



Napa County Regional Park
and Open Space District

THE NAPA COUNTY REGIONAL PARK AND OPEN SPACE DISTRICT
Camp Berryessa Improvement Project

ADDENDUM Nº 3

Issued: October 2, 2014

Dear Planholder:

Please find attached Addendum No. 3 for the Camp Berryessa Improvement Project. All bidders must submit a signed copy of this coversheet with their bid package.

Receipt of Addendum acknowledged

By: _____
(bidder)



Napa County Regional Park
and Open Space District

ADDENDUM № 3

Issued: October 2, 2014

The Napa County Regional Park and Open Space District
Camp Berryessa Improvement Project

The changes in this addendum shall be included in the Project and this addendum shall be part of the Project documents. All conditions not affected by this addendum shall remain unchanged.

The following are changes to be reflected in the drawings and/or specifications

1. BID DATE PUSHED BACK

Due to a delay in finalizing permits and in issuing this addendum, the bid date/time has been pushed back to:

Monday, October 20, 2014 1:00 pm

2. REVISED construction completion date: July 17, 2015.

To that end, Exhibit A, Item 3., at page 31 of the bid packet is hereby revised as follows:

TIME OF COMMENCEMENT AND OF COMPLETION

The CONTRACTOR shall accept the contract and execute required documents within seven (7) calendar days after Notice of Award; shall commence construction within fifteen (15) calendar days after the Notice to Proceed; and shall diligently prosecute the same to completion such that all work and improvements are completed by July 17, 2015.

3. CLARIFICATION regarding construction scheduling:

Contractor shall install the well pump and coordinate with PG&E (Owner has completed required PG&E applications and paid associated fees. PG&E contact- Dan Priest 707-257-5904) to reconnect power at the site at or immediately following the initiation of work. County of Napa Environmental Health requires a water sample for bacteriological testing before they will clear building permits for occupancy structures (tent cabins, meeting structures, and potentially the restroom building). District will contract separately for water sampling and testing.

4. Revised sheets G00.01, G00.07, D01.01, D01.02, D01.03, C01.02, C01.03, C02.07, C02.08, C02.09, C03.01, C03.04, C05.01, C06.01, C08.01, C09.01, C11.02, C12.01, and specification sections 11121, 15838, 15150 included in this addendum

1075 Creekside Drive
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Fax 916.788.0600
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Name

Page 2 of 2

October 2, 2014

Psomas Job Number (if applicable) or Reference Line Subject

5. Question: Section 01640 has a Note at the beginning stating, "...no Owner-Furnished products are planned." However Part 1.1 B "Owner furnished products for this job include the following: 1. Package water booster station." These two statements are conflicting. Will there be owner-furnished products or not? Please clarify.

Answer: Section 01640 through Part 1, 1.1 is hereby revised as follows:

**SECTION 01640
INSTALLATION OF OWNER-FURNISHED PRODUCTS**

~~Note: At this time (Oct 10, 2013), no Owner-Furnished products are planned. This section will be removed at final submittal unless this status changes for Owner-supplied tables, signs, etc.~~

PART 1 - GENERAL

1.1 Work Included

- A. This section includes delivery, storage, handling, installation and startup of Owner-furnished products.
- B. Owner furnished products for this job include following:
 - 1. As denoted in project drawings.

6. Question: C03.02 There is no info on the foundation.

Answer: See revised sheet C03.02

7. Question: Interior finish schedule for combo building?

Answer: see revised sheet C09.01

8. Question: Section 15150 sec. 3.5, para. B item 1 it states that Sections 15410 and 15430 are missing.

Answer: See Revised Section 15150.

END OF ADDENDUM #3

CAMP BERRYESSA IMPROVEMENTS

FOR NAPA COUNTY REGIONAL PARK & OPEN SPACE DISTRICT

PROJECT NO. 10002.03
CONTRACT NO. _____

NAPA COUNTY, CALIFORNIA
JULY, 2014

7850 BERRYESSA-KNOXVILLE ROAD
NAPA, CALIFORNIA 94558
APN: 019-550-001
LAT/LONG: 38°38'12.25"N 122°17'42.88" W

LAND OWNER:
U.S. BUREAU OF RECLAMATION

Board of Directors

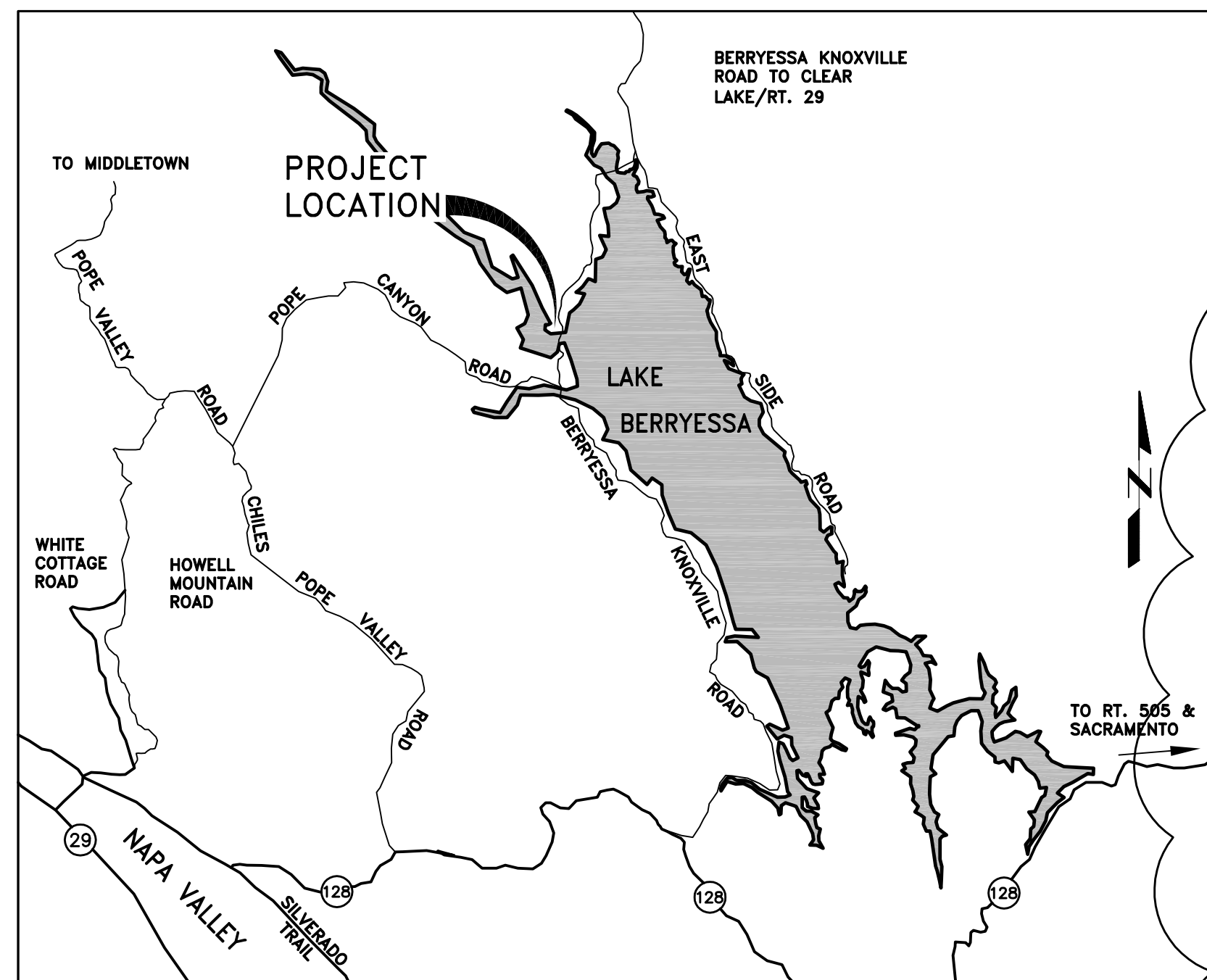
CONTACT:
WARREN KASPER, SUPERVISORY RANGER
U.S.B.O.R.
5520 KNOXVILLE ROAD
NAPA, CALIFORNIA 94558
707.966.211 x102
WKASPER@USBR.GOV

LAND MANAGER:
NAPA COUNTY REGIONAL PARK & OPEN
SPACE DISTRICT

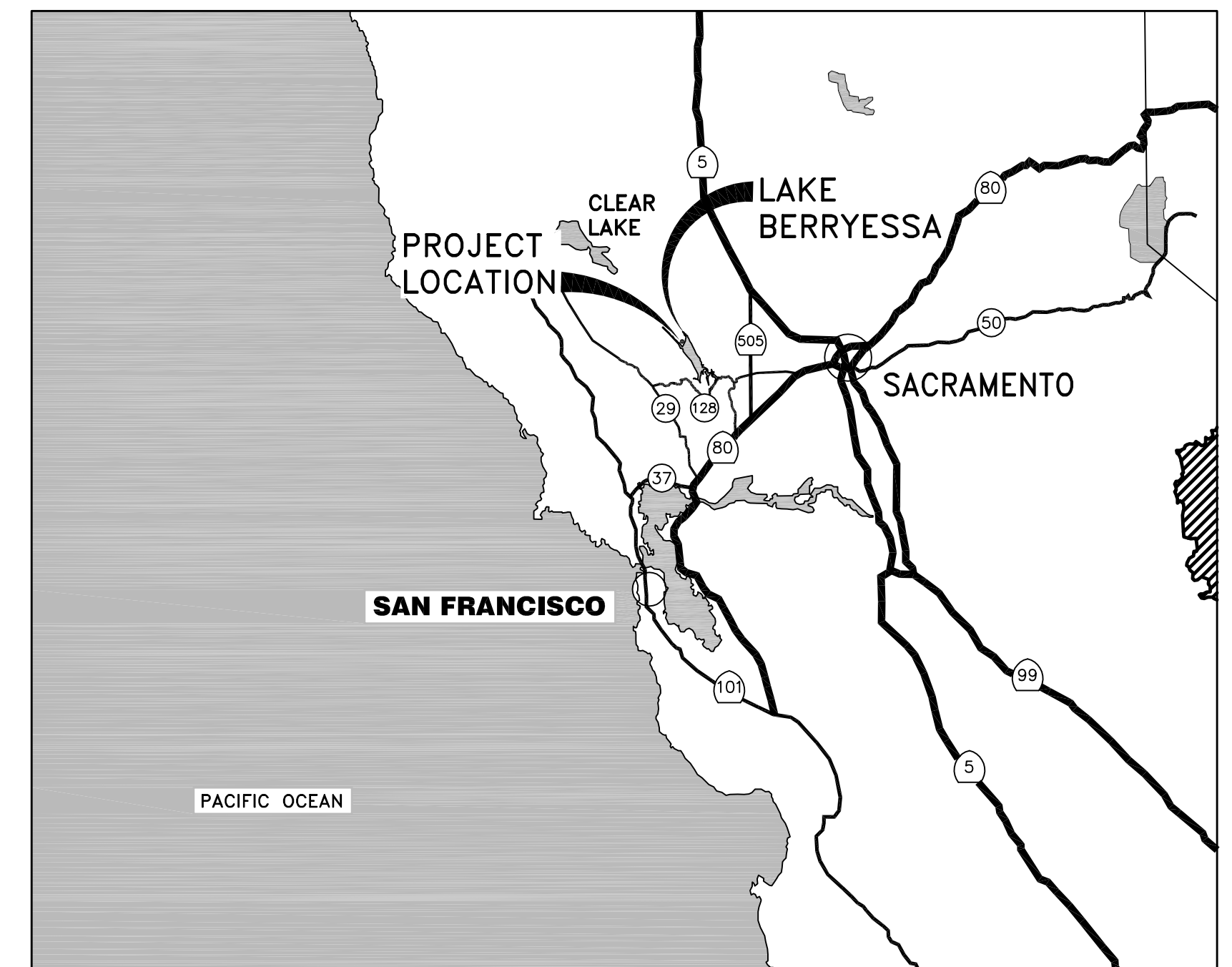
APPROVED FOR CONSTRUCTION:

DATE

CONTACT:
CHRIS CAHILL, PRINCIPAL PLANNER
1195 THIRD STREET, SECOND FLOOR
NAPA, CALIFORNIA 94559
707.253.4847
CCAHILL@NCRPOSD.ORG



LOCATION MAP
SCALE: NTS



VICINITY MAP
SCALE: NTS

BID DRAWINGS



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Rev	Date	By	Description
			ISSUED FOR BIDS
			ISSUED FOR CONSTRUCTION
9/12/14	SK		PLAN REVISION
8/29/14	SK		PUBLIC WORKS COMMENTS

Designed	ELP
Drawn	JAC
Checked	SAK
Job No.	
	BNAP010100

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1075 Creekside Ridge Drive, Suite 200
Roseville, Ca 95678
Tel (916) 788-8122
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B14.1071 - 1079
SEE SHEET G00.06 FOR BREAKDOWN

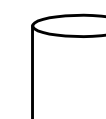




STEFANIE A. KEMEN, P.E. C72653
PROJECT ENGINEER

DATE
0 LINE IS 2 INCHES AT FULL SCALE
IF LINE IS NOT 2" SCALE ACCORDINGLY

NAPA COUNTY REGIONAL PARK
AND OPEN SPACE DISTRICT
CAMP BERRYESSA IMPROVEMENTS
GENERAL
TITLE SHEET

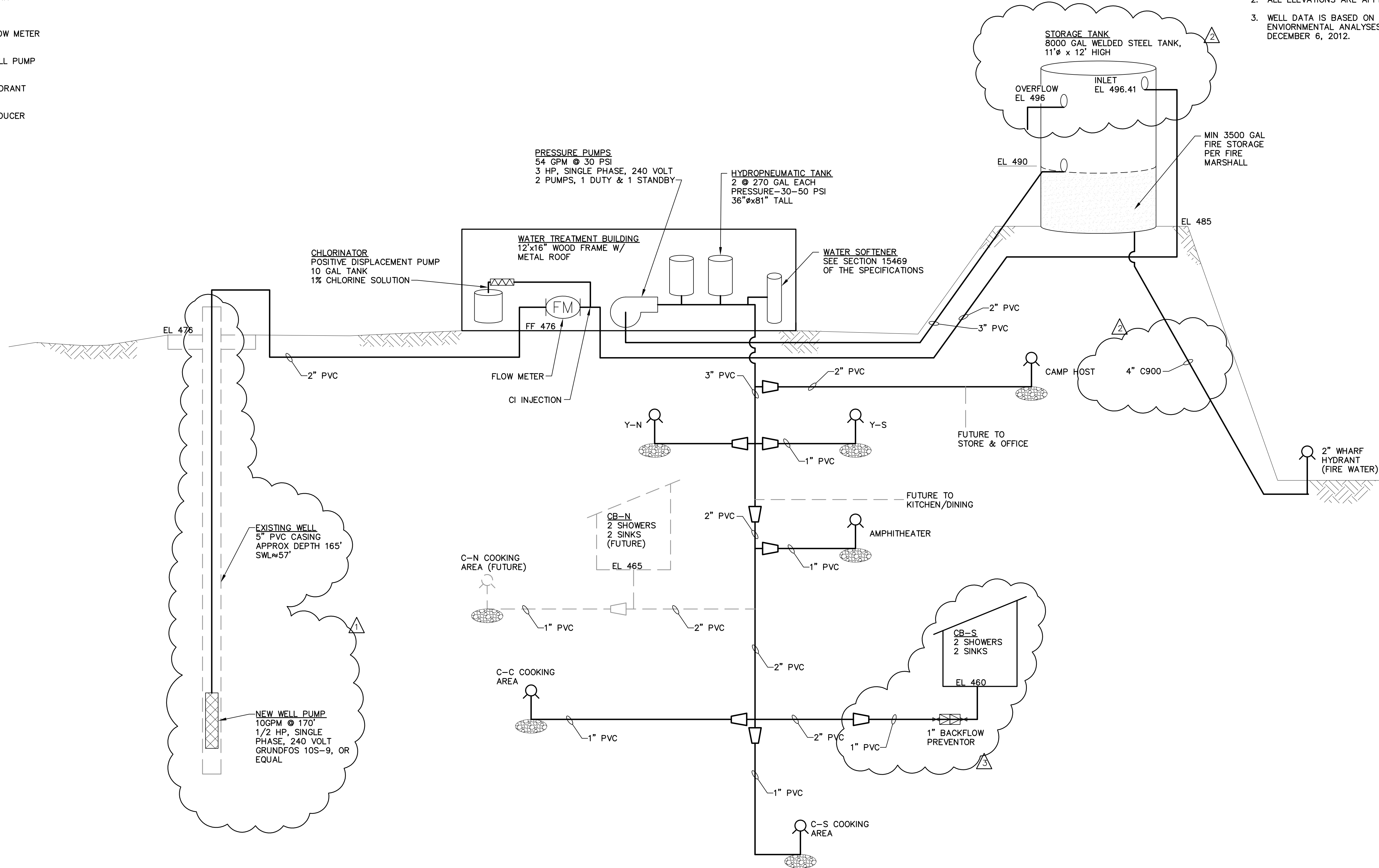
Scale
AS NOTED
Drawing No.
G00.01
Sheet No.
1 of 70

SYMBOL LEGEND:

-  TANK
-  FLOW METER
-  WELL PUMP
-  HYDRANT
-  REDUCER

NOTES:

1. VALVES ARE NOT SHOWN.
2. ALL ELEVATIONS ARE APPROXIMATE.
3. WELL DATA IS BASED ON CALTEST ANALYTICAL LABORATORY ENVIRONMENTAL ANALYSES LAB ORDER NUMBER M110831, DATED DECEMBER 6, 2012.



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Rev	Date	By	Description
3	9/12/14	SK	PLAN REVISION
2	8/29/14	SK	PUBLIC WORKS & ENVIRONMENTAL HEALTH COMMENTS
1	8/12/14	SK	WELL PUMP TO BE INSTALLED

ISSUED FOR BIDS	Designed	ELL
ISSUED FOR CONSTRUCTION	Drawn	JAC
	Checked	SAK
	Job No.	BNAP010100

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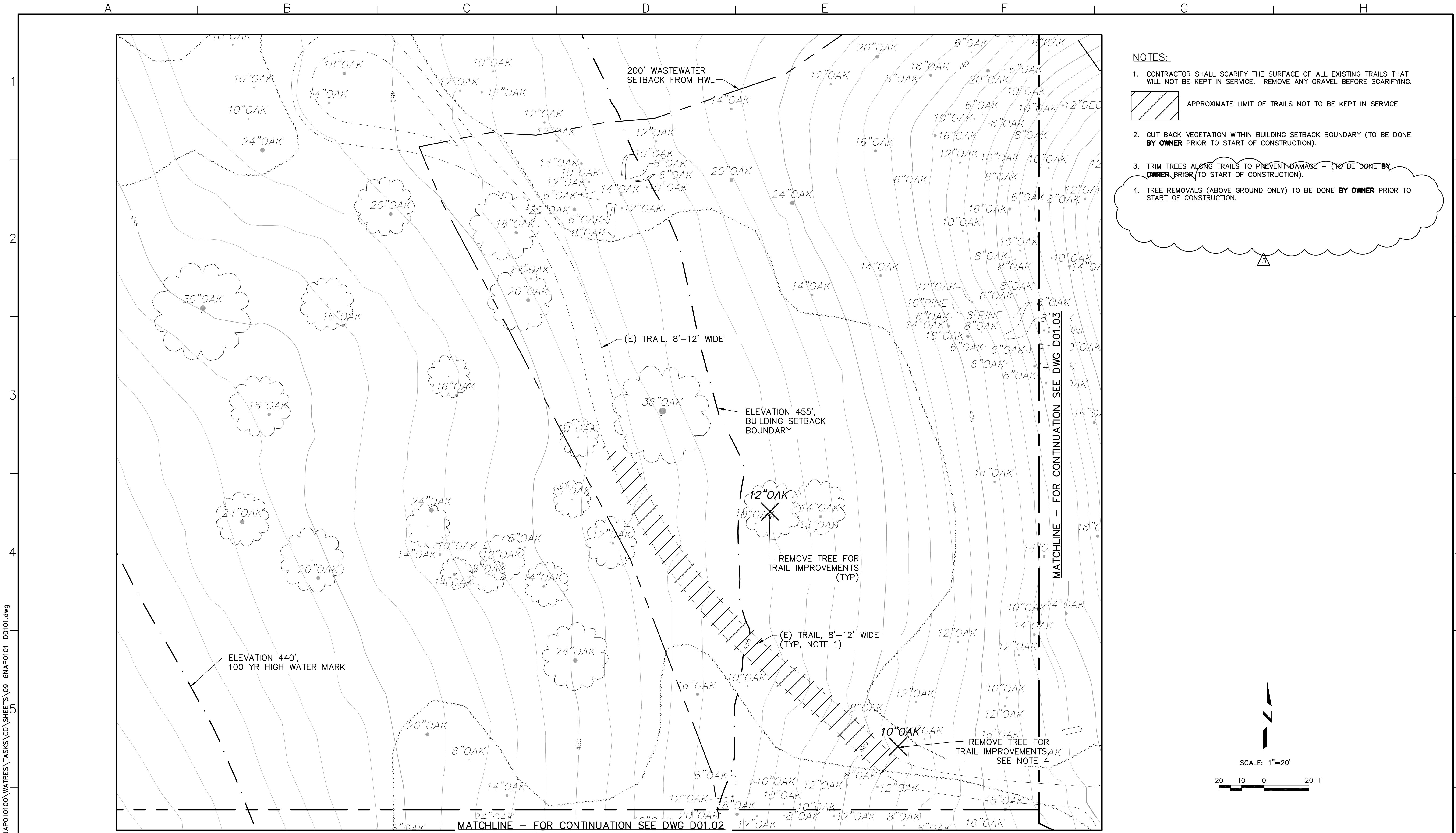
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 IF LINE IS NOT 2" SCALE ACCORDINGLY

**NAPA COUNTY REGIONAL PARK AND OPEN SPACE DISTRICT
 CAMP BERRYESSA IMPROVEMENTS**

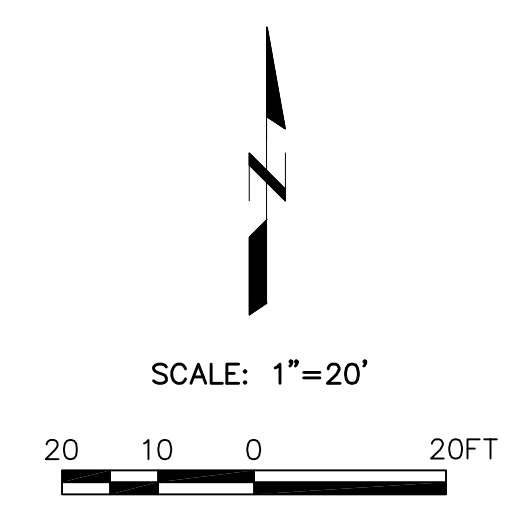
GENERAL

WATER SYSTEM SCHEMATIC

Scale: NONE
 Drawing No. G00.07
 Sheet No. 7 of 70



- NOTES:**
- CONTRACTOR SHALL SCARIFY THE SURFACE OF ALL EXISTING TRAILS THAT WILL NOT BE KEPT IN SERVICE. REMOVE ANY GRAVEL BEFORE SCARIFYING.
 - CUT BACK VEGETATION WITHIN BUILDING SETBACK BOUNDARY (TO BE DONE BY OWNER PRIOR TO START OF CONSTRUCTION).
 - TRIM TREES ALONG TRAILS TO PREVENT DAMAGE - (TO BE DONE BY OWNER PRIOR TO START OF CONSTRUCTION).
 - TREE REMOVALS (ABOVE GROUND ONLY) TO BE DONE BY OWNER PRIOR TO START OF CONSTRUCTION.



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			Checked
			SAK
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Rev	Date	By	Description
			BNAP010100

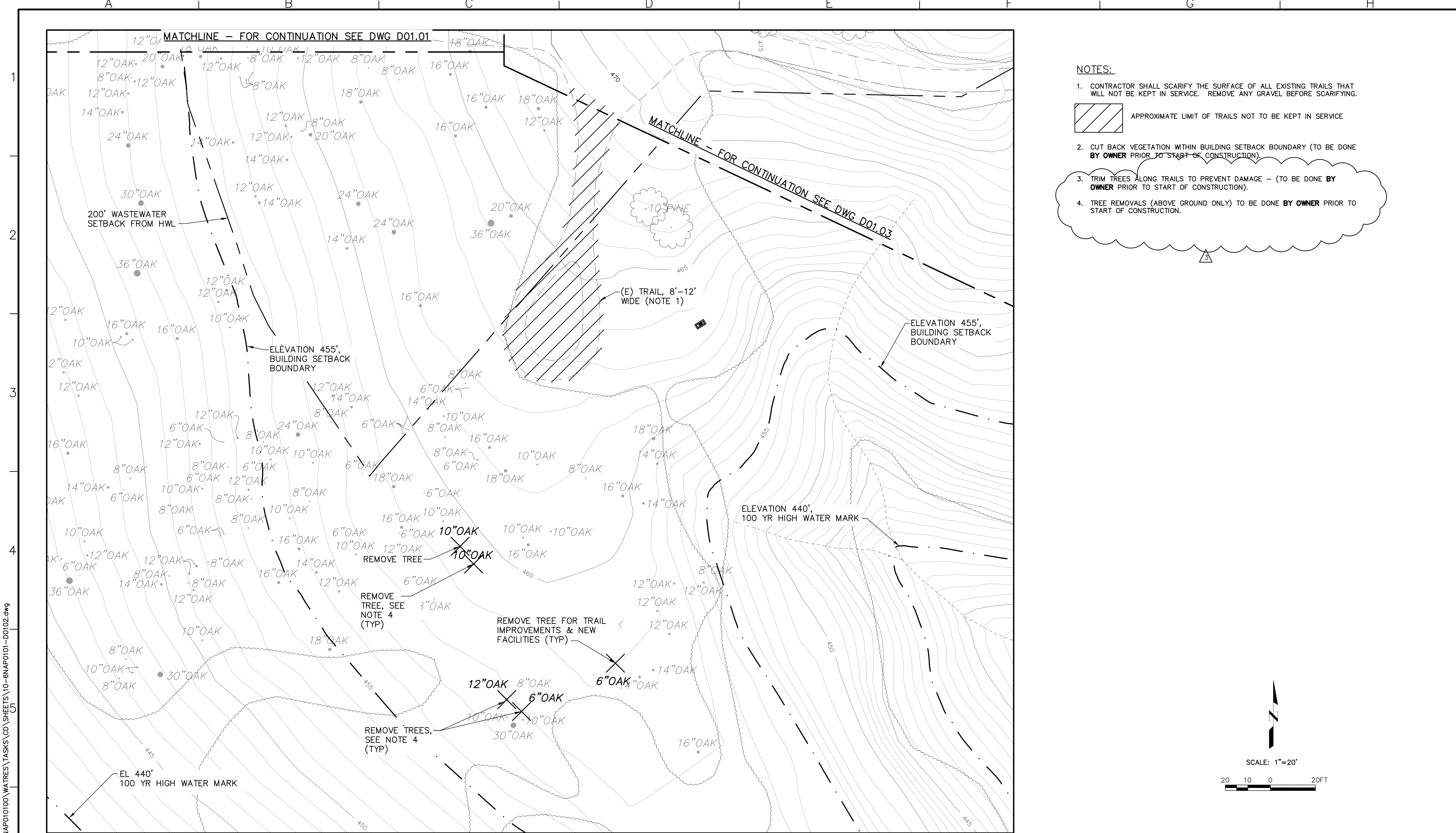
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 SEE SHEET 000.06 FOR BREAKDOWN

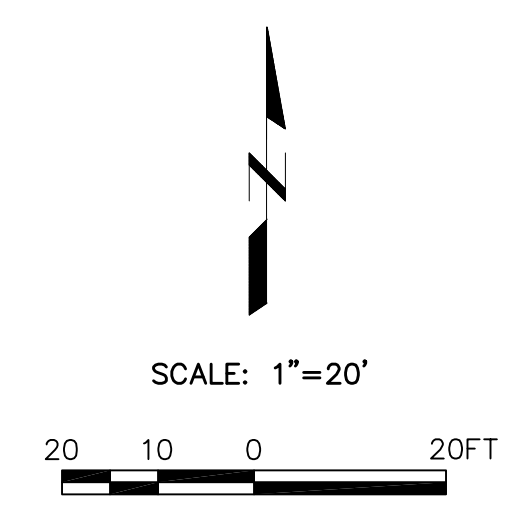
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 IF LINE IS NOT 2" SCALE ACCORDINGLY

NAPA COUNTY REGIONAL PARK
 AND OPEN SPACE DISTRICT
 CAMP BERRYESSA IMPROVEMENTS
 CIVIL
 DEMOLITION SITE PLAN
 NORTH

Scale
 AS NOTED
 Drawing No.
D01.01
 Sheet No.
 9 of 70



- NOTES:**
- CONTRACTOR SHALL SCARIFY THE SURFACE OF ALL EXISTING TRAILS THAT WILL NOT BE KEPT IN SERVICE. REMOVE ANY GRAVEL BEFORE SCARIFYING.
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	Checked	SAK
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	BNAP010100	

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B14.1071 - 1079
 SEE SHEET G00.06 FOR BREAKDOWN

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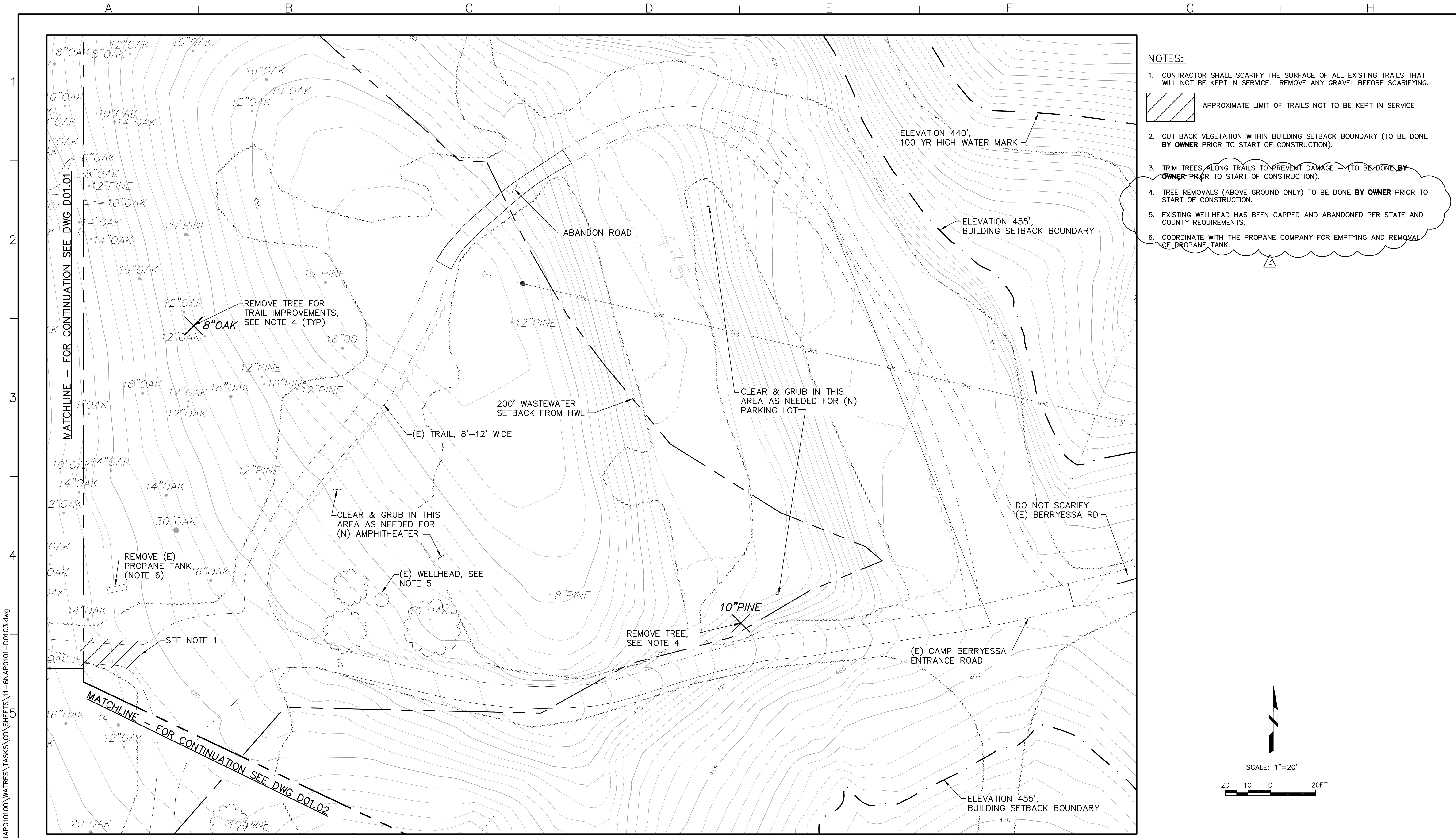
NAPA COUNTY REGIONAL PARK
 AND OPEN SPACE DISTRICT
 CAMP BERRYESSA IMPROVEMENTS

CIVIL
 DEMOLITION SITE PLAN
 SOUTH

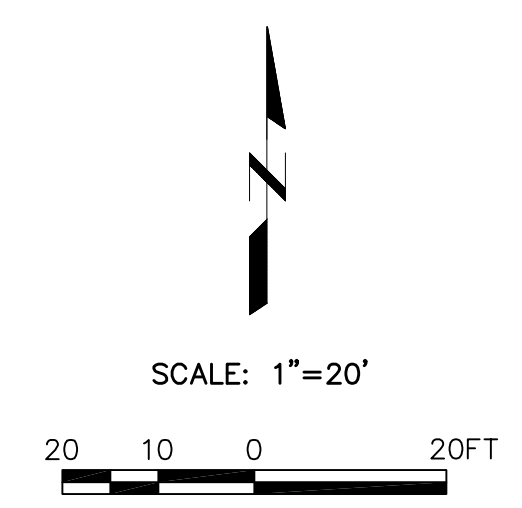
Scale
 AS NOTED

Drawing No.
D01.02

Sheet No.
 10 of 70



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- CONTRACTOR SHALL SCARIFY THE SURFACE OF ALL EXISTING TRAILS THAT WILL NOT BE KEPT IN SERVICE. REMOVE ANY GRAVEL BEFORE SCARIFYING.
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 - TREE REMOVALS (ABOVE GROUND ONLY) TO BE DONE BY OWNER PRIOR TO START OF CONSTRUCTION.
 - EXISTING WELLHEAD HAS BEEN CAPPED AND ABANDONED PER STATE AND COUNTY REQUIREMENTS.
 - COORDINATE WITH THE PROPANE COMPANY FOR EMPTYING AND REMOVAL OF PROPANE TANK.



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				BNAP010100
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Rev	Date	By	Description	

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 SEE SHEET 000.06 FOR BREAKDOWN
 0" LINE IS 2 INCHES AT FULL SCALE
 IF LINE IS NOT 2" SCALE ACCORDINGLY

NAPA COUNTY REGIONAL PARK
 AND OPEN SPACE DISTRICT
 CAMP BERRYESSA IMPROVEMENTS
 CIVIL
 DEMOLITION SITE PLAN
 EAST

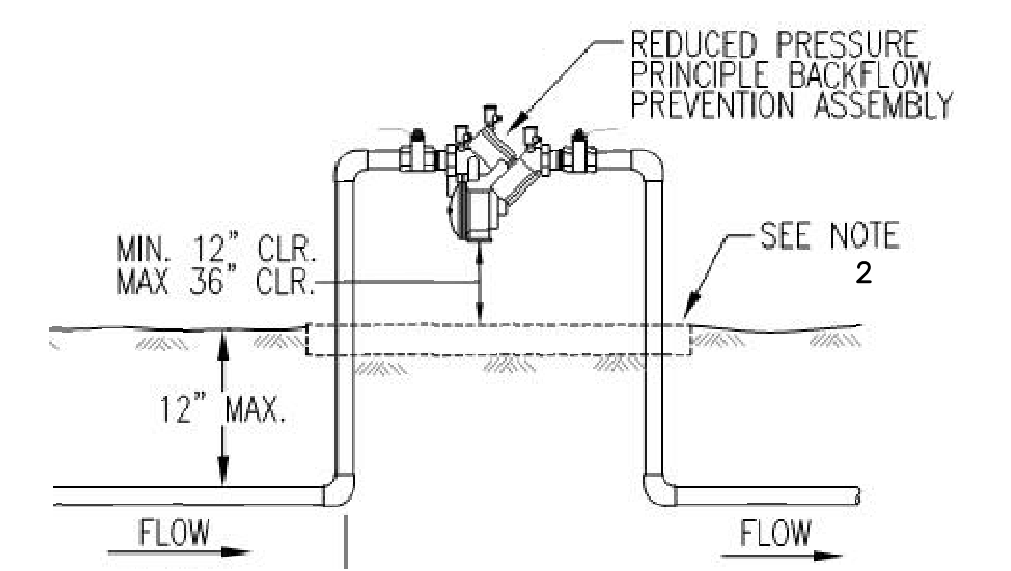
Scale
 AS NOTED
 Drawing No.
D01.03
 Sheet No.
 11 of 70

MATCHLINE — FOR CONTINUATION SEE DWG C01.01

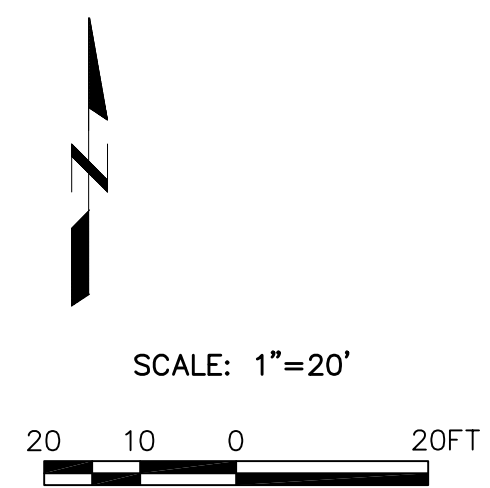
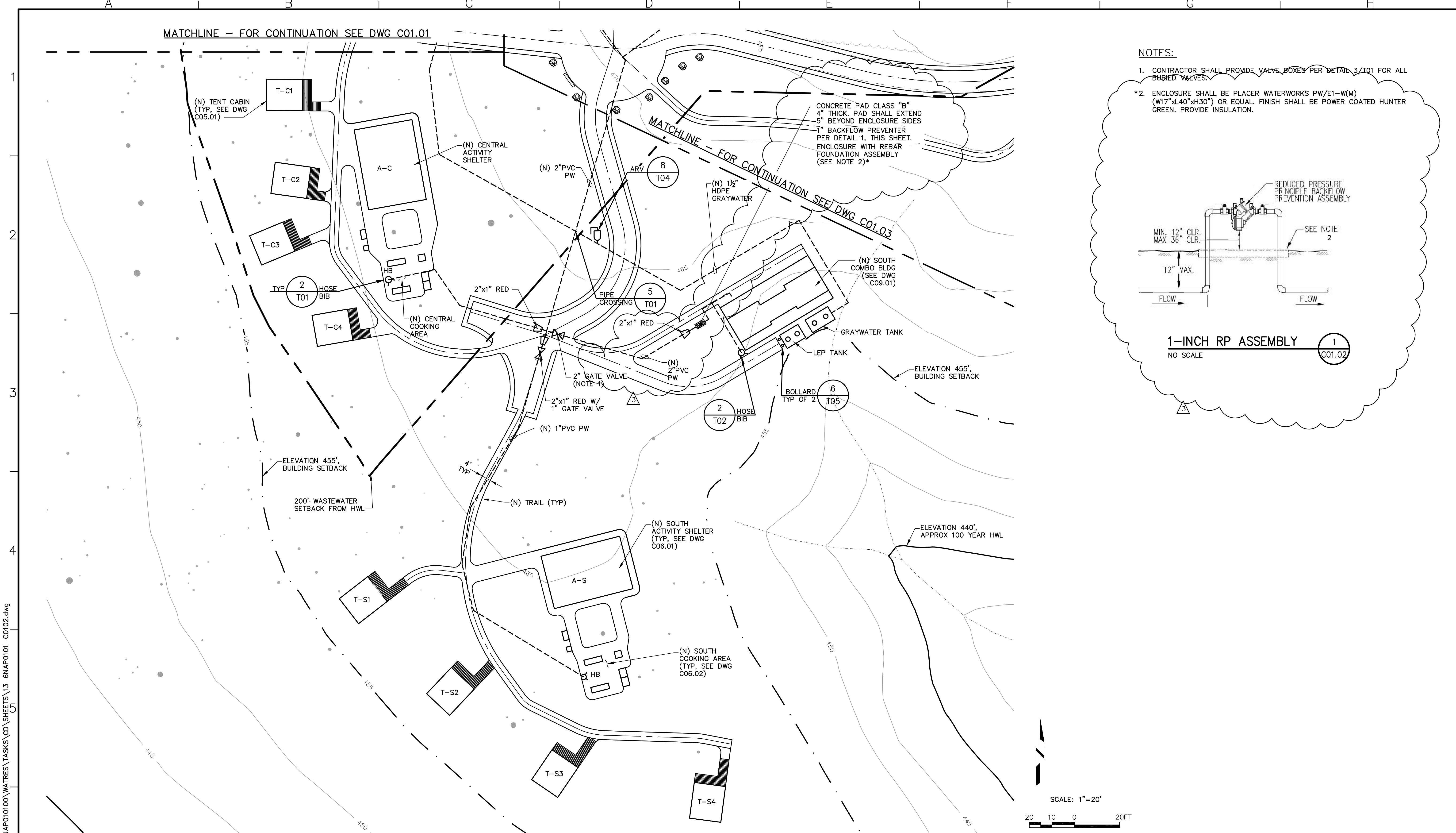
MATCHLINE — FOR CONTINUATION SEE DWG C01.03

NOTES:

- CONTRACTOR SHALL PROVIDE VALVE BOXES PER DETAIL 3/T01 FOR ALL BURIED VALVES.
- ENCLOSURE SHALL BE PLACER WATERWORKS PW/E1-W(M) (W17"xL40"xH30") OR EQUAL. FINISH SHALL BE POWER COATED HUNTER GREEN. PROVIDE INSULATION.



1-INCH RP ASSEMBLY
NO SCALE



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			BNAP010100
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Rev	Date	By	Description

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B14.1071 - 1079
SEE SHEET G00.06 FOR BREAKDOWN

0 LINE IS 2 INCHES AT FULL SCALE
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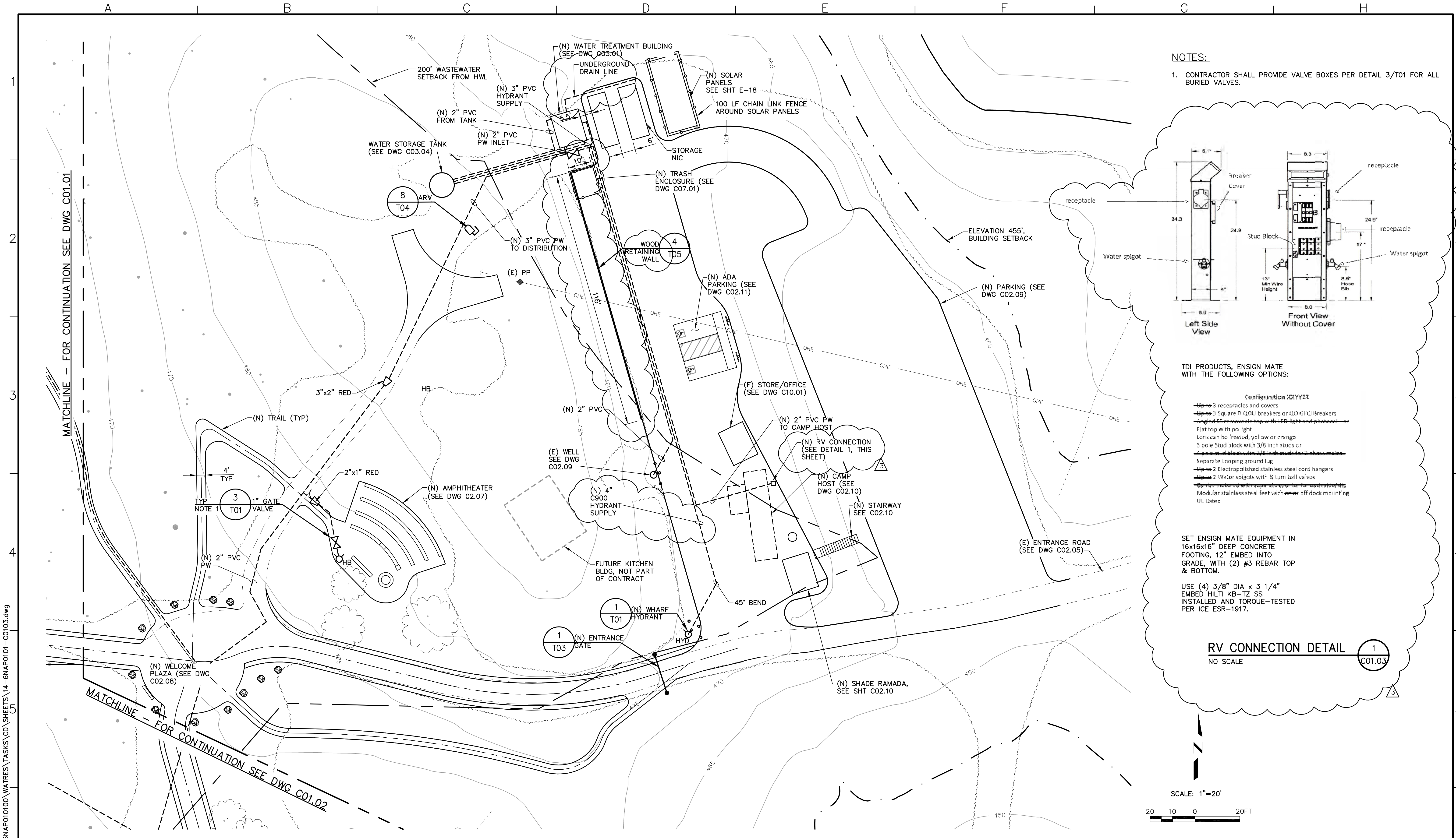
**NAPA COUNTY REGIONAL PARK AND OPEN SPACE DISTRICT
CAMP BERRYESSA IMPROVEMENTS**

CIVIL
SITE PLAN SOUTH

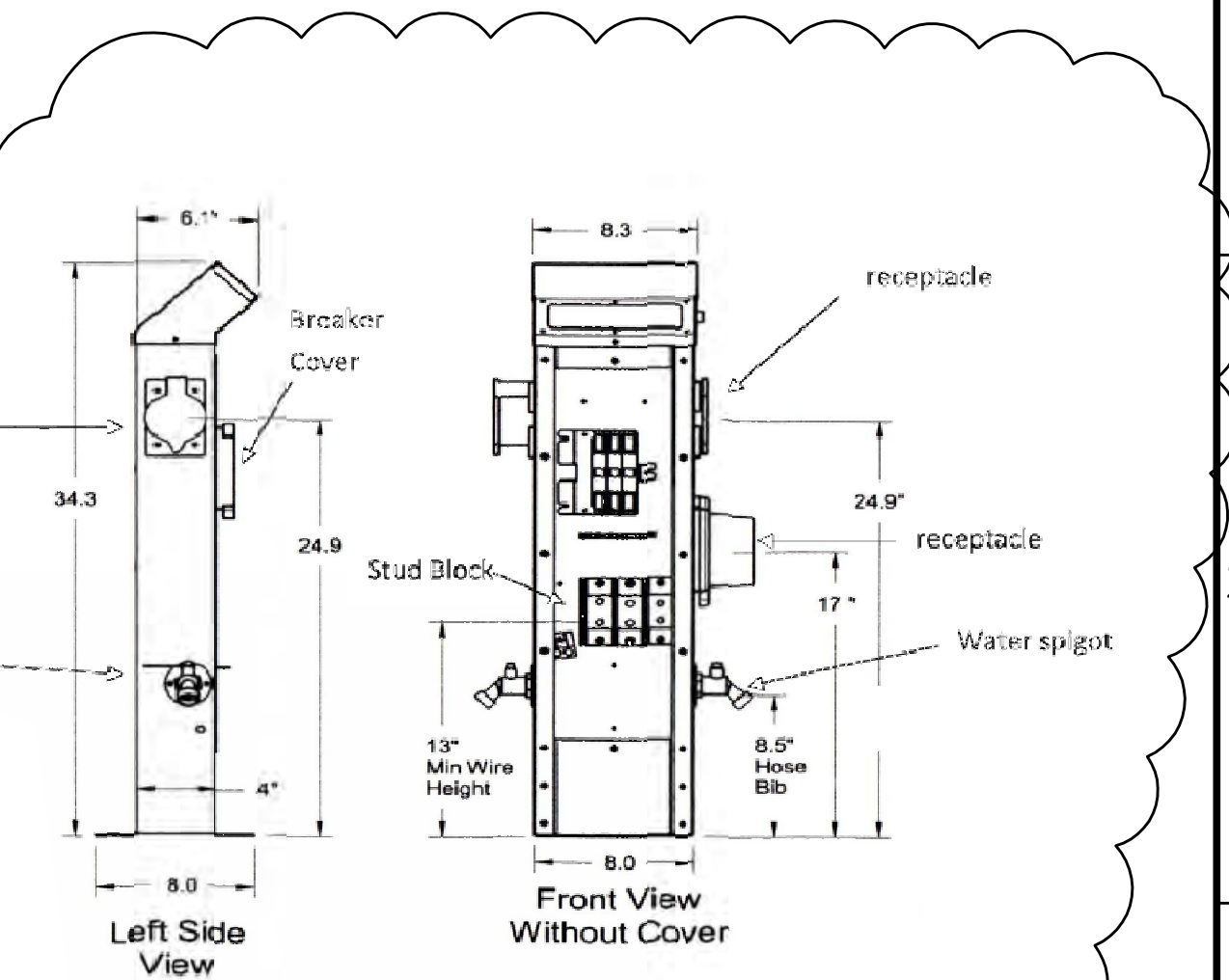
Scale
AS NOTED

Drawing No.
C01.02

Sheet No.
13 of 70



NOTES:
 1. CONTRACTOR SHALL PROVIDE VALVE BOXES PER DETAIL 3/T01 FOR ALL BURIED VALVES.



TDI PRODUCTS, ENSIGN MATE WITH THE FOLLOWING OPTIONS:

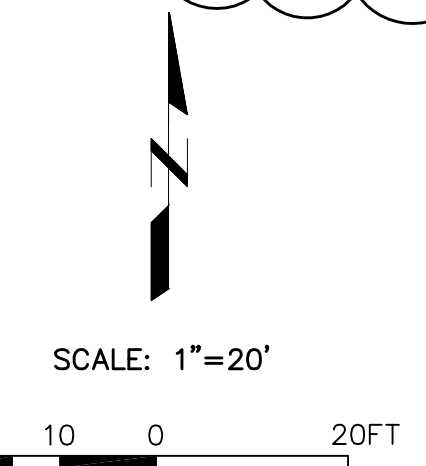
Configuration KXYZZ

- 3 receptacles and covers
- 3 Square D (QO) breakers or (QO) breakers
- Angled 55° receptacle top with 60° light and photos
- Flat top with no light
- Lens can be frosted, yellow or orange
- 3 pole Stud block with 3/8 inch studs or
- 3 pole stud block with 3/8 inch studs for a phase meter
- Separate looping ground lug
- 2 Electropolished stainless steel cord hangers
- 2 Water spigots with 1/2 turn ball valves
- Color matched with adjacent concrete for color and the Modular stainless steel feet with off dock mounting (U) listed

SET ENSIGN MATE EQUIPMENT IN 16x16x16" DEEP CONCRETE FOOTING, 12" EMBED INTO GRADE, WITH (2) #3 REBAR TOP & BOTTOM.

USE (4) 3/8" DIA x 3 1/4" EMBED HILTI KB-TZ SS INSTALLED AND TORQUE-TESTED PER ICE ESR-1917.

RV CONNECTION DETAIL 1
 NO SCALE C01.03



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 SKEMEN

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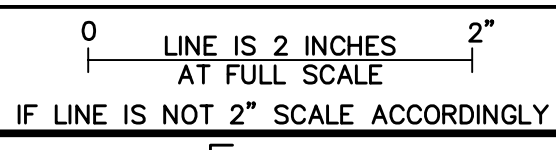


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	Checked	SAK
	Job No.	BNAP010100
Rev 9/12/14	By SK	Description PLAN REVISION

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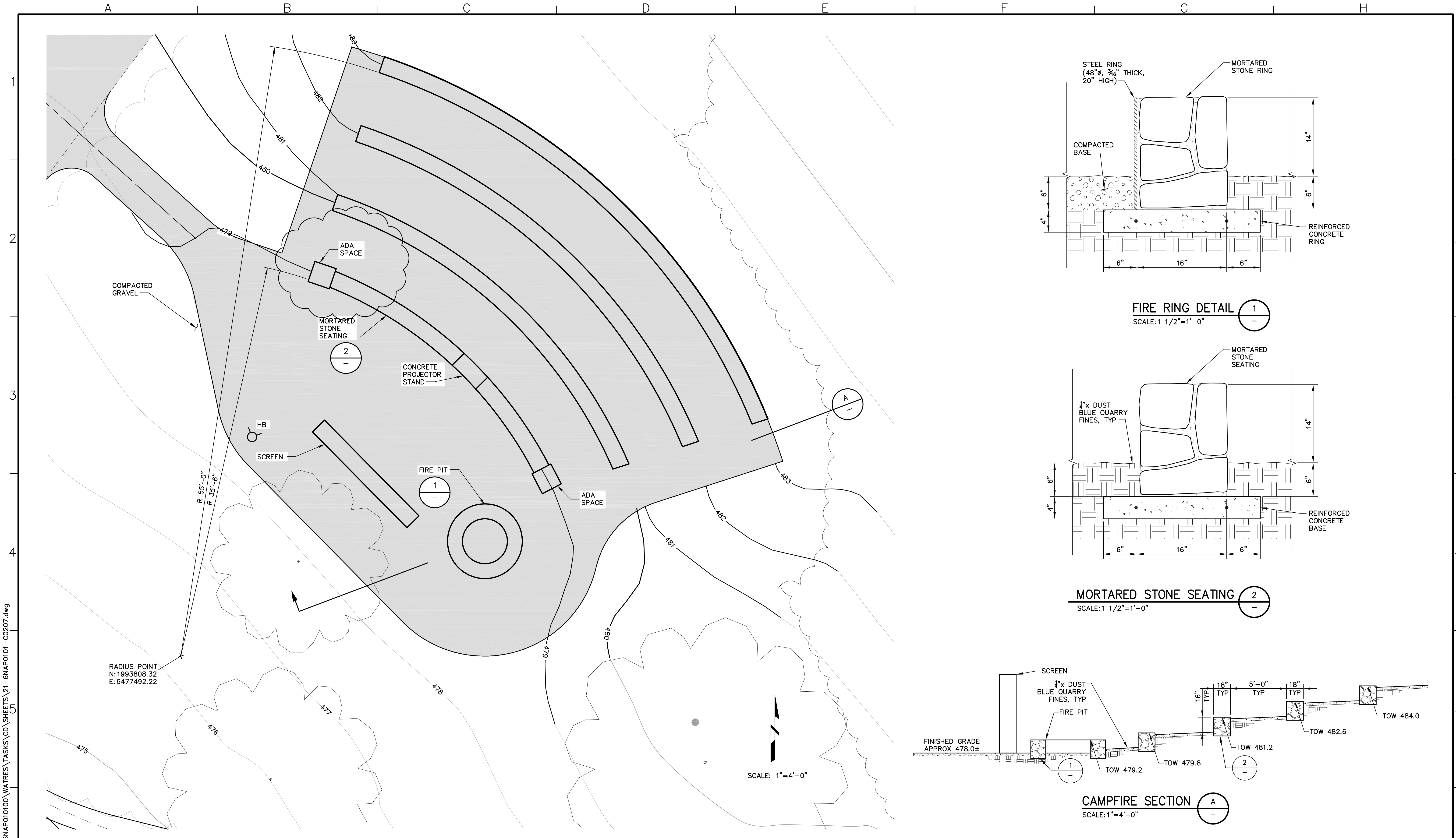
B14.1071 - 1079
 SEE SHEET G00.06 FOR BREAKDOWN



**NAPA COUNTY REGIONAL PARK AND OPEN SPACE DISTRICT
 CAMP BERRYESSA IMPROVEMENTS**

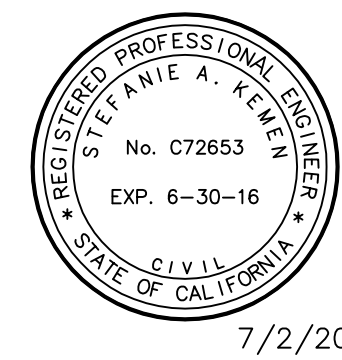
CIVIL
 SITE PLAN
 EAST

Scale AS NOTED
 Drawing No. C01.03
 Sheet No. 14 of 70



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	Description	USBR COMMENTS

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B14.1071 - 1079
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0 1" LINE IS 2 INCHES AT FULL SCALE 2"
 IF LINE IS NOT 2" SCALE ACCORDINGLY

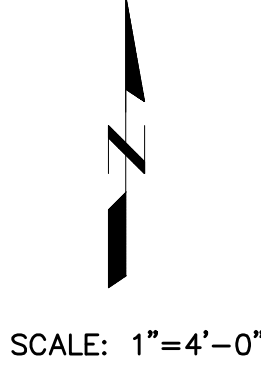
NAPA COUNTY REGIONAL PARK
 AND OPEN SPACE DISTRICT
 CAMP BERRYESSA IMPROVEMENTS
 CIVIL
 AMPHITHEATER PLAN, SECTION
 & DETAILS

Scale
 AS NOTED
 Drawing No.
C02.07
 Sheet No.
 21 of 70



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SKEMEN



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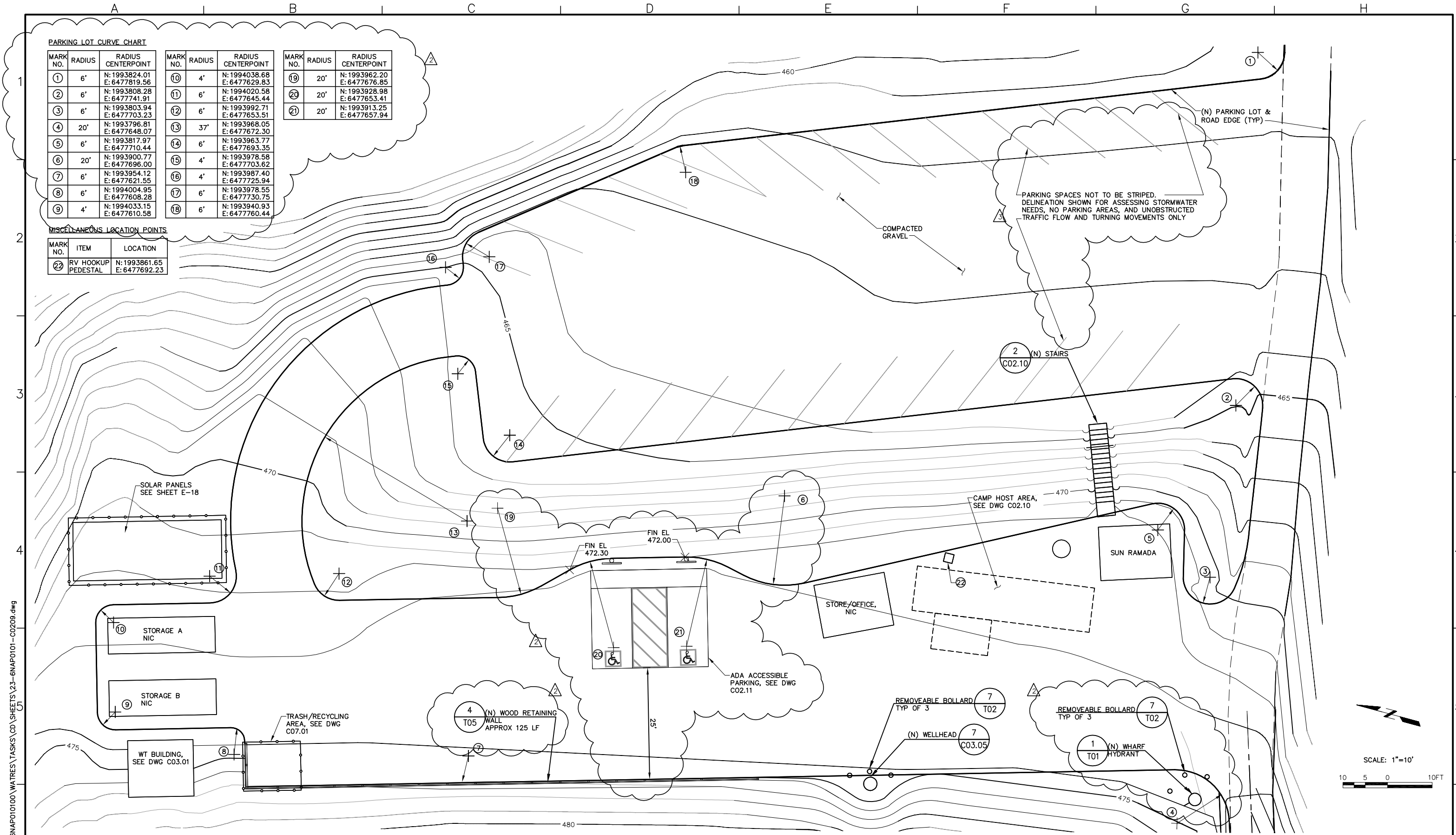
ISSUED FOR BIDS	Designed ELL
ISSUED FOR CONSTRUCTION	Drawn JAC
	Checked SAK
	Job No. 6NAP010100

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NAPA COUNTY REGIONAL PARK
 AND OPEN SPACE DISTRICT
 CAMP BERRYESSA IMPROVEMENTS
 CIVIL
 WELCOME PLAZA PLAN

Scale AS NOTED
Drawing No. C02.08
Sheet No. 22 of 70



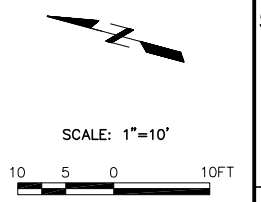
PARKING LOT CURVE CHART

MARK NO.	RADIUS	RADIUS CENTERPOINT	MARK NO.	RADIUS	RADIUS CENTERPOINT	MARK NO.	RADIUS	RADIUS CENTERPOINT
1	6'	N: 1993824.01 E: 6477819.56	10	4'	N: 1994038.68 E: 6477629.83	19	20'	N: 1993962.20 E: 6477676.85
2	6'	N: 1993808.28 E: 6477741.91	11	6'	N: 1994020.58 E: 6477645.44	20	20'	N: 1993928.98 E: 6477653.41
3	6'	N: 1993803.94 E: 6477703.23	12	6'	N: 1993992.71 E: 6477653.51	21	20'	N: 1993913.25 E: 6477657.94
4	20'	N: 1993796.81 E: 6477648.07	13	37'	N: 1993968.05 E: 6477672.30			
5	6'	N: 1993817.97 E: 6477710.44	14	6'	N: 1993963.77 E: 6477693.35			
6	20'	N: 1993900.77 E: 6477696.00	15	4'	N: 1993978.58 E: 6477703.62			
7	6'	N: 1993954.12 E: 6477621.55	16	4'	N: 1993987.40 E: 6477725.94			
8	6'	N: 1994004.95 E: 6477608.28	17	6'	N: 1993978.55 E: 6477730.75			
9	4'	N: 1994033.15 E: 6477610.58	18	6'	N: 1993940.93 E: 6477760.44			

MISCELLANEOUS LOCATION POINTS

MARK NO.	ITEM	LOCATION
22	RV HOOKUP PEDESTAL	N: 1993861.65 E: 6477692.23

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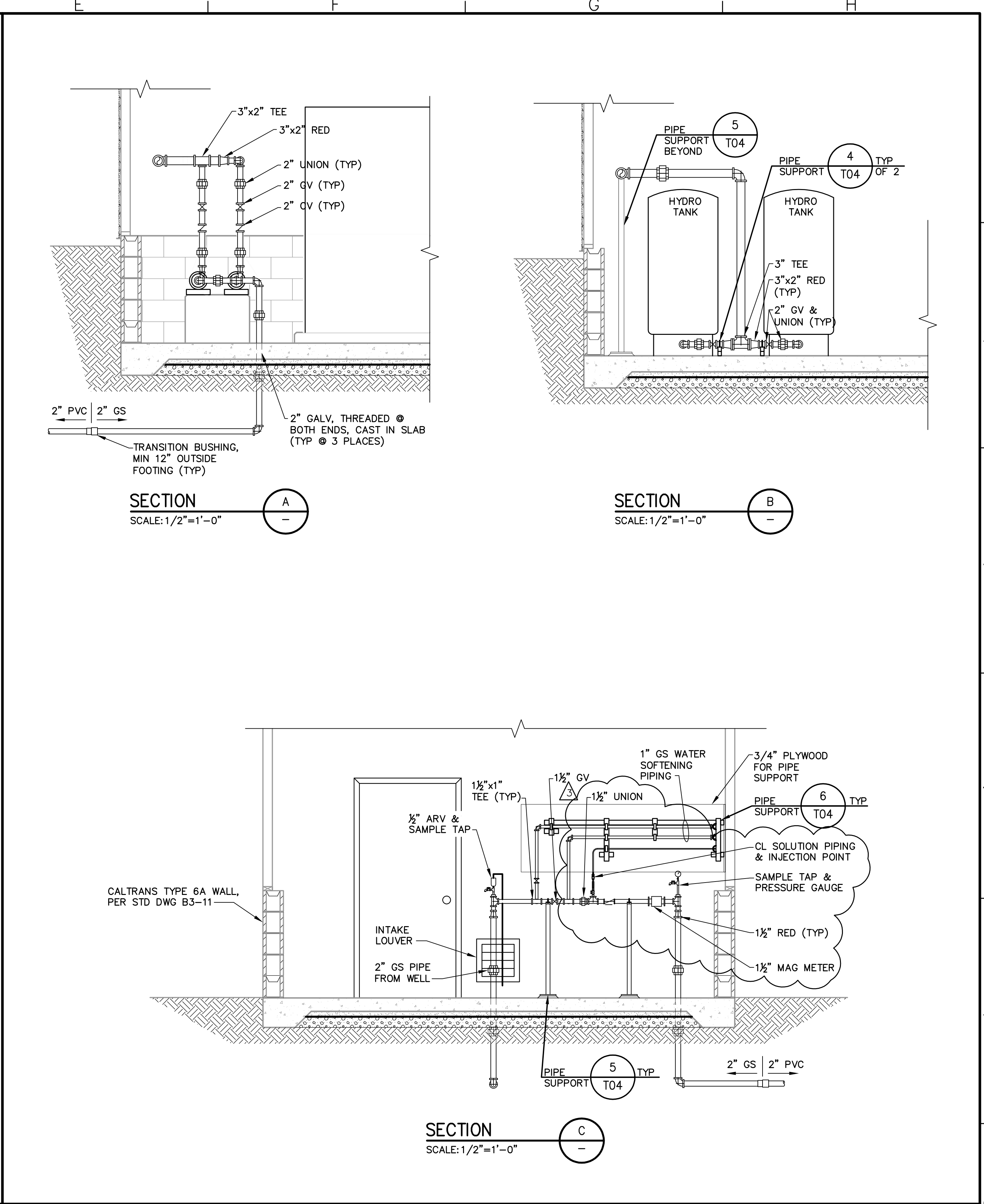
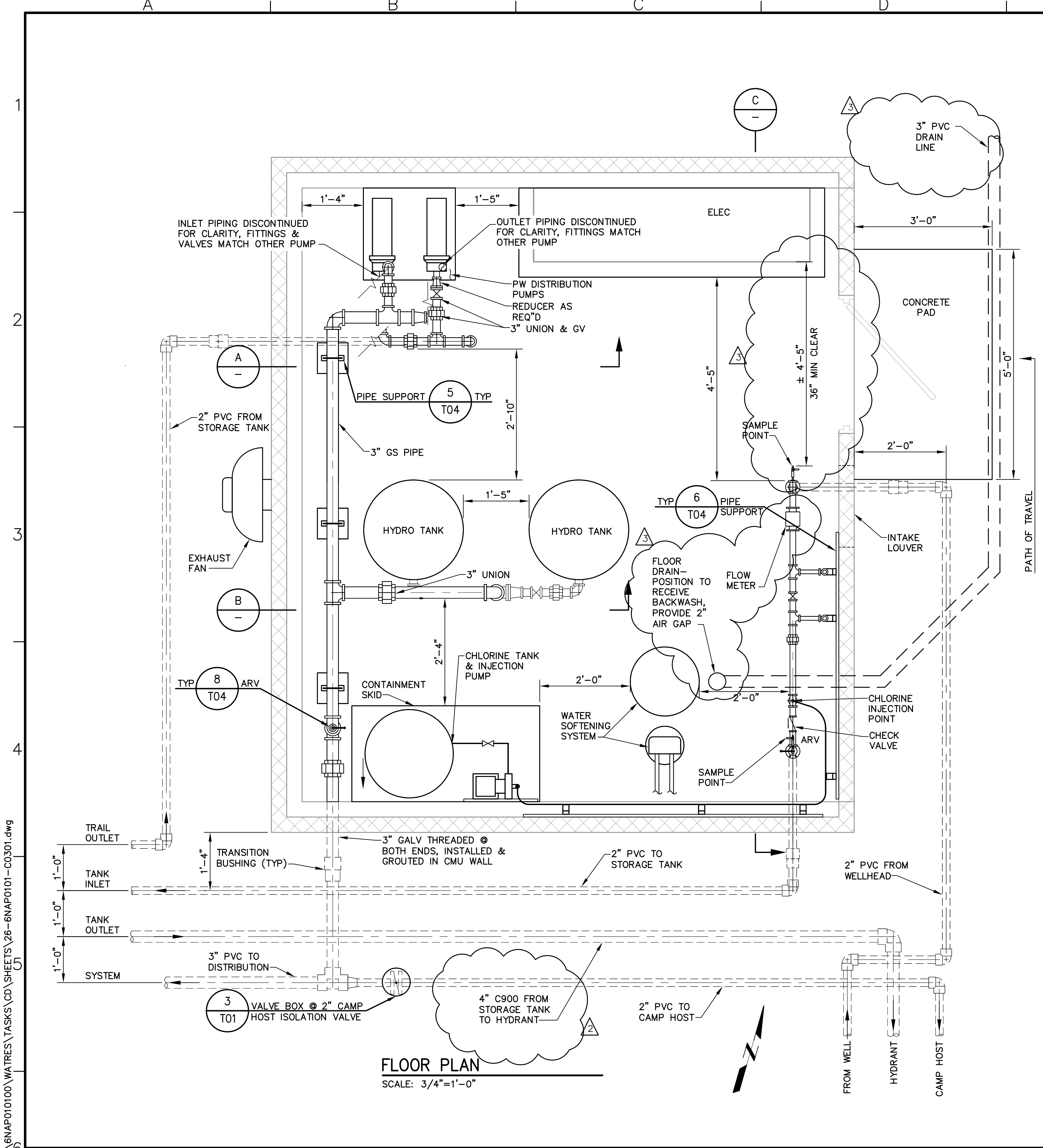
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SEE SHEET G00.06 FOR BREAKDOWN

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IF LINE IS NOT 2" SCALE ACCORDINGLY

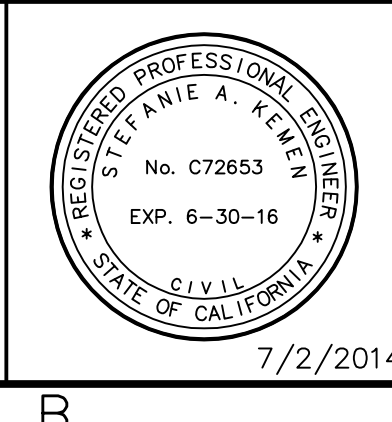
**NAPA COUNTY REGIONAL PARK AND OPEN SPACE DISTRICT
CAMP BERRYESSA IMPROVEMENTS**

CIVIL
PARKING LOT PLAN

Scale	AS NOTED
Drawing No.	C02.09
Sheet No.	23 of 70



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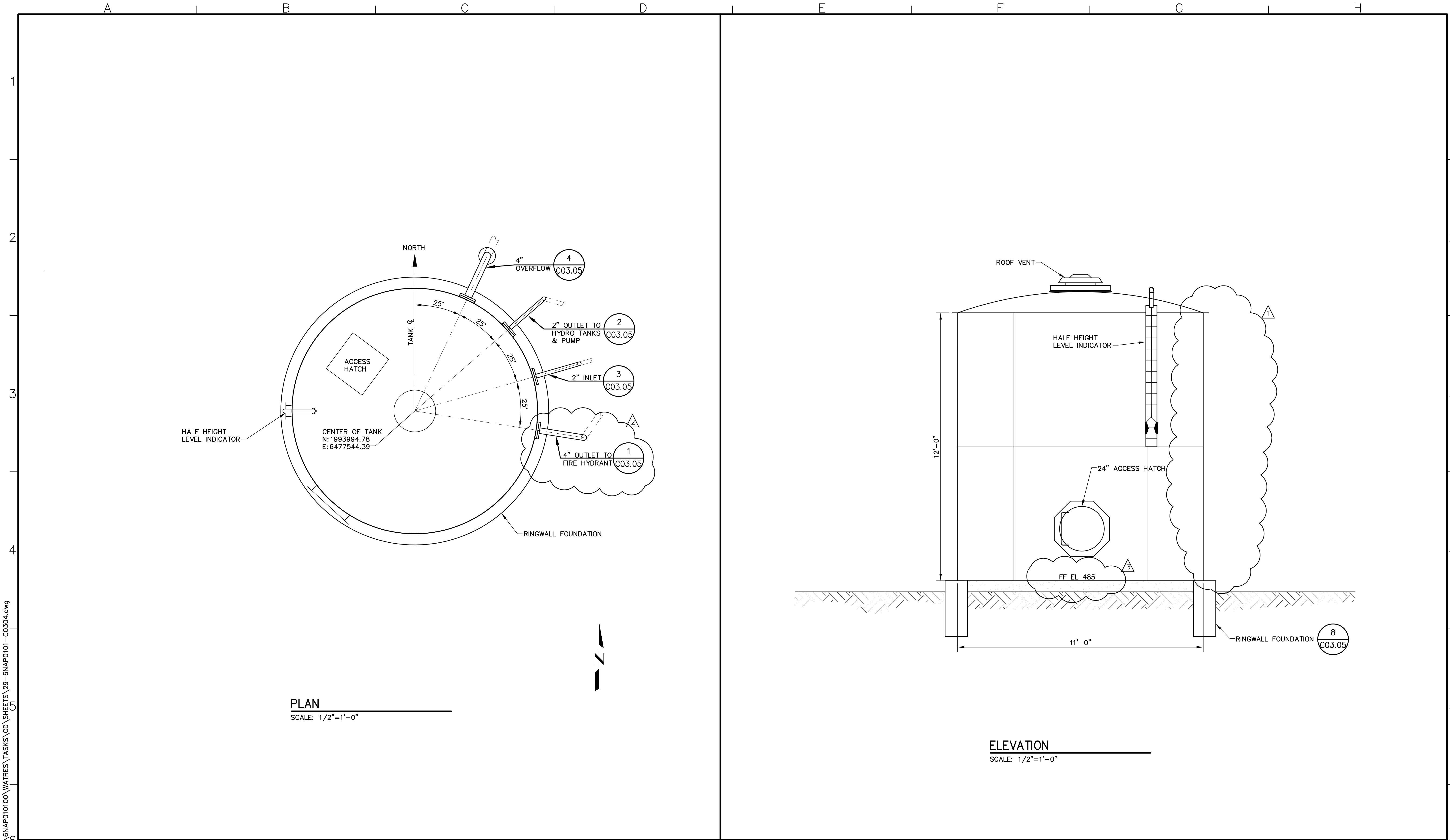
**NAPA COUNTY REGIONAL PARK
AND OPEN SPACE DISTRICT
CAMP BERRYESSA IMPROVEMENTS**

CIVIL

**WATER TREATMENT BUILDING
MECHANICAL PLAN & SECTIONS**

Scale AS NOTED
Drawing No. C03.01
Sheet No. 26 of 70

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PLAN
SCALE: 1/2"=1'-0"

ELEVATION
SCALE: 1/2"=1'-0"

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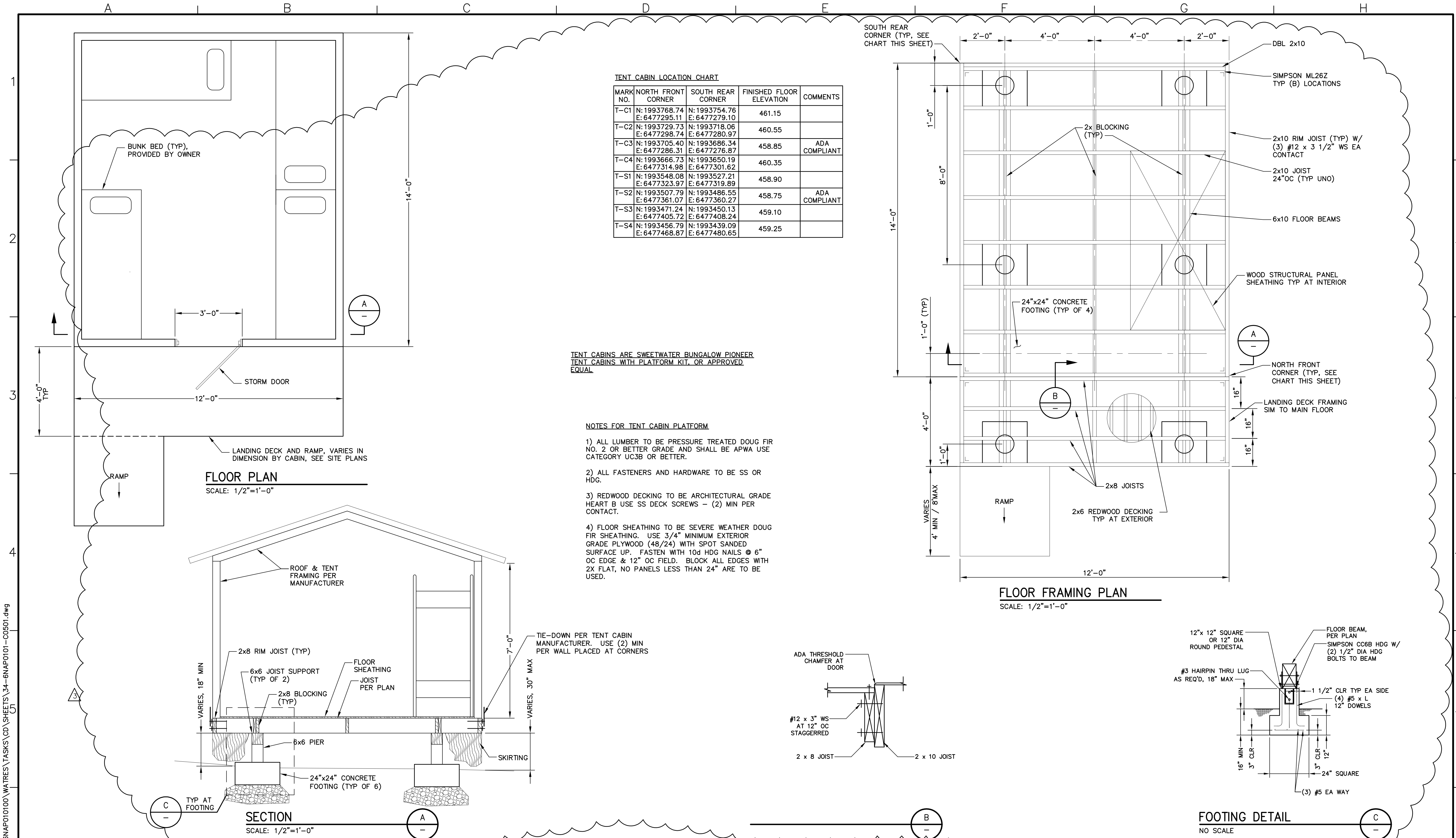
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CAMP BERRYESSA IMPROVEMENTS**

CIVIL

WATER TANK PLAN & ELEVATION

Scale	AS NOTED
Drawing No.	C03.04
Sheet No.	29 of 70



TENT CABIN LOCATION CHART

MARK NO.	NORTH FRONT CORNER	SOUTH REAR CORNER	FINISHED FLOOR ELEVATION	COMMENTS
T-C1	N: 1993768.74 E: 6477295.11	N: 1993754.76 E: 6477279.10	461.15	
T-C2	N: 1993729.73 E: 6477298.74	N: 1993718.06 E: 6477280.97	460.55	
T-C3	N: 1993705.40 E: 6477286.31	N: 1993686.34 E: 6477276.87	458.85	ADA COMPLIANT
T-C4	N: 1993666.73 E: 6477314.98	N: 1993650.19 E: 6477301.62	460.35	
T-S1	N: 1993548.08 E: 6477323.97	N: 1993527.21 E: 6477319.89	458.90	
T-S2	N: 1993507.79 E: 6477361.07	N: 1993486.55 E: 6477360.27	458.75	ADA COMPLIANT
T-S3	N: 1993471.24 E: 6477405.72	N: 1993450.13 E: 6477408.24	459.10	
T-S4	N: 1993456.79 E: 6477468.87	N: 1993439.09 E: 6477480.65	459.25	

TENT CABINS ARE SWEETWATER BUNGALOW PIONEER TENT CABINS WITH PLATFORM KIT, OR APPROVED EQUAL

- NOTES FOR TENT CABIN PLATFORM**
- 1) ALL LUMBER TO BE PRESSURE TREATED DOUG FIR NO. 2 OR BETTER GRADE AND SHALL BE APWA USE CATEGORY UC3B OR BETTER.
 - 2) ALL FASTENERS AND HARDWARE TO BE SS OR HDG.
 - 3) REDWOOD DECKING TO BE ARCHITECTURAL GRADE HEART B USE SS DECK SCREWS - (2) MIN PER CONTACT.
 - 4) FLOOR SHEATHING TO BE SEVERE WEATHER DOUG FIR SHEATHING. USE 3/4" MINIMUM EXTERIOR GRADE PLYWOOD (48/24) WITH SPOT SANDED SURFACE UP. FASTEN WITH 10d HDG NAILS @ 6" OC EDGE & 12" OC FIELD. BLOCK ALL EDGES WITH 2X FLAT, NO PANELS LESS THAN 24" ARE TO BE USED.

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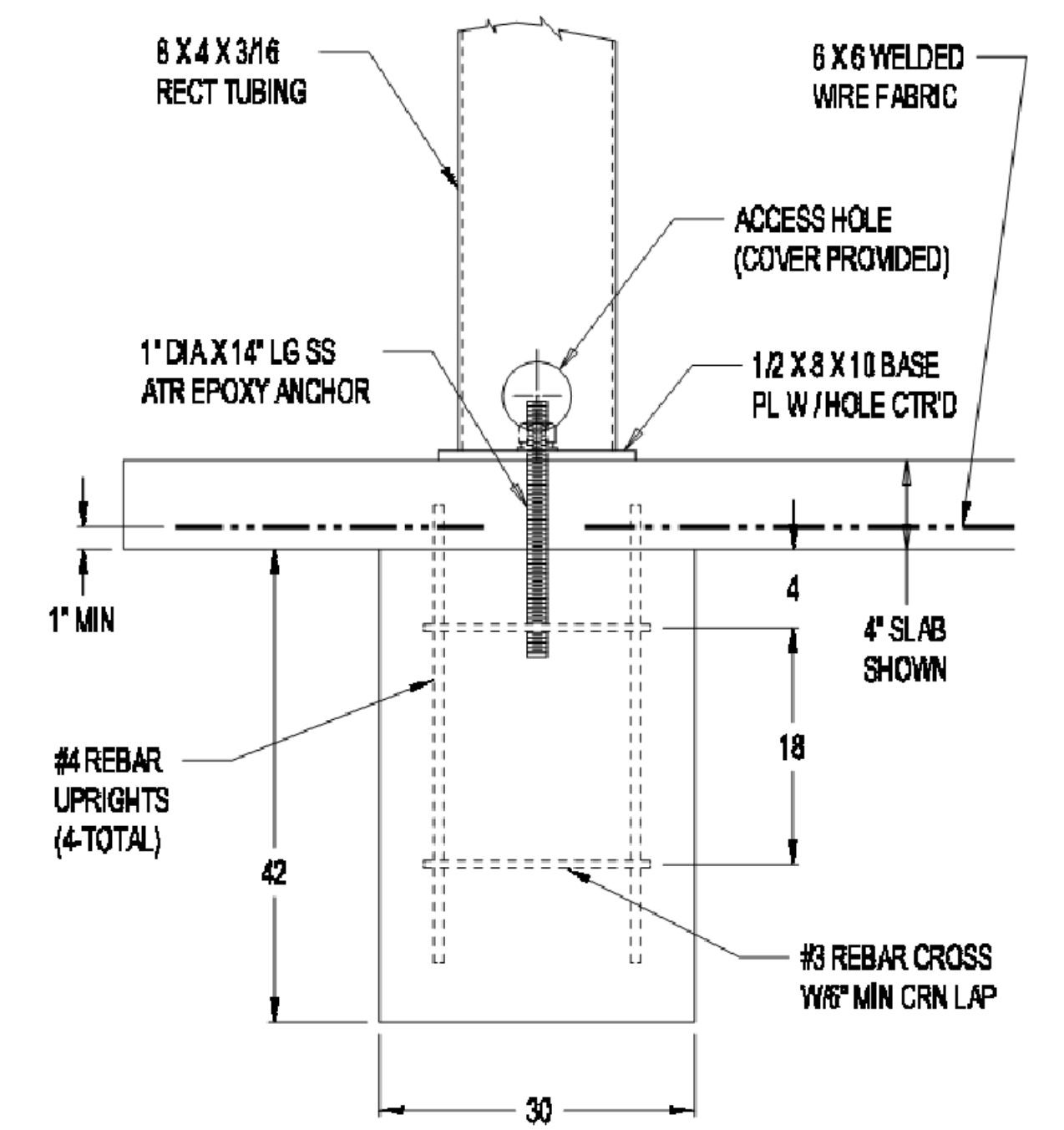
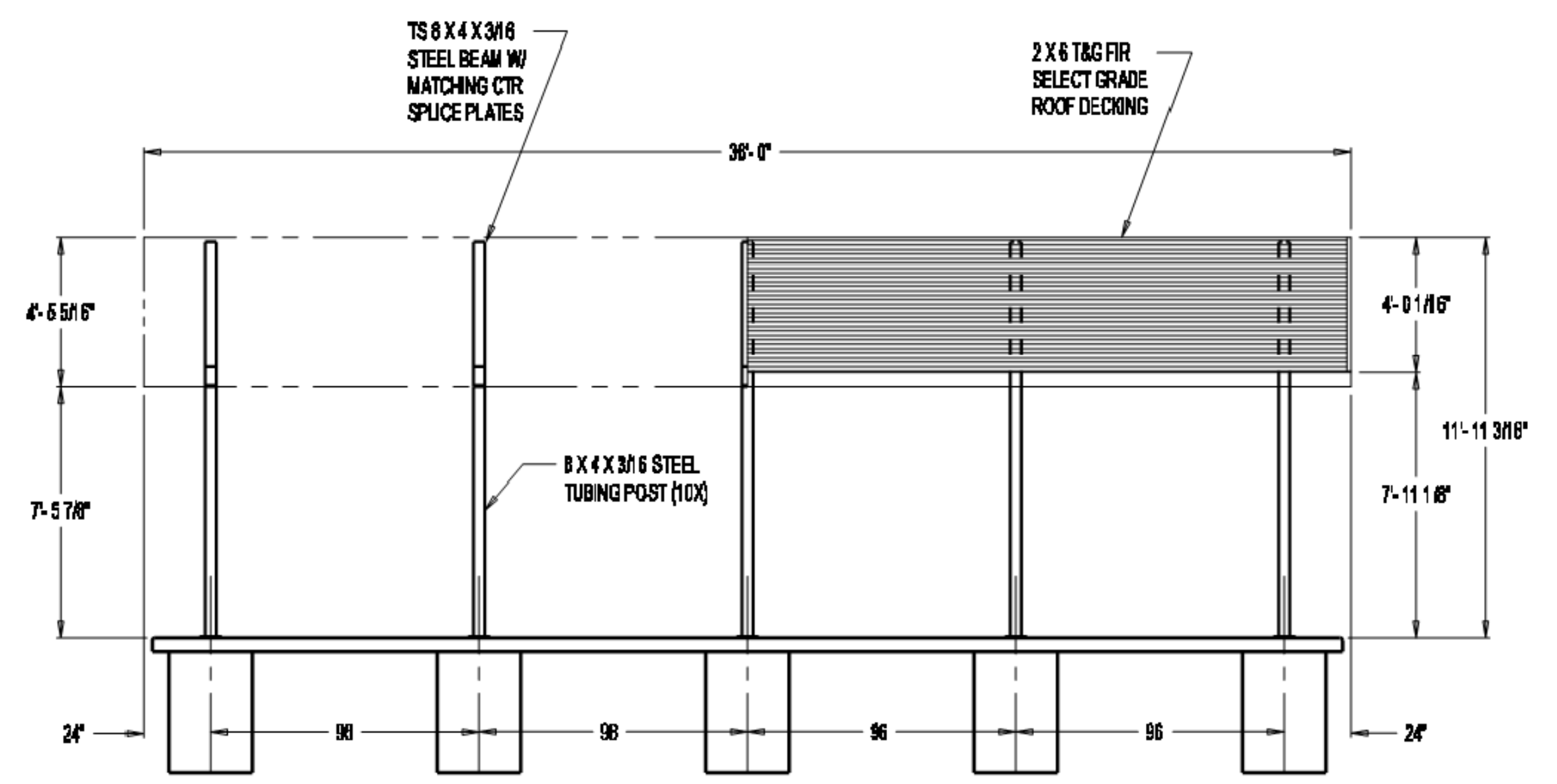
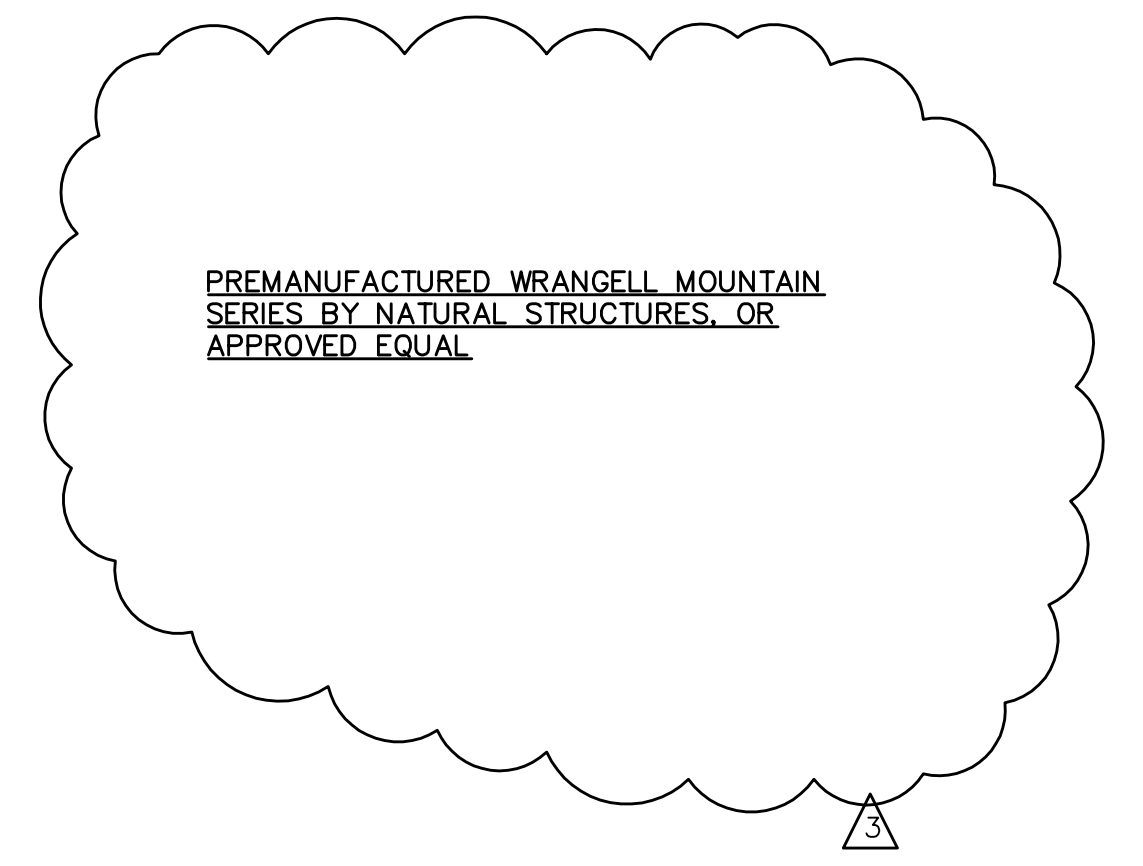
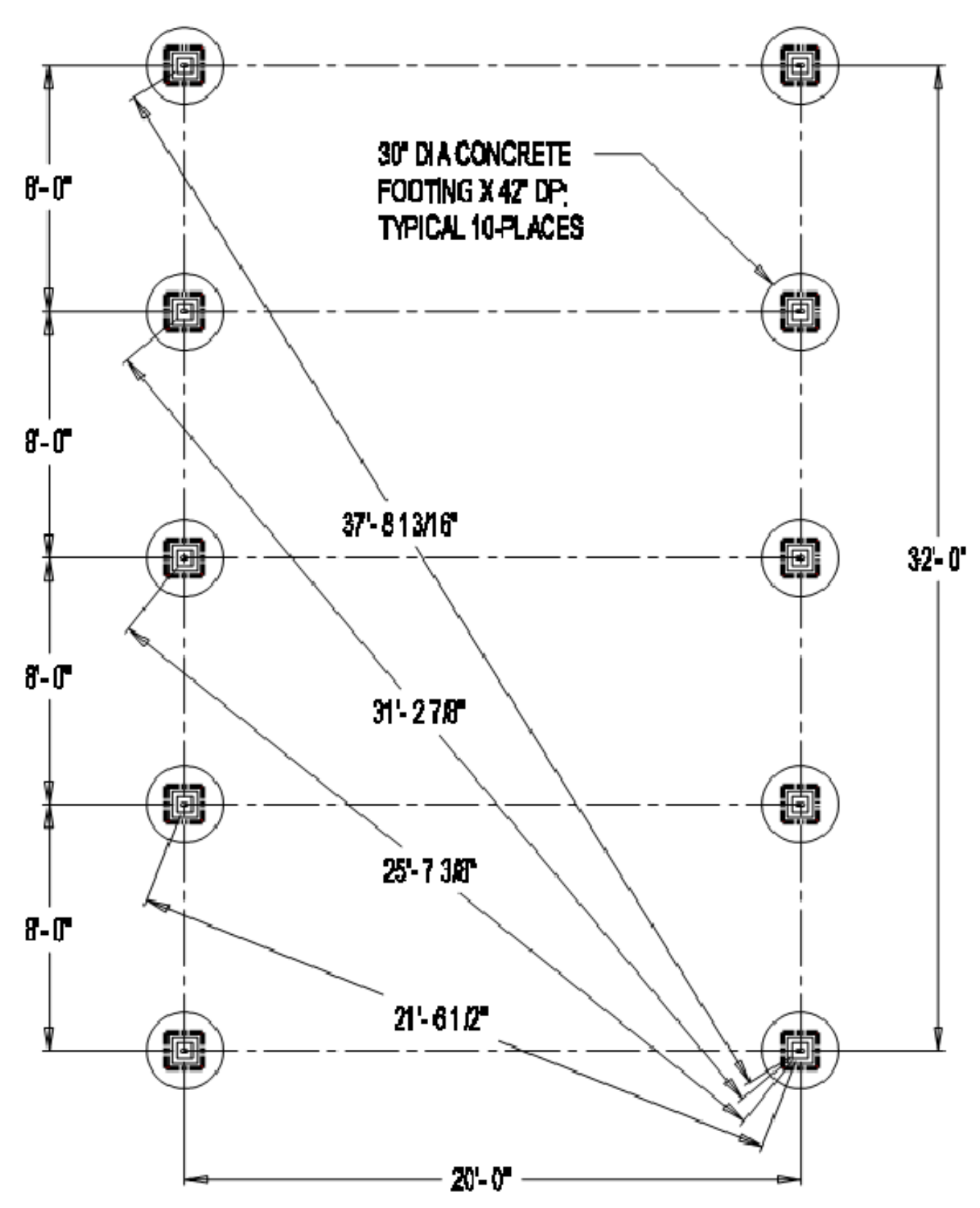
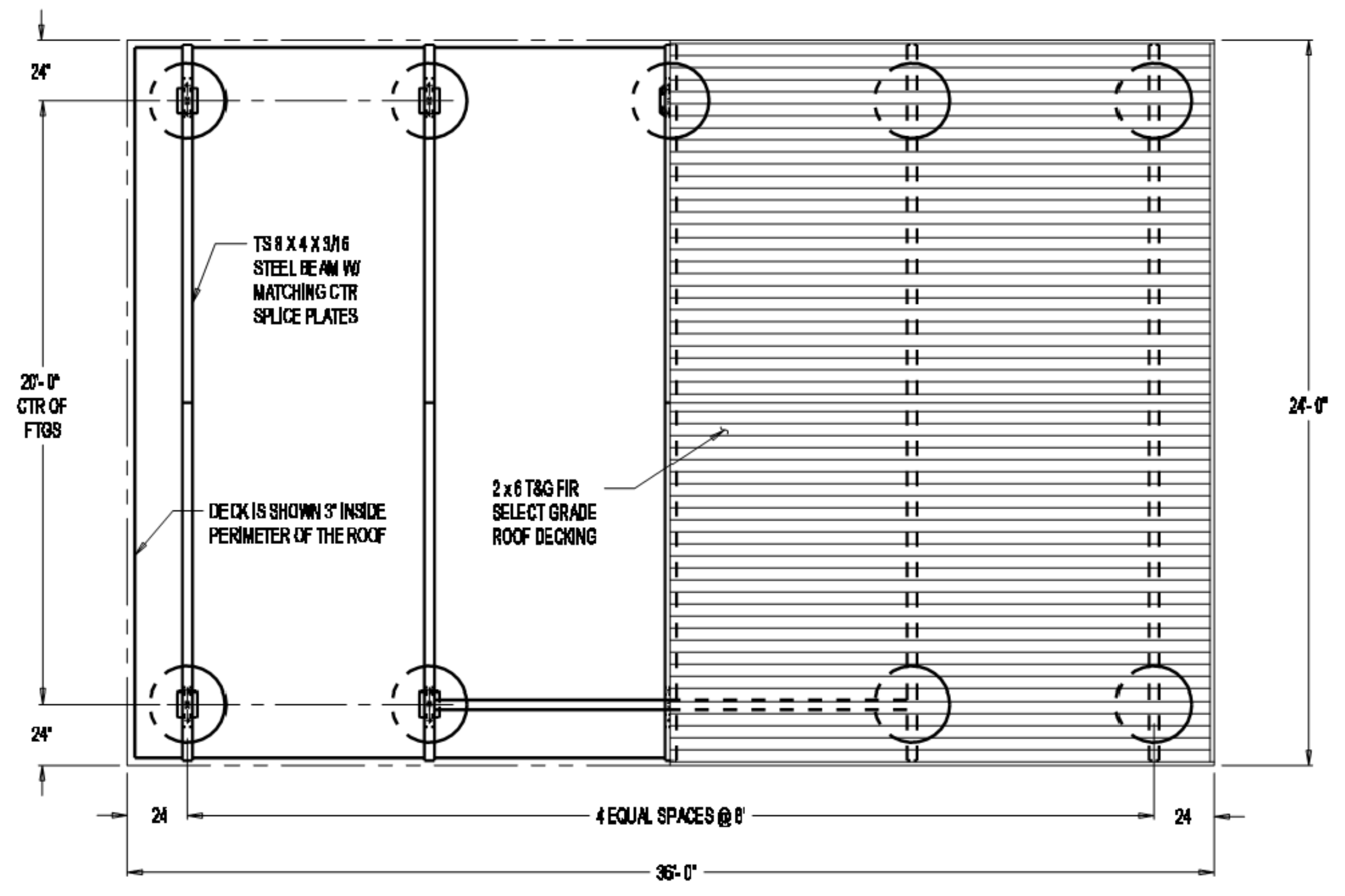
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CIVIL
TENT CABIN PLANS & SECTION

Scale	AS NOTED
Drawing No.	C05.01
Sheet No.	34 of 70

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ACTIVITY SHELTER LOCATION CHART

MARK NO.	NORTHEAST CORNER	SOUTHWEST CORNER	FINISHED SLAB ELEVATION
A-C	N: 1993746.36 E: 6477341.30	N: 1993711.32 E: 6477327.29	461.40
MARK NO.	NORTHWEST CORNER	SOUTHEAST CORNER	FINISHED SLAB ELEVATION
A-S	N: 1993553.25 E: 6477401.85	N: 1993541.77 E: 6477437.80	460.20

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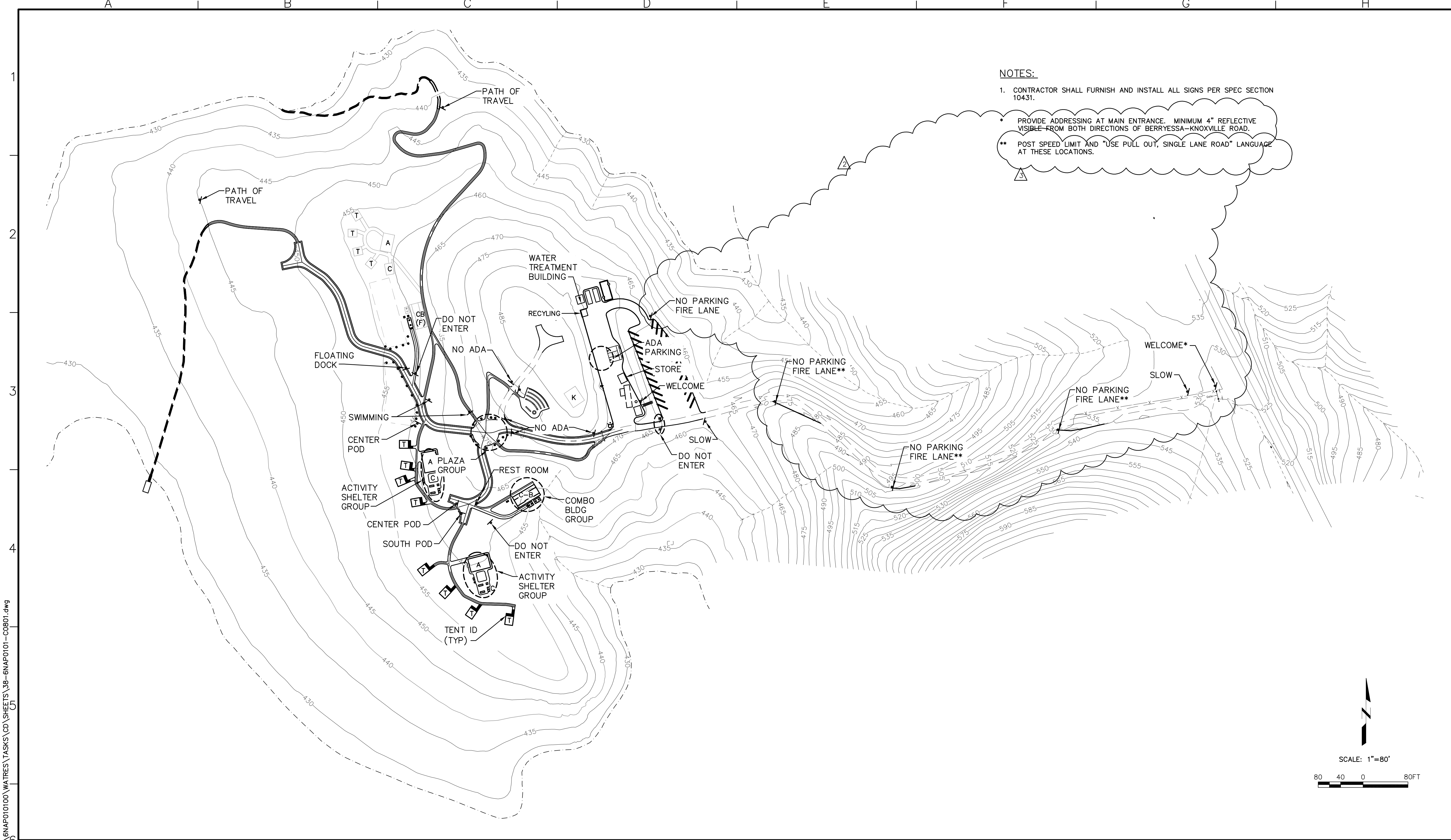
B14.1071 - 1079
 SEE SHEET 000.06 FOR BREAKDOWN

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 IF LINE IS NOT 2" SCALE ACCORDINGLY

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 CAMP BERRYESSA IMPROVEMENTS

CIVIL
 ACTIVITY SHELTER
 PLANS & SECTION

Scale
 AS NOTED
 Drawing No.
C06.01
 Sheet No.
 35 of 70

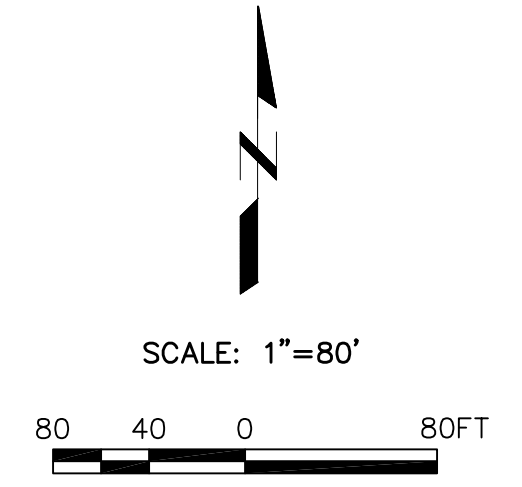


NOTES:

- CONTRACTOR SHALL FURNISH AND INSTALL ALL SIGNS PER SPEC SECTION 10431.

* PROVIDE ADDRESSING AT MAIN ENTRANCE. MINIMUM 4" REFLECTIVE VISIBLE FROM BOTH DIRECTIONS OF BERRYESSA-KNOXVILLE ROAD.

** POST SPEED LIMIT AND "USE PULL OUT, SINGLE LANE ROAD" LANGUAGE AT THESE LOCATIONS.



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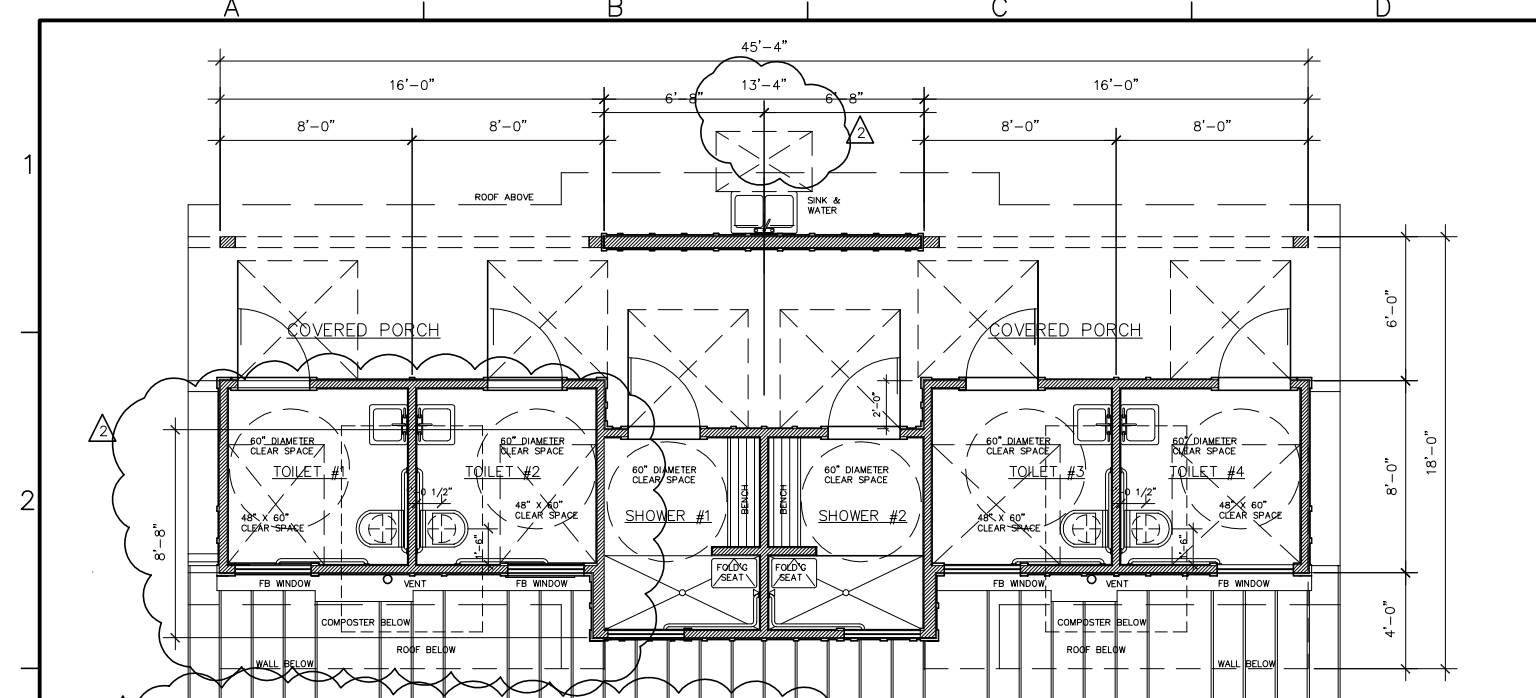
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 CAMP BERRYESSA IMPROVEMENTS

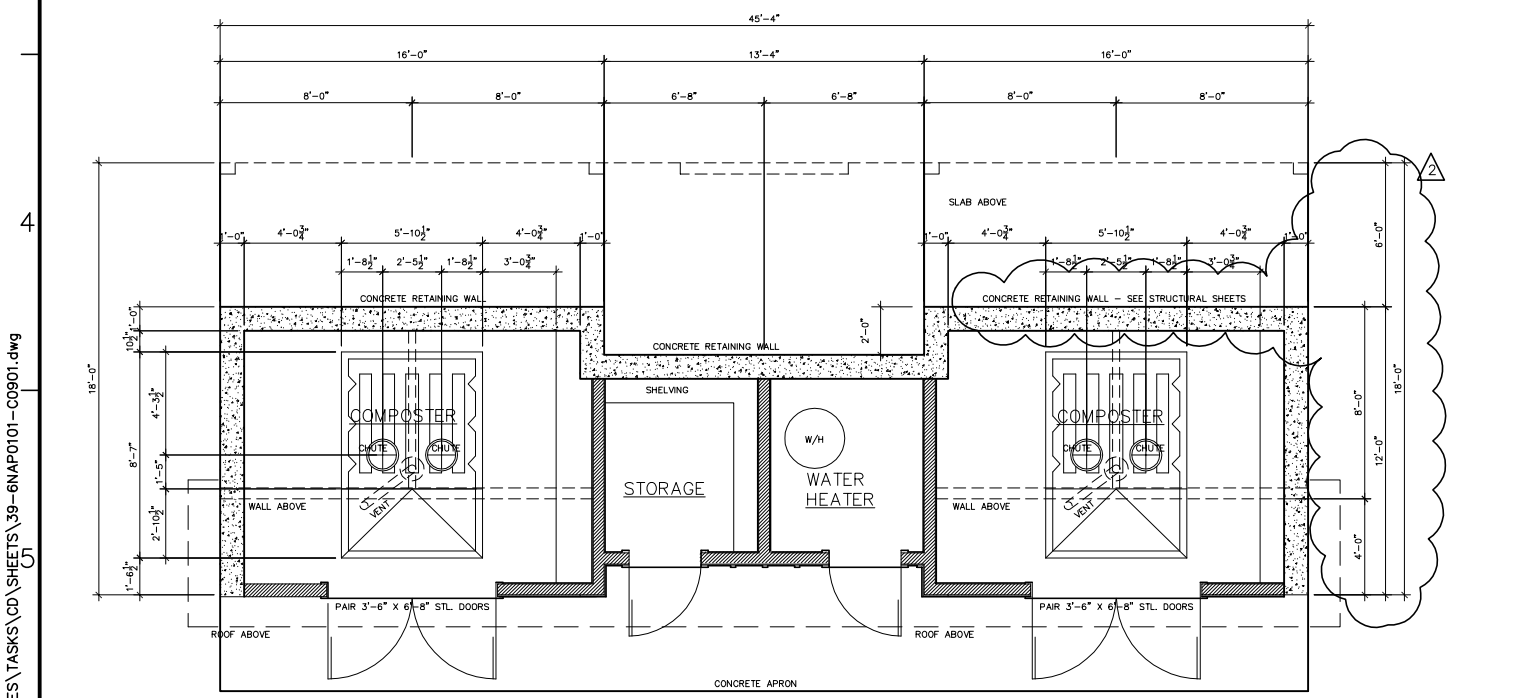
CIVIL
 SIGNAGE PLAN & DETAILS

Scale	AS NOTED
Drawing No.	C08.01
Sheet No.	38 of 70

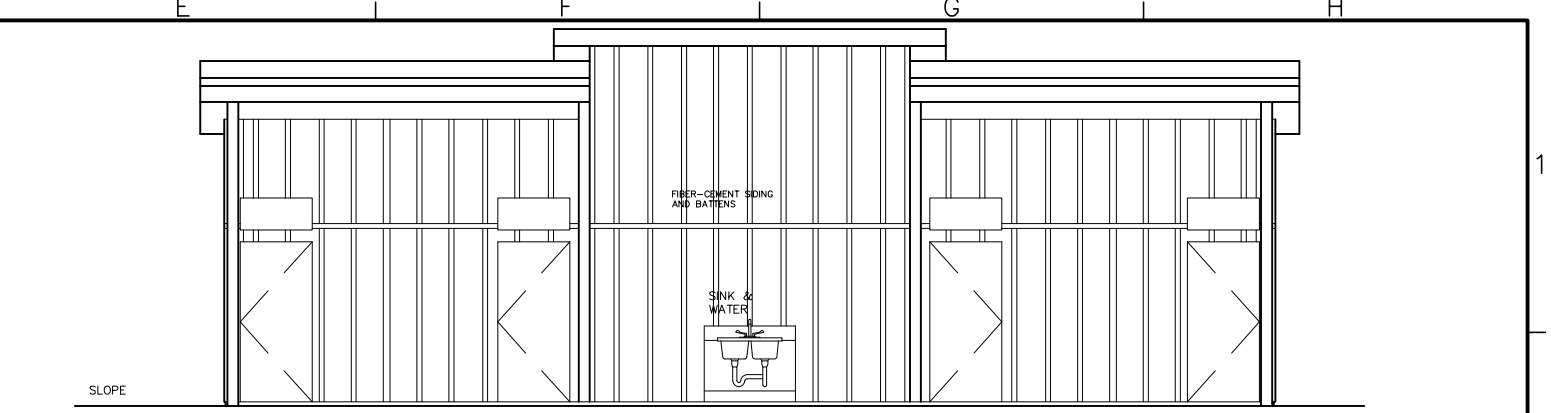


NOTE: SEE SPECIFICATION SECTION 09310, CERAMIC TILE FOR TILE SPECIFICATION
 TILE FLOORS AND WALLS WITHIN TOILET ROOMS AND SHOWER ROOMS, MINIMUM 6' HIGH.
 PAINT INTERIOR PER SPECIFICATION SECTION 09960, COATINGS.

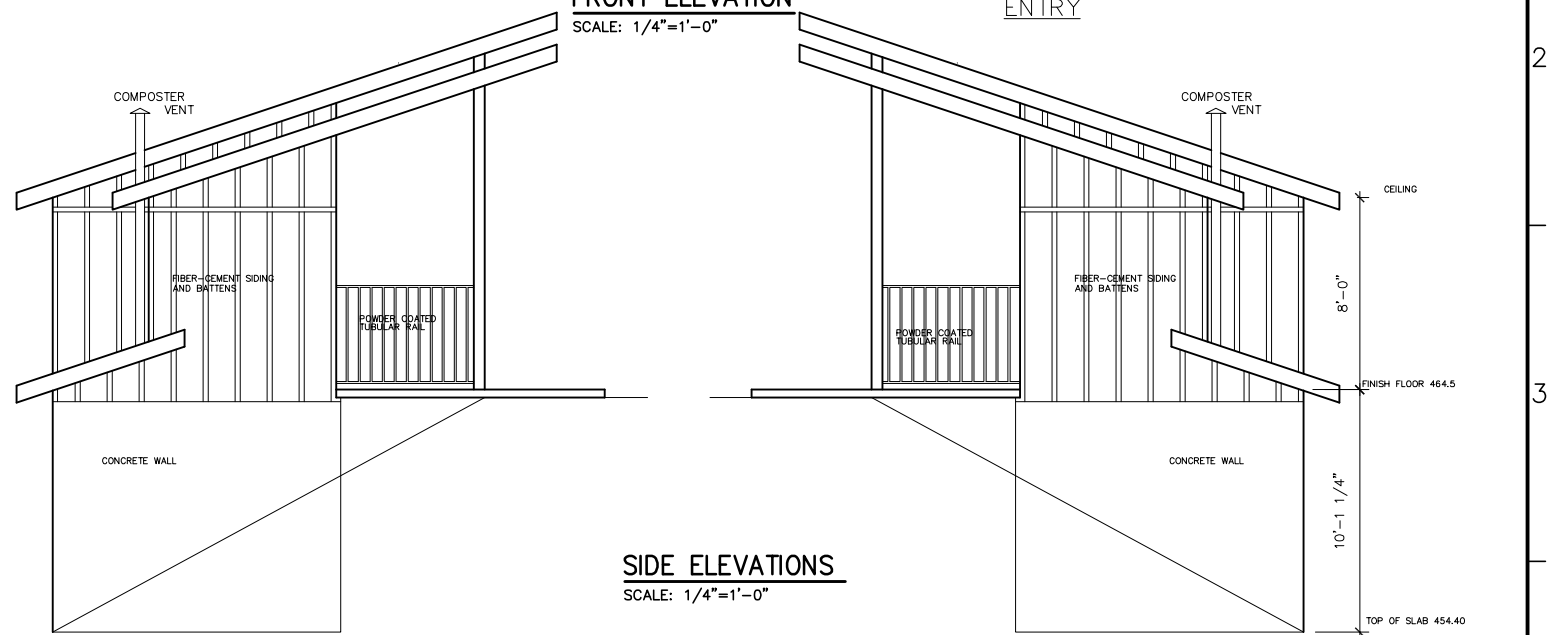
TOILET FLOOR PLAN
 SCALE: 1/4"=1'-0"



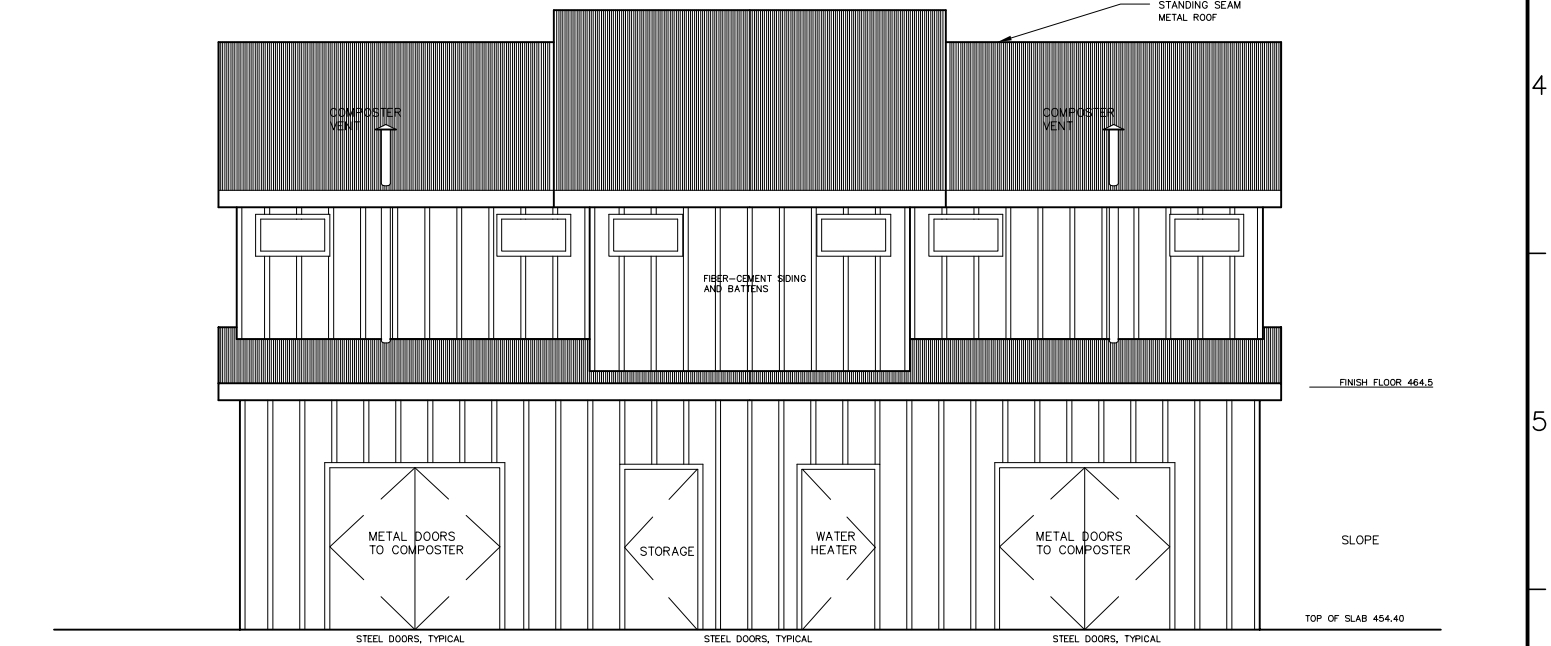
BASEMENT FLOOR PLAN
 SCALE: 1/4"=1'-0"



FRONT ELEVATION
 SCALE: 1/4"=1'-0"



SIDE ELEVATIONS
 SCALE: 1/4"=1'-0"



REAR ELEVATION
 SCALE: 1/4"=1'-0"

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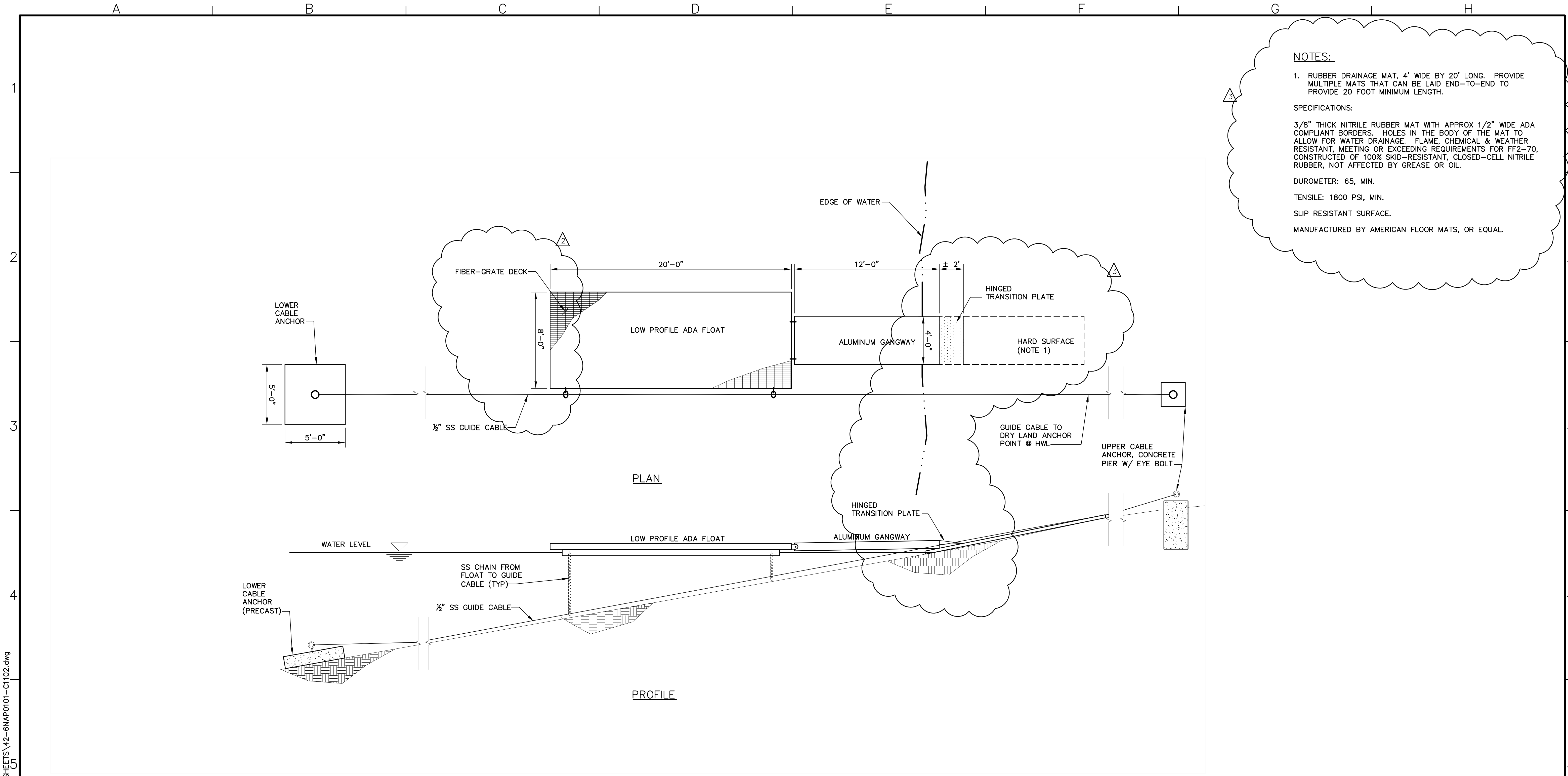
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**NAPA COUNTY REGIONAL PARK
 AND OPEN SPACE DISTRICT
 CAMP BERRYESSA IMPROVEMENTS**

**COMBO BUILDING
 FLOOR PLANS & ELEVATIONS**

Scale
 AS NOTED
 Drawing No.
C09.01
 Sheet No.
 39 of 70



NOTES:

- RUBBER DRAINAGE MAT, 4' WIDE BY 20' LONG. PROVIDE MULTIPLE MATS THAT CAN BE LAID END-TO-END TO PROVIDE 20 FOOT MINIMUM LENGTH.

SPECIFICATIONS:

3/8" THICK NITRILE RUBBER MAT WITH APPROX 1/2" WIDE ADA COMPLIANT BORDERS. HOLES IN THE BODY OF THE MAT TO ALLOW FOR WATER DRAINAGE. FLAME, CHEMICAL & WEATHER RESISTANT, MEETING OR EXCEEDING REQUIREMENTS FOR FF2-70, CONSTRUCTED OF 100% SKID-RESISTANT, CLOSED-CELL NITRILE RUBBER, NOT AFFECTED BY GREASE OR OIL.

DUROMETER: 65, MIN.

TENSILE: 1800 PSI, MIN.

SLIP RESISTANT SURFACE.

MANUFACTURED BY AMERICAN FLOOR MATS, OR EQUAL.

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DETAIL
SCALE: NTS

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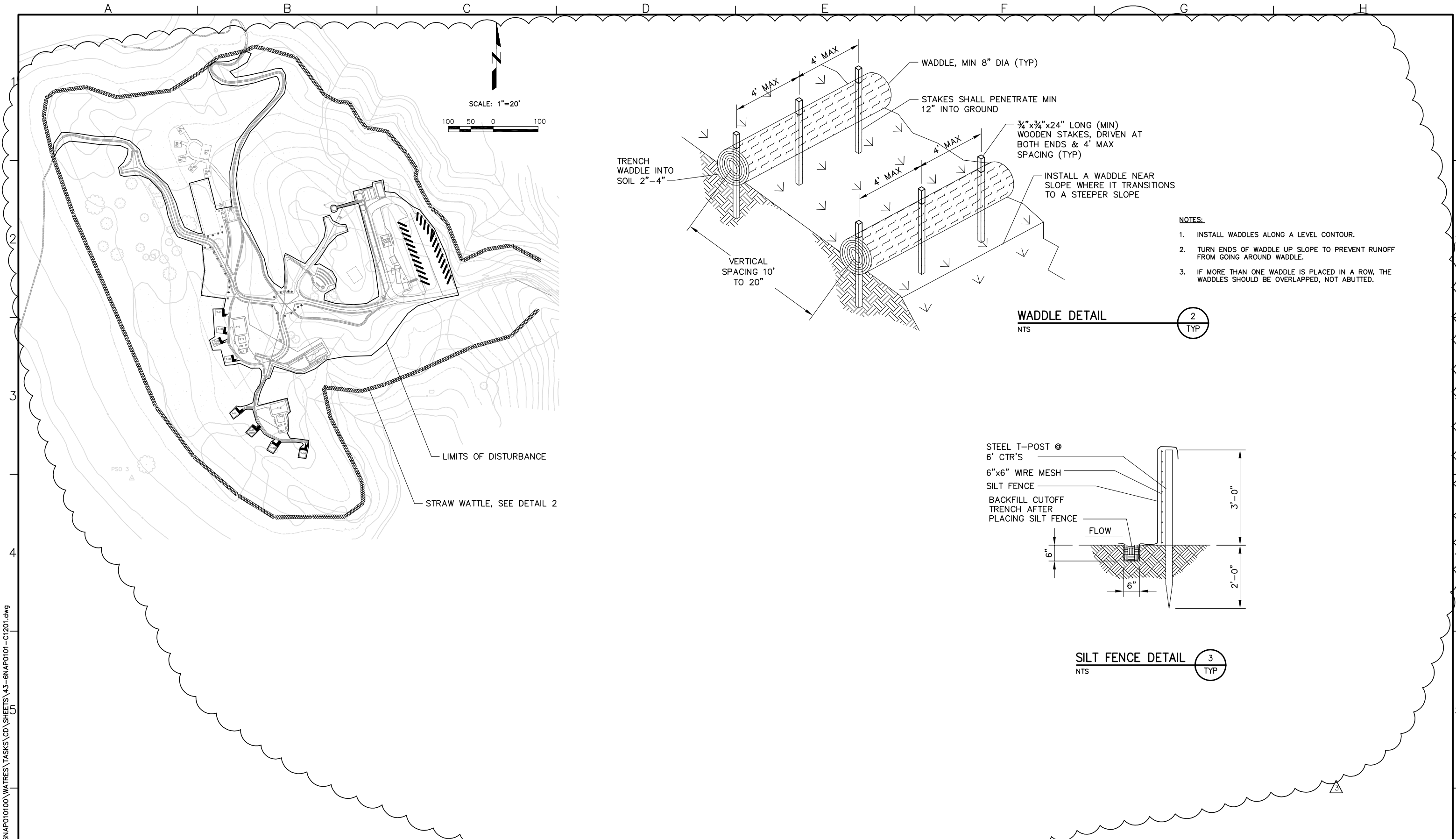
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CAMP BERRYESSA IMPROVEMENTS

CIVIL
FLOATING DOCK - PLAN & PROFILE

Scale	NONE
Drawing No.	C11.02
Sheet No.	42 of 70



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NAPA COUNTY REGIONAL PARK
 AND OPEN SPACE DISTRICT
 CAMP BERRYESSA IMPROVEMENTS
 CIVIL
 EROSION CONTROL PLAN

Scale AS NOTED
Drawing No. C12.01
Sheet No. 43 of 70

**SECTION 11121
GRAYWATER SYSTEM**

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Furnish and install graywater tanks, LEP tank, pump systems, and appurtenances.

B. Related sections:

1. Additional requirements specified elsewhere:
 - a. Shop Drawings and Product Data: Section 01330
 - b. Material and Equipment: Section 01600.
 - c. Operating and Maintenance Data: Section 01730
 - d. Warranties and Guarantees: Section 01740
2. Related Work specified elsewhere:
 - a. Earthwork: Section 03300

1.02 REFERENCES

A. Equipment shall comply with applicable portions of latest editions and amendments of the following:

1. National Electrical Code (including NFPA 70).
2. Institute of Electrical and Electronic Engineers (IEEE).
3. National Electrical Manufacturers Association (NEMA).
4. American National Standards Institute (ANSI).
5. American Society for Testing and Materials (ASTM).
6. American Concrete Institute (ACI)

1.03 DEFINITIONS (Not Used)

1.04 SYSTEM DESCRIPTION

- A. 2 each fiberglass Single compartment, 1,500 gallon graywater tank,
- B. 2 each packaged pump station with integral filter and control panel

Complete installation shall meet the criteria of Napa County Department of Environmental Health requirements.

1.05 SUBMITTALS

A. Shop Drawings and Product Data:

1. Submit complete Shop Drawings and Product Data per Section 01330.
2. Submit Operation and Maintenance Manual per Section 01730.

3. Concrete Tank:
 - a. Tank
 - b. Risers
 - c. Lids
 4. Effluent Pumping Assemblies:
 - a. Pump Vault
 - b. Discharge Hose and Valve Assembly
 - c. Float Switch Assembly
 - d. Effluent Pump
 - e. Electrical Splice Box
 - f. Controls and Alarms
- B. Operation and Maintenance Manuals:
1. Supply Operation and Maintenance Manual, reference Section 01730, Shop Drawings, Samples and Operational and Maintenance Manuals.
 2. Motors: Furnish complete Operations and Maintenance Manual per Section 16222.
- D. Spare Parts listing in accordance with Section 01750.
- 1.06 QUALITY ASSURANCE
- A. The supplier shall be regularly engaged in the business of designing and manufacturing wastewater tank effluent pumping assemblies for a minimum of ten (10) years.
- 1.07 DELIVERY, STORAGE AND HANDLING
- A. Preparation for shipment:
1. Package materials and equipment to facilitate handling and protect against damage during transit, handling or storage.
 2. Box, crate, or otherwise completely enclose and protect all equipment.
 3. Protect equipment from exposure to elements and keep thoroughly dry and dust-free at all times.
 4. Protect painted surfaces against impact, abrasion discoloration or other damage.
 5. Tag or mark each item per delivery schedule or Shop Drawings.
 6. Include complete packing lists and bills of material with each shipment.
- B. Exercise care in shipping and handling to prevent damage to equipment in accordance with Manufacturer's instructions.
- 1.08 PROJECT/SITE CONDITIONS (NOT USED)
- 1.09 SEQUENCING AND SCHEDULING (NOT USED)
- 1.10 WARRANTY

- A. Submit Warranty documentation in accordance with Section 01740.

1.11 MAINTENANCE

- A. Tools and spare parts:
 - 1. Provide a set of all tools required for complete assembly and disassembly of pump components.
 - 2. Provide recommended spare parts packed and labeled for storage.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. The following or equal:
 - a. Orenco Systems, Inc.

2.02 MATERIALS

- A. Fiberglass Tanks:
 - 1. Fiberglass tanks shall be analyzed using finite element analysis for buried structures. Calculations shall address the following:
 - strength
 - buckling
 - deflection of 5% of tank diameter, based on service load (including long-term deflection lag)
 - buoyancy

2. Material Properties and Laminates. The laminates considered in this analysis shall be of general-purpose ortho-polyester resin with Etype fiberglass reinforcement or higher grade. The thicknesses for different regions of tanks shall be described and shown in shop drawings for each individual tank. The laminate properties listed here, along with minimum thicknesses as described herein, are considered typical design values that must be maintained during manufacturing of tanks.

- a. Typical primary strength properties are listed below:
- b. Tensile Modulus (psi) 1,000,000
- c. Ultimate Tensile strength (psi) 10,000
- d. Ultimate Compressive strength (psi) 21,000
- e. Ultimate Flexural strength (psi) 18,000
- f. Ultimate Shear In-Plane (psi) 7,800

In lieu of calculations for fiberglass tanks, supplier may elect in-situ performance testing. In-situ testing of each tank model shall include use of strain gauge and deflection gauge. The tank will be subjected to external forces equal to twice actual load. Maximum initial deflection based on test loading shall not exceed 3% of tank diameter.

Performance testing will be evaluated by a Registered Professional Engineer (P.E.). Engineer will have sole responsibility to determine maximum external loading.

3. The tank shall be constructed with a glass fiber and resin content specified by Manufacturer and with no exposed glass fibers. Any permanent metal part shall be 300 series stainless steel. Inspections may be made by Owner's Representative in supplier's yard, within plant, upon delivery and again after installation. The minimum wall thickness shall be 3/16". If wall thickness is suspected to be less than 3/16" or if delamination is suspected within any portion of tank, Owner's Representative may drill a 1/4" diameter hole through tank wall for inspection purposes. If required minimum 3/16" thickness is not found, repair if feasible shall be responsibility of Contractor. If repair is judged not feasible, tank shall be rejected.

4. The Owner's Representative shall specify minimum weight of each tank model that will be allowed. The Manufacturer will permanently mark weight of each tank on top near access hole. i. minimum tank weight shall be specified by Manufacturer's Engineer (e.g., 350 lbs for 1000-gallon tanks, 400 lbs for 1500-gallon tanks ±).

5.. Holes specified for tank shall be provided by Manufacturer. Resin or other appropriate sealant shall be properly applied to all cut or ground edges so that no glass fibers are exposed and all voids are filled.

6. EPDM gaskets, or approved equal, shall be used at inlet to join tank wall and inlet piping. ABS or Schedule 40 PVC pipe and fittings shall be used at inlets.

7. Inlet plumbing shall include an inlet tee that penetrates 18" into liquid from inlet flow line. (The depth may vary depending on tank's height; in all cases, though, inlet should extend to a level below bottom of maximum scum depth). The inlet plumbing shall allow for natural ventilation back through building sewer and vent stack.

8. Water testing shall be performed on each tank and shall be witnessed by Owner's Representative. Every tank shall be assembled by Manufacturer and filled with water to brim of access opening for a minimum of two (2) hours. The tank shall show no leakage from section seams, pinholes or other imperfections. Any leakage is cause for rejection. When leakage occurs, if tank is not rejected by Owner's Representative, an additional water test shall be made on tank after repairs have been completed, upon request by Owner's Representative. The Manufacturer shall be responsible for making all corrective measures in production or assembly necessary to ensure a completely watertight tank.

9. After installation of tank with riser is completed, each tank shall be filled with water to a point 2" into access riser and water loss measured after a two-hour period. Every tank test shall be witnessed by Owner's Representative. Any leakage shall be cause for rejection. Backfill of a depth equal to water height in riser must be in place over tank to prevent damage due to hydrostatic uplift.

B. RISERS & LIDS:

1. Risers: Risers shall be required for access to internal vaults and access into tanks. All risers shall be constructed watertight. The risers shall be attached to tanks such that a watertight seal is provided. Risers shall extend 3" above original grade to allow for settlement and to ensure positive drainage away from access. Risers for inspection ports shall be a minimum of 18" in nominal diameter. Adhesive required to adhere PVC or fiberglass risers to either fiberglass or ABS tank adapter shall be either a two-part epoxy Model MA320 or approved equal, or a single component adhesive Model ADH100 or approved equal. To ensure product compatibility, risers, lids, and attachment components shall be supplied by a single manufacturer.
2. Lids: One lid shall be furnished with each access riser. Lids shall be Orenco Systems®, Inc. Model FL18G4BU, FL21G, FL24-4B, FL24G-4BU, or FL30G or Owner's Representative-approved equal, fiberglass with green non-skid finish, and provided with stainless steel bolts, and wrench.

Manufacturer shall provide evidence that lids have been used successfully in continuous field service for a minimum of five years to demonstrate long-term integrity and suitability for application. Lids shall be waterproof, corrosion resistant and UV resistant. Lids shall be flat, with no noticeable upward dome. A crown or dome of no more than 1/8" is allowable. Lids shall not allow water to pond on them. Lids shall have a green non-skid finish. Self-lubricating plastics, such as polyethylene, shall not be considered non-skid without addition of a non-skid coating. Lids shall form a watertight seal with top of riser. Lids shall be capable of withstanding a truck wheel load (36 square inches) of 2500 pounds for 60 minutes with a maximum vertical deflection of 1-1/2". To prevent a tripping hazard, fasteners shall not extend above surface of lid.

C. Effluent Pumping Assemblies:

1. Pump Assembly: Filter shall have a minimum effective screen area of no less than 15.5 square feet. Pump vault shall consist of a 12" diameter, 57" deep HDPE vault with eight (8) 2" diameter holes evenly spaced around perimeter. Flow inducer to accept effluent pump shall be attached to vault.
2. Discharge Hose and Valve Assembly: 1" diameter, 150 psi PVC ball valve, 150 psi PVC check valve, PVC flex hose with working pressure rated for 100 psi, and Schedule 40 PVC pipe.
3. Float switch assembly: three switch floats mounted on a PVC stem attached to filter cartridge. Floats must be adjustable and must be removable without removing pump vault. Each float secured with a nylon strain relief bushing at splice box. Floats shall be UL or CSA listed and be rated for a minimum of 5.0A @ 120 VAC.
4. Effluent Pump: Orenco Systems, Inc. Model PF500552, or equal, ½ hp, 115 Volt AC, single phase, 60 Hz, two-wire motor, with 10 foot long extra heavy duty

electrical cord with ground. Pump shall be capable of providing a flow rate of 25 gpm against a head of 80 feet. Pump shall be UL and CSA listed as an effluent pump. Pump shall be provided with a non-prorated five-year warranty.

5. Electrical Splice Box: UL approved for wet locations, equipped with four electrical cord grips and $\frac{3}{4}$ " outlet fitting. Also includes UL listed waterproof butt splice connectors.
6. Controls and Alarms: Shall be listed per UL 508. Panels shall be repairable in field without use of soldering irons or substantial disassembly. Shall have following standard components:
 - a. Motor start Contactor: 14 FLA, 1/2 hp, 60 Hz; 2.5 million cycles at FLA (10 million at 50% of FLA)
 - b. Toggle switch: single-pole, double-throw MOA switch. 20 amps, 1 hp.
 - c. Controls Circuit Breaker: 10 amps, OFF/ON switch. Single-pole 115 VAC. DIN rail mounting with thermal magnetic tripping characteristics.
 - d. Pump Circuit Breaker: 20 amps, OFF/ON switch. Single-pole 115 VAC, double-pole 230 VAC. DIN rail mounting with thermal magnetic tripping characteristics.
 - e. Audio Alarm: 80 dB at 24"
 - f. Visual Alarm: $\frac{7}{8}$ " diameter red lens, "Push-to-silence." NEMA 4, 1-watt bulb, 115 VAC.
 - g. Panel Enclosure: NEMA 4X rated. UV-resistant fiberglass; hinges and latch stainless steel. Conduit couplings provided.
 - h. S1RO Panel Ratings: 115 VAC, $\frac{3}{4}$ hp, 14 amp, single phase, 60 Hz.
 - i. Event Counter: 115 VAC, 6-digit, non-resettable.
 - j. Elapsed Time Meter: 115 VAC, 7-digit, non-resettable. Limit of 99,999 hours; accurate to 0.01 hours.

2.04 FABRICATION

A. Shop assembly:

1. Fully assembled at Manufacturer's shop and ready for power and piping connection.

2.05 SOURCE QUALITY CONTROL

A. Source quality control:

1. Factory test pump for capacity, power requirements, efficiency at specified rated head, shutoff head, operating head extremes, and as many other points as necessary of accurate performance curve plotting.
2. Test each pump/motor assembly as being shipped to field.
3. Provide certified test results.
4. Perform tests and prepare test reports in accordance with Hydraulic Institute Standards.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. All pumping system components shall be installed in accordance with Manufacturer's recommendations, plans, and all state and local regulations.

3.02 FIELD QUALITY CONTROL

A. Tests:

1. Field testing and checkout of installation to be approved by Manufacturer's field representative.
2. Manufacturer's field representative(s) shall perform at a minimum the following and verify all meet specifications:
 - a. Visibly check entire installation of unit:
 - 1) Check ease of pump removal and proper seat between pump and connecting pipe.
 - b. Run each unit with water up to operating speed and temperature and visually check performance across entire operating range:
 - 1) Check proper rotation of units.
 - 2) Check for excessive vibration and noise.
 - 3) Verify all wiring connects and conduct a full functional test of pumping systems verifying all sequence and level controls.
 - c. Electrical motor test of each unit on each phase:
 - 1) Insulation resistance of winding phase to ground.
 - 2) Resistance readings of windings phase to phase.
 - 3) Running amperage.
 - 4) Inrush amperage.
 - 5) Voltage phase to phase.
 - d. Verify all wiring connects and conduct a full functional test of pumping systems verifying all sequence and level controls.
3. Any spare parts shipped as specified in Article 1.11 and used during start up must be replaced prior to final acceptance.

C. Manufacturer's field service:

1. Qualified field personnel to assist in startup and operator training. Representative(s) shall be available within two (2) weeks of request of services and shall be onsite for a period of not less than three (3) working days and shall include a minimum of two (2) trips to perform the following:
 - a. Inspect completed installation.
 - b. Supervise initial startup, adjustments, and testing.
 - c. Instruct Owner's personnel in proper operation and maintenance.
2. Manufacturer's field representatives are to furnish a written report confirming equipment:
 - a. Has been properly installed and lubricated.
 - b. Is in accurate alignment.
 - c. Is free from undue stress imposed by connecting piping or anchor bolts.
 - d. Has been operated satisfactorily under full-load conditions.
 - e. Personnel trained in all operations.

END OF SECTION

**SECTION 15150
SANITARY WASTE AND VENT PIPING**

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes soil and waste, sanitary drainage and vent piping inside the building.

1.2 SUBMITTALS

- A. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping; "NSF-drain" for plastic drain piping; "NSF-tubular" for plastic continuous waste piping; and "NSF-sewer" for plastic sewer piping.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Flexible Transition Couplings for Underground Non-pressure Piping: ASTM C 1173 with elastomeric sleeve. Include ends of same sizes as piping to be joined and include corrosion-resistant metal band on each end.
- B. Transition Couplings for Underground Pressure Piping: AWWA C219 metal, sleeve-type coupling or other manufactured fitting same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
- C. Hub-and-Spigot Cast-Iron Pipe and Fittings: ASTM A 74, Service class.
 - 1. Gaskets: ASTM C 564, rubber.
- D. Hubless Cast-Iron Pipe and Fittings: ASTM A 888 or CISPI 301.
 - 1. Couplings: ASTM C 1277 assembly of metal housing, corrosion-resistant fasteners, and ASTM C 564 rubber sleeve with integral, center pipe stop.
 - a. Heavy-Duty, Type 304, Stainless-Steel Couplings: ASTM A 666, Type 304, stainless-steel shield; stainless-steel bands; and sleeve.
 - 1) NPS 1-1/2 to NPS 4: 3-inch- wide shield with 4 bands.
 - 2) NPS 5 to NPS 10: 4-inch- wide shield with 6 bands.

- b. Compact, Stainless-Steel Couplings: CISPI 310 with ASTM A 167, Type 301, or ASTM A 666, Type 301, stainless-steel corrugated shield; stainless-steel bands; and sleeve.
 - 1) NPS 1-1/2 to NPS 4: 2-1/8-inch- wide shield with 2 bands.
 - 2) NPS 5 and NPS 6: 3-inch- wide shield with 4 bands.
 - 3) NPS 8 and NPS 10: 4-inch- wide shield with 4 bands.
 - 4) NPS 12 and NPS 15: 5-1/2-inch- wide shield with 6 bands.
- E. ABS Pipe: ASTM D 2661, Schedule 40, solid wall.
 - 1. ABS Socket Fittings: ASTM D 2661, made to ASTM D 3311, drain, waste, and vent patterns.
- F. Cellular-Core, ABS Pipe: ASTM F 628, Schedule 40.
 - 1. ABS Socket Fittings: ASTM D 2661, made to ASTM D 3311, drain, waste, and vent patterns.
- G. ABS Special Fittings: ASTM F 409, drainage-pattern tube and tubular fittings with ends as required for application.
- H. PVC Pipe: ASTM D 2665, solid-wall drain, waste, and vent.
 - 1. PVC Socket Fittings: ASTM D 2665, socket type, made to ASTM D 3311, drain, waste, and vent patterns.
- I. Cellular-Core, Schedule 40, PVC Pipe: ASTM F 891, Schedule 40.
 - 1. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.
- J. Cellular-Core, Sewer and Drain Series, PVC Pipe: ASTM F 891, Series PS 100.
 - 1. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Series PS 100 sewer and drain pipe.
- K. PVC Special Fittings: ASTM F 409, drainage-pattern tube and tubular fittings with ends as required for application.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

- A. Transition and special fittings with pressure ratings at least equal to piping pressure ratings may be used in applications below, unless otherwise indicated.
- B. Flanges may be used on aboveground pressure piping, unless otherwise indicated.
- C. Aboveground, Soil, Waste, and Vent Piping: Use the following piping materials for each size range:

1. NPS 1-1/4 and NPS 1-1/2: Use NPS 1-1/2 hubless, cast-iron soil piping and one of the following:
 - a. Couplings: Heavy-duty, Type 301 304, stainless steel.
 - b. Couplings: Heavy-duty, FMG approved cast iron.
 - c. Couplings: Compact, stainless steel.
 2. NPS 1-1/4 and NPS 1-1/2: ABS pipe, ABS socket fittings, and solvent-cemented joints.
 3. NPS 1-1/4 and NPS 1-1/2: Cellular-core, ABS pipe; ABS socket fittings; and solvent-cemented joints.
 4. NPS 1-1/4 and NPS 1-1/2: PVC pipe, PVC socket fittings, and solvent-cemented joints.
 5. NPS 1-1/4 and NPS 1-1/2: Cellular-core, Schedule 40, PVC pipe; PVC socket fittings; and solvent-cemented joints.
 6. NPS 2 to NPS 4: Service class, cast-iron soil piping; gaskets; and gasketed joints.
 7. NPS 2 to NPS 4: Hubless, cast-iron soil piping and one of the following:
 - a. Couplings: Heavy-duty, Type 304 stainless steel.
 - b. Couplings: Heavy-duty, FMG approved.
 - c. Couplings: Compact, stainless steel.
 8. NPS 2 to NPS 4: Steel pipe; cast-iron, threaded drainage fittings; and threaded joints.
 9. NPS 2 to NPS 4: Stainless-steel piping, gaskets, and gasketed joints.
 10. NPS 2 to NPS 4: Copper DWV tube, copper drainage fittings, and soldered joints.
 11. NPS 2 to NPS 4: ABS pipe, ABS socket fittings, and solvent-cemented joints.
 12. NPS 2 to NPS 4: Cellular-core, ABS pipe; ABS socket fittings; and solvent-cemented joints.
 13. NPS 2 to NPS 4: PVC pipe, PVC socket fittings, and solvent-cemented joints.
 14. NPS 2 to NPS 4: Cellular-core, Schedule 40, PVC pipe; PVC socket fittings; and solvent-cemented joints.
- D. Underground, Soil, Waste, and Vent Piping: Use any of the following piping materials for each size range:
1. NPS 1-1/2: Hubless, cast-iron soil piping and one of the following:
 - a. Couplings: Heavy-duty, Type 301 304, stainless steel.
 - b. Couplings: Heavy-duty, FMG approved cast iron.
 - c. Couplings: Compact, stainless steel.
 2. NPS 2 to NPS 4: Service class, cast-iron soil piping; gaskets; and gasketed joints.
 3. NPS 2 to NPS 4: Hubless, cast-iron soil piping and one of the following:
 - a. Couplings: Heavy-duty, Type 301 304, stainless steel.
 - b. Couplings: Heavy-duty, FMG approved cast iron.
 - c. Couplings: Compact, stainless steel.

3.2 PIPING INSTALLATION

- A. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for basic piping installation.
- B. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.
- C. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for sleeves and mechanical sleeve seals.
- D. Install wall penetration system at each service pipe penetration through foundation wall. Make installation watertight. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for wall penetration systems.
- E. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
 - 1. Encase underground piping with PE film according to ASTM A 674 or AWWA C105.
- F. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- G. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- H. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
 - 1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
 - 2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
 - 3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- I. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.
- J. Install ABS soil and waste drainage and vent piping according to ASTM D 2661.

- K. Install PVC soil and waste drainage and vent piping according to ASTM D 2665.
- L. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

3.3 JOINT CONSTRUCTION

- A. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for basic piping joint construction.
- B. Cast-Iron, Soil-Piping Joints: Make joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
 - 1. Gasketed Joints: Make with rubber gasket matching class of pipe and fittings.
 - 2. Hubless Joints: Make with rubber gasket and sleeve or clamp.
- C. PVC Nonpressure Piping Joints: Join piping according to ASTM D 2665.

3.4 HANGER AND SUPPORT INSTALLATION

- A. Refer to Division 15 Section 15060 "Hangers and Supports" for pipe hanger and support devices. Install the following:
 - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs: According to the following:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than 100 Feet: MSS Type 43, adjustable roller hangers.
 - c. Longer Than 100 Feet, if Indicated: MSS Type 49, spring cushion rolls.
 - 3. Multiple, Straight, Horizontal Piping Runs 100 Feet or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Install supports according to Division 15 Section 15060 "Hangers and Supports."
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced 1 size for double-rod hangers, with 3/8-inch minimum rods.
- E. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/2 and NPS 2: 60 inches with 3/8-inch rod.
 - 2. NPS 3: 60 inches with 1/2-inch rod.
 - 3. NPS 4 and NPS 5: 60 inches with 5/8-inch rod.
 - 4. Spacing for 10-foot lengths may be increased to 10 feet. Spacing for fittings is limited to 60 inches.
- F. Install supports for vertical cast-iron soil piping every 15 feet.

- G. Install hangers for steel piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/4: 84 inches with 3/8-inch rod.
 - 2. NPS 1-1/2: 108 inches with 3/8-inch rod.
 - 3. NPS 2: 10 feet with 3/8-inch rod.
 - 4. NPS 2-1/2: 11 feet with 1/2-inch rod.
 - 5. NPS 3: 12 feet with 1/2-inch rod.
 - 6. NPS 4 and NPS 5: 12 feet with 5/8-inch rod.
- H. Install supports for vertical steel piping every 15 feet.
- I. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/4: 72 inches with 3/8-inch rod.
 - 2. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
 - 3. NPS 2-1/2: 108 inches with 1/2-inch rod.
 - 4. NPS 3 to NPS 5: 10 feet with 1/2-inch rod.
- J. Install supports for vertical copper tubing every 10 feet.
- K. Install hangers for ABS and PVC piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/2 and NPS 2: 48 inches with 3/8-inch rod.
 - 2. NPS 3: 48 inches with 1/2-inch rod.
 - 3. NPS 4 and NPS 5: 48 inches with 5/8-inch rod.
- L. Install supports for vertical ABS and PVC piping every 48 inches.
- M. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.5 CONNECTIONS

- A. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- B. Connect drainage and vent piping to the following:
 - 1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
 - 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
 - 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
 - 4. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.

3.6 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
 - 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 - 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction.
 - 1. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 - 2. Prepare reports for tests and required corrective action.

3.7 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.8 PROTECTION

- A. Exposed ABS and PVC Piping: Protect plumbing vents exposed to sunlight with two coats of water-based latex paint.

END OF SECTION

SECTION 15838

POWER VENTILATORS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Centrifugal wall ventilators.

1.2 SUBMITTALS

A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated and include the following:

1. Certified fan performance curves with system operating conditions indicated.
2. Certified fan sound-power ratings.
3. Motor ratings and electrical characteristics, plus motor and electrical accessories.
4. Material gages and finishes, including color charts.
5. Dampers, including housings, linkages, and operators.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, required clearances, and method of field assembly, components, and location and size of each field connection.

1. Wiring Diagrams: Power, signal, and control wiring.
2. Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, and base weights.

C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. AMCA Compliance: Products shall comply with performance requirements and shall be licensed to use the AMCA-Certified Ratings Seal.

C. NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.

D. UL Standard: Power ventilators shall comply with UL 705.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraphs titles below introduce lists, the following requirements apply for product selection:
1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

2.2 CENTRIFUGAL WALL VENTILATORS

- A. Description: Belt-driven or direct-driven centrifugal fans consisting of housing, wheel, fan shaft, bearings, motor and disconnect switch, drive assembly, and accessories.
1. Available Manufacturers:
 - a. Acme Engineering & Mfg. Corp.
 - b. Aerovent; a Twin City Fan Company.
 - c. Ammerman Company, Inc. /General Resource Corp.
 - d. Breidert Air Products, Inc.
 - e. Broan Mfg. Co., Inc.
 - f. Carnes Company HVAC.
 - g. Chelsea Fans & Blowers, Inc.
 - h. Cook, Loren Company.
 - i. Dayton Electric Manufacturing Co.
 - j. Greenheck Fan Corp.
 - k. Hartzell Fan, Inc.
 - l. ILG Industries, Inc. /American Coolair Corp.
 - m. JennFan; Div. of Breidert Air Products, Inc.
 - n. NuTone Inc.
 - o. Penn Ventilation Companies, Inc.
- B. Housing: Heavy-gage, removable, spun-aluminum, dome top and outlet baffle; venturi inlet cone.
- C. Fan Wheel: Aluminum hub and wheel with backward-inclined blades.
- D. Accessories:
1. Disconnect Switch: Non-fusible type, with thermal-overload protection mounted inside fan housing, factory wired through internal aluminum conduit.
 2. Bird Screens: Removable, 1/2-inch mesh, aluminum or brass wire.
 3. Wall Grille: Ring type for flush mounting.
 4. Dampers: Counterbalanced, parallel-blade, backdraft dampers mounted in wall sleeve; factory set to close when fan stops.
- E. 12" Variable speed shutter mount exhaust fan.

2.3 MOTORS

- A. Motor Construction: NEMA MG 1, general purpose, continuous duty, Design B.
- B. Enclosure Type: Open drip proof.
- C. 1/25 hp, 115 v, 1550 RPM

PART 3 - INSTALLATION

3.1 FIELD QUALITY CONTROL

- A. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation. Remove malfunctioning units, replace with new units, and retest.
- B. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- C. Shut unit down and reconnect automatic temperature-control operators.
- D. Replace fan and motor pulleys as required to achieve design airflow.
- E. Repair or replace malfunctioning units. Retest as specified above after repairs or replacements are made.

END OF SECTION