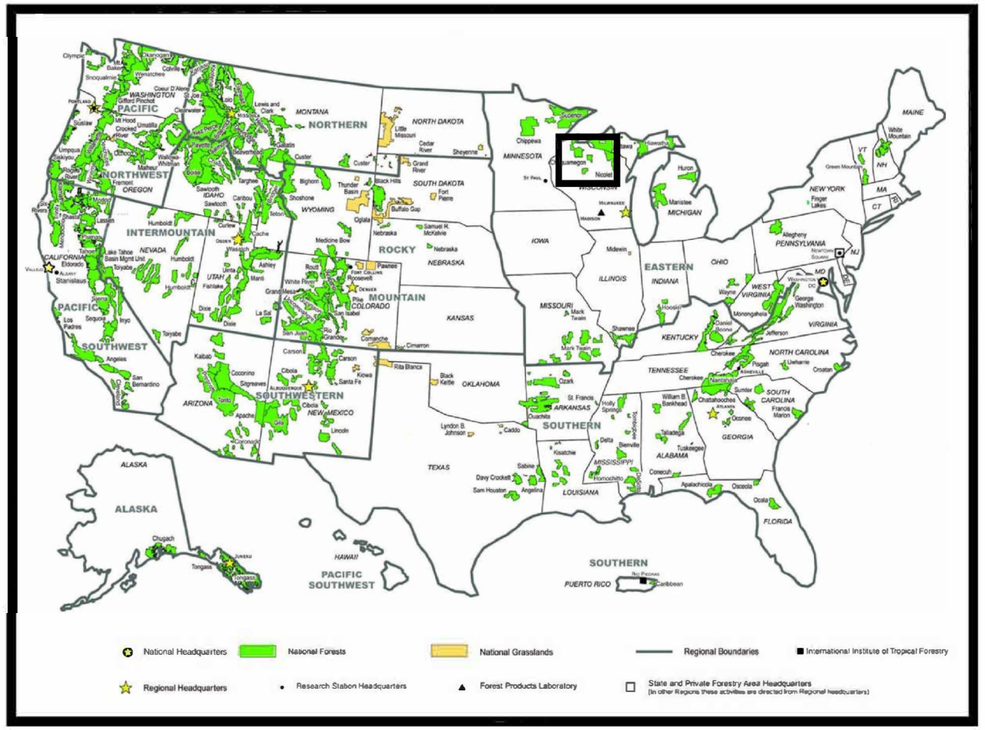
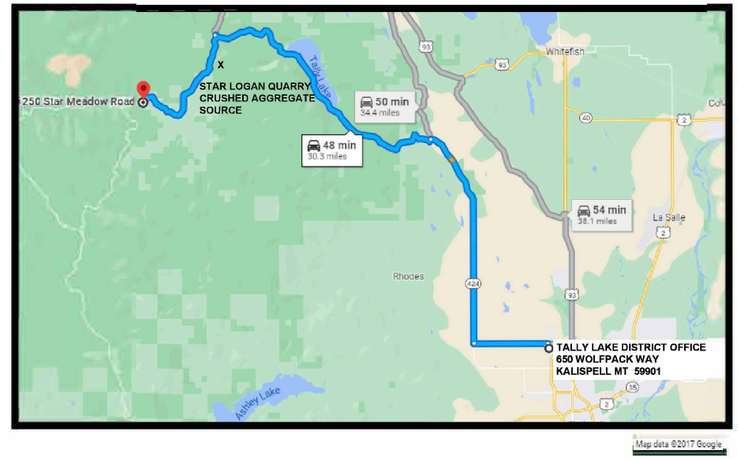
United States Department of Agriculture
Forest Service

FLATHEAD COUNTY MONTANA
R01
FLATHEAD NATIONAL FOREST
TALLY LAKE RANGER DISTRICT

STAR MEADOWS CABIN UTILITIES & REPAIRS



FOREST LOCATION MAP



PROJECT LOCATION MAP

TRAVEL DIRECTIONS (APPROXIMATELY 48 MINUTES, 30.3 MILES):

STARTING FROM 650 WOLFPACK WAY, KALISPELL, MT 59901;
- TAKE STILLWATER TO WEST RESERVE DR
  - 1 MIN (0.3 MI)
- TAKE W. RESERVE TO FARM TO MARKET RD STATE ROUTE 424 for
- 10 MILES, TURN ONTO TALLY LAKE CAMPGROUND RD for 12 MILES TO STAR MEADOW RD
  - 2.5 MI WEST turn SOUTH ON NFSR #313 LOGAN CREEK 100 YARDS turn LEFT TO QUARRY
  - 5.5 MI WEST to STAR MEADOWS CABIN, 5250 STAR MEADOW RD, WHITEFISH, MT 59937

TOTAL TIME 47 MIN (30 MI)

Sheet Number	Sheet Title
1	Cover
2	Schedule
3	GENERAL NOTES
4	Site Plan Utilities
5	Existing Condition Main Floor
6	Demolision of the Basement
7	Electrical
8	Propane
9	Bunkhouse Heat
10	CABIN FORCED AIR HEAT
11	CABIN RADIANT HEAT
12	Water Service
13	Mechanical & Plumbing
14	Well Development
15	Waterline
16	Water Profile
17	Trench & Pad Details
18	Sewer
19	Sewer Profile
20	Existing Floor Plan

RECOMMENDED BY:

TRAVIS TAYLOR — Digitally signed by TRAVIS TAYLOR Date: 2025.11.18 14:43:29 -07'00'

FOREST ENGINEER — DATE

WILLIAM MULHOLLAND — Digitally signed by WILLIAM MULHOLLAND Date: 2025.11.19 08:47:36 -07'00'

DISTRICT RANGER — DATE

APPROVED:

ANTHONY BOTELLO 2025.12.02 15:10:08 -07'00'

FOREST SUPERVISOR — DATE

8/14/25 13:22 PSIERS E:\SIERS_98232759_65141903_SN_DATACOMPLETEXP UPGRADEXP WORKSPACE\2_DESK_DRAWER\2025 FACILITIES WORK\STAR MEADOWS BARN\CABIN DRAWINGS\NAMPS\STARMEADOWBARN_UTILITIES_COVER.DWG;

SCHEDULE OF ITEMS
BASE BID STAR MEADOW CABIN RENOVATION

Pay Item	Item Description	Estimated Quantity	Method of Meas.
	DIVISION 2 - SITEWORK		
02110	Clearing and Grubbing	5	CY
	(25 yds^3 CRUSHED AGG.) Trench for Utilities	300	LF
	Fine Grading	1625	SF
02200	Excavation/Backfill	100	CY
02520	Site Concrete (5 YDS^3 CRUSHED AGG.)	96	SF
	DIVISION 2 - DEMOLITION		
03300	Demolish Basement Ceiling, Walls, & Floor	1	LS
	Saw Cut Floor Plumbing Rough-in	1	LS
	Wall Concrete Curb (5" high/6" thick)	10	LF
	Well Hand Pump Splash Pad	1	LS
	Electrical Circuit Panel-Jct Box	1	LS
	DIVISION 6 - WOOD AND PLASTICS		
06100	Interior Wall Construction	160	SF
	DIVISION 7 - WOOD AND PLASTICS		
07901	Sealants	1	LS
	DIVISION 10 - SPECIALTIES		
10200	Air Return Grill (Louvers & Vents)	1	LS
10800	Heating Vent	2	ST
	DIVISION 15 - MECHANICAL		
02230	**Plumbing for Hydronic Heat**		
	Gas Combi-Boiler, Domestic Hot Water plumbing (Zone 1), Hot Air Coil (Zone 2), 1/2" Tubing in floor Heat (Zone 3)	1	LS
02350	**HVAC Equipment**		
	Air Handling Unit, HVAC Ductwork, Insulation (Pipe & Duct), Controls, Balancing, Closeout/O & M Manuals	1	LS
01030	**Fireplace Heaters**		
07	HALIBURTON GDS28	2	LS
02210	**Plumbing**		
	Sewer Rough-IN & Kitchen Supply	1	LS
03321	**WELL**		
	Well Sanitary Cap, Pitless Adaptor, Submersible Pump, Pressure Tank, Well Pump Controls	1	LS
	DIVISION 16 - ELECTRICAL		
	Light Fixtures, Switches, Mechanical Power (Well, Boiler, AHU), Service Panels	1	LS

OPTION BID STAR MEADOW CABIN RENOVATION

Pay Item	Item Description	Estimated Quantity	Method of Meas.
	DIVISION 7 - THERMAL AND MOISTURE PROTECTION		
07210	Wall Insulation	160	SF
	Floor Insulation	600	SF
	DIVISION 15 - MECHANICAL		
02230	**Plumbing for Hydronic Heat**		
	1/2" tubing Radiant In Floor Heat (Zone 3)	600	SF

1 SCHEDULE OF ITEMS
NTS

BASE STAR MEADOW CABIN RENOVATION

PAY ITEM	DESCRIPTION	SPECIFICATION SUBSECTIONS
01	MOBILIZATION	
		010100 - SUMMARY OF WORK
		011900 - MOBILIZATION
		013300 - SUBMITTAL PROCEDURES
		014100 - QUALITY CONTROL
		017320 - SELECTIVE DEMOLITION
02	SITEWORK	
		020520 - CONCRETE PAD
03	DEMOLITION	
06	WOOD, PLASTIC, & COMPOSITES	
		061050 - MISCELLANEOUS CARPENTRY
07	THERMAL & MOISTURE PROTECTION	
		071310 - WALLS & FLOORS
22	PLUMBING	
		221100 - WATER DISTRIBUTION SYSTEMS
		221103 - PLUMBING APPURTENANCES
		221120 - SUBMERSIBLE WELL PUMP
		221300 - SEWER DRAIN SYSTEMS
23	HEATING, VENTILATING, & AIR CONDITIONING	
		231126 - PROPANE GAS SUPPLY
		235513 - PROPANE STOVES
26	ELECTRICAL	
		260519 - LOW VOLTAGE WIRING & DEVICES
31	EARTHWORK	
		312200 - EXCAVATION, TRENCHING, & EARTHWORK
33	UTILITIES	
		330530 - TRACER WIRES
		334116 - DRAIN TILE & LATERAL DRAINS

2 SPECIFICATION REFERENCES
NTS

United States Department of Agriculture
Forest Service

R01
NORTHERN REGION

PROJECT NAME
STAR MEADOW CABIN

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE
SCHEDULE OF ITEMS

DATE
12/2/2022

ARCHIVE NO.
FS090523_R102013_L1-002.dwg

DESIGNER
PATRICK SIERS

DRAWN
PATRICK SIERS

CHECKED

PROJECT NO.

DWG SHEET NO.
G-01

SHEET 2 OF 20

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GENERAL CONSTRUCTION NOTES

1.1. PLANS SHOW APPROXIMATE LOCATIONS OF ALL KNOWN EXISTING UTILITIES. THE PRESENTATION OF EXISTING UTILITIES IS NOT WARRANTED TO BE EITHER COMPLETE OR EXACT IN HORIZONTAL POSITION AND ELEVATION. THE CONTRACTOR IS RESPONSIBLE FOR REQUESTING UTILITY LOCATE REQUESTS PRIOR TO THE START OF UTILITIES AND CONFLICTS WITH NEW CONSTRUCTION SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE CONTRACTING OFFICER.

1.2. IN INSTANCES WHERE THE MANUFACTURER'S INSTRUCTIONS FOR MATERIALS ARE MORE RESTRICTIVE THAN THOSE PRESCRIBED BY THESE PLANS OR CODE, THE MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE MORE RESTRICTIVE REQUIREMENT.

1.3. LOCATIONS AND DIMENSIONS ARE PROVIDED FOR ESTIMATING PURPOSES. ADJUSTMENTS TO ACCOMMODATE A MORE APPROPRIATE "FIELD FIT" MAY BE APPLIED WITH COR APPROVAL.

1. TRENCHING

1.1. CONTRACTOR SHALL COMPLY WITH O.S.H.A. CONSTRUCTION STANDARDS FOR TRENCH EXCAVATIONS.

(SEC. 1926 SUBPART P)

2. BEDDING

2.1. BEDDING MATERIAL SHALL BE PLACED IN 6-INCH LIFTS AND TAMPED IN PLACE. BEDDING UNDER AND BESIDE THE PIPE SHALL BE COMPACTED FOR PIPE SUPPORT. BEDDING SHALL BE BROUGHT UP EVENLY ON BOTH SIDES OF THE PIPE SO THAT THE PIPE REMAINS ALIGNED.

2.1.1. PROVIDE 4-INCH THICK COMPACTED BEDDING BELOW PIPE.

2.1.2. PROVIDE 6-INCH THICK COMPACTED BEDDING ABOVE PIPE.

3. BACKFILLING

3.1. LOOSE EARTH FREE FROM ROCKS, BROKEN CONCRETE AND FROZEN CHUNKS SHALL BE PLACED IN THE TRENCH IN 6-INCH LAYERS AND TAMPED IN PLACE UNTIL THE CROWN OF THE PIPE IS COVERED IN 12 INCHES OF TAMPED EARTH.

3.2. BACKFILL REMAINING TRENCH IN 6-INCH LAYERS AND MECHANICALLY COMPACT TO 95% DRY DENSITY AND +/-3% OPTIMUM MOISTURE (TESTING NOT REQUIRED)

4. WATER DISTRIBUTION

4.1. WATER SUPPLY LINE TO ENTER NORTHEAST CORNER OF CABIN BASEMENT (EXISTING COLD ROOM).

4.1.1. SEE SHEET 06 FOR DETAILS.

4.2. PROVIDE WATER DISTRIBUTION LINES TO THE KITCHEN SINK USING 1/2-INCH PEX TUBING.

4.3. INSTALL NEW KITCHEN FAUCET AND ALL ASSOCIATED PLUMBING NECESSARY FOR OPERATION.

4.3.1. FAUCET SHALL BE EQUIPPED TO RECEIVE HOT AND COLD WATER.

GENERAL CONSTRUCTION NOTES

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5. PROPANE

5.1. CONTRACTOR RESPONSIBLE FOR ALL PERMITS, INSPECTIONS, AND COMPLIANCE FOR COMPLETE PROPANE TANK INSTALLATION TO INCLUDE GAS SUPPLY AND DISTRIBUTION LINES.

5.1.1. INSTALL CRUSHED AGGREGATE & A CONCRETE PAD FOR ABOVE GROUND PROPANE TANK.

5.1.2. BURY PROPANE SUPPLY LINE FROM TANK TO DWELLING A MINIMUM OF 18 INCHES.

5.1.3. PROVIDE EXTERIOR REGULATORS AND GAS SHUT OFF AT 2 CABINS.

5.1.4. PROVIDE GAS DISTRIBUTION PIPING TO THREE (3) PROPANE FIREPLACES & ONE (1) BOILER.

5.1.5. PROVIDE A GAS SUPPLY LINES TO ALL MECHANICAL ROOM APPLIANCES AND MAKE THE CONNECTIONS.

6. PROPANE FIREPLACE

6.1. PROPANE FIREPLACES SHALL HAVE OPTION TO OPERATE WHEN POWER SUPPLY IS DISRUPTED.

6.1.1. NAPOLEON HALIBURTON DIRECT VENT CAST IRON GAS STOVE (GDS28), OR APPROVED EQUAL.

6.2. PROPANE FIREPLACES SHALL BE UL LISTED.

6.3. SUPPLY AND INSTALL A NON-COMBUSTIBLE HEARTH AND WALL PROTECTOR SYSTEM WHICH MEETS MANUFACTURERS STANDARDS. STYLE & COLORS CHOOSEN BY CONTRACTING OFFER.

6.4. INSTALL EACH FIREPLACE IN COMPLIANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

6.4.1. MAINTAIN COMBUSTIBLE CLEARANCES

6.4.2. PROVIDE PROPER VENTILATION AND EXHAUST

7. SMOKE AND CARBON MONOXIDE (CO) ALARMS

7.1. ALL ALARMS SHALL BE COMBINATION SMOKE/CO ALARMS

7.2. COMBINATION SMOKE/CO ALARMS SHALL RECEIVE THEIR PRIMARY POWER SOURCE FROM THE BUILDING WIRING WITH BATTERY BACKUP

7.3. ALARM DEVICES SHALL BE INTERCONNECTED IN SUCH A MANNER THAT ACTUATION OF ONE ALARM WILL ACTIVATE ALL ALARMS IN THE DWELLING.

7.4. FOUR (4) ALARMS SHALL BE INSTALLED IN THE FOLLOWING AREAS:

7.4.1. FIRST LEVEL: BEDROOM, LIVING AREA, AND HALLWAY

7.4.2. BASEMENT: OPEN SPACE AREA

1 FIRST LEVEL: WATER & MECHANICAL
NTS

United States Department of Agriculture
Forest Service

R01
NORTHERN REGION

PROJECT NAME

STAR MEADOW CABIN

FLATHEAD NATIONAL FOREST

TALLY LAKE
RANGER DISTRICT

DRAWING TITLE

GENERAL NOTES

DATE
12/2/2025

ARCHIVE NO.

DESIGNER
PATRICK SIERS

DRAWN
PATRICH SIERS

CHECKED

PROJECT NO.

DWG SHEET NO.
G-02

SHEET 3 OF 20

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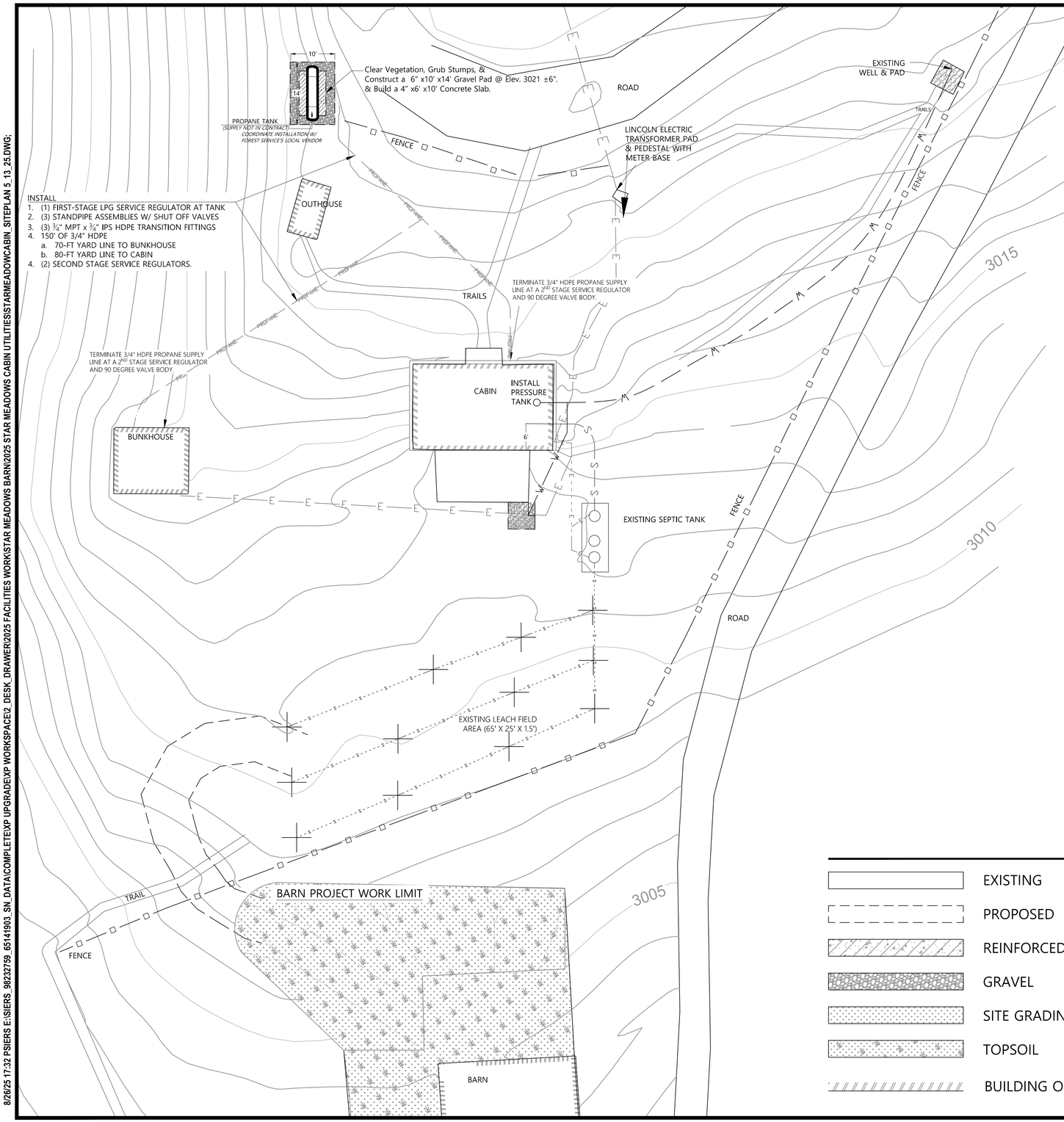

GENERAL NOTES:

1. THE PERFORMANCE OF WORK UNDER THIS CONTRACT SHALL BE COMPLETE IN EVERY DETAIL. MISCELLANEOUS ITEMS OF EQUIPMENT, TOOLS, SUPPLIES, AND MATERIALS INCLUDING ALL LABOR NECESSARY TO COMPLETE THE WORK DESCRIBED OR REASONABLY IMPLIED IN THE DRAWINGS OR IN THE SPECIFICATIONS SHALL BE INCLUDED AS PART OF THE CONTRACT AS IF FULLY SPECIFIED OR DRAWN.
2. THE CONTRACTOR SHALL NOTIFY THE CONTRACTING OFFICER (CO) 14 DAYS PRIOR TO BEGINNING WORK AND SHALL APPLY FOR AND OBTAIN ANY NECESSARY PERMITS.
3. THE EXISTING UTILITY AND MECHANICAL EQUIPMENT LOCATIONS, DEPTHS AND SIZES SHOWN ON THESE PLANS ARE DEPICTIVE AND APPROXIMATE. THE CONTRACTOR SHALL FIELD VERIFY THE EXISTENCE, LOCATION, DEPTH, SIZE, LINE AND GRADE OF EXISTING UTILITIES AND EQUIPMENT PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR DAMAGE TO THE EXISTING UTILITIES DUE TO ANY FAILURE TO LOCATE OR PROVIDE PROPER PROTECTION WHERE UTILITY LOCATIONS ARE INDICATED.
4. THE CONTRACTOR IS REQUIRED TO MARK THE EXISTING BURIED UTILITIES BEFORE DIGGING. ANY DAMAGED SERVICES SHALL BE IMMEDIATELY REPAIRED AT THE CONTRACTOR'S EXPENSE.
5. ALL HDPE PROPANE AND WATER PIPE SHALL BE BUTT FUSED UNLESS OTHERWISE SPECIFIED.
6. UTILITY TRENCHES SHALL BE BACKFILLED AND COMPACTED WITH TRENCH EDGES TRANSITIONING SMOOTHLY TO THE ADJACENT EXISTING GROUND. UTILITY TRENCHES SHALL BE FINISH GRADED TOPSOIL MOUNDED 4 INCHES ABOVE PRE-EXCAVATION ELEV. AND LANDSCAPED WITH GRASS SEED AND 100% STRAW MULCH COVERAGE.
7. COORDINATION OF THE WORK BY SUBCONTRACTORS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL ADJUST VALVE BOXES TO FINAL GRADE UPON COMPLETION OF THE UTILITY. DAMAGED OR OTHERWISE DISTURBED UTILITIES SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR.
8. UTILITIES SHALL BE LEAK TESTED IN ACCORDANCE WITH THE SPECIFICATIONS.
9. THE CONTRACTOR SHALL INSTALL A 4" SUBMERSIBLE PUMP, 1 1/4" WELD-ON PITLESS ADAPTER, 100' DROP PIPE, AND 1" HDPE PIPELINE TO SUPPLY THE CABIN'S WATER SYSTEM.
10. THE WATER SYSTEM PIPELINE SHALL BE INSTALLED SUCH THAT LINES SLOPED TO DRAIN.
11. THE DRAWING SHEETS SHOW THE INTENDED ROUTE FOR UTILITIES. THE C.O. WILL NOT PAY ADDITIONAL QUANTITIES FOR UTILITY PIPELINES INSTALLED ON ROUTES ALTERED FOR THE CONVENIENCE OF THE CONTRACTOR.
12. THE CONTRACTOR SHALL STRIP FOR SALVAGE ALL TOPSOIL AND CONSERVE THE SOIL IN A STOCKPILE. TOPSOIL EXCAVATED FROM TRENCHES SHALL BE USED TO FINISH GRADE AND UNIFORMLY LANDSCAPE THOSE DISTURBED AREAS.

LEGEND

	EXISTING		FENCE
	PROPOSED	E E	BURIED ELECTRIC (existing)
	REINFORCED CONCRETE	s s s s	DRAIN FIELD (existing)
	GRAVEL	S S	SEWER LINE (new)
	SITE GRADING	W W	WATER LINE (new)
	TOPSOIL	PROPANE	PROPANE LINE (new)
	BUILDING OUTLINE		

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

R1
NORTHERN REGION

PROJECT NAME

STAR MEADOWS

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

SITE PLAN

DATE
12/15/2025

ARCHIVE NO.

DESIGNER
P.SIERS

DRAWN
P.SIERS

CHECKED
TRAVIS TAYLOR

PROJECT NO.

DWG SHEET NO.
L-01

SHEET **4** OF **20**

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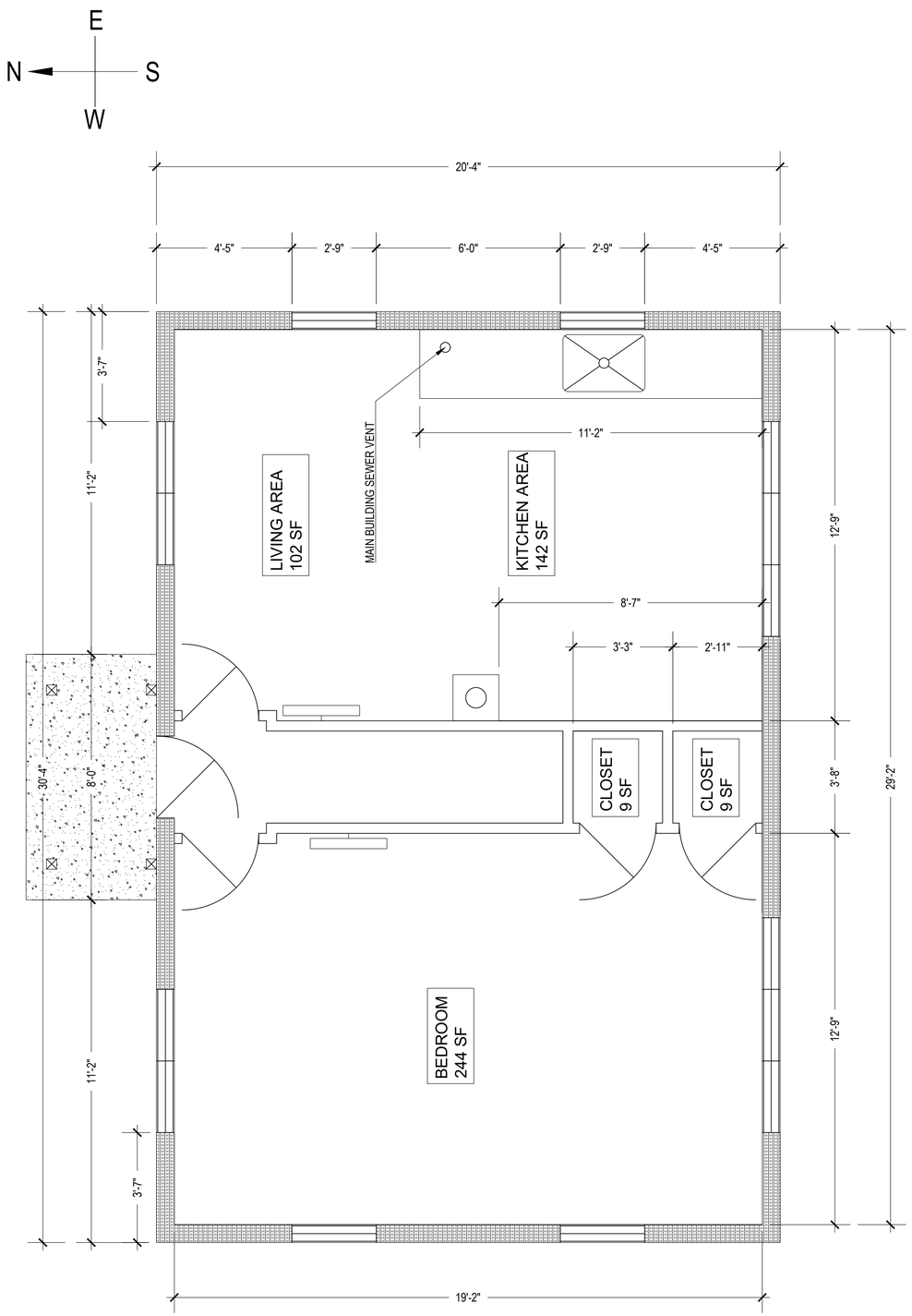
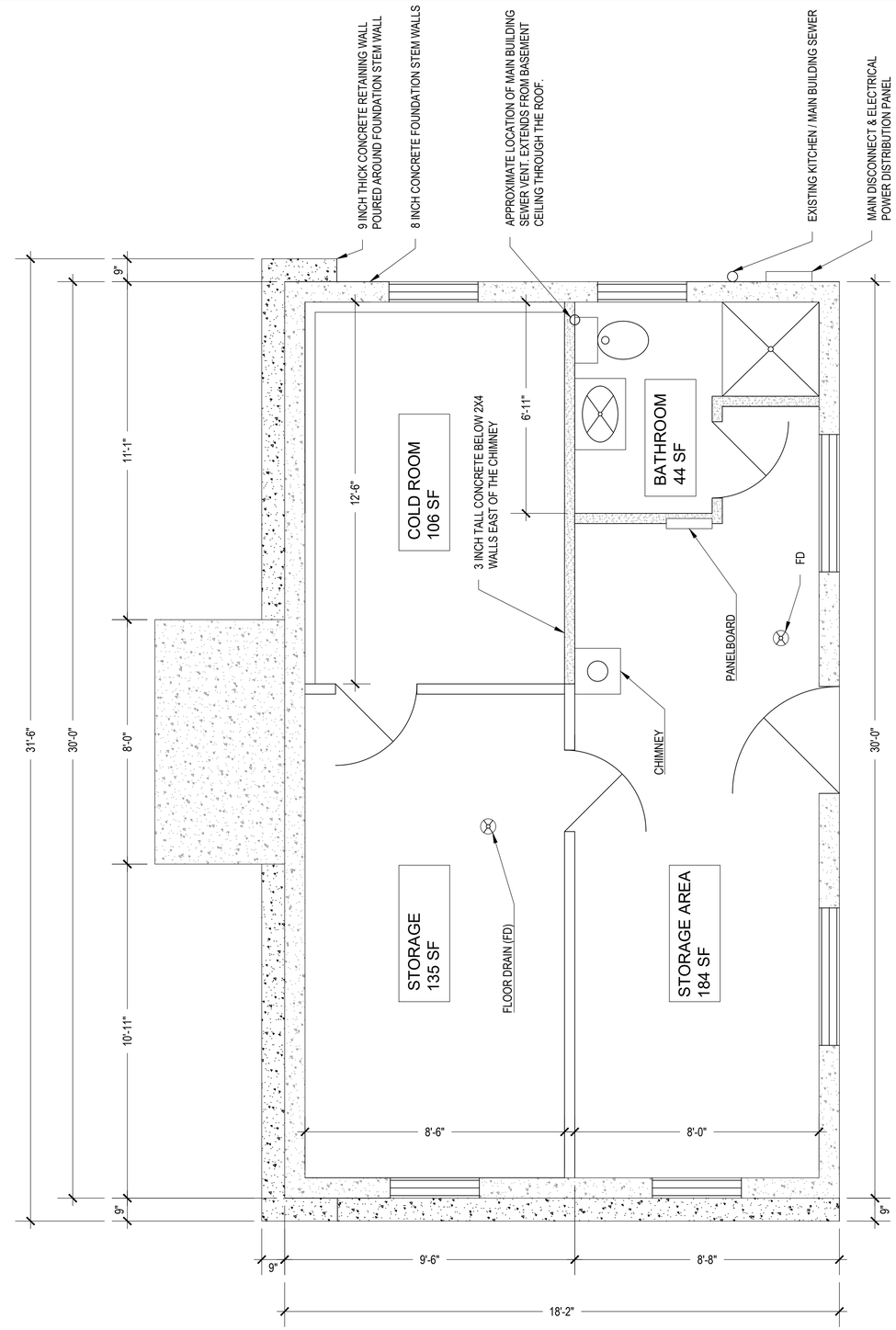


FIRST LEVEL PLAN VIEW



BASEMENT PLAN VIEW

United States Department of Agriculture
Forest Service

R01
NORTHERN REGION

PROJECT NAME

STAR MEADOW CABIN

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

EXISTING FLOOR DIMENSIONS

DATE **10/3/2022**	
ARCHIVE NO.	
DESIGNER **R. STOVALL**	DWG SHEET NO. **G-03**
DRAWN **R. STOVALL**	
CHECKED **PATRICK SIERS**	SHEET **05** OF **20**
PROJECT NO.	

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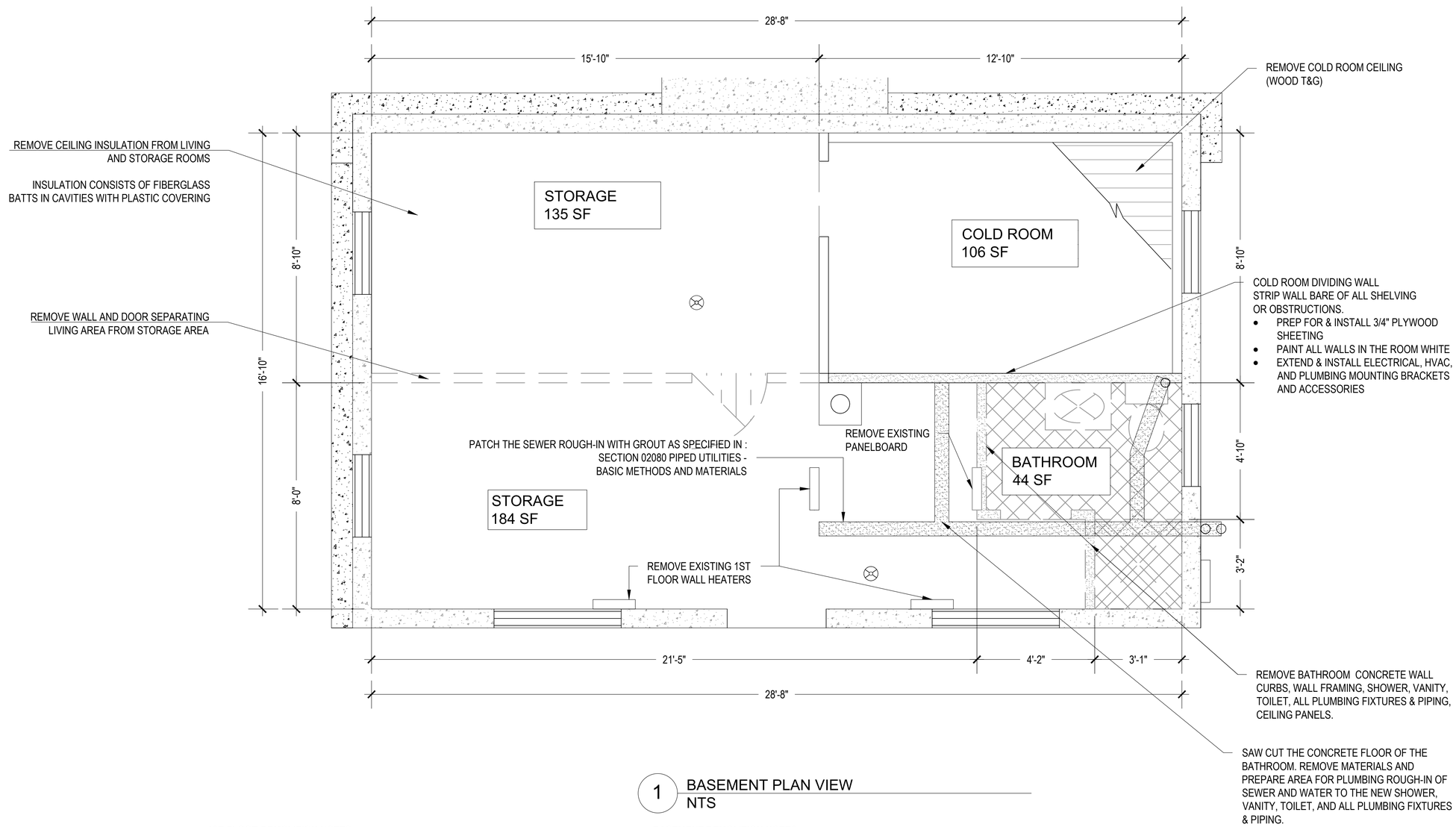

1 BASEMENT PLAN VIEW
NTS

1ST FLOOR DEMOLITION NOTES:

1. REMOVE AND DISPOSE OF THE FOLLOWING ASSEMBLIES:
   - 1.1. ELECTRIC WALL FURNACE IN BEDROOM ON SOUTH WALL
   - 1.2. ELECTRIC WALL FURNACE IN KITCHEN ON SOUTH WALL
   - 1.3. ELECTRIC WALL FURNACE IN BEDROOM ON EAST WALL
2. DEMOLITION DEBRIS BECOMES PROPERTY OF CONTRACTOR AND SHALL BE REMOVED AND DISPOSED IN ACCORDANCE WITH GOVERNING FEDERAL, STATE, AND LOCAL LAWS.
3. INSTALL BOX COVERS AND/OR BLANK WALL PLATES OVER ELECTRICAL BOXES WHICH FORMERLY HOUSED HEATER CIRCUITS..
4. DIMENSIONS ARE FOR ESTIMATING PURPOSES ONLY. CONTRACTOR SHALL VERIFY DIMENSIONS AND QUANTITIES PRIOR TO BIDDING OR COMMENCING WORK.

BASEMENT DEMOLITION NOTES:

1. REMOVE AND DISPOSE OF THE FOLLOWING ASSEMBLIES:
   - 1.1. WALL BETWEEN STORAGE AREAS
   - 1.2. CEILING INSULATION AND VAPOR BARRIER
   - 1.3. COLD ROOM CEILING (WOOD T&G)
   - 1.4. BATHROOM CEILING (SQUARE PANELS)
   - 1.5. BATHROOM WALLS (WOOD FRAMING)
   - 1.6. BATHROOM WALLS (CONCRETE CURBS)
   - 1.7. ELECTRIC PANEL
   - 1.8. BATHROOM FLOOR CUT & HAMMER FOR SEWER ROUGH-IN
   - 1.9. BASEMENT STORAGE SHELVING
2. DEMOLITION DEBRIS BECOMES PROPERTY OF CONTRACTOR AND SHALL BE REMOVED AND DISPOSED IN ACCORDANCE WITH GOVERNING FEDERAL, STATE, AND LOCAL LAWS.
3. DIMENSIONS ARE FOR ESTIMATING PURPOSES ONLY. CONTRACTOR SHALL VERIFY DIMENSIONS AND QUANTITIES PRIOR TO BIDDING OR COMMENCING WORK.

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United States Department of Agriculture
Forest Service

R01
NORTHERN REGION

PROJECT NAME

STAR MEADOW CABIN

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

SELECTIVE DEMOLITION

DATE
12/2/2022

ARCHIVE NO.
FS090523_R102013_L1-002.dwg

DESIGNER
PATRICK SIERS

DRAWN
R. STOVALL

CHECKED
PATRICK SIERS

PROJECT NO.

DWG SHEET NO.
G-04

SHEET **06** OF **20**

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L LED - Ceiling light fixture, 8.5" wraparound clear acrylic diffuser, 8 ft, 60W, 5000 LM, integrated LED, prismatic lens, flush mount.

L-1 LED - Ceiling light fixture, 8.5" wraparound clear acrylic diffuser, 4 ft, 60W, 5000 LM, integrated LED, prismatic lens, flush mount.

VL LED VANITY LIGHT - 16"x5.5"x3" curved wrap translucent acrylic diffuser w/ brushed nickel end caps, 16W, 900 LM

EFL EXHAUST FAN w/ 12W LED LIGHT 10"x10" 35W/110 CFS motor

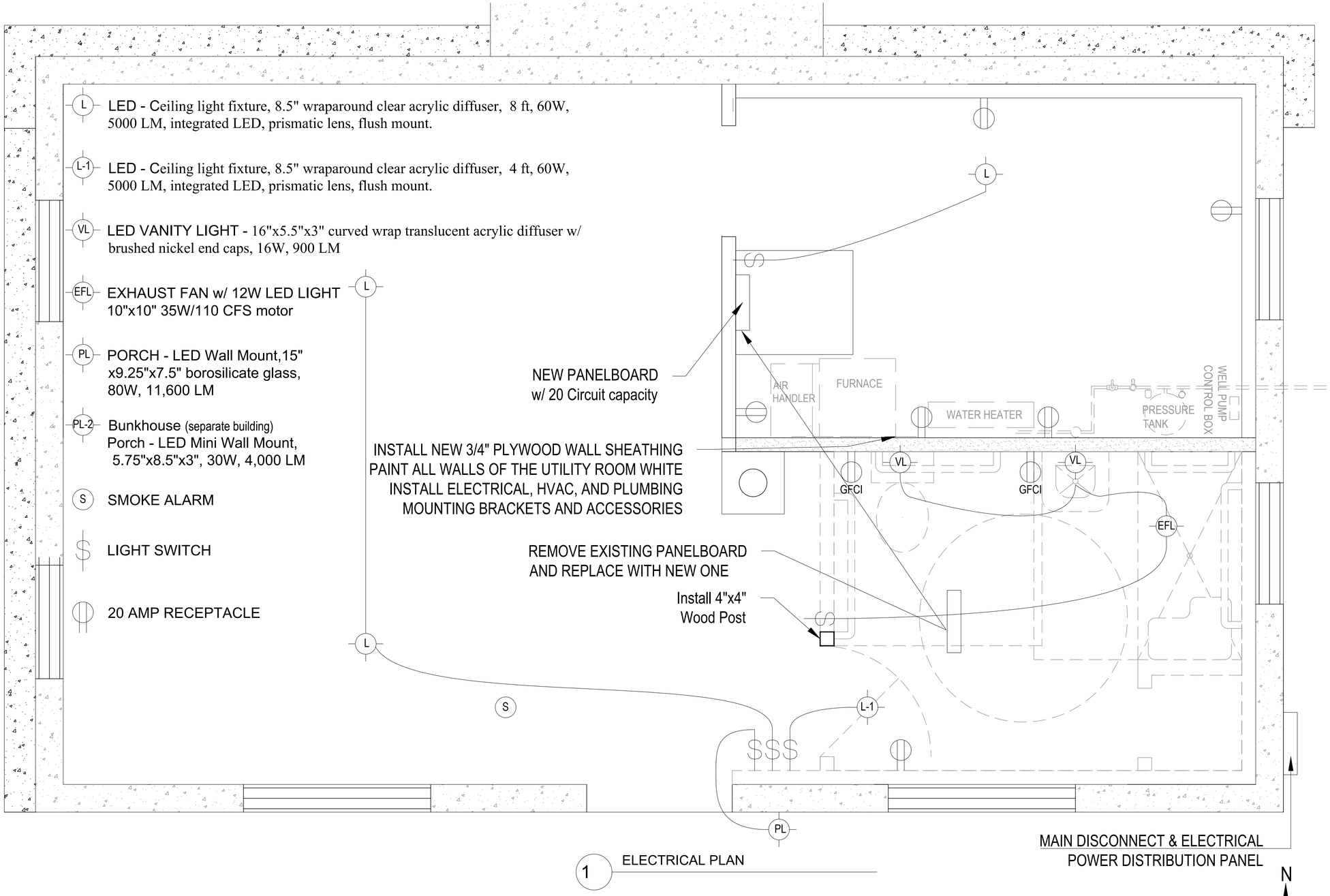
PL PORCH - LED Wall Mount,15" x9.25"x7.5" borosilicate glass, 80W, 11,600 LM

PL-2 Bunkhouse (separate building) Porch - LED Mini Wall Mount, 5.75"x8.5"x3", 30W, 4,000 LM

S SMOKE ALARM

$ LIGHT SWITCH

20 AMP RECEPTACLE



1 ELECTRICAL PLAN

United States Department of Agriculture
Forest Service

R01
NORTHERN REGION

PROJECT NAME

STAR MEADOW CABIN

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

ELECTRICAL

DATE
4/3/2025

ARCHIVE NO.

DESIGNER
PATRICK SIERS

DWG SHEET NO.
E-01

DRAWN
R. STOVALL

CHECKED
PATRICK SIERS

PROJECT NO.

SHEET **07** OF **20**

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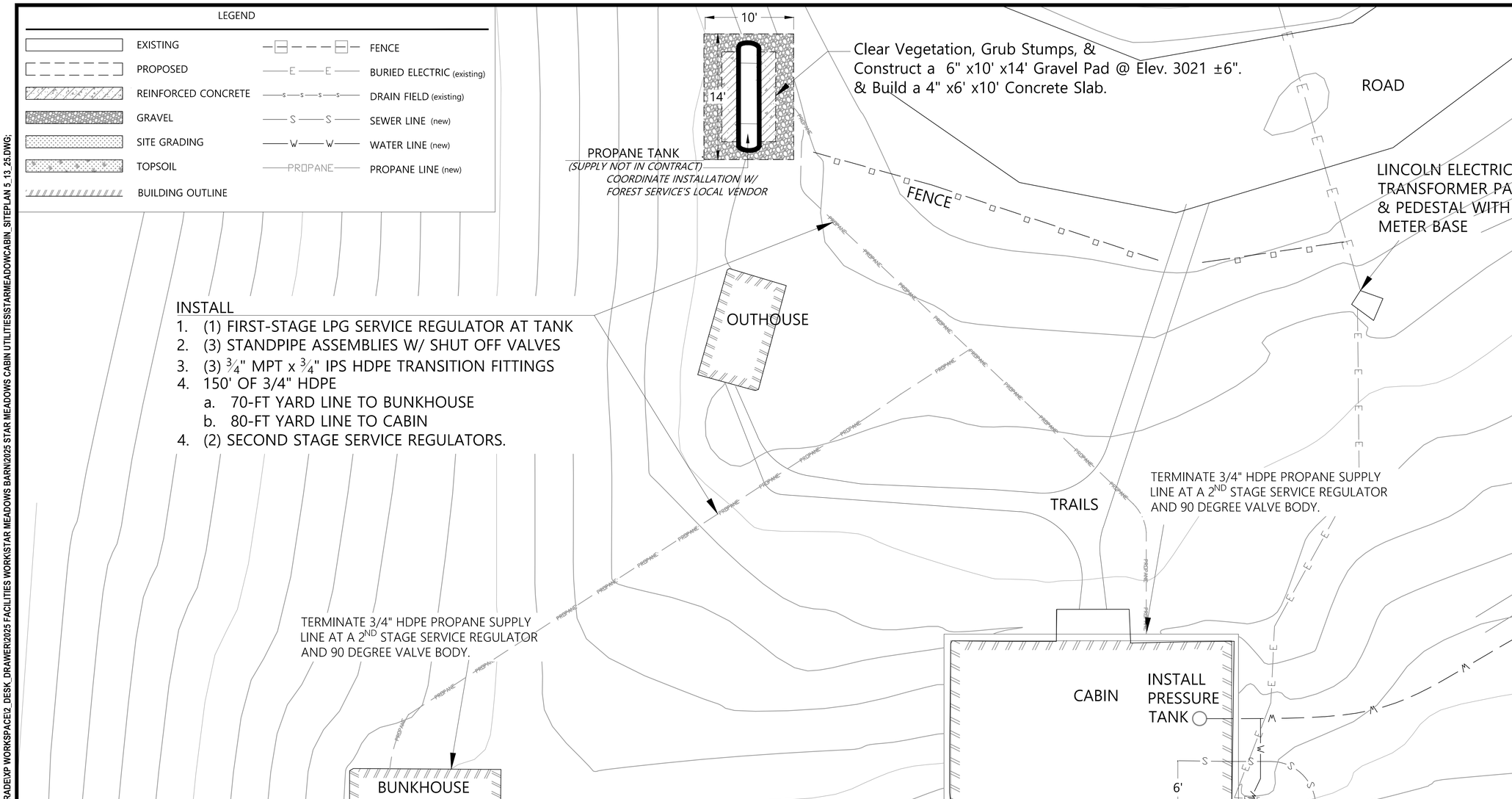

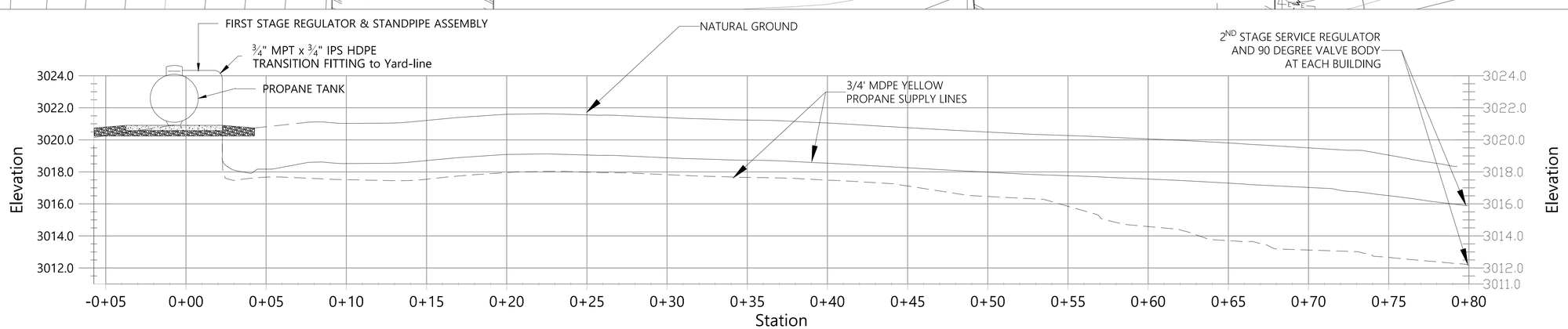

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

R1
NORTHERN REGION

PROJECT NAME

STAR MEADOWS

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

PROPANE

DATE
12/15/2022

ARCHIVE NO.

DESIGNER	DWG SHEET NO.
P.SIERS	**P-01**
DRAWN **P.SIERS**	
CHECKED **P.SIERS**	
PROJECT NO.	SHEET **8** OF **20**

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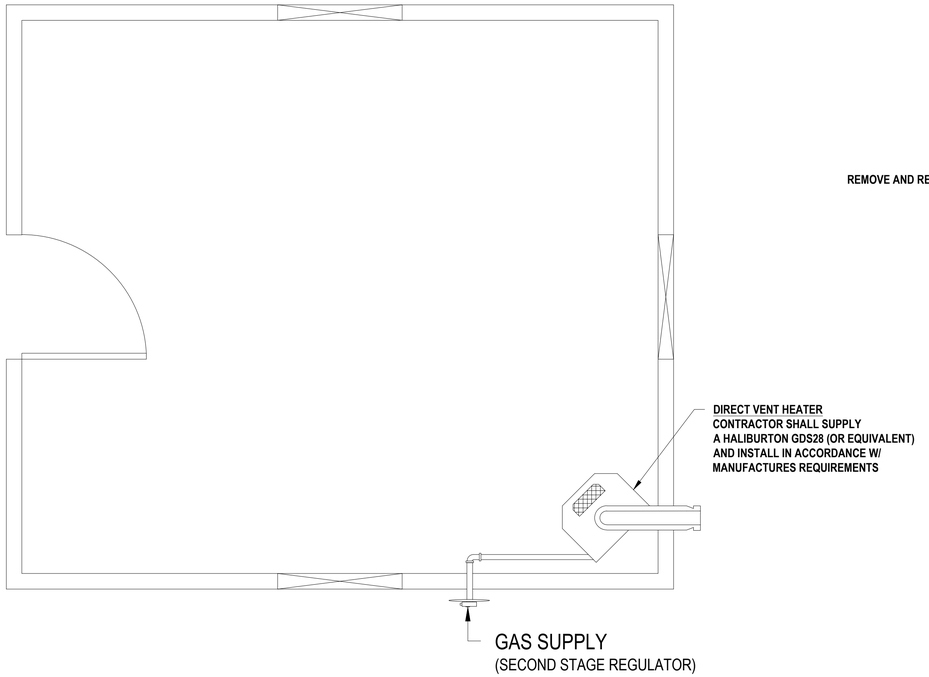
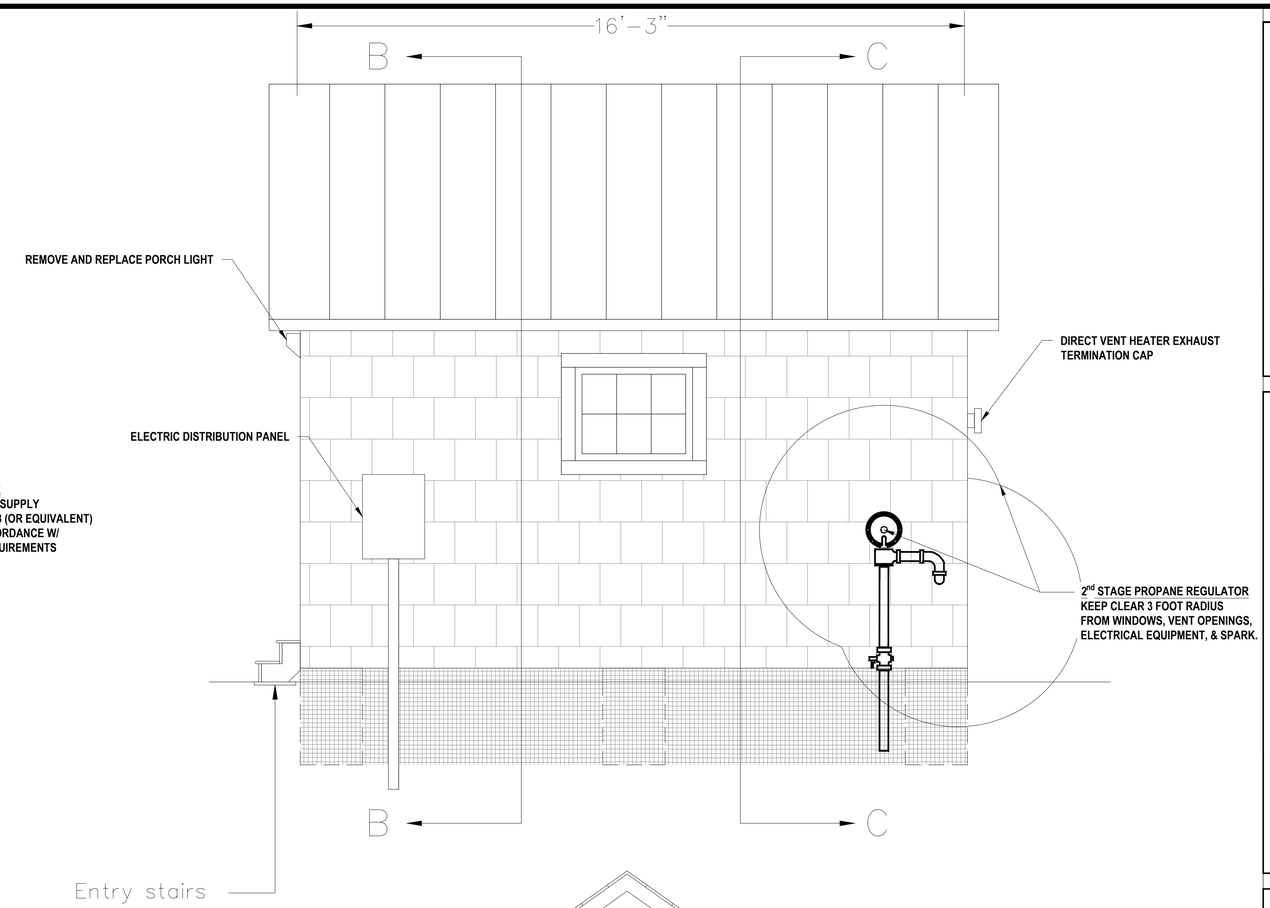
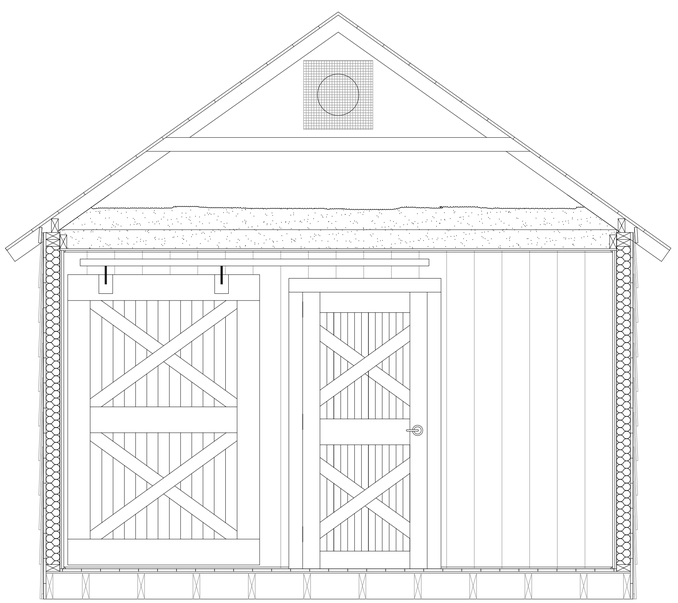
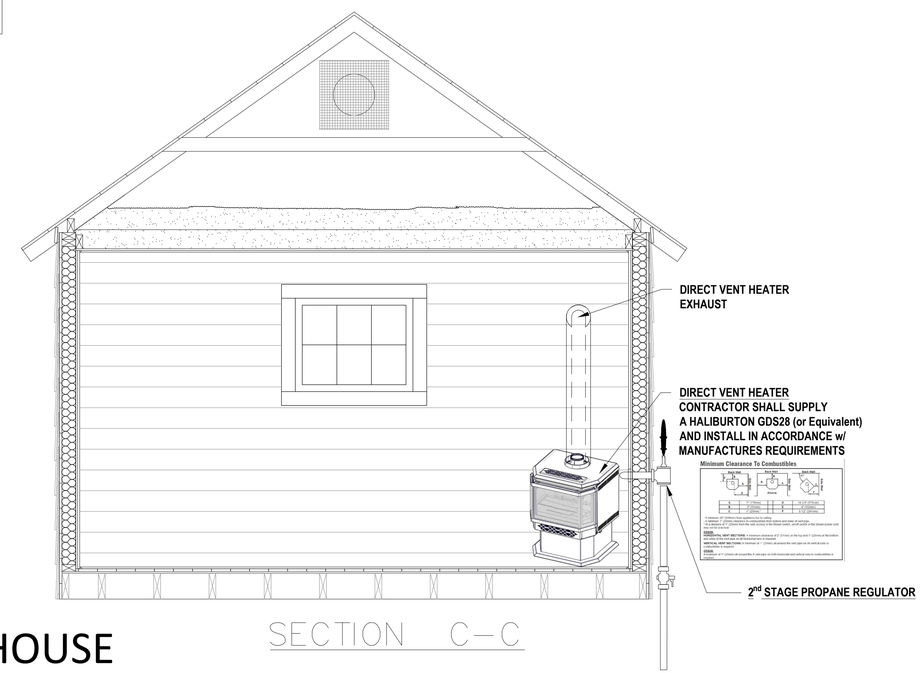






SECTION B–B



SECTION C–C

BUNKHOUSE
ELEVATION AND SECTION VIEWS

United States Department of Agriculture
Forest Service

R1
NORTHERN REGION

PROJECT NAME

STAR MEADOWS

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

Bunkhouse Heat

DATE
12/15/2022

ARCHIVE NO.

DESIGNER
P.SIERS

DRAWN
P.SIERS

CHECKED
P.SIERS

PROJECT NO.

DWG SHEET NO.
M-1

SHEET 09 OF 20

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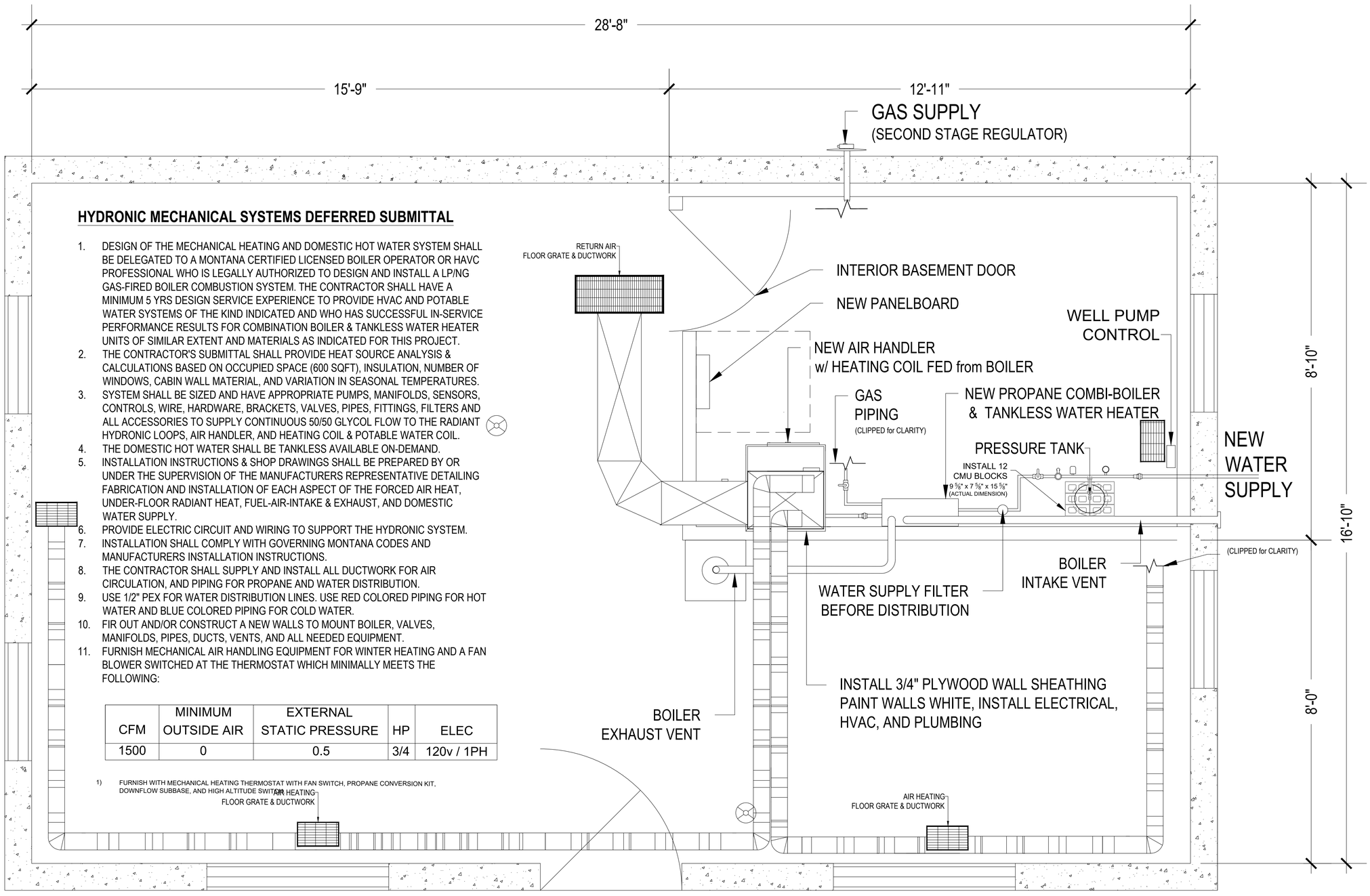
HYDRONIC MECHANICAL SYSTEMS DEFERRED SUBMITTAL

1. DESIGN OF THE MECHANICAL HEATING AND DOMESTIC HOT WATER SYSTEM SHALL BE DELEGATED TO A MONTANA CERTIFIED LICENSED BOILER OPERATOR OR HAVC PROFESSIONAL WHO IS LEGALLY AUTHORIZED TO DESIGN AND INSTALL A LP/NG GAS-FIRED BOILER COMBUSTION SYSTEM. THE CONTRACTOR SHALL HAVE A MINIMUM 5 YRS DESIGN SERVICE EXPERIENCE TO PROVIDE HVAC AND POTABLE WATER SYSTEMS OF THE KIND INDICATED AND WHO HAS SUCCESSFUL IN-SERVICE PERFORMANCE RESULTS FOR COMBINATION BOILER & TANKLESS WATER HEATER UNITS OF SIMILAR EXTENT AND MATERIALS AS INDICATED FOR THIS PROJECT.
2. THE CONTRACTOR'S SUBMITTAL SHALL PROVIDE HEAT SOURCE ANALYSIS & CALCULATIONS BASED ON OCCUPIED SPACE (600 SQFT), INSULATION, NUMBER OF WINDOWS, CABIN WALL MATERIAL, AND VARIATION IN SEASONAL TEMPERATURES.
3. SYSTEM SHALL BE SIZED AND HAVE APPROPRIATE PUMPS, MANIFOLDS, SENSORS, CONTROLS, WIRE, HARDWARE, BRACKETS, VALVES, PIPES, FITTINGS, FILTERS AND ALL ACCESSORIES TO SUPPLY CONTINUOUS 50/50 GLYCOL FLOW TO THE RADIANT HYDRONIC LOOPS, AIR HANDLER, AND HEATING COIL & POTABLE WATER COIL.
4. THE DOMESTIC HOT WATER SHALL BE TANKLESS AVAILABLE ON-DEMAND.
5. INSTALLATION INSTRUCTIONS & SHOP DRAWINGS SHALL BE PREPARED BY OR UNDER THE SUPERVISION OF THE MANUFACTURERS REPRESENTATIVE DETAILING FABRICATION AND INSTALLATION OF EACH ASPECT OF THE FORCED AIR HEAT, UNDER-FLOOR RADIANT HEAT, FUEL-AIR-INTAKE & EXHAUST, AND DOMESTIC WATER SUPPLY.
6. PROVIDE ELECTRIC CIRCUIT AND WIRING TO SUPPORT THE HYDRONIC SYSTEM.
7. INSTALLATION SHALL COMPLY WITH GOVERNING MONTANA CODES AND MANUFACTURERS INSTALLATION INSTRUCTIONS.
8. THE CONTRACTOR SHALL SUPPLY AND INSTALL ALL DUCTWORK FOR AIR CIRCULATION, AND PIPING FOR PROPANE AND WATER DISTRIBUTION.
9. USE 1/2" PEX FOR WATER DISTRIBUTION LINES. USE RED COLORED PIPING FOR HOT WATER AND BLUE COLORED PIPING FOR COLD WATER.
10. FIR OUT AND/OR CONSTRUCT A NEW WALLS TO MOUNT BOILER, VALVES, MANIFOLDS, PIPES, DUCTS, VENTS, AND ALL NEEDED EQUIPMENT.
11. FURNISH MECHANICAL AIR HANDLING EQUIPMENT FOR WINTER HEATING AND A FAN BLOWER SWITCHED AT THE THERMOSTAT WHICH MINIMALLY MEETS THE FOLLOWING:

CFM	MINIMUM OUTSIDE AIR	EXTERNAL STATIC PRESSURE	HP	ELEC
1500	0	0.5	3/4	120v / 1PH

1) FURNISH WITH MECHANICAL HEATING THERMOSTAT WITH FAN SWITCH, PROPANE CONVERSION KIT, DOWNFLOW SUBBASE, AND HIGH ALTITUDE SWITCH.



1 MECHANICAL PLANS: PROPANE GAS, FORCED AIR & WATER
NTS

United States Department of Agriculture
Forest Service

R01
NORTHERN REGION

PROJECT NAME
STAR MEADOW CABIN

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE
HYDRONIC SYSTEMS

DATE
12/2/2022

ARCHIVE NO.

DESIGNER
PATRICK SIERS

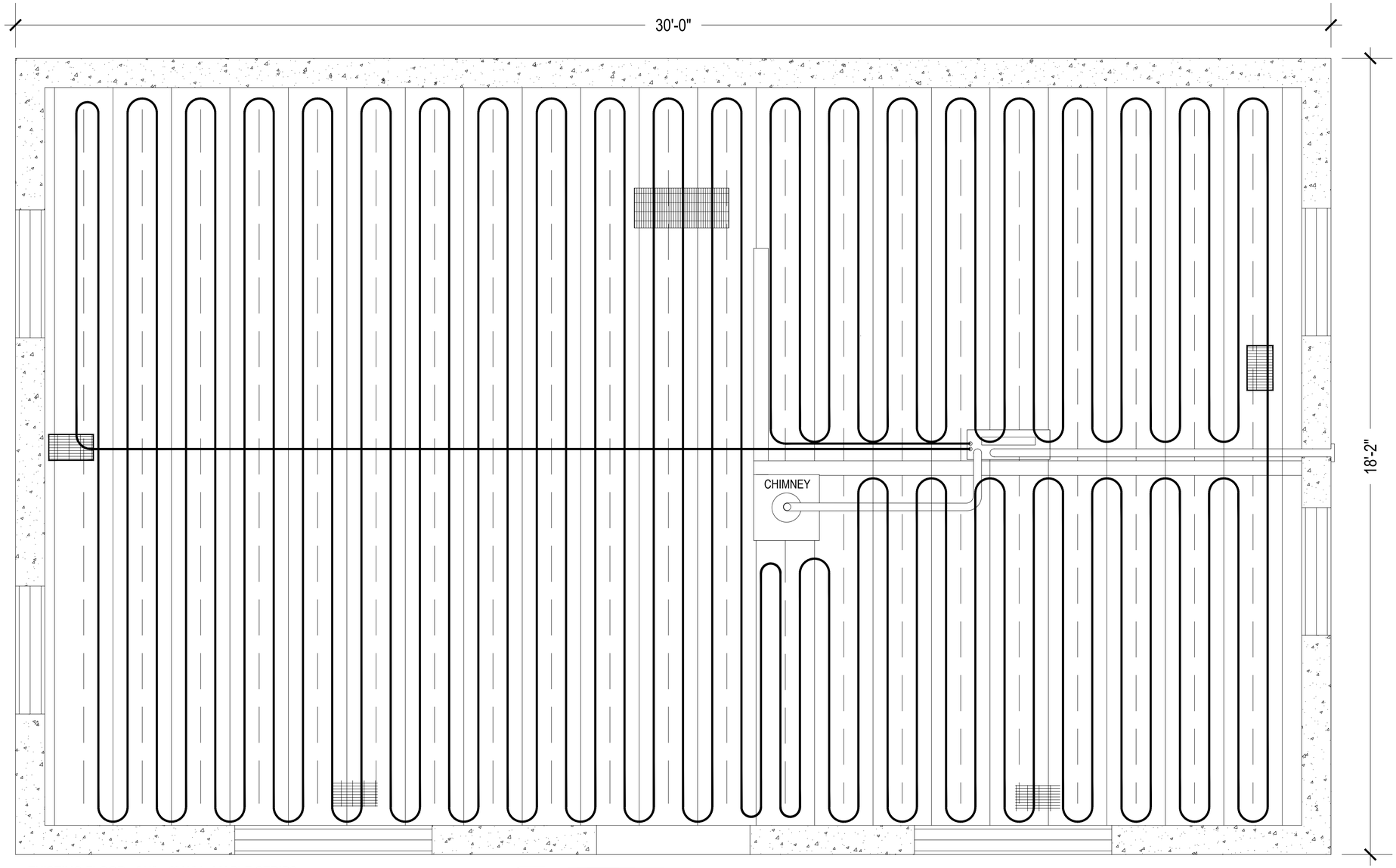
DRAWN
PATRICK SIERS

CHECKED
TRAVIS TAYLOR

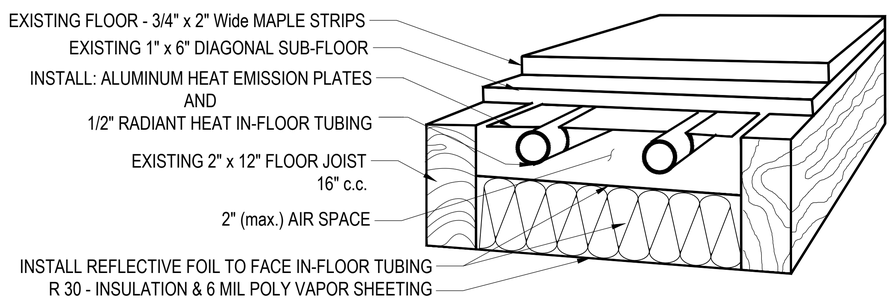
PROJECT NO.

DWG SHEET NO.
M-02

SHEET **10** OF **20**



1 RADIANT HEAT PLAN : UNDER FLOOR
NTS



2 UNDER FLOOR RADIANT HEAT DETAIL
NTS

United States Department of Agriculture
Forest Service

R01
NORTHERN REGION

PROJECT NAME

STAR MEADOW CABIN

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

RAIDIANT HEAT DETAILS

DATE **12/2/2024**	
ARCHIVE NO.	
DESIGNER **PATRICK SIERS**	DWG SHEET NO. **M-03**
DRAWN **PATRICK SIERS**	
CHECKED **TRAVIS TAYLOR**	SHEET **11** OF **20**
PROJECT NO.	

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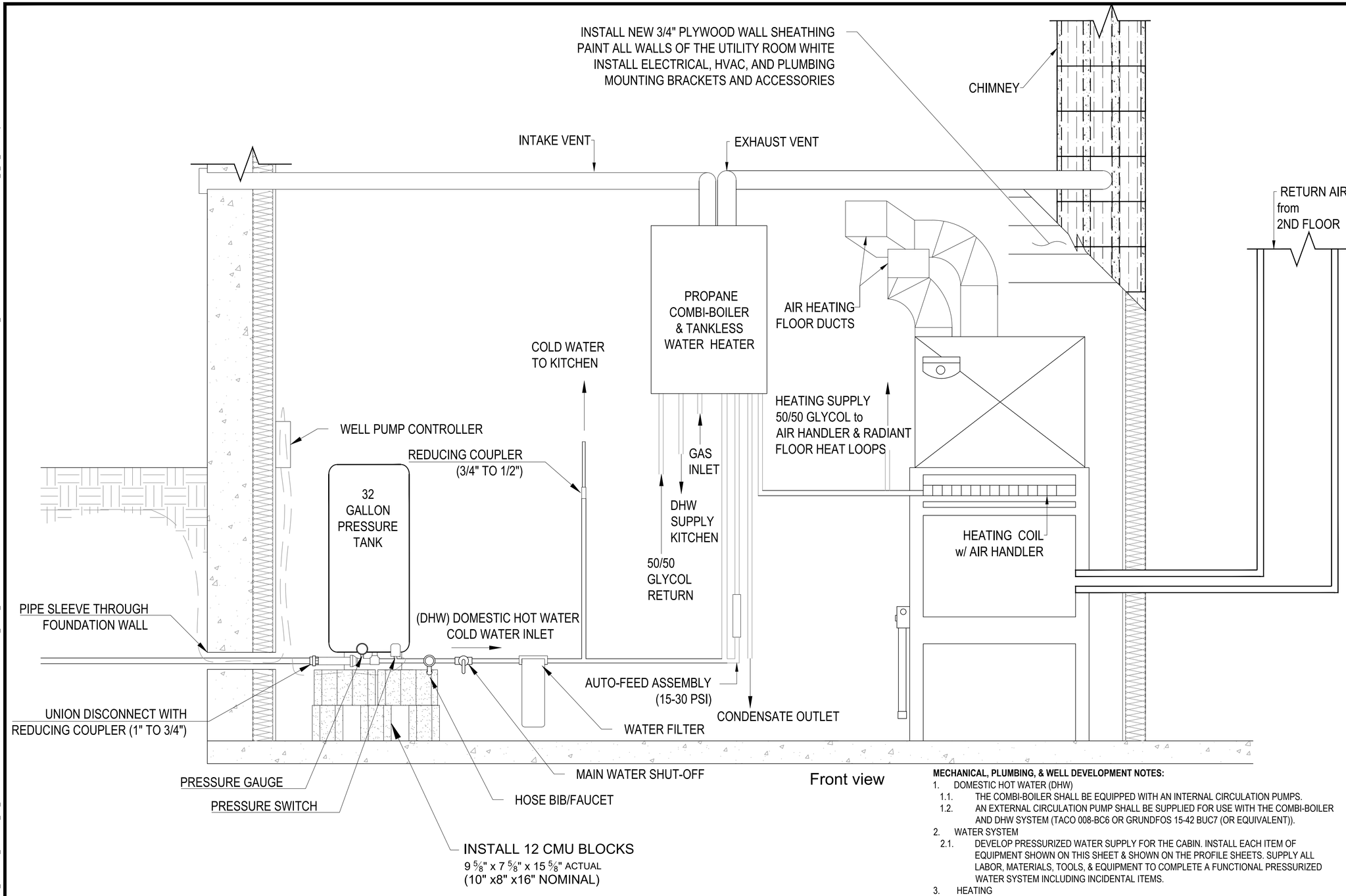

Front view

1 WATER DISTRIBUTION TYPICAL
NTS

MECHANICAL, PLUMBING, & WELL DEVELOPMENT NOTES:

1. DOMESTIC HOT WATER (DHW)
   - 1.1. THE COMBI-BOILER SHALL BE EQUIPPED WITH AN INTERNAL CIRCULATION PUMPS.
   - 1.2. AN EXTERNAL CIRCULATION PUMP SHALL BE SUPPLIED FOR USE WITH THE COMBI-BOILER AND DHW SYSTEM (TACO 008-BC6 OR GRUNDFOS 15-42 BUC7 (OR EQUIVALENT)).
2. WATER SYSTEM
   - 2.1. DEVELOP PRESSURIZED WATER SUPPLY FOR THE CABIN. INSTALL EACH ITEM OF EQUIPMENT SHOWN ON THIS SHEET & SHOWN ON THE PROFILE SHEETS. SUPPLY ALL LABOR, MATERIALS, TOOLS, & EQUIPMENT TO COMPLETE A FUNCTIONAL PRESSURIZED WATER SYSTEM INCLUDING INCIDENTAL ITEMS.
3. HEATING
   - 3.1. BOILER SHALL HAVE CONTROLS FOR THREE ZONE VALVES AND PUMPS.
   - 3.2. PUMP RATES SHALL BE SET & SIZED FOR FULL CONTINUOUS FLOW W/ 50/50 GLYCOL.
4. AIR HANDLER
   - 4.1. BLOWER MOTOR SHALL BE SIZED AND DUCTWORK PLACED TO ENSURE A SUFFICIENT AMOUNT OF AIR CIRCULATES PROVIDING CONSISTENT TEMPERATURES IN THE CABIN.
   - 4.2. HVAC INSTALLERS SHALL BALANCE THE AIR SYSTEM WHEN IT IS INSTALLED. AIRFLOW DAMPERS & REGISTERS MUST BE ADJUSTED ON BOTH SUPPLY AND RETURN VENTS.
   - 4.3. PLACE SUPPLY DUCTS TO COUNTER ACT HEAT LOSS DUE TO WINDOWS AND DOORS.

United States Department of Agriculture
Forest Service

R01
NORTHERN REGION

PROJECT NAME

STAR MEADOW CABIN

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

WATER, AIR BLOWER & BOILER LAYOUT

DATE
12/2/2022

ARCHIVE NO.
P.SIERS

DESIGNER
P.SIERS

DRAWN
P.SIERS

CHECKED
TRAVIS TAYLOR

PROJECT NO.

DWG SHEET NO.
M-4 P-2

SHEET **12** OF **20**

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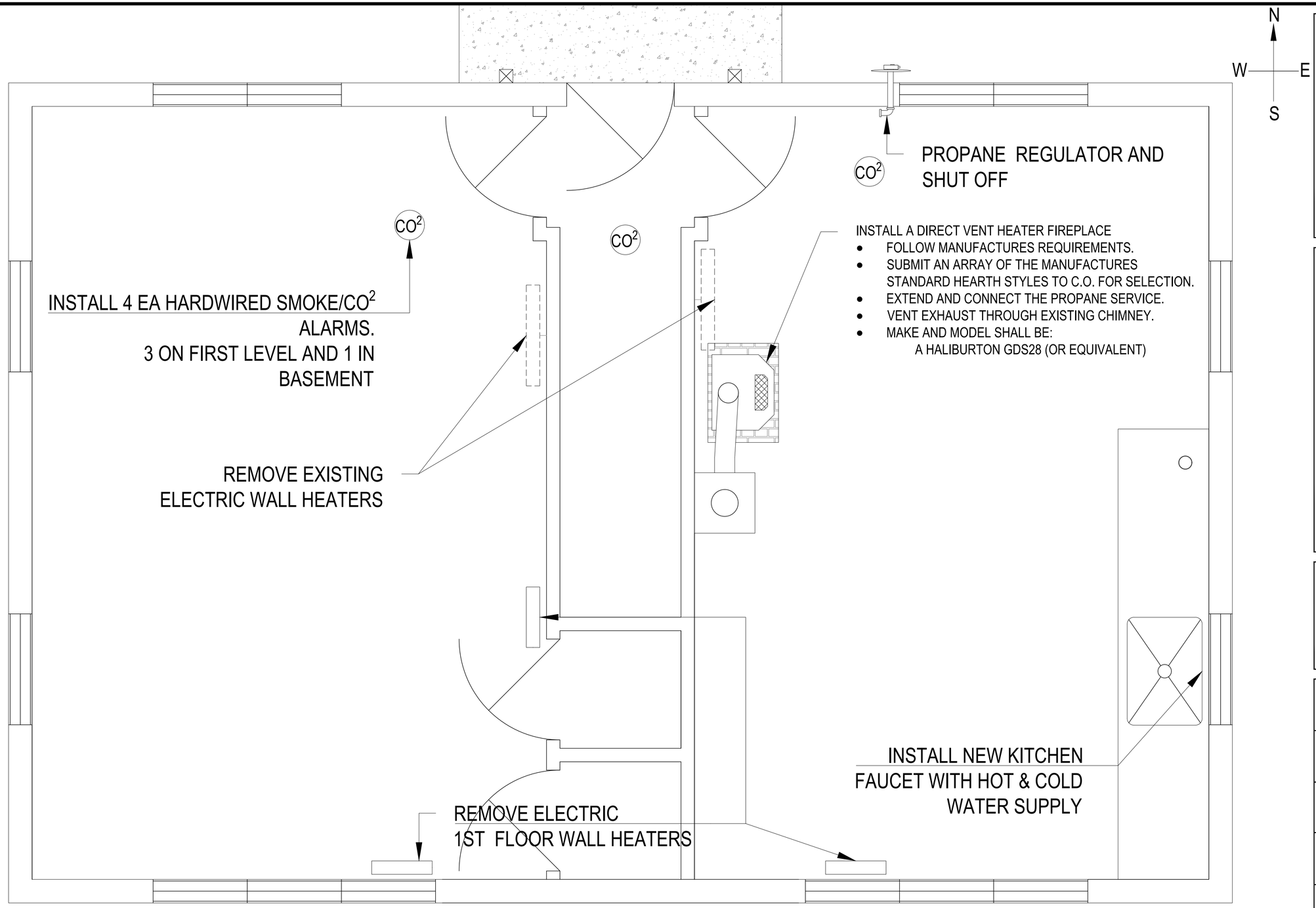

1 FIRST LEVEL: WATER & MECHANICAL
NTS

United States Department of Agriculture
Forest Service

R01
NORTHERN REGION

PROJECT NAME

STAR MEADOW CABIN

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

MECHANICAL AND PLUMBING PLAN

DATE
12/2/2022

ARCHIVE NO.
FS090523_R102013_L1-002.dwg

DESIGNER
R. STOVALL

DRAWN
R. STOVALL

CHECKED
P.SIERS

PROJECT NO.

DWG SHEET NO.
M-5 P-3

SHEET **13** OF **20**

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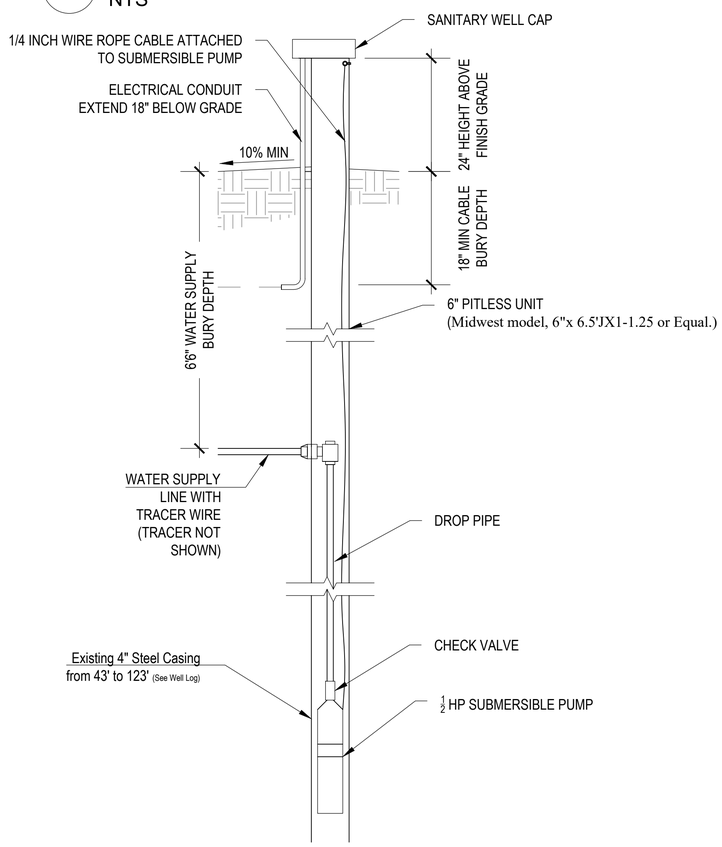
RETURN HAND PUMP TO COR

DEVELOP EXISTING WELL

DEMOLISH AND DISPOSE OF EXISTING CONCRETE PAD

FINISH GRADING USING NATIVE SOILS WITH POSITIVE DRAINAGE AWAY FROM WELL CASING.

3 WELL DEVELOPMENT SITE
NTS



WELL DEVELOPMENT NOTES:

1. INSTALL NEW SANITARY WELL PUMP, PITLESS UNIT, EQUIPMENT & ALL ASSOCIATED PLUMBING NECESSARY FOR OPERATION.

1 WELL SUBMERSIBLE PUMP & PITLESS
NTS

MONTANA WELL LOG REPORT

This well log reports the activities of a licensed Montana well driller, serves as the official record of work done within the borehole and casing, and describes the amount of water encountered. This report is compiled electronically from the contents of the Ground Water Information Center (GWIC) database for this site. Acquiring water rights is the well owner's responsibility and is NOT accomplished by the filing of this report.

Site Name: USDA FOREST SERVICE
GWIC Id: 222661

Section 1: Well Owner(s)

1) FLATHEAD NATIONAL FOREST (MAIL)
1935 3RD AVENUE EAST
KALISPELL MT 59901 [09/22/2005]

Section 2: Location

Township	Range	Section	Quarter Sections
30N	24W	7	NW¼ NE¼

County	Geocode
FLATHEAD	

Latitude	Longitude	Geomethod	Datum
48.383175	-114.705727	TRS-SEC	NAD83

Ground Surface Altitude	Ground Surface Method	Datum	Date

Addition	Block	Lot

Section 3: Proposed Use of Water

PUBLIC WATER SUPPLY (1)

Section 4: Type of Work

Drilling Method: ROTARY
Status: NEW WELL

Section 5: Well Completion Date

Date well completed: Thursday, September 22, 2005

Section 6: Well Construction Details

Borehole dimensions

From	To	Diameter
0	65	10
65	125	6

Casing

From	To	Diameter	Wall Thickness	Pressure Rating	Joint	Type
-2.1	65	6	0.250		WELDED	A53B STEEL
43	123	4		200.00	SPLINE	PVC-SDR 17

Completion (Perf/Screen)

From	To	Diameter	# of Openings	Size of Openings	Description
83	123	4	160	1/4 X 6	SAW SLOTS

Annular Space (Seal/Grout/Packer)

From	To	Description	Cont. Fed?
0	65	NEAT CEMENT	

Section 7: Well Test Data

Total Depth: 125
Static Water Level: 7.6
Water Temperature:

Air Test *

12 gpm with drill stem set at 80 feet for 1.5 hours.
Time of recovery 0.5 hours.
Recovery water level 7.6 feet.
Pumping water level _ feet.

** During the well test the discharge rate shall be as uniform as possible. This rate may or may not be the sustainable yield of the well. Sustainable yield does not include the reservoir of the well casing.*

Section 8: Remarks

THIS WELL LOG IS TO REPLACE GWIC ID #221802 FILED UNDER USDA FOREST SERVICE - TALLY LAKE RANGER DISTRICT FILED 10-13-05

Section 9: Well Log

Geologic Source
Unassigned

From	To	Description
0	8	GRAVEL & COBBLESTONES IN TAN SILTY CLAY MATRIX.
8	25	SLIGHTLY FRACTURED TO FRACTURED GREEN AND TAN ROCK.
25	58	SLIGHTLY FRACTURED GRAY TO PURPLE ROCK WITH TAN CLAY IN FRACTURES.
58	61	FRACTURED GREEN ROCK.
61	71	GREEN ROCK.
71	82	SLIGHTLY FRACTURED GRAY ROCK WITH TAN CLAY IN FRACTURES.
82	88	FRACTURED GRAY AND TAN ROCK. SEEP OF WATER.
88	112	FRACTURED GREEN ROCK - SEEPS OF WATER.
112	125	GRAY TO PURPLE ROCK. 12 GPM TOTAL WATER.

Driller Certification

All work performed and reported in this well log is in compliance with the Montana well construction standards. This report is true to the best of my knowledge.

Name:
Company: LIBERTY DRILLING & PUMP CO
License No: WWC-458
Date Completed: 9/22/2005

2 WELL LOG
NTS

United States Department of Agriculture
Forest Service

R01
NORTHERN REGION

PROJECT NAME

STAR MEADOW CABIN

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

WELL & WELL LOG

DATE
12/2/2022

ARCHIVE NO.
FS090523_R102013_L1-002.dwg

DESIGNER
R. STOVALL

DRAWN
R. STOVALL

CHECKED
P.SIERS

PROJECT NO.

DWG SHEET NO.
P-04

SHEET **14** OF **20**

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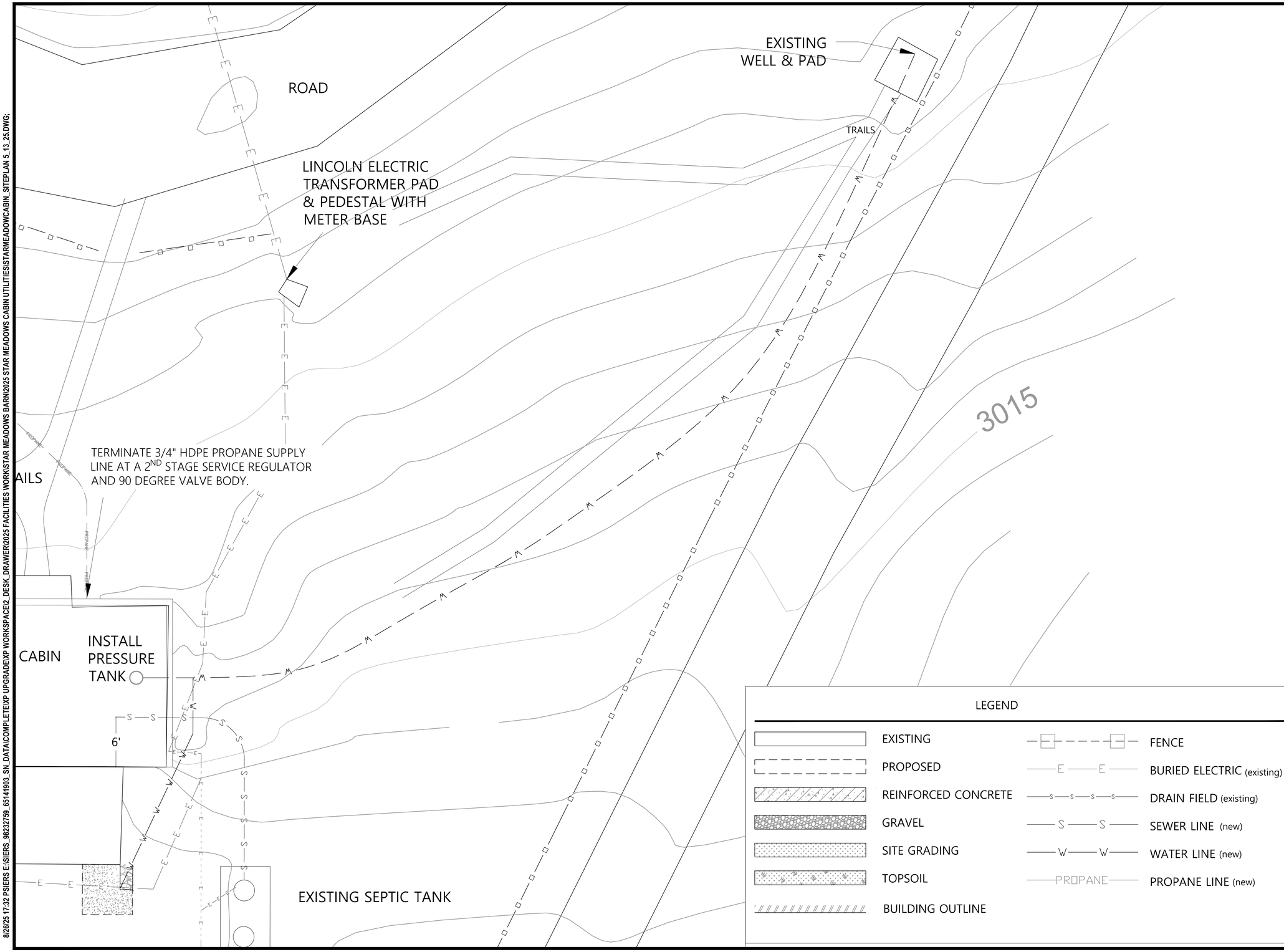

LEGEND

	EXISTING		FENCE
	PROPOSED	E	BURIED ELECTRIC (existing)
	REINFORCED CONCRETE	S	DRAIN FIELD (existing)
	GRAVEL	S	SEWER LINE (new)
	SITE GRADING	W	WATER LINE (new)
	TOPSOIL	PROPANE	PROPANE LINE (new)
	BUILDING OUTLINE		

United States Department of Agriculture
Forest Service

R1
NORTHERN REGION

PROJECT NAME

STAR MEADOWS

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

Waterline Plan

DATE
12/15/2022

ARCHIVE NO.

DESIGNER
P.SIERS

DRAWN
P.SIERS

CHECKED
P.SIERS

PROJECT NO.

DWG SHEET NO.
P-05

SHEET 15 OF 20

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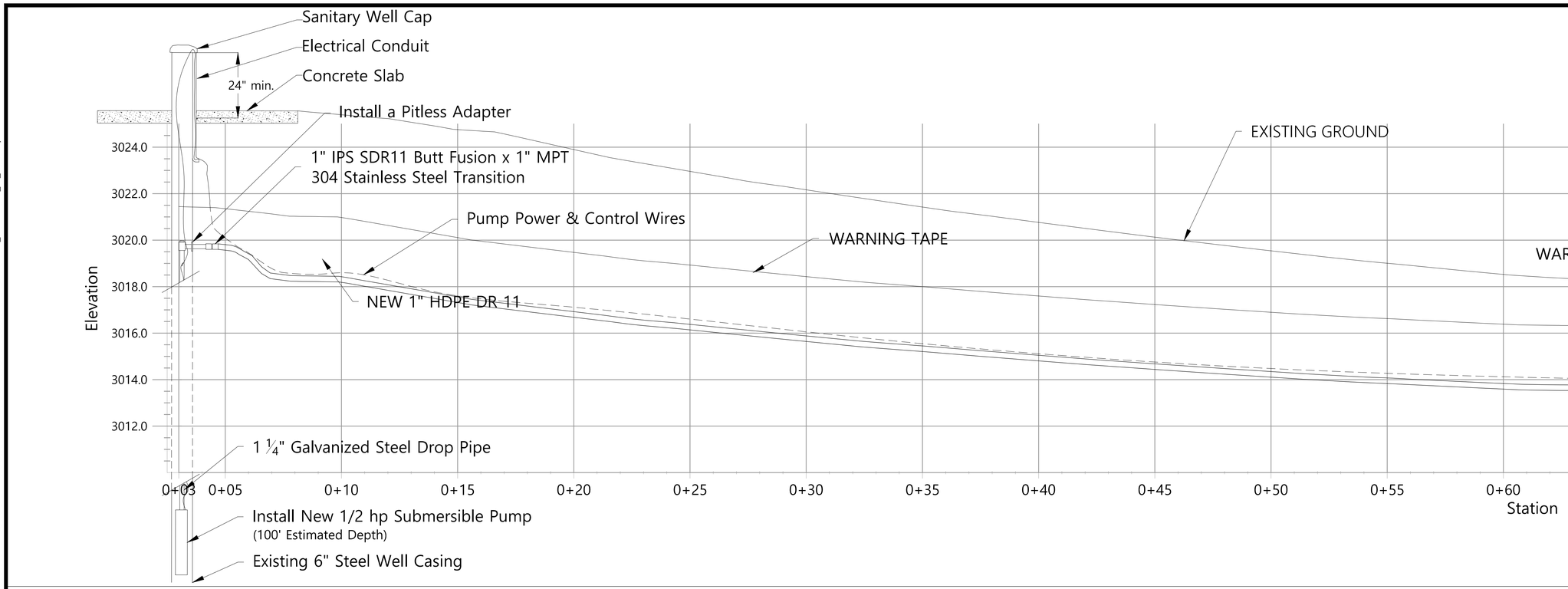

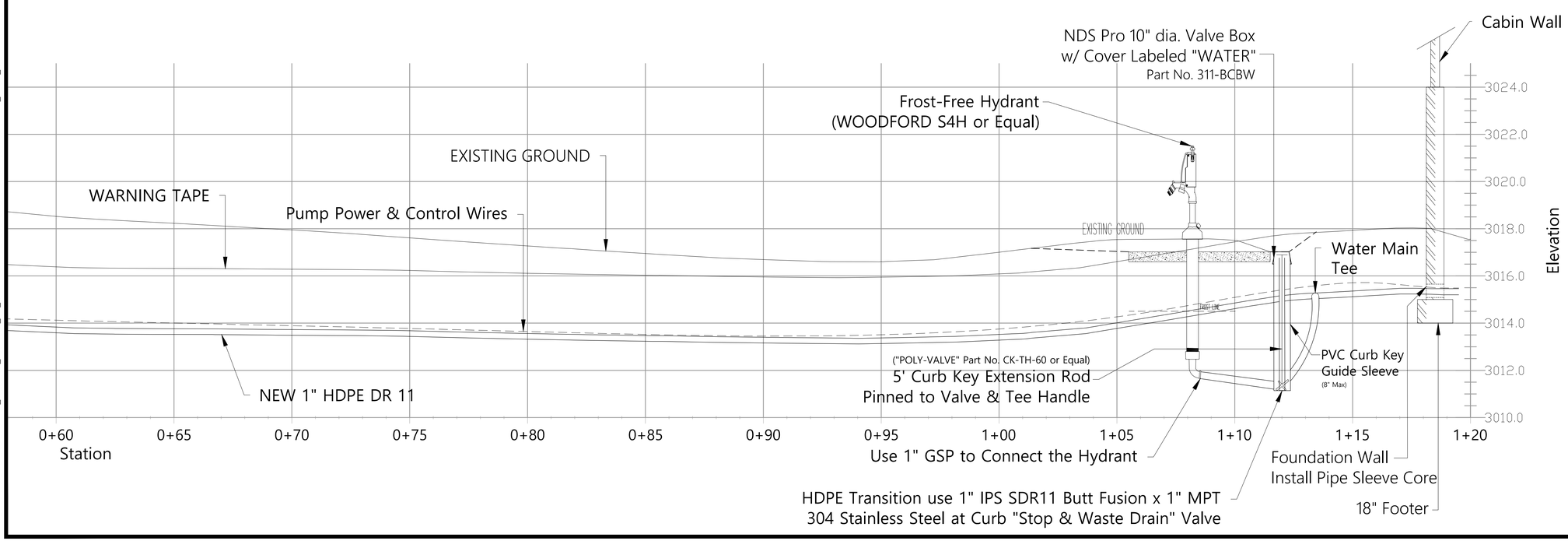

United States Department of Agriculture
Forest Service

R1
NORTHERN REGION

PROJECT NAME

STAR MEADOWS

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

Waterline Profile & Hand Pump

DATE
12/15/2022

ARCHIVE NO.

DESIGNER
P.SIERS

DRAWN
P.SIERS

CHECKED
Travis Taylor

PROJECT NO.

DWG SHEET NO.
P-06

SHEET **16** OF **20**

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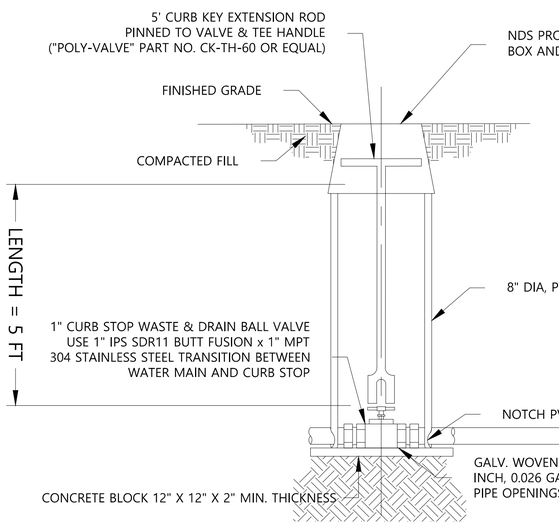
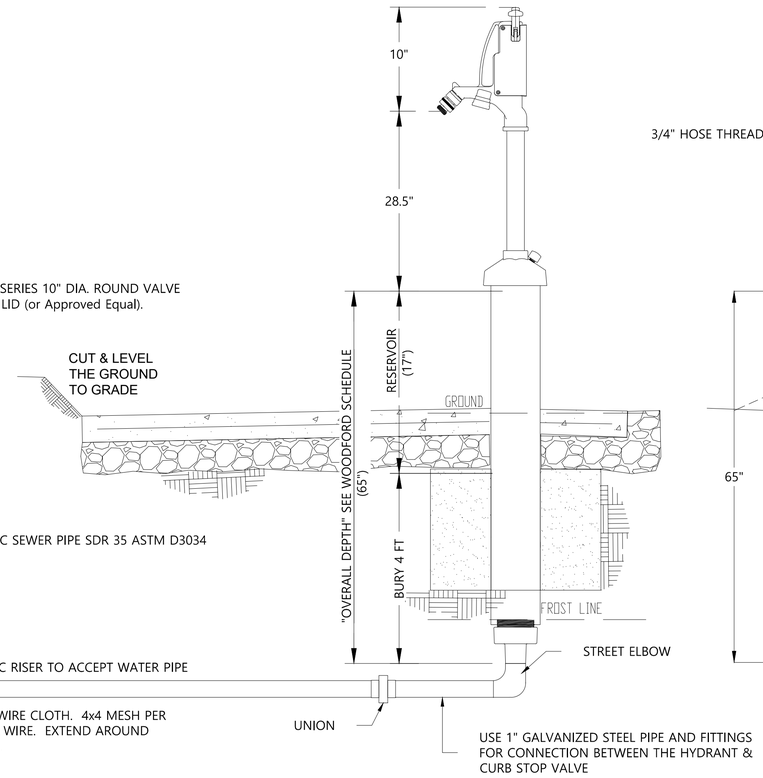


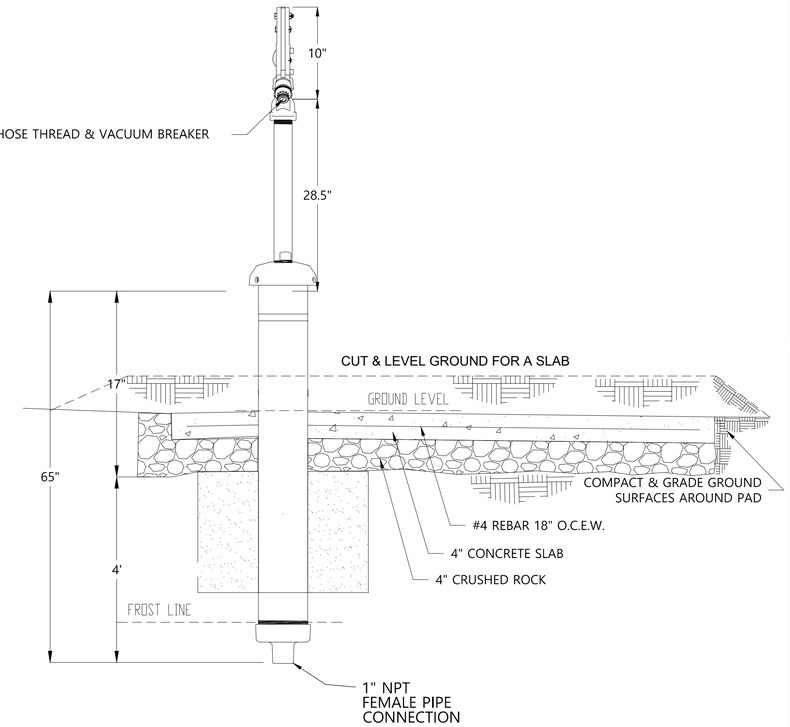
VALVE AND VALVE BOX

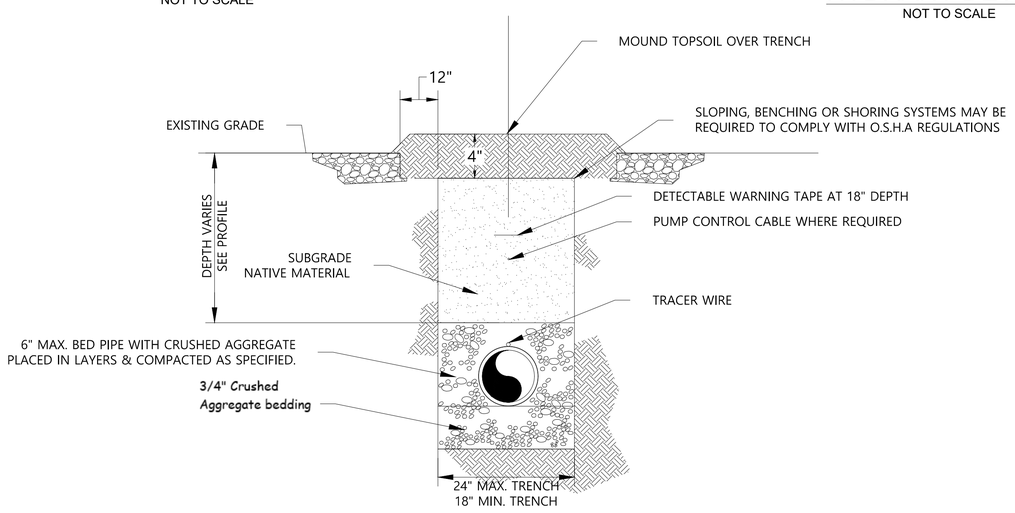
NOT TO SCALE



HYDRANT DETAILS

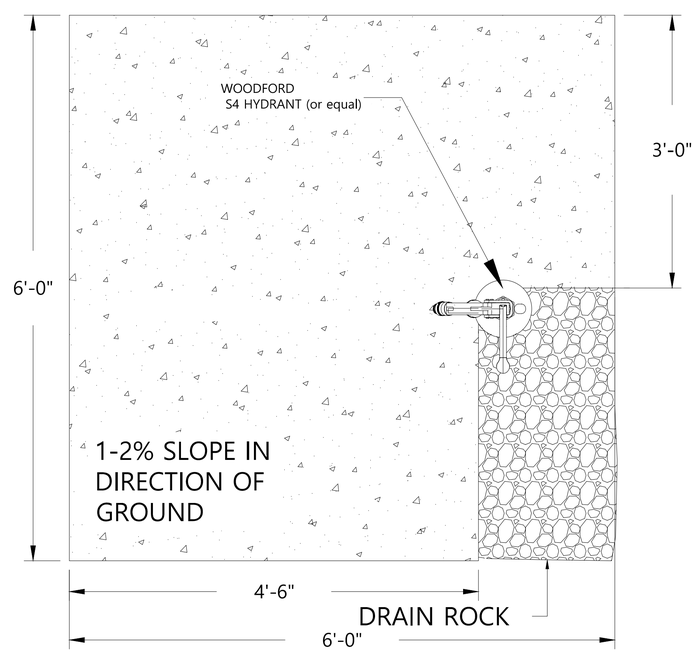
NOT TO SCALE





ALL UTILITIES TRENCH DETAIL (UNLESS OTHERWISE NOTED)

NOT TO SCALE



United States Department of Agriculture
Forest Service

R1
NORTHERN REGION

PROJECT NAME

STAR MEADOWS

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

ALL Trenches, Pad & Hydrant Details

DATE
12/15/2022

ARCHIVE NO.

DESIGNER
P.SIERS

DRAWN
P.SIERS

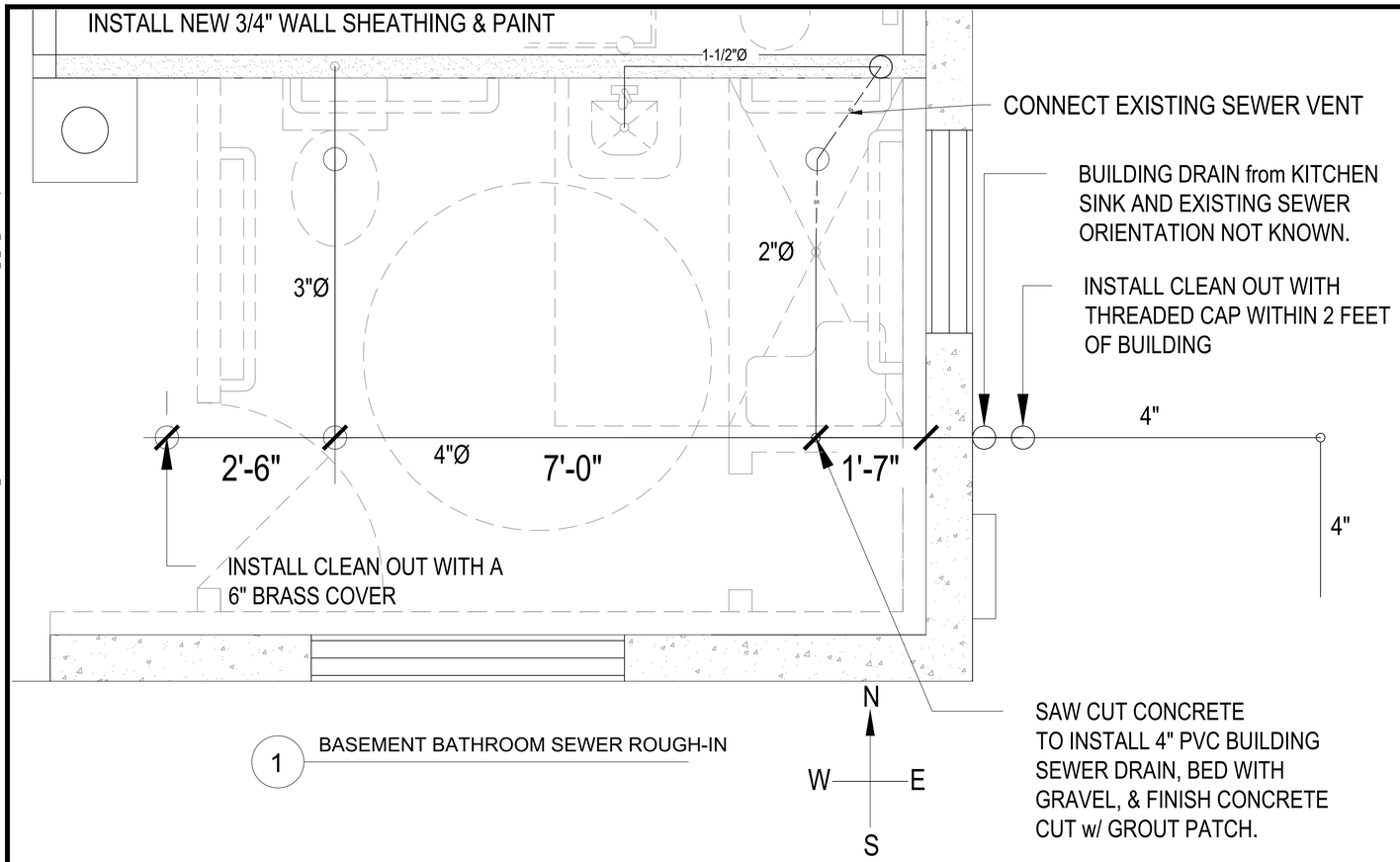
CHECKED
P.SIERS

PROJECT NO.

DWG SHEET NO.
P-07

SHEET **17** OF **20**

8/26/25 17:32 PSIERS E:\SIERS_98232759_65141903_SN_DATA\COMPLETE\XP UPGRADE\XP WORKSPACE\2_DESK_DRAWER\2025 FACILITIES WORK\STAR MEADOWS BARN\2025 STAR MEADOWS CABIN UTILITIES\STARMEADOWCABIN_SITEPLAN 5_13_25.DWG;



1 BASEMENT BATHROOM SEWER ROUGH-IN

BASEMENT BATHROOM STUB IN NOTES:

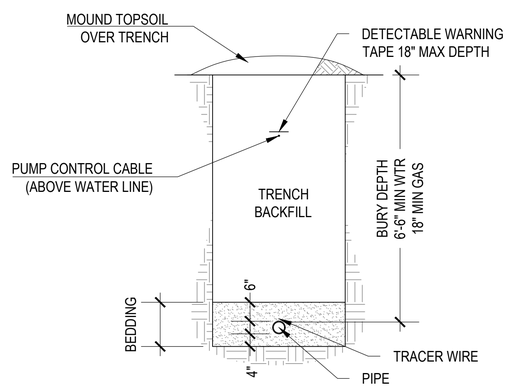
1. INSTALL 4-INCH SEWER PVC FROM EXISTING SEPTIC TANK INLET TO THE EXISTING BATHROOM FOR CONNECTIONS.
2. PROVIDE TWO CLEAN OUTS:
   - 2.1. INSTALL A SEWER LINE CLEAN OUT AT THE TERMINATION IN THE BATHROOM WITH A 6-INCH BRASS COVER AND A 4-INCH ADJUSTABLE HUB.
   - 2.2. INSTALL AN EXTERIOR CLEAN OUT WITH A THREADED PLUG WITHIN 2 FEET OF THE BUILDING.
3. MAINTAIN A (2% min.) SLOPE THAT DRAINS FROM THE CLEAN OUT LOCATION IN THE BATHROOM TO THE SEPTIC TANK INLET.
4. BURY PIPES TO THE GREATEST EXTENT POSSIBLE USING THE SEPTIC TANK INLET AS THE ELEVATION CONTROL POINT.
5. EXCAVATE AND EXPOSE EXISTING BUILDING DRAIN SERVING THE KITCHEN SINK AND RECONFIGURE PIPING TO CONNECT WITH THE NEW 4-INCH SEWER LINE.
6. ALL SEWER PIPING SHALL BE POLYVINYL CHLORIDE (PVC) SCHEDULE 40.

WARNING TAPE AND TRACER WIRES:

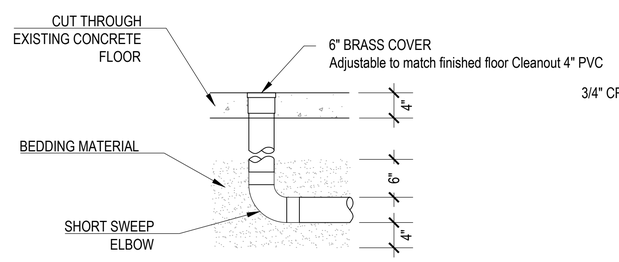
7. INSTALL WARNING TAPE AND TRACER WIRES IN EACH NEW UTILITY TRENCH PER DETAIL 2 OF THIS SHEET.
8. NEW UTILTIES REQURING WARNING TAPE AND TRACER WIRES INCLUDE THE FOLLOWING:
   - 8.1. PROPANE GAS LINES
   - 8.2. WATER SUPPLY LINE
   - 8.3. WASTE WATER LINE (SEWER)
9. TRACER WIRE FOR NONMETALLIC PIPING:
   - 9.1. AN INSULATED TRACER WIRE LISTED FOR THE PURPOSE OR OTHER APPROVED CONDUCTOR SHALL BE INSTALLED ADJACENT TO UNDERGROUND NONMETALLIC PIPING. ACCESS SHALL BE PROVIDED TO THE TRACER WIRE OR THE TRACER WIRE SHALL TERMINATE ABOVE GROUND AT EACH END OF THE NONMETALLIC PIPING. THE TRACER WIRE SIZE SHALL BE NOT LESS THAN 18 AWG AND THE WIRE INSULATION TYPE SHALL BE SUITABLE FOR DIRECT BURIAL.

GENERAL NOTE:

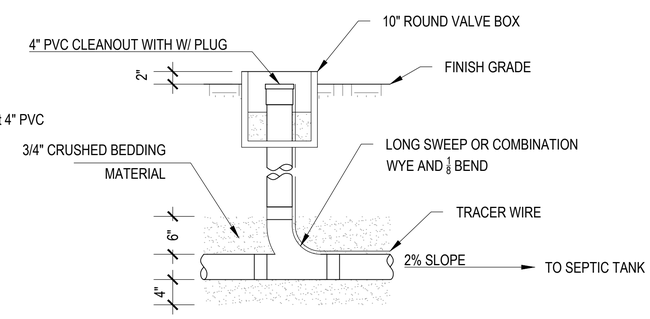
10. EXISTING BATHROOM IS NOT CONNECTED TO SEWER AND IS THEREFORE NON-FUNCTIONING.



2 TYPICAL UTILITY TRENCH DETAIL
NTS



3 BATHROOM CLEANOUT DETAIL
NTS



4 SEWER LINE CLEANOUT DETAIL
NTS

United States Department of Agriculture
Forest Service

R01
NORTHERN REGION

PROJECT NAME

STAR MEADOW CABIN

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

BASEMENT BATHROOM & SEWER

DATE **12/2/2022**	
ARCHIVE NO.	
DESIGNER **R. STOVALL**	DWG SHEET NO. **P-08**
DRAWN **R. STOVALL**	
CHECKED **PATRICK SIERS**	SHEET **18** OF **20**
PROJECT NO.	

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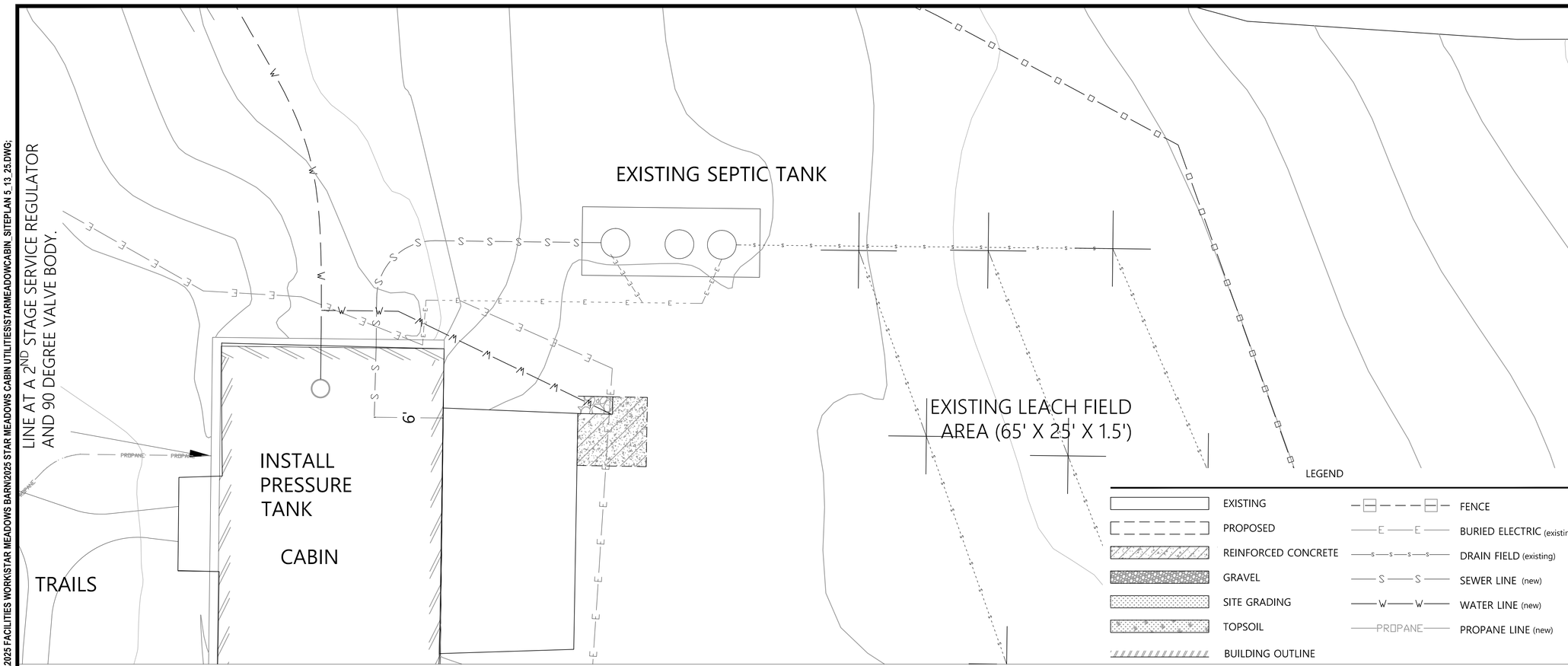

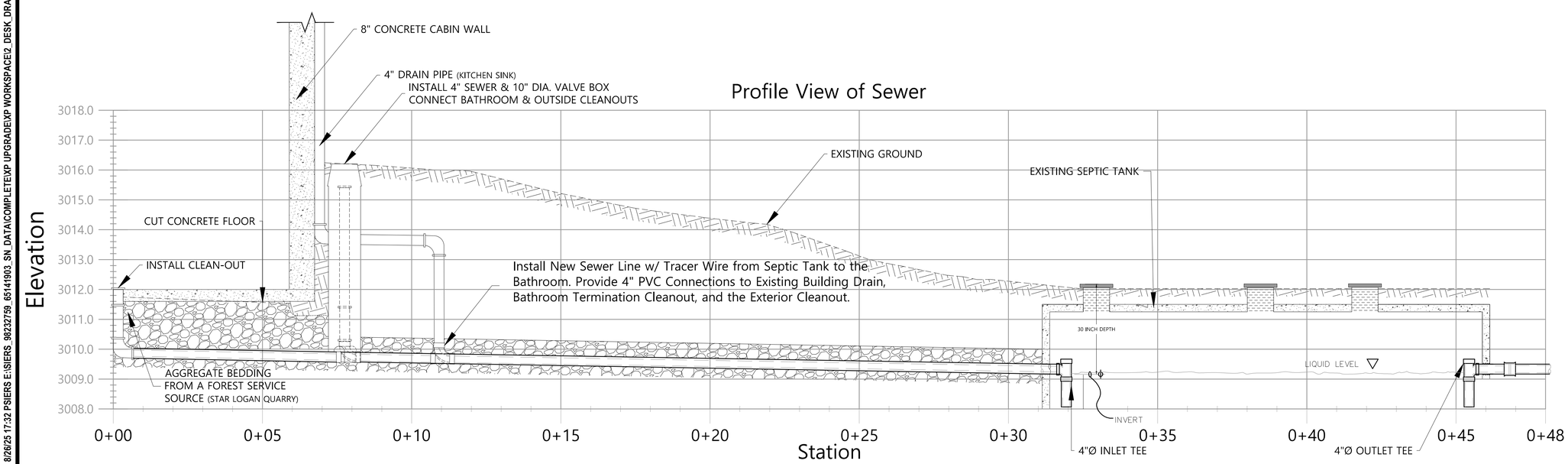

USDA FOREST SERVICE

United States Department of Agriculture
Forest Service

R1
NORTHERN REGION

PROJECT NAME

STAR MEADOWS

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

SEPTIC SYSTEM

DATE
12/15/2022

ARCHIVE NO.

DESIGNER
P.SIERS

DRAWN
P.SIERS

CHECKED
P.SIERS

PROJECT NO.

DWG SHEET NO.
P-09

SHEET **19** OF **20**

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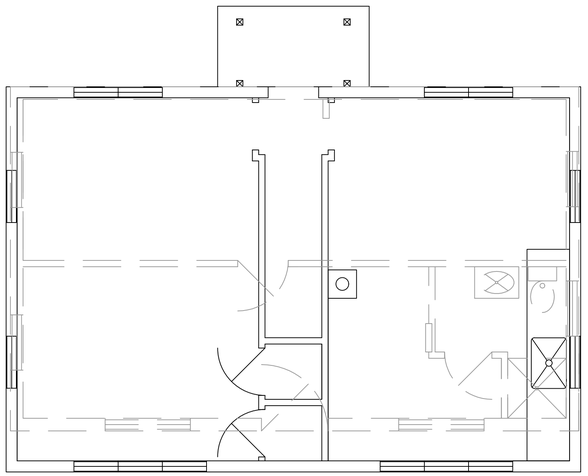
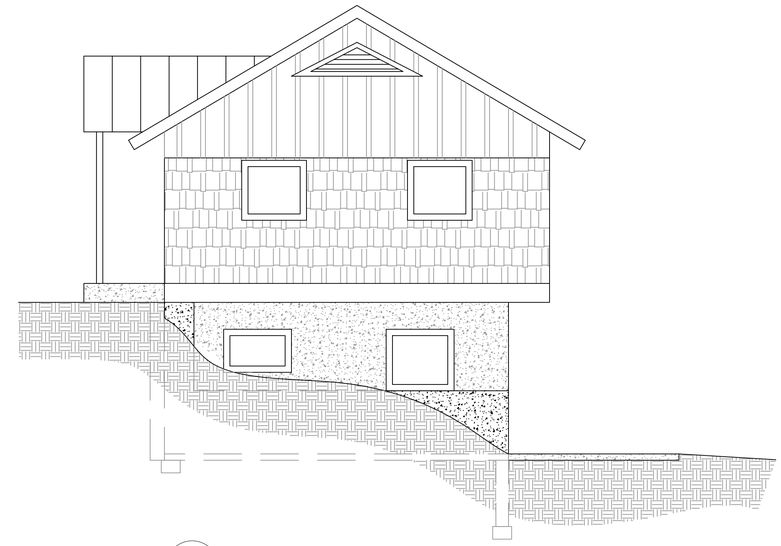
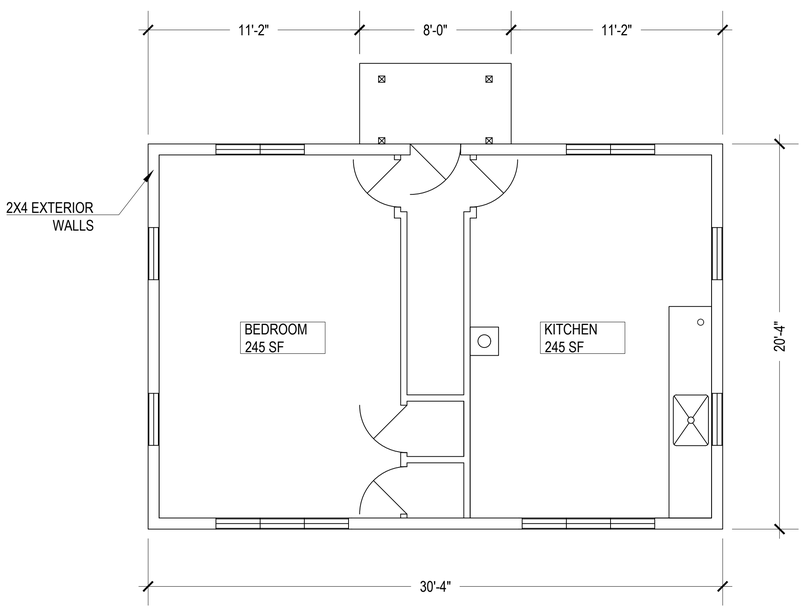


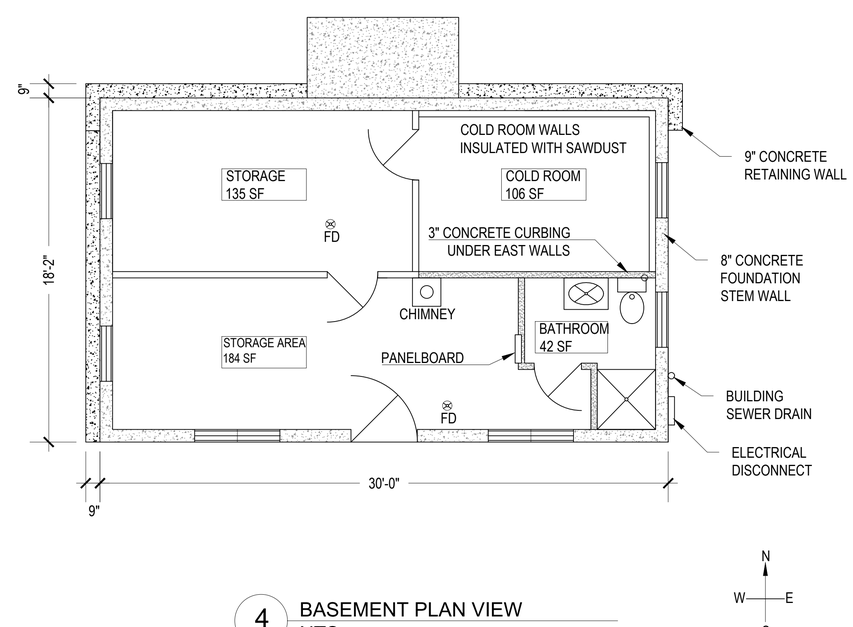
1 FIRST LEVEL OVER BASEMENT
NTS



2 SIDE ELEVATION VIEW (WEST)
NTS



3 FIRST LEVEL PLAN VIEW
NTS



4 BASEMENT PLAN VIEW
NTS

United States Department of Agriculture
Forest Service

R01
NORTHERN REGION

PROJECT NAME

STAR MEADOW CABIN

FLATHEAD NATIONAL FOREST

TALLY LAKE RANGER DISTRICT

DRAWING TITLE

EXISTING CONDITIONS

DATE
12/2/2022

ARCHIVE NO.
FS090523_R102013_L1-002.dwg

DESIGNER
R. STOVALL

DRAWN
R. STOVALL

CHECKED

PROJECT NO.

DWG SHEET NO.
A-01

SHEET **20** OF **20**

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