BLACK OAK RANCH POND DESIGN AND DIVERSION PROJECT - 100% FINAL DESIGN MENDOCINO COUNTY, CA

PROJECT PROPONENT:
EEL RIVER RECOVERY PROJECT

AGENT:
JOEL MONSCHKE PE
STILLWATER SCIENCES
850 G STREET, SUITE K
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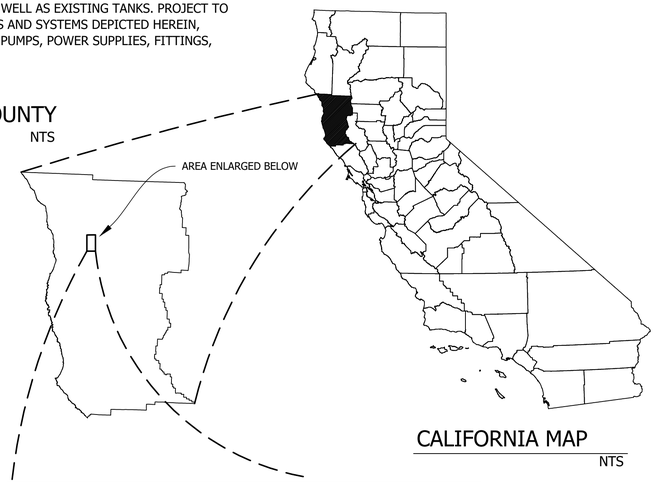
PROJECT FUNDED BY:
CALIFORNIA STATE COASTAL CONSERVANCY

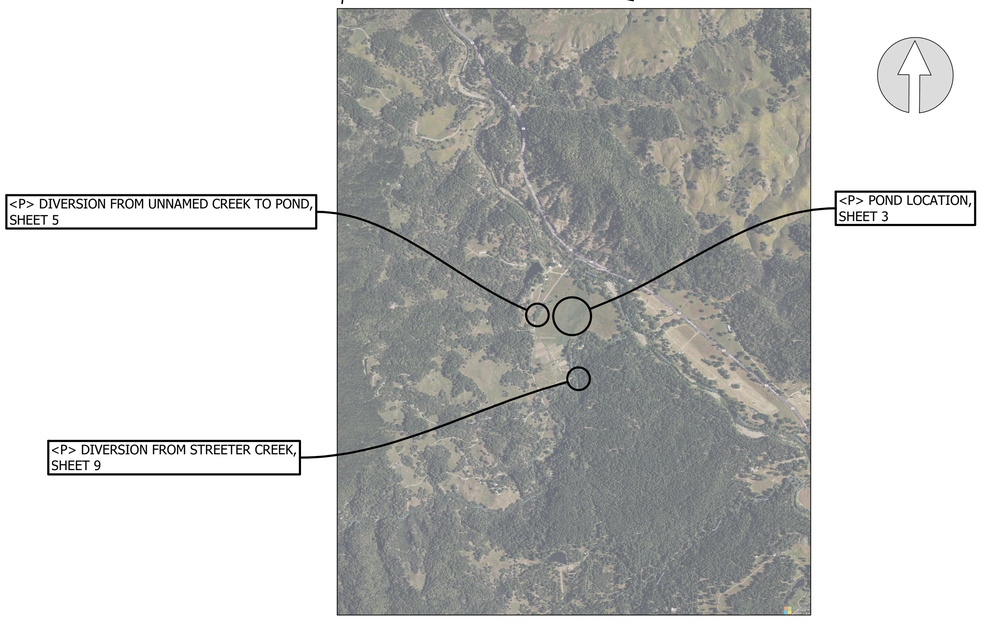
PROJECT DESCRIPTION:

CONSTRUCTION OF A ~4.14 MILLION GALLON, LINED, OFF-CHANNEL, POND FILLED ANNUALLY BY A DIVERSION FROM AN ADJACENT UNNAMED CREEK. INSTALLATION OF A SEPARATE DIVERSION ON NEARBY STREETER CREEK. BOTH DIVERSION TO SUPPLY POND. ADDITIONALLY, DIVERSIONS AND POND WILL BE USED TO SUPPLY PART/ALL OF THE ANNUAL WATER NEEDS TO ADJACENT FARM AND CAMP IRRIGATION SYSTEMS, AS WELL AS EXISTING TANKS. PROJECT TO INCLUDE CONSTRUCTION OF ALL PROPOSED FEATURES AND SYSTEMS DEPICTED HEREIN, INCLUDING : ALL ASSOCIATED SYSTEM COMPONENTS, PUMPS, POWER SUPPLIES, FITTINGS, AND TRENCHES.

MENDOCINO COUNTY
NTS



CALIFORNIA MAP
NTS



EARTHWORK ESTIMATES:

CUT/FILL:
13,500 CY BALANCED ONSITE

LARGE WOOD:
4 PIECES OF LARGE WOOD UTILIZED IN DESIGN

SYMBOL AND ABBREVIATION KEY:

<P> = PROPOSED
<E> = EXISTING

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GENERAL PROJECT AND GRADING NOTES:

1. **DESIGN INTENT.** THESE DRAWINGS REPRESENT THE GENERAL DESIGN INTENT TO BE IMPLEMENTED AND CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS SHOWN ON THESE PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE ENGINEER FOR ANY CLARIFICATIONS OR FURTHER DETAILS NECESSARY TO ACCOMMODATE ACTUAL SITE CONDITIONS. ANY DEVIATION FROM THESE PLANS WITHOUT THE LANDOWNER AND ENGINEER'S APPROVAL ARE AT THE CONTRACTOR'S OWN RISK AND EXPENSE. NOTIFY ENGINEER IMMEDIATELY OF ANY UNEXPECTED AND CHANGED CONDITIONS, SAFETY HAZARDS, AND ENVIRONMENTAL PROBLEMS ENCOUNTERED.

2. **JOB SITE CONDITIONS AND CONTRACTOR RESPONSIBILITY.** CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR SITE CONDITIONS DURING THE COURSE OF THE CONSTRUCTION OF THIS PROJECT, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY, AND ALL ENVIRONMENTAL PROTECTION ELEMENTS, WHETHER SHOWN ON THESE DRAWINGS OR NOT. CONTRACTOR SHALL FOLLOW ALL APPLICABLE CONSTRUCTION AND SAFETY REGULATIONS. THESE REQUIREMENTS SHALL APPLY CONTINUOUSLY AND WILL NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE LANDOWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPT FROM LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE LANDOWNER OR ENGINEER.

3. **DAMAGE.** CONTRACTOR SHALL EXERCISE CARE TO AVOID DAMAGE TO EXISTING PUBLIC AND PRIVATE PROPERTY, INCLUDING NATIVE TREES AND SHRUBS, AND OTHER PROPERTY IMPROVEMENTS. IF CONTRACTOR CAUSES DAMAGES TO SUCH ITEMS, HE SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT IN LIKE NUMBER, KIND, CONDITION, AND SIZE. ANY SUCH COST MAY BE DEDUCTED BY OWNER FROM MONIES DUE CONTRACTOR UNDER THIS CONTRACT.

4. **SOILS REPORT.** ALL CONSTRUCTION ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH THE SOILS REPORT PREPARED FOR THIS PROPERTY.

5. **LIMITS OF WORK, ACCESS, STAGING AND MOBILIZATION AREAS.** EXACT LIMITS OF WORK, POINTS OF INGRESS-EGRESS, MOBILIZATION, STAGING, AND WORK AREAS WILL BE IDENTIFIED IN THE FIELD BY THE LANDOWNER AND/OR ENGINEER.

6. **EARTHWORK QUANTITIES.** CONTRACTOR IS RESPONSIBLE FOR ALL EARTHWORK, INCLUDING GRADING, PROVISION AND PLACEMENT OF ROCK MEETING SIZE LIMITS, AS SHOWN ON DRAWINGS, AND DISPOSAL OF ALL EXCESS SOIL AND RUBBLE. EARTHWORK QUANTITIES, INCLUDING GRADING, PLACED ROCK RIP-RAP QUANTITY ESTIMATES PROVIDED BY THE ENGINEER ARE ESTIMATES ONLY. LANDOWNER AND ENGINEER DO NOT, EXPRESSLY OR OTHERWISE BY IMPLICATION, EXTEND ANY WARRANTY TO EARTHWORK CALCULATIONS.

7. AREAS TO BE GRADED SHALL BE CLEARED OF ALL VEGETATION INCLUDING ROOTS AND OTHER UNSUITABLE MATERIAL FOR A STRUCTURAL FILL, THEN SCARIFIED TO A DEPTH OF 6 INCHES PRIOR TO PLACING OF ANY FILL.

8. AREAS WITH EXISTING SLOPES WHICH ARE TO RECEIVE FILL MATERIAL SHALL BE KEYED AND BENCHED.

9. FILL MATERIAL SHALL BE SPREAD IN LIFTS NOT EXCEEDING 12 INCHES IN COMPACTED THICKNESS, MOISTENED OR DRIED AS NECESSARY TO NEAR OPTIMUM MOISTURE CONTENT AND COMPACTED BY AN APPROVED METHOD. FILL MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 90% MAXIMUM DENSITY AS DETERMINED BY 1957 ASTM D - 1557 - 91 MODIFIED PROCTOR (AASHO) TEST OR SIMILAR APPROVED METHODS.

10. CUT AND FILL SLOPES SHALL NOT EXCEED A GRADE OF 2 HORIZONTAL TO 1 VERTICAL EXCEPT WHEN SHOWN ON PLANS. ALL DISTURBED GROUND SHALL BE PLANTED WITH NATIVE GRASS SEED AND MULCHED.

11. BEST MANAGEMENT PRACTICES FOR CONSTRUCTION ACTIVITIES: ERODED SEDIMENTS AND OTHER POLLUTANTS MUST BE RETAINED ONSITE AND MAY NOT BE TRANSPORTED FROM THE SITE VIA SHEET FLOW, SWALES, AREA DRAINS, NATURAL DRAINAGE COURSES, OR WIND. STOCKPILES OF EARTH AND OTHER CONSTRUCTION RELATED MATERIALS MUST BE PROTECTED FROM BEING TRANSPORTED FROM THE SITE BY THE FORCES OF WIND OR WATER. FUELS, OILS, SOLVENTS, AND OTHER TOXIC MATERIALS MUST BE STORED IN ACCORDANCE WITH THEIR LISTING AND ARE NOT TO CONTAMINATE THE SOIL AND SURFACE WATERS. ALL APPROVED STORAGE CONTAINERS ARE TO BE PROTECTED FROM THE WEATHER. SPILLS MAY NOT BE WASHED INTO THE DRAINAGE SYSTEM. EXCESS OR WASTE CONCRETE MAY NOT BE WASHED INTO PUBLIC WAY OR ANY OTHER DRAINAGE SYSTEM.TRASH AND CONSTRUCTION RELATED SOLID WASTE MUST BE DEPOSITED INTO A COVERED WASTE RECEPTACLE TO PREVENT CONTAMINATION OF RAINWATER AND DISPERSAL BY WIND. SEDIMENTS AND OTHER MATERIAL MAY NOT BE TRACKED FROM TO THE SITE BY VEHICLE TRAFFIC.

BLACK OAK RANCH
POND DESIGN

LAYTONVILLE, CA

Stillwater Sciences
850 G STREET SUITE K
ARCATA, CA 95521 P: (707) 822-9607

PROJECT NUMBER: 943.00
SCALE: AS NOTED
DATE: 11/14/22

DESIGN: JM/BW
DRAWN: BW/TC
CHECKED: JM
APPROVED: JM

REGISTERED PROFESSIONAL ENGINEER JOEL MONSCHKE No. 79688 9-30-22 EXPIRES CIVIL STATE OF CALIFORNIA

TITLE SHEET

LAST SAVED: 11/16/2022 PLOT DATE: 11/16/2022 PLOT STYLE: ---- C:\ONEDRIVE\ONEDRIVE - STILLWATER SCIENCES\BLACK OAK RANCH\ACAD\ACAD_MODEL\943.00_TITLESHEET_11.16.22.DWG
BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY

ABBREVIATIONS:

'	FEET
"	INCH
#	NUMBER
AB	AGGREGATE BASE
APPROX	APPROXIMATE
CBM	CHANNEL BED MATERIAL
C	CENTERLINE
CMP	CORRUGATED METAL PIPE
CU	CUBIC
DEMO	DEMOLITION
DIA, Ø	DIAMETER
D50 CRITERIA	50% OF DIAMETER- ROCK SIZING
E	EASTING
EG	EXISTING GRADE
ELEV	ELEVATION
EOP	EDGE OF PAVEMENT
ESA	ENVIRONMENTALLY SENSITIVE AREA
EX	EXISTING
FG	FINISH GRADE
FT	FEET
GALV	GALVANIZED
H	HORIZONTAL
HDPE	HIGH DENSITY POLYETHYLENE
IE	INVERT ELEVATION
IN	INCH
INV	INVERT
LT	LEFT
LWM	LARGE WOODY MATERIAL
MAX	MAXIMUM
MIN	MINIMUM
N	NORTHING
NTS	NOT TO SCALE
OC	ON CENTER
PC	POLE CUTTING
PROP	PROPOSED
Q10	10-YEAR STREAMFLOW
Q100	100-YEAR STREAMFLOW
RCP	REINFORCED CONCRETE PIPE
ROW	RIGHT OF WAY
RS-#	ROCK STRUCTURE NUMBERING
STA	STATION
SWPPP PLAN	STORMWATER POLLUTION PREVENTION
SD	STANDARD DETAIL
SQ	SQUARE
TOT	TOWN OF TRUCKEE
TYP	TYPICAL
V	VERTICAL
W/I	WITHIN
WSE	WATER SURFACE ELEVATION
YD	YARDS
YR	YEAR
Z	ELEVATION

MATERIALS

REFER TO CONSTRUCTION CODES AND STANDARDS FOR ADDITIONAL MATERIAL SPECIFICATIONS AND CONSTRUCTION REQUIREMENTS.

1. FENCING (PROTECTIVE BARRIER): MAXIGRID WARNING BARRIER, ORANGE PLASTIC NETTING OR EQUIVALENT, 48 INCH-HIGH, SUPPORTED BY STEEL T-STYLE FENCE POSTS AT 10 FOOT SPACING.

2. FILL MATERIAL: ACCEPTABLE FILL MATERIAL CONSISTS OF: SILTY SANDS AND SAND-SILT MIXTURES (SM); CLAYEY SANDS AND SAND-CLAY MIXTURES (SC); INORGANIC SILTS AND CLAYEY SILTS WITH LOW PLASTICITY, SANDY SILTS, GRAVELY SILTS (ML); INORGANIC CLAYS WITH LOW TO MEDIUM PLASTICITY, GRAVELY CLAYS, SANDY CLAYS, LEAN CLAYS (CL). ALL FILL MATERIAL MUST HAVE A LIQUID LIMIT OF LESS THAN 40 AND A PLASTICITY INDEX OF LESS THAN FILL MATERIAL MUST NOT CONTAIN ROCK LARGER THAN 3 INCHES, VEGETATION OR OTHER ORGANIC MATERIAL.

3. RIP RAP: CALTRANS CLASSIFICATION FOR ROCK SLOPE PROTECTION (RSP) MATERIAL BASED ON THE MEAN AVERAGE DIAMETER (D50) OF THE MATERIAL. MATERIAL SHALL MEET THE REQUIREMENTS OF CALTRANS HIGHWAY DESIGN MANUAL TABLE 873.3A. FURNISHED AND INSTALLED IN ACCORDANCE WITH CALTRANS STANDARD SPECIFICATION SECTION 72

4. STRAW WATTLES: RICE OR PINE NEEDLE WATTLE, 8.0 INCH DIAMETER WITH BIODEGRADABLE COCONUT NETTING. INSTALL USING 1" X 1" X 18" WOOD STAKES. INSTALLED PER TOT SD#72.

6. SURFACE AGGREGATE: SURFACE AGGREGATE SHALL CONSIST OF A MIXTURE OF CRUSHED STONE, GRAVEL AND NATURAL SANDS. THE MIXTURE SHALL BE FREE OF ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES. GRADATION, IN ACCORDANCE WITH ASTM C136 SHALL BE:

SIEVE OPENING	% PASSING BY WEIGHT
3/4"	100
NO 4	50 TO 70
NO 8	40 TO 65
NO 40	15 TO 35
NO 200	4 TO 15

6.1. THE PORTION OF THE MATERIAL PASSING THE NO 40 SIEVE SHALL HAVE A PLASTIC INDEX BETWEEN 4 AND 12 AS DETERMINED IN ACCORDANCE WITH ASTMD424.

7. CHANNEL BED MATERIAL (CBM): CBM SHALL BE CLEANED SUBANGULAR TO SUBROUNDED ROCK, GENERALLY CONSISTING OF GRAVELS AND SAND THE CBM SHALL BE WELL MIXED PRIOR TO PLACEMENT. CBM SHALL BE INSTALLED AND HYDRAULICALLY JETTED INTO PLACE. CBM SHALL HAVE THE FOLLOWING GRADATIONS:

SIEVE OPENING	% PASSING BY WEIGHT
1"	100
3/4"	84
1/2"	50
NO 4	16
NO 10	5

CONSTRUCTION CODES & STANDARDS

CONSTRUCTION ACTIVITIES SHALL ADHERE TO THE TOWN OF TRUCKEE REQUIREMENTS FOR CONSTRUCTION EQUIPMENT AND CONSTRUCTION PRACTICES, INCLUDING THE FOLLOWING:

1. EQUIP ALL INTERNAL COMBUSTION ENGINE DRIVEN EQUIPMENT WITH INTAKE AND EXHAUST MUFFLERS THAT ARE IN GOOD CONDITIONS AND APPROPRIATE FOR THE EQUIPMENT.

2. LOCATE STATIONARY NOISE GENERATING EQUIPMENT AS FAR AS POSSIBLE FROM SENSITIVE RECEPTORS WHEN SENSITIVE RECEPTORS ADJOIN OR ARE NEAR A CONSTRUCTION PROJECT AREA.

3. UTILIZE "QUIET" AIR COMPRESSORS AND OTHER STATIONARY NOISE-GENERATING EQUIPMENT WHERE APPROPRIATE TECHNOLOGY EXISTS.

PROVIDE MATERIALS AND COMPLETE ALL CONSTRUCTION WORK IN ACCORDANCE WITH THE FOLLOWING CONSTRUCTION CODES & STANDARDS.

1. CALIFORNIA BUILDING CODE
2. CALIFORNIA PLUMBING CODE
3. CAL-OSHA CONSTRUCTION SAFETY AND SITE PROTOCOLS

PROJECT PERMIT REQUIREMENTS

PROVIDE MATERIALS AND COMPLETE ALL CONSTRUCTION WORK IN ACCORDANCE WITH THE FOLLOWING PROJECT PERMIT REQUIREMENTS.

1. GRADING AND DRAINAGE PERMIT.

2. CONSTRUCTION GENERAL PERMIT.

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LAYTONVILLE, CA

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TITLE SHEET

SHEET 2 OF 18

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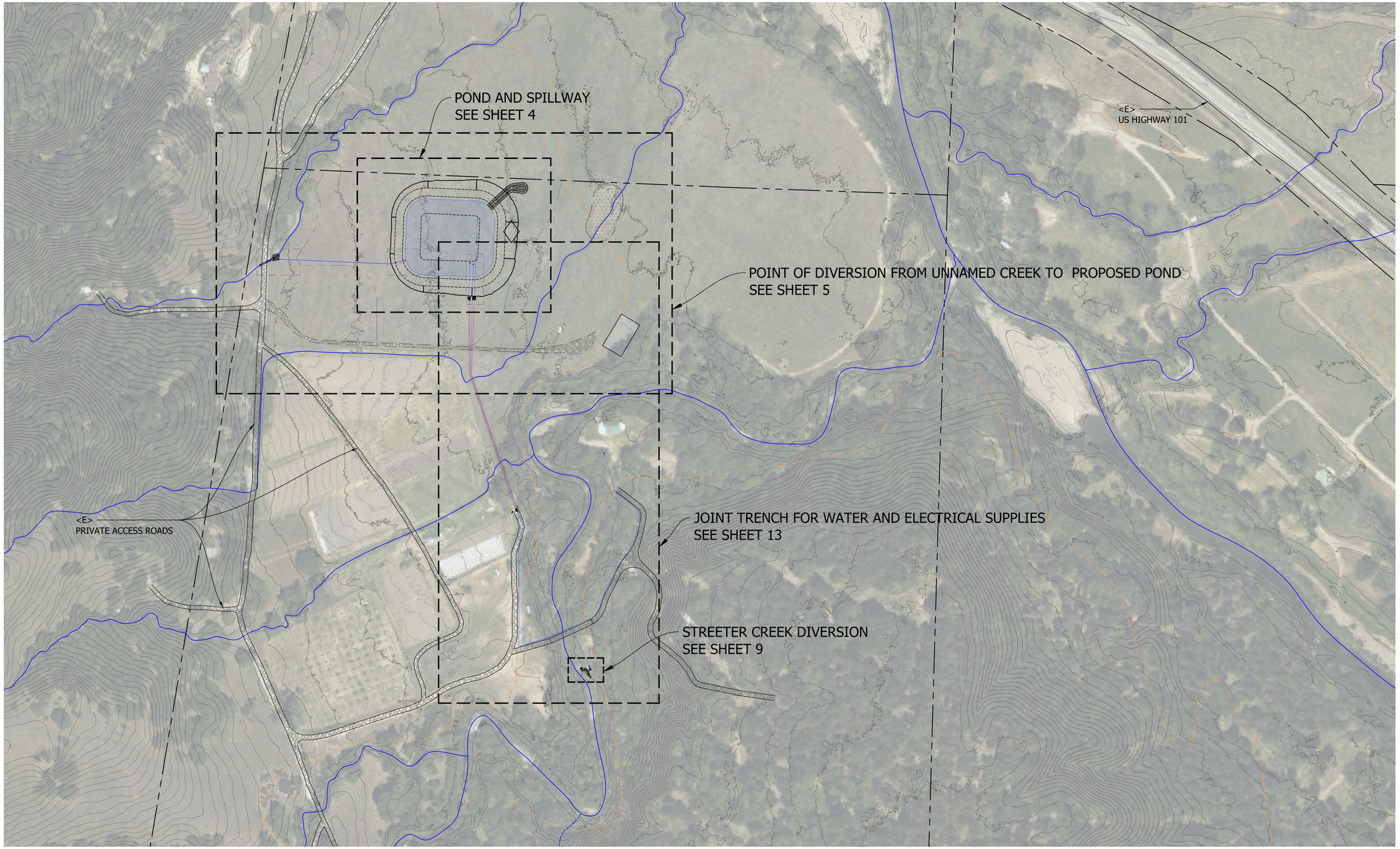

PROJECT OVERVIEW MAP

0 75 150 300 FEET

SCALE: 1" = 150'

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9-30-22
EXPIRES
CIVIL
STATE OF CALIFORNIA

OVERVIEW

SHEET 3 OF 18

LAST SAVED: 11/15/2022 PLOT DATE: 11/15/2022 PLOT STYLE: ---- DESIGN_11-14-22.DWG
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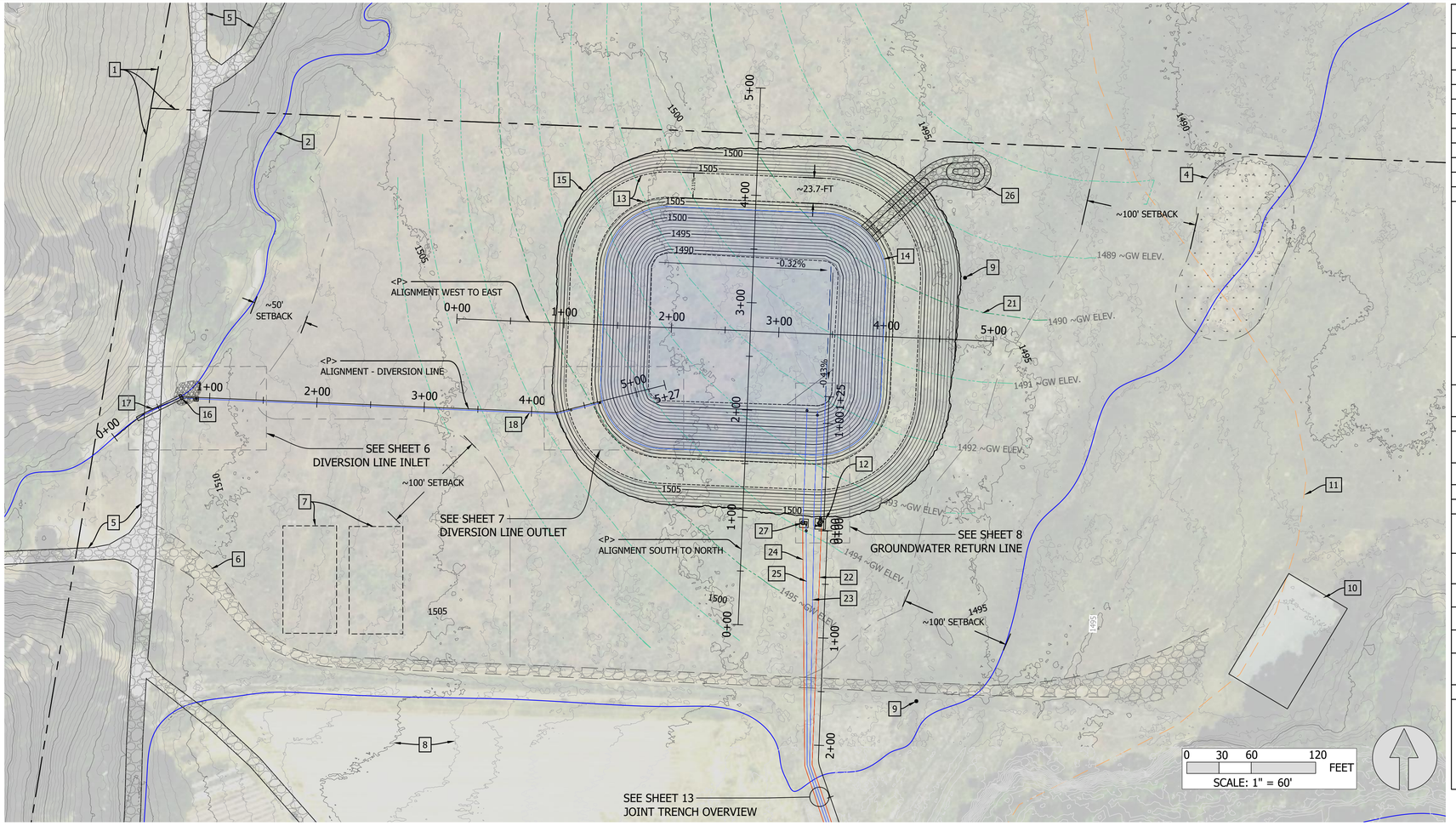
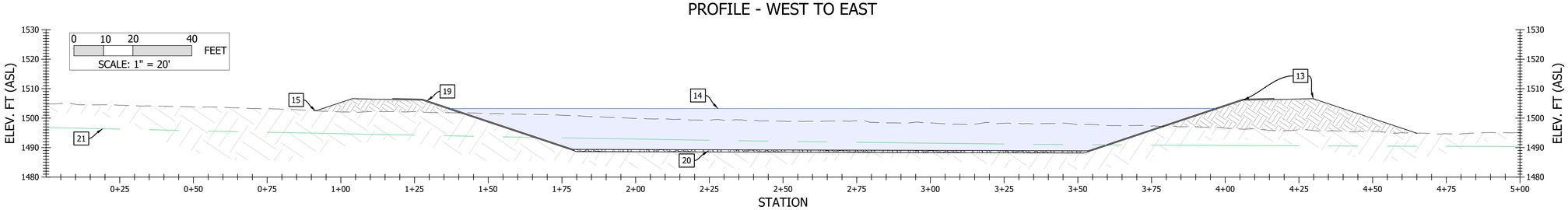
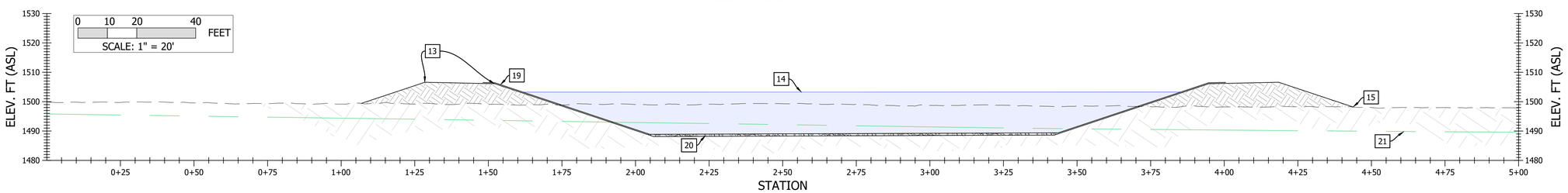


	FEATURES OF INTEREST - APPLIES TO ALL SHEETS UNLESS OTHERWISE INDICATED
1	APPROXIMATE PROPERTY BOUNDARIES FROM MENDOCINO COUNTY PORTAL
2	APPROXIMATE STREAM ALIGNMENT - UNNAMED TRIBUTARY WILL SUPPLY THE DIVERSION TO SUPPLY ANNUAL POND FILL
3	APPROXIMATE STREAM ALIGNMENT
4	APPROXIMATE WETLAND BOUNDARY
5	EXISTING NETWORK OF ACCESS ROADS
6	EXISTING INFORMAL DIRT ACCESS ROAD
7	EXISTING LEACH FIELD
8	~1-FOOT GROUND SURFACE CONTOUR DATA FROM USGS LIDAR
9	EXISTING PG&E POWER POLES (2) - PROTECT IN PLACE
10	EXISTING STRUCTURE
11	APPROXIMATE ~100-YEAR FLOOD INUNDATION LINE FROM FEMA
12	GROUNDWATER RETURN LINE AND PUMP CONNECTED TO GRAVEL BED BENEATH POND LINER TO ENSURE GW BELOW LINER DOES NOT BULGE UP WHEN POND LEVELS ARE LOW. PROVIDE 125-FEET OF 4-IN DIAM PERFORATED PIPE IN A FILTER SOCK CONNECTED TO A SOLID WALL LINE RUN TO A COLLECTION SUMP OUTSIDE OF POND AND BERM FOOTPRINT, SEE SHEET 8. PROVIDE 3/4 HP SHALLOW WELL JET PUMP THAT CAN SUPPLY ~7GPM AT ~30PSI WHILE DRAWING ~15 TO ~25 FEET OF SUCTION HEAD. AS DETAILED IN THE BASIS OF DESIGN REPORT (BOD) AND APPENDIX, THE PUMP IS RECOMMENDED TO BE: LITTLEGIANT JP-075-C - 16GPM - 3/4HP, OR APPROVED EQUAL https://www.waterpumpsdirect.com/Little-Giant-558275-Water-Pump/p10261.html . PUMP WILL DRAW WATER UP FROM WITHIN THE SUMP CHAMBER BELOW WITH PUMP POSITIONED IN SMALL PUMPHOUSE ON ADJACENT FIELD GRADE; ENSURE AT LEAST 1.5CYDS OF CONCRETE IS USED WITHIN THE FOOTING/SLAB AND IS SECURELY BOUND TO THE VERTICAL SUMP CHAMBER TO ADEQUATELY RESTRAIN INHERENTLY GENERATED BUOYANT FORCES . PUMP COLLECTS GROUNDWATER AND PUMPS IT UP AND OVER THE BERM BACK INTO THE POND. POSITION ALL FLOATS AND AUTO-SWITCHES WITHIN SUMP.
13	TOP BANKS OF BERM SET AT 23.7-FEET APART WITH ~2.11% CROSS SLOPE TO INSIDE. INTERIOR EDGE AT ~1506.1-FT ELEV. OUTSIDE EDGE AT 1506.6' ELEV. BERM CONSTRUCTED USING THE ~13,300-CYDS OF MATERIAL EXCAVATED FOR POND BASIN. REUSE ALL CUT ONSITE AND EXHAUST WITHIN BERM AS SHOWN. ALL SIDES SLOPES SHOWN AT 3:1 (H:V). BERMS TO BE COMPOSED OF REUSED EXCAVATIONS AT A RELATIVE COMPACTION RATE OF 90% MIN.
14	PONDED WATER SURFACE ELEV. ~1503.25-FT, WITH POND BOTTOM SET BETWEEN ~1488 AND ~1489 FOOT ELEV THERE IS ~4.14 MILLON GALLONS OF CAPACITY. POND IS LINED WITH A MAXIMUM PONDED WATER EXTENT OF ~55,800-SQFT.
15	MATCH GRADE ALONG PROPOSED AND EXISTING ON OUTSIDE EDGE OF PROPOSED GRADING.
16	POINT OF DIVERSION AND INTERCEPT TO SUPPLY ANNUAL FILL INTO PROPOSED POND. SET COANDA SCREENED INLET BOX ON THE EXISTING OUTLET OF THE CULVERT, CONNECT TO DIVERSION LINE TO POND, SEE SHEET 6.
17	EXISTING CULVERT CROSSING, RETAIN AND ADAPT DIVERSION INLET ONTO EXISTING CULVERT OUTLET.
18	DIVERSION SUPPLY LINE FROM UNNAMED CREEK INTO POND LINE, SEE SHEETS 5, 6, & 7.
19	POND LINER, SEE SHEET 15 FOR DETAILING
20	GRAVEL LENS (9" THICK) PLACED BELOW POND LINER TO INTERCEPT UPWELLING GROUNDWATER THAT MAY AFFECT LINER PERFORMANCE WHEN POND LEVELS ARE LOW. PROVIDE CROSS SLOPES TO BOTTOM OF POND AS SHOWN TO A LOW POINT AND SUMP COLLECTION AND PUMP SYSTEM, SEE SHEET 8 AND 15 FOR ADDITIONAL DETAILS.
21	INFERRED AND APPROXIMATED GROUNDWATER TABLE BASED ON CONNECTING EQUIVALENT ELEVATION WITHIN BOUNDING CHANNEL THALWEGS ON EACH SIDE OF POND. FOR CONCEPTUAL REFERENCE ONLY.
22	ELECTRICAL FEED TO GROUNDWATER RETURN PUMP. ANTICIPATE ~3/4HP PUMP AT LESS THAN 10AMPS AND ON TYPICAL 120/240 VOLT SUPPLY. RUN CONDUITS IN JOINT TRENCH, SEE SHEET 13.
23	WATER SUPPLY FROM STREETER DIVERSION INTO POND, 2" PVC. CONNECT TO GW RETURN LINE, SEE SHEET 8 AND 13. RUN SUPPLY LINE IN JOINT TRENCH, SEE SHEET 13.
24	ELECTRICAL FEED TO IRRIGATION PUMP. ANTICIPATE ~2HP PUMP AT LESS THAN 20AMPS AND ON TYPICAL 120/240 VOLT SUPPLY. RUN CONDUITS IN JOINT TRENCH, SEE SHEET 13.
25	WATER SUPPLY FROM POND AND IRRIGATION PUMP UP TO FARM AND CAMP. PROVIDE 4" DIAM PVC PIPING UP TO FARM, 2" TYP EXTENSION AND LATERALS BEYOND. RUN SUPPLY LINE IN JOINT TRENCH, SEE SHEET 13.
26	POND SPILLWAY AND INFILTRATION BASIN, SEE SHEET 17.
27	IRRIGATION PUMP TO DRAW FROM POND AND SUPPLY BOTH THE FARM IRRIGATION SYSTEM AND THE SEPARATE AND MORE DISTANT CAMP SPRINKLER SYSTEM, SEE SHEET 13 AND 16. 2HP CENTRIFUGAL PUMP TO DELIVER ~50GPM AT ~40PSI WHILE DRAWING UP TO ~20FT OF SUCTION HEAD FROM POND. CONNECT TO A 4" SUPPLY MAIN TO FARM, THEN SUPPLIES SPLIT INTO (2) SEPERATEE 2" SUPPLY LINES, SEE SHEET 13. AS DETAILED IN THE BASIS OF DESIGN REPORT (BOD) AND APPENDIX, THE PUMP IS RECOMMENDED TO BE: GOULDS GT IRRI-GATOR SELF-PRIMING CENTRIFUGAL PUMP, GT20 (2HP).

PROFILE - WEST TO EAST



PROFILE - SOUTH TO NORTH



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POND PLAN & TYP PROFILES

SHEET 4 OF 18

LAST SAVED: 11/16/2022 PLOT DATE: 11/16/2022 PLOT STYLE: ---
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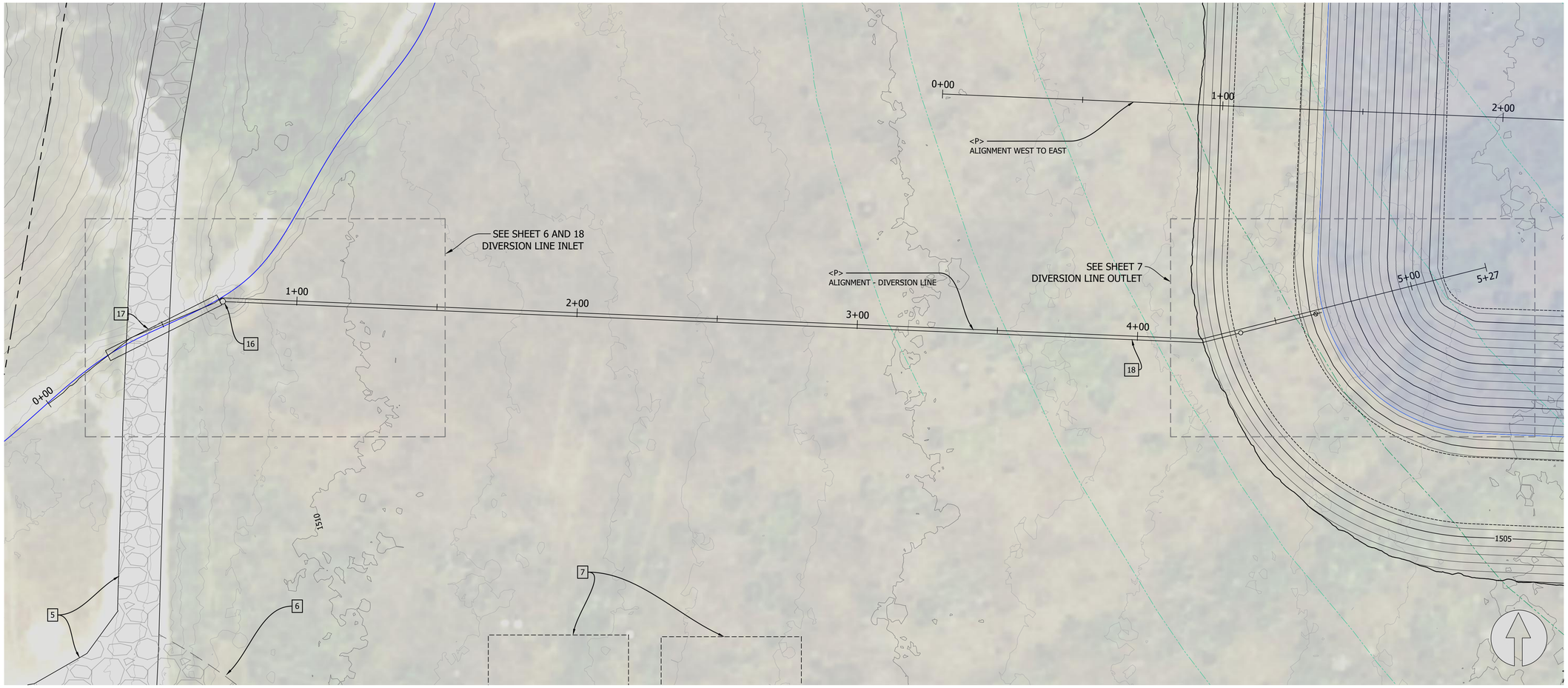
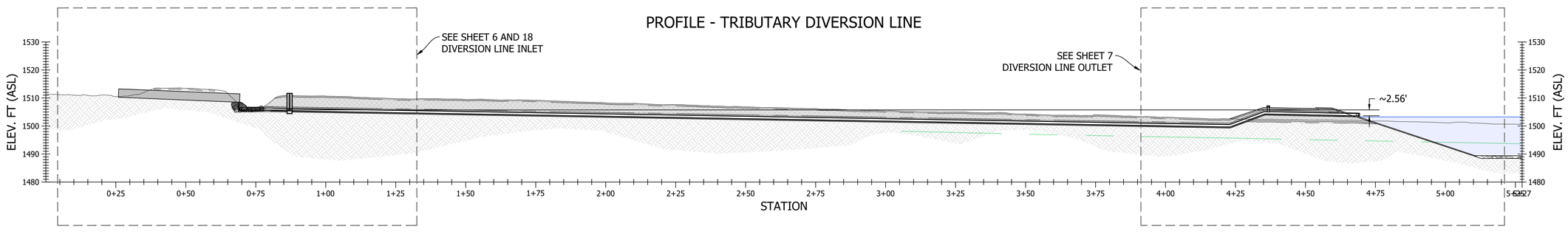


SEE SHEET 4 FOR IDENTIFICATION OF NUMBERED FEATURES

0 10 20 40 FEET
SCALE: 1" = 20'



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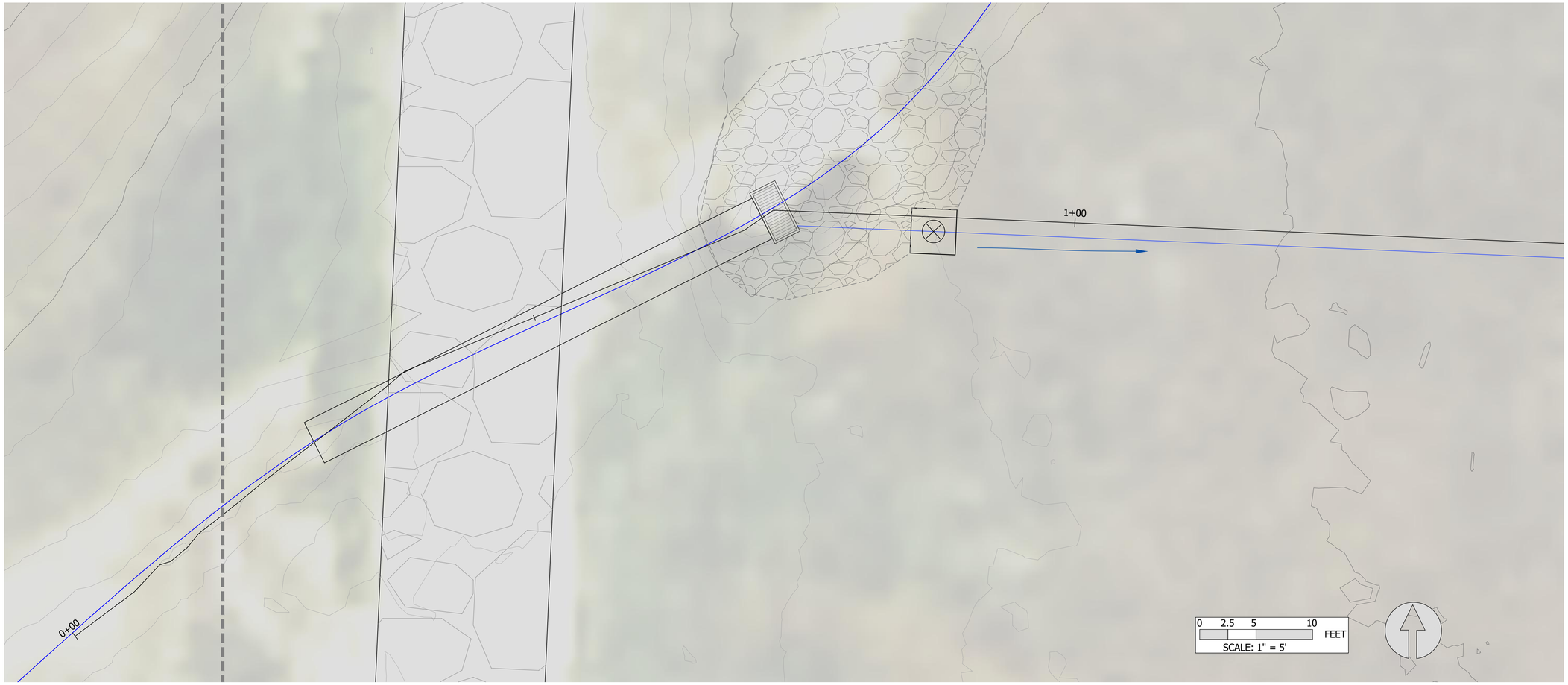
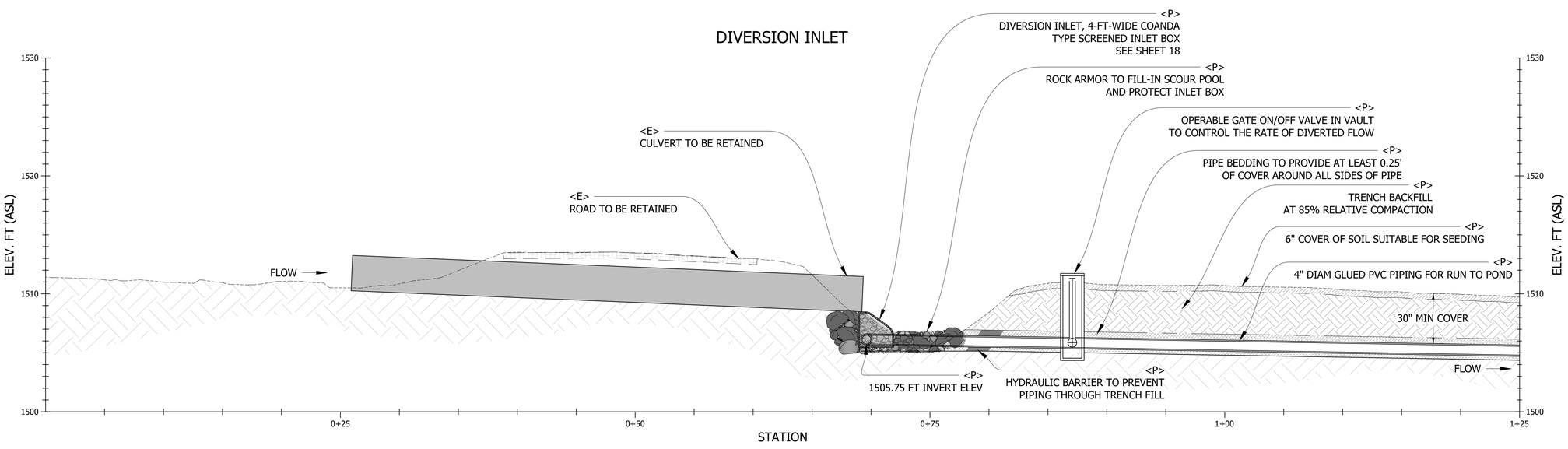
No. 79688
9-30-22
EXPIRES
CIVIL
STATE OF CALIFORNIA

DIVERSION LINE OVERVIEW

SHEET 5 OF 18

C:\ONEDRIVE - STILLWATER SCIENCES\BLACK OAK RANCH\ACAD\ACAD\2_MODEL\BLACK OAK POND DESIGN_11.14.22.DWG LAST SAVED: 11/15/2022 PLOT DATE: 11/15/2022 PLOT STYLE: ---- # BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE ADJUST ACCORDINGLY





BLACK OAK RANCH
POND DESIGN

LAYTONVILLE, CA

Stillwater Sciences
850 G STREET SUITE K
ARCATA, CA 95521 P: (707) 822-9607

PROJECT NUMBER: 943.00
SCALE: AS NOTED
DATE: 11/14/22

DESIGN: JM
DRAWN: TC/BW
CHECKED: JM
APPROVED: JM

REGISTERED PROFESSIONAL ENGINEER
JOEL MONSCHKE
No. 79688
9-30-22
EXPIRES
CIVIL
STATE OF CALIFORNIA

TRIBUTARY DIVERSION INLET

SHEET 6 OF 18

LAST SAVED: 11/15/2022 PLOT DATE: 11/15/2022 PLOT STYLE: ---
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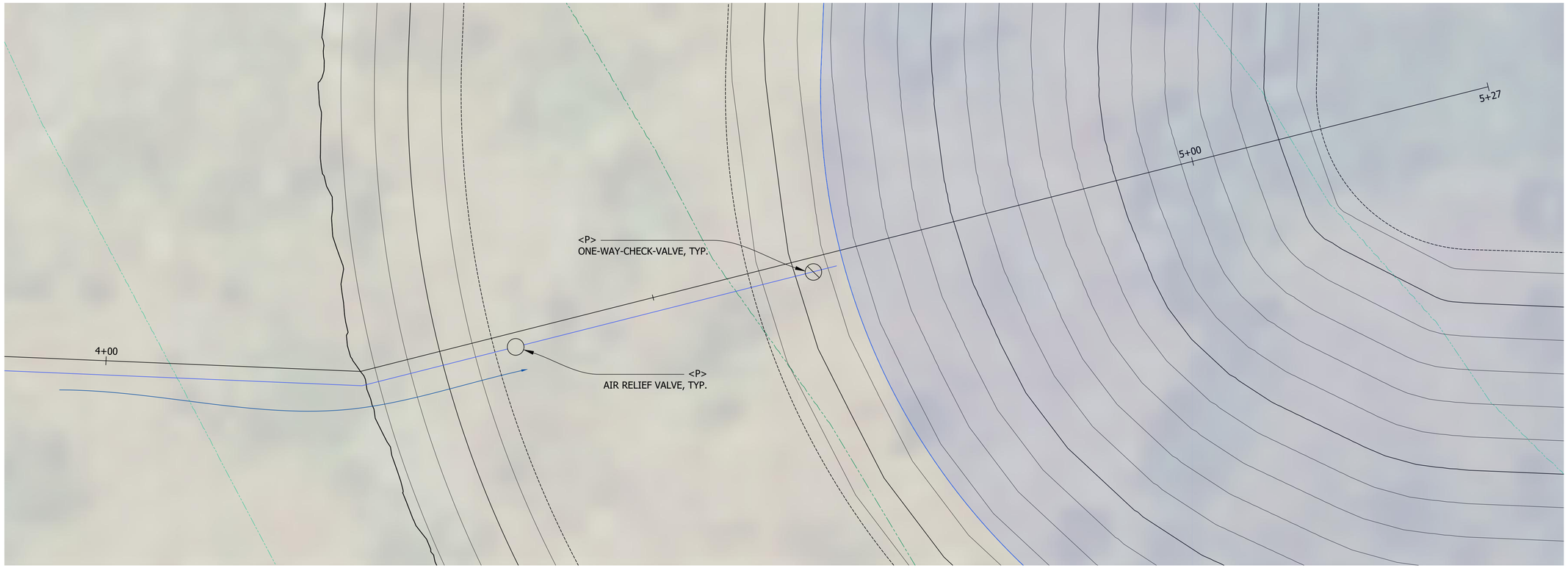
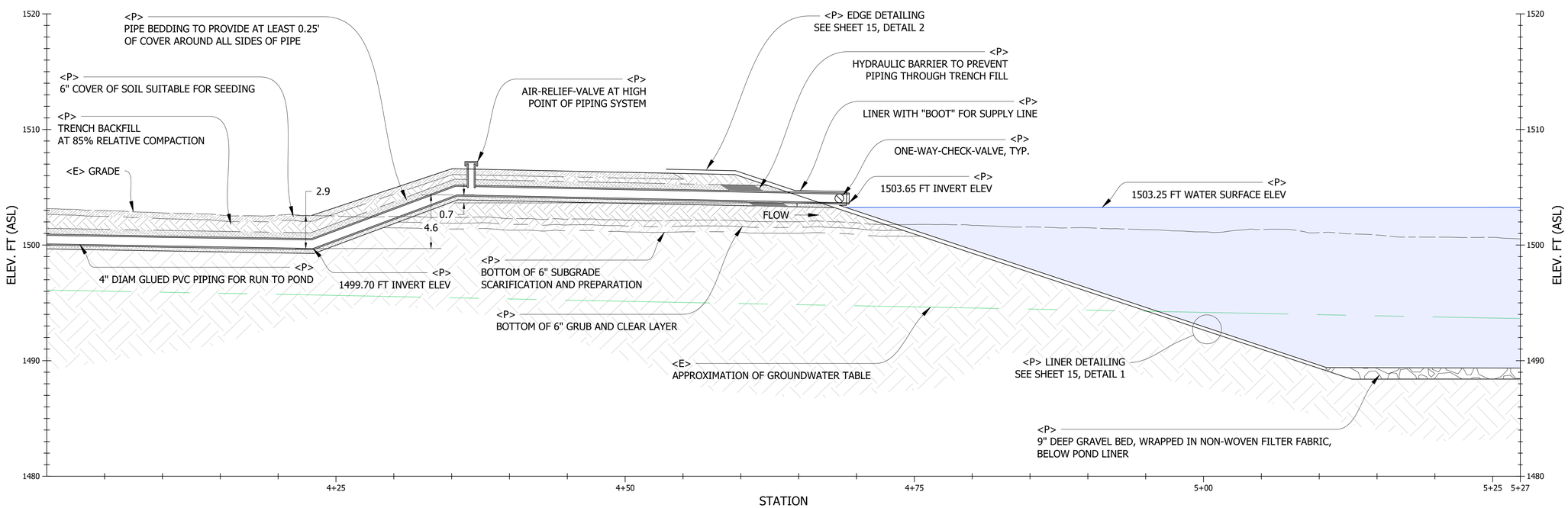
BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY



0 2.5 5 10 FEET
SCALE: 1" = 5'

DIVERSION OUTLET



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POND DESIGN

LAYTONVILLE, CA

Stillwater Sciences
850 G STREET SUITE K
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No. 79688
9-30-22
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STATE OF CALIFORNIA

TRIBUTARY DIVERSION OUTLET

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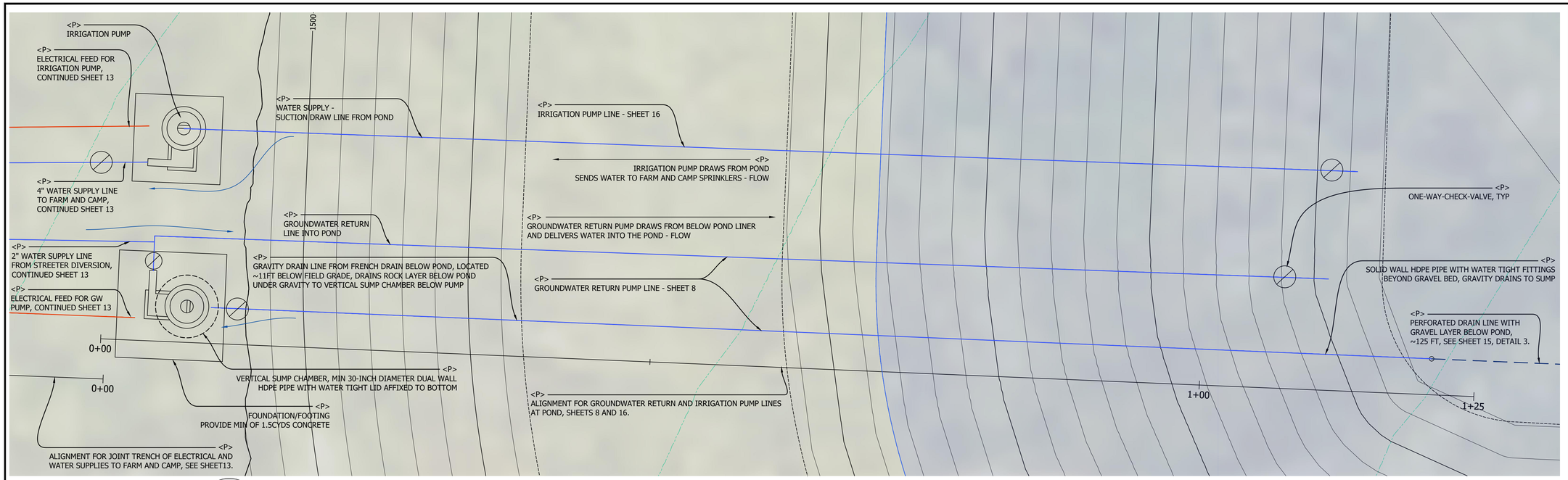
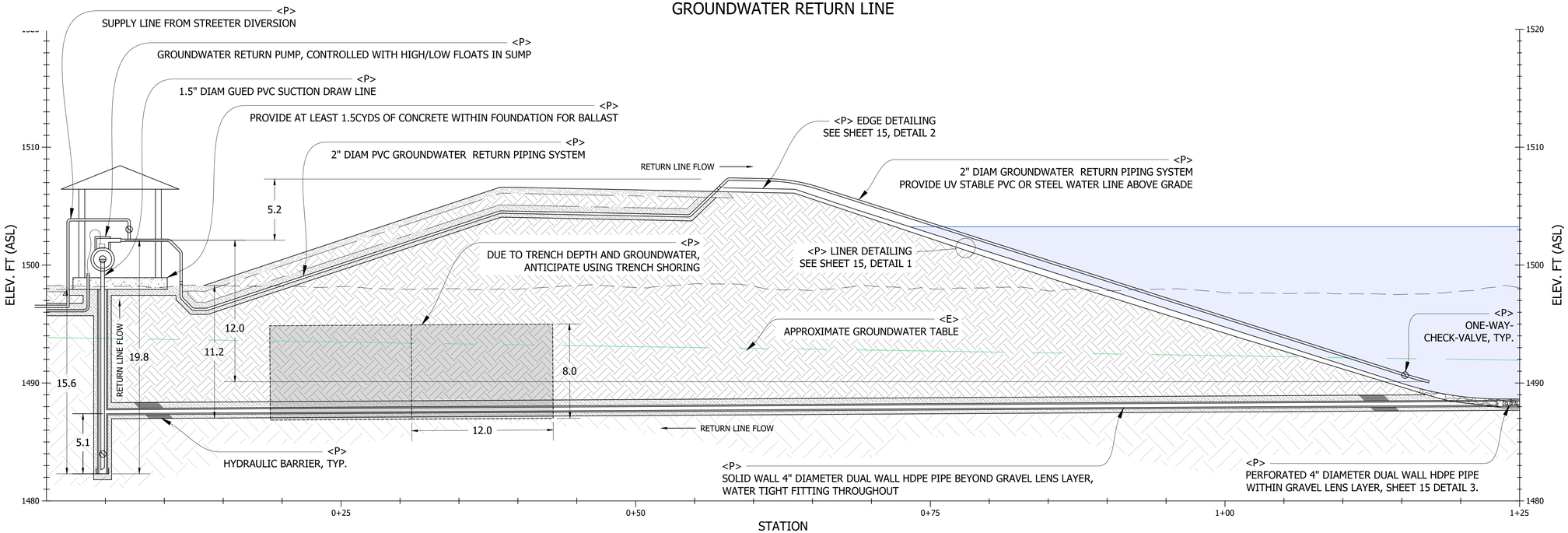


GROUNDWATER RETURN LINE



BLACK OAK RANCH POND DESIGN

LAYTONVILLE, CA

Stillwater Sciences
850 G STREET SUITE K
ARCATA, CA 95521
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REGISTERED PROFESSIONAL ENGINEER JOEL MONSORIZ-CIVIL No. 79688 9-30-22 EXPIRES STATE OF CALIFORNIA

GROUNDWATER RETURN LINE

SHEET 8 OF 18

LAST SAVED: 11/15/2022 PLOT DATE: 11/15/2022 PLOT STYLE: ---- DESIGN_11-14-22.DWG
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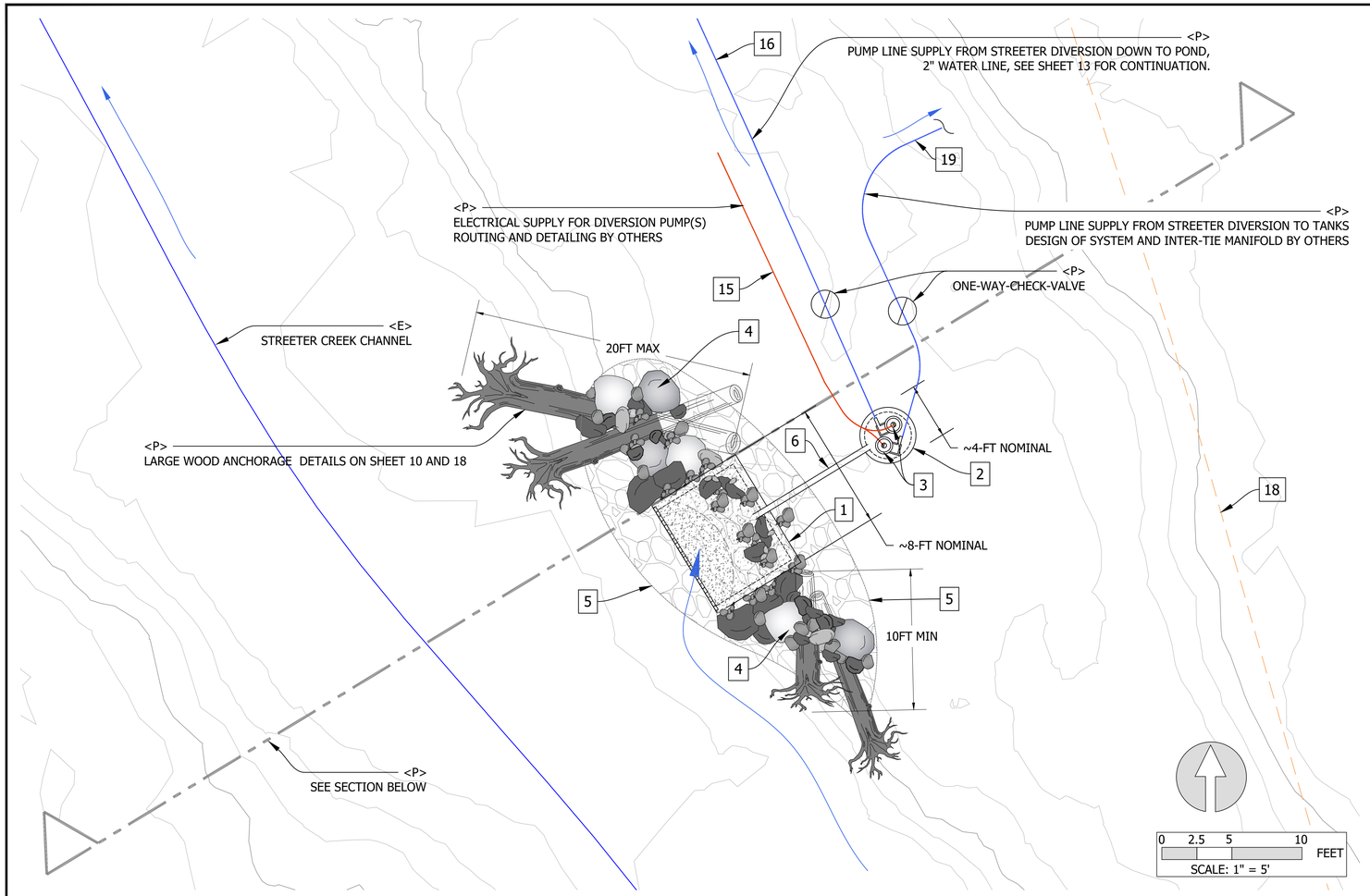
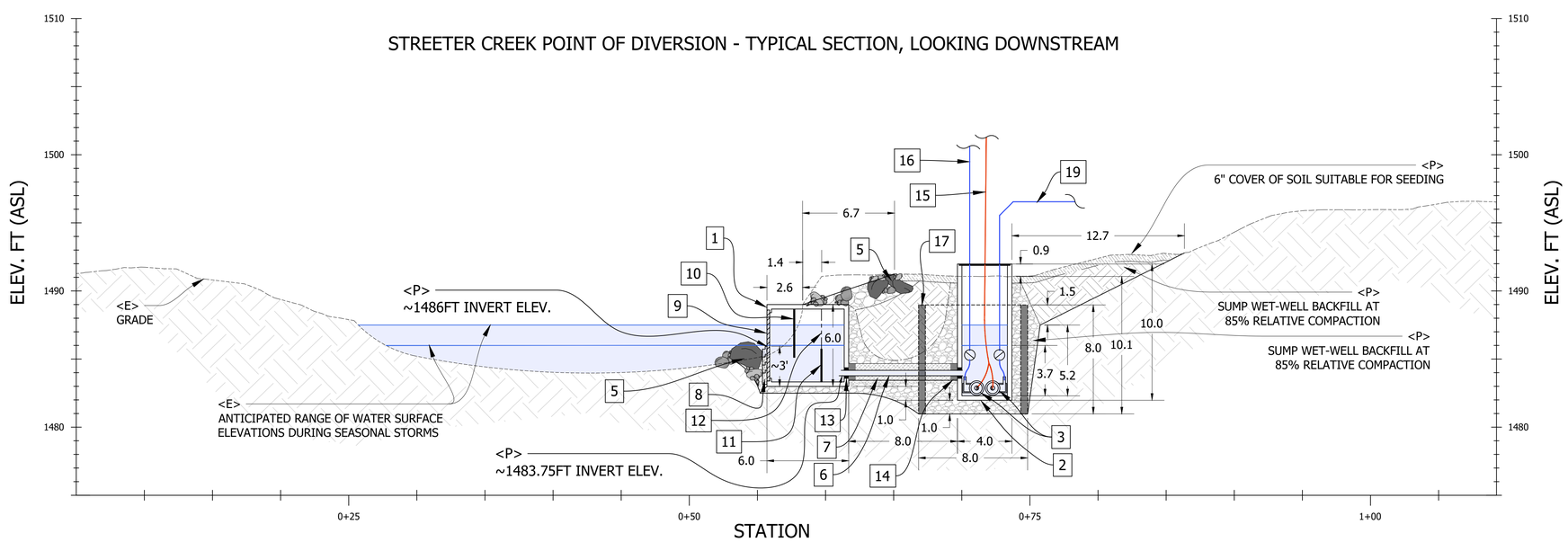


	FEATURES OF INTEREST SHEET 9
1	INTAKE DIVERSION VAULT, 6FTx6FTx8FT CONCRETE VAULT SET ON ITS SIDE SO THE GRATE THAT WOULD CONVENTIONALLY BE REST ON "TOP" OF THE VAULT IS FACING VERTICALLY TOWARDS THE RIVER CHANNEL TO ALLOW FLOW TO PASSIVELY FILL THE VAULT CHAMBER. RETAIN LID AND SECURE WITH REMOVABLE FASTENERS TO VAULT.
2	VERTICAL SUMP CHAMBER, 4FT MIN DIAM. REINFORCED CONCRETE PIPE (RCP), 10FT MIN LENGTH, 12FT MAX. OUTFIT TOP OPENING/ACCESS WITH DEBRIS LID FASTENED TO VAULT. BOTTOM UNIT OF RCP STACK TO FEATURE A SEALED END, EITHER FROM FABRICATOR OR BY MEANS OF FILLING AND SEALING THE BOTTOM 1FT OF SUMP CHAMBER W/ CONCRETE AND WOVEN GEOTEXTILE WRAP UNDER SUMP VAULT.
3	DIVERSION PUMP(S). SPECIFIED BY OTHERS. ANTICIPATE (2) SUBMERSIBLE PUMPS HOUSED AT THE BOTTOM OF THE SUMP CHAMBER. ONE PUMP WILL SUPPLY WATER TO THE POND AND THE OTHER PUMP WILL SUPPLY WATER TO A TANK FARM ON THE HILL. WITH THE EXCEPTION OF THE 2" INCH WATER SUPPLY LINE TO THE POND; ALL PUMPS, FLOATS, POWER, AND PIPING BY OTHERS; ALL MANIFOLDS AND ROUTING OF SYSTEM FED BY THESE PUMPS BY OTHERS.
4	LARGE WOOD AND BOULDER BALLAST AND ARMOR TO PROVIDE STABILITY AND DEFLECT DEBRIS AND SOME FORCE OF RUNOFF AROUND THE DIVERSION VAULT. INCORPORATE AT LEAST (4), MIN 2FT DIAM, EMBEDDED LOGS AS SHOWN, ROOTWADS PREFERRED ON ALL. BUILD UP LARGE BOULDERS, COBBLE, AND STONE TO SURROUND ALL SIDE OF THE VAULT. BOULDERS TO BE ~2-3 FT DIAMETER (1.25 TON) AND COBBLES TO BE 6" TO 12" DIAMETER (NO. 2 RSP STONE OR SIM). REMAINING STONE AND BACKFILL TO BE COARSE CRUSHED DRAIN ROCK.
5	BUILD UP COBBLE, AND STONE MATRIX TO SURROUND ALL SIDE OF THE VAULT. COBBLES TO BE 6" TO 12" DIAMETER (NO. 2 RSP STONE OR SIM). REMAINING STONE AND BACKFILL TO BE COARSE CRUSHED DRAIN ROCK.
6	DIVERSION PIPE FROM INTAKE VAULT TO PUMP/SUMP VAULT, 4" DIAMETER DUAL WALL HDPE PIPE, 10FT LONG.
7	BEDDING SAND TO SURROUND PIPING, MIN FIRMLY COMPACTED 3INCH LAYER ON ALL SIDES.
8	WALL OF TONGUE/GROOVE CEDAR PLANKS BUILT UP ACROSS THE FRONT OF THE VAULT. BOARDS TO SPAN THE FULL WIDTH/LENGTH OF THE BOX AND PROVIDE ENOUGH OF A SEAL TO PREVENT DIRT/SAND/COBBLES FROM FREELY ENTERING THE VAULT CHAMBER. FASTEN, REINFORCE AND BRACE BASED ON ENSURING STABILITY AND ACCEPTABLE LEVELS OF DEFLECTION IN THE FIELD.
9	STEEL GRATE SUPPLIED BY VAULT VENDOR. INSTALL CLIPS AND OR FASTENERS TO SECURE GRATE IN POSITION AND ALLOW REMOVAL FOR MAINTENANCE.
10	REMOVABLE INTERNAL DEBRIS BAFFLE. FASTEN AND SUSPEND FROM CEILING AND WALLS. CONSTRUCT OF ANY SOLID, SMOOTH, IMPERVIOUS SURFACE, REINFORCE AND BRACE AS DETERMINED IN THE FIELD.
11	REMOVABLE INTERNAL DEBRIS BAFFLE. FASTEN AND SUSPEND FROM FLOOR AND WALLS. CONSTRUCT OF ANY SOLID, SMOOTH, IMPERVIOUS SURFACE, REINFORCE AND BRACE AS DETERMINED IN THE FIELD.
12	PERVIOUS STAINLESS STEEL SCREEN SIZED TO EXCLUDE FISH AND OTHER AQUATIC LIFE.
13	SEAL APPURTENANCES FOR HDPE PIPE CONNECTING TWO VAULTS WITH NON-SHRINK GROUT AT VAULT WALLS.
14	PROVIDE HYDRAULIC BARRIER AT EACH END OF TRENCH TO AVOID PIPING AND CONCENTRATING A LEAK OF DIVERTED WATER INTO SURROUNDING BACKFILL PRISM.
15	ELECTRICAL FEED TO STREETER DIVERSION PUMP(S). ALL ASSOCIATED PUMPING POWER SYSTEMS, CONDUITS AND ASSOCIATED CONFIGURATION ARE BY OTHERS. SHOWN HERE FOR CLARITY.
16	2" PVC WATER SUPPLY LINE FROM STREETER DIVERSION PUMP(S) DOWN TO FILL POND. 2" WATER LINE, TRENCH AND CONFIGURATION ARE PER THIS PLAN SET, SEE SHEET 13.
17	TO MINIMIZE DISTURBANCE WITHIN THE CHANNEL TO EXTENTS REPRESENTED BELOW, ANTICIPATE USE OF BOX SHORING OR SIMILAR, TO INSTALL VERTICAL SUMP CHAMBER VAULT. RECOMMEND AN 8FTx8FTx8FT SOLID WALL BOX FOR INSTALL OF THE SUMP CHAMBER. PULL THE BOX SHORING WITH THE BACKFILL. PARTIALLY BACKFILL SURROUNDING CULVERT AND COMPLETE THE ASSOCIATED PIPING ON THE CHANNEL SIDE OF THE VERTICAL SUMP CHAMBER AND BACKFILL. PULL BOX COMPLETELY WHEN PREPARED TO BACKFILL FULL EXTENT AS AS DEPICTED.
18	APPROXIMATE FEMA 100YR FLOOD LINE EXTENT
19	PUMPED DIVERSION PILE FROM STREETER UP TO TANK FARM. ALL PUMPS, PIPING, CONFIGURATION AND SPECIFICATIONS BY OTHERS, DEPICTED HERE FOR CLARITY.



BLACK OAK RANCH POND DESIGN

LAYTONVILLE, CA

Stillwater Sciences
850 G STREET SUITE K
ARCATA, CA 95521
P: (707) 822-9607

PROJECT NUMBER: 943.00
SCALE: AS NOTED
DATE: 11/14/22

DESIGN: JM
DRAWN: TC/BW
CHECKED: JM
APPROVED: JM

REGISTERED PROFESSIONAL ENGINEER
JOEL MONSCHKE
No. 79688
9-30-22
EXPIRES
CIVIL
STATE OF CALIFORNIA

STREETER CREEK DIVERSION LINE OVERVIEW

SHEET 9 OF 18

LAST SAVED: 11/16/2022 PLOT DATE: 11/16/2022 PLOT STYLE: ---
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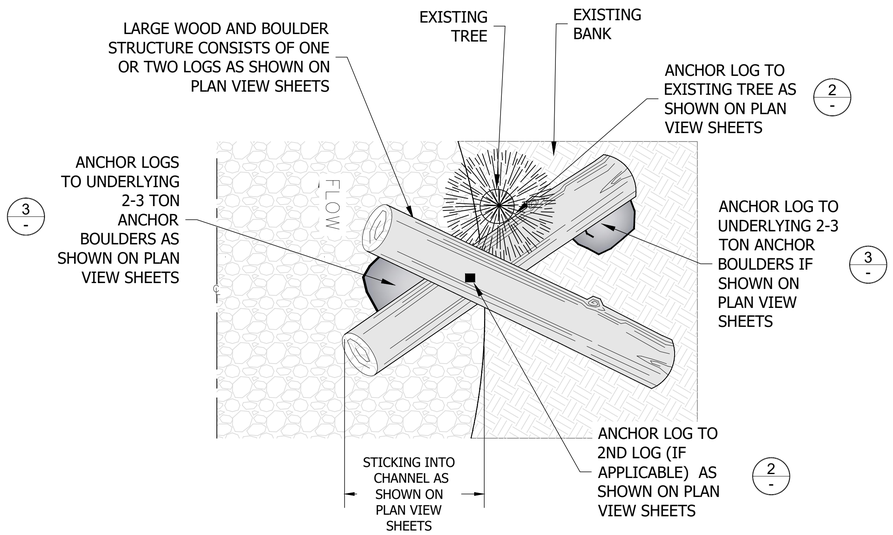
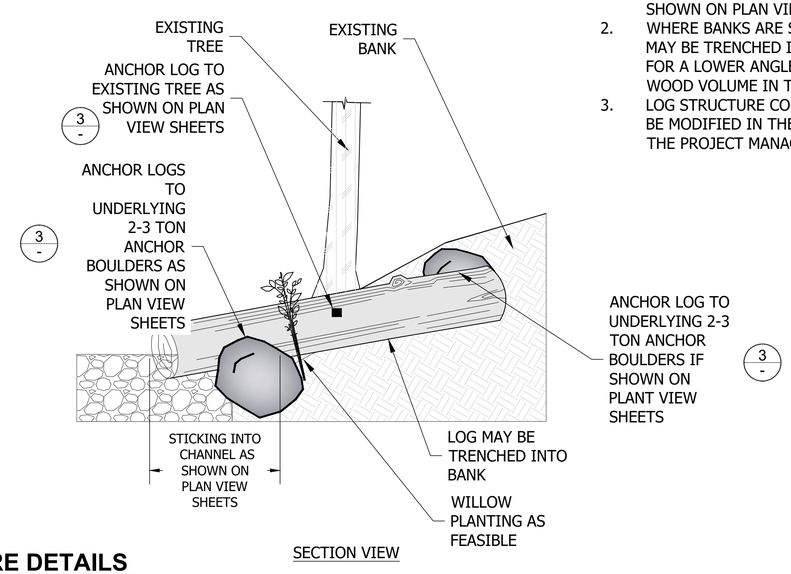
BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE ADJUST ACCORDINGLY



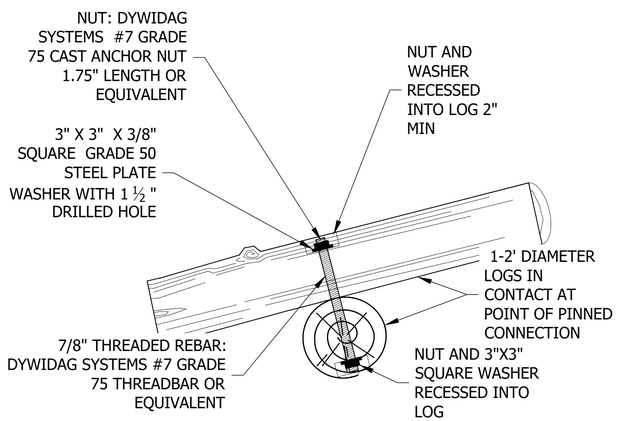


NOTES:

1. LOG STRUCTURES SHALL BE INSTALLED AS SHOWN ON PLAN VIEW SHEETS
2. WHERE BANKS ARE STEEP, LOG STRUCTURES MAY BE TRENCHED INTO THE BANK TO ALLOW FOR A LOWER ANGLE AND PROVIDE MORE WOOD VOLUME IN THE ACTIVE CHANNEL
3. LOG STRUCTURE CONSTRUCTION DETAILS MAY BE MODIFIED IN THE FIELD AS APPROVED BY THE PROJECT MANAGER AND ENGINEER

1 1- AND 2-PIECE WOOD STRUCTURE DETAILS

NTS



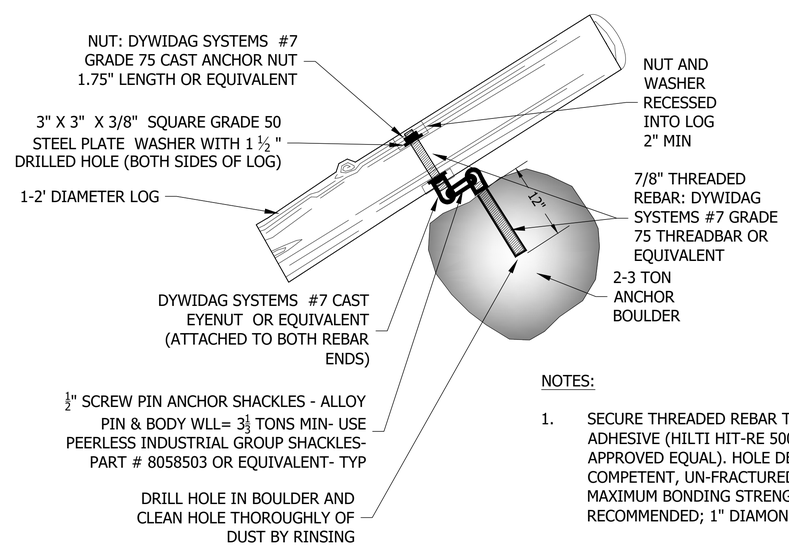
NOTES:

1. NOTCHING NOT REQUIRED ON LIVE TREES TO REDUCE IMPACTS TO TREE HEALTH

2 LOG-LOG OR LOG-TREE ANCHORING

NTS

ADDITIONAL LWD ANCHORAGE OPTION "DEADMAN BOULDER" SHOWN ON SHEET 18.



NOTES:

1. SECURE THREADED REBAR TO 2 TON BOULDER USING EPOXY ADHESIVE (HILTI HIT-RE 500-SD (TUBE) EPOXY CARTRIDGES, OR APPROVED EQUAL). HOLE DEPTH MUST BE SUFFICIENT TO REACH COMPETENT, UN-FRACTURED ROCK IN ORDER TO OBTAIN MAXIMUM BONDING STRENGTH. A MINIMUM OF 12 INCHES IS RECOMMENDED; 1" DIAMOND-TIPPED DRILL (TIGHT FIT).

3 LOG-BOULDER ANCHORING

NTS

BLACK OAK RANCH
POND DESIGN

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850 G STREET SUITE K
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LARGE WOOD ANCHORAGE DETAILS

SHEET 10 OF 18

LAST SAVED: 11/14/2022 PLOT DATE: 11/14/2022 PLOT STYLE: ---- 1" BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY
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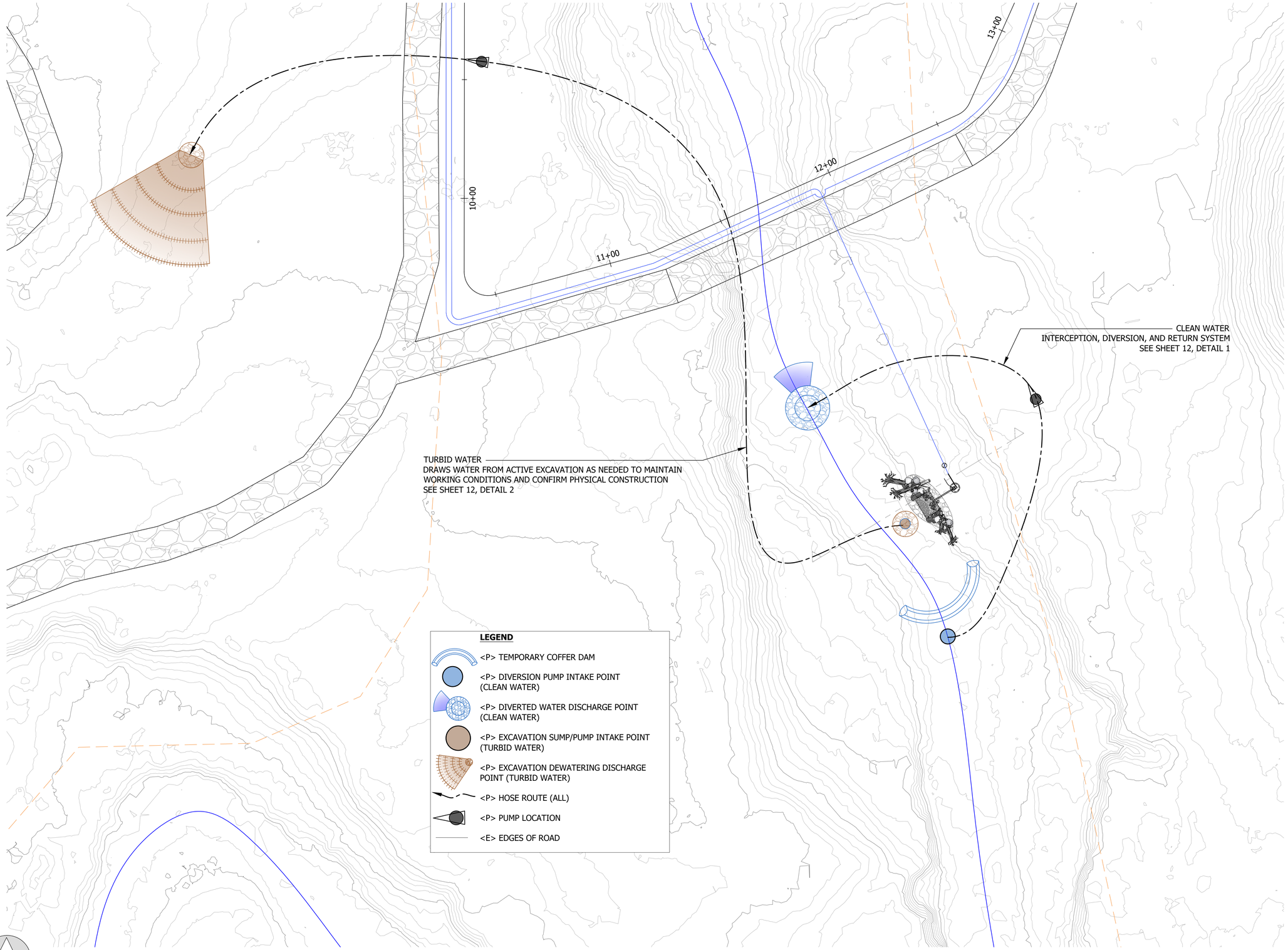

BLACK OAK RANCH POND DESIGN

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JOEL MONSEBRAIT
No. 79688
9-30-22
EXPIRES
CIVIL
STATE OF CALIFORNIA

STREETER CREEK DEWATERING PLAN

SHEET 11 OF 18

LAST SAVED: 11/14/2022 PLOT DATE: 11/14/2022 PLOT STYLE: ---
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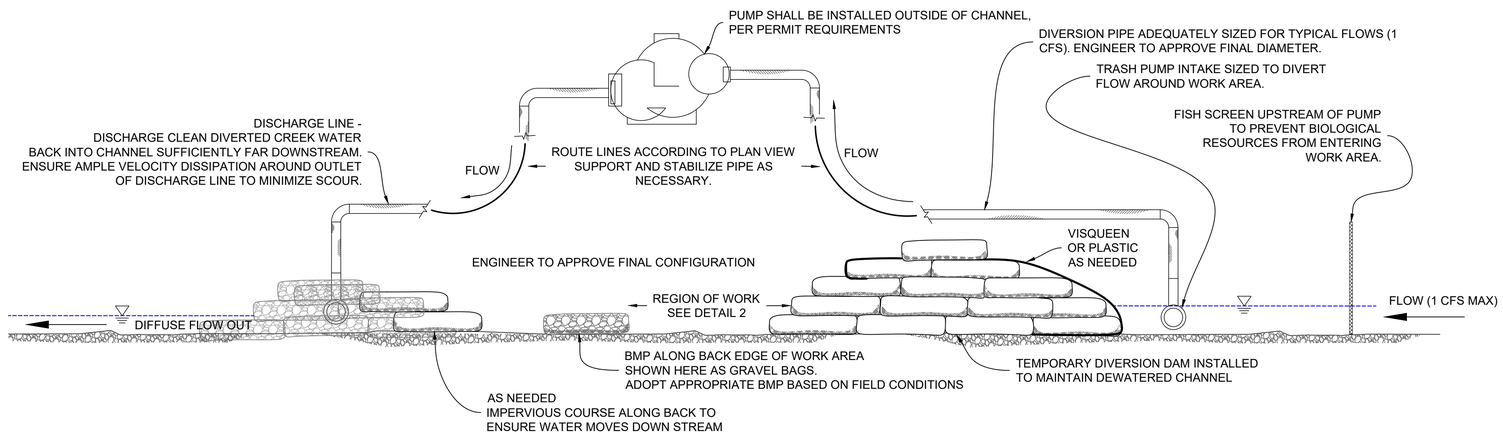
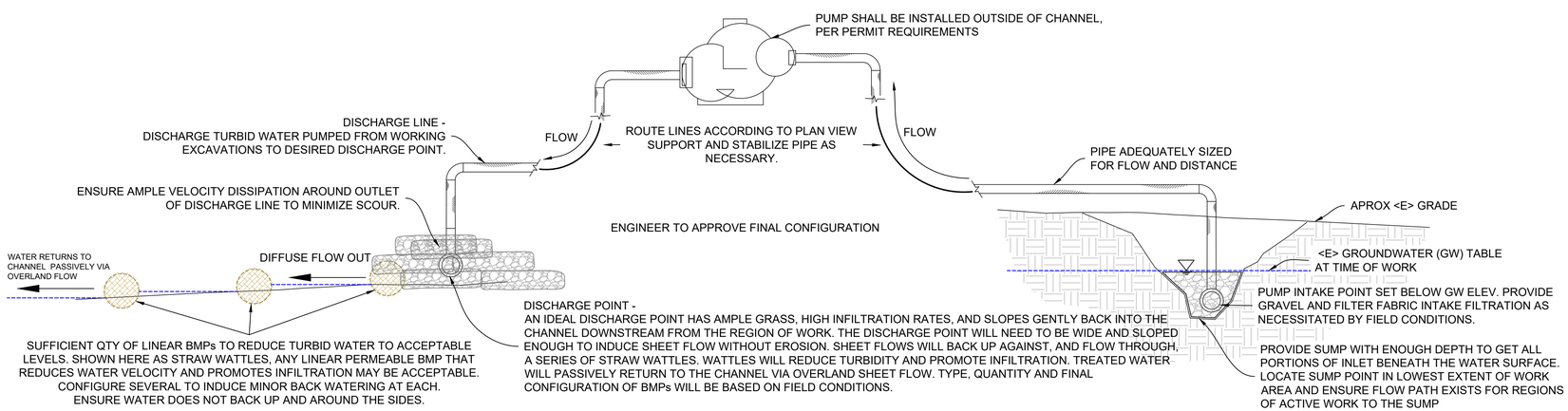


1 **COFFER DAM WITH PUMP DIVERSION AND DISCHARGE POINT**



2 **EXCAVATION DEWATERING SUMP WITH PUMP AND DISCHARGE POINT**

BLACK OAK RANCH
POND DESIGN

LAYTONVILLE, CA

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850 G STREET SUITE K
ARCATA, CA 95521 P: (707) 822-9607

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REGISTERED PROFESSIONAL ENGINEER JOEL MONSCHKE No. 79688 9-30-22 EXPIRES CIVIL STATE OF CALIFORNIA

STREETER CREEK
DEWATERING DETAILS

SHEET 12 OF 18

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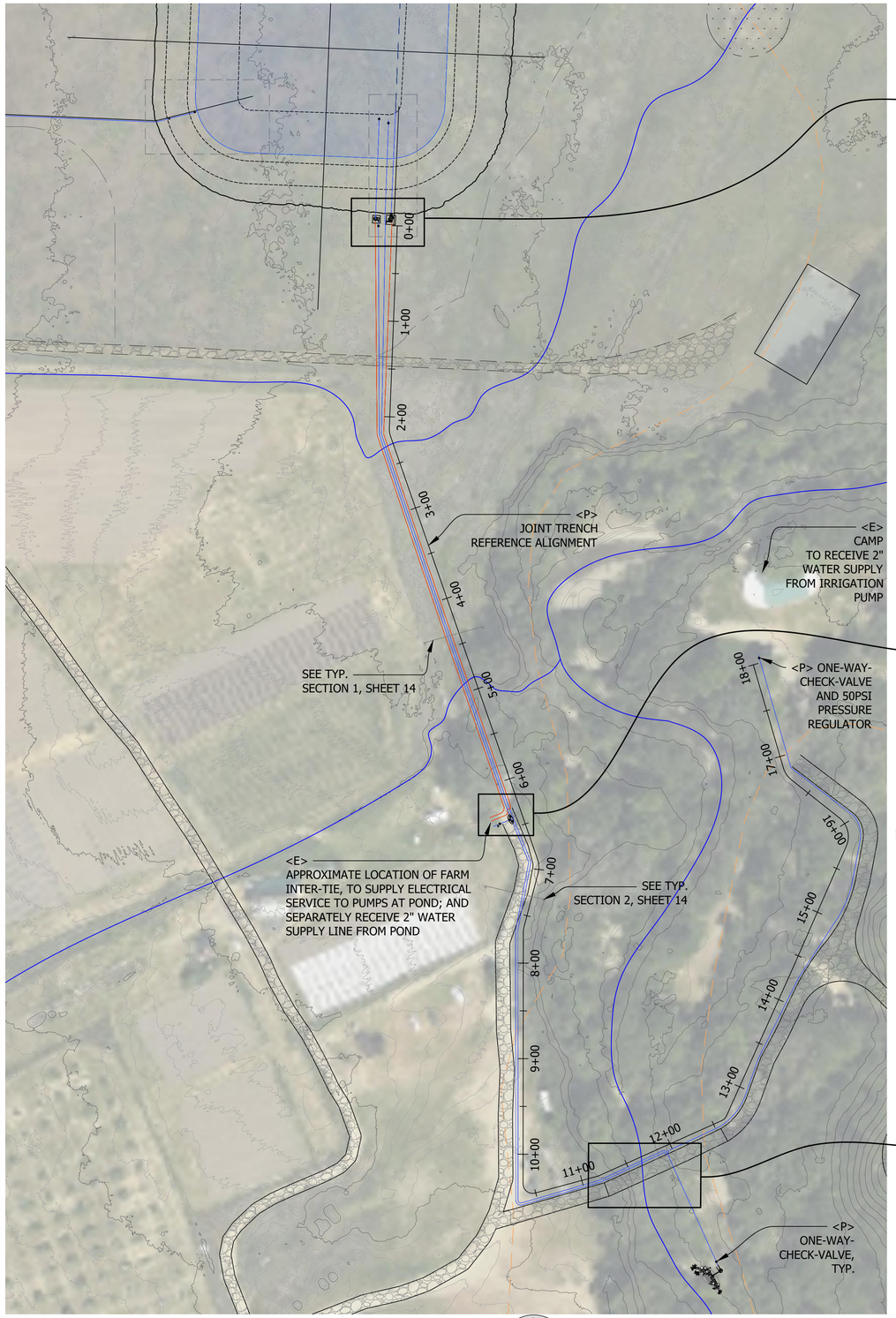


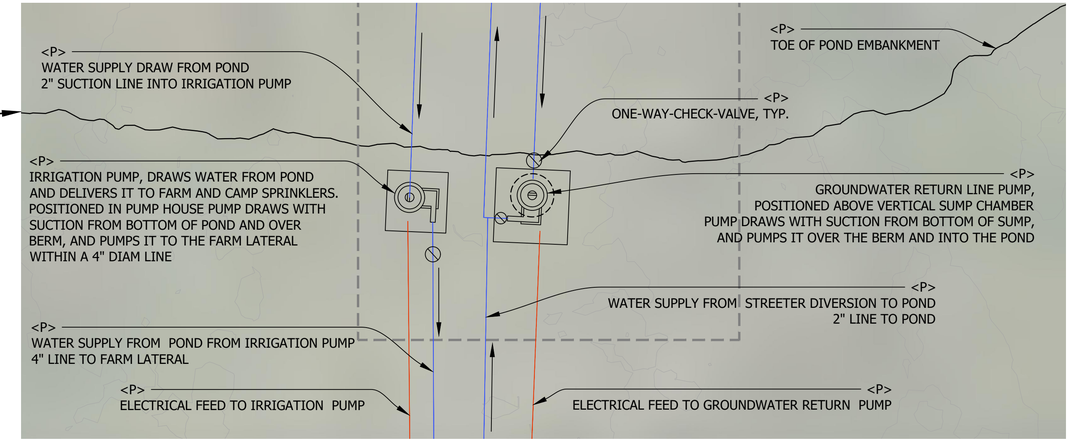
- PLANVIEW OF JOINT TRENCH LAYOUT

SCALE = 1:70

ANTICIPATED SCHEMATIC CONFIGURATION SHOWN. FIELD ROUTE AS NEEDED.

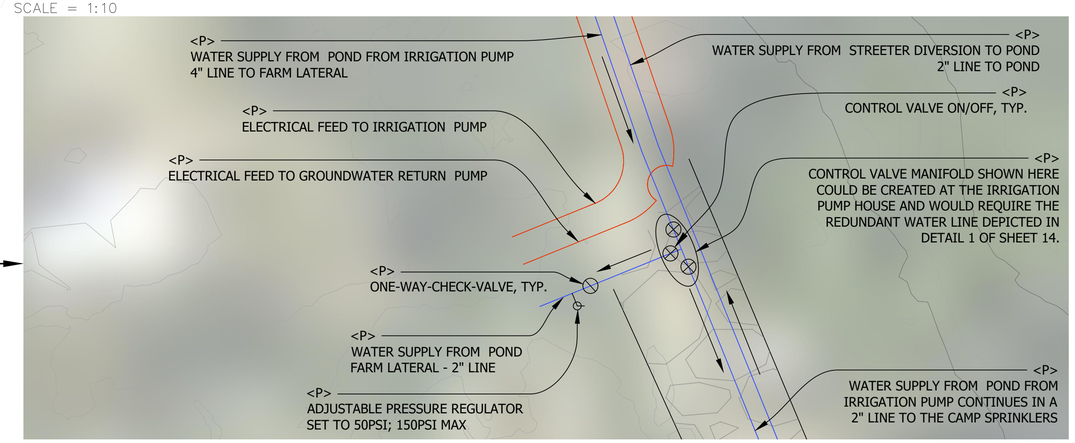
0 35 70 140 FEET

SCALE: 1" = 70'



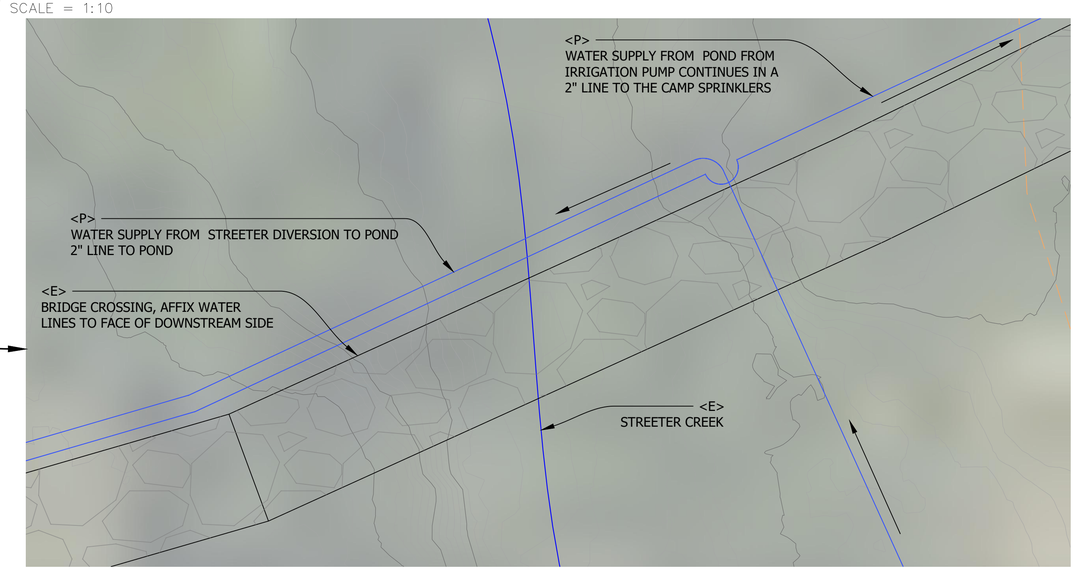
1 PLANVIEW OF PUMP HOUSE AND RESPECTIVE SYSTEMS

SCALE = 1:10



2 PLANVIEW OF FARM LATERAL AND ELECTRICAL SUPPLIES

SCALE = 1:10



3 PLANVIEW OF STREETER DIVERSION AND CAMP SPRINKLER LINES AT BRIDGE CROSSING

SCALE = 1:10

BLACK OAK RANCH POND DESIGN

LAYTONVILLE, CA

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JOEL MONSOURE
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9-30-22
EXPIRES
CIVIL
STATE OF CALIFORNIA

JOINT TRENCH OVERVIEW

SHEET 13 OF 18

IF BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY
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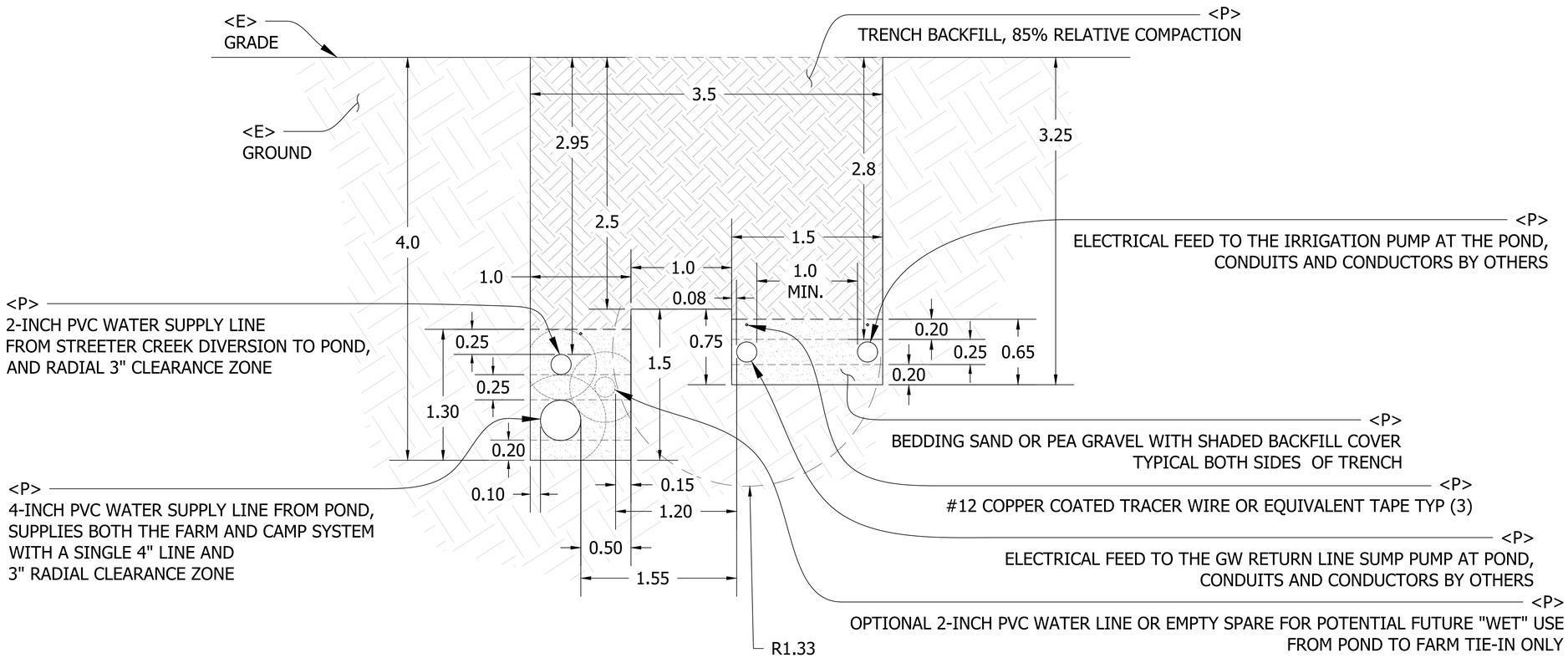
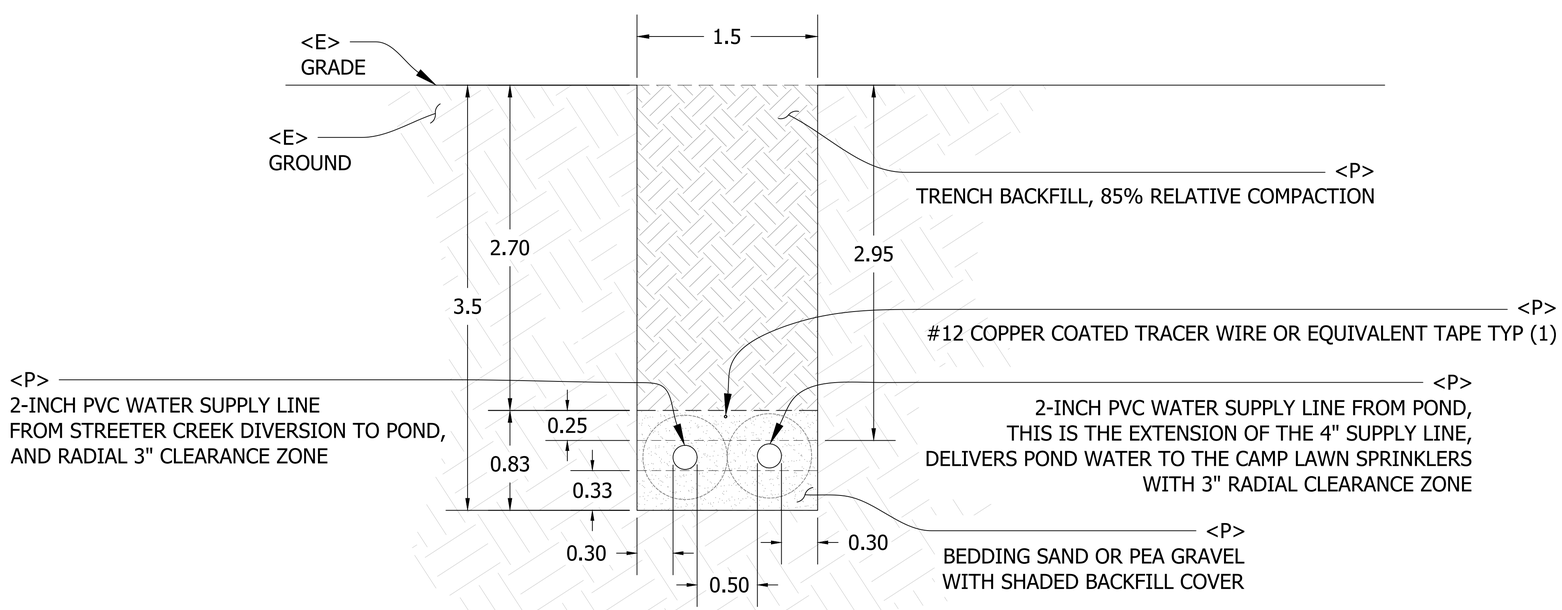


1 **TYPICAL JOINT TRENCH (A) - WITH BOTH "WET" WATER UTILITIES AND ELECTRICAL**

THIS TRENCH TYPICALL APPLIES STA 0+00 TO 6+35



2 **TYPICAL JOINT TRENCH (B) WITH WATERLINES**

THIS TRENCH TYPICALL APPLIES STA 6+35 TO 18+00

BLACK OAK RANCH
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TYPICAL JOINT TRENCH DETAILS

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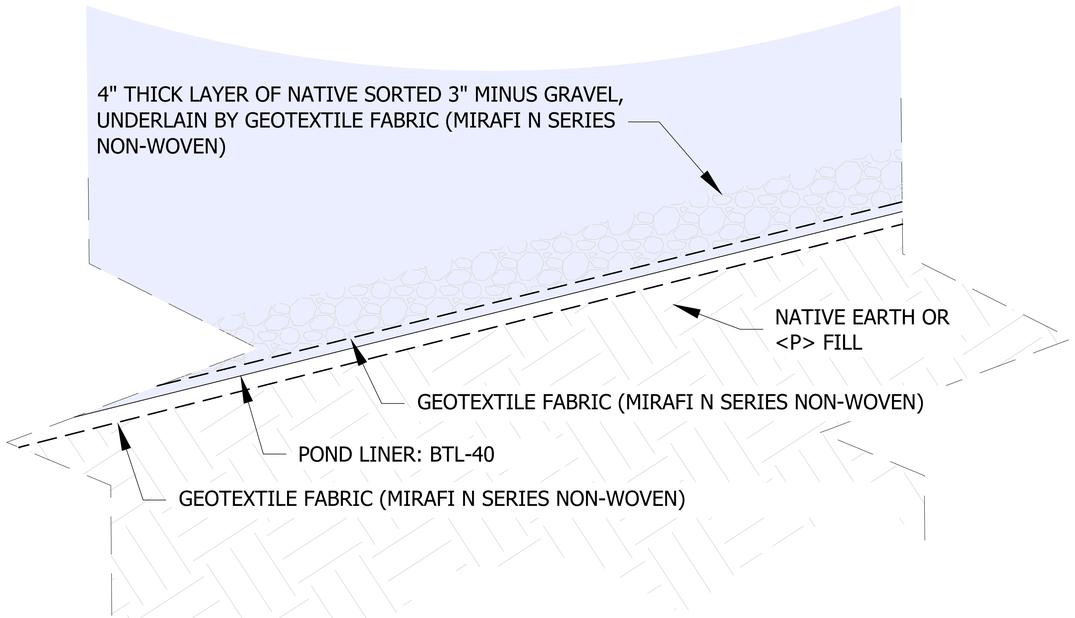
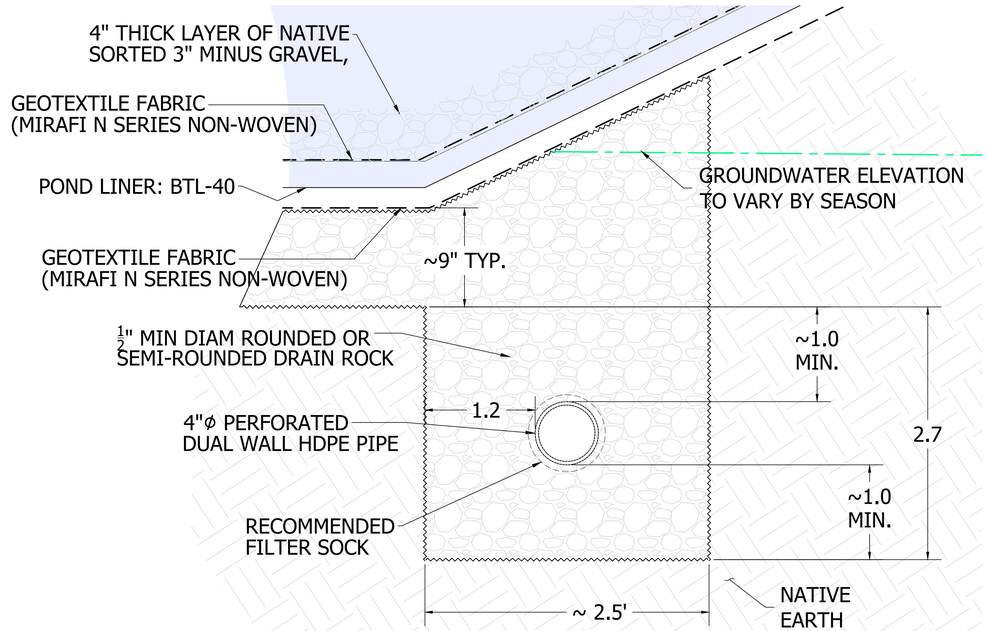
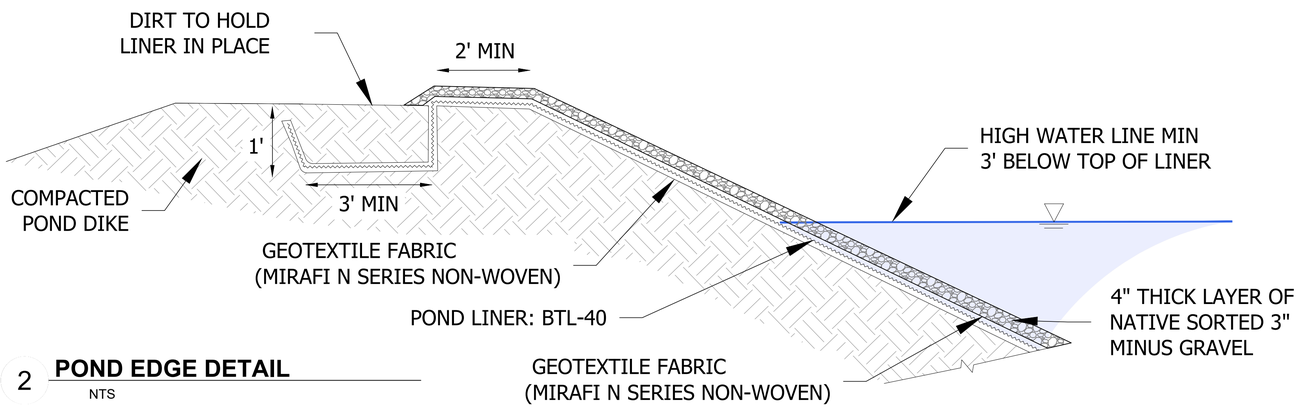


1 **POND LINER DETAIL**
NTS



3 **FRENCH DRAIN DETAIL**
NTS



2 **POND EDGE DETAIL**
NTS

BLACK OAK RANCH
POND DESIGN

LAYTONVILLE, CA

Stillwater Sciences
850 G STREET SUITE K
ARCATA, CA 95521 P: (707) 822-9607

PROJECT NUMBER: 943.00
SCALE: AS NOTED
DATE: 11/14/22

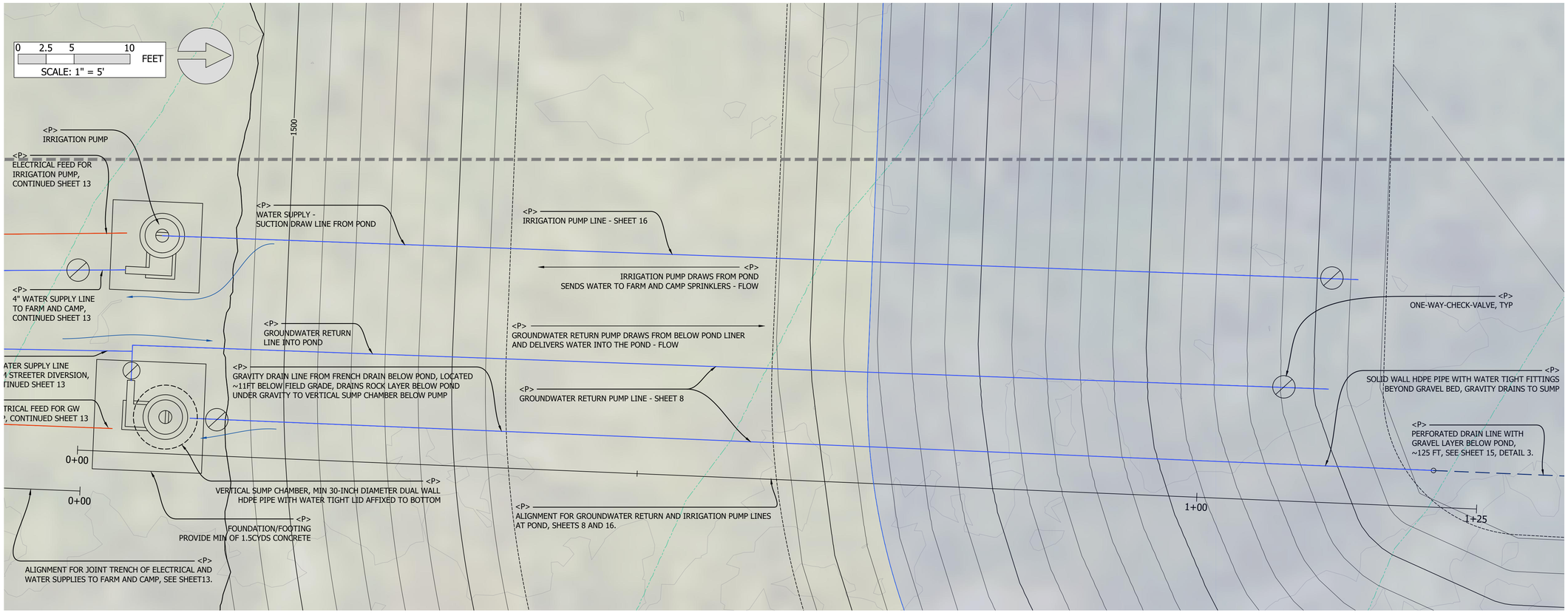
DESIGN: JM
DRAWN: TC/BW
CHECKED: JM
APPROVED: JM

REGISTERED PROFESSIONAL ENGINEER JOEL MONSCHKE No. 79688 9-30-22 EXPIRES CIVIL STATE OF CALIFORNIA

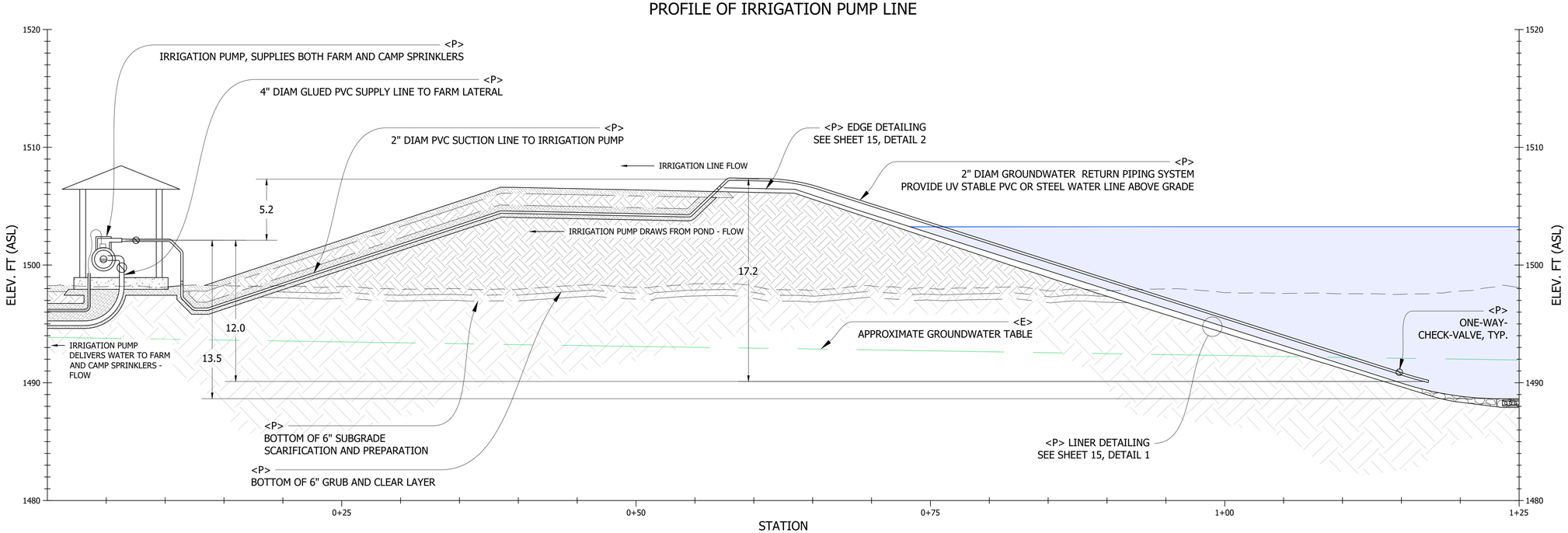
TYPICAL CIVIL DETAILS

SHEET 15 OF 18

LAST SAVED: 11/14/2022 PLOT DATE: 11/14/2022 PLOT STYLE: ---- DWG: C:\DRIVE_D\DRIVE - STILLWATER SCIENCES\BLACK OAK RANCH\CAD\ACAD\2_MODEL\BLACK OAK POND DESIGN_11-14-22.DWG
BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE ADJUST ACCORDINGLY



PROFILE OF IRRIGATION PUMP LINE



BLACK OAK RANCH POND DESIGN

LAYTONVILLE, CA

Stillwater Sciences
850 G STREET SUITE K
ARCATA, CA 95521
P: (707) 822-9607

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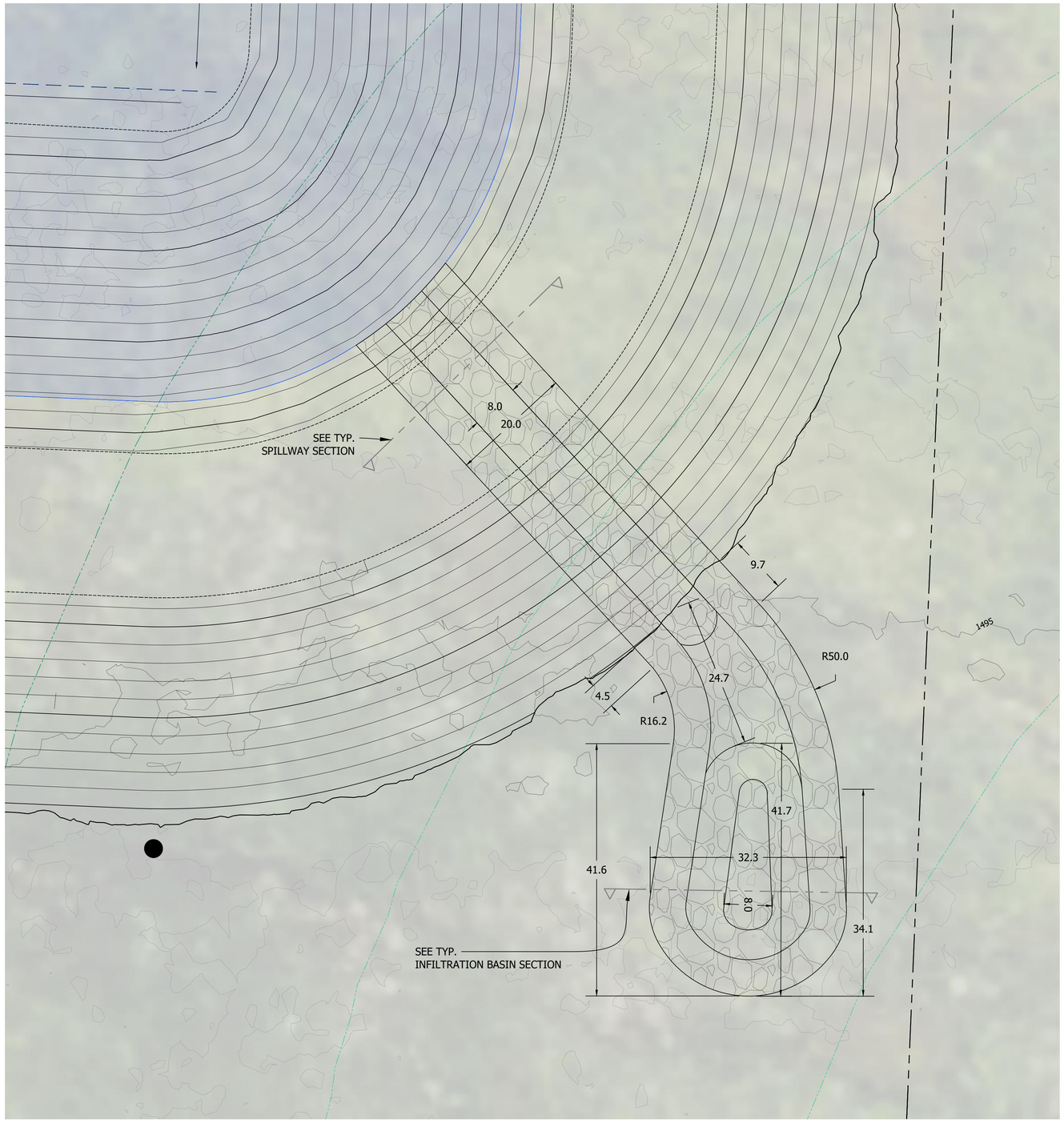
REGISTERED PROFESSIONAL ENGINEER JOEL MONSEBROKE No. 79688 9-30-22 EXPIRES CIVIL STATE OF CALIFORNIA

IRRIGATION PUMP SYSTEM

SHEET 16 OF 18

LAST SAVED: 11/15/2022 PLOT DATE: 11/15/2022 PLOT STYLE: ---
C:\ONEDRIVE\ONEDRIVE - STILLWATER SCIENCES\BLACK OAK RANCH\CAD\CAD\2_MODEL\BLACK OAK POND DESIGN_11.14.22.DWG
BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY

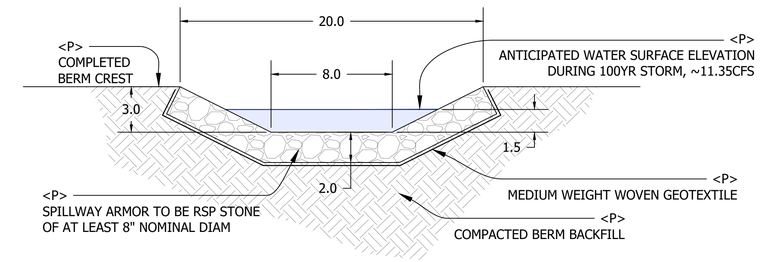


- SPILLWAY OVERVIEW

SCALE = 1:10

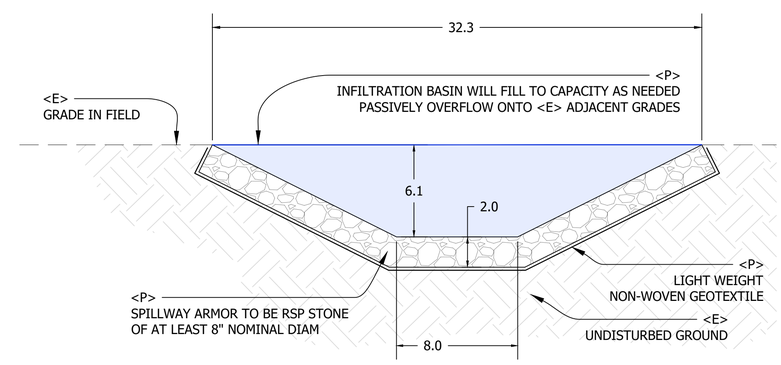
0 5 10 20 FEET

SCALE: 1" = 10'



1 TYPICAL SPILLWAY SECTION

SCALE = 1:5



2 TYPICAL INFILTRATION BASIN SECTION

SCALE = 1:5

BLACK OAK RANCH
POND DESIGN

LAYTONVILLE, CA

Stillwater Sciences
850 G STREET SUITE K
ARCATA, CA 95521 P: (707) 822-9607

PROJECT NUMBER: 943.00
SCALE: AS NOTED
DATE: 11/14/22

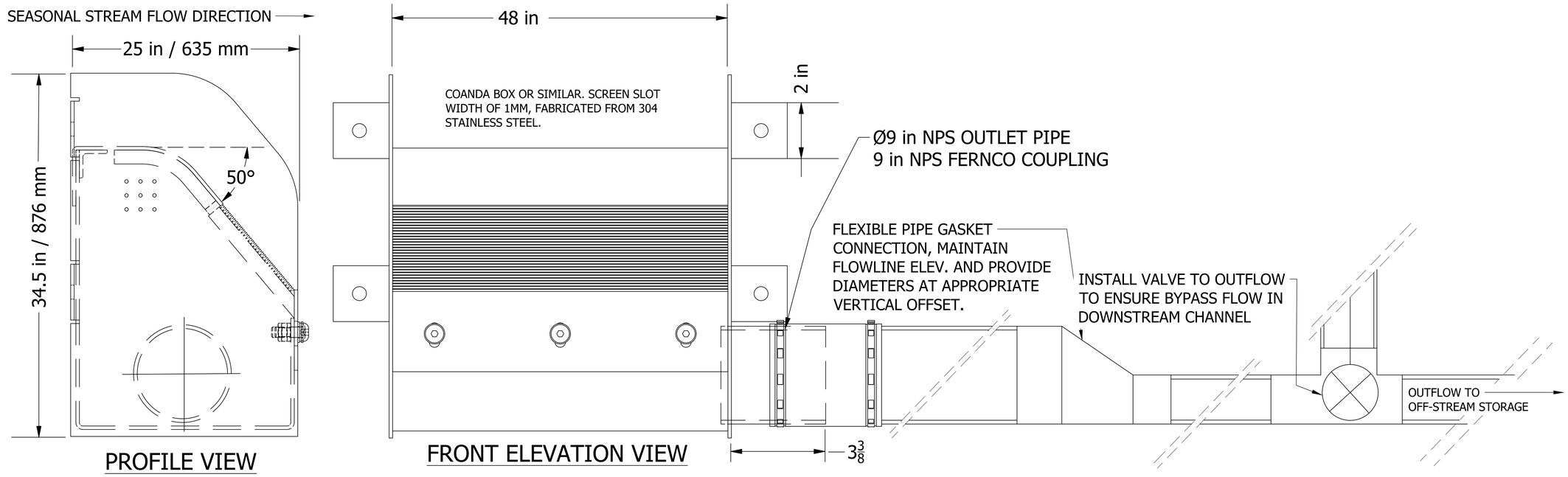
DESIGN: JM
DRAWN: TC/BW
CHECKED: JM
APPROVED: JM

REGISTERED PROFESSIONAL ENGINEER JOEL MONSEBRAATEN No. 79688 9-30-22 EXPIRES CIVIL STATE OF CALIFORNIA

POND SPILLWAY AND
INFILTRATION BASIN

SHEET 17 OF 18

LAST SAVED: 11/15/2022 PLOT DATE: 11/15/2022 PLOT STYLE: ---- STILLWATER SCIENCES\BLACK OAK RANCH\CAD_MODEL\BLACK OAK POND DESIGN_11-14-22.DWG
© UNDERWOOD LANDSCAPE — # BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE — ADJUST ACCORDINGLY

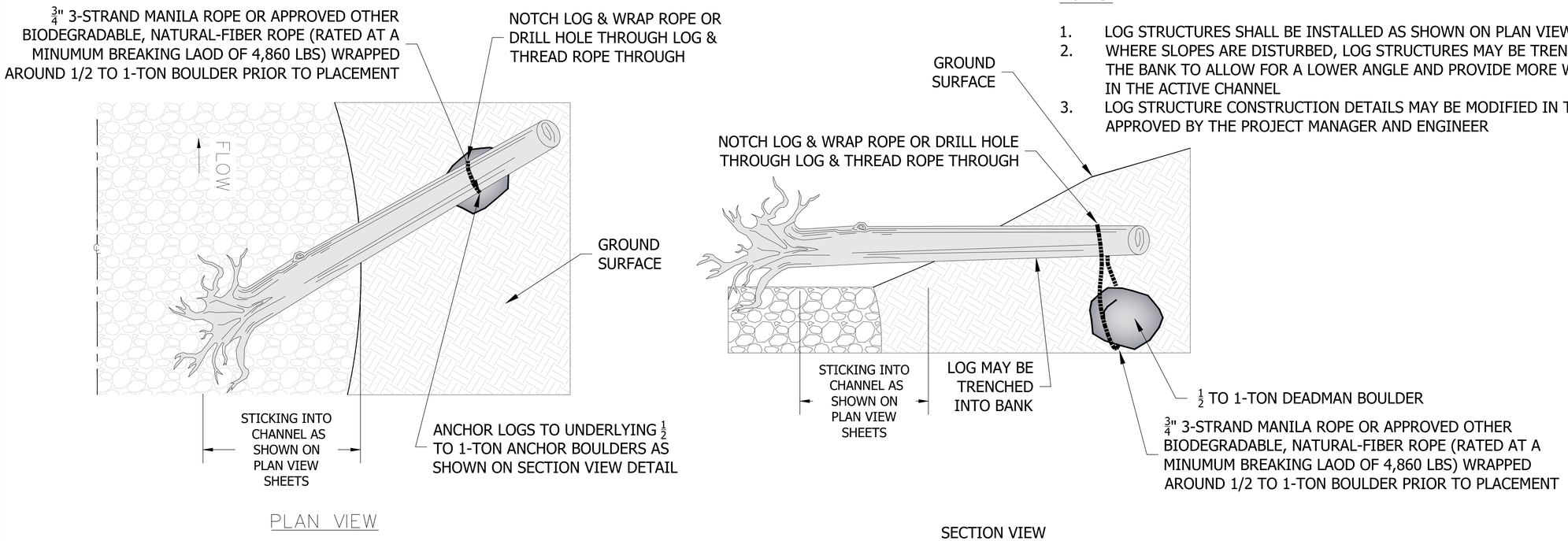


1 **COANDA TYPE SCREENED INLET BOX - ELEVATION AND SECTION VIEW**

NTS

NOTES:

1. LOG STRUCTURES SHALL BE INSTALLED AS SHOWN ON PLAN VIEW SHEETS
2. WHERE SLOPES ARE DISTURBED, LOG STRUCTURES MAY BE TRENCHED INTO THE BANK TO ALLOW FOR A LOWER ANGLE AND PROVIDE MORE WOOD VOLUME IN THE ACTIVE CHANNEL
3. LOG STRUCTURE CONSTRUCTION DETAILS MAY BE MODIFIED IN THE FIELD AS APPROVED BY THE PROJECT MANAGER AND ENGINEER



2 **LWD ANCHORAGE - ALTERNATIVE METHOD WITH "DEADMAN" BOULDER**

NTS

BLACK OAK RANCH
POND DESIGN

LAYTONVILLE, CA

Stillwater Sciences
850 G STREET SUITE K
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APPROVED: JM

REGISTERED PROFESSIONAL ENGINEER JOEL MONSCHKE No. 79688 9-30-22 EXPIRES CIVIL STATE OF CALIFORNIA

DIVERSION INTAKE DETAILS & LWD ANCHORAGE ALT

C:\ONEDRIVE\ONEDRIVE - STILLWATER SCIENCES\BLACK OAK RANCH\CADD\CAD_MODEL\BLACK OAK POND DESIGN_11-14-22.DWG LAST SAVED: 11/14/2022 PLOT DATE: 11/14/2022 PLOT STYLE: ---- # BAR DOES NOT MEASURE 1" DRAWING IS NOT TO SCALE - ADJUST ACCORDINGLY