FACILITY FOR SECONDARY WATER | DRAWING NO. 15.32 |
| REVISED: 11/2010 | | | | |
| DATE: | | | | |
| SCALE: | | | | |

K:\AMERICAN FORK 1\STANDARDS\Drawings\FINAL\SECONDARY WATER.dwg 11/15/2010 11:19 Jen mit




MAINTENANCE ACCESS WITH ASPHALT TRAIL ABOVE

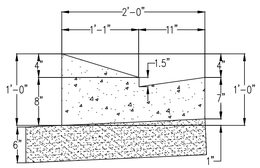



ALL WEATHER ACCESS

LEHI CITY

TEMPORARY TURNAROUND AND ACCESS ROADS

LEHI CITY STANDARD DRAWINGS ROAD-14




MODIFIED CURB DETAIL

This is not an American Fork standard. We cannot accept something that is not our own standard.

REGISTERED PROFESSIONAL ENGINEER
4/9/21
No. 270393
DAVID W. PETERSON
STATE OF UTAH

| REVISIONS | | |
|---|---|---|
| Rev. | Date | Description |
| 1 | 08/19/21 | REVISED PER CITY COMMENTS |
| 2 | 10/07/21 | REVISED PER CITY COMMENTS |

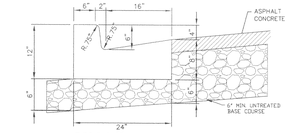
Developer: ANDERSON DEV. SERVICES
Phone: 801-856-2478

EXCEL ENGINEERING
David W. Peterson, P.E., License #270393
12 West 100 North, Suite 201, American Fork, UT 84003
P: (801) 756-4504; david@excelcivil.com

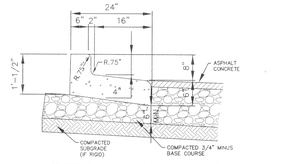
# BECK HILLSIDE ESTATES

AMERICAN FORK UTAH

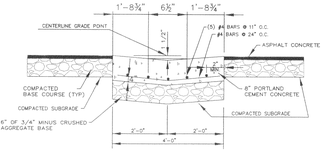
| | | |
|---|---|---|
| Drawn by: D.W.P. | DETAILS | Scale: NTS |
| Designed by: D.W.P. | | Date: 05/24/21 |
| Checked by: D.W.P. | | D2 |




TYPE E CURB & GUTTER
–NTS–

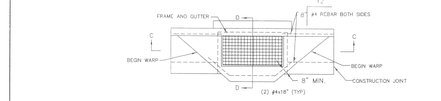


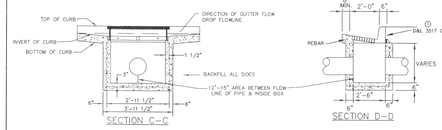

REVERSE LIP CURB & GUTTER "PRIVATE USE ONLY"
–NTS–




4.0' VALLEY GUTTER
–NTS–

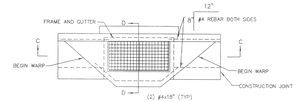
| | | | | |
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| DRAWN: JRP<br>REVISED:<br>DATE: MAY 2002<br>SCALE: VARIES | Northern<br>ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT<br>1040 E. 800 N.<br>OREM, UTAH 84057<br>(801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR<br>TYPE B1 C&G<br>REVERSE LIP C&G<br>VALLEY GUTTER | DRAWING NO.<br>15.1 |

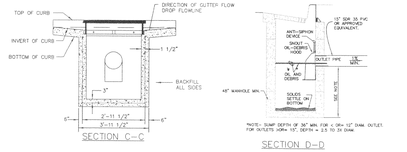



STORM DRAIN CATCH BASIN
–NTS–

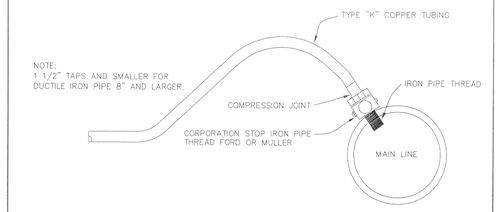
NOTE:
A POLLUTION PREVENTION DECAL SHALL BE PLACED ON STORM DRAIN CATCH BASINS AND PIPE–TREATMENT CURB INLETS.



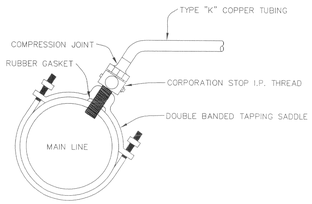




PRE–TREATMENT CURB INLET WITH SINGLE GRATE
–NTS–

| | | | | |
|---|---|---|---|---|
| DRAWN: JRP<br>REVISED:<br>DATE: MAY 2002<br>SCALE: VARIES | Northern<br>ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT<br>1040 E. 800 N.<br>OREM, UTAH 84057<br>(801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR<br>CATCH BASIN | DRAWING NO.<br>15.2 |

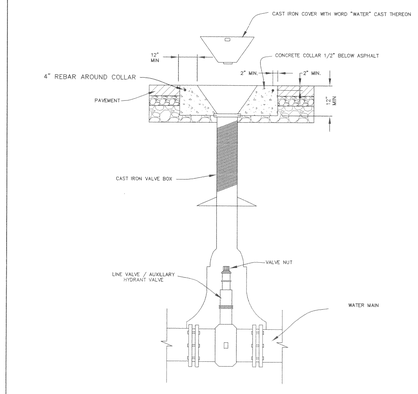



OPTION #2



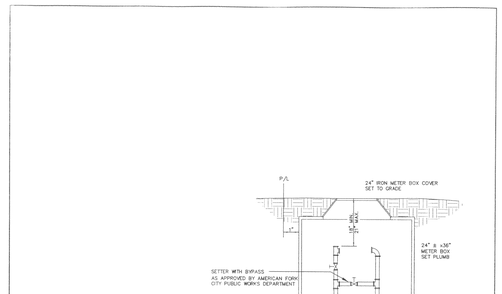

OPTION #1

| | | | | |
|---|---|---|---|---|
| DRAWN: JRP<br>REVISED:<br>DATE: JULY 2002<br>SCALE: VARIES | Northern<br>ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT<br>1040 E. 800 N.<br>OREM, UTAH 84057<br>(801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR<br>TYPICAL WATERMAN TAPS | DRAWING NO.<br>15.3 |



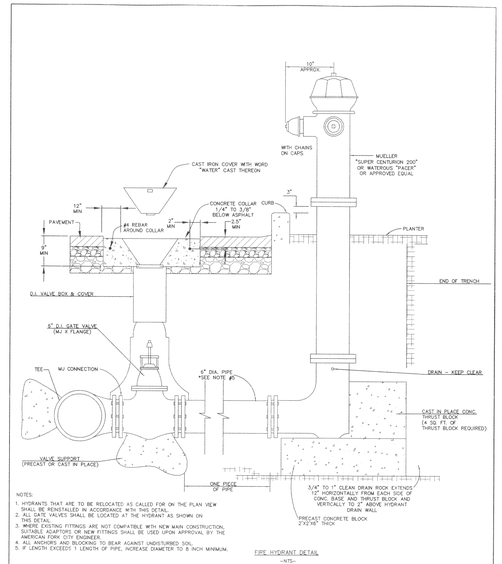

VALVE BOX DETAIL

| | | | | |
|---|---|---|---|---|
| DRAWN: JRP<br>REVISED:<br>DATE: JULY 2002<br>SCALE: VARIES | Northern<br>ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT<br>1040 E. 800 N.<br>OREM, UTAH 84057<br>(801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR<br>VALVE BOX DETAIL | DRAWING NO.<br>15.4 |




| SPACING TABLE | |
|---|---|
| SIZE | SPACING |
| 3/4" | 7 1/2" |
| 1" | 10 3/4" |
| 1 1/2" | 13" |
| 2" | 17" |

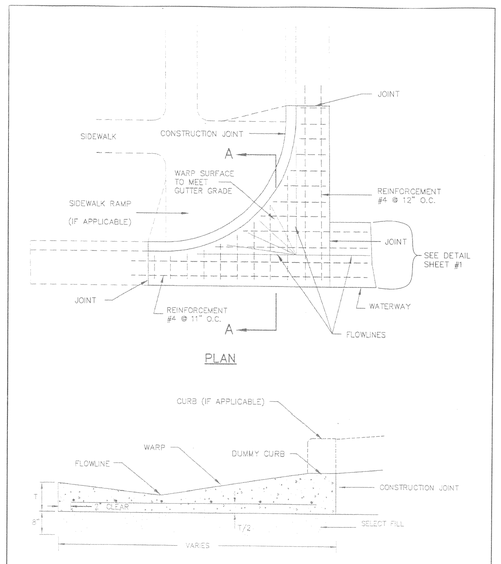
| | | | | |
|---|---|---|---|---|
| DRAWN: JRP<br>REVISED:<br>DATE: MAY 2002<br>SCALE: VARIES | Northern<br>ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT<br>1040 E. 800 N.<br>OREM, UTAH 84057<br>(801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR<br>CULINARY WATER SERVICE CONNECTION | DRAWING NO.<br>15.5 |




NOTES:
1. HYDRANTS THAT ARE TO BE RELOCATED AS CALLED FOR ON THE PLAN VIEW SHALL BE RELOCATED IN ACCORDANCE WITH THIS DETAIL.
2. ALL GATE VALVES SHALL BE LOCATED AT THE HYDRANT AS SHOWN ON THIS DETAIL.
3. WHERE EXISTING FITTINGS ARE NOT COMPATIBLE WITH NEW MAIN CONSTRUCTION, SUITABLE ADAPTERS OR NEW FITTINGS SHALL BE USED UPON APPROVAL BY THE CITY ENGINEER OR HIS DESIGNEE.
4. ALL ANCHORS AND BLOCKING TO BEAR AGAINST UNDISTURBED SOIL.
5. IF LENGTH EXCEEDS 1 LENGTH OF PIPE, INCREASE DIAMETER TO 8 INCH MINIMUM.

FIRE HYDRANT DETAIL
–NTS–

| | | | | |
|---|---|---|---|---|
| DRAWN: JRP<br>REVISED:<br>DATE: MAY 2002<br>SCALE: VARIES | Northern<br>ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT<br>1040 E. 800 N.<br>OREM, UTAH 84057<br>(801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR<br>FIRE HYDRANT | DRAWING NO.<br>15.6 |

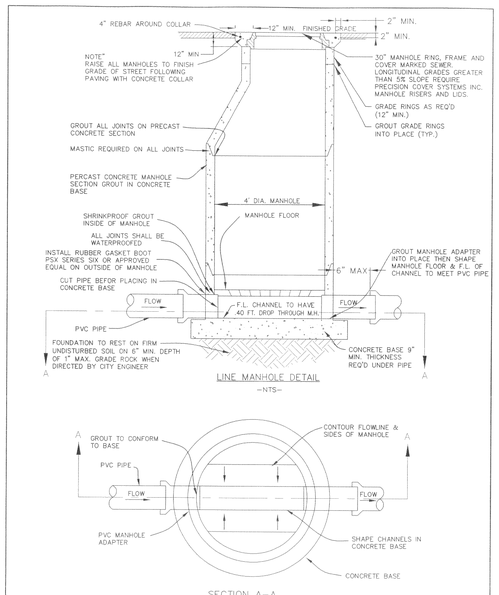



PLAN




SECTION A–A

| | | | | |
|---|---|---|---|---|
| DRAWN: JRP<br>REVISED:<br>DATE: MAY 2002<br>SCALE: VARIES | Northern<br>ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT<br>1040 E. 800 N.<br>OREM, UTAH 84057<br>(801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR<br>INTERSECTION RADIUS REBAR DETAIL | DRAWING NO.<br>15.8 |




LINE MANHOLE DETAIL
–NTS–




SECTION A–A
–NTS–

| | | | | |
|---|---|---|---|---|
| DRAWN: JRP<br>REVISED:<br>DATE: JULY 2002<br>SCALE: VARIES | Northern<br>ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT<br>1040 E. 800 N.<br>OREM, UTAH 84057<br>(801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR<br>SANITARY SEWER LINE MANHOLE DETAIL | DRAWING NO.<br>15.12 |

REGISTERED PROFESSIONAL ENGINEER
10/4/21
No. 270393
DAVID W. PETERSON
STATE OF UTAH

| REVISIONS | | |
|---|---|---|
| Rev. | Date | Description |
| | | |

Developer: ANDERSON DEV. SERVICES
Phone: 801-856-2478

EXCEL ENGINEERING
David W. Peterson, P.E., License #270393
12 West 100 North, Suite 201, American Fork, UT 84003
P: (801) 756-4504; david@excelcivil.com

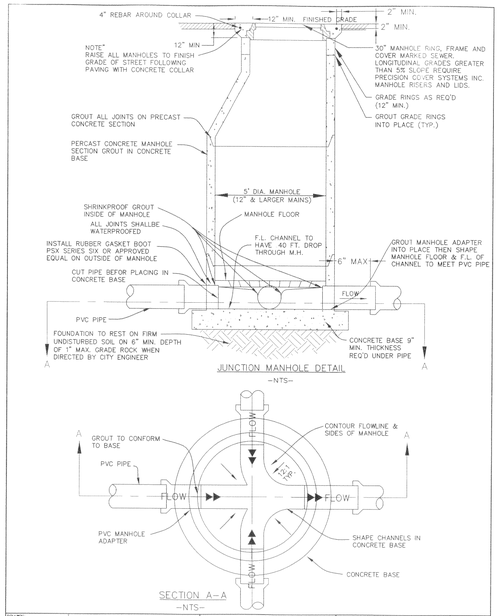
# BECK HILLSIDE ESTATES

AMERICAN FORK UTAH

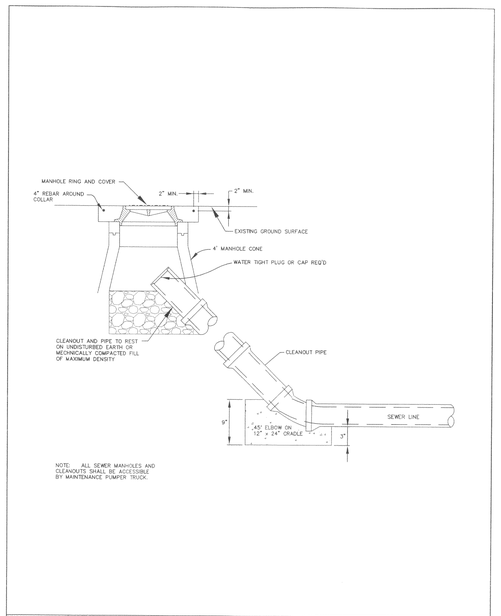
Drawn by: D.W.P.
Designed by: D.W.P.
Checked by: D.W.P.

## DETAILS

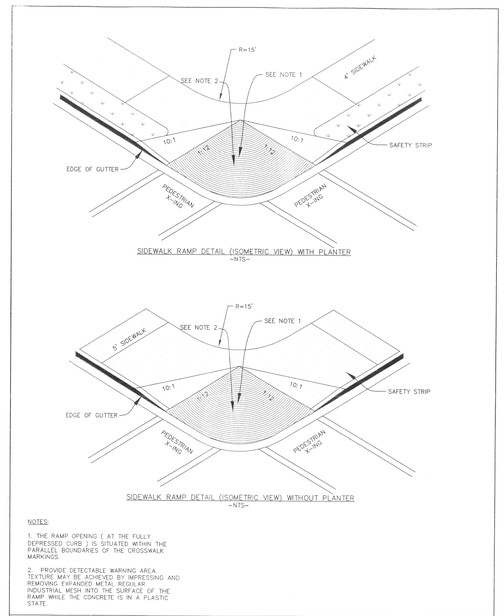
Scale: NTS
Date: 05/24/21
D3




| DRAWN: JRP | Northern ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT 1040 E. 800 N. OREM, UTAH 84057 (801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR: SANITARY SEWER JUNCTION MANHOLE DETAIL | DRAWING NO. 15.13 |
|---|---|---|---|---|
| REVISED: | | | | |
| DATE: JULY 2002 | | | | |
| SCALE: VARIES | | | | |



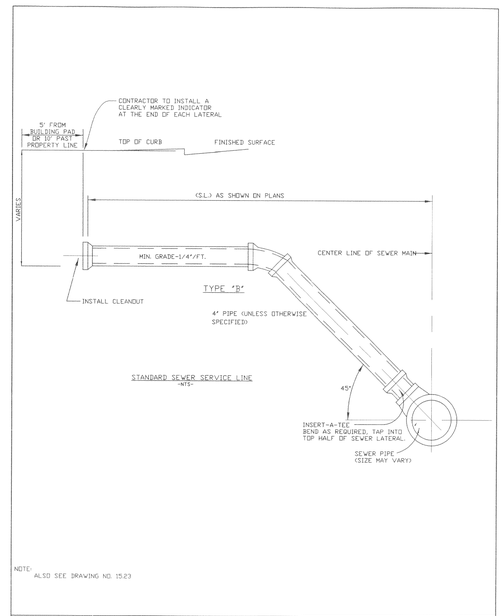

| DRAWN: JRP | Northern ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT 1040 E. 800 N. OREM, UTAH 84057 (801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR: SEWER CLEANOUT SEWER PIPE INSTALLATION | DRAWING NO. 15.15 |
|---|---|---|---|---|
| REVISED: | | | | |
| DATE: MAY 2002 | | | | |
| SCALE: VARIES | | | | |




NOTES:

1. THE RAMP OPENING ( AT THE FULLY DEPRESSED CURB ) IS SITUATED WITHIN THE PARALLEL BOUNDARIES OF THE CROSSWALK MARKINGS.
2. PROVIDE DETECTABLE WARNING AREA. TEXTURE MAY BE ACHIEVED BY IMPRESSING AND REMOVING EXPANDED METAL REGULAR INDUSTRIAL MESH INTO THE SURFACE OF THE RAMP WHILE THE CONCRETE IS IN A PLASTIC STATE.

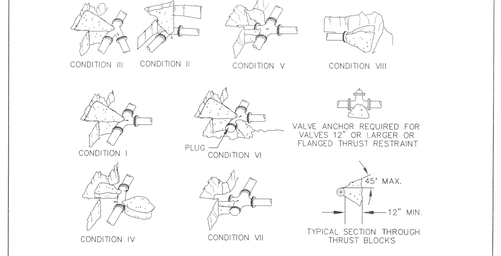
| DRAWN: JRP | Northern ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT 1040 E. 800 N. OREM, UTAH 84057 (801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR: SIDEWALK RAMP | DRAWING NO. 15.18 |
|---|---|---|---|---|
| REVISED: | | | | |
| DATE: MAY 2002 | | | | |
| SCALE: VARIES | | | | |




STANDARD SEWER SERVICE LINE
-NTS-

NOTE:
ALSO SEE DRAWING NO. 1523

| DRAWN: JRP | Northern ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT 1040 E. 800 N. OREM, UTAH 84057 (801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR: STANDARD SEWER SERVICE LINE | DRAWING NO. 15.19 |
|---|---|---|---|---|
| REVISED: | | | | |
| DATE: MAY 2002 | | | | |
| SCALE: VARIES | | | | |



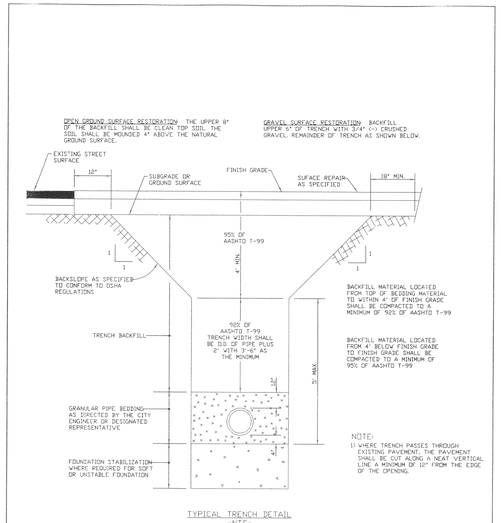

NOTES:

1. ALL THRUST BLOCK BEARING FACES SHALL BE POURED AGAINST UNDISTURBED SOIL OR APPROVED COMPACTED BACKFILL.
2. CONCRETE SHALL BE CLASS C.
3. CALCULATED ON 150 PSI STATIC PRESSURE & ALLOWABLE BEARING PRESSURE OF 1500 LB. PER SQ. FT.
4. ALL THRUST BLOCK SIDES SHALL BE FORMED. (CITY INSPECTOR MAY REQUIRE WOOD FORMS.)

| THRUST BLOCK BEARING AREA IN SQ. FEET | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PIPE SIZE (IN.) | CONDITION | | | | | | | |
| | I | II | III | IV | V | VI | VII | VIII |
| 4 | 1.5 | 1.8 | 1 | 0.5 | 1.3 | 1.3 | 1.3 | 1.3 |
| 8 | 5 | 7.1 | 3.8 | 2 | 5 | 5 | 5 | 5 |
| 10 | 7.8 | 11.1 | 6 | 3 | 7.8 | 7.8 | 7.8 | 7.8 |
| 14 | 15.4 | 21.7 | 11.8 | 6 | 15.4 | 15.4 | 15.4 | 15.4 |

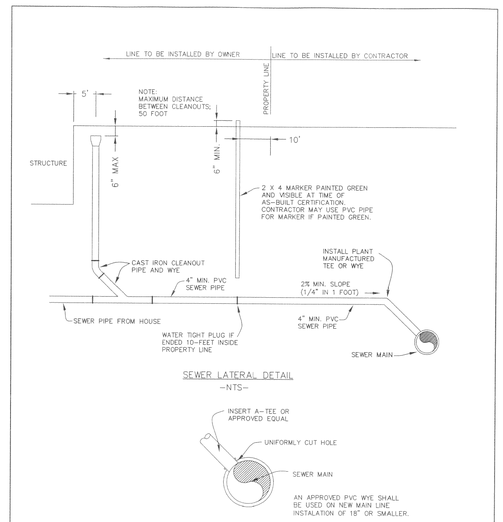
WATER LINE THRUST BLOCK DETAILS

| DRAWN: JRP | Northern ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT 1040 E. 800 N. OREM, UTAH 84057 (801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR: WATERLINE THRUST BLOCKING | DRAWING NO. 15.21 |
|---|---|---|---|---|
| REVISED: | | | | |
| DATE: MAY 2002 | | | | |
| SCALE: VARIES | | | | |




TYPICAL TRENCH DETAIL
-NTS-

| DRAWN: JRP | Northern ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT 1040 E. 800 N. OREM, UTAH 84057 (801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR: TYPICAL TRENCH DETAIL | DRAWING NO. 15.22 |
|---|---|---|---|---|
| REVISED: | | | | |
| DATE: MAY 2002 | | | | |
| SCALE: VARIES | | | | |



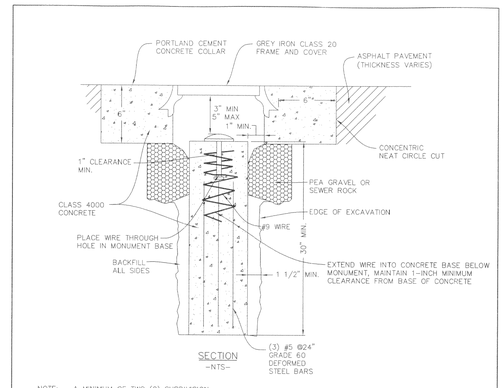

SEWER LATERAL DETAIL
-NTS-




SEWER SERVICE LATERAL SADDLE
-NTS-

NOTE
1) LATERAL SHALL NOT ENTER MANHOLE, UNLESS OTHERWISE APPROVED BY CITY ENGINEER.
2) FOR CONCRETE PIPE ADD CONCRETE COLLAR AROUND INSERT-A-TEE.
3) ALSO SEE DRAWING NO. 15.19

| DRAWN: JRP | Northern ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT 1040 E. 800 N. OREM, UTAH 84057 (801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR: SANITARY SEWER LATERAL AND CLEAN OUT | DRAWING NO. 15.23 |
|---|---|---|---|---|
| REVISED: | | | | |
| DATE: JULY 2002 | | | | |
| SCALE: VARIES | | | | |

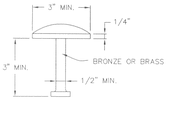



SECTION
-NTS-

NOTE: A MINIMUM OF TWO (2) SUBDIVISION MONUMENTS ARE REQUIRED ON EACH SUBDIVISION PLAT. THE LINE OF SIGHT BETWEEN EACH SUBDIVISION MONUMENT SHALL NOT BE OBSTRUCTED WITH PROPOSED BUILDINGS OR BUILDING ENVELOPES.




CAP PLAN
-NTS-




CAP SECTION
-NTS-

| DRAWN: JRP | Northern ENGINEERING LAND PLANNING CONSTRUCTION MANAGEMENT 1040 E. 800 N. OREM, UTAH 84057 (801) 802-8992 | AMERICAN FORK CITY | STANDARD DETAIL FOR: TYPE "A" MONUMENT CAP AND BASE | DRAWING NO. 15.28 |
|---|---|---|---|---|
| REVISED: | | | | |
| DATE: MAY 2002 | | | | |
| SCALE: VARIES | | | | |




| REVISIONS | | |
|---|---|---|
| Rev. | Date | Description |
| | | |

Developer: ANDERSON DEV. SERVICES
Phone: 801-856-2478

EXCEL ENGINEERING
David W. Peterson, P.E., License #270393
12 West 100 North, Suite 201, American Fork, UT 84003
P: (801) 756-4504; david@excelcivil.com

# BECK HILLSIDE ESTATES

AMERICAN FORK UTAH

Drawn by: D.W.P.
Designed by: D.W.P.
Checked by: D.W.P.

DETAILS

Scale: NTS
Date: 05/24/21
D4




## PLAT LEGEND

- PARCEL BOUNDARIES
- NEIGHBOR TITLES
- EASEMENT LINE
- CENTERLINE ROAD
- CONCRETE
- EDGE ASPHALT
- FENCE LINE
- SANITARY SEWER
- STORM DRAIN
- WATER LINE
- POWER LINE
- PHONE / FIBER OPTIC
- GAS LINE
- CONTOUR LINE

## VICINITY MAP




## ZONING TABLE

| MINIMUM LOT DIMENSIONS | |
|---|---|
| AREA | 1 AC. |
| WIDTH | 150' |
| DEPTH | 100' |
| **MINIMUM BUILDING SETBACKS** | |
| FRONT | 30' |
| SIDE | 8/10' |
| REAR | 25' |
| BUILDING SPACING | 12' |
| ACCESSORY BUILDING (SIDE AND REAR) | 5' |
| **BUILDING HEIGHT** | |
| MAXIMUM | 36' |
| **BUILDING SIZE** | |
| MINIMUM | 900 SQ FT |
| **BUILDING WIDTH** | |
| MINIMUM | 20' |

## COMMITMENT FOR TITLE INSURANCE

A COMMITMENT FOR TITLE INSURANCE # 303966, ISSUED BY WESTCOR LAND TITLE INSURANCE COMPANY, DATED MARCH 2, 2021.

SCHEDULE A:

| | |
|---|---|
| ITEM 1-4 | SURVEYOR MAKES NO COMMENT |
| ITEM 5 | SEE LEGAL DESCRIPTION |

SCHEDULE B-II:

| | |
|---|---|
| ITEM 1 | FACTS - NONE FOUND |
| ITEM 2 | NON-RECORDED EASEMENTS - SEE MAP FOR POWER LOCATION |
| ITEM 3 | CONFLICTS IN BOUNDARY - OVERLAP WITH PARCEL 12:078:0009 LIKELY DUE TO AN ERROR IN ITS TITLE. PARCEL SHOULD NOT OVERLAP SECTION LINE. RECOMMEND HAVING NEIGHBOR QUIT CLAIM THE CURRENT DESCRIPTION OF SUBJECT PARCEL TO CURRENT OWNER |
| ITEM 4 | LIENS - NO COMMENT |
| ITEM 5 | MINING/WATER CLAIMS - NO COMMENT |
| ITEM 6 | TAXES AS LIENS - NO COMMENT |
| ITEM 7 | UTILITY FEES - NO COMMENT |
| ITEM 8 | DEFECTS IN PUBLIC RECORDS - NO COMMENT |
| ITEM 9 | PROPERTY TAXES - NO COMMENT |
| ITEM 10 | FARMLAND ASSESSMENT ACT - NO COMMENT |
| ITEM 11 | CITY/DISTRICT ASSESSMENTS - NO COMMENT |
| ITEM 12 | RIGHT-OF-WAY, EASEMENTS, DITCHES - SEE MAP FOR IRRIGATION & OVERHEAD POWER SERVICE POLE LOCATIONS |
| ITEM 13 | MINERAL RIGHTS - NO COMMENT |
| ITEM 14 | IRRIGATION EASEMENT 1111:1982 - 15' EASEMENT - EXACT LOCATION NOT DEFINED |
| ITEM 15-16 | DEFECTS IN TITLE - NO COMMENT |
| ITEM 17 | SCR LIENS - NO COMMENT |
| ITEM 18 | TITLE INSURANCE - NO COMMENT |

## ALTA / NSPS TABLE "A"

2. ADDRESS 757 NORTH 200 EAST, AMERICAN FORK, UT 84003
3. FLOOD ZONE CLASSIFICATION FEMA FIRM PANEL 49049C0168F EFFECTIVE JUNE 19, 2020. ZONE X - OUTSIDE 0.2% ANNUAL CHANCE FLOODPLAIN
4. GROSS LAND AREA TOTAL AREA = 5.49 ACRES.
5. VERTICAL RELIEF GROUND SURVEY. E QTR COR. SEC. 11 = 4730.99'

6a. CURRENT ZONING CLASSIFICATION
RA-1, RESIDENTIAL AGRICULTURAL, SEE ZONING TABLE

7a. EXTERIOR DIMENSIONS OF ALL BUILDINGS SEE MAP

8. SUBSTANTIAL VISIBLE IMPROVEMENTS SEE MAP.
9. PARKING AREAS NO MARKED STALLS ON SITE.
11. LOCATION OF UTILITIES, VISIBLE & MARKED SEE MAP.
UTILITIES WERE LOCATED BASED ON VISIBLE STRUCTURES AND OTHER VISIBLE EVIDENCES. NO GUARANTEE IS GIVEN THAT ADDITIONAL UTILITIES DO NOT EXIST ON THE SITE WHICH ARE NOT VISIBLE OR MARKED ON THE GROUND. IT IS RECOMMENDED THAT BLUESTAKES BE CALLED PRIOR TO ANY EXCAVATION.
13. NAMES OF ADJOINING OWNERS SEE MAP
16. OBSERVED EVIDENCE OF RECENT CONSTRUCTION NONE FOUND
17. STREET CONSTRUCTION/CHANGES IN ALIGNMENT NONE FOUND

## RECORD DESCRIPTION

Commencing at a point South 1.41 feet and West 484.55 feet from the Southeast Corner of Section 11, Township 5 South, Range 1 East, Salt Lake Base and Meridian; thence South 89°50'00" West 305.85 feet; thence North 3°16'25" West 184.96 feet; thence North 86°21'04" East 26.5 feet; thence North 3°38'56" West 35.92 feet; thence North 88°54'01" East .01 feet; thence North 3°38'57" West 53.57 feet; thence North 54°04'36" West 33.45 feet; thence North 3°16'25" West 297.37 feet; thence East 379.7 feet; thence South 282.7 feet; thence East 154.09 feet; thence South 0°00'52" East 206.72 feet; thence North 89°50'22" West 204.2 feet; thence South 5°37'07" East 102.92 feet to the point of beginning.

## SURVEYOR'S CERTIFICATION

To RD Development, Westcor Land Title Insurance Company, and American Land Title Association:

This is to cerfity that this map or plat and the survey on which it is based were made in accordance with the 2021 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items 2, 3, 4, 5, 6a, 7a, 8, 9, 11, 13, 16, and 17 of Table A thereof. The field work was completed in April 2021.

PROFESSIONAL LAND SURVEYOR
No. 6418780
AARON D. THOMAS
9-16-21
STATE OF UTAH

9-16-21
DATE

AARON D. THOMAS - PLS NO. 6418780

40 20 0 40 80 120
Scale 1" = 40'

| | | | |
|---|---|---|---|
| PROJECT NAME | BECK HILLSIDE ESTATES | | |
| ADDRESS +/- | 757 NORTH 200 EAST | | |
| CITY: AMERICAN FORK | COUNTY: UTAH | STATE: UTAH | |

SURVEYOR: AZTEC ENGINEERING INC.
732 N. 780 W.
AMERICAN FORK, UT. 84003
AZTECENGINEERING@GMAIL.COM

CIVIL ENGINEER: EXCEL ENGINEERING
David W. Peterson, P.E., License #270393
12 West 100 North, Suite 201, American Fork, UT 84003
P: (801) 756-4504; F: (801) 756-4511

# ALTA / NSPS LAND TITLE SURVEY

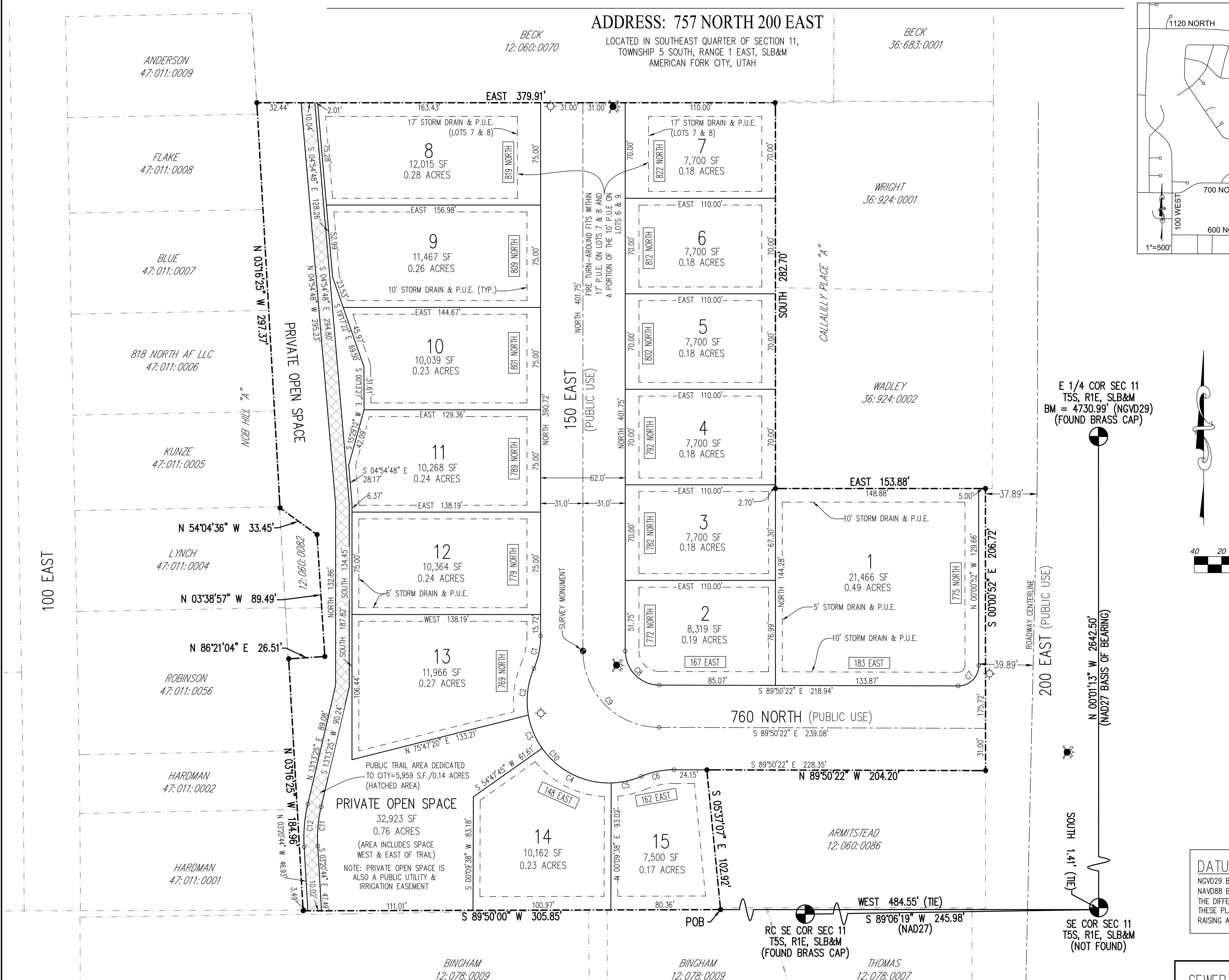
LOCATED IN THE SOUTHEAST QUARTER OF SECTION 11,
TOWNSHIP 5 SOUTH, RANGE 1 EAST, SLB&M

| | |
|---|---|
| SHEET: | 1 OF 1 |
| DATE: | APR. 16, 2021 |
| SCALE: | 1"=40' |

# BECK HILLSIDE ESTATES PLAT "A"

## ADDRESS: 757 NORTH 200 EAST

LOCATED IN SOUTHEAST QUARTER OF SECTION 11,
TOWNSHIP 5 SOUTH, RANGE 1 EAST, SLB&M
AMERICAN FORK CITY, UTAH




## VICINITY MAP




### TABULATIONS

ZONING CLASSIFICATION:
R1-9000, P.U.D.
TOTAL PROPERTY ACREAGE: 5.49 ACRES
TOTAL LOT ACREAGE: 3.49 ACRES
PRIVATE OPEN SPACE: 0.76 ACRES
PUBLIC OPEN SPACE (TRAIL): 0.14 ACRES
TOTAL OPEN SPACE ACREAGE: 0.89 ACRES
NUMBER OF LOTS: 15

### ABRREVIATION TABLE

| | |
|---|---|
| S | SOUTH |
| N | NORTH |
| W | WEST |
| E | EAST |
| PUE | PUBLIC UTILITY EASEMENT |
| SF | SQUARE FEET |
| P.O.B. | POINT OF BEGINNING |

40 20 0 40 80 120
*Scale 1" =40'*

### PLAT LEGEND

SECTION CORNER
PROPERTY CORNER
SURVEY MONUMENT
PC/PT
BOUNDARY LINE
SECTION TIE
EASEMENT LINE
LOT LINE
ADDRESS — ADDRESS LABEL
LIGHT POLE
FIRE HYDRANT

### DATUM ELEVATION NOTE:

NGVD29 BENCHMARK ELEVATION = 4730.99'
NAVD88 BENCHMARK ELEVATION = 4734.52'
THE DIFFERENCE IN ELEVATIONS=3.53'
THESE PLANS CAN BE ADJUSTED TO NAVD88 BY RAISING ALL ELEVATIONS +3.53'

## CURVE TABLE

| CURVE | RADIUS | LENGTH | DELTA | CHORD | BEARING |
|---|---|---|---|---|---|
| C1 | 60.00 | 24.58 | 23°28'08" | 24.41 | S 11°44'04" W |
| C2 | 60.00 | 34.85 | 33°17'01" | 34.37 | S 6°49'38" W |
| C3 | 60.00 | 26.59 | 25°23'22" | 26.37 | S 22°30'34" E |
| C4 | 60.00 | 59.01 | 56°21'17" | 56.66 | S 63°22'54" E |
| C5 | 60.00 | 22.70 | 21°40'32" | 22.56 | N 77°36'12" E |
| C6 | 60.00 | 24.50 | 23°23'42" | 24.33 | N 78°27'47" E |
| C7 | 15.00 | 23.61 | 90°10'30" | 21.25 | S 45°04'23" W |
| C8 | 25.00 | 39.20 | 89°50'22" | 35.31 | N 44°55'11" W |
| C9 | 56.00 | 87.81 | 89°50'22" | 79.08 | N 44°55'11" W |
| C10 | 60.00 | 143.16 | 136°42'12" | 111.54 | N 44°52'58" W |
| C11 | 100.00 | 28.92 | 16°34'8" | 28.82 | S 4°56'21" W |
| C12 | 110.00 | 31.81 | 16°34'8" | 31.70 | N 4°56'21" E |

## GENERAL NOTES

1. OFF-SET PINS TO BE PLACED IN THE BACK OF THE CURB AND 5/8"X24" REBAR WITH NUMBERED SURVEY CAP TO BE PLACED AT ALL REAR LOT CORNERS PRIOR TO ANY OCCUPANCY.
2. FLOOD ZONE DESIGNATION: X – AREA DETERMINED TO BE OUTSIDE 500-YEAR FLOOD PLAIN
   FIRM MAP PANEL #: 49049C0168F
3. SETBACKS AND BUILDABLE AREA WILL BE IN ACCORDANCE W/ CURRENT ZONING.
4. GROUND WATER ENCOUNTERED 6.5' DOWN IN ONE TEST HOLE IN THIS SUBDIVISION PER THE GEOTECHNICAL STUDY. THE OTHER THREE TEST HOLES SHOWED NO GROUND WATER (TESTED DOWN 9' DEEP).
5. BUILDING PERMITS WILL NOT BE ISSUED FOR ANY HOME UNTIL (1) ASPHALT PAVING IS INSTALLED; AND (2) FIRE HYDRANTS ARE INSTALLED, APPROVED AND CHARGED.
6. NO FOOTINGS, EAVES, ETC. CAN BE WITHIN ANY OF THE EASEMENTS.
7. DRY UTILITIES TO BE INSTALLED PRIOR TO BUILDING PERMIT.

### SEWER & WATER AUTHORITY APPROVAL

APPROVED THIS ____DAY OF ___________A.D. 20___,
BY THE SEWER AUTHORITY.

SEWER & WATER AUTHORITY


LAND SURVEYOR:
AZTEC ENGINEERING INC.
732 N. 780 W.
AMERICAN FORK, UT. 84003
AZTECENGINEERING@GMAIL.COM


## *SURVEYOR'S CERTIFICATE*

I, AARON D. THOMAS, DO HEREBY CERTIFY THAT I AM A PROFESSIONAL LAND SURVEYOR, AND THAT I HOLD LICENSE NO. 6418780, IN ACCORDANCE WITH TITLE 58, CHAPTER 22 OF THE PROFESSIONAL ENGINEERS AND LAND SURVEYORS LICENSING ACT. I FURTHER CERTIFY THAT BY AUTHORITY OF THE OWNERS, A SURVEY WAS COMPLETED IN ACCORDANCE WITH SECTION 17-23-17. I FURTHER CERTIFY THAT I HAVE VERIFIED ALL MEASUREMENTS AND THAT MONUMENTS HAVE BEEN PLACED AS SHOWN ON THIS PLAT. I HEREBY STATE THAT THIS PLAT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION, BELIEF AND IN MY PROFESSIONAL OPINION.

______________________ DATE ______________________ (SEE SEAL BELOW)

## *BOUNDARY DESCRIPTION*

BEGINNING AT A POINT LOCATED SOUTH 1.41 FEET & WEST 484.55 FEET FROM THE SOUTHEAST CORNER OF SECTION 11, TOWNSHIP 5 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN;

THENCE SOUTH 89°50'00" WEST 305.85 FEET; THENCE NORTH 03°16'25" WEST 184.96 FEET; THENCE NORTH 86°21'04" EAST 26.51 FEET; THENCE NORTH 03°38'57" WEST 89.49 FEET; THENCE NORTH 54°04'36" WEST 33.45 FEET; THENCE NORTH 03°16'25" WEST 297.37 FEET; THENCE EAST 379.91 FEET; THENCE ALONG THE BOUNDARY OF CALLALILLY PLACE PLAT "A" THE FOLLOWING TWO COURSES AND DISTANCES: 1) SOUTH 282.70 FEET, AND 2) EAST 153.88 FEET; THENCE SOUTH 00°00'52" EAST 206.72 FEET; THENCE NORTH 89°50'22" WEST 204.20 FEET; THENCE SOUTH 05°37'07" EAST 102.92 FEET TO THE POINT OF BEGINNING.

PARCEL CONTAINS = 5.49 ACRES MORE OR LESS

NUMBER OF LOTS = 15

BASIS OF BEARING: THE LINE BETWEEN THE SOUTHEAST CORNER AND THE EAST QUARTER OF SECTION 11, TOWNSHIP 5 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN WHICH BEARS NORTH 00°01'13" WEST

## *OWNER'S DEDICATION*

KNOW ALL MEN BY THESE PRESENTS THAT WE, ALL OF THE UNDERSIGNED OWNERS OF ALL OF THE PROPERTY DESCRIBED IN THE SURVEYOR'S CERTIFICATE HERON AND SHOWN ON THE MAP, AND SUBJECT TO ANY CONDITIONS AND RESTRICTIONS STATED HEREON, HAVE CAUSED THE SAME TO BE SUBDIVIDED INTO LOTS, BLOCKS, STREETS, AND EASEMENTS AND DO HEREBY DEDICATE THE STREETS AND OTHER PUBLIC AREAS AS INDICATED HEREON FOR PERPETUAL USE OF THE PUBLIC.
PURSUANT TO UTAH CODE 10-9A-604(1)(D) THE OWNER HEREBY CONVEYS THE PRIVATE OPEN SPACE AS INDICATED HEREON, TO THE BECK HILLSIDE ESTATES HOMEOWNERS ASSOCIATION, 9730 SOUTH 700 EAST SUITE #100, SANDY, UTAH 84070

IN WITNESS HEREOF, WE HAVE HEREUNTO SET OUR HANDS THIS ______________________ DAY OF ______________, A.D. 20__.

______________________ ______________________

______________________ ______________________

## *ACKNOWLEDGMENT*

STATE OF UTAH
COUNTY OF UTAH S.S.

ON THE ________________ DAY OF ________________, 20__, PERSONALLY APPEARED BEFORE ME THE SIGNERS OF THE FOREGOING DEDICATION WHO DULY ACKNOWLEDGE TO ME THAT THEY DID EXCUTE THE SAME.

______________________________________________
MY COMMISSION EXPIRES NOTARY PUBLIC (SEE SEAL BELOW)

## *ACCEPTANCE BY LEGISLATIVE BODY*

THE CITY COUNCIL OF AMERICAN FORK CITY, COUNTY OF UTAH, APPROVES THIS SUBDIVISION SUBJECT TO THE CONDITIONS AND RESTRICTIONS STATED HEREON AND HEREBY ACCEPTS THE DEDICATION OF ALL STREETS, EASEMENTS, AND OTHER PARCELS OF LAND INTENDED FOR PUBLIC PURPOSES FOR THE PERPETUAL USE OF THE PUBLIC.
THIS __________________ DAY OF ________________, 20__.

MAYOR — CITY COUNCIL MEMBER
CITY COUNCIL MEMBER — CITY COUNCIL MEMBER
CITY COUNCIL MEMBER — CITY COUNCIL MEMBER

APPROVED ______________________
CITY ENGINEER

ATTEST ______________________
CLERK RECORDER (SEE SEAL BELOW)

## *PLANNING COMMISSION APPROVAL*

APPROVED THIS __________________ DAY OF ________________, 20__, BY THE AMERICAN FORK CITY PLANNING COMMISSION.

______________________ ______________________
PLANNING DIRECTOR — CHAIRPERSON, PLANNING COMMISSION.

PLAT "A"

# BECK HILLSIDE ESTATES

A PLANNED UNIT DEVELOPMENT

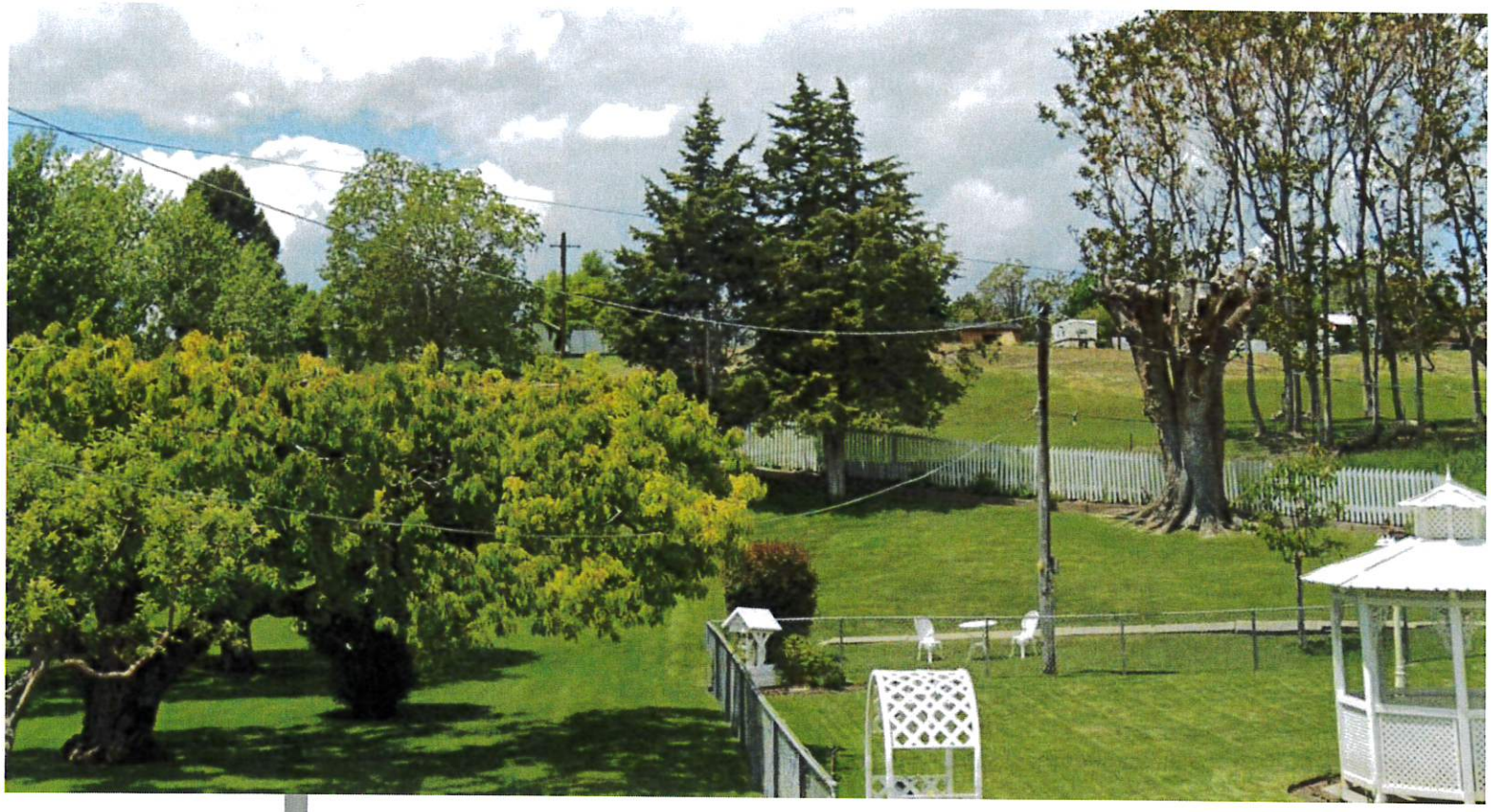
LOCATED IN THE SOUTHEAST QUARTER OF SECTION 11, TOWNSHIP 5 SOUTH, RANGE 1 EAST, SLB&M

AMERICAN FORK CITY, UTAH COUNTY, UTAH

SCALE: 1" = 40 FEET

| Surveyor's Seal | Notary Public Seal | Clerk-Recorder Seal | |
|---|---|---|---|
| | | | |

CMT ENGINEERING LABORATORIES



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

## GEOTECHNICAL ENGINEERING STUDY

# American Fork Development

About 750 North 200 East
American Fork, Utah

**CMT PROJECT NO. 16342**

FOR:
**Anderson Development Services**
9710 South 700 East
Sandy, Utah 84070

May 13, 2021

CMT ENGINEERING LABORATORIES

May 13, 2021

Mr. Keaton Morton
Anderson Development Services
9710 South 700 East
Sandy, Utah 84070

Subject: Geotechnical Engineering Study
American Fork Development
About 750 North 200 East
American Fork, Utah
CMT Project No. 16342

Mr. Morton:

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 13, 2021, a CMT Engineering Laboratories (CMT) staff professional was on-site and supervised the excavation of 4 test pits extending to a depth of about 9 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 residences, 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 Utah, Idaho 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 801-590-0394.

Sincerely,
**CMT Engineering Laboratories**

LICENSED PROFESSIONAL ENGINEER # 374995 JEFFREY J. EGBERT 5/13/21 STATE OF UTAH

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

**Reviewed by:**

Andrew M. Harris, P.E.
Geotechnical Division Manager

CMT ENGINEERING LABORATORIES

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**APPENDIX**
**Figure 1:** Site Plan
**Figures 2 -5:** Test Pit Logs
**Figure 6:** Key to Symbols

# 1.0 INTRODUCTION

## 1.1 General

CMT Engineering Laboratories (CMT) was retained to conduct a geotechnical subsurface study for the proposed American Fork Development. The parcel is situated on the west side of 200 East Street at about 750 North in American Fork, Utah, as shown in 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. Keaton Morton of Anderson Development Services, and Mr. Andrew Harris 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 4 test pits, performing laboratory testing on representative samples of the subsurface soils collected in the test pits, 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 30, 2021 and executed on April 2, 2021.

## 1.3 Description of Proposed Construction

We understand that development of a single-family residential subdivision is planned for the 5.49-acre parcel. Residences are likely to be 1 to 3 levels above grade of conventional wood-framing founded on spread footings, possibly with basements. Maximum continuous wall and column loads are anticipated to be 1,000 to 3,000 pounds per lineal foot and 15,000 to 25,000 pounds, respectively. 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 residential streets will be constructed as part of the development. Traffic is projected to consist of a light volume of automobiles and pickup trucks, one or two daily 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 2 to 3 feet. If deeper cuts or fills are planned, CMT should be notified to provide additional recommendations, if needed.

## 1.4 Executive Summary

Proposed residences can be supported upon conventional spread and continuous wall foundations. The most significant geotechnical aspects regarding site development include the following:

1. The site does not appear to fall within the special study areas defined by the American Fork Sensitive Lands Ordinance.
2. Approximately 12 inches of topsoil over the surface of the site to be removed;
3. Subsurface natural soils consist predominately of GRAVEL (GP, GP-GC) layers, with some layers of SAND (SP), and CLAY (CL, CL-ML);
4. Groundwater encountered at about 6.5 feet below the surface at the south end of the site which will limit the practical depth of basements in this area;
5. Natural clay soils have moderate to slightly high compressibility; and
6. Foundations and floor slabs may be placed on suitable, undisturbed natural soils or on properly placed and compacted structural fill extending to suitable, undisturbed natural soils.

CMT must assess that topsoil, any 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/seismic setting, earthwork, foundations, lateral resistance, lateral pressure, floor slabs, and pavements.

# 2.0 FIELD EXPLORATION

## 2.1 General

In order to define and evaluate the subsurface soil and groundwater conditions, 4 test pits were excavated with a backhoe at the site to approximately 9 feet below the existing ground surface. Locations of the test pits are shown 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, cutting relatively undisturbed "block" samples, and by utilizing a 2.5-inch outside diameter thin-wall drive sampler from within the test pits. The samples were sealed in plastic bags and containers prior to transport to the laboratory.

The subsurface soils encountered in the test pits were classified in the field based upon visual and textural examination, logged and described in general accordance with ASTM[1] D-2488. 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 5**, included in the Appendix. A Key to Symbols defining the terms and symbols used on the logs, is provided as **Figure 6** in the Appendix.

Following completion of excavating operations, 1.25-inch diameter slotted PVC pipe was installed in test pit TP-1 to allow subsequent water level measurements.

Upon completion of logging and sampling, the test pits were backfilled with the excavated soils. When backfilling, minimal to no effort was made to compact the backfill and no compaction testing was performed. Thus, the test pit backfill is considered undocumented fill and settlement of the backfill in the test pits over time should be anticipated.

## 2.2 Infiltration Testing

An infiltration test was also performed as part of our field exploration in the vicinity of TP-2. The testing consisted of digging a small hole with a shovel within the natural gravel soils, filling the small hole with water, and measuring the rate of water drop over a certain time period (i.e. 10 minutes). This process was repeated multiple times until subsequent readings were the same. The results of this test indicate that the natural gravel soils have an infiltration rate of about 6 minutes per inch. This rate will likely slow over time and an appropriate factor of safety should be applied for design purposes.

# 3.0 LABORATORY TESTING

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

[1]American Society for Testing and Materials

1. Moisture Content, ASTM D-2216, Percent moisture representative of field conditions
2. Dry Density, ASTM D-2937, Dry unit weight representing field conditions
3. Atterberg Limits, ASTM D-4318, Plasticity and workability
4. Gradation Analysis, ASTM D-1140/C-117, Grain Size Analysis
5. One Dimension Consolidation, ASTM D-2435, Consolidation properties

To provide data necessary for our analysis of potential settlement from structural loading, a consolidation test was performed on each of 2 representative samples of the subsurface clay soils encountered in a couple of the test pits.
Based upon data obtained from the consolidation testing, the clay soils at this site are slightly to moderately over-consolidated and have moderate to slightly high compressibility under planned additional loading. Detailed results of the consolidation tests are maintained within our files and can be transmitted to you, if so desired.

Laboratory test results are presented on the test pit logs (**Figures 2 through 5**) and in the following Lab Summary table:

**LAB SUMMARY TABLE**

| TEST PIT | DEPTH (feet) | SAMPLE TYPE | SOIL CLASS | MOISTURE CONTENT(%) | DRY DENSITY (pcf) | GRADATION | | | ATTERBERG LIMITS | | | COLLAPSE (-)/ EXPANSION(+) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | GRAV. | SAND | FINES | LL | PL | PI | |
| TP-1 | 2.5 | Thin Wall | CL-ML | 27 | 120 | | | | | | | |
| TP-2 | 3 | Bag | GP-GC | 5 | | 68 | 22 | 10 | 24 | 17 | 7 | |
| TP-2 | 7 | Bag | GP-GC | 6 | | 61 | 36 | 3 | | | | |
| TP-3 | 5 | Block | CL-ML | 26 | 121 | | | 62 | 28 | 21 | 7 | |
| TP-4 | 3 | Bag | GP-GC | 5 | | 74 | 18 | 8 | | | | |

# 4.0 GEOLOGIC & SEISMIC CONDITIONS

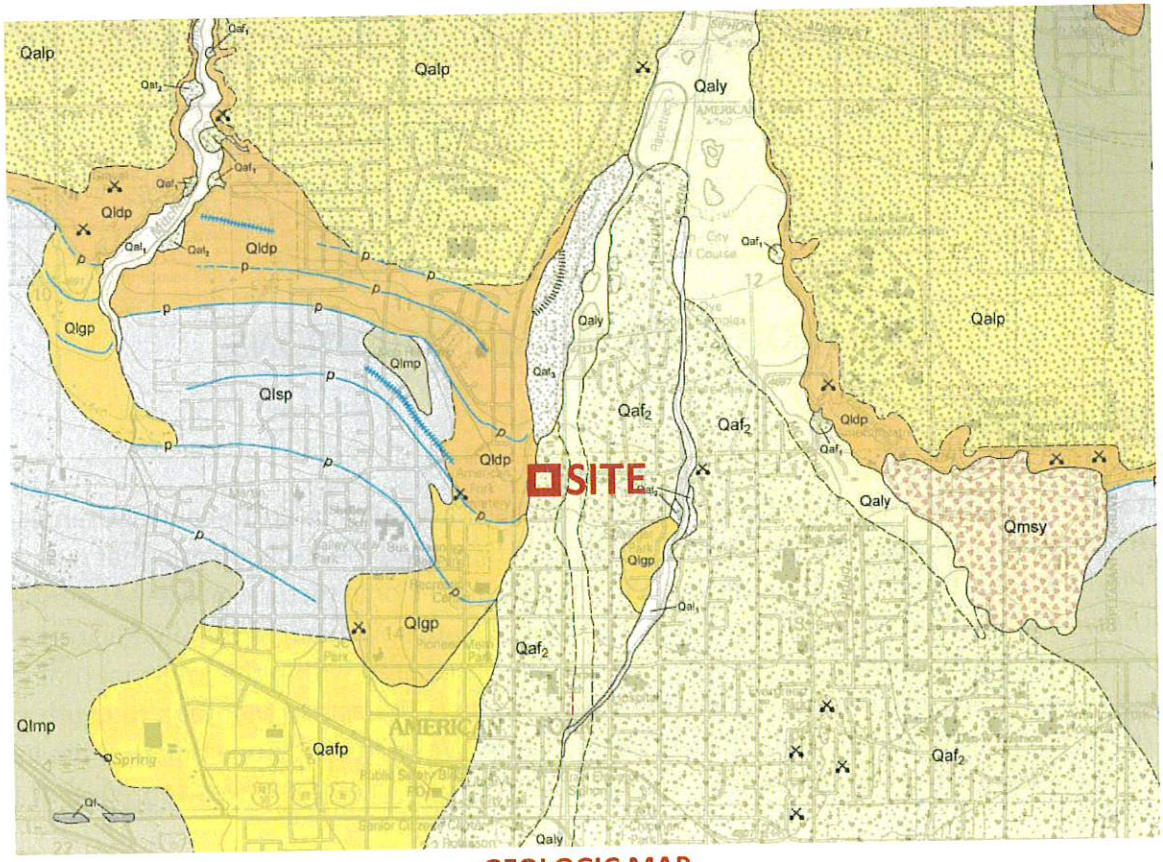
## 4.1 Geologic Setting

The subject site is located in the north-central portion of the Utah Valley in north-central Utah at an elevation of approximately 4,669 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 fresh water lake. Lake Bonneville reached a high-stand elevation of 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 Biek[2]. The surficial geology at the site and adjacent properties is mapped as "Level 2 alluvial-fan deposits" (Map Unit $Qaf_2$) dated Holocene to Upper Pleistocene. Unit $Qaf_2$ is described in the referenced map as "Poorly to moderately sorted, clay- to boulder-size sediment deposited principally by debris flows; large deposits at American Fork likely also deposited by perennial and intermittent streams of the American Fork River distributary system; incised by modern alluvial-fan and alluvial deposits; forms moderately dissected surfaces equivalent to the lower part of Qafy; probably less than 30 feet (9 m) thick." No fill has been mapped at the location of the site on the geologic map. Refer to the **Geologic Map**, shown below.




GEOLOGIC MAP

[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.

## 4.2 Faulting

No surface fault traces are shown on the referenced geologic map crossing, adjacent to, or projecting toward the subject site. The nearest mapped active (Holocene) fault is the Provo Segment of the Wasatch Fault Zone approximately 3.0 miles to the east.

## 4.3 Seismicity

### 4.3.1 Site Class

Utah has adopted the International Building Code (IBC) 2018, 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 2018 Section 1613.2.2 refers to Chapter 20, Site Classification Procedure for Seismic Design, of ASCE[3] 7-16, which stipulates that the 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 Ashland[4], the subject site is located within unit description Q02, 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 Profile (with data), which we recommend for seismic structural design.

### 4.3.2 Seismic Design Category

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 Seismic Design Categories in the International Residential Code (IRC 2018 Table R301.2.2.1.1) are based upon the Site Class as addressed in the previous section. For Site Class D at site grid coordinates of 40.3922 degrees north latitude and -111.7946 degrees west longitude, $\mathbf{S_{DS}}$ is 0.884 and the **Seismic Design Category** is $D_2$.

### 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.

[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.

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

A special liquefaction study was not performed for this site. We encountered mostly unsaturated, medium dense to dense (estimated) 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 known or mapped potential debris flow, stream flooding[6], 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 pasture vegetated with grasses, weeds, and some trees. The site grade sloped gently downward to the north and east. Based upon aerial photos readily available online dating back to 1993, the site appears to have remained relatively unchanged since that time. The site is bounded on the north by similar pasture land, on the south by undeveloped land, and on the east and west by residences (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 topsoil at the surface. Natural soils observed beneath the topsoil consisted mostly of gray to light gray-brown Poorly Graded GRAVEL with varying amounts of fines (GP, GP-GC), sand, and cobbles. These gravel soils were estimated to be dense.

Interbedded with the gravel in TP-1 and TP-3 were layers of gray Silty CLAY (CL-ML) with sand about 2.5 to 3 feet in thickness. And in TP-4 we encountered a layer of light gray Poorly Graded SAND (SP) with gravel interbedded with the gravel layers.

The clay soils were moist and estimated to be medium stiff to soft in consistency. They also exhibited slight over consolidation and strength characteristics with moderate to slightly high compressibility characteristics in laboratory testing.

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[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

[6] https://msc.fema.gov/portal/search?AddressQuery=750%20North%20200%20East%2C%20American%20Fork%2C%20Utah#searchresultsanchor

The natural gravel and sand soils were slightly moist to moist and estimated to be medium dense to dense. They will also exhibit moderately high strength and low compressibility characteristics.

For a more descriptive interpretation of subsurface conditions, please refer to the test pit logs, **Figures 2 through 5**, 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 encountered in test pit TP-1 at about 6.5 below existing grade at the time of our field exploration, but was not encountered in the other test pits to the maximum depth explored of about 9 feet below the surface.

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, 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.

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, the test pit backfill is considered undocumented fill and 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 vegetation, topsoil, loose and disturbed soils, 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 12 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 6 inches. However, if the site has been cultivated in the past, the upper 12 to 15 inches may have been disturbed during farming.

Following stripping and grubbing the site should be observed 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 3 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 encountered within TP-1 only, at about 6.5 feet below the surface. We anticipate that excavations extending below a depth of about 6 feet in the vicinity of TP-1 will likely encounter groundwater, and dewatering of such excavations will likely be required.

The natural soils encountered at this site predominantly consisted of 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).

To reduce disturbance of the natural soils during excavation, we recommend that smooth edge buckets/blades be utilized.

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, 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-inch to 2.0-inch gravel placed on stabilization fabric, such as Mirafi RS280i, 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.

On-site clay soils are not suitable for use as structural fill, but may be used as site grading fill and non-structural fill. Note that these clay soils are moisture-sensitive, which means they are inherently more difficult to work with in proper moisture conditioning (they are very sensitive to changes in moisture content), requiring very close moisture control during placement and compaction. This will be very difficult, if not impossible, during wet and cold periods of the year. We also recommend the site grading fill thickness using on-site clay soils not exceed a maximum of 3 feet below structures, to minimize potential settlements.

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 AASHTO[7] T-180) in accordance with the following recommendations:

[7] American Association of State Highway and Transportation Officials

| 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<br>5 to 8 | 95<br>98 |
| Site grading fill outside area defined above | 0 to 5<br>5 to 8 | 92<br>95 |
| Utility trenches within structural areas | -- | 96 |
| Roadbase and subbase | - | 96 |
| Non-structural fill | 0 to 5<br>5 to 8 | 90<br>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 APWA[8] 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). The natural sand and gravel soils at this site may meet these specifications.

Where the utility does not underlie structurally loaded facilities and public rights of way, 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

The natural clay soils at this site will likely be susceptible to rutting and pumping. The likelihood of disturbance or rutting and/or pumping of the existing natural soils is a function of the moisture content, the load applied to the surface, as well as the frequency of the load. Consequently, rutting and pumping can be minimized by

[8] American Public Works Association

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, including the maximum loads discussed in **Section 1.3**, the subsurface conditions observed in the field and the laboratory test data, and standard geotechnical engineering practice.

## 7.1 Foundation Recommendations

Based on our geotechnical engineering analyses, the proposed residences may be supported upon conventional spread and/or continuous wall foundations placed on suitable, undisturbed natural soils and/or on structural fill extending to suitable natural soils. Footings supported on natural clay soils may be designed using a net bearing pressure of 1,200 psf. Footings supported in native gravel soils or structural fill extending to native gravel soils may be designed for a net bearing pressure of 2,500 psf.

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

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. Footings should be supported on uniform conditions and not on combination soils such as partly on native clay and partly on native gravel or structural fill. If unsuitable soils are encountered, they must be completely removed and replaced with properly compacted structural fill. The base of footing excavations should be observed by a CMT geotechnical engineer to confirm that suitable bearing soils have been exposed.

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.

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 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 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 0.30 for natural clay soils or 0.40 for natural gravel soils and 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 425 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 basement walls up to 8 feet tall will be constructed at this site (except where groundwater may limit practical basement depth). 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. 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.

| CONDITION | STATIC (psf/ft)* | SEISMIC (psf)** |
|---|---|---|
| **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 | 124 |
| **At-Rest Pressure** (wall is not allowed to yield) | 55 | 330 |
| **Passive Pressure** (wall moves into the soil) | 425 | 700 |

*Equivalent Fluid Pressure (applied at 1/3 Height of 8-foot High Wall)
**Uniform Pressure, Seismic Only (applied at 1/2 Height of 8-foot High Wall)

## 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 directly on any topsoil, undocumented fills, loose or disturbed soils, sod, rubbish, construction debris, other deleterious materials, frozen soils, or within ponded water.

We also recommend that floor slabs be kept at least 3 feet above measured groundwater levels at this site.

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 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

## 10.1 Surface Drainage

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 residence 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.

## 10.2 Foundation Subdrains

Groundwater at this site is relatively shallow in the vicinity of TP-1. If floor slabs will be placed deeper than approximately 3 feet below the existing ground surface in the vicinity of TP-1, we recommend that perimeter foundation subdrains be installed.

Foundation subdrains should consist of a 4-inch diameter perforated or slotted plastic or PVC pipe surrounded by clean gravel. The invert of the subdrain should be at least 2 feet below the top of the lowest adjacent floor slab. The gravel portion of the drain should extend a minimum 2 inches laterally and below the perforated pipe and at least 1 foot above the top of the lowest adjacent floor slab. The gravel zone must be installed immediately adjacent to the perimeter footings and the foundation walls. To reduce the possibility of plugging, the gravel must be wrapped with a geotextile, such as Mirafi 140N or equivalent. Prior to the installation of the footing subdrain, the below-grade walls should be dampproofed. The slope of the subdrain should be at least 0.5%. The gravel placed around the drain pipe should be clean 3/4-inch to 1-inch minus gap-graded gravel and/or "pea" gravel. The foundation subdrains can be discharged into the area subdrains, storm drains, or other suitable down-gradient location.

For other areas of the site the soils encountered primarily consisted of gravel (GP, GP-GC) which are Group 1 soils per IRC[9] 2018. Thus, perimeter foundation subdrains are not needed for these areas.

## 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 roadway 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.

We anticipate the natural gravel 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 20 for the natural gravel soils.

Given the projected traffic as discussed above in **Section 1.3**, the following pavement sections are recommended for approximately 4 ESAL's (18-kip equivalent single-axle loads) per day:

| MATERIAL | PAVEMENT SECTION THICKNESS (inches) | |
|---|---|---|
| Asphalt | **3** | **3** |
| Road-Base | **7** | **4** |
| Subbase | **0** | **5** |
| Total Thickness | **10** | **12** |

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-gyration Superpave mix containing no more than 15% of recycled asphalt (RAP) and a PG58-28 binder.

## 12.0 QUALITY CONTROL

We recommend that CMT be retained 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

[9] International Residential Code

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.

# 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




**American Fork Development**

About 750 North 200 East, American Fork, Utah

CMT ENGINEERING LABORATORIES

**Site Map**

| | |
|---|---|
| Date: | 14-Apr-21 |
| Job # | 16342 |

Figure: 1

# American Fork Development

## Test Pit Log TP-1

About 750 North 200 East, American Fork, Utah

Total Depth: 9'
Water Depth: 6.5'

Date: 4/13/21
Job #: 16342

| Depth (ft) | GRAPHIC LOG | Soil Description | Sample Type | Sample # | Moisture (%) | Dry Density(pcf) | Gradation | | | Atterberg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Gravel % | Sand % | Fines % | LL | PL | PI |
| 0 | | Topsoil | | | | | | | | | | |
| 1 | | Gray Poorly Graded GRAVEL (GP) with sand, moist<br>dense (estimated) | | | | | | | | | | |
| 2 | | Gray Silty CLAY (CL-ML) with sand, moist<br>medium stiff (estimated) | | | | | | | | | | |
| 3 | | | | 1 | 27 | 120 | | | | | | |
| 4 | | | | | | | | | | | | |
| 5 | | Gray Silty Clayey GRAVEL (GM-GC) with cobbles, moist<br>dense (estimated) | | | | | | | | | | |
| 6 | | | | 2 | | | | | | | | |
| 7 | | wet | | | | | | | | | | |
| 8 | | | | | | | | | | | | |
| 9 | | | | 3 | | | | | | | | |
| | | END AT 9' | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |

Remarks: Groundwater encountered during excavation at depth of 6.5 feet.
Slotted PVC pipe installed to depth of 9.0 feet to facilitate water level measurements.

Coordinates: 40.32908°, -111.79435°
Surface Elev. (approx): Not Given

Equipment: Rubber Tire Backhoe
Excavated By: Blaine Hone
Logged By: Sterling Howell

Figure: 2

# American Fork Development

About 750 North 200 East, American Fork, Utah

## Test Pit Log TP-2

Total Depth: 9'
Water Depth: (see Remarks)

Date: 4/13/21
Job #: 16342

| Depth (ft) | GRAPHIC LOG | Soil Description | Sample Type | Sample # | Moisture (%) | Dry Density(pcf) | Gradation Gravel % | Gradation Sand % | Gradation Fines % | Atterberg LL | Atterberg PL | Atterberg PI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | Topsoil | | | | | | | | | | |
| 1 | | Light Grayish-Brown Poorly Graded GRAVEL with clay (GP-GC), sand and cobbles, slightly moist to moist — dense (estimated) | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | 4 | 5 | | 68 | 22 | 10 | 24 | 17 | 7 |
| 4 | | | | | | | | | | | | |
| 5 | | grades with more sand, less fines — medium dense (estimated) | | | | | | | | | | |
| 6 | | | | | | | | | | | | |
| 7 | | | | 5 | 6 | | 61 | 36 | 3 | | | |
| 8 | | | | | | | | | | | | |
| 9 | | END AT 9' | | 6 | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |

Remarks: Groundwater not encountered during excavation.

Coordinates: 40.392542°, -111.7947°
Surface Elev. (approx): Not Given

Equipment: Rubber Tire Backhoe
Excavated By: Blaine Hone
Logged By: Sterling Howell

CMT ENGINEERING LABORATORIES



Figure: 3

# American Fork Development

## Test Pit Log — TP-3

About 750 North 200 East, American Fork, Utah

Total Depth: 9'
Water Depth: (see Remarks)

Date: 4/13/21
Job #: 16342

| Depth (ft) | GRAPHIC LOG | Soil Description | Sample Type | Sample # | Moisture (%) | Dry Density(pcf) | Gradation: Gravel % | Gradation: Sand % | Gradation: Fines % | Atterberg: LL | Atterberg: PL | Atterberg: PI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | Topsoil/Sod | | | | | | | | | | |
| 1 | | Gray Poorly Graded GRAVEL (GP) with sand and cobble, moist, dense (estimated) | | | | | | | | | | |
| 2 | | | | 7 | | | | | | | | |
| 3 | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | |
| 5 | | Gray Silty CLAY (CL-ML) with sand, moist, soft (estimated) | | 8 | 26 | 121 | | | 62 | 28 | 21 | 7 |
| 6 | | | | | | | | | | | | |
| 7 | | | | 9 | | | | | | | | |
| 8 | | Gray Poorly Graded GRAVEL (GP) with sand and cobble, moist, dense (estimated) | | | | | | | | | | |
| 9 | | | | 10 | | | | | | | | |
| | | END AT 9' | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |

Remarks: Groundwater not encountered during excavation.

Coordinates: 40.3925°, -111.79343°
Surface Elev. (approx): Not Given

Equipment: Rubber Tire Backhoe
Excavated By: Blaine Hone
Logged By: Sterling Howell

CMT ENGINEERING LABORATORIES



Figure: 4

# American Fork Development

About 750 North 200 East, American Fork, Utah

## Test Pit Log TP-4

Total Depth: 9'
Water Depth: (see Remarks)

Date: 4/13/21
Job #: 16342

| Depth (ft) | GRAPHIC LOG | Soil Description | Sample Type | Sample # | Moisture (%) | Dry Density(pcf) | Gradation | | | Atterberg | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Gravel % | Sand % | Fines % | LL | PL | PI |
| 0 | | Topsoil | | | | | | | | | | |
| 1 | | Light Grayish-Brown Poorly Graded GRAVEL with clay (GP-GC), sand and cobbles, cemented, slightly moist dense (estimated) | | | | | | | | | | |
| 2 | | | | | | | | | | | | |
| 3 | | | | 11 | 5 | | 74 | 18 | 8 | | | |
| 4 | | | | | | | | | | | | |
| 5 | | Light Gray Poorly Graded SAND (SP) with gravel, moist medium dense (estimated) | | 12 | | | | | | | | |
| 6 | | Gray Poorly Graded GRAVEL (GP) with sand and cobbles, moist dense (estimated) | | | | | | | | | | |
| 7 | | | | | | | | | | | | |
| 8 | | | | 13 | | | | | | | | |
| 9 | | END AT 9' | | | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |
| 14 | | | | | | | | | | | | |

Remarks: Groundwater not encountered during excavation.

Coordinates: 40.39311°, -111.79415°
Surface Elev. (approx): Not Given

Equipment: Rubber Tire Backhoe
Excavated By: Blaine Hone
Logged By: Sterling Howell

CMT ENGINEERING LABORATORIES



Figure: 5

# American Fork Development

About 750 North 200 East, American Fork, Utah

# Key to Symbols

Date: 4/13/21

Job #: 16342

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

## COLUMN DESCRIPTIONS

① **Depth (ft.):** Depth (feet) below the ground surface (including groundwater depth - see water symbol below).

② **Graphic Log:** Graphic depicting type of soil encountered (see ② below).

③ **Soil Description:** Description of soils encountered, including Unified Soil Classification Symbol (see below).

④ **Sample Type:** Type of soil sample collected at depth interval shown; sampler symbols are explained below-right.

⑤ **Sample #:** Consecutive numbering of soil samples collected during field exploration.

⑥ **Moisture (%):** Water content of soil sample measured in laboratory (percentage of dry weight of sample).

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

⑧ **Gradation:** Percentages of Gravel, Sand and Fines (Silt/Clay), obtained from lab test results of soil passing the No. 4 and No. 200 sieves.

⑨ **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 | |
|---|---|
| **Description** | **Thickness** |
| Seam | Up to ½ inch |
| Lense | Up to 12 inches |
| Layer | Greater than 12 in. |
| Occasional | 1 or less per foot |
| Frequent | More than 1 per foot |

| MODIFIERS | |
|---|---|
| **Trace** | <5% |
| **Some** | 5-12% |
| **With** | > 12% |

| MOISTURE CONTENT |
|---|
| **Dry:** Absence of moisture, dusty, dry to the touch. |
| **Moist:** Damp / moist to the touch, but no visible water. |
| **Wet:** Visible water, usually soil below groundwater. |

## UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

| 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 |
| | | | GP | | Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines |
| | | **GRAVELS WITH FINES** ( ≥ 12% 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 |
| | | | SP | | Poorly-Graded Sands, Gravelly Sands, Little or No Fines |
| | | **SANDS WITH FINES** ( ≥ 12% 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 Sandy Silts with No Plasticity or Clayey Silts with Slight Plasticity |
| | | | CL | | Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays |
| | | | OL | | Organic Silts and Organic Silty Clays of Low Plasticity |
| | **SILTS AND CLAYS** Liquid Limit greater than 50% | | MH | | Inorganic Silts, Micacious or Diatomacious Fine Sand or Silty Soils |
| | | | CH | | Inorganic Clays of High Plasticity, Fat Clays |
| | | | OH | | Organic Silts and Organic Clays of Medium to High Plasticity |
| **HIGHLY ORGANIC SOILS** | | | PT | | Peat, Soils with High Organic Contents |

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

**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)

1. The results of laboratory tests on the samples collected are shown on the logs at the respective sample depths.
2. 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.
3. The information presented on each log is subject to the limitations, conclusions, and recommendations presented in this report.

CMT ENGINEERING LABORATORIES

Figure: 6

TAYLOR GEOTECHNICAL

2650 North 180 East
Lehi, Utah 84043
P. 801-766-3246

July 8, 2021

Mr. Ben Hunter
Project Engineer
City of American Fork
51 East Main Street
American Fork, Utah 84003

Subject: **Geotechnical Review No. 1**
**Beck Hillside Estates**
757 North 200 East
American Fork Utah
TG Project No. 21100

Subject Document: CMT Engineering Laboratories, Geotechnical Engineering Study, American Fork Development, About 750 North 200 East, American Fork, Utah, CMT Project No. 16342, prepared for Mr. Keaton Morton, Anderson Development Services, 9710 South 700 East, Sandy, Utah 84070, dated May 13, 2021.

Submittal Status: **GEOTECHNICAL SUBMITTAL INCOMPLETE**

Dear Mr. Hunter:

At your request, Taylor Geotechnical (TG) reviewed the subject document. The purpose of TG's review is to evaluate whether or not CMT Engineering Laboratories (CMT) adequately addresses geotechnical engineering parameters at the site, consistent with concerns for public health, safety, welfare, reasonable professional standards-of-care and the American Fork City Sensitive Lands Ordinance 07-10-47. Section 4-2-2 of the of the American Fork City Sensitive Land Ordinance sub-item (10), states the report must be in accordance with the guidelines and recommendations of the "American Fork Sensitive Lands Geologic Hazards Study," Chapter 5 titled "Conclusions and Recommendations" prepared by RB&G Engineering, Inc., dated December 2006.

**TG Conclusion**

Based substantially in and on reliance of the technical documentation and assurances provided by CMT, including their opinions and conclusions, it is TG's opinion the May 13, 2021, CMT report does not fulfill the requirements of the American Fork City Sensitive Lands Ordinance 07-10-47.

**TG Recommendations**

Based on the requirements of the American Fork City Sensitive Land Ordinance and the technical documentation provided by CMT, TG recommends the City of American Fork not consider the CMT report complete from a geotechnical perspective until the following items are adequately addressed.

1. On page 2, section 1.4 Executive Summary, of the May 13, 2021 CMT report, CMT states: "The site does not appear to fall within the special study areas defined by the American Fork Sensitive Lands Ordinance." Chapter 3, Definitions of the Sensitive Lands Ordinance, defines a Sensitive Land Area as any property with groundwater measured above 8 feet below surface grade. CMT encountered groundwater at 6.5 feet below surface grade within the proposed development. *Therefore, TG recommends American Fork City request CMT to provide the geotechnical engineering data as required in Chapter 4 of the Sensitive Land Ordinance.*

2. In accordance with section 4-2-4 of the of the American Fork City Sensitive Land Ordinance, sub-item (7B), the report should be accompanied with the following Certificate statement sealed by the licensed professional that prepared the report:

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

   The subject document did not contain the required certificate. *TG recommends the City of American Fork request the required certificate for the subject document.*

3. *In accordance with the American Fork Sensitive Land Ordinance, TG recommends American Fork City request CMT to provide an additional water table measurement that should have taken place at least 24 hours after the field investigation.*

4. *TG recommends American Fork City request CMT provide calculations to support the allowable foundation bearing recommendations, settlement analysis, and lateral load recommendations provided in the subject document. Variables used in the calculations should be substantiated.*

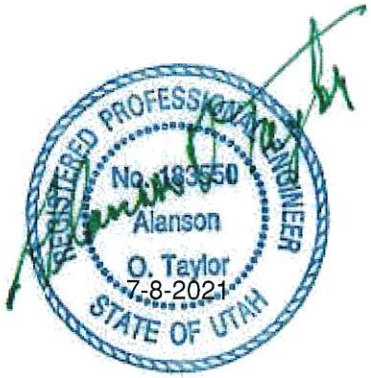
5. On page 13, section 9.0 Floor Slabs, of the May 13, 2021, CMT document, CMT states "We also recommend that floor slabs be kept at least 3 feet above measure groundwater levels at this site." On page 15, section 10.2 Foundation Subdrains, of the same document, CMT states "Groundwater at this site is relatively shallow in the vicinity of TP-1. If floor slabs will be placed deeper than approximately 3 feet below the existing ground surface in the vicinity of TP-1, we recommend that perimeter foundation subdrains be installed." *TG recommends American for City request CMT to clarify the discrepancy of the recommendation provided on page 13 and the recommendation provided on page 15 of the referenced document.*

**CLOSURE**

All services performed by Taylor Geotechnical for this review were provided for the exclusive use and benefit of the City of American Fork. No other person or entity is entitled to use or rely upon any of the information or reports generated by Taylor Geotechnical as a result of this review.

If you have any questions, please feel free to contact the undersigned. The opportunity to be of continued service to the City of American Fork is appreciated.

Respectfully submitted,
Taylor Geotechnical




Alanson O. Taylor, P.E.
Principal

September 22, 2021

Anderson Development Services
Attn: Keaton Morton
9710 South 700 East
Sandy, Utah 84070

Re: Geotechnical Report Review Response
American Fork Development (Beck Hillside Estates)
American Fork, Utah
CMT Job No. 16342

Mr. Morton;

The purpose of this letter is to address review comments of the geotechnical report[1] CMT performed for the project site. The review was provided by Taylor Geotechnical (Project #21100, July 8, 2021). This letter will serve as an addendum to the referenced report.

*Comment No. 1: "On page 2, section 1.4 Executive Summary, of the May 13, 2021 CMT report, CMT states "The site does not appear to fall within the special studies areas as defined by the American Fork Sensitive Lands Ordinance." Chapter 3, definitions of Sensitive Lands Ordinance, defines a Sensitive Lands Area as any property with groundwater measured above 8 feet below surface grade. CMT encountered groundwater at 6.5 feet below surface grade within the proposed development. Therefore, TG recommends American Fork City request CMT provide the geotechnical engineering data as required in chapter 4 of the Sensitive Lands Ordinance."*

Response: As noted in the geotechnical report, groundwater was encountered in test pit TP-1 only and was measured at about 6.5 feet below the existing grade. Historical groundwater data obtained from well logs found on the Utah Division of Water Rights website indicate groundwater levels in excess of 100 feet below the existing ground surface in the immediate vicinity of the site. See attached.

*Comment No. 2: "In accordance with section 4-2-4 of the American Fork City Sensitive Lands Ordinance, sub-item (7B), the report should be accompanied by the following Certificate statement sealed by the licensed professional that prepared the report:"*

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

[1] Geotechnical Engineering Study, American Fork Development, 750 North 200 East, American Fork, Utah, Project No. 16342, May 13, 2021

Geotechnical Report Review Response
Meadows at American Fork Phase II
American Fork, Utah
Project No. 8477

*Comment No. 3: "In accordance with the American Fork Sensitive Lands Ordinance, TG recommends American Fork City request CMT to provide an additional water table measurement that should have taken place at least 24 hours after the field investigation."*

Response: We returned to the site Wednesday, September 15, 2021 and measured the water level at 6.5 feet below the ground surface in the slotted PVC pipe left in TP-1.

*Comment No. 4: "TG recommends American Fork City request CMT to provide calculations to support the allowable foundation bearing recommendations, settlement analysis, and lateral load recommendations provided in the subject document. Variable used in the calculations should be substantiated."*

Response: See attached documentation. Note that the consolidations were not rebounded so the recompression index values used for settlement analysis were estimated using published correlations with soil index properties (LL, PI), Nakase et al. (1988), Sinan (2009), Kordnaeij et al. (2015).

*Comment No. 5: "On page 13, section 9.0 Floor Slabs, of the May 13, 2021, CMT document, CMT states "We recommend that floor slabs be kept at least 3 feet above measure groundwater levels at this site." On page 15, section 10.2 Foundation Subdrains, of the same document, CMT states "Groundwater at the site is relatively shallow in the vicinity of TP-1. If floor slabs will be placed deeper than 3 feet below the existing ground surface in the vicinity of TP-1, we recommend that perimeter foundation subdrains be installed." TG recommends that American for City request CMT to clarify the discrepancy of the recommendation provided on page 13 and the recommendation provided on page 15 of the referenced document."*

Response: As the report indicates, groundwater levels can fluctuate. To account for these potential fluctuations, the recommendation provided on page 15 should read: In the vicinity of TP-1 (low point of the site) if a floor slab will be placed below the existing ground surface, foundation subdrains should be installed.

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) 590-0394.

Respectfully submitted,
**CMT Engineering Laboratories**

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

Form 113—5M—12-60

Examined 7-11-70 V.L.C.
Recorded: B. C. 7-13-70 V.L.C. T. B. V.L.C.
Inspection Sheet 7-20-70 B.M.
Copied

# REPORT OF WELL DRILLER
## STATE OF UTAH

Application No. 39740 (55-4332)
Claim No.
Coordinate No. (D-5-1)11 dda

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

## (1) WELL OWNER:
Name CRAIG H. OSTLER
Address AMERICAN FORK UTAH

## (2) LOCATION OF WELL:
County UTAH Ground Water Basin (leave blank)
~~North~~ 1510 feet, ~~East~~ West 433 feet from E¼ Corner
of Section 11, T. 5 S., R. 1 E SLBM (strike out words not needed)

## (3) NATURE OF WORK (check):
New Well ☒ Replacement Well ☐ Deepening ☐ Repair ☐ Abandon ☐
If abandonment, describe material and procedure:

## (4) NATURE OF USE (check):
Domestic ☒ Industrial ☐ Municipal ☐ Stockwater ☐
Irrigation ☐ Mining ☐ Other ☐ Test Well ☐

## (5) TYPE OF CONSTRUCTION (check):
Rotary ☐ Dug ☐ Jetted ☐
Cable ☒ Driven ☐ Bored ☐

## (6) CASING SCHEDULE:
Threaded ☐ Welded ☒
6 " Diam. from 0 feet to 201 feet Gage .280
" Diam. from feet to feet Gage
" Diam. from feet to feet Gage
New ☒ Reject ☐ Used ☐

## (7) PERFORATIONS:
Perforated? Yes ☒ No ☐
Type of perforator used MILLS KNIFE
Size of perforations ¼ inches by 2 inches
80 perforations from 170 feet to 190 feet
perforations from feet to feet
perforations from feet to feet
perforations from feet to feet
perforations from feet to feet

## (8) SCREENS:
Well screen installed? Yes ☐ No ☐
Manufacturer's Name
Type Model No.
Diam. Slot size Set from ft. to
Diam. Slot size Set from ft. to

## (9) CONSTRUCTION:
Was well gravel packed? Yes ☐ No ☐ Size of gravel:
Gravel placed from feet to feet
Was a surface seal provided? Yes ☐ No ☐
To what depth? feet
Material used in seal:
Did any strata contain unusable water? Yes ☐ No ☐
Type of water: Depth of strata
Method of sealing strata off:

Was surface casing used? Yes ☐ No ☐
Was it cemented in place? Yes ☐ No ☐

## (10) WATER LEVELS:
Static level 149 feet below land surface Date 7/3/70
Artesian pressure feet above land surface Date

LOG RECEIVED: JUL 30 19 (STATE SEAL)

## (11) FLOWING WELL:
Controlled by (check) Valve ☐
Cap ☐ Plug ☐ No Control ☐
Does well leak around casing? Yes ☐ No ☐

## (12) WELL TESTS:
Drawdown is the distance in feet the water level is lowered below static level.
Was a pump test made? Yes ☐ No ☐ If so, by whom?
Yield: gal./min. with feet drawdown after hours
" " " " " "
" " " " " "
Bailer test 15 gal./min. with NO feet drawdown after ½ hours
Artesian flow g.p.m. Date
Temperature of water Was a chemical analysis made? No ☐ Yes ☐

## (13) WELL LOG:
Diameter of well 6 inches
Depth drilled 201 feet. Depth of completed well 201 feet.

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

| DEPTH From | DEPTH To | Clay | Silt | Sand | Gravel | Cobbles | Boulders | Hardpan | Conglomerate | Bedrock | Other | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 9 | | | | X | X | X | | | | | |
| 9 | 15 | X | | | | | | | | | | TAN |
| 15 | 35 | X | | X | | | | | | | | TAN |
| 35 | 103 | X | | X | | | | | | | | BLUE |
| 103 | 149 | X | | X | X | | | | | | | CEMENTED |
| 149 | 195 | | | X | X | | | | | | | WATER |
| 195 | 201 | X | | | | | | | | | | TAN |

Work started MAY 26, 19 70 Completed JULY 3, 19 70

## (14) PUMP:
Manufacturer's Name
Type: H. P.
Depth to pump or bowles feet

### Well Driller's Statement:
This well was drilled under my supervision, and this report is true to the best of my knowledge and belief.
Name Eldon Comer (Person, firm, or corporation) (Type or print)
Address LEHI UTAH
(Signed) Eldon Comer (Well Driller)
License No. 5 Date JULY 7, 19 70

USE OTHER SIDE FOR ADDITIONAL REMARKS

# Utah Division of Water Rights

## WELLPRT Well Log Information Listing

**Version: 2003.09.18.00** **Rundate: 10/11/2003 12:57 AM**

Utah Division of Water Rights

## Water Well Log

---

**LOCATION:**
N 910 ft W 75 ft from SE CORNER of SECTION 11 T 5S R 1E BASE SL Elevation: feet

**DRILLER ACTIVITIES:**
ACTIVITY # 1 NEW WELL
START DATE: 04/03/1959 COMPLETION DATE: 05/08/1959

**BOREHOLE INFORMATION:**

| Depth(ft) From | Depth(ft) To | Diameter(in) | Drilling Method | Drilling Fluid |
|---|---|---|---|---|
| 0 | 162 | | | |

**LITHOLOGY:**

| Depth(ft) From | Depth(ft) To | Lithologic Description | Color | Rock Type |
|---|---|---|---|---|
| 1 | 7 | GRAVEL,BOULDERS | | |
| 7 | 42 | CLAY,SAND | TAN | |
| 42 | 139 | CLAY,OTHER STRATIS | BLUE | HARDPAN |
| 139 | 162 | SAND,GRAVEL | | |

**WATER LEVEL DATA:**

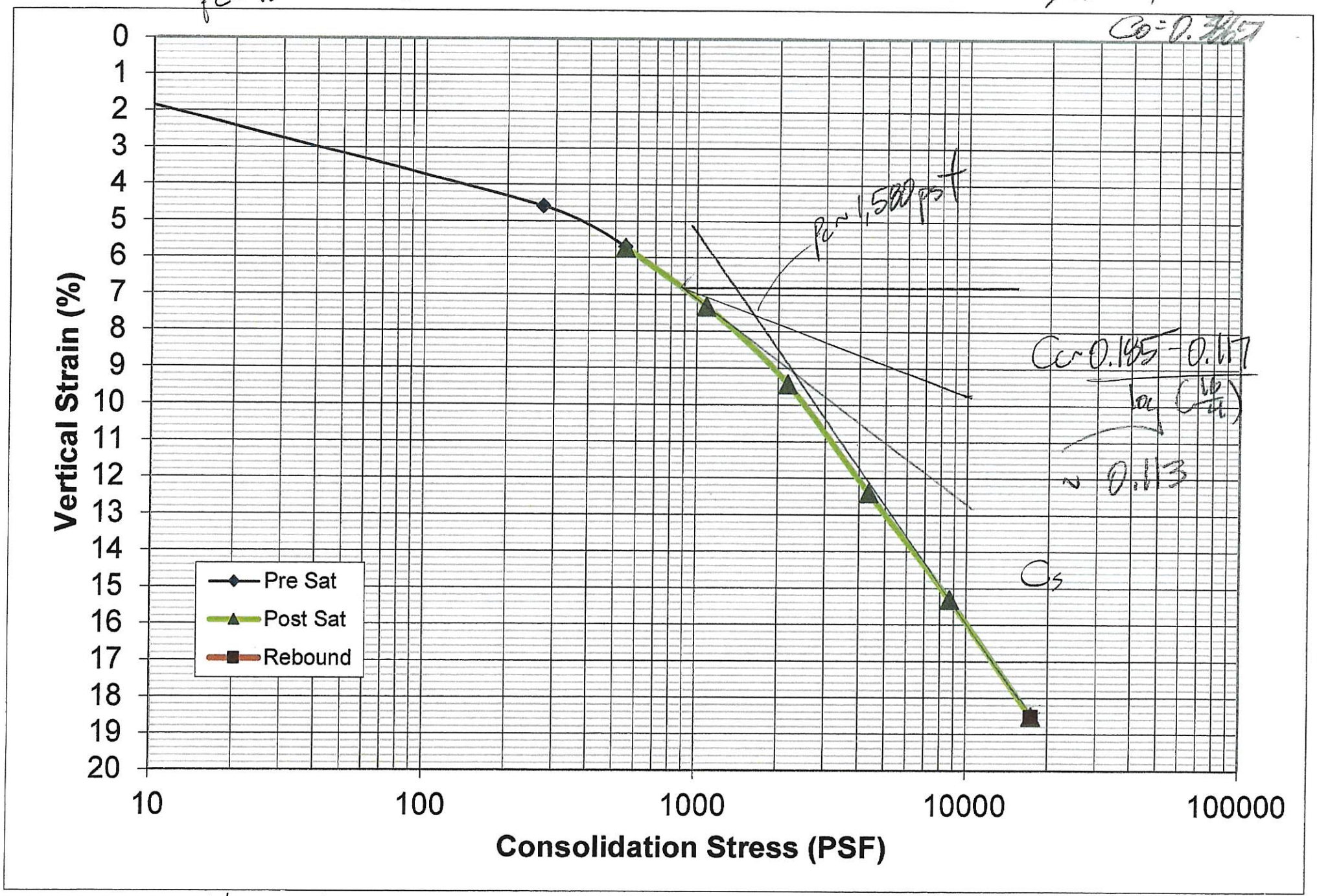
| Date | Time | Water Level (feet) (-)above ground | Status |
|---|---|---|---|
| 05/08/1959 | | 139.00 | STATIC |

**CONSTRUCTION - SCREENS/PERFORATIONS:**

| Depth(ft) From | Depth(ft) To | Screen(S) or Perforation(P) | Slot/Perf. siz | Screen Diam/Length Perf(in) | Screen Type/# Perf. |
|---|---|---|---|---|---|
| 0 | 152 | PERFORATION | | | |

---

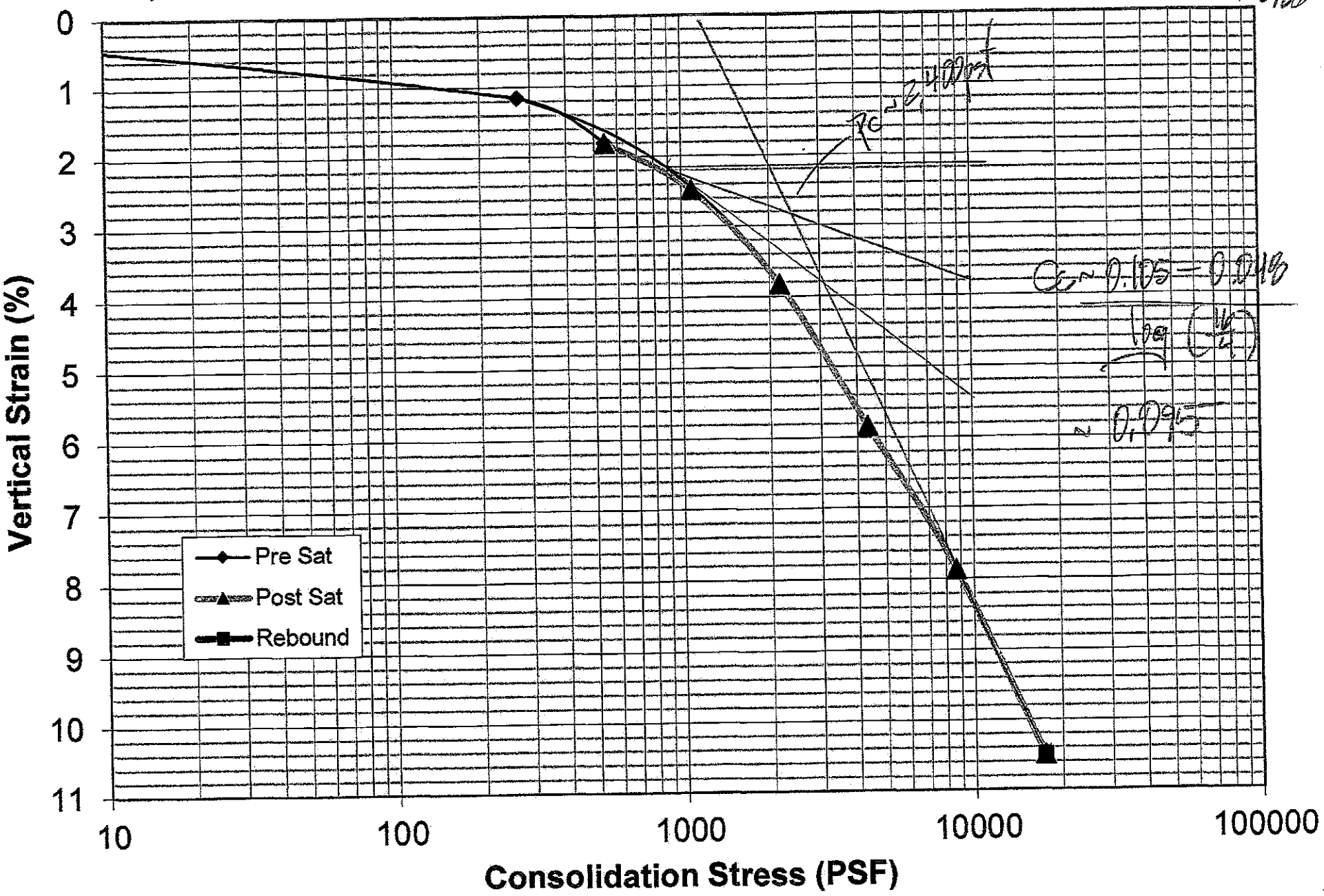
---


Vertical Strain (%)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
10
100
1000
10000
100000
Consolidation Stress (PSF)
Pre Sat
Post Sat
Rebound

$P_c \sim 10^{\frac{21}{55}} \sim 2.4$

$\gamma = 118.3,\ w_d = 94.0,\ w = 25.8$

$e_o = 0.736$




$1\ \log \sim 55\text{mm}$

$C_r = 0.00194(PI - 46) = 0.00194(7 - 46) = 0.0046$

$C_r = 0.0007(LL) + 0.0002 = 0.0007(28) + 0.0002 = 0.023$

## Meyerhof (1963) General Bearing Capacity Equation

$$q_{all} = (cN_cF_{cs}F_{cd}F_{ci} + qN_qF_{qs}F_{qd}F_{qi} + 0.5\gamma BN_\gamma F_{\gamma s}F_{\gamma d}F_{\gamma i})/FS$$

where: $c$ = cohesion

$q$ = effective stress at the level of the bottom of the foundation

γ = unit weight of soil

B = width of foundation (= diameter for circular foundation)

*Fcs, Fqs, Fγs* = shape factors

*Fcd, Fqd, Fγd* = depth factors

*Fci, Fqi, Fγi* = load inclination factors

*Nc, Nq, Nγ* = bearing capacity factors

| | | | | | |
|---|---|---|---|---|---|
| Friction Angle, ϕ = | 28 | degrees | *Nq* = | 14.72 | $= e^{\pi \tan \phi} tan^2\left(45 + \frac{\phi}{2}\right)$ |
| Cohesion, c = | 0 | psf | | | |
| Effective Unit Weight, γ = | 120 | pcf | *Nc* = | 25.80 | $= (N_q - 1)\cot \phi$ |
| Longest Wall Footing Length, L = | 25 | ft | | | |
| Load Inclination (from veritcal), β = | 0 | degrees | *Nγ* = | 16.72 | $= 2(N_q + 1)\tan \phi$ |
| Factor of Safety, FS = | 3 | | | | |

## Summary Tables

Wall Footing Allowable Bearing Capacity, $q_{all}$ (ksf)

| Footing Depth, D (ft) | Structural Fill Depth, z (ft) | Footing Width, B (ft) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.67 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 |
| 2.5 | 0 | 2.30 | 2.27 | 2.34 | 2.27 | 2.24 | 2.21 | 2.19 | 2.18 | 2.17 |
| 4 | 0 | 3.62 | 3.59 | 3.55 | 3.52 | 3.49 | 3.63 | 3.58 | 3.54 | 3.51 |
| 6 | 0 | 5.41 | 5.38 | 5.35 | 5.32 | 5.30 | 5.27 | 5.26 | 5.24 | 5.23 |
| 8 | 0 | 7.20 | 7.18 | 7.16 | 7.15 | 7.13 | 7.12 | 7.11 | 7.10 | 7.09 |
| 2.5 | 1.5 | 4.36 | 3.97 | 3.74 | 3.41 | 3.19 | 3.04 | 2.92 | 2.83 | 2.77 |
| 4 | 1.5 | 6.88 | 6.29 | 5.68 | 5.28 | 4.99 | 5.00 | 4.77 | 4.60 | 4.47 |
| 6 | 1.5 | 10.26 | 9.42 | 8.56 | 7.98 | 7.57 | 7.25 | 7.01 | 6.81 | 6.66 |
| 8 | 1.5 | 13.66 | 12.57 | 11.46 | 10.72 | 10.19 | 9.79 | 9.48 | 9.23 | 9.03 |

Square Footing Allowable Bearing Capacity, $q_{all}$ (ksf)

| Footing Depth, D (ft) | Structural Fill Depth, z (ft) | Footing Width, B (ft) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 | 6.5 |
| 2.5 | 0 | 3.13 | 3.02 | 2.94 | 2.88 | 2.83 | 2.79 | 2.76 | 2.74 | 2.71 |
| 4 | 0 | 4.90 | 4.81 | 4.73 | 4.89 | 4.77 | 4.67 | 4.59 | 4.53 | 4.47 |
| 6 | 0 | 7.52 | 7.40 | 7.30 | 7.20 | 7.11 | 7.03 | 6.95 | 7.23 | 7.11 |
| 8 | 0 | 10.15 | 10.03 | 9.92 | 9.81 | 9.70 | 9.60 | 9.51 | 9.42 | 9.33 |
| 2.5 | 1.5 | 8.01 | 6.79 | 5.99 | 5.44 | 5.03 | 4.72 | 4.47 | 4.28 | 4.11 |
| 4 | 1.5 | 12.55 | 10.82 | 9.65 | 9.24 | 8.48 | 7.90 | 7.44 | 7.07 | 6.77 |
| 6 | 1.5 | 19.24 | 16.66 | 14.90 | 13.62 | 12.65 | 11.88 | 11.26 | 11.30 | 10.77 |
| 8 | 1.5 | 25.99 | 22.57 | 20.24 | 18.54 | 17.25 | 16.23 | 15.40 | 14.72 | 14.14 |

## Summary Tables of Shape, Depth, and Inclination Factors

### Wall Footings

| Fotting Width, B = | 1.67 | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 |
|---|---|---|---|---|---|---|---|---|---|
| *Fcs* = | 1.04 | 1.05 | 1.06 | 1.07 | 1.08 | 1.09 | 1.10 | 1.11 | 1.13 |
| *Fqs* = | 1.04 | 1.04 | 1.05 | 1.06 | 1.07 | 1.09 | 1.10 | 1.11 | 1.12 |
| *F γs* = | 0.97 | 0.97 | 0.96 | 0.95 | 0.94 | 0.94 | 0.93 | 0.92 | 0.91 |
| Footing Depth, Df = | 2.5 | | | | | | | | |
| *Fcd* = | 1.39 | 1.36 | 1.40 | 1.33 | 1.29 | 1.25 | 1.22 | 1.20 | 1.18 |
| *Fqd* = | 1.29 | 1.27 | 1.30 | 1.25 | 1.21 | 1.19 | 1.17 | 1.15 | 1.14 |
| *F γd* = | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Footing Depth, Df = | 4 | | | | | | | | |
| *Fcd* = | 1.47 | 1.44 | 1.40 | 1.37 | 1.34 | 1.40 | 1.36 | 1.32 | 1.29 |
| *Fqd* = | 1.35 | 1.33 | 1.30 | 1.28 | 1.26 | 1.30 | 1.27 | 1.24 | 1.22 |
| *F γd* = | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Footing Depth, Df = | 6 | | | | | | | | |
| *Fcd* = | 1.52 | 1.50 | 1.47 | 1.44 | 1.42 | 1.39 | 1.37 | 1.35 | 1.33 |
| *Fqd* = | 1.39 | 1.37 | 1.35 | 1.33 | 1.31 | 1.29 | 1.28 | 1.26 | 1.25 |
| *F γd* = | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Footing Depth, Df = | 8 | | | | | | | | |
| *Fcd* = | 1.55 | 1.53 | 1.51 | 1.48 | 1.46 | 1.44 | 1.42 | 1.40 | 1.39 |
| *Fqd* = | 1.41 | 1.40 | 1.38 | 1.36 | 1.35 | 1.33 | 1.32 | 1.30 | 1.29 |
| *F γd* = | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

### Column Footings

| Fotting Width, B = | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 | 5.5 | 6 | 6.5 |
|---|---|---|---|---|---|---|---|---|---|
| *Fcs* = | 1.57 | 1.57 | 1.57 | 1.57 | 1.57 | 1.57 | 1.57 | 1.57 | 1.57 |
| *Fqs* = | 1.53 | 1.53 | 1.53 | 1.53 | 1.53 | 1.53 | 1.53 | 1.53 | 1.53 |
| *F γs* = | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 | 0.60 |
| Footing Depth, Df = | 2.5 | | | | | | | | |
| *Fcd* = | 1.40 | 1.33 | 1.29 | 1.25 | 1.22 | 1.20 | 1.18 | 1.17 | 1.15 |
| *Fqd* = | 1.30 | 1.25 | 1.21 | 1.19 | 1.17 | 1.15 | 1.14 | 1.12 | 1.12 |
| *F γd* = | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Footing Depth, Df = | 4 | | | | | | | | |
| *Fcd* = | 1.40 | 1.37 | 1.34 | 1.40 | 1.36 | 1.32 | 1.29 | 1.27 | 1.25 |
| *Fqd* = | 1.30 | 1.28 | 1.26 | 1.30 | 1.27 | 1.24 | 1.22 | 1.20 | 1.18 |
| *F γd* = | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Footing Depth, Df = | 6 | | | | | | | | |
| *Fcd* = | 1.47 | 1.44 | 1.42 | 1.39 | 1.37 | 1.35 | 1.33 | 1.40 | 1.37 |
| *Fqd* = | 1.35 | 1.33 | 1.31 | 1.29 | 1.28 | 1.26 | 1.25 | 1.30 | 1.28 |
| *F γd* = | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Footing Depth, Df = | 8 | | | | | | | | |
| *Fcd* = | 1.51 | 1.48 | 1.46 | 1.44 | 1.42 | 1.40 | 1.39 | 1.37 | 1.36 |
| *Fqd* = | 1.38 | 1.36 | 1.35 | 1.33 | 1.32 | 1.30 | 1.29 | 1.28 | 1.27 |
| *F γd* = | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

### All Footings

| | |
|---|---|
| *Fci = Fqi* = | 1 |
| *F γi* = | 1 |

CMT ENGINEERING LABORATORIES

**Project #:** 16432
**Project Name:** American Fork Development (Beck Hillside Estates)
**Address:** About 750 N 200 E, AmericanF ork

| | |
|---|---|
| **Footing Depth, D (ft)** | 2.5 |
| **Depth to Water (ft)** | 6.5 |
| **Bearing Capacity, P (psf)** | 1200 |

| | |
|---|---|
| **Spot Load (k)** | 40 |
| **Strip Load (klf)** | 4 |

| | Strip | Spread |
|---|---|---|
| **Footing Width, B** | 3.3333333 | 5.8 |
| **Footing Length, L** | 25 | 5.8 |

Soil Parameters

| Type | Cc | Cs | pc | e° | Unit Weight, γ (pcf) | Bottom of Layer (from BOF) |
|---|---|---|---|---|---|---|
| Structural Fill | --- | --- | --- | --- | --- | |
| CL1 | 0.113 | 0.02 | 1500 | 0.38651 | 120 | 15 |
| CL2 | | | | | | |
| CL3 | | | | | | |

Total Settlement Strip Footing **0.44"**

Total Settlement Spread Footing **0.61"**

Settelement (S) Calculations

| | | | | | | Strip Footing | | | | Spread Footing | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| z=BBOF | Pc | Cs | Cc | e° | (Cs*H)/(1+e°) | (Cc*H)/(1+e | po+Δp | S (ft) | S (in) | po+Δp | S (ft) | S (in) |
| 1 | 2000 | 0 | 0 | 0.720 | 0.00872093 | 0.0697674 | 2476.62 | 0.009762 | 0.117145 | 2840 | 0.01391 | 0.166925 |
| 2 | 2000 | 0 | 0 | 0.720 | 0.00872093 | 0.0697674 | 2059.63 | 0.00367 | 0.044041 | 2960 | 0.014659 | 0.175903 |
| 3 | 2000 | 0 | 0 | 0.720 | 0.00872093 | 0.0697674 | 1871.637 | 0.002083 | 0.02499 | 2436.346 | 0.008313 | 0.099762 |
| 4 | 2000 | 0 | 0 | 0.720 | 0.00872093 | 0.0697674 | 1811.502 | 0.00156 | 0.018718 | 2156.433 | 0.004217 | 0.050598 |
| 5 | 2000 | 0 | 0 | 0.720 | 0.00872093 | 0.0697674 | 1816.186 | 0.001209 | 0.014503 | 2013.591 | 0.001779 | 0.021347 |
| 6 | 2000 | 0 | 0 | 0.720 | 0.00872093 | 0.0697674 | 1856.745 | 0.000963 | 0.011552 | 1959.236 | 0.001166 | 0.013994 |
| 7 | 2000 | 0 | 0 | 0.720 | 0.00872093 | 0.0697674 | 1918.922 | 0.000784 | 0.009412 | 1960.327 | 0.000865 | 0.010382 |
| 8 | 2000 | 0 | 0 | 0.720 | 0.00872093 | 0.0697674 | 1995.04 | 0.000651 | 0.007811 | 1996.662 | 0.000654 | 0.007848 |
| 9 | 2000 | 0 | 0 | 0.720 | 0.00872093 | 0.0697674 | 2080.639 | 0.001597 | 0.019161 | 2056.024 | 0.001236 | 0.014834 |

Overburden Pressure Calculations

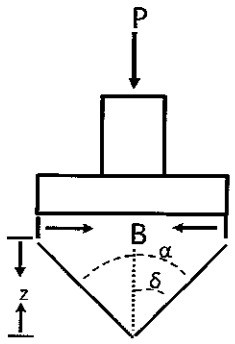
| z= (Below BOF) | Soil Unit Weight ($\gamma$) | Below Water Table? | Effective Unit Weight ($\gamma'$) = $\gamma - \gamma_w$ (if below WT) | Existing Effective Stress (psf) = $\gamma' * z$ |
|---|---|---|---|---|
| 1 | 120 | n | 120 | 420 |
| 2 | 120 | n | 120 | 540 |
| 3 | 120 | n | 120 | 660 |
| 4 | 120 | n | 120 | 780 |
| 5 | 120 | y | 57.6 | 837.6 |
| 6 | 120 | y | 57.6 | 895.2 |
| 7 | 120 | y | 57.6 | 952.8 |
| 8 | 120 | y | 57.6 | 1010.4 |
| 9 | 120 | y | 57.6 | 1068 |
| 10 | 120 | y | 57.6 | 1125.6 |
| 11 | 120 | y | 57.6 | 1183.2 |
| 12 | 120 | y | 57.6 | 1240.8 |
| 13 | | y | #VALUE! | #VALUE! |
| 14 | | y | #VALUE! | #VALUE! |
| 15 | | y | #VALUE! | #VALUE! |
| 16 | | y | #VALUE! | #VALUE! |
| 17 | | y | #VALUE! | #VALUE! |
| 18 | | y | #VALUE! | #VALUE! |
| 19 | | y | #VALUE! | #VALUE! |
| 20 | | y | #VALUE! | #VALUE! |
| 21 | | y | #VALUE! | #VALUE! |
| 22 | | y | #VALUE! | #VALUE! |
| 23 | | y | #VALUE! | #VALUE! |
| 24 | | y | #VALUE! | #VALUE! |
| 25 | | y | #VALUE! | #VALUE! |
| 26 | | y | #VALUE! | #VALUE! |
| 27 | | y | #VALUE! | #VALUE! |
| 28 | | y | #VALUE! | #VALUE! |
| 29 | | y | #VALUE! | #VALUE! |
| 30 | | y | #VALUE! | #VALUE! |
| 31 | | y | #VALUE! | #VALUE! |
| 32 | | y | #VALUE! | #VALUE! |
| 33 | | y | #VALUE! | #VALUE! |
| 34 | | y | #VALUE! | #VALUE! |
| 35 | | y | #VALUE! | #VALUE! |
| 36 | | y | #VALUE! | #VALUE! |
| 37 | | y | #VALUE! | #VALUE! |
| 38 | | y | #VALUE! | #VALUE! |
| 39 | | y | #VALUE! | #VALUE! |
| 40 | | y | #VALUE! | #VALUE! |

Strip Footing Stress Increase Calculations

Boussinesq's Solution for Stress Increase Below Center of a Strip Footing

| Depth, z | δ (radians) | 2δ=α | sin(α) | cos(α+2(-δ)) | Δp= |
|---|---|---|---|---|---|
| 1 | 1.03037683 | 2.060754 | 0.8824 | 1 | 1124 |
| 2 | 0.69473828 | 1.389477 | 0.9836 | 1 | 906 |
| 3 | 0.5070985 | 1.014197 | 0.8491 | 1 | 712 |
| 4 | 0.39479112 | 0.789582 | 0.7101 | 1 | 573 |
| 5 | 0.32175055 | 0.643501 | 0.6 | 1 | 475 |
| 6 | 0.27094685 | 0.541894 | 0.5158 | 1 | 404 |
| 7 | 0.23374318 | 0.467486 | 0.4506 | 1 | 351 |
| 8 | 0.20539539 | 0.410791 | 0.3993 | 1 | 309 |
| 9 | 0.18311082 | 0.366222 | 0.3581 | 1 | 277 |
| 10 | 0.16514868 | 0.330297 | 0.3243 | 1 | 250 |
| 11 | 0.15037143 | 0.300743 | 0.2962 | 1 | 228 |
| 12 | 0.13800602 | 0.276012 | 0.2725 | 1 | 210 |
| 13 | 0.12750956 | 0.255019 | 0.2523 | 1 | 194 |
| 14 | 0.11848996 | 0.23698 | 0.2348 | 1 | 180 |
| 15 | 0.11065722 | 0.221314 | 0.2195 | 1 | 168 |
| 16 | 0.10379234 | 0.207585 | 0.2061 | 1 | 158 |
| 17 | 0.09772691 | 0.195454 | 0.1942 | 1 | 149 |
| 18 | 0.09232933 | 0.184659 | 0.1836 | 1 | 141 |
| 19 | 0.08749534 | 0.174991 | 0.1741 | 1 | 133 |
| 20 | 0.08314123 | 0.166282 | 0.1655 | 1 | 127 |
| 21 | 0.07919907 | 0.158398 | 0.1577 | 1 | 121 |
| 22 | 0.07561314 | 0.151226 | 0.1507 | 1 | 115 |
| 23 | 0.07233733 | 0.144675 | 0.1442 | 1 | 110 |
| 24 | 0.06933313 | 0.138666 | 0.1382 | 1 | 106 |
| 25 | 0.06656816 | 0.133136 | 0.1327 | 1 | 102 |
| 26 | 0.06401498 | 0.12803 | 0.1277 | 1 | 98 |
| 27 | 0.06165017 | 0.1233 | 0.123 | 1 | 94 |
| 28 | 0.05945366 | 0.118907 | 0.1186 | 1 | 91 |
| 29 | 0.05740811 | 0.114816 | 0.1146 | 1 | 88 |
| 30 | 0.05549851 | 0.110997 | 0.1108 | 1 | 85 |
| 31 | 0.05371173 | 0.107423 | 0.1072 | 1 | 82 |
| 32 | 0.05203631 | 0.104073 | 0.1039 | 1 | 79 |
| 33 | 0.05046217 | 0.100924 | 0.1008 | 1 | 77 |
| 34 | 0.0489804 | 0.097961 | 0.0978 | 1 | 75 |
| 35 | 0.0475831 | 0.095166 | 0.095 | 1 | 73 |
| 36 | 0.04626326 | 0.092527 | 0.0924 | 1 | 71 |
| 37 | 0.04501462 | 0.090029 | 0.0899 | 1 | 69 |
| 38 | 0.04383156 | 0.087663 | 0.0876 | 1 | 67 |
| 39 | 0.04270906 | 0.085418 | 0.0853 | 1 | 65 |
| 40 | 0.04164258 | 0.083285 | 0.0832 | 1 | 64 |
| 41 | 0.04062804 | 0.081256 | 0.0812 | 1 | 62 |
| 42 | 0.03966173 | 0.079323 | 0.0792 | 1 | 61 |
| 43 | 0.0387403 | 0.077481 | 0.0774 | 1 | 59 |
| 44 | 0.03786069 | 0.075721 | 0.0756 | 1 | 58 |
| 45 | 0.03702012 | 0.07404 | 0.074 | 1 | 57 |
| 46 | 0.03621604 | 0.072432 | 0.0724 | 1 | 55 |
| 47 | 0.03544614 | 0.070892 | 0.0708 | 1 | 54 |
| 48 | 0.03470828 | 0.069417 | 0.0694 | 1 | 53 |
| 49 | 0.0340005 | 0.068001 | 0.0679 | 1 | 52 |
| 50 | 0.033321 | 0.066642 | 0.0666 | 1 | 51 |

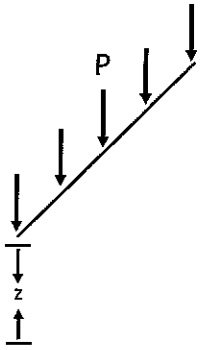
$$\Delta p = \frac{P}{\pi}\left[\alpha + (\sin\alpha) * \cos\left(\alpha + 2(-\delta)\right)\right]$$




Stress Below a Line Load

| z= | Δp = |
|---|---|
| 1 | 764 |
| 2 | 382 |
| 3 | 255 |
| 4 | 191 |
| 5 | 153 |
| 6 | 127 |
| 7 | 109 |
| 8 | 95 |
| 9 | 85 |
| 10 | 76 |
| 11 | 69 |
| 12 | 64 |
| 13 | 59 |
| 14 | 55 |
| 15 | 51 |
| 16 | 48 |
| 17 | 45 |
| 18 | 42 |
| 19 | 40 |
| 20 | 38 |
| 21 | 36 |
| 22 | 35 |
| 23 | 33 |
| 24 | 32 |
| 25 | 31 |
| 26 | 29 |
| 27 | 28 |
| 28 | 27 |
| 29 | 26 |
| 30 | 25 |
| 31 | 25 |
| 32 | 24 |
| 33 | 23 |
| 34 | 22 |
| 35 | 22 |
| 36 | 21 |
| 37 | 21 |
| 38 | 20 |
| 39 | 20 |
| 40 | 19 |
| 41 | 19 |
| 42 | 18 |
| 43 | 18 |
| 44 | 17 |
| 45 | 17 |
| 46 | 17 |
| 47 | 16 |
| 48 | 16 |
| 49 | 16 |
| 50 | 15 |

$$\Delta p = \frac{2Pz^2}{\pi(z^2)^2}$$




2:1 Method Stress Increase

| z= | Δp = |
|---|---|
| 1 | 888 |
| 2 | 694 |
| 3 | 564 |
| 4 | 470 |
| 5 | 400 |
| 6 | 346 |
| 7 | 302 |
| 8 | 267 |
| 9 | 238 |
| 10 | 214 |
| 11 | 194 |
| 12 | 176 |
| 13 | 161 |
| 14 | 148 |
| 15 | 136 |
| 16 | 126 |
| 17 | 117 |
| 18 | 109 |
| 19 | 102 |
| 20 | 95 |
| 21 | 89 |
| 22 | 84 |
| 23 | 79 |
| 24 | 75 |
| 25 | 71 |
| 26 | 67 |
| 27 | 63 |
| 28 | 60 |
| 29 | 57 |
| 30 | 55 |
| 31 | 52 |
| 32 | 50 |
| 33 | 47 |
| 34 | 45 |
| 35 | 43 |
| 36 | 42 |
| 37 | 40 |
| 38 | 38 |
| 39 | 37 |
| 40 | 36 |
| 41 | 34 |
| 42 | 33 |
| 43 | 32 |
| 44 | 31 |
| 45 | 30 |
| 46 | 29 |
| 47 | 28 |
| 48 | 27 |
| 49 | 26 |
| 50 | 25 |

$$\Delta p = P\frac{B+z}{B}$$

| Average |
|---|
| 925 |
| 661 |
| 510 |
| 411 |
| 343 |
| 292 |
| 254 |
| 224 |
| 200 |
| 180 |
| 164 |
| 150 |
| 138 |
| 128 |
| 119 |
| 111 |
| 104 |
| 97 |
| 92 |
| 87 |
| 82 |
| 78 |
| 74 |
| 71 |
| 68 |
| 65 |
| 62 |
| 59 |
| 57 |
| 55 |
| 53 |
| 51 |
| 49 |
| 48 |
| 46 |
| 45 |
| 43 |
| 42 |
| 41 |
| 39 |
| 38 |
| 37 |
| 36 |
| 35 |
| 34 |
| 33 |
| 33 |
| 32 |
| 31 |
| 30 |

Spread Footing Stress Increase Calculations

Boussinesq's Solution Rectangular Footing

$$\Delta p = P * \frac{2}{\pi}\left[\frac{m_1 * n_1}{\sqrt{1+m_1^2+n_1^2}} * \frac{1+m_1^2+2n_1^2}{(1+n_1^2)*(m_1^2+n_1^2)}\right] + \sin^{-1}\left(\frac{m_1}{\sqrt{m_1^2+n_1^2}*\sqrt{1+n_1^2}}\right)$$

| $m_1 = \frac{L}{B} =$ 1 | | $m_1^2 =$ 1 | | $\frac{2}{\pi} =$ 0.636619772 | | | | |
|---|---|---|---|---|---|---|---|---|
| Depth, z | $b = \frac{B}{2}$ | $n_1 = \frac{z}{b}$ | $n_1^2$ | $\frac{m_1 * n_1}{\sqrt{1+m_1^2+n_1^2}}$ | $\frac{1+m_1^2+2n_1^2}{(1+n_1^2)*(m_1^2+n_1^2)}$ | $\sin^{-1}\left(\frac{m_1}{\sqrt{m_1^2+n_1^2}*\sqrt{1+n_1^2}}\right)$ | $\frac{2}{\pi}\left[\frac{m_1 * n_1}{\sqrt{1+m_1^2+n_1^2}} * \frac{1+m_1^2+2n_1^2}{(1+n_1^2)*(m_1^2+n_1^2)}\right] + \sin^{-1}\left(\frac{m_1}{\sqrt{m_1^2+n_1^2}*\sqrt{1+n_1^2}}\right)$ | Δp= |
| 1 | 2.886751 | 0.34641 | 0.12 | 0.237915476 | 1.785714286 | 1.103650216 | 1 | 1200 |
| 2 | 2.886751 | 0.69282 | 0.48 | 0.439941345 | 1.351351351 | 0.741880862 | 1 | 1200 |
| 3 | 2.886751 | 1.03923 | 1.08 | 0.592156525 | 0.961538462 | 0.501531771 | 0.864011148 | 1036.813 |
| 4 | 2.886751 | 1.385641 | 1.92 | 0.699854212 | 0.684931507 | 0.3495401 | 0.654705188 | 785.6462 |
| 5 | 2.886751 | 1.732051 | 3 | 0.774596669 | 0.5 | 0.252680255 | 0.499242033 | 599.0904 |
| 6 | 2.886751 | 2.078461 | 4.32 | 0.826767382 | 0.37593985 | 0.189094818 | 0.386965668 | 464.3588 |
| 7 | 2.886751 | 2.424871 | 5.88 | 0.863824573 | 0.290697674 | 0.145865545 | 0.305728278 | 366.8739 |
| 8 | 2.886751 | 2.771281 | 7.68 | 0.890723543 | 0.230414747 | 0.11546376 | 0.246120954 | 295.3451 |
| 9 | 2.886751 | 3.117691 | 9.72 | 0.910687397 | 0.186567164 | 0.093419404 | 0.201583883 | 241.9007 |
| 10 | 2.886751 | 3.464102 | 12 | 0.9258201 | 0.153846154 | 0.076999141 | 0.167675353 | 201.2104 |
| 11 | 2.886751 | 3.810512 | 14.52 | 0.937515133 | 0.128865979 | 0.064477657 | 0.141390114 | 169.6681 |
| 12 | 2.886751 | 4.156922 | 17.28 | 0.946713029 | 0.10940919 | 0.054731917 | 0.120672424 | 144.8069 |
| 13 | 2.886751 | 4.503332 | 20.28 | 0.954061525 | 0.093984962 | 0.047009794 | 0.104093857 | 124.9126 |
| 14 | 2.886751 | 4.849742 | 23.52 | 0.960015674 | 0.081566069 | 0.040794348 | 0.090644671 | 108.7736 |
| 15 | 2.886751 | 5.196152 | 27 | 0.964901281 | 0.071428571 | 0.035721882 | 0.079598685 | 95.51842 |
| 16 | 2.886751 | 5.542563 | 30.72 | 0.968955781 | 0.063051702 | 0.031531076 | 0.070424922 | 84.50991 |
| 17 | 2.886751 | 5.888973 | 34.68 | 0.972355065 | 0.056053812 | 0.028030576 | 0.062729033 | 75.27484 |
| 18 | 2.886751 | 6.235383 | 38.88 | 0.975231419 | 0.050150451 | 0.025077854 | 0.056213842 | 67.45661 |
| 19 | 2.886751 | 6.581793 | 43.32 | 0.977685723 | 0.045126354 | 0.022565092 | 0.050652369 | 60.78284 |
| 20 | 2.886751 | 6.928203 | 48 | 0.979795897 | 0.040816327 | 0.02040958 | 0.045869068 | 55.04288 |
| 21 | 2.886751 | 7.274613 | 52.92 | 0.981622837 | 0.037091988 | 0.018547057 | 0.041726601 | 50.07192 |
| 22 | 2.886751 | 7.621024 | 58.08 | 0.983214652 | 0.033852404 | 0.01692701 | 0.038116377 | 45.73965 |
| 23 | 2.886751 | 7.967434 | 63.48 | 0.984609731 | 0.03101737 | 0.015509307 | 0.034951677 | 41.94201 |
| 24 | 2.886751 | 8.313844 | 69.12 | 0.98583899 | 0.028522533 | 0.01426175 | 0.032162622 | 38.59515 |
| 25 | 2.886751 | 8.660254 | 75 | 0.986927542 | 0.026315789 | 0.013158274 | 0.029692421 | 35.63091 |
| 26 | 2.886751 | 9.006664 | 81.12 | 0.987895947 | 0.024354603 | 0.012177602 | 0.027494556 | 32.99347 |
| 27 | 2.886751 | 9.353074 | 87.48 | 0.988761163 | 0.022603978 | 0.01130223 | 0.025530641 | 30.63677 |
| 28 | 2.886751 | 9.699485 | 94.08 | 0.989537272 | 0.021034918 | 0.010517653 | 0.023768789 | 28.52255 |
| 29 | 2.886751 | 10.04589 | 100.92 | 0.990236048 | 0.019623234 | 0.009811774 | 0.022182337 | 26.6188 |
| 30 | 2.886751 | 10.3923 | 108 | 0.990867389 | 0.018348624 | 0.009174441 | 0.020748858 | 24.89863 |
| 31 | 2.886751 | 10.73872 | 115.32 | 0.991439664 | 0.017193948 | 0.00859708 | 0.019449385 | 23.33926 |
| 32 | 2.886751 | 11.08513 | 122.88 | 0.991959992 | 0.016144656 | 0.008072416 | 0.018267788 | 21.92135 |
| 33 | 2.886751 | 11.43154 | 130.68 | 0.99243445 | 0.015188335 | 0.007594241 | 0.017190283 | 20.62834 |
| 34 | 2.886751 | 11.77795 | 138.72 | 0.992868259 | 0.014314343 | 0.007157233 | 0.016205036 | 19.44604 |
| 35 | 2.886751 | 12.12436 | 147 | 0.993265917 | 0.013513514 | 0.006756808 | 0.015301845 | 18.36221 |
| 36 | 2.886751 | 12.47077 | 155.52 | 0.99363132 | 0.01277792 | 0.006389003 | 0.014471873 | 17.36625 |
| 37 | 2.886751 | 12.81718 | 164.28 | 0.993967854 | 0.012100678 | 0.006050376 | 0.013707438 | 16.44893 |
| 38 | 2.886751 | 13.16359 | 173.28 | 0.994278475 | 0.011475786 | 0.005737925 | 0.013001837 | 15.6022 |
| 39 | 2.886751 | 13.51 | 182.52 | 0.994565768 | 0.010897995 | 0.005449024 | 0.012349201 | 14.81904 |

Settelement (S) Calculations

| | | | | | | | Strip Footing | | | Spread Footing | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| z=BBOF | Pc | Cs | Cc | e° | (Cs*H)/(1+e°) | (Cc*H)/(1+e°) | po+Δp | S (ft) | S (in) | po+Δp | S (ft) | S (in) |
| 1 | | 1500 | 0.02 | 0.113 | 0.38651 | 0.014424707 | 0.081499593 | 1544 | 0.009002111 | 0.10802533 | 1620 | 0.010699 | 0.128383 |
| 2 | | 1500 | 0.02 | 0.113 | 0.38651 | 0.014424707 | 0.081499593 | 1446 | 0.006172476 | 0.074069708 | 1740 | 0.011654 | 0.139842 |
| 3 | | 1500 | 0.02 | 0.113 | 0.38651 | 0.014424707 | 0.081499593 | 1372 | 0.004582996 | 0.054995956 | 1697 | 0.009507 | 0.114082 |
| 4 | | 1500 | 0.02 | 0.113 | 0.38651 | 0.014424707 | 0.081499593 | 1353 | 0.003449606 | 0.041395275 | 1566 | 0.005613 | 0.067352 |
| 5 | | 1500 | 0.02 | 0.113 | 0.38651 | 0.014424707 | 0.081499593 | 1313 | 0.002814115 | 0.033769378 | 1437 | 0.00338 | 0.040561 |
| 6 | | 1500 | 0.02 | 0.113 | 0.38651 | 0.014424707 | 0.081499593 | 1299 | 0.002333252 | 0.027999019 | 1360 | 0.002618 | 0.031413 |
| 7 | | 1500 | 0.02 | 0.113 | 0.38651 | 0.014424707 | 0.081499593 | 1303 | 0.001963336 | 0.023560032 | 1320 | 0.002041 | 0.024487 |
| 8 | | 1500 | 0.02 | 0.113 | 0.38651 | 0.014424707 | 0.081499593 | 1320 | 0.001673693 | 0.020084317 | 1306 | 0.001606 | 0.019277 |
| 9 | | 1500 | 0.02 | 0.113 | 0.38651 | 0.014424707 | 0.081499593 | 1345 | 0.001443097 | 0.017317162 | 1310 | 0.001279 | 0.015348 |
| 10 | | 1500 | 0.02 | 0.113 | 0.38651 | 0.014424707 | 0.081499593 | 1376 | 0.001256723 | 0.015080674 | 1327 | 0.00103 | 0.012363 |
| 11 | | 1500 | 0.02 | 0.113 | 0.38651 | 0.014424707 | 0.081499593 | 1411 | 0.001104047 | 0.013248569 | 1353 | 0.000839 | 0.010074 |
| 12 | | 1500 | 0.02 | 0.113 | 0.38651 | 0.014424707 | 0.081499593 | 1450 | 0.000977466 | 0.011729586 | 1386 | 0.000691 | 0.008298 |
| 13 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 14 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 15 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 16 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 17 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 18 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 19 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 20 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 21 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 22 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 23 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 24 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 25 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 26 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 27 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 28 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 29 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 30 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 31 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 32 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 33 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 34 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 35 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 36 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 37 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 38 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 39 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| 40 | | | | | | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! | #VALUE! |
| | | | | | | | | | | 0.44 | | | 0.61 |

## LATERAL EARTH PRESSURES

| | ENTER | | | | |
|---|---|---|---|---|---|
| Internal Friction Angle of Soil: | 34 | deg. | = 0.593412 rad. | 0.449672 | |
| Angle of Soil Backfill (from horiz.): | 0 | deg. | = 0 rad. | | |
| Density of soil (above water): | 125 | pcf | | | |
| Horizontal $k_h$: | 0.33 | g | => 0.318748 (theta, radians, for $k_v = 0$) | | |
| Height of Wall, H: | 8 | feet | | | |
| Non-Rigid (0) or Rigid (1) base of wall: | 1 | | | | |
| Wood's Thrust Force, $F_p$ : | 1 | (~ 1.0 for Poisson's Ratio of 0.3 to 0.4 & L/H>4) | | | |

CALCULATIONS

| | | | Uniform pressures | | |
|---|---|---|---|---|---|
| AT REST $K_o$ = | 0.441 | | $p_o=½\gamma HK_o$ = | 220 | psf (static only) |
| At Rest Pressure = | 55 | pcf | | | |
| Coulomb $K_a$ = | 0.256 | | $p_a=½\gamma HK_a$ = | 128 | psf (static only) |
| Coulomb $K_p$ = | 6.767 | (w/wall friction) | | | |
| Coulomb Active Pressure = | 32 | pcf | | | |
| Coulomb Passive Pressure = | 846 | pcf | | | |
| Rankine $K_a$ = | 0.283 | | $p_a=½\gamma HK_a$ = | 141 | psf (static only) |
| Rankine $K_p$ = | 3.537 | | | | |
| Rankine Active Pressure = | 35 | pcf | | | |
| Rankine Passive Pressure = | 442 | pcf | | | |
| Mononobe-Okabe Seismic $K_{ae}$ = | 0.53 | | $p_{ae}=½\gamma HK_{ae}$ = | 263 | psf (incl. static) |
| Mononobe-Okabe Seismic $K_{pe}$ = | 4.94 | | $p_{pe}=½\gamma HK_{pe}$ = | 2469 | psf (incl. static) |
| M.-O. Seismic Active Pressure = | 66 | pcf | $p_{ae}=½\gamma HK_{ae}$ = | 134 | psf (seismic only) |
| M.-O. Seismic Passive Pressure= | 617 | pcf | $p_{ae}=½\gamma HK_{ae}$ = | 700 | psf (seismic only) |
| M-O Dynamic Active Pressure ONLY = | 34 | pcf | | | |
| M-O Dynamic Passive Press. ONLY = | 229 | pcf | | | |
| Seed & Whitman Seismic $K_{ae}$ = | 0.248 | | $p_{ae}=½\gamma HK_{ae}$ = | 124 | psf (seismic only) |
| Seed & Whitman Seismic Pressure = | 30.9 | | | 252 | psf (incl. static) |
| Wood (1973), $\Delta P_E = F_p k_h \gamma H^2$ = | 2640 | lbs/ft | $p_{ae}=\Delta P_E/H$ = | 330 | psf (seismic only) |

| | |
|---|---|
| Ultimate Coefficient of Friction = | 0.674508517 |
| Allowable Coefficient of Friction (FS=1.5) = | 0.449672345 |

TAYLOR GEOTECHNICAL

2650 North 180 East
Lehi, Utah 84043
P. 801-766-3246

October 23, 2021

Mr. Ben Hunter
Project Engineer
American Fork City
51 East Main Street
American Fork, Utah 84003

Subject: **Geotechnical Engineering Review No. 2**
**Beck Hillside Estates**
757 North 200 East
American Fork Utah
TG Project No. 21100

Subject Document: CMT Engineering Laboratories, Geotechnical Report Review Response, American Fork Development (Beck Hillside Estates), American Fork, Utah, CMT Project No. 16342, prepared for Mr. Keaton Morton, Anderson Development Services, 9710 South 700 East, Sandy, Utah 84070, dated September 22, 2021.

Previous Submittal: CMT Engineering Laboratories, Geotechnical Engineering Study, American Fork Development, About 750 North 200 East, American Fork, Utah, CMT Project No. 16342, prepared for Mr. Keaton Morton, Anderson Development Services, 9710 South 700 East, Sandy, Utah 84070, dated May 13, 2021.

Submittal Status: **GEOTECHNICAL ENGINEERING SUBMITTAL COMPLETE**

Dear Mr. Hunter:

At your request, Taylor Geotechnical (TG) reviewed the above referenced September 22, 2021, CMT Engineering Laboratories (CMT) document. The subject document was prepared in response to review comments by TG to American Fork City on July 8, 2021, of the May 13, 2021, CMT report. The purpose of TG's review is to evaluate whether or not the CMT submittals adequately address geotechnical engineering parameters at the site, consistent with concerns for public health, safety, welfare, reasonable professional standards-of-care and the American Fork City Sensitive Lands Ordinance 07-10-47.

Proposed construction for the approximately 5.49-acre site will consist of roads, sidewalks, utility installation, and conventionally framed, one to two residential structures with basements. Structural loads for the building are anticipated to consist of column loads up to 25 kips and wall loads up to 3 kips per lineal foot.

**TG Conclusion**

Based substantially in and on reliance of the technical documentation and assurances provided by CMT, including their opinions and conclusions, it is TG's opinion that the CMT submittals have adequately addressed geotechnical engineering parameters at the site, consistent with concerns for public health, safety and welfare; and the American Fork City Sensitive Lands Ordinance 07-10-47.

**TG Recommendations**

TG recommends American Fork City:

1. Consider the CMT submittals complete from a geotechnical engineering perspective.

2. Request certification letters from the geotechnical engineer prior to placement of concrete for each structure.

**Public Right-of-Way**

Pavement recommendations provided in the May 13, 2021, CMT report are for public streets based on an assumed CBR of 20.

**Geotechnical Report Summary for Plan Review**

1. All organics, topsoil, existing fill and other deleterious material should be removed from below proposed building and pavement areas.

2. Footings may be supported on suitable undisturbed native soils or on compacted structural fill extending to suitable undisturbed native soils.

3. Footings for the structures may be designed using an allowable bearing capacity of 1,200 pounds per square foot for footings bearing on suitable native clay soils. An allowable bearing capacity of 2,500 pounds per square foot may be used for footings bearing on gravel soils or compacted structural fill extending to native gravel soils.

4. Footings should have a minimum width of 18 inches for strip footings and 24 inches for spot footings.

5. Footings susceptible to frost should be located a minimum depth of 30 inches. Footings not susceptible to frost should have a minimum embedment of 16 inches.

6. Groundwater was encountered at 6.5 feet below the surface on the low elevation portion of the site during the investigation. Basement floor slabs should be kept 3 feet above this elevation.

7. Basement foundation walls should be designed using an at-rest equivalent fluid weight of 55 pounds per cubic feet.

8. Perimeter foundation drains are required for basements in this development.

9. Seismic analysis of proposed structures at the site should be based on a spectral response design acceleration of 0.2 sec (short period) $S_{DS}$ = 0.884g and a Seismic Design Category of $D_2$. The spectral response design acceleration value was based on factored spectral response accelerations using Site Class D.

10. Prior to the placement of concrete for footings, a letter from the geotechnical engineer should be obtained that indicates subgrade for footing and floor slab support was prepared in accordance with the geotechnical report and ready for the placement of concrete.

11. Floor slabs may be supported on suitable undisturbed native soils or on compacted structural fill extending to suitable undisturbed native soils.

12. Floor slabs should be underlain by at least 4-inches of free draining gravel.

13. Gutters should discharge beyond the limits of backfill or at least 10 feet from the buildings, whichever is greater.

14. Surface drainage should slope away from the structure in all directions with a 5 percent grade for the first 10 feet.

15. All import materials should be approved by Geotechnical Engineer.

16. All compaction for interior and exterior backfill adjacent to the building should be verified by the geotechnical engineer.

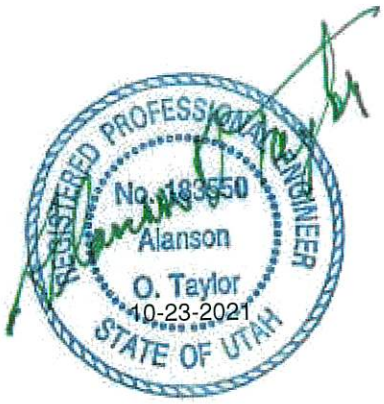
**Closure**

This letter is issued solely in response to the Consultants' evaluation of the referenced site. Comments and recommendations in this review are based on data presented in the referenced reports. Taylor Geotechnical accordingly provides no warranty that the data in the referenced reports is correct or accurate, and has not performed an independent site evaluation. Comments and recommendations presented herein are provided to aid American Fork City in reducing risks from geotechnical hazards and to protect public health and safety.

All services performed by Taylor Geotechnical for this review were provided for the exclusive use and benefit of American Fork City. No other person or entity is entitled to use or rely upon any of the information or reports generated by Taylor Geotechnical as a result of this review.

If you have any questions, please feel free to contact the undersigned. The opportunity to be of continued service to American Fork City is appreciated.

Respectfully submitted,
Taylor Geotechnical




Alanson O. Taylor, P.E.
Principal

**AMERICAN FORK CITY**
**PLANNING COMMISSION**

**MEETING DATE:** January 5th, 2022
**STAFF:** Patrick O'Brien

**AGENDA TOPIC:** Hearing, review, and action on a commercial site plan for Goldfish Swim School, located at 348 South 500 East, in the GC-2 General Commercial Zone.

| BACKGROUND INFORMATION | | | | | |
|---|---|---|---|---|---|
| Location: | | 348 South 500 East | | | |
| Applicants: | | Lars Grisley/Goldfish Swim School | | | |
| Existing Land Use: | | Vacant/Design Commercial | | | |
| Proposed Land Use: | | Design Commercial | | | |
| Surrounding Land Use: | North | Design Commercial | | | |
| | South | Design Commercial | | | |
| | East | Design Commercial | | | |
| | West | Residential High Density | | | |
| Existing Zoning: | | GC-2 | | | |
| Proposed Zoning: | | N/A | | | |
| Surrounding Zoning: | North | GC-2 | | | |
| | South | GC-2 | | | |
| | East | GC-1 & GC-2 | | | |
| | West | R4-7500 | | | |
| Land Use Plan Designation: | | Design Commercial | | | |
| Zoning within Land Use Plan Designation? | | X | Yes | | No |

Background

Goldfish Swim School proposes a one-story, 8,540 square foot building with 66 parking stalls for a swim school to teach swimming to children. The proposed site is 1.01 acres. The use is a permitted use identified as a specialty school as allowed in the GC-2 Planned Commercial Zone. Access to the Goldfish Swim school is provided off 500 East.

Consistency with the Land Use Plan

The Land Use Plan designates this area as General Commercial. The site plan is consistent with the Land Use Plan designation.

Section 17.6.101.B of the Development Code

Application for site plan approval shall be submitted on forms provided by the City and shall be accompanied by maps and drawings showing the following:

a. The location of all existing and proposed buildings and structures on the site, with full dimensions showing the distance between buildings and distances from buildings to adjacent property lines.

b. The location of all parking spaces, driveways, and points of vehicular ingress and egress.

c. A landscaping plan showing the location, types and initial sizes of all planting materials to be used together with the location of fences, walls, hedges, and decorative materials.

d. Preliminary elevations of main buildings showing the general appearance and types of external materials to be used.

e. The location of solid waste receptacles and trash pick-up areas.

**STAFF FINDINGS/RECOMMENDATIONS:**

After reviewing the application for site plan approval, staff has found that the proposal is consistent with what is allowed in this area of American Fork, and the use is a beneficial and positive use of the existing land. Planning and Zoning staff recommends approval of this site plan, subject to any findings, conditions and modifications found in the engineering report.

POTENTIAL MOTIONS

## APPROVAL

Mr. Chairman, I move that we recommend approval of the site plan for Goldfish Swim School, located at 348 South 500 East, in the GC-2 General Commercial Zone, with the findings listed in the staff report, and subject to any findings, conditions and modifications found in the engineering report, and subject to any findings or recommendations identified by the Fire Marshal.

## DENIAL

Mr. Chairman, I move that we deny the site plan for Goldfish Swim School

## TABLE

Mr. Chairman, I move that we table action on the site plan for Goldfish Swim School

# AMERICAN FORK CITY ENGINEERING DIVISION
# STAFF REPORT

Planning Commission Meeting Date: 1/5/2022

This report is a summary of the American Fork City Engineering Division plan review comments regarding the subject plan as submitted by the applicant for American Fork City Land Use Authority approval:

Project Name: Goldfish Swim School

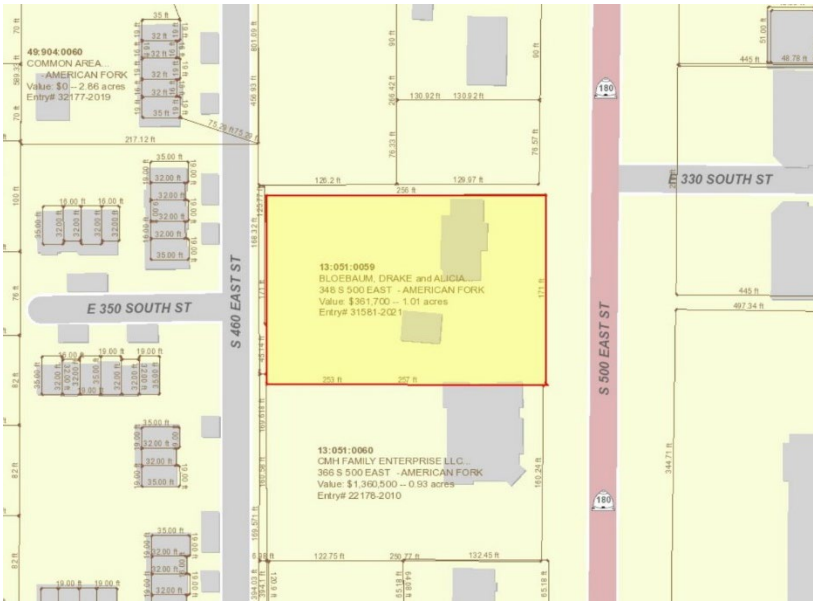
Project Address: 348 South 500 East

Developer / Applicant's Name: Lars and Katie Grisley

Type of Application:

- ☐ Subdivision Final Plat
- ☐ Subdivision Preliminary Plan
- ☐ Annexation
- ☐ Code Text Amendment
- ☐ General Plan Amendment
- ☐ Zone Change
- ☒ Commercial Site Plan
- ☐ Residential Accessory Structure Site Plan

**Project Map:**




**Engineering Division Recommendation:** The Engineering Division recommends APPROVAL of the proposed development with the following conditions and standard conditions of approval:

1. A percolation test must be completed for the site confirming that infiltration rates identified in the geotechnical report are accurate and drainage calculations updated if necessary.

## STANDARD CONDITIONS OF APPROVAL

**Standard Conditions of Approval:**

APPLICANT is responsible and shall submit/post/obtain all necessary documentation and evidence to comply with these Standard Conditions of Approval prior to any platting, permitting, or any other form of authorization by the City including plat recording or other property conveyance to the City and prior to scheduling a pre-construction meeting. All recording shall take place at the Utah County Recorder's Office.

1. **Title Report:** Submit an updated Title Report not older than 30 days or other type of appropriate verification that shows all dedications to the City are free and clear of encumbrances, taxes, or other assessments.
2. **Property Taxes and Liens:** Submit evidence that all the property taxes, for the current and/or previous years, liens, and agricultural land use roll over fees have been paid in full.
3. **Water Rights:** Submit evidence that all the required water rights have been conveyed to American Fork City.
4. **Performance Guarantee:** Post a performance guarantee for all required public and essential common improvements.
5. **Easements and Agreements:** Submit/record a long-term Storm Water Pollution Prevention Maintenance Agreement signed and dated by the property owner and any required easement documentation.
6. **Land Disturbance Permit:** Obtain a Land Disturbance Permit.
7. **Compliance with the Engineering Division Plan Review Comments:** All plans and documents shall comply with all the Technical Review Committee comments and the City Engineer's final review.
8. **Commercial Structure:** Record an Owner Acknowledgment and Utility Liability Indemnification if the proposed building is a multi-unit commercial structure served by a single utility service.
9. **Sensitive Lands:** Record all applicable documents required for compliance with the City's Sensitive Lands Ordinance.
10. **Utility Notification Form:** Submit a Subdivision Utility Notification Form.
11. **Professional Verification:** Submit final stamped construction documentation by all appropriate professionals.
12. **Fees:** Payment of all development, inspection, recording, street light, and other project related fees.
13. **Mylar:** Submit a Mylar. All plats will receive final verification of all formats, notes, conveyances, and other items contained on the plat by City staff (recorder, legal, engineer, GIS, planning).

**Plan Modifications Required:**

1. Outstanding TRC comments need to be addressed.

# goldfish swimschool

## Legend

| Symbol | Description |
|---|---|
| | Proposed 8" Sanitary Sewer Main |
| | Existing Sanitary Sewer Main (size noted on plan) |
| | Proposed Culinary Water Main (size noted on plan) |
| | Existing Culinary Water Main (size noted on plan) |
| | Existing Storm Drain pipe (size noted on plan) |
| | Proposed Storm Drain pipe (size noted on plan) |
| CTV CTV | Cable TV utility lines |
| P P | Existing Power lines |
| P P | New underground Power lines |
| | Outside Boundary line |
| | Existing surface improvements |
| | Existing Sidewalk |
| | Existing Sidewalk |
| 4503 | Existing Contour Elevation |
| 4503 | Finish Contour Elevation |
| 4503.00 | Finish Spot Elevation |
| | Drainage Flow Direction |
| | Water Meter (size noted on plan) |
| | Culinary Water Valve |
| | Fire Hydrant |
| | Sanitary Sewer Manhole |
| | Storm Drain Manhole |
| | Storm Drain Box |
| ta | top of asphalt |
| tw | top of sidewalk |
| boc | back of top of curb |
| bow | back of top of sidewalk |
| SSMH | Sanitary Sewer Manhole |
| SDMH | Storm Drain Manhole |
| WV | Water Valve |
| GV | Gas valve |
| WM | Water Meter |
| eo | edge of existing asphalt |
| PUE | Public Utility Easement |

**Planning Department**

275 East 200 North
American Fork, Utah 84003
Phone (801) 763-3060
Fax (801) 763-3005

Project Manager: Adam Olsen

**Public Safety**

75 East 80 North
American Fork, Utah 84003
801-763-3020
Fire Marshall - Mat Sacco 801-763-3045

Emergency 911
Utah County Animal Shelter 801-785-3442

**Engineering**

Engineer: Trent Andrus
275 East 200 North
American Fork, Utah 84003
Phone (801) 763-3060
Fax (801) 763-3005

**Building Inspection**

275 East 200 North
American Fork, Utah 84003
Phone (801) 763-3060
Fax (801) 763-3005
Dan Rojas

Timpanogos Special Sewer District (TSSD)
6400 North 5050 West
Utah County, Utah 84003
801-756-5231
David Barlow

**Public Works Department**

275 East 200 North
American Fork, Utah 84003
Phone (801) 763-3060
Fax (801) 763-3005

**Gas**

Dominion Energy
1140 West 200 South
Salt Lake City, Utah 84119
Phone (801) 853-6585
Trent Johnson

**Electricity**

Rocky Mountain Power
70 North 200 East
American Fork, Utah 84003
Phone (801) 756-1310
Fax (801) 756-1274
Teria Walker

**Telephone**

CenturyLink
160 East University Parkway Suite G
Orem, Utah 84058
Phone (435)-623-4252
Bill Westfall

**Cable T.V.**

Comcast Cable Communications, Inc.
1350 East Miller Avenue
Salt Lake City, Utah 84106
Phone (801) 401-3017
Fax (801) 487-1887
Elysia Valdez

Project Address:

348 South 500 East
American Fork, Utah 84003

Developer/Owner:

GOLDFISH SWIM SCHOOL

Architect:

Krieger Klatt Architects
2120 East 11 Mile Rd.
Royal Oak, MI 48067
248-414-9270
www.kriegerklatt.com

Engineer/Land Surveyor:

Dudley and Associates, Inc.
353 East 1200 South
Orem, Utah 84058
801-224-1252

Site Data:

Zone = GC-2 (General Commercial)
Total Property Area = 43,937 sq.ft. or 1.01 Acres
Total number of Buildings = 1

Building Data:

Footprint Area = 8,540 sq.ft.
IBC Construction Type 2B
IFC Occupancy Type Group A-3
Buildings will NOT be fire sprinkled

Parking Requirements

Total parking required = 1 space / 200 sq.ft. = 43
Total parking provided = 66
ADA Spaces Required = 4 ADA Accessible spaces

American Fork City
Technical Review Committee

Engineering Division
Approved As Corrected
bhunter 12/29/2021

Pending Fire Department Review

Planning and Zoning
Approved as Corrected
pobrien 12/30/2021

We have continued to ask you to complete a site specific percolation test but you still haven't done it. You keep sending the same document from August which is based on assumptions and does not include actual data for the actual site for what the actual percolation will be on-site. And you say this is the percolation test, when in fact it is not. If the system were to fail because it isn't designed large enough due to an incorrect infiltration rate, and when the loss over time of the infiltration capabilities as outlined in your geotechnical memorandum occurs, there is the possibility of flooding adjacent property owners. Until I have an actual percolation rate for this site, I can't confirm that won't be a problem. You will need to provide a percolation test that is site specific prior to construction.

Provide documentation from Rocky Mountain Power confirming your response that the voltage along 500 East is 12,470 kV or higher.

Thank you for providing the HOA documentation. Although you indicated you sent it several times, this is the first time we've received the submittal. Please include a visual exhibit that shows where the various easements should fall to include in the recorded easement document as an exhibit.

As far as dry utilities, we have repeatedly asked you to provide it and still have not received it. The purpose behind this is to confirm that no unnecessary bends will be created in the waterline and to plan for any potential conflicts before construction and be aware of it during construction. We can't confirm what utilities you'll be crossing and we're concerned there will be conflicts and issues discovered in the field because you still have not provided these dry utility locations on the plans as previously requested. I would hope that you and the Grisley's would be concerned about it as well to prevent unnecessary issues and costs.

You can complete this starting online through Bluestake's website to get a planning/design contact for all 3rd party utilities adjacent to the property. Once you have the list, you can contact each utility listed and ask them to provide you with a map of their facilities adjacent to the project. Although this does not replace the need to have it marked by bluestake in the field before excavation as required by law, we're trying to preserve the integrity of the city infrastructure by eliminating unnecessary bends or loops in waterlines as well as preventing any unnecessary costs the owners and/or their engineer may incur due conflicts with utilities that are not shown on the plans that the contractor is not aware of.

Any issues, damages to the facilities, etc., and all costs related to it will be the owner/engineer/contractors responsibility and any modifications to the design will need to be approved by the engineering division. Depending on what you may encounter in the field, it could include removing public infrastructure you may have already installed in order to eliminate unnecessary compromises to the infrastructure, including but not limited to bends, loops, utility conflict resolution, etc.




VICINITY MAP

REGISTERED PROFESSIONAL ENGINEER
No. 147089
Roger D Dudley
STATE OF UTAH

Sheet Index


| | |
|---|---|
| 1.0 | Cover Sheet |
| | ALTA Survey |
| 1.1 | General Notes |
| 1.2 | Demolition Plan |
| 2.0 | Site Plan |
| LS1.1-LS 4.2 | Landscape Plan |
| A100 | Architectural Floor Plan |
| A200 | Architectural Elevation |
| A201 | Architectural Elevation |
| CS 000 | 3D Rendering |
| CS 001 | Trash Enclosure details |
| 3.0 | Utility Plan |
| P-1 | 500 East Improvement Plan |
| ES 102 | Photometric Plan |
| 4.0 | Grading and Drainage Plan |
| 5.0-5.1 | Project Detail Sheets |
| 6.0 | Erosion Control Sheet |
| 7.0 | UDOT Exhibit |
| 7.1 | UDOT Details |
| 7.2 | UDOT Details |


| | Square Footage | Acreage | Percent of total |
|---|---|---|---|
| Total Area | 43,937 | 1.01 | 100 |
| Total Building / Pad Area | 8,530 | 0.19 | 19 |
| Total Hard Surface Area | 27,442 | 0.63 | 62 |
| Total Impervious Area | 35,699 | 0.82 | 81 |
| Total Landscaped Area | 18,912 | 0.19 | 19 |

Tabulation Table

Sheet No.
C - 1.0

# ALTA/NSPS LAND TITLE SURVEY

## *PARCEL NUMBER 13-051-0059*

## *LOCATED IN THE WEST HALF OF SECTION 24, TOWNSHIP 5 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN, AMERICAN FORK, UTAH COUNTY, UTAH*

TO DRAKE BLOEBAUM, VANGUARD TITLE INSURANCE AGENCY, LLC:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 1, 2, 3, 4, 5, 11, AND 13 OF TABLE A THEREOF. THE FIELDWORK WAS COMPLETED ON DECEMBER 17, 2020

DATE OF MAP: DECEMBER 21, 2020.

SURVEY NARRATIVE:
THE PURPOSE OF THIS SURVEY IS TO CORRECTLY IDENTIFY THE BOUNDARY LINES AND CORNERS OF THE PROPERTY DESCRIBED IN THE TITLE COMMITMENT PROVIDED FOR FUTURE DEVELOPMENT OF SAID PROPERTY.

THE RECORD LEGAL DESCRIPTION COMMENCES FROM A MONUMENT LOCATED IN THE INTERSECTION OF FIFTH EAST AND SECOND SOUTH STREETS, SAID MONUMENT WAS NOT FOUND. THE SURVEYED BOUNDARY DESCRIPTION DESCRIBES THE SAME REAL ESTATE AS THE RECORD DESCRIPTION AND WAS PREPARED TO IDENTIFY THE PROPERTY BOUNDARY WITH TIES TO THE UTAH COUNTY SURVEY MONUMENTS IN SECTION 24, T5S, R1E, SLB&M, WITH THE FOLLOWING BOUNDARY DETERMINATIONS. THE EASTERLY BOUNDARY LINE WAS ESTABLISHED FROM THE EXISTING HIGHWAY RIGHT OF WAY PLANS FOR UDOT PROJECT NO. F-001-6(7) AND SP-0180(1)0. SAID EASTERLY BOUNDARY LINE BEING THE EXISTING WESTERLY RIGHT OF WAY LINE OF STATE ROAD 180 (500 EAST STREET). THE SOUTHERLY BOUNDARY LINE WAS ESTABLISHED FROM BOUNDARY LINE AGREEMENT RECORDED IN THE UTAH COUNTY RECORDER'S OFFICE AS ENTRY NO. 123211-1998, ALSO REFERENCED IN THIS SURVEY AS EXCEPTION 16. THE WESTERLY BOUNDARY LINE WAS ESTABLISHED FROM THE EXISTING EASTERLY BOUNDARY LINE OF PENNYLANE TOWNHOMES PHASE 2, RECORDED IN THE UTAH COUNTY RECORDER'S OFFICE AS ENTRY NO. 60952-1999, MAP NO. 8076. THE NORTHERLY BOUNDARY LINE WAS ESTABLISHED ALONG AN EXISTING FENCE LINE BETWEEN THE SURVEYED PARCEL AND ADJOINING PARCEL NO. 13-057-0127 TO THE SOUTHWEST CORNER OF WYLER SUBDIVISION, RECORDED IN THE UTAH COUNTY RECORDER'S OFFICE AS ENTRY NO 81222-2017, MAP NO. 15672. THE NORTHERLY BOUNDARY THEN CONTINUES ALONG THE SOUTH LINE OF WYLER SUBDIVISION TO THE EXISTING HIGHWAY RIGHT OF WAY LINE.

BASIS OF BEARING
NORTH 00°04'38" WEST BETWEEN A FOUND UTAH COUNTY BRASS CAP AT THE SOUTH QUARTER CORNER OF SECTION 24 AND A FOUND UTAH COUNTY BRASS CAP AT THE NORTH QUARTER CORNER OF SECTION 24, TOWNSHIP 5 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN.

***RECORD LEGAL DESCRIPTION FROM TITLE REPORT***

A PARCEL OF LAND LOCATED IN SECTION 24, TOWNSHIP 5 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN, DESCRIBED AS FOLLOWS:

COMMENCING AT A POINT IN THE WEST LINE OF FIFTH EAST STREET, AMERICAN FORK, WHICH POINT OF BEGINNING IS SOUTH 0°24' WEST ALONG THE CENTERLINE OF SAID FIFTH EAST STREET 882.85 FEET AND NORTH 89°36' WEST 30.0 FEET FROM THE INTERSECTION MONUMENT AT FIFTH EAST STREET AND SECOND SOUTH STREET, AMERICAN FORK; AND RUNNING THENCE SOUTH 0°24' WEST ALONG THE STREET LINE 171.0 FEET; THENCE NORTH 89°36' WEST 256.0 FEET; THENCE NORTH 171.0 FEET; THENCE SOUTH 89°36' EAST 257.0 FEET TO THE POINT OF BEGINNING, UTAH COUNTY, STATE OF UTAH.

***SURVEYED BOUNDARY DESCRIPTION***

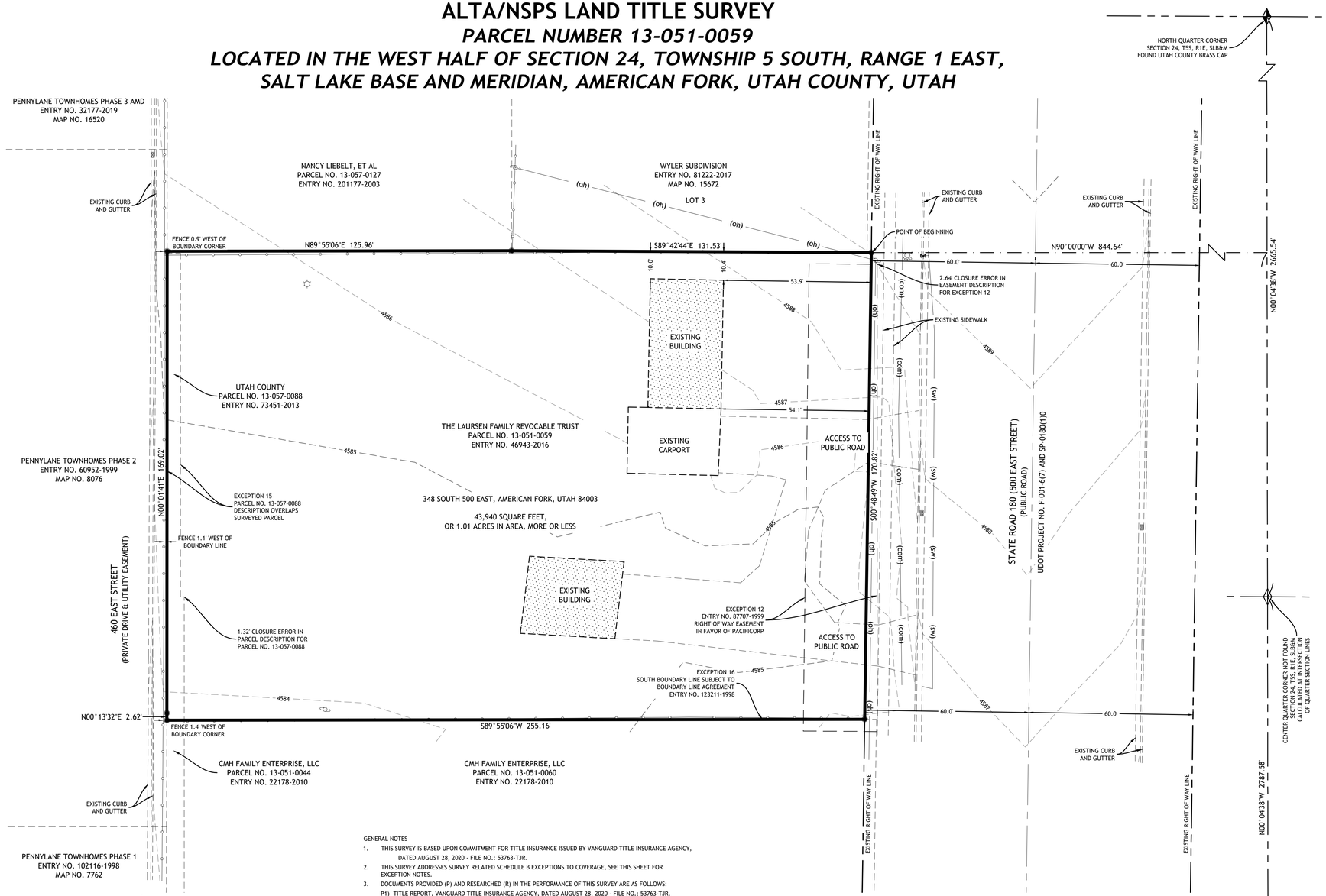
A PARCEL OF LAND LOCATED IN SECTION 24, TOWNSHIP 5 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN, DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT IN THE WEST LINE OF FIFTH EAST STREET, AMERICAN FORK, WHICH POINT OF BEGINNING IS 2787.58 FEET NORTH 0°04'38" WEST ALONG THE NORTH-SOUTH QUARTER SECTION LINE AND 844.64 FEET WEST FROM THE SOUTH QUARTER CORNER OF SECTION 24, TOWNSHIP 5 SOUTH, RANGE 1 EAST, SALT LAKE BASE AND MERIDIAN, SAID POINT OF BEGINNING IS ALSO, BY RECORD, SOUTH 0°24' WEST ALONG THE CENTERLINE OF SAID FIFTH EAST STREET 882.85 FEET AND NORTH 89°36' WEST 30.0 FEET FROM THE INTERSECTION MONUMENT AT FIFTH EAST STREET AND SECOND SOUTH STREET, AMERICAN FORK; AND RUNNING THENCE SOUTH 0°48'49" WEST 170.82 FEET ALONG SAID WEST LINE OF FIFTH EAST STREET TO THE BOUNDARY LINE DESCRIBED IN THAT CERTAIN BOUNDARY LINE AGREEMENT RECORDED IN THE UTAH COUNTY RECORDER'S OFFICE AS ENTRY NO. 123211-1998; THENCE ALONG SAID BOUNDARY LINE AGREEMENT SOUTH 89°55'06" WEST 255.16 FEET TO THE EASTERLY BOUNDARY LINE OF PENNYLANE TOWNHOMES PHASE 2, RECORDED IN THE UTAH COUNTY RECORDER'S OFFICE AS ENTRY NO. 60952-1999, MAP NO. 8076; THENCE ALONG SAID PENNYLANE TOWNHOMES PHASE 2 THE FOLLOWING TWO COURSES AND DISTANCES: 1) NORTH 0°13'32" EAST 2.62 FEET, AND 2) NORTH 0°01'41" EAST 169.02 FEET; THENCE NORTH 89°55'06" EAST 125.96 FEET TO THE SOUTHWEST CORNER OF WYLER SUBDIVISION, RECORDED IN THE UTAH COUNTY RECORDER'S OFFICE AS ENTRY NO 81222-2017, MAP NO. 15672; THENCE ALONG SAID WYLER SUBDIVISION SOUTH 89°42'44" EAST 131.53 FEET TO SAID WEST LINE OF FIFTH EAST STREET AND THE POINT OF BEGINNING.

THE ABOVE DESCRIBED PARCEL OF LAND CONTAINS 43,940 SQUARE FEET, OR 1.01 ACRES IN AREA, MORE OR LESS.

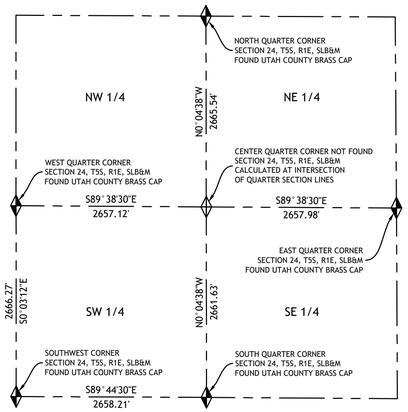
TABLE A COMMENTS:

ITEM 1: BOUNDARY CORNERS NOTED ON SURVEY.
ITEM 2: ADDRESS OF SURVEYED PROPERTY: 348 SOUTH 500 EAST, AMERICAN FORK, UT 84003.
ITEM 3: FLOOD ZONE CLASSIFICATION: "ZONE X".
ITEM 4: GROSS LAND AREA: 43,940 SQUARE FEET, OR 1.01 ACRES IN AREA, MORE OR LESS.
ITEM 5: VERTICAL RELIEF LABELED ON SURVEY. ORIGINATING BENCH MARK SOUTH QUARTER CORNER SECTION 24, T5S, R1E, SLB&M UTAH COUNTY BRASS CAP, NAVD88 ELEVATION = 4555.73'. ELEVATION DERIVED FROM RTK GPS MEASUREMENTS FROM THE STATE OF UTAH VRS NETWORK. CONTOURS DISPLAYED AT 1 FOOT INTERVAL.
ITEM 11: OBSERVED EVIDENCE OF UTILITIES LABELED ON SURVEY.
ITEM 13: ADJOINING OWNER NAMES LABELED ON SURVEY.




LEGEND

- BOUNDARY LINE
- LOT LINE
- SECTION LINE
- CENTERLINE / MONUMENT LINE
- ADJACENT PROPERTY LINE
- SURVEY TIE LINE
- FEMA FLOOD PLAIN LINE
- RIGHT OF WAY LINE
- EASEMENT LINE
- EXISTING CONCRETE & ASPHALT
- EXISTING BUILDING
- FENCE LINE
- SECTION CORNER (FOUND)
- SECTION CORNER (NOT FOUND)
- ROAD MONUMENT
- PROPERTY MARKER (SET OR FOUND AS NOTED)
- (4252) EXISTING GROUND CONTOUR
- (ss) SANITARY SEWER LINE
- SANITARY SEWER MANHOLE
- (w) CULINARY WATER LINE
- FIRE HYDRANT
- CULINARY WATER METER
- CULINARY WATER FIXTURES
- (sw) SECONDARY WATER LINE
- SECONDARY WATER FIXTURES
- STORM DRAIN LINE
- SD COMBOBOX, INLET & CLEANOUT
- UTILITY POLE
- LIGHT POLE
- (oh) OVERHEAD UTILITY
- (ug) UNDERGROUND UTILITY
- EB ELECTRICAL BOX / MANHOLE
- XFMR ELECTRICAL TRANSFORMER
- (com) COMMUNICATIONS LINE
- COMM COMMUNICATIONS BOX / MANHOLE
- (gas) GAS LINE
- GAS METER
- GUY WIRE
- CONIFEROUS TREE
- DECIDUOUS TREE
- SIGN
- IR IRRIGATION CONTROL VALVE




SECTION 24, T5S, R1E, SLB&M - NOT TO SCALE

GENERAL NOTES

1. THIS SURVEY IS BASED UPON COMMITMENT FOR TITLE INSURANCE ISSUED BY VANGUARD TITLE INSURANCE AGENCY, DATED AUGUST 28, 2020 - FILE NO.: 53763-TJR.
2. THIS SURVEY ADDRESSES SURVEY RELATED SCHEDULE B EXCEPTIONS TO COVERAGE, SEE THIS SHEET FOR EXCEPTION NOTES.
3. DOCUMENTS PROVIDED (P) AND RESEARCHED (R) IN THE PERFORMANCE OF THIS SURVEY ARE AS FOLLOWS:
   P1) TITLE REPORT, VANGUARD TITLE INSURANCE AGENCY, DATED AUGUST 28, 2020 - FILE NO.: 53763-TJR.
   R1) FEMA MAP PANEL - 49049C0306F - EFFECTIVE 6/19/2020.
   R2) ADJOINING PROPERTY DESCRIPTIONS ACCORDING TO CURRENT PUBLIC RECORDS.
4. SURVEYED PROPERTY IS LOCATED WITHIN "ZONE X" OF SAID FEMA MAP PANEL.
5. UTILITIES AS SHOWN HEREON WERE LOCATED BASED UPON VISIBLE IMPROVEMENTS AT THE TIME OF THE SURVEY. ADDITIONAL UTILITIES MAY EXIST.
6. A SURVEYED BOUNDARY DESCRIPTION WAS PREPARED WITH THIS SURVEY.
7. THE SURVEY IS BASED ON GROUND MEASUREMENTS FROM FIELD SURVEY.
8. SEE THIS SHEET FOR TABLE A COMMENTS.
9. EXISTING BUILDINGS OBSERVED ON THE SURVEYED PROPERTY ARE LABELED ON THIS SURVEY.
10. DIMENSIONS ALONG THE BOUNDARY ARE TO EXISTING FENCE LINES.

EXCEPTION NOTES:

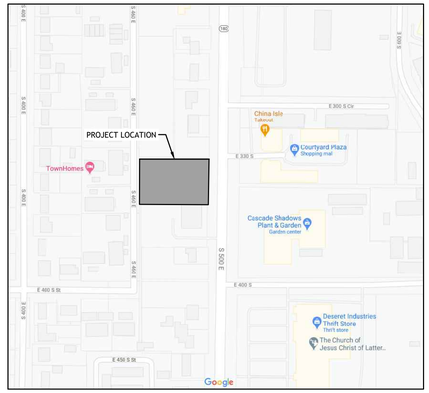
EXCEPTION 12: RIGHT OF WAY EASEMENT AND THE TERMS, CONDITIONS AND LIMITATIONS CONTAINED THEREIN, RECORDED ON AUGUST 5, 1999, AS ENTRY NO. 87707 IN BOOK 5174 AT PAGE 240 OF OFFICIAL RECORDS.
SURVEY FINDING: THE EASEMENT AFFECTS THE EASTERLY SIDE OF THE SURVEYED PROPERTY AND IS LABELED ON THE SURVEY.

EXCEPTION 13: OVERHEAD POWER LINE EASEMENTS AND THE TERMS, CONDITIONS AND LIMITATIONS CONTAINED THEREIN, RECORDED ON NOVEMBER 30, 1998, AS ENTRY NO. 123347 IN BOOK 4877 AT PAGE 249 OF OFFICIAL RECORDS.
SURVEY FINDING: THE EASEMENT IS NOT ON OR NEAR THE SURVEYED PROPERTY.

EXCEPTION 14: PUBLIC UTILITY EASEMENTS INCLUDING, BUT NOT LIMITED TO, UTILITY LINES, CABLE LINES, STREET LIGHTS, OVERHEAD POWER LINES AND THEIR SUPPORTING STRUCTURES LOCATED OVER AND ACROSS THE PROPERTY, AS DISCLOSED BY A VISUAL INSPECTION OF THE SUBJECT PROPERTY.
SURVEY FINDING: EXISTING UTILITIES VISIBLE AT TIME OF SURVEY ARE LABELED.

EXCEPTION 15: RIGHTS OR CLAIMS OF PARTIES IN POSSESSION AND EASEMENTS, OR CLAIMS OF EASEMENTS, DISCREPANCIES, CONFLICTS IN BOUNDARY LINES, SHORTAGES IN AREA ENCROACHMENTS, AND ANY FACTS WHICH A CORRECT SURVEY OF AND INSPECTION OF THE PREMISES WOULD DISCLOSE.
SURVEY FINDING: PARCEL NO. 13-057-0088 DESCRIPTION OVERLAPS SURVEYED PARCEL. AFFECTS WESTERLY SIDE OF THE SURVEYED PROPERTY AND IS LABELED ON THE SURVEY.

EXCEPTION 16: SUBJECT TO THE EFFECTS, IF ANY, OF THAT CERTAIN BOUNDARY LINE AGREEMENT RECORDED NOVEMBER 30, 1998, AS ENTRY NO. 123211, IN BOOK 4876, AT PAGE 537, OF OFFICIAL RECORDS, WHEREIN INSUFFICIENT LEGAL DESCRIPTION.
SURVEY FINDING: THE BOUNDARY LINE AGREEMENT AFFECTS THE SOUTHERLY BOUNDARY LINE AND IS LABELED ON THE SURVEY.




VICINITY MAP - NOT TO SCALE

EDM Partners
2815 East 3300 South, Salt Lake City, UT 84109
(801) 305-4670 www.edmpartners.com

NORTH

SCALE: 1" = 20

0 10 20 40 60

DEVELOPER:

NOTES:

# ALTA/NSPS LAND TITLE SURVEY
## 348 SOUTH 500 EAST, AMERICAN FORK, UTAH, 84003

PROFESSIONAL LAND SURVEYOR
Electronic Seal
KYLE W. TURNER
PLS # 7820824
FOR REVIEW
STATE OF UTAH

DO NOT FILE
SURVEY FOR REVIEW

DRAKE BLOEBAUM

PARCEL NUMBER 13-051-0059

ALTA/NSPS LAND TITLE SURVEY

| | |
|---|---|
| PROJECT: | |
| DRAWN BY: | KWT |
| REVIEWED BY: | TEJ |
| REVISIONS: | |
| No. DATE | REMARKS |

DATE: DECEMBER 2020

SHEET NUMBER:
1 OF 1

C:\Users\Kyler Turner\EDM Partners Dropbox\Projects\Goldfish\Survey\Goldfish ALTA.dwg

NOTES:

1. The fire protection items (fire hydrant, water mains, access roads, etc..) shown on this site plan are preliminary only. Detailed fire protection plans shall be submitted with the building plans. Plan reviews by the fire Prevention Bureau shall be completed prior to the issuance of a building permit. The plan reviews by the Fire Prevention Bureau may identify additional fire protection requirements mandated by the International Fire Code. Fire hydrant foot valves shall be installed at the connection point with the main water lines.
2. All landscaped areas shall have an automatic, underground sprinkling system with a back-flow device to the building. Back-flow devices shall be installed and tested in accordance with the City Code. Water meters shall be located at the back of sidewalk or curb in an area that is accessible for reading and servicing. Water meters shall not be located within areas enclosed with fences or within 10 feet (10') of any existing or proposed structure.
3. If required by the City Code or by the applicant's permit for Industrial Wastewater Discharge, a sampling manhole and fat and oil separator/grease trap shall be installed I.A.W. City standards and specifications.
4. All signage shall comply with the requirements of the City Code.
5. All utilities, including water and sewer laterals, water and sewer mains, storm water drains, storm water sumps, sewer manholes, water valves, etc., shall not be located under covered parking areas and shall be installed according to the City Code.
6. All roof drainage shall be routed through on-site storm water management facilities.
7. At the time of construction, the City of American Fork may determine based on professional experience and judgment and at its sole discretion, the need for the Owner/Developer to pay for, remove, and replace any existing substandard improvements such as curbs, gutters, sidewalks, drive approaches, driveways, decorative concrete, wheelchair ramps, etc., or any unused drive approaches.
8. All construction shall conform to the City of American Fork construction standards and specifications unless the improvement is within the UDOT right-of-way, in which case the construction shall conform to UDOT construction standards and specifications.

UTILITY GENERAL NOTES

1. All installation and materials shall, at a minimum, conform to standards, specifications, and plans.

2. The contractor shall obtain a permit for utility construction at least 48 hours prior to construction.

3. Contractor shall coordinate with all utility companies for installation requirements and specifications.

4. All necessary inspections and/or certifications required by codes and/or utility service companies shall be preformed prior to announced building possession and the final connection of service.

5. The contractor is specifically cautioned that the location and/or elevation of existing utilities as shown on these pans is based on records of the various utility companies, and where possible, measurements taken in the field. The information is not to be relied on as being exact or complete. The contractor must call the appropriate utility companies at least 48 hours before any excavation to request exact field location of utilities. It shall be the responsibility of the contractor to relocate all existing utilities which conflict with the proposed improvements shown on the plans.

6. Underground utilities shall be installed, inspected and approved before backfilling.

7. Contractor shall notify Engineering inspectors 72 hours before connecting to any existing utility.

8. All fill material is to be in place and compacted before installation of proposed utilities.

9. Existing utilities shall be verified in field prior to installation of any new lines.

10. All ductile and gray iron fittings shall be manufactured in accordance with the following AWWA standards: C-104 cement mortar lining, C-110 gray-iron and ductile iron joints. All fittings shall be seal coated with bituminous material. All fitting shall be 250 PSI minimum pressure rating.

11. Manholes shall be precast conforming to ASTM C-478. Concrete bases shall be poured in place or precast.

12. All utility pipes shall be bedded and backfilled in accordance with the detail drawings and site work specifications.

13. Tops of existing manholes shall be raised as necessary to be flush with proposed pavement elevations. Any existing manholes in unpaved areas shall be 6 inches above finished ground elevations with water tight lids.

14. All concrete for encasements shall have a minimum 28 day compression strength at 4000 PSI.

15. Site work contractor shall be responsible for all improvements to with 5 ft. of proposed building unless specified otherwise. Site work contractor shall coordinate with building contractor on all utility building entrance locations.

16. In the event of a vertical conflict between waterlines, sanitary lines, storm lines and gas lines (existing and proposed), the sanitary line shall be ductile iron pipe with mechanical joints at least 10 feet on both sides of crossing, the waterline shall have mechanical joints with appropriate thrust blocking as required to provide a minimum of 18-inch clearance meeting requirements of ANSI A21.10 or ANSI 21.11 (AWWA C-151) (CLASS 50).

17. Drawings do not purport to show all existing utilities.

18. Contractor shall verify utility locations prior to subsurface work for light poles (boring etc.) and similar structures.

19. See notice requirement under general project notes.

20. The general contractor shall ensure that all sub-contractors have installed utilities in accordance with the specifications and design (line, grade, no sags, etc.) prior to scheduling close-out meetings with the city.

21. All utilities shall be pre-tested prior to the city witnessing the test to ensure that said utilities will pass during city witness of testing.

SURVEY CONTROL NOTE:

The contractor or surveyor shall be responsible for following the National Society of Professional Surveyors (NSPS) model standards for any surveying or construction layout to be completed using Dudley & Associates ALTA Survey or Dudley & Associates construction improvement plans. Prior to proceeding with construction staking, the surveyor shall be responsible for verifying horizontal and vertical control from the survey monuments and for verifying any additional control points shown provided by Dudley & Associates. The surveyor shall also use the benchmarks as shown on the plan, and verify them against no less than three existing hard improvement elevations included on these plans or on electronic data provided by Dudley & Associates. If any discrepancies are encountered, the surveyor shall immediately notify the engineer and resolve the discrepancies before proceeding with any construction staking.

PRIVATE ENGINEER'S NOTICE TO CONTRACTORS

The Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the contractor shall defend, indemnify, and hold the owner and the engineer harmless from any and all liability, real or alleged, in connection with the performance of work on this project, excepting for liability arising from the sole negligence of the owner or the engineer.

SANITARY SEWER GENERAL NOTES

1. See this sheet for general project notes.

2. All sanitary sewer construction shall be in conformance with the standards and specifications. All sanitary sewer mains and laterals must be inspected and approved by the city inspector before trench backfilling is completed.

3. All gravity sanitary sewer lines shall be in conformance with the standards and specifications.

4. Sanitary sewer lines shall be ASTM D3034 SDR-35 PVC. Sewer line construction and materials shall conform to ASTM standards and specifications.

5. Rim elevations shown are approximate only and are not to be taken as final elevation. Pipeline contractor shall use precast concrete adjustments rings, grout, and steel shims to adjust the manhole frame to the required final grade in conformance with the standard specifications. All frames shall be adjusted to final grade prior to the final lift of asphalt.

6. All sanitary sewer main testing shall be accordance with the standards and specifications copies of all test results shall provided to the engineer, the owner, and the governing authority prior to the start of the warranty period.

7. Compaction of all trenches within the project site must be attained and compaction results submitted to Department of Public Works.

8. The contractor is responsible for protecting all existing structures and improvements during installation of sanitary sewer line.

9. The contractor is responsible for the following:

(A) Obtaining all required permits from the city or regulatory authorities at the contractors cost including permits required for work within the public right-of-way.

(B) Restoration of any existing improvements including (but not limited to) fences, sod, landscaping, pavement, sprinkler systems.

(C) Verification and protection of all existing utilities within the limits of construction.

(D) Providing as-built drawings to the City and engineer.

(E) All permitting, development, location, connecting and inspection.

(F) Verifying all standard details conform to the current standards and specifications.

(G) For obtaining and understanding all city, county, and state standards and specifications pertaining to the construction of sanitary sewer improvements.

(H) Reference architectural plans for all connections to building services and verify locations as shown.

10. The contractor shall provide all materials necessary for construction or installation of all proposed improvements shown.

11. The contractor shall pothole the existing sewer main and provide an as-built elevation of the main to the engineer prior to any new construction.

12. Sanitary sewer pipes shall be bedded in accordance with standards.

STORM DRAIN GENERAL NOTES

1. The contractor shall be responsible for the following:
(A) Obtaining all required permits from the city or regulatory authorities at the contractor's cost including permits required for work within the public right-of-way.

(B) Restoration of any existing improvements including (but not limited to) fences, sod, landscaping, pavement, sprinklers systems.

(C) Verification and protection of all existing utilities within the limits of construction.

(D) Providing as-built drawings to the city and engineer.

(E) All permitting, development, location, connection and inspection.

(F) Scheduling all required inspections.

2. All storm drain construction shall be in conformance with standards, specifications, and plans.

3. Distances for storm drains are the horizontal distances from center of manhole or inlet to center of manhole or inlet. Therefore, distances shown on plans are approximate and could vary due to vertical alignment.

4. Rim elevations shown are approximate only and are not to be taken as final elevation. Pipeline contractor shall use precast concrete adjustments rings, grout, and steel shims to adjust the manhole frame to the required final grade in conformance with standards, specifications and plans. All frames shall be adjusted to final grade prior to the final lift of asphalt.

5. Compaction of all trenches within the project site must be attained and compaction results submitted to the engineer prior to final acceptance.

6. All storm drain pipes entering structures shall be grouted to assure connection at structure is watertight.

7. All storm drain manholes in paved areas shall be flush with pavement and shall have traffic bearing lids. Manholes in unpaved areas shall be 6" above finished grade. All storm drain lids shall be labeled "storm drain".

8. Contractors shall verify horizontal and vertical location of all existing storm drain structures, pipes, and all utilities prior to construction.

9. Storm drains shall be bedded in accordance with the City standards.

GRADING PLAN GENERAL NOTES

1. Contours shown are for finished paving, sidewalk, slab, or ground adjustment to sub-grade is the contractor's responsibility.

2. All disturbed areas that are un-surfaced or are not designated as landscape areas are to be seeded, fertilized, and watered until a healthy stand of grass is obtained.

3. If during the overall grading process, conditions are encountered which could indicate an unidentified situation is present, the soils engineer shall be contacted for recommendations.

4. Unless otherwise shown, not proposed slope shall exceed three (3) horizontal to one (1) vertical. All sloped areas must be protected from erosion.

5. If stripped materials consisting of vegetation and organic materials are stockpiled on the site, topsoil may be placed to a height of five feet. Silt fence shall be placed around the base of the stockpile and the stockpile shall be seeded with native seed mix immediately after stripping operations are complete.

6. On-site materials suitable for fill beneath drives and asphalt areas beyond 5' (five) of the building shall be compacted in accordance with guidelines presented in the soils report.

7. Spot elevations shall take precedence over contours and slopes shown. The contractor shall notify the engineer of the spot elevations that do not appear to be consistent with the contours and slopes. Spot elevations and specific profile design shall be used for setting elevations of curb, gutter and utilities.

8. Benchmark verification: Contractor shall use benchmarks and datums shown hereon to set project benchmark(s), by running level loop between at least two benchmarks, and shall provide survey notes of such to project engineer prior to commencing construction.

9. All utilities (manholes, valve covers, cleanouts, vaults, boxes, etc.) shall be adjusted to final grade prior to the final lift of asphalt.

10. All earth moving and placement operations shall be in conformance with the recommendations identified in the soils report. The contractor shall have a signed and sealed copy of the soils report on the site at all times.

11. The contours shown in the detention/retention pond area represent final grade. The top 6 inches of material in the detention/retention pond and berm areas shall be top soil as specified in the project standards.

12. Grades within asphalt areas shall be constructed to within 0.10 feet of the design grade. However, the contractor shall maintain positive drainage in all pavement areas and along all curbs. All curbs shall be built in accordance to the plan. Curbs or pavement areas which do not provide proper drainage must be removed and replaced at the contractor's expense.

13. Spot elevations represent flow line or top of asphalt unless otherwise noted.

14. The contractor is responsible for providing his own estimate of earthwork quantities.

15. All landscaped islands shall have a crown of topsoil prior to landscaping. Refer to landscape plan for specifications.

16. Were new curb and gutter is being constructed adjacent to existing asphalt or concrete pavement, the following shall apply: Prior to placement of any concrete, the contractor shall have a licensed surveyor verify the grade and cross slope of the curb and gutter forms. The contractor shall submit the slopes and grades to the engineer immediately of any section which does not conform to the design or typical cross section. The contractor shall be solely responsible for curb and gutter pours without the approval of the engineer.

17. The earthwork for all building foundations and slabs shall be in accordance with architectural building plans and specifications.

18. Pre cast structures may be used at contractor's option.

19. Existing drainage structures to be inspected and repaired as needed, and existing pipes to be cleaned out to remove

20. Existing grade contour intervals shown at 1 foot intervals.

21. Proposed grade contour intervals shown at 1 foot intervals.

22. If any existing structures to remain are damaged during construction, it shall be the contractor's responsibility to repair and/or replace the existing structure as necessary to return it to existing conditions or better.

23. The contractor shall adhere to all terms & conditions as outlined in the general permit for storm water discharge associated with construction activities.

24. Contractor shall adjust and/or cut existing pavement as necessary to assure a smooth fit and continuous grade.

25. Contractor shall assure positive drainage away from buildings for all natural and paved areas.

26. Topographical information taken from a topographic survey by (Dudley & Associates). If contractor does not accept existing topography as shown on the plans, without exception, he shall have made, at his expense, a topographic survey by a registered land surveyor and submit it to the owner for review.

27. All unsurfaced areas disturbed by grading operation shall receive 4 inches of topsoil. Contractor shall apply stabilization fabric to all slopes 3H:1V or steeper. Contractor shall place sod or hydroseed to disturbed areas in accordance with city/county specifications and maintain until a healthy stand of grass is obtained.

28. Construction shall comply with all applicable governing codes and be constructed to same.

29. Contractor is responsible for verifying all utilities and notifying the appropriate utility company prior to beginning construction.

30. Site work shall meet or exceed site specifications.

31. All concrete to have a minimum 28 day compression strength of 4000 PSI.

GENERAL NOTES

1. All materials, workmanship, and construction of site improvements shall meet or exceed specifications set forth in the City Public Works, Regulations and applicable state and federal regulations (including ADA guidelines). Where there is a conflict between these plans and the specifications, or any applicable standards, the higher quality standard shall apply. All work with public R.O.W. or easements shall be inspected and approved by the City Public Works Inspector and/or UDOT. Inspection services and construction certification to be provided by engineer of record.

2. The contractor is specifically cautioned that the location and/or elevation of existing utilities, as shown on these plans, is based on records of the various utility companies and where possible, measurements taken in the field, the information is not to be relied upon as being exact or complete. The contractor must call the local utility location center at least 48 hours before any excavation to requested exact field locations of the utilities. Prior to construction, the contractor shall verify pertinent locations and elevations, especially at the connection points and at potential utility conflicts. It shall be the responsibility of the contractor to relocate all existing utilities that conflict with the proposed improvements shown on these plans.

3. The contractor shall be responsible for obtaining all necessary permits from all applicable agencies. The contractor shall notify the City Public Works Inspector at least 48 hours prior to the start of any earth disturbing activity, or construction on any and all public improvements.

4. The contractor shall coordinate with City and all utility companies involved with regard to relocations or adjustments of existing utilities during construction and to assure that the work is accomplished in a timely fashion and with a minimum disruption of service. The contractor shall be responsible for contacting all parties affected by any disruption of any utility service.

5. The contractor shall have one (1) signed copy of the approved plans, one (1) copy of the appropriated standards and specifications, and a copy of any permits and extension agreements needed for the job, on-site at all times.

6. The contractor shall be responsible for all aspects of safety including, but not limited to, excavation, trenching, shoring, traffic control and security.

7. If during the construction process, conditions are encountered by the contractor, his subcontractors, or other affected parties which could indicate a situation that is not identified in the plans or specifications, the contractor shall contact the engineer immediately.

8. All references to any published standards shall refer to the latest revision of said standard, unless specifically stated otherwise.

9. The contractor shall submit a traffic control plan in accordance with the manual on uniform traffic control devices to the appropriate right-of-way authority (city, county or state) for approval, prior to any construction activities within, or affecting the right-of-way. The contractor shall be responsible for providing any and all traffic control devices as may be required buy the construction activities.

10. The contractor is responsible for providing all labor and materials necessary for the completion of the intended improvements shown on these drawings or designated to be provided, installed, constructed, removed and relocated unless specifically noted otherwise.

11. The contractor shall be responsible for keeping roadways free and clear of all construction debris and dirt tracked from the site.

12. The contractor shall be responsible for recording as-built information on a set of record drawings kept at the construction site, and available to the City Public Works Inspector at all times.

13. Dimensions for layout and construction are not to be scaled from any drawing. If pertinent dimensions are not shown, contact the consultant engineer for clarification and annotate the dimension on the as-built record drawings.

14. All structural erosion control measures shall be installed, at the limits of construction, prior to any other ground-disturbing activity. All erosion control measures shall be maintained in good repair by the contractor, until such time as the entire disturbed areas are stabilized with hard surface or landscaping.

15. The contractor shall sequence installation of utilities in such a manner as to minimize potential utility conflicts, in general, storm sewer and sanitary sewer should be constructed prior to installation of water lines and dry utilities.

16. All work within the public right-of-way is subject to the jurisdiction of the City Engineering Department Standard Details Specifications and Utah Department of Transportation Standard Details and Specifications.

17. The contractor shall submit a phasing plan for all work in all public roads and R.O.W.'s to the City before beginning any work on these streets. Contractor shall begin work only after City approves the phasing plan, and a preconstruction meeting is held between the city, the engineer and the contractor.

18. All operations conducted on the premises, including the warming up, repair, arrival, departure, or running of trucks, earthmoving equipment, construction equipment and any other associated equipment shall be limited to the period between 7:00 a.m. and 10:00 p.m. everyday, unless otherwise approved by the city.

19. It is the responsibility of the contractor to coordinate all utility relocations consistent with the contractor's schedule for this project. Whether shown or not shown as it relates to the construction activities contemplated in these plans.

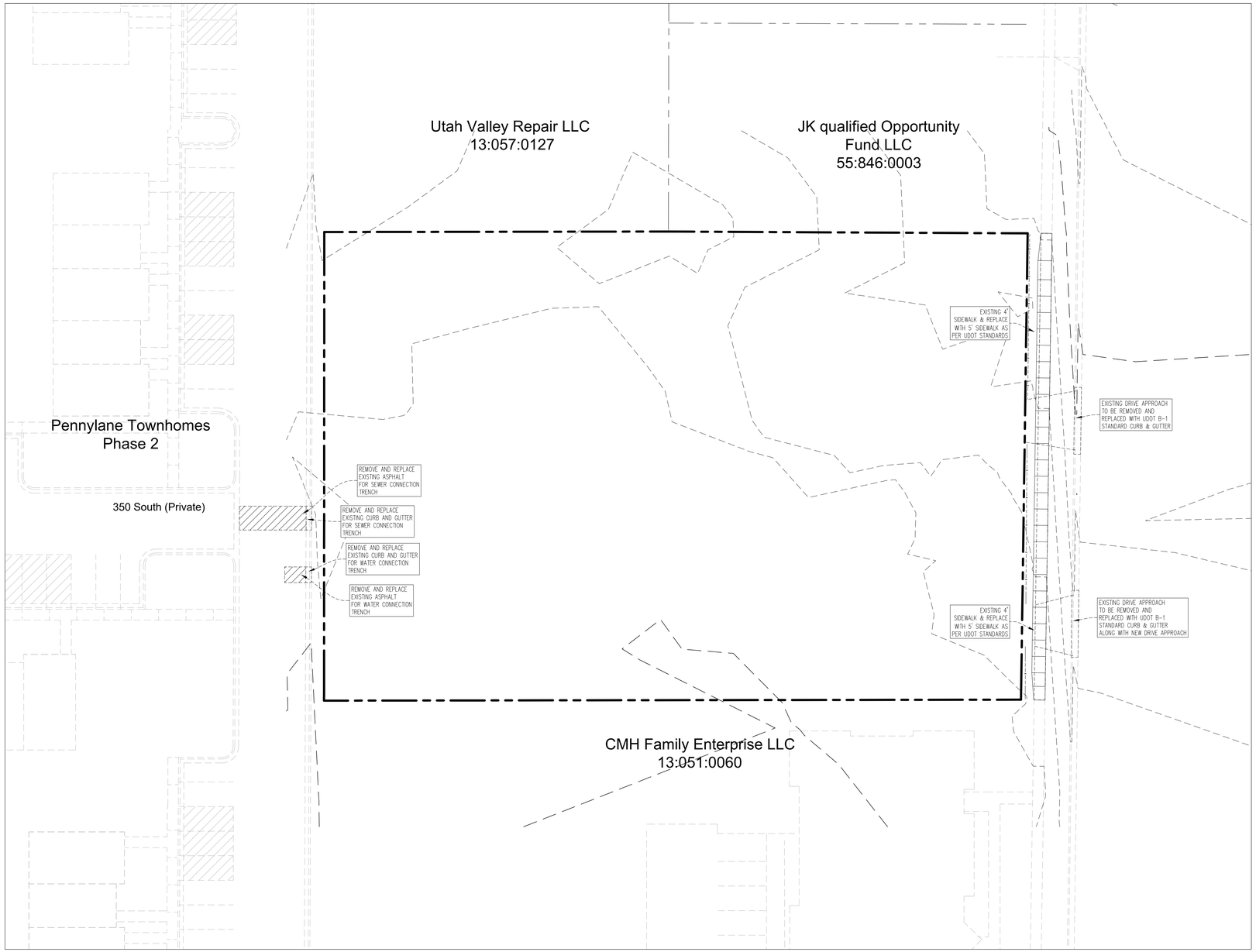
20. Contractor shall be responsible for obtaining all temporary power and water to the sire, paying all fees excluding tap fees and system development fees, referring to the geotechnical report prepared by (EarthTec Testing and Engineering P.C.)

21. In general, limits of site work are up to (and excluding) constructing sidewalks.

REGISTERED PROFESSIONAL ENGINEER
No. 147089
Roger D. Dunn
STATE OF UTAH

Sheet No.
C - 1.1

NORTH
1" = 30




CAUTION!!! Notice to contractors

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GRAPHIC SCALE

30 0 15 30 60 120

( IN FEET )
1 inch = 30 ft.

DUDLEY AND ASSOCIATES
ENGINEERS PLANNERS SURVEYORS
353 EAST 1200 SOUTH, OREM, UTAH
801-224-1252

Goldfish Swim School

# Demolition Plan

American Fork Utah

REGISTERED PROFESSIONAL ENGINEER
No. 147089
Roger D Dudley
STATE OF UTAH

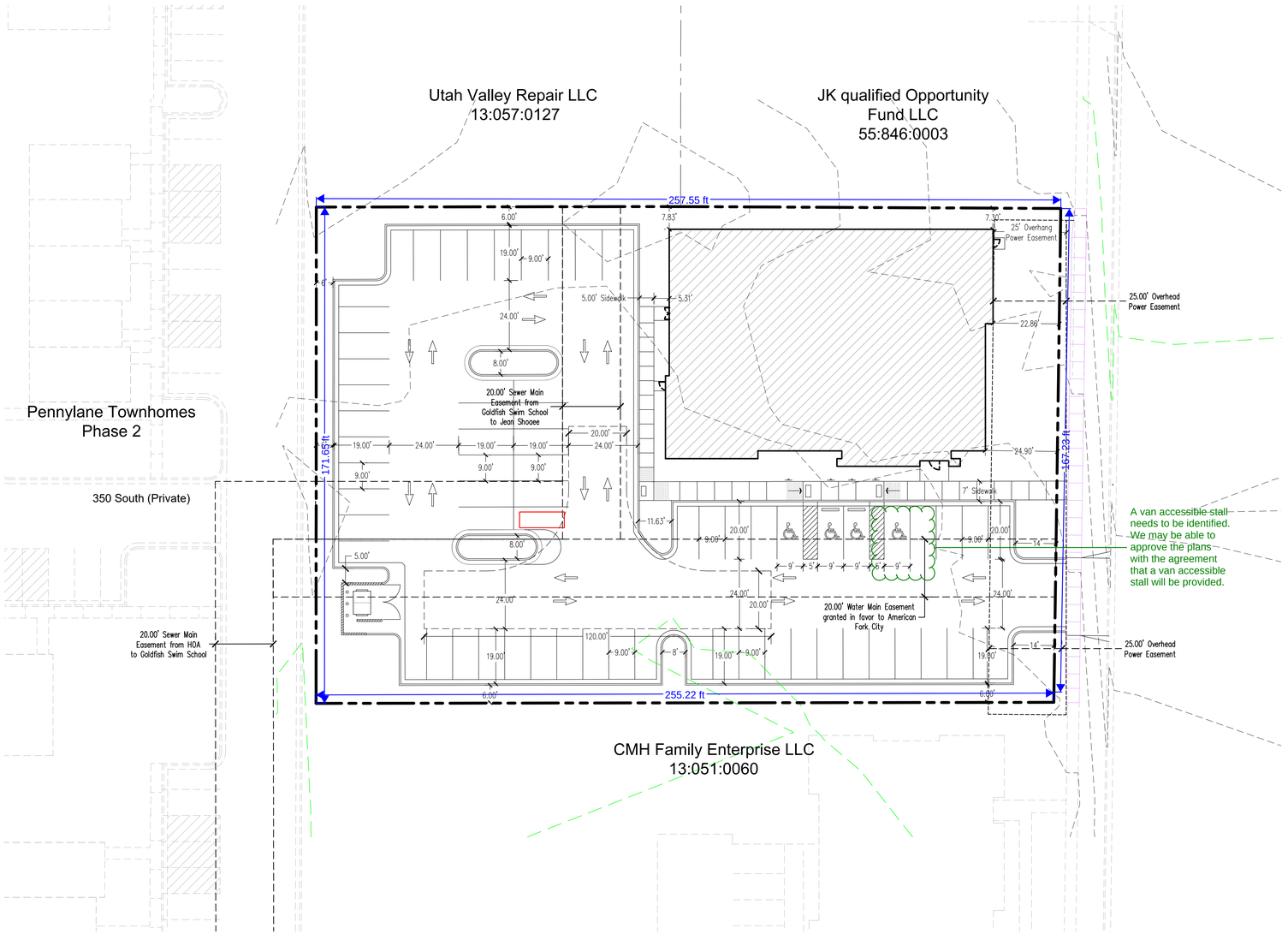
Revisions

| |
|---|
| Date<br>11-18-2021 |
| Scale<br>1" = 20' |
| By<br>TD |
| Tracing No.<br>L - 14630 |

Sheet No.
C -

NORTH
1" = 20'

# goldfish swimschool




Missing the text for the boundary measurements. Based on calibrated measurements, the property lines on the site plan don't match the property lines on the ALTA. Why is there a discrepancy?

A van accessible stall needs to be identified. We may be able to approve the plans with the agreement that a van accessible stall will be provided.

Project Address:

348 South 500 East
American Fork, Utah 84003

Developer/Owner:

GOLDFISH SWIM SCHOOL

Architect:

Krieger Klatt Architects
2120 East 11 Mile Rd.
Royal Oak, MI 48067
248-414-9270
www.kriegerklatt.com

Engineer/Land Surveyor:

Dudley and Associates, Inc.
353 East 1200 South
Orem, Utah 84058
801-224-1252

REGISTERED PROFESSIONAL ENGINEER No. 147089 Roger D. Dudley STATE OF UTAH

Site Data:

Zone = GC-2 (General Commercial)
Total Property Area = 43,937 sq.ft. or 1.01 Acres
Total number of Buildings = 1

Building Data:

Footprint Area = 8,540 sq.ft.
IBC Construction Type II
IFC Occupancy Type Group E
Buildings will NOT be fire sprinkled

Parking Requirements

Total parking required = 1 space / 200 sq.ft. = 43
Total parking provided = 68
ADA Spaces Required = 4 ADA Accessible spaces

GRAPHIC SCALE

30 0 15 30 60 120
( IN FEET )
1 inch = 30 ft.

CAUTION!!! Notice to contractors

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DUDLEY AND ASSOCIATES
ENGINEERS PLANNERS SURVEYORS
353 EAST 1200 SOUTH, OREM, UTAH
801-224-1252

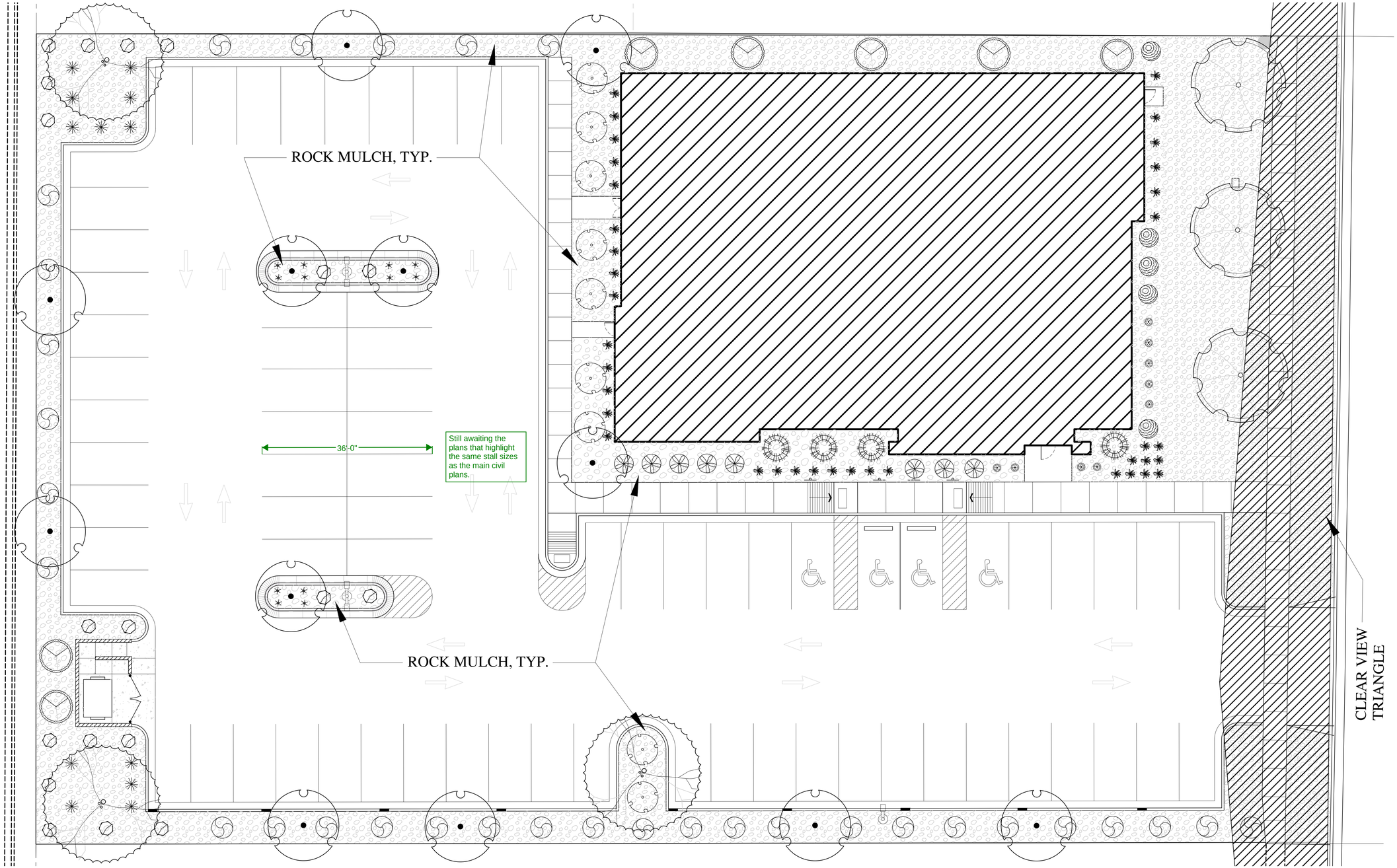
Goldfish Swim School
American Fork, Utah

# Site Plan

Revisions

| | |
|---|---|
| Date | 11-18-2021 |
| Scale | 1" = 20' |
| By | TD |
| Tracing No. | L - 14630 |

Sheet No.
C -




## AREA CALCULATIONS

| | |
|---|---|
| TOTAL SITE AREA<br>*NOT INCLUDING PARK STRIP AREA ( 1,505 S.F.) | 44,557 S.F. |
| TOTAL LANDSCAPE AREA<br>*NOT INCLUDING PARK STRIP AREA ( 1,318 S.F.) | 9,932 S.F. |
| TREES (1 PER 2,500 S.F. OF IMPROVED AREA | |
| REQUIRED: | 18 |
| PROVIDED | 18 |
| SHRUBS ( 1 PER 300 S.F. OF IMPROVED AREA | |
| REQUIRED: | 149 |
| PROVIDED: | 154 |

## DECIDUOUS TREE LEGEND

| SYMBOL | BOTANICAL NAME/COMMON NAME | QTY | SIZE |
|---|---|---|---|
| | GLEDITSIA TRIACANTHOS INERMIS 'IMPCOLE'<br>IMPERIAL HONEY LOCUST | 3 | 2" CAL |
| | PRUNUS SERRULATA 'KWANZAN'<br>KWANZAN JAPANESE FLOWERING CHERRY | 3 | 2" CAL. |
| | TILIA CORDATA 'CORZAM'<br>CORINTHIAN LITTLELEAF LINDEN | 12 | 2" CAL. |

## DECIDUOUS SHRUB LEGEND

| SYMBOL | BOTANICAL NAME/COMMON NAME | QTY | SIZE |
|---|---|---|---|
| | CORNUS ALBA 'MINBAT'<br>BATON ROUGE DOGWOOD | 32 | 5 GAL. |
| | CORNUS SERICEA 'KELSEYI'<br>KELSEY'S DWARF RED TWIG DOGWOOD | 19 | 5 GAL. |
| | HISBISCUS SYRIACUS 'ANTONG TWO'<br>LIL KIM DWARF ROSE OF SHARON | 5 | 5 GAL. |
| | PHYSOCARPUS OPULIFOLIUS 'SMPOTW'<br>TINY WINE NINEBARK | 8 | 5 GAL. |
| | RHUS AROMATICA 'GRO-LOW'<br>GRO-LOW FRAGRANT SUMAC | 9 | 5 GAL. |
| | VIBURNUM X BURKWOODII<br>BURKWOOD VIBURNUM | 7 | 5 GAL. |

## EVERGREEN SHRUB LEGEND

| SYMBOL | BOTANICAL NAME/COMMON NAME | QTY | SIZE |
|---|---|---|---|
| | JUNIPERUS CHINENSIS 'BLUE POINT'"<br>BLUE POINT JUNIPER | 4 | 5-6' TALL |

## PERENNIALS / GRASSES LEGEND

| SYMBOL | BOTANICAL NAME/COMMON NAME | QTY | SIZE |
|---|---|---|---|
| | CALAMAGROSTIS X ACUTIFLORA 'AVALANCHE'<br>FEATHER REED GRASS | 9 | 1 GAL. |
| | CAREX ELATA 'BOWLES GOLDEN'<br>BOWLES GOLDEN SEDGE | 12 | 1 GAL. |
| | CAREX MUSKINGUMENSIS 'ICE FOUNTAINS'<br>ICE FOUNTAINS PALM SEDGE | 12 | 1 GAL. |
| | HEMEROCALLIS X `ALWAYS AFTERNOON'<br>DAYLILY | 37 | 1 GAL. |

10' 0 10' 20' 30'

SCALE: 1"=10'-0" ON 24X36 SHEET

In Site
DESIGN GROUP
Landscape Architecture Land Planning
57 North 450 West American Fork, Utah 84003
801.756.5043 www.in-sitedesigngroup.com

2120 E. 11 Mile Rd. | Royal Oak, MI 48067
**P:** 248.414.9270 **F:** 248.414.9275
**www.kriegerklatt.com**

Client:
Goldfish Swim Schools

Project:
GSS - American Fork, UT
348 South 500 East
American Fork, Utah

| Issued | Description | By |
|---|---|---|
| 04.19.2021 | Site Plan Review | TS |
| 06.07.2021 | TRC Review | DW |
| 08.24.2021 | TRC Revisions 01 | DW |
| 09.29.2021 | C&S/Bids | DW |
| 10.29.2021 | C&S/Bids | CW |

Brand Standard:
All Brand Standards must be followed - No deviation permitted without prior written Goldfish Franchise approval.

Seal:
STATE OF UTAH
DARREN G. WILSON
NO. 356187
10-08-2021
LICENSED LANDSCAPE ARCHITECT

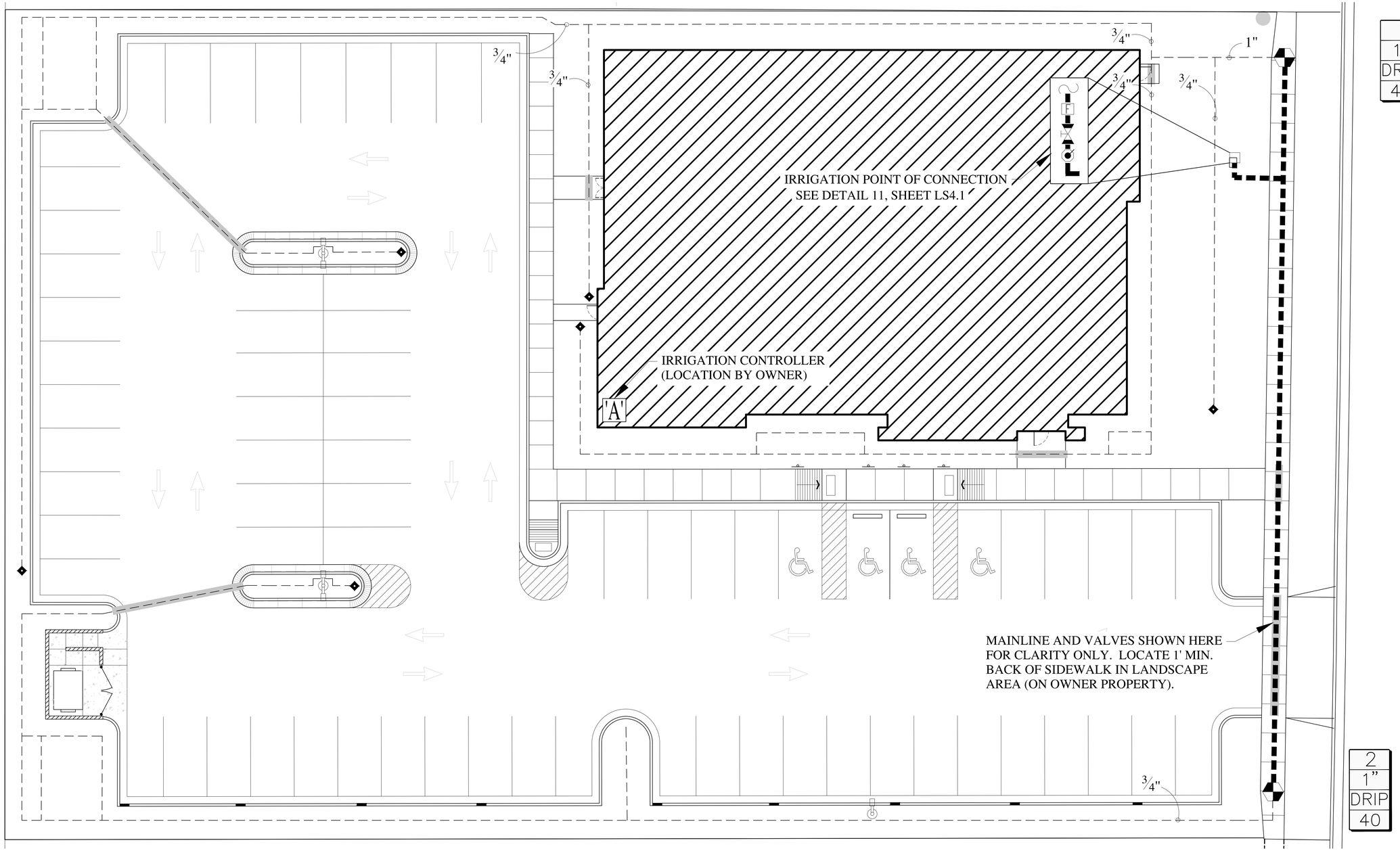
Note:
Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

North Arrow:

Sheet Title:
PLANTING PLAN

Project Number:
21-017

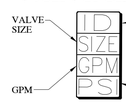
Sheet Number:
LS1.1




## IRRIGATION LEGEND

| SYMBOL | MANUFACTURER-MODEL NUMBER | PAT. | RD. | PSI | GPM | | | | | | DRIP GPH | DETAILS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Q | T | H | TT | TQ | F | | | |
| NOT SHOWN | GPH INC. GPSCV2M DRIP EMITTER | F | -- | 30 | -- | -- | -- | -- | -- | -- | 2.0 | 16-19 | SEE IRRIGATION DETAILS |
| NOT SHOWN | RAINBIRD PC-05 EMITTER WITH DIFFUSER CAP | F | -- | 30 | -- | -- | -- | -- | -- | -- | 5.0 | 16-19 | SEE IRRIGATION DETAILS |
| NOT SHOWN | DRIPLINE: NETAFIM TLCV26-18 | F | -- | 30 | -- | -- | -- | -- | -- | -- | .26/18" | 16-19 | SEE IRRIGATION DETAILS |
| NOT USED | RAIN BIRD 1804-PRS POP-UP SPRAY 10 SERIES | Q,T,H | 10' | 30 | .39 | .53 | .79 | -- | -- | -- | -- | 6 | ADJUST ARC AS NEEDED |
| NOT USED | RAIN BIRD 1804-PRS POP-UP SPRAY SERIES VAN | VAN | 10' | 30 | -- | -- | -- | -- | -- | -- | -- | 6 | ADJUST ARC AS NEEDED |
| NOT USED | RAIN BIRD R-VAN24 (RD-04-SAM-P45 TURF ROTARY) | VAN | 24' | 45 | -- | -- | -- | -- | -- | -- | -- | 6 | ADJUST ARC AS NEEDED |
| | | | | | | | | | | | | | |
| 'A' | RAINBIRD CONTROLLER, MODEL #ESPLXBASIC. LC TO COORDINATE WITH TRADES TO RUN CONDUIT AND SLEEVING FOR WIRING TO VALVES. SIZE CONTROLLER AS NECESSARY. PLACE CONTROLLER IN WEATHER RESISTANT CABINET | | | | | | | | | | | 1 | COORDINATE EXACT LOCATION WITH OWNER. |
| F | 1" RAINBIRD SCREEN FILTER | | | | | | | | | | | 12-13 | SEE IRRIGATION DETAILS |
| | 1" SCHEDULE 80 ISOLATION VALVE | | | | | | | | | | | 12-13 | JUMBO VALVE BOX |
| | 1" POINT OF CONNECTION TO P.I. WATER MAIN PER CIVIL DRAWINGS. | | | | | | | | | | | 12-13 | JUMBO VALVE BOX |
| NOT USED | RAIN BIRD PESB-PRS-D AUTOMATIC CONTROL VALVE (SIZE AS NOTED ON PLAN). INSTALL PRS-D OPTION PER DETAILS. | | | | | | | | | | | 5-7 | SEE IRRIGATION DETAILS |
| | DRIP CONTROL ZONE KIT: RAINBIRD XCZ-100-PRB COM | | | | | | | | | | | 14 | JUMBO VALVE BOX |
| | 1" SCH. 40 PVC MAINLINE | | | | | | | | | | | 4, 8 | SEE IRRIGATION DETAILS |
| NOT USED | LATERAL LINE: PVC SCH. 40 (SIZE PER PLAN) | | | | | | | | | | | 4, 8 | SEE IRRIGATION DETAILS |
| | DRIP LATERAL: PVC SCH 40, OR STICKY-STRIP PVC HOSE BY GPH. L.C. SHALL SIZE PIPE PER DETAILS AND SPECS. | | | | | | | | | | | 16-19 | SEE IRRIGATION DETAILS |
| | 1" RAINBIRD QUICK COUPLER VALVE, MODEL #44NP FOR SYSTEM BLOWOUT. ALL GALVANIZED FITTINGS & PIPE. | | | | | | | | | | | 3 | SEE IRRIGATION DETAILS |
| NOT SHOWN | 14 GAUGE SINGLE STRAND SOLID COPPER CONTROL WIRE | | | | | | | | | | | 4 | SEE IRRIGATION DETAILS |
| | SLEEVE (SIZE TO BE A MIN. OF TWICE THE DIAMETER OF THE MAIN, LATERAL) | | | | | | | | | | | 8 | COORDINATE WITH ALL TRADES |
| NOT SHOWN | WIRE CHASE. SIZE TO BE 2X THE DIAMETER OF THE WIRE BUNDLE WITHIN, 1" DIA. WC IS THE MINIMUM SIZE ALLOWED. | | | | | | | | | | | 4 | COORDINATE WITH ALL TRADES |
| ◆ | FLUSH VALVE: 1/2" PVC BALL VALVE. INSTALL AT END OF ALL DRIP LINES IN 10" ROUND VALVE BOX | | | | | | | | | | | 15 | REFERENCE DETAILS |

## VALVE ID TAG




## DRIP EMITTER LEGEND

| PLANT TYPE | EMITTER QTY | EMITTER TYPE |
|---|---|---|
| PERENNIALS/GRASSES | 1 | GPSTCV2M (2GPH) |
| ALL SHRUBS | 2 | GPSTCV2M (2GPH) |
| TREES IN PLANTERS | 2 | PC-05 (5GPH) |

NOTE:
1. EMITTERS LISTED ARE AVAILABLE FROM GPH AND RAINBIRD.
2. EMITTERS ARE NOT NECESSARY FOR TREES IN LAWN AREAS.
3. INSTALL NETAFIM TLCV IN ADDITION TO PC-05 EMITTERS PER IRRIGATION DETAILS.
4. INSTALL PC-DIFFUSER CAP ON ALL PC-05 EMITTERS.

## IRRIGATION NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE CITY AND/OR COUNTY CODES. THE LANDSCAPE CONTRACTOR (L.C.) SHALL APPLY AND PAY FOR ALL NECESSARY PERMITS.
2. L.C. SHALL HAVE ALL UTILITIES BLUE STAKED BEFORE DIGGING. ANY DAMAGE TO THE UTILITIES SHALL BE REPAIRED AT THE EXPENSE OF CONTRACTOR WITH NO EXTRA COST TO THE OWNER.
3. PROVIDE AN AS-BUILT, REPRODUCIBLE DRAWING TO OWNER SHOWING ALL DRAINS, VALVES, AND PIPES. PROVIDE INSTRUCTIONS TO MAINTENANCE PERSONNEL FOR WINTERIZATION. SPRINKLER SYSTEM TO BE BLOWN OUT WITH AN AIR COMPRESSOR EACH FALL.
4. L.C. SHALL ONLY USE COMMERCIAL GRADE PRODUCTS AND IS RESPONSIBLE FOR ENSURING ACCURATE COUNTS/QUANTITIES OF ALL IRRIGATION MATERIALS FOR BIDDING AND INSTALLATION.
5. L.C. SHALL PROVIDE AND INSTALL SLEEVES FOR ALL PIPES AND WIRES UNDER PAVEMENT AND SIDEWALKS. SLEEVES SHALL BE 2 SIZES LARGER THAN PIPE INSIDE. ALL WIRE SHALL BE IN SEPARATE SLEEVES (NOT SHOWN). ALL CONTROL WIRE SHALL BE INSTALLED IN SCH. 40 ELECTRICAL CONDUIT. PLACE JUNCTION BOXES WHERE NECESSARY TO MINIMIZE LONG RUNS OR AT DIRECTIONAL CHANGES AS NECESSARY.
6. ALL SLEEVES INSTALLED SHALL BE DUCT TAPED TO PREVENT DIRT OR OTHER DEBRIS ENTERING PIPE. ALL SLEEVES SHALL BE IDENTIFIED BY WOOD OR PVC STAKES AND BE SPRAY PAINTED WITH MARKING PAINT. REMOVE STAKES ONCE IRRIGATION SYSTEM IS COMPLETE.
7. MAIN LINE SHALL BE 1" (UNLESS OTHERWISE DIRECTED). LATERAL LINES SHALL BE NO SMALLER THAN 3/4" UNLESS NOTED ON PLAN. PIPES SHALL CARRY NO MORE THAN THE FOLLOWING: 1/2" MAX. 4 GPM, 3/4" PIPE MAX. 8GPM, 1" PIPE MAX. 13GPM. ADJUST LOCATION OF MAINLINE AND LATERAL LINES AS NECESSARY IN ORDER TO AVOID PLACING BOULDERS, TREES AND SHRUBS DIRECTLY OVER MAINLINE AND LATERAL LINES.
8. MAIN LINES SHALL BE 18" DEEP MIN. AND LATERAL LINES 12" DEEP MIN. NO ROCK GREATER THAN 3/4" DIAMETER SHALL BE ALLOWED IN TRENCHES.
9. PLACE PIPES, VALVE BOXES AND ALL OTHER SPRINKLER CONSTRUCTION IN LANDSCAPE AREAS. ALL PIPES SHALL BE ON PROPERTY OF OWNER. MODIFY LOCATION OF VALVE BOXES AS NECESSARY IN ORDER TO AVOID TREES AND SHRUBS PER PLANTING PLAN. DO NOT LOCATE VALVE BOXES IN LAWN AREAS IF POSSIBLE.
10. LANDSCAPE ARCHITECT OR OWNER SHALL VISUALLY INSPECT ALL TRENCHES PRIOR TO BACKFILLING. L.C. SHALL GIVE LANDSCAPE ARCHITECT MIN. 72 HR. NOTICE BEFORE INSPECTION IS TO BE MADE. L.C. SHALL PRESSURE TEST MAINLINE FOR LEAKS PRIOR TO BACKFILLING.
11. ACTUAL INSTALLATION OF IRRIGATION SYSTEM MAY VARY SOMEWHAT FROM PLANS. CONTRACTOR IS RESPONSIBLE TO MAKE NECESSARY ADJUSTMENTS TO ENSURE PROPER COVERAGE OF ALL LANDSCAPED AREAS. L.C. SHALL MATCH PRECIPITATION RATES AS MUCH AS POSSIBLE FOR ALL LANDSCAPED AREAS.
12. VALVE BOXES SHALL BE INSTALLED SQUARED TO AND 6" MIN. AWAY FROM WALKS AND WALLS.
13. DRIP LINES SHALL BE FLEXIBLE AR PVC TUBING BY GPH. FOR DRIP AREAS REQUIRING 0-4 GPM USE 1/2" TUBING. FOR DRIP AREAS REQUIRING 4-8GPM USE 3/4" TUBING AND FOR DRIP AREAS REQUIRING 8-13 GPM USE 1" TUBING. CONTRACTOR TO VERIFY PLANT QUANTITIES ON EACH DRIP LINE AND SIZE PIPE ACCORDINGLY. L.C. TO INSTALL RAIN BIRD XFD-09-12 ON-SURFACE DRIP LINE FOR TREES PER THE DETAILS. MODIFY DRIP ZONES AS NECESSARY TO PROVIDE ADEQUATE COVERAGE TO ALL LANDSCAPED AREAS.
14. POWER TO CONTROLLER TO BE PROVIDED BY ELECTRICAL CONTRACTOR. OWNER TO SPECIFY EXACT LOCATION OF CONTROLLER. IF MOUNTED OUTSIDE, CONTROLLER TO BE MOUNTED IN WEATHERPROOF LOCKING WALL MOUNTED CABINET PER MANUFACTURERS INSTRUCTIONS. L.C. SHALL ENSURE THE CONTROLLER IS GROUNDED PER LOCAL CODE AND PER MANUFACTURER SPEC.
15. IF THE STATIC PRESSURE AT THE POINT OF CONNECTION EXCEEDS 110 PSI, INSTALL A BRASS PRESSURE REDUCER IN-LINE WITH THE FILTER PER MANUFACTURER SPECS. INSTALL THE FILTER AND PRESSURE REDUCER IN A VALVE BOX (SIZE AS REQUIRED). ADJUST PRESSURE AS REQUIRED FOR NORMAL OPERATION OF THE IRRIGATION SYSTEM.


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**Client:**
Goldfish Swim Schools

**Project:**
GSS - American Fork, UT
348 South 500 East
American Fork, Utah

| Issued | Description | By |
|---|---|---|
| 04.19.2021 | Site Plan Review | TS |
| 06.07.2021 | TRC Review | DW |
| 08.24.2021 | TRC Revisions 01 | DW |
| 09.29.2021 | C&S/Bids | DW |
| 10.29.2021 | C&S/Bids | CW |

**Brand Standard:**
All Brand Standards must be followed - No deviation permitted without prior written Goldfish Franchise approval.

**Seal:**




**Note:**
Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

**North Arrow:**



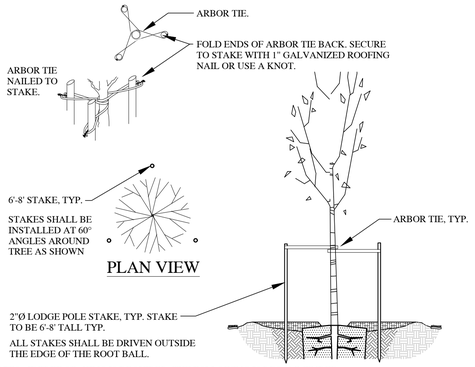
**Sheet Title:**
IRRIGATION PLAN

**Project Number:**
21-017

**Sheet Number:**
LS2.1


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10' 0 10' 20' 30'
SCALE: 1"=10'-0" ON 24X36 SHEET

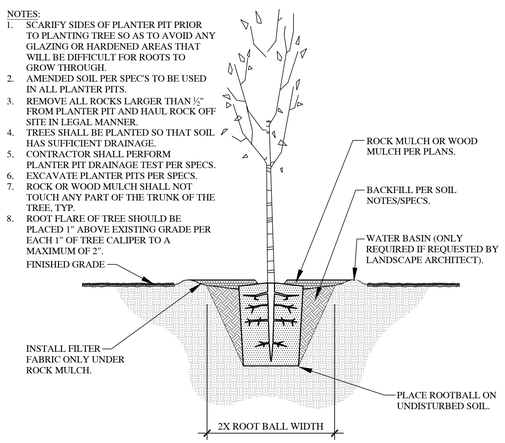



NOTES: IF TREE STAKING IS REQUIRED, THE FOLLOWING IS RECOMMENDED:
1. ALLOW FOR SOME TRUNK MOVEMENT. ATTACH ARBOR TIE TO TREE AND STAKE.
2. REMOVE ALL WRAPPING MATERIAL FROM ROOTBALL PRIOR TO PLANTING.
3. INSTALL THREE STAKES PER TREE, SPACED EVENLY AROUND THE TRUNK
4. REMOVE ALL STAKING AS SOON AS THE TREE IS STABLE.
5. CONTRACTOR SHALL PROVIDE TREE STAKING AS PART OF THE BASE BID.
6. CONTRACTOR TO REMOVE NURSERY TREE STAKE FROM ROOTBALL AT TIME OF PLANTING (TYP.).

## 1 TREE STAKING

SCALE: NTS

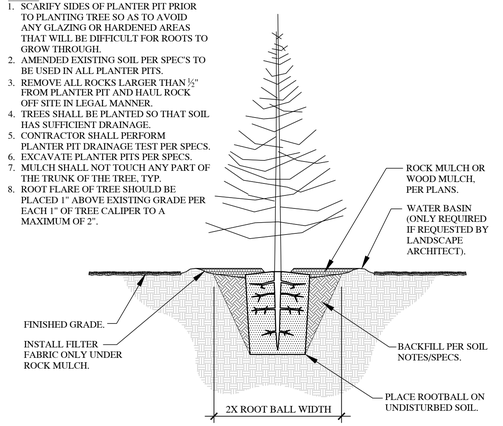
NOTES:
1. SCARIFY SIDES OF PLANTER PIT PRIOR TO PLANTING TREE SO AS TO AVOID ANY GLAZING OR HARDENED AREAS THAT WILL BE DIFFICULT FOR ROOTS TO GROW THROUGH.
2. AMENDED SOIL PER SPEC'S TO BE USED IN ALL PLANTER PITS.
3. REMOVE ALL ROCKS LARGER THAN ½" FROM PLANTER PIT AND HAUL ROCK OFF SITE IN LEGAL MANNER.
4. TREES SHALL BE PLANTED SO THAT SOIL HAS SUFFICIENT DRAINAGE.
5. CONTRACTOR SHALL PERFORM PLANTER PIT DRAINAGE TEST PER SPECS.
6. EXCAVATE PLANTER PITS PER SPECS.
7. ROCK OR WOOD MULCH SHALL NOT TOUCH ANY PART OF THE TRUNK OF THE TREE, TYP.
8. ROOT FLARE OF TREE SHOULD BE PLACED 1" ABOVE EXISTING GRADE PER EACH 1" OF TREE CALIPER TO A MAXIMUM OF 2".




## 2 DECIDUOUS TREE PLANTING

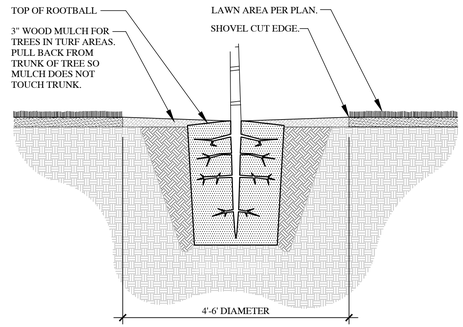
SCALE: NTS

NOTES:
1. SCARIFY SIDES OF PLANTER PIT PRIOR TO PLANTING TREE SO AS TO AVOID ANY GLAZING OR HARDENED AREAS THAT WILL BE DIFFICULT FOR ROOTS TO GROW THROUGH.
2. AMENDED EXISTING SOIL PER SPEC'S TO BE USED IN ALL PLANTER PITS.
3. REMOVE ALL ROCKS LARGER THAN ½" FROM PLANTER PIT AND HAUL ROCK OFF SITE IN LEGAL MANNER.
4. TREES SHALL BE PLANTED SO THAT SOIL HAS SUFFICIENT DRAINAGE.
5. CONTRACTOR SHALL PERFORM PLANTER PIT DRAINAGE TEST PER SPECS.
6. EXCAVATE PLANTER PITS PER SPECS.
7. MULCH SHALL NOT TOUCH ANY PART OF THE TRUNK OF THE TREE, TYP.
8. ROOT FLARE OF TREE SHOULD BE PLACED 1" ABOVE EXISTING GRADE PER EACH 1" OF TREE CALIPER TO A MAXIMUM OF 2".




## 3 EVERGREEN PLANTING

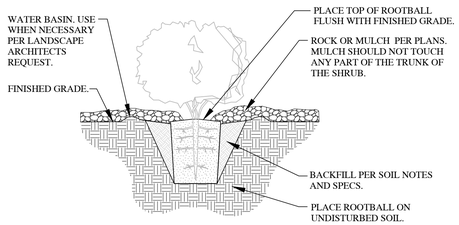
SCALE: NTS




NOTES:
1. DO NOT INSTALL WEED FABRIC UNDER WOOD MULCH.
2. TREE WELL FOR SMALL FLOWERING TREES SHALL BE 4'-0".
3. TREE WELL FOR LARGE SHADE TREES OR EVERGREENS SHALL BE 6'-0" UNLESS OTHERWISE NOTED.
4. AS TREES MATURE TREE WELL WILL NEED TO EXPAND.

## 4 TREE WELL IN TURF AREA

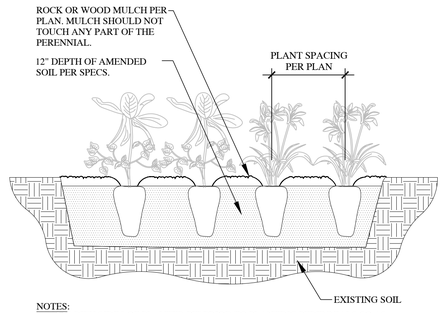
SCALE: NTS




NOTES:
1. SCARIFY SIDES OF PLANTER PIT PRIOR TO PLANTING SHRUB/GRASS SO AS TO AVOID ANY GLAZING OR HARDENED AREAS THAT WILL BE DIFFICULT FOR ROOTS TO GROW THROUGH.
2. IMPORTED & AMENDED TOPSOIL PER SPEC'S TO BE USED IN ALL PLANTER PITS.
3. REMOVE ALL COMPACTED, CLAY OR ROCKY SOILS FROM PIT AND HAUL OFF SITE IN A LEGAL MANNER.
4. CONTRACTOR SHALL PERFORM PLANTER PIT DRAINAGE TEST PER SPECS.
5. EXCAVATE PLANTER PITS PER SPECS.

## 5 SHRUB & ORNAMENTAL GRASS PLANTING

SCALE: NTS




NOTES:
1. SCARIFY SIDES OF PLANTER PIT PRIOR TO PLANTING PERENNIALS SO AS TO AVOID ANY GLAZING OR HARDENED AREAS THAT WILL BE DIFFICULT FOR ROOTS TO GROW THROUGH.
2. REMOVE ALL COMPACTED, CLAY OR ROCKY SOILS FROM PIT AND HAUL OFF SITE IN LEGAL MANNER.
3. CONTRACTOR SHALL PERFORM PLANTER PIT DRAINAGE TEST PER SPECS.
4. EXCAVATE PLANTER PITS PER SPECS.

## 6 PERENNIAL PLANTING

SCALE: NTS

# NOT USED

## 7 SOD LAYING AND EDGE

SCALE: NTS

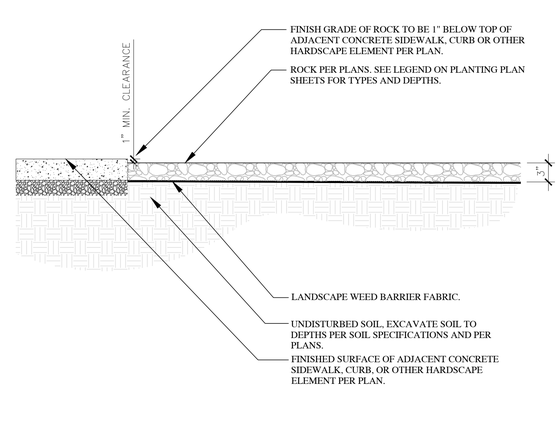
# NOT USED

## 00 6" MOWCURB SECTION

SCALE: NTS

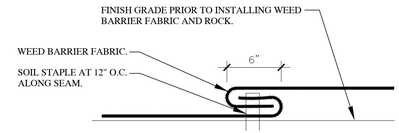
1. LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR VERIFYING QUANTITIES OF ALL MATERIALS FOR BIDDING AND INSTALLATION PURPOSES. IF DISCREPANCIES EXIST, THE PLAN SHALL DICTATE.
2. PLANT MATERIAL TO BE INSTALLED PER PLANT LEGEND. ANY SUBSTITUTIONS TO BE APPROVED BY OWNER AND/OR LANDSCAPE ARCHITECT.
3. NEW AUTOMATIC UNDERGROUND IRRIGATION SYSTEM TO BE INSTALLED PRIOR TO LANDSCAPE INSTALLATION TO ENSURE PROPER WATERING OF ALL LANDSCAPE AREAS. REFER TO IRRIGATION PLANS FOR SPECIFICS.
4. SANDY LOAM TOPSOIL TO BE INSTALLED AT THE FOLLOWING DEPTHS: 12" IMPORTED SANDY LOAM TOPSOIL (INCLUDING MIN. 15% HIGH GRADE DECOMPOSED ORGANIC MATERIAL MIXED INTO TOPSOIL PRIOR TO SPREADING) IN ALL NEW PLANTER AREAS. PROVIDE OWNER A BID ALTERNATE TO ONLY INSTALL 6" OF AMENDED TOPSOIL IN PLANTER AREAS VS. 12".
5. PLANTER BEDS TO BE EXCAVATED AS NECESSARY IN ORDER TO ALLOW FOR TOPSOIL, AMENDMENTS AND MULCH. THE FINISHED GRADE OF PLANTER AREAS SHALL BE APPROX. 1" BELOW TOP OF CURB, SIDEWALK, OR OTHER PAVED AREA.
6. DEWITT 5 OZ. WEED BARRIER FABRIC TO BE INSTALLED IN ALL ROCK MULCH AREAS (IF ANY). DO NOT INSTALL WEED BARRIER FABRIC UNDER ANNUALS, GROUNDCOVERS AND AREAS TO RECEIVE WOOD MULCH.
7. INSTALL PRE-EMERGENT HERBICIDE TO THE TOP OF THE FABRIC AFTER INSTALLING PLANTS AND PRIOR TO INSTALLING MULCH. AFTER INSTALLATION OF THE MULCH THE CONTRACTOR SHALL EVENLY BROADCAST A SECOND APPLICATION OF SLOW-RELEASE PRE-EMERGENT HERBICIDE. APPLY PRE-EMERGENT HERBICIDE PER MANUFACTURERS RECOMMENDATIONS. ALL PLANTING AREAS SHALL RECEIVE 2 APPLICATIONS OF PRE-EMERGENT HERBICIDE REGARDLESS OF WHETHER WEED FABRIC IS INSTALLED OR NOT.
8. DECORATIVE ROCK MULCH TO BE 1"-2" SIZE SOUTHTOWN CRUSHED STONE FROM UTAH LANDSCAPE ROCK AND INSTALLED AT A 3" DEPTH IN ALL TREE AND SHRUB PLANTER AREAS. PULL MULCH MIN. 3" AWAY FROM BASE OF ALL PERENNIALS AND SHRUBS AND MIN. 6" AWAY FROM ALL TREES. MULCH TYPE AND COLOR SHALL MATCH THE ADJACENT DEVELOPMENT. OWNER TO APPROVE THE MULCH TYPE AND COLOR PRIOR TO INSTALLATION.
9. IF HIGH WINDS ARE FREQUENT ON SITE, ALL TREES TO BE STAKED AT TIME OF PLANTING. SEE DETAILS FOR SPECIFICS. REMOVE STAKING WITHIN FIRST YEAR OR WHEN TREE IS ESTABLISHED.
10. CONTRACTOR SHALL INSPECT ALL DRAWINGS AND SPECIFICATIONS. ANY DISCREPANCIES FOUND IN THE DRAWINGS, DETAILS OR SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND IN-SITE DESIGN GROUP PRIOR TO CONSTRUCTION. CONTRACTOR SHALL OBTAIN WRITTEN FIELD DIRECTIVES FROM IN-SITE DESIGN GROUP AND/OR THE OWNER STATING PROPER COURSE OF ACTION IF DISCREPANCIES OR ERRORS ARE DISCOVERED PRIOR TO AND DURING CONSTRUCTION.

## 9 LANDSCAPE NOTES




NOTES:
1. ROCK SHALL BE SCREENED & DOUBLE WASHED AND BE FREE OF DEBRIS PRIOR TO INSTALLATION. IF ROCK SUPPLIER DOES NOT HAVE A WASH PLANT, THE LANDSCAPE CONTRACTOR SHALL STILL BE RESPONSIBLE FOR DOUBLE WASHING ALL ROCK AND BOULDERS PRIOR TO INSTALLATION.
2. INSTALL PRE-EMERGENT HERBICIDE TO THE TOP OF THE FABRIC AFTER INSTALLING PLANTS AND PRIOR TO INSTALLING MULCH. AFTER INSTALLATION OF THE MULCH THE CONTRACTOR SHALL EVENLY BROADCAST A SECOND APPLICATION OF SLOW-RELEASE PRE-EMERGENT HERBICIDE. APPLY PRE-EMERGENT HERBICIDE PER MANUFACTURERS RECOMMENDATIONS.
3. KEEP TOP OF ROCK 1"-1½" BELOW ADJACENT WALKS AND CURBS. DO NOT ALLOW ROCK TO TOUCH THE TRUNK OF ANY PLANT. INSTALL ROCK AFTER INSTALLATION OF WEED BARRIER FABRIC AND PLANT MATERIAL.
4. CONTRACTOR TO ENSURE THAT TOP OF WEED BARRIER FABRIC IS FREE OF SOILS AND DEBRIS PRIOR TO PLACING ROCK.
5. SEE LANDSCAPE PLANS FOR ROCK TYPE AND DEPTH.

WEED FABRIC NOTE:
INSTALL 6" SOIL STAPLE IN WEED BARRIER FABRIC AT 5' O.C. TRIANGULAR SPACING. INSTALL 6" SOIL STAPLE AT 12" O.C. ALONG ALL WEED BARRIER FABRIC SEAMS. OVERLAP FABRIC MIN. OF 6" AT ALL SEAMS AS SHOWN BELOW. INSTALL SOIL STAPLE 6' O.C. ALONG EDGES & 2 AT EACH CORNER.




## 10 ROCK AND WEED BARRIER FABRIC

SCALE: NTS


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## Client:

Goldfish Swim Schools

## Project:

GSS - American Fork, UT
348 South 500 East
American Fork, Utah

| Issued | Description | By |
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## Brand Standard:

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## Seal:

STATE OF UTAH
DARREN G. WILSON
NO. 356187
08-24-2021
LICENSED LANDSCAPE ARCHITECT

## Note:

Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

## North Arrow:

## Sheet Title:

PLANTING DETAILS

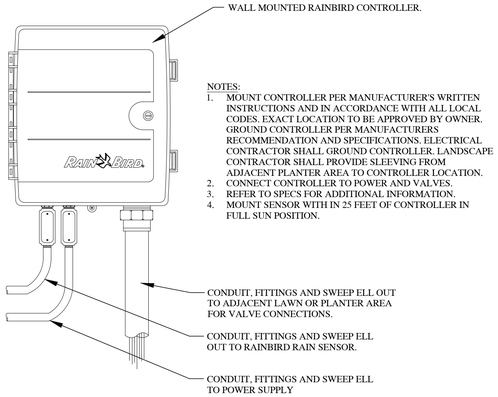
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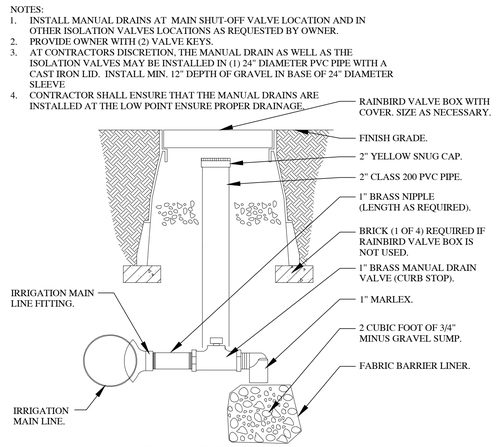
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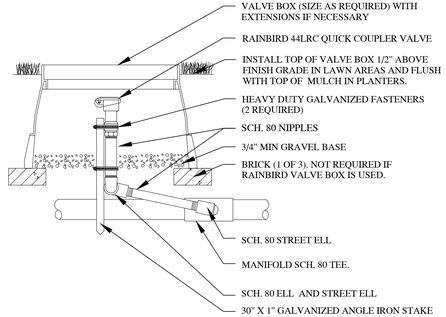

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1 CONTROLLER WITH SENSOR
SCALE: NTS

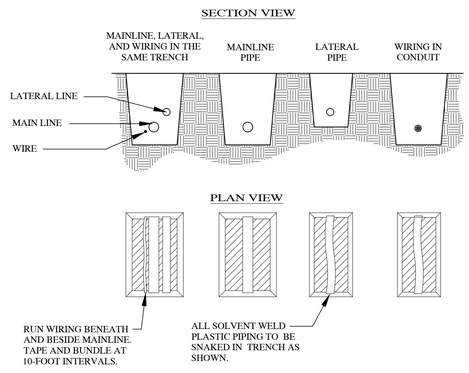



2 MANUAL DRAIN (OPTIONAL)
SCALE: NTS




NOTES:
1. FLUSH ALL PIPING PRIOR TO INSTALLING VALVE.
2. WRAP ALL THREADS WITH TEFLON TAPE. 1.1/2 TO 2 WRAPS MAXIMUM.
3. COMPACT SOILS AROUND VALVE BOX TO 80% OF ORIGINAL DRY DENSITY.
4. INSTALL GEOFABRIC UNDER VALVE BOXES AND TAPE TO PIPE NIPPLES AND VALVE BOX.
5. BOX COLOR - GREEN IN TURF AND TAN IN PLANTER AREAS.
6. IRRIGATION SYSTEM TO BE BLOWN OUT WITH AIR COMPRESSOR THROUGH THE RPZ AND QUICK COUPLERS BEFORE FREEZING TEMPERATURES OCCUR, TYP.
7. SCH 80 PVC TEE OR ELL'S CAN BE USED ON ALL QUICK COUPLERS EXCEPT AT POINT OF CONNECTION (IF QUICK COUPLER(S) ARE INSTALLED AT THE POINT OF CONNECTION). ALL QUICK COUPLER FITTINGS AND NIPPLES AT P.O.C. QUICK COUPLER(S) TO BE GALVANIZED.

3 QUICK COUPLER VALVE
SCALE: NTS

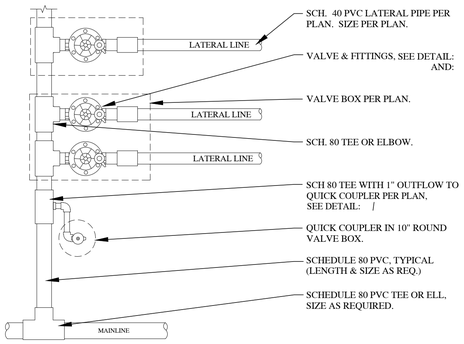



NOTES:
1. SLEEVE BELOW ALL HARDSCAPE ELEMENTS (WITH CLASS 200 OR SCH. 40 OR SCH. 80 PER SPECS.) TWICE THE DIAMETER OF THE PIPE OR WIRE BUNDLE WITHIN.
2. FOR PIPE AND WIRE BURIAL DEPTHS, SEE NOTES AND SPECS.
3. NO LINE VOLTAGE WIRING SHALL BE ALLOWED IN IRRIGATION TRENCHES.

4 PIPE, WIRE, AND TRENCH
SCALE: NTS

NOT USED

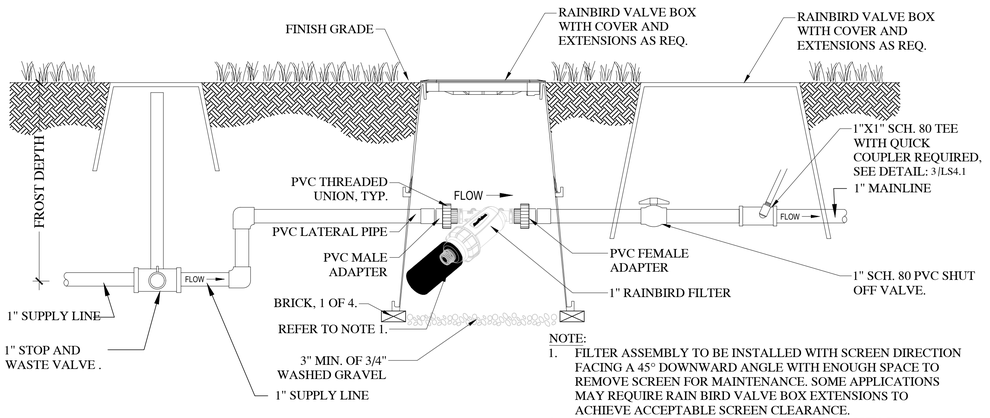
NOT USED




NOTES:
1. ALL VALVE MANIFOLD PIPING AND FITTINGS TO BE SCH. 80 FITTINGS, UNLESS THERE IS A DRIP ZONE ALL BY ITSELF IN WHICH CASE THE PIPING SHALL BE SIZED PER THE FLOW OF THE DRIP ZONE.
2. MODIFY MANIFOLD AS NECESSARY DEPENDING ON HOW MANY VALVES ARE IN A CLUSTER.
3. MODIFY AS REQUIRED DEPENDING ON WHETHER THE VALVES ARE PARALLEL OR PERPENDICULAR TO MAINLINE.

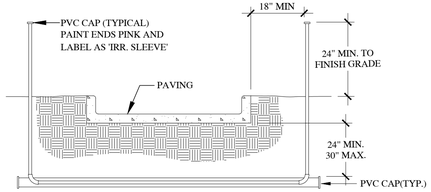
5 VALVE MANIFOLD
SCALE: NTS

NOT USED



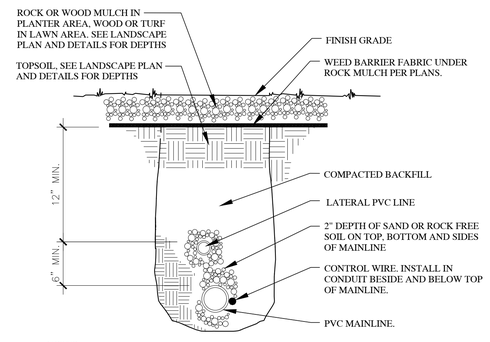

NOTE:
1. FILTER ASSEMBLY TO BE INSTALLED WITH SCREEN DIRECTION FACING A 45° DOWNWARD ANGLE WITH ENOUGH SPACE TO REMOVE SCREEN FOR MAINTENANCE. SOME APPLICATIONS MAY REQUIRE RAIN BIRD VALVE BOX EXTENSIONS TO ACHIEVE ACCEPTABLE SCREEN CLEARANCE.
2. BRICKS ARE NOT REQUIRED UNDER VALVE BOXES IF RAINBIRD VALVE BOXES ARE USED.
3. INSTALL MISC. REDUCER FITTINGS AS REQ. (NOT SHOWN).

11 1-1/2" SCREEN FILTER IN BOX
SCALE: NTS




NOTE:
1. WHERE THERE IS MORE THAN ONE SLEEVE, EXTEND THE SMALLER SLEEVE TO 24-INCHES MINIMUM ABOVE FINISH GRADE.
2. ALL SLEEVES INSTALLED SHALL BE DUCT TAPED TO PREVENT DIRT OR OTHER DEBRIS ENTERING PIPE. ALL SLEEVES SHALL BE IDENTIFIED BY WOOD OR PVC STAKES AND BE SPRAY PAINTED WITH MARKING PAINT. REMOVE STAKES ONCE IRRIGATION SYSTEM IS COMPLETE.

8 SLEEVING
SCALE: NTS




NOTES:
1. PROVIDE SLACK IN CONTROL WIRES AT ALL CHANGES IN DIRECTION.
2. MAINLINE DEPTH SHALL BE 18" DEEP EXCEPT UNDER ASPHALT & CONCRETE PAVING AND AT P.O.C. SHALL BE MIN OF 24" & MAX OF 30". INSTALL ADDITIONAL FITTINGS & RESTRAINTS AS REQUIRED.
3. MAINLINE AND LATERAL LINES SHALL BE KEPT MIN. 12" FROM ALL SIDEWALKS AND CURBS.

9 TRENCH SECTION
SCALE: NTS

NOT USED

10 POP-UP SPRAY
SCALE: NTS


In Site DESIGN GROUP
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17 North 470 West American Fork, Utah 84003
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## Client:
Goldfish Swim Schools

## Project:
GSS - American Fork, UT
348 South 500 East
American Fork, Utah

| Issued | Description | By |
|---|---|---|
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| 09.29.2021 | C&S/Bids | DW |
| 10.29.2021 | C&S/Bids | GW |

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## Seal:
STATE OF UTAH
DARREN G. WILSON
NO. 356187
05-24-2021
LICENSED LANDSCAPE ARCHITECT

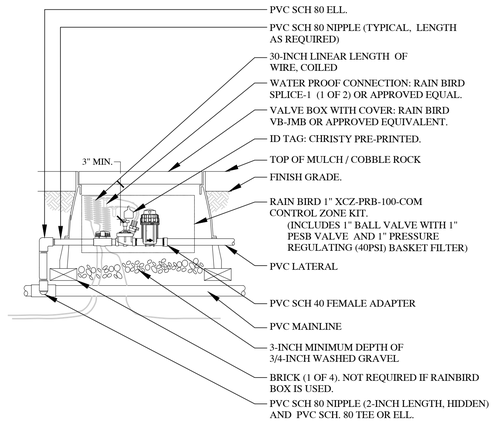
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## North Arrow:

## Sheet Title:
IRRIGATION DETAILS

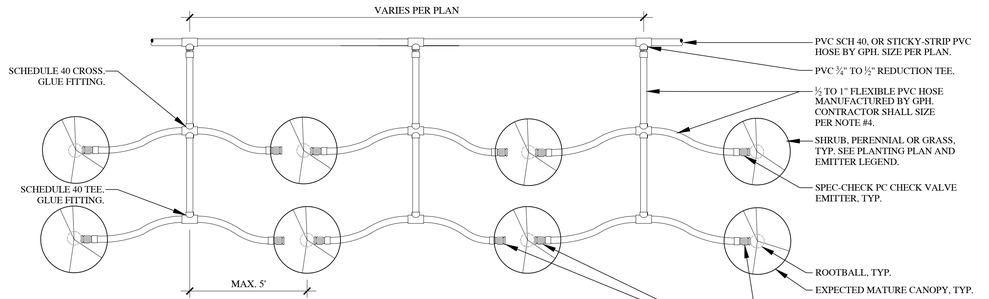
## Project Number:
21-017

## Sheet Number:
LS4.1




## 12 1" DRIP CONTROL ZONE KIT

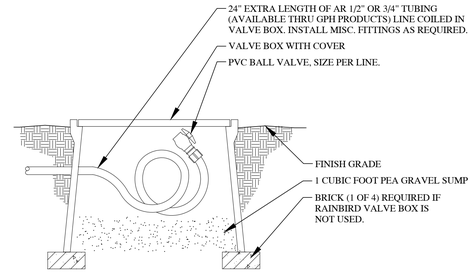
SCALE: NTS




NOTES:
1. EMITTER SPACING SHALL BE BASED ON PLANT SPACING. INSTALL ALL IRRIGATION USING THE COMPONENTS DESCRIBED ABOVE.
2. IRRIGATION EQUIPMENT SHALL BE COMPLETELY INSTALLED PRIOR TO PLANT LAYOUTS.
3. ADJUST IRRIGATION SPACING TO ACCOMMODATE FINAL PLANT LAYOUT.
4. 1/2" PVC FLEX HOSE SHALL NOT EXCEED 4GPM, 3/4" PVC FLEX HOSE SHALL NOT EXCEED 8GPM AND 1" PVC FLEX HOSE SHALL NOT EXCEED 13GPM.
5. AT OWNERS DISCRETION, A LESS EXPENSIVE DRIP SYSTEM MAY BE INSTALLED. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS, SUBMITTAL CUT SHEETS AND POTENTIAL COST SAVINGS TO OWNER. HOWEVER, THE OWNER AND LANDSCAPE ARCHITECT MUST APPROVE ALL CHANGES IN MATERIALS AND CONSTRUCTION PRACTICES IF DIFFERENT FROM THE PLAN.
6. SMALL EVERGREEN TREES MAY NEED FEWER EMITTERS. CONSULT WITH THE LANDSCAPE ARCHITECT ON-SITE PRIOR TO INSTALLING IRRIGATION TO DETERMINE QUANTITY OF EMITTERS.
7. SEE IRRIGATION SHEET FOR DRIP EMITTER LEGEND.
8. USE IPS WELDON 795 GLUE AND P70 PRIMER PER GPH INC. SPECIFICATIONS.
9. DO NOT INSTALL PIPE, FITTINGS, OR GLUE IN TEMPERATURES BELOW 40 DEGREES. SEE MANUFACTURER SPECIFICATIONS FROM MORE INFORMATION.

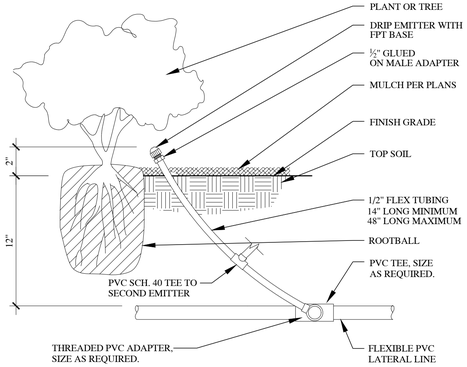
## 13 GPH DRIP EMITTER PLAN VIEW

SCALE: NTS




## 14 DRIP LINE FLUSH CAP

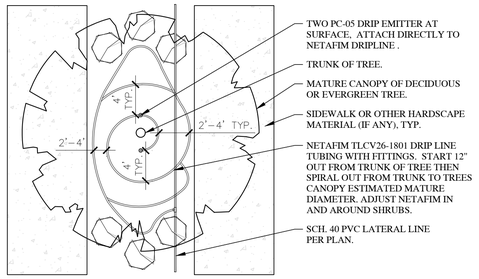
SCALE: NTS




NOTE:
1. FOR LAYOUT OF MULTIPLE SHRUBS, CONTRACTOR SHALL USE TEE'S AS NECESSARY. FOR LAYOUT INFORMATION, SEE DETAIL: /

## 15 DRIP EMITTER

SCALE: NTS




NOTES:
1. LAYOUT SHOWN IS TYPICAL. ON SITE MODIFICATIONS WILL BE REQUIRED DUE TO VARYING SIZE OF PLANTER ISLANDS. CONSULT WITH LANDSCAPE ARCHITECT ON-SITE PRIOR TO INSTALLATION TO DETERMINE HOW MUCH DRIP NEEDS TO BE INSTALLED AND WHAT CONFIGURATION IS APPROPRIATE.
2. INSTALL NETAFIM DRIP TUBING UNDER WEED BARRIER FABRIC. USE THIS DETAIL FOR ALL TREES PLANTED IN COBBLE ROCK AREAS. CONTRACTOR SHALL BE CAREFUL NOT TO DAMAGE OR PINCH TUBING WHEN PLACING COBBLE ROCK AND BOULDERS.
3. TREES PLANTED IN LAWN AREAS WILL NOT BE WATERED BY DRIP BUT WILL BE WATERED BY THE LAWN SPRINKLERS.
4. THIS DETAIL IS FOR DESIGN INTENT ONLY AND IS NOT TO SCALE. CONTRACTOR MUST INSTALL DRIP LINE PER THIS DETAIL OUT TO THE DRIPLINE OF THE TREES MATURE SIZE.
5. FOR LINEAR PLANTERS WITH TREES, INSTALL NETAFIM IN STRAIGHT LINES RATHER THAN A CIRCULAR PATTERN AROUND THE TREE.
6. INSTALL A FLUSH VALVE (NOT SHOWN) AT THE END OF ALL DRIP LINES, PER PLAN.

## 16 TREE DRIP WITH PARTIAL PLANTING UNDER CANOPY

SCALE: NTS

2120 E. 11 Mile Rd. | Royal Oak, MI 48067
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## Client:

Goldfish Swim Schools

## Project:

GSS - American Fork, UT
348 South 500 East
American Fork, Utah

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## Seal:

STATE OF UTAH
DARREN G. WILSON
NO. 356187
08-24-2021
LICENSED LANDSCAPE ARCHITECT

## Note:

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## North Arrow:

## Sheet Title:

IRRIGATION DETAILS

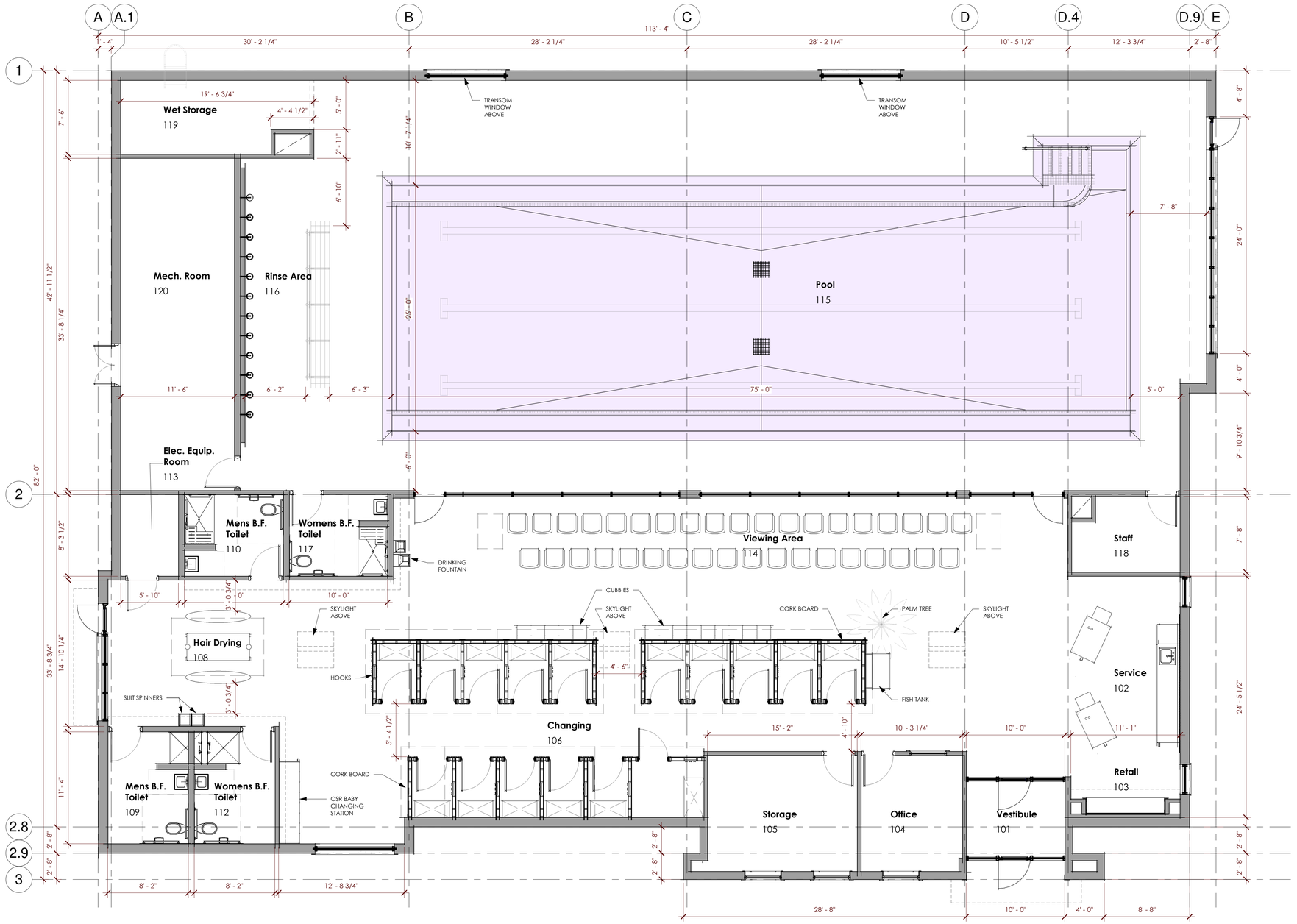
## Project Number:

21-017

## Sheet Number:

LS4.2

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Landscape Architecture Land Planning
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801.756.5043 www.in-sitedesigngroup.com




## First Floor - Proposed - 8,783 Gross S.F.

3/16" = 1'-0"


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## Client:

Goldfish Swim Schools
FA.192

## Project:

GSS - American Fork, UT
348 South 500 East
American Fork, Utah

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STATE OF UTAH
JEFFREY G. KRATT
10079384-0301
LICENSED ARCHITECT

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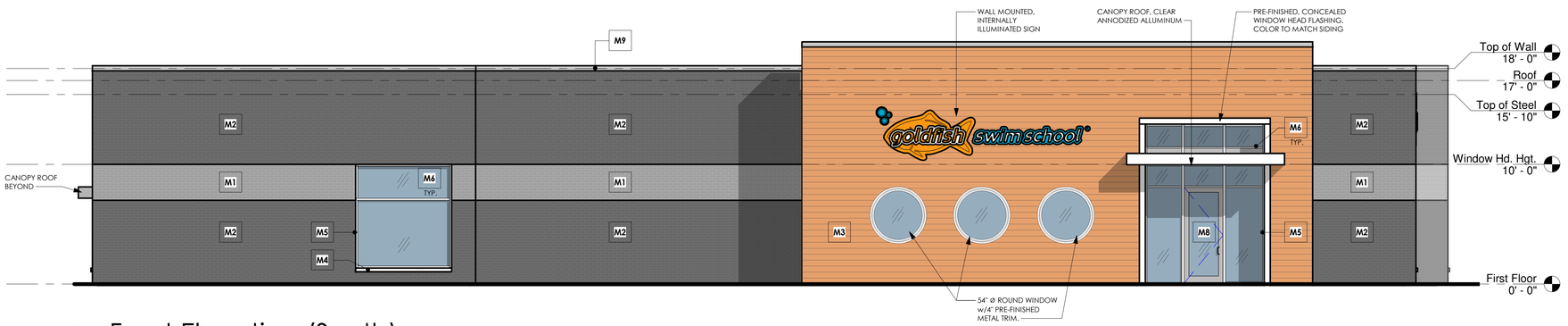
Floor Plan - Proposed

## Project Number:

21-017

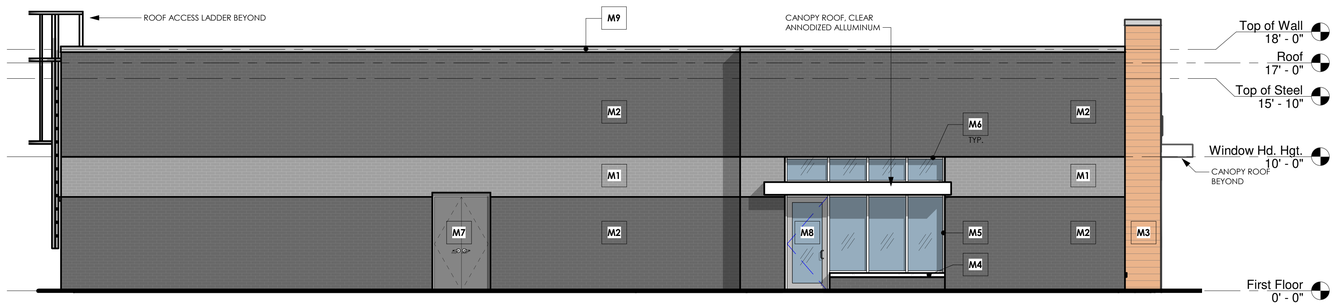
## Sheet Number:

A.100




1 Front Elevation (South)

3/16" = 1'-0"
A.101




2 Side Elevation (West)

3/16" = 1'-0"
A.101

## Exterior Material Schedule X

| TAG | DESCRIPTION | LOCATION | MANUFACTURER | FINISH / COLOR |
|---|---|---|---|---|
| M-1 | CMU (BRICK) FACADE (LIGHTER) | AS NOTED ON ELEVATIONS | SPEC-BRIK - HI-R | FACE BRICK: HARGUS<br>MORTAR: MATCH BRICK COLORS (SUBMIT SAMPLE) |
| M-2 | CMU (BRICK) FACADE (DARKER) | AS NOTED ON ELEVATIONS | SPEC-BRIK - HI-R | FACE BRICK: CHESAPEAKE<br>MORTAR: MATCH BRICK COLORS (SUBMIT SAMPLES) |
| M-3 | HORIZONTAL ALUMINUM WOOD GRAIN SIDING | AS NOTED ON ELEVATIONS | LONGBOARD - 6" CHANNEL SIDING PLANKS | WOODGRAIN - COLOR TBD. |
| M-4 | STONE SILL | AS NOTED ON ELEVATIONS | - | - |
| M-5 | STOREFRONT GLAZING FRAMES | AS NOTED ON ELEVATIONS | SUBMIT SHOP DRAWINGS FOR APPROVAL | KAWNEER-TRIFAB VG451T |
| M-6 | STOREFRONT CLEAR GLASS | AS NOTED ON ELEVATIONS | SUBMIT SHOP DRAWINGS FOR APPROVAL | 1" INSULATED W/LOW E-COATING PPG SOLARBAN 60 |
| M-7 | H.M. DELIVERY DOOR & FRAME | AS NOTED ON ELEVATIONS | SEE DOOR SCHEDULE ON A.600 | SHERWIN WILLIAMS SW6075 GARRET GRAY |
| M-8 | ALUMINUM/GLASS DOOR | AS NOTED ON ELEVATIONS | SEE DOOR SCHEDULE ON A.600 | CLEAR ANOD. ALUMINUM W/CLEAR TEMP. GLASS |
| M-9 | PRE-FINISHED METAL COPING | AS NOTED ON ELEVATIONS | PAC-CLAD PAC TITE COPING | SILVER METALLIC (SUBMIT SAMPLES FOR APPROVAL) |
| M-10 | PRE-FIN. METAL FLUSH WALL PANELS | AS NOTED ON ELEVATIONS | CEI-COMPOSITE MATERIALS 734-212-3006 | MCM-METAL COMPOSITE MATERIAL/#4000 COLOR: TO MATCH STOREFRONT (SUBMIT SAMPLE) |

**NOTE:**
INSTALL CONTROL JOINT AT MAXIMUM 25'-0" SPACING IN BRICK VENEER.
INSTALL PER CODE AND MASONRY INSTITUTE STANDARDS.
CAULK ALL EXPANSION JOINTS WITH SPECIFIED COLOR TO MATCH BRICK, OR APPROVED SAMPLE/
CAULK: TREMCO - DYMONIC 100 - POLYURETHANE SEALANT (OR EQUIVALANT) : MATCH TO BRICK COLOR - SEE COLOR GUIDE online:
TREMCOSEALANTS.COM/PRODUCTS/DYMONIC-100.ASPX (MATCH TO SUBMITTED BRICK SAMPLES)

**REFER TO SHEET CS.600 FOR WINDOW TYPE LEGEND. *ALL GLAZING AND DOORS TO BE THERMALLY BROKEN***

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Client:
Goldfish Swim Schools
FA.192

Project:
GSS - American Fork, UT
348 South 500 East
American Fork, Utah

| Issued | Description | By |
|---|---|---|
| 06.07.2021 | TRC Review | TS |
| 08.24.2021 | TRC Revisions 01 | TS |

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Seal:
STATE OF UTAH
JEFFREY G KLATT
9079384-0301
LICENSED ARCHITECT

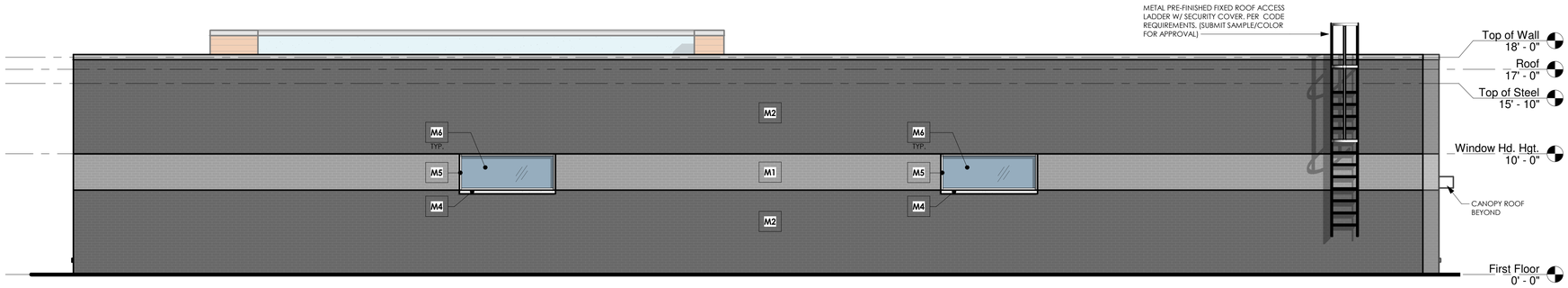
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North Arrow:

Sheet Title:
Exterior Elevations

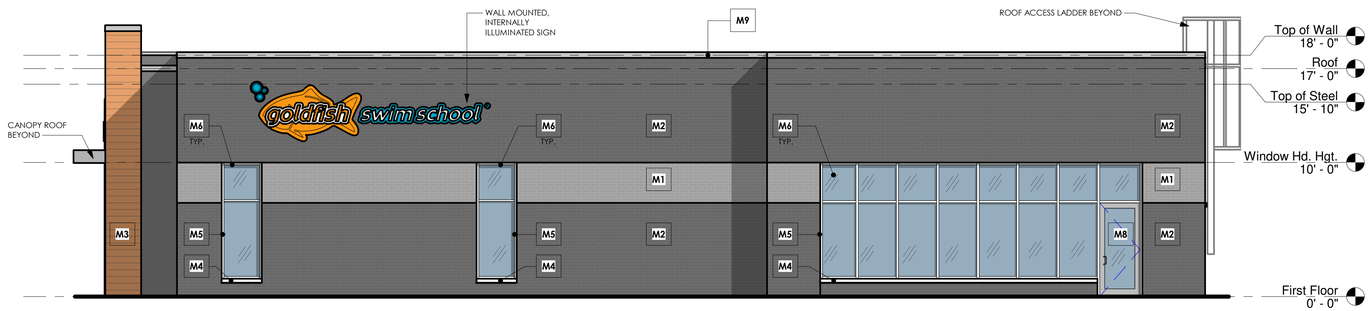
Project Number:
21-017

Sheet Number:
A.200




## 3 Rear Elevation (North)

3/16" = 1'-0"
A.101




## 4 Side Elevation (East)

3/16" = 1'-0"
A.101

## Exterior Material Schedule X

| TAG | DESCRIPTION | LOCATION | MANUFACTURER | FINISH / COLOR |
|---|---|---|---|---|
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| M-5 | STOREFRONT GLAZING FRAMES | AS NOTED ON ELEVATIONS | SUBMIT SHOP DRAWINGS FOR APPROVAL | KAWNEER-TRIFAB VG451T |
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| M-8 | ALUMINUM/GLASS DOOR | AS NOTED ON ELEVATIONS | SEE DOOR SCHEDULE ON A.600 | CLEAR ANOD. ALUMINUM W/CLEAR TEMP. GLASS |
| M-9 | PRE-FINISHED METAL COPING | AS NOTED ON ELEVATIONS | PAC-CLAD PAC TITE COPING | SILVER METALLIC (SUBMIT SAMPLES FOR APPROVAL) |
| M-10 | PRE-FIN. METAL FLUSH WALL PANELS | AS NOTED ON ELEVATIONS | CEI-COMPOSITE MATERIALS 734-212-3006 | MCM-METAL COMPOSITE MATERIAL/#4000 COLOR: TO MATCH STOREFRONT (SUBMIT SAMPLE) |

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STATE OF UTAH
JEFFREY G KLATT
9079384-0301
LICENSED ARCHITECT

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North Arrow:

Sheet Title:
Exterior Elevations

Project Number:
21-017

Sheet Number:
A.201



South-West Rendering - 1
No Scale



South-West Rendering - 2
No Scale



South-East Rendering - 1
No Scale



South-East Rendering - 2
No Scale

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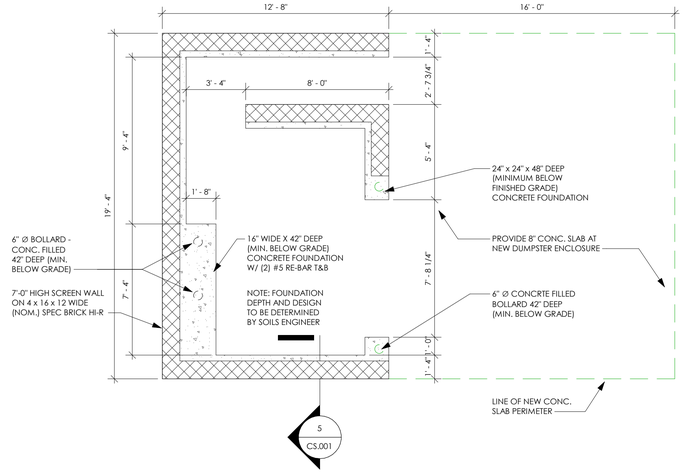
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## North Arrow:

## Sheet Title:
3D Views

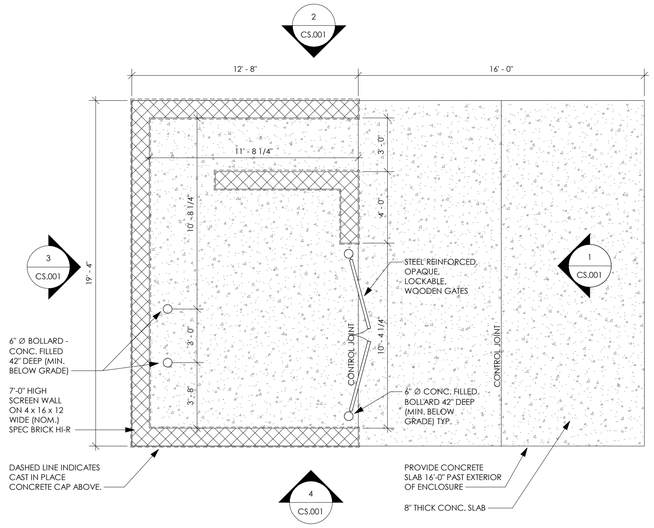
## Project Number:
21-017

## Sheet Number:
CS.000




# Trash Enclosure Foundation Plan

1/4" = 1'-0"




# Trash Enclosure Floor Plan

1/4" = 1'-0"



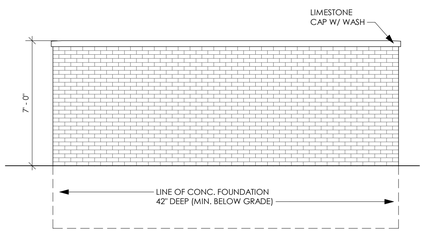

# 1 Trash Enclosure Elev. 1

1/4" = 1'-0"



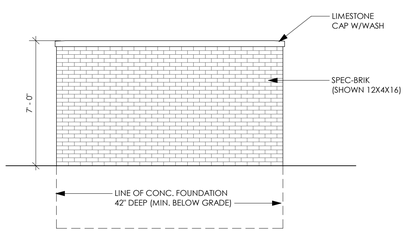

# 2 Trash Enclosure Elev. 2

1/4" = 1'-0"



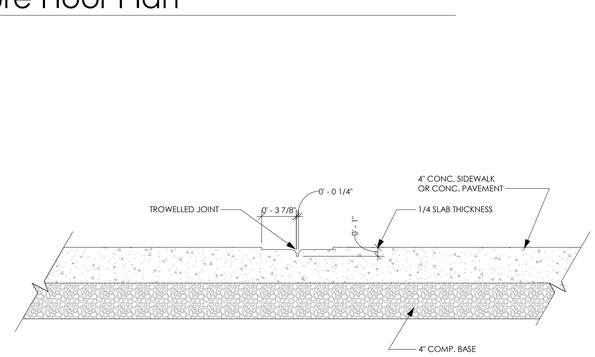

# 3 Trash Enclosure Elev. 3

1/4" = 1'-0"



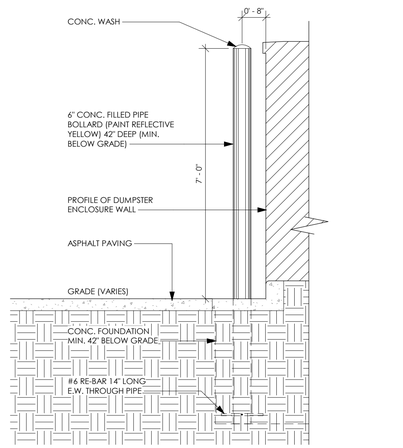

# 4 Trash Enclosure Elev. 4

1/4" = 1'-0"



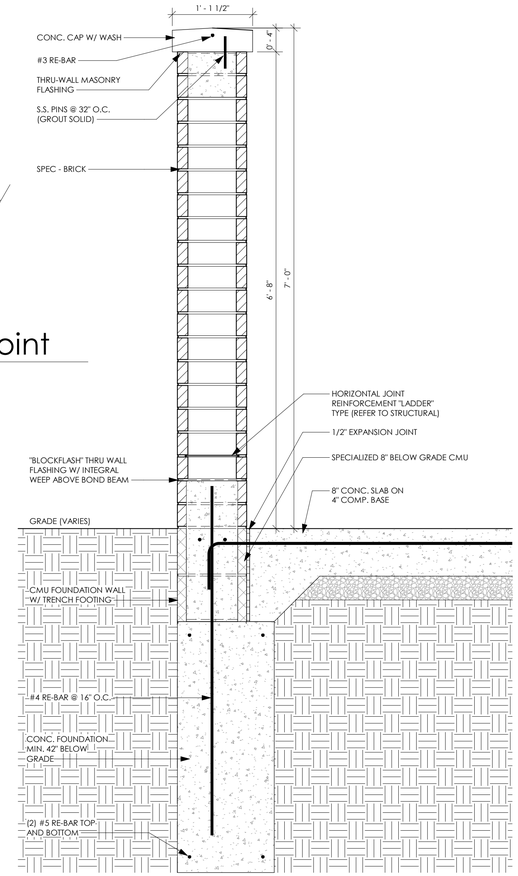

# Trash Enclosure Detail @ Construction Joint

1 1/2" = 1'-0"




# Trash Enclosure Bollard Detail

1/2" = 1'-0"




# 5 Trash Enclosure Section

1" = 1'-0"

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**P:** 248.414.9270 **F:** 248.414.9275
**www.kriegerklatt.com**

## Client:

Goldfish Swim Schools
FA.192

## Project:

GSS - American Fork, UT
348 South 500 East
American Fork, Utah

| Issued | Description | By |
|---|---|---|
| 06.07.2021 | TRC Review | TS |
| 08.24.2021 | TRC Revisions 01 | TS |

## Brand Standard:

All Brand Standards must be followed - No deviation permitted without prior written Goldfish Franchise approval.

## Seal:

STATE OF UTAH
JEFFREY O KLATT
1079384-0301
LICENSED ARCHITECT

## Note:

Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

## North Arrow:

## Sheet Title:

Trash Enclosure Plans & Details

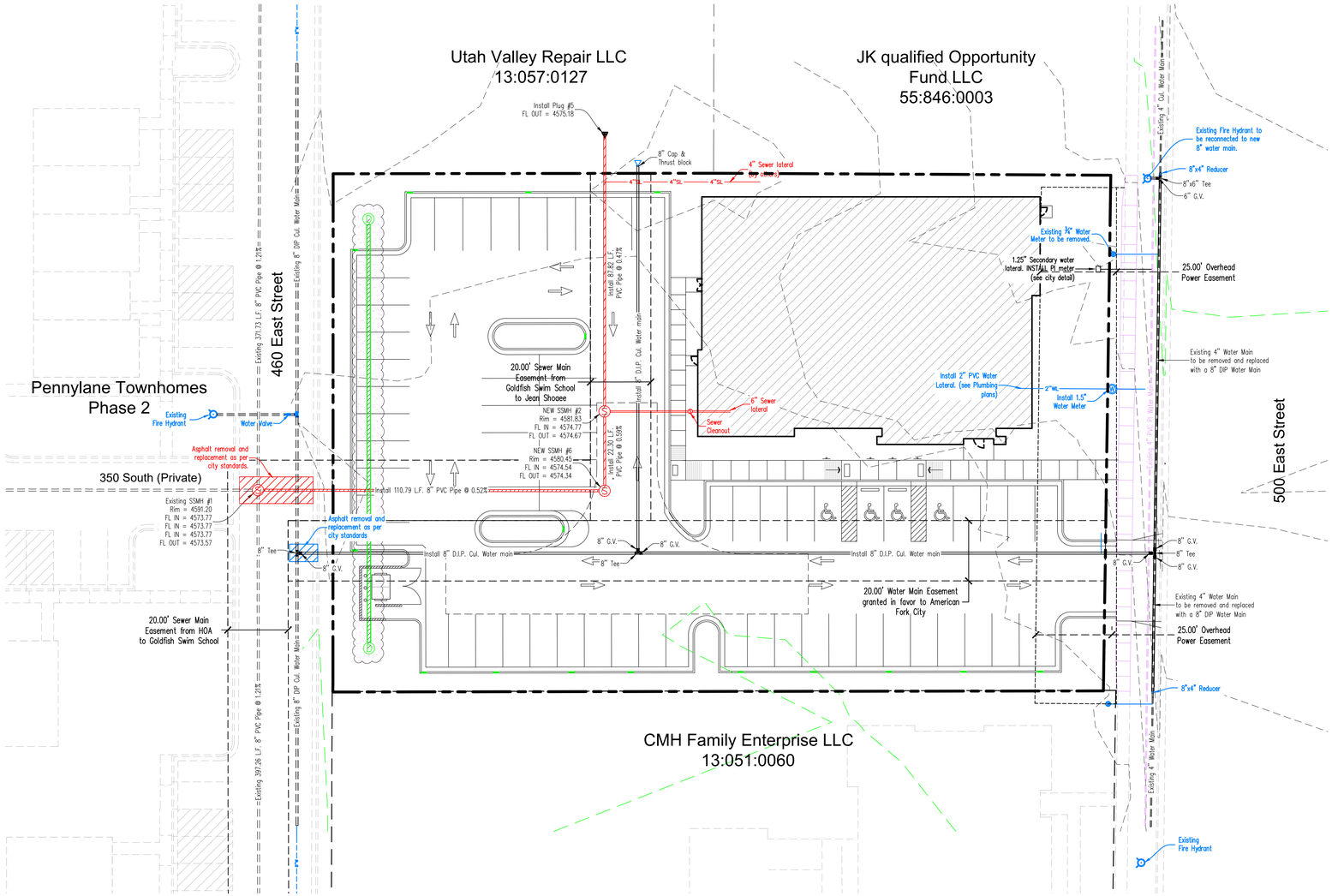
## Project Number:

21-017

## Sheet Number:

CS.001

NORTH
1" = 20'




CAUTION!!! Notice to contractors

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Note:

Source information from plans and markings has been combined with observed evidence of existing utilities to develop a view of those underground utilities. However lacking excavation, Blue Staking, etc. the exact location of underground features cannot be accurately, completely and reliably depicted. Where additional or more detailed information is required, the client is advised that excavation may be necessary.

GRAPHIC SCALE

20 0 10 20 40 80

( IN FEET )
1 inch = 20 ft.

DUDLEY AND ASSOCIATES
ENGINEERS PLANNERS SURVEYORS
353 EAST 1200 SOUTH, OREM, UTAH
801-224-1252

Goldfish Swim School

# Utility Plan

American Fork, Utah

REGISTERED PROFESSIONAL ENGINEER
No. 147089
Roger D Dudley
STATE OF UTAH

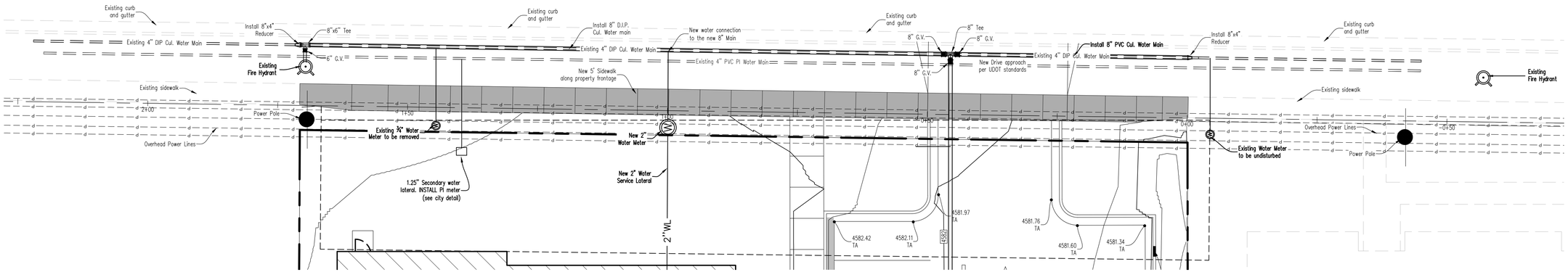
Revisions

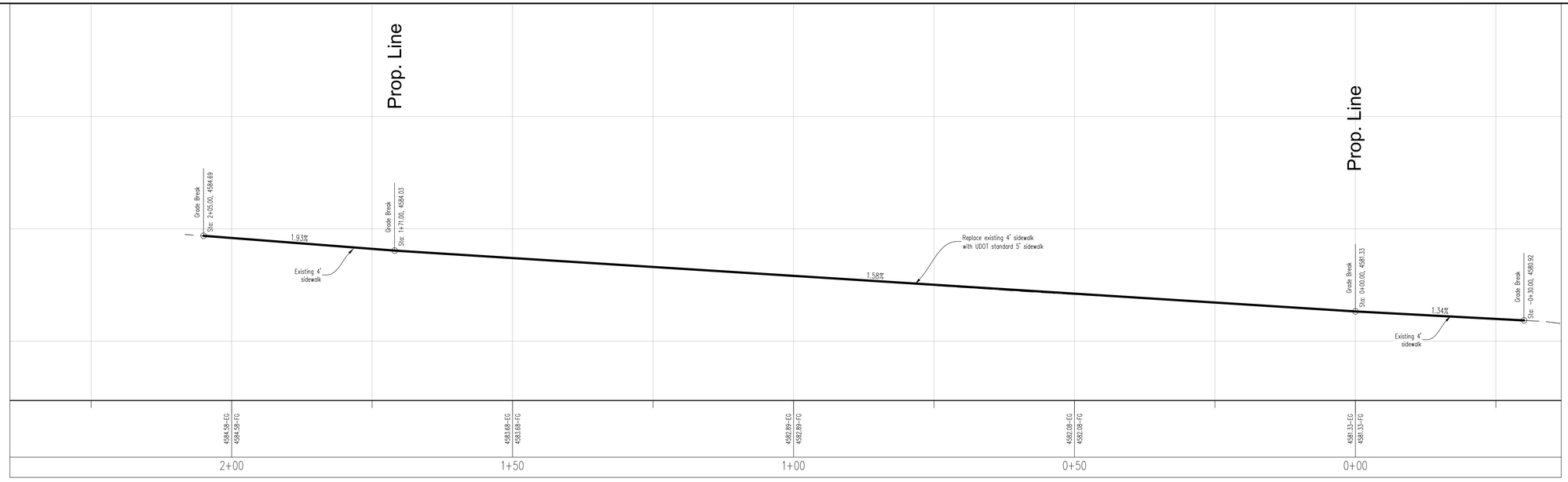
| |
|---|
| Date |
| 11-18-2021 |
| Scale |
| 1" = 20' |
| By |
| TD |
| Tracing No. |
| L - 14630 |

Sheet No.
C - 3.0

NORTH
1" = 10'

500 East Street




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GRAPHIC SCALE
10 0 5 10 20 40
( IN FEET )
1 inch = 10 ft.

DUDLEY AND ASSOCIATES
ENGINEERS PLANNERS SURVEYORS
353 EAST 1200 SOUTH, OREM, UTAH
801-224-1252

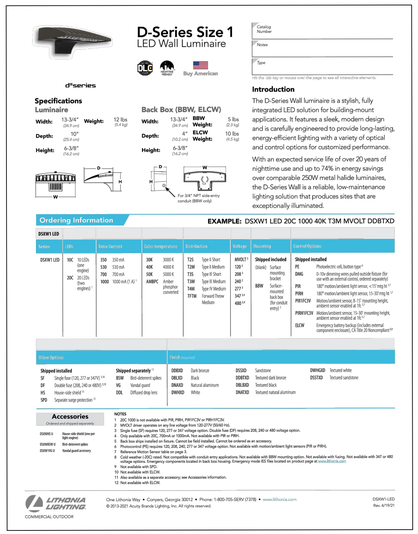
Street Improvement Plan
Goldfish Swim School
American Fork Utah

REGISTERED PROFESSIONAL ENGINEER
No. 147089
Roger D. Dudley
STATE OF UTAH

Revisions

| |
|---|
| Date |
| 8-24-2021 |
| Scale |
| 1" = 10' |
| By |
| TD |
| Tracing No. |
| L - |

Sheet No.
P - 1



D-Series Size 1
LED Wall Luminaire

Buy American

d*series

Specifications

Luminaire

Width: 13-3/4" (34.9 cm) Weight: 12 lbs (5.4 kg)
Depth: 10" (25.4 cm)
Height: 6-3/8" (16.2 cm)

Back Box (BBW, ELCW)

Width: 13-3/4" (34.9 cm) BBW Weight: 5 lbs (2.3 kg)
Depth: 4" (10.2 cm) ELCW Weight: 10 lbs (4.5 kg)
Height: 6-3/8" (16.2 cm)

For 3/4" NPT side-entry conduit (BBW only)

Catalog Number
Notes
Type

Hit the tab key or mouse over the page to see all interactive elements.

Introduction

The D-Series Wall luminaire is a stylish, fully integrated LED solution for building-mount applications. It features a sleek, modern design and is carefully engineered to provide long-lasting, energy-efficient lighting with a variety of optical and control options for customized performance.

With an expected service life of over 20 years of nighttime use and up to 74% in energy savings over comparable 250W metal halide luminaires, the D-Series Wall is a reliable, low-maintenance lighting solution that produces sites that are exceptionally illuminated.

Ordering Information EXAMPLE: DSXW1 LED 20C 1000 40K T3M MVOLT DDBTXD

DSXW1 LED

| Series | LEDs | Color Correct | Color temperature | Distribution | Voltage | Mounting | Control Options |
|---|---|---|---|---|---|---|---|
| DSXW1 LED | 10C 10 LEDs (one engine) | 350 350 mA | 30K 3000 K | T2S Type II Short | MVOLT[1] | Shipped included | Shipped included |
| | 20C 20 LEDs (two engines) | 530 530 mA | 40K 4000 K | T2M Type II Medium | 120[1] | PE Photoelectric cell, button type[2] | |
| | | 700 700 mA | 50K 5000 K | T3S Type III Short | 208[1] | DMG 0-10v dimming wires pulled outside fixture (for use with an external control, ordered separately) | |
| | | 1000 1000 mA [1,2] | AMBPC Amber phosphor converted | T3M Type III Medium | 240[1] | PIR 180° motion/ambient light sensor, <15' mtg ht[3] | |
| | | | | T4M Type IV Medium | 277[1] | PIR1 180° motion/ambient light sensor, 15-30' mtg ht[3] | |
| | | | | TFTM Forward Throw Medium | 347[1,3] | PIRTCW Motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5fc[3] | |
| | | | | | 480[1,3] | PIRHTCW Motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 3fc[3] | |
| | | | | | | ELCW Emergency battery backup (includes external components enclosure), CA Title 20 Noncompliant[4] | |

| Other Options | Finish (required) |
|---|---|
| Shipped installed: SF Single fuse (120, 277 or 347V)[1,5]; DF Double fuse (208, 240 or 480V)[1,5]; HS House-side shield[6]; SPD Separate surge protection[7] | Shipped separately[8]: BSW Bird deterrent spikes; WG Vandal guard; DDL Diffused drop lens. DDBDD Dark bronze; DBLXD Black; DNAXD Natural aluminum; DWHXD White; BSSXD Sandstone; DDBTXD Textured dark bronze; DBLBXD Textured black; DNATXD Textured natural aluminum; DWHGXD Textured white; DSSTXD Textured sandstone |

Accessories

Ordered and shipped separately

DSXW1 U Square pole shield (one per light engine)
DSXW1B U Bird deterrent spike
DSXW1W U Vandal guard accessory

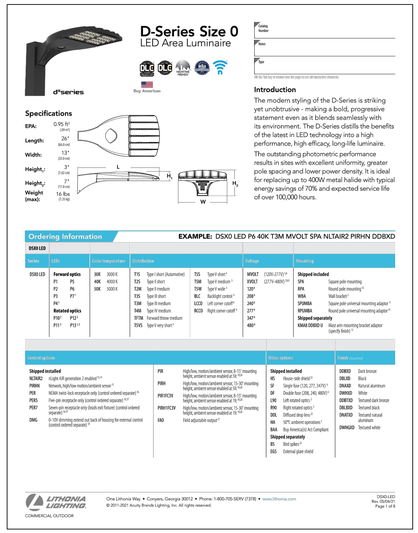
NOTES

1. 20C 1000 is not available with PIR, PIRH, PIRTCW or PIRHTCW.
2. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz).
3. Reference Motion Sensor table on page 3. Dimming driver standard. PIR, PIR1, PIRTCW and PIRHTCW require 208, 240 or 480 voltage option.
4. Only available with 20C, 700mA or 1000mA. Not available with PIR or PIR1.
5. Sets fuse drips installed on fixture. Cannot be field installed. Cannot be ordered as an accessory.
6. Photocontrol (PE) requires 120, 208, 240, 277 or 347 voltage option. Not available with motion/ambient light sensors (PIR or PIR1).
7. Reference Motion Sensor table on page 3.
8. Shipped separately keyed for ease of ordering with conduit entry applications. Not available with SBBW mounting option. Not available with fusing. Not available with 347 or 480 voltage options. Emergency components located in back box housing. Emergency mode IES files located on product page at www.lithonia.com.
9. Not available with SPD.
10. Not available with PE.
11. Not available with keyless accessory; see Accessories information.
12. Not available with ELCW.

LITHONIA LIGHTING
COMMERCIAL OUTDOOR

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DSXW1 LED
Rev. 4/19/21



D-Series Size 0
LED Area Luminaire

Buy American

d*series

Specifications

EPA: 0.95 ft² (.09 m²)
Length: 26" (660 mm)
Width: 13" (330 mm)
Height$_1$: 3" (76 mm)
Height$_2$: 7" (178 mm)
Weight (max): 16 lbs (7.7 kg)

Catalog Number
Notes
Type

Hit the tab key or mouse over the page to see all interactive elements.

Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment. The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire.

The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 400W metal halide with typical energy savings of 70% and expected service life of over 100,000 hours.

Ordering Information EXAMPLE: DSX0 LED P6 40K T3M MVOLT SPA NLTAIR2 PIRHN DDBXD

DSX0 LED

| Series | LEDs | Color temperature | Distribution | Voltage | Mounting |
|---|---|---|---|---|---|
| DSX0 LED | Forward optics: P1 P5; P2 P6; P3 P7; P4*. Rotated optics: P10* P12*; P11* P13*[1,2] | 30K 3000 K; 40K 4000 K; 50K 5000 K | T1S Type I short (Automotive); T2S Type II short; T2M Type II medium; T3S Type III short; T3M Type III medium; T4M Type IV medium; TFTM Forward throw medium; TSVS Type V very short*; TSS Type V short*; T5W Type V medium*; T5VW Type V wide*; BLC Backlight control*; LCCO Left corner cutoff*; RCCO Right corner cutoff* | MVOLT (120-277V)[3]; XVOLT (277V-480V)[3,4]; 120*; 208*; 240*; 277*; 347*; 480*[4] | Shipped included: SPA Square pole mounting; RPA Round pole mounting[5]; WBA Wall bracket*; SPUMBA Square pole universal mounting adaptor*; RPUMBA Round pole universal mounting adaptor*. Shipped separately: KMA8 DDBXD U Mast arm mounting bracket adaptor (specify finish)*[6] |

| Control options | Other options | Finish (required) |
|---|---|---|
| Shipped installed: NLTAIR2 nLight AIR generation 2 enabled[7,8]; PIRHN Network, high/low motion/ambient sensor[9]; PER NEMA twist-lock receptacle only (control ordered separately)[10]; PER5 Five-pin receptacle only (control ordered separately)[8,10]; PER7 Seven-pin receptacle only (leads exit fixture) (control ordered separately)[8,10]; DMG 0-10V dimming extend out back of housing for external control (control ordered separately)[11]; PIR High/low, motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5fc[7,8]; PIR1 High/low, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 3fc[7,8]; PIRTCW Motion/ambient sensor, 8-15' mounting height, ambient sensor enabled at 5fc[7,8]; PIRHTCW High/low, motion/ambient sensor, 15-30' mounting height, ambient sensor enabled at 3fc[7,8]; FAO Field adjustable output[12] | Shipped installed: HS House-side shield[13]; SF Single fuse (120, 277, 347V)[1]; DF Double fuse (208, 240, 480V)[1]; L90 Left rotated optics[2]; R90 Right rotated optics[2]; DDL Diffused drop lens[14]; PA DFC ambient sensor adjustment[15]; RAA Buy America(n) Act Compliant. Shipped separately: BS Bird spikes[14]; EGS External glare shield | DDBXD Dark bronze; DBLXD Black; DNAXD Natural aluminum; DWHXD White; DDBTXD Textured dark bronze; DBLBXD Textured black; DNATXD Textured natural aluminum; DWHGXD Textured white |

LITHONIA LIGHTING
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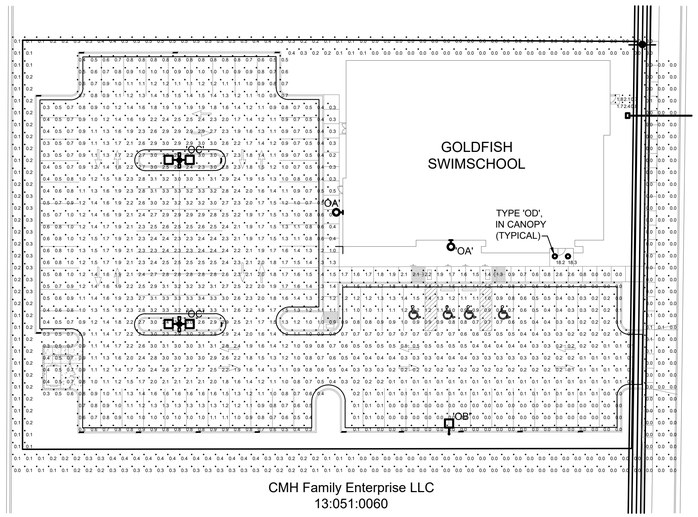
DSX0 LED
Rev. 05/04/21
Page 1 of 8

Schedule

| Symbol | Label | Image | Quantity | Manufacturer | Catalog Number | Description | Lamp | Number Lamps | Filename | Lumens Per Lamp | Lumen Multiplier | Light Loss Factor | Wattage | Efficiency | Distribution | Plot | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | OA |  | 3 | Lithonia Lighting | DSXW1 LED 20C 1000 AMBPC T3M MVOLT | DSXW1 LED WITH (2) 10 LED LIGHT ENGINES, TYPE T3M OPTIC, AMBPC, @ 1000mA. | LED | 1 | DSXW1_LED_20C_1000_AMBPC_T3M_MVOLT.ies | 4335 | 1 | 0.9 | 73.2 | 100% | TYPE IV, MEDIUM, BUG RATING: B1 - U0 - G2 |  | |
| | OB |  | 1 | Lithonia Lighting | DSX0 LED P4 40K T3M MVOLT HS | DSX0 LED P4 40K T3M MVOLT with houseside shield | LED | 1 | DSX0_LED_P4_40K_T3M_MVOLT_HS.ies | 8310 | 1 | 0.9 | 92 | 100% | TYPE III, SHORT, BUG RATING: B1 - U0 - G2 |  | |
| | OC |  | 2 | Lithonia Lighting | DSX0 LED P3 40K T5M MVOLT | DSX0 LED P3 40K T5M MVOLT | LED | 1 | DSX0_LED_P3_40K_T5M_MVOLT.ies | 8770 | 1 | 0.9 | 142 | 100% | TYPE VS, BUG RATING: B3 - U0 - G2 |  | |
| | OD |  | 2 | Lithonia Lighting | LDN6 40/15 LO6WR | 6IN LDN, 4000K, 1500LM, WHITE, CRI80 | | 1 | LDN6_40_15_LO6WR.ies | 1389 | 1 | 0.9 | 17.52 | 100% | DIRECT, SC-0=1.02, SC-90=1.03 |  | |
| | XR |  | 3 | Lithonia Lighting | ELA Q L0304 | ELM2 LED REMOTE LAMP HEAD | ONE 1.5-WATT LED ASSEMBLY | 1 | ELA_Q_L0304.ies | 80 | 1 | 0.9 | 0 | 90% | 4 X 4 |  | |

Statistics

| Description | Symbol | Min | Max/Min | Avg | Max | Avg/Min |
|---|---|---|---|---|---|---|
| PARKING, DRIVES & WALKWAYS | + | 0.0 fc | N/A | 1.2 fc | 18.3 fc | N/A |
| PROPERTY LINE | + | 0.0 fc | N/A | 0.1 fc | 0.5 fc | N/A |
| SECONDARY ENTRANCE | + | 0.7 fc | 3.4:1 | 1.6 fc | 2.4 fc | 2.3:1 |



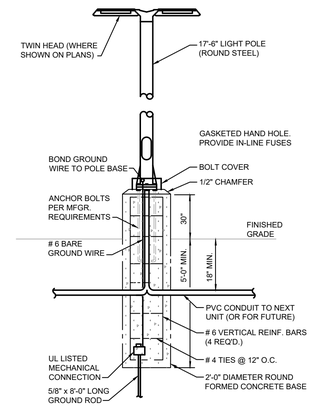

CMH Family Enterprise LLC
13:051:0060

# SITE PLAN - LIGHTING PHOTOMETRICS

Scale: 1" = 30'-0"

## GENERAL NOTES:

1. ELECTRICAL CONTRACTOR SHALL VERIFY ALL NEW AND EXISTING UNDERGROUND UTILITY SERVICES TO AVOID ANY INTERFERENCES.
2. WALL MOUNT TYPE 'OA' FIXTURES AT 18'-0" ABOVE FINISHED GRADE.
3. FIXTURES TYPES 'OB' & 'OC' SHALL BE POLE MOUNTED AT 20'-0" ABOVE FINISH GRADE.
4. VERIFY EXACT LOCATION OF ALL SITE POLE LIGHTS WITH CIVIL PLANS PRIOR TO INSTALLATION.

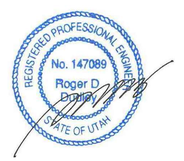



## TYPES 'OB' & 'OC' LIGHTING POLE - CONCRETE BASE DETAIL

N.T.S.

NOTES:

1. POLE BASES OVER 36" FROM CURB SHALL NOT EXCEED 6" ABOVE GRADE PER LOCAL ORDINANCE.
2. LOCATE ALL POLE BASES WITHIN 36" FROM CURB.




NOT FOR CONSTRUCTION

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F 734-454-5517

MEEC JOB # 21-0423

THIS DRAWING IS DIAGRAMMATIC AND SHOULD BE USED TO DETERMINE THE DESIGN INTENT. THE CONTRACTOR SHALL FIELD VERIFY ALL WORK AND SHALL NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES IN THE DOCUMENTS BEFORE PROCEEDING. FAILURE TO DO SO WILL RESULT IN THE CONTRACTOR TAKING FULL RESPONSIBILITY AND LIABILITY FOR SAID DISCREPANCIES.
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ARCHITECTS
architecture interiors consulting
2120 E. 11 Mile Rd. | Royal Oak, MI 48067
P: 248.414.9270 F: 248.414.9275
www.kriegerklatt.com

## Client:

Goldfish Swim Schools

## Project:

GSS - American Fork, UT
348 South 500 East
American Fork, Utah

| Issued | Description | By |
|---|---|---|
| 06.07.2021 | TRC Review | JK |

## Brand Standard:

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## Seal:

## Note:

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## North Arrow:

## Sheet Title:

Site Plan - Lighting Photometrics

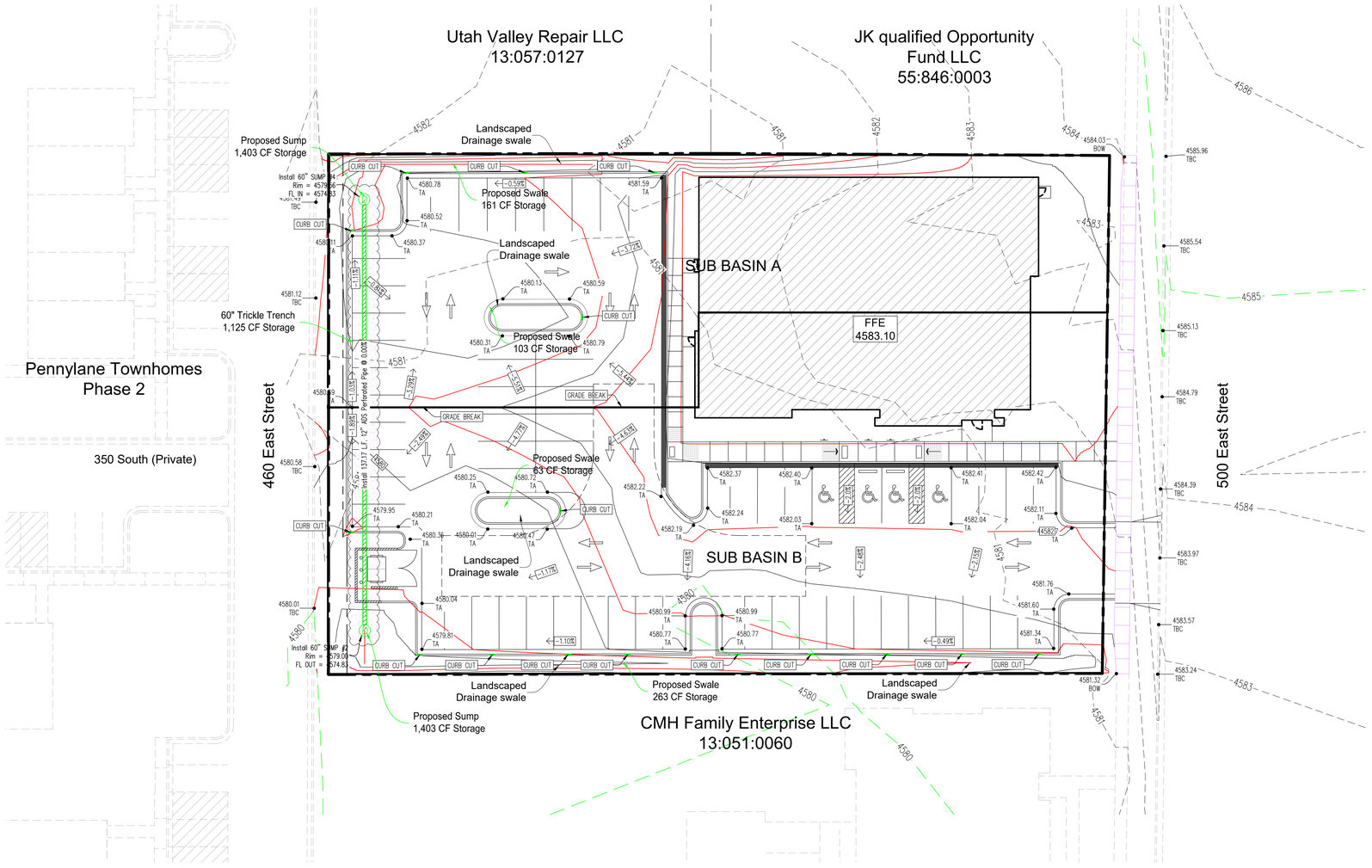
## Project Number:

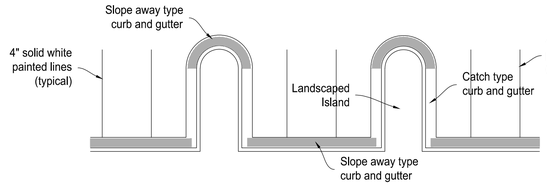
21-017

## Sheet Number:

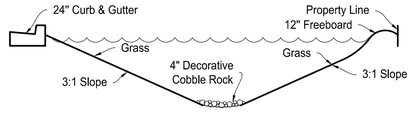
ES.102

NORTH
1" = 20'

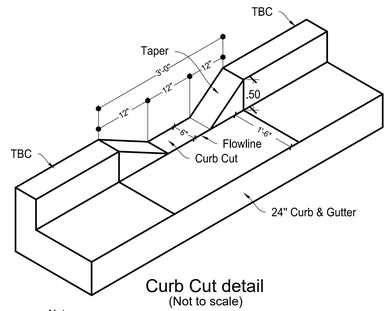



Curb and gutter detail

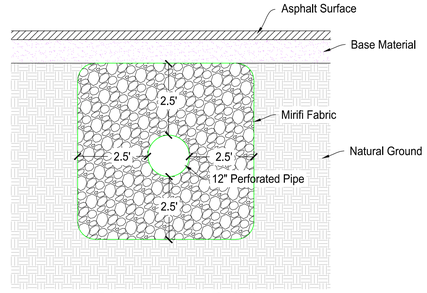



Drainage Swale Detail




Curb Cut detail
(Not to scale)

Note:
Landscaping adjacent to curb cut is to be installed 3" below flowline of gutter to prevent blockage.




Trickle Trench Detail
(Not to scale)

150 LF 6'x6' trench
= 1,620 cf potential storage

GRAPHIC SCALE
20 0 10 20 40 80
( IN FEET )
1 inch = 20 ft.

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801-224-1252

Goldfish Swim School

# Grading and Drainage Plan

American Fork Utah

REGISTERED PROFESSIONAL ENGINEER
No. 147089
Roger D Dudley
STATE OF UTAH

Revisions

| | |
|---|---|
| Date | 11-18-2021 |
| Scale | 1" = 20' |
| By | TD |
| Tracing No. | L - 14630 |

Sheet No.
C - 4.0

# Goldfish Swim School Basin B

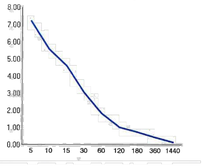
## Detention Pond Sizing

**Date:** 27-Dec-2021
**Area =** 0.860 = total acreage of site
**C =** 0.62 = weighted run-off coefficient

| | C | Area | Weighted C |
|---|---|---|---|
| **Landscaping :** | 0.20 | 0.330 | 0.07 |
| **Building:** | 0.80 | 0.080 | 0.06 |
| **Hard Surface:** | 0.90 | 0.450 | 0.41 |

| Lapsed Time (min) | Rainfall Intensity (in/hr) | Total Rainfall (in) | Rainfall Volume (cf) | Release Volume (cf) | Required Storage (cf) |
|---|---|---|---|---|---|
| A | B | C | D | E | F |
| 5 | 7.20 | 0.600 | 1165 | 6 | 1159 |
| 10 | 5.58 | 0.930 | 1806 | 11 | 1795 |
| 15 | 4.60 | 1.150 | 2233 | 17 | 2216 |
| 30 | 3.04 | 1.520 | 2952 | 34 | 2917 |
| 60 | 1.83 | 1.830 | 3554 | 69 | 3485 |
| 120 | 1.03 | 2.050 | 3981 | 138 | 3843 |
| 180 | 0.74 | 2.210 | 4292 | 207 | 4085 |
| 360 | 0.42 | 2.530 | 4913 | 414 | 4500 |
| 1440 | 0.15 | 3.480 | 6758 | 1655 | 5103 |

**Intensity - Duration - Frequency Curve**
**100-Year Storm Event**
***American Fork City***




**$Q_p$ =** 2.2 cfs = 980 gpm
**$T_c$ =** 20 min
**$I_p$ =** 4.08 in/hr
**Storage =** 5,103 cf = 0.117 Acre-feet

*Notes:*
A, B & C are based on American Fork City's historical rainfall data:
B = C / A x 60 min/hr
C = precipitation based upon aforementioned data.
D = C / (12 inches/foot) x total acreage of site x 43,560 sf/acre x weighted run-off coefficient, where Q=CIA and V=CIAt
E = an allowable release rate(gpm/acre) x total acreage of site x A / 7.481 gal/cf or another release rate such as percolation or release into storm system
F = D - E to determine storage volume

## Orifice Sizing

$$Q = C_d * A_c * (2 * g * h)^{\frac{1}{2}}, \text{ where:}$$

| | | |
|---|---|---|
| $Q$ = | 8.6 gpm | = the maximum allowable release rate |
| $C_d$ = | 0.62 | = coefficient of discharge; engineering judgement required |
| $A_c$ = | $A_c$ in² | = unknown cross-sectional orifice area |
| g = | 32.2 feet/s² | = acceleration of gravity |
| h = | 4.0 feet | = variable, site-dependant head; engineering judgement required |
| $A$ = | 0.860 acres | = total acreage of site |

### Maximum Outlet Design Requirements

**$A_c$ =** 0.3 square-inch cross-sectional orifice area
l = 0.5 inches = edge length of a square orifice
d = 0.6 inches = diameter of a circular orifice

STORM MASTER 4.WB2: DETENTION POND AND ORIFICE SIZING

### American Fork Sump Capacity Calculations
### GOLDFISH SWIM SCHOOL
### 12/27/2021
### SUB BASIN B

| SUMP SPECIFICATIONS | |
|---|---|
| Percolation Rate (min/in): | 15.00 |
| Void ratio in drain rock: | 0.30 |
| Height of top cone section (ft): | 3.0 (A) |
| Height of manhole section (ft): | 4.0 (B) |
| Diameter of manhole section (ft): | 5.0 (C) |
| Thickness of section (in): | 3.00 (D) |
| Number of manhole sections: | 2 |
| Excavation beyond outside of manhole (ft): | 5.00 (E) |
| Bottom of manhole section to bottom of rock (ft): | 2.00 (F) |
| Depth to top of drain rock (ft): | 2.50 (G) |
| Depth to bottom of sections (ft): | 11.00 (H) |
| Depth to bottom of drain rock (ft): | 13.00 (I) |
| Height of drain rock (ft): | 9.50 (J) |
| Area available for percolation (ft^2): | 651.29 |
| Calculated Percolation Capacity (ft^3/sec): | 0.0603 |
| Additional Outflow (ft^3/sec): | 0.000 |
| Storage in Manhole Sections (ft^3): | 166.90 |
| Storage in drain rock voids (ft^3): | 535.03 |
| Total storage in sump (ft^3): | 701.93 |

| BASIN | |
|---|---|
| Total Area (acres): | 0.86 |
| Average Runoff Coefficient: | 0.62 |
| Number of sumps in area: | 2 |
| Max required storage (from below) (ft^3): | 1322.167 |
| Storage available in sump(s) (ft^3): | 1403.85995 |
| Additional storage to be provided (ft^3): | -81.693 |

| time (min) | rain (I) in/hr | C | Area (Acre) | Q (CIA) | vol (ft^3) | perc+outflow (ft^3) | req'd storage (ft^3) |
|---|---|---|---|---|---|---|---|
| 5 | 7.24 | 0.62 | 0.860 | 3.860 | 579.055 | 36.183 | 542.872 |
| 10 | 5.60 | 0.62 | 0.860 | 2.986 | 895.776 | 72.366 | 823.410 |
| 15 | 4.61 | 0.62 | 0.860 | 2.458 | 1106.123 | 108.549 | 997.575 |
| 30 | 3.04 | 0.62 | 0.860 | 1.621 | 1458.835 | 217.097 | 1241.738 |
| 60 | 1.83 | 0.62 | 0.860 | 0.976 | 1756.361 | 434.194 | 1322.167 |
| 120 | 1.03 | 0.62 | 0.860 | 0.549 | 1977.105 | 868.389 | -1108.717 |
| 180 | 0.74 | 0.62 | 0.860 | 0.395 | 2130.857 | 1302.583 | -828.084 |
| 360 | 0.42 | 0.62 | 0.860 | 0.224 | 2406.894 | 2605.166 | -198.271 |
| 720 | 0.33 | 0.62 | 0.860 | 0.176 | 3800.650 | 5210.331 | -1409.682 |
| 1440 | 0.15 | 0.62 | 0.860 | 0.080 | 3455.136 | 10420.663 | -6965.527 |

Drainage Report Goldfish Swim School Drainage Calculations

k:\3-02-11400\project studies\GOLDFISH 100yr Sump Calcs

# Goldfish Swim School Basin A

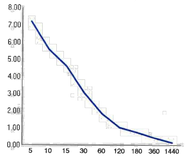
## Detention Pond Sizing

**Date:** 27-Dec-2021
**Area =** 0.610 = total acreage of site
**C =** 0.76 = weighted run-off coefficient

| | C | Area | Weighted C |
|---|---|---|---|
| **Landscaping :** | 0.20 | 0.110 | 0.02 |
| **Building:** | 0.80 | 0.090 | 0.07 |
| **Hard Surface:** | 0.90 | 0.410 | 0.37 |

| Lapsed Time (min) | Rainfall Intensity (in/hr) | Total Rainfall (in) | Rainfall Volume (cf) | Release Volume (cf) | Required Storage (cf) |
|---|---|---|---|---|---|
| A | B | C | D | E | F |
| 5 | 7.20 | 0.600 | 1008 | 4 | 1004 |
| 10 | 5.58 | 0.930 | 1563 | 8 | 1555 |
| 15 | 4.60 | 1.150 | 1933 | 12 | 1921 |
| 30 | 3.04 | 1.520 | 2555 | 24 | 2530 |
| 60 | 1.83 | 1.830 | 3076 | 49 | 3027 |
| 120 | 1.03 | 2.050 | 3445 | 98 | 3348 |
| 180 | 0.74 | 2.210 | 3714 | 147 | 3568 |
| 360 | 0.42 | 2.530 | 4252 | 294 | 3959 |
| 1440 | 0.15 | 3.480 | 5849 | 1174 | 4675 |

**Intensity - Duration - Frequency Curve**
**100-Year Storm Event**
***American Fork City***




**$Q_p$ =** 1.9 cfs = 848 gpm
**$T_c$ =** 20 min
**$I_p$ =** 4.08 in/hr
**Storage =** 4,675 cf = 0.107 Acre-feet

*Notes:*
A, B & C are based on American Fork City's historical rainfall data:
B = C / A x 60 min/hr
C = precipitation based upon aforementioned data.
D = C / (12 inches/foot) x total acreage of site x 43,560 sf/acre x weighted run-off coefficient, where Q=CIA and V=CIAt
E = an allowable release rate(gpm/acre) x total acreage of site x A / 7.481 gal/cf or another release rate such as percolation or release into storm system
F = D - E to determine storage volume

## Orifice Sizing

$$Q = C_d * A_c * (2 * g * h)^{\frac{1}{2}}, \text{ where:}$$

| | | |
|---|---|---|
| $Q$ = | 6.1 gpm | = the maximum allowable release rate |
| $C_d$ = | 0.62 | = coefficient of discharge; engineering judgement required |
| $A_c$ = | $A_c$ in² | = unknown cross-sectional orifice area |
| g = | 32.2 feet/s² | = acceleration of gravity |
| h = | 4.0 feet | = variable, site-dependant head; engineering judgement required |
| $A$ = | 0.610 acres | = total acreage of site |

### Maximum Outlet Design Requirements

**$A_c$ =** 0.2 square-inch cross-sectional orifice area
l = 0.4 inches = edge length of a square orifice
d = 0.5 inches = diameter of a circular orifice

STORM MASTER 4.WB2: DETENTION POND AND ORIFICE SIZING

### American Fork Sump Capacity Calculations
### GOLDFISH SWIM SCHOOL
### 12/27/2021
### SUB BASIN A

| SUMP SPECIFICATIONS | |
|---|---|
| Percolation Rate (min/in): | 15.00 |
| Void ratio in drain rock: | 0.30 |
| Height of top cone section (ft): | 3.0 (A) |
| Height of manhole section (ft): | 4.0 (B) |
| Diameter of manhole section (ft): | 5.0 (C) |
| Thickness of section (in): | 3.00 (D) |
| Number of manhole sections: | 2 |
| Excavation beyond outside of manhole (ft): | 5.00 (E) |
| Bottom of manhole section to bottom of rock (ft): | 2.00 (F) |
| Depth to top of drain rock (ft): | 2.50 (G) |
| Depth to bottom of sections (ft): | 11.00 (H) |
| Depth to bottom of drain rock (ft): | 13.00 (I) |
| Height of drain rock (ft): | 9.50 (J) |
| Area available for percolation (ft^2): | 651.29 |
| Calculated Percolation Capacity (ft^3/sec): | 0.0603 |
| Additional Outflow (ft^3/sec): | 0.000 |
| Storage in Manhole Sections (ft^3): | 166.90 |
| Storage in drain rock voids (ft^3): | 535.03 |
| Total storage in sump (ft^3): | 701.93 |

| BASIN | |
|---|---|
| Total Area (acres): | 0.61 |
| Average Runoff Coefficient: | 0.76 |
| Number of sumps in area: | 2 |
| Max required storage (from below) (ft^3): | 1092.904 |
| Storage available in sump(s) (ft^3): | 1403.85995 |
| Additional storage to be provided (ft^3): | -310.956 |

| time (min) | rain (I) in/hr | C | Area (Acre) | Q (CIA) | vol (ft^3) | perc+outflow (ft^3) | req'd storage (ft^3) |
|---|---|---|---|---|---|---|---|
| 5 | 7.24 | 0.76 | 0.610 | 3.356 | 503.470 | 36.183 | 467.287 |
| 10 | 5.60 | 0.76 | 0.610 | 2.596 | 778.848 | 72.366 | 706.482 |
| 15 | 4.61 | 0.76 | 0.610 | 2.137 | 961.738 | 108.549 | 853.190 |
| 30 | 3.04 | 0.76 | 0.610 | 1.409 | 1268.410 | 217.097 | 1051.312 |
| 60 | 1.83 | 0.76 | 0.610 | 0.848 | 1527.098 | 434.194 | 1092.904 |
| 120 | 1.03 | 0.76 | 0.610 | 0.478 | 1719.028 | 868.389 | 850.640 |
| 180 | 0.74 | 0.76 | 0.610 | 0.343 | 1852.546 | 1302.583 | 549.963 |
| 360 | 0.42 | 0.76 | 0.610 | 0.195 | 2102.890 | 2605.166 | -502.276 |
| 720 | 0.33 | 0.76 | 0.610 | 0.153 | 3304.541 | 5210.331 | -1905.791 |
| 1440 | 0.15 | 0.76 | 0.610 | 0.070 | 3004.128 | 10420.663 | -7416.535 |

k:\3-02-11400\project studies\GOLDFISH 100yr Sump Calcs

## GOLDFISH SWIM SCHOOL

**DRAINAGE INFORMATION**
**5/21/2021**

| **TOTAL PROJECT** | AREA (sf) | AREA (ac) | % |
|---|---|---|---|
| TOTAL AREA | 43,937 | 1.01 | 100 |
| BUILDING FOOTPRINT AREA | 8,540 | 0.20 | 19.44% |
| HARD SURFACE AREA | 27,478 | 0.63 | 62.54% |
| LANDSCAPING AREA | 7,919 | 0.18 | 18.02% |
| TOTAL IMPERVIOUS AREA | 36,018 | 0.83 | 81.98% |
| WATER QUALITY VOLUME | WQV = RvDA | | |
| Rv = 0.91(I)-0.0204 | 0.7256 | | |
| D | 0.0358 | | |
| A | 43,937 | 1.01 | |
| **TOTAL WATER QUALITY VOLUME (CF)** | | | 1,141 |
| **TOTAL DETENTION REQUIREMENT** | | | 2,476 |
| **LESS WQV THROUGH INFILTRATION** | | | 1,141 |
| **TOTAL DETENTION VOLUME REQUIRED.** | | | 1,335 |

0.43" 0.0358'

| **SUB BASIN A (NORTH BASIN)** | AREA (sf) | AREA (ac) | % |
|---|---|---|---|
| TOTAL AREA | 17,216 | 0.40 | 100 |
| BUILDING FOOTPRINT AREA | 4,970 | 0.11 | 28.87% |
| HARD SURFACE AREA | 8,236 | 0.19 | 47.84% |
| LANDSCAPING AREA | 4,010 | 0.09 | 23.29% |
| TOTAL IMPERVIOUS AREA | 13,206 | 0.30 | 76.71% |
| WATER QUALITY VOLUME | WQV = RvDA | | |
| Rv = 0.91(I)-0.0204 | 0.6776 | | |
| D | 0.0358 | | |
| A | 17,216 | 0.40 | |
| **TOTAL WATER QUALITY VOLUME (CF)** | | | 418 |
| **SUB BASIN DETENTION REQUIREMENT** | | | 933 |
| **LESS WQV THROUGH INFILTRATION** | | | 418 |
| **TOTAL DETENTION VOLUME REQUIRED.** | | | 515 |

**SUB BASIN B (SOUTH)**

| | | | |
|---|---|---|---|
| TOTAL AREA | 26,667 | 0.61 | 100 |
| BUILDING FOOTPRINT AREA | 3,800 | 0.09 | 14.25% |
| HARD SURFACE AREA | 17,934 | 0.41 | 67.25% |
| LANDSCAPING AREA | 4,933 | 0.11 | 18.50% |
| TOTAL IMPERVIOUS AREA | 21,734 | 0.50 | 81.50% |
| WATER QUALITY VOLUME | WQV = RvDA | | |
| Rv = 0.91(I)-0.0204 | 0.7213 | | |
| D | 0.0358 | | |
| A | 26,667 | 0.61 | |
| **TOTAL WATER QUALITY VOLUME (CF)** | | | 689 |
| **SUB BASIN DETENTION REQUIREMENT** | | | 1,558 |
| **LESS WQV THROUGH INFILTRATION** | | | 689 |
| **TOTAL DETENTION VOLUME REQUIRED.** | | | 869 |

DUDLEY AND ASSOCIATES
ENGINEERS PLANNERS SURVEYORS
353 EAST 1200 SOUTH, OREM, UTAH
801-224-1252

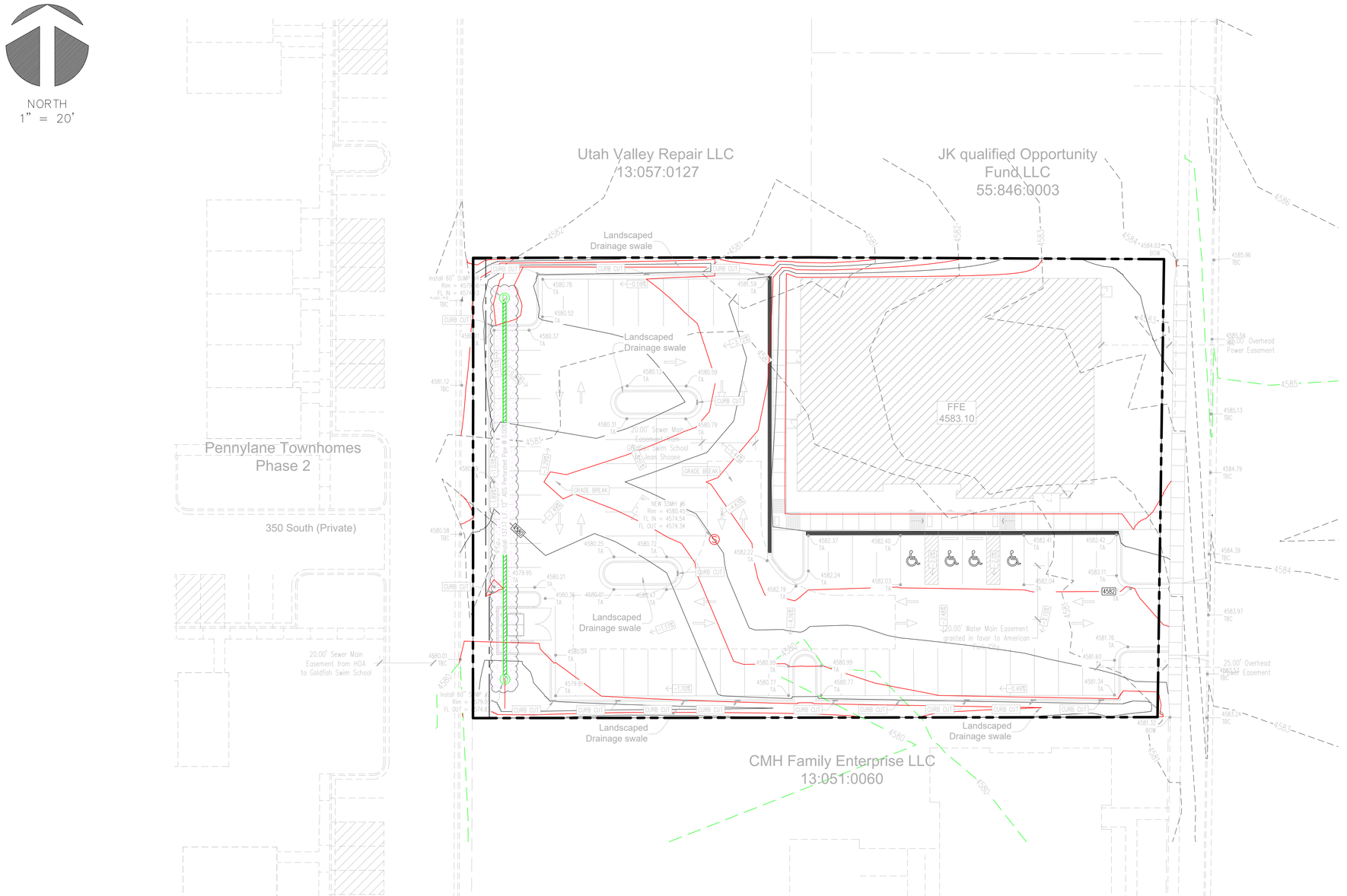
Goldfish Swim School
Drainage Calculations
American Fork Utah

REGISTERED PROFESSIONAL ENGINEER
No. 147089
Roger D Dudley
STATE OF UTAH

Revisions

Date
10-25-2021
Scale
1" = 20'
By
TD
Tracing No.
L - 14630

Sheet No.
C - 4.1




NOTES:

This plan is to be used to control storm water runoff and reduce pollutants in storm water runoff until construction is complete and the subject site is in operation.

THE FOLLOWING BEST MANAGEMENT PRACTICES (BMP'S) ARE TO BE USED AS A PART OF THE CONSTRUCTION SITE STORM WATER MANAGEMENT PLAN FOR THIS SITE

1. Contaminated or Erodible Surface Areas (CESA) Prevent the discharge, pollutants, and storm water from contaminated or erodible surface areas by maintaining undisturbed site until construction of Phase II is completed.

2. Dust Controls (DC) Dust control measures including vegetation, seeding, etc. to stabilize site from wind erosion and reduce dust until site is completely developed.

3. Detention/Infiltration Device Maintenance (DIDM) Detention basin and accompanying facilities will be regularly maintained and corrected to promote effective storm drain pollutant removal for pond, piping, and boxes.

4. Material Storage (MS) Any hazardous, toxic, or chemical substances will be stored and controlled inside building areas. No control substances will be discharged into storm water or sewage systems.

5. Portable Toilets (PT) Temporary on site sanitary facilities will be furnished and maintained during all construction activity until on site facilities are constructed and usable.

6. Stabilized Construction Entrance and Wash Area (SCEWA) A stabilized pad of crushed stone located at the construction entrance as shown will be provided and maintained during all construction activities.

7. Spill Cleanup (SCU) All on site materials used in construction will be maintained on site to prevent harmful materials from entering off site receiving waters.

8. Silt Fencing (SF) placed on the perimeter of the project where there is potential runoff from site to adjacent streets, or properties.

- **A** → **Construct Stabilized Construction Entry (See Detail SCE)**
- **B** → **Construct Silt Fencing as needed to prevent runoff onto existing street, adjacent properties and existing ditch. (See detail SF)**
- **C** → **Install Filter Fabric in existing downstream and/or recently installed inlet boxes or manholes to prevent silt buildup.**

  **Portable toilet locations are to be determined by the contractor.**
- **D** → **Contractor Washdown area in sediment basin (see detail CWM, SCU)**
- **E** → **Material Storage Area (see detail MS)**

GRAPHIC SCALE

20 0 10 20 40 80

( IN FEET )
1 inch = 20 ft.

CAUTION!!! Notice to contractors

The Contractor is specifically cautioned that the location and/or elevation of existing utilities as shown on these plans is based on records of the various utility companies and where possible from measurements taken in the field. the information is not to be considered exact or complete. The Contractor must notify the utility location center at least 48 hours prior to any excavation to request the exact location of the utilities in the field. It shall be the responsibility of the Contractor to relocate all existing utilities which conflict with the proposed improvements shown on the plan.




DUDLEY AND ASSOCIATES
ENGINEERS PLANNERS SURVEYORS
353 EAST 1200 SOUTH, OREM, UTAH
801-224-1252

Goldfish Swim School

# Erosion Control Plan

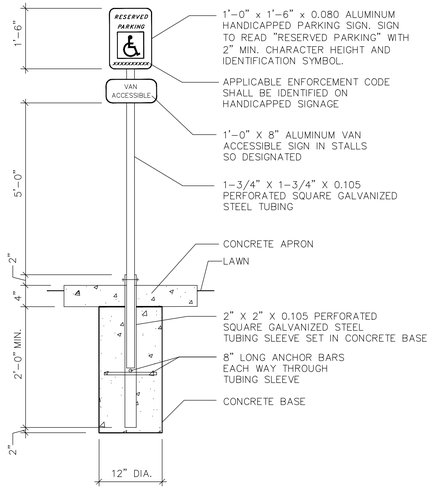
American Fork Utah

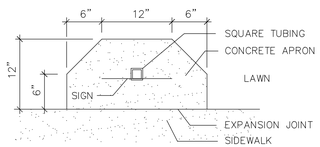
REGISTERED PROFESSIONAL ENGINEER
No. 147089
Roger D Dudley
STATE OF UTAH

Revisions

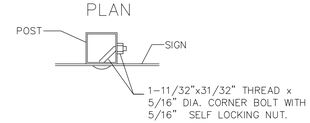
| | |
|---|---|
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| Scale | 1" = 20' |
| By | TD |
| Tracing No. | L - 14630 |

Sheet No.
C - 6.0

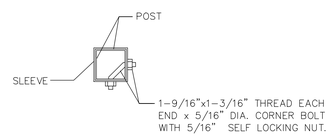



PLAN



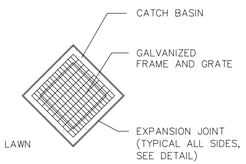

SIGN MOUNTING



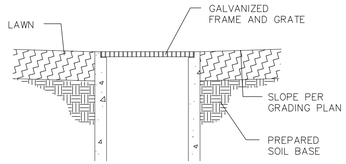

ANCHOR ASSEMBLY

TYPICAL HANDICAPPED PARKING SIGN MOUNTING AND ANCHOR

A HANDICAP PARKING SIGN
Not to Scale

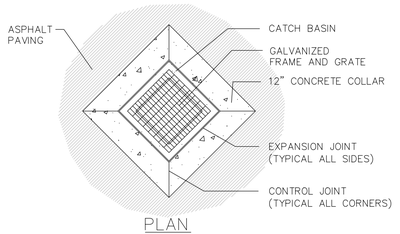



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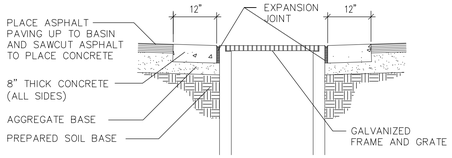



SECTION

E BASIN IN LANDSCAPE
Not to Scale

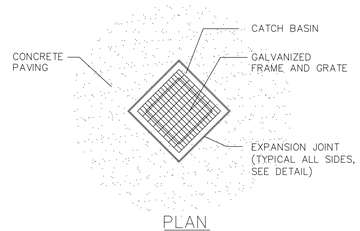



PLAN

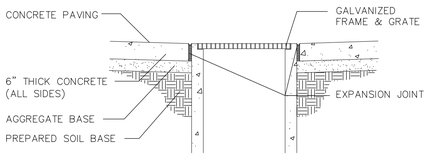



SECTION

BASIN IN ASPHALT WITH 12" CONCRETE COLLAR
C NOT TO SCALE



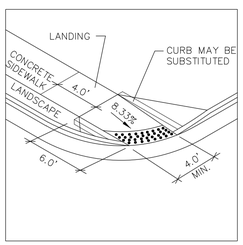

PLAN



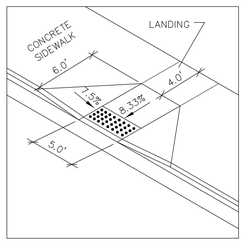

SECTION

D BASIN IN CONCRETE PAVING
Not to Scale

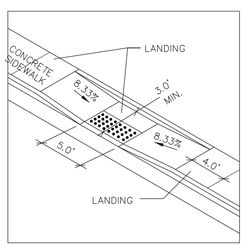
NOTES:
1. PROVIDE DETECTABLE WARNING PANELS PER ADA REQUIREMENTS. (MINIMUM OF 2' DEEP BY THE WIDTH OF RAMP).
2. ALL LANDINGS MUST HAVE 1:48 CROSS SLOPE AND RUNNING SLOPE. LANDING MUST BE AS WIDE AS THE RAMP.
3. CROSS SLOPE ON RAMP MUST BE 1:48 OR LESS.
4. COUNTER SLOPES OF ADJOINING GUTTERS AND PAVING ADJACENT TO THE CURB RAMP SHALL NOT BE STEEPER THAN 1:20.



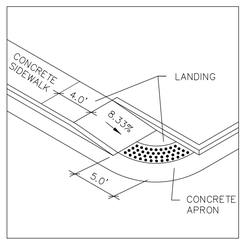

TYPE A



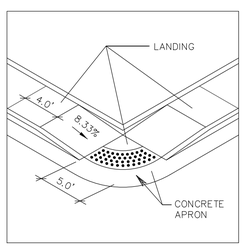

TYPE B




TYPE C

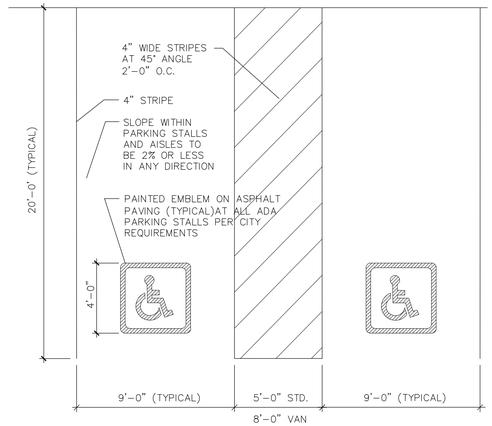



TYPE D




TYPE E

F CURB RAMPS
Not to Scale




H ADA PARKING
Not to Scale

REGISTERED PROFESSIONAL ENGINEER
No. 147089
Roger D. Dunn
STATE OF UTAH

DUDLEY AND ASSOCIATES
ENGINEERS PLANNERS SURVEYORS
353 EAST 1200 SOUTH, OREM, UTAH
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Goldfish Swim School

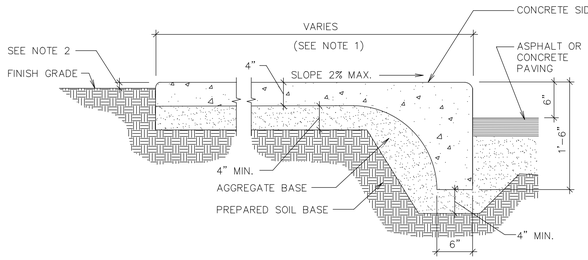
# DETAIL SHEET

American Fork Utah

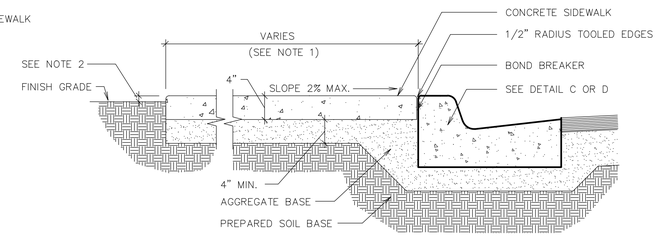
Revisions

| | |
|---|---|
| Date | 11-18-2021 |
| Scale | not to scale |
| By | TD |
| Tracing No. | |

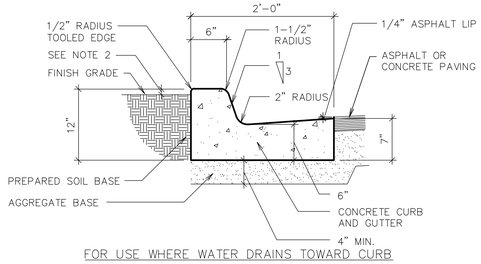
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A INTEGRAL SIDEWALK & CURB
1" = 1'-0"

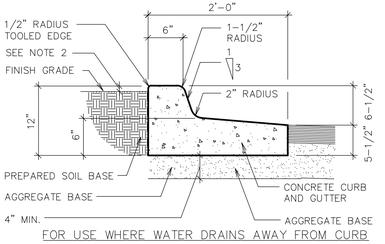



B SIDEWALK, CURB AND GUTTER
1" = 1'-0"



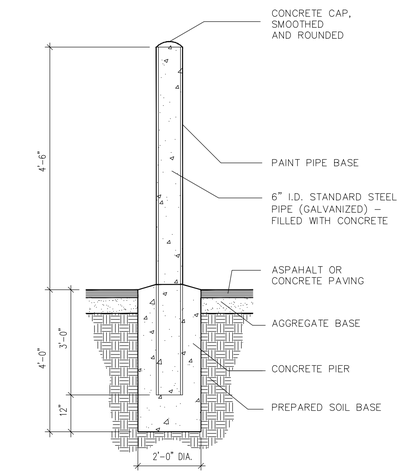

FOR USE WHERE WATER DRAINS TOWARD CURB

C CURB AND GUTTER
1" = 1'-0"

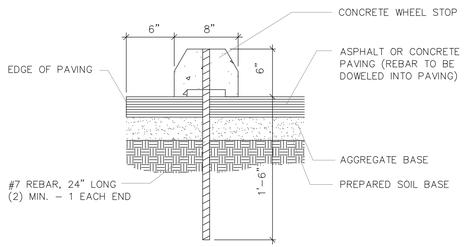



FOR USE WHERE WATER DRAINS AWAY FROM CURB

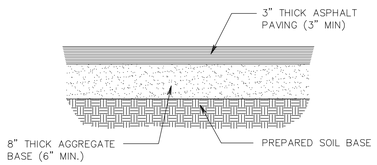
OPEN FACE
D CURB AND GUTTER
1" = 1'-0"



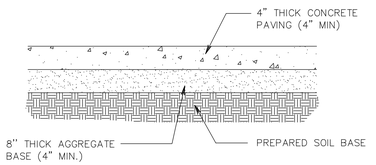

B CONCRETE BOLLARD
Not to Scale



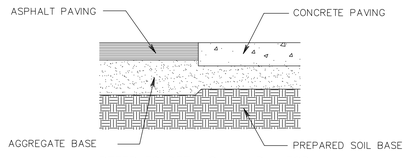

Q TYPICAL CONCRETE WHEEL STOP
Not to Scale




K ASPHALT PAVING
1" = 1'-0"

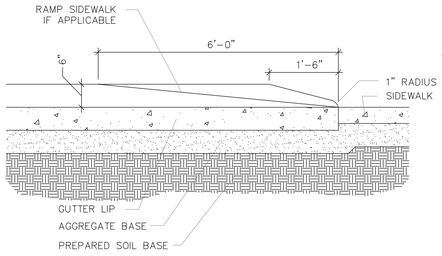



L CONCRETE PAVING
1" = 1'-0"

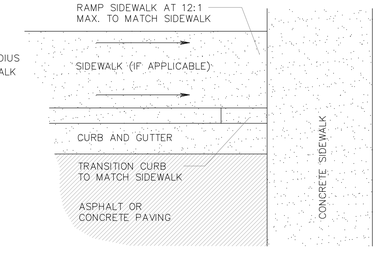



REFER TO DETAILS K AND L FOR
AGGREGATE BASE AND PAVING

JOINT BETWEEN
M ASPHALT AND CONCRETE PAVING
1" = 1'-0"

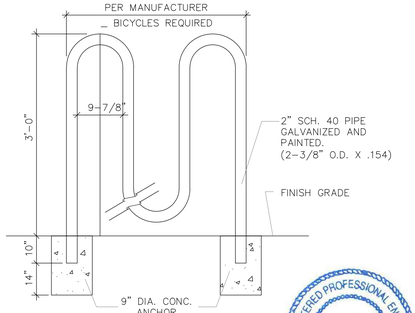



SECTION




PLAN

R CURB TRANSITION
Not to Scale




S BICYCLE RACK
Not to Scale

REGISTERED PROFESSIONAL ENGINEER
No. 147089
Roger D Dudley
STATE OF UTAH

DUDLEY AND ASSOCIATES
ENGINEERS PLANNERS SURVEYORS
353 EAST 1200 SOUTH, OREM, UTAH
801-224-1252

Goldfish Swim School

# DETAIL SHEET

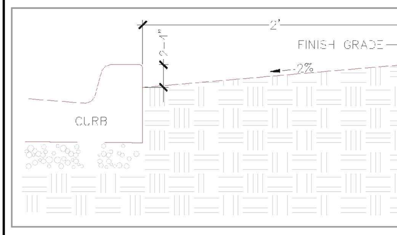
American Fork, Utah

Revisions

| | |
|---|---|
| Date | 11-18-2021 |
| Scale | not to scale |
| By | TD |
| Tracing No. | |

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## BMP: Curb Sedimentation Trap — CST




**Objectives:**
- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☑ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
A temporary sediment trap formed by excavation behind the curb

**Application:**
- Interception of runoff containing sediment from the lot during construction
- Retain sediment on the lot during construction

**Installation/Application Criteria:**
- Excavate soil behind curb to a depth of 2-4 inches
- Create slope of 2% from finished grade to curb for a distance of approximately 2 feet

**Limitations:**
No limitations

**Maintenance:**
- Inspect after each rainfall event
- Remove accumulated sediment as it reaches 2/3 height of available storage

**Targeted Pollutants**
- ▣ Sediment
- ☐ Nutrients
- ◪ Toxic Materials
- ☐ Oil & Grease
- ◪ Floatable Materials
- ☐ Other Waste

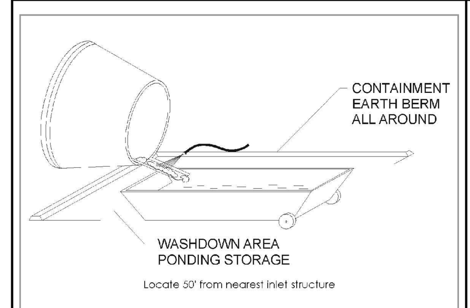
**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $$ Capital Costs
- $ O & M Costs
- $$ Maintenance
- $ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapted from Salt Lake County BMP Manual and Paradigm Engineering BMP Fact Sheet (Cut Back Curb)
Stormwater Discharge management from Construction Activities 2005

## BMP: Concrete Waste Management — CWM




**Objectives:**
- ☐ Housekeeping Practices
- ☑ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout off-site, performing on-site washout in a designated area, and training employees and subcontractors.

**Application:**
This technique is applicable to all types of sites.

**Installation/Application Criteria:**
- Store dry materials under cover, away from drainage areas.
- Minimize excess mixing of fresh concrete, mortar or cement on-site.
- Perform washout of concrete trucks off-site or in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on-site, except in designated areas.
- When washing concrete to remove fine particles and expose the aggregate, avoid creating runoff by draining the water within a bermed or level area. (See Earth Berm Barrier information sheet.)
- Train employees and subcontractors in proper concrete waste management.

**Limitations:**
- Off-site washout of concrete wastes may not always be possible.

**Maintenance:**
- Inspect subcontractors to ensure that concrete wastes are being properly managed.
- If using a temporary pit, dispose hardened concrete on a regular basis.

**Targeted Pollutants**
- ☐ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ▣ Other Waste

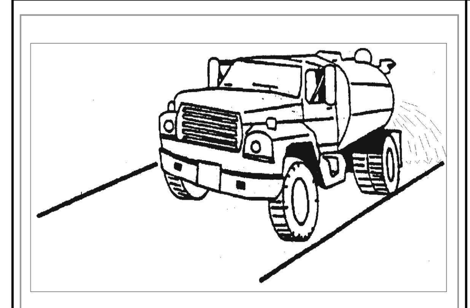
**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $ Capital Costs
- $ O & M Costs
- $$ Maintenance
- $$ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapted from Salt Lake County BMP Manual
Stormwater Discharge management from Construction Activities 2005

## BMP: Dust Controls — DC



**Objectives:**
- ☑ Housekeeping Practices
- ☐ Contain Waste
- ☑ Minimize Disturbed Areas
- ☑ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
Dust control measures are used to stabilize soil from wind erosion and reduce dust by construction activities.

**Application:**
Dust control is useful in any construction area where dust is generated. Street sweeping is limited to areas that are paved.

**Installation/Application Criteria:**
- Water may be sprayed on the ground surface to moisten dry soils, making it less susceptible to wind erosion. Repeat as needed. At no time should the site be irrigated to the point that runoff begins to flow.
- Two kinds of street weepers are common: brush and vacuum. Vacuum sweepers are more efficient and work best when the area is dry.
- Mechanical equipment should be operated according to the manufacturers' recommendations and should be inspected regularly.

**Limitations:**
- Water sprayed from water trucks must be done at a rate such that the water is absorbed in the soil; if excessive amounts of water are used, it may run off, carrying soil with it.
- Street sweeping is labor and equipment intensive and may not be effective for all pollutants.

**Maintenance:**
- If excess water results from water spraying, dust-contaminated waters should not be allowed to run off site. Areas may need to be resprayed to keep dust from spreading.

**Targeted Pollutants**
- ▣ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

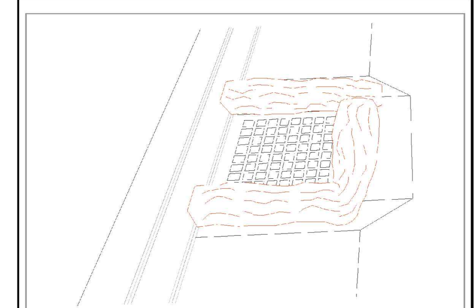
**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $$ Capital Costs
- $ O & M Costs
- $$ Maintenance
- $$ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapted from Pleasant Grove City Stormwater Technical Manual and Best Management Practices
Stormwater Discharge management from Construction Activities 2005

## BMP: Inlet Protection – Wattle — IP-W



**Objectives:**
- ☑ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☑ Control site Perimeter
- ☑ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
Sediment barrier erected around storm drain inlet.

**Application:**
Construct at storm drainage inlets located down-gradient of areas to be disturbed by construction.

**Installation/Application Criteria:**
- Provide up-gradient sediment controls, such as silt fence during construction of inlet
- When construction of curb and gutter and roadways is complete, install gravel filled or straw wattles around perimeter of inlet

**Limitations:**
- Recommended maximum contributing drainage area of one acre
- Requires shallow slopes adjacent to inlet

**Maintenance:**
- Inspect inlet protection following storm event and at a minimum of once every 14 days
- Remove accumulated sediment when it reaches 4 inches in depth
- Look for bypassing or undercutting and repair or realign as needed

**Targeted Pollutants**
- ▣ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ▣ Floatable Materials
- ☐ Other Waste

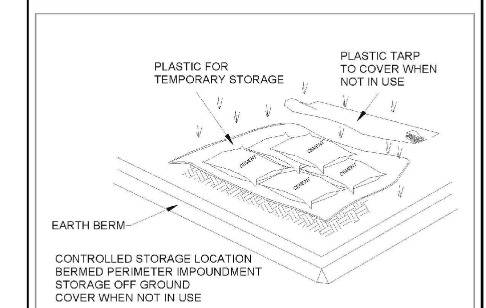
**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $$ Capital Costs
- $ O & M Costs
- $$ Maintenance
- $ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapted from Salt Lake County BMP Manual
Stormwater Discharge management from Construction Activities 2005

## BMP: Material Storage — MS




**Objectives:**
- ☑ Housekeeping Practices
- ☑ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
Controlled storage of on-site materials.

**Application:**
- Storage of hazardous, toxic, and all chemical substances.
- Any construction site with outside storage of materials.

**Installation/Application Criteria:**
- Designate a secured area with limited access as the storage location. Ensure no waterways or drainage paths are nearby.
- Construct compacted earthen berm (See Earth Berm Barrier Information Sheet), or similar perimeter containment around storage location for impoundment in the case of spills.
- Ensure all on-site personnel utilize designated storage area. Do not store excessive amounts of material that will not be utilized on site.
- For active use of materials away from the storage area ensure materials are not set directly on the ground and are covered when not in use. Protect storm drainage during use.

**Limitations:**
- Does not prevent contamination due to mishandling of products.
- Spill Prevention and Response Plan still required.
- Only effective if materials are actively stored in controlled location.

**Maintenance:**
- Inspect daily and repair any damage to perimeter impoundment or security fencing.
- Check materials are being correctly stored (i.e. standing upright, in labeled containers, tightly capped) and that no materials are being stored away from the designated location.

**Targeted Pollutants**
- ☐ Sediment
- ☐ Nutrients
- ▣ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ◪ Other Waste

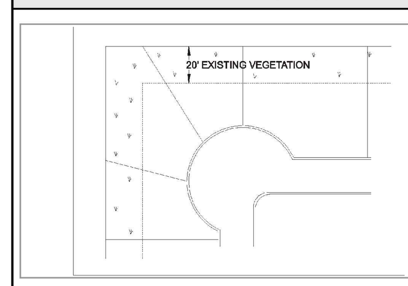
**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $$ Capital Costs
- $$ O & M Costs
- $$ Maintenance
- $$$ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapted from Salt Lake County BMP Manual
Stormwater Discharge management from Construction Activities 2005

## BMP: Preservation of Existing Vegetation — PEV




**Objectives:**
- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☑ Minimize Disturbed Areas
- ☑ Stabilize Disturbed Areas
- ☑ Protect Slopes/Channels
- ☑ Control Site Perimeter
- ☐ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs and/or grasses that serve as erosion controls.

**Application:**
This technique is applicable to all types of sites. Areas where preserving vegetation can be particularly beneficial are floodplains, wetlands, stream banks, steep slopes, and other areas where erosion controls would be difficult to establish, install, or maintain.

**Installation/Application Criteria:**
- Clearly mark, flag or fence vegetation or areas where vegetation should be preserved.
- Prepare landscaping plans which include as much existing vegetation as possible and state proper care during and after construction.
- Define and protect with berms, fencing, signs, etc. a setback area from vegetation to be preserved.
- Propose landscaping plans which do not include plant species that compete with the existing vegetation.
- Do not locate construction traffic routes, spoil piles, etc. where significant adverse impact on existing vegetation may occur.

**Limitations:**
- Requires forward planning by the owner/developer, contractor and design staff.
- For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactorily for the planned development.
- May not be cost effective with high land costs.

**Maintenance:**
- Inspection and maintenance requirements for protection of vegetation are low.
- Maintenance of native trees or vegetation should conform to landscape plan specifications.

**Targeted Pollutants**
- ▣ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

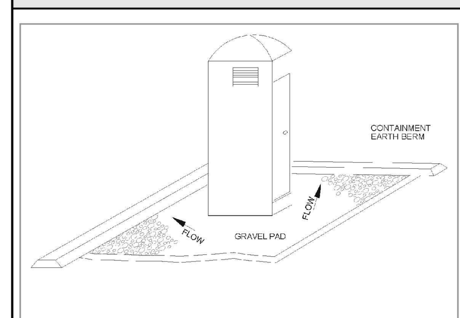
**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $ Capital Costs
- $ O & M Costs
- $ Maintenance
- $ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapted from Salt Lake County BMP Manual
Stormwater Discharge management from Construction Activities 2005

## BMP: Portable Toilets — PT




**Objectives:**
- ☑ Housekeeping Practices
- ☑ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
Temporary on-site sanitary facilities for construction personnel.

**Application:**
All sites with no permanent sanitary facilities or where permanent facility is too far from activities.

**Installation/Application Criteria:**
- Locate portable toilets in convenient locations throughout the site.
- Prepare level, gravel surface and provide clear access to the toilets for servicing and for on-site personnel.
- Construct earth berm perimeter (See Earth Berm Barrier Information Sheet), control for spill/protection leak.

**Limitations:**
- No limitations.

**Maintenance:**
- Portable toilets should be maintained in good working order by licensed service with daily observation for leak detection.
- Regular waste collection should be arranged with licensed service.
- All waste should be deposited in sanitary sewer system for treatment with appropriate agency approval.

**Targeted Pollutants**
- ☐ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ▣ Other Waste

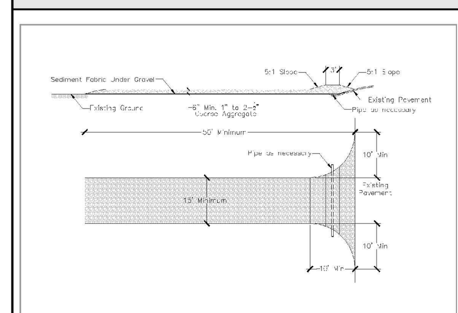
**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $$ Capital Costs
- $$ O & M Costs
- $$ Maintenance
- $ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapted from Salt Lake County BMP Manual
Stormwater Discharge management from Construction Activities 2005

## BMP: Stabilized Construction Entrance — SCE



**Objectives:**
- ☑ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☑ Control Site Perimeter
- ☐ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
A stabilized pad of crushed stone located where construction traffic enters or leaves the site from or to paved surface.

**Application:**
At any point of ingress or egress at a construction site where adjacent traveled way is paved. Generally applies to sites over 2 acres unless special conditions exist.

**Installation/Application Criteria:**
- Clear and grub area and grade to provide maximum slope of 2%.
- Compact subgrade and place filter fabric if desired (recommended for entrances to remain for more than 3 months.
- Place coarse aggregate, 1 to 2-1/2 inches in size, to a minimum depth of 8 inches.

**Limitations:**
- Requires periodic top dressing with additional stones.
- Should be used in conjunction with street sweeping on adjacent public right-of-way.

**Maintenance:**
- Inspect daily for loss of gravel or sediment buildup.
- Inspect adjacent roadway for sediment deposit and clean by sweeping or shoveling.
- Repair entrance and replace gravel as required to maintain control in good working condition.
- Expand stabilized area as required to accommodate traffic and prevent erosion at driveways.

**Targeted Pollutants**
- ▣ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

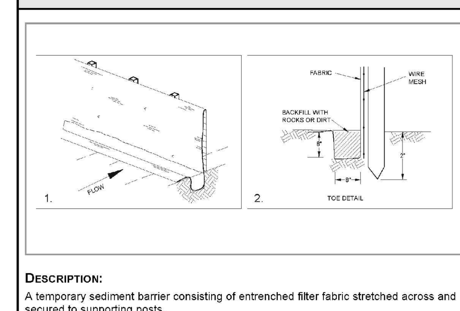
**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $$$ Capital Costs
- $$ O & M Costs
- $$ Maintenance
- $ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapted from Salt Lake County BMP Manual
Stormwater Discharge management from Construction Activities 2005

## BMP: Silt Fence — SF




**Objectives:**
- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☑ Stabilize Disturbed Areas
- ☑ Protect Slopes/Channels
- ☑ Control Site Perimeter
- ☑ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
A temporary sediment barrier consisting of entrenched filter fabric stretched across and secured to supporting posts.
Application:
- Perimeter control: place barrier at down-gradient limits of disturbance
- Sediment barrier: place barrier at toe of slope or soil stockpile
- Protection of existing waterways: place barrier at top of stream bank
- Inlet protection: place fence surrounding catchbasins

**Installation/Application Criteria:**
- Place posts 6 feet apart on center along contour (or use preassembled unit) and drive 2 feet minimum into ground. Excavate an anchor trench immediately up-gradient of posts.
- Secure wire mesh (14 gage min. with 6-inch openings) to upslope side of posts. Attach with heavy duty 1 inch long wire staples, tie wires or hog rings.
- Cut fabric to required width, unroll along length of barrier and drape over barrier. Secure fabric to mesh with twine, staples, or similar, with trailing edge extending into anchor trench.
- Backfill trench over filter fabric to anchor.

**Limitations:**
- Recommended maximum drainage area of 0.5 acre per 100 feet of fence
- Recommended maximum up-gradient slope length of 150 feet
- Recommended maximum uphill grade of 2:1 (50%)
- Recommended maximum flow rate of 0.5 cfs
- Ponding should not be allowed behind fence

**Maintenance:**
- Inspect immediately after any rainfall and at least daily during prolonged rainfall.
- Look for runoff bypassing ends of barriers or undercutting barriers.
- Repair or replace damaged areas of the barrier and remove accumulated sediment.
- Reanchor fence as necessary to prevent shortcutting.
- Remove accumulated sediment when it reaches ½ the height of the fence.

**Targeted Pollutants**
- ▣ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

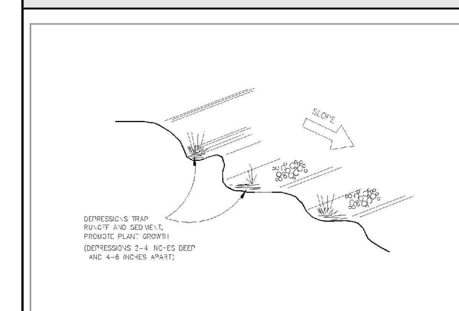
**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $$ Capital Costs
- $$ O & M Costs
- $$ Maintenance
- $ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapted from Salt Lake County BMP Manual
Stormwater Discharge management from Construction Activities 2005

## BMP: Surface Roughening — SR




**Objectives:**
- ☐ Housekeeping Practices
- ☑ Contain Waste
- ☐ Minimize Disturbed Areas
- ☑ Stabilize Disturbed Areas
- ☑ Protect Slopes/Channels
- ☐ Control site Perimeter
- ☑ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
Rough preparation of working areas leaving depressions and uneven surface. Depressions should be done parallel to contours

**Application:**
Surface roughening is appropriate for all construction that will not be receiving impervious cover within 14 days and that will be exposed less than 60 days (seed areas to be open in excess of 60 days).

**Installation/Application Criteria:**
- Surface should be left in rough condition during initial earthwork activity.
- Surfaces that have become smoothed or compacted due to equipment traffic should be roughened by use of disks, spring harrows, teeth on front end loader, or similar, operating along the contours of the slope. Tracking (by crawler tractor driving up and down slope) may also be used to provide depressions parallel to contours.
- Avoid compaction of soils during roughening as this inhibits plant growth and promotes storm water runoff. Limit tracked machinery to sandy soil.
- Seed or mulch areas to be exposed in excess of 60 days.
- Employ dust controls. (See Dust Control Detail Sheet).

**Limitations:**
- Will not withstand heavy rainfall.
- Slopes steeper than 2:1 (50%) should be benched (see Benching Detail Sheet).

**Maintenance:**
- Inspect following any storm event and at a minimum of weekly.
- If erosion in the form of rills (small waterways formed by runoff) is evident, perform machine roughening of area.
- For vegetated slopes reseed areas that are bare or have been reworked.

**Targeted Pollutants**
- ▣ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

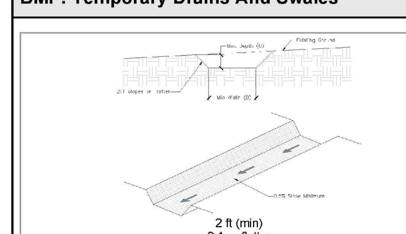
**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $$ Capital Costs
- $$ O & M Costs
- $$ Maintenance
- $ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapeted from Salt Lake County BMP Manual
Stormwater Discharge management from Construction Activities 2005

## BMP: Temporary Drains And Swales — TDS




**Objectives:**
- ☐ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☑ Protect Slopes/Channels
- ☑ Control Site Perimeter
- ☑ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
Temporary drains and swales are used to divert off-site runoff around the construction site, divert runoff from stabilized areas around disturbed areas, and direct runoff into sediment.

**Application:**
Temporary drains and swales are appropriate for diverting any upslope runoff around unstabilized or disturbed areas of the construction site.
Prevent slope failures. Prevent damage to adjacent property. Prevents erosion and transport of sediments into water ways. Increases the potential for infiltration. Diverts sediment-laden runoff into sediment basins or traps.

**Installation/Application Criteria:**
- Temporary drainage swales will effectively convey runoff and avoid erosion if built properly:
- Size temporary drainage swales using local drainage design criteria. A permanent drainage channel must be designed by a professional engineer (see the local drainage design criteria for proper design).
- At a minimum, the drain/swale should conform to pre-development drainage patterns and capacities.
- Construct the drain/swale with an uninterrupted, positive grade to a stabilized outlet. Provide erosion protection or energy dissipation measures if the flow out of the drain or swale can reach an erosive velocity.

**Limitations:**
- Temporary drains and swales or any other diversion of runoff should not adversely impact upstream or downstream properties.
- Temporary drains and swales must conform to local floodplain management requirements.

**Maintenance:**
- Inspect weekly and after each rain.
- Repair any erosion immediately.
- Remove sediment which builds up in the swale and restricts its flow capacity.

**Targeted Pollutants**
- ▣ Sediment
- ☐ Nutrients
- ☐ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

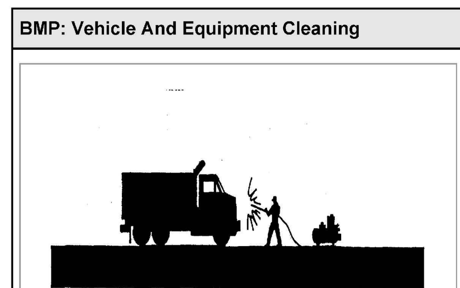
**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $$$ Capital Costs
- $ O & M Costs
- $ Maintenance
- $ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapted from Salt Lake County BMP Manual
Stormwater Discharge management from Construction Activities 2005

## BMP: Vehicle And Equipment Cleaning — VEC



**Objectives:**
- ☑ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☑ Control Site Perimeter
- ☑ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
Prevent or reduce the discharge of pollutants to storm water from vehicle and equipment cleaning by using off-site facilities, washing in designated, contained areas only, eliminating discharges to the storm drain by infiltrating or recycling the wash water, and/or training employees and subcontractors.

**Application:**
<text here>

**Installation/Application Criteria:**
- Use off-site commercial washing businesses as much as possible. Washing vehicles and equipment outdoors or in areas where wash water flows onto paved surfaces or into drainage pathways can pollute storm water. If you wash a large number of vehicles or pieces of equipment, consider conducting this work at an off-site commercial business. These businesses are better equipped to handle and dispose of the wash waters properly. Performing this work off-site can also be economical by eliminating the need for a separate washing operation at your site.
- If washing must occur on-site, use designated, bermed wash areas to prevent wash water contact with storm water, creeks, rivers, and other water bodies. The wash area can be sloped for wash water collection and subsequent infiltration into the ground.
- Use as little water as possible to avoid having to install erosion and sediment controls for the wash area. Use phosphate-free biodegradable soaps. Educate employees and subcontractors on pollution prevention measures. Do not permit steam cleaning on-site. Steam cleaning can generate significant pollutant concentrations.

**Limitations:**
- Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades.
- Sending vehicles/equipment off-site should be done in conjunction with Stabilized Construction Entrance.

**Maintenance:**
- Minimal, some berm repair may be necessary.

**Targeted Pollutants**
- ☐ Sediment
- ☐ Nutrients
- ▣ Toxic Materials
- ▣ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

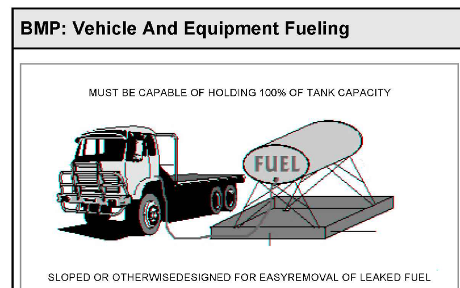
**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $$ Capital Costs
- $ O & M Costs
- $$$ Maintenance
- $ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapted from Salt Lake County BMP Manual
Stormwater Discharge management from Construction Activities 2005

## BMP: Vehicle And Equipment Fueling — VEF




**Objectives:**
- ☑ Housekeeping Practices
- ☐ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
Prevent fuel spills and leaks, and reduce their impacts to storm water by using off-site facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors.

**Installation/Application Criteria:**
- Use off-site fueling stations as much as possible. Fueling vehicles and equipment outdoors or in areas where fuel may spill/leak onto paved surfaces or into drainage pathways can pollute storm water. If you fuel a large number of vehicles or pieces of equipment, consider using an off-site fueling station. These businesses are better equipped to handle fuel and spills properly. Performing this work off-site can also be economical by eliminating the need for a separate fueling area at your site.
- If fueling must occur on-site, use designated areas, located away from drainage courses, to prevent the runon of storm water and the runoff of spills. Discourage"topping-off" of fuel tanks.
- Always use secondary containment, such as a drain pan or drop cloth, when fueling to catch spills/leaks. Place a stockpile of spill cleanup materials where it will be readily accessible. Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Carry out all Federal and State requirements regarding stationary above ground storage tanks.(40 CF Sub. J) Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and perhaps forklifts, most vehicles should be able to travel to a designated area with little lost time. Train employees and subcontractors in proper fueling and cleanup procedures.

**Limitations:**
- Sending vehicles/equipment off-site should be done in conjunction with Stabilized Construction Entrance.

**Maintenance:**
- Keep ample supplies of spill cleanup materials on-site.
- Inspect fueling areas and storage tanks on a regular schedule.

**Targeted Pollutants**
- ☐ Sediment
- ☐ Nutrients
- ◪ Toxic Materials
- ◪ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

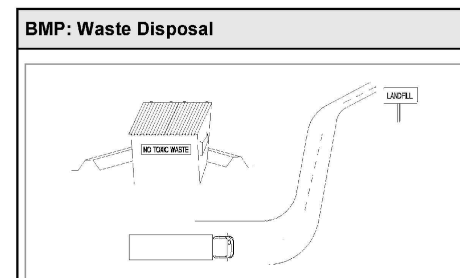
**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $$ Capital Costs
- $ O & M Costs
- $$ Maintenance
- $$ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapted from Salt Lake County BMP Manual
Stormwater Discharge management from Construction Activities 2005

## BMP: Waste Disposal — WD




**Objectives:**
- ☑ Housekeeping Practices
- ☑ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

**Description:**
Controlled storage and disposal of solid waste generated by construction activities.

**Application:**
All construction sites.

**Installation/Application Criteria:**
- Designate one or several waste collection areas with easy access for construction vehicles and personnel. Ensure no waterways or storm drainage inlets are located near the waste collection areas.
- Construct compacted earthen berm (See Earth Berm Barrier Information Sheet), or similar perimeter containment around collection area for impoundment in the case of spills and to trap any windblown trash.
- Use water tight containers with covers to remain closed when not in use. Provide separate containers for different waste types where appropriate and label clearly.
- Ensure all on site personnel are aware of and utilize designated waste collection area properly and for intended use only (e.g. all toxic, hazardous, or recyclable materials shall be properly disposed of separately from general construction waste).
- Arrange for periodic pickup, transfer and disposal of collected waste at an authorized disposal location. Include regular Porto-potty service in waste management activities.

**Limitations:**
- On-site personnel are responsible for correct disposal of waste.

**Maintenance:**
- Discuss waste management procedures at progress meetings.
- Collect site trash daily and deposit in covered containers at designated collection areas.
- Check containers for leakage or inadequate covers and replace as needed.
- Randomly check disposed materials for any unauthorized waste (e.g. toxic materials).
- During daily site inspections check that waste is not being incorrectly disposed of on-site (e.g. burial, burning, surface discharge, discharge to storm drain).erosion at driveways.

**Targeted Pollutants**
- ☐ Sediment
- ☐ Nutrients
- ▣ Toxic Materials
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

**Pollutant Impact**
- ▣ High Impact
- ◪ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- $$$ Capital Costs
- $$$ O & M Costs
- $$ Maintenance
- $$$ Training

**Relative Costs**
- $$$ High
- $$ Medium
- $ Low

Adapted from Salt Lake County BMP Manual
Stormwater Discharge management from Construction Activities 2005

## BMP: Spill Clean-Up — SCU



**Description:**
Practices to clean-up leakage/spillage of on-site materials that may be harmful to receiving waters.

**Application:**
All sites

**General:**
- Store controlled materials within a storage area.
- Educate personnel on prevention and clean-up techniques.
- Designate an Emergency Coordinator responsible for employing preventative practices and for providing spill response.
- Maintain a supply of clean-up equipment on-site and post a list of local response agencies with phone numbers.

**Methods:**
- Clean-up spills/leaks immediately and remediate cause.
- Use as little water as possible. NEVER HOSE DOWN OR BURY SPILL CONTAMINATED MATERIAL.
- Use rags or absorbent material for clean-up. Excavate contaminated soils. Dispose of clean-up material and soil as hazardous waste.
- Document all spills with date, location, substance, volume, actions taken and other pertinent data.
- Contact local Fire Department and State Division of Environmental Response and Remediation (Phone #801-536-4100) for any spill of reportable quantity.

**Objectives**
- ☒ Housekeeping Practices
- ☒ Contain Waste
- ☐ Minimize Disturbed Areas
- ☐ Stabilize Disturbed Areas
- ☐ Protect Slopes/Channels
- ☐ Control Site Perimeter
- ☐ Control Internal Erosion

Dudley & Associates, Inc.
Engineers Planners Surveyors
353 East 1200 South
Orem, Utah

Adapted from Salt Lake County BMP Fact Sheet

**Targeted Pollutants**
- ☐ Sediment
- ☐ Nutrients
- ■ Toxic Materials
- ☒ Oil & Grease
- ☐ Floatable Materials
- ☐ Other Waste

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

**Implementation Requirements**
- ☒ Capital Costs
- ☐ O&M Costs
- ☐ Maintenance
- ■ Training

■ High ☒ Medium ☐ Low

## EROSION CONTROL NOTES:

1. CONTROLLING SEDIMENT TRANSPORT AND PREVENTING AND/OR CORRECTING PROBLEMS ASSOCIATED WITH EROSION AND RUNOFF PROCESSES THAT COULD OCCUR BOTH DURING AND AFTER PROJECT CONSTRUCTION WILL BE CLOSELY MONITORED. PERIODIC MAINTENANCE AND INSPECTION OF SEDIMENT CONTROL DEVICES WILL BE SCHEDULED. PARTICULAR ATTENTION SHALL BE GIVEN TO EXISTING DRAINAGE PATTERNS THAT RUN THROUGH DISTURBED AREAS AND OVER EXTREME SLOPES. THESE PATTERNS WILL BE IDENTIFIED TO ISOLATE PROBLEM AREAS WHERE WATER WILL CONCENTRATE. PROVISIONS SHALL BE MADE TO CHANNEL RUNOFF AWAY FROM NEW OR EXISTING IMPROVEMENTS TO PREVENT UNDERMINING AND GENERAL SITE EROSION. THESE PROVISIONS SHALL BE STABILIZED AND SHALL REMAIN IN PLACE UNTIL THE PERMANENT STORM DRAINAGE FACILITIES ARE INSTALLED AND FUNCTIONAL.

2. EROSION CONTROL - A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) HAS BEEN PREPARED IN ACCORDANCE WITH THE UTAH POLLUTANT DISCHARGE ELIMINATION SYSTEM (UPDES) PERMIT FOR CONSTRUCTION, OUTLINING HOW EROSION AND SILTATION WILL BE CONTROLLED. A NOTICE OF INTENT (NOI) HAS BEEN SUBMITTED TO OBTAIN THE UPDES CONSTRUCTION PERMIT. A COPY OF THE PLAN MUST BE ON SITE AT ALL TIMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING THE PLAN AND INSTALLING AND MAINTAINING THE EROSION CONTROL FACILITIES WITH EACH PHASE OF WORK. SHOULD SILT LEAVE THE SITE OR EROSION OCCURS, IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO TAKE CORRECTIVE ACTION AND REPAIR ANY DAMAGE CAUSED BY THE SILT OR EROSION IMMEDIATELY. ALL COSTS ASSOCIATED WITH THE MODIFICATION AND APPROVAL OF THE PLAN WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.

3. BEFORE CONSTRUCTION BEGINS, THE LIMITS OF DISTURBANCE (LOD) BOUNDARY SHALL BE STAKED ON SITE AND APPROVED BY THE OWNER'S REPRESENTATIVE AND THE ENGINEER.

4. EXCAVATION AND EMBANKMENT OPERATIONS SHALL PROCEED IN SUCH A MANNER SO THAT FINISHING OF SLOPES, INCLUDING REVEGETATION SHALL BE ACCOMPLISHED AS SOON AS POSSIBLE AFTER ROUGH GRADING. ALL SLOPES 2:1 OR FLATTER SHALL BE SCARIFIED WITH HEAVY EQUIPMENT, LEAVING TRACKS PERPENDICULAR TO THE SLOPE. SLOPES OVER 1:1 SHALL UTILIZE EROSION CONTROL/REVEGETATION MATTING.

5. CUT AND FILL SLOPES SHALL BE CONDUCTED PER THE GEOTECHNICAL REPORT. THE TOPS OF ALL CUT SLOPES IN SOIL SHALL BE ROUNDED FOR A HORIZONTAL DISTANCE OF THREE (3) FEET BEYOND THE CATCH POINT. SLOPE ROUNDING SHALL OCCUR AS THE SLOPE IS BEING BROUGHT DOWN. THE OVERALL SHAPE, HEIGHT AND GRADE OF ANY CUT AND/OR FILL SLOPE SHALL BE DEVELOPED IN CONCERT WITH THE EXISTING NATURAL CONTOURS, SCALE AND VEGETATION OF NATURAL TERRAIN.

6. EXISTING VEGETATION SHOULD BE PRESERVED WHEREVER POSSIBLE AND DISTURBED PORTIONS OF THE SITE SHALL BE STABILIZED. STABILIZATION PRACTICES MAY INCLUDE, BUT NOT BE LIMITED TO, TEMPORARY SEEDING, PERMANENT SEEDING, MULCHING, GEOTEXTILES, SOD STABILIZATION, VEGETATIVE BUFFER STRIPS, PROTECTION OF TREES, PRESERVATION OF NATURAL VEGETATION AND OTHER APPROPRIATE MEASURES. USE OF IMPERVIOUS SURFACES FOR STABILIZATION SHALL BE AVOIDED. STABILIZATION MEASURES SHALL BE INITIATED AS SOON AS POSSIBLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED.

7. SPECIFICALLY OUTLINED DISTURBED AREAS, BOTH ON AND OFF-SITE SHALL BE REVEGETATED. THESE AREAS SHALL INCLUDE, BUT NOT BE LIMITED TO, ALL UNSURFACED AREAS WITHIN THE STAKED LOD, STAGING AND STORAGE AREAS, MATERIAL WASTE AREAS, UNDERGROUND UTILITY CONSTRUCTION AREAS, BENCHED AREAS, INCLUDING RETAINING WALL BENCHES, AND TEMPORARY OR EXISTING ACCESS ROADS USED FOR CONSTRUCTION ACTIVITIES.

8. A SWALE SEDIMENT TRAP FOR ALL DRAINAGE WAYS INTERCEPTED BY PROPOSED ROAD CONSTRUCTION WILL BE FORMED, TRAPS WILL BE PLACED IN SURFACE DRAIN DITCHES JUST BEFORE THE RUNOFF LEAVES THE PROPERTY, ENTERS A WATERCOURSE OR IMMEDIATELY PROCEEDING DITCH INLETS OF STABILIZED OUTLETS. SEDIMENT TRAPS MUST OUTLET ONTO STABILIZED (PREFERABLY UNDISTURBED) GROUND OR LEFT TO PERCOLATE INTO THE GROUND.

9. CONTROLLED OUTLETS SHALL DIRECT COLLECTED RUNOFF THROUGH SILT FENCES OR STRAW BALES

10. TYPICAL FUGITIVE DUST SHALL BE CONTROLLED BY WATERIN AND/OR CHEMICAL STABILIZATION, PROVIDING VEGETATIVE OR SYNTHETIC COVER AND WIND BREAKS CONSISTENT WITH THE UTAH STATE DIVISION OF AIR QUALITY STANDARDS.

11. ANY SEDIMENT TRACKED OFF-SITE SHALL BE REMOVED PRIOR TO THE END OF THE WORK SHIFT OR PRIOR TO SUNSET, WHICHEVER COMES FIRST.

12. CONTRACTOR MAY ADJUST THE LOCATIONS OF THE CONSTRUCTION FENCE, CONSTRUCTION TRAILERS, AND CONSTRUCTION MATERIALS RECEIVING AND STORAGE AREAS, AS NEEDED TO ACCOMPLISH THE CONSTRUCTION. ALL CHANGES SHALL BE NOTATED ON THE EROSION CONTROL PLAN.

13. THE CONTRACTOR SHALL CONDUCT PERIODIC INSPECTIONS OF THE EROSION CONTROL MEASURES, AS REQUIRED AND NOTATED IN THE SWPPP. THE CONTRACTOR WILL MAINTAIN A LOG ON-SITE OF ALL INSPECTIONS WITH THE SWPPP.

14. ANY TREE 12" IN DIAMETER OR LARGER WILL NOT BE REMOVED UNTIL LOCATED BY SURVEY AND THE REMOVAL APPROVED BY THE OWNER OR EQUAL.

15. ALL DITCHES AND SWALES GREATER THAN 5% SHALL BE ARMORED WITH AN APPROPRIATE EROSION CONTROL/REVEGETATION STABILIZATION MAT TO PROMOTE REVEGETATION.

16. PORTABLE TOILETS MAY BE LOCATED UPON ANY INDIVIDUAL HOME LOT.

17. CONTRACTOR MAY ADJUST THE LOCATION OF CONCRETE WASHOUT AREAS AS NEEDED TO ACCOMPLISH THE CONSTRUCTION.

DUDLEY AND ASSOCIATES
ENGINEERS PLANNERS SURVEYORS
353 EAST 1200 SOUTH, OREM, UTAH
801-224-1252

# BMP DETAILS

REGISTERED PROFESSIONAL ENGINEER
No. 147089
Roger D Dudley
STATE OF UTAH

Revisions

Date 8-12-2021
Scale NOT TO SCALE
By TD
Tracing No. L -

Sheet No.
C- 6.1

NORTH
1" = 20'

All above ground features including utilities (poles, fire hydrants, boxes, etc.) must be out of AASHTO clear zone or a min 18' behind curb.

All work within UDOT ROW to conform to UDOT Standards.

Speed Limit -500 East Street - 45 MPH (Posted)

All striping removal will be to UDOT Standards - No grinding will be permitted.

No parking is permitted on 500 East Street Right of Way.

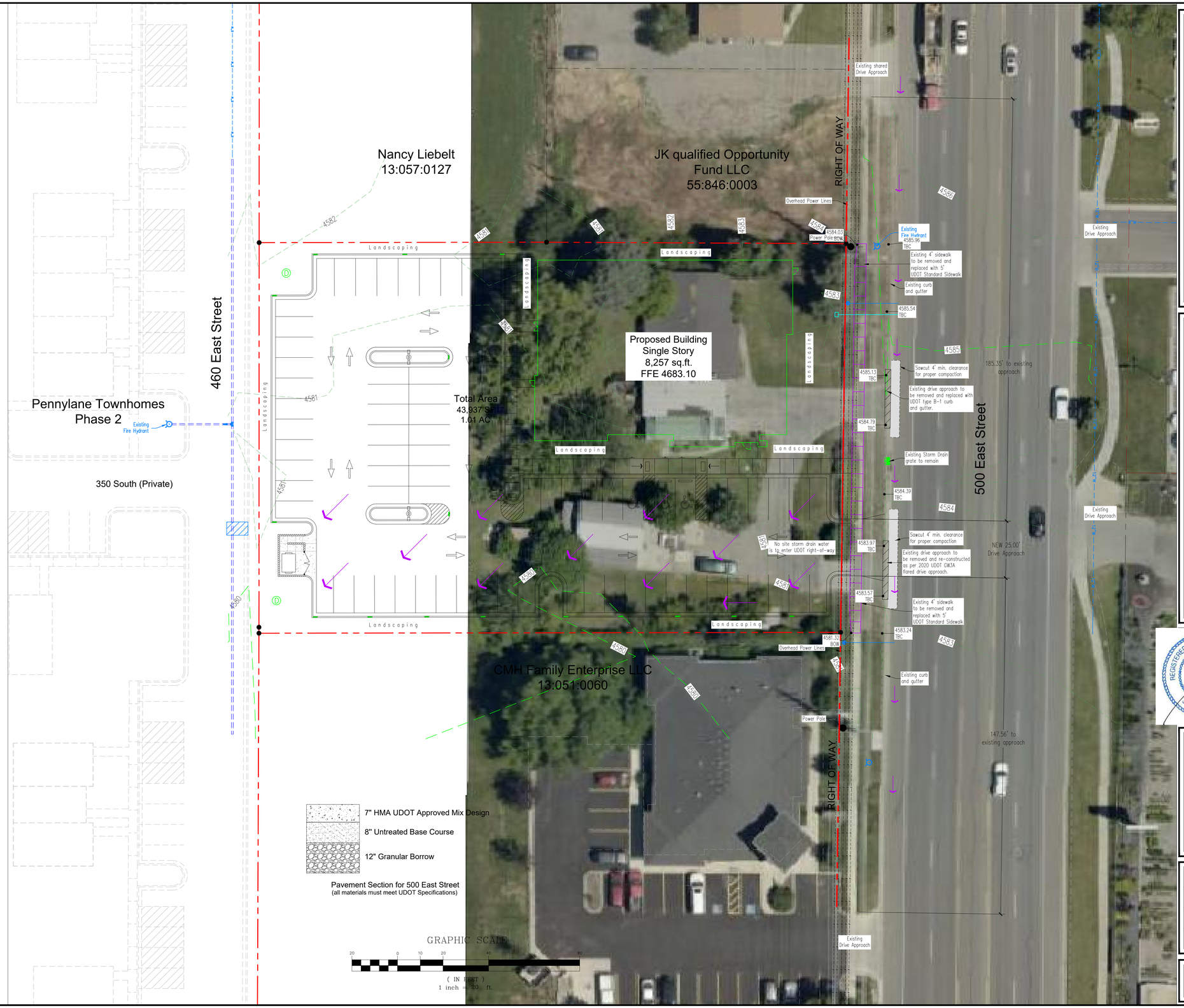
UDOT NOTES

1. UDOT reserves the right, at its option, to install a raised median island or restrict the access to a right-in or rightout at any time.
2. Work on the UDOT right-of-way is seasonally restricted from October 15 to April 15.
3. ROW Work: Work is not allowed on the right-of-way during the AM/PM peak traffic hours (6:00 - 9:00 AM and 3:30 -6:00 PM). Additional work restrictions or modifications may be imposed at the time of the encroachment permit.
4. Replace all pavement markings in kind (tape with tape and paint with paint). Install all paint lines with permanent paint application per UDOT specification 02765. Paint must have at least 6 months life as determined by UDOT's Permits Officer.
5. All new pavement words, arrows and symbols marking within the right-of-way shall be pre-formed thermo plastic. All letters, arrows, and symbols shall conform with the "Standard Alphabet for Highway Signs and Pavement Markings" adopted by the Federal Highway Administration.
6. All signs installed on the UDOT right-of-way must be high intensity grade (Type IX sheeting) with a B3 slip base. Install all signs per UDOT SN series Standard Drawings.
7. Before commencing work on the State highway, the general contractor is required to obtain an encroachment permit from the applicable Region's Permits Office before working within the State right-of-way.
8. No road cuts allowed on this job.
9. For all utility taps (road cuts), use flowable fill per UDOT's current mix design (50-150 psi) UDOT spec. 03575.
10. All utilities within the paved surface must be bored.
11. For excavations outside of the roadway, back fill with UDOT approved granular borrow and road base. Compaction per UDOT spec. 2056 and 2721.
12. Owner, developer, and/or the contractor is required to hire an independent company for all testing within the UDOT right-of-way.
13. Owner, developer, and the contractor are responsible for any damage to the UDOT right-of-way that may be directly or indirectly caused by the development activity.
14. Traffic signal installation or modification requires a separate warranty bond once the work has been completed and accepted. The permittee is responsible for hiring an independent inspection company to perform inspection services for all signal work completed. For a list of the UDOT approved contractors and consultants contact the appropriate Regions Traffic Signals Engineer.
15. Partial concrete panel replacement is not allowed. When panels are removed, the entire panel is required to be replaced per UDOT standards, specifications, and standard drawings.
16. Double saw cut the concrete to prevent the spalling of other concrete panels and to avoid over cuts. Over cuts and spalls will require full panel replacement.
17. All above ground features including utilities (poles, fire hydrants, boxes, etc.) must be relocated out of the AASHTO clear zone or a minimum of 18" behind curb.

CAUTION!!! Notice to contractors

The Contractor is specifically cautioned that the location and/or elevation of existing utilities as shown on these plans is based on records of the various utility companies and where possible from measurements taken in the field. the information is not to be considered exact or complete. The Contractor must notify the utility location center at least 48 hours prior to any excavation to request the exact location of the utilities in the field. It shall be the responsibility of the Contractor to relocate all existing utilities which conflict with the proposed improvements shown on the plan.

Know what's below. 811
Call 811 before you dig.
BLUE STAKES OF UTAH
UTILITY NOTIFICATION CENTER, INC.
www.bluestakes.org
1-800-662-4111




DUDLEY AND ASSOCIATES
ENGINEERS PLANNERS SURVEYORS
353 EAST 1200 SOUTH, OREM, UTAH
801-224-1252

Goldfish Swim School

# Site Plan

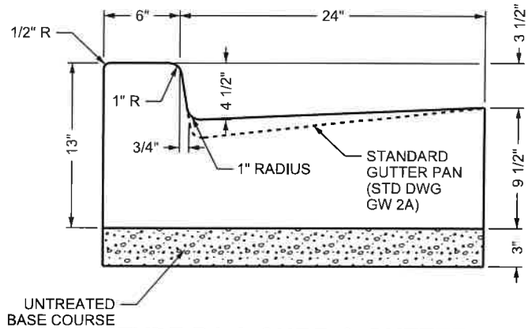
American Fork, Utah




Revisions

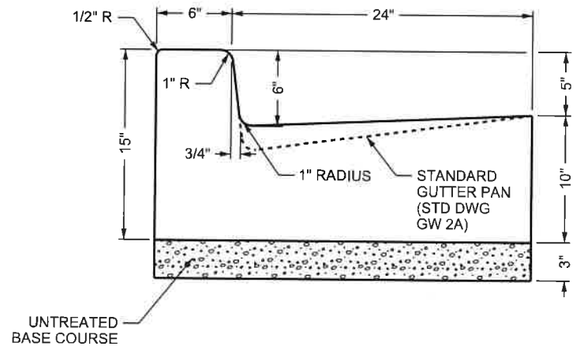
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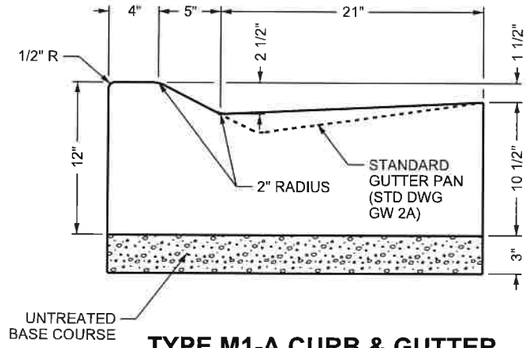

## TYPE B1-A CURB & GUTTER

GUTTER PAN SLOPE REDUCED FOR ADA ACCESS
AREA = 2.050 SQ FT



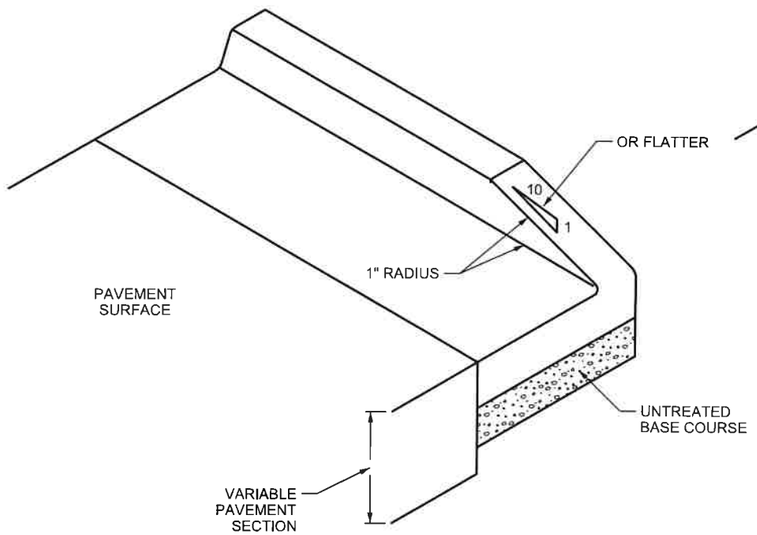

## TYPE B2-A CURB & GUTTER

GUTTER PAN SLOPE REDUCED FOR ADA ACCESS
AREA = 2.221 SQ FT

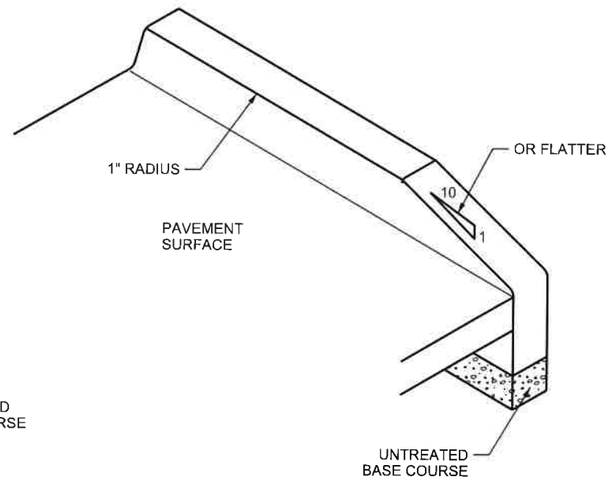



## TYPE M1-A CURB & GUTTER

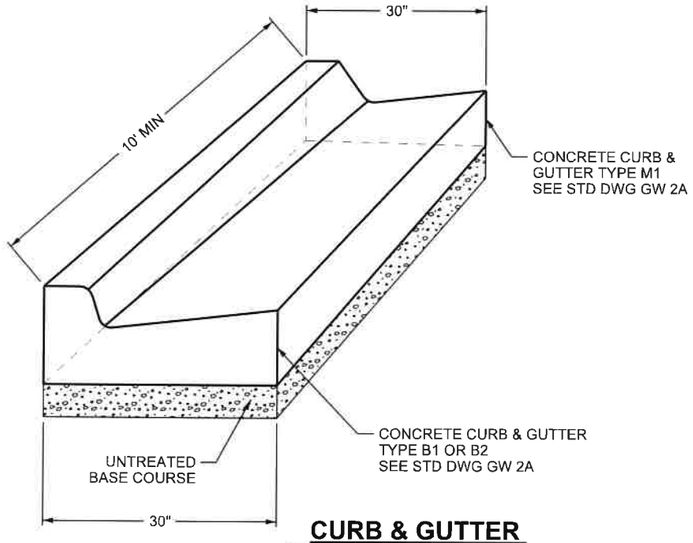
GUTTER PAN SLOPE REDUCED FOR ADA ACCESS
AREA = 2.164 SQ FT




## TYPICAL CURB & GUTTER END DETAIL




## TYPICAL CURB END DETAIL




## CURB & GUTTER TRANSITION DETAIL

**NOTE:**

1. FLATTEN GUTTERS AS SHOWN AT ADA ACCESS LOCATIONS. FLATTEN GUTTER BETWEEN ACCESSES AS WELL AS AT CURB ACCESSES WHERE MORE THAN ONE ACCESS WILL BE CONSTRUCTED AT A CORNER.

REVISIONS

| NO. | DATE | APPR. | REMARKS |
|---|---|---|---|
| 1 | 8/31/17 | CGW | LEVELED BOTTOM OF CURB AND GUTTER SECTIONS |

**UTAH DEPARTMENT OF TRANSPORTATION**
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

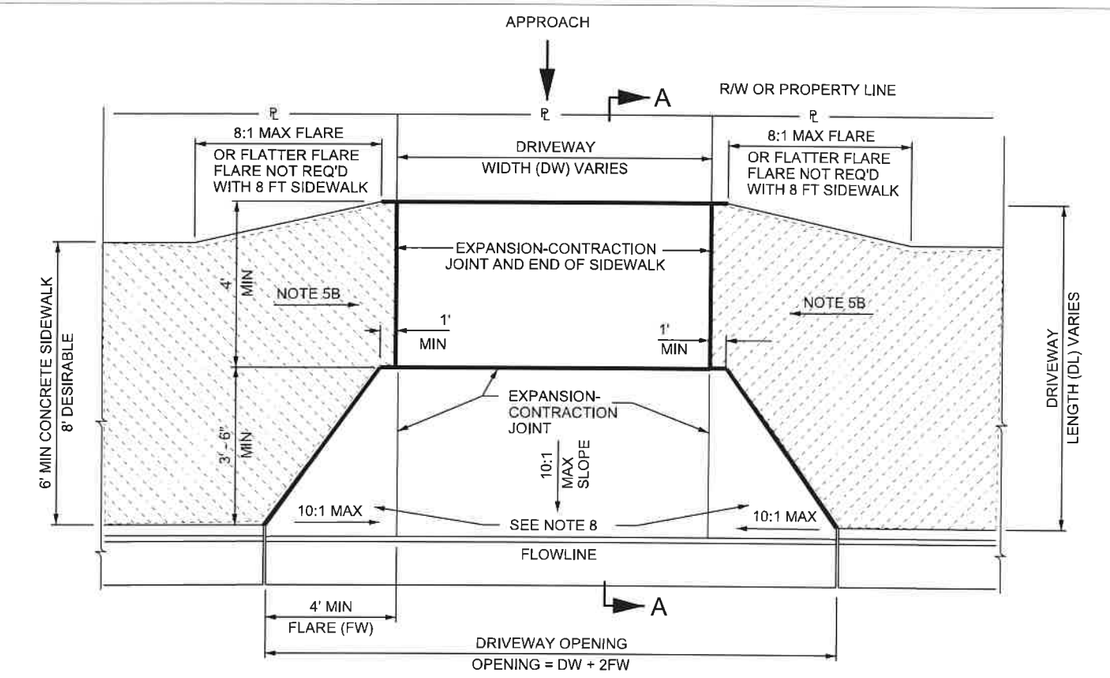
RECOMMENDED FOR APPROVAL — DATE 03/17/2021
CHAIRMAN STANDARDS COMMITTEE — DATE
APPROVED
DEPUTY DIRECTOR — DATE 03/17/2021

# CONCRETE CURB AND GUTTER DETAILS

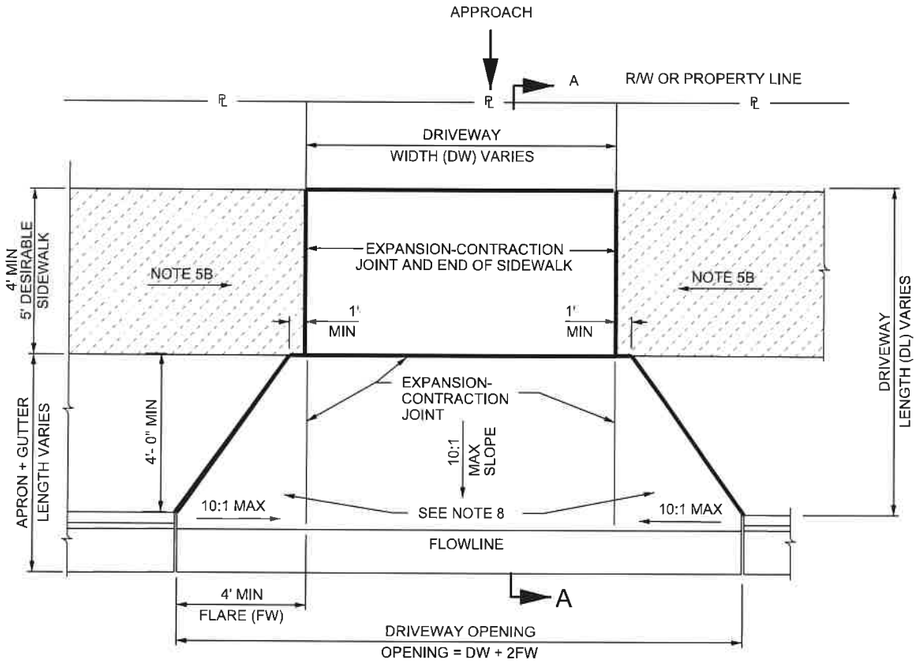
STANDARD DRAWING TITLE

STD. DWG. NO.
GW 2B

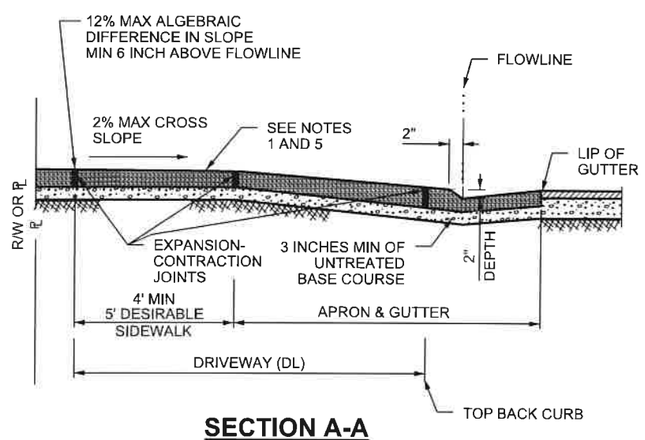
15-MAR-2021 DGN File: D:\Standardsandspecs\Section\2022 Section\Electronic Books\Master Drawings\Drawing Batches for PDF\Batch 5 (FG, GF, GW, PA) 46\GW02B.dgn




## FLARED DRIVEWAY WITH ADJACENT SIDEWALK

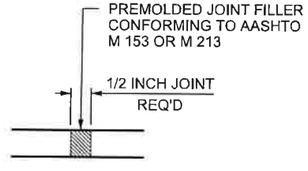



## FLARED DRIVEWAY WITH PARKSTRIP




## SECTION A-A

| DRIVEWAY FLARE AREA CHART | |
|---|---|
| FLARED DRIVEWAY | |
| DISTANCE FROM BACK OF CURB TO SIDEWALK | FLARE AREA |
| | |
| 3 FT | 18 ft$^2$ |
| 4 FT | 24 ft$^2$ |
| 6 FT | 36 ft$^2$ |
| 8 FT | 48 ft$^2$ |
| 10 FT | 60 ft$^2$ |
| | |
| ADD (DL)(DW) FOR | |
| TOTAL QUANTITY | |
| QUANTITY CALCULATED USING A 6 INCH CURB | |




## EXPANSION-CONTRACTION JOINT DETAIL

**NOTES:**

1. SIDEWALK CROSS SLOPE DIMENSIONS SHOWN ARE NOT SUBJECT TO CONVENTIONAL INDUSTRY TOLERANCES. CONSTRUCT SIDEWALKS AND RAMPS SUCH THAT THE MAXIMUM OR MINIMUM VALUES ARE NOT EXCEEDED. WORK THAT EXCEEDS THOSE VALUES WILL NOT BE ACCEPTED.
2. MAXIMUM DISTANCE BETWEEN CONTROL JOINTS 10 FT LATERALLY AND LONGITUDINALLY SPACED EQUALLY.
3. PROVIDE EXPANSION-CONTRACTION JOINTS IN CONCRETE SIDEWALK AT 30 FT INTERVALS AND WHERE CONCRETE SIDEWALK BUTTS AGAINST DRIVEWAY.
4. SIDEWALK INSIDE THE DRIVEWAY LIMITS IS PAID AS PART OF DRIVEWAY, NOT AS PART OF SIDEWALK.
5. FLARED CONCRETE DRIVEWAY
   A. RESIDENTIAL = 6 INCH THICK, COMMERCIAL = 7 INCH THICK. USE THESE THICKNESSES FOR APRON, SIDEWALK WITHIN DRIVEWAY AREA, APPROACH AND FLARE.
   B. DEPRESS THE LONGITUDINAL SLOPE OF THE SIDEWALK AT A MAXIMUM RATE OF 5 PERCENT TO MEET THE APRON - APPROACH ELEVATION IF THE GRADES SHOWN ON THE SLOPE DETAIL CANNOT BE MET. THE TOP BACK OF SIDEWALK IS TO BE A MINIMUM 6 INCHES ABOVE THE FLOWLINE OF CURB AND GUTTER AT ALL TIMES.
6. USE CLASS AA(AE) CONCRETE FOR SIDEWALK AND DRIVEWAYS.
7. USE UNTREATED BASE COURSE UNDER ALL SIDEWALKS AND DRIVEWAYS.
8. QUANTITIES FOR DRIVEWAYS INCLUDE FLARES TO TOP BACK OF CURB. CURB AND GUTTER PAID SEPARATELY THROUGH DRIVEWAY LOCATIONS.
9. REMOVE EXISTING SIDEWALK AND REPLACE BACK TO NEAREST EXPANSION-CONTRACTION JOINT.
10. APPROACH IS FROM EXISTING DRIVEWAY TIE-IN TO TOP-BACK-CURB AND IS PART OF DRIVEWAY QUANTITIES.

**DESIGN-ONLY NOTES:**

A. DRIVEWAY DIMENSIONS (MAX.& MIN.) ARE LOCATED IN UDOT "ADMINISTRATIVE RULE R930-6 ACCOMMODATION OF UTILITIES AND THE CONTROL AND PROTECTION OF STATE HIGHWAY RIGHTS OF WAY."

| NO. | DATE | APPR. | REMARKS |
|---|---|---|---|
| 1 | 8/31/17 | CGW | INCREASED MINIMUM APRON DEPTH TO 3.5 FT |

REVISIONS

**UTAH DEPARTMENT OF TRANSPORTATION**

STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

03/17/2021

RECOMMENDED FOR APPROVAL — DATE 03/17/2021
CHAIRMAN STANDARDS COMMITTEE
APPROVED: [illegible]
DEPUTY DIRECTOR — DATE

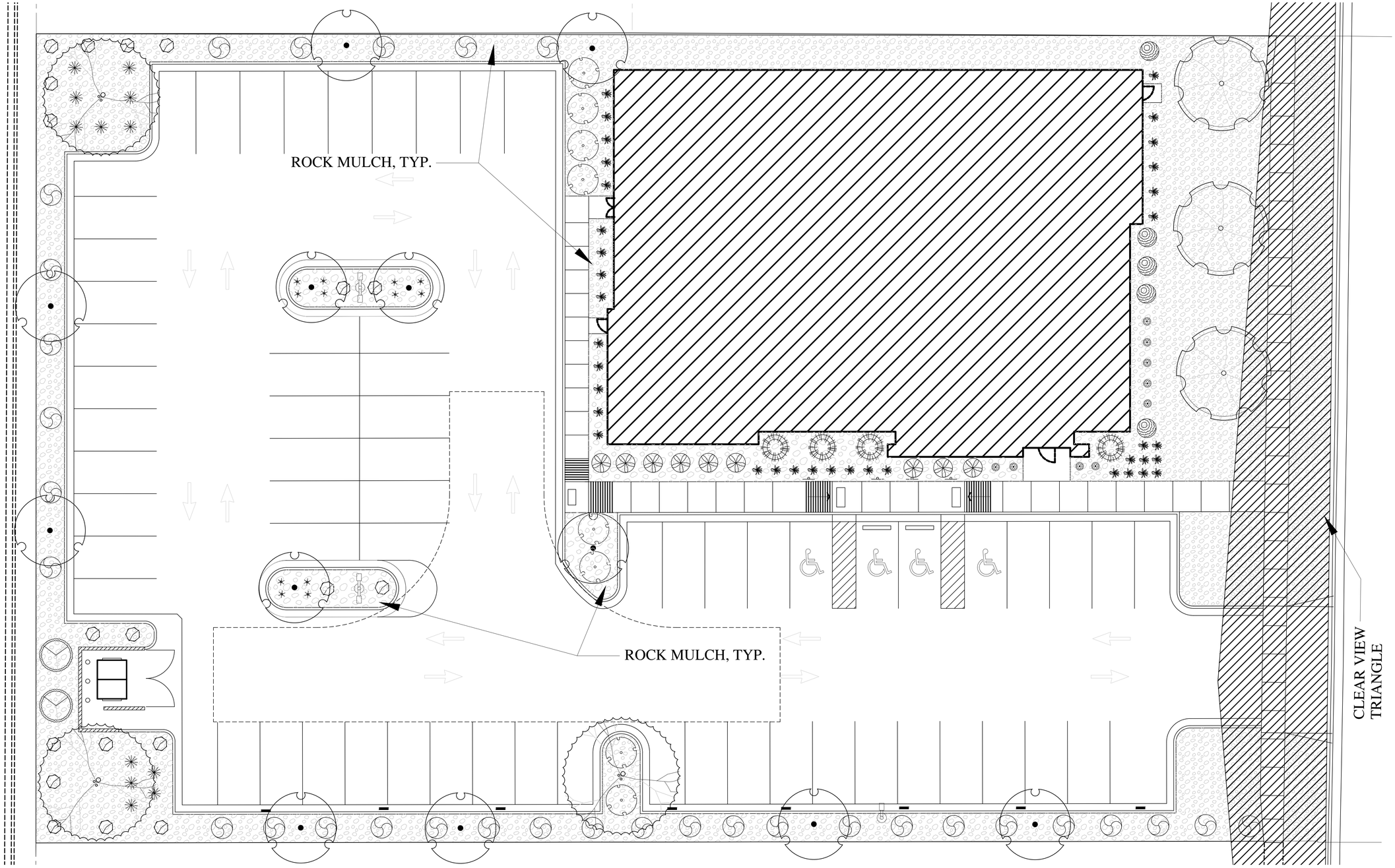
# CONCRETE DRIVEWAYS AND SIDEWALKS

STANDARD DRAWING TITLE

STD. DWG. NO.

GW 3A

DGN File: D:\StandardsandSpecs\Section\2022 Section\Electronic Books\Master Drawings\Drawing Batches for PDF\Batch 5 IFG, GF, DW, PAI 46\GW03A.dgn
15-MAR-2021




## AREA CALCULATIONS

| | |
|---|---|
| TOTAL SITE AREA<br>*NOT INCLUDING PARK STRIP AREA ( 1,505 S.F.) | 44,557 S.F. |
| TOTAL LANDSCAPE AREA<br>*NOT INCLUDING PARK STRIP AREA ( 1,232 S.F.) | 10,347 S.F. |
| TREES (1 PER 2,500 S.F. OF IMPROVED AREA<br>REQUIRED:<br>PROVIDED | <br>18<br>18 |
| SHRUBS ( 1 PER 300 S.F. OF IMPROVED AREA<br>REQUIRED:<br>PROVIDED: | <br>149<br>149 |

## DECIDUOUS TREE LEGEND

| SYMBOL | BOTANICAL NAME/COMMON NAME | QTY | SIZE |
|---|---|---|---|
| | GLEDITSIA TRIACANTHOS INERMIS 'IMPCOLE'<br>IMPERIAL HONEY LOCUST | 3 | 2" CAL |
| | PRUNUS SERRULATA 'KWANZAN'<br>KWANZAN JAPANESE FLOWERING CHERRY | 3 | 2" CAL. |
| | TILIA CORDATA 'CORZAM'<br>CORINTHIAN LITTLELEAF LINDEN | 12 | 2" CAL. |

## DECIDUOUS SHRUB LEGEND

| SYMBOL | BOTANICAL NAME/COMMON NAME | QTY | SIZE |
|---|---|---|---|
| | CORNUS ALBA 'MINBAT'<br>BATON ROUGE DOGWOOD | 32 | 5 GAL. |
| | CORNUS SERICEA 'KELSEYI'<br>KELSEY'S DWARF RED TWIG DOGWOOD | 19 | 5 GAL. |
| | HISBISCUS SYRIACUS 'ANTONG TWO'<br>LIL KIM DWARF ROSE OF SHARON | 5 | 5 GAL. |
| | PHYSOCARPUS OPULIFOLIUS 'SMPOTW'<br>TINY WINE NINEBARK | 9 | 5 GAL. |
| | RHUS AROMATICA 'GRO-LOW'<br>GRO-LOW FRAGRANT SUMAC | 8 | 5 GAL. |
| | VIBURNUM X BURKWOODII<br>BURKWOOD VIBURNUM | 2 | 5 GAL. |

## EVERGREEN SHRUB LEGEND

| SYMBOL | BOTANICAL NAME/COMMON NAME | QTY | SIZE |
|---|---|---|---|
| | JUNIPERUS CHINENSIS 'BLUE POINT'"<br>BLUE POINT JUNIPER | 4 | 5-6' TALL |

## PERENNIALS / GRASSES LEGEND

| SYMBOL | BOTANICAL NAME/COMMON NAME | QTY | SIZE |
|---|---|---|---|
| | CALAMAGROSTIS X ACUTIFLORA 'AVALANCHE'<br>FEATHER REED GRASS | 9 | 1 GAL. |
| | CAREX ELATA 'BOWLES GOLDEN'<br>BOWLES GOLDEN SEDGE | 12 | 1 GAL. |
| | CAREX MUSKINGUMENSIS 'ICE FOUNTAINS'<br>ICE FOUNTAINS PALM SEDGE | 12 | 1 GAL. |
| | HEMEROCALLIS X `ALWAYS AFTERNOON'<br>DAYLILY | 37 | 1 GAL. |

10' 0 10' 20' 30'

SCALE: 1"=10'-0" ON 24X36 SHEET

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57 North 450 West American Fork, Utah 84003
801.756.5043 www.in-sitedesigngroup.com

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**www.kriegerklatt.com**

Client:
Goldfish Swim Schools

Project:
GSS - American Fork, UT
348 South 500 East
American Fork, Utah

| Issued | Description | By |
|---|---|---|
| 04.19.2021 | Site Plan Review | TS |
| 06.07.2021 | TRC Review | DW |
| 08.24.2021 | TRC Revisions 01 | DW |
| 09.29.2021 | C&S/Bids | DW |
| 10.29.2021 | C&S/Bids | CW |
| 12.30.2021 | Revisions | CW |

Brand Standard:
All Brand Standards must be followed - No deviation permitted without prior written Goldfish Franchise approval.

Seal:
STATE OF UTAH
DARREN G. WILSON
NO. 356187
12-30-2021
LICENSED LANDSCAPE ARCHITECT

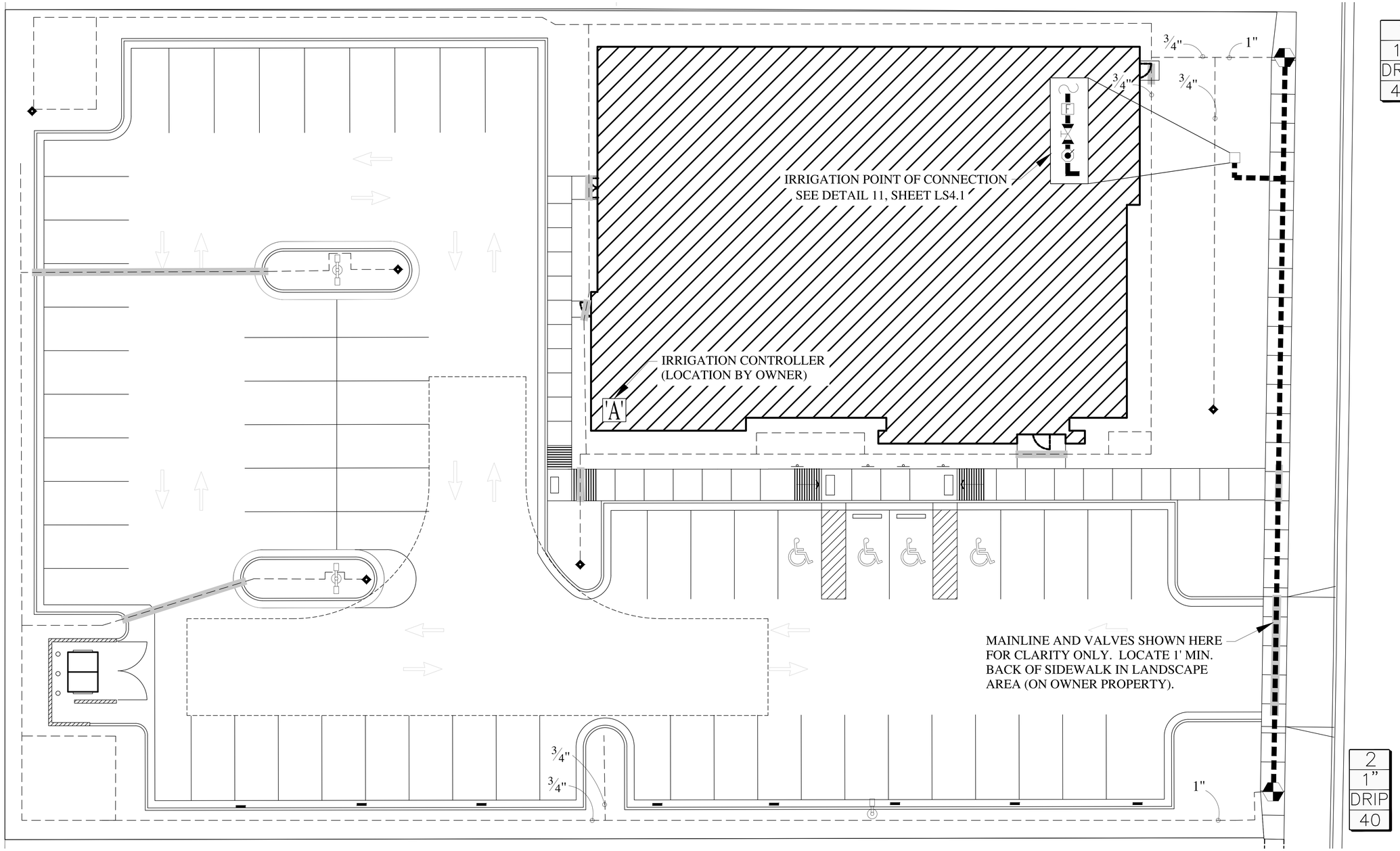
Note:
Do not scale drawings. Use calculated dimensions only. Verify existing conditions in field.

North Arrow:

Sheet Title:
PLANTING PLAN

Project Number:
21-017

Sheet Number:
LS1.1



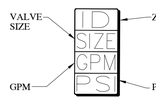

1
1"
DRIP
40

2
1"
DRIP
40

## IRRIGATION LEGEND

| SYMBOL | MANUFACTURER-MODEL NUMBER | PAT. | RD. | PSI | GPM Q | T | H | TT | TQ | F | DRIP GPH | DETAILS | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NOT SHOWN | GPH INC. GPSCV2M DRIP EMITTER | F | -- | 30 | -- | -- | -- | -- | -- | -- | 2.0 | 16-19 | SEE IRRIGATION DETAILS |
| NOT SHOWN | RAINBIRD PC-05 EMITTER WITH DIFFUSER CAP | F | -- | 30 | -- | -- | -- | -- | -- | -- | 5.0 | 16-19 | SEE IRRIGATION DETAILS |
| NOT SHOWN | DRIPLINE: NETAFIM TLCV26-18 | F | -- | 30 | -- | -- | -- | -- | -- | -- | 26/18" | 16-19 | SEE IRRIGATION DETAILS |
| NOT USED | RAIN BIRD 1804-PRS POP-UP SPRAY 10 SERIES | Q,T,H | 10' | 30 | .39 | .53 | .79 | -- | -- | -- | -- | 6 | ADJUST ARC AS NEEDED |
| NOT USED | RAIN BIRD 1804-PRS POP-UP SPRAY SERIES VAN | VAN | 10' | 30 | -- | -- | -- | -- | -- | -- | -- | 6 | ADJUST ARC AS NEEDED |
| NOT USED | RAIN BIRD R-VAN24 (RD-04-SAM-P45 TURF ROTARY) | VAN | 24' | 45 | -- | -- | -- | -- | -- | -- | -- | 6 | ADJUST ARC AS NEEDED |
| 'A' | RAINBIRD CONTROLLER, MODEL #ESPLXBASIC. LC. TO COORDINATE WITH TRADES TO RUN CONDUIT AND SLEEVING FOR WIRING TO VALVES. SIZE CONTROLLER AS NECESSARY. PLACE CONTROLLER IN WEATHER RESISTANT CABINET | | | | | | | | | | | 1 | COORDINATE EXACT LOCATION WITH OWNER. |
| F | 1" RAINBIRD SCREEN FILTER | | | | | | | | | | | 12-13 | SEE IRRIGATION DETAILS |
| | 1" SCHEDULE 80 ISOLATION VALVE | | | | | | | | | | | 12-13 | JUMBO VALVE BOX |
| | 1" POINT OF CONNECTION TO P.I. WATER MAIN PER CIVIL DRAWINGS. | | | | | | | | | | | 12-13 | JUMBO VALVE BOX |
| NOT USED | RAIN BIRD PESB-PRS-D AUTOMATIC CONTROL VALVE (SIZE AS NOTED ON PLAN). INSTALL PRS-D OPTION PER DETAILS. | | | | | | | | | | | 5-7 | SEE IRRIGATION DETAILS |
| | DRIP CONTROL ZONE KIT: RAINBIRD XCZ-100-PRB COM | | | | | | | | | | | 14 | JUMBO VALVE BOX |
| | 1" SCH. 40 PVC MAINLINE | | | | | | | | | | | 4, 8 | SEE IRRIGATION DETAILS |
| NOT USED | LATERAL LINE: PVC SCH. 40 (SIZE PER PLAN) | | | | | | | | | | | 4, 8 | SEE IRRIGATION DETAILS |
| | DRIP LATERAL: PVC SCH 40, OR STICKY-STRIP PVC HOSE BY GPH. L.C. SHALL SIZE PIPE PER DETAILS AND SPECS. | | | | | | | | | | | 16-19 | SEE IRRIGATION DETAILS |
| | 1" RAINBIRD QUICK COUPLER VALVE, MODEL #44NP FOR SYSTEM BLOWOUT. ALL GALVANIZED FITTINGS & PIPE. | | | | | | | | | | | 3 | SEE IRRIGATION DETAILS |
| NOT SHOWN | 14 GAUGE SINGLE STRAND SOLID COPPER CONTROL WIRE | | | | | | | | | | | 4 | SEE IRRIGATION DETAILS |
| | SLEEVE (SIZE TO BE A MIN. OF TWICE THE DIAMETER OF THE MAIN, LATERAL) | | | | | | | | | | | 8 | COORDINATE WITH ALL TRADES |
| NOT SHOWN | WIRE CHASE, SIZE TO BE 2X THE DIAMETER OF THE WIRE BUNDLE WITHIN, 1" DIA. WC IS THE MINIMUM SIZE ALLOWED. | | | | | | | | | | | 4 | COORDINATE WITH ALL TRADES |
| | FLUSH VALVE: 1/2" PVC BALL VALVE. INSTALL AT END OF ALL DRIP LINES IN 10" ROUND VALVE BOX | | | | | | | | | | | 15 | REFERENCE DETAILS |

## VALVE ID TAG




## DRIP EMITTER LEGEND

| PLANT TYPE | EMITTER QTY | EMITTER TYPE |
|---|---|---|
| PERENNIALS/GRASSES | 1 | GPSTCV2M (2GPH) |
| ALL SHRUBS | 2 | GPSTCV2M (2GPH) |
| TREES IN PLANTERS | 2 | PC-05 (5GPH) |

NOTE:
1. EMITTERS LISTED ARE AVAILABLE FROM GPH AND RAINBIRD.
2. EMITTERS ARE NOT NECESSARY FOR TREES IN LAWN AREAS.
3. INSTALL NETAFIM TLCV IN ADDITION TO PC-05 EMITTERS PER IRRIGATION DETAILS.
4. INSTALL PC-DIFFUSER CAP ON ALL PC-05 EMITTERS.

## IRRIGATION NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE CITY AND/OR COUNTY CODES. THE LANDSCAPE CONTRACTOR (L.C.) SHALL APPLY AND PAY FOR ALL NECESSARY PERMITS.
2. L.C. SHALL HAVE ALL UTILITIES BLUE STAKED BEFORE DIGGING. ANY DAMAGE TO THE UTILITIES SHALL BE REPAIRED AT THE EXPENSE OF CONTRACTOR WITH NO EXTRA COST TO THE OWNER.
3. PROVIDE AN AS-BUILT, REPRODUCIBLE DRAWING TO OWNER SHOWING ALL DRAINS, VALVES, AND PIPES. PROVIDE INSTRUCTIONS TO MAINTENANCE PERSONNEL FOR WINTERIZATION. SPRINKLER SYSTEM TO BE BLOWN OUT WITH AN AIR COMPRESSOR EACH FALL.
4. L.C. SHALL ONLY USE COMMERCIAL GRADE PRODUCTS AND IS RESPONSIBLE FOR ENSURING ACCURATE COUNTS/QUANTITIES OF ALL IRRIGATION MATERIALS FOR BIDDING AND INSTALLATION.
5. L.C. SHALL PROVIDE AND INSTALL SLEEVES FOR ALL PIPES AND WIRES UNDER PAVEMENT AND SIDEWALKS. SLEEVES SHALL BE 2 SIZES LARGER THAN PIPE INSIDE. ALL WIRE SHALL BE IN SEPARATE SLEEVES (NOT SHOWN). ALL CONTROL WIRE SHALL BE INSTALLED IN SCH. 40 ELECTRICAL CONDUIT. PLACE JUNCTION BOXES WHERE NECESSARY TO MINIMIZE LONG RUNS OR AT DIRECTIONAL CHANGES AS NECESSARY.
6. ALL SLEEVES INSTALLED SHALL BE DUCT TAPED TO PREVENT DIRT OR OTHER DEBRIS ENTERING PIPE. ALL SLEEVES SHALL BE IDENTIFIED BY WOOD OR PVC STAKES AND BE SPRAY PAINTED WITH MARKING PAINT. REMOVE STAKES ONCE IRRIGATION SYSTEM IS COMPLETE.
7. MAIN LINE SHALL BE 1" (UNLESS OTHERWISE DIRECTED). LATERAL LINES SHALL BE NO SMALLER THAN 3/4" UNLESS NOTED ON PLAN. PIPES SHALL CARRY NO MORE THAN THE FOLLOWING: 1/2" MAX. 4 GPM, 3/4" PIPE MAX. 8GPM, 1" PIPE MAX. 13GPM. ADJUST LOCATION OF MAINLINE AND LATERAL LINES AS NECESSARY IN ORDER TO AVOID PLACING BOULDERS, TREES AND SHRUBS DIRECTLY OVER MAINLINE AND LATERAL LINES.
8. MAIN LINES SHALL BE 18" DEEP MIN. AND LATERAL LINES 12" DEEP MIN. NO ROCK GREATER THAN 3/4" DIAMETER SHALL BE ALLOWED IN TRENCHES.
9. PLACE PIPES, VALVE BOXES AND ALL OTHER SPRINKLER CONSTRUCTION IN LANDSCAPE AREAS. ALL PIPES SHALL BE ON PROPERTY OF OWNER. MODIFY LOCATION OF VALVE BOXES AS NECESSARY IN ORDER TO AVOID TREES AND SHRUBS PER PLANTING PLAN. DO NOT LOCATE VALVE BOXES IN LAWN AREAS IF POSSIBLE.
10. LANDSCAPE ARCHITECT OR OWNER SHALL VISUALLY INSPECT ALL TRENCHES PRIOR TO BACKFILLING. L.C. SHALL GIVE LANDSCAPE ARCHITECT MIN. 72 HR. NOTICE BEFORE INSPECTION IS TO BE MADE.
11. L.C. SHALL PRESSURE TEST MAINLINE FOR LEAKS PRIOR TO BACKFILLING.
12. ACTUAL INSTALLATION OF IRRIGATION SYSTEM MAY VARY SOMEWHAT FROM PLANS. CONTRACTOR IS RESPONSIBLE TO MAKE NECESSARY ADJUSTMENTS TO ENSURE PROPER COVERAGE OF ALL LANDSCAPED AREAS. L.C. SHALL MATCH PRECIPITATION RATES AS MUCH AS POSSIBLE FOR ALL LANDSCAPED AREAS.
13. VALVE BOXES SHALL BE INSTALLED SQUARED TO AND 6" MIN. AWAY FROM WALKS AND WALLS.
14. DRIP LINES SHALL BE FLEXIBLE AR PVC TUBING BY GPH. FOR DRIP AREAS REQUIRING 0-4 GPM USE 1/2" TUBING. FOR DRIP AREAS REQUIRING 4-8GPM USE 3/4" TUBING AND FOR DRIP AREAS REQUIRING 8-13 GPM USE 1" TUBING. CONTRACTOR TO VERIFY PLANT QUANTITIES ON EACH DRIP LINE AND SIZE PIPE ACCORDINGLY. L.C. TO INSTALL RAIN BIRD XFD-09-12 ON-SURFACE DRIP LINE FOR TREES PER THE DETAILS. MODIFY DRIP ZONES AS NECESSARY TO PROVIDE ADEQUATE COVERAGE TO ALL LANDSCAPED AREAS. PIPE SIZING SHOWN IS FOR HEADERS. THE CONTRACTOR MAY DOWNSIZE TO $\frac{3}{4}$" FOR HEADERS THAT DONT EXCEED 4 GPM.
15. POWER TO CONTROLLER TO BE PROVIDED BY ELECTRICAL CONTRACTOR. OWNER TO SPECIFY EXACT LOCATION OF CONTROLLER. IF MOUNTED OUTSIDE, CONTROLLER TO BE MOUNTED IN WEATHERPROOF LOCKING WALL MOUNTED CABINET PER MANUFACTURERS INSTRUCTIONS. L.C. SHALL ENSURE THE CONTROLLER IS GROUNDED PER LOCAL CODE AND PER MANUFACTURER SPEC.
16. IF THE STATIC PRESSURE AT THE POINT OF CONNECTION EXCEEDS 110 PSI, INSTALL A BRASS PRESSURE REDUCER IN-LINE WITH THE FILTER PER MANUFACTURER SPECS. INSTALL THE FILTER AND PRESSURE REDUCER IN A VALVE BOX (SIZE AS REQUIRED). ADJUST PRESSURE AS REQUIRED FOR NORMAL OPERATION OF THE IRRIGATION SYSTEM.

10' 0 10' 20' 30'

SCALE: 1"=10'-0" ON 24X36 SHEET


2120 E. 11 Mile Rd. | Royal Oak, MI 48067
**P:** 248.414.9270 **F:** 248.414.9275
**www.kriegerklatt.com**


Client:
Goldfish Swim Schools

Project:
GSS - American Fork, UT
348 South 500 East
American Fork, Utah

| Issued | Description | By |
|---|---|---|
| 04.19.2021 | Site Plan Review | TS |
| 06.07.2021 | TRC Review | DW |
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Seal:
STATE OF UTAH
DARREN G. WILSON
NO. 356187
12-30-2021
LICENSED LANDSCAPE ARCHITECT

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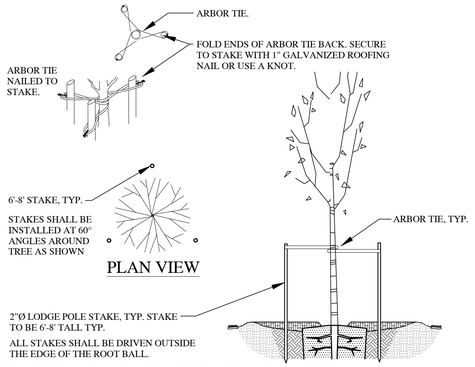
North Arrow:

Sheet Title:
IRRIGATION PLAN

Project Number:
21-017

Sheet Number:
LS2.1

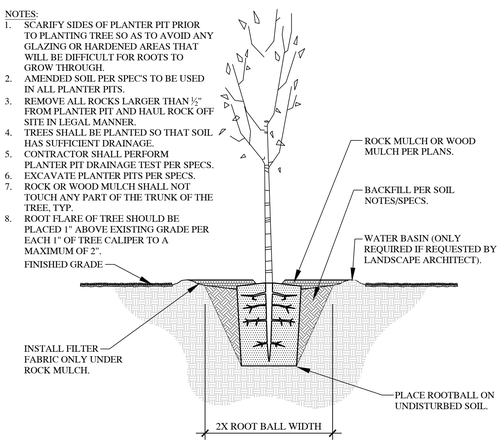

In Site DESIGN GROUP
Landscape Architecture Land Planning
92 North 400 West American Fork, Utah 84003
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NOTES: IF TREE STAKING IS REQUIRED, THE FOLLOWING IS RECOMMENDED:
1. ALLOW FOR SOME TRUNK MOVEMENT. ATTACH ARBOR TIE TO TREE AND STAKE.
2. REMOVE ALL WRAPPING MATERIAL FROM ROOTBALL PRIOR TO PLANTING.
3. INSTALL THREE STAKES PER TREE, SPACED EVENLY AROUND THE TRUNK
4. REMOVE ALL STAKING AS SOON AS THE TREE IS STABLE.
5. CONTRACTOR SHALL PROVIDE TREE STAKING AS PART OF THE BASE BID.
6. CONTRACTOR TO REMOVE NURSERY TREE STAKE FROM ROOTBALL AT TIME OF PLANTING (TYP.).

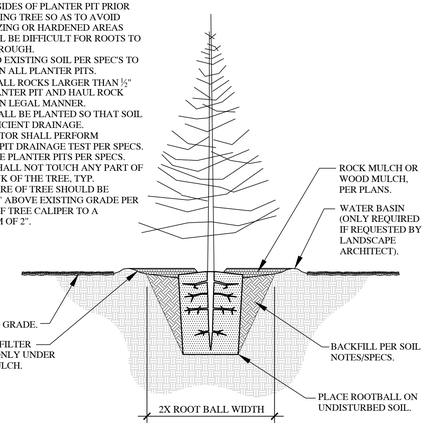
## 1 TREE STAKING
SCALE: NTS

NOTES:
1. SCARIFY SIDES OF PLANTER PIT PRIOR TO PLANTING TREE SO AS TO AVOID ANY GLAZING OR HARDENED AREAS THAT WILL BE DIFFICULT FOR ROOTS TO GROW THROUGH.
2. AMENDED SOIL PER SPEC'S TO BE USED IN ALL PLANTER PITS.
3. REMOVE ALL ROCKS LARGER THAN ½" FROM PLANTER PIT AND HAUL ROCK OFF SITE IN LEGAL MANNER.
4. TREES SHALL BE PLANTED SO THAT SOIL HAS SUFFICIENT DRAINAGE.
5. CONTRACTOR SHALL PERFORM PLANTER PIT DRAINAGE TEST PER SPECS.
6. EXCAVATE PLANTER PITS PER SPECS.
7. ROCK OR WOOD MULCH SHALL NOT TOUCH ANY PART OF THE TRUNK OF THE TREE, TYP.
8. ROOT FLARE OF TREE SHOULD BE PLACED 1" ABOVE EXISTING GRADE PER EACH 1" OF TREE CALIPER TO A MAXIMUM OF 2".

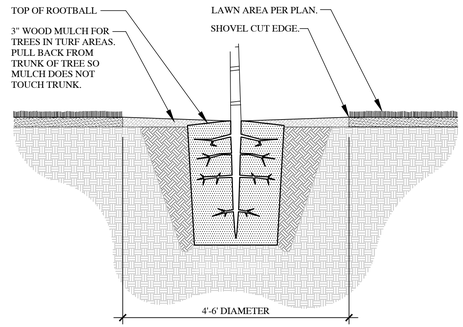



## 2 DECIDUOUS TREE PLANTING
SCALE: NTS

NOTES:
1. SCARIFY SIDES OF PLANTER PIT PRIOR TO PLANTING TREE SO AS TO AVOID ANY GLAZING OR HARDENED AREAS THAT WILL BE DIFFICULT FOR ROOTS TO GROW THROUGH.
2. AMENDED EXISTING SOIL PER SPEC'S TO BE USED IN ALL PLANTER PITS.
3. REMOVE ALL ROCKS LARGER THAN ½" FROM PLANTER PIT AND HAUL ROCK OFF SITE IN LEGAL MANNER.
4. TREES SHALL BE PLANTED SO THAT SOIL HAS SUFFICIENT DRAINAGE.
5. CONTRACTOR SHALL PERFORM PLANTER PIT DRAINAGE TEST PER SPECS.
6. EXCAVATE PLANTER PITS PER SPECS.
7. MULCH SHALL NOT TOUCH ANY PART OF THE TRUNK OF THE TREE, TYP.
8. ROOT FLARE OF TREE SHOULD BE PLACED 1" ABOVE EXISTING GRADE PER EACH 1" OF TREE CALIPER TO A MAXIMUM OF 2".

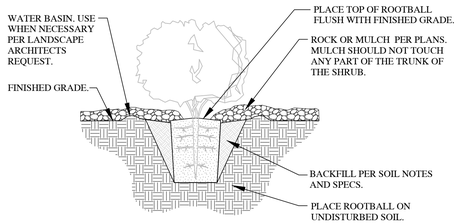



## 3 EVERGREEN PLANTING
SCALE: NTS



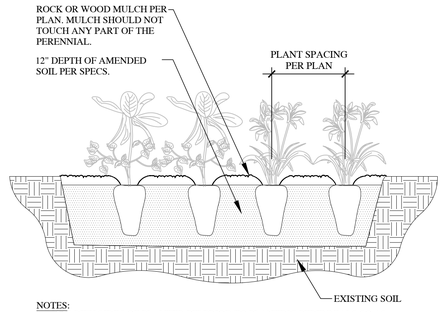

NOTES:
1. DO NOT INSTALL WEED FABRIC UNDER WOOD MULCH.
2. TREE WELL FOR SMALL FLOWERING TREES SHALL BE 4'-0".
3. TREE WELL FOR LARGE SHADE TREES OR EVERGREENS SHALL BE 6'-0" UNLESS OTHERWISE NOTED.
4. AS TREES MATURE TREE WELL WILL NEED TO EXPAND.

## 4 TREE WELL IN TURF AREA
SCALE: NTS




NOTES:
1. SCARIFY SIDES OF PLANTER PIT PRIOR TO PLANTING SHRUB/GRASS SO AS TO AVOID ANY GLAZING OR HARDENED AREAS THAT WILL BE DIFFICULT FOR ROOTS TO GROW THROUGH.
2. IMPORTED & AMENDED TOPSOIL PER SPEC'S TO BE USED IN ALL PLANTER PITS.
3. REMOVE ALL COMPACTED, CLAY OR ROCKY SOILS FROM PIT AND HAUL OFF SITE IN A LEGAL MANNER.
4. CONTRACTOR SHALL PERFORM PLANTER PIT DRAINAGE TEST PER SPECS.
5. EXCAVATE PLANTER PITS PER SPECS.

## 5 SHRUB & ORNAMENTAL GRASS PLANTING
SCALE: NTS




NOTES:
1. SCARIFY SIDES OF PLANTER PIT PRIOR TO PLANTING PERENNIALS SO AS TO AVOID ANY GLAZING OR HARDENED AREAS THAT WILL BE DIFFICULT FOR ROOTS TO GROW THROUGH.
2. REMOVE ALL COMPACTED, CLAY OR ROCKY SOILS FROM PIT AND HAUL OFF SITE IN LEGAL MANNER.
3. CONTRACTOR SHALL PERFORM PLANTER PIT DRAINAGE TEST PER SPECS.
4. EXCAVATE PLANTER PITS PER SPECS.

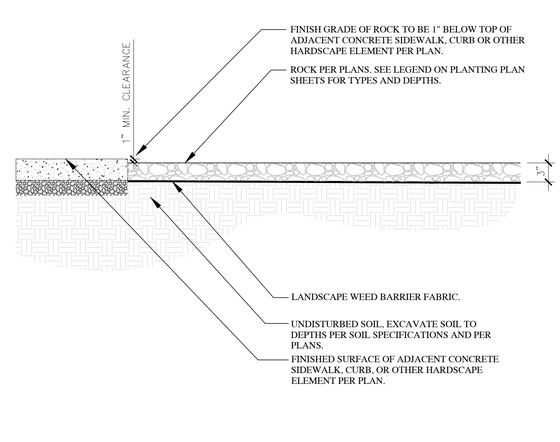
## 6 PERENNIAL PLANTING
SCALE: NTS

# NOT USED

## 7 SOD LAYING AND EDGE
SCALE: NTS

1. LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR VERIFYING QUANTITIES OF ALL MATERIALS FOR BIDDING AND INSTALLATION PURPOSES. IF DISCREPANCIES EXIST, THE PLAN SHALL DICTATE.
2. PLANT MATERIAL TO BE INSTALLED PER PLANT LEGEND. ANY SUBSTITUTIONS TO BE APPROVED BY OWNER AND/OR LANDSCAPE ARCHITECT.
3. NEW AUTOMATIC UNDERGROUND IRRIGATION SYSTEM TO BE INSTALLED PRIOR TO LANDSCAPE INSTALLATION TO ENSURE PROPER WATERING OF ALL LANDSCAPE AREAS. REFER TO IRRIGATION PLANS FOR SPECIFICS.
4. SANDY LOAM TOPSOIL TO BE INSTALLED AT THE FOLLOWING DEPTHS: 12" IMPORTED SANDY LOAM TOPSOIL (INCLUDING MIN. 15% HIGH GRADE DECOMPOSED ORGANIC MATERIAL MIXED INTO TOPSOIL PRIOR TO SPREADING) IN ALL NEW PLANTER AREAS. PROVIDE OWNER A BID ALTERNATE TO ONLY INSTALL 6" OF AMENDED TOPSOIL IN PLANTER AREAS VS. 12".
5. PLANTER BEDS TO BE EXCAVATED AS NECESSARY IN ORDER TO ALLOW FOR TOPSOIL, AMENDMENTS AND MULCH. THE FINISHED GRADE OF PLANTER AREAS SHALL BE APPROX. 1" BELOW TOP OF CURB, SIDEWALK, OR OTHER PAVED AREA.
6. DEWITT 5 OZ. WEED BARRIER FABRIC TO BE INSTALLED IN ALL ROCK MULCH AREAS (IF ANY). DO NOT INSTALL WEED BARRIER FABRIC UNDER ANNUALS, GROUNDCOVERS AND AREAS TO RECEIVE WOOD MULCH.
7. INSTALL PRE-EMERGENT HERBICIDE TO THE TOP OF THE FABRIC AFTER INSTALLING PLANTS AND PRIOR TO INSTALLING MULCH. AFTER INSTALLATION OF THE MULCH THE CONTRACTOR SHALL EVENLY BROADCAST A SECOND APPLICATION OF SLOW-RELEASE PRE-EMERGENT HERBICIDE. APPLY PRE-EMERGENT HERBICIDE PER MANUFACTURERS RECOMMENDATIONS. ALL PLANTING AREAS SHALL RECEIVE 2 APPLICATIONS OF PRE-EMERGENT HERBICIDE REGARDLESS OF WHETHER WEED FABRIC IS INSTALLED OR NOT.
8. DECORATIVE ROCK MULCH TO BE 1"-2" SIZE SOUTHTOWN CRUSHED STONE FROM UTAH LANDSCAPE ROCK AND INSTALLED AT A 3" DEPTH IN ALL TREE AND SHRUB PLANTER AREAS. PULL MULCH MIN. 3" AWAY FROM BASE OF ALL PERENNIALS AND SHRUBS AND MIN. 6" AWAY FROM ALL TREES. MULCH TYPE AND COLOR SHALL MATCH THE ADJACENT DEVELOPMENT. OWNER TO APPROVE THE MULCH TYPE AND COLOR PRIOR TO INSTALLATION.
9. IF HIGH WINDS ARE FREQUENT ON SITE, ALL TREES TO BE STAKED AT TIME OF PLANTING. SEE DETAILS FOR SPECIFICS. REMOVE STAKING WITHIN FIRST YEAR OR WHEN TREE IS ESTABLISHED.
10. CONTRACTOR SHALL INSPECT ALL DRAWINGS AND SPECIFICATIONS. ANY DISCREPANCIES FOUND IN THE DRAWINGS, DETAILS OR SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER AND IN-SITE DESIGN GROUP PRIOR TO CONSTRUCTION. CONTRACTOR SHALL OBTAIN WRITTEN FIELD DIRECTIVES FROM IN-SITE DESIGN GROUP AND/OR THE OWNER STATING PROPER COURSE OF ACTION IF DISCREPANCIES OR ERRORS ARE DISCOVERED PRIOR TO AND DURING CONSTRUCTION.

## 9 LANDSCAPE NOTES

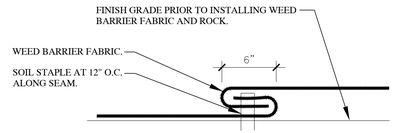



## 10 ROCK AND WEED BARRIER FABRIC
SCALE: NTS

## 00 6" MOWCURB SECTION
SCALE: NTS

NOTES:
1. ROCK SHALL BE SCREENED & DOUBLE WASHED AND BE FREE OF DEBRIS PRIOR TO INSTALLATION. IF ROCK SUPPLIER DOES NOT HAVE A WASH PLANT, THE LANDSCAPE CONTRACTOR SHALL STILL BE RESPONSIBLE FOR DOUBLE WASHING ALL ROCK AND BOULDERS PRIOR TO INSTALLATION.
2. INSTALL PRE-EMERGENT HERBICIDE TO THE TOP OF THE FABRIC AFTER INSTALLING PLANTS AND PRIOR TO INSTALLING MULCH. AFTER INSTALLATION OF THE MULCH THE CONTRACTOR SHALL EVENLY BROADCAST A SECOND APPLICATION OF SLOW-RELEASE PRE-EMERGENT HERBICIDE. APPLY PRE-EMERGENT HERBICIDE PER MANUFACTURERS RECOMMENDATIONS.
3. KEEP TOP OF ROCK 1"-1½" BELOW ADJACENT WALKS AND CURBS. DO NOT ALLOW ROCK TO TOUCH THE TRUNK OF ANY PLANT. INSTALL ROCK AFTER INSTALLATION OF WEED BARRIER FABRIC AND PLANT MATERIAL.
4. CONTRACTOR TO ENSURE THAT TOP OF WEED BARRIER FABRIC IS FREE OF SOILS AND DEBRIS PRIOR TO PLACING ROCK.
5. SEE LANDSCAPE PLANS FOR ROCK TYPE AND DEPTH.

WEED FABRIC NOTE:
INSTALL 6" SOIL STAPLE IN WEED BARRIER FABRIC AT 5' O.C. TRIANGULAR SPACING. INSTALL 6" SOIL STAPLE AT 12" O.C. ALONG ALL WEED BARRIER FABRIC SEAMS. OVERLAP FABRIC MIN. OF 6" AT ALL SEAMS AS SHOWN BELOW. INSTALL SOIL STAPLE 6' O.C. ALONG EDGES & 2 AT EACH CORNER.




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## Seal:
STATE OF UTAH — DARREN G. WILSON — NO. 356187 — 08-24-2021 — LICENSED LANDSCAPE ARCHITECT

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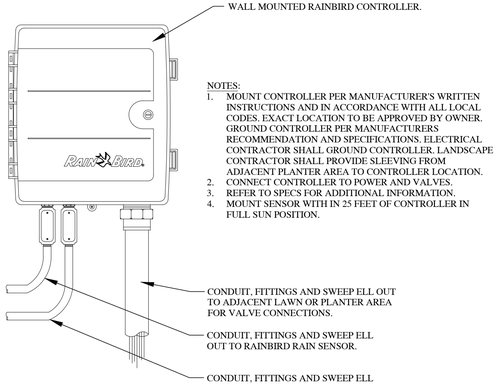
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## Sheet Title:
PLANTING DETAILS

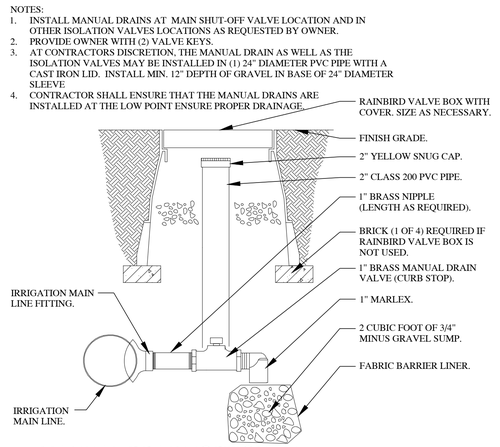
## Project Number:
21-017

## Sheet Number:
LS3.1

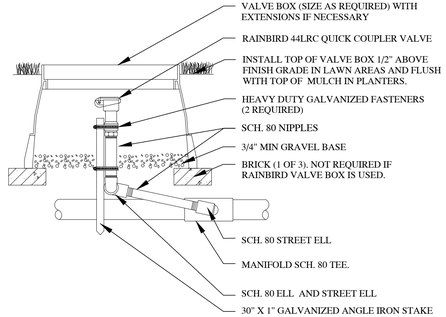
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1 CONTROLLER WITH SENSOR
SCALE: NTS

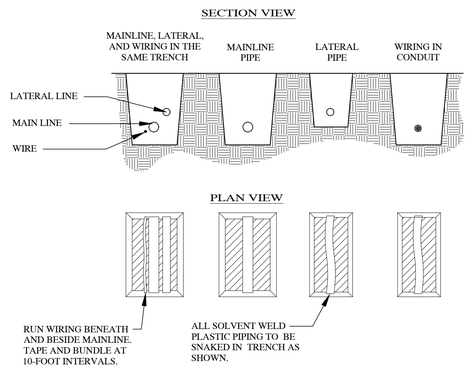



2 MANUAL DRAIN (OPTIONAL)
SCALE: NTS




NOTES:
1. FLUSH ALL PIPING PRIOR TO INSTALLING VALVE.
2. WRAP ALL THREADS WITH TEFLON TAPE. 1.1/2 TO 2 WRAPS MAXIMUM.
3. COMPACT SOILS AROUND VALVE BOX TO 80% OF ORIGINAL DRY DENSITY.
4. INSTALL GEOFABRIC UNDER VALVE BOXES AND TAPE TO PIPE NIPPLES AND VALVE BOX.
5. BOX COLOR - GREEN IN TURF AND TAN IN PLANTER AREAS.
6. IRRIGATION SYSTEM TO BE BLOWN OUT WITH AIR COMPRESSOR THROUGH THE RPZ AND QUICK COUPLERS BEFORE FREEZING TEMPERATURES OCCUR, TYP.
7. SCH 80 PVC TEE OR ELL'S CAN BE USED ON ALL QUICK COUPLERS EXCEPT AT POINT OF CONNECTION (IF QUICK COUPLER(S) ARE INSTALLED AT THE POINT OF CONNECTION). ALL QUICK COUPLER FITTINGS AND NIPPLES AT P.O.C. QUICK COUPLER(S) TO BE GALVANIZED.

3 QUICK COUPLER VALVE
SCALE: NTS

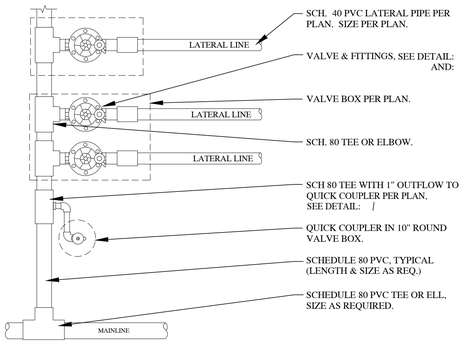



NOTES:
1. SLEEVE BELOW ALL HARDSCAPE ELEMENTS (WITH CLASS 200 OR SCH. 40 OR SCH. 80 PER SPECS.) TWICE THE DIAMETER OF THE PIPE OR WIRE BUNDLE WITHIN.
2. FOR PIPE AND WIRE BURIAL DEPTHS, SEE NOTES AND SPECS.
3. NO LINE VOLTAGE WIRING SHALL BE ALLOWED IN IRRIGATION TRENCHES.

4 PIPE, WIRE, AND TRENCH
SCALE: NTS

NOT USED

NOT USED



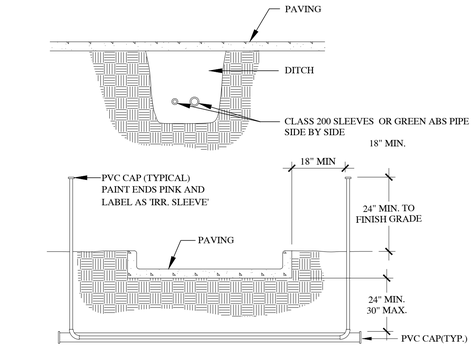

NOTES:
1. ALL VALVE MANIFOLD PIPING AND FITTINGS TO BE SCH. 80 FITTINGS, UNLESS THERE IS A DRIP ZONE ALL BY ITSELF IN WHICH CASE THE PIPING SHALL BE SIZED PER THE FLOW OF THE DRIP ZONE.
2. MODIFY MANIFOLD AS NECESSARY DEPENDING ON HOW MANY VALVES ARE IN A CLUSTER.
3. MODIFY AS REQUIRED DEPENDING ON WHETHER THE VALVES ARE PARALLEL OR PERPENDICULAR TO MAINLINE.

5 VALVE MANIFOLD
SCALE: NTS

NOT USED

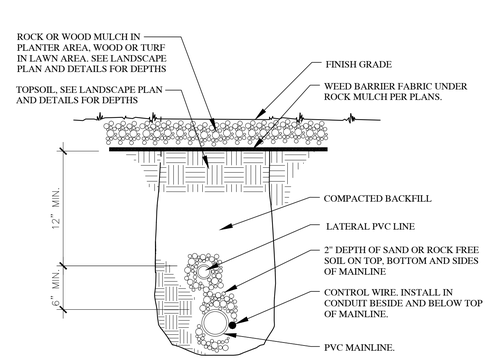
6 CONTROL VALVE
SCALE: NTS

7 VALVE ASSEMBLY
SCALE: NTS




NOTE:
1. WHERE THERE IS MORE THAN ONE SLEEVE, EXTEND THE SMALLER SLEEVE TO 24-INCHES MINIMUM ABOVE FINISH GRADE.
2. ALL SLEEVES INSTALLED SHALL BE DUCT TAPED TO PREVENT DIRT OR OTHER DEBRIS ENTERING PIPE. ALL SLEEVES SHALL BE IDENTIFIED BY WOOD OR PVC STAKES AND BE SPRAY PAINTED WITH MARKING PAINT. REMOVE STAKES ONCE IRRIGATION SYSTEM IS COMPLETE.

8 SLEEVING
SCALE: NTS

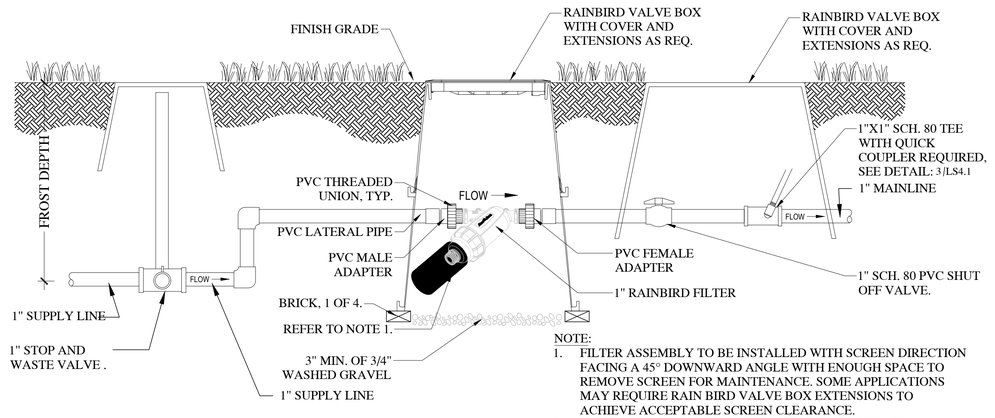



NOTES:
1. PROVIDE SLACK IN CONTROL WIRES AT ALL CHANGES IN DIRECTION.
2. MAINLINE DEPTH SHALL BE 18" DEEP EXCEPT UNDER ASPHALT & CONCRETE PAVING AND AT P.O.C. SHALL BE MIN OF 24" & MAX OF 30". INSTALL ADDITIONAL FITTINGS & RESTRAINTS AS REQUIRED.
3. MAINLINE AND LATERAL LINES SHALL BE KEPT MIN. 12" FROM ALL SIDEWALKS AND CURBS.

9 TRENCH SECTION
SCALE: NTS

NOT USED

10 POP-UP SPRAY
SCALE: NTS




NOTE:
1. FILTER ASSEMBLY TO BE INSTALLED WITH SCREEN DIRECTION FACING A 45° DOWNWARD ANGLE WITH ENOUGH SPACE TO REMOVE SCREEN FOR MAINTENANCE. SOME APPLICATIONS MAY REQUIRE RAIN BIRD VALVE BOX EXTENSIONS TO ACHIEVE ACCEPTABLE SCREEN CLEARANCE.
2. BRICKS ARE NOT REQUIRED UNDER VALVE BOXES IF RAINBIRD VALVE BOXES ARE USED.
3. INSTALL MISC. REDUCER FITTINGS AS REQ. (NOT SHOWN).

11 1-1/2" SCREEN FILTER IN BOX
SCALE: NTS


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GSS - American Fork, UT
348 South 500 East
American Fork, Utah

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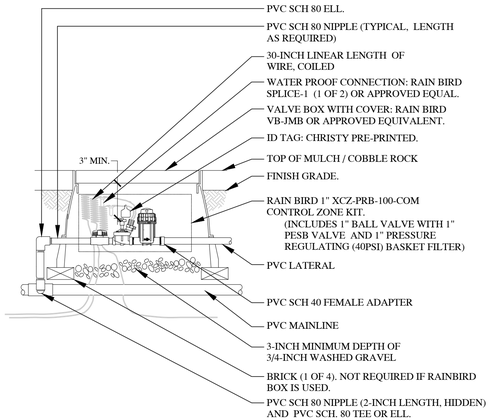
## North Arrow:

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IRRIGATION DETAILS

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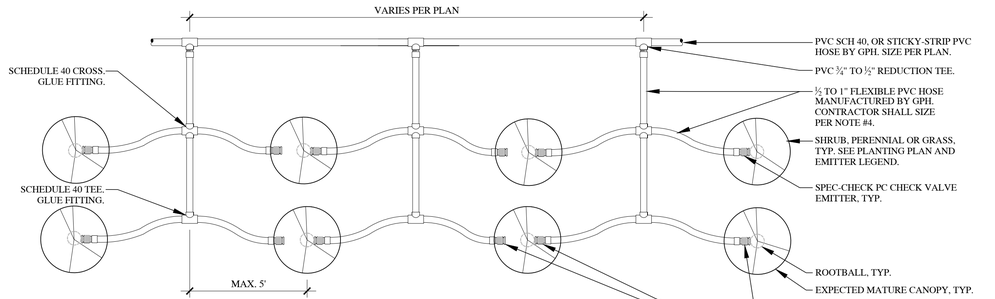
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## 12 1" DRIP CONTROL ZONE KIT

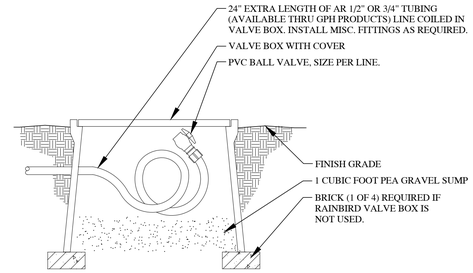
SCALE: NTS




NOTES:
1. EMITTER SPACING SHALL BE BASED ON PLANT SPACING. INSTALL ALL IRRIGATION USING THE COMPONENTS DESCRIBED ABOVE.
2. IRRIGATION EQUIPMENT SHALL BE COMPLETELY INSTALLED PRIOR TO PLANT LAYOUTS.
3. ADJUST IRRIGATION SPACING TO ACCOMMODATE FINAL PLANT LAYOUT.
4. 1/2" PVC FLEX HOSE SHALL NOT EXCEED 4GPM, 3/4" PVC FLEX HOSE SHALL NOT EXCEED 8GPM AND 1" PVC FLEX HOSE SHALL NOT EXCEED 13GPM.
5. AT OWNERS DISCRETION, A LESS EXPENSIVE DRIP SYSTEM MAY BE INSTALLED. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS, SUBMITTAL CUT SHEETS AND POTENTIAL COST SAVINGS TO OWNER. HOWEVER, THE OWNER AND LANDSCAPE ARCHITECT MUST APPROVE ALL CHANGES IN MATERIALS AND CONSTRUCTION PRACTICES IF DIFFERENT FROM THE PLAN.
6. SMALL EVERGREEN TREES MAY NEED FEWER EMITTERS. CONSULT WITH THE LANDSCAPE ARCHITECT ON-SITE PRIOR TO INSTALLING IRRIGATION TO DETERMINE QUANTITY OF EMITTERS.
7. SEE IRRIGATION SHEET FOR DRIP EMITTER LEGEND.
8. USE IPS WELDON 795 GLUE AND P70 PRIMER PER GPH INC. SPECIFICATIONS.
9. DO NOT INSTALL PIPE, FITTINGS, OR GLUE IN TEMPERATURES BELOW 40 DEGREES. SEE MANUFACTURER SPECIFICATIONS FROM MORE INFORMATION.

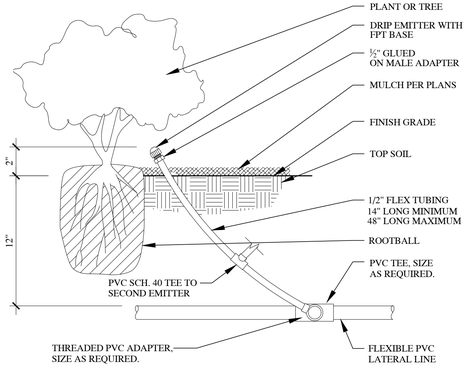
## 13 GPH DRIP EMITTER PLAN VIEW

SCALE: NTS




## 14 DRIP LINE FLUSH CAP

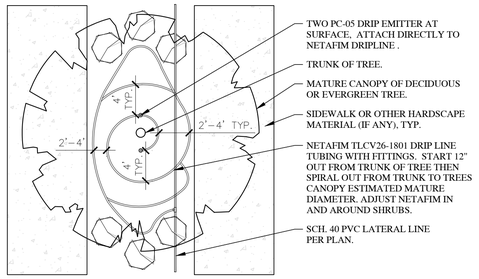
SCALE: NTS




NOTE:
1. FOR LAYOUT OF MULTIPLE SHRUBS, CONTRACTOR SHALL USE TEE'S AS NECESSARY. FOR LAYOUT INFORMATION, SEE DETAIL: /

## 15 DRIP EMITTER

SCALE: NTS




NOTES:
1. LAYOUT SHOWN IS TYPICAL. ON SITE MODIFICATIONS WILL BE REQUIRED DUE TO VARYING SIZE OF PLANTER ISLANDS. CONSULT WITH LANDSCAPE ARCHITECT ON-SITE PRIOR TO INSTALLATION TO DETERMINE HOW MUCH DRIP NEEDS TO BE INSTALLED AND WHAT CONFIGURATION IS APPROPRIATE.
2. INSTALL NETAFIM DRIP TUBING UNDER WEED BARRIER FABRIC. USE THIS DETAIL FOR ALL TREES PLANTED IN COBBLE ROCK AREAS. CONTRACTOR SHALL BE CAREFUL NOT TO DAMAGE OR PINCH TUBING WHEN PLACING COBBLE ROCK AND BOULDERS.
3. TREES PLANTED IN LAWN AREAS WILL NOT BE WATERED BY DRIP BUT WILL BE WATERED BY THE LAWN SPRINKLERS.
4. THIS DETAIL IS FOR DESIGN INTENT ONLY AND IS NOT TO SCALE. CONTRACTOR MUST INSTALL DRIP LINE PER THIS DETAIL OUT TO THE DRIPLINE OF THE TREES MATURE SIZE.
5. FOR LINEAR PLANTERS WITH TREES, INSTALL NETAFIM IN STRAIGHT LINES RATHER THAN A CIRCULAR PATTERN AROUND THE TREE.
6. INSTALL A FLUSH VALVE (NOT SHOWN) AT THE END OF ALL DRIP LINES, PER PLAN.

## 16 TREE DRIP WITH PARTIAL PLANTING UNDER CANOPY

SCALE: NTS

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## North Arrow:

## Sheet Title:

IRRIGATION DETAILS

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21-017

## Sheet Number:

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# REPORT
# GEOTECHNICAL STUDY
# PROPOSED GOLDFISH SWIM SCHOOL
# 348 SOUTH 500 EAST
# AMERICAN FORK, UTAH

May 28, 2021

Job No. 900-003-21

**Prepared for:**
Goldfish Swim School
1485 South 300 West
Salt Lake City, Utah 84115

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May 28, 2021
Job No. 900-003-21

Goldfish Swim School
1485 South 3000 West
Salt Lake City, Utah 84115

**Attention: Ms. Katie Grisley**

Ladies and Gentlemen:

Re: Report
Geotechnical Study
Proposed Goldfish Swim School
348 South 500 East
American Fork, Utah

## 1. INTRODUCTION

### 1.1 GENERAL

This report presents the results of our geotechnical study performed at the site of the proposed Goldfish Swim School, which is located at 348 South 500 East in American Fork, Utah. The general location of the site with respect to major topographic features and existing facilities, as of 1994 and 1999, is presented on Figure 1, Vicinity Map. A detailed location of the site showing existing roadways and surrounding facilities, on an air photograph base, is presented on Figure 2, Area Map. A more detailed layout of the site showing the proposed structure and parking area is presented on Figure 3, Site Plan. The borings drilled in conjunction with this study are also presented on Figure 3.

### 1.2 OBJECTIVES AND SCOPE

The objectives and scope of our study were planned in discussions between Ms. Katie Grisley of Goldfish Swim School and Mr. Patrick Emery of Gordon Geotechnical Engineering, Inc. ($G^2$).

In general, the objectives of this study were to:

1. Accurately define and evaluate the subsurface soil and groundwater conditions across the site.
2. Provide appropriate foundation, earthwork, pavement, and geoseismic recommendations to be utilized in the design and construction of the proposed structure.

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

1. A field program consisting of the drilling, logging, and sampling of four borings.

2. A laboratory testing program.

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

### 1.3 AUTHORIZATION

Authorization was provided by authorizing our Professional Services Agreement No. 21-0442 dated and executed on April 27, 2021.

### 1.4 PROFESSIONAL STATEMENTS

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

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

## 2. PROPOSED CONSTRUCTION

A children's swim school is planned for the 1.01-acre site. The structure will cover approximately 8,540 square feet in the northeast corner of the site and is anticipated to be one-extended level in height and of masonry construction established slab-on-grade.

It is anticipated that the maximum column and wall loads will be in the range of 90 to 120 kips and 3 to 5 kips per lineal foot, respectively.

We estimate that maximum cuts and fills to achieve design grades will be on the order of one to three feet.
Paved entryways and at-grade parking will cover the remaining portion of the site. Traffic over the entryway pavement surface will consist of a moderate volume of automobiles and light trucks, and a light volume of medium- and heavy-weight trucks. Traffic in the parking areas will be lighter.

## 3. INVESTIGATIONS

### 3.1 FIELD PROGRAM

In order to evaluate the subsurface soil and groundwater conditions across the site, 4 borings were drilled to depths ranging from 5 to 46 feet below surrounding grades in the area of the proposed structure. The borings were drilled using a rubber tire truck-mounted drill rig equipped with hollow-stem augers. Locations of the borings are presented on Figure 3.

The field portion of our study was under the direct control and continual supervision of an experienced member of our geotechnical staff. During the course of the drilling operations, a continuous log of the subsurface conditions encountered was maintained. In addition, relatively undisturbed and small disturbed samples of the typical soils encountered were obtained for subsequent laboratory testing and examination. The soils were classified in the field based upon visual and textural examination. These classifications have been supplemented by subsequent inspection and testing in our laboratory. Detailed graphical representation of the subsurface conditions encountered is presented on Figures 4A through 4D, Log of Borings. Soils were classified in accordance with the nomenclature described on Figure 5, Unified Soil Classification System.

A 3.25-inch outside diameter, 2.42-inch inside diameter drive sampler (Dames & Moore) was utilized in the majority of the subsurface sampling at the site. Additionally, a 2.0-inch outside diameter, 1.38-inch inside diameter drive sampler (SPT) was utilized at select locations and depths. The blow counts recorded on the boring logs were those required to drive the sampler 12 inches with a 140-pound hammer dropping 30 inches.

Following completion of drilling operations, one and one-quarter-inch diameter slotted PVC pipe was installed in Boring B-4 in order to provide a means of monitoring the groundwater fluctuations.

## 3.2 LABORATORY TESTING

### 3.2.1 General

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

### 3.2.2 Moisture and Density Tests

To aid in classifying the soils and to help correlate other test data, moisture and density tests were performed on selected undisturbed samples. The results of these tests are presented on the boring logs, Figures 4A through 4D.

### 3.2.3 Partial Gradation Tests

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

| Boring No. | Depth (feet) | %Gravel | %Sand | %Silt/Clay | Soil Classification |
|---|---|---|---|---|---|
| | | % > #4 sieve | #4 > % > #200 | % < #200 sieve | |
| B-3 | 2.5 | 0 | 21.1 | 78.9 | CL Clay with Sand |
| B-4 | 2.5 | 56.2 | 38.0 | 5.7 | GPGM/SPSM Gravel/Sand |
| B-4 | 10.0 | 48.7 | 41.7 | 9.6 | GPGM/SPSM Gravel/Sand |

### 3.2.4 Atterberg Limits Test

To further aid in classifying the site soils, an Atterberg limits test was performed on one selected sample. Results of the tests are tabulated below:

| Boring No. | Depth (feet) | Liquid Limit (percent) | Plastic Limit (percent) | Plasticity Index (percent) | Soil Classification |
|---|---|---|---|---|---|
| B-3 | 2.5 | 26 | 20 | 6 | CL |

### 3.2.5 Chemical Tests

To determine if the site soils will react detrimentally with concrete, chemical tests were performed on a representative sample of the natural soils. The results of the chemical tests are tabulated below.

| Boring No. | Depth (feet) | Soil Classification | pH | Total Water-Soluble Sulfate (mg/kg-dry) |
|---|---|---|---|---|
| B-3 | 5.0 | CL | 8.0 | 20.0 |

## 4. SITE CONDITIONS

### 4.1 SURFACE

The site consists of a rectangular shaped 1.01-acre parcel containing a single-family residential structure and detached garage. It is our understanding the structures will be removed as part of the overall site development. The residential structure is one-level in height and appears to be established slab-on-grade. Vegetation at the site consists of ankle-high grasses with numerous tall trees.

The site is bordered by residential structures to the north and west, 500 East Street to the east, and a dental office to the south.

The topography of the site is relatively flat with an overall relief on the order of four to five feet across the site. The site grade is approximately the same elevation as the adjacent streets.

Representative photographs of the site area are shown on Figures 6A and 6B, Photographs.

### 4.2 SUBSURFACE SOIL

Subsurface conditions encountered at the boring locations were relatively consistent. From the surface in Borings B-3 and B-4 and extending to depths of 2.0 to 19 feet, natural silty fine and coarse sand and gravel was encountered. The sand and gravel is medium dense to very dense, moist, brown, and will exhibit high strength and low compressibility characteristics under the anticipated loading range. The upper 3 to 4 inches of the soil profile is loose, contains major roots, and has been classified as topsoil.

From the surface in Borings B-1 and B-2, underlying the sand and gravel in Boring B-3, and extending to depths of 3.5 to 9.5 feet, natural silty clay with varying amounts of sand and gravel was encountered. The clay grades with occasional cobbles with depth. The clay is moist, soft

grading to stiff, moist, dark brown to brown, and is anticipated to exhibit moderate strength and compressibility characteristics under the anticipated loading range.

Underlying the clay in Boring B-3 and extending to the maximum explored depth of 16 feet, fine to coarse sand and gravel with some silt was encountered. The sand and gravel is medium dense to very dense, moist, brown, and will exhibit high strength and low compressibility characteristics under the anticipated loading range.

A deeper layer of fine sandy silt was encountered from depths of 19 to 25.5 feet in Boring B-4. This silt layer is medium stiff to stiff, moist, brown, and is anticipated to exhibit moderate strength and compressibility characteristics under the anticipated loading range.

Below the fine sandy silt in B-4, silty fine to coarse gravel and sand was encountered. Auger refusal due to potential cobbles within the gravels was encountered at a depth of 28 feet in this layer.

The lines designating the interface between soil types on the boring logs generally represent approximate boundaries. In-situ, the transition between soil types may be gradual.

### 4.3 GROUNDWATER

During drilling operations, groundwater was not encountered at the maximum explored depth of 28 feet. When we returned to the site on May 17, 2021, groundwater was not encountered within the piezometer installed in Boring B-4.

## 5. DISCUSSIONS AND RECOMMENDATIONS

### 5.1 SUMMARY OF FINDINGS

The proposed structure may be supported upon conventional spread and continuous wall foundations established on suitable natural soils and/or granular structural fill extending to suitable natural soils

The most significant geotechnical aspects of the site are:

1. Potential for encountering non-engineered fills. Although not encountered at our boring locations, non-engineered fills associated with the demolition and backfill of the existing structures on the site may be encountered. Non-engineered fills must be completely removed from below foundations, floor slabs, and rigid pavements.

2. Soft natural silty clay soils encountered at a depth of 2 to 4 feet in Boring B-3. Soft clay soils, if encountered in foundation excavations, must be over-excavated and replaced with granular structural fill. The remainder of the clays encountered at

the site are medium stiff, contain a significant amount of gravel and are suitable for foundation support.

Due to the variable nature of the soft clay encountered, a qualified geotechnical engineer from our staff must aid in verifying the soft clays have been completely removed and that suitable natural soils have been encountered prior to the placement of structural site grading fills, or foundations.

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

## 5.2 EARTHWORK

### 5.2.1 Site Preparation

Initial preparation of the site must consist of the removal of any existing structures, debris and pavements, and any associated non-engineered fills.

Further preparation of the site must consist of the removal of all non-engineered fills, loose surficial soils, topsoil, debris, and other deleterious materials from beneath an area extending at least three feet beyond the perimeter of the proposed building, rigid pavement, and exterior flatwork areas. In proposed flexible pavement areas, the existing asphalt concrete and fills may remain provided that they do not interfere with the final grade. The asphalt concrete should be perforated to facilitate drainage and proofrolled.

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

Subsequent to the above operations and prior to the placement of footings, structural site grading fill, or floor slabs, the exposed natural subgrade must be proofrolled by passing moderate-weight rubber tire-mounted construction equipment over the surface at least twice. If any loose, soft, or disturbed zones are encountered, they must be completely removed in footing and floor slab areas and replaced with granular structural fill. If removal depth required is greater than two feet, $G^2$ must be notified to provide further recommendations. In pavement areas, unsuitable soils

encountered during recompaction and proofrolling must be removed to a maximum depth of two feet and replaced with compacted granular structural fill.

### 5.2.2 Excavations

Temporary construction excavations not exceeding four feet in depth may be constructed with near-vertical sideslopes. Excavations up to eight feet in the finer-grained soils can be constructed with sideslopes no steeper than one-half horizontal to one vertical (0.5H:1.0V). Excavations up to eight feet in the granular soils can be constructed with sideslopes no steeper than one horizontal to one vertical (1.0H:1.0V). If saturated granular soils are encountered (not anticipated), flatter sideslopes, shoring and bracing, and/or dewatering will be required.

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

To minimize disturbance to the underlying soils, it is our recommendation that footings be excavated with a backhoe equipped with a smooth-lip bucket.

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

### 5.2.3 Structural Fill

Structural fill is defined as all fill which will ultimately be subjected to structural loadings, such as imposed by footings, floor slabs, pavements, etc. Structural fill will be required as backfill over foundations and utilities, as site grading fill, and in some areas, as replacement fill below footings. All structural fill must be free of sod, rubbish, topsoil, frozen soil, and other deleterious materials. Structural site grading fill is defined as fill placed over fairly large open areas to raise the overall site grade. For structural site grading fill, the maximum particle size should generally not exceed four inches; although, occasional larger particles, not exceeding six inches in diameter may be incorporated if placed randomly in a manner such that "honeycombing" does not occur and the desired degree of compaction can be achieved. The maximum particle size within structural fill placed within confined areas should generally be restricted to two inches.

The on-site natural soils may be utilized as structural site grading fill. It should be noted that unless moisture control is maintained, utilization of natural on-site clayey soils as structural site grading fill will be very difficult, if not impossible, during wet and cold periods of the year. Only granular soils are recommended as structural fill in confined areas, such as around foundations and within utility trenches. The natural granular soils contain cobbles which may need to be screened out to allow for the use of nuclear density gauge compaction testing.

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

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

### 5.2.4 Fill Placement and Compaction

Structural fill shall be placed in lifts not exceeding eight inches in loose thickness. Structural fills shall be compacted in accordance with the percent of the maximum dry density as determined by the AASHTO[1] T-180 (ASTM[2] D-1557) compaction criteria in accordance with the table below:

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

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

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

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

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

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

cobbles shall be adequately placed so that the "fines" are "worked into" the voids in the underlying coarser gravels and cobbles.

### 5.2.5 Utility Trenches

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

Most utility companies and City-County governments are now requiring that Type A-1 or A-1-a (AASHTO Designation – basically granular soils with limited fines) soils be used as backfill over utilities. These organizations are also requiring that in public roadways the backfill over major utilities be compacted over the full depth of fill to at least 96 percent of the maximum dry density as determined by the AASHTO T-180 (ASTM D-1557) method of compaction. We recommend that as the major utilities continue onto the site that these compaction specifications are followed.

The natural fine-grained cohesive soils are not recommended for use as trench backfill. Some of the natural sand and gravel may be suitable for use as trench backfill provided it meets the requirements of Type A-1 or A-1-a material.

### 5.2.6 Areal Settlements

Areal settlements resulting from site grading fills as much as two to three feet should be less than one-half of an inch. These settlements are in addition to settlements induced by foundation and floor slab loads. To reduce the total settlement that the structure will realize, site grading fill must be placed as far in advance of other construction as possible. The majority of this settlement will occur during placement.

## 5.3 SPREAD AND CONTINUOUS WALL FOUNDATIONS

### 5.3.1 Design Data

The proposed structure may be supported upon conventional spread and continuous wall foundations established upon suitable natural soils and/or structural fill extending to suitable natural soils. Under no circumstances shall footings be placed overlying non-engineered fills. Structural fill should extend to suitable natural soils and should not be underlain by sod, rubbish, topsoil, non-engineered fill, disturbed soil, or other unsatisfactory materials.

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

| | |
|---|---|
| Minimum Recommended Depth of Embedment for Frost Protection | - 30 inches |
| Minimum Recommended Depth of Embedment for Non-frost Conditions | - 15 inches |
| Recommended Minimum Width for Continuous Wall Footings | - 18 inches |
| Minimum Recommended Width for Isolated Spread Footings | - 24 inches |
| Recommended Net Bearing Pressure for Real Load Conditions | |
| For footings on suitable natural soils and/or structural fill extending to suitable natural soils | - 2,000 pounds per square foot |
| Bearing Pressure Increase for Seismic Loading | - 50 percent* |

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

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

### 5.3.2 Installation

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

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

### 5.3.3 Settlements

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

## 5.4 LATERAL PRESSURES

The lateral pressure parameters, as presented within this section, assume that the backfill extending at least five feet from the back of the wall be properly placed and compacted granular soil. The lateral pressures imposed upon subgrade facilities will, therefore, be basically dependent upon the relative rigidity and movement of the backfilled structure. For active walls, such as retaining walls which can move outward (away from the backfill), granular backfill may be considered equivalent to a fluid with a density of 35 pounds per cubic foot in computing lateral pressures. For more rigid basement walls, granular backfill may be considered equivalent to a fluid with a density of 45 pounds per cubic foot. For very rigid non-yielding walls, granular backfill should be considered equivalent to a fluid with a density with at least 55 pounds per cubic foot. The above values assume that the surface of the soils slope behind the wall is horizontal, that the granular fill has been placed and lightly compacted, not as structural fill. If the fill is placed as a structural fill the values should be increased to 45 pounds per cubic foot, 60 pounds per cubic foot, and 120 pounds per cubic foot, respectively.

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

| Wall Height (feet) | Uniform Seismic Lateral Pressure* (psf) |
|---|---|
| 4 | 74 |

* Maximum short-term pressures, they are not sustained loads.

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

## 5.5 LATERAL RESISTANCE

Lateral loads imposed upon foundations due to wind or seismic forces may be resisted by the development of passive earth pressures and friction between the base of the footings and the

supporting soils. In determining frictional resistance on fine-grained soils, a coefficient of 0.40 should be utilized. In determining frictional resistance on granular soils, a coefficient of 0.45 should be utilized. Passive resistance provided by properly placed and compacted granular structural fill above the water table may be considered equivalent to a fluid with a density of 300 pounds per cubic foot. Below the water table, this granular soil should be considered equivalent to a fluid with a density of 150 pounds per cubic foot.

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

## 5.6 FLOOR SLABS

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

Design water table recommendations are presented in Section 5.10, Design Water Table.

## 5.7 PAVEMENTS

The natural clay soils will exhibit poor engineering characteristics when saturated or near saturated. Considering silty clay as the subgrade soils and the projected traffic, the following pavement sections are recommended:

Parking Areas

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

Flexible:

| | |
|---|---|
| 2.5 inches | Asphalt concrete |
| 8.0 inches | Aggregate base |
| Over | Properly prepared natural soils, and/or structural site grading fill extending to suitable stabilized natural soils. |

Rigid:

| | |
|---|---|
| 5.0 inches | Portland cement concrete (non-reinforced) |
| 4.0 inches | Aggregate base |
| Over | Properly prepared natural soils, and/or structural site grading fill extending to suitable stabilized natural soils.* |

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

Primary Roadway Areas

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

Flexible:

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

Rigid:

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

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

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

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

## 5.8 GEOSEISMIC SETTING

### 5.8.1 General

In July 2019, the State of Utah adopted the International Building Code (IBC) 2018. The IBC 2018 code 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).

The structure must be designed in accordance with the procedure presented in Section 1613, Earthquake Loads, of the IBC 2018 edition.

### 5.8.2 Faulting

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

### 5.8.3 Soil Class

Based on the soils encountered in this study as well as our review of shear wave velocity profiles in the area and knowledge of the underlying geology, we recommend that Site Class D - Stiff Soil Profile as defined in Table 20.3-1, Site Classification, of ASCE 7-16 be utilized for dynamic structural analysis.

### 5.8.4 Ground Motions

The IBC 2018 code is based on 2014 USGS mapping, which provides values of short and long period accelerations for the Site Class B boundary for the Maximum Considered Earthquake (MCE). This Site Class B boundary represents a hypothetical sandstone bedrock surface and

must be corrected for local soil conditions. The following table summarizes the peak ground and short and long period accelerations for a MCE event and incorporates a soil amplification factor for a Site Class D soil profile in the second column. Based on the site latitude and longitude (40.3700 degrees north and -111.7858 degrees west, respectively), the values for this site are tabulated below.

| Spectral Acceleration Value, T Seconds | Site Class B-C Boundary [mapped values] (% g) | Site Class D [adjusted for site class effects] (% g) |
|---|---|---|
| Peak Ground Acceleration (Geo-Mean) | 59.0 | 64.9 |
| 0.2 Seconds (Short Period Acceleration) | $S_S$ = 130.4 | $S_{MS}$ = 130.4 |
| 1.0 Seconds (Long Period Acceleration) | $S_1$ = 47.6 | $S_{M1}$ = * |

* See Section 11.4.8 for requirements on site-specific ground motion studies. Please contact us for a proposal, if needed.

### 5.8.5 Liquefaction

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

Groundwater was not encountered at the maximum explored depth of 28 feet below surrounding grades. Due to the dense nature of the natural granular soils and lack of a shallow water table, liquefaction is not anticipated during the design seismic event.

## 5.9 CEMENT TYPES

The laboratory tests indicate that the site soils contain negligible amounts of water-soluble sulfates. Therefore, all concrete which will be in contact with the site soils may be prepared using standard Type I/II cement.

## 5.10 SITE OBSERVATIONS

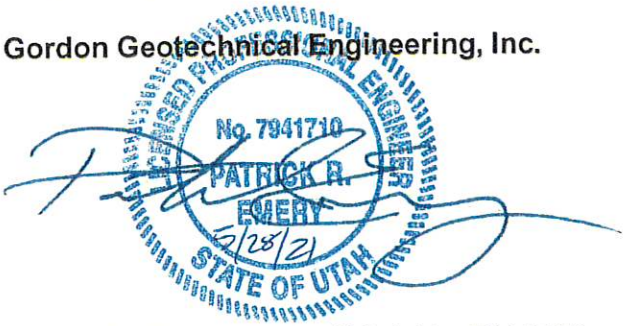
As stated previously, due to the variable nature of the soft clay encountered, a qualified geotechnical engineer from our staff must aid in verifying that all soft clay has been completely removed and suitable natural soils encountered prior to the placement of structural site grading fills, footings, or foundations.

GORDON GEOTECHNICAL ENGINEERING, INC.

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

Respectfully submitted,

**Gordon Geotechnical Engineering, Inc.**




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

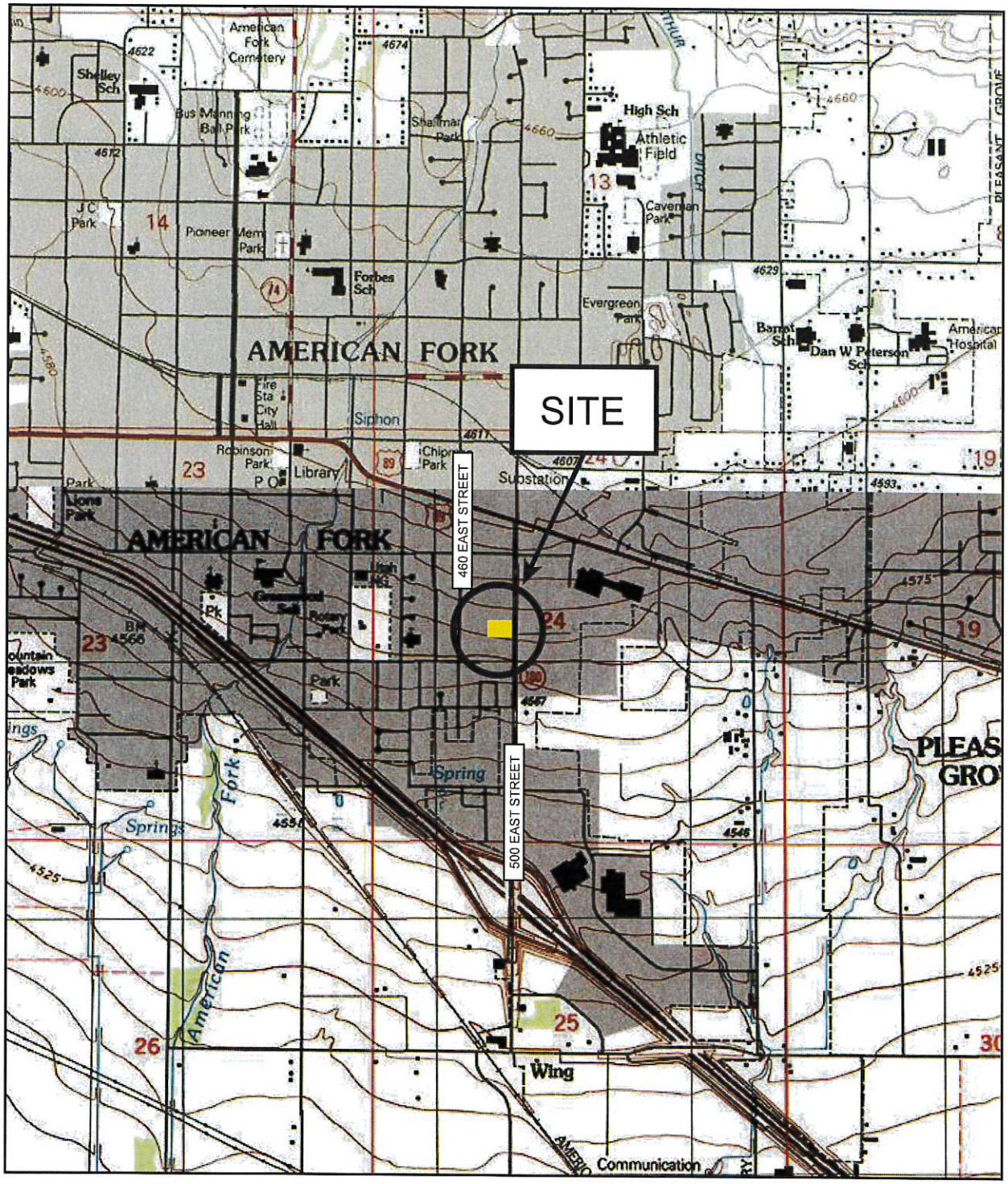
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Encl. Figure 1, Vicinity Map
Figure 2, Area Map
Figure 3, Site Plan
Figures 4A through 4D, Log of Borings
Figure 5, Unified Soil Classification System
Figure 6A and 6B, Photographs

Addressee (3 + email)

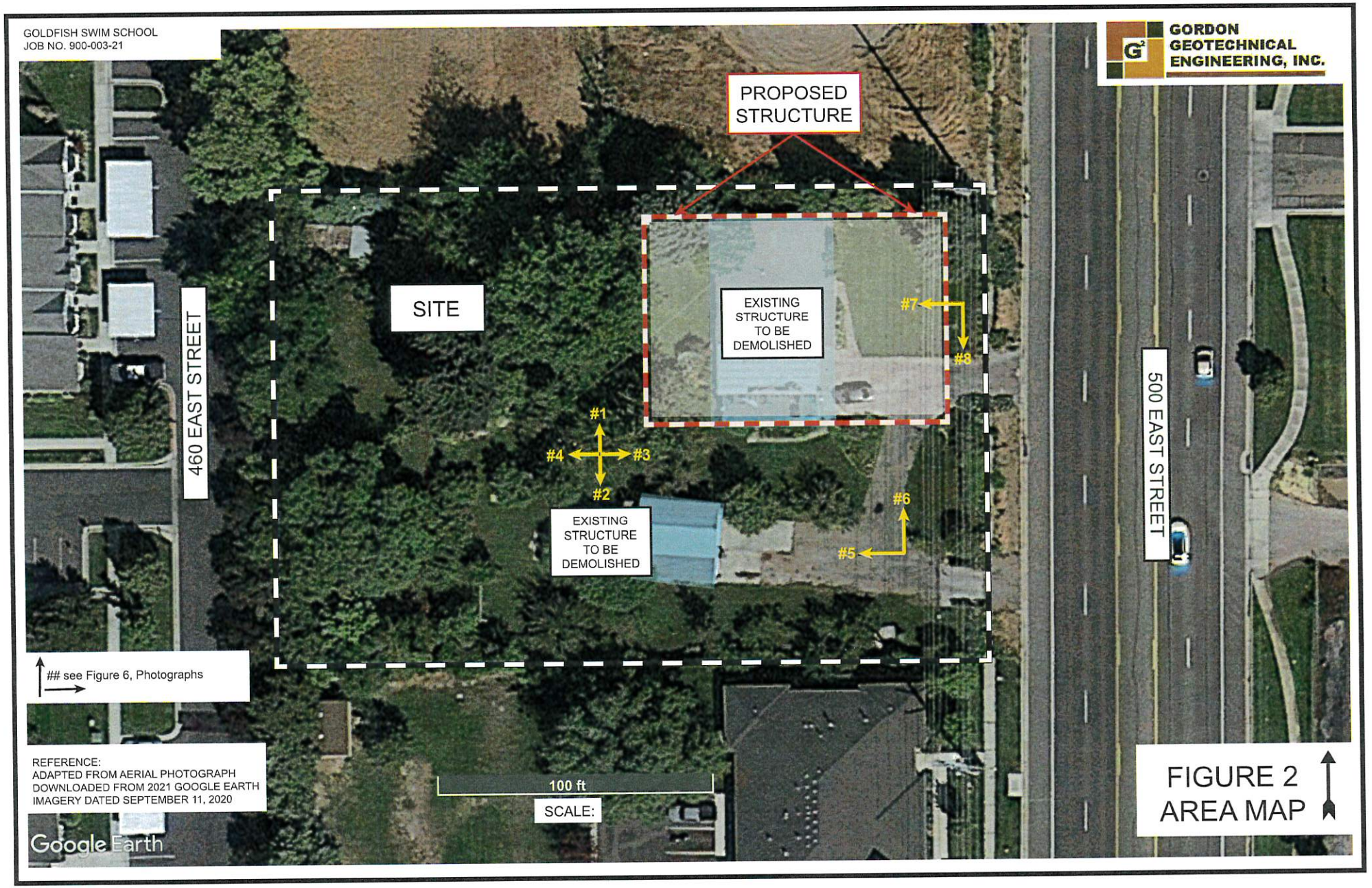
GOLDFISH SWIM SCHOOL
JOB NO. 900-003-21

GORDON GEOTECHNICAL ENGINEERING, INC.



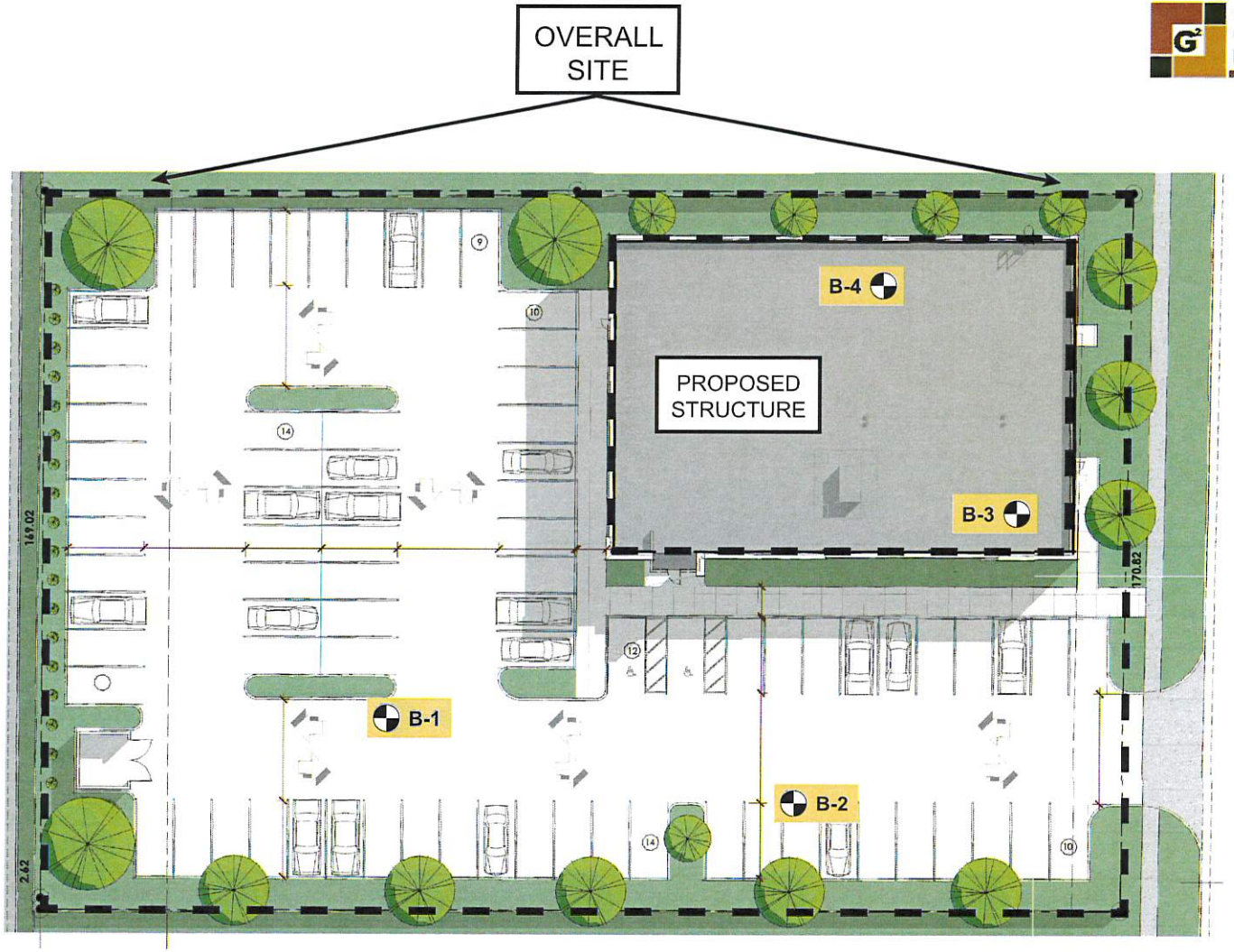

REFERENCE:
USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE MAPS
TITLED "PELICAN POINT, UTAH", DATED 1999 AND
"LEHI, UTAH", DATED 1994

# FIGURE 1
# VICINITY MAP


GOLDFISH SWIM SCHOOL
JOB NO. 900-003-21
GORDON GEOTECHNICAL ENGINEERING, INC.
PROPOSED STRUCTURE
SITE
EXISTING STRUCTURE TO BE DEMOLISHED
EXISTING STRUCTURE TO BE DEMOLISHED
460 EAST STREET
500 EAST STREET
#1
#2
#3
#4
#5
#6
#7
#8
## see Figure 6, Photographs
REFERENCE:
ADAPTED FROM AERIAL PHOTOGRAPH
DOWNLOADED FROM 2021 GOOGLE EARTH
IMAGERY DATED SEPTEMBER 11, 2020
100 ft
SCALE:
Google Earth
FIGURE 2
AREA MAP

GOLDFISH SWIM SCHOOL
JOB NO. 900-003-21

GORDON GEOTECHNICAL ENGINEERING, INC.




REFERENCE:
ADAPTED FROM DRAWING ENTITLED
"GSS - AMERICAN FORK, ARCHITECTURAL SITE PLAN (OPTION 2)
SHEET NO. C.000
BY KRIEGER KLATT ARCHITECTS, APRIL 19, 2021

NOT TO SCALE

FIGURE 3
SITE PLAN

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

**BOREHOLE B-1**



Project Name: Proposed Goldfish Swim School - American Fork
Project No.: 900-003-21
Location: 348 South 500 East, American Fork, Utah
Client: Goldfish Swim School
Drilling Method: 3.75" ID Hollow-Stem Auger
Date Drilled: 05-04-21
Elevation: ---
Water Level: No groundwater encountered.
Remarks:

| DESCRIPTION | GRAPHIC LOG | WATER LEVEL | DEPTH (FT.) | SAMPLE SYMBOL | SAMPLE TYPE | BLOWS/FT. | MOISTURE (%) | DRY DENSITY (PCF) | % PASSING 200 | LIQUID LIMIT (%) | PLASTIC LIMIT (%) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SILTY CLAY** with some fine sand and frequent organics; major roots (topsoil) to 3"; dark brown (CL) | | | | | | | | | | | | slightly moist medium stiff |
| | | | | | D | 8 | | | | | | |
| grades with some fine sand and occasional organics | | | 5 | | D | 6 | | | | | | moist |
| Stopped drilling at 4.5'<br>Stopped sampling at 6.0'<br>No groundwater encountered at time of drilling. | | | 10<br>15<br>20<br>25 | | | | | | | | | |

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

FIGURE 4A

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

**BOREHOLE B-2**



Project Name: Proposed Goldfish Swim School - American Fork
Project No.: 900-003-21
Location: 348 South 500 East, American Fork, Utah
Client: Goldfish Swim School
Drilling Method: 3.75" ID Hollow-Stem Auger
Date Drilled: 05-04-21
Elevation: ---
Water Level: No groundwater encountered.
Remarks:

| DESCRIPTION | GRAPHIC LOG | WATER LEVEL | DEPTH (FT.) | SAMPLE SYMBOL | SAMPLE TYPE | BLOWS/FT. | MOISTURE (%) | DRY DENSITY (PCF) | % PASSING 200 | LIQUID LIMIT (%) | PLASTIC LIMIT (%) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FINE SANDY CLAY** with trace fine and coarse gravel; major roots (topsoil) to 3"; dark brown (CL) | | | | | D | 8 | | | | | | slightly moist medium stiff |
| **SILTY FINE AND COARSE GRAVEL / SILTY FINE TO COARSE SAND** grayish-brown (GM/SM) | | | 5 | | D | 46 | | | | | | no recovery slightly moist medium dense |
| Stopped drilling at 3.5' | | | | | | | | | | | | |
| Stopped sampling at 5.0' | | | | | | | | | | | | |
| No groundwater encountered at time of drilling. | | | 10 | | | | | | | | | |
| | | | 15 | | | | | | | | | |
| | | | 20 | | | | | | | | | |
| | | | 25 | | | | | | | | | |

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

FIGURE 4B

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

**BOREHOLE B-3**



Project Name: Proposed Goldfish Swim School - American Fork
Location: 348 South 500 East, American Fork, Utah
Drilling Method: 3.75" ID Hollow-Stem Auger
Elevation: ---
Remarks:

Project No.: 900-003-21
Client: Goldfish Swim School
Date Drilled: 05-04-21
Water Level: No groundwater encountered.

| DESCRIPTION | GRAPHIC LOG | WATER LEVEL | DEPTH (FT.) | SAMPLE SYMBOL | SAMPLE TYPE | BLOWS/FT. | MOISTURE (%) | DRY DENSITY (PCF) | % PASSING 200 | LIQUID LIMIT (%) | PLASTIC LIMIT (%) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SILTY FINE AND COARSE GRAVEL / SILTY FINE TO COARSE SAND** with major roots (topsoil) to 3"; grayish-brown (GM/SM) | | | | | | | | | | | | slightly moist |
| **SILTY CLAY** with some fine sand and occasional organics; dark brown (CL) | | | | | SPT | 3 | 18.7 | | 78.9 | 26 | 20 | slightly moist soft |
| grades with silty fine and coarse gravelley clay; some fine sand; occasional cobbles and occasional organics; brown | | | 5 | | D | 20 | | | | | | moist stiff |
| **FINE TO COARSE GRAVEL / SAND** with some silt; gray (GPGM/SPSM) | | | 10 | | D | 52 | | | | | | no recovery slightly moist medium dense |
| | | | 15 | | SPT | 52 | | | | | | very dense |
| Stopped drilling at 14.5'<br>Stopped sampling at 16.0'<br>No groundwater encountered at time of drilling. | | | 20<br>25 | | | | | | | | | |

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

FIGURE 4C

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

**BOREHOLE B-4**



Project Name: Proposed Goldfish Swim School - American Fork
Project No.: 900-003-21
Location: 348 South 500 East, American Fork, Utah
Client: Goldfish Swim School
Drilling Method: 3.75" ID Hollow-Stem Auger
Date Drilled: 05-04-21
Elevation: ---
Water Level: No groundwater encountered.
Remarks:

| DESCRIPTION | GRAPHIC LOG | WATER LEVEL | DEPTH (FT.) | SAMPLE SYMBOL | SAMPLE TYPE | BLOWS/FT. | MOISTURE (%) | DRY DENSITY (PCF) | % PASSING 200 | LIQUID LIMIT (%) | PLASTIC LIMIT (%) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **FINE TO COARSE GRAVEL / SAND** with some silt; major roots (topsoil) to 3"; grayish-brown (GPGM/SPSM) | | | | | | | | | | | | slightly moist medium dense |
| | | | | | SPT | 16 | 1.1 | | 5.74 | | | |
| **FINE TO COARSE SAND** with some silt and some fine and coarse gravel; grayish-brown (SP) | | | 5 | | SPT | 10 | | | | | | slightly moist medium dense |
| **FINE TO COARSE GRAVEL / SAND** with some silt; gray (GPGM/SPSM) | | | | | | | | | | | | gravel noted slightly moist dense |
| | | | 10 | | SPT | 50 | 1.5 | | 9.6 | | | |
| grades to grayish-brown | | | 15 | | SPT | 69 | | | | | | very dense |
| | | | | | | | | | | | | dense |
| **FINE SANDY SILT** light brownish-gray (ML) | | | | | SPT | 10 | | | | | | slightly moist stiff |
| | | | 20 | | | | | | | | | layers of gravel noted |
| grades fine sand; brown | | | | | | | | | | | | moist |
| | | | 25 | | | 60 7" | | | | | | |

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

FIGURE 4D

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

**BOREHOLE B-4**



Project Name: Proposed Goldfish Swim School - American Fork
Location: 348 South 500 East, American Fork, Utah
Drilling Method: 3.75" ID Hollow-Stem Auger
Elevation: ---
Remarks:

Project No.: 900-003-21
Client: Goldfish Swim School
Date Drilled: 05-04-21
Water Level: No groundwater encountered.

| DESCRIPTION | GRAPHIC LOG | WATER LEVEL | DEPTH (FT.) | SAMPLE SYMBOL | SAMPLE TYPE | BLOWS/FT. | MOISTURE (%) | DRY DENSITY (PCF) | % PASSING 200 | LIQUID LIMIT (%) | PLASTIC LIMIT (%) | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | SPT | 7" | | | | | | |
| **SILTY FINE AND COARSE GRAVEL / SILTY FINE TO COARSE SAND**<br>grayish-brown (GPGM/SPSM) | | | | | SPT | 50<br>5" | | | | | | moist<br>very dense |
| Boring refusal at 26.5' due to very dense gravel and potential cobbles.<br><br>Stopped sampling at 28.0'<br><br>No groundwater encountered at time of drilling.<br><br>Installed slotted PVC pipe to 28.0' | | | 30<br>35<br>40<br>45<br>50 | | | | | | | | | |

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

FIGURE 4D
(Con't)

**GORDON GEOTECHNICAL ENGINEERING, INC.**

## UNIFIED SOIL CLASSIFICATION SYSTEM

| FIELD IDENTIFICATION PROCEDURES | | | | GRAPH SYMBOL | LETTER SYMBOL [1] | TYPICAL DESCRIPTIONS |
|---|---|---|---|---|---|---|
| COARSE GRAINED SOILS<br>More than half of material is larger than No. 200 sieve size. [2]<br>(The No. 200 sieve size is about the smallest particle visible to the naked eye) | GRAVELS<br>More than half of coarse fraction is larger than No. 4 sieve size.<br>(For visual classifications, the 1/4" size may be used as equivalent to the No. 4 sieve size.) | CLEAN GRAVELS<br>(Little or no fines) | Wide range in grain size and substantial amounts of all intermediate particle sizes. | | GW | Well graded gravels, gravel-sand mixtures, little or no fines. |
| | | | Predominantly one size or a range of sizes with some intermediate sizes missing. | | GP | Poorly graded gravels, gravel-sand mixtures, little or no fines. |
| | | GRAVELS WITH FINES<br>(Appreciable amount of fines) | Non-plastic fines (for identification procedures see ML below). | | GM | Silty gravels, poorly graded gravel-sand-silt mixtures. |
| | | | Plastic fines (for identification procedures see CL below). | | GC | Clayey gravels, poorly graded gravel-sand-clay mixtures. |
| | SANDS<br>More than half of coarse fraction is smaller than No. 4 sieve size.<br>(For visual classifications, the 1/4" size may be used as equivalent to the No. 4 sieve size.) | CLEAN SANDS<br>(Little or no fines) | Wide range in grain sizes and substantial amounts of all intermediate particle sizes. | | SW | Well graded sands, gravelly sands, little or no fines. |
| | | | Predominantly one size or a range of sizes with some intermediate sizes missing. | | SP | Poorly graded sands, gravelly sands, little or no fines. |
| | | SANDS WITH FINES<br>(Appreciable amount of fines) | Non-plastic fines (for identification procedures see ML below). | | SM | Silty sands, poorly graded sand-silt mixtures. |
| | | | Plastic fines (for identification procedures see CL below). | | SC | Clayey sands, poorly graded sand-clay mixtures. |

| IDENTIFICATION PROCEDURES ON FRACTION SMALLER THAN No. 40 SIEVE SIZE | | | | | | |
|---|---|---|---|---|---|---|
| | | DRY STRENGTH (CRUSHING CHARACTERISTICS) | DILATANCY (REACTION TO SHAKING) | TOUGHNESS (CONSISTENCY NEAR PLASTIC LIMIT) | | |
| FINE GRAINED SOILS<br>More than half of material is smaller than No. 200 sieve size.<br>(The No. 200 sieve size is about the smallest particle visible to the naked eye) | SILTS AND CLAYS<br>Liquid limit less than 50 | None to slight | Quick to slow | None | ML | Inorganic silts and very fine sands, rock flour, silty or clayey fine sand with slight plasticity. |
| | | Medium to high | None to very slow | Medium | CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. |
| | | Slight to medium | Slow | Slight | OL | Organic silts and organic silt-clays of low plasticity. |
| | SILTS AND CLAYS<br>Liquid limit greater than 50 | Slight to medium | Slow to none | Slight to medium | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts. |
| | | High to very high | None | High | CH | Inorganic clays of high plasticity, fat clays. |
| | | Medium to high | None to very slow | Slight to medium | OH | Organic clays of medium to high plasticity. |
| HIGHLY ORGANIC SOILS | | Readily identified by color, odor, spongy feel and frequently by fibrous texture. | | | Pt | Peat and other highly organic soils. |

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

### GENERAL NOTES

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

### FINE - GRAINED SOIL

| CONSISTENCY | SPT (blows/ft) | TORVANE UNDRAINED SHEAR STRENGTH (tsf) | POCKET PENETROMETER UNCONFINED COMPRESSIVE STRENGTH (tsf) | FIELD TEST |
|---|---|---|---|---|
| Very Soft | <2 | <0.125 | <0.25 | Easily penetrated several inches by Thumb. Squeezes through fingers. |
| Soft | 2 - 4 | 0.125 - 0.25 | 0.25 - 0.5 | Easily penetrated 1 " by Thumb . Molded by light finger pressure. |
| Medium Stiff | 4 - 8 | 0.25 - 0.5 | 0.5 - 1.0 | Penetrated over 1/2 " by Thumb with moerate effort. Molded by strong finger pressure. |
| Stiff | 8 - 15 | 0.5 - 1.0 | 1.0 - 2.0 | Indented about 1/2 " by Thumb but penetrated only with great effort |
| Very Stiff | 15 - 30 | 1.0 - 2.0 | 2.0 - 4.0 | Readily indented by Thumbnail |
| Hard | >30 | >2.0 | >4.0 | Indented with difficulty by Thumbnail |

### LOG KEY SYMBOLS

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

### COARSE -GRAINDE SOIL

| APPERENT DENSITY | SPT (blows ft) | RELATIVE DENSITY (%) | FIELD TEST |
|---|---|---|---|
| Very Loose | <4 | 0 - 15 | Easily penetrated with 1/2 " reinforcing rod pushed by hand |
| Loose | 4 - 10 | 15 - 35 | Difficult to penetrated with 1/2 " reinforcing rod pushed by hand |
| Medium Dense | 10 - 30 | 35 - 65 | Easily penetrated a foot with 1/2 " reinforcing rod driven with 5-lb hammer |
| Dense | 30 - 50 | 65 - 85 | Difficult to penetrated a foot with 1.2 " reinforcing rod driven with 5-lb hammer |
| Very Dense | >50 | 85 - 100 | Penetrated only a few inches with 1/2 " reinforcing rod driven with 5-lb hammer |

### STRATIFICATION

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

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

### CEMENTATION

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

### MODIFIERS

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

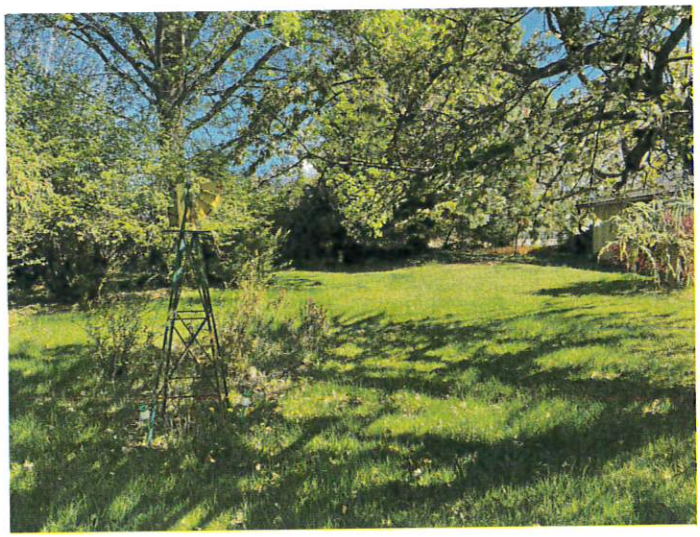
### MOISTURE CONTENT

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

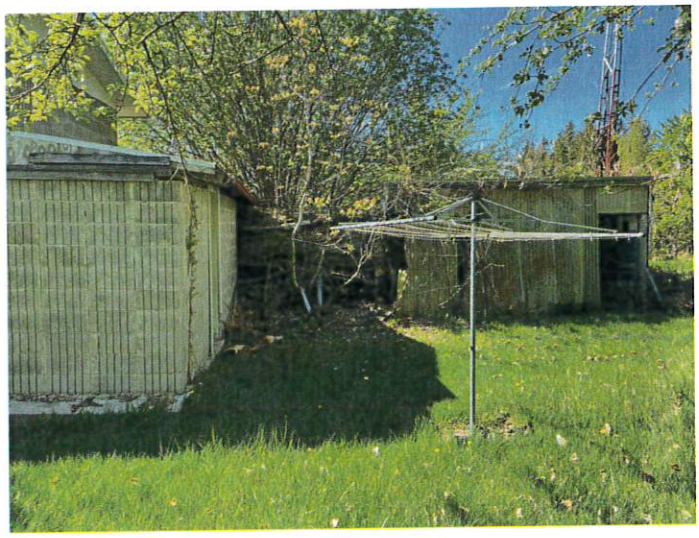
FIGURE 5

GOLDFISH SWIM SCHOOL
JOB NO. 900-003-21

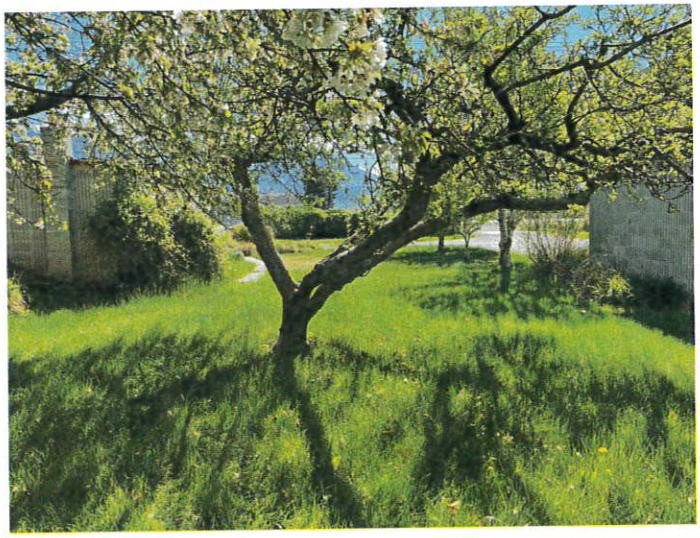
GORDON GEOTECHNICAL ENGINEERING, INC.



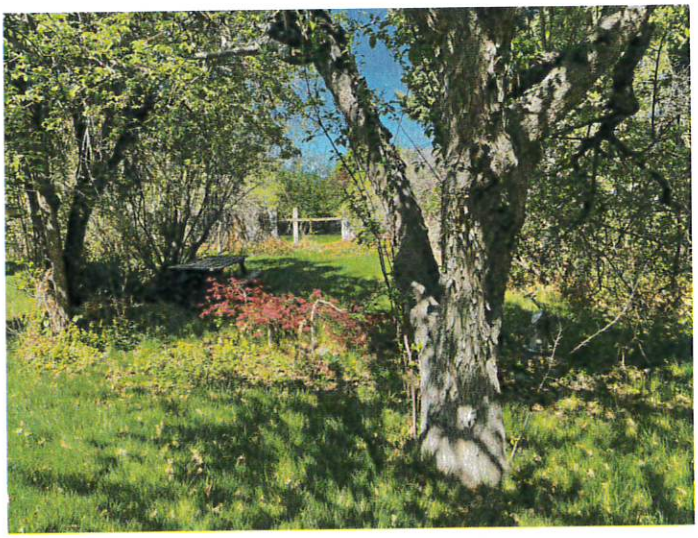
#1 Looking north.



#2 Looking south.



#3 Looking east.



#4 Looking west.

Locations and direction, see Figure 2, Area Map

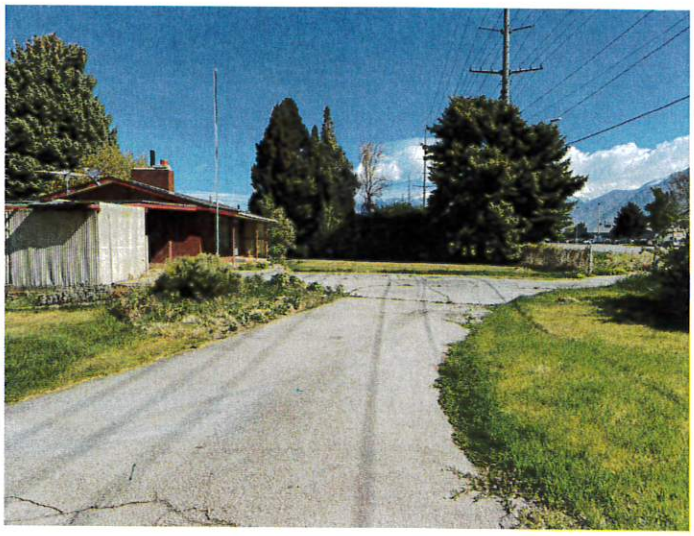
# FIGURE 6A
# PHOTOGRAPHS

GOLDFISH SWIM SCHOOL
JOB NO. 900-003-21

GORDON GEOTECHNICAL ENGINEERING, INC.



#5 Looking west.



#6 Looking north.



#7 Looking west.



#8 Looking south.

Locations and direction, see Figure 2, Area Map

# FIGURE 6B
# PHOTOGRAPHS

GORDON
GEOTECHNICAL
ENGINEERING, INC.

August 16, 2021
Job No. 900-003-21

Goldfish Swim School
1485 South 3000 West
Salt Lake City, Utah 84115

**Attention: Ms. Katie Grisley**

Re: Addendum to Geotechnical Study
Infiltration Rate
Proposed Goldfish Swim School
348 South 500 East
American Fork, Utah

A recommended infiltration rate has been requested for the design of a storm water detention system within the natural soils at the site. Gordon Geotechnical Engineering previously performed a geotechnical study for the referenced site dated May 28, 2021[1].

The natural soils encountered in the exploration borings are generally silty or sandy clay (CL) with significant layers of sands and gravels with silt (SP-SM, GP-GM). It is our experience that the infiltration rate will decrease over the lifetime of the system due to siltation and the introduction of other materials. Accordingly, we recommend a conservative reduced design infiltration rate of at least 60 minutes per inch be used in design for a system installed in the natural clay soils. A design infiltration rate of 15 minutes per inch may be used for a system installed in the sand and gravel soils.

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

Respectfully submitted,

**Gordon Geotechnical Engineering, Inc.**

LICENSED PROFESSIONAL ENGINEER
8.16.21
No. 10975604
JORDAN K. CULP
STATE OF UTAH

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

Reviewed By:

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

JKC/PRE:nc

Addressee (email only)

---

1 "Report, Geotechnical Study, Proposed Goldfish Swim School, 348 South 500 East, American Fork, Utah" G² Job Number 900-003-21, Dated May 28, 2021.

Gordon Geotechnical Engineering, Inc.
4426 South Century Drive, Suite 100
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TAYLOR GEOTECHNICAL

2650 North 180 East
Lehi, Utah 84043
P. 801-766-3246
F. 801-769-3336

November 5, 2021

Mr. Ben Hunter
Project Engineer
City of American Fork
51 East Main Street
American Fork, Utah 84003

Subject: **Geotechnical Review No. 1**
**Goldfish Swim School**
**348 South 500 East**
American Fork Utah
American Fork Application No. 2021-032
TG Project No. 21147

Subject Document: Gordon Geotechnical Engineering, Report, Geotechnical Study, Proposed Goldfish Swim School, 348 South 500 East, American Fork, Utah, G2 Project No. 900-003-021, prepared for Goldfish Swim School, 1485 South 300 West, Salt Lake City, Utah 84115, May 28, 2021.

Submittal Status: **GEOTECHNICAL SUBMITTAL INCOMPLETE**

Dear Mr. Hunter:

At your request, Taylor Geotechnical (TG) reviewed the subject document. The purpose of TG's review is to evaluate whether or not Gordon Geotechnical Engineering, Inc. (G2) adequately addresses geotechnical engineering parameters at the site, consistent with concerns for public health, safety, welfare, reasonable professional standards-of-care and the American Fork City Sensitive Lands Ordinance 07-10-47. Section 4-2-2 of the of the American Fork City Sensitive Land Ordinance sub-item (10), states the report must be in accordance with the guidelines and recommendations of the "American Fork Sensitive Lands Geologic Hazards Study," Chapter 5 titled "Conclusions and Recommendations" prepared by RB&G Engineering, Inc., dated December 2006.

**TG Conclusion**

Based substantially in and on reliance of the technical documentation and assurances provided by G2, including their opinions and conclusions, it is TG's opinion the May 28, 2021, G2 report does not fulfill the requirements of the American Fork City Sensitive Lands Ordinance 07-10-47.

## TG Recommendations

Based on the requirements of the American Fork City Sensitive Land Ordinance and the technical documentation provided by G2, TG recommends the American Fork City not consider the G2 report complete from a geotechnical perspective until the following items are adequately addressed.

1. The subject site is below elevation 4593 feet. For sites below elevation 4593 feet, the Sensitive Land Ordinance requires the geotechnical report address current groundwater conditions and artesian conditions at the site. The May 28, 2021, G2 report did not address artesian conditions at the property.

   *TG recommends the City of American Fork request G2 address artesian conditions for the proposed development.*

2. The RB&G, 2006, report specifies for facilities designed according to the IBC seismic provisions and located within the moderate or high liquefaction hazard zones identified on Figure 6 of the RB&G report, that the recommended Site Class be based on a site-specific subsurface investigation to a depth of at least 30 feet, supplemented by at least one investigation to a depth of at least 70 feet and located within 2,000 feet of the site (see page 17, RGB 2006).

   *TG recommends the City of American Fork request G2 to*

   a) *A site plan depiction the location of the boring that extended to 70 feet below the surface;*

   b) *The boring log for boring that extended to 70 feet; and,*

   c) *Update the Site Class, if required, based on the boring to 70 feet.*

3. In accordance with section 4-2-4 of the of the American Fork City Sensitive Land Ordinance, sub-item (7B), the report should be accompanied with the following Certificate statement sealed by the licensed professional that prepared the report

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

   The subject document did not contain the required certificate. *TG recommends the American Fork City request the required certificate for the subject document.*

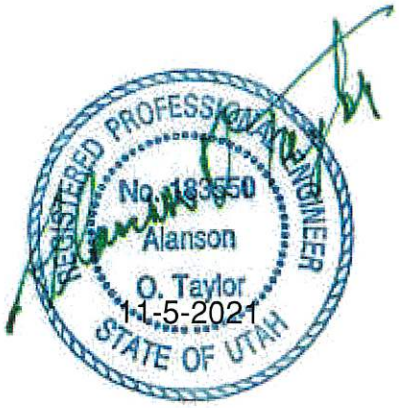
4. *TG recommends American Fork City request CMT provide calculations to support the allowable foundation bearing recommendations, settlement analysis, and lateral load recommendations provided in the subject document. Variables used in the calculations should be substantiated.*

**CLOSURE**

All services performed by Taylor Geotechnical for this review were provided for the exclusive use and benefit of the City of American Fork. No other person or entity is entitled to use or rely upon any of the information or reports generated by Taylor Geotechnical as a result of this review.

If you have any questions, please feel free to contact the undersigned. The opportunity to be of continued service to the City of American Fork is appreciated.

Respectfully submitted,
Taylor Geotechnical




Alanson O. Taylor, P.E.
Principal

November 23, 2021
Job No. 900-003-21

Goldfish Swim School
1485 South 3000 West
Salt Lake City, Utah 84115

**Attention: Ms. Katie Grisley**

Ladies and Gentlemen:

Re: American Fork Geotechnical Report Review
Geotechnical Study
Proposed Goldfish Swim School
348 South 500 East
American Fork, Utah

As part of American Fork's plan review, Mr. Alanson Taylor of Taylor Geo-Engineering LLC (TG) completed a geotechnical review of the proposed Goldfish Swim School geotechnical report dated May 28, 2021[1]. As a result of this review, three items of clarification were requested by Mr. Taylor as outlined in his letter entitled "Geotechnical Review No. 1 – Goldfish Swim School" dated November 5, 2021. The items of clarification and our responses are provided below:

> 1. The subject site is below elevation 4593 feet. For sites below elevation 4593 feet, the Sensitive Land Ordinance requires the geotechnical report address current groundwater conditions and artesian conditions at the site. The May 28, 2021, G2 report did not address artesian conditions at the property.
>
> *TG recommends the City of American Fork request G2 address artesian conditions for the proposed development.*

During drilling operations for the November 5, 2021 study, groundwater was not encountered at the maximum explored depth of 28 feet below the ground surface. Due to the depth of groundwater being greater than 28 feet, artesian conditions are not anticipated at the site. Groundwater is not anticipated to impact the proposed development.

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1 "Report, Geotechnical Study, Proposed Goldfish Swim School, 1485 South 3000 West, Salt Lake City, Utah," G² Job No. 900-003-21, Dated November 23, 2021.

2. The RB&G, 2006, report specifies for facilities designed according to the IBC seismic provisions and located within the moderate or high liquefaction hazard zones identified on Figure 6 of the RB&G report, that the recommended Site Class be based on a site specific subsurface investigation to a depth of at least 30 feet, supplemented by at least one investigation to a depth of at least 70 feet and located within 2,000 feet of the site (see page 17, RGB 2006).

*TG recommends the City of American Fork request G2 to a) A site plan depiction the location of the boring that extended to 70 feet below the surface; b) The boring log for boring that extended to 70 feet; and, c) Update the Site Class, if required, based on the boring to 70 feet.*

Gordon Geotechnical Engineering, Inc. ($G^2$) reviewed the RB&G 2006 report and identified that the deep borings associated with Investigation No. RBG-05-1: I-15 over 300 West occurred within 2,000 feet of the project site. Boring No. 04-1 from the RBG-05-1 investigation was extended to a depth of 82 feet. Based on our review, the soils encountered in Boring No. 04-1 back up our previous recommendation that Site Class D – Stiff Soil be utilized for dynamic structural analysis. The log from Boring No. 04-1 has been enclosed with this letter.

3. In accordance with section 4-2-4 of the of the American Fork City Sensitive Land Ordinance, sub-item (7B), the report should be accompanied with the following Certificate statement sealed by the licensed professional that prepared the report

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

The subject document did not contain the required certificate. *TG recommends the American Fork City request the required certificate for the subject document.*

As requested, and per the American Fork Sensitive Land Ordinance, $G^2$ provides the following certificate applicable to the May 28, 2021 Geotechnical Study with the additional content and clarifications provided within this Geotechnical Review Response Letter.

## CERTIFICATE

I hereby certify that I am a licensed professional engineer, as those terms are defined in the "Sensitive Lands Ordinance" Section of the American Fork City Ordinances. I have examined

the letter report/geologic report to which this certificate is attached and the information and conclusions contained therein are, without any reasonable reservation not stated therein, accurate and complete. All procedures and tests used in said letter report/geologic report meet minimum applicable professional standards.

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

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

Respectfully submitted,

**Gordon Geotechnical Engineering, Inc.**




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

PRE:sn

Encl. Boring Log

# DRILL HOLE LOG

BORING NO. 04-1

Sheet: 1 of 2

PROJECT: I-15, CORRIDOR IN UTAH COUNTY - STRUCTURE C345 PROJECT NO.: 200401.045
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION DATE: 7/29/04 TO 7/30/04
LOCATION: SEE SITE PLAN: N 108668, E 189444 ELEVATION: 4513.2'
DRILLER: D. SAMPSON LOGGED BY: R.J., V.N.B.
EQUIP./DRILL METHOD: CME-55 / N.W. CASING TO 50' THEN DRILLING MUD
DEPTH TO WATER - INITIAL: ▽ N.M. AFTER 24 HOURS: ▽ 21.6'

| Elev. (Feet) | Depth (Feet) | Lithology | SAMPLE Type | SAMPLE Rec. (in.) | SAMPLE Blows Per 6" & Torvane (tsf) | USCS (AASHTO) | Material Description | Dry Density, pcf | Moisture Content, % | Atter. Liquid Limit, % | Atter. Plasticity Index, % | Gradation Gravel, % | Gradation Sand, % | Gradation Silt/Clay, % | Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4510 | 0 | | | 12 | 8,13,19 | GM | brown & gray, dry, med. dense, sulphur odor — SILTY GRAVEL W/SAND | | | | | | | | |
| 4505 | 5 | | | 12 | 11,26,26 | GP-GM (A-1-a) | brown, slightly moist, dense — POORLY GRADED GRAVEL W/SILT & SAND | | 5.8 | | NP | 49 | 42 | 9 | |
| 4500 | 10 | | | 7 | 16,19,18 | GP | black, wet, med. dense — POORLY GRADED GRAVEL | | | | | | | | |
| 4495 | 15 | | | 12 | 26,34,35 | GP-GM | brown, slightly moist, dense | | | | | | | | |
| 4490 | 20 | | | 7 | 14,22,17 | GP-GM | brown, wet, med. dense — POORLY GRADED GRAVEL W/SILT & SAND | | | | | | | | |
| 4485 | 25 | | | 7 | 8,10,14 | GP-GM (A-1-a) | brown, wet, loose to med. dense | | 8.2 | | NP | 76 | 18 | 6 | |
| 4480 | 30 | | | 11 | 8,8,8 | SM (A-3) | brown, wet, med. dense | | 20.3 | | NP | 0 | 81 | 18 | DS |
| 4475 | 35 | | | 13 | 9,11,9 | SM (A-3) | brown, wet, med. dense, 0.75" silty clay layer — SILTY FINE TO MEDIUM SAND | | 22.3 | | NP | 1 | 82 | 17 | |
| 4470 | 40 | | | 15 | Pushed | SM? | gray, wet, med. dense — SILTY FINE SAND? | | | | | | | | |
| | | | | 16 | 10,11,11 0.84 | ML? | gray, moist, stiff | | | | | | | | |
| 4465 | 45 | | | 18 | 2,3,3 | ML (A-4(8)) | gray, very moist, firm — SILT | | 36.5 | 33 | 4 | 0 | 1 | 99 | |
| | 50 | | | | | | | | | | | | | | |

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**LEGEND**

2,3,2 — Blow Count per 6"
0.45 — Torvane (tsf)
Disturbed Sample
Undisturbed Sample
Groundwater Elevation

UC = Unconfined Compression Test
CT = Consolidation Test
SG = Specific Gravity Test
DS = Direct Shear Test

RB&G ENGINEERING INC.
Provo, Utah

# DRILL HOLE LOG

BORING NO. 04-1

Sheet: 2 of 2

PROJECT: I-15, CORRIDOR IN UTAH COUNTY - STRUCTURE C345 PROJECT NO.: 200401.045
CLIENT: UTAH DEPARTMENT OF TRANSPORTATION DATE: 7/29/04 TO 7/30/04
LOCATION: SEE SITE PLAN: N 108668, E 189444 ELEVATION: 4513.2'
DRILLER: D. SAMPSON LOGGED BY: R.J., V.N.B.
EQUIP./DRILL METHOD: CME-55 / N.W. CASING TO 50' THEN DRILLING MUD
DEPTH TO WATER - INITIAL: ▽ N.M. AFTER 24 HOURS: ▽ 21.6'

| Elev. (Feet) | Depth (Feet) | Lith-ology | SAMPLE Type | SAMPLE Rec. (In.) | SAMPLE Blows Per 6" & Torvane (tsf) | USCS (AASHTO) | Material Description | Dry Density pcf | Moisture Content, % | Atter. Liquid Limit, % | Atter. Plasticity Index, % | Gradation Gravel, % | Gradation Sand, % | Gradation Silt/Clay, % | Other Tests |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 18 | Pushed 0.57 | CL | gray, moist, stiff | | | | | | | | |
| 4460 | | | | | | | LEAN CLAY | | | | | | | | |
| | 55 | | | 18 | 0.38 2,6,7 0.77 | CL CL-ML | gray, firm<br>gray, moist, stiff | | | | | | | | |
| 4455 | | | | | | | SILTY CLAY W/SAND LAYERS TO 0.75" THICK | | | | | | | | |
| | 60 | | | 16 | Pushed 0.88 | CL-ML | gray, slightly moist, stiff | | | | | | | | |
| 4450 | | | | 24 | 4,4,5,6 0.60 | CL | gray, moist, stiff | | | | | | | | |
| | 65 | | | 24 | 2,3,3,5 0.60 | CL | gray, moist, stiff<br>LEAN CLAY W/SOME SILTY SAND LENSES | | | | | | | | |
| 4445 | | | | | | | SAND | | | | | | | | |
| | 70 | | | 18 | Pushed 0.56 | SC | gray, moist, stiff<br>SANDY CLAY | | | | | | | | |
| 4440 | | | | 24 | 10,14,25 | SM | gray, wet, dense | | | | | | | | |
| | 75 | | | 21 | 19,30,31,30 | SM | SILTY SAND<br>gray, wet, very dense | | | | | | | | |
| 4435 | | | | | | | | | | | | | | | |
| | 80 | | | 24 | 10,10,9,14 1.00+ | CL,SM | gray, wet to moist, med. dense to very stiff<br>LAYERS OF CLAY & SILTY SAND | | | | | | | | |
| 4430 | | | | | | | | | | | | | | | |
| | 85 | | | | | | | | | | | | | | |
| 4425 | | | | | | | | | | | | | | | |
| | 90 | | | | | | | | | | | | | | |
| 4420 | | | | | | | | | | | | | | | |
| | 95 | | | | | | | | | | | | | | |
| 4415 | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | |

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**LEGEND**

2,3,2 ← Blow Count per 6"
0.45 ← Torvane (tsf)
Disturbed Sample
Undisturbed Sample
▽ Groundwater Elevation

UC = Unconfined Compression Test
CT = Consolidation Test
SG = Specific Gravity Test

RB&G ENGINEERING INC.
Provo, Utah

TAYLOR GEOTECHNICAL

2650 North 180 East
Lehi, Utah 84043
P. 801-766-3246

December 17, 2021

Mr. Ben Hunter
Project Engineer
American Fork City
51 East Main Street
American Fork, Utah 84003

Subject: **Geotechnical Engineering Review No. 2**
**Goldfish Swim School**
**348 South 500 East**
American Fork, Utah
American Fork Application No. 2021-032
TG Project No. 21147

Subject Document: Gordon Geotechnical Engineering, American Fork Geotechnical Report Review, Goldfish Study, 348 South 500 East, American Fork, Utah, G2 Project No. 900-003-021, prepared for Ms. Katie Grisley, Goldfish Swim School, 1485 South 3000 West, Salt Lake City, Utah 84115, November 23, 2021.

Previous Submittal: Gordon Geotechnical Engineering, Report, Geotechnical Study, Proposed Goldfish Swim School, 348 South 500 East, American Fork, Utah, G2 Project No. 900-003-021, prepared for Mr. Katie Grisley, Goldfish Swim School, 1485 South 3000 West, Salt Lake City, Utah 84115, May 28, 2021.

Submittal Status: **GEOTECHNICAL ENGINEERING SUBMITTAL COMPLETE**

Dear Mr. Hunter:

At your request, Taylor Geotechnical (TG) reviewed the above referenced November 23, 2021, Gordon Geotechnical Engineering (G2) document. The subject document was prepared in response to review comments by TG[1] to American Fork City on November 5, 2021, of the May 28, 2021, G2 report. The purpose of TG's review is to evaluate whether or not the G2 submittals adequately address geotechnical engineering parameters at the site, consistent with concerns for public health, safety, welfare, reasonable professional standards-of-care and the American Fork City Sensitive Lands Ordinance 07-10-47. Section 4-2-2 of the of the American Fork City Sensitive Land Ordinance sub-item (10), states the report must be in accordance with the

[1] Taylor Geotechnical, Geotechnical Review No. 1, Goldfish Swim School, 348 South 500 East, American Fork, Utah, American Fork Application No. 2021-032, TG Project No. 21147, prepared for Mr. Ben Hunter, Project Engineer, American Fork City, 51 East Main Street, American Fork, Utah 84003, dated November 5, 2021.

guidelines and recommendations of the "American Fork Sensitive Lands Geologic Hazards Study," Chapter 5 titled "Conclusions and Recommendations" prepared by RB&G Engineering, Inc., dated December 2006.

Proposed construction for the approximately 1.01-acre site will consist of an 8,540 square feet slab-on-grade building with accompanying parking lot. Structural loads for the building are anticipated to consist of column loads up to 120 kips and wall loads up to 5 kips per lineal foot.

**TG Conclusion**

Based substantially in and on reliance of the technical documentation and assurances provided by G2, including their opinions and conclusions, it is TG's opinion that the G2 submittals have adequately addressed geotechnical engineering parameters at the site, consistent with concerns for public health, safety and welfare; and the American Fork City Sensitive Lands Ordinance 07-10-47.

**TG Recommendations**

*TG recommends American Fork City:*

1. *Consider the G2 submittals complete from a geotechnical engineering perspective.*

2. *Request certification letters from the geotechnical engineer prior to placement of concrete for footings.*

**Public Right-of-Way**

No public right-of-way improvements are planned for the subject site.

**Geotechnical Report Summary for Plan Review**

1. All organics, topsoil, existing fill and other deleterious material should be removed from below proposed building and pavement areas.

2. Footings may be supported on suitable undisturbed native soils or on compacted structural fill extending to suitable undisturbed native soils.

3. Footings for the structures may be designed using an allowable bearing capacity of 2,000 pounds per square foot

4. Footings should have a minimum width of 18 inches for strip footings and 24 inches for spot footings.

5. Footings susceptible to frost should be located a minimum depth of 30 inches. Footings not susceptible to frost should have a minimum embedment of 15 inches.

6. Groundwater was encountered at the site.

7. Basement and swimming pool walls should be designed using an at-rest equivalent fluid weight of 55 pounds per cubic feet.

8. Seismic analysis of proposed structures at the site should be based on a spectral response design acceleration of 0.2 sec (short period) $S_{DS}$ = 0.859g. The spectral response design acceleration value was based on factored spectral response accelerations using Site Class D.

9. Prior to the placement of concrete for footings, a letter from the geotechnical engineer should be obtained that indicates subgrade for footing and floor slab support was prepared in accordance with the geotechnical report and ready for the placement of concrete.

10. Floor slabs may be supported on suitable undisturbed native soils or on compacted structural fill extending to suitable undisturbed native soils.

11. Floor slabs should be underlain by at least 4-inches of free draining gravel.

12. Gutters should discharge beyond the limits of backfill or at least 10 feet from the buildings, whichever is greater.

13. Surface drainage should slope away from the structure in all directions with a 5 percent grade for the first 10 feet.

14. All import materials should be approved by Geotechnical Engineer.

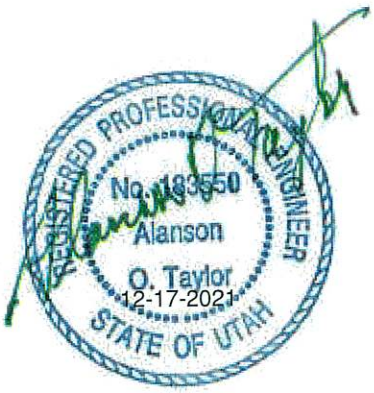
15. All compaction for interior and exterior backfill adjacent to the building should be verified by the geotechnical engineer.

**Closure**

This letter is issued solely in response to the Consultants' evaluation of the referenced site. Comments and recommendations in this review are based on data presented in the referenced reports. Taylor Geotechnical accordingly provides no warranty that the data in the referenced reports is correct or accurate, and has not performed an independent site evaluation. Comments and recommendations presented herein are provided to aid American Fork City in reducing risks from geotechnical hazards and to protect public health and safety.

All services performed by Taylor Geotechnical for this review were provided for the exclusive use and benefit of American Fork City. No other person or entity is entitled to use or rely upon any of the information or reports generated by Taylor Geotechnical as a result of this review. If you have any questions, please feel free to contact the undersigned. The opportunity to be of continued service to American Fork City is appreciated.

Respectfully submitted,
Taylor Geotechnical




Alanson O. Taylor, P.E.
Principal

# AMERICAN FORK CITY ENGINEERING DIVISION
# STAFF REPORT

Planning Commission Meeting Date: 1/5/2022

This report is a summary of the American Fork City Engineering Division plan review comments regarding the subject plan as submitted by the applicant for American Fork City Land Use Authority approval:

Project Name: Code Text Amendment creating Section 13.04.050 regarding Utility Services

Project Address: American Fork City

Developer / Applicant's Name: Public Works Department – Engineering Division

Type of Application:

| | | |
|---|---|---|
| ☐ Subdivision Final Plat | ☐ Subdivision Preliminary Plan | ☐ Annexation |
| ☒ Code Text Amendment | ☐ General Plan Amendment | ☐ Zone Change |
| ☐ Commercial Site Plan | ☐ Residential Accessory Structure Site Plan | |

**Engineering Division Recommendation:** Hearing, review and action on adding Section 13.04.050 to the American Fork City Municipal Code entitled "Utility Services" clarifying city services to parcels outside of city boundaries.

POTENTIAL MOTIONS:

APPROVAL

Mr. Chairman, I move that we recommend approval of the code text amendment.

DENIAL

Mr. Chairman, I move that we recommend denial of the code text amendment.

TABLE

Mr. Chairman, I move that we recommend table of the code text amendment.

**AN ORDINANCE CREATING SECTION 13.04.050 OF THE AMERICAN FORK MUNICIPAL CODE REGARDING UTILITY SERVICES TO PROPERTY OUTSIDE OF CITY BOUNDARIES.**

WHEREAS, municipalities are authorized to provide water, sewer, storm drain, and garbage (solid waste) collection services to its inhabitants and businesses, and to enact ordinances, resolutions, rules and regulations for the cost, control, maintenance, conduct, and operations of the systems providing such services and the enforcement of such ordinances, resolutions, rules and regulations; and

WHEREAS, the City council finds and determines that it is in the best interest of the city to limit new applications for city utility services to properties within the city's corporate boundaries.

NOW THEREFORE, IT IS ORDAINED BY THE CITY COUNCIL OF AMERICAN FORK, UTAH:

PART I

Text of Ordinance

**SECTION 1:** Section 13.04.050, Service Rendered Outside City Boundaries, shall read as follows:

**Sec 13.04.050 Service Rendered Outside City Boundaries.**

The City shall not approve or honor any new applications for city utility service, including culinary water, pressurized irrigation, sewer, storm drain collection, and/or garbage collection services from the city, outside of its corporate boundaries. Existing users outside of the corporate boundaries shall be subject to the laws and regulations of the city pertaining to utility service. Rates shall be as established by Resolution of City Council.

PART II

Severance and Effective Date

**SECTION 1: Conflicting Provisions.** Whenever the provisions of this Ordinance conflict with the provisions of any other ordinance, resolution or part thereof, the more stringent shall prevail.

**SECTION 2: Provisions Severable.** This Ordinance and the various sections, clauses and paragraphs are hereby declared to be severable. If any part, sentence, clause or phrase is adjudged to be unconstitutional or invalid it is hereby declared that the remainder of the ordinance shall not be affected thereby.

**SECTION 3: Effective Date.** This Ordinance shall take effect upon its passage and publication as required by law.

PASSED AND ADOPTED BY THE AMERICAN FORK CITY COUNCIL, STATE OF UTAH, ON THIS ____ DAY OF _____, 2022.

AMERICAN FORK CITY:

_____
MAYOR BRADLEY J. FROST

ATTEST:

_____
TERILYN LURKER, CITY RECORDER

AMERICAN FORK CITY
PLANNING COMMISSION MINUTES
DECEMBER 8, 2021

The American Fork City Planning Commission met in a regular session on December 8, 2021, at the American Fork City Hall, 31 North Church Street, commencing at 7:00 pm.

Present: Chairman Woffinden
Jenny Peay
Harold Dudley
Chris Christiansen
Christine Anderson
Bruce Frandsen

Absent: Rod Brocious

Staff Present: Ben Hunter, Engineer
Patrick O'Brien, Development Services Director
George Schade, Communications Director
Lisa Halversen, Administrative Assistant

Others Present: Ken Berg

Chairman Woffinden led the "Pledge of Allegiance." He invited Mr. Patrick O'Brien, the new Development Services Director, to introduce himself to the commissioners.

Mr. O'Brien gave a brief introduction. He is from Ireland, where he got his education. His background is in Urban Geography and he has a Master's degree in Planning and is currently working on a Master's in Public Administration from Southern Utah University. School, work, and his two children keep him busy. He previously worked at Midvale in the Affordable Housing and Development Office. He has also worked as a planner in Ireland, the UK, and Utah. His office door is always open and he looks forward to meeting with you all.

1. Hearing, review and action on adding Section 15.01.1526 to the American Fork City Municipal Code entitled "Minor Collector Cross-Section with Sidepath, Median and Bike Lanes"

Mr. Hunter said that there are a couple of roadways on the Transportation Master plan that are minor collectors. There are also bike lanes and sidepaths identified on the Pedestrian and Bicycle

Master Plan. The current cross-sections don't incorporate all of the different components into one cross-section. This proposed change would accommodate all the different users as shown, and it brings all the pieces together.

Ms. Peay expressed concern that the travel lanes are only 10 feet wide.

Mr. Hunter replied that these minor collector roads also include a median. 1100 South is a good example, it has a combination of residential and commercial uses. The width of the travel lanes has been reduced as a traffic calming mechanism, there is also a bike lane and median. Our hope is to prevent speeders, the speed limit will be 30 mph at most along this corridor.

Ms. Peay noticed that on the other minor collector roads the travel lane is 14 feet wide.

Mr. Hunter felt that the width should still be sufficient, on UDOT roads and freeways the lanes can be 12-14 wide, but we're comfortable with the widths as shown. This applies to the TOD area, where there are other 10 feet widths in the lanes of the other roads. This width is an industry standard, though obviously on the smaller side. We also have the median, the striped buffer, and the bike lane.

**Public Hearing Opened**

No comments received.

**Public Hearing Closed**

**Mr. Dudley moved to recommend approval of the code text amendment.**

**Mr. Christiansen seconded the motion. Voting was as follows:**

| | |
|---|---|
| **Chairman Woffinden** | **Aye** |
| **Jenny Peay** | **Aye** |
| **Harold Dudley** | **Aye** |
| **Christine Anderson** | **Aye** |
| **Chris Christiansen** | **Aye** |
| **Bruce Frandsen** | **Aye** |

**The motion passed.**

2. Hearing, review and action on the preliminary plan and final plat for CK Farms, Terracom Communities, Phase 1 1st Amendment Plat, located at approximately 360 South 600 East in the PC Planned Community zone

Mr. Hunter stated that CK Farms Phase 1 is an existing subdivision consisting of 184 lots. The proposed amendment adds 1 additional unit, bringing the total to 185 lots. This lot was originally removed for a detention area, but it was installed in a different underground location enabling them to add the lot back again. The subdivision units meet or exceed the area and dimensional requirements of the PC Planned Community zone.

**Public Hearing Opened**

No comments received.

**Public Hearing Closed**

**Ms. Peay moved to approve the preliminary plan for the CK Farms, Terracom Communities, Phase 1 1st Amendment plat, located at approximately 360 South 600 East subject to any findings, conditions and modifications found in the engineering report.**

**Mr. Christiansen seconded the motion. Voting was as follows:**

| | |
|---|---|
| **Chairman Woffinden** | **Aye** |
| **Jenny Peay** | **Aye** |
| **Harold Dudley** | **Aye** |
| **Christine Anderson** | **Aye** |
| **Chris Christiansen** | **Aye** |
| **Bruce Frandsen** | **Aye** |

**The motion passed.**

**Ms. Peay moved to recommend approval of the final plat for the CK Farms Terracom Communities, Phase 1 1st Amendment plat, located at approximately 360 South 600 East subject to any findings, conditions and modifications found in the engineering report.**

**Mr. Christiansen seconded the motion. Voting was as follows:**

| | |
|---|---|
| **Chairman Woffinden** | **Aye** |
| **Jenny Peay** | **Aye** |
| **Harold Dudley** | **Aye** |
| **Christine Anderson** | **Aye** |

| | |
|---|---|
| **Chris Christiansen** | **Aye** |
| **Bruce Frandsen** | **Aye** |

**The motion passed.**

3. Hearing, review and action on a District Framework Plan for Meadowbrook, located at approximately 560 South 800 West in the TOD Transit-Oriented Development zone

This item was pulled from the agenda at the request of the developer.

Chairman Woffinden indicated that items 4, 5, and 6 will be discussed together and voted on separately.

4. Review and action on the final plat for AF Crossing Plat E-1, located at approximately 950 South 900 West in the PR-3.0 Planned Residential zone

Mr. Hunter told commissioners that AF Crossing Plat E-1 is a subdivision of parcel 13:068:00028 and 13:068:0027 which was previously approved by City Council as Dixie Farms Plat E-1. This project proposes to construct 40 residential units and incorporates a slight boundary adjustment with the adjacent property to the west. Minor corrections are being made, so according to code there does not need to be a hearing on it. The subdivision units meet or exceed the area and dimensional requirements of the PR-3.0 Planned Residential Zone.

**Mr. Christiansen moved to recommend approval of the final plat for the AF Crossing Plat E-1, located at 950 South 900 West with the findings listed in the staff report, and subject to any findings, conditions and modifications found in the engineering report.**

**Mr. Dudley seconded the motion. Voting was as follows:**

| | |
|---|---|
| **Chairman Woffinden** | **Aye** |
| **Jenny Peay** | **Aye** |
| **Harold Dudley** | **Aye** |
| **Christine Anderson** | **Aye** |
| **Chris Christiansen** | **Aye** |
| **Bruce Frandsen** | **Aye** |

**The motion passed.**

5. Review and action on the final plat for AF Crossing Plat E-2, located at approximately 950 South 1000 West in the PR-3.0 Planned Residential zone

Mr. Hunter told commissioners that AF Crossing Plat E-2 is a subdivision of parcel 13:068:00028 and 13:068:0027 which was previously approved by City Council as Dixie Farms Plat E-2. This project proposes to construct 32 residential units and incorporates minor adjustments due to boundary line agreements with the adjacent property to the west. The subdivision units meet or exceed the area and dimensional requirements of the PR-3.0 Planned Residential Zone.

**Ms. Anderson recommends approval of the final plat for the AF Crossing Plat E-2, located at 950 South 1000 West with the findings listed in the staff report, and subject to any findings, conditions and modifications found in the engineering report.**

**Mr. Frandsen seconded the motion. Voting was as follows:**

| | |
|---|---|
| **Chairman Woffinden** | **Aye** |
| **Jenny Peay** | **Aye** |
| **Harold Dudley** | **Aye** |
| **Christine Anderson** | **Aye** |
| **Chris Christiansen** | **Aye** |
| **Bruce Frandsen** | **Aye** |

**The motion passed.**

6. Review and action on the final plat for AF PD South Plat A, located at approximately 650 South 900 West in the PR-3.0 Planned Residential zone

Mr. Hunter informed commissioners that AF PD South Plat A is a subdivision of parcels 35:280:0009, 35:280:0008, 35:280:0021, 35:280:0023, 13:069:0033, 35:280:0022, 13:068:0028, and 35:280:0500 and proposes to create 22 lots. The City Council previously approved this subdivision as Dixie Farms Plat E-2 and this updated plat incorporates adjustments due to boundary line agreements with the adjacent property owner to the west. The subdivision units meet or exceed the area and dimensional requirements of the PR-3 Planned Residential zone.

**Ms. Anderson moved to recommend approval of the final plat for the AF PD South Plat A, located at approximately 650 South 900 West with the findings listed in the staff report, and subject to any findings, conditions and modifications found in the engineering report.**

**Mr. Frandsen seconded the motion. Voting was as follows:**

| | |
|---|---|
| **Chairman Woffinden** | **Aye** |
| **Jenny Peay** | **Aye** |
| **Harold Dudley** | **Aye** |
| **Christine Anderson** | **Aye** |
| **Chris Christiansen** | **Aye** |
| **Bruce Frandsen** | **Aye** |

**The motion passed.**

7. Other Business

Chairman Woffinden indicated that there will be no meeting held on December 22, this is too close to Christmas. The next planning commission meeting will be held on January 5, 2022.

Mr. Dudley thanked Mr. Schade and city staff for helping during this time of transition.

8. Site Plan Committee Report

Mr. Hunter expressed gratitude that Mr. O'Brien is here to help with the backlog of work. The agenda for the next meeting hasn't been prepared yet, there are likely to be some site plan approvals and possibly the item that was removed from tonight's agenda.

9. Review and action on the minutes of the November 17, 2021 Planning Commission Regular Session

**Mr. Dudley moved to recommend approval of the minutes of the November 17, 2021 Planning Commission Regular Session.**

**Ms. Anderson seconded the motion. Voting was as follows:**

| | |
|---|---|
| **Chairman Woffinden** | **Aye** |
| **Jenny Peay** | **Aye** |
| **Harold Dudley** | **Aye** |
| **Christine Anderson** | **Aye** |
| **Chris Christiansen** | **Aye** |
| **Bruce Frandsen** | **Aye** |

**The motion passed.**

10. Adjournment

**Mr. Christiansen motioned to adjourn.**

**Ms. Peay seconded the motion. All voted in favor.**

Meeting adjourned at 7:45 pm.

Lisa Halversen
Administrative Assistant