May 5, 2023

Evaluation and Improvements Design of the Cloud Cap Inn Water System Mt Hood, Oregon

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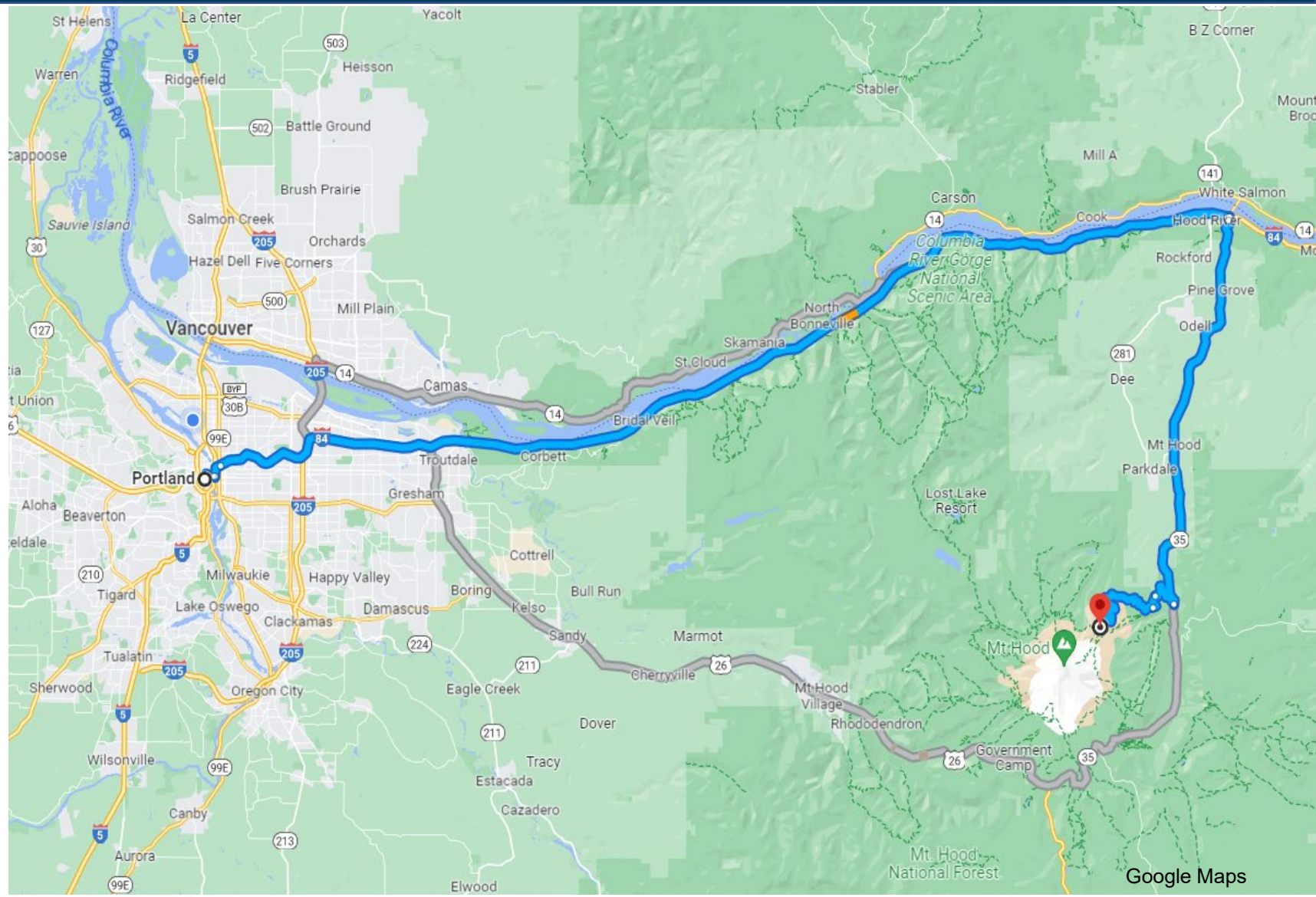
Agenda/Outline

- History – Mt Hood Area
- History – Water System
- Project Purpose
- Project Timeline
- Evaluation and Design



History – Water Service Customers

- Cloud Cap Inn
  - 1889 – Established
  - 1940 – Forest Service
- Crag Rats 1954 – Present
  - Oldest Search and Rescue organization in America
- Snowshoe Club Cabin
  - 1910 – Privately owned and operated
- Cloud Cap Saddle Campground
  - 3 single sites
  - Access to Tilly Jane North and Trail #600

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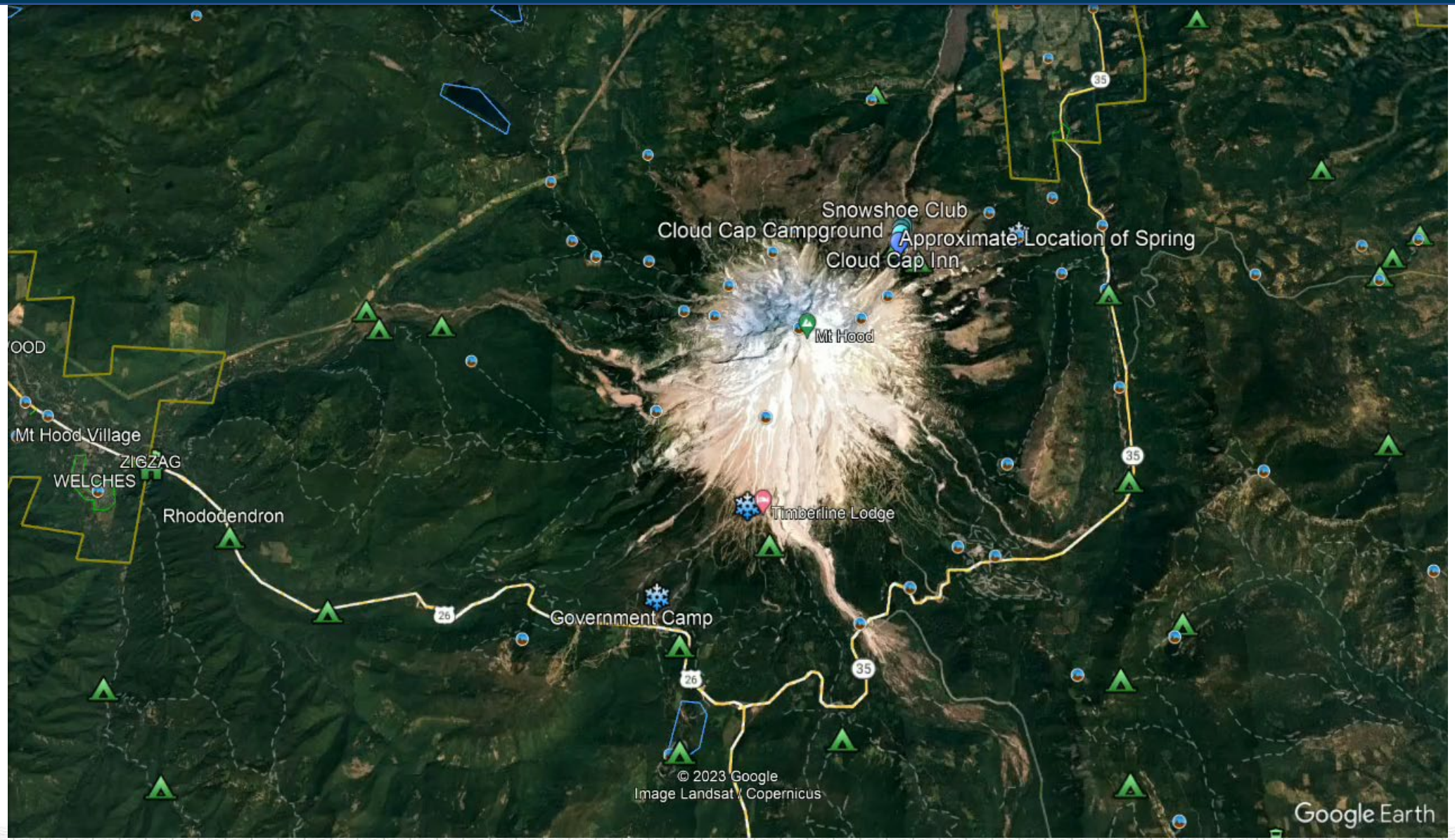
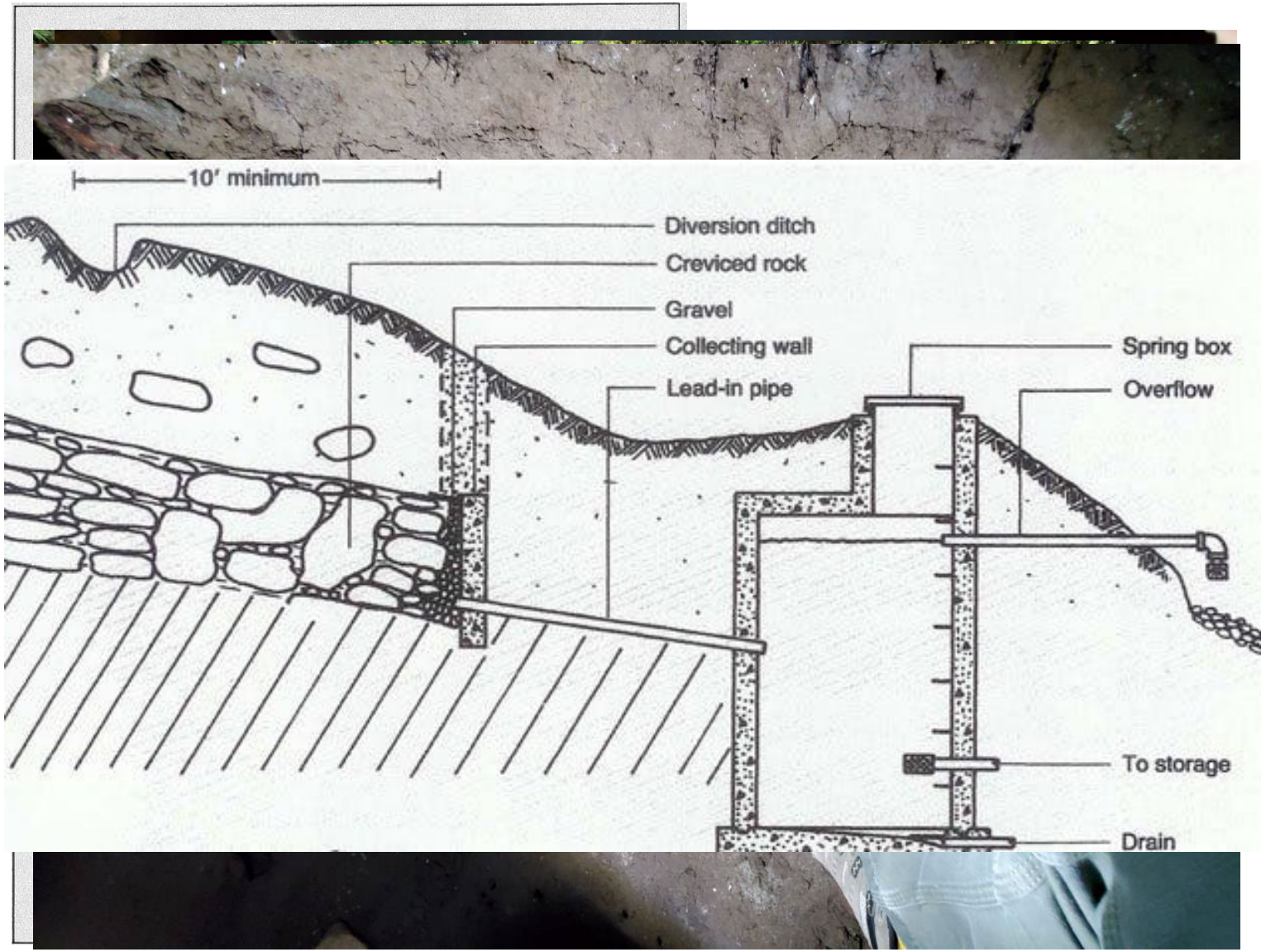
History – Water System



History – Water System

- Water right filed and developed in 1926
- Spring – Water emerges naturally
- Location, design and protection
- Transmission main

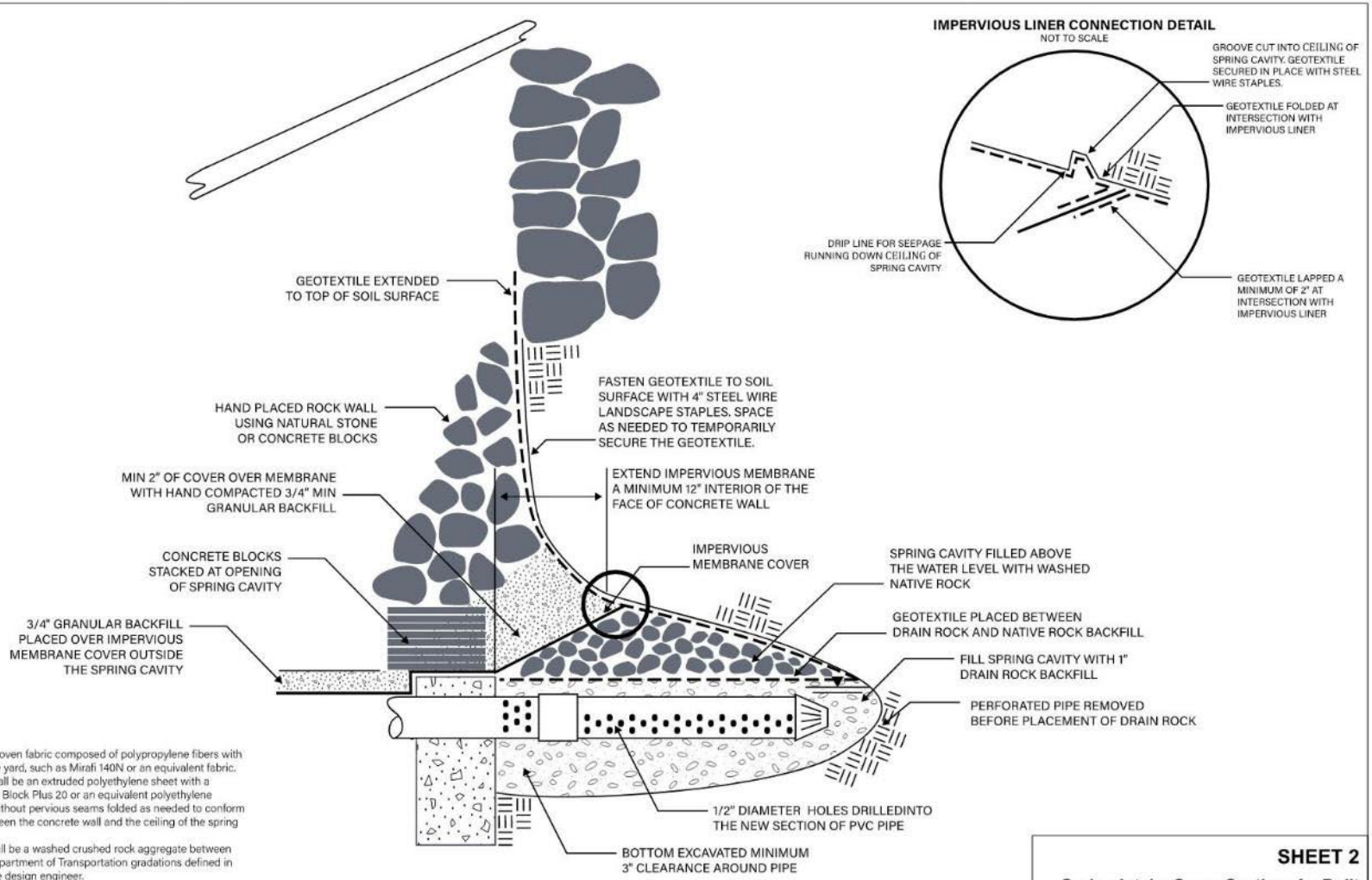


Project Purpose and Timeline

- Aging infrastructure
- Positive coliform sample in 2017
- Loss of water 2017 – Dry Summer
- Low water pressure at Cloud Cap Inn
- Bratslavsky Consulting Engineers, BCE - Consor (Murraysmith) 2019

- Groundwater Solutions Inc., GSI - Repairs to Spring October 2019
- Engineering Report – January 2020
- Conceptual Design – December 2020
- Final Design – March 2022

Evaluation and Design



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Evaluation and Design

Alternatives Analysis - **Source**

1. Rebuild spring source (do nothing)
    - Repairs by Crag Rats and Snow Shoe Club in October 2019
2. Redevelop spring source
3. Construct a new well

Alternatives Analysis - **Distribution**

1. Apply for OHA pressure variance at Cloud Cap Inn
2. Construct pump house to boost pressure
3. Reconstruct distribution system

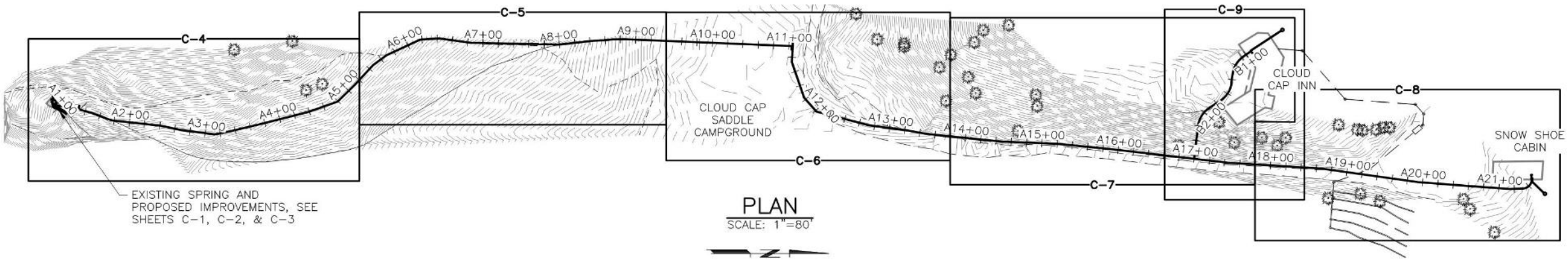
Evaluation and Design

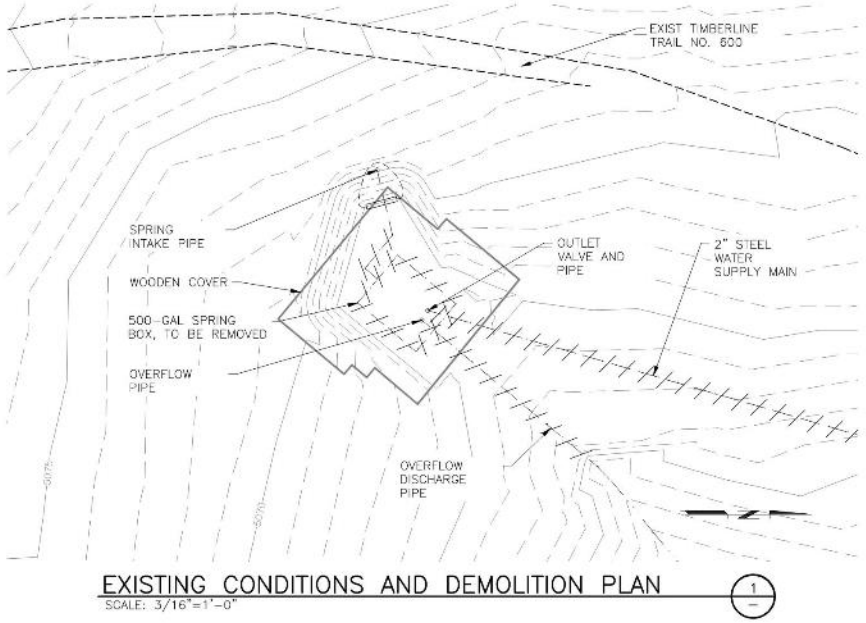
Comparative Cost Analysis*

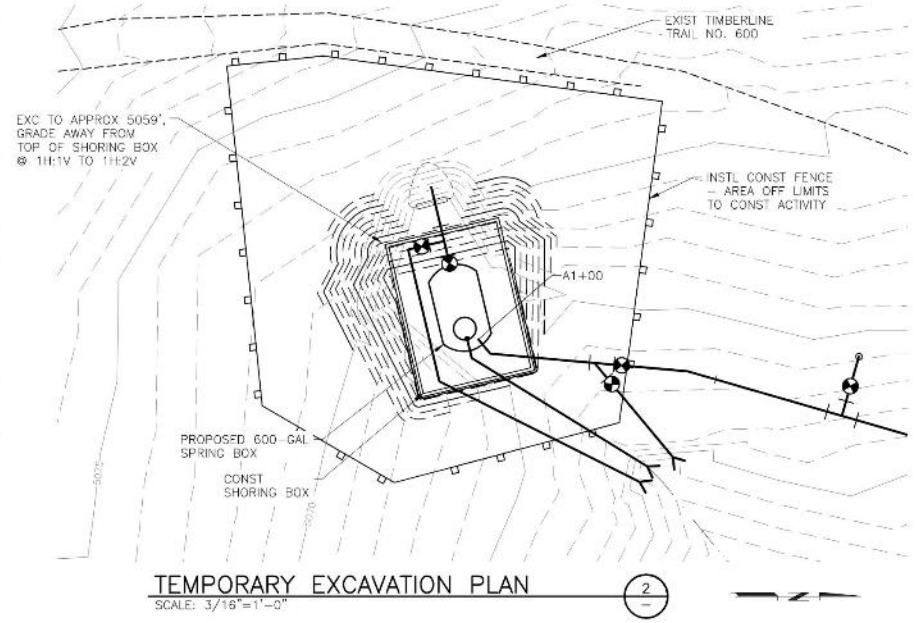
Alternative	Initial Capital Cost	30-Year Life Cycle Cost	Present Worth Cost
Alternative 1 – Rebuild Spring Source	$0.00	$101,958.66	$27,222.96
Alternative 2 – Redevelop Spring System	$75,000.00	$176,958.66	$47,247.96
Alternative 3 – Construct a Well	$422,000.00	$599,147.30	$159,972.34
Alternative D1 – Apply for Variance**	$1,500.00	$103,458.66	$27,623.46
Alternative D2 – Construct a Pumphouse	$60,000.00	$236,063.18	$63,028.87
Alternative D3 – Reconstruct Distribution	$110,000.00	$198,061.76	$52,882.49

* 30-year life cycle cost and present worth analysis calculation based upon an average construction cost index of 4.5%
** Design variance requires annual updates and reporting

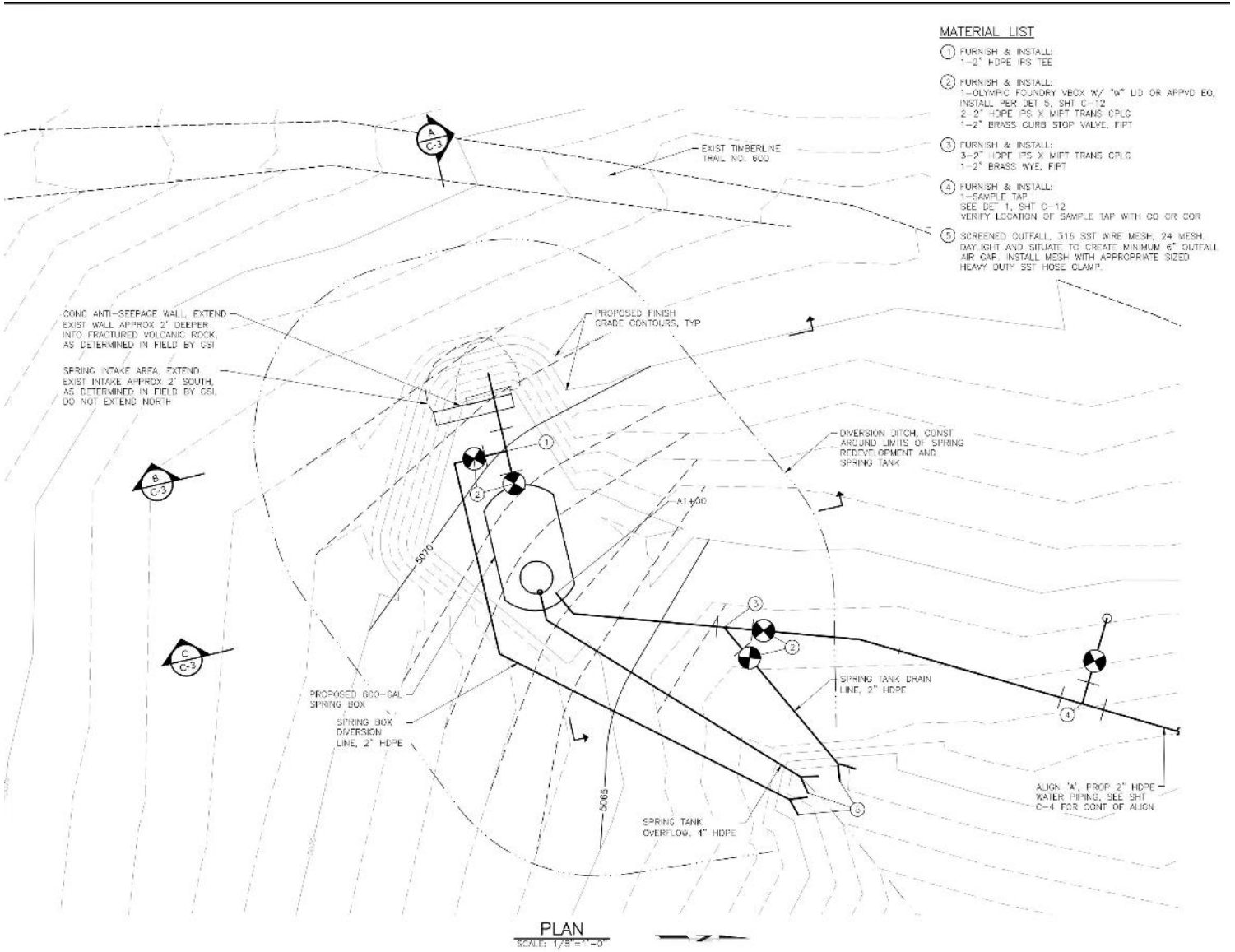
Final Design



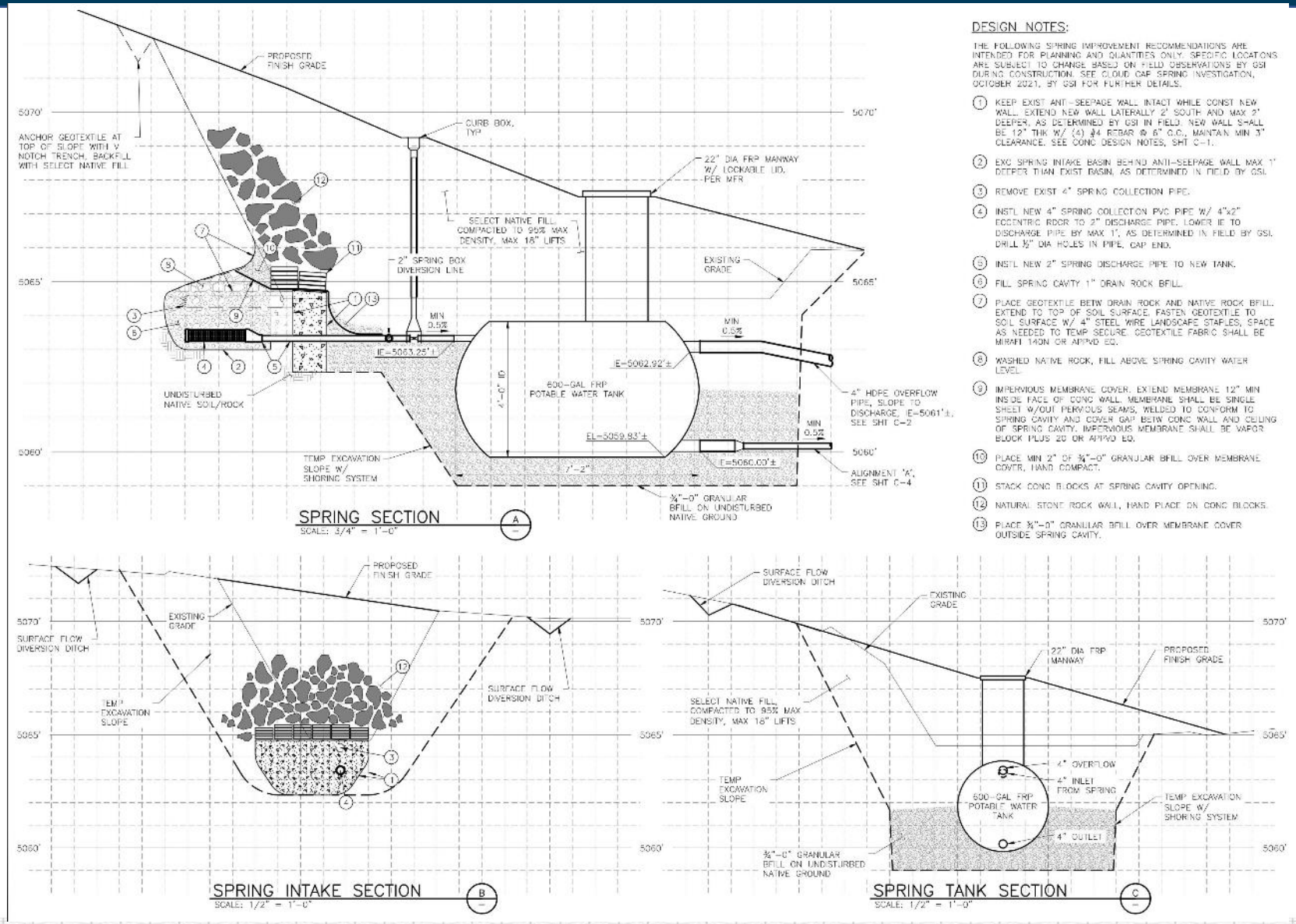




Final Design



Final Design



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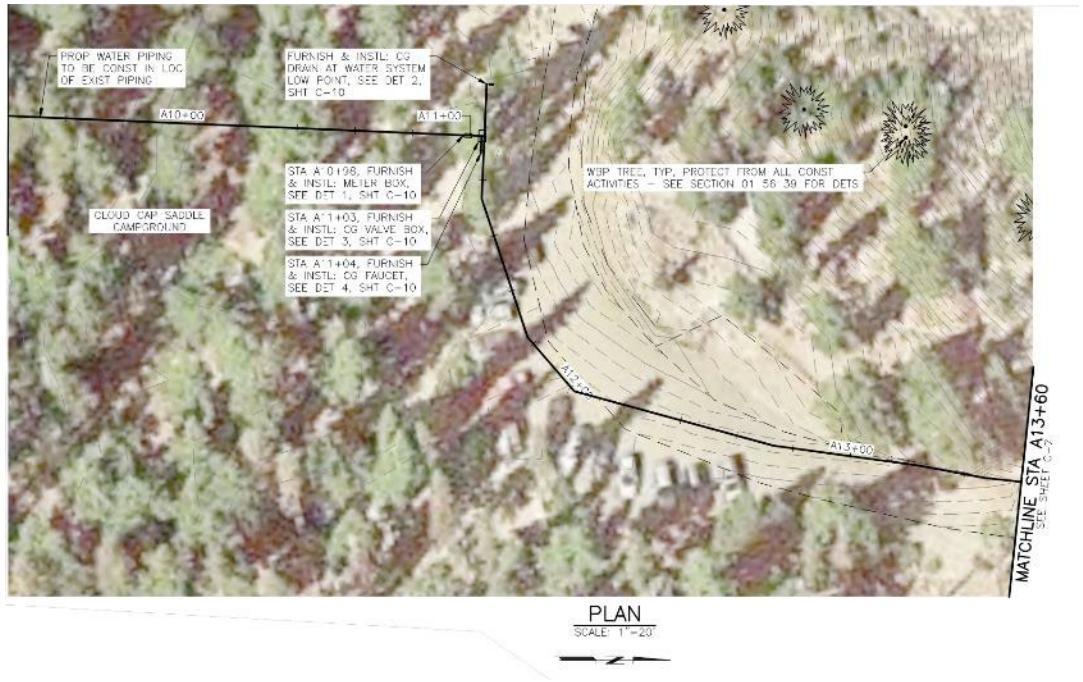
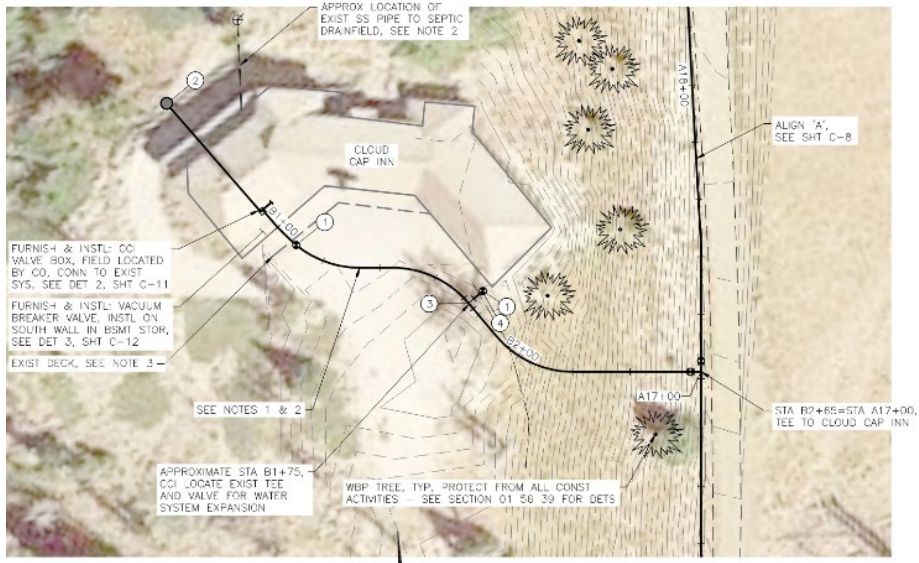


PLAN
SCALE: 1"=20'



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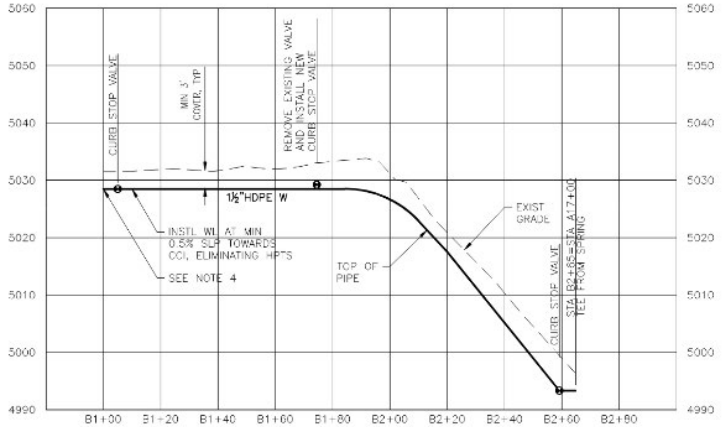

PROFILE
SCALE: 1"=20' HORIZ, 1"=10' VERT

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Final Design

NOTES:

1. PROPOSED WATER PIPING SHALL BE INSTALLED WITH A MINIMUM COVER OF 3'. THE ACTUAL DEPTH SHOULD BE ADJUSTED IN THE FIELD AND APPROVED BY THE CO TO PROVIDE FOR SMOOTH GRADIENTS THROUGHOUT THE PIPELINE AND SUCH THAT NO LOCALIZED LOW POINTS OR HIGH POINTS ARE CREATED.

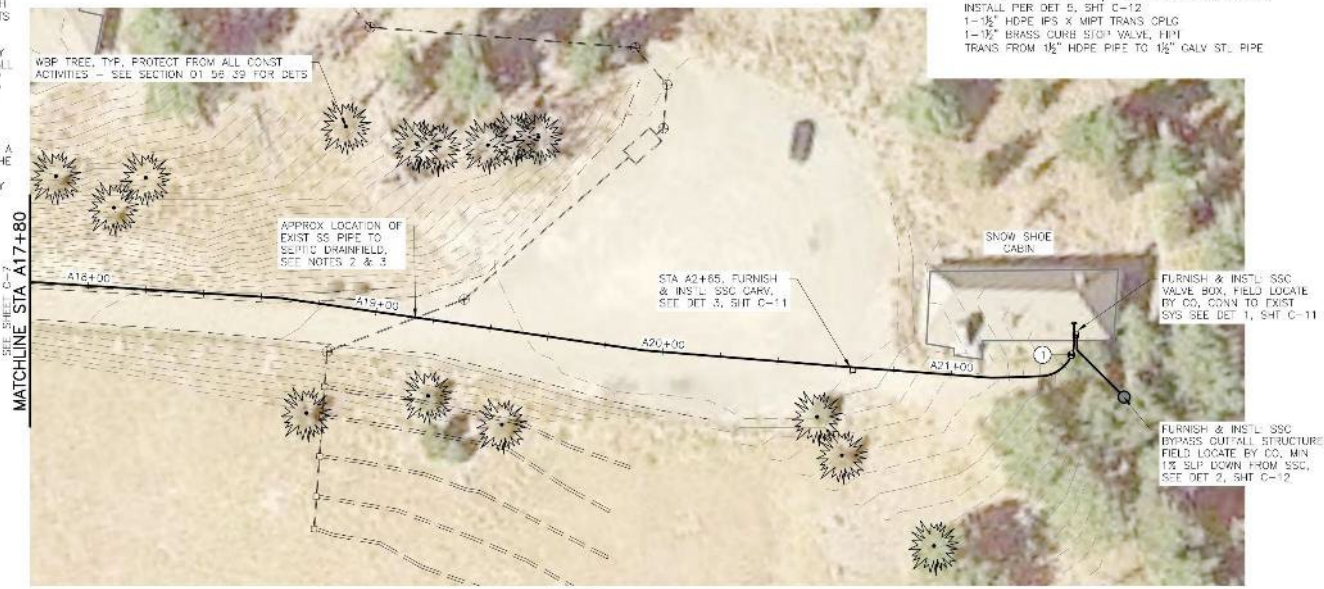
2. THE CONTRACTOR SHALL POTHOLE AND VERIFY LOCATIONS, ELEVATIONS, TYPES, AND SIZES OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTING NEW WATER LINE FAR ENOUGH IN ADVANCE TO ALLOW NECESSARY ADJUSTMENTS IN GRADE AND SHALL NOTIFY CO OF NEED TO ADJUST PIPING INSTALLATION ACCORDINGLY.

3. WHERE THE PROPOSED WATER LINE CROSSES A SEWER LINE, THE CONTRACTOR SHALL INSTALL THE WATER LINE IN ACCORDANCE WITH OAR 333-061-0050(9)(c)(C), CROSSINGS – SANITARY SEWERS AND WATER LINES.

MATERIAL LIST

(1) FURNISH & INSTALL:

1-CURB BOX INSIDE ANSI TIER 22 LOAD RATED OLDCASTLE 910 V30X W/ "WATER" LID OR APPVD EQ, INSTALL PER DET 5, SHT C-12
1-1½" HDPE IPS x MIPT TRANS CPLG
1-1½" BRASS CURB STOP VALVE, FIPT TRANS FROM 1½" HDPE PIPE TO 1½" GALV STL PIPE



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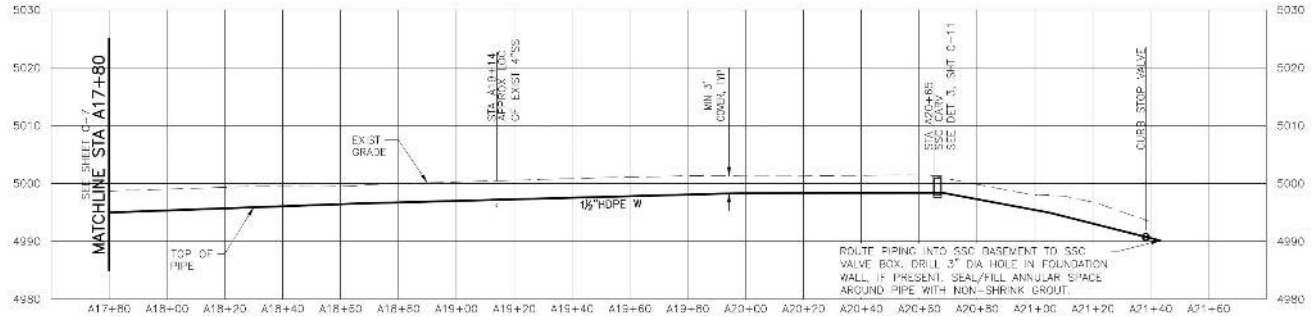

PROFILE
SCALE: 1"=20' HORIZ, 1"=10' VERT

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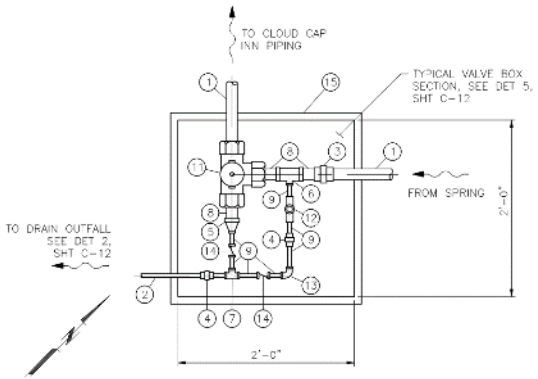
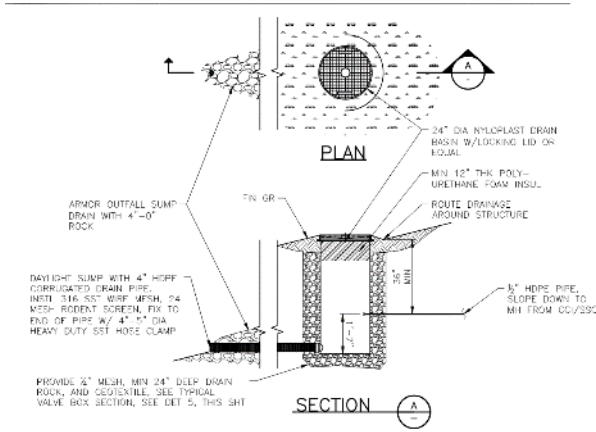
MATERIAL LIST

1. 1½" GALV STL PIPE
2. ¾" GALV STL PIPE
3. 1½" BRASS UNION, FIPT
4. ¾" BRASS UNION, FIPT
5. 1½" x ¾" BRASS RDCR, FIPT
6. 1½" x ¾" BRASS TEE, FIPT
7. ¾" BRASS TEE, FIPT
8. 1½" BRASS NIPPLE
9. ¾" BRASS NIPPLE
10. 1½" BRASS 3-WAY BALL VALVE W/ MANUAL HANDLE LEVER, FIPT, SEE NOTE 1, ASSURED AUTOMATION 31D SERIES (FLOW PLAN "F") OR APPVD EQ
11. 1½" BRASS 3-WAY BALL VALVE W/ MANUAL HANDLE LEVER, FIPT, SEE NOTE 2, ASSURED AUTOMATION 31D SERIES (FLOW PLAN "F") OR APPVD EQ
12. ¾" BRASS NEEDLE VALVE, FIPT
13. ¾" BRASS 90° ELBOW, FIPT
14. ¾" BRASS CHECK VALVE, FIPT
15. VALVE VAULT, OLDCASTLE POLYMER 2424, 48" HT, RECTANGULAR POLYMER ENCL

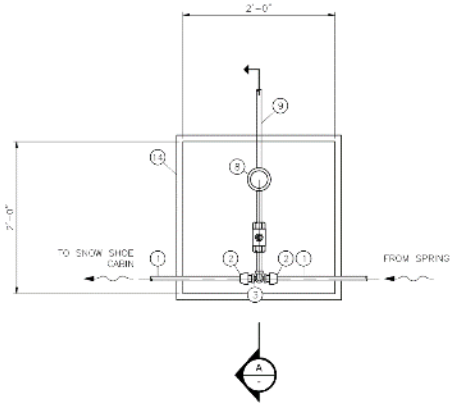


INSTALLATION NOTES:
1. SNOW SHOE CABIN 3-WAY BALL VALVE:
   1.1. POSITION 1 – BLDG PLUMBING DRAIN
   1.2. POSITION 2 – SYSTEM OPERATION
2. CLOUD CAP INN 3-WAY BALL VALVE:
   2.1. POSITION 1 – SYSTEM OPERATION
   2.2. POSITION 2 – BLDG PLUMBING DRAIN

CLOUD CAP INN VALVE BOX DETAIL (2 / C-9)
SCALE: 1/8" = 1'-0"



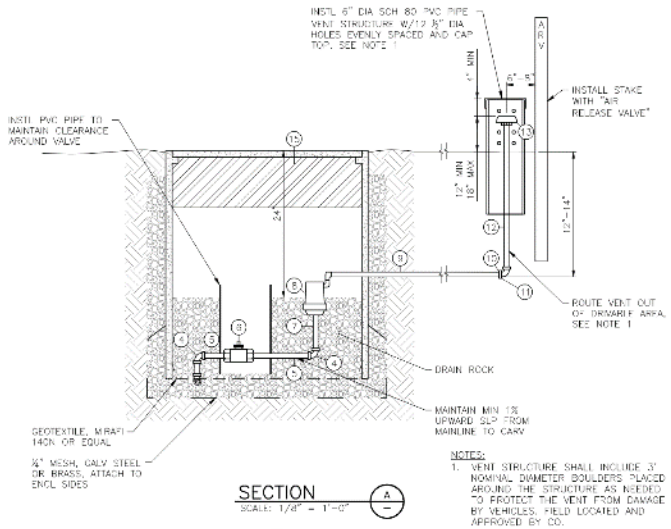
TYPICAL DRAIN/BYPASS OUTFALL STRUCTURE DETAIL (2 / –)
SCALE: NTS



MATERIAL LIST

1. 1½" HDPE PIPE
2. 1½" HDPE IPS X MIPT TRANS CPLG
3. 1½" BRASS TEE, FIPT, ROTATE UP
4. 1½" BRASS 90° ELBOW, FIPT
5. 1½" BRASS NIPPLE
6. 1½" BRASS CURB STOP VALVE, FIPT
7. 1½" BRASS NIPPLE W/ BRASS COUPLER
8. ½" COMB AIR/VACUUM RELEASE VALVE
9. ½" HDPE PIPE
10. ¾" HDPE X MIPT ADAPTOR
11. ¾" GALV 90° ELBOW, FIPT
12. ¾" GALV PIPE
13. ¾" SCREENED TANK VENT
14. FOR SSC CABV – VALVE VAULT, OLDCASTLE POLYMER 2424, 36" HT, TRAFFIC-RATED, RECTANGULAR POLYMER ENCL
15. MIN 12" THK POLYURETHANE FOAM INSUL

TYPICAL COMBINATION AIR RELEASE VALVE DETAIL (3 / C-8)
SCALE: 1/8" = 1'-0"



SECTION (A / –)
SCALE: 1/4" = 1'-0"

NOTES:
1. VENT STRUCTURE SHALL INCLUDE 3' NOMINAL DIAMETER BOULDERS PLACED AROUND THE STRUCTURE AS NEEDED TO PROTECT THE VENT FROM DAMAGE BY VEHICLES. FIELD LOCATED AND APPROVED BY CO.

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Takeaways

- Location – Design and construction challenges
- Collaboration – USFS, Consultants, Tenants and Hood River County
- Cost – Limited funding for construction to effect repairs
- Risks – Possible loss of water from spring

Thank you!

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