

Emberá Puru

Water Supply and Distribution System




Darien Province of Panama



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LEGEND	
	Supply Line
	Distribution System
	Water Storage Tank

ABBREVIATIONS

@	AT
ALT.	ALTERNATE
AV	AIR VALVE
BLDG.	BUILDING
B.O.	BOTTOM OF
CL	CENTERLINE
CONC.	CONCRETE
CV	CLEANOUT VALVE
DIA.	DIAMETER
DIM.	DIMENSION
DN.	DOWN
DWG.	DRAWING
EA.	EACH
EQ.	EQUAL
EXIST.	EXISTING
EXT.	EXTERIOR
F	FAUCET
G	GENERAL
GALV.	GALVANIZED
INT.	INTERIOR
MAX.	MAXIMUM
ME.	MECHANICAL & ELECTRICAL
MIN.	MINIMUM
MISC.	MISCELLANEOUS
N.	NORTH
N.I.S.	NOT IN SCOPE
N.T.S	NOT TO SCALE
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
OPP.	OPPOSITE
PL	PIPELINE
PROV.	PROVIDED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
R.	RADIUS
REBAR	REINFORCING BARS
REQ.	REQUIRED
S	STRUCTURAL
SPECS.	SPECIFICATIONS
SL	STEEL
ST.	STREET
T.O.	TOP OF
TYP.	TYPICAL
W/	WITH
WG	WATER GAUGE
WST	WATER STORAGE TANK

GENERAL PROJECT DATA

PROJECT LOCATION: EMBERA PURU
DARIEN, PANAMA

POPULATION: 305 PEOPLE
GROWTH RATE: 4%
EXPECTED LIFE: 20 YEARS

PROJECT SUMMARY: THE INTENTION IS TO IMPLEMENT A FUNCTIONING AND SUFFICIENT WATER SUPPLY AND DISTRIBUTION SYSTEM TO MEET THE CURRENT AND PROJECTED DEMAND OF THE COMMUNITY. THE MAIN COMPONENTS OF THE SYSTEM WILL INCLUDE WATER INTAKE STRUCTURE, CENTRIFUGAL PUMP, SUPPLY PIPELINE, RIVER CROSSING FOR PIPELINE, WATER STORAGE TANK, BOOSTER PUMP, DISTRIBUTION PIPELINE, AND ELECTRICAL SUPPLY.

APPLICABLE BUILDING CODES

Seismic Code Evaluation - Panama	2003
Wind Code Evaluation - Panama	2003



1400 Townsend Drive
Houghton, MI 49931

ISSUED FOR :
MTU 12/13/2019
FPP/GB 12/13/2019

PROJECT TITLE
**Emberá Puru Water Supply and
Distribution System**

Darien, Panama

REVISIONS

NUM.	REASON	DATE
1.0	Update	12/12/2019

THE DRAWINGS ARE PREPARED PER ESTABLISHED INDUSTRY STANDARDS AND REPRESENT THE ENGINEERS DESIGN CONCEPT. THE DRAWINGS ARE NOT INTENDED TO PROVIDE EVERY DETAIL OR CONDITION REQUIRED TO CONSTRUCT THE SYSTEM. THE CONTRACTOR THROUGH SUBMITTALS AND OTHER COORDINATION EFFORTS IS FULLY RESPONSIBLE FOR PROVIDING A COMPLETE AND OPERATIONAL SYSTEM WHETHER INDICATED ON THE PLANS OR NOT.

FILE NUMBER
N/A

DRAWING TITLE
GENERAL NOTES / PROJECT DATA

DATE : 12/12/2019 DRAWN BY : KF

DRAWING NUMBER

G - 001

01 – GENERAL REQUIREMENTS

QUALITY REQUIREMENTS

1.0 CONCRETE WORK

- 1.1 All concrete utilized for the construction of the design elements in this construction set shall follow the approved concrete mix design.
 - a. Approved Mix Design:
 - 1) One Part – Cement
 - 2) Two Parts – Sand
 - 3) Four Parts – Aggregate
 - 4) One Part – Water
 - a) Amount of water should be determine on-site based on environmental conditions and observations of the consistency.
 - b. Must retain a workable and homogeneous consistency, where all particles are completely wetted and just loose enough to pour.
 - c. All mixes must be tested for consistency with the exerted force test.
 - 5) Pat a hoe or shovel on against the surface of the concrete.
 - 6) Observe the concrete.
 - 7) A slightly shiny surface that appears greasy should be observed.
- 1.2 All concrete must be reinforced with rebar as specified in the respective drawing set.
 - a. Must be tied at all crossings.
 - b. Must maintain minimum of 1.5-inch cover on all sides.
 - c. Rebar chairs must be utilized and spaced to maintain the minimum concrete cover.
 - d. All lap joints must maintain a minimum of 24-inch overlap with at least two ties to secure.
- 1.3 All forms must have the required support and must be inspected prior to pour.
- 2.0 PIPE WORK
 - 2.1 All pipe should be installed at a minimum burial depth of 2-ft.
 - a. Exception: The valve locations must be 1-ft burial depth with smooth transitions on both sides.
 - 2.2 Connections must be sufficiently primed and cemented to allow for proper bonding.
 - a. Must clean connections prior to application.
 - b. Cement and Primer must be applied to fully cover connection.
 - c. Cement and Primer must be applied to both connections, male and female, and be applied to fully cover the surface area of the connection.
 - d. Primer must be allowed sufficient drying time prior to cement application. Reference the product label for required drying time.
 - 2.3 Trenches including more than one water line must maintain a minimum 6-inch CL to CL distance for the entire length.

- 2.4 Trenches that include electrical wire must maintain a minimum 14-inch CL to CL distance for the entire length or at least a 12-inch radial clearance of all other utilities.
 - a. Exception: The river crossing structure does not require a minimum CL to CL distance, but the electrical conduit must remain above the water line.
- 2.5 All connections must be properly inspected prior to backfill of trenches.
- 2.6 Compaction of trench backfill must follow the guidelines below to ensure minimal particle settlement.
 - a. Lift height must not exceed 1-ft.
 - b. Direct pressure must not be applied directly over conduit or PVC prior to sufficient backfill of trench.
- 3.0 ELECTRICAL
 - 3.1 All electrical components must be thoroughly inspected and properly tested prior to system start up.

INSTALLATION REQUIREMENTS

- 1.0 PIPEWORK
 - 1.1 Route of installation should be surveyed and marked.
- 2.0 ELECTRICAL COMPONENTS
 - 2.1 All electrical components must be installed by a qualified electrical worker (QEW)

TO THE BEST OF THE ENGINEER’S KNOWLEDGE, THE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES AND THE APPLICABLE SAFETY STANDARDS AS DETERMINED BY THE LOCAL AND NATIONAL AUTHORITY IN ACCORDANCE WITH THIS SECTION AND PANAMA STATUES.



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FILE NUMBER

N/A

DRAWING TITLE
Specifications

DATE: 12/12/2019
DRAWN BY: KF

DRAWING NUMBER

G - 002

ISSUED FOR :
MTU 11/22/2019
FPP/GB 12/13/2019

PROJECT TITLE
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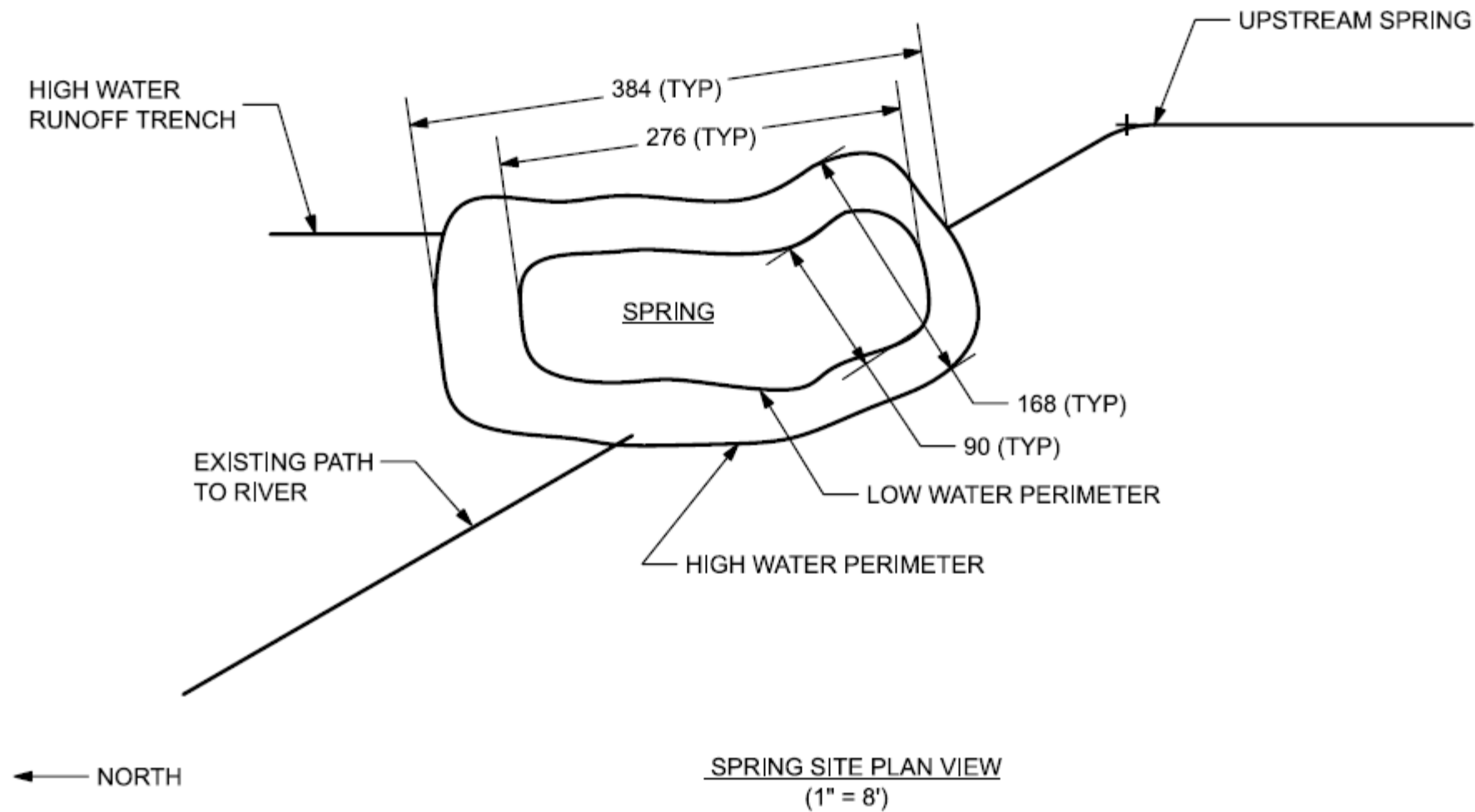
K: EmberaPuru/CADModels

DRAWING TITLE
Existing Spring Site

DATE: 11/22/2019
DRAWN BY: RH

DRAWING NUMBER

S - 001



ISSUED FOR :	
MTU	12/13/2019
FPP/GB	12/13/2019

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NUM.	REASON	DATE
1.0	Added Detail	12/8/2019

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K: EmberaPuru/CADModels

DRAWING TITLE

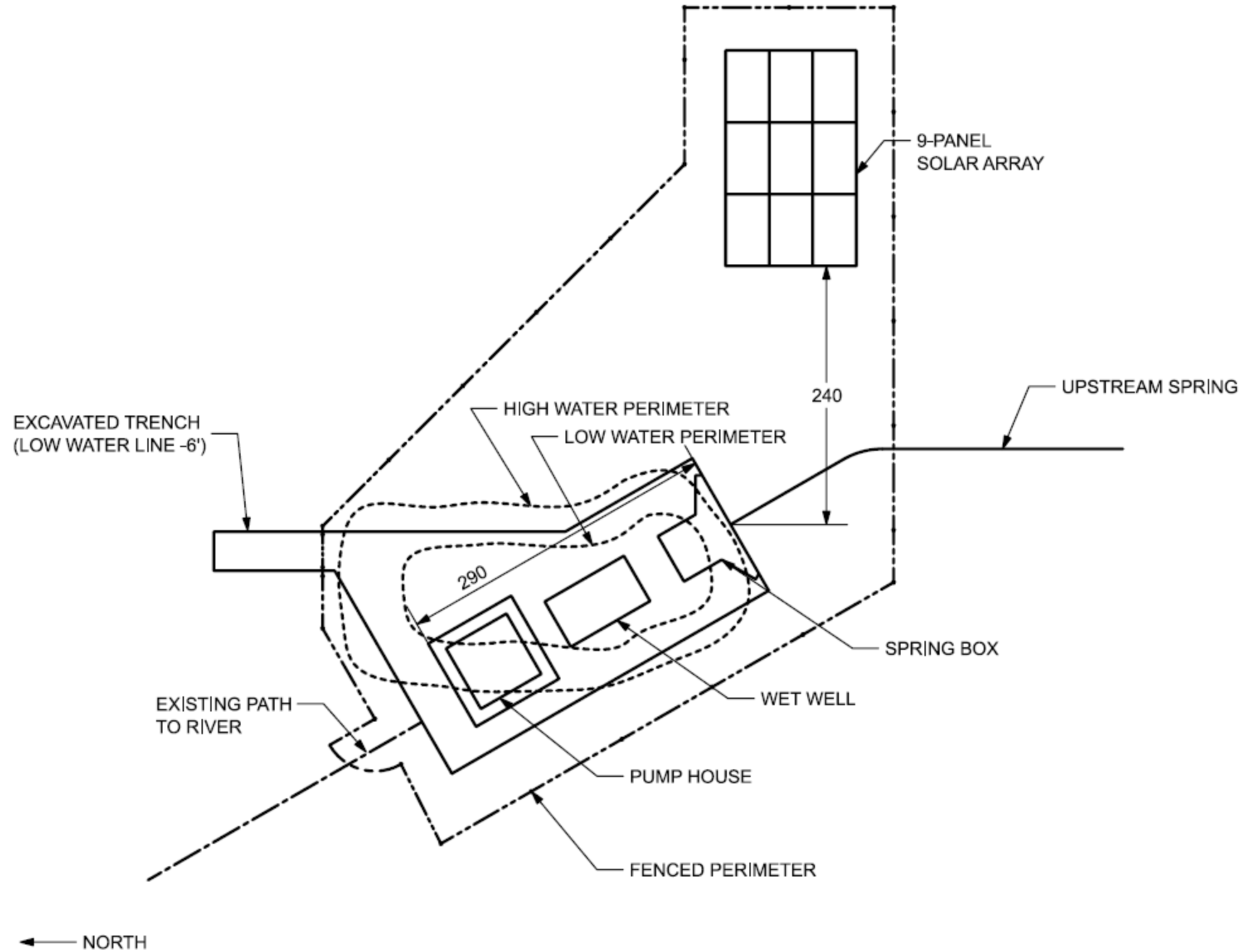
Proposed Spring Site

DATE: 11/22/2019

DRAWN BY: RH

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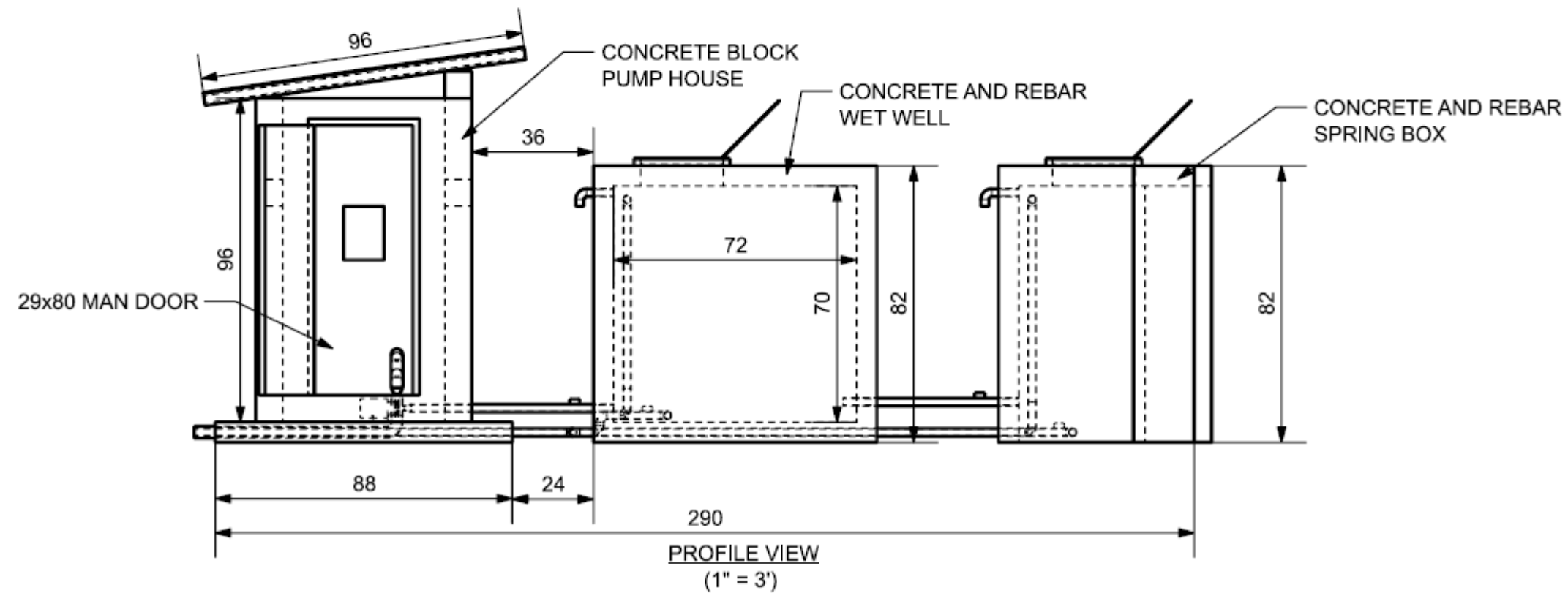
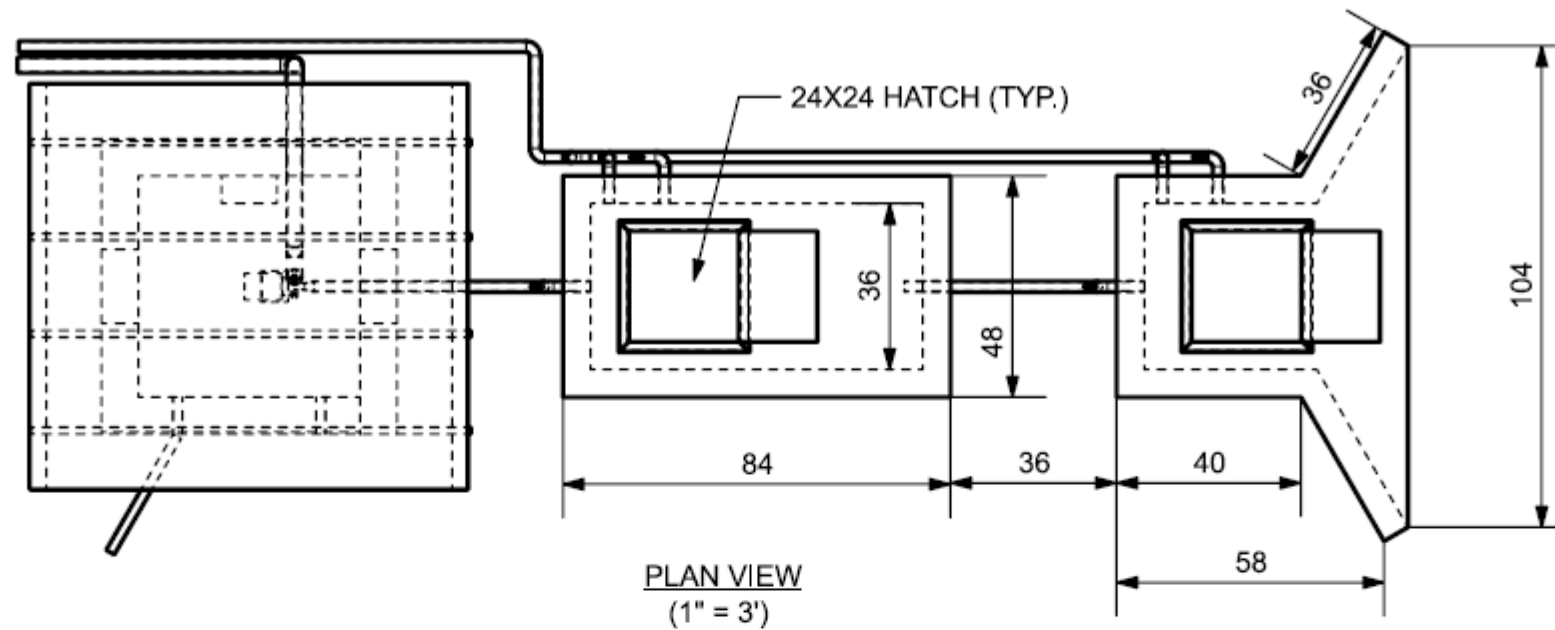
S - 002



PROPOSED SPRING SITE WITH WATER COLLECTION STRUCTURES- PLAN VIEW
(1" = 8')

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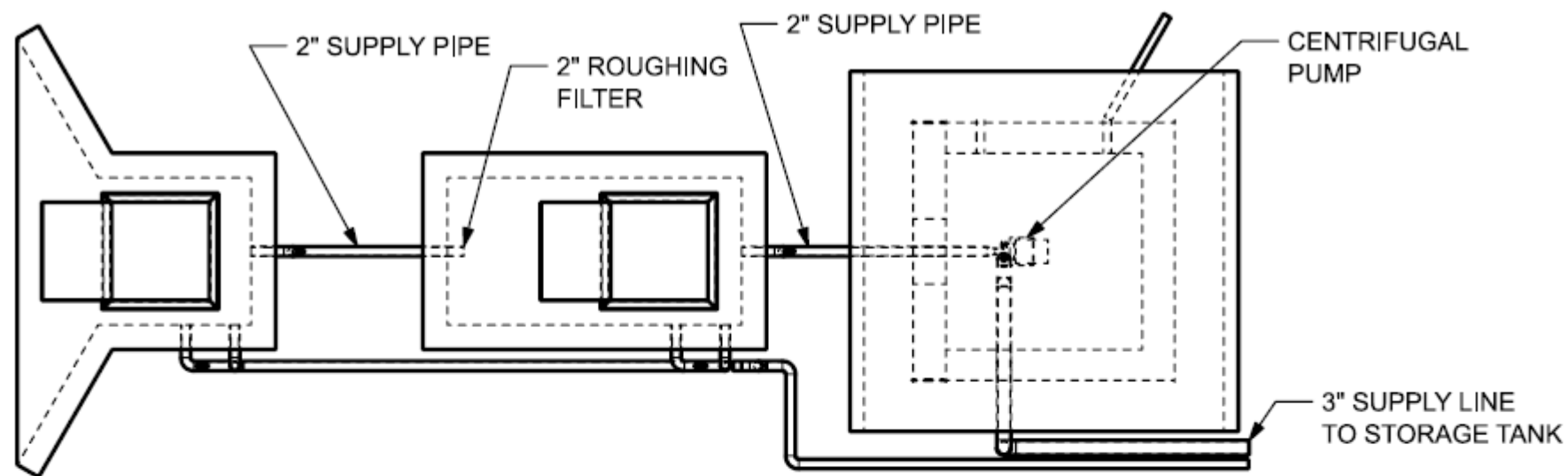
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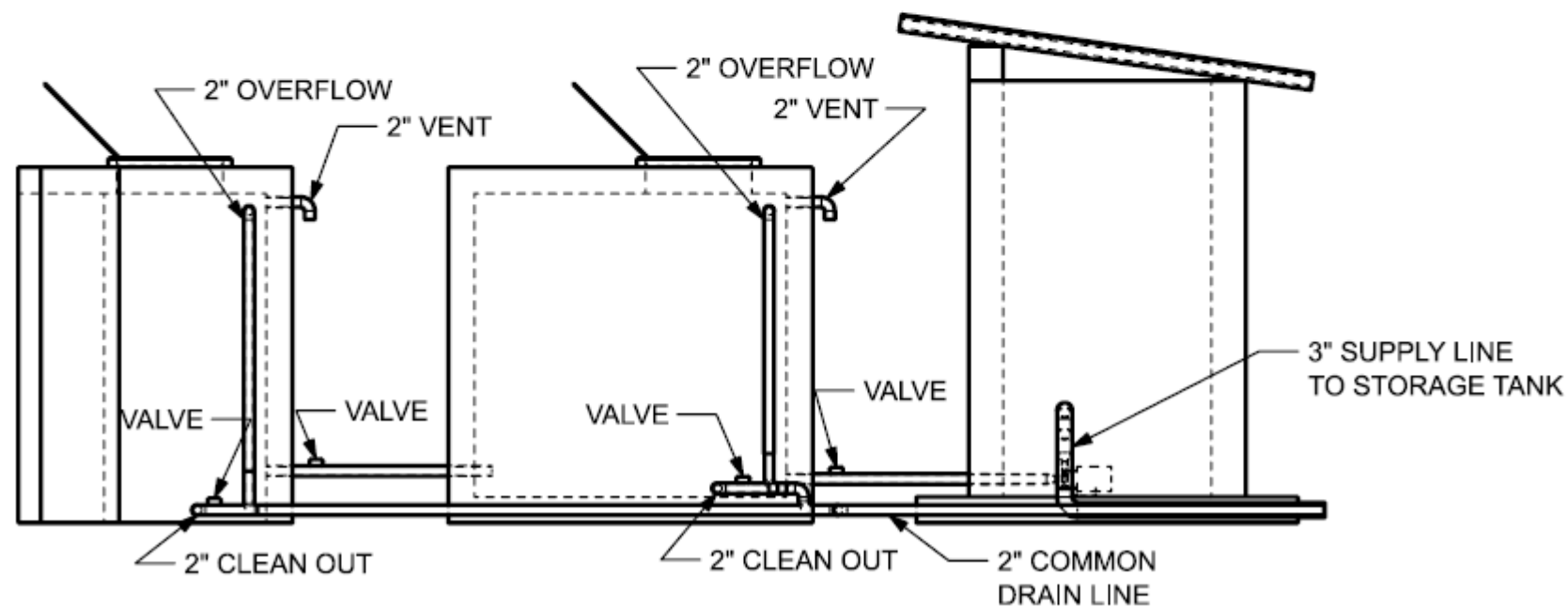
DRAWING TITLE
**Water Collection Structure
Piping**

DATE: 12/08/2019
DRAWN BY: RH

DRAWING NUMBER



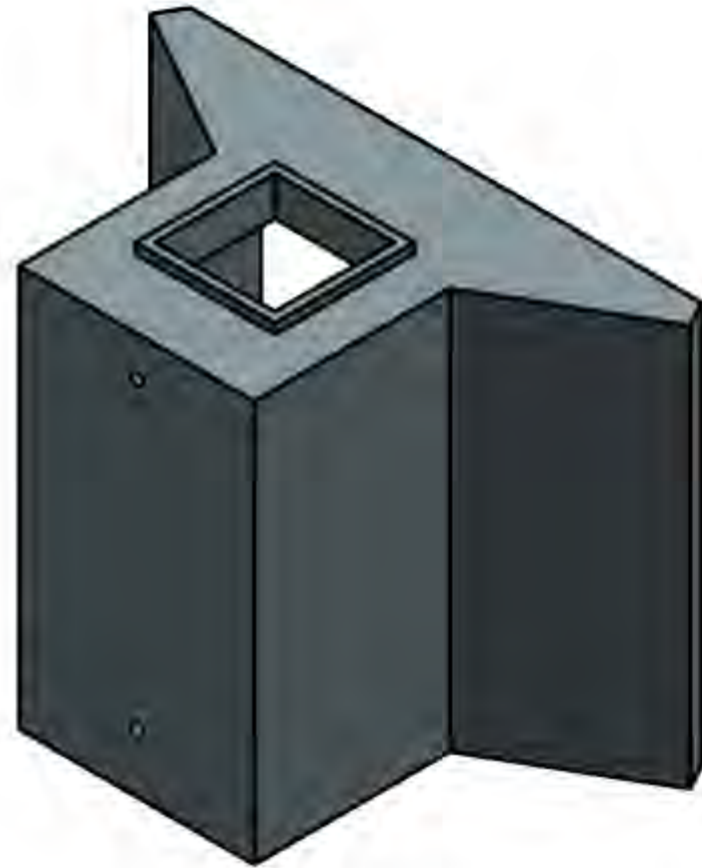
PLAN VIEW
(1" = 3')



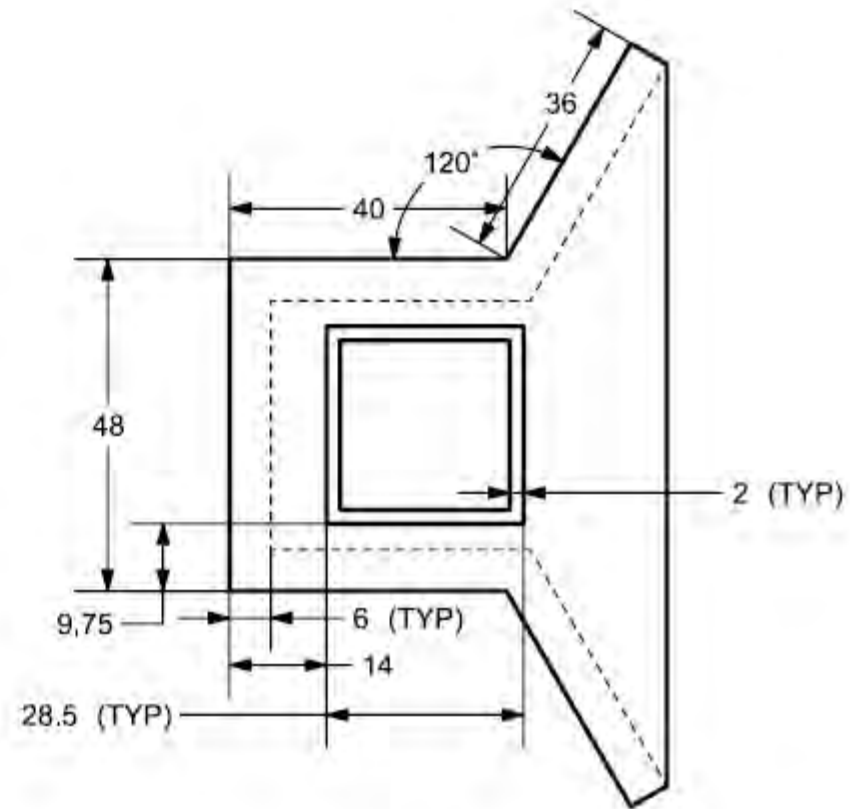
PROFILE VIEW
(1" = 3')

NUM.	REASON	DATE

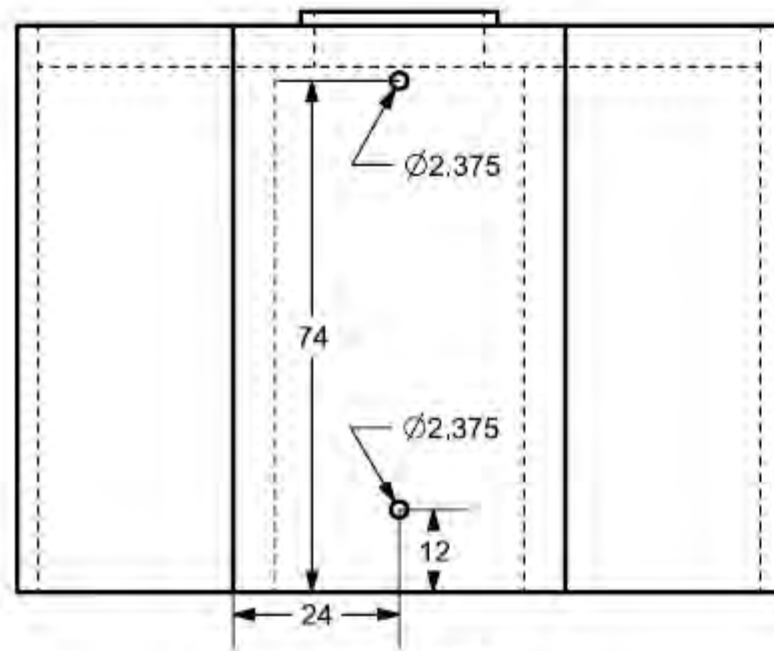
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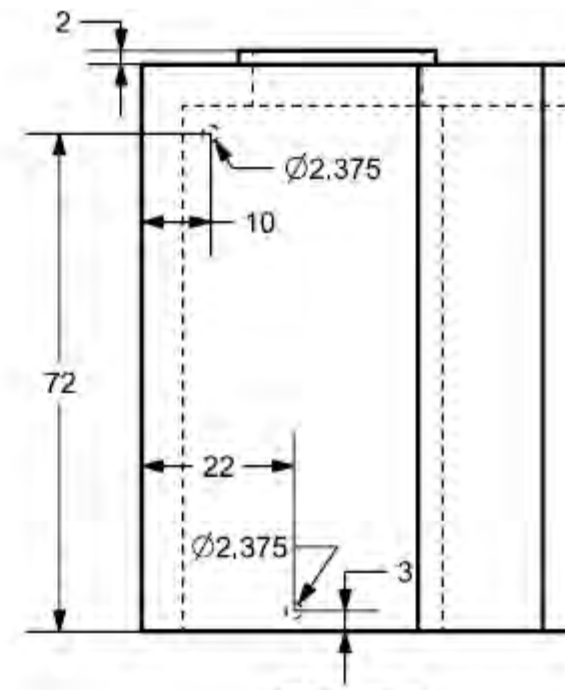
ISOMETRIC VIEW



PLAN VIEW



FRONT VIEW

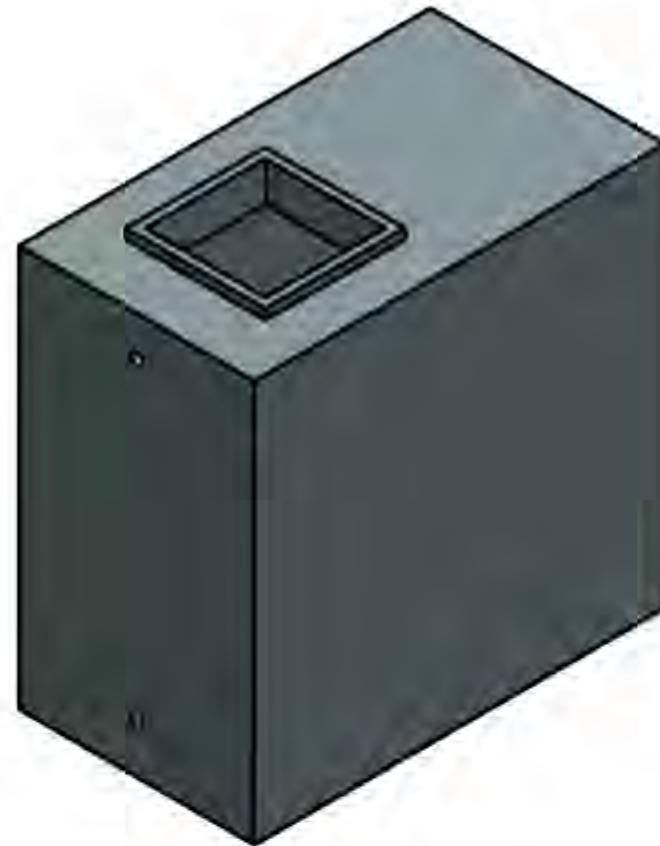


SIDE VIEW

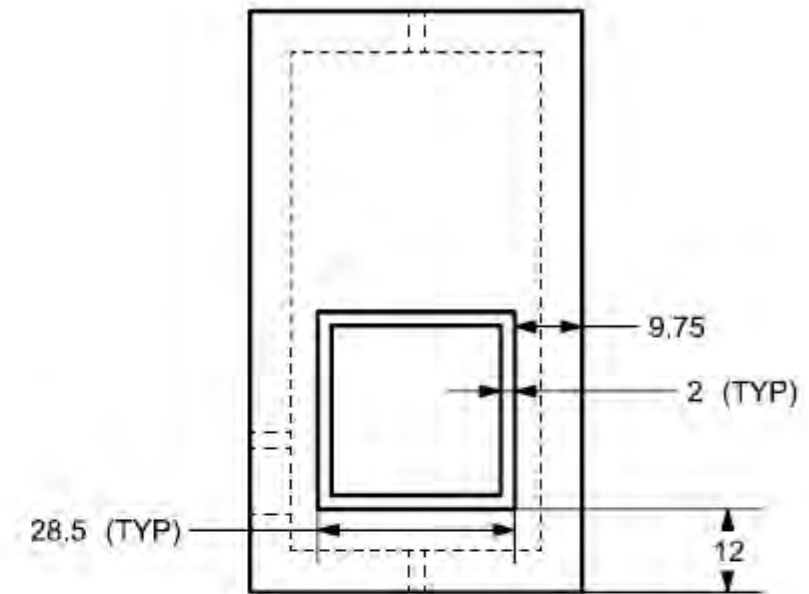
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NUM.	REASON	DATE

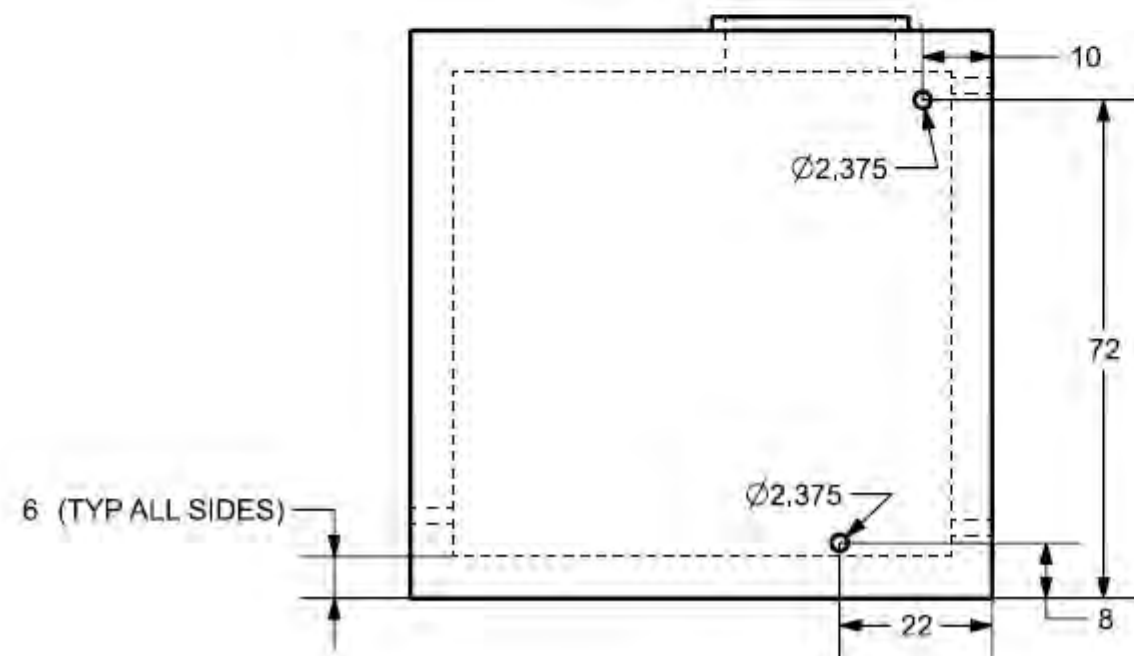
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ISOMETRIC VIEW

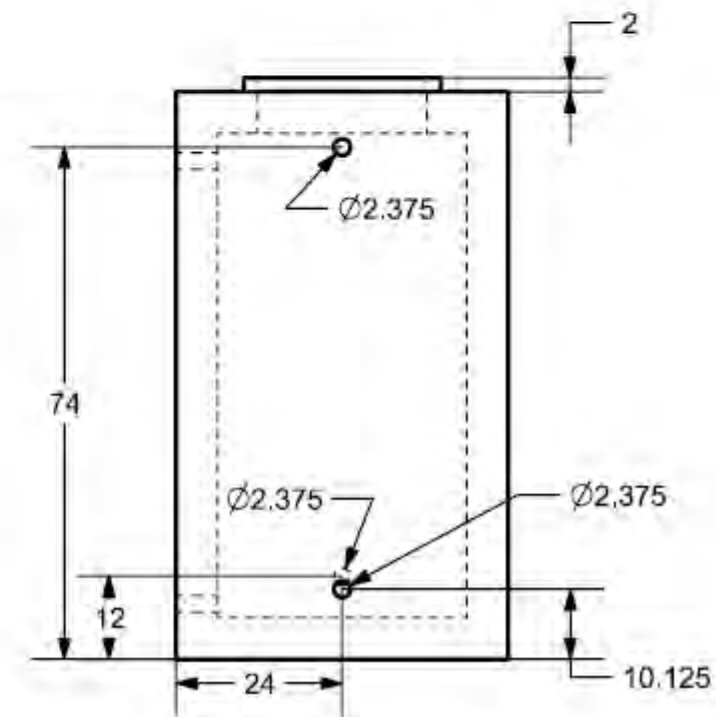


PLAN VIEW



SIDE VIEW

(SCALE: 1" = 2')



FRONT VIEW

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Darien, Panama

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FILE NUMBER

K: EmberaPuru/CADModels

DRAWING TITLE
Spring Pump House

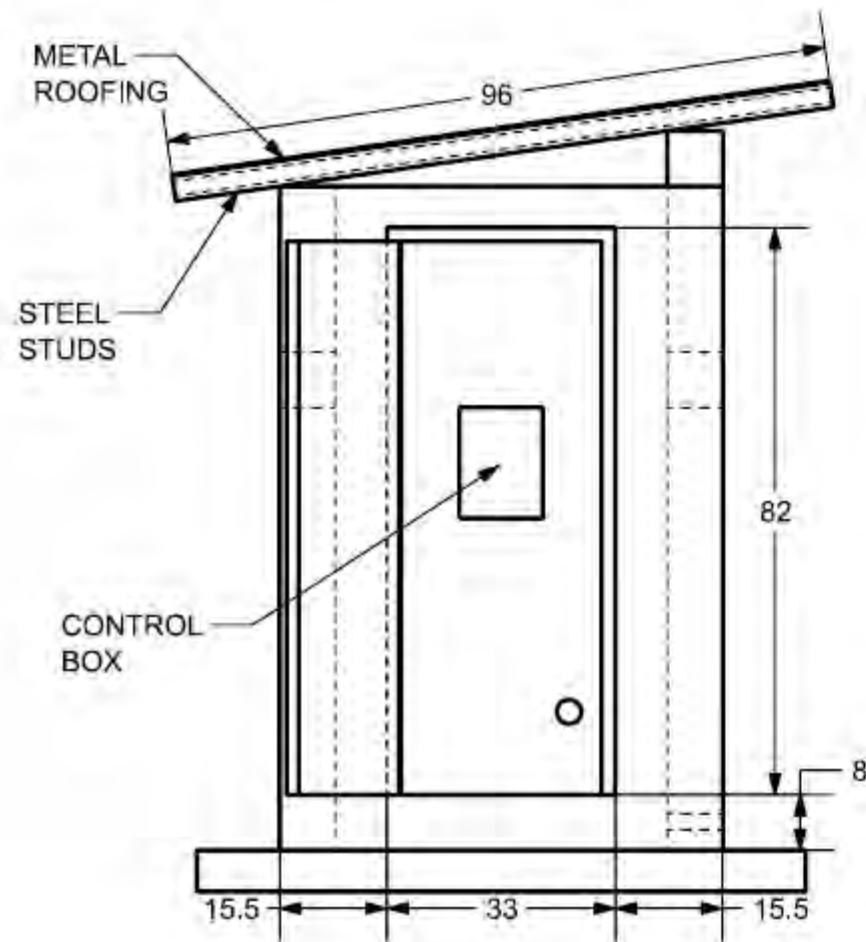
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DRAWN BY: RH

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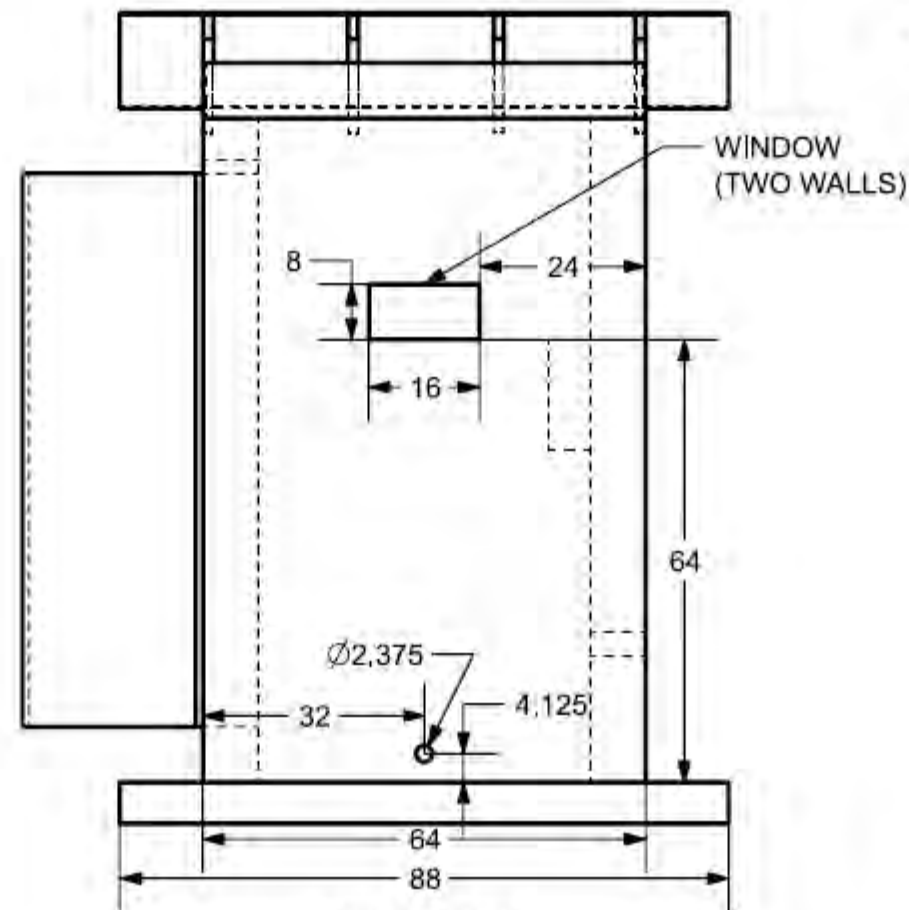
S - 007



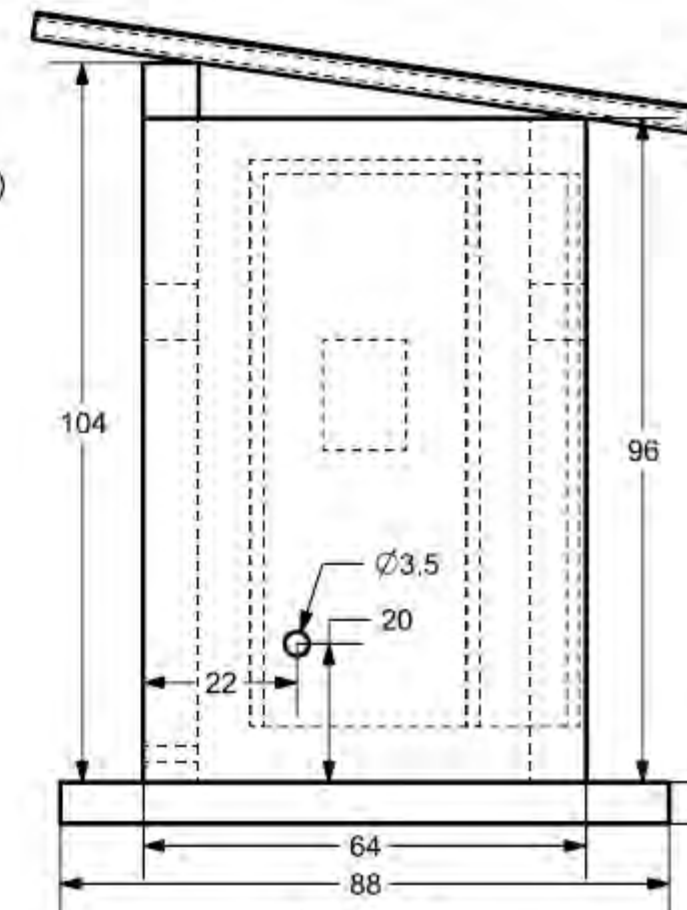
ISOMETRIC VIEW
(1" = 4')



LEFT VIEW
(1" = 2')



FRONT VIEW
(1" = 2')



RIGHT VIEW
(1" = 2')

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FPP/GB 12/13/2019

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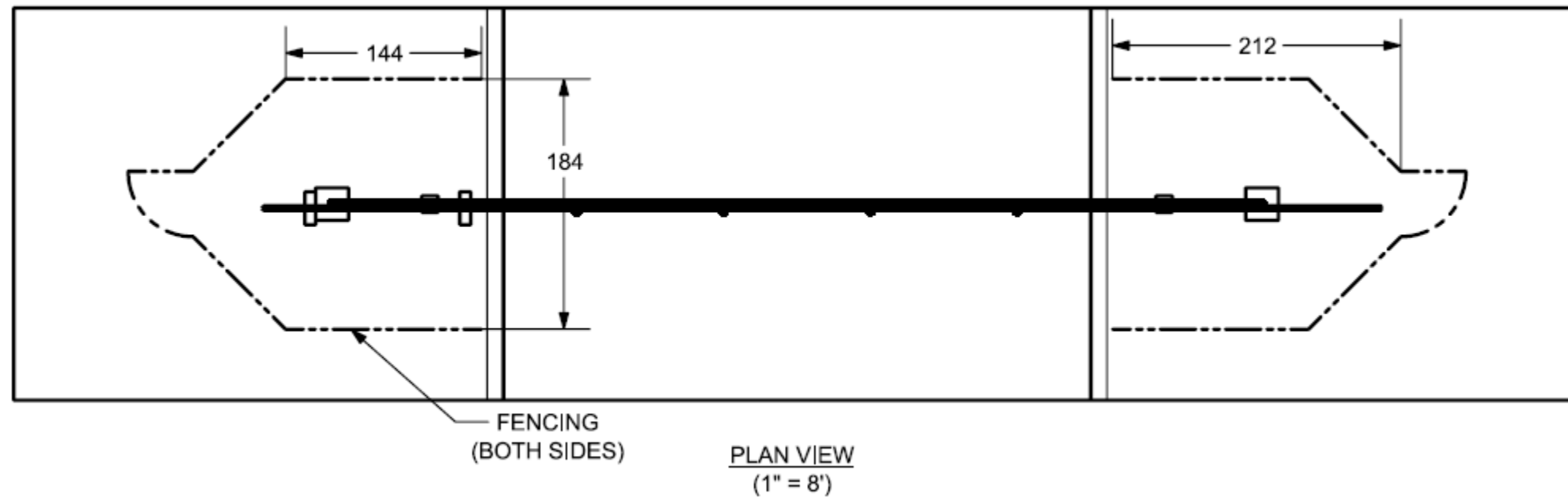
K: EmberaPuru/CADModels

DRAWING TITLE
Pipe Bridge Site

DATE: 12/09/2019
DRAWN BY: RH

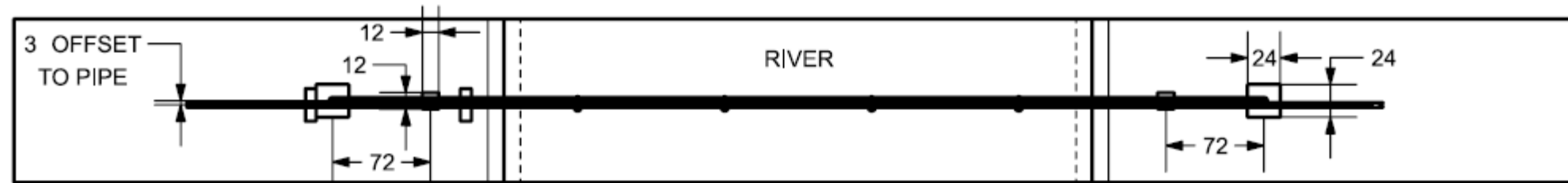
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S - 008

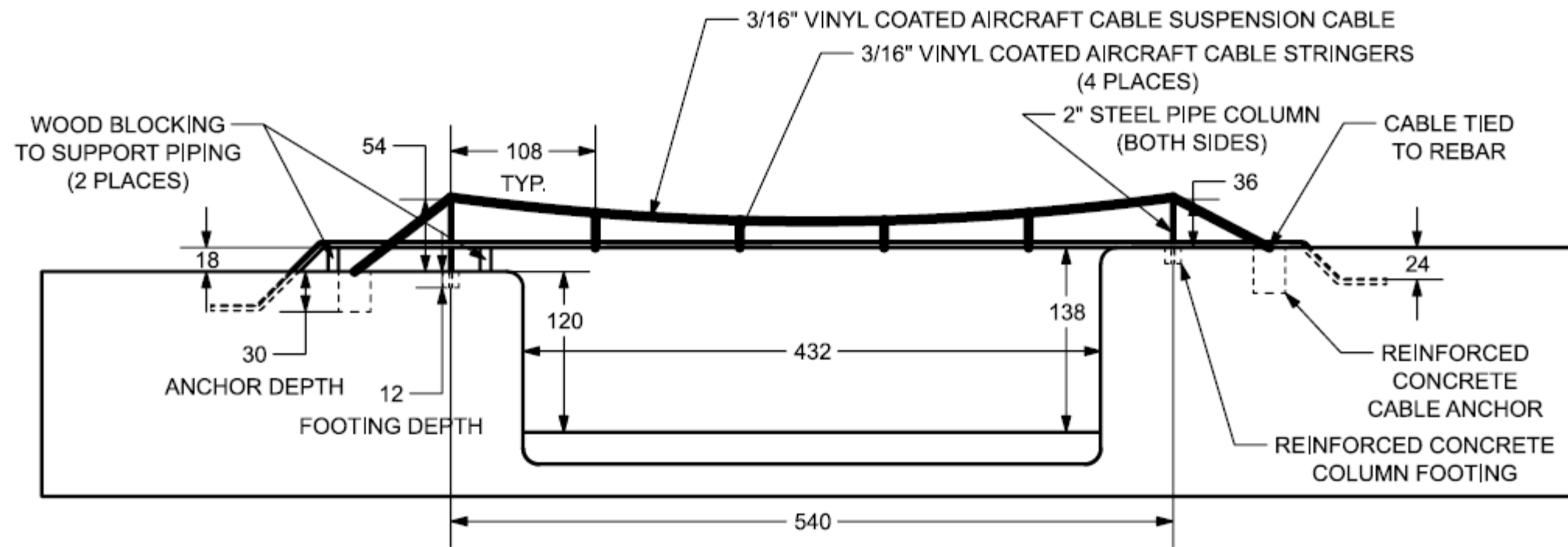


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TOP VIEW
(1" = 8')



FRONT VIEW
(1" = 8')

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1.0	Earth Shelf	12/08/2019

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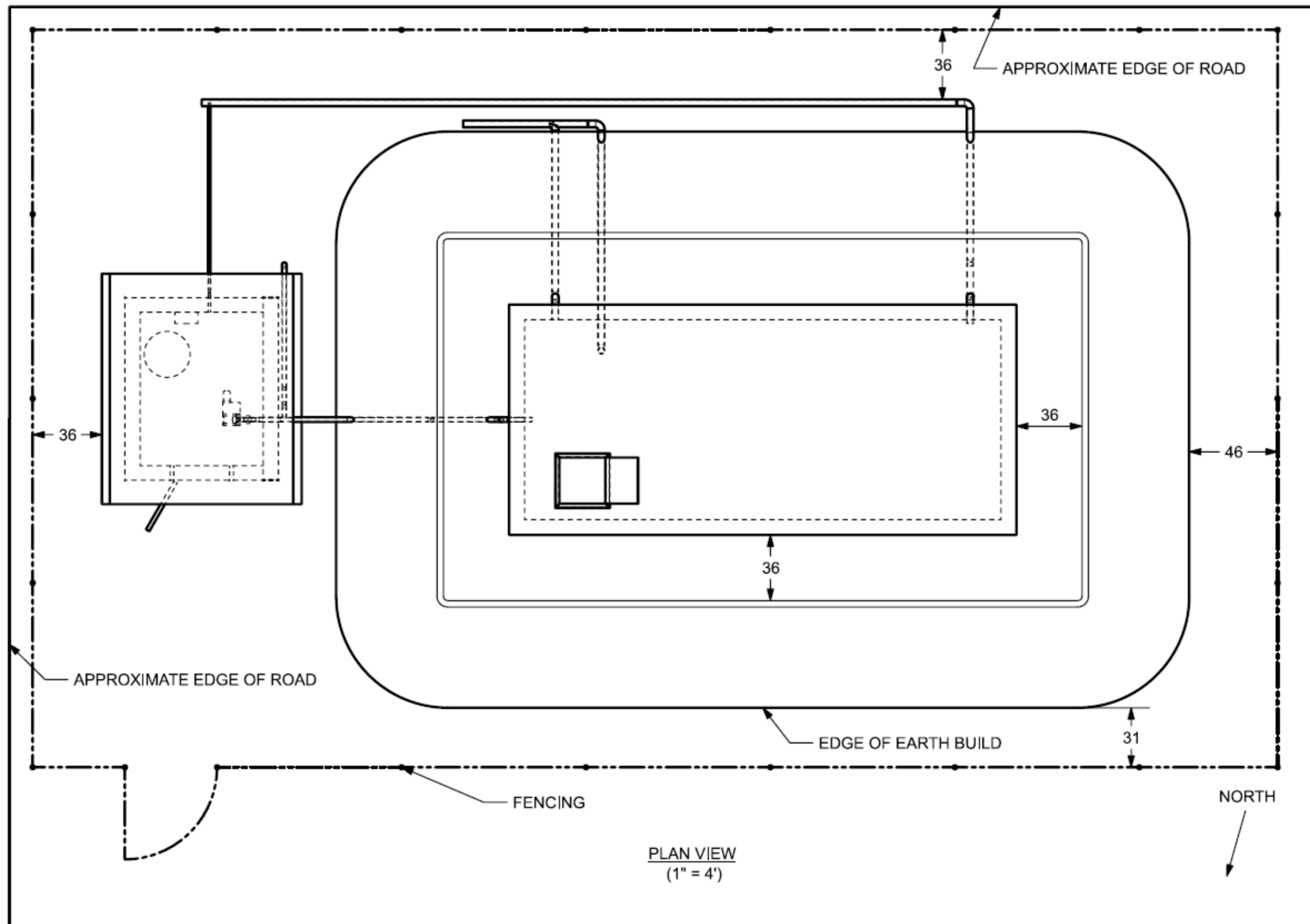
Storage Tank Full Site Plan

DATE: 12/08/2019

DRAWN BY: RH

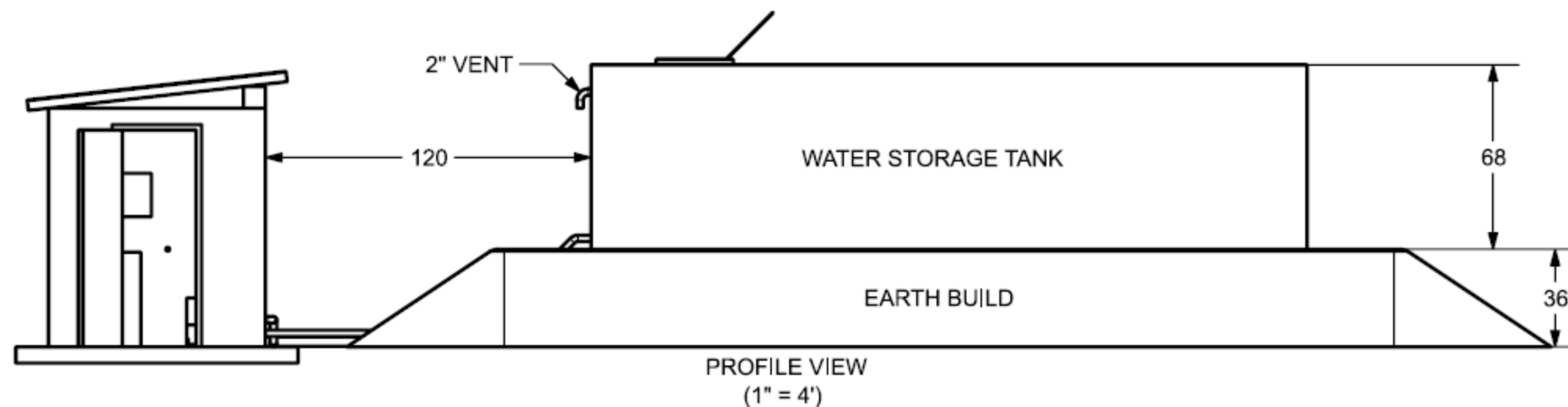
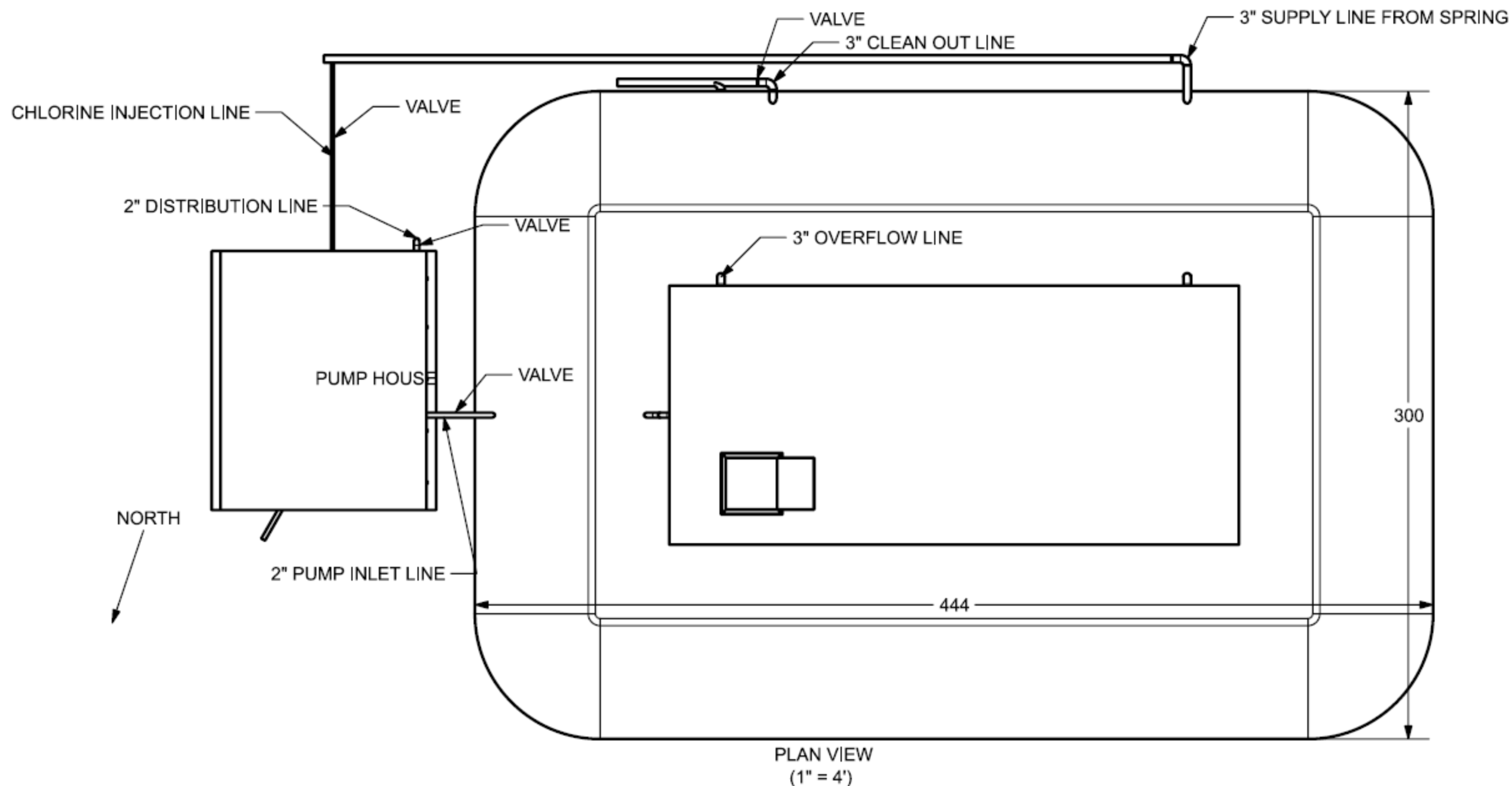
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S - 010



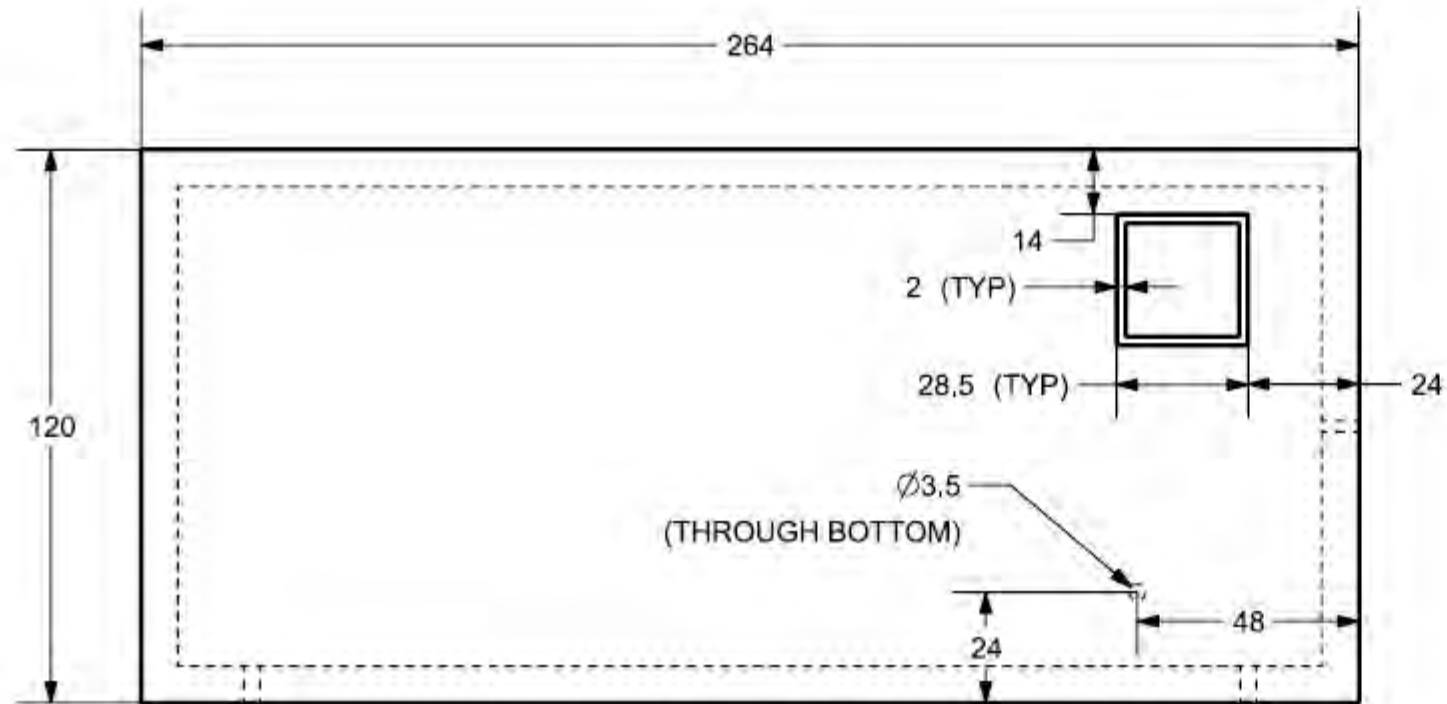
NUM.	REASON	DATE
1.0	Earth Shelf	12/9/2019

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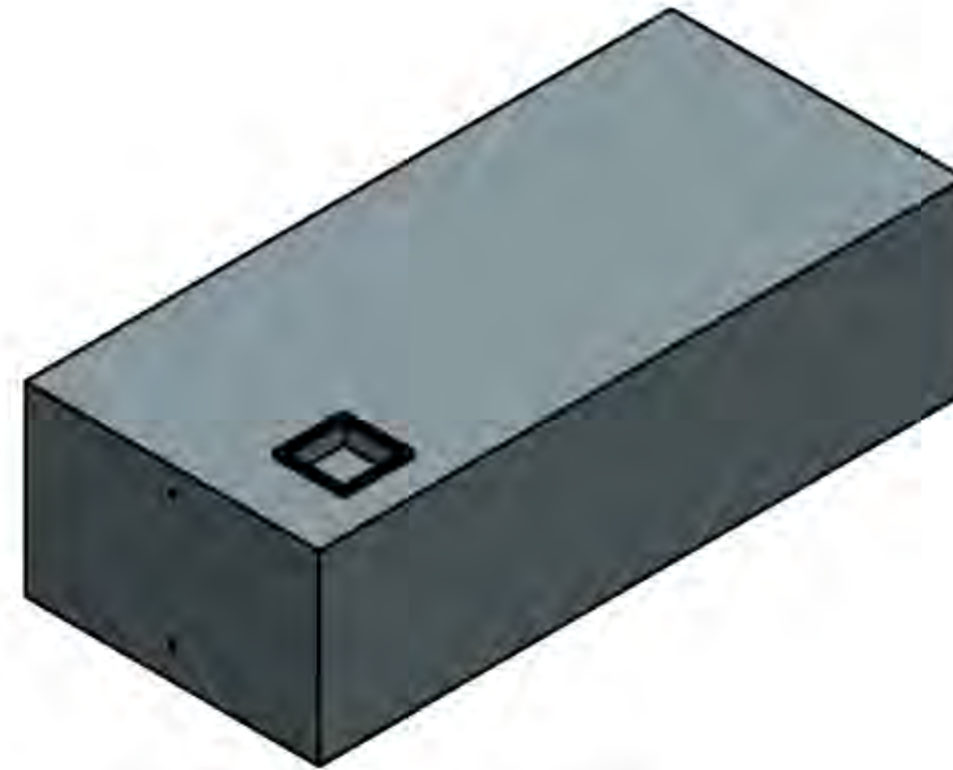


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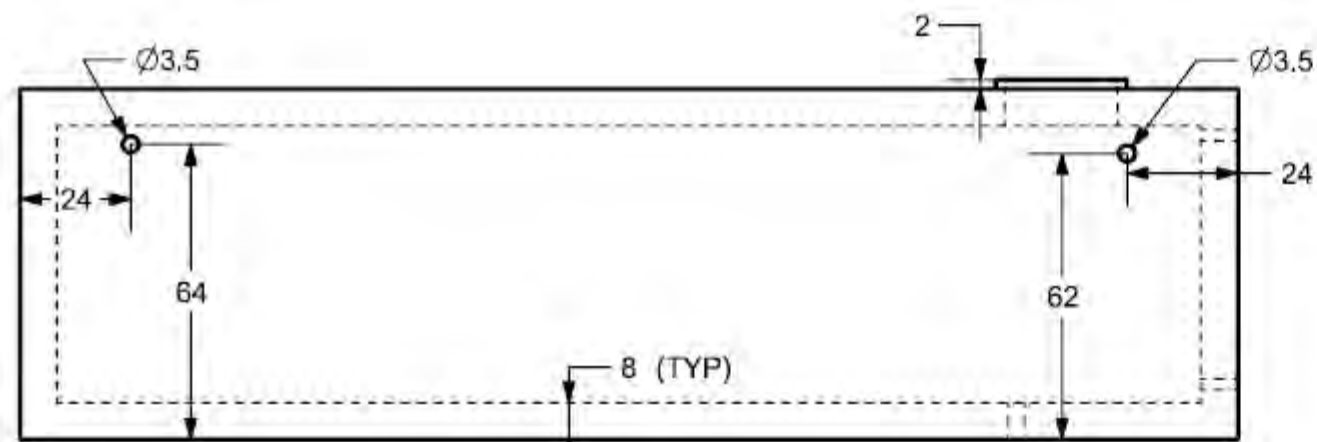
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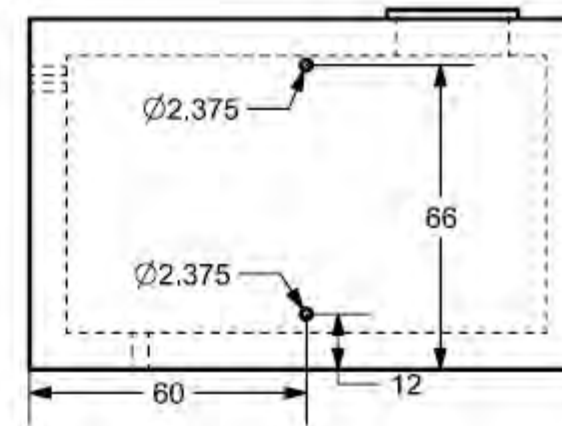
PLAN VIEW
(1" = 3')



ISOMETRIC VIEW
(1" = 4')



FRONT VIEW
(1" = 3')



RIGHT VIEW
(1" = 3')

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DRAWING TITLE

Storage Tank Pump House

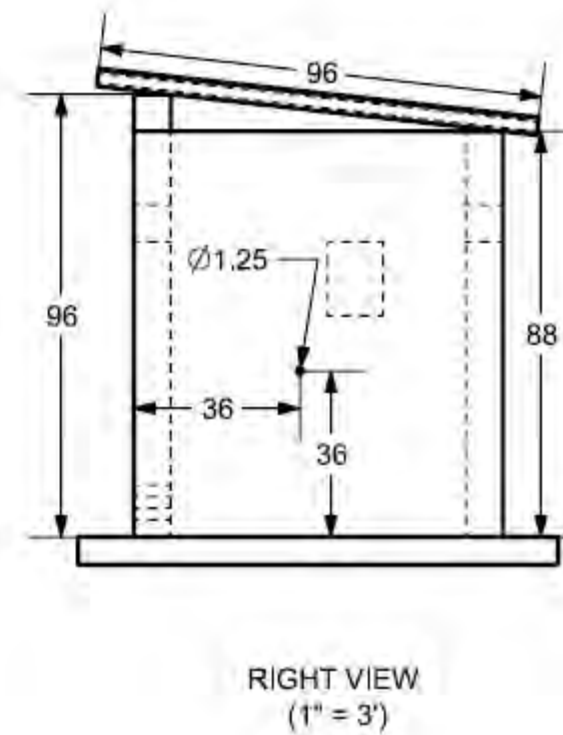
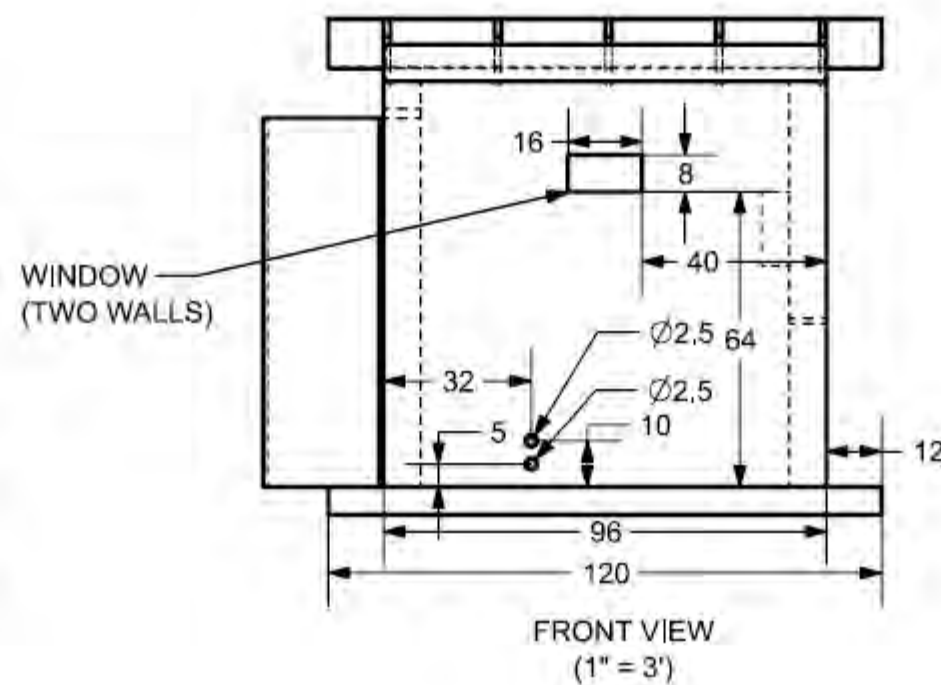
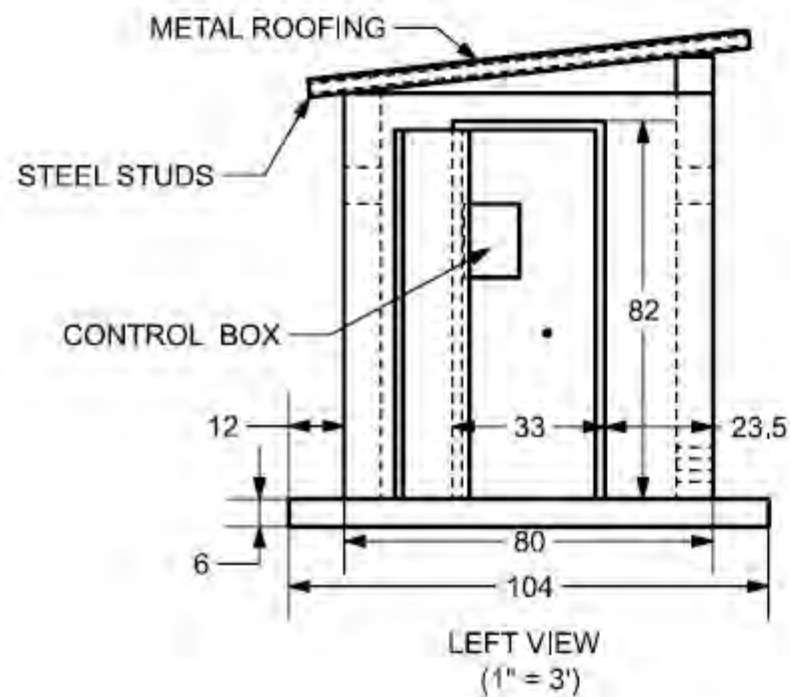
DATE: 11/22/2019

DRAWN BY: RH

DRAWING NUMBER

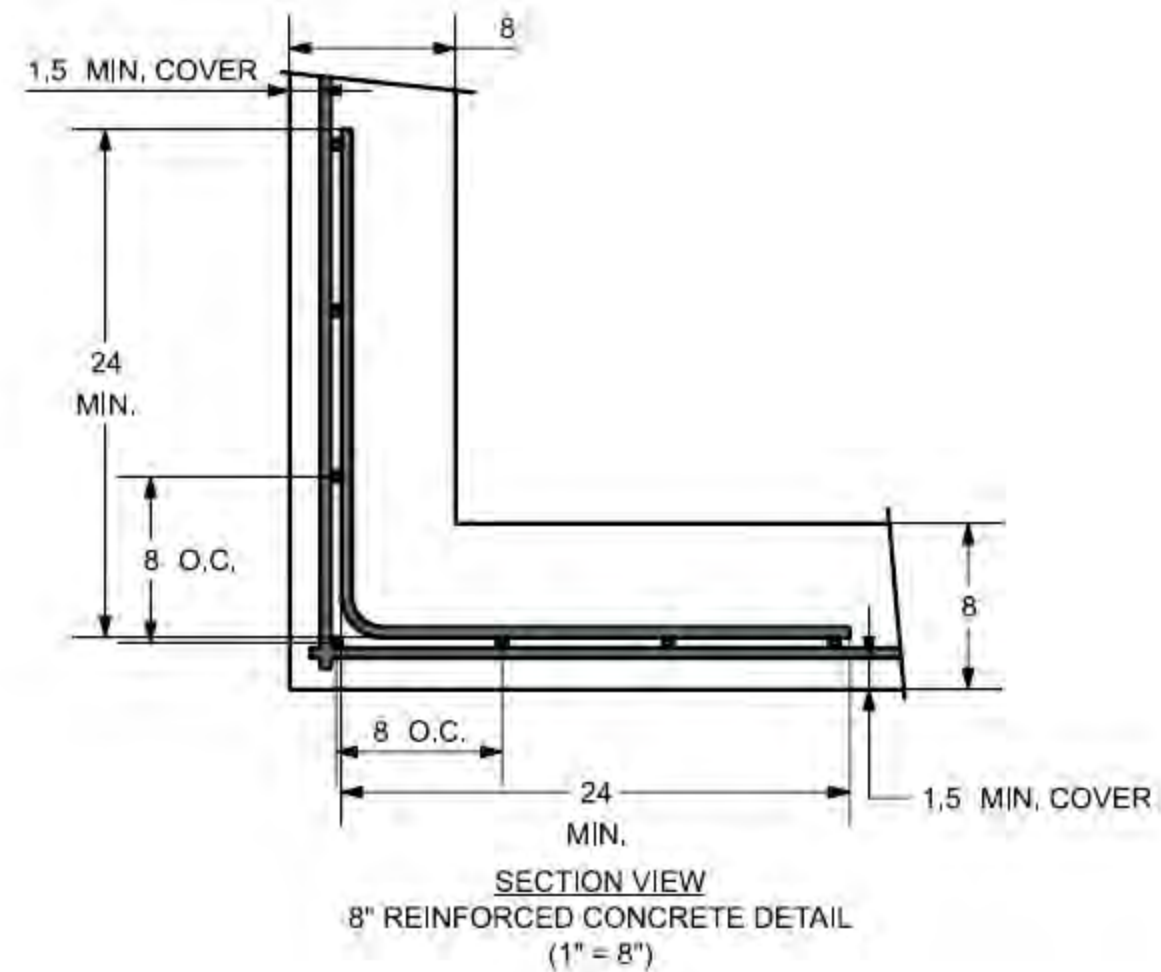
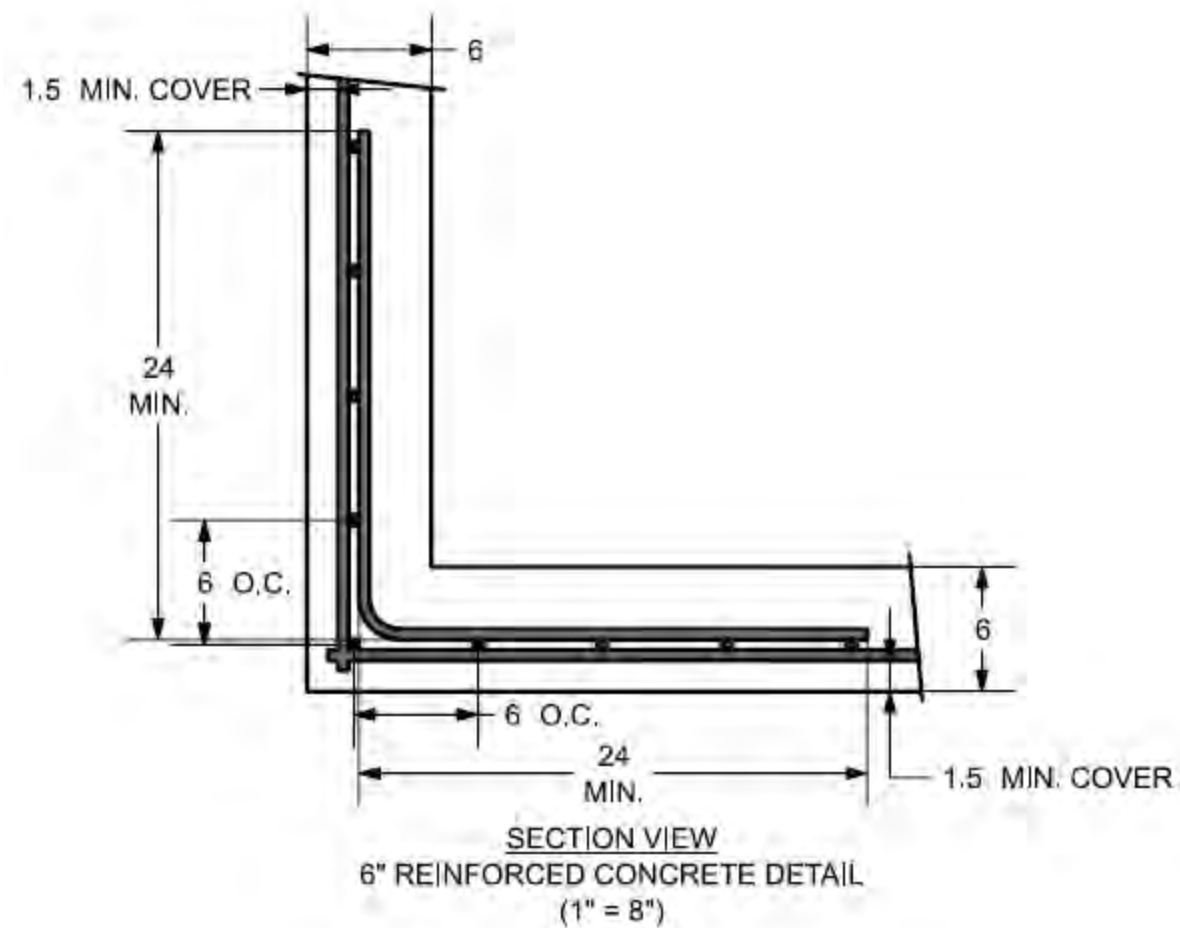


ISOMETRIC VIEW
(1" = 2')



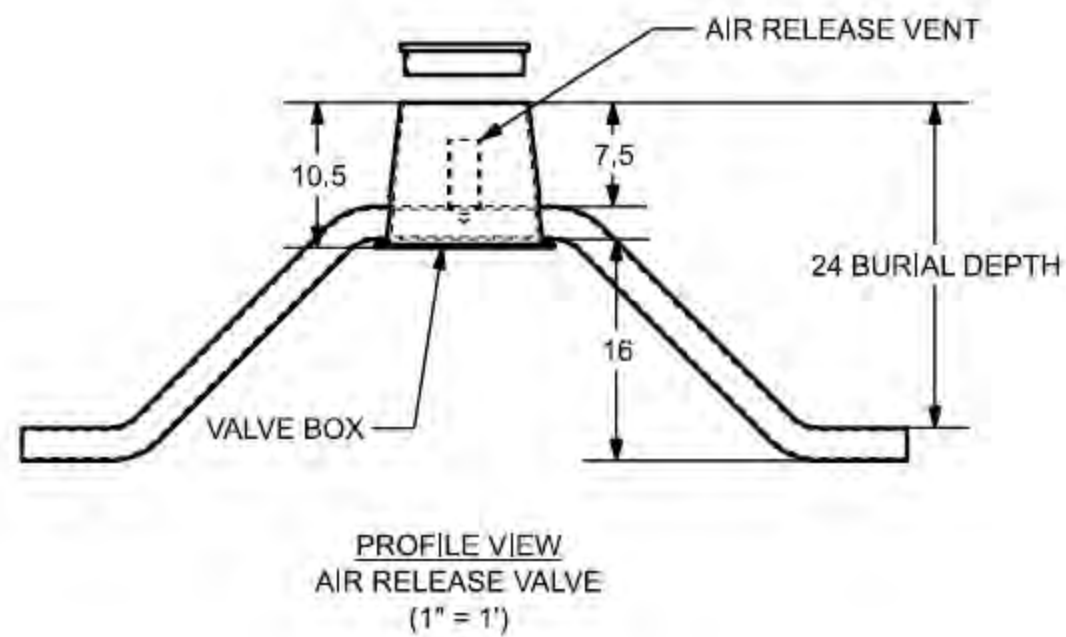
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PROJECT TITLE
**Emberá Puru Water
Supply and Distribution
System**

Darien, Panama

REVISIONS

NUM.	REASON	DATE

THE DRAWINGS ARE PREPARED PER ESTABLISHED INDUSTRY STANDARDS AND REPRESENT THE ENGINEERS DESIGN CONCEPT. THE DRAWINGS ARE NOT INTENDED TO PROVIDE EVERY DETAIL OR CONDITION REQUIRED TO CONSTRUCT THE SYSTEM. THE CONTRACTOR THROUGH SUBMITTALS AND OTHER COORDINATION EFFORTS IS FULLY RESPONSIBLE FOR PROVIDING A COMPLETE AND OPERATIONAL SYSTEM WHETHER INDICATED ON THE PLANS OR NOT.

FILE NUMBER

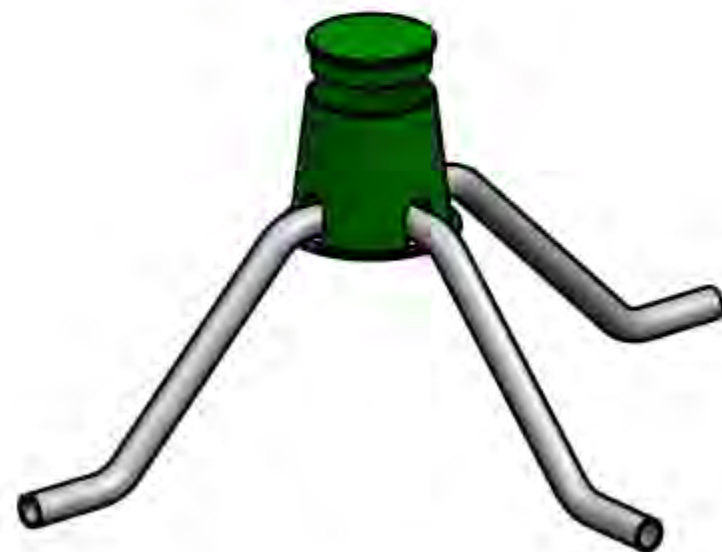
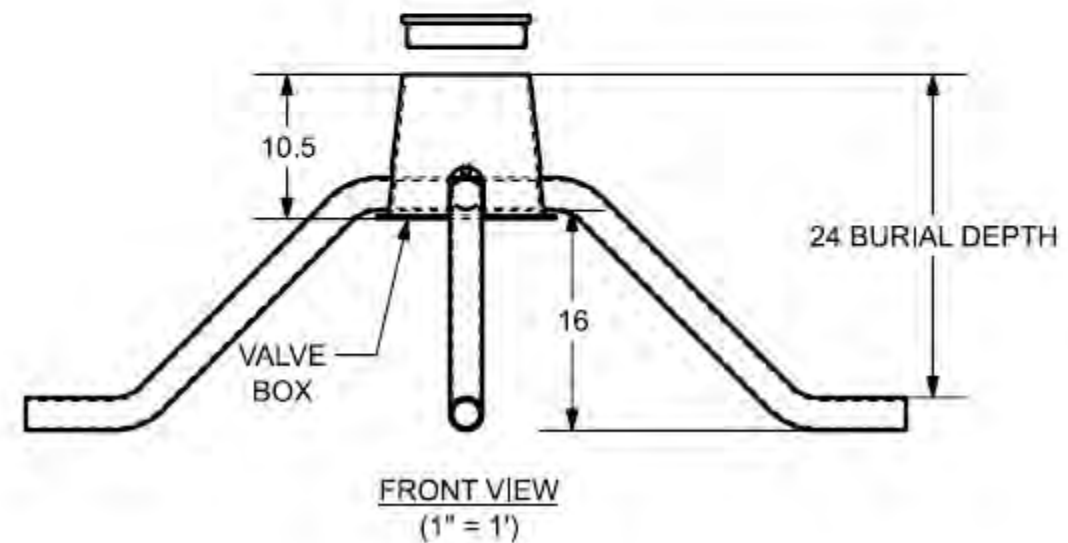
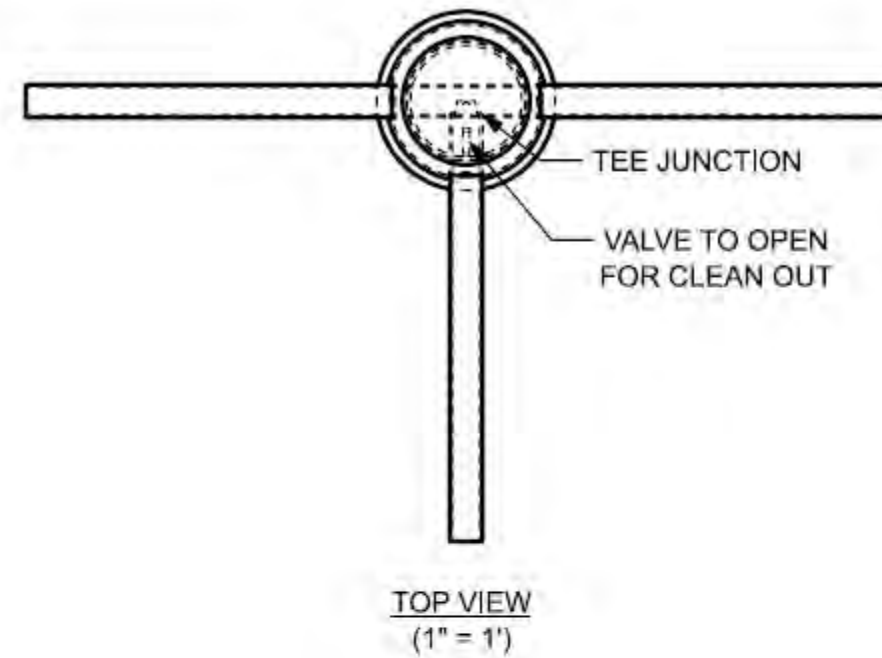
K: EmberaPuru/CADModels

DRAWING TITLE
Clean Out Valve Detail

DATE: 12/11/2019
DRAWN BY: RH

DRAWING NUMBER

D - 003



ISOMETRIC VIEW
(1" = 1')

ISSUED FOR :
MTU 12/13/2019
FPP/GB 12/13/2019

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FILE NUMBER

K: EmberaPuru/CADModels

DRAWING TITLE
Shut Off Valve Detail

DATE: 12/11/2019
DRAWN BY: RH

DRAWING NUMBER

D - 004

