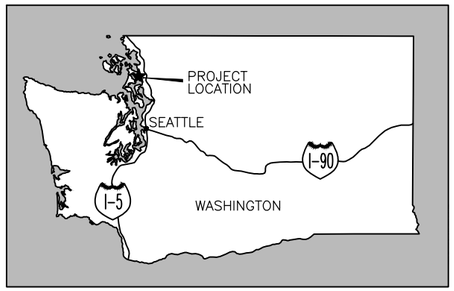
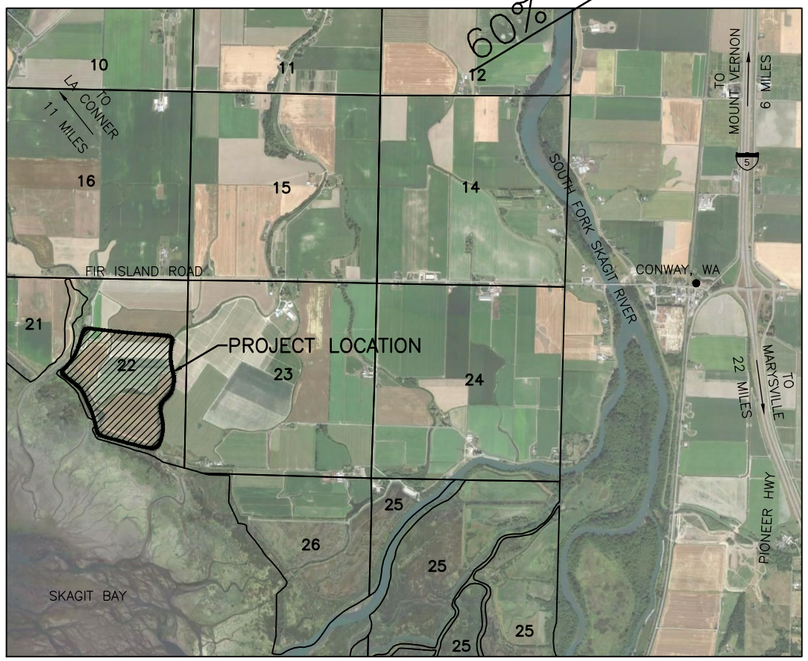
WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

FIR ISLAND FARM ECOSYSTEM RESTORATION ST:R4:11-3

60% DESIGN - NOT FOR CONSTRUCTION



LOCATION MAP



VICINITY MAP
SCALE: 1" = 2000'

GRAPHIC SCALE
0 2000 4000 6000
SCALE: 1" = 2000'

INDEX

SHEET NO.

1. COVER SHEET, LOCATION & VICINITY MAPS, AND SHEET INDEX
2. LEGEND, ABBREVIATIONS, AND GENERAL NOTES
3. SUMMARY OF QUANTITIES
4. SITE SURVEY - PROPERTY LINES, BOUNDARIES AND CONTROL
5. ALIGNMENT AND TIES
6. SITE PLAN
7. SITE PREPARATION PLAN
8. DEMOLITION PLAN AND SECTIONS
9. DEMOLITION PLAN AND SECTIONS
10. DIKE SETBACK - PLAN AND PROFILE STATIONS 10+00 TO 25+00
11. DIKE SETBACK - PLAN AND PROFILE STATIONS 25+00 TO 38+00
12. DIKE SETBACK - PLAN AND PROFILE STATIONS 38+00 TO 53+00
13. DIKE SETBACK - PLAN AND PROFILE STATIONS 53+00 TO 68+30
14. DIKE EXTENSION PLAN AND PROFILE
15. INTERIOR DRAINAGE STORAGE POND GRADING PLAN
16. TIDEGATE INSTALLATIONS PLAN AND DETAILS
17. INTERIOR STORAGE POND PUMP STATION PLAN
18. PUMP STATION DETAIL
19. MARSH GRADING AND PILOT CHANNEL PLANS
20. MARSH GRADING AND PILOT CHANNEL PLANS
21. MARSH GRADING AND PILOT CHANNEL PLANS
22. PLANTING AND SEEDING PLAN
23. TYPICAL DIKE SETBACK DETAIL
24. DIKE SETBACK CROSS SECTIONS STATIONS 10+00 TO 22+00
25. DIKE SETBACK CROSS SECTIONS STATIONS 24+00 TO 36+00
26. DIKE SETBACK CROSS SECTIONS STATIONS 38+00 TO 52+00
27. DIKE SETBACK CROSS SECTIONS STATIONS 54+00 TO 68+00
28. TYPICAL DETAILS
29. TYPICAL DETAILS

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 39326 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....

PROGRAM ..... DATE: .....

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
COVER SHEET, LOCATION & VICINITY MAPS, AND SHEET INDEX

PROJECT NO. ST:R4:11-3

SHEET 1 OF 29

FILENAME: I:\WRV1\1-A\73918_Fir_Island\CAD\LS0041\0041113\A\0041113-0001.dgn DATE: 05-15-2014 LOGIN: cnt

GENERAL NOTES

1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND SPECIFICATIONS.
2. ALL WORK SHALL BE IN ACCORDANCE WITH AND THE CONTRACTOR SHALL ADHERE TO ALL TERMS AND CONDITIONS OF PROJECT PERMITS. THE CONTRACTOR IS RESPONSIBLE TO SECURE APPLICABLE PERMITS THAT HAVE NOT BEEN PROVIDED BY THE OWNER. THE CONTRACTOR SHALL OBTAIN A GENERAL CONSTRUCTION STORMWATER PERMIT FROM THE WASHINGTON STATE DEPARTMENT OF ECOLOGY, AND SUBMIT A TRAFFIC CONTROL PLAN TO SKAGIT COUNTY PUBLIC WORKS ROADS DEPARTMENT, AND RECEIVE PERMITS PRIOR TO STARTING THE CONSTRUCTION.
3. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS RELATED TO SAFETY OF PERSONNEL, OWNER'S REPRESENTATIVES AND THE PUBLIC, AND IS RESPONSIBLE FOR ADHERING TO ALL ENVIRONMENTAL LAWS AND REGULATIONS RELEVANT TO THE PROJECT.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THEIR OWN ELECTRICITY, WATER, AND SANITARY FOR THE PROJECT AS DESCRIBED IN TEMPORARY FACILITIES SPECIFICATIONS.
5. ALL AREAS DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS, OR AS SHOWN ON PLANS.
6. ALL LOCATIONS OF EXISTING UTILITIES SHOWN SHOULD BE CONSIDERED APPROXIMATE. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACCURACY OF ALL UTILITY LOCATIONS SHOWN OR NOT SHOWN ON THE PLANS. EXISTING UTILITIES SHALL BE AVOIDED, PROTECTED, SUPPORTED AND MAINTAINED DURING CONSTRUCTION AND ARE THE RESPONSIBILITY OF THE CONTRACTOR.
7. CONTACT THE UNDERGROUND UTILITIES LOCATION SERVICE (1-800-424-5555 OR 811) AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.
8. SEE TESC PLANS AND NOTES FOR EROSION AND SEDIMENTATION CONTROL REQUIREMENTS.
9. HIGHLY CONTAMINATED OR TURBID DEWATERING EFFLUENT FROM CONSTRUCTION EQUIPMENT OPERATION, TRUCK WASH WATER, OPEN TRENCHES OR WORK INSIDE A COFFERDAM SHALL BE HANDLED SEPARATELY FROM STORMWATER.
10. SURVEY DATUM INFORMATION IS PROVIDED ON THE SITE SURVEY SHEET. ELEVATIONS ARE SHOWN IN FEET. DISTANCES ARE SHOWN IN FEET, DECIMAL FEET AND INCHES.
11. ALL STATIONING REFERS TO THE CENTERLINE OF CONSTRUCTION AND IS THE MEASURED HORIZONTAL DISTANCE.
12. ALL TRASH, RUBBLE, ASPHALT, CONCRETE, DEBRIS AND BURIED DEBRIS NOT REQUIRED FOR THE PROJECT, WITHIN THE PROJECT WORK LIMITS SHALL BE REMOVED AND DISPOSED OF OFFSITE BY THE CONTRACTOR.
13. THE CONTRACTOR SHALL PERFORM EXCAVATION IN A SAFE CONDITION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SHORING, SHEETING, BRACING, BENCHING, DEWATERING AND ALL NECESSARY PROTECTIVE MEASURES TO PREVENT DAMAGE TO ADJACENT PROPERTIES, STRUCTURES OR UTILITIES.
14. IF UNANTICIPATED CONDITIONS ARE ENCOUNTERED DURING THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY BRING THE CONDITION TO THE ATTENTION OF THE OWNER'S CONSTRUCTION MANAGER OR ENGINEER.
15. DETAILS ARE INTENDED TO SHOW FINAL CONDITIONS OF THE DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT THE JOB SITE DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED IN THE WORK.
16. THE CONTRACTOR SHALL MAKE ALL NECESSARY PROVISIONS TO PROTECT AND REPAIR IMPACTS TO EXISTING STRUCTURES INCLUDING ROADWAYS, DRAINAGES, FARM STRUCTURES, AND VEGETATION UNLESS SUCH ITEMS ARE TO BE DISTURBED OR REMOVED AS INDICATED IN THE CONSTRUCTION PLANS AND DOCUMENTS.

UTILITY CONTACTS

UTILITY PROVIDERS THAT MAY BE AFFECTED BY THE PROPOSED CONSTRUCTION WORK SHALL BE NOTIFIED IN ADVANCE OF CONSTRUCTION. A LIST OF UTILITY PROVIDERS IS SHOWN BELOW.

POWER –	PUGET SOUND ENERGY
WATER –	SKAGIT P.U.D.
TELECOMMUNICATIONS –	TBD
SKAGIT COUNTY ROADS –	

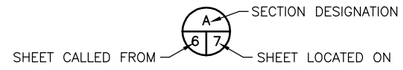
60% DESIGN – NOT FOR CONSTRUCTION

ABBREVIATIONS

ALUM	–	ALUMINUM
∠	–	ANGLE
APPROX.	–	APPROXIMATELY
BM	–	BENCH MARK
BTM	–	BOTTOM
℄	–	CENTERLINE
CB	–	CATCH BASIN
CLR.	–	CLEARANCE
CONC	–	CONCRETE
ø	–	DIAMETER
E	–	EAST
ELEV	–	ELEVATION
EX	–	EXISTING
GA.	–	GAUGE
HDPE	–	HIGH DENSITY POLYETHYLENE
ID	–	INSIDE DIAMETER
IE	–	INVERT ELEVATION
LG	–	LONG
MFG.	–	MANUFACTURER'S
MISC.	–	MISCELLANEOUS
MOD.	–	MODEL
N	–	NORTH
OC	–	ON CENTER
OD	–	OUTSIDE DIAMETER
OHW	–	ORDINARY HIGH WATER
PAV'T	–	ASPHALT / CONCRETE PAVEMENT
ℙ	–	PLATE
PT	–	PRESSURE TREATED
R	–	RADIUS
REQ'D	–	REQUIRED
R/W	–	RIGHT OF WAY
SEC.	–	SECTION
SHT.	–	SHEET
S	–	SOUTH
S.F.	–	SQUARE FEET
STA	–	STATION
SPEC'S.	–	PROJECT SPECIFICATIONS
S.S.	–	STAINLESS STEEL
TBD	–	TO BE DETERMINED
TESC	–	TEMPORARY EROSION AND SEDIMENT CONTROL
TOB	–	TOP OF BANK
TYP	–	TYPICAL
W.S.	–	WATER SURFACE
W	–	WEST

SHEET SYMBOLS

DETAIL



SECTION

NOTE REFERENCE
REFERENCE DESIGNATION TO NOTE APPEARING ON SAME SHEET

LEGEND

- EXISTING CONTOUR (MAJOR)
- EXISTING CONTOUR (MINOR)
- WB — EXISTING WETLAND BOUNDARY
- OHW — ORDINARY HIGH WATER MARK
- EXISTING FENCE
- EDGE OF PAVEMENT
- PROPERTY LINE
- OH — EXISTING OVERHEAD POWER
- PROPOSED CONTOUR (MAJOR)
- PROPOSED CONTOUR (MINOR)
- CONSTRUCTION LIMITS
- CONSTRUCTION FENCE
- RIPRAP BURIED TOE
- CULVERT NEW
- SF — SILT FENCE
- ACCESS ROAD/HAUL ROUTE
- INTERIOR DRAINAGE STORAGE POND
- RIPRAP
- EXISTING GROUNDWATER OBSERVATION WELL
- EXISTING SURFACE WATER OBSERVATION WELL
- CATCH BASIN
- FSC — FLOATING SILT CURTAIN
- W — WATER
- T — UNDERGROUND TELEPHONE
- E — E — UNDERGROUND POWER

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 38326 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....

PROGRAM ..... DATE: .....

0 —— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
LEGEND, ABBREVIATIONS, AND GENERAL NOTES

PROJECT NO. ST:R4:11-3

SHEET 2 OF 29

DI DWG: N:\WO\21-LV\318.01\Final\CAD\LB004\LB004113\LB004113-0002.dgn DATE: 06-15-2014 USER: cnt

SUMMARY OF QUANTITIES

Item	Description	Quantity	Units
1.0	Contractor Administration, Submittals, Closeout		
1.01	Bonding	1	LS
1.02	Permits	1	LS
1.03	Submittals (Schedules, Shop Drawings, Manufacturer Specs)	1	LS
1.04	Construction Pay Surveys (Grade Checks, Settlement Monitoring)	1	LS
1.05	As Built Survey	1	LS
2.0	Mobilization and Demobilization		
2.01	Mobilization	1	LS
2.02	Demobilization	1	LS
2.03	Final Site Cleanup - Post Inspection	1	LS
2.05	Removal of Temp Haul Routes	11,810	CY
3.0	Site Preparation, Temporary Facilites		
3.01	Contractor Field Office and Toilets	12	MO
3.02	Fir Island Road Traffic Control	120	DAY
3.03	High Visibility Fence	96	FT
4.0	Temporary Erosion and Sediment Control		
4.01	Stabilized Construction Entrance (Quarry Spalls)	400	TON
4.02	Silt Fence	12,570	FT
4.03	Diversion of Water	1	LS
4.04	Floating Silt Curtain	1,600	FT
4.05	Coir Logs, Wattles	31,482	FT
4.06	Gravel Check Dams	19	TON
4.07	Street Cleaning	120	HR
5.0	Earthwork		
5.01	Dike Alignment Stripping	12,017	CY
5.02	Riprap Toe Excavation, Haul and Spreading	5,443	CY
5.03	Pond Excavation, Dewatering, Haul	77,085	CY
5.04	Tidegate Excacvation, Dewatering, Haul	407	CY
5.05	Pilot Tidal Channel Excavation and Spreading	4,042	CY
5.06	Existing Levee Excavation including Haul	20,214	CY
5.07	Geotextile Reinforcement	68,600	SY
5.08	Crushed Surfacing Base Course Incl. Haul	69,903	TON
5.09	Dike Fill Including Haul	148,160	TON
5.10	High Marsh Fill Grading	82,935	CY
5.11	Sand Drainage Blanket (Filter Diaphragm)	135	TON
5.12	Pipe Annulus Backfill	169	TON
5.13	Riprap Bedding	8,203	TON
5.14	Riprap (Levee Sideslope)	37,681	TON
5.15	Riprap (Pump Station Outfall)	99	TON
5.16	Topsoil	5,679	TON
6.0	Drainage		
6.01	24" RCP	135	FT
6.02	24" FES + Grate	2	EA
6.03	48" HDPE Pipe	564	FT
6.04	48" Pipe (Haul Route Crossing)	200	FT
6.05	48" Top Hinge Tidegate	1	EA
6.06	48" Side Hinge Tidegate	4	EA
6.07	Pump Station	1	LS
7.0	Vegetation and Plantings		
7.01	Bulk Seed Procurement	9,056	LB
7.02	Native Marsh Seed Procurement	2	AC
7.03	Hydroseed Marsh	126	AC
7.04	Hydroseed w/ Tackifier Mulch	8	AC
7.05	Irrigation	1	LS
8.0	Miscellaneous		
8.01	Log Boom	1	LS
8.02	Settlement Monitoring Plate Installation & Weekly Survey	20	WK
8.03	Fish Screen and Defishing	1	LS
8.04	Fence Relocation	900	ft
9.0	Contingency Bid Items		
9.01	Culvert Replacement, No Name Slough at WDFW Main Access	1	EA
9.02	Asphalt Repaving along Fir Island Road	356	SY
9.03	Dike Fill Including Haul (10% Add)	14,816	TON
9.04	Unsuitable Foundation Excavation Haul and Spread	1	LS
9.05	Dewatering	1	EA

60% DESIGN – NOT FOR CONSTRUCTION

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 38326 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER .....DATE:.....

PROGRAM .....DATE:.....

0 —— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
SUMMARY OF QUANTITIES

PROJECT NO. ST:R4:11–3

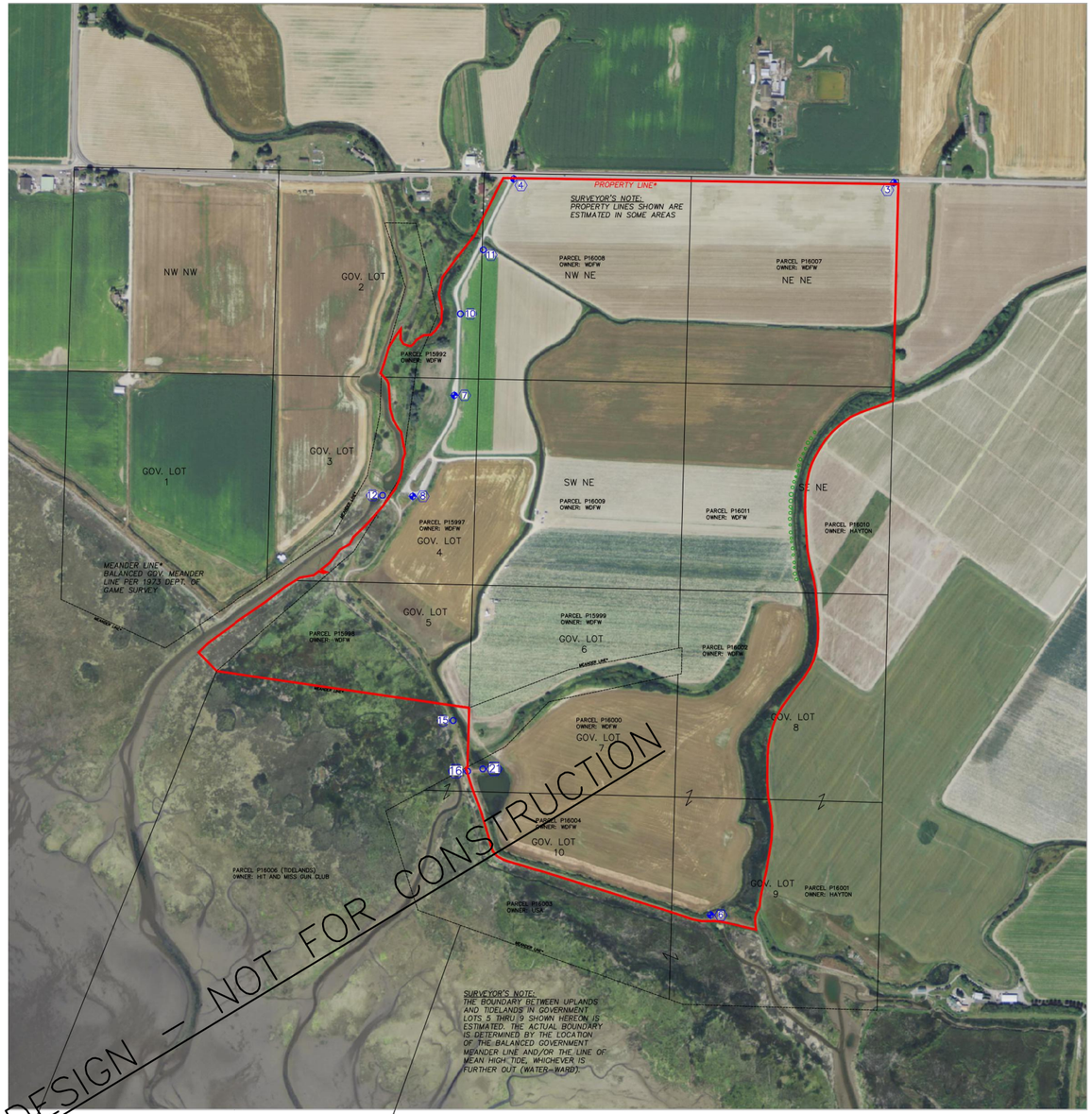
SHEET 3 OF 29

PLTNAME: J:\WP\21-11\2318.F\dwg\ACAD\R004\R004113A\R004113-003.dwg DATE: 05-15-2014 LOGIN: cmh

STATE OF WASHINGTON
DEPARTMENT OF FISH & WILDLIFE

TOPOGRAPHIC SURVEY IN SECTION 22, TOWNSHIP 33 NORTH, RANGE 3 EAST, W.M.
SKAGIT COUNTY

PRELIMINARY



60% DESIGN – NOT FOR CONSTRUCTION

FIR ISLAND FARM PHASE 2

PRELIMINARY

③ TBM SWA GPS-3
SET 3/4" REBAR WITH 2 1/2" ALUM. CAP MARKED AS SHOWN ±37' SOUTHWEST OF CORNER TO SECS. 22,23,26,27.
NOTE: TBM SWA GPS-3 IS A HORIZONTAL AND VERTICAL CONTROL STATION AND IS NOT A WDFW PROPERTY CORNER.
NAVD 88 ELEV: 7.12'
GRID N: 493110.601
GRID E:1259287.840
LAT: 48°20'28.267"
LONG: –122°24'02.043"

④ TBM SWA GPS-4
SET 3/4" REBAR WITH 2 1/2" ALUM. CAP MARKED AS SHOWN ±2' EAST OF GRAVEL ENTRANCE ROAD AND ±30' SOUTH OF C/L FIR ISLAND ROAD.
NOTE: TBM SWA GPS-4 IS A HORIZONTAL AND VERTICAL CONTROL STATION AND IS NOT A WDFW PROPERTY CORNER.
NAVD 88 ELEV: 8.85'
GRID N: 493135.177
GRID E:1256828.463
LAT: 48°20'28.013"
LONG: –122°24'38.447"

⑥ TBM 6
SET 3/4" REBAR WITH 2 1/2" ALUM. CAP MARKED AS SHOWN.
NOTE: TBM 6 IS A HORIZONTAL AND VERTICAL CONTROL STATION AND IS NOT A WDFW PROPERTY CORNER.
NAVD 88 ELEV: 10.96'
GRID N: 488370.468
GRID E:1258102.338
LAT: 48°19'41.260"
LONG: –122°24'18.155"

⑦ TBM 7
SET 3/4" REBAR WITH 2 1/2" ALUM. CAP MARKED AS SHOWN ±4' EAST OF METAL SWING GATE POST.
NOTE: TBM 7 IS A HORIZONTAL AND VERTICAL CONTROL STATION AND IS NOT A WDFW PROPERTY CORNER.
NAVD 88 ELEV: 8.40'
GRID N: 491735.040
GRID E:1256443.735
LAT: 48°20'14.121"
LONG: –122°24'43.716"

⑧ TBM 8
SET 3/4" REBAR WITH 2 1/2" ALUM. CAP MARKED AS SHOWN ±3' NORTHEAST FROM WOOD FENCE POST AT ANGLE POINT IN FENCE IN SOUTH EDGE OF GRAVEL.
NOTE: TBM 8 IS A HORIZONTAL AND VERTICAL CONTROL STATION AND IS NOT A WDFW PROPERTY CORNER.
NAVD 88 ELEV: 8.79'
GRID N: 491081.188
GRID E:1256174.335
LAT: 48°20'07.615"
LONG: –122°24'47.504"

⑩ TBM SWA CP-10SET 8" LONG GALV. STEEL SPIKE
NAVD 88 ELEV: 9.50'

GRID N: 492262.472
GRID E:1256483.181
LAT: 48°20'19.333"
LONG: –122°24'43.292"

⑪ TBM SWA CP-11
SET 8" LONG GALV. STEEL SPIKE
NAVD 88 ELEV: 7.06'
GRID N: 492677.227
GRID E:1256630.776
LAT: 48°20'23.455"
LONG: –122°24'41.234"

⑫ TBM SWA CP-12
SET 8" LONG GALV. STEEL SPIKE
NAVD 88 ELEV: 12.65'
GRID N: 491087.456
GRID E:1255978.993
LAT: 48°20'07.638"
LONG: –122°24'50.396"

⑮ TBM SWA CP-16
SET 8" LONG GALV. STEEL SPIKE
NAVD 88 ELEV: 13.90'
GRID N: 489629.125
GRID E:1256436.785
LAT: 48°19'53.342"
LONG: –122°24'43.179"

⑯ TBM SWA CP-16
SET 8" LONG GALV. STEEL SPIKE
NAVD 88 ELEV: 14.19'
GRID N: 489301.6798
GRID E: 1256529.0808
LAT: 48°19'50.130"
LONG: –122°24'41.714"

㉑ TBM SWA CP-16
SET 8" LONG GALV. STEEL SPIKE
NAVD 88 ELEV: 10.32'
GRID N: 489316.629
GRID E:1256627.493
LAT: 48°19'50.297"
LONG: –122°24'40.263"

0 400 800
200
SCALE IN FEET
JOB SCALE FACTOR 0.9999491

LEGEND

- ③ PROJECT TBMS (WITH NUMBER DESIGNATION) SET 3/4" REBAR WITH 2 1/2" ALUM. CAP STAMPED WITH NAVD 88 ELEVATION AS SHOWN.
- ⑯ OTHER PROJECT TBMS (WITH NUMBER DESIGNATION) SET 8" LONG GALV STEEL SPIKE NAVD 88 ELEVATION AS SHOWN.
- MONUMENT FND/SET AS NOTED
- UTILITY POLE
- —UG— UNDERGROUND UTILITY –(AS INDICATED BY PAINT MARKINGS)
- —OH— OVERHEAD POWER LINES
- CONIFER TREE
- BARRIER ROCK
- RIPRAP BANK FORTIFIED WITH RIPRAP
- FOUND STAKES MARKED WITH "TP" DESIGNATION
- X FOUND STAKES MARKED WITH "CPT" DESIGNATION
- △ FOUND DATA LOGGER (ELEVATION TAKEN AT TOP OF CAP, IF APPLICABLE)
- FOUND STAKES MARKED BORE HOLE
- (W) MONITORING WELL (ELEVATION TAKEN AT TOP OF CAP)
- —x— CHAIN LINK FENCE/BARB WIRE FENCE
- —□— WOOD FENCE
- BARRIER POST (7" DIA. METAL FILLED WITH CONC.)
- WOOD POST 4" DIA./PILING (AS NOTED)
- DOUBLE POST SIGN
- SINGLE POST SIGN
- CONC. PARKING CURB (5.9' X 7")
- WM WATER METER
- BURIED PIPE

VERTICAL DATUM

NAVD88 DERIVED FROM NGS BENCHMARK
DESIGNATION – T 331 RESET 1975
PID – TR0121
ELEVATION – 54.31 FEET (PER SKAGIT CO. PUBLIC WORKS)

CONVERSIONS:
NAVD88 + 2.14(FT) = TIDAL DATUM*

*TIDAL DATUM CONVERSION DERIVED FROM TIDAL ELEVATIONS PUBLISHED FOR TIDE STATIONS 9447952 (CRESCENT HARBOR PID TR0440) AND 9448576 (SNEEOOSH POINT).

NAVD88
MHHW = 9.31'
MHW = 8.42'
MSL = 4.51'
MTL = 4.50'
MLW = 0.58'
NAVD88 = 0.00'
MLLW = –2.14'

TIDAL DATUM
MHHW = 11.45'
MHW = 10.56'
MSL = 6.65'
MTL = 6.64'
MLW = 2.72'
NAVD88 = 2.14'
MLLW = 0.00'

BASIS OF BEARINGS
NAD83(2011) WA. STATE PLANE NORTH ZONE

NOTE:
SURVEY POINTS WITH DESCRIPTIONS BEGINNING WITH "2D" WERE NOT USED TO CREATE CONTOURS

EQUIPMENT USED
TOPCON GTS-600 TOTAL STATION THEODOLITE
WILD NA 2002 DIGITAL LEVEL
TRIMBLE GPS RECEIVERS MODEL 4700

FIELD BOOKS
400.58, 4-196-13

DISCLAIMER
AS A TOPOGRAPHICAL MAP ONLY.

NO.	DATE	DESCRIPTION	BY
1	11/20/13	REVISED TOP CAP ELEV. FOR DATA LOGGERS: 4336,5016,6879	AFH

DRAWN BY: S. DABROWSKI, PLS	DATE: NOVEMBER 7, 2013
CHECKED BY: A. HAMMOND, PLS	DRAWING NO.:
JOB NO.: 36425	SHEET 1 OF 1

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	AFH

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

0 ——— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY A HAMMOND
CHECKED BY DRC
DRAWN BY WDFW
DATE MAY 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
SITE SURVEY – PROPERTY LINES, BOUNDARIES AND CONTROL

PROJECT NO. ST:R4:11-3

SHEET 4 OF 29

P:\PROJ\...\V12318.Fir Island\CAD\L800\L800111\dwg\800111s004.dgn DATE: 05-15-2014 LOGIN: smh

ALIGNMENT AND TIES

PROPOSED DIKE ALIGNMENT					
NUMBER	STATION	LENGTH	RADIUS	BEARING	DELTA
L1	10+00	3.18'		N32° 14' 58.43"E	
C7	10+03	47.12'	79.34	N60° 56' 05.35"E	34°01'51"
L7	10+50	63.93'		N79° 32' 38.63"E	
C8	11+14	134.72'	156.02	N49° 08' 29.27"E	49°28'28"
L2	12+49	208.52'		N22° 22' 14.40"E	
C1	14+57	121.05'	99.00	N57° 23' 46.15"E	70°03'03"
L3	15+79	1961.72'		S87° 34' 42.11"E	
C2	35+40	209.82'	137.05	S43° 43' 07.45"E	87°43'09"
L4	37+50	161.43'		S0° 08' 27.21"W	
C3	39+11	478.81'	2276.58	S6° 08' 19.74"E	12°03'02"
L5	43+90	127.89'		S15° 15' 58.49"E	
C4	45+18	418.48'	421.57	S14° 07' 07.66"W	56°52'37"
L6	49+37	422.09'		S40° 50' 11.69"W	
C5	53+59	227.76'	249.05	S17° 10' 48.56"W	52°23'47"
L8	55+87	267.20'		S11° 58' 29.92"E	

PROPOSED DIKE ALIGNMENT					
NUMBER	STATION	LENGTH	RADIUS	BEARING	DELTA
C9	58+54	103.03'	178.39	S12° 25' 04.63"W	33°05'32"
L9	59+57	25.50'		S30° 01' 10.34"W	
C10	59+82	117.38'	92.56	S7° 23' 53.97"E	72°39'32"
L10	61+00	35.75'		S48° 07' 20.19"E	
C11	61+35	112.72'	73.42	S5° 39' 22.50"E	87°58'07"
L11	62+48	28.63'		S34° 54' 18.30"W	
C12	62+77	91.83'	147.68	S19° 10' 22.80"W	35°37'42"
L12	63+69	60.40'		S0° 32' 55.30"W	
C13	64+29	164.10'	136.40	S36° 00' 42.41"W	68°55'58"
L13	65+93	48.11'		S74° 17' 54.76"W	
C6	66+41	189.21'	99.44	S16° 17' 02.40"W	109°00'52"

EXISTING DIKE ALIGNMENT					
NUMBER	STATION	LENGTH	RADIUS	BEARING	DELTA
L14	0+00	311.63'		S32° 14' 58.43"W	
C14	3+12	85.99'	106.06	S55° 57' 42.38"W	46°27'19"
C15	3+98	34.53'	134.88	S88° 24' 06.90"W	14°40'01"
L15	4+32	19.89'		N86° 18' 34.78"W	
C16	4+52	30.06'	75.40	S83° 57' 01.85"W	22°50'20"
C17	4+82	132.15'	67.44	S11° 47' 48.52"W	112°15'42"
L16	6+14	538.54'		S46° 34' 17.97"E	
C18	11+53	141.89'	424.97	S40° 38' 42.11"E	19°07'48"
L17	12+95	443.25'		S27° 19' 18.93"E	
C19	17+38	82.28'	416.78	S17° 51' 04.08"E	11°18'40"
C20	18+20	68.87'	571.02	S16° 21' 31.55"E	6°54'36"
L18	18+89	347.74'		S18° 26' 11.71"E	
C21	22+37	190.69'	1260.42	S18° 52' 29.85"E	8°40'06"
L19	24+28	165.23'		S16° 04' 38.48"E	
C22	25+93	106.88'	122.09	S42° 47' 32.74"E	50°09'31"
L20	27+00	1213.27'		S72° 44' 20.31"E	

60% DESIGN – NOT FOR CONSTRUCTION

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 38326 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....

PROGRAM ..... DATE: .....

0 —— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
ALIGNMENT AND TIES

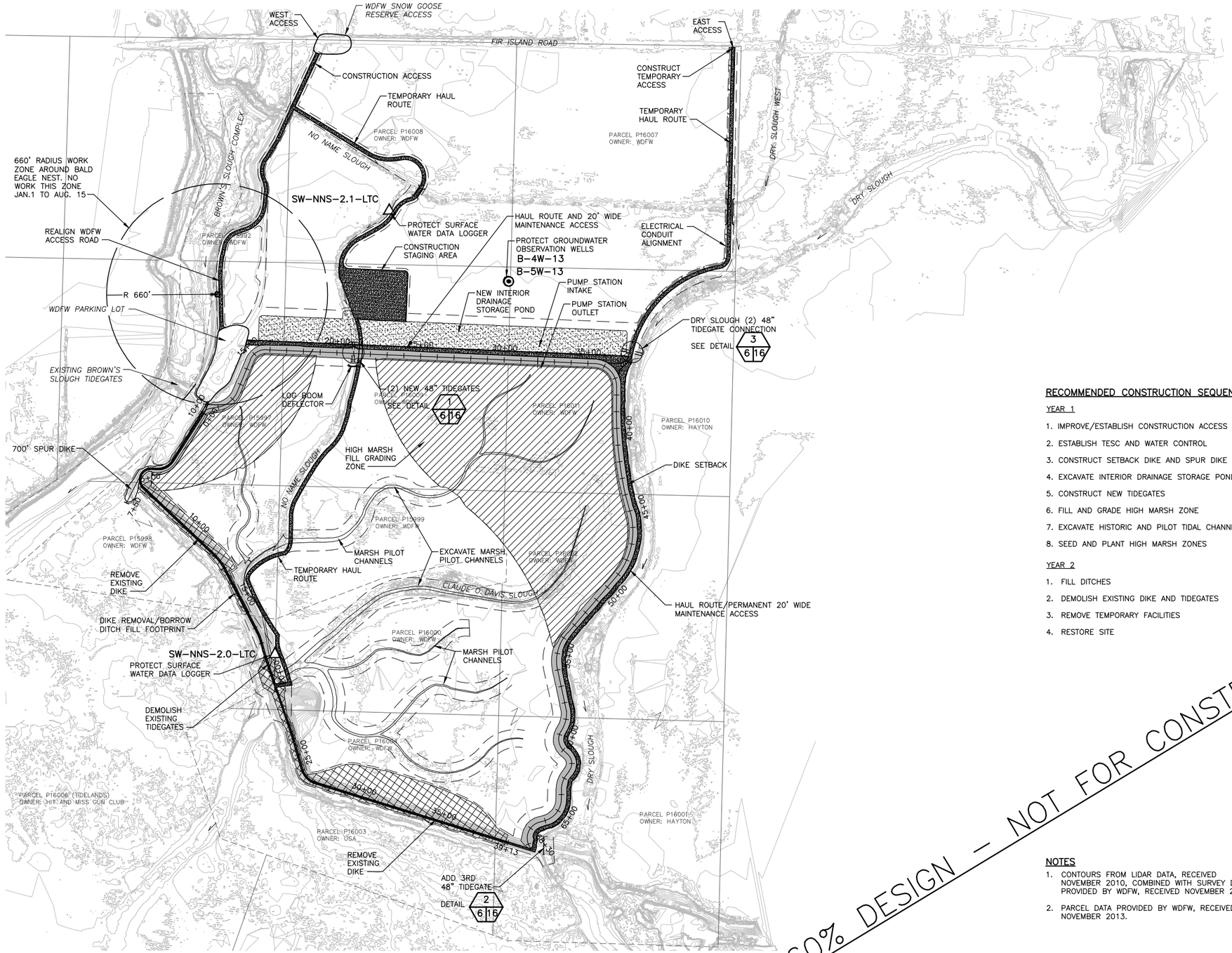
PROJECT NO. ST:R4:11–3

SHEET 5 OF 29

PLTNME: \\WP2-1\1\2318 Fir Island\GIS\R\0041\R0041113\R0041113-006.dwg DATE: 05-15-2014 LOGIN: cnt

LEGEND

- DIKE REMOVAL AND GRADING
- HIGH MARSH FILL
- INTERIOR DRAINAGE STORAGE POND
- NEW DIKE SETBACK



GRAPHIC SCALE
0 300 600 900
SCALE: 1" = 300'

SITE PLAN
SCALE: 1" = 300'-0"

RECOMMENDED CONSTRUCTION SEQUENCE

YEAR 1

1. IMPROVE/ESTABLISH CONSTRUCTION ACCESS
2. ESTABLISH TESC AND WATER CONTROL
3. CONSTRUCT SETBACK DIKE AND SPUR DIKE
4. EXCAVATE INTERIOR DRAINAGE STORAGE POND
5. CONSTRUCT NEW TIDEGATES
6. FILL AND GRADE HIGH MARSH ZONE
7. EXCAVATE HISTORIC AND PILOT TIDAL CHANNELS
8. SEED AND PLANT HIGH MARSH ZONES

YEAR 2

1. FILL DITCHES
2. DEMOLISH EXISTING DIKE AND TIDEGATES
3. REMOVE TEMPORARY FACILITIES
4. RESTORE SITE

60% DESIGN – NOT FOR CONSTRUCTION

NOTES

1. CONTOURS FROM LIDAR DATA, RECEIVED NOVEMBER 2010, COMBINED WITH SURVEY DATA PROVIDED BY WDFW, RECEIVED NOVEMBER 2013.
2. PARCEL DATA PROVIDED BY WDFW, RECEIVED NOVEMBER 2013.

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE STATE OF WASHINGTON 39326 REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....

PROGRAM ..... DATE: .....

0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM

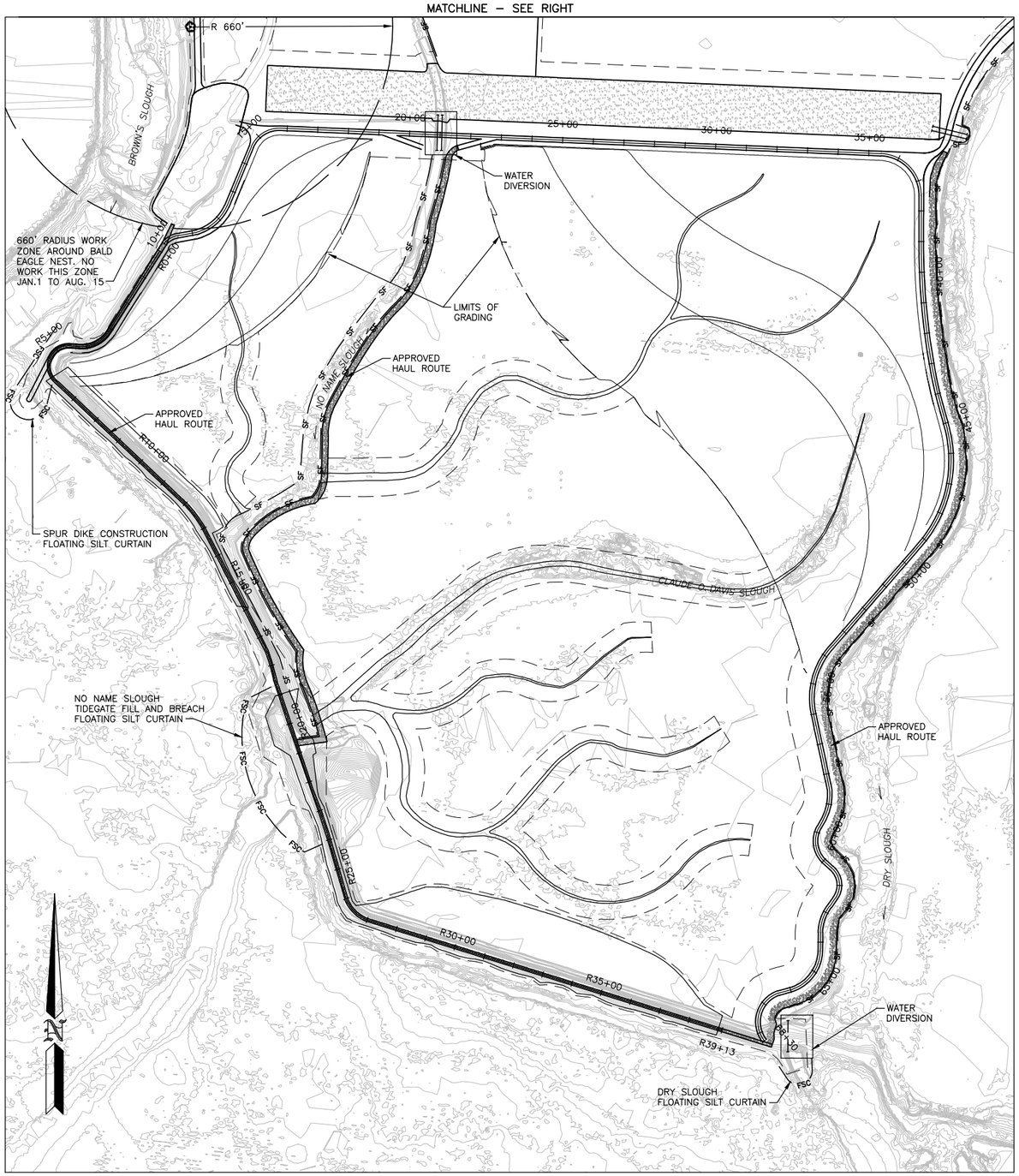
ECOSYSTEM RESTORATION

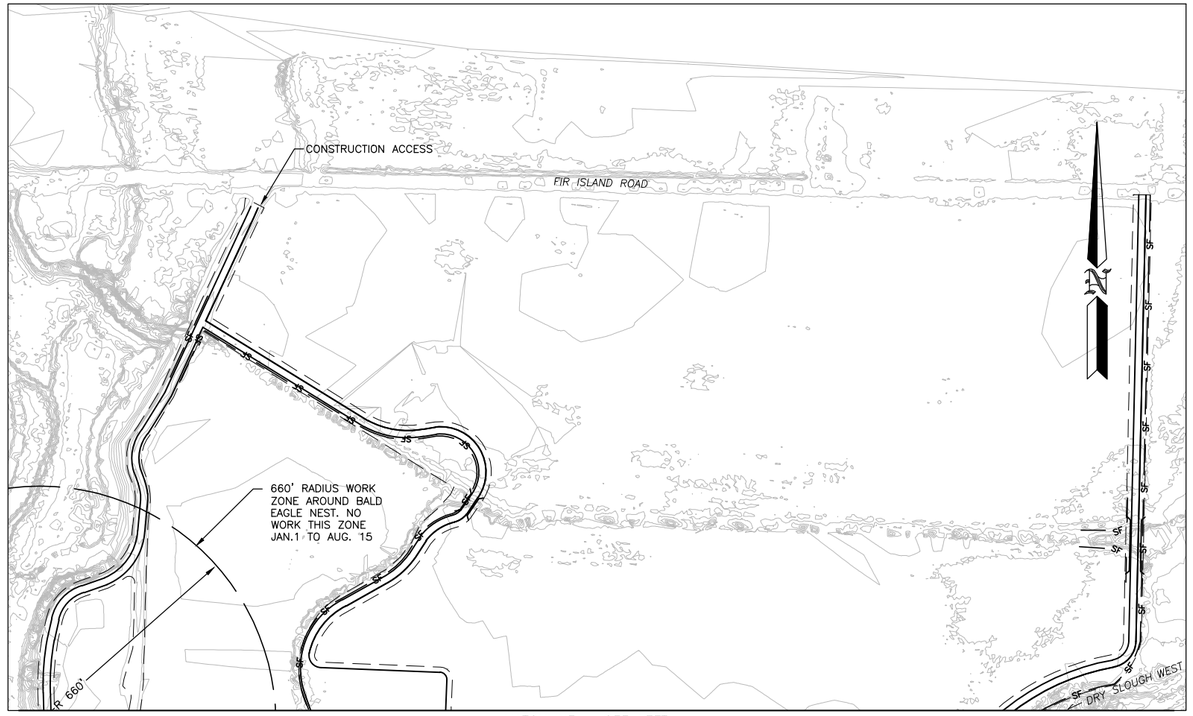
SITE PLAN

PROJECT NO. ST:R4:11-3

SHEET 6 OF 29

P:\ENVIR\...\WDFW 21-11\2318.F\...\dgn\C60\60041\60041113-A\60041113-A006.dgn DATE: 05-14-2014 LOGIN: cnt





SITE PLAN
SCALE: 1" = 300'–0"

NOTES

1. ALONG EAST ACCESS ROAD WHERE SHOWN, INSTALL SILT FENCE JUST INSIDE LIMITS OF CONSTRUCTION.
2. EROSION PROTECTION MEASURES TO BE INSTALLED BEFORE SOIL IS DISTURBED OR GRADING ACTIVITIES BEGIN.

APPROVED HAUL ROUTES
SF — SILT FENCE
FSC — SILT CURTAIN
LIMITS OF CONSTRUCTION

60% DESIGN – NOT FOR CONSTRUCTION

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 39326 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

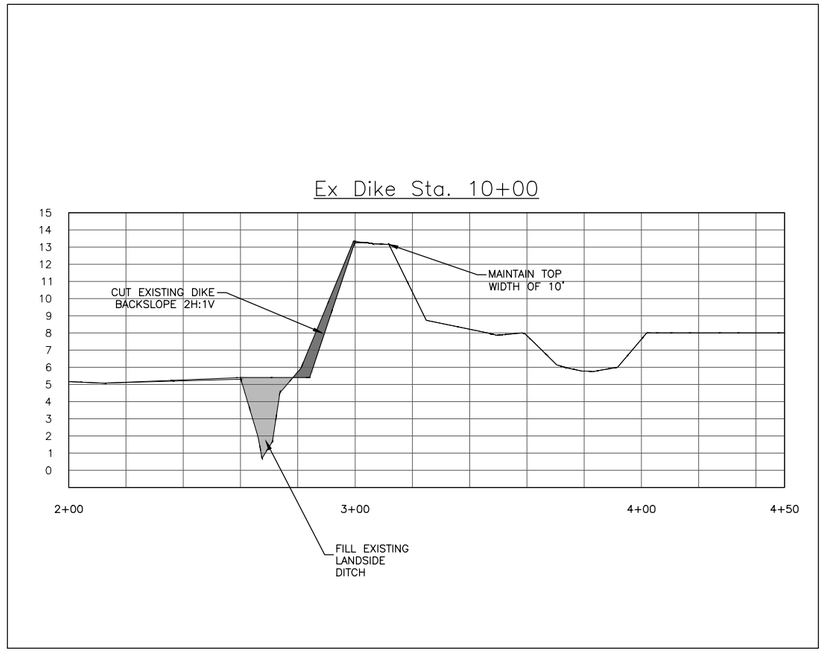
0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

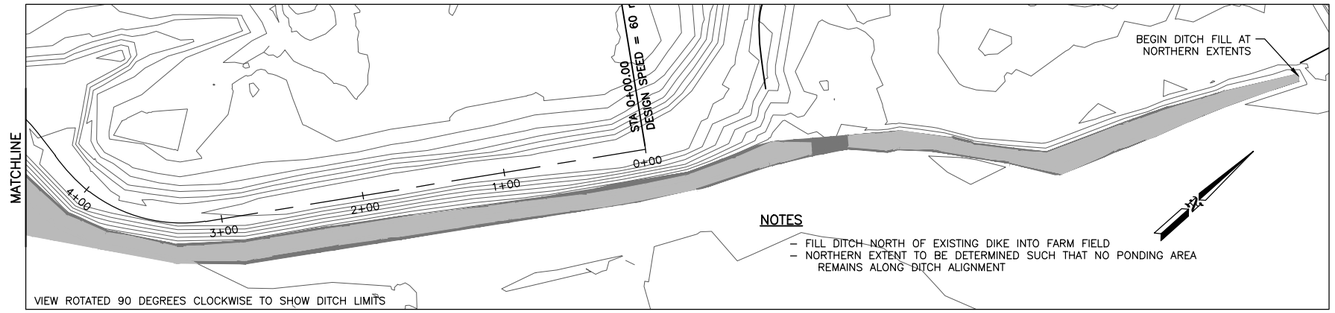
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

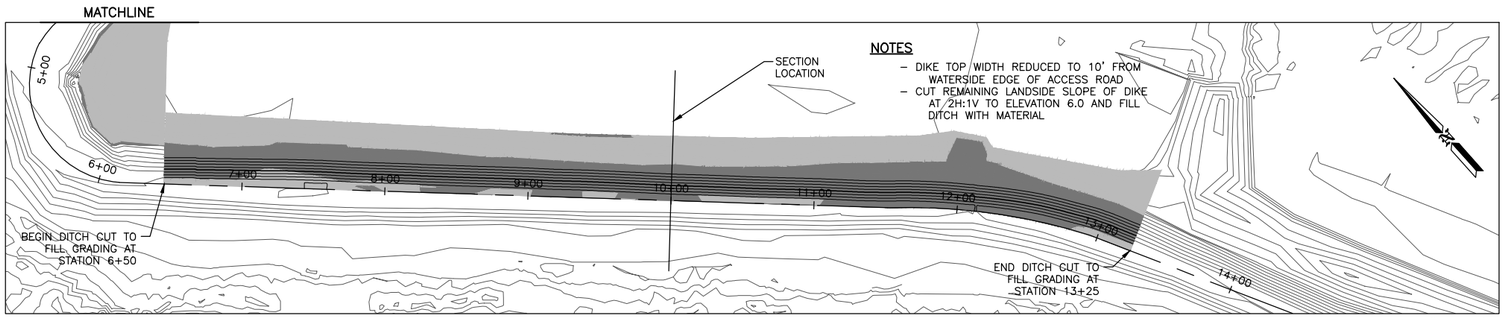
FIR ISLAND FARM
ECOSYSTEM RESTORATION
SITE PREPARATION PLAN

PROJECT NO. ST:R4:11–3
SHEET 7 OF 29

PLOTTED: \\WA1-1\V3318_Fir_Island\CAD\LAYOUTS\R0011136\R0011136002.dgn DATE: 05-15-2014 USER: cnt



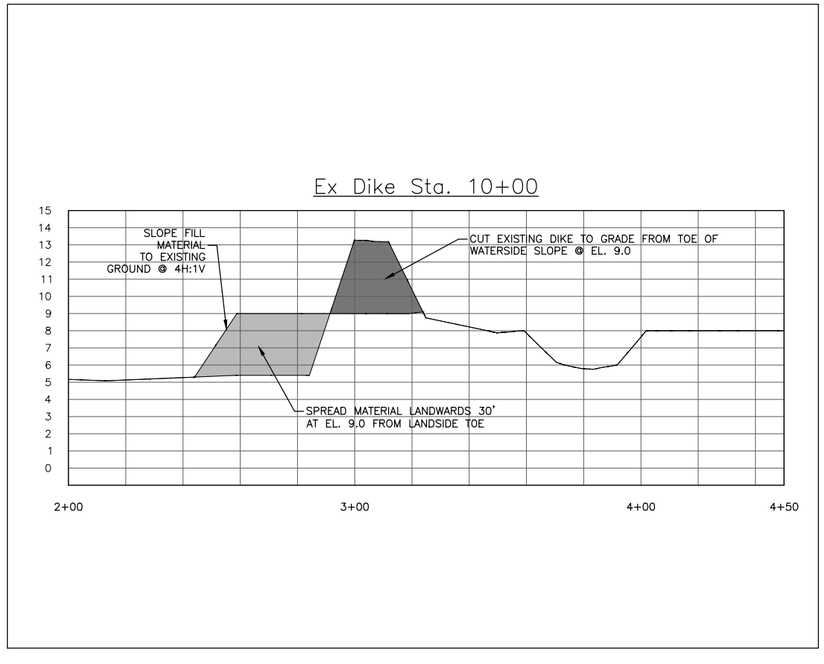


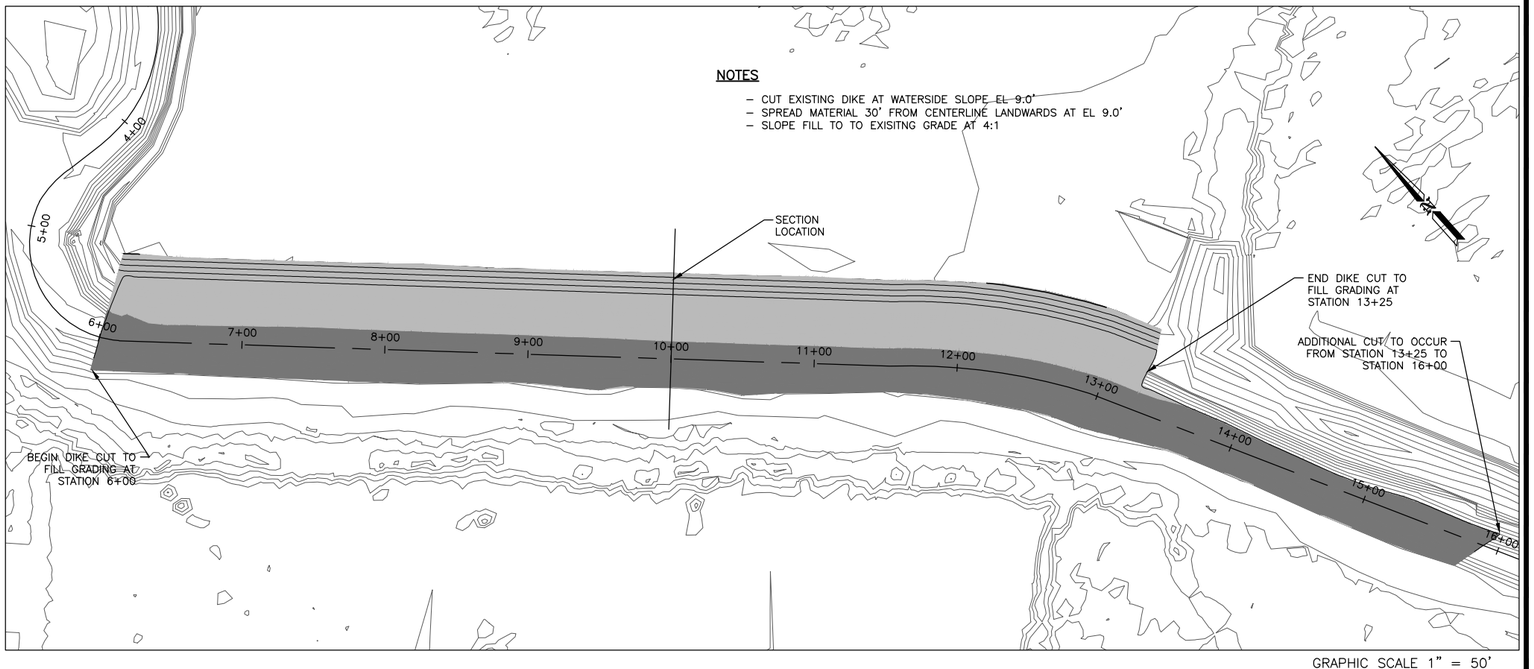


GRAPHIC SCALE 1" = 50'

0 50 100 150

WEST DIKE DITCH FILL (STAGE 1)





GRAPHIC SCALE 1" = 50'

0 50 100 150

WEST DIKE REGRADE (STAGE 2)

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE
STATE OF WASHINGTON
38526
REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....

PROGRAM ..... DATE: .....

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM

ECOSYSTEM RESTORATION

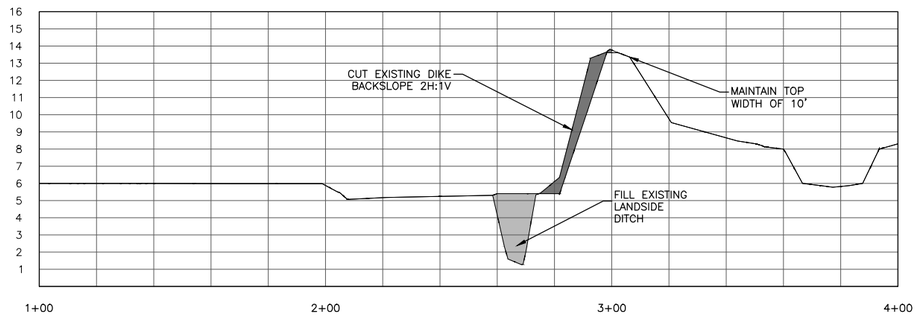
DEMOLITION PLAN AND SECTIONS

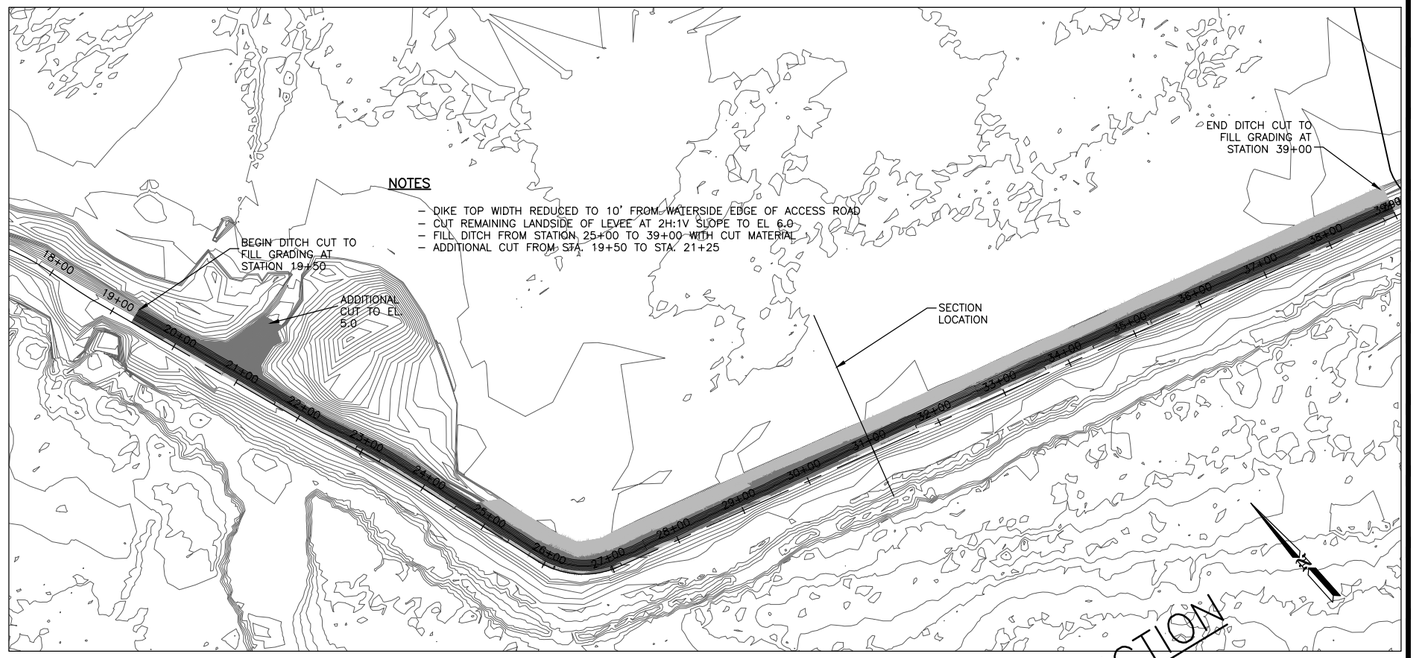
PROJECT NO. ST:R4:11-3

SHEET 8 OF 29

FILENAME: I:\WIP\21-1\12318 Fir Island\CAD\R004\R004113c\R004113c008.dwg DATE: 05-14-2014 LOGIN: cmh

Ex Dike Sta. 31+00



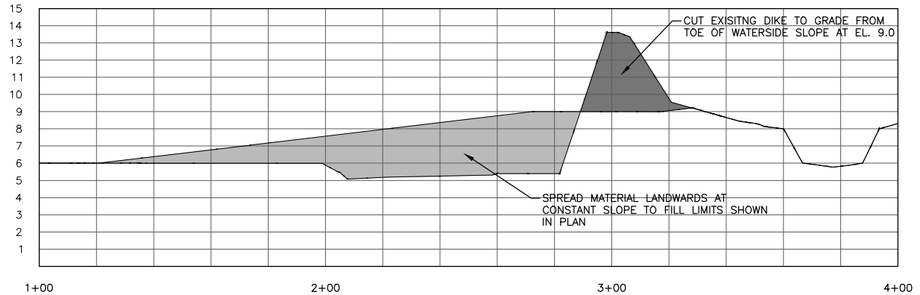


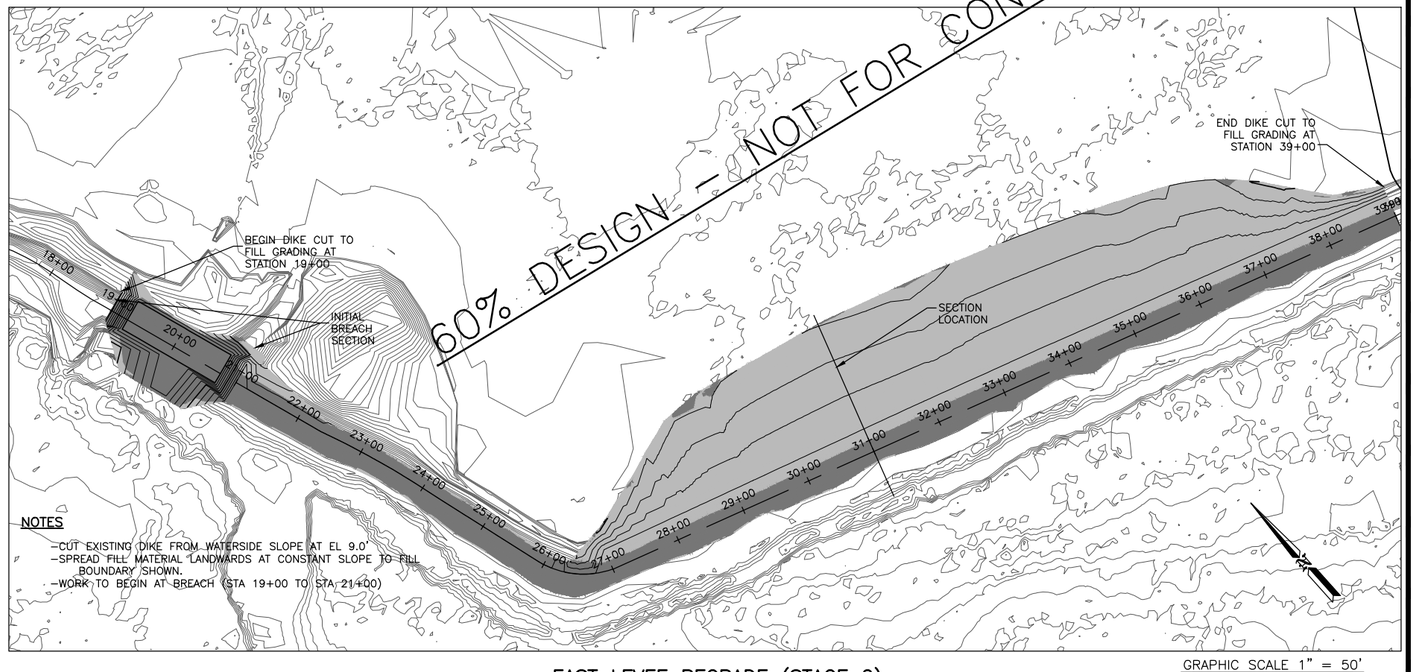
EAST LEVEE DITCH FILL (STAGE 1)

GRAPHIC SCALE 1" = 50'
0 50 100 150

60% DESIGN – NOT FOR CONSTRUCTION

Ex Dike Sta. 31+00





NOTES
–CUT EXISTING DIKE FROM WATERSIDE SLOPE AT EL 9.0'
–SPREAD FILL MATERIAL LANDWARDS AT CONSTANT SLOPE TO FILL BOUNDARY SHOWN.
–WORK TO BEGIN AT BREACH (STA 19+00 TO STA 21+00)

EAST LEVEE REGRADE (STAGE 2)

GRAPHIC SCALE 1" = 50'
0 50 100 150

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE STATE OF WASHINGTON 39326 REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
DEMOLITION PLAN AND SECTIONS
–

PROJECT NO. ST:R4:11–3
SHEET 9 OF 29

P:\EMRS_NWP\V1-1\V1318 Fir Island\CAD\LAYOUTS\041113\A\041113-0009.dwg DATE: 05-14-2014 LOGIN: cmh

REALIGN ACCESS ROAD

LIMITS OF CONSTRUCTION

ACCESS RAMP (TO BE ADDED)

INTERIOR DRAINAGE STORAGE POND

NEW GATE

ACCESS ROAD

ACCESS ROAD

EXISTING GATE

BROWN'S SLOUGH

WDFW SNOW GOOSE RESERVE PARKING LOT

TOE OF DIKE

15' TOP WIDTH ELEV = 15.0 FT

INGRESS RAMP (TO BE ADDED)

MATCHLINE – STA. 25+00 – SEE SHEET 11

(2) NEW 48" TIDEGATES

LOG BOOM DEFLECTOR

PROTECT EXISTING CATCH BASIN

RIPRAP BURIED TOE

LIMITS OF CONSTRUCTION

EXISTING BROWN'S SLOUGH TIDEGATES

LIMITS OF CONSTRUCTION

PROPOSED DIKE ℄ ALIGNMENT

LIMITS OF CONSTRUCTION

STA. 10+00 MATCH EXISTING DIKE AND EXTENSION ELEV 15.0' (SEE SHEET 14)

EXISTING DIKE

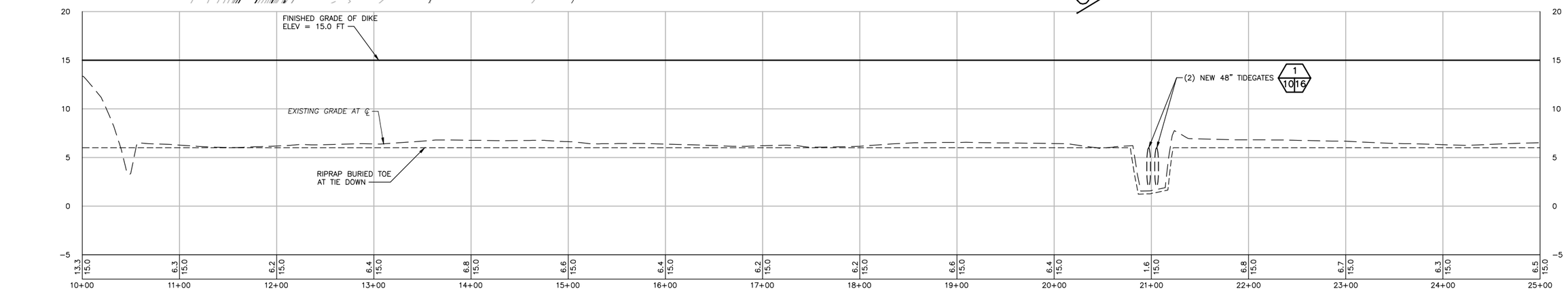
60% DESIGN – NOT FOR CONSTRUCTION

LEGEND

WB EXISTING WETLANDS

SITE PLAN

SCALE: 1" = 50'–0"



GRAPHIC SCALE

0 50 100 150

SCALE: 1" = 50'

PROFILE

HORIZONTAL SCALE: 1" = 50'–0"
VERTICAL SCALE: 1" = 5'–0"

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE STATE OF WASHINGTON 38526 REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE:

PROGRAM ..... DATE:

0 —— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM

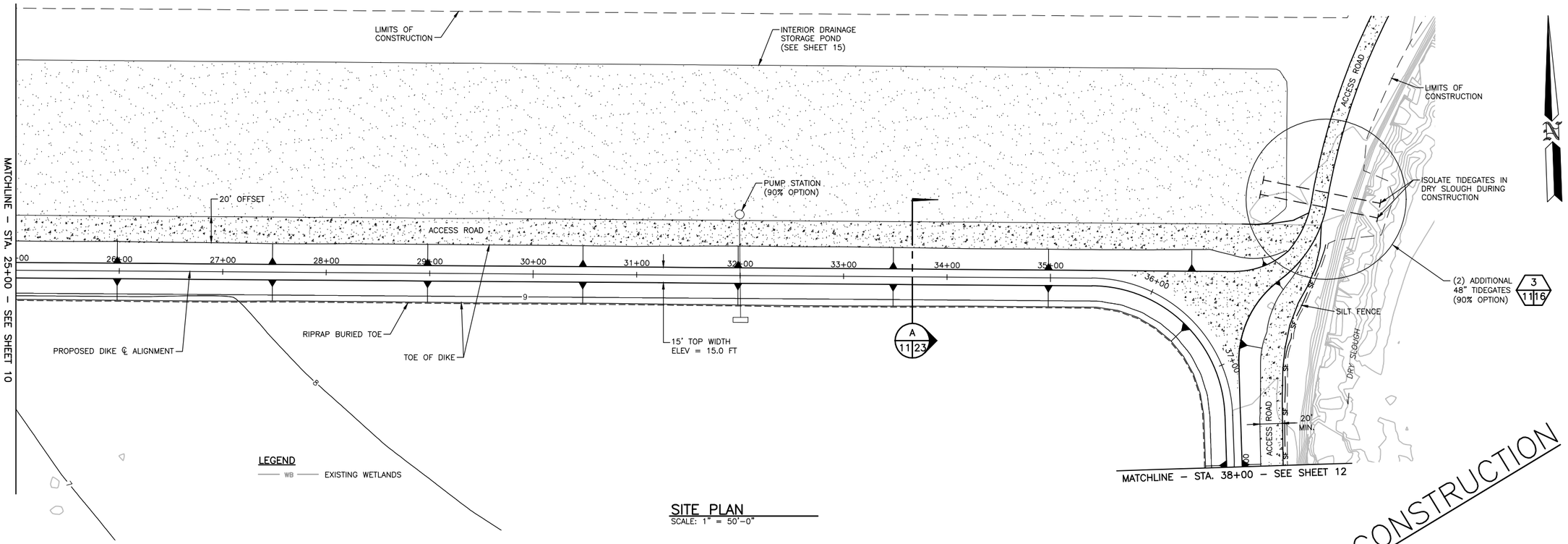
ECOSYSTEM RESTORATION

DIKE SETBACK – PLAN AND PROFILE
STATIONS 10+00 TO 25+00

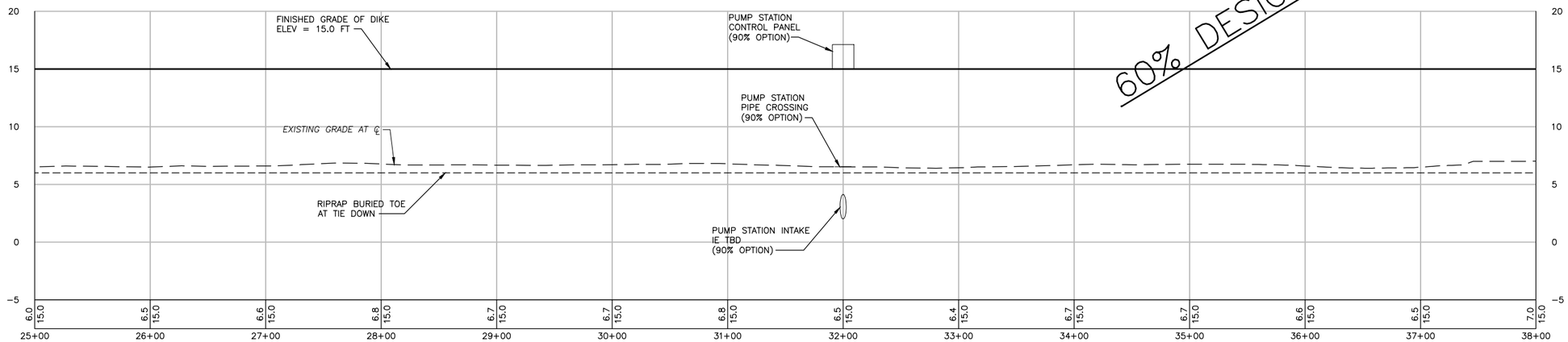
PROJECT NO. ST:R4:11–3

SHEET 10 OF 29

PLOTTED: 6/4/2014 7:18:21 AM By: Chris Tuttle
FILENAME: J:\WP\R4\11\ST11318_Fir Island\CAD\LAYOUTS\R04111s01_0010.dgn DATE: 06-11-2014 100% cnt



SITE PLAN
SCALE: 1" = 50'-0"



PROFILE
HORIZONTAL SCALE: 1" = 50'-0"
VERTICAL SCALE: 1" = 5'-0"

GRAPHIC SCALE
0 50 100 150
SCALE: 1" = 50'

60% DESIGN – NOT FOR CONSTRUCTION

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE STATE OF WASHINGTON 39326 REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

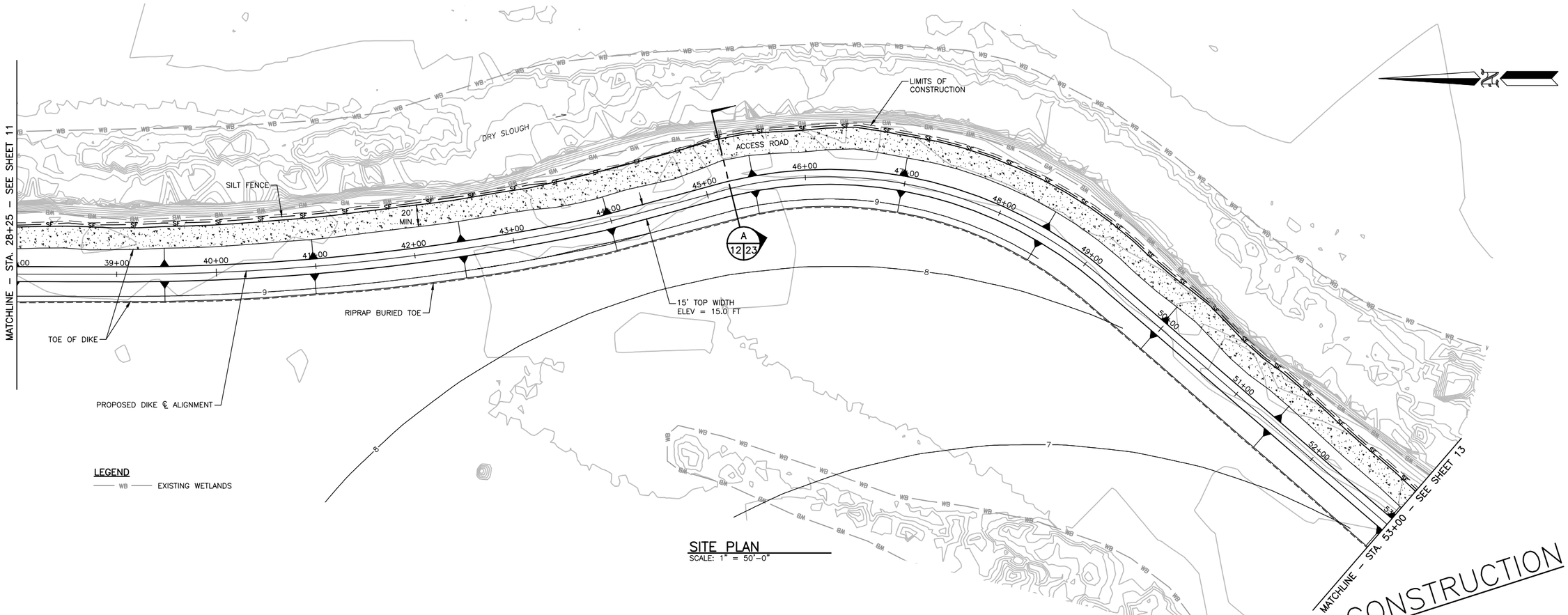
0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

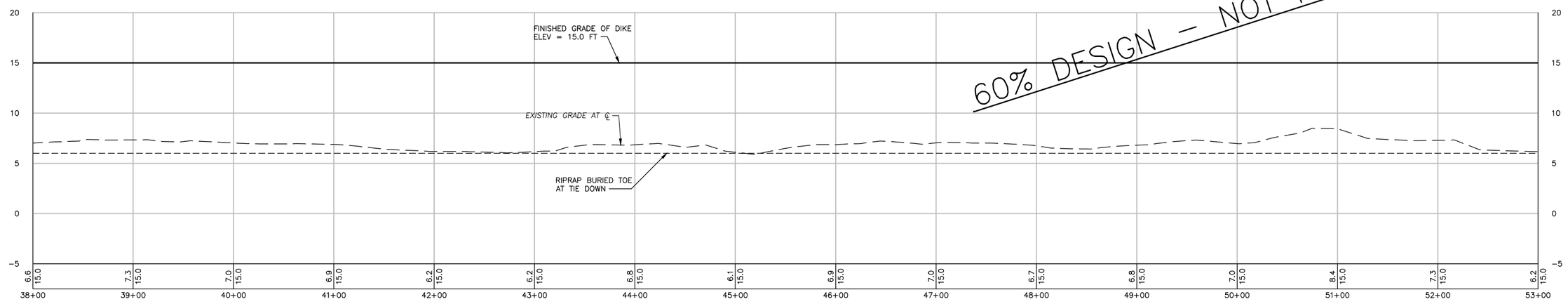
FIR ISLAND FARM
ECOSYSTEM RESTORATION
DIKE SETBACK – PLAN AND PROFILE
STATIONS 25+00 TO 38+00

PROJECT NO. ST:R4:11-3
SHEET 11 OF 29

P:\EVMS\...\MEP\11-11738 Fir Island\CAD\LAYOUTS\11738 LOGNL.ctl DATE: 05-14-2014 LOGNL.ctl



SITE PLAN
SCALE: 1" = 50'–0"



GRAPHIC SCALE
0 50 100 150
SCALE: 1" = 50'

PROFILE
HORIZONTAL SCALE: 1" = 50'–0"
VERTICAL SCALE: 1" = 5'–0"

60% DESIGN – NOT FOR CONSTRUCTION

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE STATE OF WASHINGTON 38328 REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

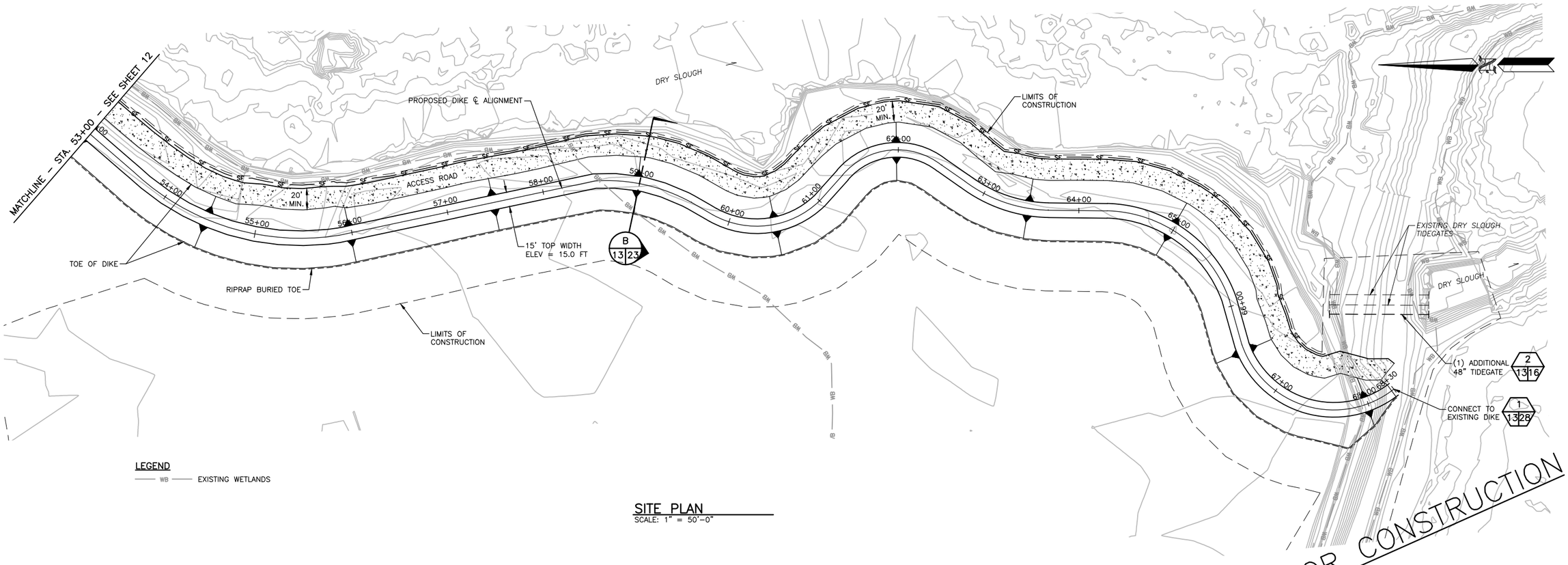
0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

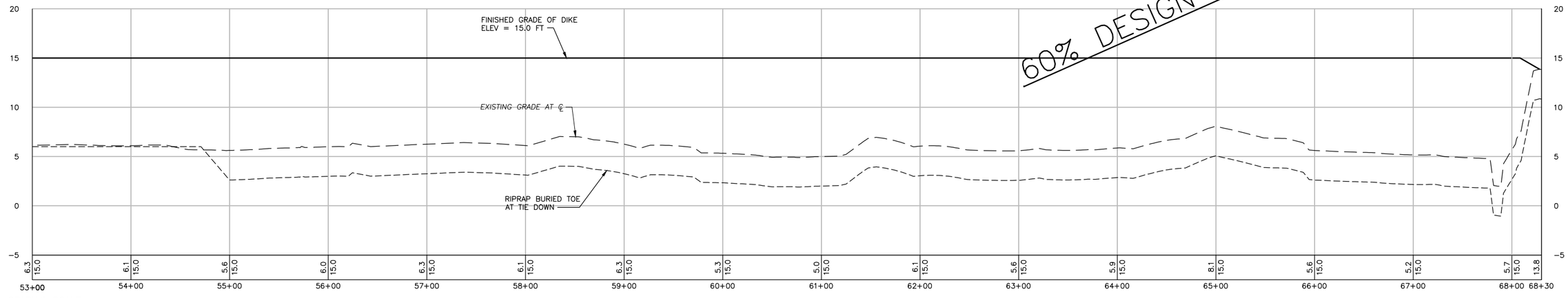
FIR ISLAND FARM
ECOSYSTEM RESTORATION
DIKE SETBACK – PLAN AND PROFILE
STATIONS 38+00 TO 53+00

PROJECT NO. ST:R4:11–3
SHEET 12 OF 29

PLOTNAME: J:\WP\21-1\121318.F1_plans\CAD\L00041\P00041113-L00041113-012.dwg DATE: 05-14-2014 LOGIN: ent



SITE PLAN
SCALE: 1" = 50'–0"



GRAPHIC SCALE
0 50 100 150
SCALE: 1" = 50'

PROFILE
HORIZONTAL SCALE: 1" = 50'–0"
VERTICAL SCALE: 1" = 5'–0"

60% DESIGN – NOT FOR CONSTRUCTION

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE STATE OF WASHINGTON 38326 REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE:
PROGRAM ..... DATE:

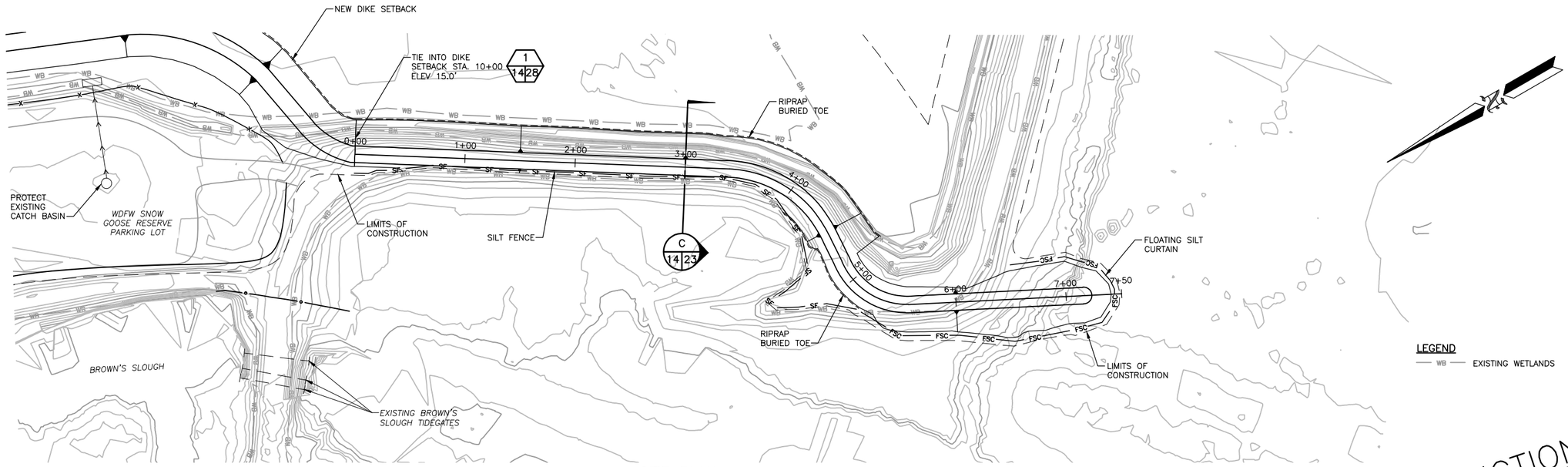
0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

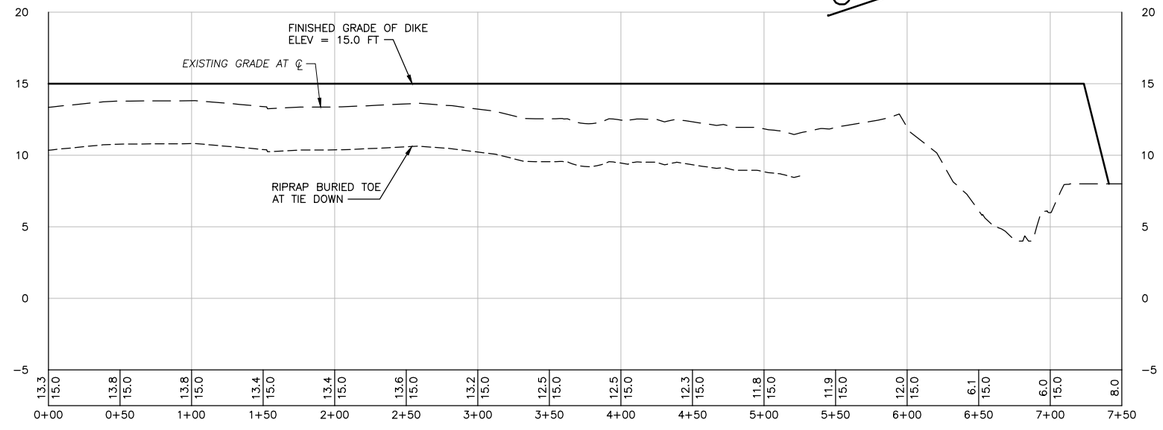
FIR ISLAND FARM
ECOSYSTEM RESTORATION
DIKE SETBACK – PLAN AND PROFILE
STATIONS 53+00 TO 68+30

PROJECT NO. ST:R4:11–3
SHEET 13 OF 29

PLTUSR: jWP0-21-1\1731\8 Fir Island\CAD\BASE\180411\A\180411A013.dgn DATE: 05-14-2014 LOGIN: cnt



SITE PLAN
SCALE: 1" = 50'-0"



PROFILE
HORIZONTAL SCALE: 1" = 50'-0"
VERTICAL SCALE: 1" = 5'-0"

GRAPHIC SCALE
0 50 100 150
SCALE: 1" = 50'

60% DESIGN - NOT FOR CONSTRUCTION

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE STATE OF WASHINGTON 43326 REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

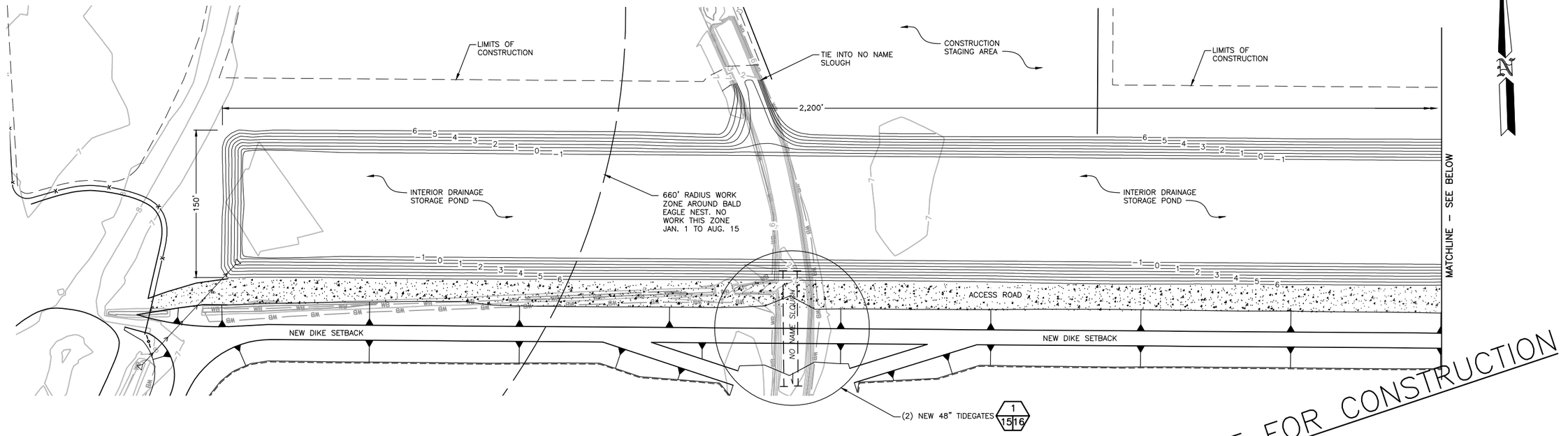
APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

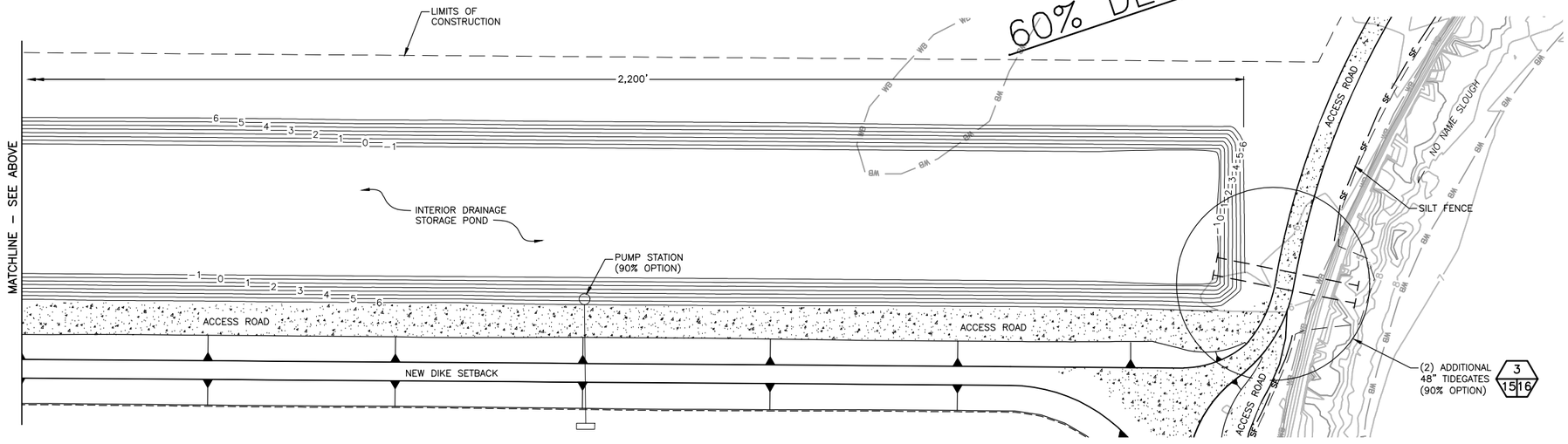
FIR ISLAND FARM
ECOSYSTEM RESTORATION
DIKE EXTENSION
PLAN AND PROFILE

PROJECT NO. ST:R4:11-3
SHEET 14 OF 29

PLOTTED: 15-MAY-14 BY: CNT
FILENAME: N:\WP\21-N\21318 Fir Island\CAD\LAYOUTS\R4\11-3\R4S11-3x14.dgn DATE: 05-15-2014 LOGON: cnt



60% DESIGN – NOT FOR CONSTRUCTION



GRAPHIC SCALE
0 50 100 150
SCALE: 1" = 50'

SITE PLAN
SCALE: 1" = 50'-0"

LEGEND
- EXISTING CONTOUR
- PROPOSED CONTOUR
- WB EXISTING WETLANDS

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE STATE OF WASHINGTON 39326 REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

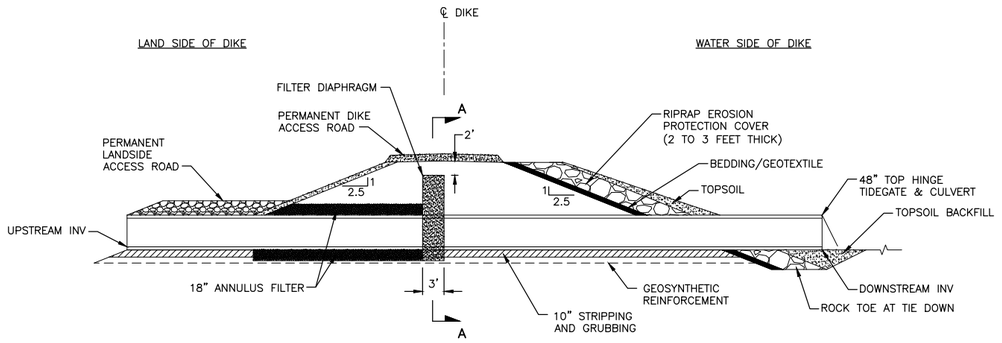
0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

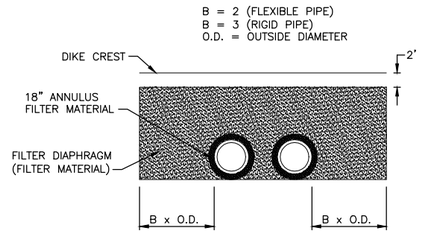
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
INTERIOR DRAINAGE STORAGE POND
GRADING PLAN

PROJECT NO. ST:R4:11-3
SHEET 15 OF 29

PLOTTED: 05-15-2014 10:09a cnt
P:\PROJ\...\V1\318_Fir Island\CAD\LAYOUT\A1\60%\113a1160%.dgn



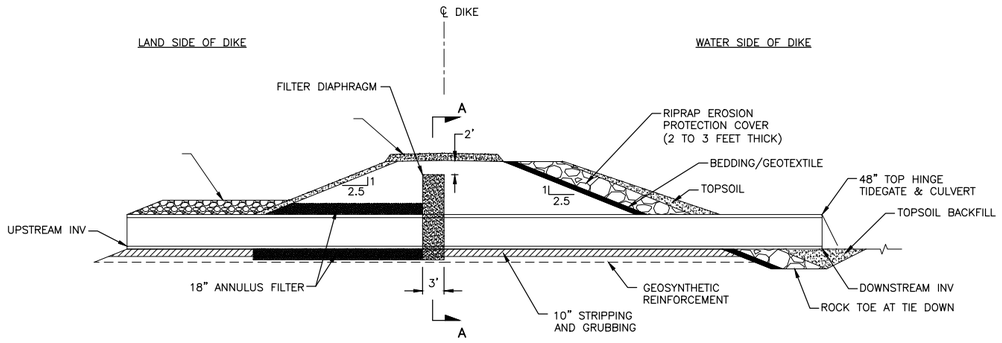


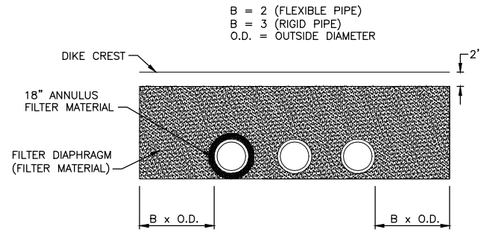
SECTION A–A

DETAIL – TYPICAL 48" TIDEGATE (DIKE)

SCALE: 1" = 10'–0"

1 / X|16



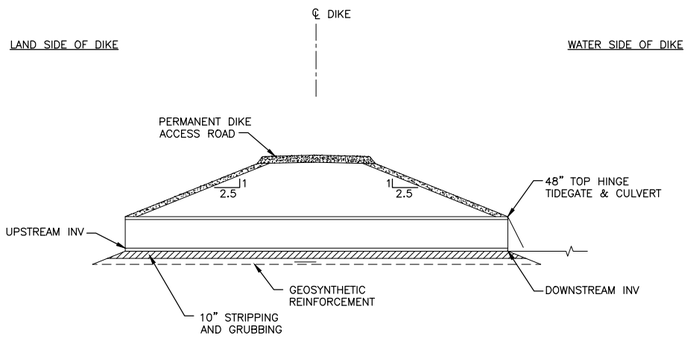


SECTION A–A

DETAIL – TYPICAL 48" TIDEGATE (DRY SLOUGH)

SCALE: 1" = 10'–0"

2 / X|16



DETAIL – TYPICAL 48" TIDEGATE (ACCESS ROAD)

SCALE: 1" = 10'–0"

3 / X|16

TIDEGATE #	LOCATION	DETAIL #	PIPE DIAMETER	TYPE	UPSTREAM INVERT	DOWNSTREAM INVERT	CREST ELEVATION
1	NO NAME SLOUGH WEST CULVERT	1	4'–0"	CORRUGATED POLYETHYLENE PIPE	1.99	1.99	15
2	NO NAME SLOUGH EAST CULVERT	1	4'–0"	CORRUGATED POLYETHYLENE PIPE	1.99	1.99	15
3	DRY SLOUGH ADDITIONAL CULVERT	2	4'–0"	CORRUGATED POLYETHYLENE PIPE	1.89	1.67	13.8
4	POND TO DRY SLOUGH CONNECTION NORTH CULVERT	3	4'–0"	CORRUGATED POLYETHYLENE PIPE	2.50	2.43	8
5	POND TO DRY SLOUGH CONNECTION SOUTH CULVERT	3	4'–0"	CORRUGATED POLYETHYLENE PIPE	2.50	2.43	8

60% DESIGN – NOT FOR CONSTRUCTION

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 39526 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....

PROGRAM ..... DATE: .....

0 —— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
TIDEGATE INSTALLATIONS
PLAN AND DETAILS

PROJECT NO. ST:R4:11–3
SHEET 16 OF 29

PLOTTED: 6/4/2014 7:21:13 AM By: mbeck
FILE NAME: J:\WO\21-11\2318.Fir Island\CAD\L000\A000411\a000411s5016.dgn DATE: 06-15-2014 L000s.ctb

PLACEHOLDER FOR 90%

CURRENTLY NOT UNDER CONTRACT

60% DESIGN – NOT FOR CONSTRUCTION

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE
STATE OF WASHINGTON
38326
REGISTERED
PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....

PROGRAM ..... DATE: .....

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM

ECOSYSTEM RESTORATION
INTERIOR STORAGE POND
PUMP STATION PLAN

PROJECT NO. ST:R4:11–3

SHEET 17 OF 29

FILENAME: I:\WIP\21-1\12318 Fir Island\CAD\R004\R004113c\R004113c017.dwg DATE: 05-15-2014 LOGIN: cnt

PLACEHOLDER FOR 90%

CURRENTLY NOT UNDER CONTRACT

60% DESIGN – NOT FOR CONSTRUCTION

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE
STATE OF WASHINGTON
38326
REGISTERED
PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....

PROGRAM ..... DATE: .....

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM

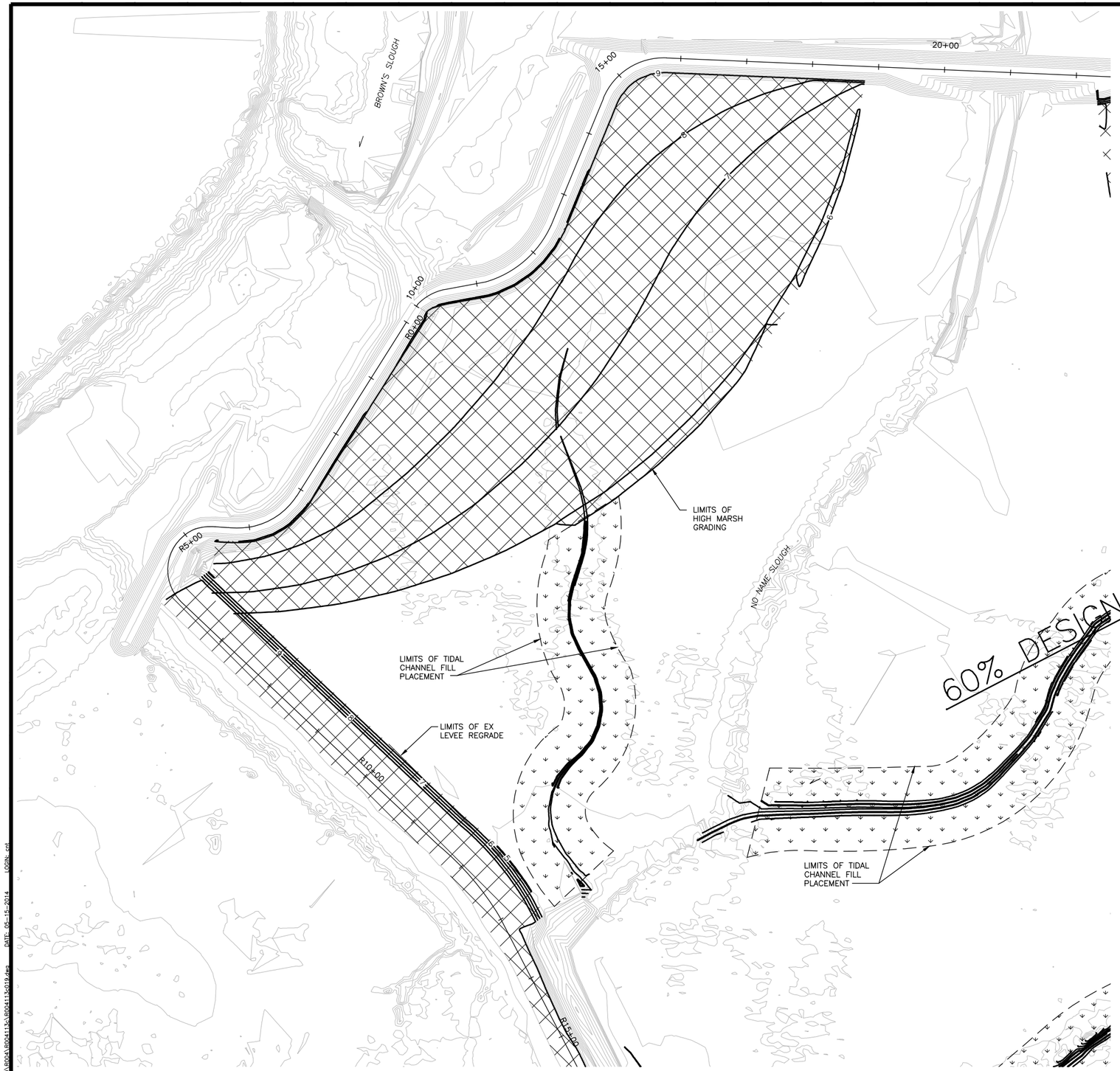
ECOSYSTEM RESTORATION

PUMP STATION DETAIL

PROJECT NO. ST:R4:11-3

SHEET 18 OF 29

FILENAME: I:\WIP\21-1\12318 Fir Island\CAD\R004\R004113c\R004113c018.dwg DATE: 05-15-2014 LOGIN: cnt



KEY PLAN

N

TIDAL CUT AND SPREAD LIMITS

HIGH MARSH GRADING

NOTES

1. UPPER MARSH AREA TO BE GRADED WITH FILL FROM PROPOSED INTERIOR DRAINAGE STORAGE POND EXCAVATION.
2. TIDAL CHANNELS OUTSIDE OF HIGH MARSH GRADING AREA TO BE EXCAVATED TO DEPTH SHOWN, AND SPOIL TO BE SPREAD 50' ON EITHER SIDE.
3. ALL SEDIMENT CONTROL MEASURES SHALL BE IN PLACE BEFORE GROUND IS DISTURBED.
4. CONTRACTOR SHALL PROTECT THE MAIN REACH OF NO NAME SLOUGH DURING TIDAL CHANNEL EXCAVATION.

SITE PLAN

SCALE: 1" = 80'-0"

GRAPHIC SCALE

0 80 160 240

SCALE: 1" = 80'

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 39526 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....

PROGRAM ..... DATE: .....

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM

ECOSYSTEM RESTORATION

MARSH GRADING AND PILOT CHANNEL PLANS

PROJECT NO. ST:R4:11-3

SHEET 19 OF 29

PLOTTED: 16 MAY 2014 - 11:19AM By: jdrago
F:\projects\0900\0904\09041113\active\904111300.dgn DATE: 05-15-2014 L0001.ctb

SITE PLAN
SCALE: 1" = 80'-0"

KEY PLAN

NOTES

1. UPPER MARSH AREA TO BE GRADED WITH FILL FROM PROPOSED INTERIOR DRAINAGE STORAGE POND EXCAVATION.
2. TIDAL CHANNELS OUTSIDE OF HIGH MARSH GRADING AREA TO BE EXCAVATED TO DEPTH SHOWN, AND SPOIL TO BE SPREAD 50' ON EITHER SIDE.
3. ALL SEDIMENT CONTROL MEASURES SHALL BE IN PLACE BEFORE GROUND IS DISTURBED.
4. CONTRACTOR SHALL PROTECT THE MAIN REACH OF NO NAME SLOUGH DURING TIDAL CHANNEL EXCAVATION.

60% DESIGN – NOT FOR CONSTRUCTION

TIDAL CUT AND SPREADING LIMITS

HIGH MARSH GRADING

GRAPHIC SCALE
0 80 160 240
SCALE: 1" = 80'

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE STATE OF WASHINGTON 18332 REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
MARSH GRADING AND PILOT CHANNEL PLANS

PROJECT NO. ST:R4:11-3
SHEET 20 OF 29

PLOTTED: J:\WP\21-1\13218.F1_plans\CAD\LOG\L800\11A\L800211A-L800211A-0010.dgn DATE: 05-15-2014 LOGIN: cnt

SITE PLAN
SCALE: 1" = 80'-0"

KEY PLAN

NOTES

1. UPPER MARSH AREA TO BE GRADED WITH FILL FROM PROPOSED INTERIOR DRAINAGE STORAGE POND EXCAVATION.
2. TIDAL CHANNELS OUTSIDE OF HIGH MARSH GRADING AREA TO BE EXCAVATED TO DEPTH SHOWN, AND SPOIL TO BE SPREAD 50' ON EITHER SIDE.
3. ALL SEDIMENT CONTROL MEASURES SHALL BE IN PLACE BEFORE GROUND IS DISTURBED.
4. CONTRACTOR SHALL PROTECT THE MAIN REACH OF NO NAME SLOUGH DURING TIDAL CHANNEL EXCAVATION.

60% DESIGN – NOT FOR CONSTRUCTION

GRAPHIC SCALE
0 80 160 240
SCALE: 1" = 80'

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 38526 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

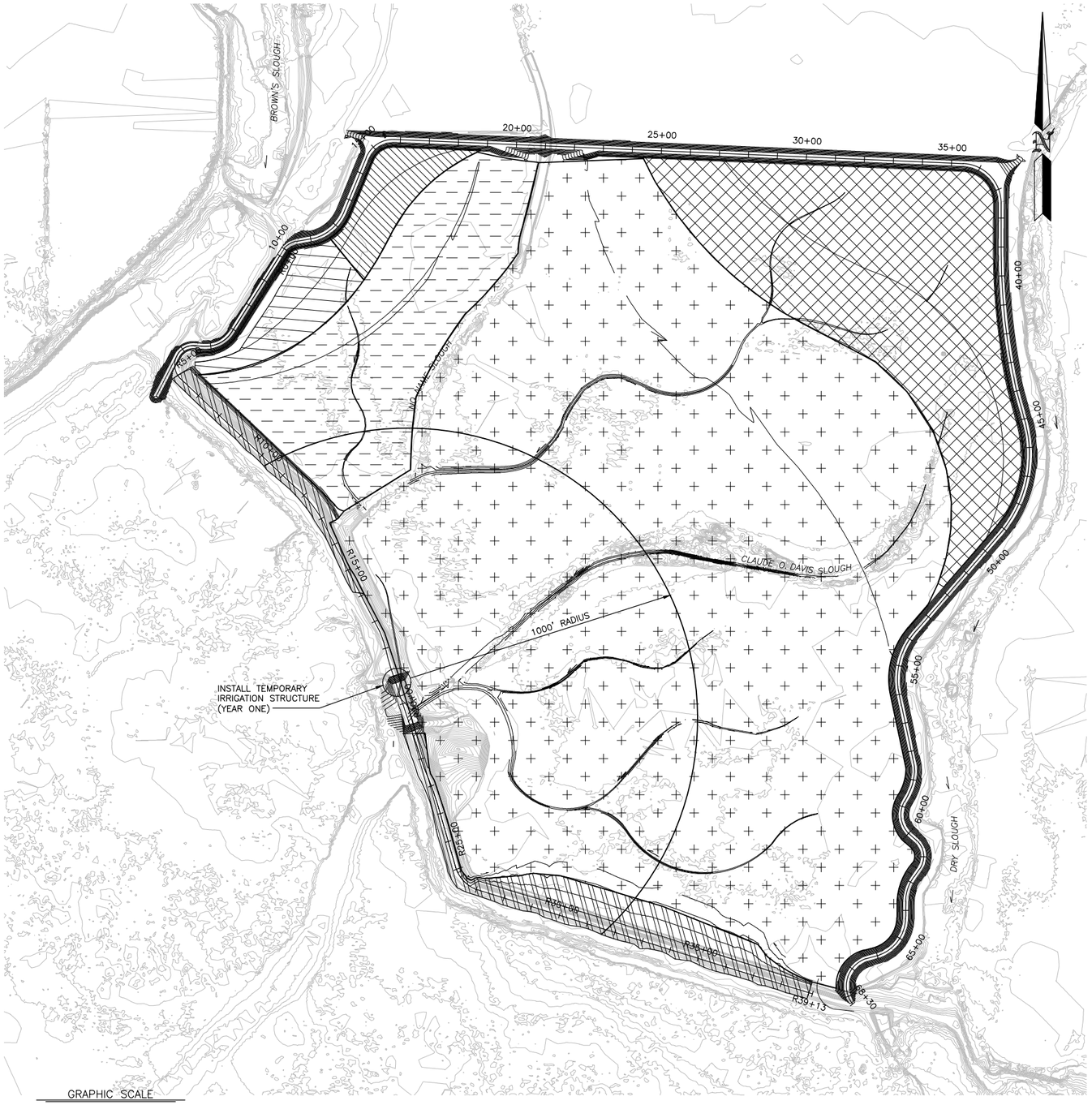
0 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
MARSH GRADING AND PILOT CHANNEL PLANS

PROJECT NO. ST:R4:11-3
SHEET 21 OF 29

P:\DWG\...\A1\19318_P1-...\dgn\C01L0004L0004113A0004113d021.dgn DATE: 06-15-2014 L003fs.cnt



GRAPHIC SCALE

0 200 400 600

SCALE: 1" = 200'

SITE PLAN

SCALE: 1" = 200'-0"

Legend	Site Location	Scientific Name	Common Name	Unit Type	Seeding Rate (lbs/acres)	Acres	Total Lbs of Seed	Notes
	Dike Side Slopes	*Triticum aestivum x Elytrigia elongata (hybrid)*	Wheatgrass, sterile*	PLS	10	7.9	79.0	Hydroseed levee side slopes with wood cellulose long-fiber mulch and slow-release granual fertilizer above Elev. 9.0 feet.
		Agrostis stolonifera	Creeping bentgrass		3		23.7	
		Festuca rubra	Fescue, Creeping Red		15		118.5	
		Festuca trachyphylla	Fescue, Hard		10		79.0	
		Lolium perenne 'Amazing GS'	Ryegrass, 'Amazing GS' Perennial		20		158.0	
		Lolium perenne ssp. multiflorum	Ryegrass, Annual or Italian		20		158.0	
	Zone 1: High Marsh (> Elev. 7 ft)	*Triticum spp.*	Winter wheat	PLS	60	18.3	1,098.0	Hydroseed High Marsh, Zones 1, 2, and 3 with wood cellulose long-fiber mulch between Elev. 7.0 to 9.0 feet.
		Agrostis stolonifera	Creeping bentgrass		3		54.9	
		Distichlis spicata	Inland saltgrass		6		109.8	
	Zone 2: High Marsh (> Elev. 7 ft)	*Triticum spp.*	Winter wheat	PLS	60	2.0	120.6	
		Agrostis stolonifera **	Creeping bentgrass	Seed	3		6.0	
		Carex Lyngbyei **	Lyngbye's sedge		18		36.2	
		Juncus balticus **	Baltic rush		2		4.0	
	Zone 3: High Marsh (> Elev. 7 ft)	*Triticum spp.*	Winter wheat	PLS	60	2.0	122.4	
	Zone 4: High Marsh (> Elev. 7 ft)	None	N/A	N/A	N/A	5.6	N/A	None
	Zone 5: Low Marsh (< Elev. 7 ft.)	*Triticum spp.*	Winter wheat	PLS	60	84.9	5,095.2	Hydroseed Low Marsh, Zones 5 and 6 with wood cellulose long-fiber mulch below Elev. 7.0 feet.
		Agrostis stolonifera	Creeping bentgrass		3		254.8	
		Schoenoplectus acutus	Hardstem bulrush		4		339.7	
		Schoenoplectus maritimus	Alkali bulrush		8		679.4	
	Zone 6: Low Marsh (< Elev. 7 ft)	*Triticum spp.*	Winter wheat	PLS	60	12.7	760.8	

PLS = Pure Live Seed

* Sterile wheatgrass shall be a single-season cover crop for erosion control purposes, such as Regreen™ or similar.

** Native seed to be collected from adjacent high marsh environment in Skagit Bay and shall be free of Typha sp seed.

NOTES

1. INSTALL TEMPORARY IRRIGATION SYSTEM IN YEAR 1 TO DELIVER WATER FROM INTERIOR DRAINAGE(S) TO LOW MARSH WITHIN 1,000 FEET OF THE BREACH LOCATION. TEMPORARY IRRIGATION SYSTEM SHALL BE SCREENED APPROPRIATELY TO PROTECT FISH PRESENT WITHIN INTERIOR DRAINAGES.
2. IRRIGATION SHALL OCCUR IN THE LOW MARSH AS DEFINED IN NOTE 1, TWO TO THREE TIMES PER WEEK AT A RATE OF 1 INCH PER WEEK FOLLOWING SEED APPLICATION THROUGH OCTOBER 1 DURING YEAR 1 AND FROM MARCH 15 UNTIL ONE WEEK PRIOR TO THE DIKE BREACH DURING YEAR 2.
3. REMOVE ALL HAUL ROUTES, ACCESS, STAGING, STOCKPILE AREAS, AND TEMPORARY CONSTRUCTION FACILITIES. ALL DISTURBED AREAS SHALL BE GRADED TO MATCH PLANS OR TO EXISTING GRADE PRIOR TO SEED APPLICATION.
4. ALL GRAVEL OR ROCK USED IN TEMPORARY ROADS, PARKING, OR STAGING AREAS SHALL BE COMPLETELY REMOVED AND DISPOSED OF OFF-SITE.
5. COMPACTED SOILS, AS A RESULT OF HEAVY EQUIPMENT TRAVEL, SHALL BE SCARIFIED OR THOROUGHLY TILLED TO REDUCE COMPACTION. THIS SHALL TAKE PLACE PRIOR TO SEEDING.
6. ALL CATTAIL (Typha sp.) SHALL BE REMOVED FROM THE RESTORED AREA PRIOR TO SEEDING. THIS MAY OCCUR THROUGH GRUBBING, SELECTIVE CHEMICAL TREATMENT BY A LICENSED APPLICATOR, OR OTHER MEANS APPROVED BY THE OWNER.
7. SEEDING SHALL OCCUR IN MID-SEPTEMBER DURING YEAR 1.
8. ALL SEEDED AREAS SHALL BE HYDROSEEDED WITH A WOOD CELLULOSE LONG-FIBER MULCH PER THE SPECIFICATIONS
9. UNLESS AUTHORIZED BY OWNER, CONSTRUCTION ACTIVITIES AND EQUIPMENT SHALL AVOID IMPACT TO SEEDED AREAS DURING YEAR 1.
10. BEGIN DIKE BREACH AFTER ESTABLISHMENT OF MARSH SEED. REMOVE IRRIGATION HEADWORKS AS NEEDED.

60% DESIGN - NOT FOR CONSTRUCTION

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE STATE OF WASHINGTON 38526 REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....

PROGRAM ..... DATE: .....

0 1" BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM

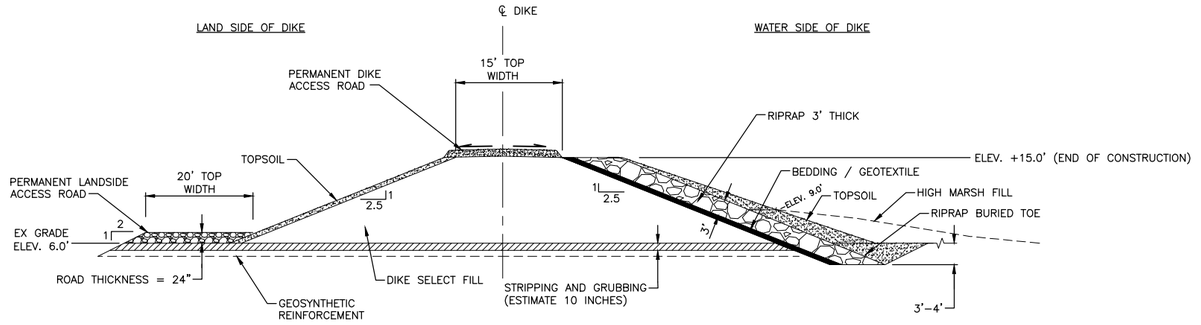
ECOSYSTEM RESTORATION

PLANTING AND SEEDING PLAN

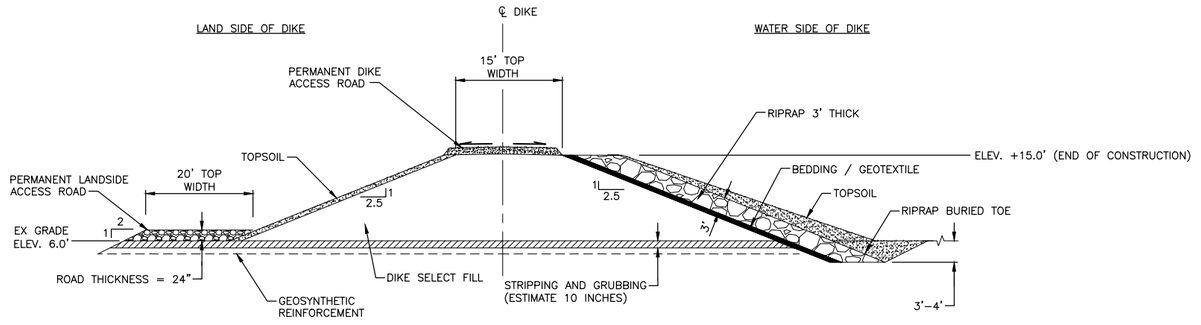
PROJECT NO. ST:R4:11-3

SHEET 22 OF 29

P:\FIMS\...\WP\21-11731\8_Fir Island\CAD\BOA\B004113\A\B004113-0022.dgn DATE: 05-15-2014 LOGN: crt



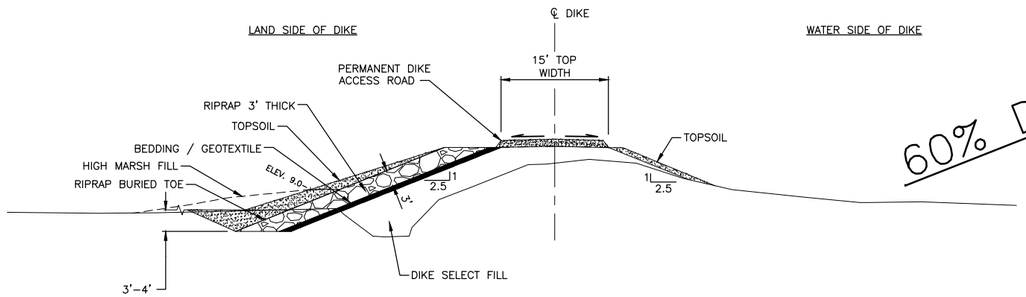
TYPICAL DIKE SECTION (HIGH MARSH GRADING) STA. 10+00 TO 54+00 (A 10,11,12|23)
SCALE: 1" = 10'–0"



TYPICAL DIKE SECTION (NO HIGH MARSH GRADING) STA. 54+00 TO 68+00 (B 13|23)
SCALE: 1" = 10'–0"

NOTE

BACKFILL 10" STRIPPING AND GRUBBING DEPTH WITH DIKE SELECT FILL.



TYPICAL DIKE SECTION DIKE SPUR STA. 0+00 TO 7+50 (C 14|23)
SCALE: 1" = 10'–0"

60% DESIGN – NOT FOR CONSTRUCTION

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 39326 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

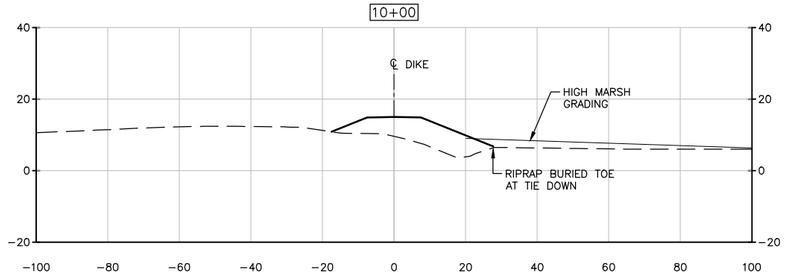
0 —— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

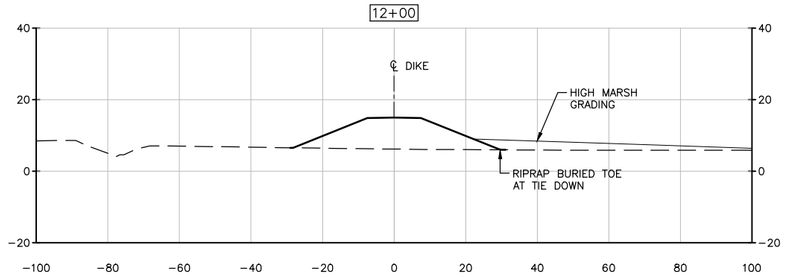
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

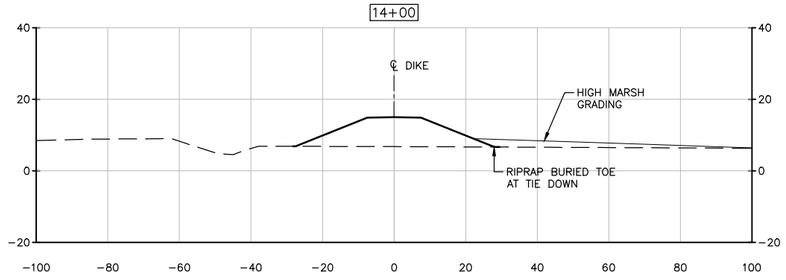
FIR ISLAND FARM
ECOSYSTEM RESTORATION
TYPICAL DIKE SETBACK DETAIL

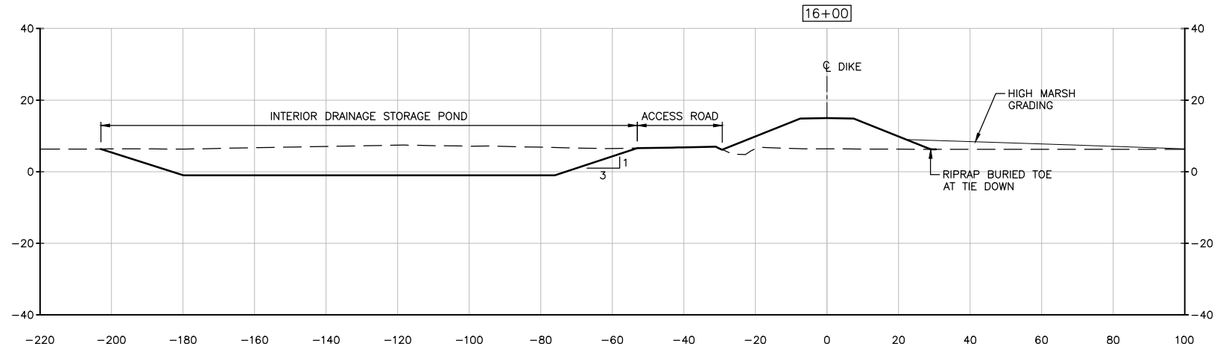
PROJECT NO. ST:R4:11–3
SHEET 23 OF 29

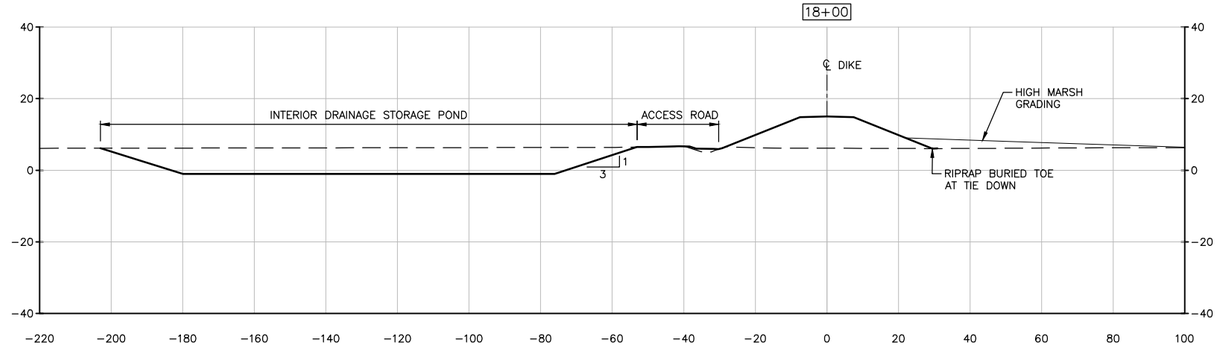
P:\EVMS\...\WRP\11-11738 Fir Island\CAD\L8004\L8004113\A\L8004113-0023.dgn DATE: 05-15-2014 LOGIN: cnt

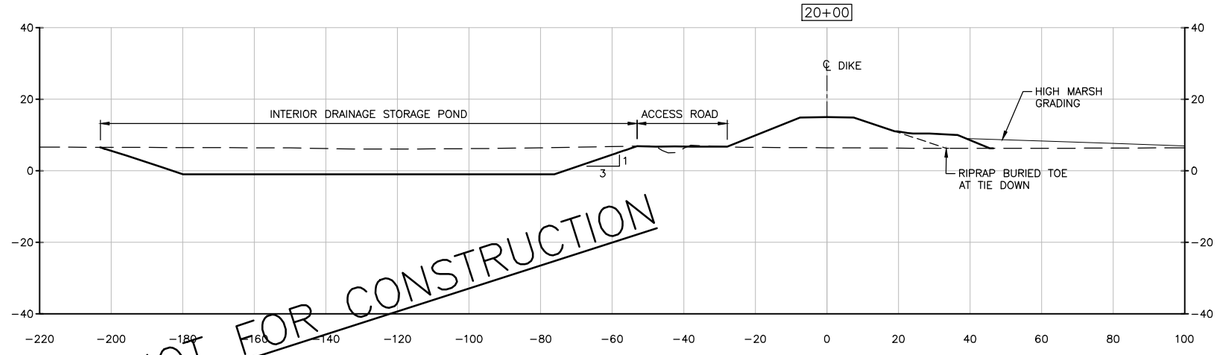


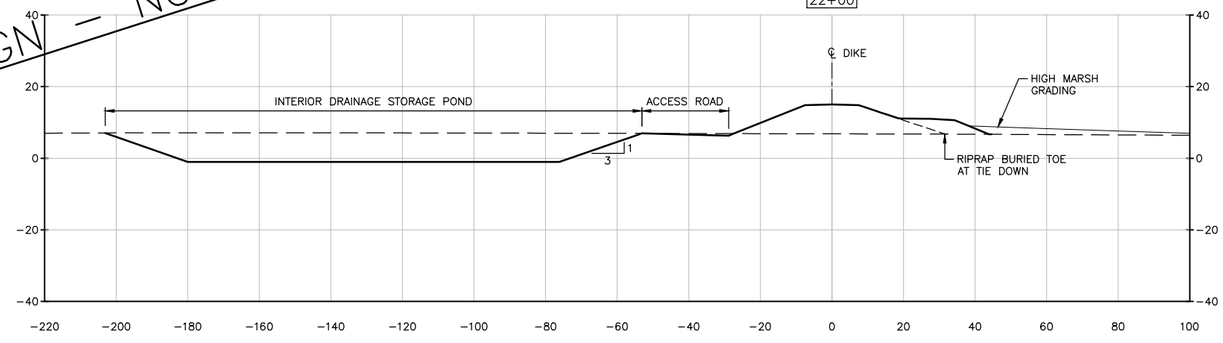












60% DESIGN – NOT FOR CONSTRUCTION

GRAPHIC SCALE
0 20 40 60
SCALE: 1" = 20'

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 39526 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....

PROGRAM ..... DATE: .....

0 —— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM

ECOSYSTEM RESTORATION

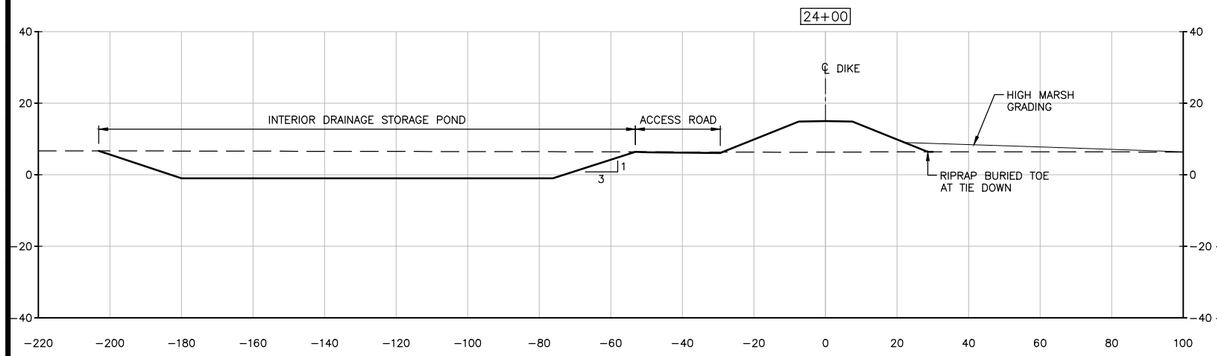
DIKE SETBACK CROSS SECTIONS

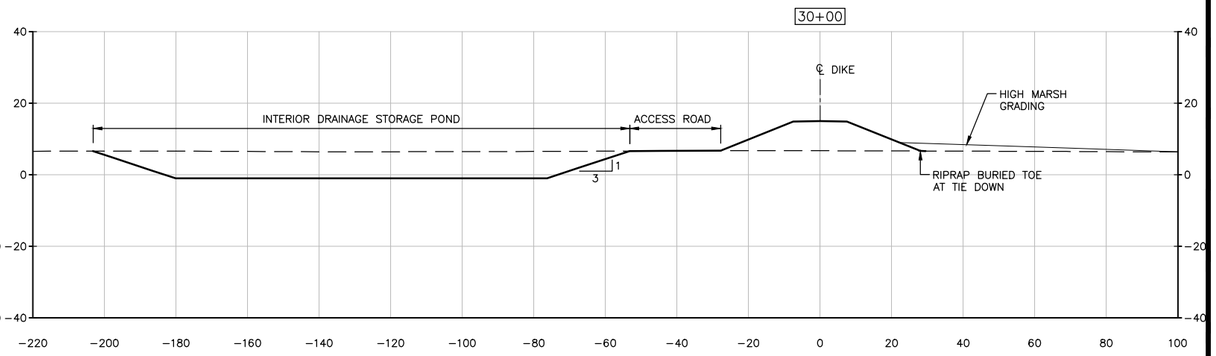
STATIONS 10+00 TO 22+00

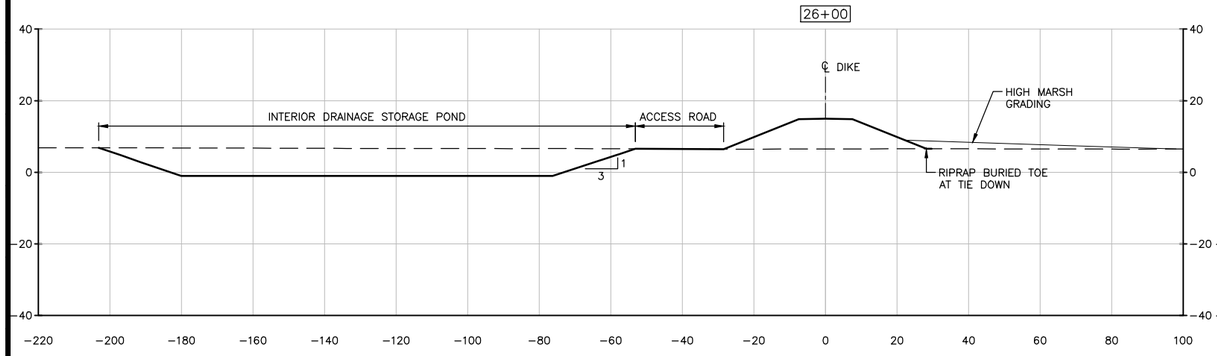
PROJECT NO. ST:R4:11-3

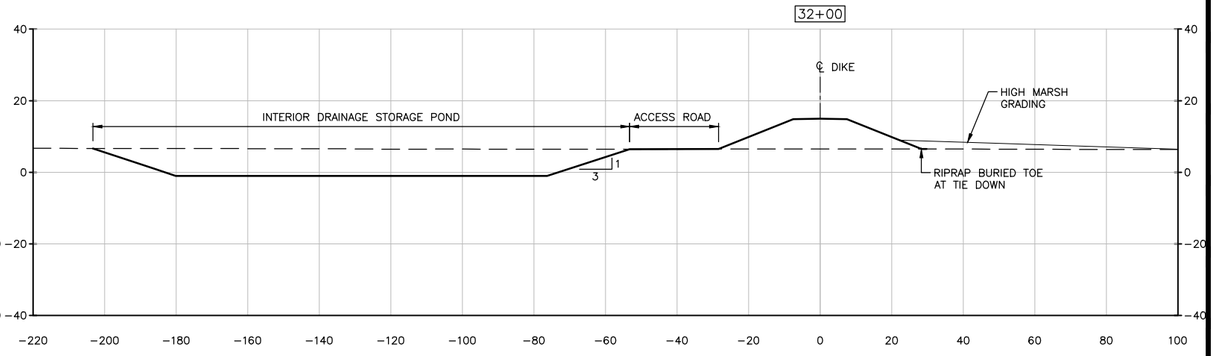
SHEET 24 OF 29

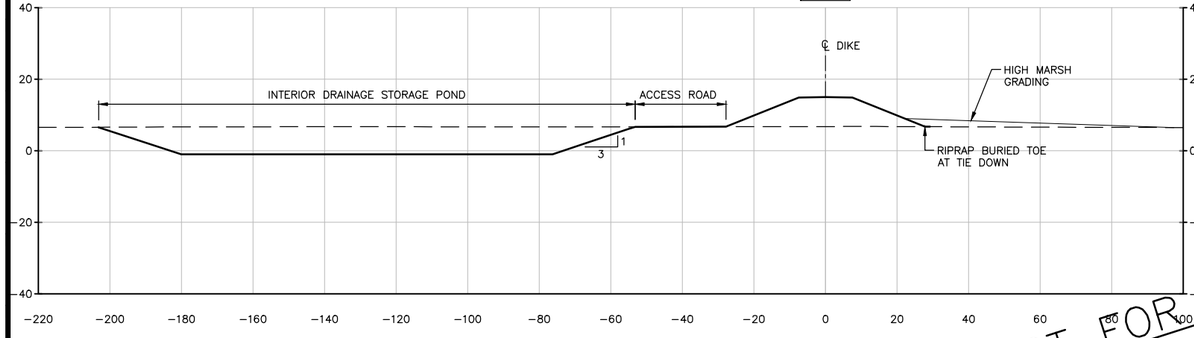
PLOTTED: 06-15-2014 10:09a cnt
P:\Projects\0900A\900411\a\900411a004.dgn

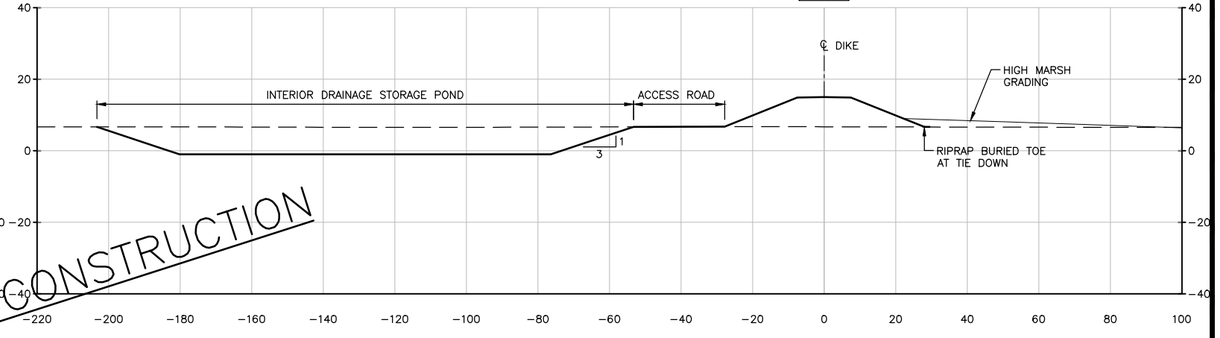


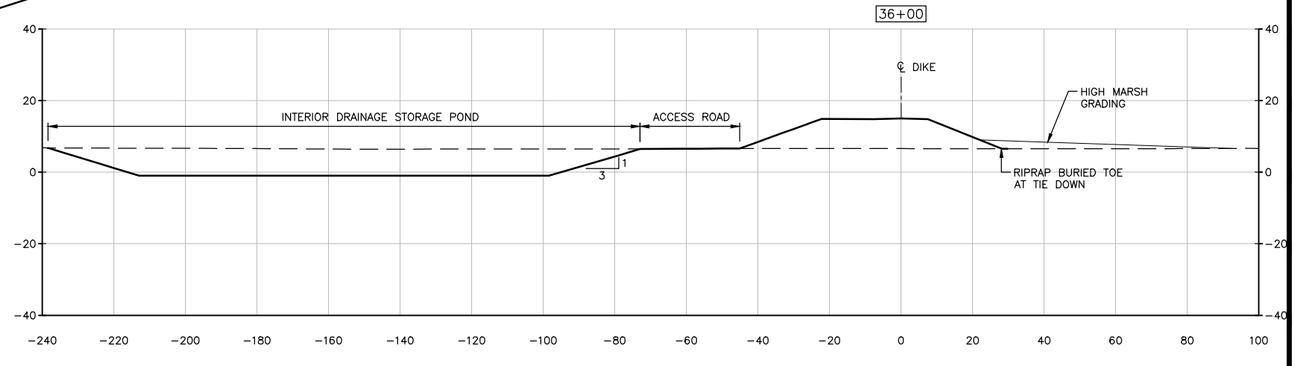












60% DESIGN – NOT FOR CONSTRUCTION

GRAPHIC SCALE
0 20 40 60
SCALE: 1" = 20'

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 38526 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

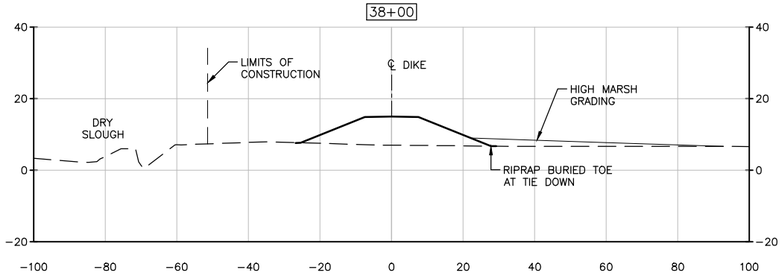
0 ——— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

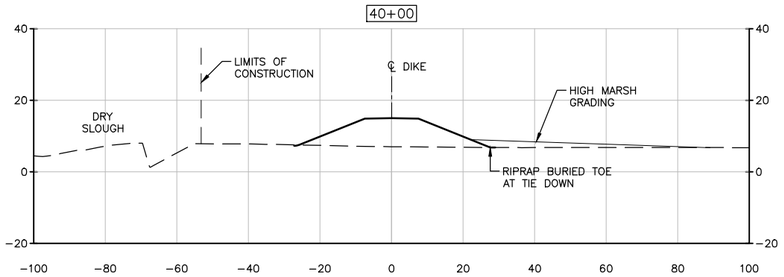
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

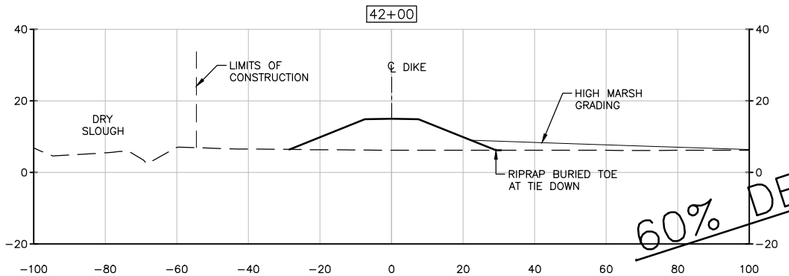
FIR ISLAND FARM
ECOSYSTEM RESTORATION
DIKE SETBACK CROSS SECTIONS
STATIONS 24+00 TO 36+00

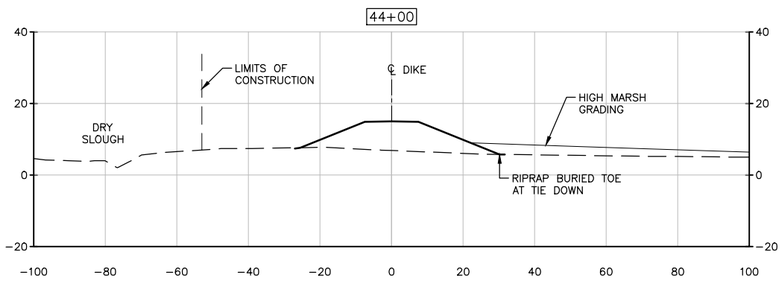
PROJECT NO. ST:R4:11-3
SHEET 25 OF 29

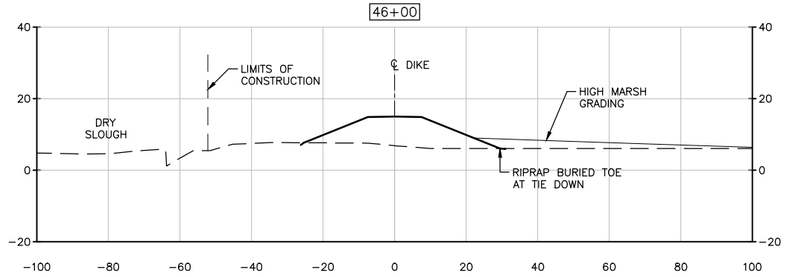
DATE: 06-15-2014 I:\005\c.ctl
PLOTTED: 14 JUN 21:11:13:18 By: klong\CAD\L800\A800411\A800411s005.dgn

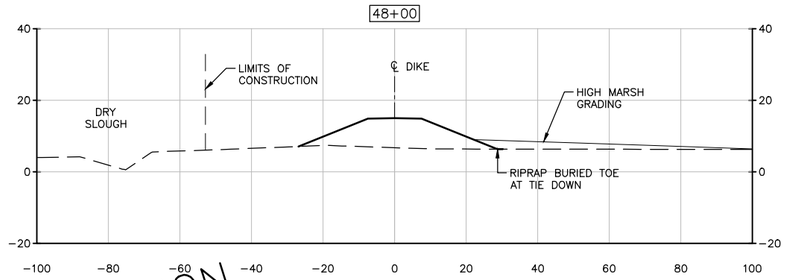


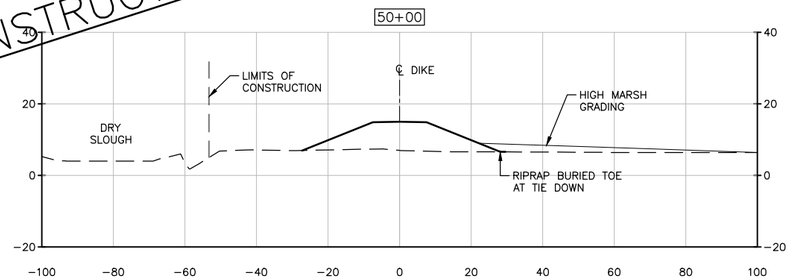


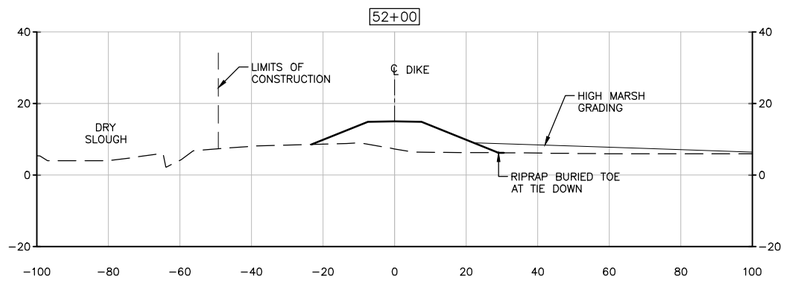












60% DESIGN – NOT FOR CONSTRUCTION

GRAPHIC SCALE

0 20 40 60

SCALE: 1" = 20'

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE
STATE OF WASHINGTON
38526
REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....

PROGRAM ..... DATE: .....

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

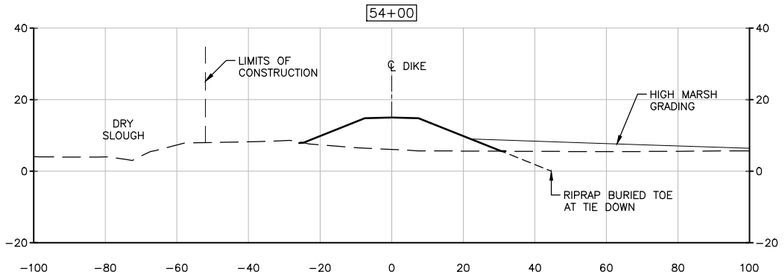
FIR ISLAND FARM

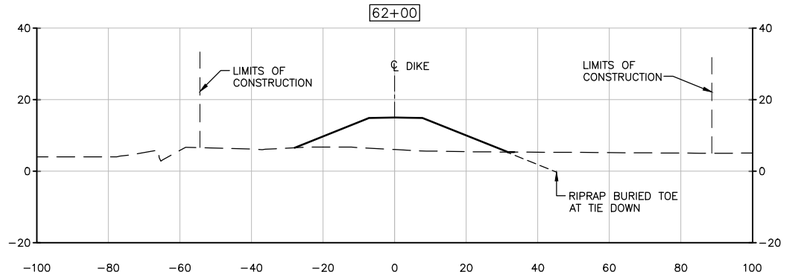
ECOSYSTEM RESTORATION
DIKE SETBACK CROSS SECTIONS
STATIONS 38+00 TO 52+00

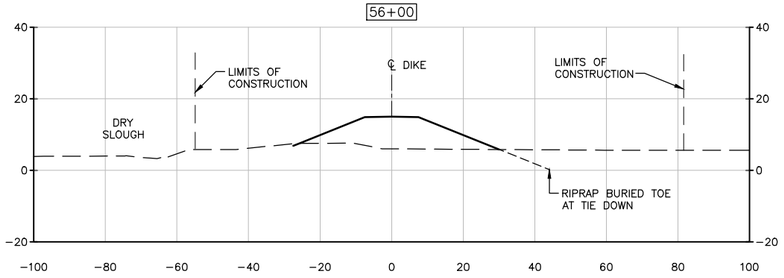
PROJECT NO. ST:R4:11-3

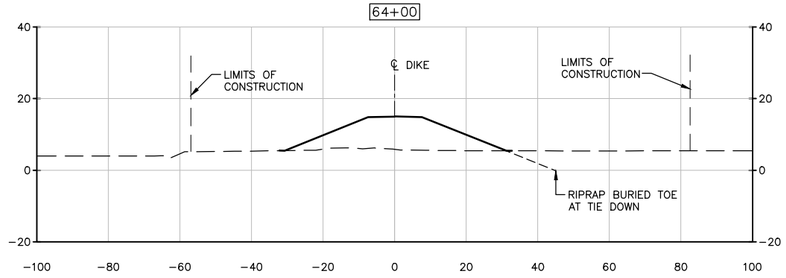
SHEET 26 OF 29

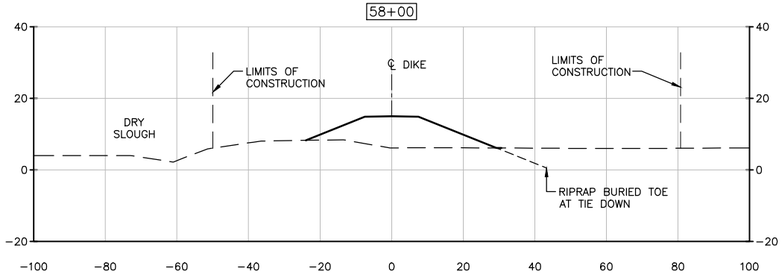
FILENAME: I:\WIP\21-1\12318 Fir Island\CAD\R004\R004113c\R004113c026.dwg DATE: 05-15-2014 LOGIN: cnt

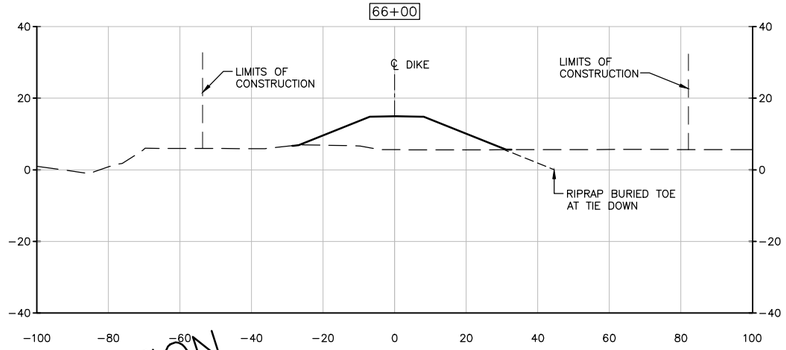


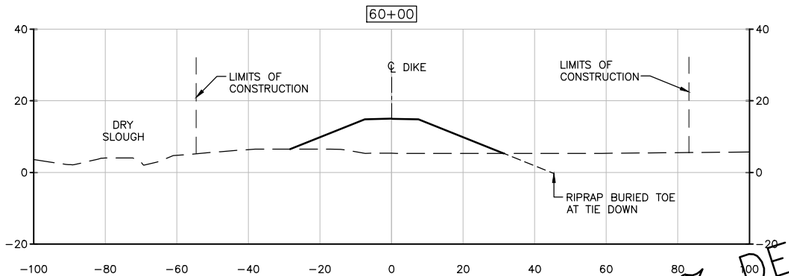


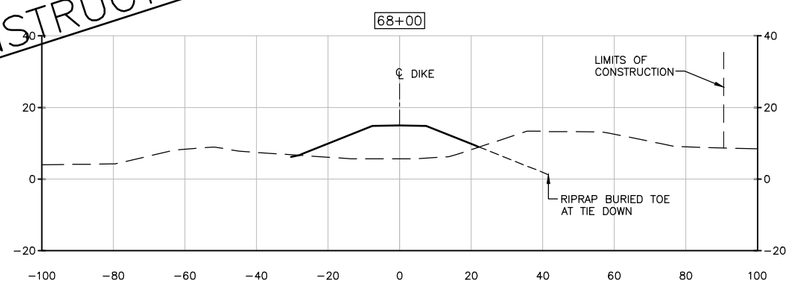












60% DESIGN – NOT FOR CONSTRUCTION

GRAPHIC SCALE
0 20 40 60
SCALE: 1" = 20'

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE STATE OF WASHINGTON 18332 REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

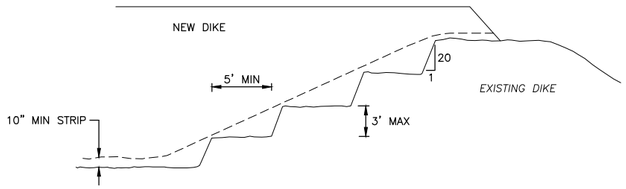
0 —— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

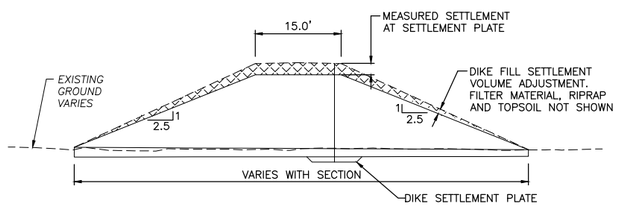
FIR ISLAND FARM
ECOSYSTEM RESTORATION
DIKE SETBACK CROSS SECTIONS
STATIONS 54+00 TO 68+00

PROJECT NO. ST:R4:11-3
SHEET 27 OF 29

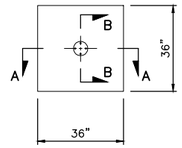
PLOTTED: \\WP21-\V1318 Fir_Island\CAD\L00CA1\L00CA11A\L00CA1113\L00CA1113-0022.dgn DATE: 05-15-2014 LOGIN: cnt



DETAIL – DIKE TIE IN BENCH EXCAVATION
NTS
1 / X28

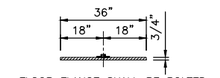


SECTION – TYPICAL DIKE



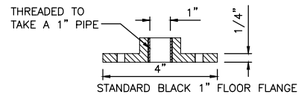
SETTLEMENT PLATE SHALL BE CONSTRUCTED OF PLYWOOD (EXTERIOR).

PLAN VIEW

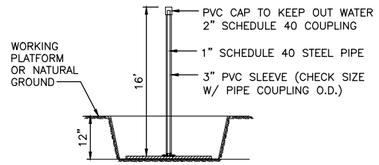


FLOOR FLANGE SHALL BE BOLTED TO THE PLATE WITH A MINIMUM OF FOUR THROUGH BOLTS PER THE MANUFACTURER'S SPECIFICATIONS

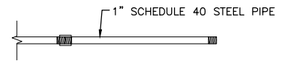
SECTION A–A



SECTION B–B



SETTLEMENT PLATE INSTALLATION



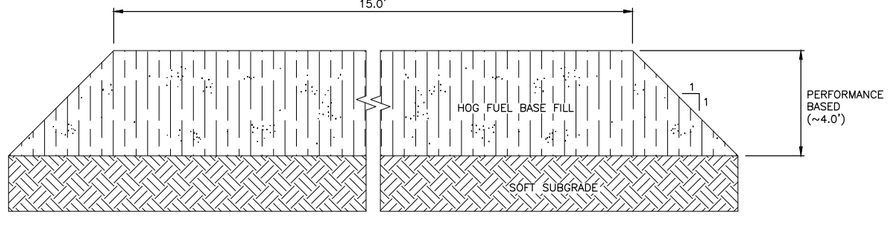
IN SEATING THE PLATE, THE TRENCH SHALL BE BACKFILLED AND COMPACTED WITH DIKE SELECT FILL COMPACTION SPECS.

RISER PIPE & COUPLING

DETAIL – SETTLEMENT PLATE DETAIL
NTS
4 / X28

LANDSLIDE ACCESS ROAD

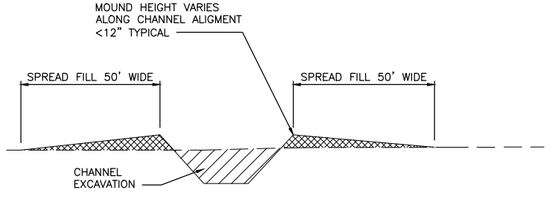
60% DESIGN – NOT FOR CONSTRUCTION



WATERSIDE ACCESS ROAD

DETAIL – ACCESS ROAD CROSS SECTIONS
NTS
5 / X28

DETAIL – DITCH FILL CROSS SECTIONS
SCALE: 3" = 1'–0"
2 / X28



DETAIL – TYPICAL PILOT CHANNEL CROSS SECTION
SCALE: 3" = 1'–0"
3 / X28

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 39326 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

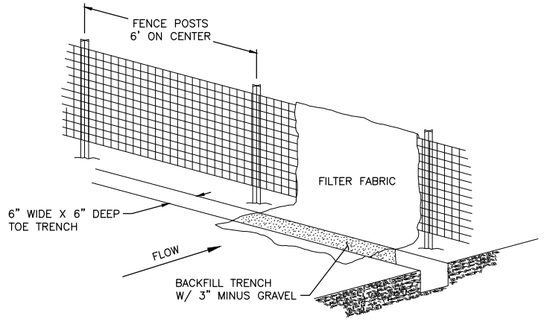
0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
TYPICAL DETAILS

PROJECT NO. ST:R4:11–3
SHEET 28 OF 29

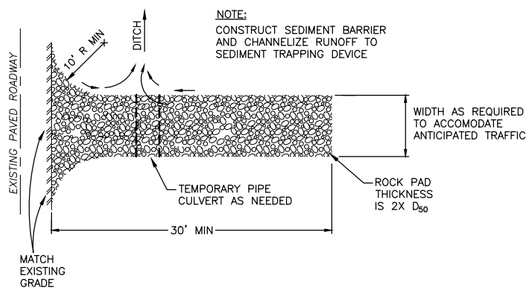
PLOTTED: \\WP2-1\1\2318 Fir Island\CAD\LAYOUTS\2014\ST4113A\2014113A028.dwg DATE: 05-15-2014 LOGIN: cnt



DETAIL – SILT FENCE (7 X 29)
NTS

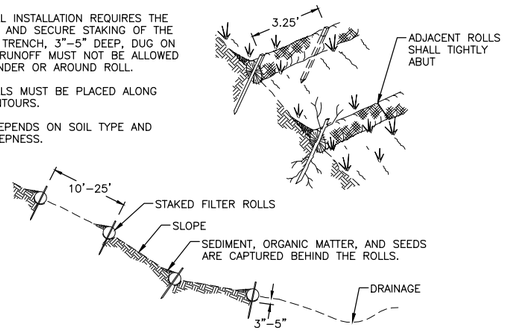
DETAIL – FISH SCREEN DETAIL (9 X 29)
NTS

60% DESIGN – NOT FOR CONSTRUCTION

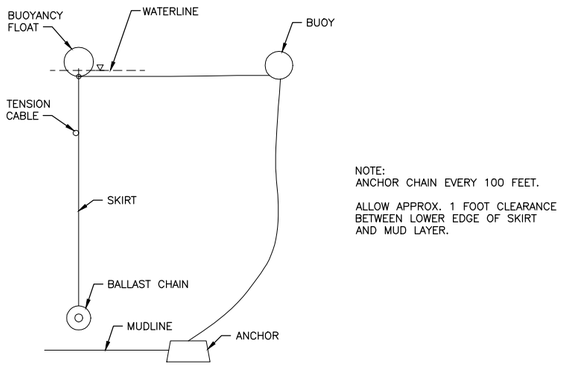


DETAIL – STABILIZED CONSTRUCTION ENTRANCE (8 X 29)
NTS

NOTES:
1. STRAW ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"–5" DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.
2. STRAW ROLLS MUST BE PLACED ALONG SLOPE CONTOURS.
3. SPACING DEPENDS ON SOIL TYPE AND SLOPE STEEPNESS.



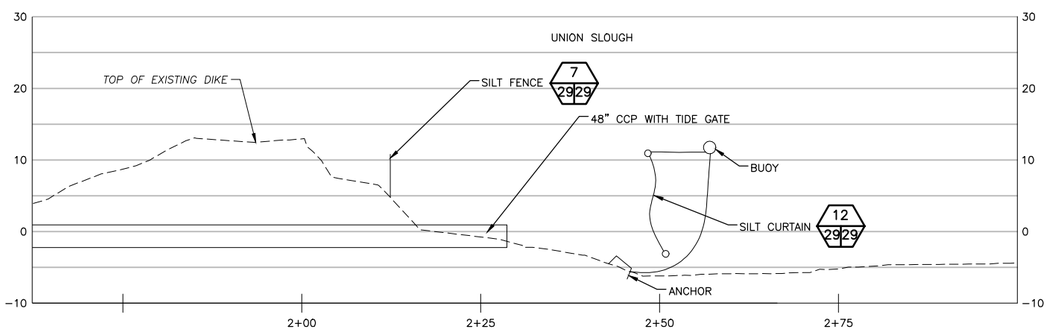
DETAIL – STRAW WATTLE (10 X 29)
NTS



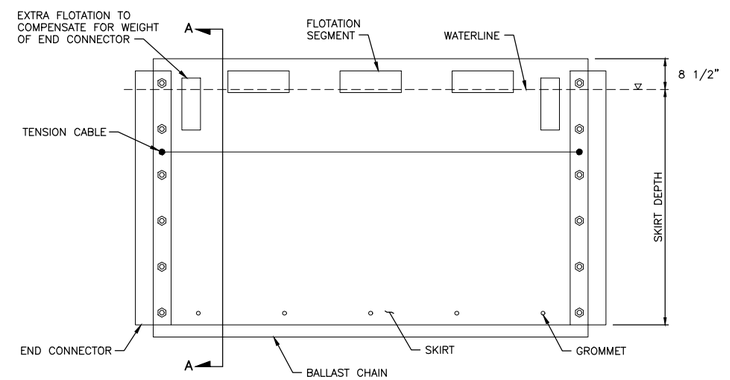
NOTE:
ANCHOR CHAIN EVERY 100 FEET.

ALLOW APPROX. 1 FOOT CLEARANCE BETWEEN LOWER EDGE OF SKIRT AND MUD LAYER.

SECTION A–A



DETAIL – SILT CURTAIN PLACEMENT (11 X 29)
SCALE: 1" = 10'–0"



DETAIL – SILT CURTAIN DETAIL (12 X 29)
NTS

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 39526 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
	5/14	60% DESIGN SUBMITTAL	DRC

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: .....

PROGRAM ..... DATE: .....

0 —— 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CNT, CMH
DATE MAY 2014

FIR ISLAND FARM

ECOSYSTEM RESTORATION

TYPICAL DETAILS

PROJECT NO. ST:R4:11–3

SHEET 29 OF 29

P:\DWG_A\WDFW\11-11731\9 Fir_Island\CAD\LAYOUTS\2014\11A\D0041113A0029.dgn DATE: 06-15-2014 LOGIN: cnt