

# MONUMENT GLAMPING OWTS

18045 HWY 83, COLORADO SPRINGS, CO 80908

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MONUMENT RIDGE LTD, LLC  
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PROJECT ENGINEER: ALEX EWERS, P.E. 53341  
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## 100% CONSTRUCTION DOCUMENTS May 20, 2025

### NOTES

- GENERAL NOTES
  - DESIGN IS BASED UPON IMPROVEMENT SURVEY PLAT BY APEX LAND SURVEYING AND MAPPING. TOPOGRAPHY BASED UPON CWCB LIDAR DATA. DO NOT USE TOPOGRAPHICAL DATA FOR VERTICAL CONSTRUCTION STAKING.
  - JURISDICTIONAL AUTHORITY IS EL PASO COUNTY. PERMIT MUST BE OBTAINED BEFORE BEGINNING CONSTRUCTION.
  - THESE PLANS ARE THE RESULT OF INTERPRETATION OF THE ENGINEER'S ANALYSIS OF THE EXISTING SOIL CONDITIONS AS FOUND ON SITE FROM THE OPEN HOLE INSPECTION AND SUBSEQUENT ANALYSIS OF THE SOIL SAMPLES. FAILURE TO THOROUGHLY FOLLOW PLANS, ENGINEER'S RECOMMENDATIONS, MANUFACTURER'S GUIDELINES FOR TANK INSTALLATION, AND THE EL PASO COUNTY OWTS REGULATIONS CAN RESULT IN PREMATURE SOIL TREATMENT AREA FAILURE. POOR CONTRACTOR PRACTICES, ABUSE OF SYSTEM, OR FAILURE TO PERFORM SCHEDULED MAINTENANCE CAN CAUSE PREMATURE FAILURE OF SOIL TREATMENT AREA. THESE PLANS ARE NOT A CONSTRUCTION MANUAL. FOR SUCCESSFUL SEPTIC SYSTEM INSTALLATION CONTRACTOR MUST REVIEW THE EL PASO COUNTY OWTS REGULATIONS, BE CERTIFIED FOR INSTALLATION, AND FOLLOW GENERAL CONTRACTOR BEST PRACTICES.
  - CONTACT ENGINEER IN CASE OF ANY UNCLEAR INFORMATION IN THESE PLANS.
  - CONTRACTOR IS RESPONSIBLE FOR READING THE ENTIRETY OF THE PLANS. FAILURE TO UNDERSTAND THE SCOPE OF THE PROJECT WILL NOT RESULT IN SUFFICIENT GROUNDS FOR CUTTING CORNERS AND POOR INSTALLATION PRACTICES. CONSTRUCTION THAT DOES NOT MATCH THE DESIGN SHALL BE CORRECTED BY THE INSTALLER AT THE INSTALLER'S EXPENSE.
- CONSTRUCTION AND CONTRACTOR
  - FOLLOW INFILTRATOR WATER TECHNOLOGIES DOCUMENTS ON INSTALLATION OF QUICK 4 STANDARD CHAMBERS
  - CONTRACTOR REQUIRED TO LOCATE ALL UTILITIES PRIOR TO EXCAVATION.
  - COMPACTION OF SOIL INFILTRATIVE AREA TO BE AVOIDED DURING CONSTRUCTION (AVOID TRAFFIC AND STORAGE OF MATERIALS). IT IS RECOMMENDED TO STAKE OFF SOIL TREATMENT AREA (STA) FOOTPRINT DURING CONSTRUCTION AND PLACE PERMANENT SIGNS AFTER CONSTRUCTION. CONTRACTOR SHALL NOT DRIVE WHEELED MACHINERY OVER BOTTOM OF THE INFILTRATIVE SURFACE. IT IS RECOMMENDED TO PLACE CHAMBERS AND THEN BACKFILL WITH TRACKED MACHINERY. CONSTRUCTION SHOULD PROCEED ONLY WHEN THE SOIL IS SUFFICIENTLY DRY TO RESIST COMPACTION AND SMEARING DURING EXCAVATION. (TAKE A SAMPLE OF SOIL FROM THE BOTTOM OF INFILTRATIVE SURFACE AND IF WHEN ROLLED BETWEEN THE FINGERS FORMS A WIRE INSTEAD OF CRUMBING, THE SOIL IS TOO WET). TRAFFIC OVER THE STA WILL CAUSE AND SUBSEQUENT FAILURE. TOP SOIL TO BE EXCAVATED AND STOCKPILED FOR LATER USE. RESEED SOIL TREATMENT AREA WITH NATIVE VEGETATION (SHALLOW ROOT).
  - SLOPE FINISHED GRADE ABOVE LEACH FIELD 3-4% TO MAXIMIZE RUNOFF FROM PRECIPITATION. AVOID IRRIGATION ON STA.
  - QUICK 4 PLUS CHAMBERS PROPOSED FOR EFFLUENT DISTRIBUTION. PLACE CHAMBERS ACCORDING TO THE SECTION VIEW.
- SANITARY LINES
  - GRAVITY SEWER LINES (4" PVC SCH 40 ASTM F891 DWV PIPE) SHALL BE INSTALLED WITH SLOPE NO LESS THAN  $\frac{1}{8}$ " PER FOOT (~1%) AND NO GREATER THAN 1.8" PER FOOT (~15%). THERE SHALL BE A MINIMUM 36" OF COVER ON SEWER LINES. INSTALL CLEANOUTS AT ANY CHANGE OF DIRECTION OF 45° OR GREATER OR IF NO OTHER CLEANOUT EXISTS WITHIN 40' OF THE BEND. SWEEPING 90'S MUST BE USED OR BENDS LIMITED TO 45° MUST BE PROVIDED. CLEANOUTS MUST BE PROVIDED AT INTERVALS OF NO MORE THAN 100'. 10' LATERAL SEPARATION IS REQUIRED FROM POTABLE WATER LINES AND 2' VERTICAL SEPARATION WITH SANITARY CROSSING UNDER.
  - IF ANY TWO SEWER LINES CONNECT, THEY SHALL CONNECT THROUGH 45° Y FITTINGS AND A 2-WAY CLEANOUT MUST BE PROVIDED BEFORE THE CONNECTION
  - CONTACT ENGINEER IMMEDIATELY IF ANY VARIANCE IS SOUGHT FROM THIS PLAN.
- OFFSET REQUIREMENTS
  - HORIZONTAL INFLUENCE AREA (ACCORDING TO CDPHE WOSA POLICY 6)
  - 1.1. THERE ARE NO OTHER EXISTING SYSTEMS KNOWN ON SITE THAT WILL INFLUENCE THE PROPOSED SYSTEM.
  2. OFFSET REQUIREMENTS ACCORDING TO EL PASO COUNTY OWTS REGULATIONS ARE GIVEN IN THE TABLE (SHEET C1).
  3. CONTRACTOR TO VERIFY ALL SETBACKS ARE MET BEFORE CONSTRUCTION.
- SEPTIC TANKS AND PUMP TANK
  - THE TANKS ARE NOT TRAFFIC RATED UNLESS CLEARLY SPECIFIED. PLACE BOULDERS OR FENCE AROUND PERIMETER OF TANKS TO AVOID DAMAGE. INSTALL TANK ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
- PRESSURE DOSED SYSTEM
  - ELECTRICAL WIRING, SPLICE BOX SET UP, AND CONTROL PANEL SET UP ARE ALL OUTSIDE THE SCOPE OF THESE PLANS. ALL OF THESE SHALL BE DONE BY A CERTIFIED AND COMPETENT ELECTRICIAN.
- OPERATION AND MAINTENANCE (O&M)
  - OPERATION AND MAINTENANCE IS OUTSIDE OF THE SCOPE AND RESPONSIBILITY OF 3 ROCKS ENGINEERING. IT IS HIGHLY RECOMMENDED TO INSPECT SLUDGE AND SCUM LEVELS ONCE A YEAR IN BOTH COMPARTMENTS OF SEPTIC TANK. DUE TO MOSTLY ANAEROBIC CONDITIONS IN A SEPTIC TANK, NOT ALL SOLIDS WILL BE DIGESTED BY THE BACTERIA AND THEREFORE SOLIDS WILL HAVE TO BE PUMPED OUT AS DETERMINED BY INSPECTION. A GOOD INTERVAL FOR PUMPING SLUDGE FROM TANK IS WHENEVER SCUM AND SLUDGE LEVELS SURPASS 25% OF WORKING CAPACITY OF TANK.
  - PULL ORENCO BIOTUBE FT SERIES FILTER AT LEAST ONCE A YEAR AND RINSE SOLIDS INTO PRIMARY TREATMENT TANK. IT IS RECOMMENDED TO PLACE A SIGN AT EACH SERVICED LOCATION WITH INSTRUCTIONS FOR USERS TO PREVENT FLUSHING OF CHEMICALS, MEDICINES, AND ANY OTHER MATERIAL/SUBSTANCE THAT COULD CAUSE PREMATURE FAILURE OF STA
  - O&M PROVIDER SHOULD CHECK ACTUATION OF THE AUTOMATIC DISTRIBUTION VALVE (THE CLEAR TUBING SHOULD SHOW ACTUATION BETWEEN ZONES). VALVES WILL BUILD UP SLIME OVER TIME AND WILL HAVE TO BE CLEANED AT AN INTERVAL TO BE DETERMINED BY INSPECTION DURING THE FIRST YEAR OF OPERATION. FAILURE TO CLEAN THE VALVE WILL RESULT IN THE CAM LOCKING INTO ONE ZONE AND CAN CAUSE SYSTEM FAILURE.

### DESIGN CRITERIA

SERVICED LOCATIONS: 24 PROPOSED GLAMPING SITES AND EXISTING RESIDENCE  
TYPE: PRESSURIZED TRENCH SYSTEM

#### DESIGN FLOW AND TANKAGE:

SYSTEM = 1,650 GPD  
GLAMPING SITES ARE RATED AT 50 GPD PER GLAMPING TENT (50 GPD PER CAMPGROUND CAMPSITE) ACCORDING TO TABLE 6-2, AND A SINGLE FAMILY 3-BEDROOM RESIDENCE IS RATED AT 450 GPD.  
TANKAGE: (1) 2,000 GAL SEPTIC TANK, (1) 1,500 GAL SEPTIC TANK, AND (1) 1,000 GAL TANK AS A DISCHARGE TANK.

#### APPLIED LTAR:

0.5 GPD/SQ. FT. FOR TL1 WASTEWATER

#### SIZING ADJUSTMENTS:

0.7 FOR CHAMBERS  
0.8 FOR PRESSURIZED TRENCH SYSTEM

#### TOTAL REQUIRED INFILTRATIVE SURFACE:

1848 SQ. FT.  
160 QUICK 4 CHAMBERS

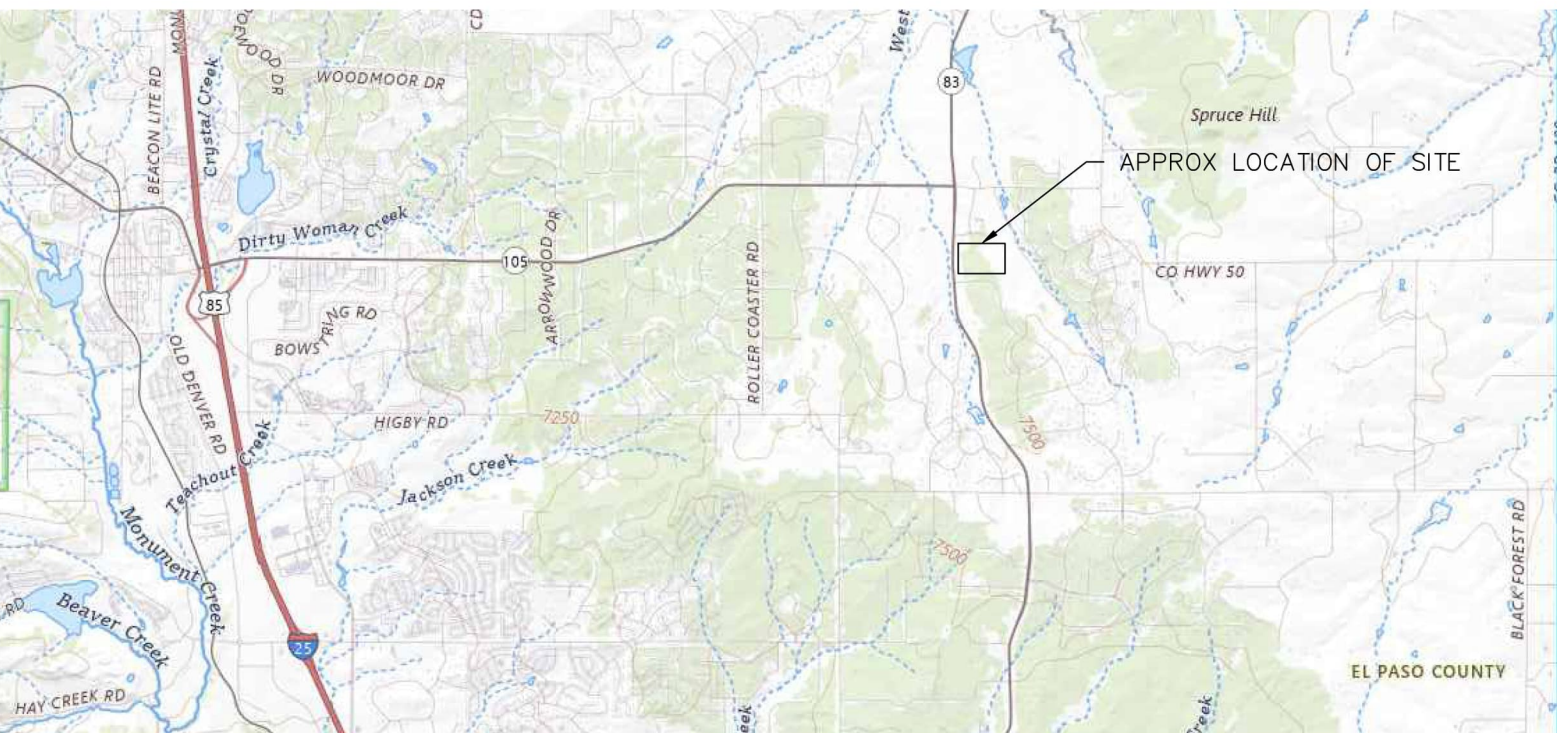
#### ADDITIONAL REMARKS:

AN OPERATIONS AND MAINTENANCE IS REQUIRED BY EL PASO COUNTY TO MONITOR THAT SEPTIC TANK EFFLUENT QUALITY MEETS THE REG 43 DEFINITION FOR TL1 WASTE WATER

SHEET INDEX	
NUMBER	TITLE
C1	COVER
C2	EX CONDITIONS & DEMO PLAN
C3	SITE PLAN
C4	OWTS DESIGN AND DETAILS
C5	TANK DETAILS

SOIL OBSERVATION PIT # 1								
DATE OF OBSERVATION	7/30/2024	SLOPE		LANDSCAPE POSITION		NOTES	NO ROCK CONTENT BY VISUAL OBSERVATION	
COORDINATES /LOCATION						SOILS EVALUATOR	MORGAN HEGGIE, SEPTEMBER 2022 CPOW CERTIFIED	
DEPTH (IN)	SOIL TYPE, TEXTURE & LTAR (GAL PER DAY PER SQ FT)	PRESENCE OF R TYPE SOILS (ROCKY SOILS)	MATRIX COLOR(S)	MOTTLE COLOR(S)	REDOX KIND(S)	STRUCTURE SHAPE	STRUCTURE GRADE	CONSISTENCE
0-6	TOPSOIL	NONE						
6-48	2A, SANDY LOAM, 0.5	NONE			NONE	MASSIVE		LOOSE
48-96	2A, SANDY LOAM, 0.5	NONE			NONE	MASSIVE		LOOSE

SOIL OBSERVATION PIT # 2								
DATE OF OBSERVATION	7/30/2024	SLOPE		LANDSCAPE POSITION		NOTES:	NO ROCK CONTENT BY VISUAL OBSERVATION	
COORDINATES /LOCATION						SOILS EVALUATOR	MORGAN HEGGIE, SEPTEMBER 2022 CPOW CERTIFIED	
DEPTH (IN)	SOIL TYPE, TEXTURE & LTAR (GAL PER DAY PER SQ FT)	PRESENCE OF R TYPE SOILS (ROCKY SOILS)	MATRIX COLOR(S)	MOTTLE COLOR(S)	REDOX KIND(S)	STRUCTURE SHAPE	STRUCTURE GRADE	CONSISTENCE
0-6	TOPSOIL	NONE						
6-48	2A, SANDY LOAM, 0.5	NONE			NONE	MASSIVE		LOOSE
48-96	2A, SANDY LOAM, 0.5	NONE			NONE	MASSIVE		LOOSE



VICINITY MAP  
(NOT TO SCALE)

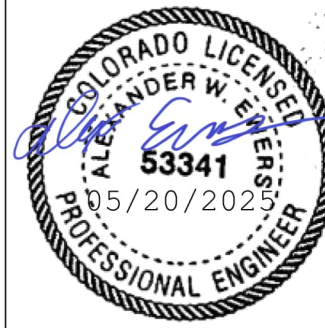
ABBREVIATIONS:  
APPROX = APPROXIMATE  
ASPH = ASPHALT  
BLDG = BUILDING  
CONC = CONCRETE  
C&G= CURB AND GUTTER  
Ø=DIAMETER  
E = EASTING  
EL = ELEVATION  
EX = EXISTING  
GPD= GALLONS PER DAY  
GPH= GALLONS PER HOUR  
IRR = IRRIGATION  
N = NORTHING  
NDDSE= NON-PRESSURIZED DRIP DISPERSAL SYSTEM  
O.C.=ON CENTER SPACING  
OWTS= ON-SITE WASTEWATER TREATMENT SYSTEM  
PL = PROPERTY LINE  
PROP = PROPOSED  
PVC = POLYVINYL CHLORIDE PIPE  
ROW = RIGHT OF WAY  
SCH= SCHEDULE  
SDR= STANDARD DIMENSIONAL RATIO  
SQ.FT= SQUARE FEET  
TP=SOIL OBSERVATION TEST PIT  
TYP = TYPICAL  
W/= WITH

\*NOT ALL ABBREVIATIONS  
MAY BE PRESENT IN THIS DRAWING

#### LINE TYPE KEY:

- 4" PVC SCH 40 (ASTM F891 DWV)
- 1.5" PVC SCH 40 (ASTM D1785)
- PROPERTY LINE
- PROPERTY BOUNDARY OFFSET
- WELL OFFSET
- EX MAJOR CONTOURS
- EX MINOR CONTOURS
- PROP MAJOR CONTOURS
- PROP MINOR CONTOURS
- EX EASEMENT
- EX WS LINE
- EX TELECOMM LINE
- EX FENCE
- EX. ELEC LINE

SEPARATION REQUIREMENTS ACCORDING TO TABLE 7-1 OF EL PASO COUNTY OWTS REGULATIONS					
	WELL, OR POTABLE WATER CISTERN	POTABLE WATER LINES	STRUCTURE WITH BASEMENT, CRAWL SPACE, OR FOOTING DRAINS	STRUCTURE W/OUT BASEMENT, CRAWL SPACE, OR FOOTING DRAINS	PROPERTY LINES
STA TRENCH	100	5	20	10	10
SEWER OR EFFLUENT LINES	50	5	0	0	10
SEPTIC TANK	50	10	5	5	10



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V1.0-30% SD-08/30/2024  
V2.0-100% CD-09/06/2024  
V2.1-100% CD-5/20/2025  
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PROJECT ENG: AWE  
QA/QC: PBG  
Drawn by: MPH  
Prj # 24.144  
Date: 07/26/2024

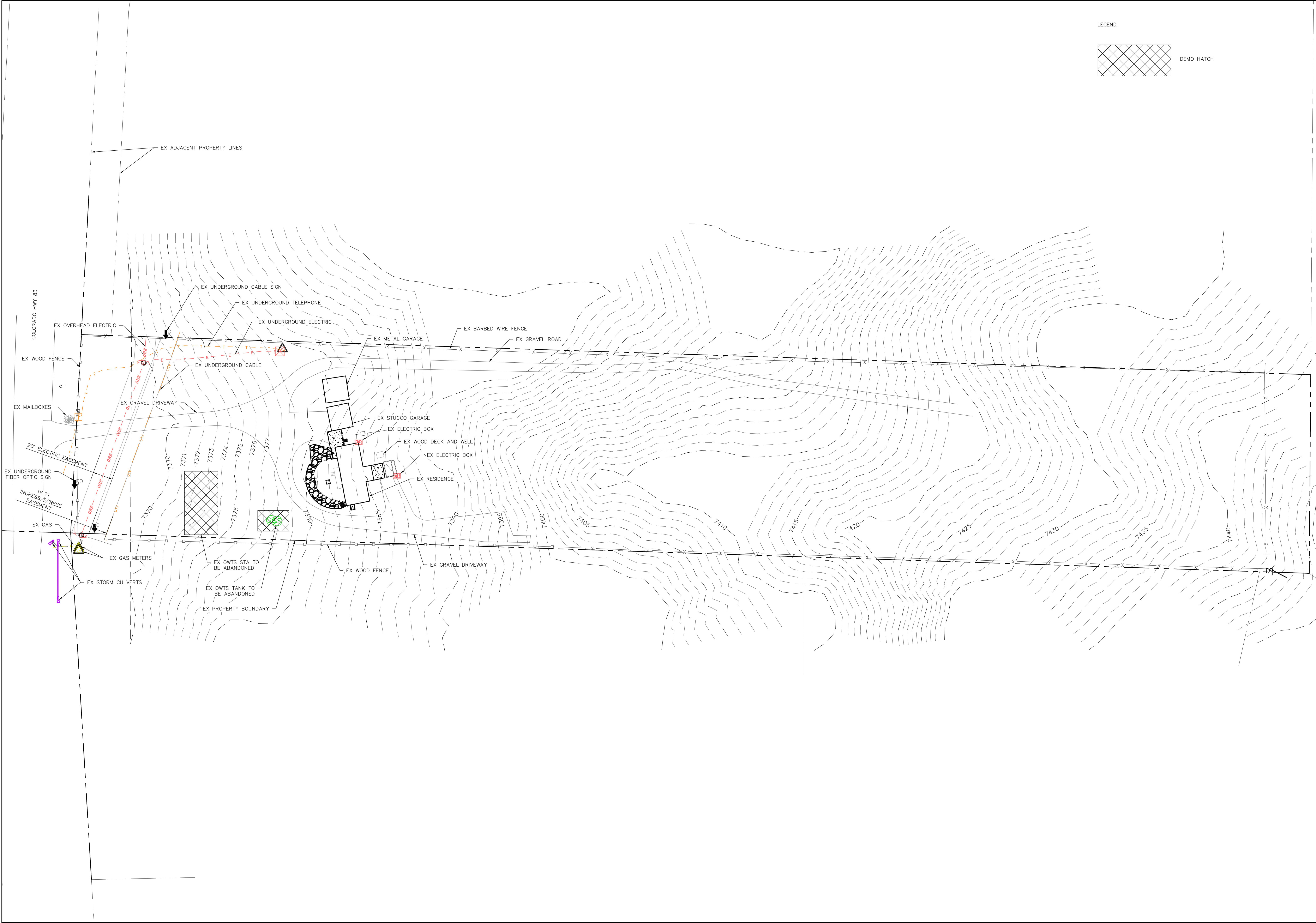
COVER

C1/5



Know what's below.  
Call before you dig.





LEGEND

DEMO HATCH

0 20' 40'

SCALE: 1" = 40'

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MONUMENT GLAMPING OWTS

1804.5 HWY 83,  
COLORADO  
SPRINGS, CO  
80908

ISSUED DATES

V1.0-30% SD-08/30/2024  
V2.0-100% CD-09/06/2024  
V2.1-100% CD-5/20/2025

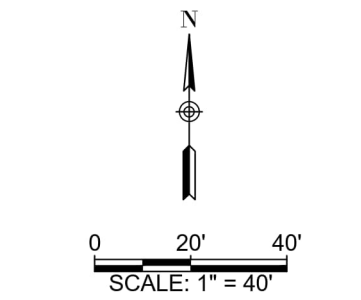
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C2/5

EX CONDITIONS &  
DEMO PLAN



NOTES:  
1. CIVIL SITE LAYOUT, DESIGN AND  
OTHER CIVIL INFRASTRUCTURE IS BY  
OTHERS. THIS INFORMATION IS  
SHOWN HERE FOR REFERENCE



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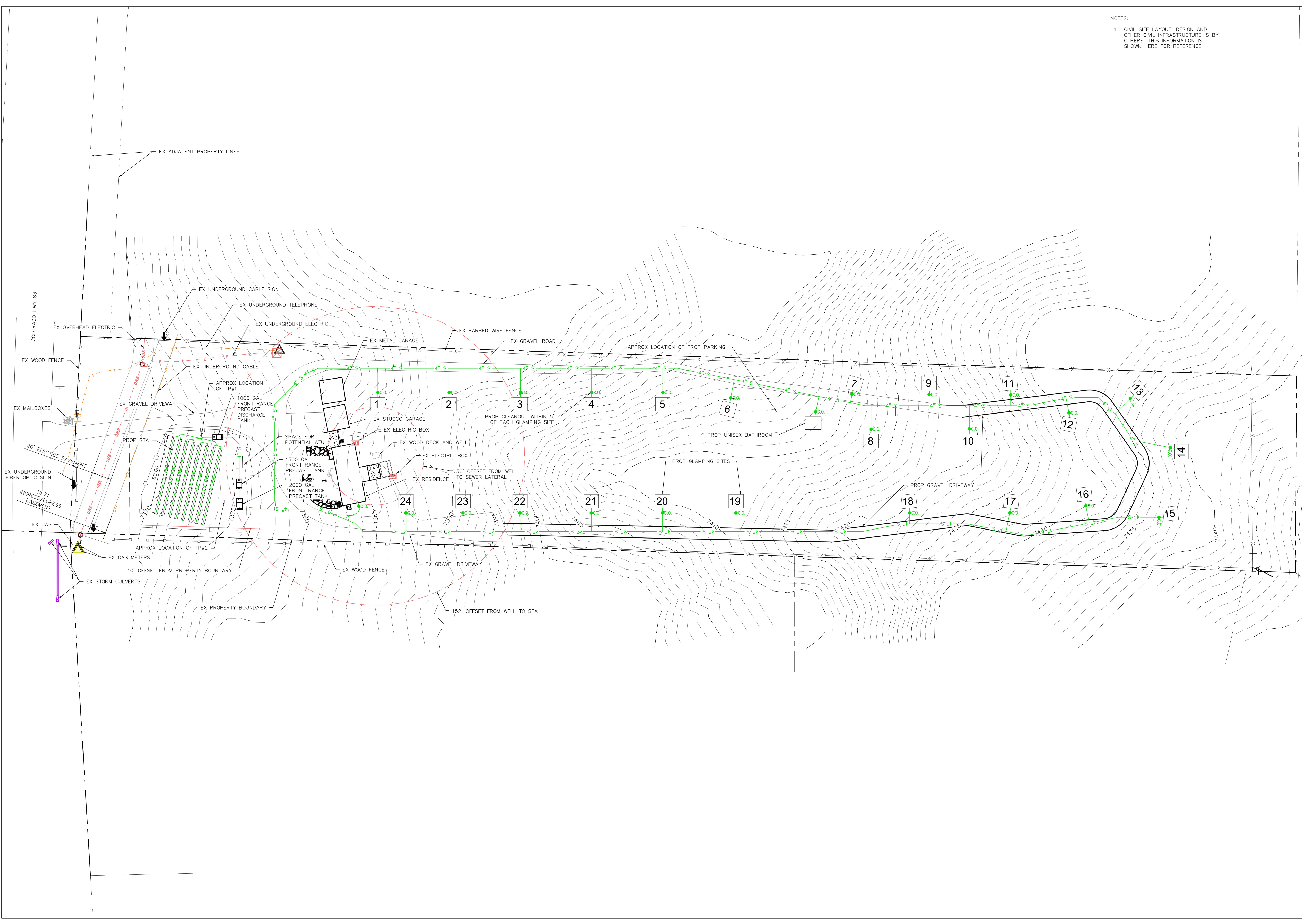
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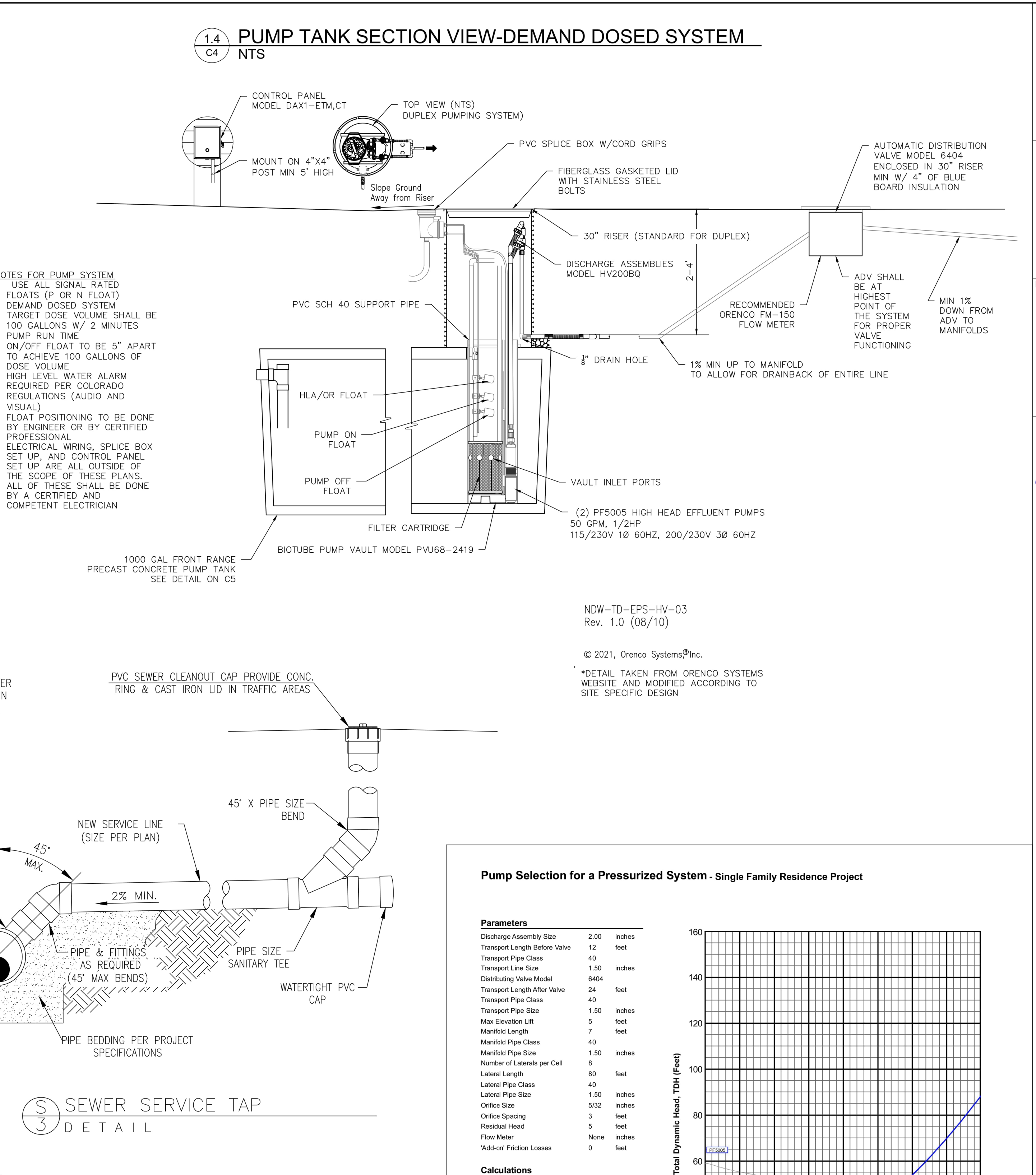
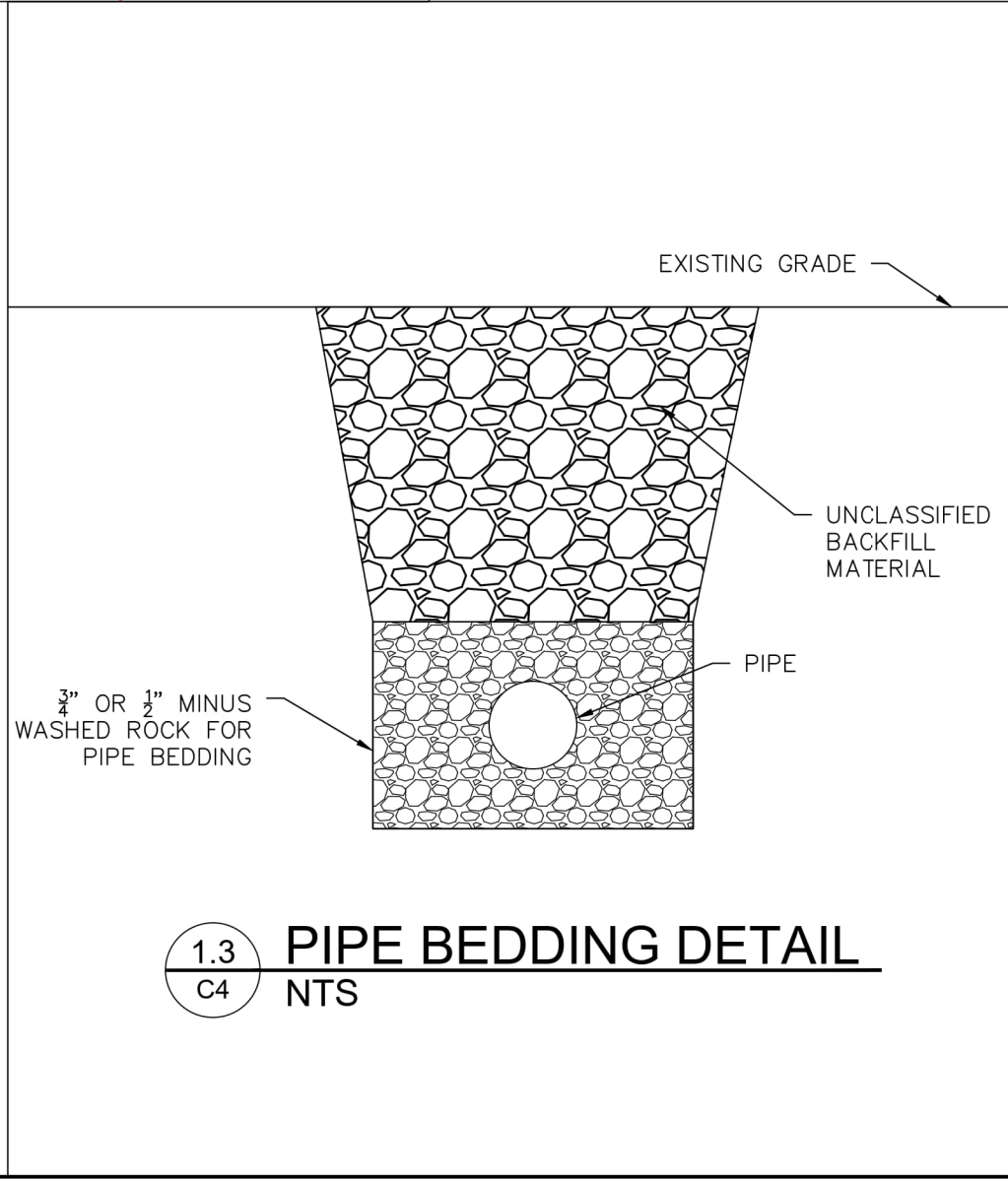
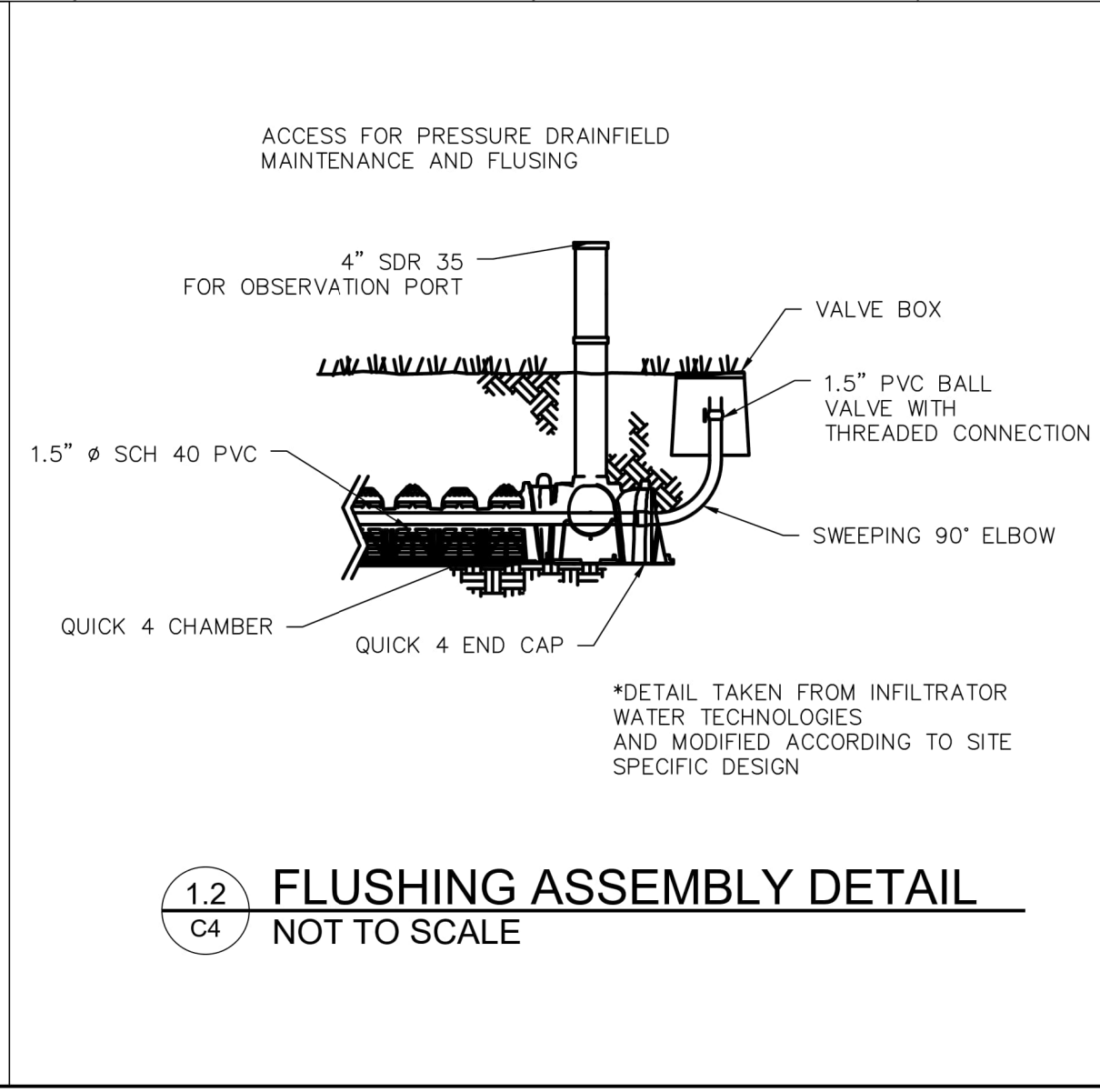
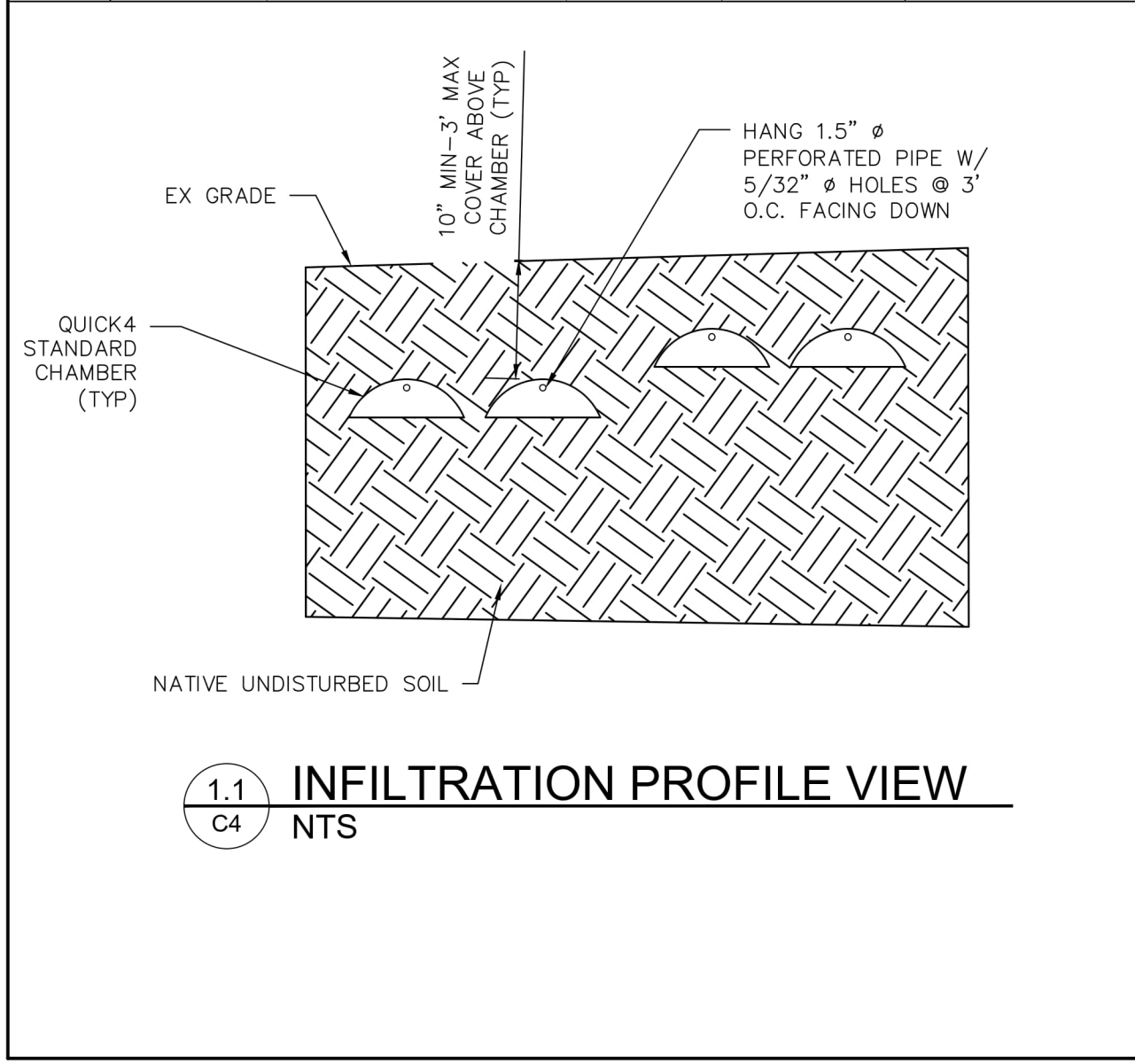
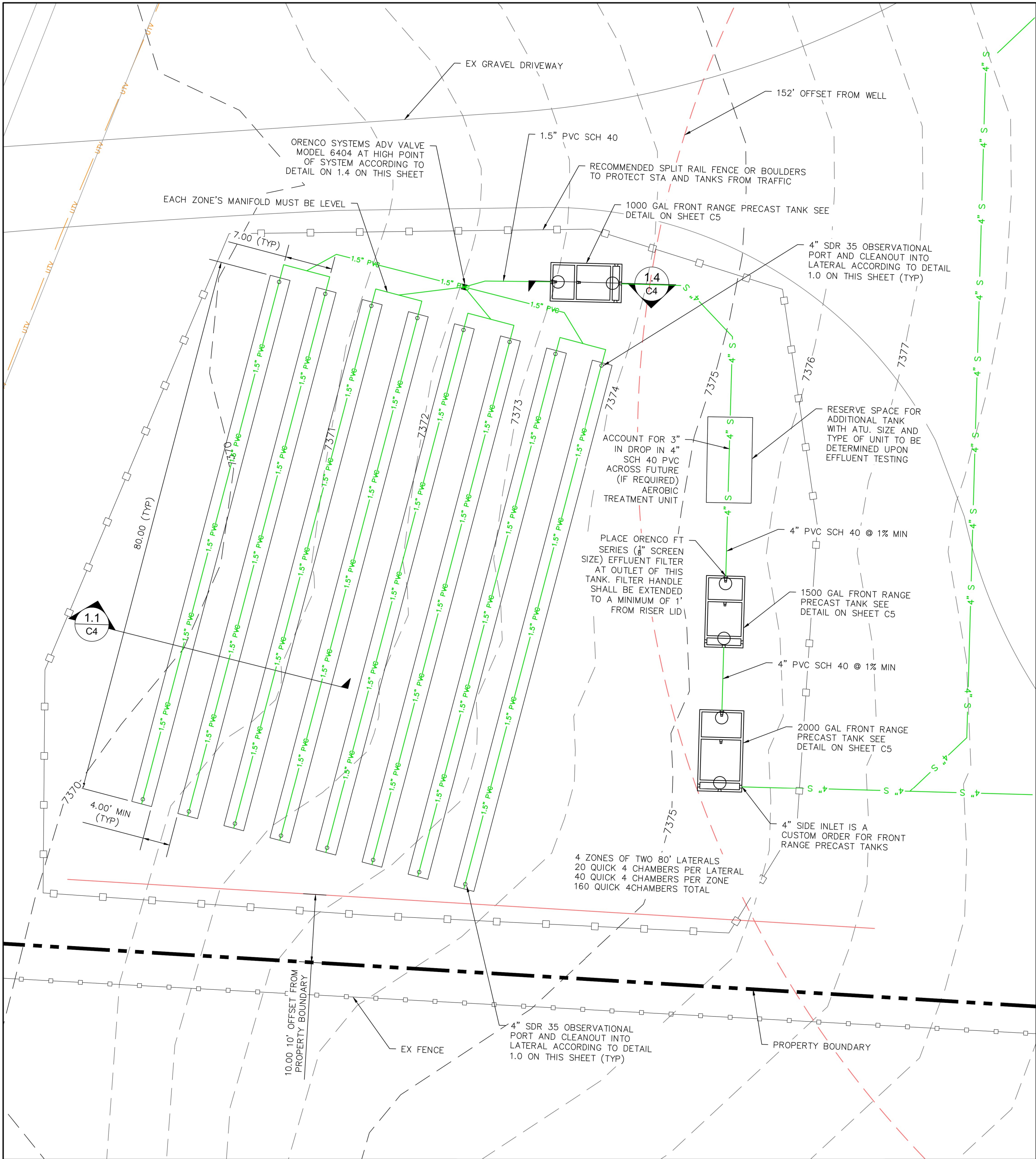
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C3/5

SITE PLAN







NOTES:

- COMPACTION SHALL BE 90% MAXIMUM DRY DENSITY FOR PIPE IN GRAVEL ROADWAYS AND LANDSCAPE AREAS. FOLLOW ASTM D-698

**Pump Selection for a Pressurized System - Single Family Residence Project**

Parameters	
Discharge Assembly Size	2.00 inches
Transport Length Before Valve	12 feet
Transport Pipe Class	40
Transport Line Size	1.50 inches
Distributing Valve Model	6404
Transport Length After Valve	24 feet
Transport Pipe Class	40
Transport Pipe Size	1.50 inches
Max Elevation Lift	5 feet
Manifold Length	7 feet
Manifold Pipe Class	40
Manifold Pipe Size	1.50 inches
Number of Laterals per Cell	8
Lateral Length	80 feet
Lateral Pipe Class	40
Lateral Pipe Size	1.50 inches
Orifice Size	5/32 inches
Orifice Spacing	3 feet
Residual Head	5 feet
Flow Meter	None
Add-on Friction Losses	0 feet

Calculations	
Minimum Flow Rate per Orifice	0.68 gpm
Number of Orifices per Zone	54
Total Flow Rate per Zone	37.1 gpm
Number of Laterals per Zone	2
% Flow Differential 1st/Last Orifice	5.5 %
Transport Velocity Before Valve	5.9 fps
Transport Velocity After Valve	5.9 fps

Frictional Head Losses	
Loss through Discharge	2.7 feet
Loss in Transport Before Valve	0.9 feet
Loss through Valve	9.3 feet
Loss in Transport after Valve	1.9 feet
Loss in Manifold	0.2 feet
Loss in Laterals	0.6 feet
Loss through Flowmeter	0.0 feet
Add-on Friction Losses	0.0 feet

Pipe Volumes	
Vol of Transport Line Before Valve	1.3 gals
Vol of Transport Line After Valve	2.5 gals
Vol of Manifold	0.7 gals
Vol of Laterals per Zone	16.9 gals
Total Vol Before Valve	1.3 gals
Total Vol After Valve	20.2 gals

**Legend**

- System Curve: —
- Pump Curve: —
- Pump Optimal Range: —
- Operating Point: ●
- Design Point: ○

**PumpData**

PF5005 High Head Effluent Pump  
50 GPM, 1/2HP  
115/230V 1Ø 60Hz; 200/230V 3Ø 60Hz

**Requirements**

37.1	gpm
25.6	feet

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C4/5  
OWTS DESIGN AND  
DETAILS

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53341  
5/20/2025  
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NDW-TD-EPS-HV-03  
Rev. 1.0 (08/10)

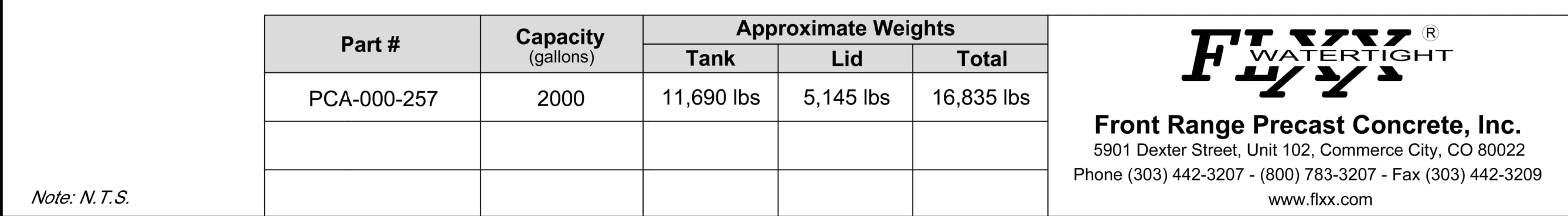
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\*DETAIL TAKEN FROM ORENCO SYSTEMS  
WEBSITE AND MODIFIED ACCORDING TO  
SITE SPECIFIC DESIGN

SCALE: 1" = 10'

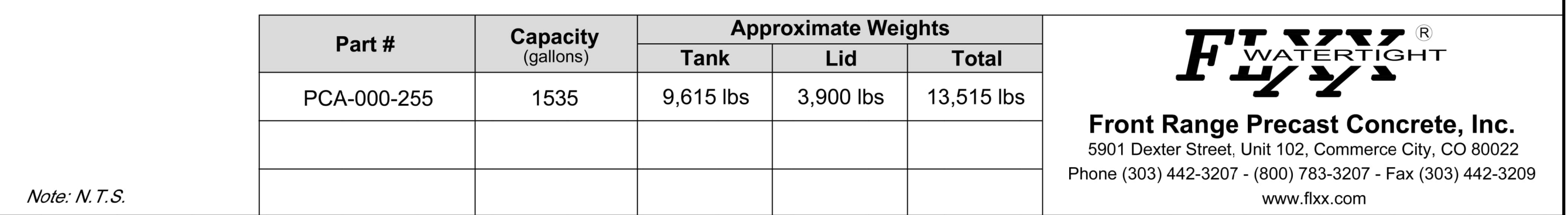
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DETAILS



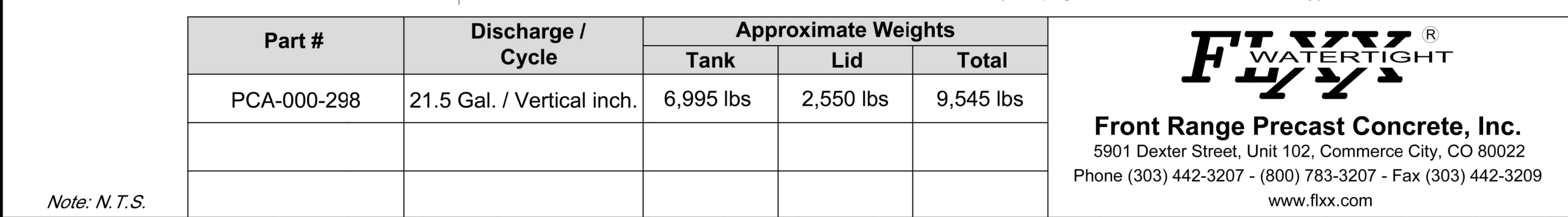
**FLXX** PLAN **FLXX**



**FLXX** \_\_\_\_\_ **FLXX**



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TANK DETAILS