



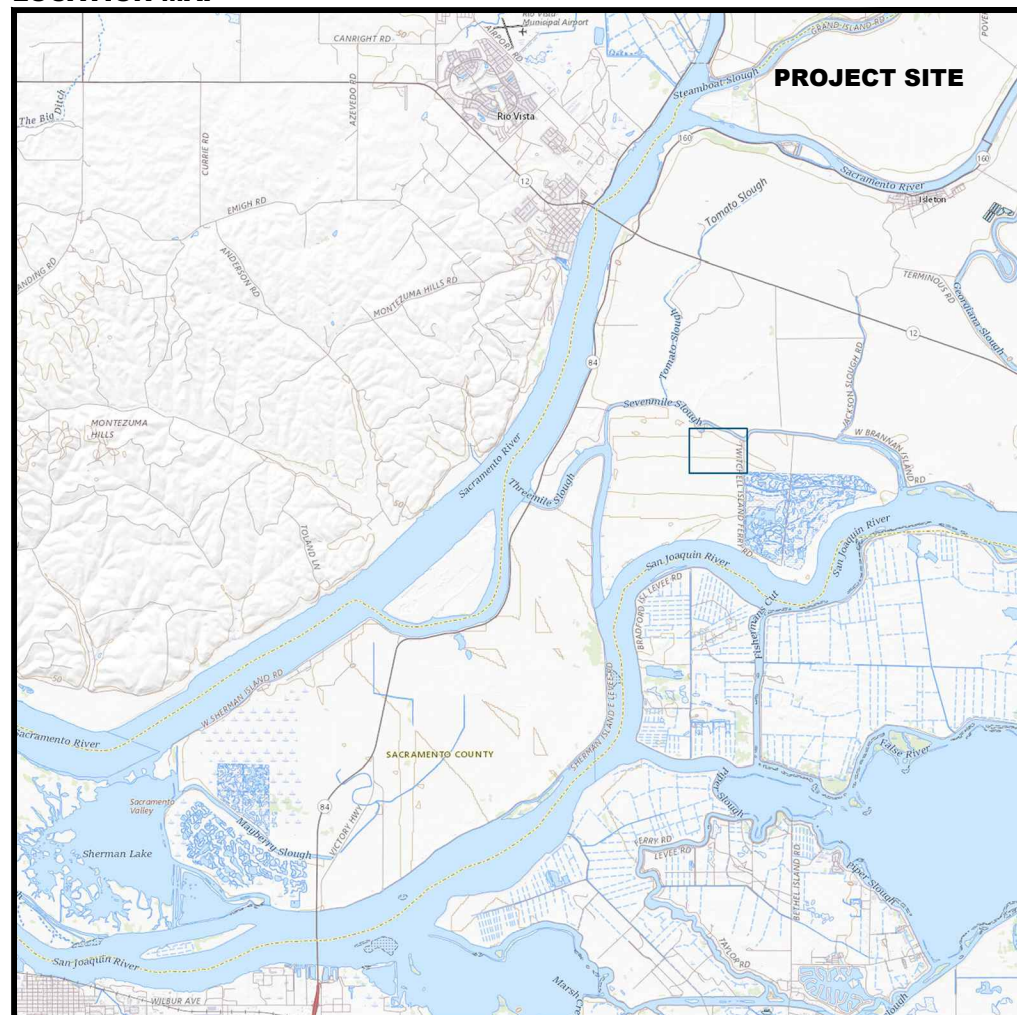
US-CA-437-6

TWITCHELL ISLAND WETLAND ENHANCEMENT AND RESTORATION PROJECT



RECLAMATION DISTRICT 1601

LOCATION MAP



NOT TO SCALE

VICINITY MAP



See Location Map

SURVEY DATUM

Horizontal and Vertical Control:
The horizontal datum for this survey is the California Coordinate System of 1983, Zone 2 (0402), NAD 83, Epoch Date 2010.00 in U.S. Survey Feet. The vertical datum for this survey is the North American Vertical Datum of 1988 (NAVD88) computed using GEOID18. Both datums were derived from GPS observations collected on April 5, 2022. Said observations were fixed to local area National Geodetic Survey (NGS) Control Point "A 969", respectively.

MAP DATA

Contour Interval: 1 Foot

Aerial Photo: 2020 NAIP, Autodesk / Bing

SHEET INDEX

- | | |
|-----|----------------------|
| 1 | Cover Sheet |
| 2 | Definitions & Legend |
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| 4-5 | Site Plan |
| 6-8 | Details |

EMERGENCY CONTACT INFORMATION

In case of fire: CALL 911
Then contact:
Otome Lindsey
California Department of Water Resources
(916) 599-5717

PROJECT DIRECTORY

Ducks Unlimited, Inc.
Western Regional Office
3074 Gold Canal Drive
Rancho Cordova, Ca. 95670-6116
Ph. (916) 852-2000

100% DESIGN

Unauthorized Changes & Uses
The engineer preparing these plans will not be responsible for, or liable for, unauthorized changes to or uses of these plans. All changes must be in writing and must be approved by the preparer of these plans.



REVISIONS			
REV. NO.	DESCRIPTION	DATE	APPROVED
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PROJECT NO. US-CA-437-6	DATE: 11/14/2023	DESIGNED BY: AT
TWITCHELL ISLAND WETLAND ENHANCEMENT AND RESTORATION PROJECT		DRAWN BY: JS
		SURVEYED BY: JM
		CHECKED BY: BW
APPROVED BY:		SHEET NO. 1 of 8

GENERAL NOTES:

1. Ducks Unlimited makes no representations as to the existence or nonexistence of utilities. It is the responsibility of the contractor to comply with the provisions of all applicable utility notification regulations. The contractor will be liable for any damage to utilities caused by construction activities.
2. The engineer does not represent that the location of utilities shown on the plans are exact or complete. It shall be the responsibility of the contractor to determine the presence of, actual locations of and make provisions for all watercourses and utilities. The contractor shall verify location, depth and height. Their verification shall be coordinated by the contractor with the appropriate utility company.
3. The contractor shall exercise extreme caution when working in the vicinity of overhead power lines. Verify location in the field and protect in place.
4. At least 2 working days prior to beginning any digging or excavation work, the contractor shall notify underground service alert (a.k.a. USA North) at www.usanorth.org or by phone at 811 or 1-800-227-2600, to determine locations of existing utilities.
5. In accordance with generally accepted construction practices, the contractor will be solely and completely responsible for the conditions of the job site including safety of all persons and property during performance of the work. The contractor shall ensure that all work is performed in accordance with occupational safety laws, including the design and construction of proper shoring of trenches. The duties of the project engineer do not include review of the adequacy of the contractor's safety in, on, or near the job site.
6. It is the responsibility of the contractor to be knowledgeable about the project specifications and permits. All work shall be completed in compliance with the contract documents. The contractor shall have copies of the most current approved plans, specifications and permit conditions on site during all work operations.
7. The project site and adjacent areas contain sensitive habitat areas for protected wildlife, and may include endangered species. The contractor shall protect wildlife and water quality, and minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
8. Should it appear that the work to be done, or any matter relative thereto, is not sufficiently detailed or explained on these plans or in the specifications, the contractor shall contact the construction manager for such further explanations as may be necessary.
9. Should the contractor find any discrepancies between the conditions existing in the field and the information shown on the drawings, he shall notify the construction manager before proceeding with construction.

SURVEY POINT DESCRIPTORS

CTBM	Bench Mark (permanent)	RDSH	Road Shoulder
CTBT	Bench Mark (temporary)	RDSN	Road Sign
CTCP	Survey Control Point (permanent)	RDTO	Road, Toe of Slope
CTCT	Survey Control Point (temporary)	RDTP	Road, Top of Slope
DIFL	Ditch Flowline	SDMH	Storm Drain, Manhole
DIGB	Ditch Grade Break	SDPI	Storm Drain, Pipe Invert
DITO	Ditch Toe	SDPT	Storm Drain, Pipe Top
DITP	Ditch Top	SSMH	Sanitary Sewer, Manhole
ELBX	Electric, Box or Pullbox	SWFL	Swale Flowline
ELGY	Electric, Guy Wire	SWGB	Swale Grade Break
ELPP	Electric, Power Pole	SWTO	Swale Toe
ELSN	Electric, Warning Sign	SWTP	Swale Top
ELTR	Electric, Transformer	TFBL	Topo Feature, Building
ELTW	Electric, Tower	TFBR	Topo Feature, Brush
ELVT	Electric, Vault	TFCO	Topo Feature, Concrete (pad, slab, etc.)
FNAP	Fence Angle Point	TFFL	Topo Feature, Flowline
FNCR	Fence Corner	TFGS	Topo Feature, Grade Break
FNGT	Fence Gate	TFRK	Topo Feature, Ground Shot
FNLN	Fence Line	TFTR	Topo Feature, Tree
IRCO	Irrigation Concrete Pad	TFTL	Topo Feature, Tree line
IRCP	Irrigation Control Panel	TFTO	Topo Feature, Grade Break at Toe
IRPI	Irrigation Pipe Invert	TFTP	Topo Feature, Grade Break at Top
IRPM	Irrigation Pump	TFTR	Topo Feature, Tree
IRPT	Irrigation Pipe Top	WAEW	Edge of Water
IRVL	Irrigation Valve	WAHW	High Water Mark
IRWL	Irrigation Well	WAUW	Under Water Ground Shot
LVCL	Levee / Berm Centerline	WAWS	Water Surface
LVGB	Levee / Berm Grade Break	WCFL	Water Control Structure, Flowline/Invert at Structure
LVTO	Levee / Berm Toe of Slope	WCFR	Water Control Structure, Frame Top
LVTP	Levee / Berm Top of Slope	WCHW	Water Control Structure, Headwall
RDCL	Road, Centerline	WCPI	Water Control Structure, Pipe Invert at Outlet
RDED	Road, Edge of Dirt Road	WCPT	Water Control Structure, Pipe Top at Outlet
RDEG	Road, Edge of Gravel Road	WCST	Water Control Structure, Top of Structure
RDEP	Road, Edge of Paved Road	WCWW	Water Control Structure, Wing Wall
RDGB	Road Grade Break		

ABBREVIATIONS

AB	Aggregate Base	L	Length, Left	TBM	Temporary Benchmark
AC	Acre	LBF	Pounds-Force	TE	Top Elevation
ADA	Americans with Disabilities Act	LF	Linear Feet	TEMP	Temporary
APPROX	Approximate	MAINT	Maintenance	TOI	Top of Island
AR	Air Relief (Valve)	MAX	Maximum	TOL	Top of Levee
BM	Benchmark	MIN	Minimum	TOB	Top of Berm
CAP	Corrugated Aluminum Pipe	MISC	Miscellaneous	TOMP	Top of Maintenance Path
CC	Center to Center	(N)	New	TP	Top of Pipe
CCF	Coast Casey Forebay	N	North	TYP	Typical
CF	Cubic Foot	NE	Northeast	USA	Underground Service Alert
CFS	Cubic Foot Per Second	NIC	Not In Contract	U.S.A.	United States of America
CL, Ɔ	Centerline	NTS	Not To Scale	U/S	Upstream
CMP	Corrugated Metal Pipe	NW	Northwest	VLV	Valve
CMPA	Corrugated Metal Arch Pipe	OC	On Center	W	Width, West (where applicable)
CONC	Concrete	OD	Outside Diameter	W /	With
CP	Control Point	PG&E	Pacific Gas and Electric	WCS	Water Control Structure
CY	Cubic Yard	PIP	Pressure Irrigation Pipe	WS	Water Surface
DEMO	Demolish	PL	Property Line	WSEL	Water Surface Elevation
DIA, Ø	Diameter	PP	Property Line	WWF	Welded Wire Fabric
Dp	Pipe Diameter	PSI	Pounds per Square Inch	X:1	Slope, Horizontal:Vertical
Dr	Riser Diameter	PT	Pressure Treated		
DU	Ducks Unlimited, Inc.	PVC	Polyvinyl Chloride		
D/S	Downstream	QTY	Quantity		
E	East	R	Right		
EG	Existing Ground	RC	Relative Compaction		
EL	Elevation	RCB	Reinforced Concrete Box		
EX, EXIST	Existing	RD	Road		
FG	Finished Grade	REF	Reference Dimension		
FL	Flowline	REQD	Required		
FRG	Final Rough Grade	ROW	Right Of Way		
FT	Foot, Feet	S	South		
FTG	Fitting, Footing	SCH	Schedule		
GA	Gauge	SE	Southeast		
GB	Grade Break	SS	Stainless Steel		
H	Height	SDR	Standard Dimension Ratio		
HDPE	High-Density Polyethylene	SF	Square Feet		
HR	Half Round	SHT	Sheet		
HTZ	Habitat Transition Zone	SP	Special		
ID	Inside Diameter	SPECS	Specifications		
IE	Invert Elevation	STA	Station		
IG	Initial Grade	STD	Standard		
IN	Inch, Inches	SW	Southwest		
INV	Invert	SY	Square Yard		
IPS	Iron Pipe Size	TBD	To Be Determined by Engineer		

LEGEND & STANDARD SYMBOLS

(Symbols do not represent actual scale / size of object)

	Existing Fence Line - Barbed Wire		Existing Power / Telephone Pole
	Existing Fence Line - Chain Link		Existing Electric Guy Wire
	Existing Fence Line - Stockade		Existing Electric Transformer
	Power / Telephone Overhead Lines		Existing Electric Tower
	Underground Gas Line		Existing Electric Vault
	Electric Line		Existing Blind
	Force Main Line		Existing Gate Valve
	Sanitary Sewer Line		Existing Air Relief Valve
	Storm Drain Line		Existing Alfalfa / Overflow Valve
	Existing Ditch		Existing Irrigation Well
	Existing Levee / Berm		Existing Irrigation Pump
	Existing Swale		Existing Water Meter
	Existing Road - Dirt		Existing Fire Hydrant
	Existing Road - Gravel		Existing Manhole
	Existing Road - Paved		Existing Natural Gas Meter / Valve
	Existing Trees / Brushline		Existing Sign

DESIGN SYMBOLS

	Water Control Structure ID#		New Power Pole
	Revision Number Identifier		New Gate Valve
	Cut/Borrow Area / Pothole		New Air Relief Valve
	Fill Area		New Alfalfa / Overflow Valve
	Extent of Field Grading		New Irrigation Pump
	Ditch/Stream/Channel Flow Direction		New Water Control Structure
	Ditch Cleaning		New Water Control Structure
	New Ditch Centerline / Flowline		Water Control Structure w/ Flow
	New Swale Centerline / Flowline		Benchmark
	Regrade Existing Swale		Temporary Benchmark
	New Levee / Berm Centerline		Control Point
	New Maintenance Path / Berm Centerline		Wood Debris Pile
	Regraded / Lowered Levee / Berm Centerline		
	Remove Existing Levee / Berm		

XXX
WSEL=XX.X

DESIGN
WSEL=XXX.X

Design Water Surface Elevation
(with Field or Unit number optional)

DETAILING CONVENTIONS

SEE SECTION	SEE DETAIL	Section Letter
<i>Sheet Where Section is Shown</i>	<i>Sheet Where Detail is Shown</i>	<i>Direction of Section</i>
TYPICAL DETAIL	TYPICAL SECTION	Approximate Limits of Section
XXX	XXX	<i>Sheet Where Section is Shown</i>
<i>Dash indicates that detail is typical and may appear on multiple sheets - a number would indicate the sheet(s) where detail was taken</i>	<i>Dash indicates that section is typical and may appear on multiple sheets - a number would indicate the sheet(s) where section was taken</i>	Section Cut (Alternate)
		Construction Notes (See sheet where appears)

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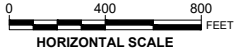
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TWITCHELL ISLAND WETLAND ENHANCEMENT AND RESTORATION PROJECT		DRAWN BY: JS
		SURVEYED BY: JM
		CHECKED BY: BW
DEFINITIONS & LEGEND		SHEET NO. 2 of 8



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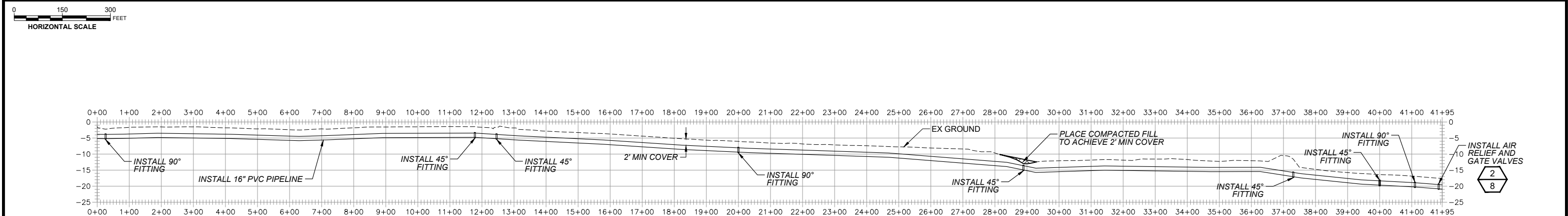
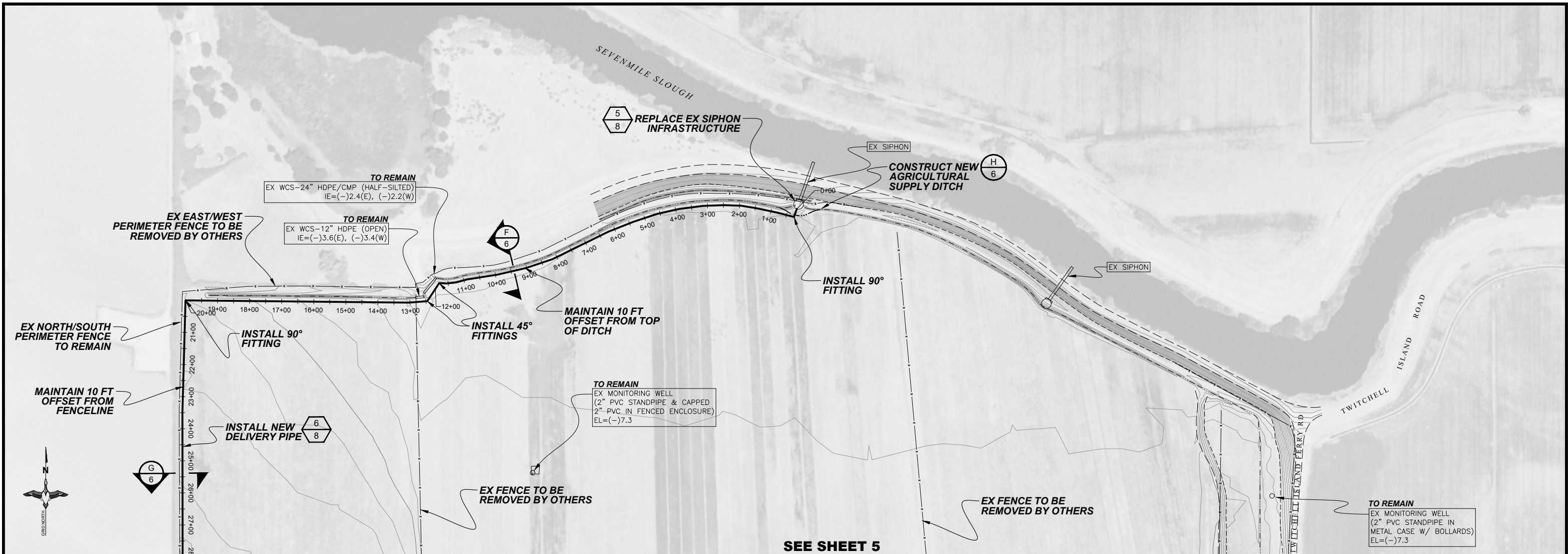


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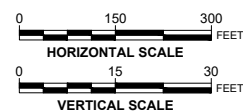


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				CHECKED BY: BW	
				SHEET NO.	
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SHEET INDEX



PROFILE - DELIVERY PIPE (Sta. 0+00.00 to Sta. 41+95.06)



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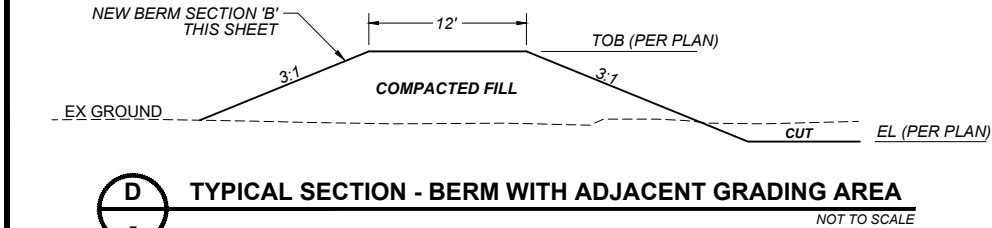
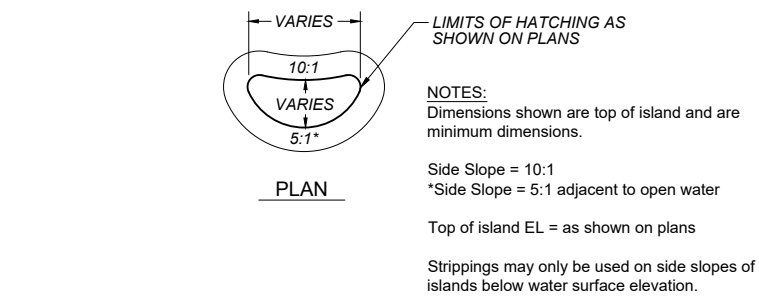
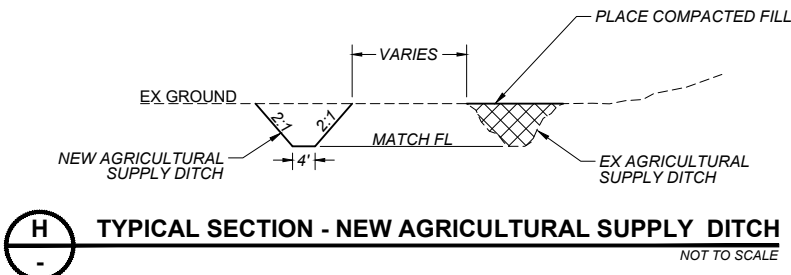
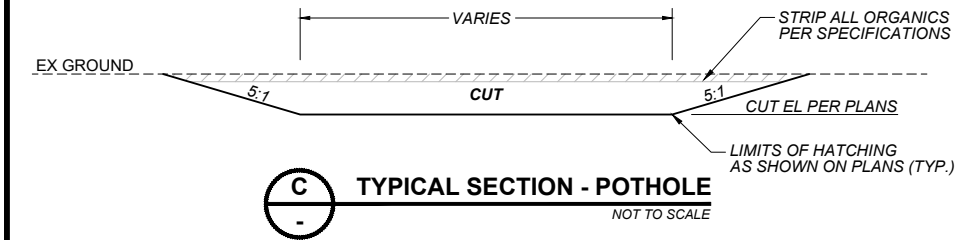
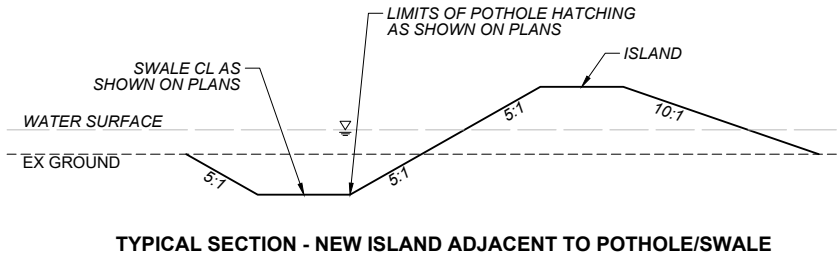
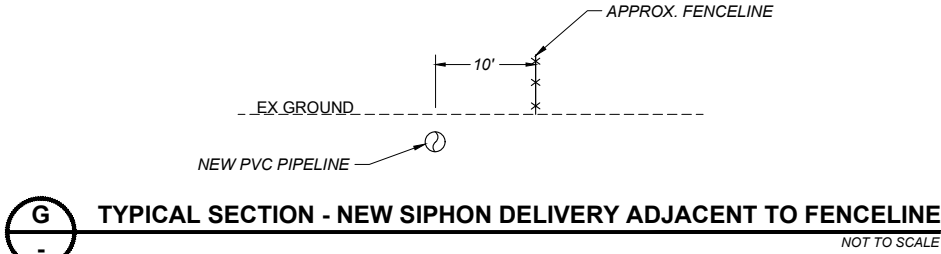
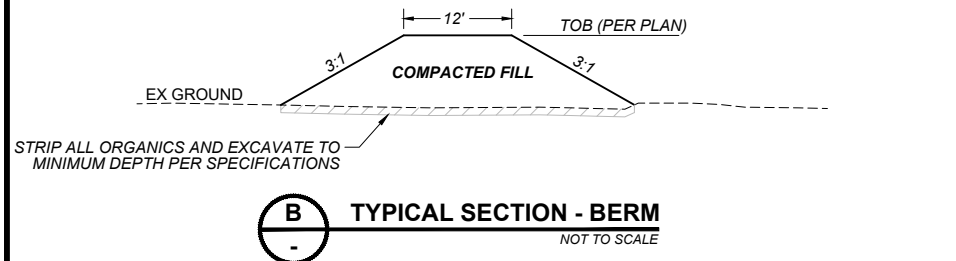
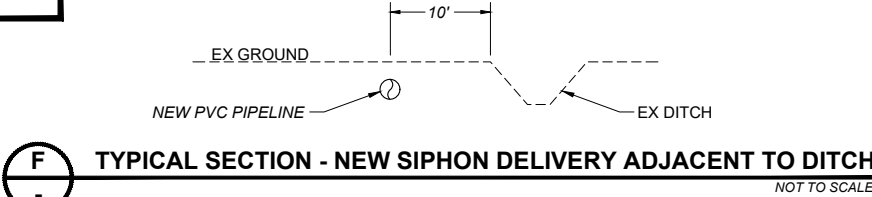
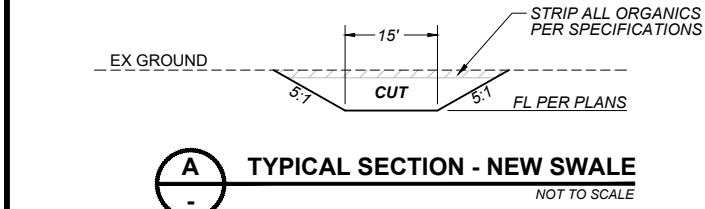
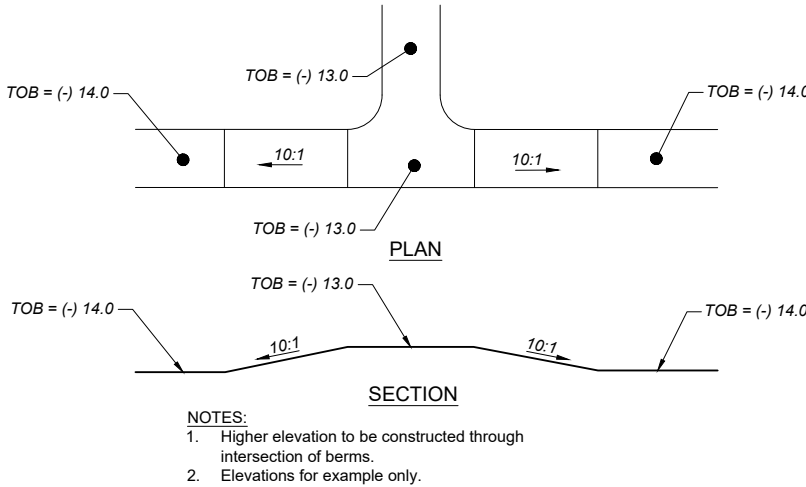
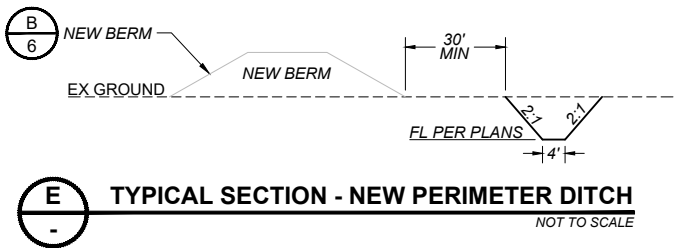
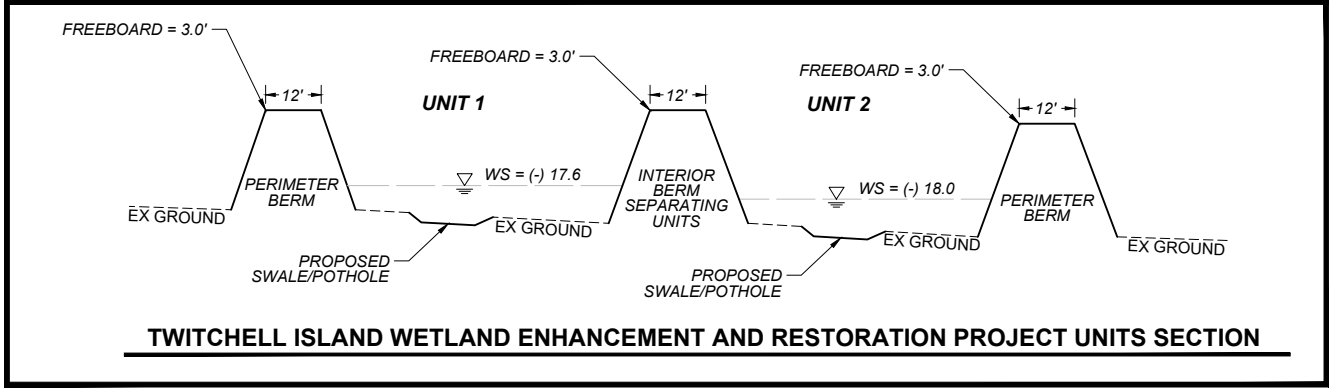


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PROJECT NO. US-CA-437-6	DATE: 1/12/2024	DESIGNED BY: AT
TWITCHELL ISLAND WETLAND ENHANCEMENT AND RESTORATION PROJECT		DRAWN BY: JS
		SURVEYED BY: JM
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SITE PLAN		SHEET NO. 4 of 8

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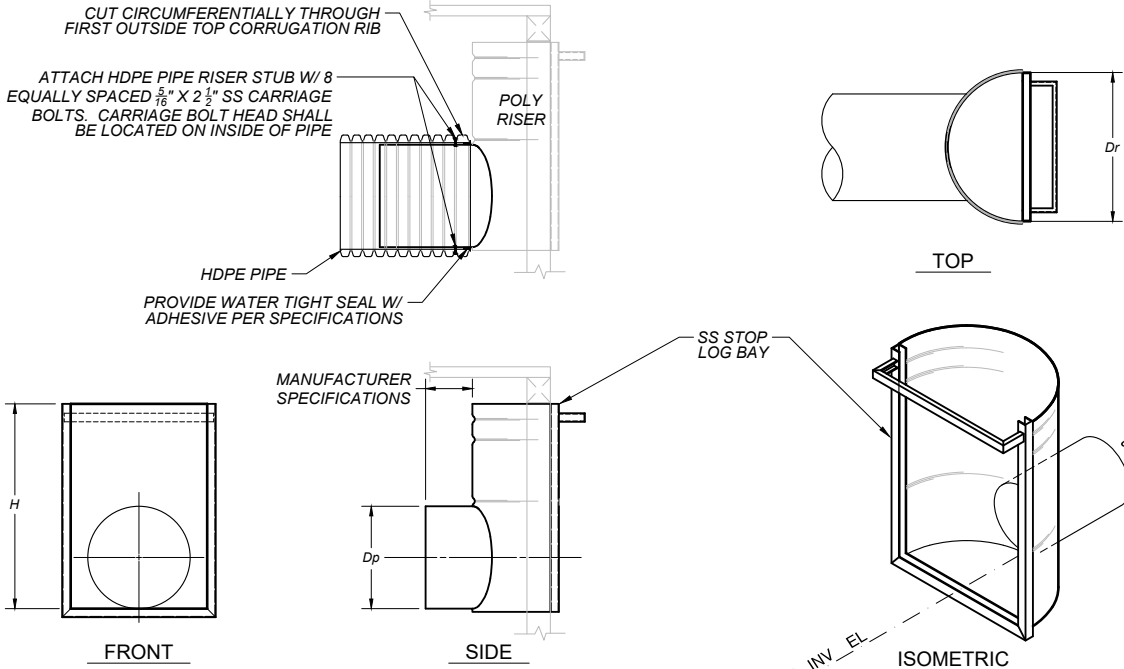
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TWITCHELL ISLAND WETLAND ENHANCEMENT AND RESTORATION PROJECT		DRAWN BY: JS
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DETAILS		SHEET NO. 6 of 8

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WATER CONTROL STRUCTURE TABLE

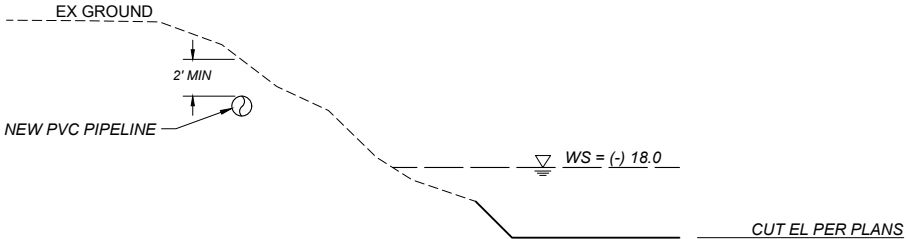
STRUCTURE NO.	Dr	H	Dp	L	LEVEE EL	RISER TOP EL	PIPE INLET	PIPE OUTLET	DESCRIPTION	NOTES
	(ft)	(ft)	(in)	(ft)			INV EL	INV EL		
WCS01	4.0	7.0	24	44	(-)14.6	(-)14.5	(-)21.5	(-)21.5	HDPE PIPE W/RISER	
WCS02	4.0	7.0	24	46	(-)14.6	(-)14.6	(-)21.6	(-)21.6	HDPE PIPE W/RISER	
WCS03	4.0	7.0	24	76	(-)15.0	(-)15.4	(-)22.4	(-)22.4	HDPE PIPE W/RISER	
WCS04	4.0	7.0	24	70	(-)15.0	(-)15.2	(-)22.2	(-)22.2	HDPE PIPE W/RISER	
WCS05	4.0	7.0	24	70	(-)14.6	(-)14.9	(-)21.9	(-)21.9	HDPE PIPE W/RISER	
WCS06	-	-	24	40	-	-	(-)20.0	(-)20.0	HDPE CULVERT	

Contractor to field verify riser height prior to construction

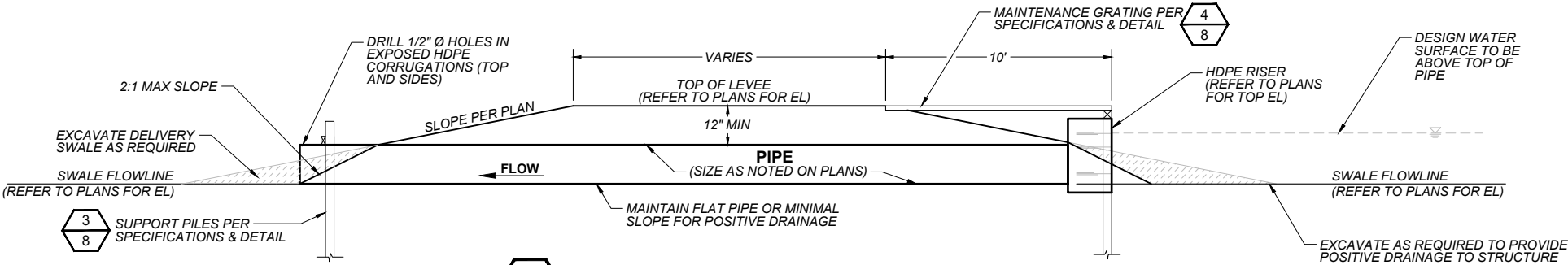


NOTE:
1. Detail is a schematic representation only. Final configuration will depend upon manufacturer's specifications.

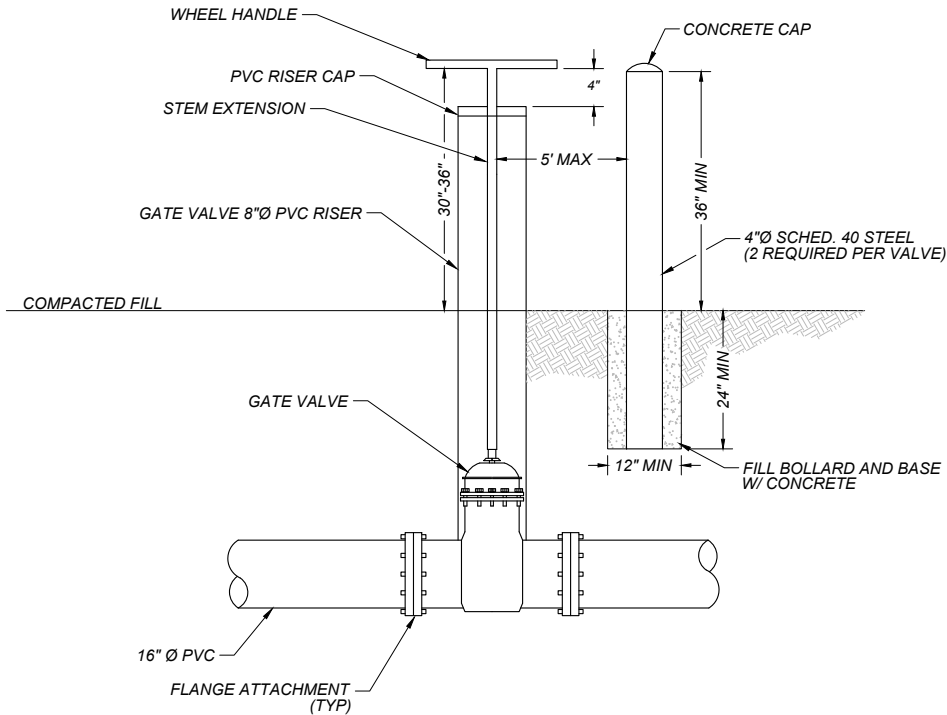
1 TYPICAL DETAIL - HDPE POLY RISER
NOT TO SCALE



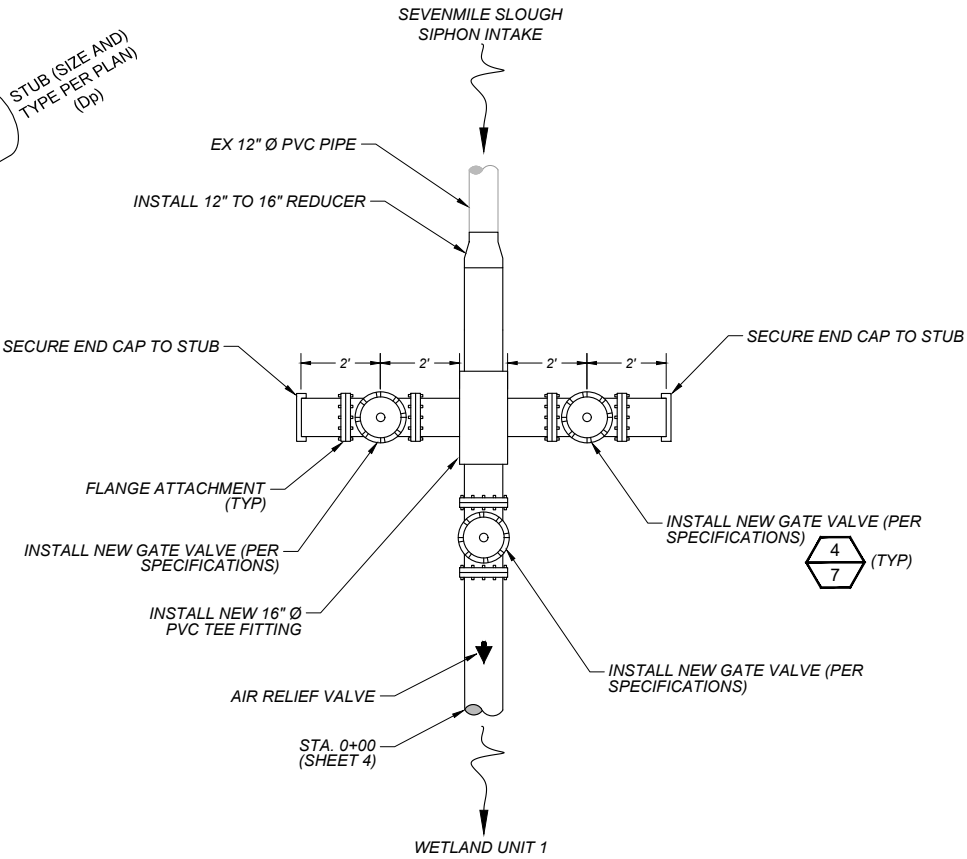
A TYPICAL SECTION - EG TRANSITION TO WETLAND UNIT
NOT TO SCALE



2 TYPICAL DETAIL - CROSSING AT HDPE WCS
NOT TO SCALE



4 TYPICAL DETAIL - GATE VALVE
NOT TO SCALE



3 TYPICAL DETAIL - SIPHON VALVE ASSEMBLY
NOT TO SCALE

REQUIRED BEARING AREA - TOTAL SQUARE FEET							
TYPE OF FITTING	90° BEND	45° BEND	11 1/4" OR 22 1/2" BEND	TEE OR DEAD END	TEE W/PLUG	CROSS W/PLUG	CROSS W/PLUGS
TYPICAL INSTALLATION							
SIZE OF PIPE							
12"	8	5	3	6	8	6	8
14"	11	6	3	8	11	8	11
16"	15	8	4	10	15	10	15
18"	18	10	5	13	18	13	18
20"	23	12	7	16	23	16	23

NOTES:
1. Thrust blocks to be constructed using 4000 PSI concrete.
2. Blocks to be poured against undisturbed soil.
3. Joints and face of plugs to be kept free of concrete.
4. Thrust blocks may be required for cases not depicted above.
5. Restrained flexible joints may be used in place of thrust blocks, subject to approval of engineer.

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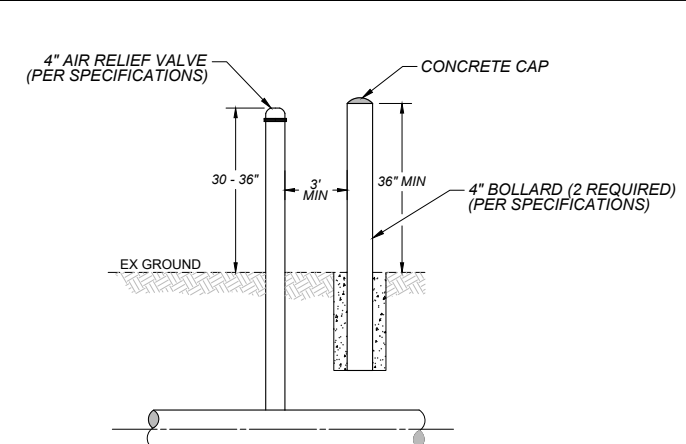


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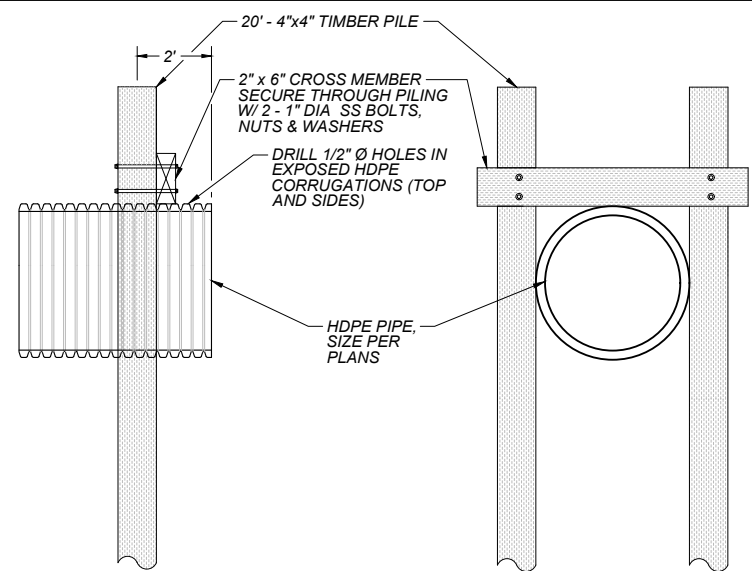
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DETAILS		SHEET NO. 7 of 8

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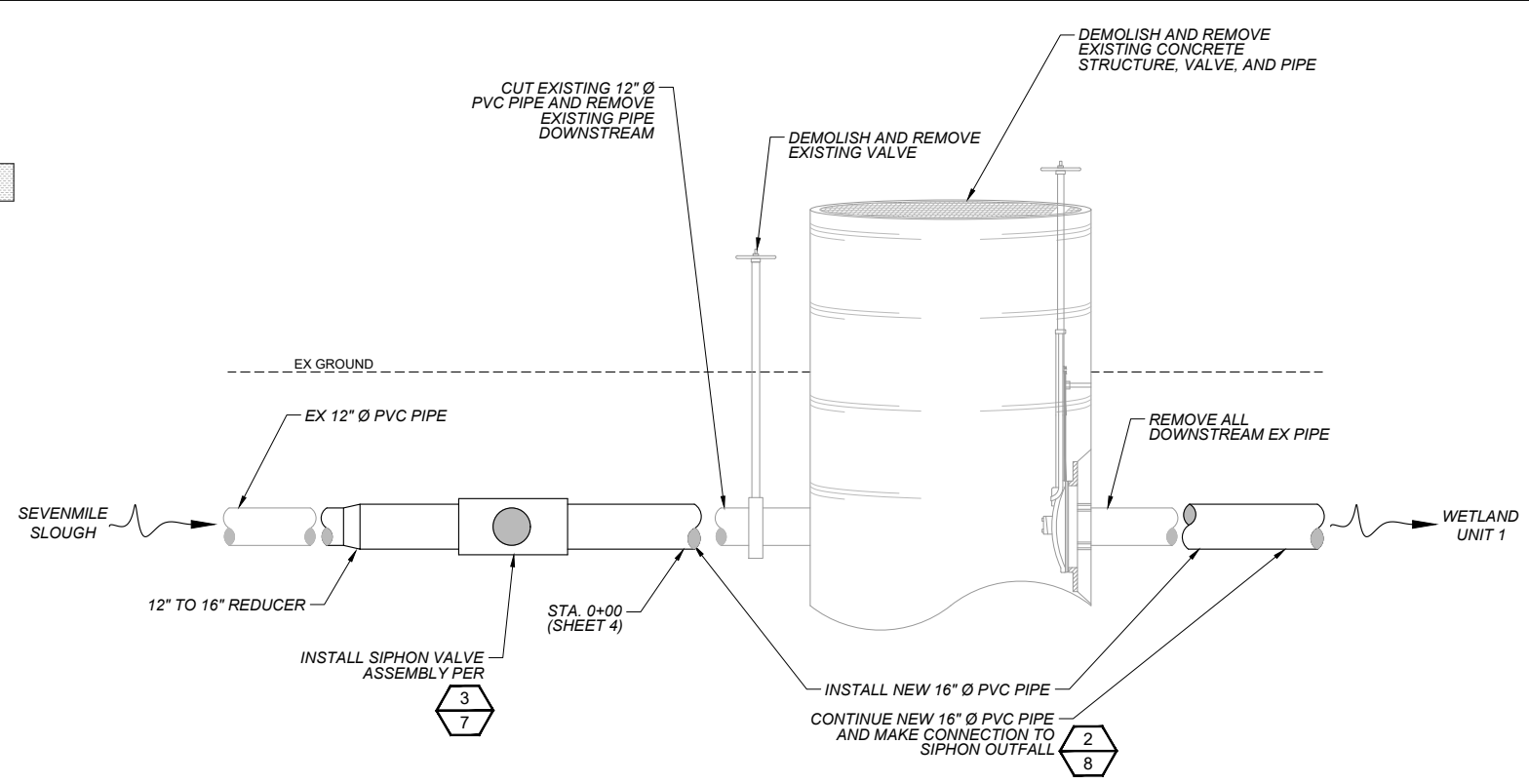


1 TYPICAL DETAIL - AIR RELIEF VALVE ASSEMBLY
NOT TO SCALE

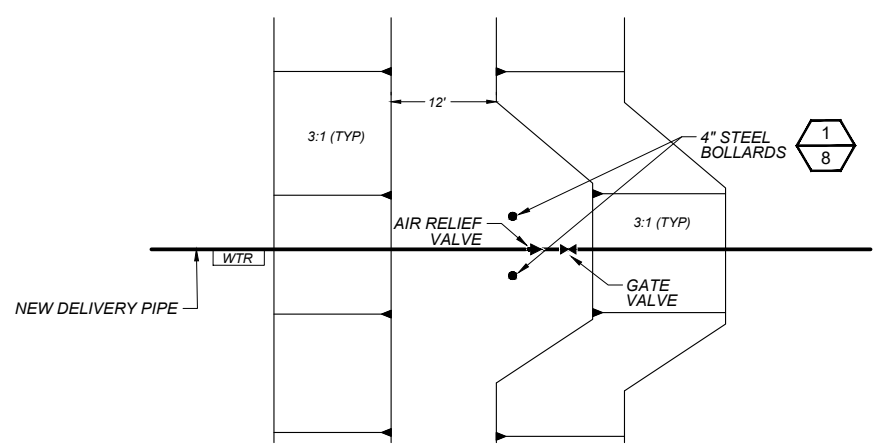
NOTE:
1. The cost and installation of the bollards and concrete shall be considered incidental to air relief valve installation.



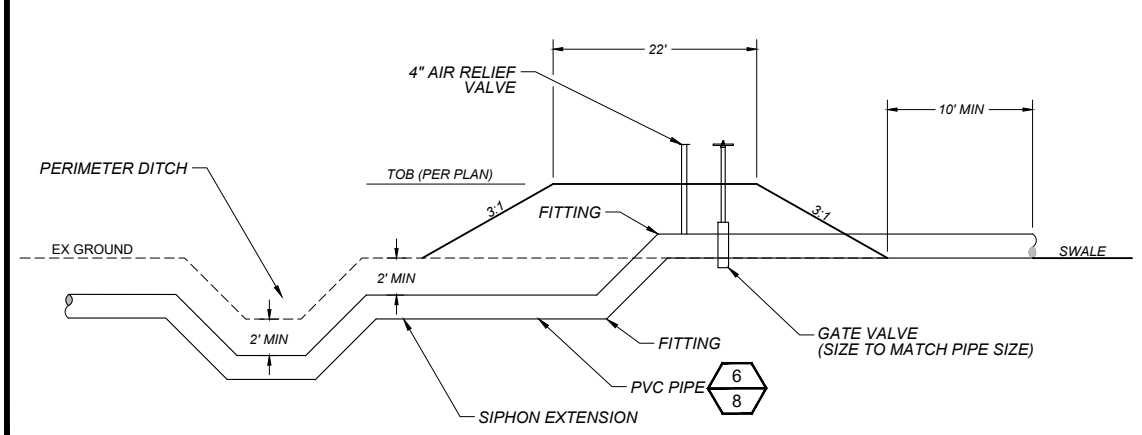
3 TYPICAL DETAIL - HDPE PIPE SUPPORT
NOT TO SCALE



5 TYPICAL DETAIL - SIPHON VALVE REPLACEMENT
NOT TO SCALE

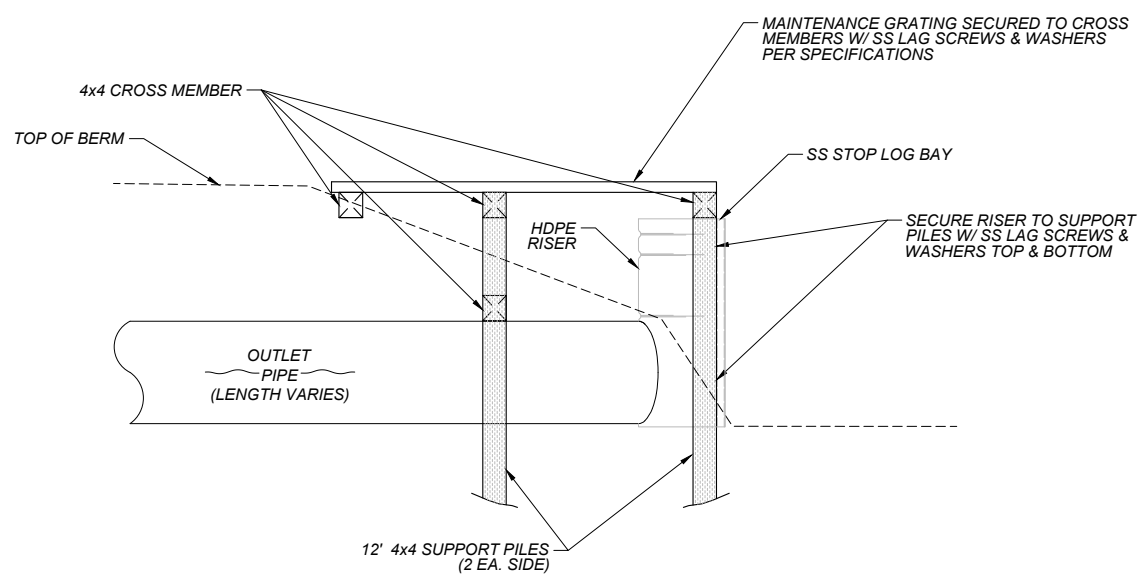


TYPICAL PLAN VIEW

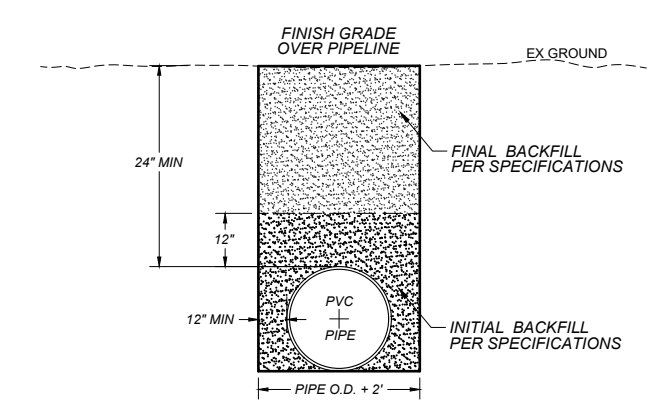


TYPICAL SECTION VIEW

2 TYPICAL DETAIL - SIPHON OUTFALL
NOT TO SCALE



4 TYPICAL DETAIL - WATER CONTROL STRUCTURE MAINTENANCE GRATING
NOT TO SCALE



6 TYPICAL DETAIL - PIPE TRENCH
NOT TO SCALE

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