

SANITATION FACILITIES CONSTRUCTION
PUBLIC LAW 86-121
I.H.S. PROJECT NO. CA 22-J22
BOOSTER STATION AND TANK
GRINDSTONE INDIAN RANCHERIA
GLENN COUNTY, CA.
FEBRUARY 2023

Not official until signed

REGISTERED PROFESSIONAL ENGINEER

STEPHEN J. ROOKLIDGE

C80460

CIVIL

STATE OF CALIFORNIA

DATE	REVISIONS	INIT.

CALIFORNIA INDIAN HEALTH SERVICE

OFFICE OF ENVIRONMENTAL HEALTH & ENGINEERING

INDIAN HEALTH SERVICE

SANITATION FACILITIES CONSTRUCTION

650 CAPITOL MALL, SUITE 7-100

SACRAMENTO, CA 95814

(916) 930-3945

INDIAN HEALTH SERVICE

1953

GRINDSTONE INDIAN RANCHERIA

BOOSTER STATION AND TANK

TITLE SHEET

FILE NAME: CA22-J22-BOOSTER

LAYOUT NAME: G101

PROJ ENG: J. LEIBSCHER

DRAWN BY: J. HOLDEN

CHECKED BY:

APPROVED BY:

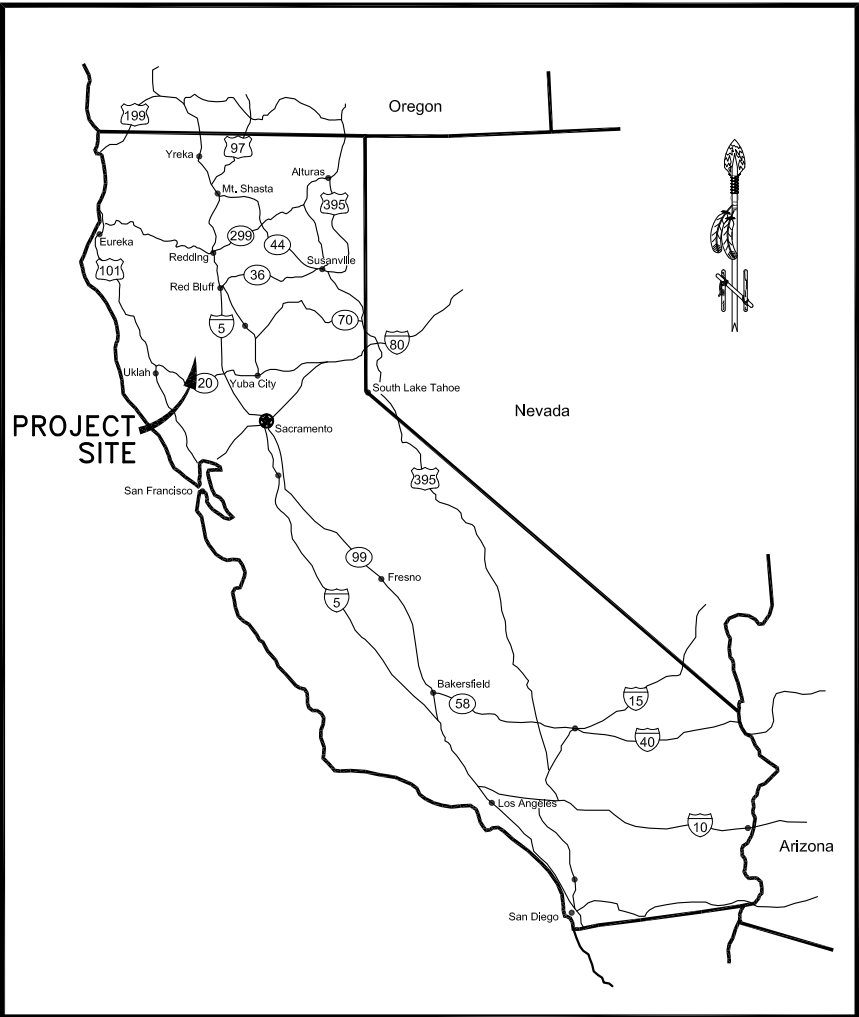
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DATE: 1/23/2023

G101

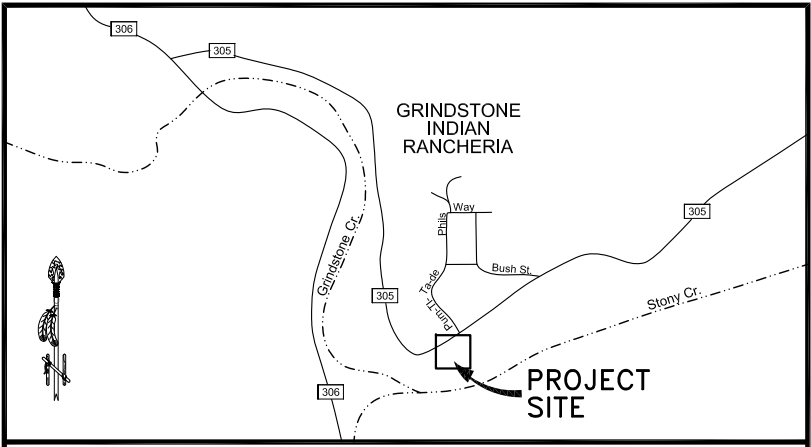
SHEET

1 OF 12

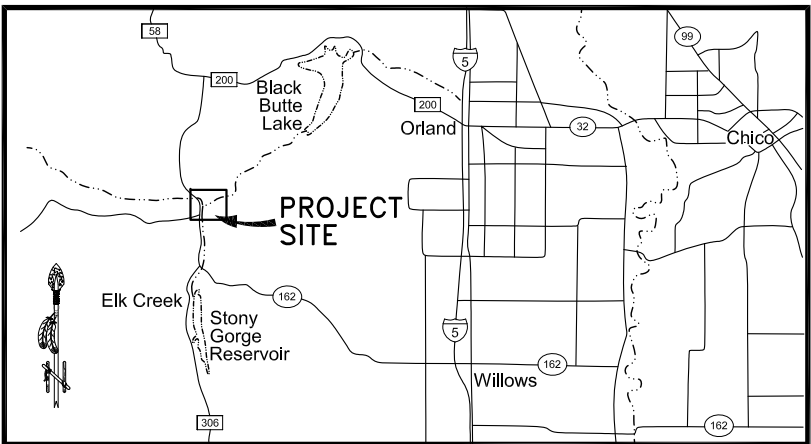


LOCATION IN CALIFORNIA

THIS PROJECT DESIGNED TO COMPLY WITH THE REQUIREMENTS OF THE U.B.C., U.P.C, U.M.C., & N.E.C. (CURRENT EDITIONS)



VICINITY MAP




VICINITY MAP

GRINDSTONE INDIAN RANCHERIA
3600 COUNTY ROAD 305, ELK CREEK, CA 95939


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APPROVAL SIGNATURES


Jeremy Liebscher
Field Engineer

2/8/2023
Date


Stephen Rooklidge, P.E.
District Engineer

02/08/2023
Date


J. David Mazorra, P.E.
Director Sanitation Facilities Construction

2/16/2023
Date

GENERAL NOTES

1. THE TYPES, LOCATIONS, SIZES AND DEPTHS OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE IMPROVEMENT PLANS WERE OBTAINED FROM AVAILABLE RECORDS. A REASONABLE EFFORT HAS BEEN MADE TO LOCATE AND DELINEATE ALL KNOWN UNDERGROUND UTILITIES; HOWEVER, THE OWNER AND THE ENGINEER ASSUME NO RESPONSIBILITY FOR THE COMPLETENESS OR ACCURACY OF ITS DELINEATION OF SUCH UNDERGROUND UTILITIES NOR FOR THE EXISTENCE OF OTHER BURIED OBJECTS OR UTILITIES WHICH MAY BE ENCOUNTERED BUT WHICH ARE NOT SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATIONS OF THOSE UTILITIES SHOWN AND ANY THAT MAY EXIST AND ARE NOT SHOWN PRIOR TO COMMENCEMENT OF ANY WORK. THE CONTRACTOR SHALL EXPOSE ALL UNDERGROUND FACILITIES THAT ARE TO BE CONNECTED TO OR THAT ARE IN THE PATH OF THE PROPOSED IMPROVEMENTS FOR VERIFICATION OF LOCATION AND ELEVATION PRIOR TO COMMENCING CONSTRUCTION. IN ADDITION, THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICES ALERT (U.S.A.) 48 HOURS PRIOR TO ANY EXCAVATION WORK FOR DETERMINATION AND LOCATION OF UNDERGROUND UTILITIES. (PHONE: 800-227-2600)
2. THE CONTRACTOR SHALL PERFORM WORK WITH A MINIMAL DISRUPTION OF SERVICES, AND SHALL NOTIFY THE ENGINEER AT LEAST 72 HOURS IN ADVANCE OF ANY PLANNED SHUTDOWN OF POTABLE WATER FACILITIES.
3. HORIZONTAL ELEVATION DATUM AND CONTOURS ARE AT 1-FOOT INTERVALS.
4. THE PIPELINE PROFILE SHOWN IS SCHEMATIC ONLY. PROVIDE 3' MIN BURY DEPTH (COVER) UNLESS SPECIFIED OTHERWISE. SLOPE PIPELINE CONTINUOUSLY DOWNHILL TO BLOWOFF VALVE ASSYS AND CONTINUOUSLY UPHILL TO ARV ASSYS. SEE SPECIFICATIONS FOR LIMITATIONS ON DEFLECTION OF JOINTS AND LONGITUDINAL BENDING OF PIPE.
5. PROVIDE SERVICE SADDLES, ALIGNED VERTICALLY, ADJACENT TO VALVES OR AT OTHER LOCATIONS AS NECESSARY, FOR PRESSURE TESTING AND /OR DISINFECTION OF PRESSURE PIPELINES. SADDLE SHALL BE AT LEAST 3 FEET FROM A PIPE JOINT, FITTING OR VALVE.
6. PROVIDE 6' CC HORIZ MIN BETWEEN (E) POWER POLES AND (N) PIPELINE.
7. PROVIDE 1' MIN CLEARANCE BETWEEN (E) CULVERTS AND (N) PIPELINE; CENTER FULL LENGTH OF PIPE AT CULVERT. PROVIDE MIN CLASS 200 PIPE WHERE PIPELINE IS BELOW CULVERT.
8. THE CONTRACTOR SHALL RESTORE ALL SURVEY MONUMENTS THAT ARE DAMAGED OR DESTROYED.
9. THE CONTRACTOR SHALL MAINTAIN VEHICLE ACCESS TO ALL PROPERTIES ADJACENT TO THE WORK THROUGHOUT THE PERIOD OF CONSTRUCTION.
10. PROTECT PIPING AGAINST THRUST BY USE OF THRUST BLOCK UNLESS SHOWN OTHERWISE.
11. RECORD DRAWINGS SHALL INCLUDE THE LOCATION OF INSTALLED OR RECONNECTED WATER SERVICES.

ABBREVIATIONS

A	AB AC AFF AFG AGG AGGB ARV ASPH	ANCHOR BOLT ASPHALT CONCRETE ABOVE FINISHED FLOOR ABOVE FINISHED GRADE AGGREGATE AGGREGATE BASE AIR RELEASE VALVE ASPHALT CONCRETE
B	BF BOT BOF BLDG BLKG BLV BM BRG BUR CBL BV	BLIND FLANGE BOTTOM BOTTOM OF FOOTING BUILDING BLOCKING BALL VALVE BENCH MARK BEARING BURIED CABLE BUTTERFLY VALVE
C	C CB CIP CL CMU CO COL CONC CONST CP CPLG CS CV CY	CONDUIT CATCH BASIN CAST IRON PIPE CHLORINE CONCRETE MASONRY UNIT CLEAN OUT COLUMN CONCRETE CONSTRUCTION CONTROL POINT COUPLING CURB STOP CHECK VALVE CUBIC YARD
D	D DEMO DET DI DIA DIP DMH DWG	DRAIN DEMOLISH, DEMOLITION DETAIL DUCTILE IRON DIAMETER DUCTILE IRON PIPE DROP MANHOLE DRAWING
E	E EJ ELEC ELEV ELL EP EQ <E> EXT	EAST EXPANSION ELECTRICAL ELEVATION ELBOW EDGE OF PAVEMENT EQUAL EXISTING EXTERIOR
F	FD FDN FG FH FLG FLH FLR FRP FS FT FM FTG FV	FLOOR DRAIN FOUNDATION FINISH GRADE FIRE HYDRANT FLANGE FLUSH HYDRANT FLOOR DRAIN FIBERGLASS REINF. PLASTIC FLOW SWITCH FOOT OR FEET FORCE MAIN FOOTING FLUSH VALVE
G	GA GAL GALV GR GV GVL	GAUGE GALLON GALVANIZED GRADE GATE VALVE GRAVEL
H	HB HDR HDWR HORIZ HT HWY	HOSE BIB HEADER HARDWARE HORIZONTAL HEIGHT HIGHWAY
I	ID IE IN INL INV IP IRRIG IPS	INSIDE DIAMETER INVERT ELEVATION INCH INLET INVERT IRON PIPE IRRIGATION IRON PIPE SIZE
J	JB JT	JUNCTION BOX JOINT
L	LB LF LG LT LWL	LAG BOLT LINEAR FEET LENGTH LEFT LOW WATER LEVEL
M	M MAS MAX MFR MH MJ MIN	METER MASONRY MAXIMUM MANUFACTURER MANHOLE MECHANICAL JOINT MINIMUM
N	<N> N NEC NIC NTS	NEW NORTH NATIONAL ELECTRICAL CODE NOT IN CONTRACT NOT TO SCALE
O	OC OD OH OPNG	ON CENTER OUTSIDE DIAMETER OVERHEAD OPENING
P	PE PG PL PP PRESS PRV PVC PS PVMT PW PSI	POLYETHYLENE PRESSURE GAUGE PROPERTY LINE POWER POLE PRESSURE PRESSURE RELIEF VALVE POLYVINYL CHLORIDE PRESSURE SWITCH PAVEMENT POTABLE WATER POUNDS PER SQUARE INCH
R	R RCP REINF REQ'D ROW RTWL	RADIUS REINFORCED CONCRETE PIPE REINFORCEMENT REQUIRED RIGHT OF WAY RETAINING WALL
S	S SCH SECT SHT SPEC SQ SS SSL STA STD STL STR	SOUTH SCHEDULE SECTION SHEET SPECIFICATION SQUARE SANITARY SEWER SANITARY SERVICE LINE STATION POINT STANDARD STEEL STRUCTURE
T	TBM TC TNK TOF TOM TOW TYP	TEMPORARY BENCH MARK TOP OF CONCRETE TANK TOP OF FOUNDATION TOP OF MASONRY TOP OF WALL TYPICAL
U	UTL UBC UPC UMC	UTILITY UNIFORM BUILDING CODE UNIFORM PLUMBING CODE UNIFORM MECHANICAL CODE
V	VAR VB VC VERT	VARIOUS VAPOR BARRIER VERTICAL CURVE VERTICAL
W	W W/ WM W/O WSL WSP WW WWTP	WATER OR WEST WITH WATER MAIN WITHOUT WATER SERVICE LINE WELDED STEEL PIPE WASTEWATER WASTEWATER TREATMENT PLANT

CONTACTS

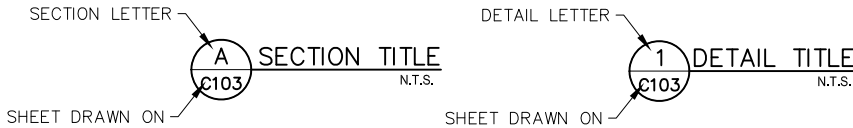
ENGINEERING:
INDIAN HEALTH SERVICE
1900 CHURN CREEK ROAD, STE. 210
REDDING, CA 96002
TELE: 530-246-5339
FAX: 530-246-5210

TRIBE:
GRINDSTONE INDIAN RESERVATION
3600 COUNTY ROAD 305
ELK CREEK, CA 95939
TELE: 530-968-5365

LEGEND

	PROPOSED WATER MAIN		EXISTING WATER MAIN
	PROPOSED WATER SERVICE LINE		EXISTING WATER SERVICE LINE
	PROPOSED FENCE LINE		EXISTING ELECTRICAL LINE
	PROPOSED CONTROL LINE		EXISTING SEWER LINE
	PROPOSED DRAIN LINE		EXISTING FENCE LINE
	PROPOSED ELECTRICAL LINE		EXISTING CONTROL LINE
	PROPOSED GATE VALVES		EXISTING GATE VALVES
	PROPOSED AIR RELEASE VALVE (ARV)		EXISTING PRESSURE RELIEF VALVE (PRV)
	PROPOSED FIRE HYDRANT		EXISTING POWER POLE
	PROPOSED FLUSH HYDRANT		EXISTING WATER METER
	PROPOSED BLIND FLANGE		EXISTING AIR RELEASE VALVE (ARV)
	PROPOSED WATER METER		EXISTING WELL
	PROPOSED CHECK VALVE		ROAD (DIRT/GRAVEL)
			ROAD (PAVED)
			ABANDONED UTILITY LINES
			CONCRETE
			EARTH

REFERENCE SYMBOLS



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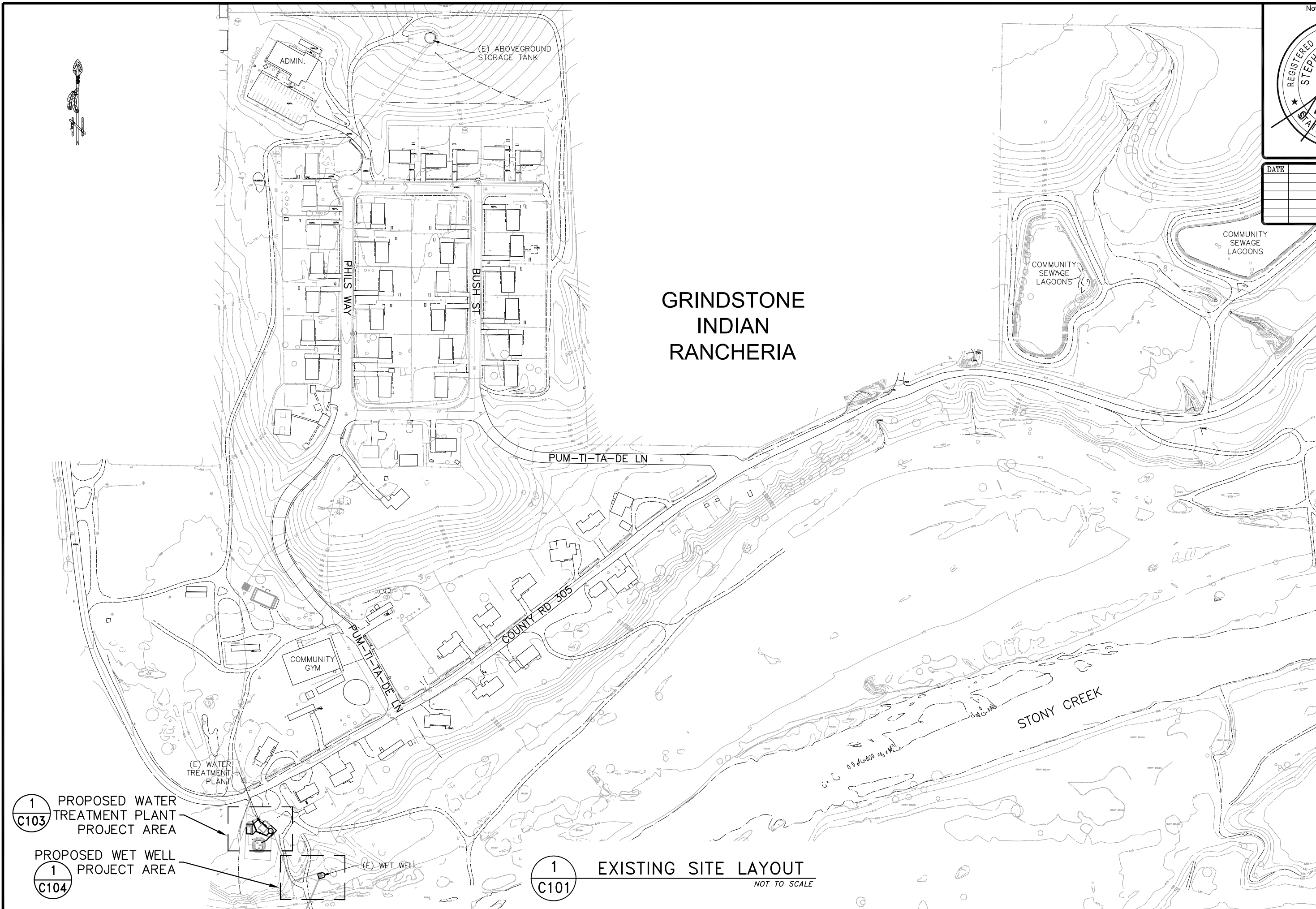
GRINDSTONE INDIAN RANCHERIA
BOOSTER STATION AND TANK
GENERAL NOTES AND LEGEND

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LAYOUT NAME: G102	DRAWN BY: J. HOLDEN
PROJ ENG: J. IJERSCHER	CHECKED BY:
	APPROVED BY:
	DATE: 1/23/2023

G102

SHEET
OF 12

USER: jholden FILE: Q:\District Offices\RD0\A. SPC Main Files\Grindstone\CA 22-122 Booster Station and Tank\ACAD\Grindstone-CA22-122-Booster.dwg 2/07/2023 - 9:56am



1
C103 PROPOSED WATER
TREATMENT PLANT
PROJECT AREA

1
C104 PROPOSED WET WELL
PROJECT AREA

(E) WET WELL

(E) ABOVEGROUND
STORAGE TANK

GRINDSTONE
INDIAN
RANCHERIA

PUM-TI-TA-DE LN

COUNTY RD 305

PUM-TI-TA-DE LN

COMMUNITY
GYM

(E) WATER
TREATMENT
PLANT

COMMUNITY
SEWAGE
LAGOONS

COMMUNITY
SEWAGE
LAGOONS

STONY CREEK

1
C101

EXISTING SITE LAYOUT
NOT TO SCALE

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GRINDSTONE INDIAN RANCHERIA
BOOSTER STATION AND TANK
OVERALL SITE MAP

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FILE NAME: CA22-122-BOOSTER
LAYOUT NAME: C101
DATE: 1/23/2023
PROJ ENG: J. LIEBSCHER

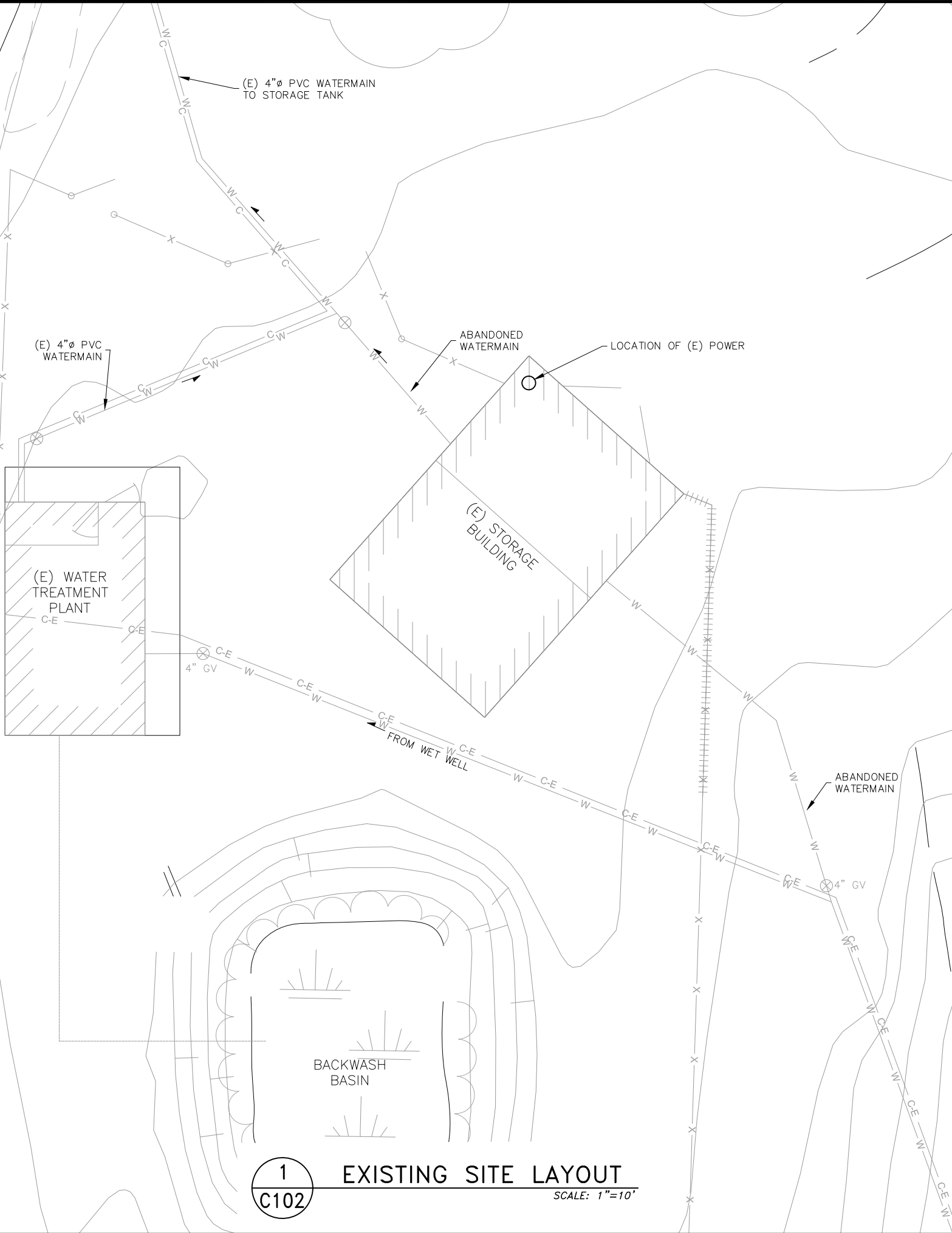
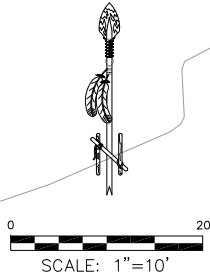
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C101

SHEET

3 OF 12

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1
C102

EXISTING SITE LAYOUT

SCALE: 1"=10'

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GRINDSTONE INDIAN RANCHERIA
BOOSTER STATION AND TANK
EXISTING SITE LAYOUT

DRAWN BY: J. HOLDEN
CHECKED BY: _____
APPROVED BY: _____

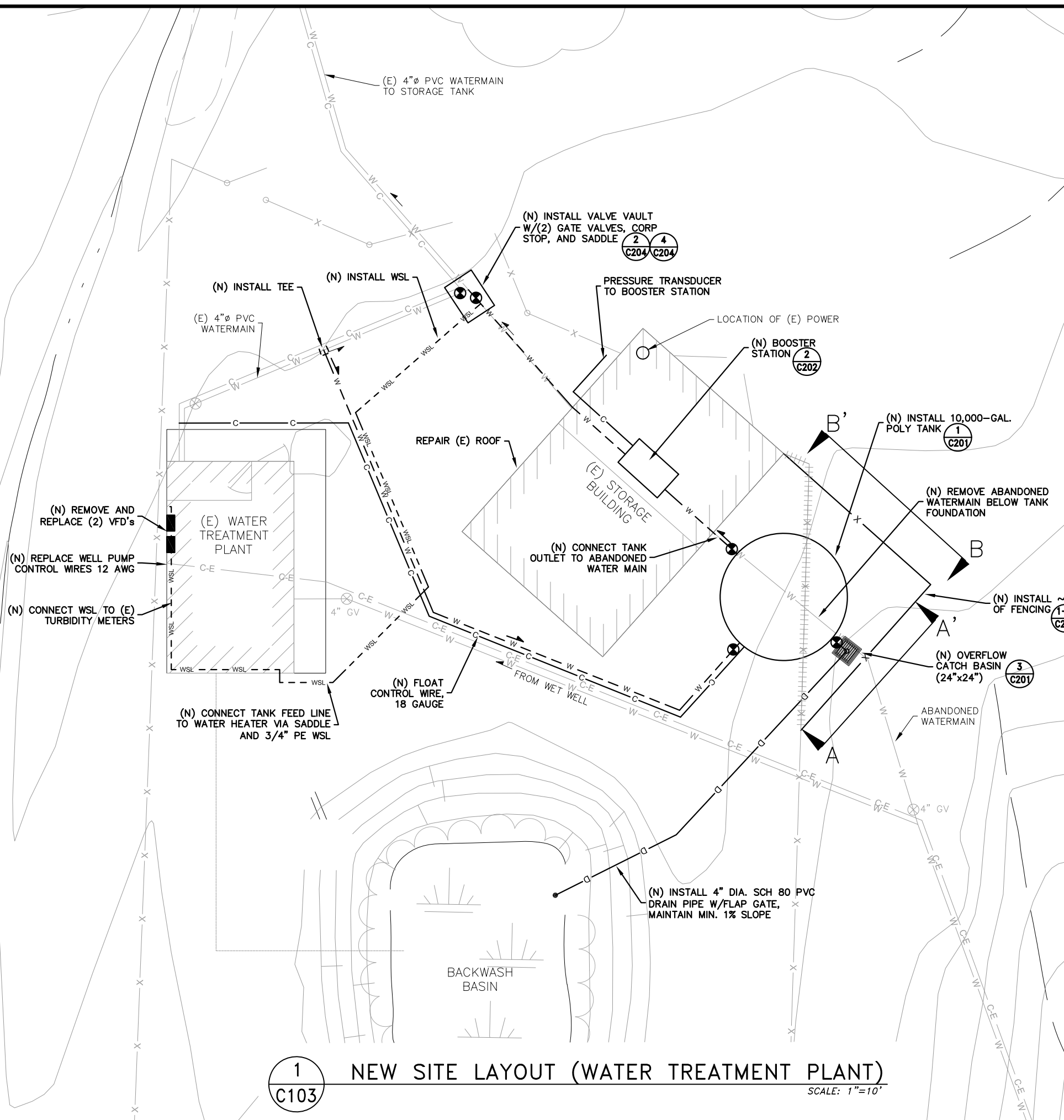
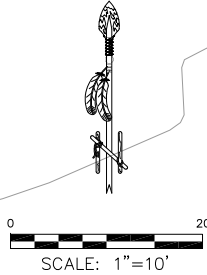
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LAYOUT NAME: C102
PROJ ENG: J. LIEBSCHER

SCALE: AS NOTED
DATE: 1/23/2023

C102

SHEET
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INDIAN HEALTH SERVICE

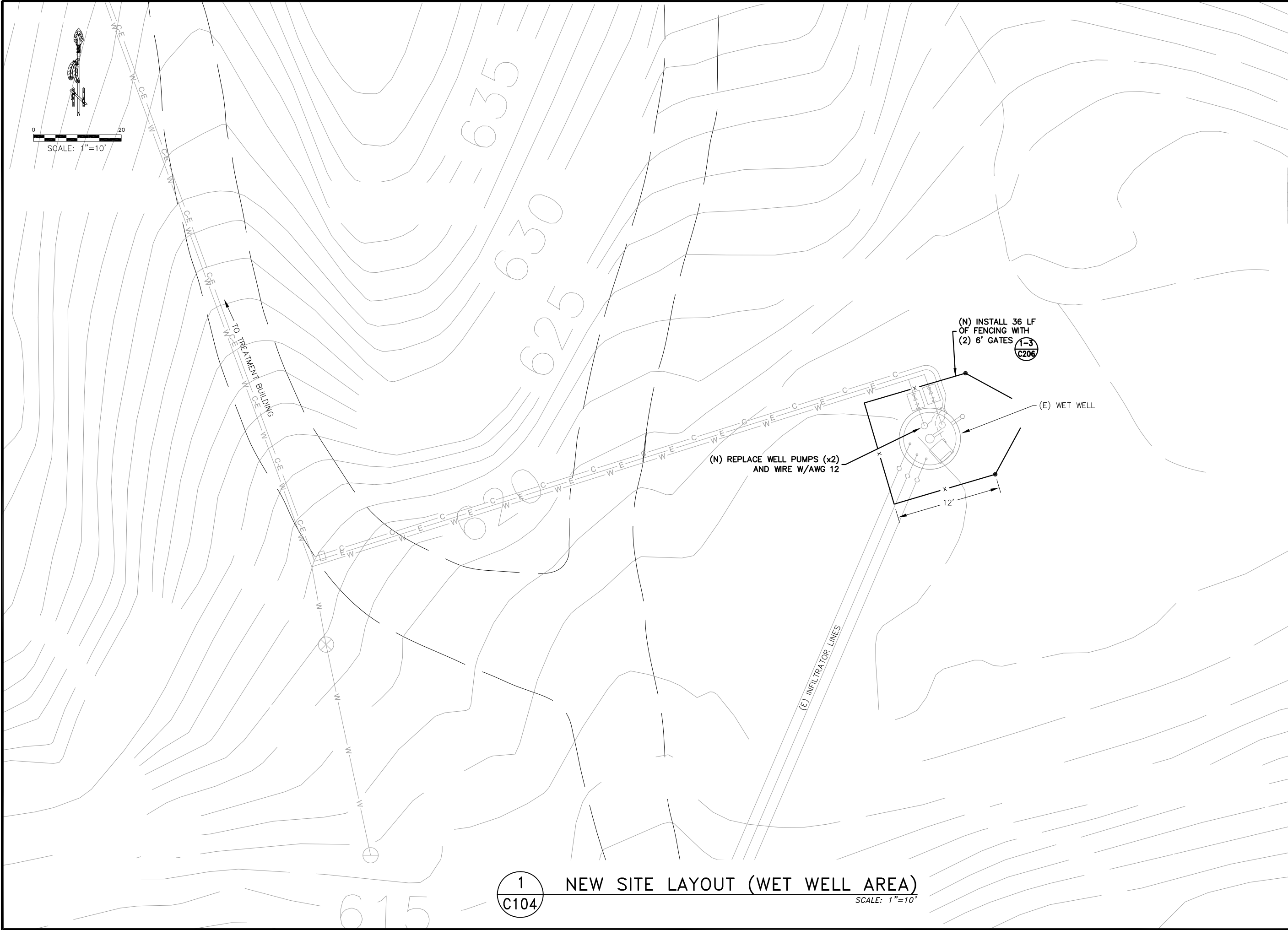
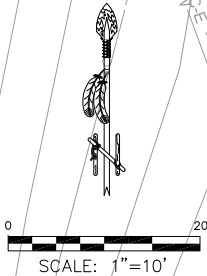
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GRINDSTONE INDIAN RANCHERIA
BOOSTER STATION AND TANK
NEW SITE LAYOUT (WATER TREATMENT PLANT)

DRAWN BY: J. HOLDEN
CHECKED BY:
APPROVED BY:
FILE NAME: CA22-122-BOOSTER
LAYOUT NAME: C103
PROJ ENG: J. LIEBSCHER

SCALE: AS NOTED
DATE: 1/23/2023

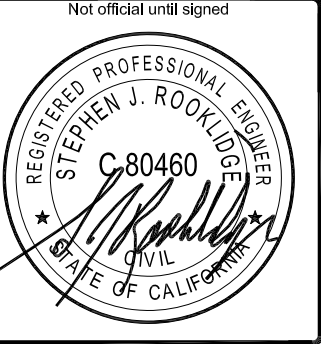
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1
C104

NEW SITE LAYOUT (WET WELL AREA)

SCALE: 1"=10'



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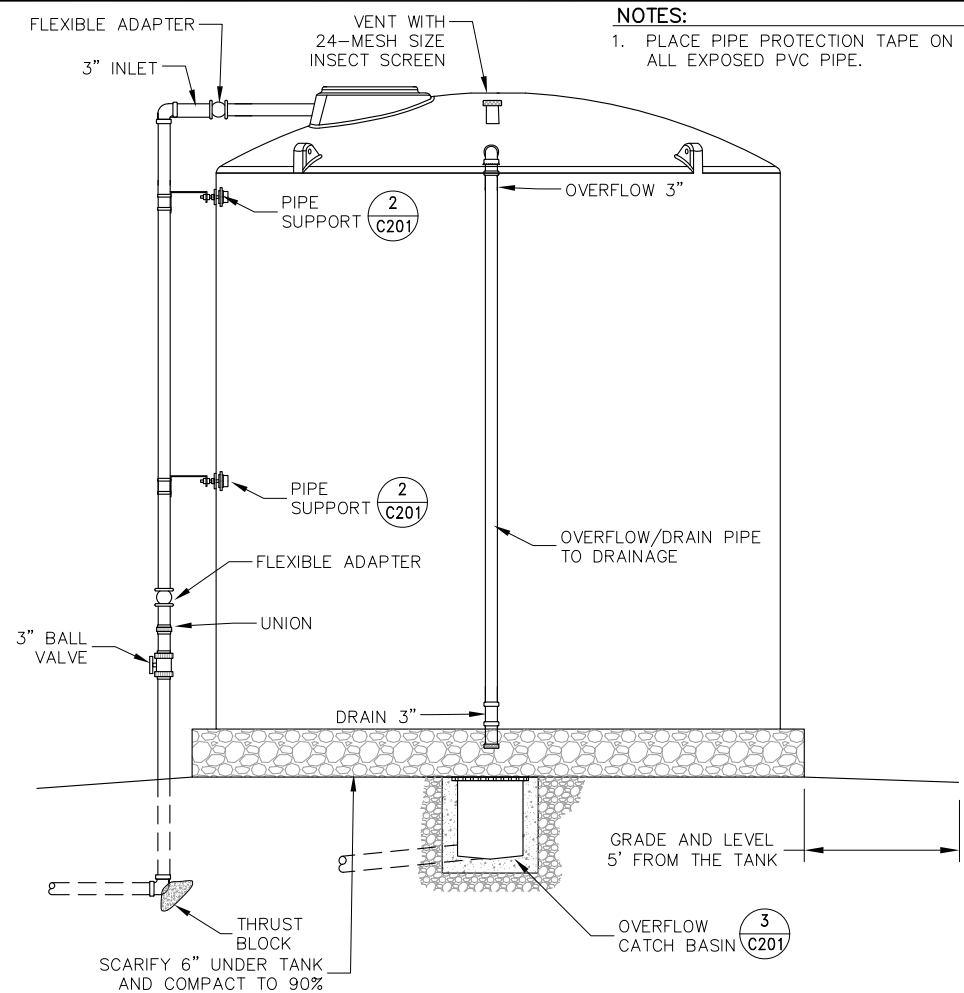
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650 CAPITOL MALL, SUITE 7-100
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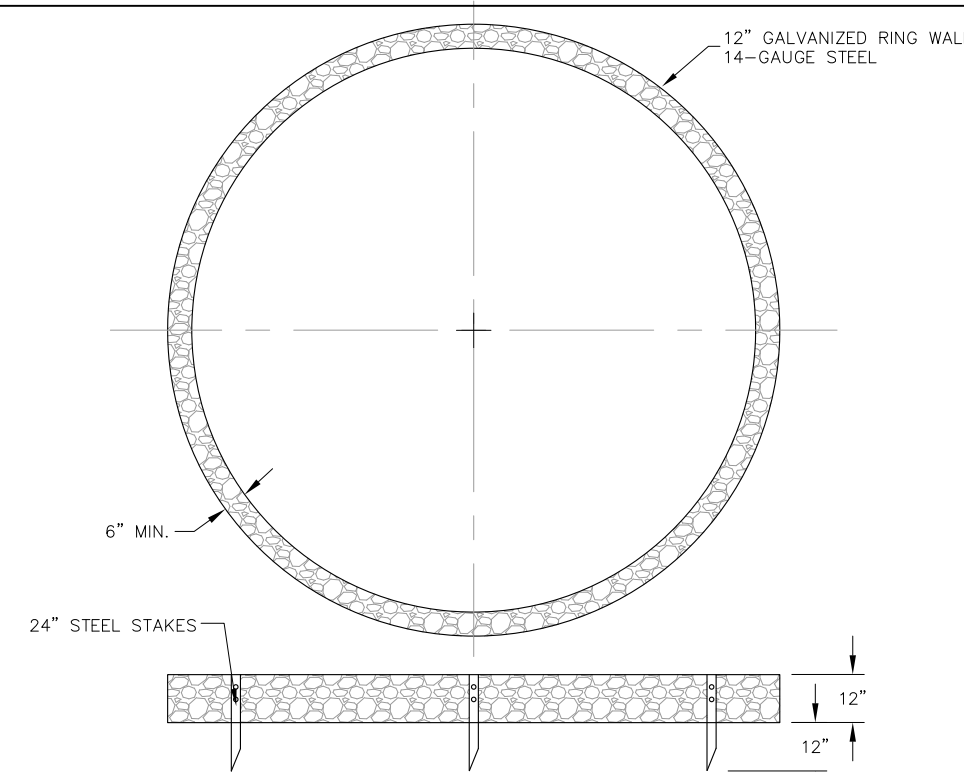
GRINDSTONE INDIAN RANCHERIA
BOOSTER STATION AND TANK
NEW SITE LAYOUT (WET WELL AREA)
FILE NAME: CA22-122-BOOSTER
LAYOUT NAME: C104
PROJ ENG: J. LIEBSCHER
DRAWN BY: J. HOLDEN
SCALE: AS NOTED
CHECKED BY: _____
DATE: 1/23/2023
APPROVED BY: _____

C104
SHEET
6 OF 12

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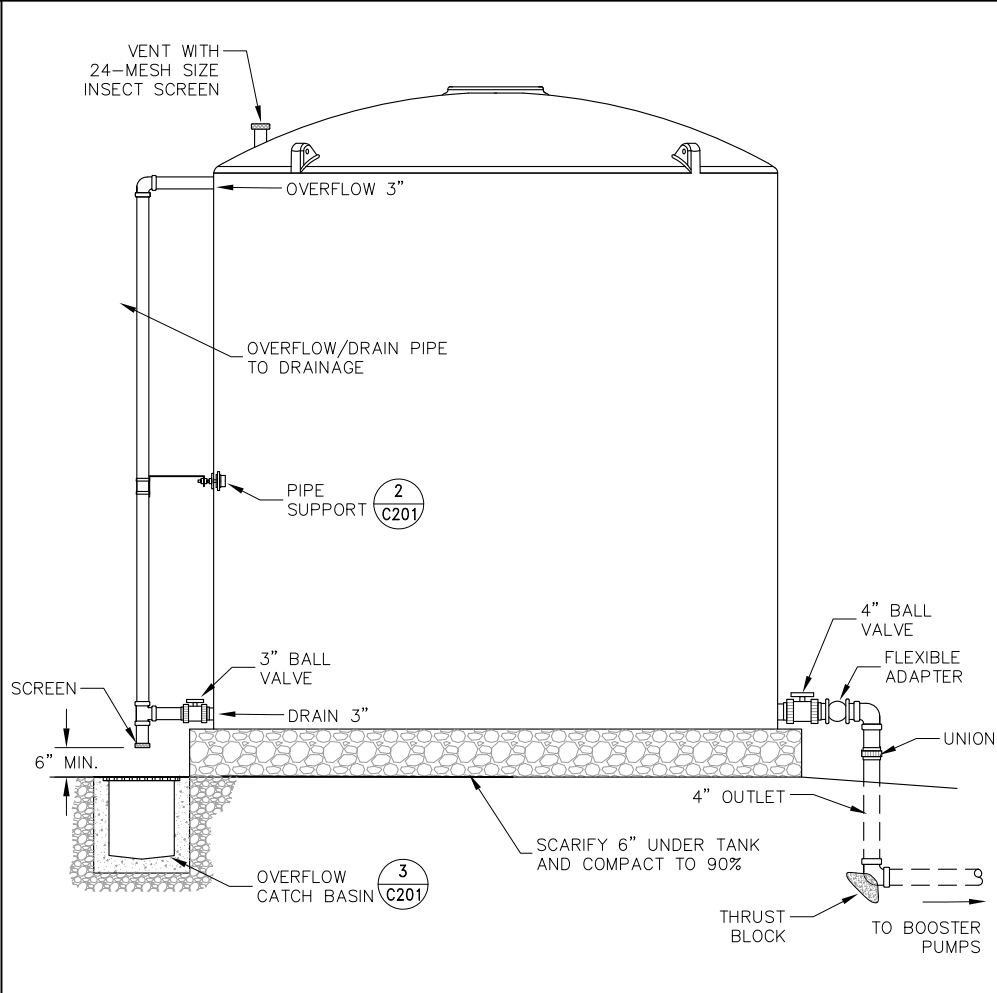


A-A'
C201 SECTION A-A'
NOT TO SCALE

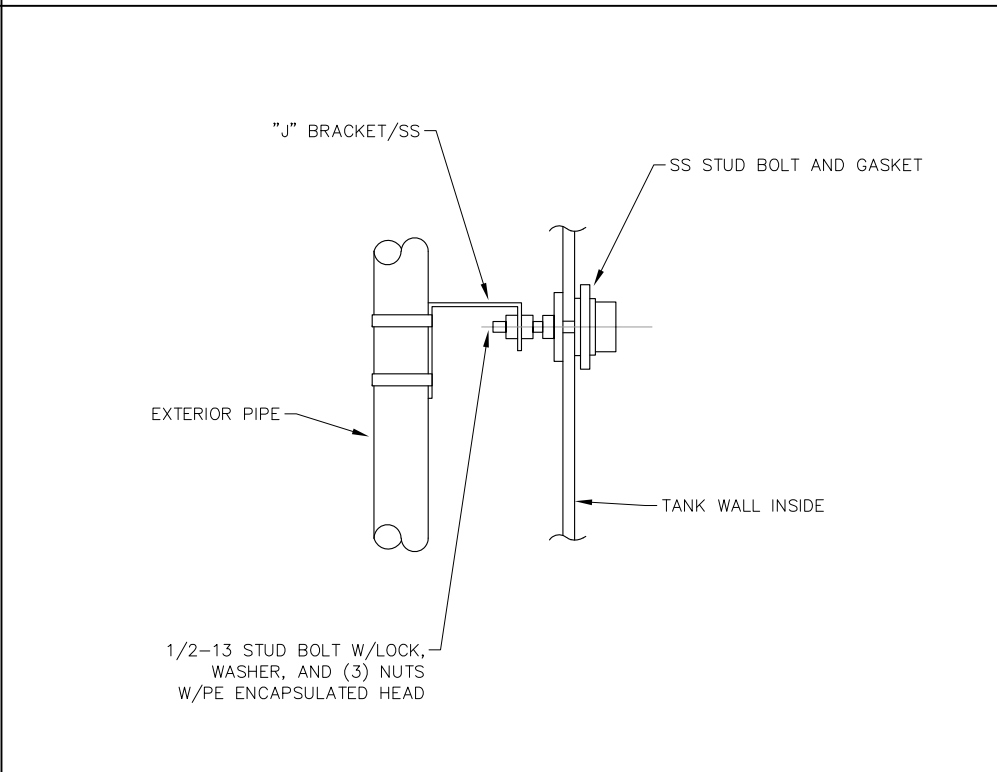


1
C201 GRAVEL FOUNDATION RINGWALL
NOT TO SCALE

NOTES:
1. PLACE PIPE PROTECTION TAPE ON ALL EXPOSED PVC PIPE.




B-B'
C201 SECTION B-B'
NOT TO SCALE



2
C201 PIPE SUPPORT
NOT TO SCALE

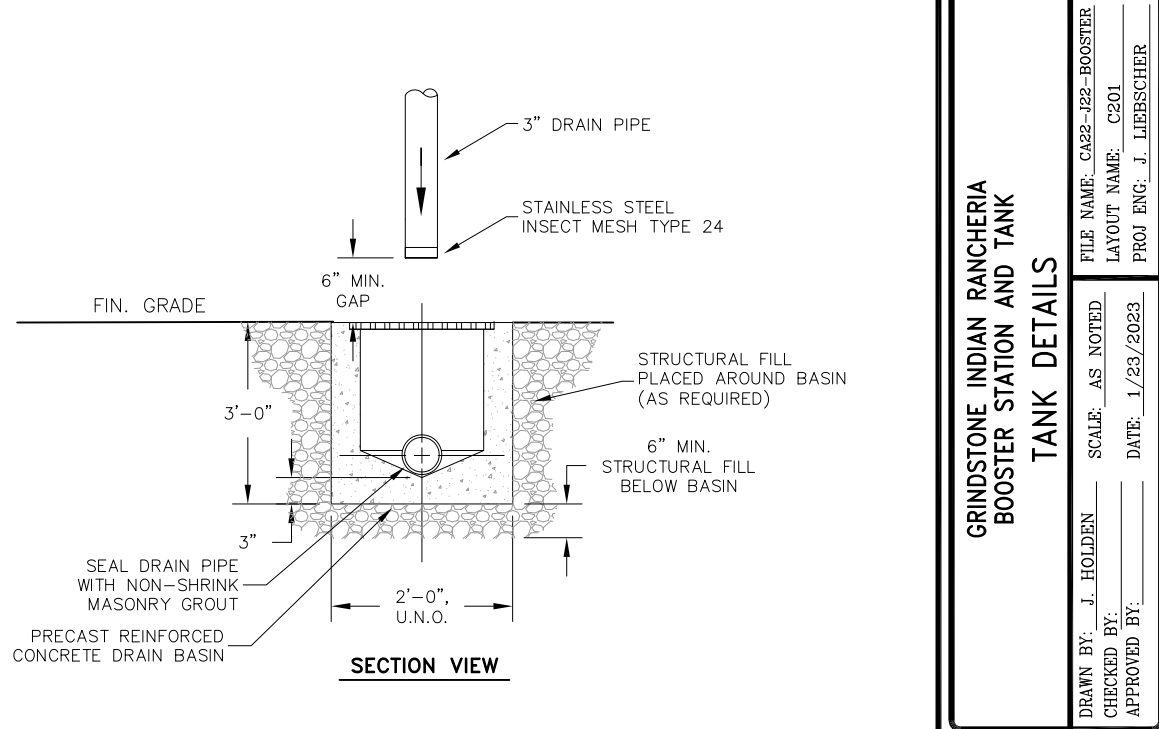
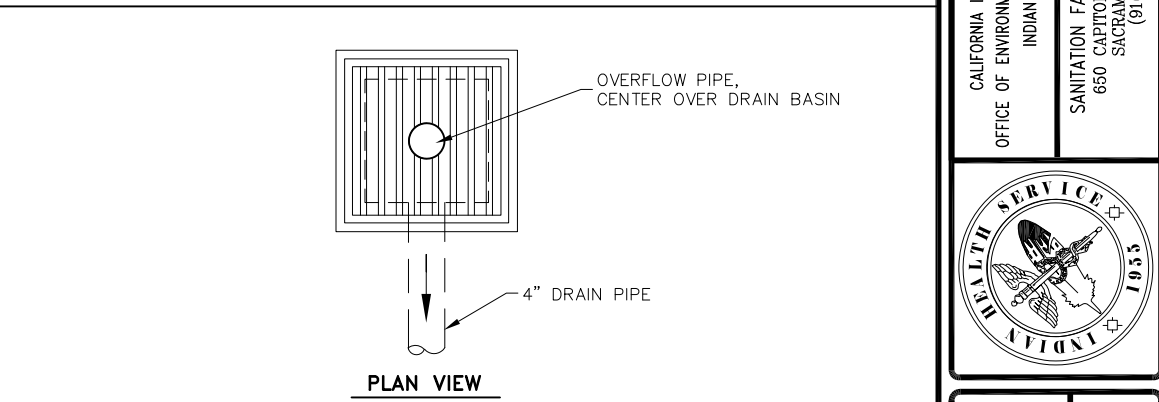
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3
C201 OVERFLOW CATCH BASIN
NOT TO SCALE



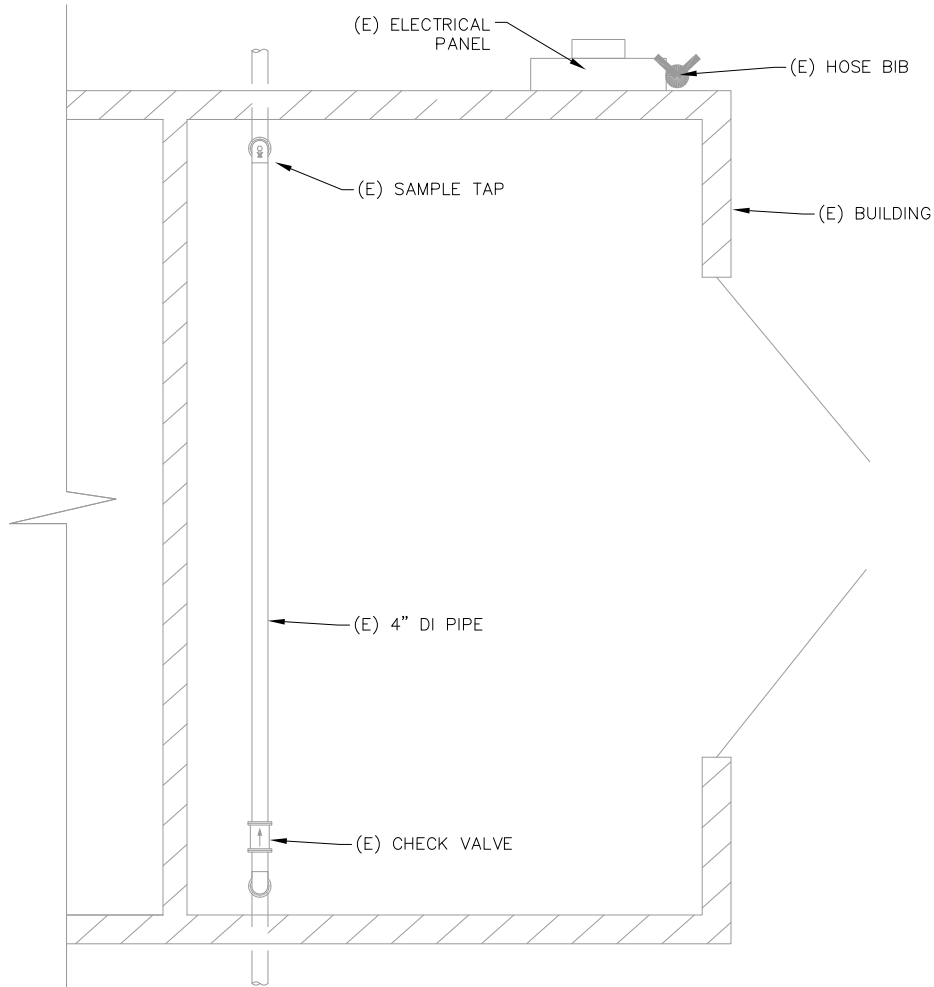
GRINDSTONE INDIAN RANCHERIA
BOOSTER STATION AND TANK
TANK DETAILS

DRAWN BY: J. HOLDEN
CHECKED BY: J. HOLDEN
APPROVED BY: J. HOLDEN

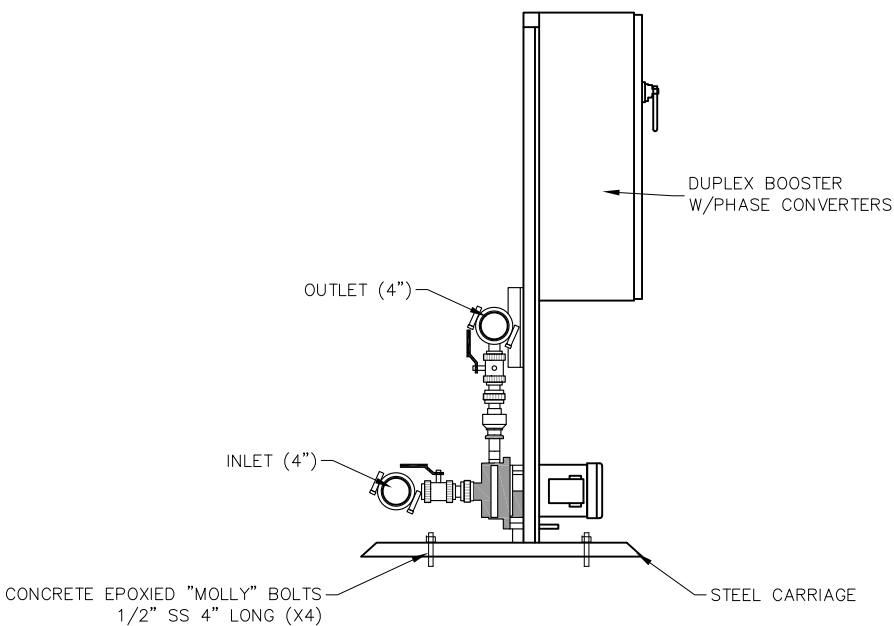
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LAYOUT NAME: C201
PROJ ENG: J. LIEBSCHER

SCALE: AS NOTED
DATE: 1/23/2023

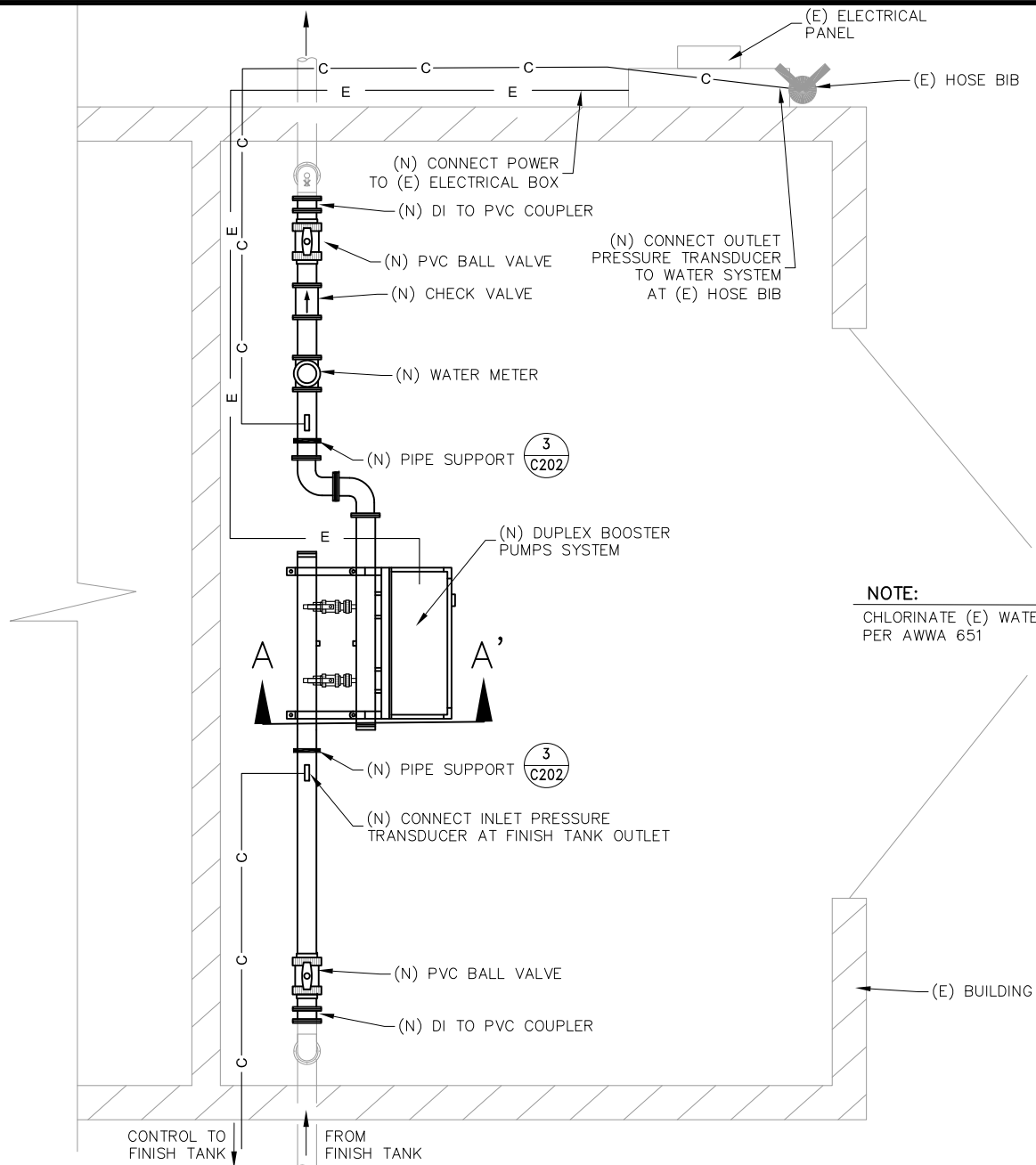
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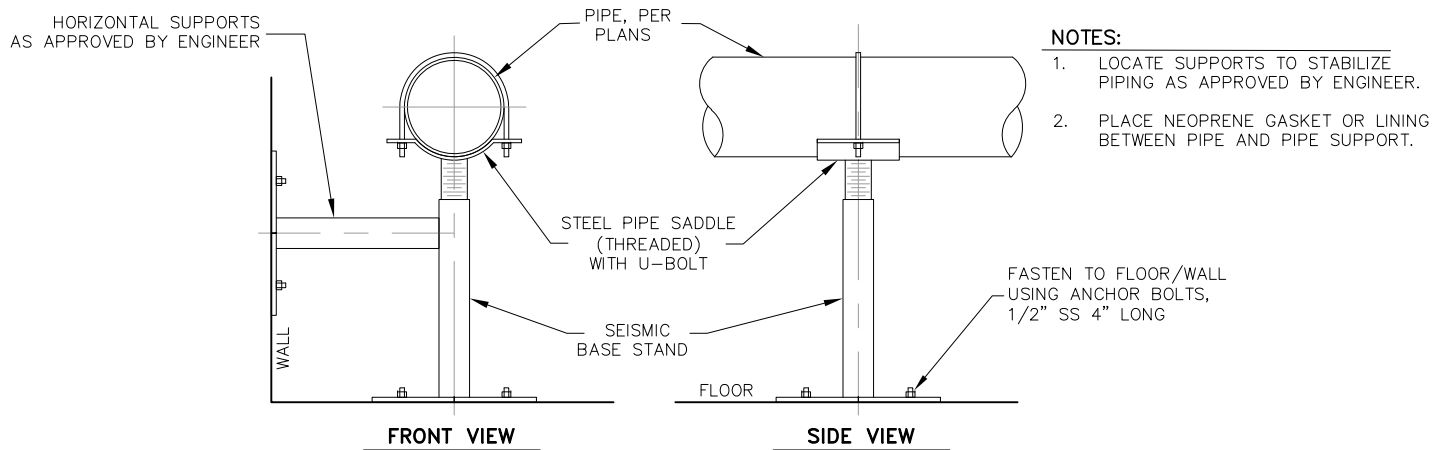
1 EXISTING CONDITIONS
C202 NOT TO SCALE



A SECTION A-A'
C202 NOT TO SCALE



2 BOOSTER STATION LAYOUT
C202 NOT TO SCALE



3 PIPE SUPPORT DETAIL
C202 NOT TO SCALE



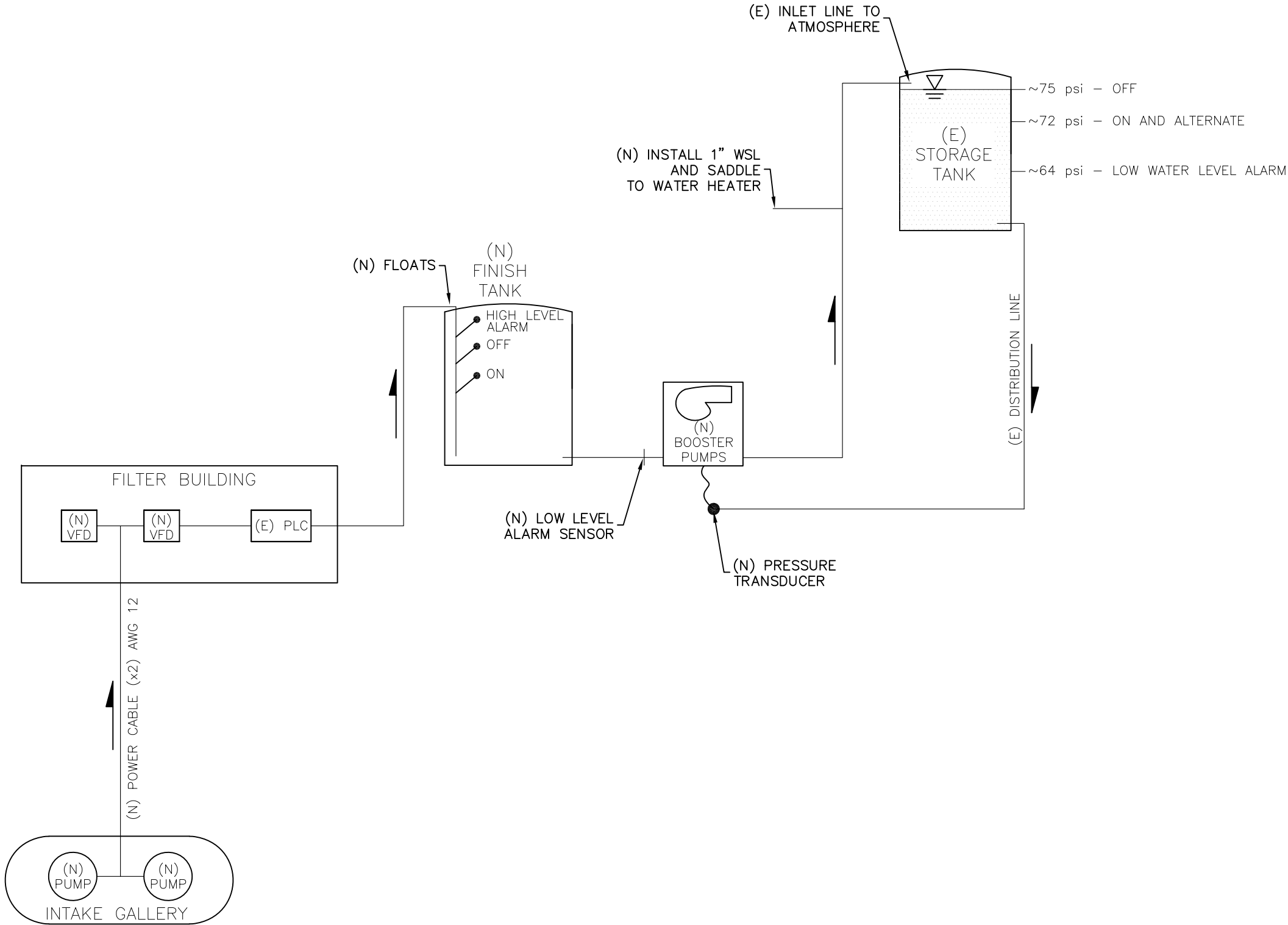
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INDIAN HEALTH SERVICE
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GRINDSTONE INDIAN RANCHERIA
BOOSTER STATION AND TANK
BOOSTER STATION LAYOUT
FILE NAME: CA22-122-BOOSTER
LAYOUT NAME: C202
PROJ ENG: J. LIEBSCHER
DRAWN BY: J. HOLDEN
SCALE: AS NOTED
CHECKED BY: _____
DATE: 1/23/2023
APPROVED BY: _____

USER: jholden FILE: Q:\District Offices\BDO\A. SFC Main Files\Grindstone\CA 22-J22 Booster Station and Tank\ACAD\Grindstone-CA22-J22-Booster.dwg 2/07/2023 -- 9:59am




1

C203

SCHEMATIC DIAGRAM


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CALIFORNIA INDIAN HEALTH SERVICE
OFFICE OF ENVIRONMENTAL HEALTH & ENGINEERING
INDIAN HEALTH SERVICE


1955

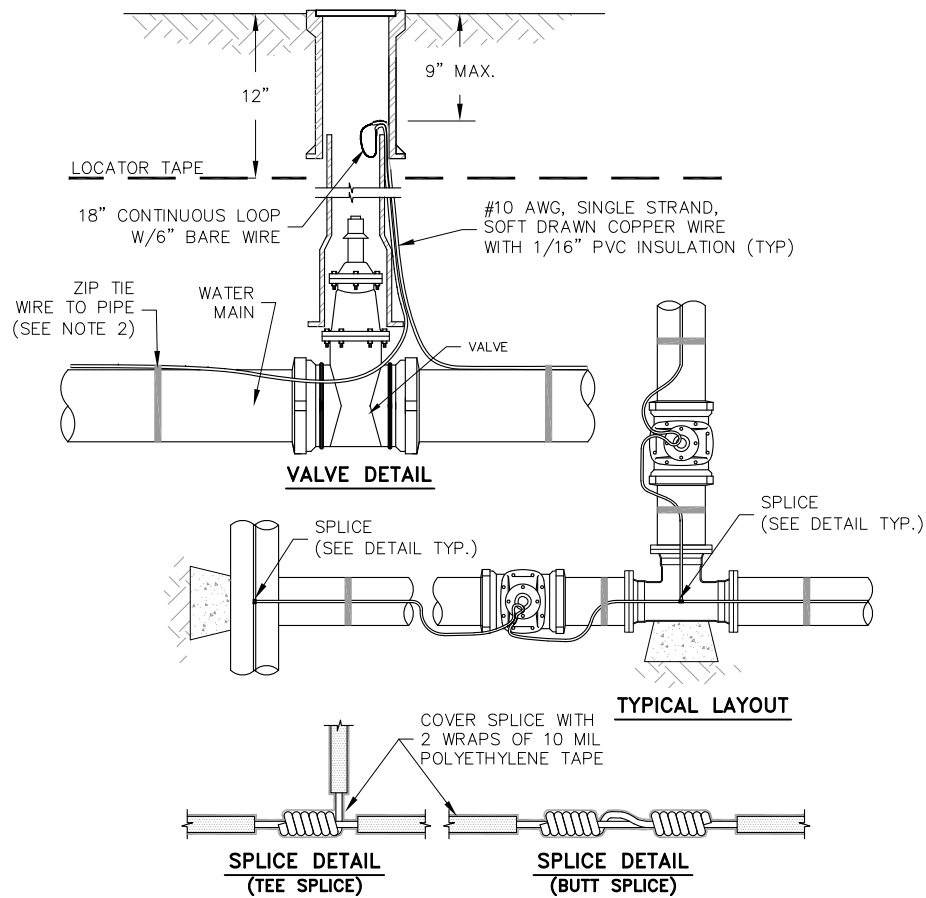
SANITATION FACILITIES CONSTRUCTION
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GRINDSTONE INDIAN RANCHERIA
BOOSTER STATION AND TANK
SCHEMATIC DIAGRAM

DRAWN BY: J. HOLDEN	SCALE: AS NOTED	FILE NAME: CA22-J22-BOOSTER
CHECKED BY:	DATE: 1/23/2023	LAYOUT NAME: C203
APPROVED BY:		PROJ ENG: J. LIEBSCHER

NOTES:

1. WIRE SHALL BE CONTINUOUS, EXCEPT WHERE SPLICES ARE REQUIRED AT TEES, CROSSES, AND CONNECTIONS TO EXISTING LOCATING WIRES.
2. LOCATING WIRE SHALL BE LAID ON TOP OF THE PIPE, AND SHALL BE ZIP-TIED TO IT AT 10' INTERVALS AND AT ALL FITTINGS.
3. CONTINUITY TEST SHALL BE PERFORMED ON EACH SPlice PRIOR TO BACKFILL, AND ON THE FULL WIRE SYSTEM AFTER IT IS FINISHED.
4. ALL SPLICES SHALL BE SOLDERED AND TAPED.
5. DO NOT COVER TRACER WIRE WITH THRUST BLOCKS.

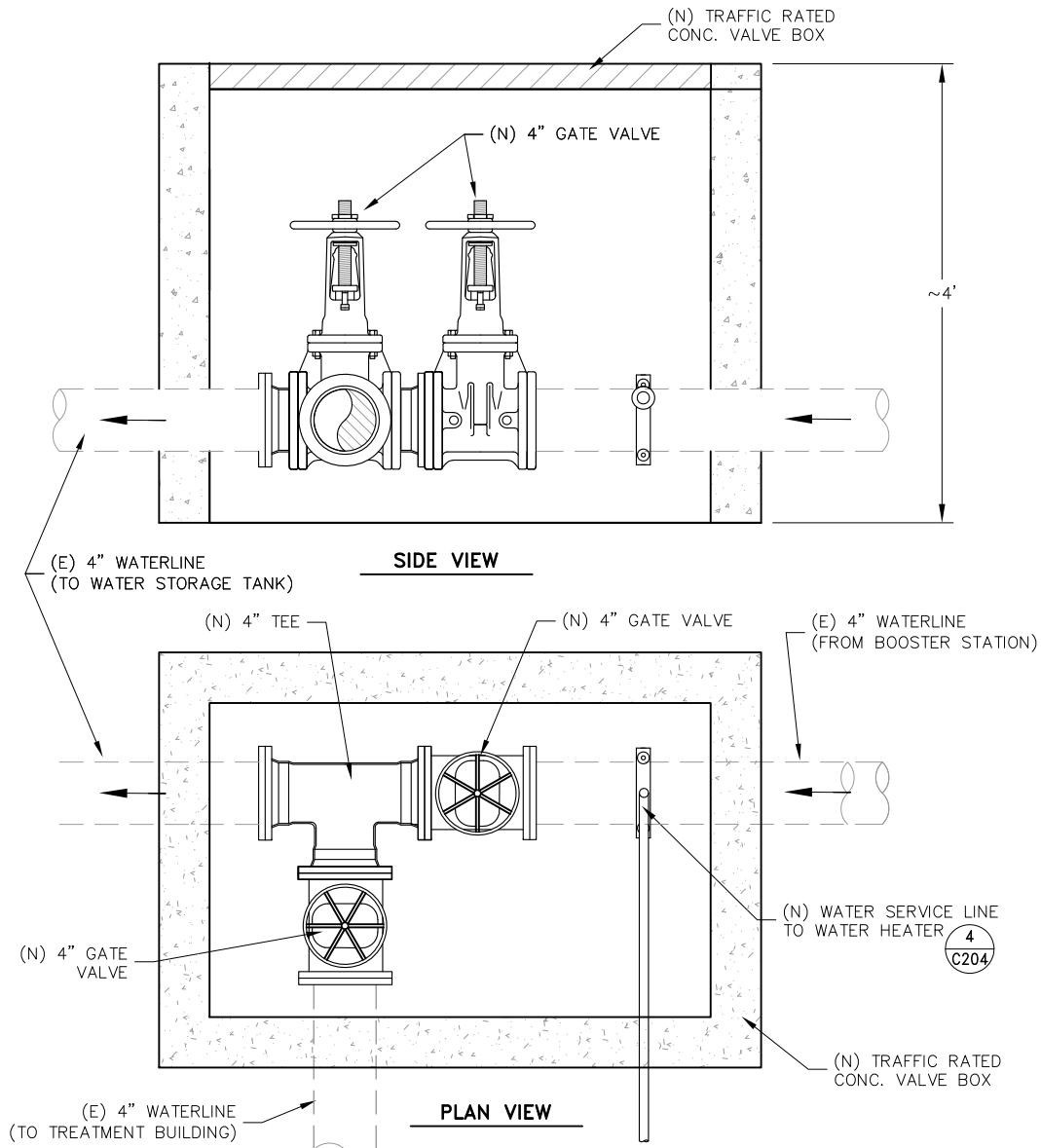


1

C204

TRACER WIRE DETAIL

NOT TO SCALE



2

C204

VALVE VAULT DETAIL

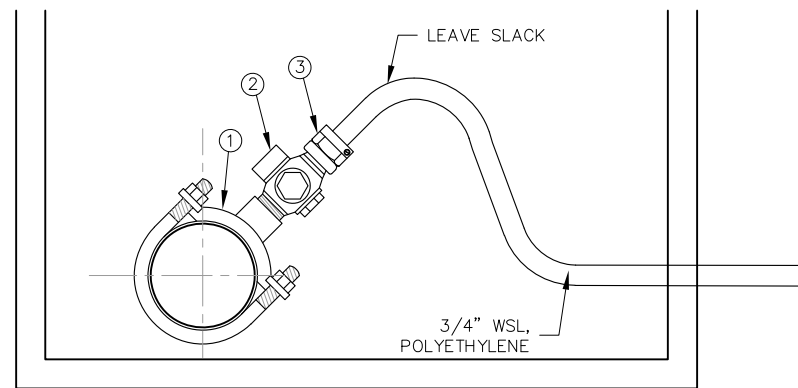
NOT TO SCALE

NOTES:

1. USE 10 GA TRACER WIRE. SECURE TO TOP OF PIPE WITH ZIP TIES EVERY 10 FEET.
2. MINIMUM VERTICAL CLEARANCE OF TWELVE INCHES (12 INCHES) SHALL BE MAINTAINED BETWEEN THE PROPOSED WATER MAIN AND ANY DRAINAGE FACILITIES (INCLUDING, BUT NOT LIMITED TO DRAINAGE DITCHES, DRAINAGE INLETS, UNDERDRAINS AND CULVERTS). IF LESS THAN 24 INCHES IS NECESSARY, APPROVAL MUST BE OBTAINED FROM THE PROJECT ENGINEER AND THE WATER MAIN SHALL BE ENCASED IN STEEL CONDUIT OR CONCRETE CASING EXTENDING TEN FEET (10 FEET) EACH SIDE OF THE DRAINAGE FACILITY.
3. MINIMUM VERTICAL CLEARANCE OF TWENTY-FOUR INCHES (24 INCHES) SHALL BE MAINTAINED BETWEEN THE PROPOSED WATER MAIN AND ANY DRAINAGE FACILITIES (INCLUDING, BUT NOT LIMITED TO DRAINAGE DITCHES, DRAINAGE INLETS, UNDERDRAINS AND CULVERTS). IF LESS THAN 24 INCHES IS NECESSARY, APPROVAL MUST BE OBTAINED FROM THE PROJECT ENGINEER AND THE WATER MAIN SHALL BE ENCASED IN STEEL CONDUIT OR CONCRETE CASING EXTENDING TEN FEET (10 FEET) EACH SIDE OF THE DRAINAGE FACILITY.

DESCRIPTION:

1. DOUBLE-STRAP SERVICE SADDLE (MALLEABLE OR DUCTILE IRON), OR TAPPED COUPLING (1" IRON PIPE THREAD OUTLET)
2. CORPORATION STOP, 1" MALE IRON PIPE THREAD INLET x 1" MALE 1.P.T. OUTLET
3. BRASS COUPER, 3/4" FEMALE IP THREAD TO 3/4" IP PE PIPE

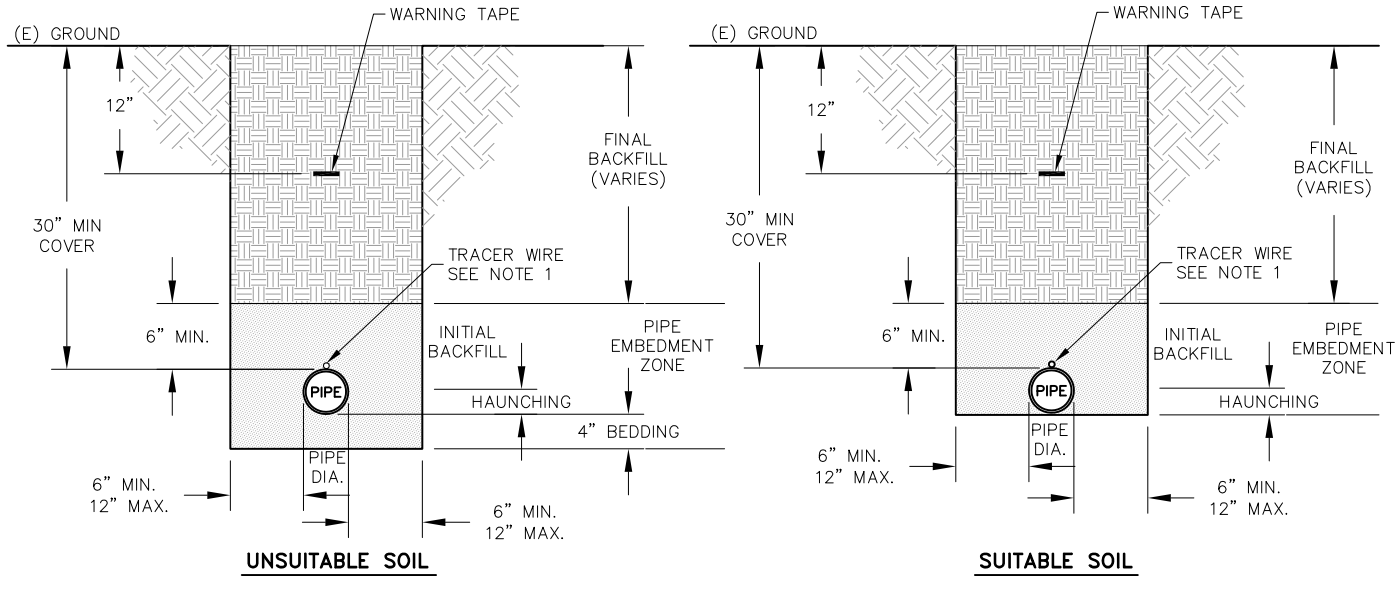


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C204

WATER SERVICE CONNECTION

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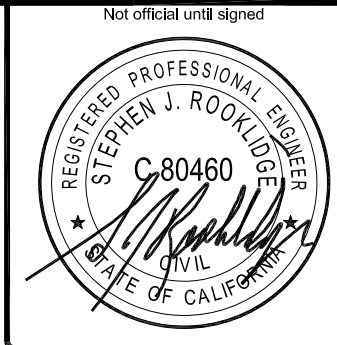


3

C204

STANDARD TRENCH DETAIL

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GRINDSTONE INDIAN RANCHERIA
BOOSTER STATION AND TANK
DETAILS
FILE NAME: CA22-122-BOOSTER
LAYOUT NAME: C204
PROJ ENG: J. LIEBSCHER
DRAWN BY: J. HOLDEN
SCALE: AS NOTED
CHECKED BY: J. HOLDEN
DATE: 1/23/2023
APPROVED BY: J. LIEBSCHER

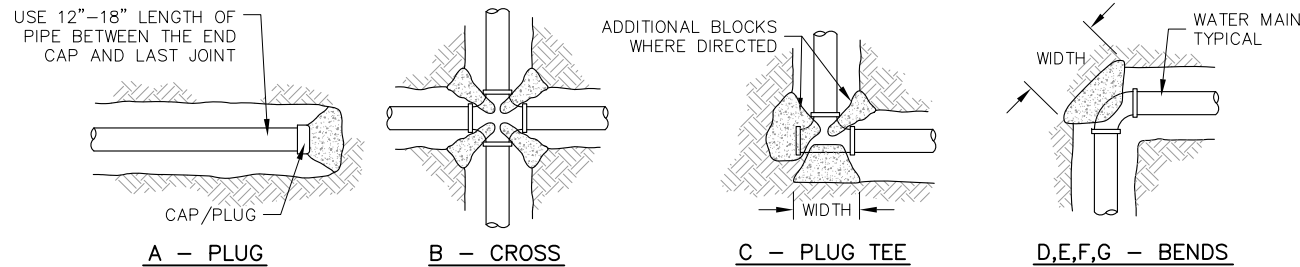
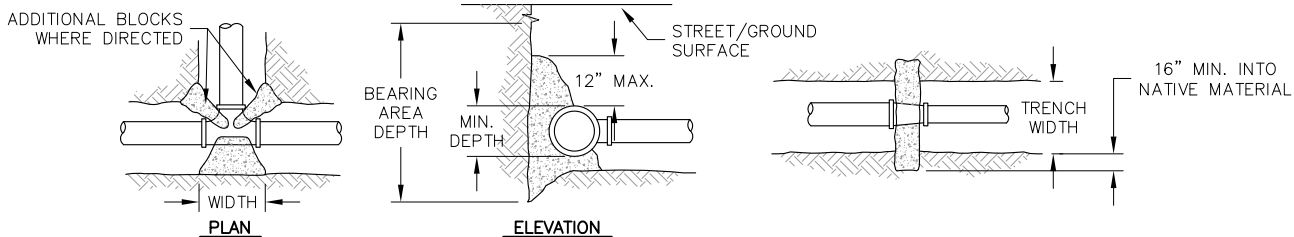
C204
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10 OF 12

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NOTES:

- ALL VALUES SHOWN ARE MINIMUM FOR A HYDROSTATIC PRESSURE OF 200 PSI AND 2,000 PSF SOIL BEARING CAPACITY.
- CONCRETE SHALL PASS 4,000 PSI CYLINDER TEST PRIOR TO WATER LINE PRESSURE TEST.
- THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED SOIL.
- JOINTS AND FACE OF PIPE PLUGS SHALL BE KEPT CLEAR OF CONCRETE.
- REQUIRED THRUST BLOCK SURFACE AREA SHALL BE MET BY CONSTRUCTING BLOCKS WITH REQUIRED HEIGHT AND WIDTH WHILE MAINTAINING REQUIRED THICKNESS.
- MIN. SOIL COVER SHALL BE 30" (GENERAL)

SIZE OF THRUST FACE (DIMS IN INCHES)							
PIPE NOM. SIZE	A TEE, PLUG, OR 60° BEND	B CROSS (EACH)	C PLUG, TEE (EACH)	D 90° BEND	E 45° BEND	F 22-1/2° BEND	G 11-1/4° BEND
2"	9 x 9	8 x 8	9 x 9	10 x 10	8 x 8	6 x 6	4 x 4
4"	17 x 17	15 x 15	17 x 17	20 x 20	15 x 15	11 x 11	8 x 8
6"	25 x 25	22 x 22	25 x 25	30 x 30	22 x 22	16 x 16	11 x 11
8"	33 x 33	29 x 29	33 x 33	40 x 40	29 x 29	21 x 21	15 x 15
10"	42 x 42	36 x 36	42 x 42	49 x 49	37 x 37	26 x 26	19 x 19
12"	50 x 50	43 x 43	50 x 50	59 x 59	44 x 44	31 x 31	22 x 22
14"	58 x 58	50 x 50	58 x 58	69 x 69	51 x 51	37 x 37	26 x 26
16"	66 x 66	57 x 57	66 x 66	79 x 79	58 x 58	42 x 42	30 x 30
18"	75 x 75	64 x 64	75 x 75	89 x 89	65 x 65	47 x 47	33 x 33



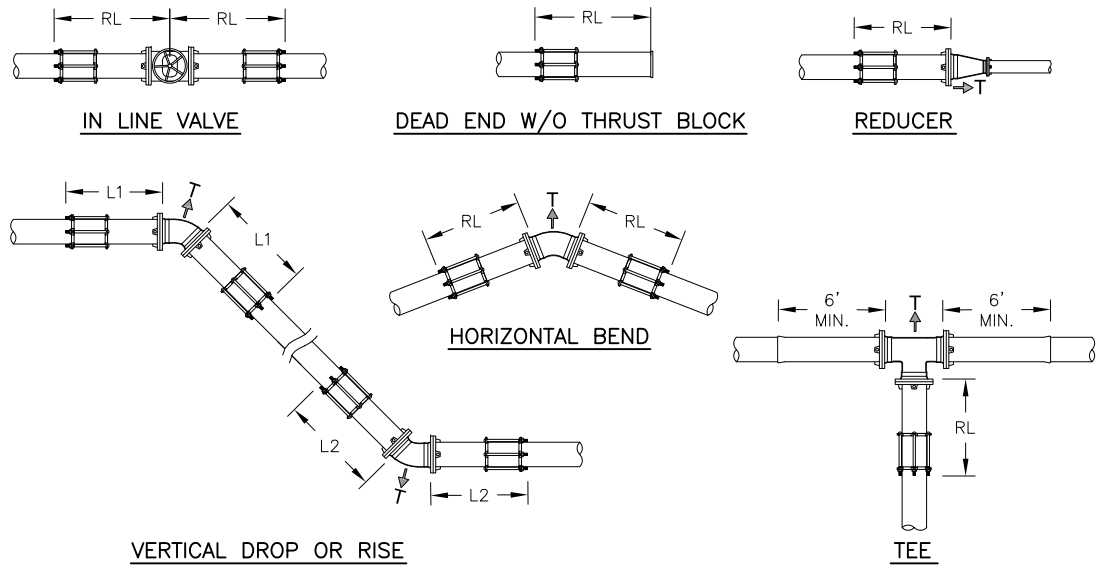
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C205
THRUST BLOCKS DETAIL
NOT TO SCALE

NOTES:

- NO FLANGE FITTINGS ALLOWED FOR DIRECT BURY.
- RESTRAINED LENGTHS SHOWN IN DRAWINGS SUPERSEDE THIS TABLE. USE THIS TABLE WHEN RESTRAINED LENGTHS ARE NOT OTHERWISE PROVIDED.
- ALL RESTRAINED LENGTHS IN TABLE ABOVE ARE BASED ON 200 PSI TEST PRESSURE, 30 INCH BURY DEPTH, FINE SILT SOIL, AND A SAFETY FACTOR OF 1.5. CONTRACTOR MAY SUBMIT ALTERNATE RESTRAINED LENGTH CALCULATIONS FOR APPROVAL FOR CONDITIONS SUBSTANTIALLY DIFFERENT FROM THESE.
- ALL JOINTS WITHIN THE RESTRAINED LENGTH SHALL BE RESTRAINED. NO JOINTS WITHIN 6 FEET OF FITTING ARE PERMITTED, UNLESS OTHERWISE SPECIFIED.
- RESTRAINED LENGTHS FOR TEES ARE ALONG THE BRANCH LINE. TEE FITTINGS MUST BE FULLY RESTRAINED, BUT NO OTHER RESTRAINTS REQUIRED ON RUN LINE, PROVIDED THERE ARE NO JOINTS ALONG RUN LINE WITHIN 6 FEET OF TEE FITTING.
- FOR DEAD ENDS AND HORIZONTAL BENDS ONLY: IF A THRUST BLOCK IS INSTALLED BEHIND THE FITTING IN ACCORDANCE WITH THRUST BLOCK DETAIL DRAWING, RESTRAINED JOINTS NOT REQUIRED UNLESS OTHERWISE SPECIFIED.
- RESTRAINED LENGTHS OR THRUST BLOCKS ARE REQUIRED AT CROSSES, WYES, AND OTHER FITTINGS NOT LISTED ABOVE. PROVIDE RESTRAINED LENGTH CALCULATIONS FOR APPROVAL.

	Ductile Iron					PVC				
	4"	6"	8"	10"	12"	4"	6"	8"	10"	12"
90° Horizontal Bend	20	28	36	43	50	24	34	44	52	60
45° Horizontal Bend	9	12	15	18	21	10	14	18	22	25
22.5° Horizontal Bend	6	6	8	9	10	6	7	9	11	12
11.25° Horizontal Bend	6	6	6	6	6	6	6	6	6	6
Dead End or In-Line Valve	42	58	76	91	106	66	92	120	144	169
45° Vertical Offset	L1 18	25	32	38	44	28	39	50	60	70
	L2 6	9	11	14	16	8	11	14	16	19
22.5° Vertical Offset	L1 9	12	16	18	22	14	19	24	29	34
	L2 6	6	6	7	8	6	6	7	8	9
11.25° Vertical Offset	L1 6	6	8	9	11	7	10	12	15	17
	L2 6	6	6	6	6	6	6	6	6	6
Reducer to 4"	*	30	55	74	92	*	48	87	117	147
Reducer to 6"	*	*	32	56	77	*	*	51	88	123
Reducer to 8"	*	*	*	31	57	*	*	*	49	90
Reducer to 10"	*	*	*	*	31	*	*	*	*	50
Tee to 4" Line (see Note 4)	22	12	6	6	6	35	19	6	6	6
Tee to 6" Line (see Note 4)	45	38	32	24	17	71	61	50	38	27
Tee to 8" Line (see Note 4)	66	61	56	50	45	104	96	88	79	71
Tee to 10" Line (see Note 4)	83	79	75	70	66	131	125	118	11	104
Tee to 12" Line (see Note 4)	100	96	93	89	86	158	153	148	142	136

RESTRAINED LENGTH (IN FEET)



2
C205
RESTRAINED FITTINGS DETAIL
NOT TO SCALE

Not official until signed

REGISTERED PROFESSIONAL ENGINEER
STEPHEN J. ROOKLIDGE
C80460
CIVIL
STATE OF CALIFORNIA

DATE
REVISIONS
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INDIAN HEALTH SERVICE
1953

GRINDSTONE INDIAN RANCHERIA
BOOSTER STATION AND TANK
DETAILS

DRAWN BY: J. HOLDEN
CHECKED BY:
APPROVED BY:

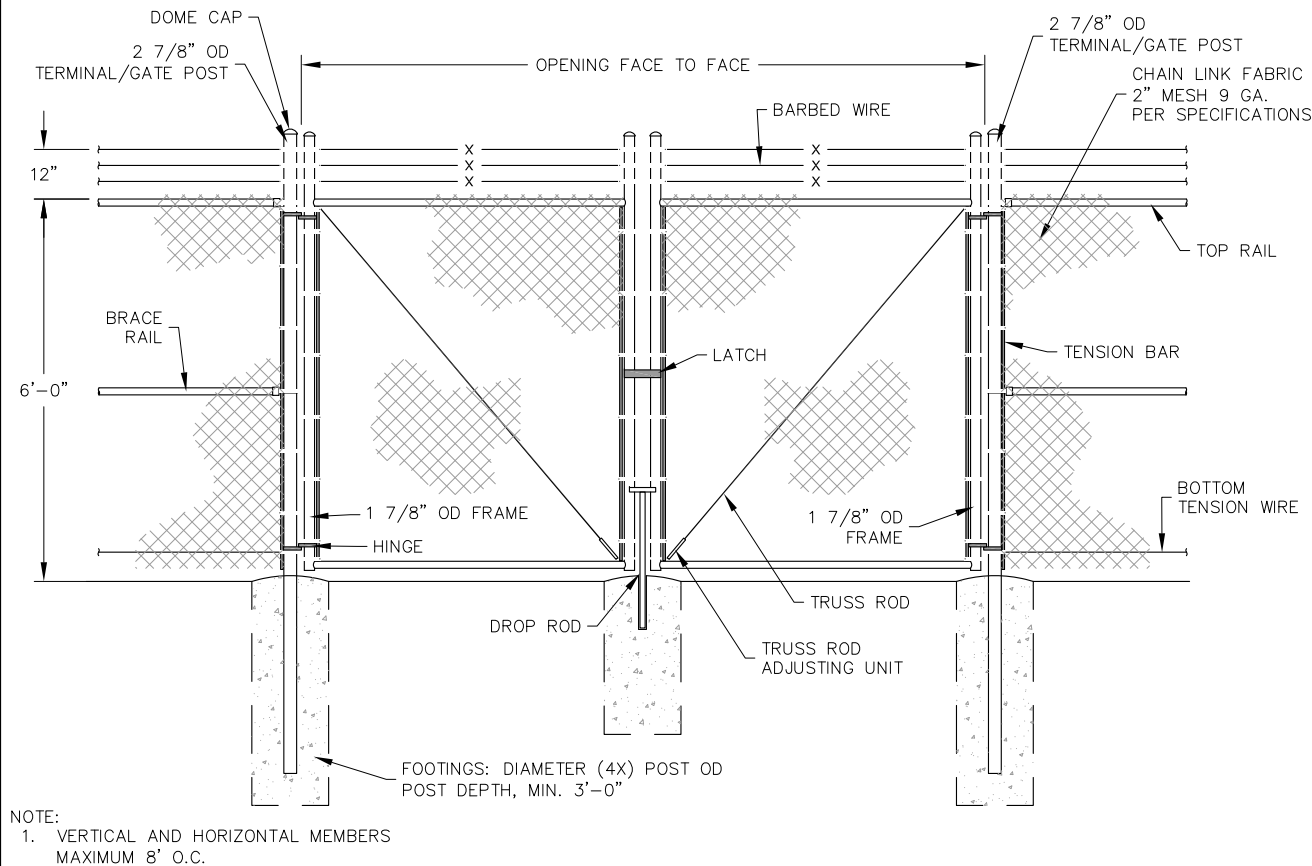
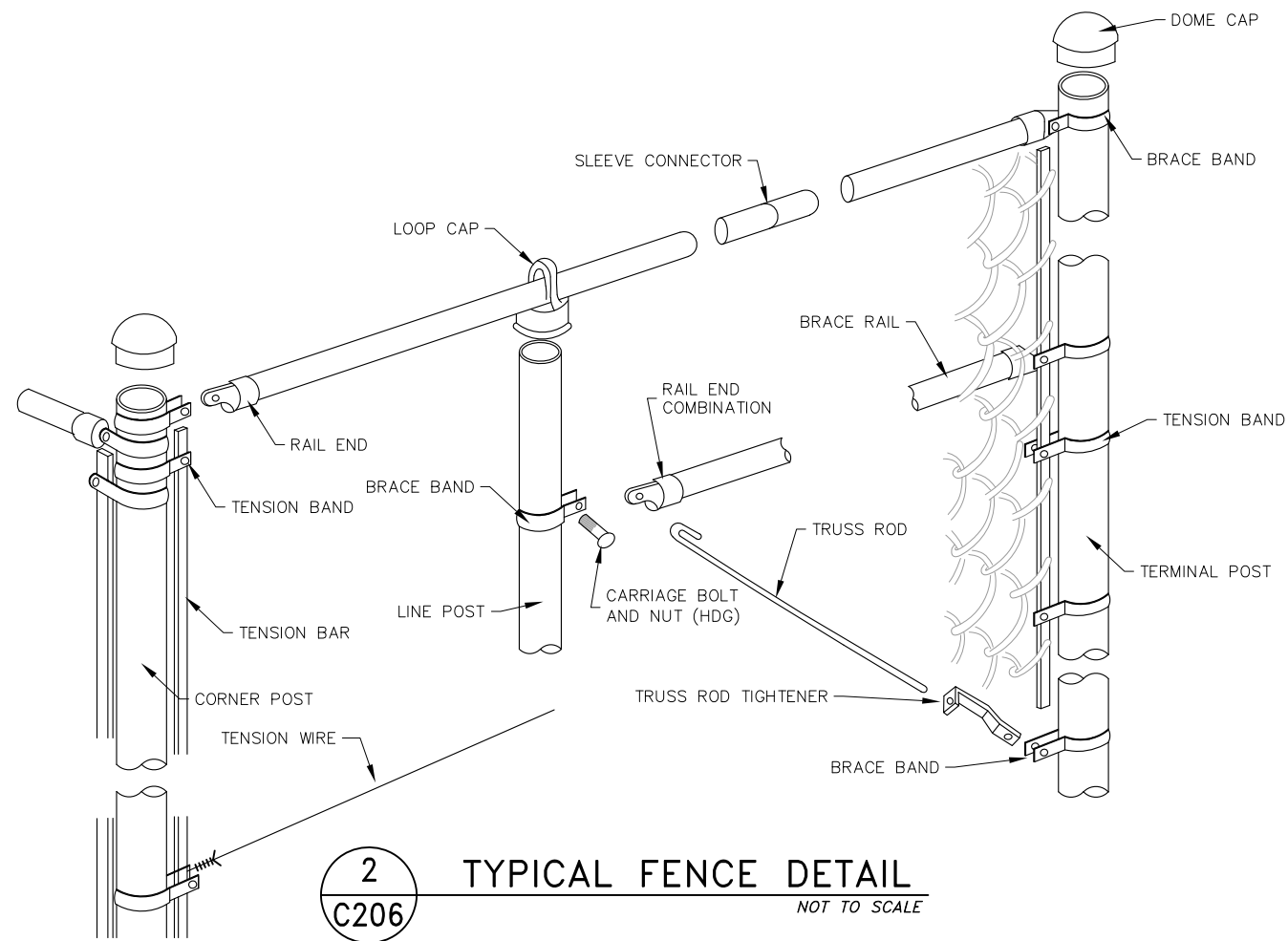
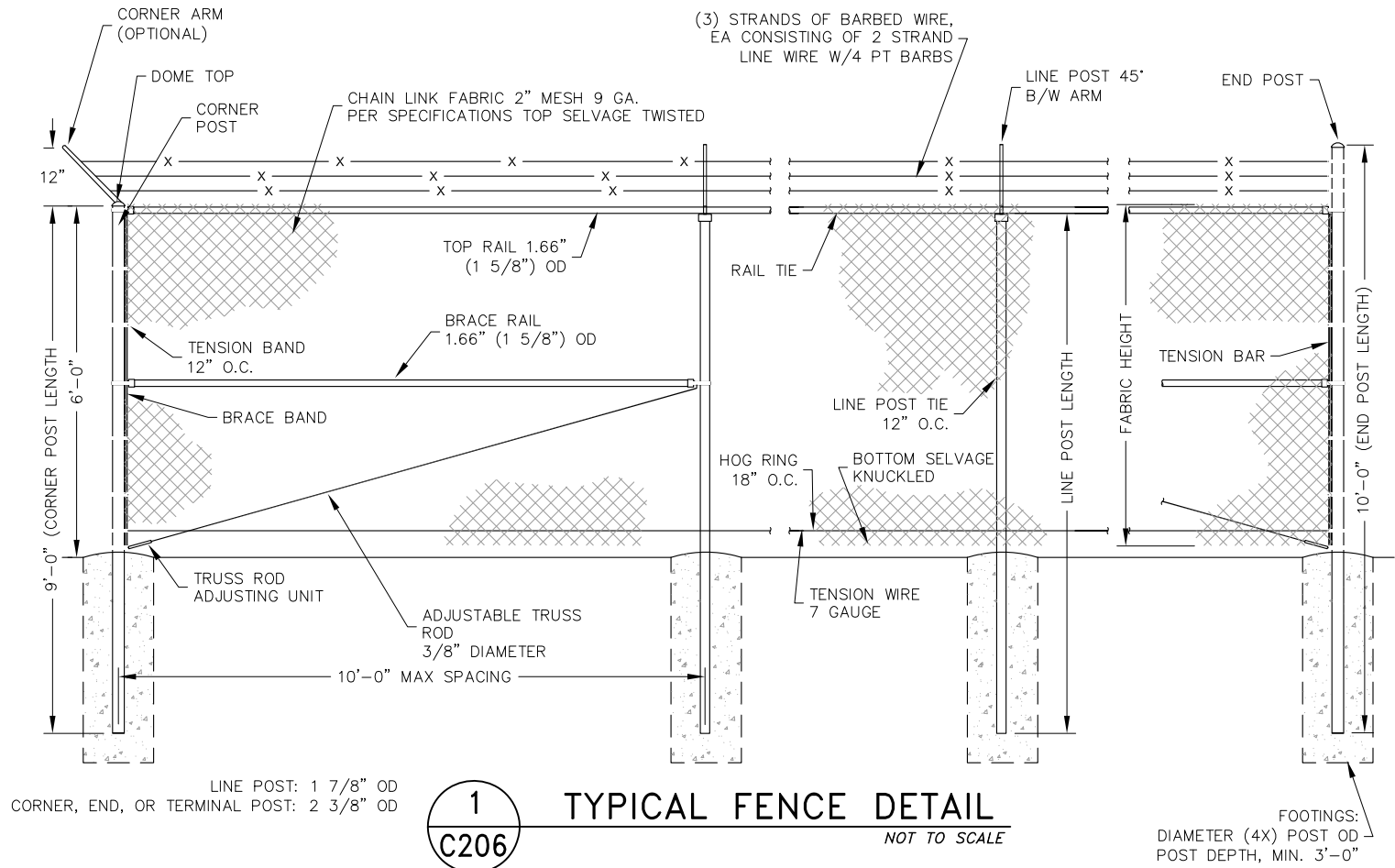
FILE NAME: CA22-122-BOOSTER
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C205

SHEET
11 OF 12

USER: jholden FILE: Q:\District Offices\RDO\A. SFC Main Files\Grindstone\CA 22-122 Booster Station and Tank\A04D\Grindstone-CA22-122-Booster.dwg 2/07/2023 - 9:58am



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BOOSTER STATION AND TANK
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FILE NAME: CA22-122-BOOSTER
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PROJ ENG: J. LIEBSCHER