# WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

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

90% DESIGN – NOT FOR CONSTRUCTION

## INDEX

SHEET NO.


1 – COVER SHEET, INDEX, SYMBOLS ABBREVIATIONS, SYMBOLS, LEGEND AND SHEET INDEX
2 – EXISTING SITE PLAN LOCATION & VICINITY MAP
3 – SUMMARY OF QUANTITIES, GENERAL NOTES, POINTS OF CONTACT
4 – SITE SURVEY – PROPERTY LINES, BOUNDARIES AND CONTROL
5 – ALIGNMENT, TIES AND GRADING TABLES –
6 – PROJECT SITE PLAN –
7 – TEMPORARY EROSION AND SEDIMENT CONTROL PLAN
8 – SETBACK DIKE – PLAN AND PROFILE STATIONS 10+00 TO 25+00
9 – SETBACK DIKE – PLAN AND PROFILE STATIONS 25+00 TO 38+00
10 – SETBACK DIKE – PLAN AND PROFILE STATIONS 38+00 TO 53+00
11 – SETBACK DIKE – PLAN AND PROFILE STATIONS 53+00 TO 68+30
12 – TYPICAL SETBACK DIKE DETAILS
13 – SETBACK DIKE CROSS SECTIONS STATIONS 10+00 TO 22+00
14 – SETBACK DIKE CROSS SECTIONS STATIONS 24+00 TO 36+00
15 – SETBACK DIKE CROSS SECTIONS STATIONS 38+00 TO 52+00
16 – SETBACK DIKE CROSS SECTIONS STATIONS 54+00 TO 68+00
17 – STORAGE POND GRADING PLAN –
18 – TIDEGATE INSTALLATIONS PLAN AND DETAILS
19 – DRY SLOUGH TIDEGATE PLAN AND DETAILS
20 – MARSH GRADING AND PILOT CHANNEL PLANS, NW AREA
21 – MARSH GRADING AND PILOT CHANNEL PLANS, NE AREA
22 – MARSH GRADING AND PILOT CHANNEL PLANS, SE AREA
23 – PLANTING AND SEEDING PLAN
24 – STORAGE POND PUMP STATION PLAN
25 – PUMP STATION PROFILE
26 – PUMP STATION INTAKE GENERAL ARRANGEMENT
27 – PUMP STATION INTAKE CONCRETE SECTIONS AND DETAILS
28 – PUMP STATION INTAKE STEEL SECTIONS AND DETAILS
29 – PUMP STATION INTAKE PIPE PLAN AND PROFILE
30 – PUMP HOUSE GENERAL ARRANGEMENT
31 – PUMP HOUSE SHORING
32 – PUMP HOUSE SUBSTRUCTURE SECTIONS AND DETAILS 1
33 – PUMP HOUSE SUBSTRUCTURE SECTIONS AND DETAILS 2
34 – PUMP HOUSE SUPERSTRUCTURE ELEVATIONS
35 – PUMP HOUSE SUPERSTRUCTURE SECTIONS AND DETAILS
36 – PUMP STATION DISCHARGE PIPE PLAN AND PROFILE
37 – EXISTING DIKE RECOMMENDED DEMOLITION SEQUENCE
38 – ESTUARINE TIDAL BERM PLAN AND PROFILE
39 – EXISTING DIKE DEMOLITION AND GRADING PLAN
40 – EXISTING DIKE DEMOLITION AND GRADING PLAN
41 – TYPICAL DETAILS I
42 – TYPICAL DETAILS II
43 – TYPICAL DETAILS III

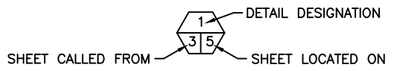

## LEGEND

- EXISTING CONTOUR (MAJOR)
- EXISTING CONTOUR (MINOR)
- WL — EXISTING WETLAND BOUNDARY
- OHW — ORDINARY HIGH WATER MARK
- EXISTING FENCE
- PROPOSED FENCE
- EDGE OF PAVEMENT
- PROPERTY LINE
- OH — EXISTING OVERHEAD POWER
- T — UNDERGROUND TELEPHONE
- E — UNDERGROUND POWER
- PROPOSED CONTOUR (MAJOR)
- PROPOSED CONTOUR (MINOR)
- CONSTRUCTION LIMITS
- RIPRAP BURIED TOE
- EXISTING CULVERT
- PROPOSED CULVERT
- SF — SILT FENCE
- EXISTING GROUNDWATER OBSERVATION WELL
- EXISTING SURFACE WATER OBSERVATION STATION
- EXISTING CATCH BASIN
- FSC — FLOATING SILT CURTAIN
- W — WATER
- CHANNEL TOP OF BANK
- RIPRAP
- HIGH MARSH FILL
- DIKE REMOVAL AND GRADING
- PROPOSED SETBACK DIKE
- PROPOSED STORAGE POND
- TEMPORARY HAUL ROAD
- ACCESS ROAD
- GRASS MAINTENANCE AREA
- GRADING POINT
- TREE
- DEMOLISH STRUCTURE

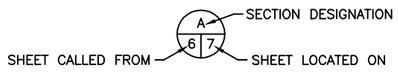
## ABBREVIATIONS

| | | |
|---|---|---|
| ALUM | – | ALUMINUM |
| ∠ | – | ANGLE |
| APPROX. | – | APPROXIMATELY |
| BM | – | BENCH MARK |
| BTM | – | BOTTOM |
| CB | – | CATCH BASIN |
| ℄ | – | CENTERLINE |
| CLR. | – | CLEARANCE |
| CONC | – | CONCRETE |
| ø | – | DIAMETER |
| E | – | EAST |
| ELEV | – | ELEVATION |
| EX | – | EXISTING |
| FG | – | FINISH GRADE |
| GA. | – | GAUGE |
| HDPE | – | HIGH DENSITY POLYETHYLENE |
| HAT | – | HIGHEST ASTRONOMICAL TIDE |
| ID | – | INSIDE DIAMETER |
| IE | – | INVERT ELEVATION |
| LG | – | LONG |
| MFG. | – | MANUFACTURER'S |
| MHW | – | MEAN HIGH WATER |
| MHHW | – | MEAN HIGHER HIGH WATER |
| MLLW | – | MEAN LOWER LOW WATER |
| MISC. | – | MISCELLANEOUS |
| MOD. | – | MODEL |
| N | – | NORTH |
| NE | – | NORTHEAST |
| NW | – | NORTHWEST |
| OC | – | ON CENTER |
| OHW | – | ORDINARY HIGH WATER |
| OD | – | OUTSIDE DIAMETER |
| PAV'T | – | PAVEMENT (ASPHALT / CONCRETE) |
| ⊡ | – | PLATE |
| PT | – | PRESSURE TREATED |
| SPEC'S. | – | PROJECT SPECIFICATIONS |
| R | – | RADIUS |
| REQ'D | – | REQUIRED |
| R/W | – | RIGHT OF WAY |
| SE | – | SOUTHEAST |
| SEC. | – | SECTION |
| SHT. | – | SHEET |
| S | – | SOUTH |
| S.F. | – | SQUARE FEET |
| STA | – | STATION |
| S.S. | – | STAINLESS STEEL |
| TESC | – | TEMPORARY EROSION AND SEDIMENT CONTROL |
| TBD | – | TO BE DETERMINED |
| TOB | – | TOP OF BANK |
| TYP | – | TYPICAL |
| WDFW | – | WASHINGTON DEPARTMENT OF FISH AND WILDLIFE |
| W.S. | – | WATER SURFACE |
| W | – | WEST |

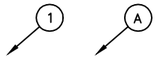
## SHEET SYMBOLS




DETAIL



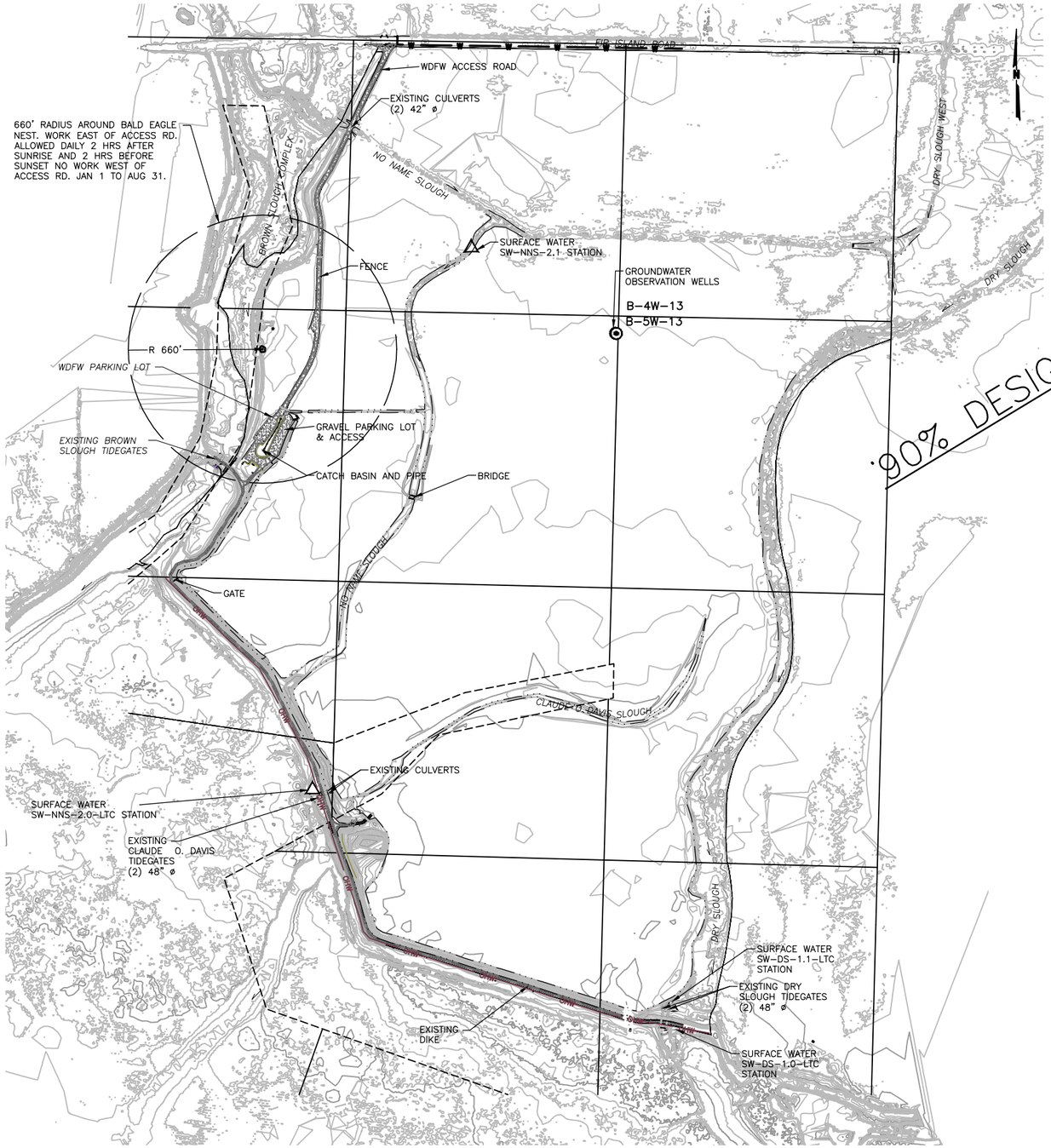

SECTION




NOTE REFERENCE
REFERENCE DESIGNATION TO NOTE APPEARING ON SAME SHEET

| PROJECT NO. | |
|---|---|
| ST:R4:11-3 | |
| SHEET | OF |
| 1 | 43 |

FILENAME: L:\WIP\21-11\2318 FIR ISLAND\CAD\R00A\R0041113\R0041113-001.dwg DATE: 11-07-2014 LOGIN: cmh




SITE PLAN

0 300 600 900

SCALE: 1" = 300'

NOTES

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

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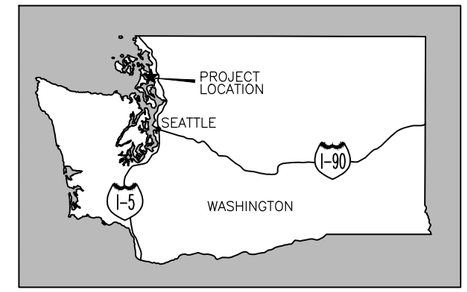
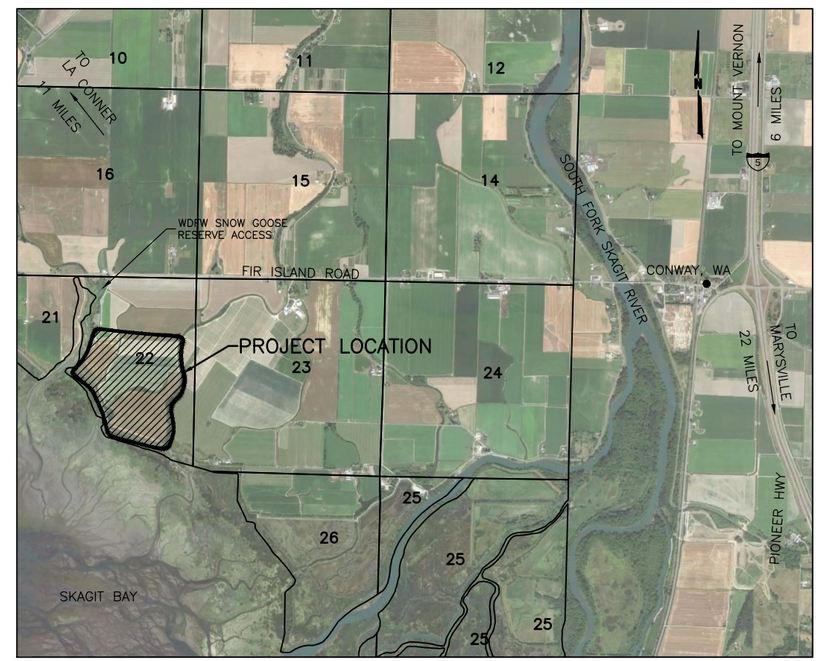



LOCATION MAP




VICINITY MAP

0 2000 4000 6000

SCALE: 1" = 2000'

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE
STATE OF WASHINGTON
30326
REGISTERED
PROFESSIONAL ENGINEER

| SYM | DATE | REVISION DESCRIPTION | BY |
|---|---|---|---|
| | 11/14 | 90% 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 CMH, EAA
DATE NOV 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
EXISTING SITE PLAN
LOCATION & VICINITY MAP

PROJECT NO. ST:R4:11-3

SHEET 2 OF 43

FILENAME: L:\WP\21-1\12318 Fir Island\CAD\R004\R004113a\R004113a002.dwg DATE: 11-06-2014 LOGIN: cmh

# SUMMARY OF QUANTITIES

| Item | Description | Quantity | Units |
|---|---|---|---|
| 3.0 | Site Preparation, Temporary Facilites | | |
| 3.01 | High Visibility Fence | 96 | FT |
| | | | |
| 4.0 | Temporary Erosion and Sediment Control | | |
| 4.01 | Stabilized Construction Entrance (Quarry Spalls) | 467 | TON |
| 4.02 | Silt Fence | 10,359 | FT |
| 4.03 | Diversion of Water | 1 | LS |
| 4.04 | Floating Silt Curtain | 635 | FT |
| 4.05 | Coir Logs, Wattles | 25,622 | FT |
| 4.06 | Gravel Check Dams | 28 | TON |
| | | | |
| 5.0 | Earthwork | | |
| 5.01 | Dike Alignment Stripping | 13,567 | CY |
| 5.02 | Riprap Toe Excavation, Haul and Spreading | 1,321 | CY |
| 5.03 | Pond Excavation, Dewatering, Haul | 67,718 | CY |
| 5.04 | Tidegate Excacvation, Dewatering, Haul | 1,289 | CY |
| 5.05 | Pilot Tidal Channel Excavation and Spreading | 2,460 | CY |
| 5.06 | Existing Levee Excavation including Haul | 35,308 | CY |
| 5.07 | Existing Levee Rock Remova including Haul | 19,982 | CY |
| 5.08 | Geotextile Reinforcement | 67,284 | SY |
| 5.09 | Crushed Surfacing Base Course Incl. Haul | 37,357 | TON |
| 5.10 | Dike Fill Including Haul | 180,908 | TON |
| 5.11 | High Marsh Fill Grading | 75,824 | CY |
| 5.12 | Sand Drainage Blanket (Filter Diaphragm) | 298 | TON |
| 5.13 | Pipe Annulus Backfill | 630 | TON |
| 5.14 | Riprap Bedding | 5,271 | TON |
| 5.15 | Riprap (Levee Sideslope) | 28,917 | TON |
| 5.16 | Riprap (Pump Station Outfall) | 40 | TON |
| 5.17 | No Name Slough Dredging | 2,183 | TON |
| 5.18 | Dredge Spoils Removal and Stockpile | 6,843 | TON |
| 5.19 | Coir separation fabric | 6,024 | SY |
| 5.20 | Topsoil Reuse From Storage Pond | 15,220 | TON |
| 5.21 | Dike Final Elevation Finish Grading | 9,717 | SY |
| | | | |
| 6.0 | Drainage | | |
| 6.01 | 12" HDPE | 420 | FT |
| 6.02 | 24" HDPE | 294 | FT |
| 6.03 | 12"FES and Grate | 5 | EA |
| 6.04 | 48" HDPE Tidegate Pipe | 502 | FT |
| 6.05 | 48" Pipe Temporary Crossing | 90 | FT |
| 6.06 | 48" Pipe Permanent Crossing | 90 | FT |
| 6.07 | 48" Top Hinge Tidegate | 1 | EA |
| 6.08 | 48" Side Hinge Tidegate | 4 | EA |
| 6.09 | Pump Station | 1 | LS |
| 6.10 | Concrete Demolition haul disposal (Dry Slough Tidegate) | 1,764 | TON |
| | | | |
| 7.0 | Vegetation and Plantings | | |
| 7.01 | Bulk Seed Procurement | 8,184 | LB |
| 7.02 | Native Marsh Seed Procurement | 2 | AC |
| 7.03 | Year 1 Hydroseed | 20 | AC |
| 7.03 | Year 1 Drill Seeding | 107 | AC |
| 7.04 | Year 2 Hydroseed | 98 | AC |
| 7.05 | Year 2 Specialty seeding – 4 quadrants | 4 | AC |
| 7.06 | Marsh Plantings | 0 | |
| 7.07 | Year 2 Irrigation Request to CDD22 | 1 | LS |
| 7.08 | Year 2 Irrigation at site | 1 | LS |
| | | | |
| 8.0 | Miscellaneous | | |
| 8.01 | Log Boom | 1 | LS |

# 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 THESE TWO 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. THE CONTRACTOR SHALL ADHERE TO ALL ENVIRONMENTAL LAWS, REGULATIONS, AND PERMIT CONDITIONS RELEVANT TO THE PROJECT.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THEIR OWN ELECTRICITY, WATER, AND SANITARY FACILITIES 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. 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 AND LENGHTHS 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, 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, THE CONTRACTOR SHALL IMMEDIATELY BRING THE CONDITION TO THE ATTENTION OF THE OWNER'S CONSTRUCTION MANAGER.
15. DETAILS ARE INTENDED TO SHOW FINAL CONDITIONS OF THE DESIGN. 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.

90% DESIGN – NOT FOR CONSTRUCTION

# POINTS OF CONTACT

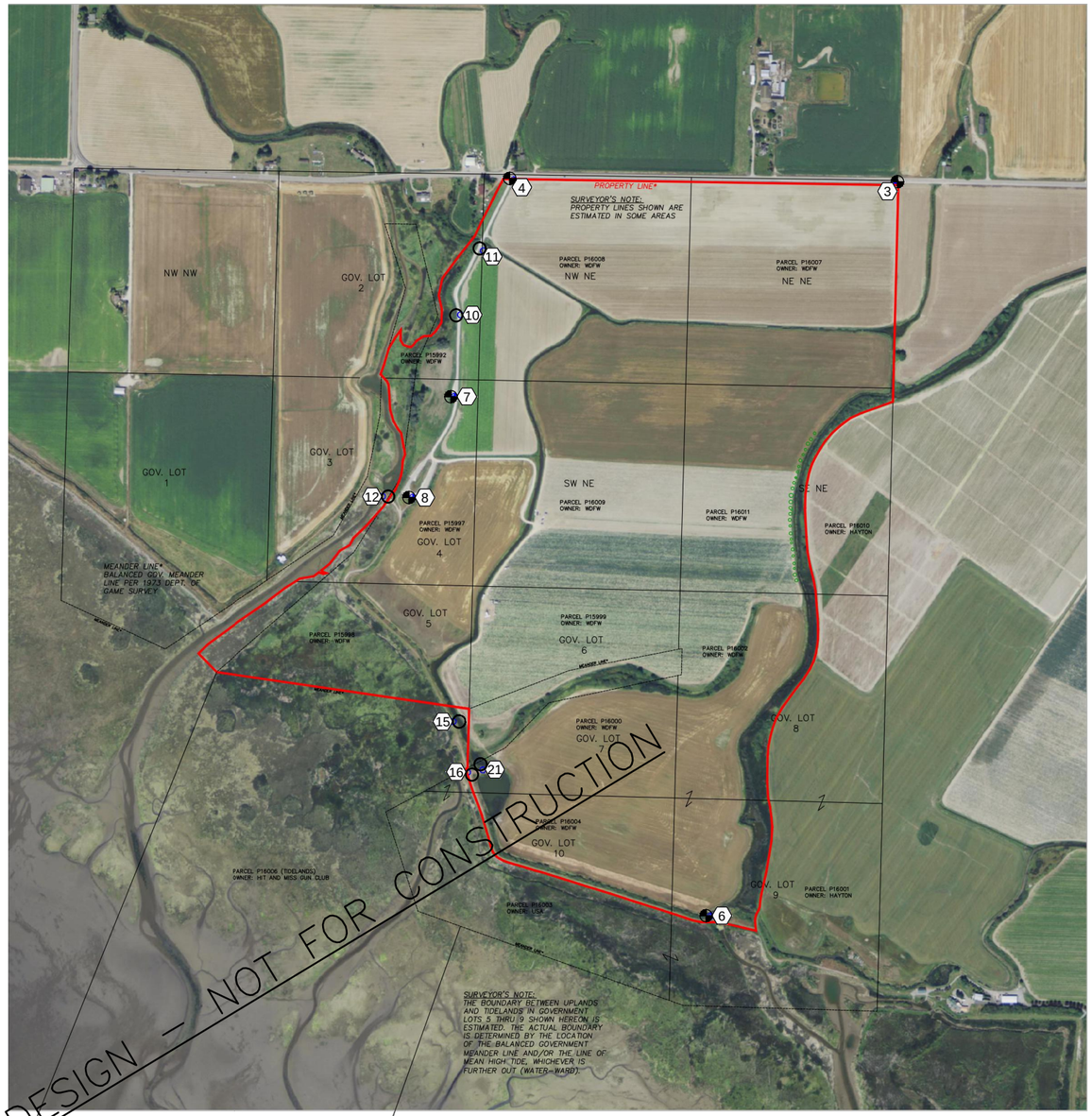
UTILITY PROVIDERS AND LOCAL ORGANIZATIONS THAT MAY BE AFFECTED BY THE PROPOSED CONSTRUCTION WORK SHALL BE NOTIFIED IN ADVANCE OF CONSTRUCTION. A LIST OF POINT OF CONTACT IS SHOWN BELOW.

1. WDFW – BRIAN WILLIAMS, PHONE 360.3466.4345 X250
2. SKAGIT COUNTY CONSOLIDATED DIKING DISTRICT NO. 22 – STAN NELSON, PHONE 360.202.7310
3. SKAGIT COUNTY SHERIFF, LACONNER – PHONE 360.466.3134
4. SKAGIT COUNTY ROADS – TBD
5. POWER – PUGET SOUND ENERGY, STEVE GATES, PHONE 360.766.5496
6. WATER – SKAGIT P.U.D. – TBD
7. TELECOMMUNICATIONS – TBD

# STATE OF WASHINGTON
# DEPARTMENT OF FISH & WILDLIFE

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

PRELIMINARY




FIR ISLAND FARM PHASE 2

90% DESIGN — NOT FOR CONSTRUCTION

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"

*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' |

0 200 400 800
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

*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 |

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

| SYM | DATE | REVISION DESCRIPTION | BY |
|---|---|---|---|
| | 11/14 | 90% DESIGN SUBMITTAL | AFH |
| | 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 NOV 2014

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

PROJECT NO. ST:R4:11-3
SHEET 4 OF 43

| PROPOSED DIKE GRADING POINTS (SHEETS 12-16) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | POINT 1 | | | POINT 2 | | POINT 3 | | POINT 4 | | POINT 5 | | |
| STATION | NORTHING | EASTING | ELEVATION | NORTHING | EASTING | NORTHING | EASTING | NORTHING | EASTING | NORTHING | EASTING | ELEVATION |
| 11+00 | 491006.6 | 1256189.3 | 6.3 | 490985.5 | 1256193.2 | 490978.1 | 1256194.5 | 490970.7 | 1256195.9 | 490947.5 | 1256200.2 | 5.8 |
| 13+00 | 491124.3 | 1256300.0 | 6.6 | 491116.2 | 1256319.8 | 491113.3 | 1256326.7 | 491110.5 | 1256333.7 | 491101.8 | 1256354.7 | 6.3 |
| 14+00 | 491216.6 | 1256338.7 | 6.9 | 491208.7 | 1256357.9 | 491205.8 | 1256364.8 | 491203.0 | 1256371.7 | 491194.6 | 1256392.1 | 6.6 |
| 15+00 | N/A | N/A | N/A | 491299.1 | 1256405.6 | 491293.7 | 1256410.7 | 491288.2 | 1256415.8 | 491271.7 | 1256431.2 | 6.4 |
| 16+00 | 491348.5 | 1256505.1 | 6.1 | 491326.8 | 1256504.2 | 491319.3 | 1256503.9 | 491311.8 | 1256503.5 | 491288.9 | 1256502.6 | 6.2 |
| 18+00 | 491340.0 | 1256705.1 | 6.2 | 491318.3 | 1256704.2 | 491310.8 | 1256703.9 | 491303.3 | 1256703.5 | 491280.0 | 1256702.4 | 6.1 |
| 19+00 | 491335.6 | 1256804.8 | 6.2 | 491314.1 | 1256803.9 | 491306.6 | 1256803.5 | 491299.1 | 1256803.3 | 491276.5 | 1256802.3 | 6.4 |
| 21+00 | 491336.7 | 1257005.0 | 2.4 | 491305.6 | 1257003.7 | 491298.2 | 1257003.3 | 491290.7 | 1257003.1 | 491257.9 | 1257001.7 | 2.1 |
| 23+00 | 491319.0 | 1257204.4 | 6.1 | 491297.2 | 1257203.6 | 491289.7 | 1257203.2 | 491282.2 | 1257202.9 | 491260.2 | 1257202.0 | 6.6 |
| 25+00 | 491309.6 | 1257404.3 | 6.5 | 491288.7 | 1257403.4 | 491281.3 | 1257403.1 | 491273.8 | 1257402.7 | 491251.7 | 1257401.8 | 6.6 |
| 27+00 | 491300.8 | 1257604.1 | 6.7 | 491280.3 | 1257603.2 | 491272.8 | 1257602.9 | 491265.3 | 1257602.6 | 491243.1 | 1257601.6 | 6.5 |
| 29+00 | 491292.2 | 1257803.9 | 6.7 | 491271.8 | 1257803.0 | 491264.4 | 1257802.7 | 491256.9 | 1257802.4 | 491235.0 | 1257801.5 | 6.7 |
| 31+00 | 491283.4 | 1258003.7 | 6.9 | 491263.4 | 1258002.8 | 491255.9 | 1258002.5 | 491248.4 | 1258002.2 | 491226.6 | 1258001.3 | 6.7 |
| 33+00 | 491275.9 | 1258203.6 | 6.4 | 491254.9 | 1258202.7 | 491247.5 | 1258202.3 | 491240.0 | 1258202.0 | 491217.5 | 1258201.1 | 6.4 |
| 35+00 | 491266.6 | 1258403.3 | 6.8 | 491246.5 | 1258402.5 | 491239.0 | 1258402.1 | 491231.5 | 1258401.9 | 491209.7 | 1258400.9 | 6.7 |
| 36+00 | 491262.1 | 1258520.7 | 6.6 | 491228.6 | 1258503.1 | 491221.9 | 1258499.6 | 491215.3 | 1258496.2 | 491195.6 | 1258485.9 | 6.6 |
| 37+00 | 491163.0 | 1258602.3 | 7.0 | 491151.4 | 1258571.6 | 491148.8 | 1258564.5 | 491146.2 | 1258557.5 | 491138.3 | 1258536.6 | 6.5 |
| 38+00 | 491048.5 | 1258598.3 | 7.0 | 491049.5 | 1258578.5 | 491049.9 | 1258571.0 | 491050.3 | 1258563.5 | 491051.5 | 1258540.5 | 6.7 |
| 39+00 | 490952.0 | 1258592.3 | 7.0 | 490950.8 | 1258572.7 | 490950.3 | 1258565.2 | 490949.8 | 1258557.8 | 490948.6 | 1258537.1 | 7.0 |
| 40+00 | 490850.0 | 1258593.8 | 7.0 | 490850.3 | 1258574.2 | 490850.4 | 1258566.7 | 490850.5 | 1258559.2 | 490850.8 | 1258538.0 | 6.8 |
| 41+00 | 490755.3 | 1258602.1 | 7.0 | 490752.3 | 1258582.8 | 490751.1 | 1258575.3 | 490750.0 | 1258567.9 | 490746.6 | 1258546.4 | 6.8 |
| 42+00 | 490652.0 | 1258612.0 | 7.0 | 490651.9 | 1258592.4 | 490651.8 | 1258584.9 | 490651.8 | 1258577.4 | 490651.6 | 1258555.0 | 6.2 |
| 43+00 | 490559.2 | 1258626.0 | 7.0 | 490554.6 | 1258604.3 | 490553.1 | 1258597.0 | 490551.5 | 1258589.7 | 490546.6 | 1258566.5 | 5.9 |
| 44+00 | 490467.9 | 1258655.6 | 6.0 | 490460.5 | 1258634.7 | 490458.0 | 1258627.7 | 490455.5 | 1258620.6 | 490446.9 | 1258596.2 | 5.7 |
| 45+00 | 490360.2 | 1258677.2 | 6.0 | 490361.1 | 1258654.9 | 490361.3 | 1258647.4 | 490361.7 | 1258639.9 | 490362.6 | 1258616.2 | 5.5 |
| 46+00 | 490263.8 | 1258689.9 | 6.0 | 490262.7 | 1258667.8 | 490262.2 | 1258660.3 | 490261.9 | 1258652.8 | 490260.7 | 1258627.6 | 5.9 |
| 47+00 | 490158.2 | 1258684.5 | 6.0 | 490161.5 | 1258662.7 | 490162.6 | 1258655.2 | 490163.8 | 1258647.8 | 490167.1 | 1258625.2 | 6.1 |
| 48+00 | 490055.7 | 1258658.3 | 6.0 | 490063.4 | 1258637.5 | 490065.9 | 1258630.5 | 490068.5 | 1258623.4 | 490076.5 | 1258601.7 | 6.3 |
| 49+00 | 489964.4 | 1258596.1 | 6.0 | 489979.7 | 1258580.2 | 489984.9 | 1258574.7 | 489990.1 | 1258569.3 | 490006.3 | 1258552.5 | 6.3 |
| 50+00 | 489892.2 | 1258527.0 | 6.0 | 489907.5 | 1258511.0 | 489912.7 | 1258505.6 | 489917.9 | 1258500.1 | 489933.6 | 1258483.8 | 6.6 |
| 51+00 | 489820.3 | 1258465.5 | 6.0 | 489832.6 | 1258447.1 | 489836.7 | 1258440.9 | 489840.9 | 1258434.6 | 489853.5 | 1258415.7 | 6.3 |
| 52+00 | 489737.7 | 1258406.2 | 6.0 | 489751.0 | 1258388.6 | 489755.5 | 1258382.6 | 489760.1 | 1258376.6 | 489774.2 | 1258357.8 | 6.2 |
| 53+00 | 489658.3 | 1258344.2 | 6.0 | 489672.1 | 1258326.9 | 489676.7 | 1258321.0 | 489681.4 | 1258315.2 | 489695.1 | 1258297.8 | 6.0 |
| 54+00 | 489580.7 | 1258281.5 | 6.0 | 489594.3 | 1258264.1 | 489599.0 | 1258258.2 | 489603.6 | 1258252.3 | 489618.8 | 1258233.2 | 5.6 |
| 55+00 | 489502.7 | 1258242.8 | 6.0 | 489508.2 | 1258221.4 | 489510.0 | 1258214.1 | 489511.9 | 1258206.9 | 489518.0 | 1258182.8 | 5.3 |
| 56+00 | 489416.4 | 1258242.0 | 5.0 | 489412.1 | 1258217.7 | 489410.8 | 1258210.4 | 489409.6 | 1258203.0 | 489405.7 | 1258180.7 | 5.8 |
| 57+00 | 489317.9 | 1258270.8 | 5.0 | 489316.1 | 1258246.3 | 489315.6 | 1258238.8 | 489315.0 | 1258231.3 | 489313.3 | 1258207.6 | 6.2 |
| 58+00 | 489218.2 | 1258278.1 | 5.0 | 489216.4 | 1258253.5 | 489215.7 | 1258246.1 | 489215.3 | 1258238.6 | 489213.6 | 1258215.3 | 6.1 |
| 59+00 | 489120.4 | 1258285.2 | 5.0 | 489117.1 | 1258260.8 | 489115.8 | 1258253.4 | 489114.8 | 1258246.0 | 489111.9 | 1258222.1 | 5.6 |
| 60+00 | 489013.3 | 1258252.5 | 5.0 | 489021.8 | 1258229.3 | 489024.4 | 1258222.2 | 489027.0 | 1258215.2 | 489035.1 | 1258192.8 | 5.3 |
| 61+00 | 488949.9 | 1258262.9 | 5.0 | 488934.4 | 1258243.0 | 488929.8 | 1258237.0 | 488925.2 | 1258231.1 | 488911.5 | 1258213.5 | 6.0 |
| 62+00 | 488855.8 | 1258332.0 | 5.0 | 488858.6 | 1258307.4 | 488859.4 | 1258300.0 | 488860.3 | 1258292.5 | 488863.3 | 1258265.5 | 5.3 |
| 63+00 | 488756.0 | 1258278.0 | 5.0 | 488769.1 | 1258257.1 | 488773.0 | 1258250.7 | 488777.0 | 1258244.3 | 488789.9 | 1258223.6 | 5.3 |
| 64+00 | 488679.7 | 1258263.8 | 5.0 | 488677.9 | 1258239.2 | 488677.2 | 1258231.8 | 488676.6 | 1258224.3 | 488674.8 | 1258199.6 | 5.4 |
| 65+00 | 488566.0 | 1258255.1 | 5.0 | 488575.8 | 1258232.5 | 488578.8 | 1258225.7 | 488581.8 | 1258218.8 | 488591.5 | 1258196.4 | 5.6 |
| 66+00 | 488483.3 | 1258162.9 | 5.0 | 488507.0 | 1258155.6 | 488514.2 | 1258153.4 | 488521.4 | 1258151.2 | 488544.3 | 1258144.1 | 5.6 |
| 67+00 | 488439.0 | 1258099.1 | 5.0 | 488453.1 | 1258078.8 | 488457.4 | 1258072.7 | 488461.7 | 1258066.5 | 488476.0 | 1258046.1 | 4.9 |
| 68+00 | N/A | N/A | N/A | 488363.8 | 1258062.0 | 488362.1 | 1258054.7 | 488360.3 | 1258047.5 | N/A | N/A | N/A |

| PROPOSED POND GRADING POINTS (SHEET 17) | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| P01 | 491523.9 | 1256444.5 | 7.0 |
| P02 | 491500.0 | 1256443.5 | -1.0 |
| P03 | 491503.5 | 1256417.1 | 7.0 |
| P04 | 491497.7 | 1256440.4 | -1.0 |
| P05 | 491422.9 | 1256397.1 | 7.0 |
| P06 | 491417.2 | 1256420.4 | -1.0 |
| P07 | 491413.4 | 1256423.2 | -1.0 |
| P08 | 491389.5 | 1256422.2 | 7.0 |
| P09 | 491515.3 | 1256644.3 | 7.0 |
| P10 | 491491.3 | 1256643.3 | -1.0 |
| P11 | 491404.5 | 1256639.5 | -1.0 |
| P12 | 491380.5 | 1256638.5 | 7.0 |
| P13 | 491502.8 | 1256944.1 | 7.0 |
| P14 | 491478.3 | 1256943.0 | -1.0 |
| P15 | 491392.0 | 1256939.3 | -1.0 |
| P16 | 491368.1 | 1256938.3 | 7.0 |
| P17 | 491497.0 | 1257062.4 | 6.6 |
| P18 | 491473.2 | 1257061.4 | -1.0 |
| P19 | 491387.1 | 1257057.8 | -1.0 |
| P20 | 491363.2 | 1257056.6 | 7.0 |
| P21 | 491485.0 | 1257362.1 | 7.0 |
| P22 | 491460.2 | 1257361.1 | -1.0 |
| P23 | 491374.7 | 1257357.5 | -1.0 |
| P24 | 491350.7 | 1257356.3 | 7.0 |
| P25 | 491471.4 | 1257661.8 | 7.0 |
| P26 | 491447.2 | 1257660.8 | -1.0 |
| P27 | 491362.3 | 1257657.3 | -1.0 |
| P28 | 491338.3 | 1257656.3 | 7.0 |
| P29 | 491458.4 | 1257961.6 | 7.0 |
| P30 | 491434.3 | 1257960.5 | -1.0 |
| P31 | 491349.8 | 1257956.9 | -1.0 |
| P32 | 491325.9 | 1257955.9 | 7.0 |
| P33 | 491445.4 | 1258260.8 | 7.0 |
| P34 | 491421.3 | 1258260.0 | -1.0 |
| P35 | 491337.4 | 1258256.6 | -1.0 |
| P36 | 491313.4 | 1258255.6 | 7.0 |
| P37 | 491428.5 | 1258648.7 | 7.0 |
| P38 | 491404.5 | 1258647.6 | -1.0 |
| P39 | 491402.1 | 1258649.5 | -1.0 |
| P40 | 491397.8 | 1258673.1 | 7.0 |
| P41 | 491323.5 | 1258631.5 | -1.0 |
| P42 | 491311.6 | 1258653.4 | 7.0 |
| P43 | 491321.9 | 1258629.4 | -1.0 |
| P44 | 491297.7 | 1258635.1 | 7.0 |

| PROPOSED MARSH GRADING POINTS (SHEETS 20-22) | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| UM01 | 490663.7 | 1256056.8 | 8.0 |
| UM02 | 490620.5 | 1256073.1 | 7.0 |
| UM03 | 490579.5 | 1256086.9 | 6.0 |
| UM04 | 490826.2 | 1256216.8 | 8.0 |
| UM05 | 490739.2 | 1256288.6 | 7.0 |
| UM06 | 490652.3 | 1256346.7 | 6.0 |
| UM07 | 490992.7 | 1256329.5 | 8.0 |
| UM08 | 490914.9 | 1256429.0 | 7.0 |
| UM09 | 490822.8 | 1256577.4 | 6.0 |
| UM10 | 491148.0 | 1256441.9 | 8.0 |
| UM11 | 491071.2 | 1256517.6 | 7.0 |
| UM12 | 490966.6 | 1256680.4 | 6.0 |
| UM13 | 491285.0 | 1256699.1 | 8.0 |
| UM14 | 491250.8 | 1256718.8 | 7.0 |
| UM15 | 491176.5 | 1256760.2 | 6.0 |
| UM16 | 491265.6 | 1257190.9 | 8.0 |
| UM17 | 491262.9 | 1257190.8 | 7.0 |
| UM18 | 491206.5 | 1257147.5 | 6.0 |
| UM19 | 491247.8 | 1257612.2 | 8.0 |
| UM20 | 491256.9 | 1257337.2 | 7.0 |
| UM21 | 491120.5 | 1257726.1 | 8.0 |
| UM22 | 491061.5 | 1257430.9 | 7.0 |
| UM23 | 491020.6 | 1257183.4 | 6.0 |
| UM24 | 491016.7 | 1257861.6 | 8.0 |
| UM25 | 490898.2 | 1257560.9 | 7.0 |
| UM26 | 490794.0 | 1257301.6 | 6.0 |
| UM27 | 490912.6 | 1258095.1 | 8.0 |
| UM28 | 490679.4 | 1257922.6 | 7.0 |
| UM29 | 490483.3 | 1257782.6 | 6.0 |
| UM30 | 490733.7 | 1258409.0 | 8.0 |
| UM31 | 490513.1 | 1258203.9 | 7.0 |
| UM32 | 490336.4 | 1257978.7 | 6.0 |
| UM33 | 490448.9 | 1258576.6 | 8.0 |
| UM34 | 490321.1 | 1258338.0 | 7.0 |
| UM35 | 490175.4 | 1258104.8 | 6.0 |
| UM35 | 490146.2 | 1258591.4 | 8.0 |
| UM36 | 490089.4 | 1258398.7 | 7.0 |
| UM37 | 490022.0 | 1258176.1 | 6.0 |
| UM38 | 489941.1 | 1258519.2 | 8.0 |
| UM39 | 489767.4 | 1258345.4 | 7.0 |
| UM40 | 489542.6 | 1258198.8 | 6.0 |

| EXISTING WEST DIKE REGRADE POINTS (SHEET 39) | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| RW01 | 490587.8 | 1255886.5 | 6.0 |
| RW02 | 490587.3 | 1255850.5 | 7.0 |
| RW03 | 490586.6 | 1255812.6 | 8.0 |
| RW04 | 490570.1 | 1255763.0 | 9.0 |
| RW05 | 490548.5 | 1255873.2 | 6.0 |
| RW06 | 490543.2 | 1255818.7 | 7.0 |
| RW07 | 490537.8 | 1255771.2 | 8.0 |
| RW08 | 490538.3 | 1255751.5 | 9.0 |
| RW09 | 490524.1 | 1255880.2 | 6.0 |
| RW10 | 490514.7 | 1255825.1 | 7.0 |
| RW11 | 490510.6 | 1255771.4 | 8.0 |
| RW12 | 490514.6 | 1255754.7 | 9.0 |
| RW13 | 490491.0 | 1255718.0 | 9.0 |
| RW14 | 490509.2 | 1255896.7 | 6.0 |
| RW15 | 490475.5 | 1255866.2 | 7.0 |
| RW16 | 490442.7 | 1255830.8 | 8.0 |
| RW17 | 490416.4 | 1255797.3 | 9.0 |
| RW18 | 490386.7 | 1256032.2 | 6.0 |
| RW19 | 490356.5 | 1255997.9 | 7.0 |
| RW20 | 490323.7 | 1255962.5 | 8.0 |
| RW21 | 490295.5 | 1255928.6 | 9.0 |
| RW22 | 490272.1 | 1256157.5 | 6.0 |
| RW23 | 490243.2 | 1256123.3 | 7.0 |
| RW24 | 490207.1 | 1256093.1 | 8.0 |
| RW25 | 490170.9 | 1256051.8 | 9.0 |
| RW26 | 490184.2 | 1256218.9 | 6.0 |
| RW27 | 490157.9 | 1256191.2 | 7.0 |
| RW28 | 490135.6 | 1256167.9 | 8.0 |
| RW29 | 490104.0 | 1256132.1 | 9.0 |
| RW30 | 490116.3 | 1256239.6 | 6.0 |
| RW31 | 490108.8 | 1256215.2 | 7.0 |
| RW32 | 490095.7 | 1256195.4 | 8.0 |
| RW33 | 490070.4 | 1256162.4 | 9.0 |
| RW34 | 490070.0 | 1256242.2 | 6.0 |
| RW35 | 490057.8 | 1256230.1 | 7.0 |
| RW36 | 490053.2 | 1256222.7 | 8.0 |
| RW37 | 490035.9 | 1256189.1 | 9.0 |
| RW38 | 490014.4 | 1256253.4 | 6.0 |
| RW39 | 489992.4 | 1256264.1 | 7.0 |
| RW40 | 489950.0 | 1256284.4 | 8.0 |
| RW41 | 489938.5 | 1256250.1 | 9.0 |
| RW42 | 489850.6 | 1256328.6 | 8.0 |
| RW43 | 489840.6 | 1256297.1 | 9.0 |
| RW44 | 489733.4 | 1256393.1 | 8.0 |
| RW45 | 489739.8 | 1256347.5 | 9.0 |

| EXISTING EAST DIKE REGRADE POINTS (SHEET 40) | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| RE01 | 489436.0 | 1256451.7 | 0.0 |
| RE02 | 489470.8 | 1256467.8 | 14.0 |
| RE03 | 489477.4 | 1256487.8 | 14.0 |
| RE04 | 489459.7 | 1256523.7 | 0.0 |
| RE05 | 488931.6 | 1256588.9 | 0.0 |
| RE06 | 488917.3 | 1256629.1 | 9.0 |
| RE07 | 488922.2 | 1256653.5 | 8.5 |
| RE08 | 488949.2 | 1256688.1 | 0.0 |
| RE09 | 488931.0 | 1256677.3 | 8.0 |
| RE10 | 488751.4 | 1256686.5 | 9.0 |
| RE11 | 488805.6 | 1256755.4 | 8.0 |
| RE12 | 488822.3 | 1256775.4 | 7.0 |
| RE13 | 488835.9 | 1256790.3 | 6.0 |
| RE14 | 488693.9 | 1256826.6 | 9.0 |
| RE15 | 488748.5 | 1256847.0 | 8.0 |
| RE16 | 488785.1 | 1256859.2 | 7.0 |
| RE17 | 488821.5 | 1256868.9 | 6.0 |
| RE18 | 488652.6 | 1256979.2 | 9.0 |
| RE19 | 488725.7 | 1256999.2 | 8.0 |
| RE20 | 488782.0 | 1257009.1 | 7.0 |
| RE21 | 488849.1 | 1257021.1 | 6.0 |
| RE22 | 488575.0 | 1257210.7 | 9.0 |
| RE23 | 488694.1 | 1257236.8 | 8.0 |
| RE24 | 488768.1 | 1257250.3 | 7.0 |
| RE25 | 488837.2 | 1257266.5 | 6.0 |
| RE26 | 488491.9 | 1257494.0 | 9.0 |
| RE27 | 488613.4 | 1257531.2 | 8.0 |
| RE28 | 488685.9 | 1257551.9 | 7.0 |
| RE29 | 488752.4 | 1257572.0 | 6.0 |
| RE30 | 488398.5 | 1257779.1 | 9.0 |
| RE31 | 488538.8 | 1257798.0 | 8.0 |
| RE32 | 488615.5 | 1257806.6 | 7.0 |
| RE33 | 488684.3 | 1257812.4 | 6.0 |
| RE34 | 488343.3 | 1257966.3 | 9.0 |
| RE35 | 488553.3 | 1257963.0 | 8.0 |
| RE36 | 488618.2 | 1257952.6 | 7.0 |
| RE37 | 488682.6 | 1257945.9 | 6.0 |
| RE38 | 488519.7 | 1258116.3 | 9.0 |
| RE39 | 488620.6 | 1258096.7 | 8.0 |
| RE40 | 488666.8 | 1258088.0 | 7.0 |
| RE41 | 488718.4 | 1258080.0 | 6.0 |
| RE42 | 488725.1 | 1258209.0 | 9.0 |
| RE43 | 488780.6 | 1258226.7 | 8.0 |
| RE44 | 488816.5 | 1258245.8 | 7.0 |
| RE45 | 488835.7 | 1258253.0 | 6.0 |

| TIDAL CHANNEL GRADING POINTS (SHEETS 20-22) | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| TC01 | 490063.7 | 1256362.1 | 4.0 |
| TC02 | 490079.6 | 1256372.7 | 4.0 |
| TC03 | 490068.0 | 1256366.3 | 4.0 |
| TC04 | 490187.8 | 1256300.9 | 5.0 |
| TC05 | 490188.5 | 1256306.6 | 4.1 |
| TC06 | 490189.0 | 1256311.9 | 5.0 |
| TC07 | 490273.4 | 1256354.9 | 5.0 |
| TC08 | 490271.1 | 1256357.6 | 4.0 |
| TC09 | 490267.6 | 1256362.0 | 5.0 |
| TC10 | 490347.4 | 1256377.7 | 5.0 |
| TC11 | 490347.5 | 1256381.7 | 4.8 |
| TC12 | 490347.8 | 1256387.0 | 5.0 |
| TC13 | 490463.8 | 1256331.7 | 5.0 |
| TC14 | 490464.9 | 1256336.8 | 4.9 |
| TC15 | 490465.8 | 1256339.6 | 5.0 |
| TC16 | 490606.8 | 1256356.9 | 5.3 |
| TC17 | 490606.6 | 1256361.1 | 5.0 |
| TC18 | 490607.2 | 1256363.6 | 5.0 |
| TC19 | 490760.9 | 1256313.5 | 7.0 |
| TC20 | 490761.8 | 1256317.8 | 6.0 |
| TC21 | 490762.1 | 1256319.9 | 6.8 |
| TC22 | 490878.2 | 1256329.6 | 7.0 |

| TIDAL CHANNEL GRADING POINTS (SHEETS 20-22) | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| TC23 | 490877.6 | 1256331.9 | 7.0 |
| TC24 | 490877.4 | 1256334.1 | 7.0 |
| TC25 | 491008.0 | 1256307.4 | 8.0 |
| TC26 | 490153.8 | 1256572.5 | 5.0 |
| TC27 | 490175.6 | 1256594.8 | 4.0 |
| TC28 | 490217.8 | 1256631.5 | 6.0 |
| TC29 | 490186.7 | 1256929.4 | 6.0 |
| TC30 | 490195.9 | 1256925.1 | 4.0 |
| TC31 | 490206.1 | 1256920.8 | 6.0 |
| TC32 | 490463.1 | 1257147.7 | 6.0 |
| TC33 | 490467.9 | 1257145.6 | 5.0 |
| TC34 | 490475.4 | 1257140.3 | 6.0 |
| TC35 | 490485.2 | 1257291.8 | 6.0 |
| TC36 | 490492.2 | 1257294.2 | 5.0 |
| TC37 | 490498.9 | 1257296.0 | 6.0 |
| TC38 | 490436.8 | 1257474.5 | 6.0 |
| TC39 | 490443.6 | 1257474.1 | 5.0 |
| TC40 | 490449.7 | 1257474.1 | 6.0 |
| TC41 | 490561.4 | 1257664.1 | 6.0 |
| TC42 | 490563.5 | 1257656.7 | 5.9 |
| TC43 | 490564.7 | 1257652.4 | 6.0 |
| TC44 | 490681.3 | 1257753.8 | 6.0 |

| TIDAL CHANNEL GRADING POINTS (SHEETS 20-22) | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| TC45 | 490689.1 | 1257746.6 | 6.0 |
| TC46 | 490696.5 | 1257738.2 | 6.1 |
| TC47 | 490734.9 | 1257775.3 | 6.8 |
| TC48 | 490735.6 | 1257768.8 | 6.0 |
| TC49 | 490736.7 | 1257763.3 | 6.6 |
| TC50 | 490894.3 | 1257782.4 | 7.0 |
| TC51 | 490894.5 | 1257778.0 | 7.0 |
| TC52 | 490895.0 | 1257774.7 | 7.0 |
| TC53 | 490987.4 | 1257812.4 | 7.3 |
| TC54 | 490988.5 | 1257808.0 | 7.0 |
| TC55 | 490989.8 | 1257805.8 | 7.0 |
| TC56 | 491117.4 | 1258016.7 | 8.0 |
| TC57 | 491119.2 | 1258014.4 | 8.0 |
| TC58 | 491120.9 | 1258011.5 | 8.0 |
| TC59 | 490697.0 | 1257850.7 | 6.5 |
| TC60 | 490701.3 | 1257850.9 | 6.0 |
| TC61 | 490706.4 | 1257850.8 | 6.9 |
| TC62 | 490646.5 | 1258106.3 | 7.0 |
| TC63 | 490649.3 | 1258106.1 | 7.0 |
| TC64 | 490653.0 | 1258106.0 | 7.0 |
| TC65 | 490732.9 | 1258290.1 | 7.0 |
| TC66 | 490734.0 | 1258287.7 | 7.0 |

| TIDAL CHANNEL GRADING POINTS (SHEETS 20-22) | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| TC67 | 490736.0 | 1258285.8 | 7.0 |
| TC68 | 490887.2 | 1258389.1 | 8.0 |
| TC69 | 489884.3 | 1258230.6 | 6.0 |
| TC70 | 489939.5 | 1258215.9 | 5.6 |
| TC71 | 489998.7 | 1258193.4 | 6.0 |
| TC72 | 490180.3 | 1258352.0 | 6.0 |
| TC73 | 490184.6 | 1258338.3 | 5.0 |
| TC74 | 490188.1 | 1258326.8 | 6.0 |
| TC75 | 490469.9 | 1258412.7 | 7.0 |
| TC76 | 489410.8 | 1256643.0 | 4.0 |
| TC77 | 489438.0 | 1256656.3 | 2.0 |
| TC78 | 489458.3 | 1256665.2 | 2.0 |
| TC79 | 489427.0 | 1256757.0 | 4.0 |
| TC80 | 489435.6 | 1256757.4 | 3.9 |
| TC81 | 489450.7 | 1256756.7 | 4.0 |
| TC82 | 489393.3 | 1256821.0 | 4.0 |
| TC83 | 489398.0 | 1256832.9 | 4.0 |
| TC84 | 489403.9 | 1256849.3 | 4.5 |
| TC85 | 489242.2 | 1256879.6 | 4.0 |
| TC86 | 489244.5 | 1256889.9 | 4.0 |
| TC87 | 489246.3 | 1256901.3 | 4.0 |
| TC88 | 489027.8 | 1256989.2 | 5.0 |

| TIDAL CHANNEL GRADING POINTS (SHEETS 20-22) | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| TC89 | 489031.7 | 1256991.3 | 4.6 |
| TC90 | 489036.5 | 1256993.1 | 5.0 |
| TC91 | 489006.7 | 1257170.6 | 5.0 |
| TC92 | 489012.1 | 1257171.6 | 5.0 |
| TC93 | 489018.4 | 1257172.4 | 5.0 |
| TC94 | 488884.9 | 1257320.6 | 5.0 |
| TC95 | 488887.6 | 1257324.2 | 5.0 |
| TC96 | 488890.5 | 1257328.1 | 5.0 |
| TC97 | 488821.4 | 1257677.0 | 5.0 |
| TC98 | 488901.4 | 1257789.3 | 5.0 |
| TC99 | 489001.2 | 1257959.5 | 5.0 |
| TC100 | 489038.9 | 1257188.5 | 5.0 |
| TC101 | 489044.0 | 1257185.9 | 5.0 |
| TC102 | 489048.6 | 1257183.7 | 5.0 |
| TC103 | 489275.3 | 1257422.8 | 5.0 |
| TC104 | 489278.8 | 1257420.0 | 5.0 |
| TC105 | 489283.4 | 1257417.8 | 5.0 |
| TC106 | 489300.2 | 1257573.2 | 5.0 |
| TC107 | 489304.5 | 1257574.1 | 5.0 |
| TC108 | 489307.9 | 1257574.3 | 5.0 |
| TC109 | 489279.3 | 1257770.8 | 5.0 |
| TC110 | 489283.0 | 1257770.4 | 5.0 |

| TIDAL CHANNEL GRADING POINTS (SHEETS 20-22) | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| TC111 | 489285.1 | 1257770.0 | 5.0 |
| TC112 | 489360.5 | 1257920.4 | 5.1 |
| TC113 | 489411.9 | 1256868.9 | 4.9 |
| TC114 | 489418.0 | 1256869.2 | 4.0 |
| TC115 | 489423.9 | 1256869.7 | 5.0 |
| TC116 | 489428.2 | 1257015.7 | 5.0 |
| TC117 | 489433.0 | 1257014.1 | 4.0 |
| TC118 | 489438.8 | 1257013.1 | 5.0 |
| TC119 | 489521.5 | 1257144.0 | 5.0 |
| TC120 | 489524.7 | 1257143.5 | 4.9 |
| TC121 | 489529.7 | 1257142.5 | 5.0 |
| TC122 | 489525.3 | 1257258.9 | 5.0 |
| TC123 | 489529.2 | 1257259.0 | 4.9 |
| TC124 | 489530.8 | 1257259.3 | 5.0 |
| TC125 | 489496.9 | 1257410.2 | 5.0 |
| TC126 | 489499.8 | 1257409.2 | 5.0 |
| TC127 | 489501.8 | 1257408.9 | 5.0 |
| TC128 | 489627.4 | 1257583.2 | 5.0 |
| TC129 | 489629.3 | 1257582.5 | 5.0 |
| TC130 | 489631.1 | 1257582.0 | 5.0 |
| TC131 | 489655.1 | 1257626.1 | 5.1 |

| PARKING LOT DITCH REGRADE POINTS (SHEET 8) | | | |
|---|---|---|---|
| POINT | NORTHING | EASTING | ELEVATION |
| PL01 | 491030.0 | 1256176.9 | 6.0 |
| PL02 | 491178.6 | 1256303.9 | 5.0 |
| PL03 | 491268.7 | 1256340.8 | 4.5 |

90% DESIGN — NOT FOR CONSTRUCTION

NOTES

1. PROPOSED DIKE GRADING POINTS ASSOCIATED WITH POINTS SHOWN ON TYPICAL SETBACK DIKE SECTIONS SHEET 12
2. STORAGE POND, MARSH, EXISTING DIKE (EAST AND WEST) GRADING POINTS ARE SHOWN ON GRADING PLANS FOR EACH CONSTRUCTED FEATURE'S PLAN SHEET.

# ALIGNMENT AND TIES

*WASHINGTON STATE*

*DEPARTMENT OF FISH AND WILDLIFE*

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

| SYM | DATE | REVISION DESCRIPTION | BY |
|---|---|---|---|
| | 11/14 | 90% DESIGN SUBMITTAL | DRC |

APPROVED AND RELEASED FOR CONSTRUCTION

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

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

0 —— 1"
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CHECKED BY CAR
DRAWN BY CMH, EAA
DATE NOV 2014

FIR ISLAND FARM

ECOSYSTEM RESTORATION

ALIGNMENT, TIES AND GRADING TABLES

—

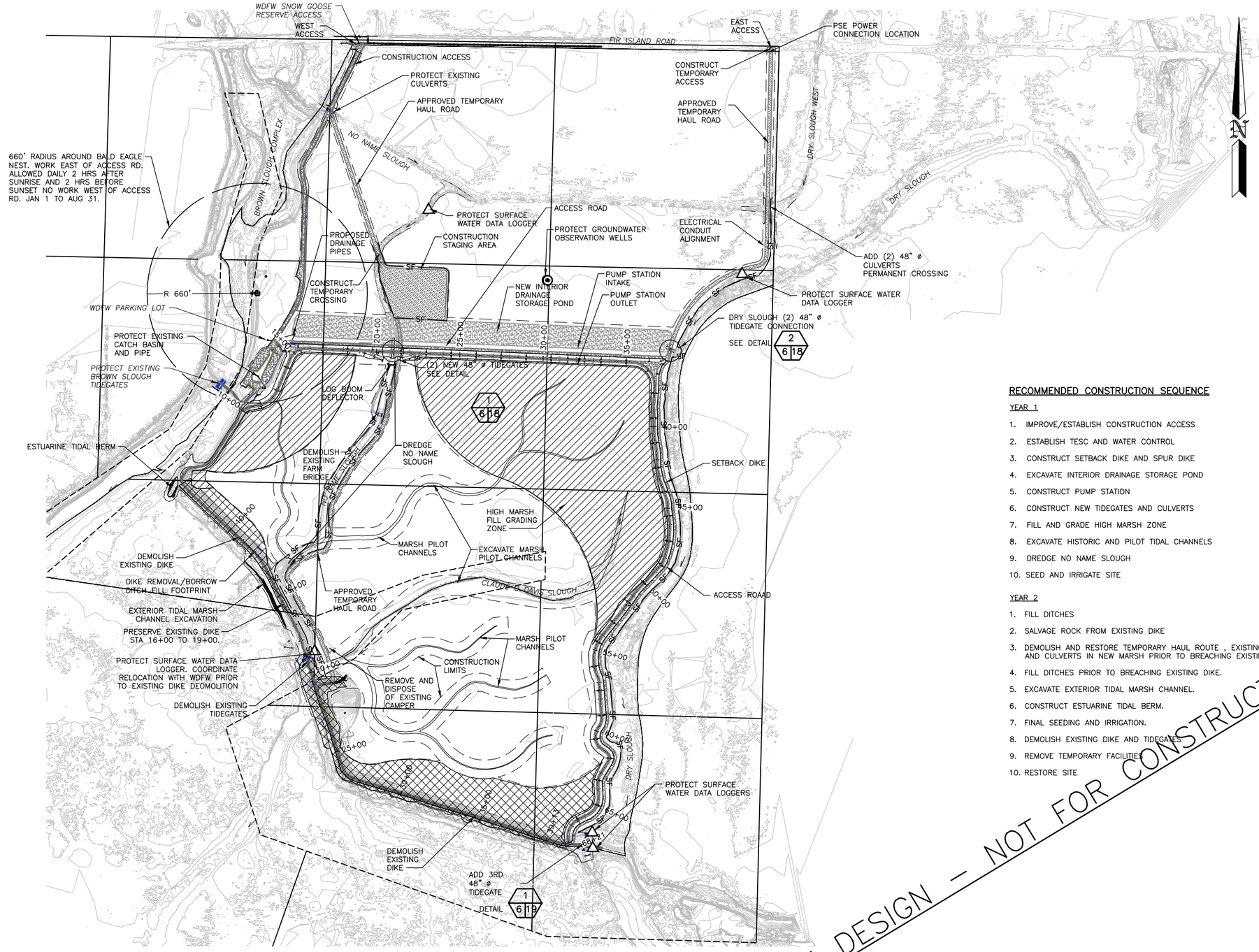
PROJECT NO. ST:R4:11-3

SHEET 5 OF 43

FILENAME: I:\WIP\21-1\12318 FIR ISLAND\CAD\R004\R004113c\R004113c005.dwg DATE: 11-07-2014 LOGIN: cmh

## LEGEND

- DIKE REMOVAL AND GRADING
- HIGH MARSH FILL
- PROPOSED STORAGE POND
- PROPOSED SETBACK DIKE
- TEMPORARY HAUL ROUTE
- PERMANENT ACCESS MAINTENANCE ROUTE
- CONSTRUCTION LIMITS
- TIDEGATE
- SURFACE WATER OBSERVATION STATION




SITE PLAN

0 300 600 900

SCALE: 1" = 300'

## 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 PUMP STATION
6. CONSTRUCT NEW TIDEGATES AND CULVERTS
7. FILL AND GRADE HIGH MARSH ZONE
8. EXCAVATE HISTORIC AND PILOT TIDAL CHANNELS
9. DREDGE NO NAME SLOUGH
10. SEED AND IRRIGATE SITE

YEAR 2

1. FILL DITCHES
2. SALVAGE ROCK FROM EXISTING DIKE
3. DEMOLISH AND RESTORE TEMPORARY HAUL ROUTE , EXISTING FARM BRIDGE, AND CULVERTS IN NEW MARSH PRIOR TO BREACHING EXISTING DIKE
4. FILL DITCHES PRIOR TO BREACHING EXISTING DIKE.
5. EXCAVATE EXTERIOR TIDAL MARSH CHANNEL.
6. CONSTRUCT ESTUARINE TIDAL BERM.
7. FINAL SEEDING AND IRRIGATION.
8. DEMOLISH EXISTING DIKE AND TIDEGATES
9. REMOVE TEMPORARY FACILITIES
10. RESTORE SITE

90% DESIGN – NOT FOR CONSTRUCTION

*WASHINGTON STATE*
*DEPARTMENT OF FISH AND WILDLIFE*

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

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

0 — 1"
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DATE NOV 2014

FIR ISLAND FARM

ECOSYSTEM RESTORATION

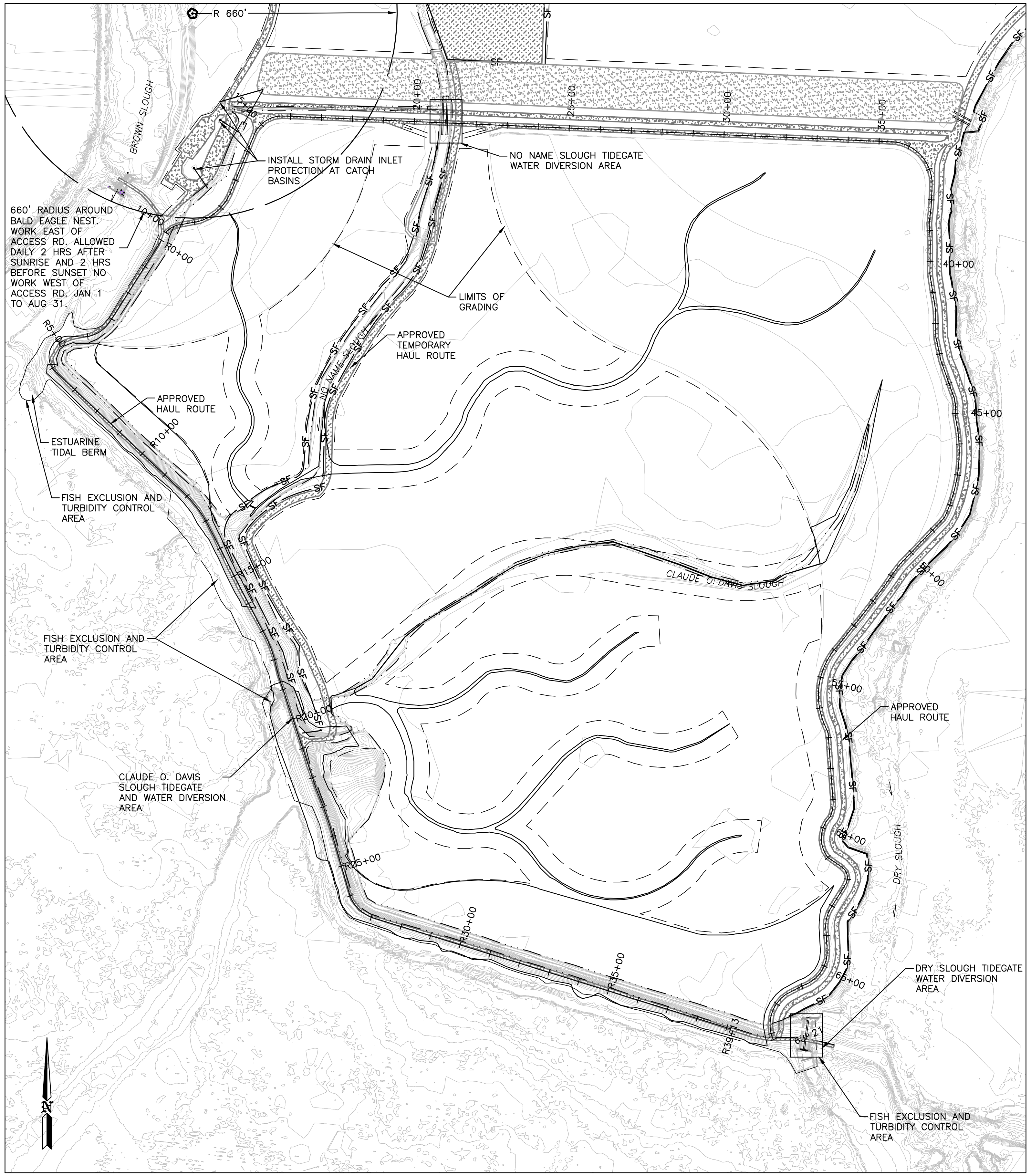
PROJECT SITE PLAN

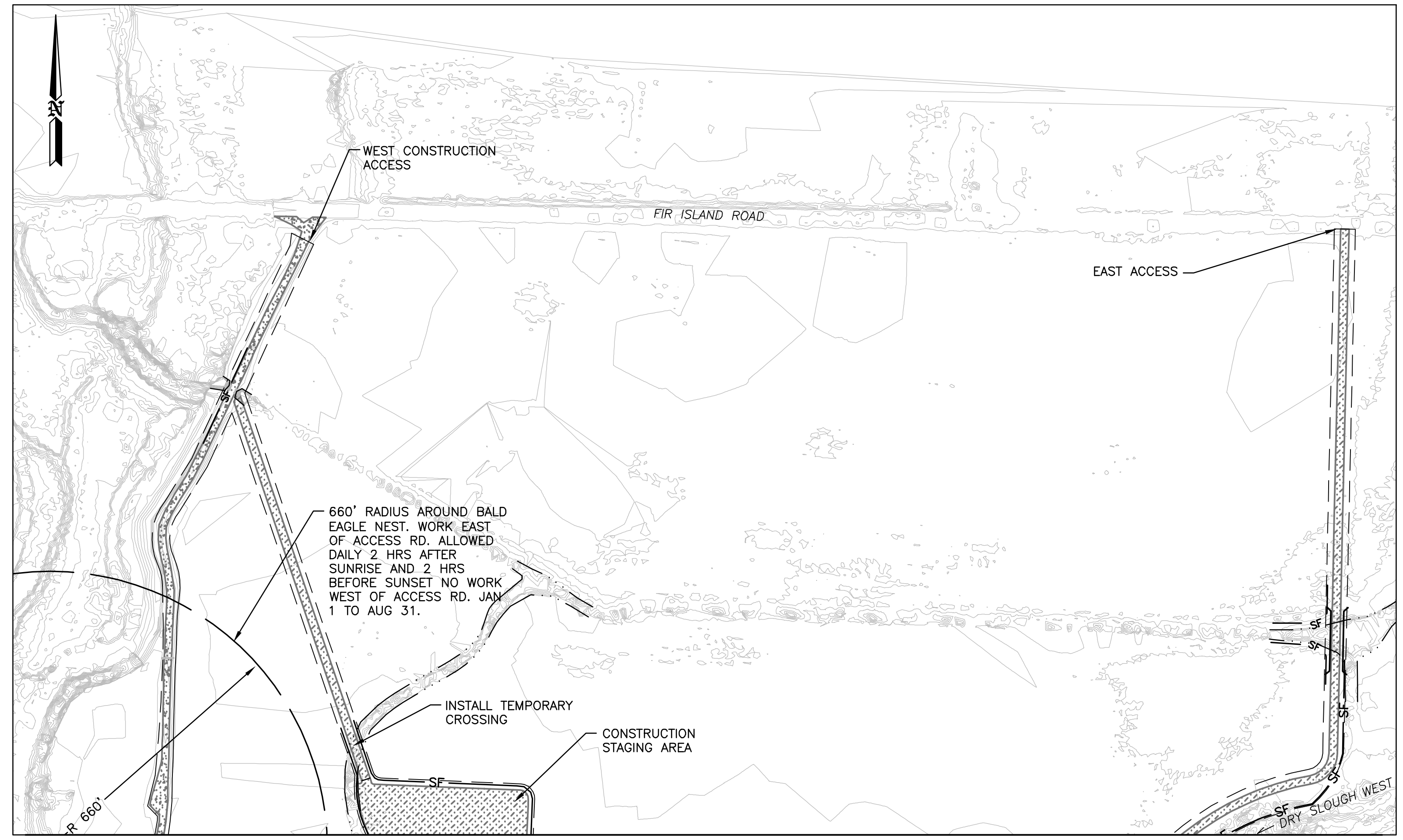
–

PROJECT NO. ST:R4:11–3

SHEET 6 OF 43

FILENAME: I:\WP\21-11\2318 Fir Island\CAD\R00A\R004113A\R004113-006.dwg DATE: 11-06-2014 LOGIN: cmh




MATCHLINE – SEE LEFT

## SITE PLAN

0 200 400 600

SCALE: 1" = 200'

## NOTES

1. CONTRACTOR TO PROVIDE STORMWATER POLLUTION PROTECTION PLAN AND UPDATED TEMPORARY EROSION AND SEDIMENT CONTROL PLAN PER THE CONSTRUCTION STORMWATER GENERAL PERMIT REQUIREMENTS. CONTRACTOR RESPONSIBLE FOR IMPLEMENTATION OF SWPPP AND TESC PLANS.
2. ALONG EAST ACCESS ROAD WHERE SHOWN, INSTALL SILT FENCE JUST INSIDE LIMITS OF CONSTRUCTION.
3. EROSION PROTECTION MEASURES TO BE INSTALLED BEFORE SOIL IS DISTURBED OR GRADING ACTIVITIES BEGIN.
4. PROVIDE INSTALLATION AND DIVERSION OF WATER FOR ALL TIDEGATES AND CULVERT INSTALLATIONS.
5. EXISTING DIKE DEMOLITION AFTER TIDAL BREACH SHALL OCCUR AT LOW–TIDE PERIODS, BELOW MEAN LOW WATER OR IN THE DRY.
6. ESTUARINE TIDAL BERM AND TIDAL MARSH CHANNEL EXCAVATIONS WATERWARD OF DIKE SHALL OCCUR BELOW THE MEAN LOWER WATER, OR IN THE DRY. EXCAVATED SOILS SHALL BE PLACED IN DRY AREAS ONLY.
7. APPROVED TEMPORARY HAUL ROUTE MUST BE COMPLETELY REMOVED AND RESTORED PRIOR TO EXISTING DIKE BREACH.
8. FISH SCREENS AND DEFISHING TO MEET REQUIRMEENTS OF THE PERMITS.
9. REFER TO SHEET 23 FOR TEMPORARY SEEDING MIX AND APPLICATION AREAS DURING YEAR 1.

## LEGEND

PERMANENT ACCESS ROAD

APPROVED TEMPORARY HAUL ROAD

SF SILT FENCE

LIMITS OF CONSTRUCTION

90% DESIGN – NOT FOR CONSTRUCTION

*WASHINGTON STATE*

*DEPARTMENT OF FISH AND WILDLIFE*

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

| SYM | DATE | REVISION DESCRIPTION | BY |
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APPROVED AND RELEASED FOR CONSTRUCTION

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

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

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DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH, EAA
DATE NOV 2014

# FIR ISLAND FARM

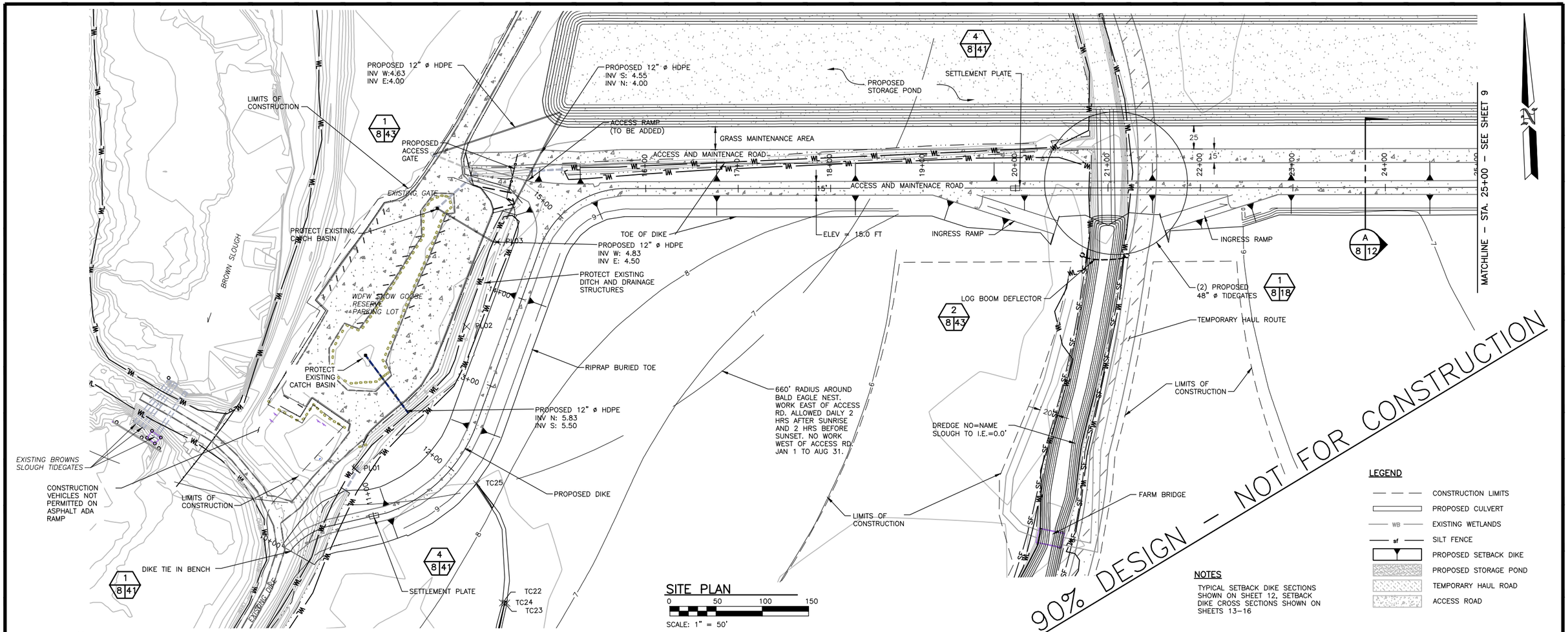
## ECOSYSTEM RESTORATION

TEMPORARY EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO. ST:R4:11–3

SHEET 7 OF 43

FILENAME: I:\WIP\21-1\12318 Fir Island\CAD\R004\R004113c\R004113c007.dwg DATE: 11-06-2014 LOGIN: cmh




## SITE PLAN

0 50 100 150

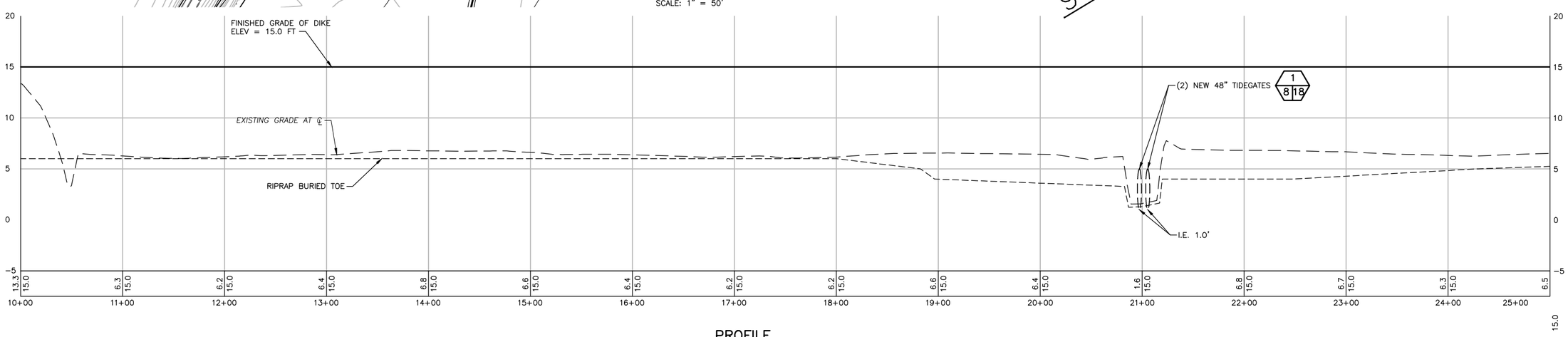
SCALE: 1" = 50'

## LEGEND

- CONSTRUCTION LIMITS
- PROPOSED CULVERT
- EXISTING WETLANDS
- SILT FENCE
- PROPOSED SETBACK DIKE
- PROPOSED STORAGE POND
- TEMPORARY HAUL ROAD
- ACCESS ROAD

## NOTES

TYPICAL SETBACK DIKE SECTIONS SHOWN ON SHEET 12, SETBACK DIKE CROSS SECTIONS SHOWN ON SHEETS 13–16




## PROFILE

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

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

| SYM | DATE | REVISION DESCRIPTION | BY |
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CHIEF ENGINEER ..... DATE: .....

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

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

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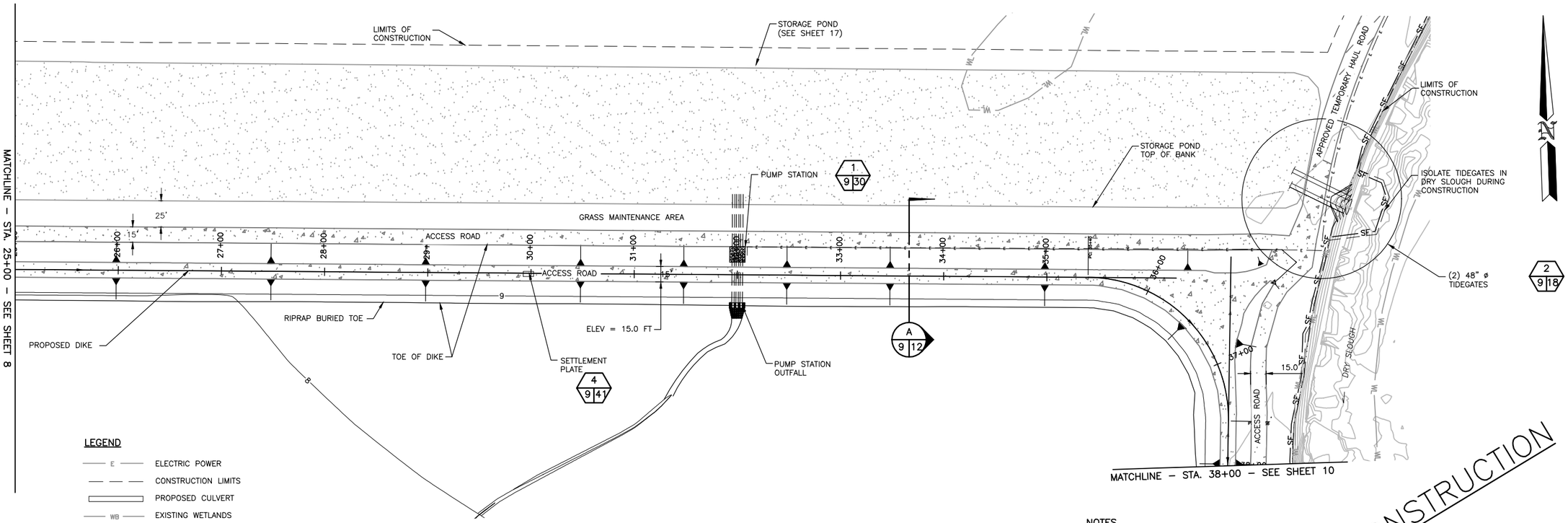
CHECKED BY CAR
DRAWN BY CMH, EAA
DATE NOV 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
SETBACK DIKE – PLAN AND PROFILE
STATIONS 10+00 TO 25+00

PROJECT NO. ST:R4:11–3

SHEET 8 OF 43

FILENAME: I:\WIP\21-1\12318 Fir Island\CAD\B004\B004\B004113c\B004113c008.dwg DATE: 11-06-2014 LOGIN: cmh




## LEGEND

- E — ELECTRIC POWER
- CONSTRUCTION LIMITS
- PROPOSED CULVERT
- WB — EXISTING WETLANDS
- SF — SILT FENCE
- PROPOSED SETBACK DIKE
- PROPOSED STORAGE POND
- TEMPORARY HAUL ROAD
- ACCESS ROAD

## SITE PLAN

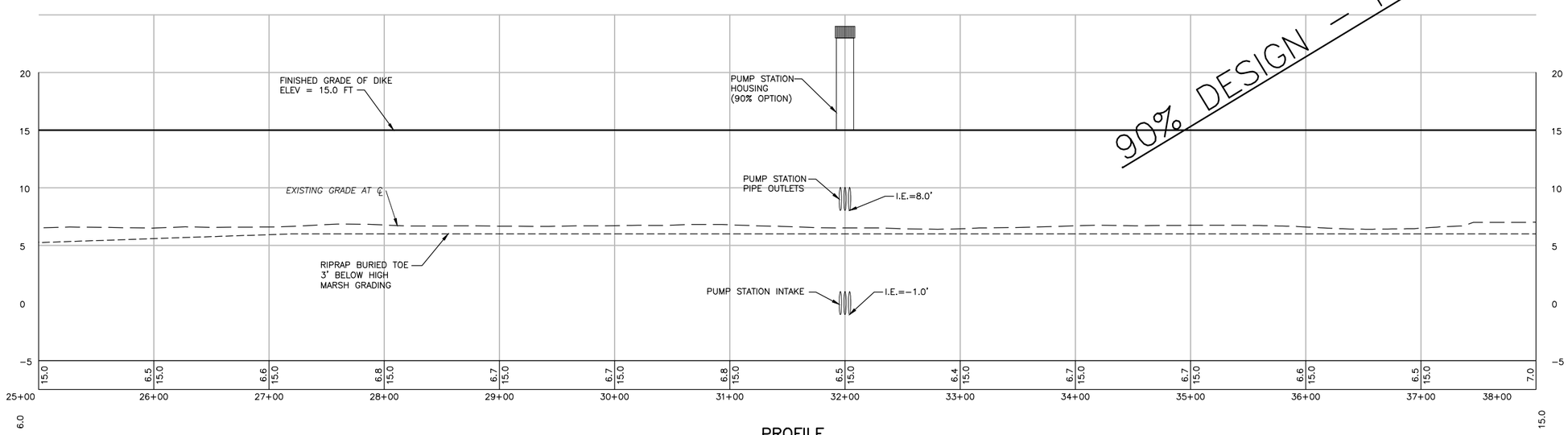
0 50 100 150

SCALE: 1" = 50'

## NOTES

TYPICAL SETBACK DIKE SECTIONS SHOWN ON SHEET 12, SETBACK DIKE CROSS SECTIONS SHOWN ON SHEETS 13–16

90% DESIGN – NOT FOR CONSTRUCTION




## PROFILE

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

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

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

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DATE NOV 2014

FIR ISLAND FARM

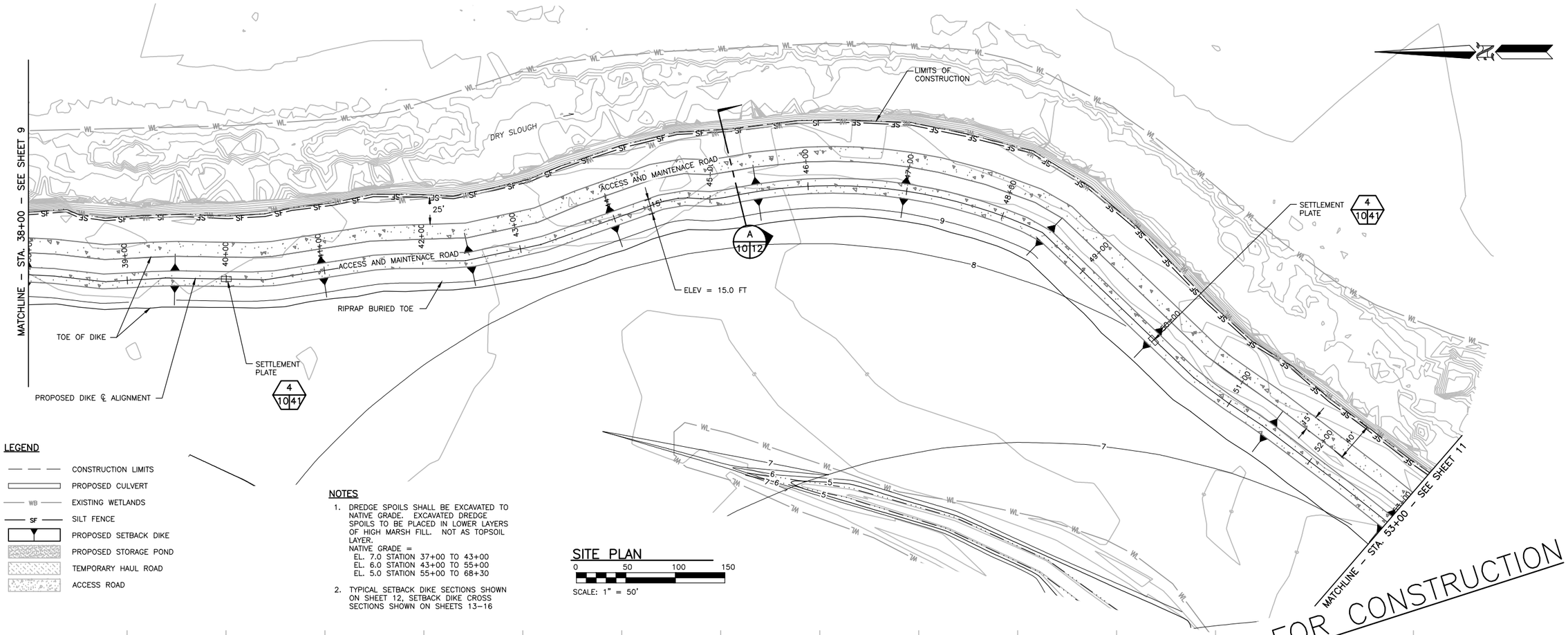
ECOSYSTEM RESTORATION

SETBACK DIKE – PLAN AND PROFILE
STATIONS 25+00 TO 38+00

PROJECT NO. ST:R4:11-3

SHEET 9 OF 43

FILENAME: J:\WDW21-J\13118.Fir Island\C02\D002\D002113\D002113c009.dgn DATE: 10-31-2014 LOGIN: cmh




## LEGEND

- CONSTRUCTION LIMITS
- PROPOSED CULVERT
- EXISTING WETLANDS
- SILT FENCE
- PROPOSED SETBACK DIKE
- PROPOSED STORAGE POND
- TEMPORARY HAUL ROAD
- ACCESS ROAD

## NOTES

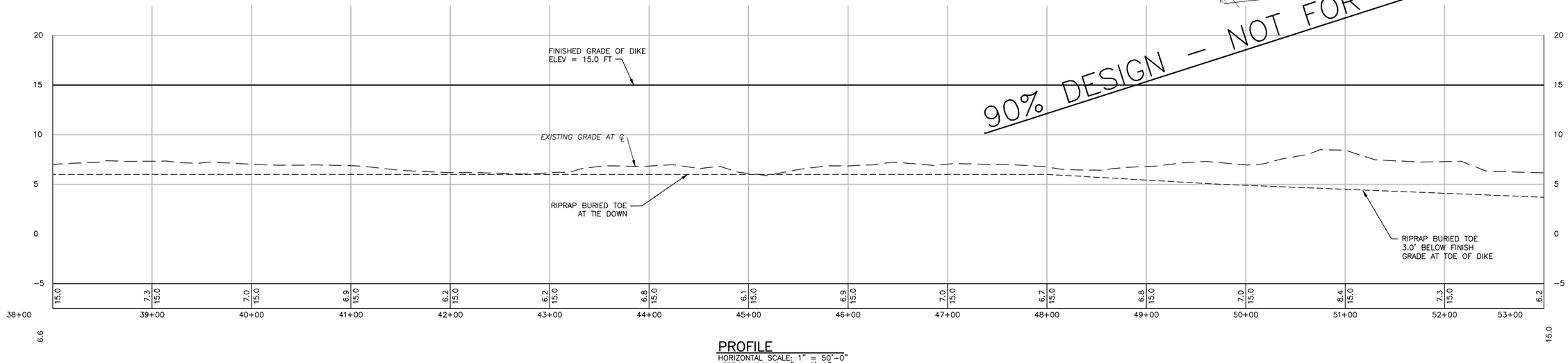
1. DREDGE SPOILS SHALL BE EXCAVATED TO NATIVE GRADE. EXCAVATED DREDGE SPOILS TO BE PLACED IN LOWER LAYERS OF HIGH MARSH FILL. NOT AS TOPSOIL LAYER.
   NATIVE GRADE =
   EL. 7.0 STATION 37+00 TO 43+00
   EL. 6.0 STATION 43+00 TO 55+00
   EL. 5.0 STATION 55+00 TO 68+30
2. TYPICAL SETBACK DIKE SECTIONS SHOWN ON SHEET 12, SETBACK DIKE CROSS SECTIONS SHOWN ON SHEETS 13–16

## SITE PLAN

0 50 100 150

SCALE: 1" = 50'

90% DESIGN – NOT FOR CONSTRUCTION




## PROFILE

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

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

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

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

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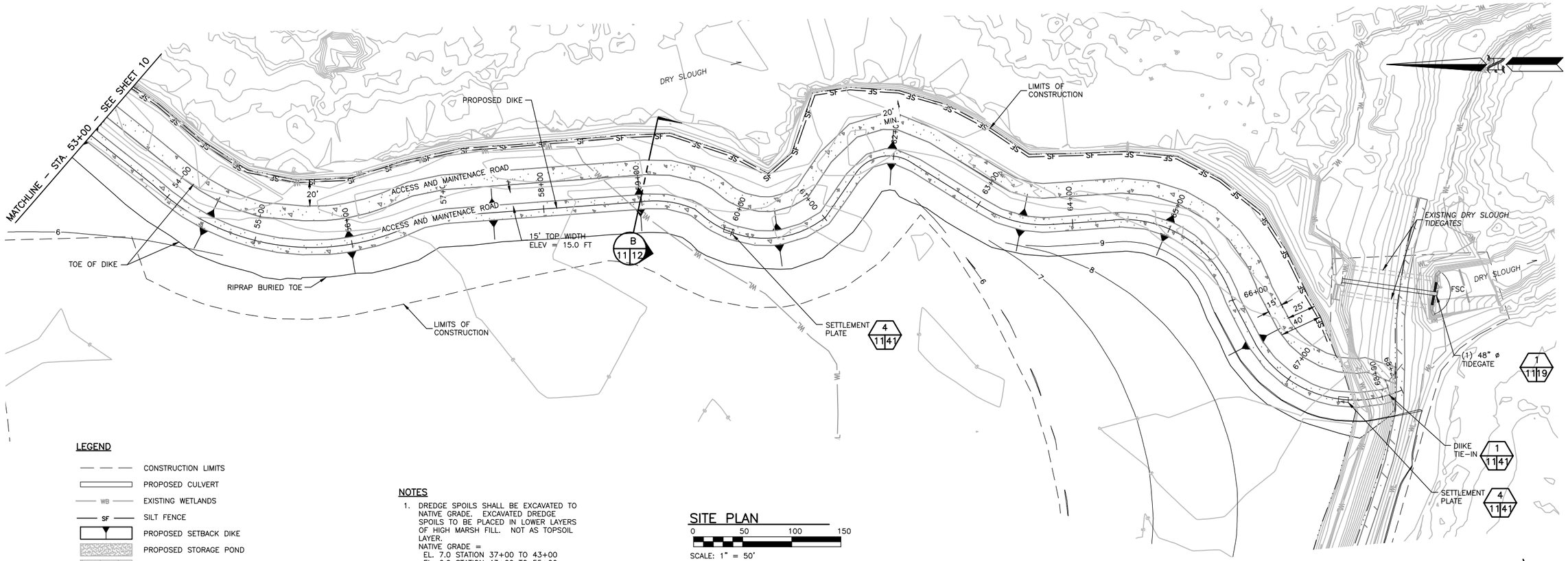
CHECKED BY CAR
DRAWN BY CMH, EAA
DATE NOV 2014

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

PROJECT NO. ST:R4:11–3

SHEET 10 OF 43

FILENAME: J:\WP\71-1\73318\Fir Island\C(0)\B00A\B004113\A\B004113-010.dgn DATE: 10-31-2014 USER: cmh




## LEGEND

- CONSTRUCTION LIMITS
- PROPOSED CULVERT
- EXISTING WETLANDS
- SILT FENCE
- PROPOSED SETBACK DIKE
- PROPOSED STORAGE POND
- TEMPORARY HAUL ROAD
- ACCESS ROAD

## NOTES

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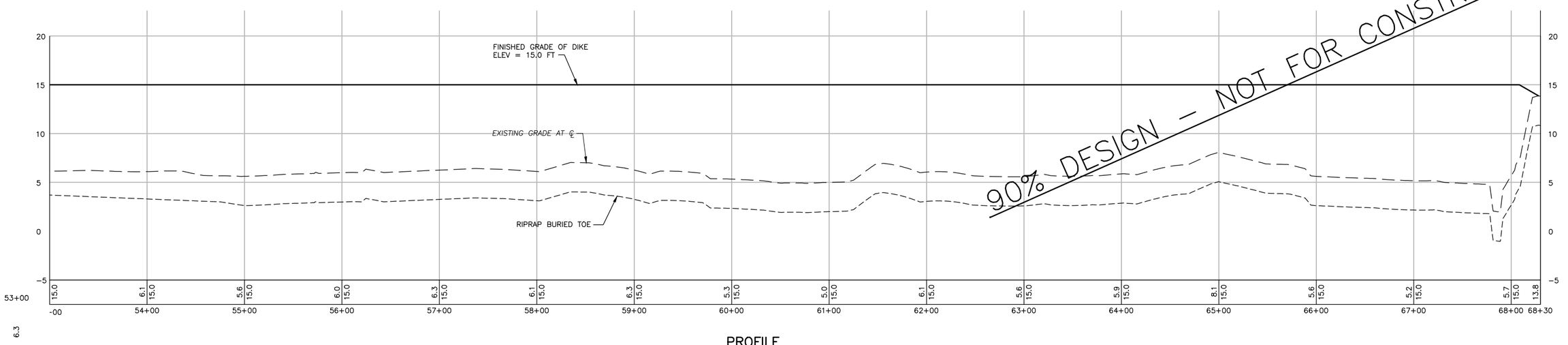
   NATIVE GRADE =
   EL. 7.0 STATION 37+00 TO 43+00
   EL. 6.0 STATION 43+00 TO 55+00
   EL. 5.0 STATION 55+00 TO 68+30
2. TYPICAL SETBACK DIKE SECTIONS SHOWN ON SHEET 12, SETBACK DIKE CROSS SECTIONS SHOWN ON SHEETS 13–16

## SITE PLAN

0 50 100 150

SCALE: 1" = 50'




## PROFILE

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

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE
STATE OF WASHINGTON
39526
REGISTERED PROFESSIONAL ENGINEER

| SYM | DATE | REVISION DESCRIPTION | BY |
|---|---|---|---|
| | 11/14 | 90% DESIGN SUBMITTAL | DRC |

APPROVED AND RELEASED FOR CONSTRUCTION

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

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

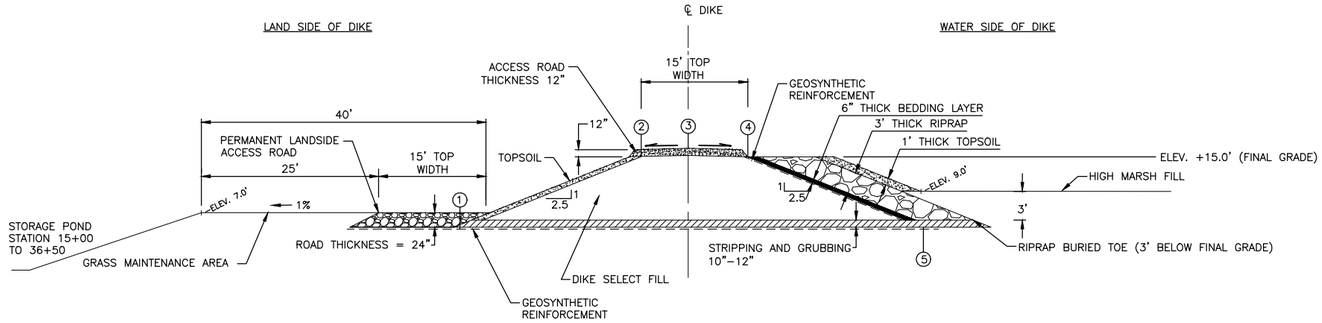
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH, EAA
DATE NOV 2014

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

PROJECT NO. ST:R4:11–3

SHEET 11 OF 43

FILENAME: J:\WFA\31-11\7318 Fir Island\CAD\R04\R04113\R04113-011.dwg DATE: 10-31-2014 LOGIN: cmh



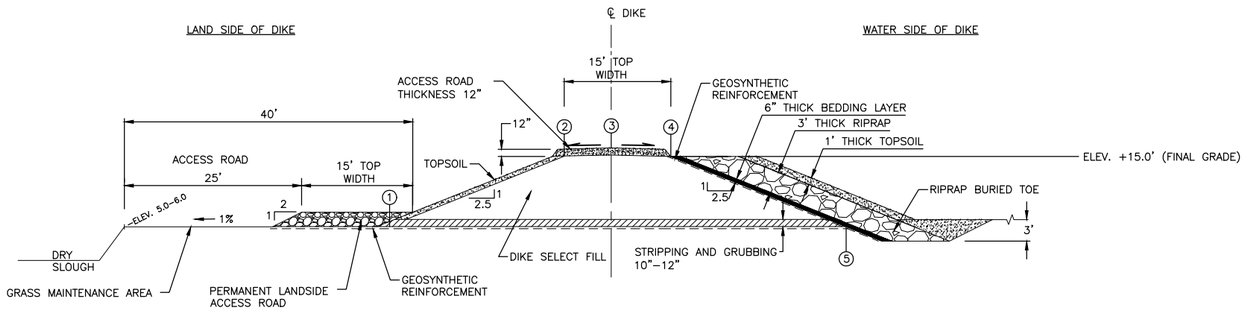

## TYPICAL DIKE SECTION (HIGH MARSH GRADING) STA. 10+00 TO 54+00

A 8|12 A 9|12

0 10 20 30

SCALE: 1" = 10'

⑤ = GRADING REFERENCE POINTS AS LISTED ON SHEET 5




## TYPICAL DIKE SECTION (NO HIGH MARSH GRADING) STA. 54+00 TO 68+00

B 11|12

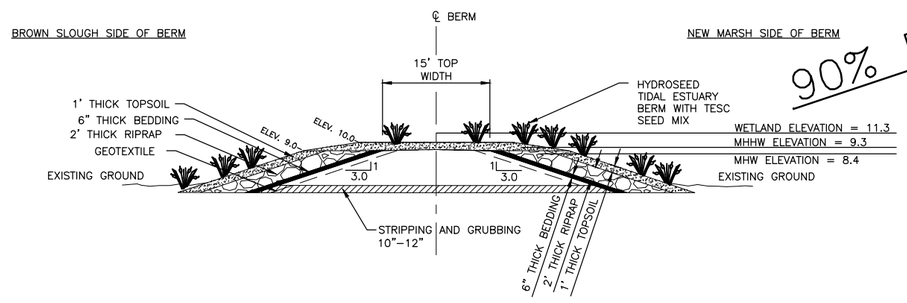
0 10 20 30

SCALE: 1" = 10'

90% DESIGN – NOT FOR CONSTRUCTION

**NOTE**

1. BACKFILL STRIPPING DEPTH WITH DIKE SELECT FILL.
2. ESTUARINE TIDAL BERM CONSTRUCTION TO BE COMPLETE PRIOR TO EXISTING DIKE FINAL DEMOLITION AND TIDAL "BREACH". ESTUARINE TIDAL BERM TO BE INSTALLED AFTER EXCAVATION OF EXTERIOR TIDAL MARSH CHANNEL, EAST OF BERM.




## TYPICAL ESTUARINE TIDAL BERM SECTION 6+21 TO 7+22

C 38|12

0 10 20 30

SCALE: 1" = 10'

*WASHINGTON STATE*
*DEPARTMENT OF FISH AND WILDLIFE*

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

| SYM | DATE | REVISION DESCRIPTION | BY |
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| | 11/14 | 90% DESIGN SUBMITTAL | DRC |

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

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

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH, EAA
DATE NOV 2014

FIR ISLAND FARM

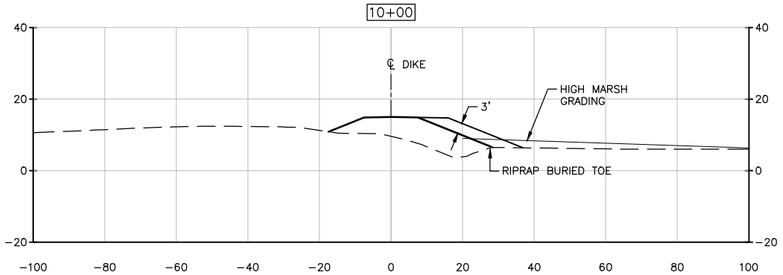
ECOSYSTEM RESTORATION

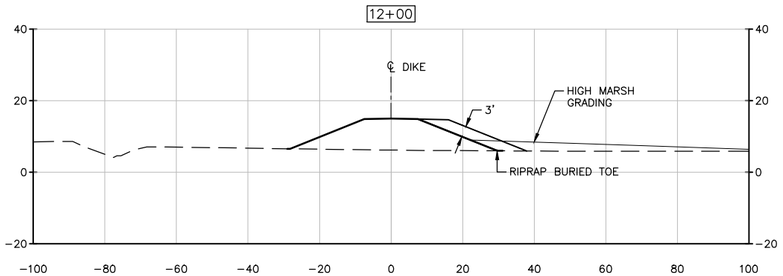
TYPICAL SETBACK DIKE DETAILS

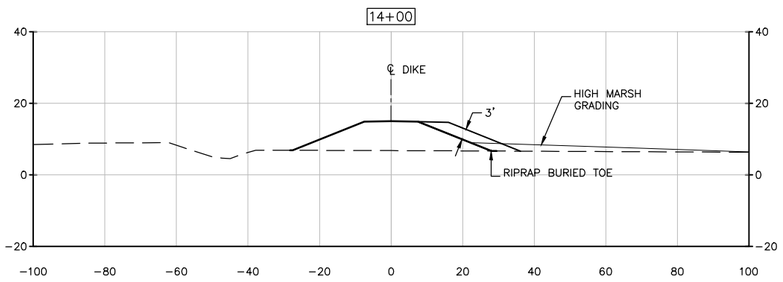
PROJECT NO. ST:R4:11–3

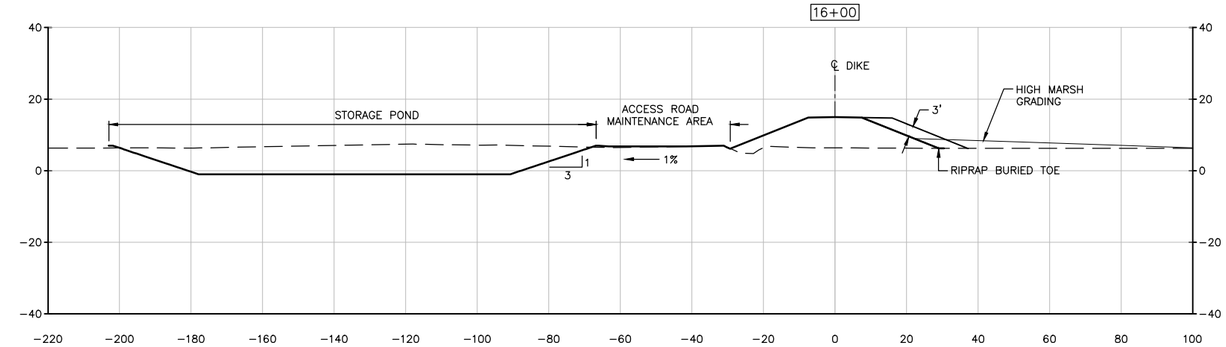
SHEET 12 OF 43

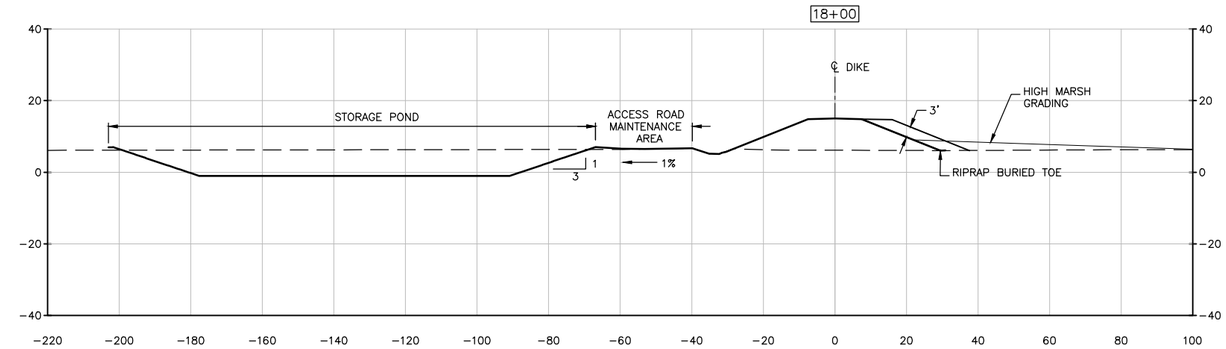
FILENAME: J:\WFA\31-11\7318 Fir Island\CAD\R04\R04113\R04113-012.dwg DATE: 10-31-2014 LOGIN: cmh

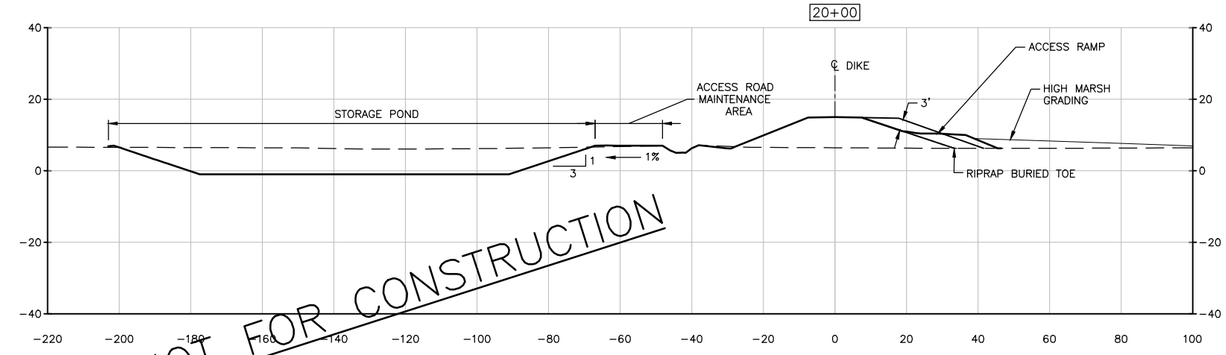


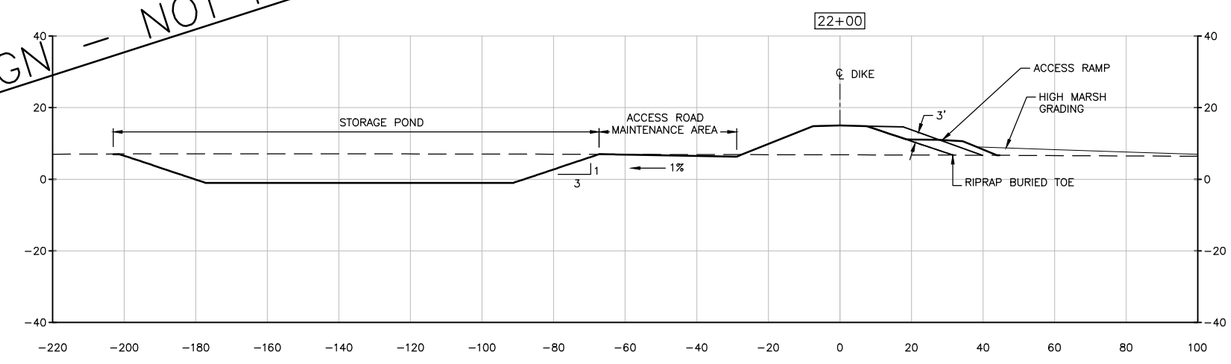




90% DESIGN – NOT FOR CONSTRUCTION

**LEGEND**

— — — EXISTING GRADE

——— PROPOSED GRADE

GRAPHIC SCALE

0 20 40 60

SCALE: 1" = 20'

DATE: 10-31-2014

FILENAME: L:\WDW21-L\19318 Fir Island\CAD\8004\8004113\8004113cs013.dgn

*WASHINGTON STATE*

*DEPARTMENT OF FISH AND WILDLIFE*

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

| SYM | DATE | REVISION DESCRIPTION | BY |
|---|---|---|---|
| | 11/14 | 90% 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 CMH, EAA
DATE NOV 2014

FIR ISLAND FARM

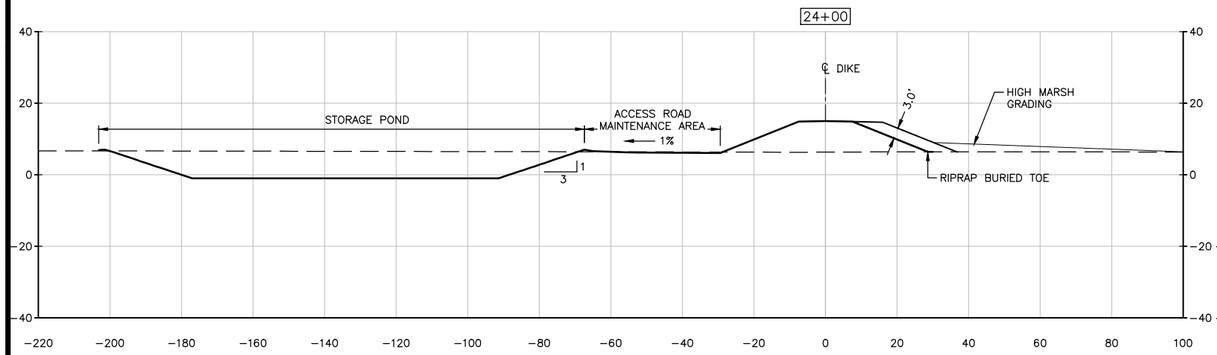
ECOSYSTEM RESTORATION

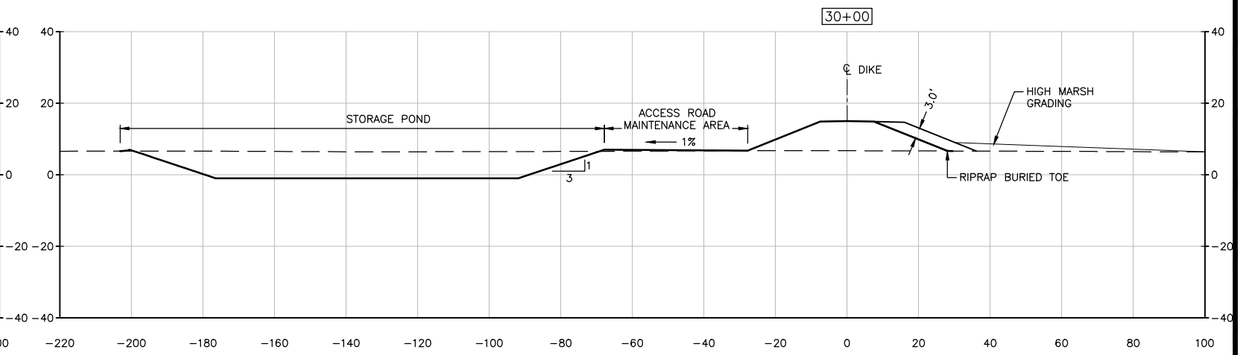
SETBACK DIKE CROSS SECTIONS

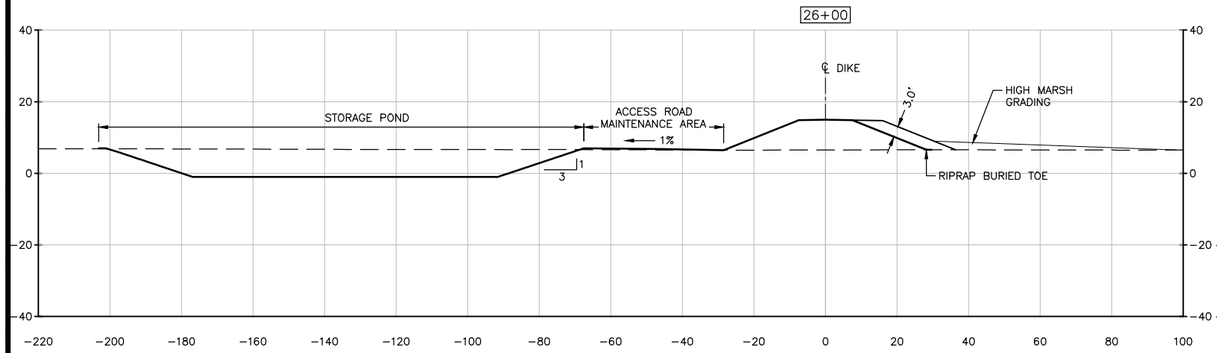
STATIONS 10+00 TO 22+00

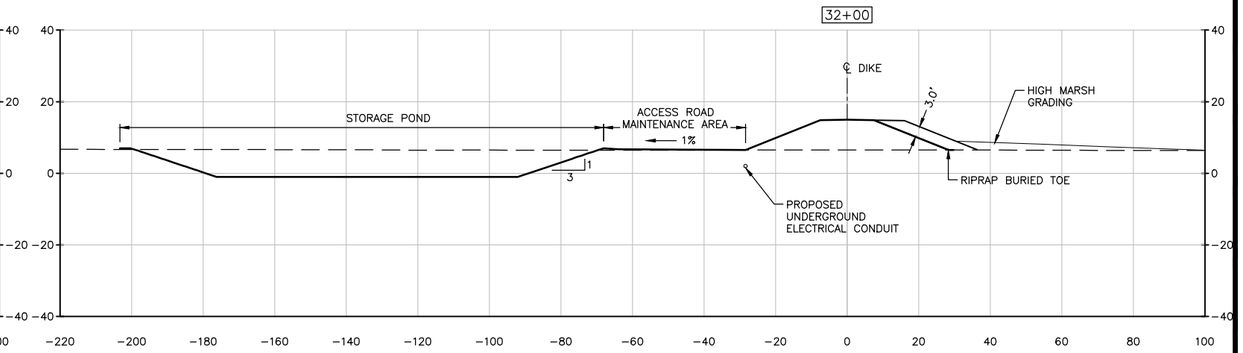
PROJECT NO. ST:R4:11-3

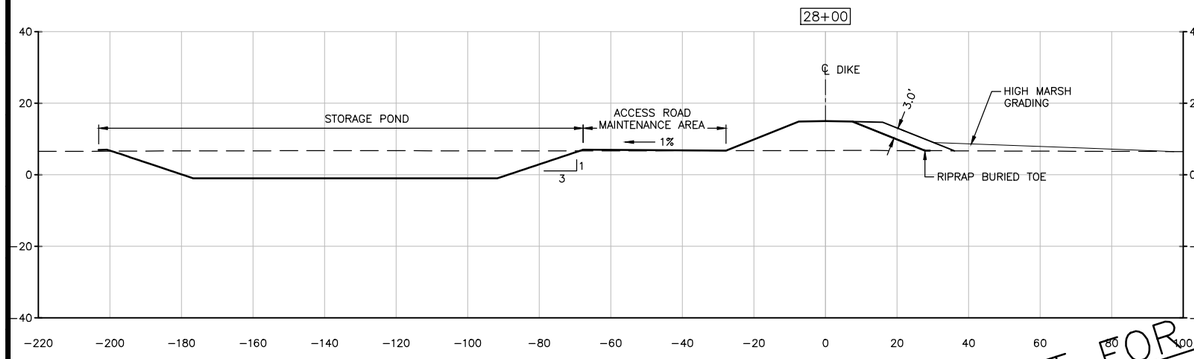
SHEET 13 OF 43

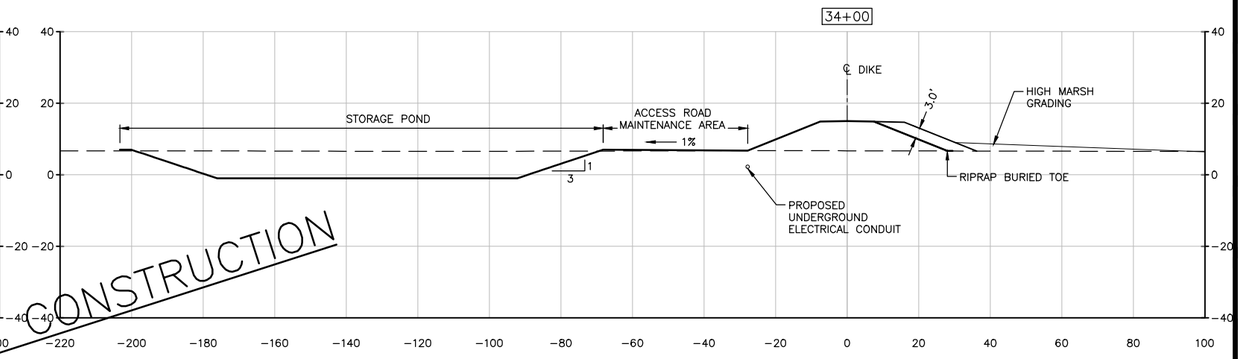


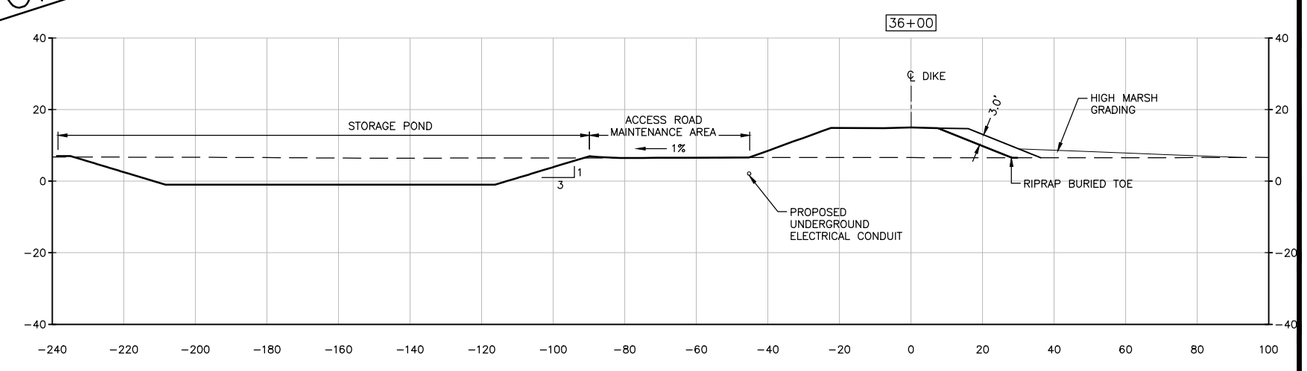




90% DESIGN – NOT FOR CONSTRUCTION

**LEGEND**

— — — EXISTING GRADE

——— PROPOSED GRADE

GRAPHIC SCALE

0 20 40 60

SCALE: 1" = 20'

DATE: 10-31-2014

DLFILNAME: L:\WRA\21-L\19318 Fir Island\CAD\800A\800411\A\800411SC014.dwg

*WASHINGTON STATE*

*DEPARTMENT OF FISH AND WILDLIFE*

DAVID R. CLINE STATE OF WASHINGTON 38526 REGISTERED PROFESSIONAL ENGINEER

| SYM | DATE | REVISION DESCRIPTION | BY |
|---|---|---|---|
| | 11/14 | 90% 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 CMH, EAA
DATE NOV 2014

FIR ISLAND FARM

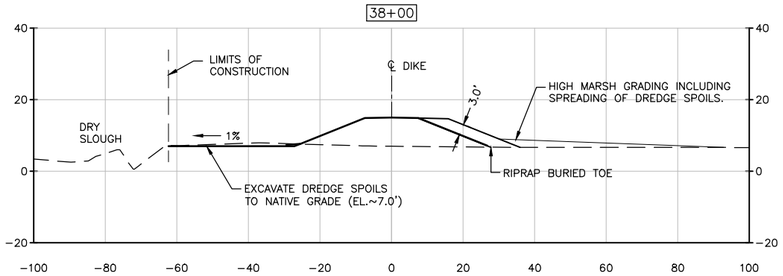
ECOSYSTEM RESTORATION

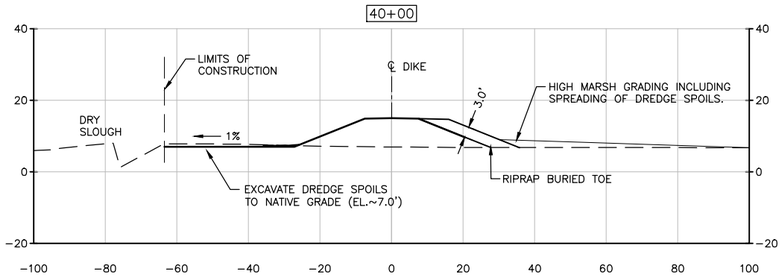
SETBACK DIKE CROSS SECTIONS

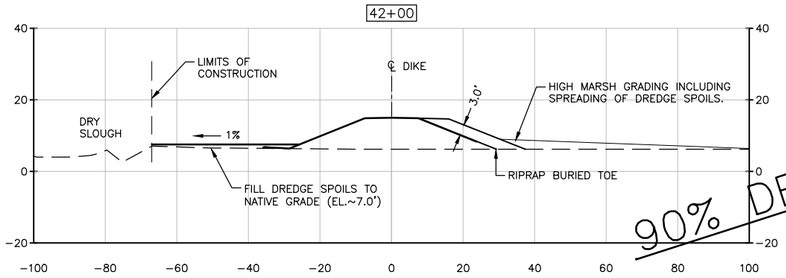
STATIONS 24+00 TO 36+00

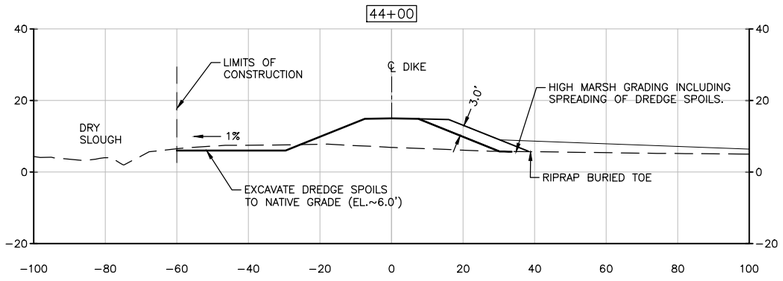
PROJECT NO. ST:R4:11-3

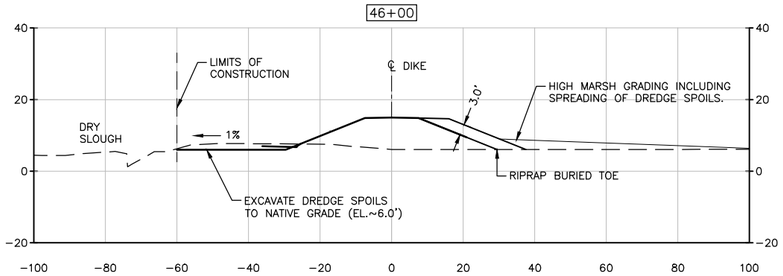
SHEET 14 OF 43

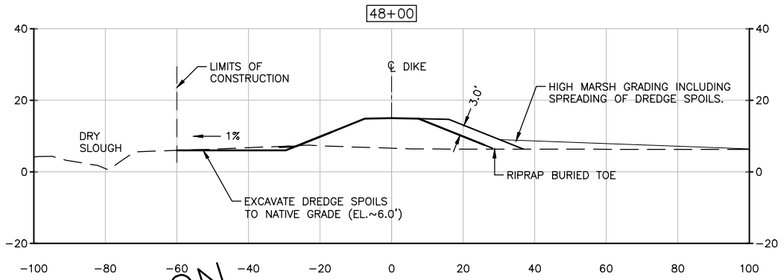


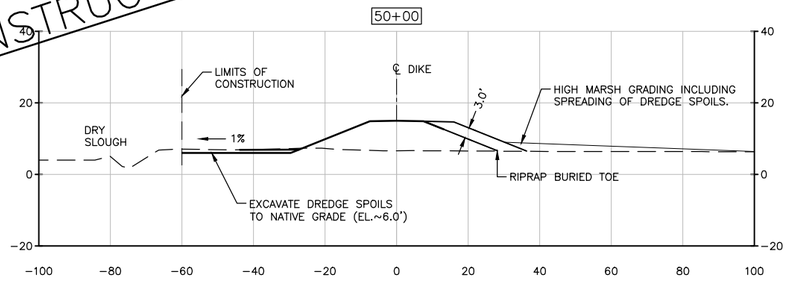



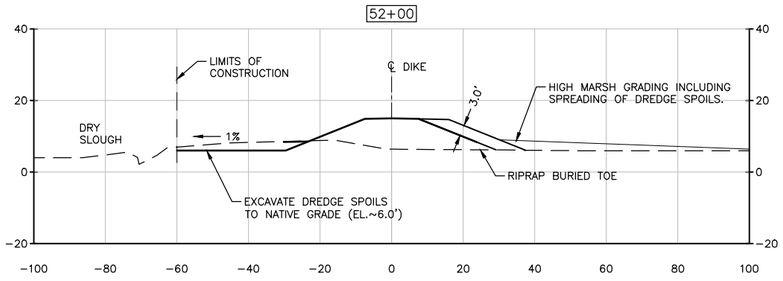




90% DESIGN – NOT FOR CONSTRUCTION

**LEGEND**

EXISTING GRADE

PROPOSED GRADE

**NOTES**

DREDGE SPOILS SHALL BE EXCAVATED TO NATIVE GRADE AND SPREAD IN HIGH MARSH AREAS.

GRAPHIC SCALE

0 20 40 60

SCALE: 1" = 20'

*WASHINGTON STATE*

*DEPARTMENT OF FISH AND WILDLIFE*

DAVID R. CLINE · STATE OF WASHINGTON · 38328 · REGISTERED PROFESSIONAL ENGINEER

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

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

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH, EAA
DATE NOV 2014

FIR ISLAND FARM

ECOSYSTEM RESTORATION

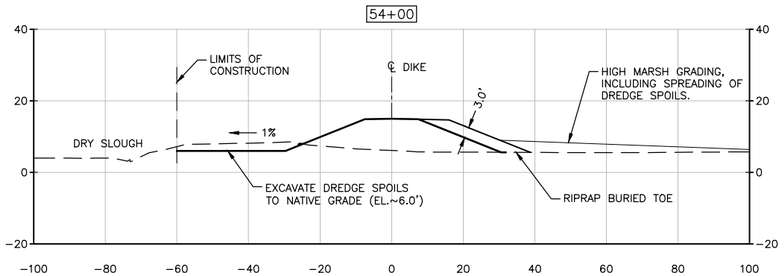
SETBACK DIKE CROSS SECTIONS

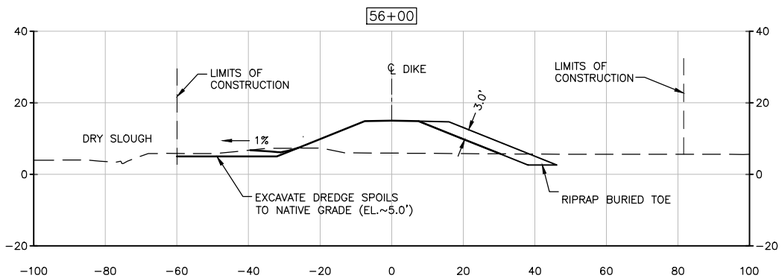
STATIONS 38+00 TO 52+00

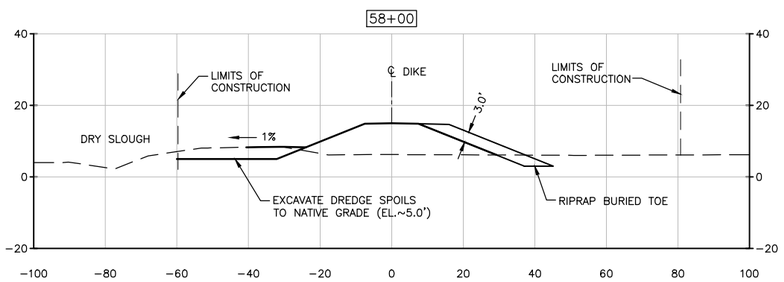
PROJECT NO. ST:R4:11–3

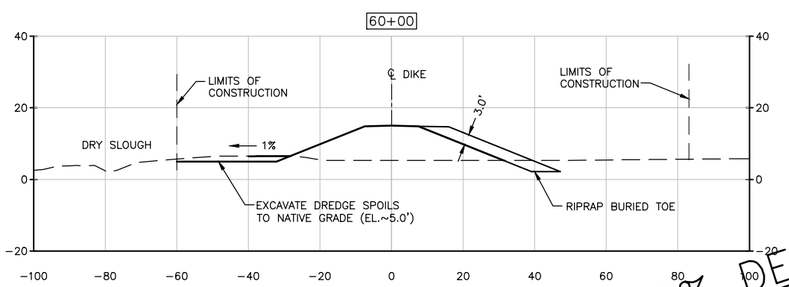
SHEET 15 OF 43

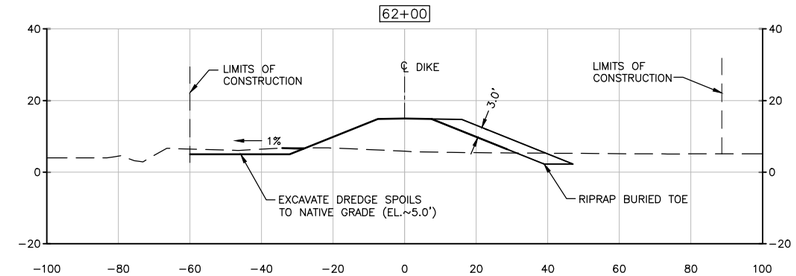
FI ENVIRO - J:\WP2-21-1\12318 Fir Island\CADD\02414\02411\A\02411-015.dwg DATE: 10-31-2014 LOCN: crch

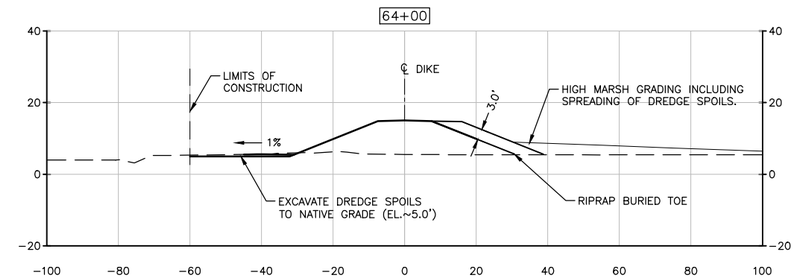


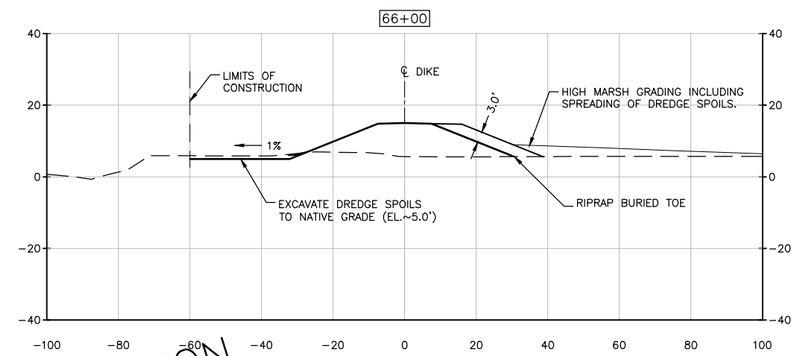



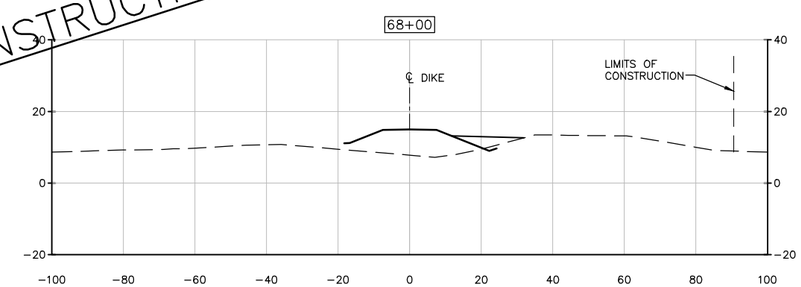




90% DESIGN – NOT FOR CONSTRUCTION

**LEGEND**

— — — EXISTING GRADE

——— PROPOSED GRADE

**NOTES**

DREDGE SPOILS SHALL BE EXCAVATED TO NATIVE GRADE AND SPREAD IN HIGH MARSH AREAS.

GRAPHIC SCALE

0 20 40 60

SCALE: 1" = 20'

*WASHINGTON STATE*

*DEPARTMENT OF FISH AND WILDLIFE*

DAVID R. CLINE, STATE OF WASHINGTON, 41328, REGISTERED PROFESSIONAL ENGINEER

| SYM | DATE | REVISION DESCRIPTION | BY |
|---|---|---|---|
| | 11/14 | 90% 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 CMH, EAA
DATE NOV 2014

FIR ISLAND FARM

ECOSYSTEM RESTORATION

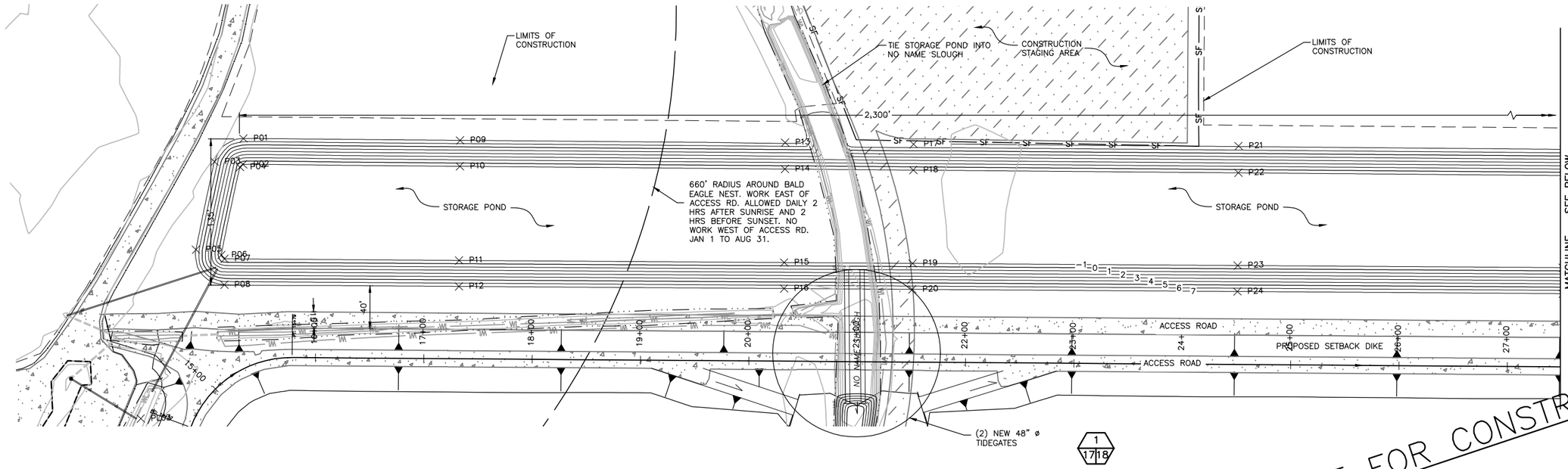
SETBACK DIKE CROSS SECTIONS

STATIONS 54+00 TO 68+00

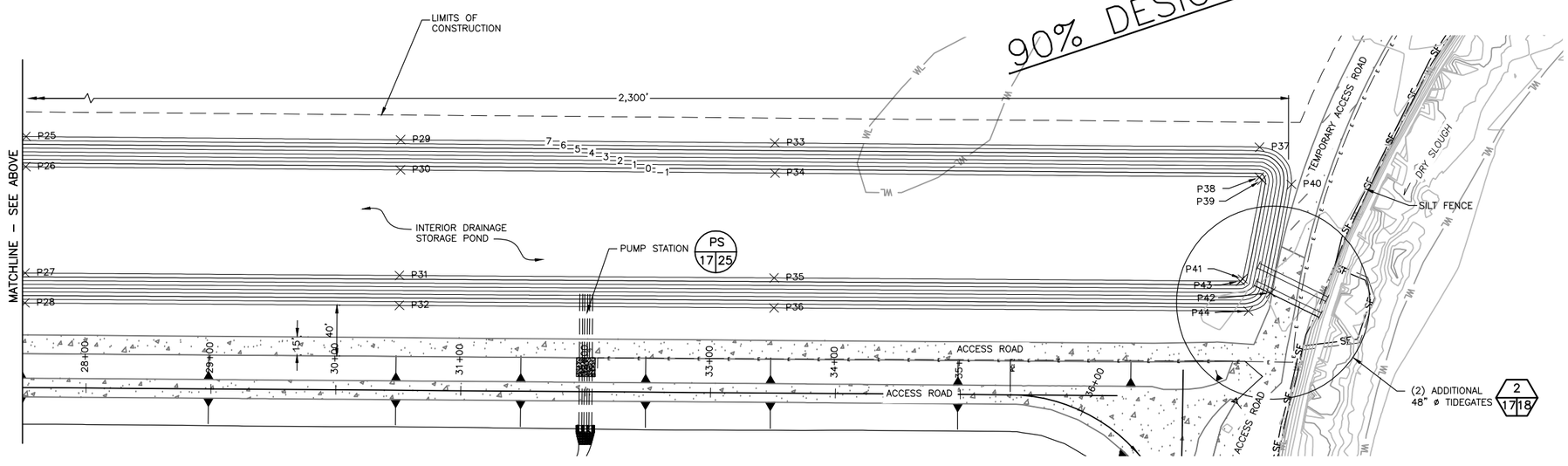
PROJECT NO. ST:R4:11–3

SHEET 16 OF 43

FI FILNAME: J:\WP21-1\13318 Fir Island\CAD\000A\0004113\A\0004113-016.dwg DATE: 10-31-2014 LOGIN: cmh




90% DESIGN – NOT FOR CONSTRUCTION




## SITE PLAN

0 50 100 150

SCALE: 1" = 50'

**NOTE**

STOCKPILE TOPSOIL EXCAVATED FROM STORAGE POND. PLACE TOPSOIL A MINIMUM THICKNESS OF 1' OVER HIGH MARSH GRADING AREAS. UNDERLYING SANDY SOILS SHALL BE PLACED BELOW 1' THICK TOPSOIL AT HIGH MARSH FILL GRADE.

**LEGEND**

- CONSTRUCTION LIMITS
- PROPOSED CULVERT
- WB — EXISTING WETLANDS
- SF — SILT FENCE
- PROPOSED SETBACK DIKE
- PROPOSED STORAGE POND
- TEMPORARY HAUL ROAD
- ACCESS ROAD

*WASHINGTON STATE*
*DEPARTMENT OF FISH AND WILDLIFE*

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

| SYM | DATE | REVISION DESCRIPTION | BY |
|---|---|---|---|
| | 11/14 | 90% DESIGN SUBMITTAL | DRC |

APPROVED AND RELEASED FOR CONSTRUCTION

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

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

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

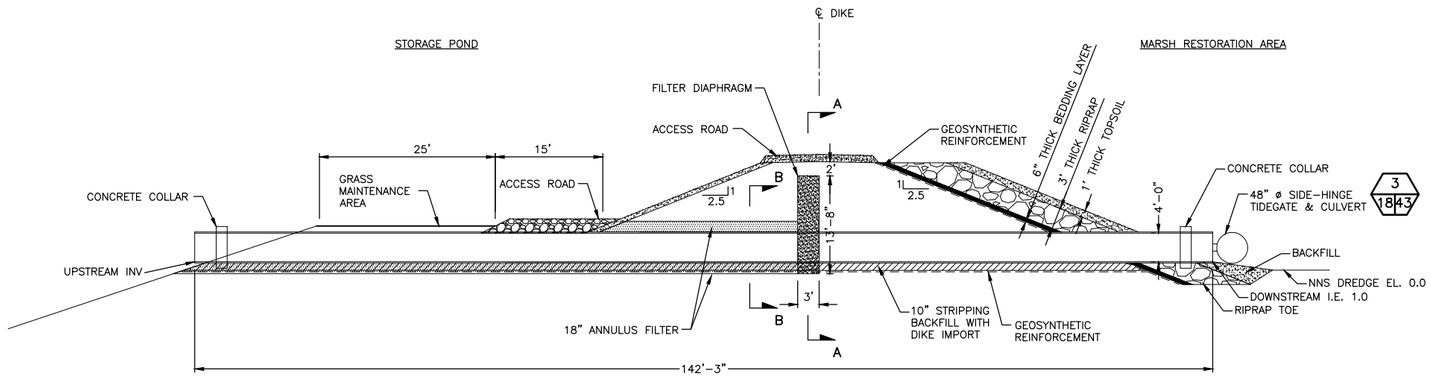
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH, EAA
DATE NOV 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
STORAGE POND GRADING PLAN
–

PROJECT NO. ST:R4:11–3

SHEET 17 OF 43

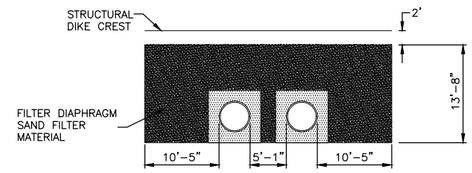
FILENAME: L:\WP\21-1\12318 Fir Island\CAD\R004\R004113a\R004113a017.dwg DATE: 11-06-2014 LOGIN: cmh



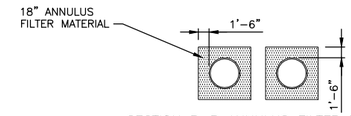

DETAIL – TYPICAL 48" ø TIDEGATE (DIKE) 1 X 18

0 10 20 30

SCALE: 1" = 10'

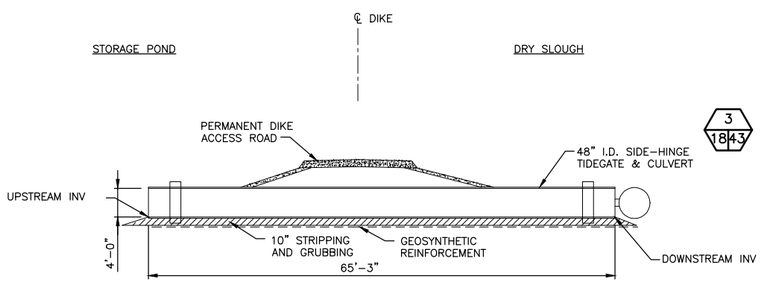



SECTION A–A FILTER DIAPHRAM DETAIL




SECTION B–B ANNULUS FILTER DETAIL

90% DESIGN – NOT FOR CONSTRUCTION




DETAIL – TYPICAL 48" ø TIDEGATE (ACCESS ROAD) 2 X 18

0 10 20 30

SCALE: 1" = 10'

| TIDEGATE # | LOCATION | DETAIL # | PIPE I.D. | TYPE | UPSTREAM I.E. | DOWNSTREAM I.E. | CREST ELEVATION |
|---|---|---|---|---|---|---|---|
| 1 | NO NAME SLOUGH WEST CULVERT | 1 | 4'–0" | SINGLE WALL HDPE | 1.00 | 1.00 | 15 |
| 2 | NO NAME SLOUGH EAST CULVERT | 1 | 4'–0" | SINGLE WALL HDPE | 1.00 | 1.00 | 15 |
| 4 | STORAGE POND TO DRY SLOUGH CONNECTION NORTH CULVERT | 2 | 4'–0" | SINGLE WALL HDPE | 1.00 | 1.00 | 8 |
| 5 | STORAGE POND TO DRY SLOUGH CONNECTION SOUTH CULVERT | 2 | 4'–0" | SINGLE WALL HDPE | 1.00 | 1.00 | 8 |

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

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

0 — 1"
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CHECKED BY CAR
DRAWN BY CMH, EAA
DATE NOV 2014

FIR ISLAND FARM

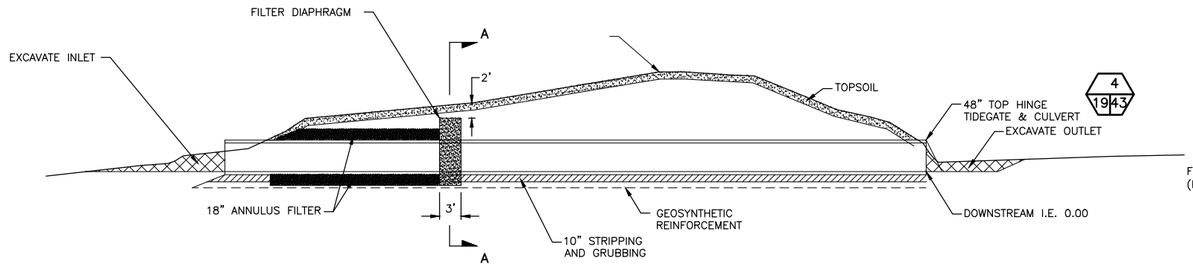
ECOSYSTEM RESTORATION

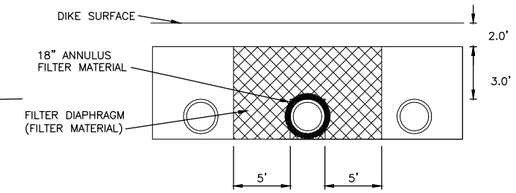
TIDEGATE INSTALLATIONS
PLAN AND DETAILS

PROJECT NO. ST:R4:11–3

SHEET 18 OF 43

FILENAME: I:\WIP\21-1\12318 Fir Island\CAD\R00A\R004113A\R004113-018.dwg DATE: 11-06-2014 LOGIN: cmh



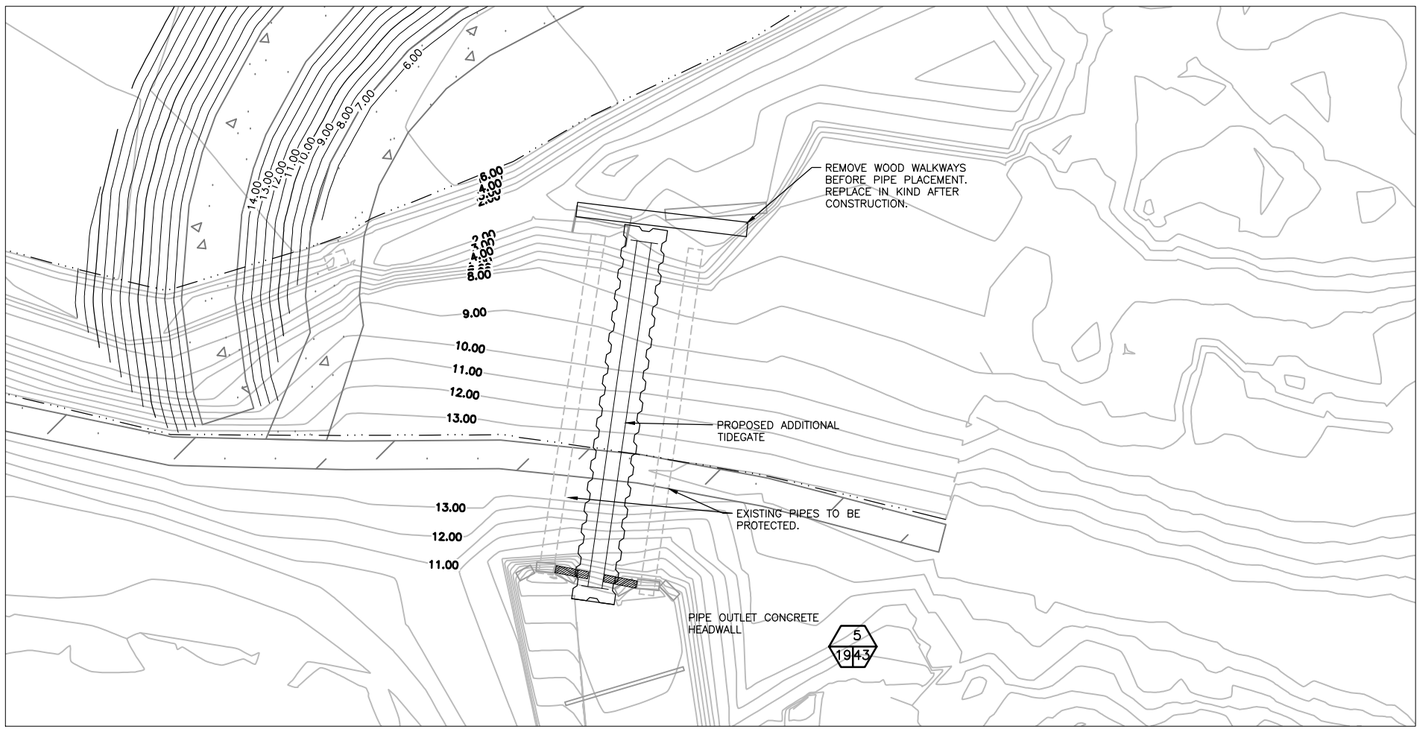

SECTION A–A

## DETAIL – DRY SLOUGH ADDITIONAL TIDEGATE (1 / X 19)

0 10 20 30

SCALE: 1" = 10'

| TIDEGATE # | LOCATION | DETAIL # | PIPE DIAMETER | TYPE | UPSTREAM INVERT | DOWNSTREAM INVERT | CREST ELEVATION |
|---|---|---|---|---|---|---|---|
| 3 | DRY SLOUGH 3RD CULVERT | 2 | 4'–0" | SINGLE WALL HDPE | 1.89 | 1.67 | 13.8 |




## DETAIL – TYPICAL 48" ø TIDEGATE (DRY SLOUGH) (2 / X 19)

0 10 20 30

SCALE: 1" = 10'

NOTES

1. INSTALL 3RD TIDEGATE IN BETWEEN EXISTING TIDEGATES.
2. CONTRACTOR SHALL PROVIDE SHORING AND DEWATERING PLAN FOR REVIEW PRIOR TO STARTING CONSTRUCTION.
3. CONTRACTOR SHALL PROTECT IN PLACE EXISTING TIDEGATES.
4. CONTRACTOR SHALL PLAN FOR CONCRETE REMOVAL AND DISPOSAL FROM 3RD TIDEGATE TRENCH.

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0 — 1"
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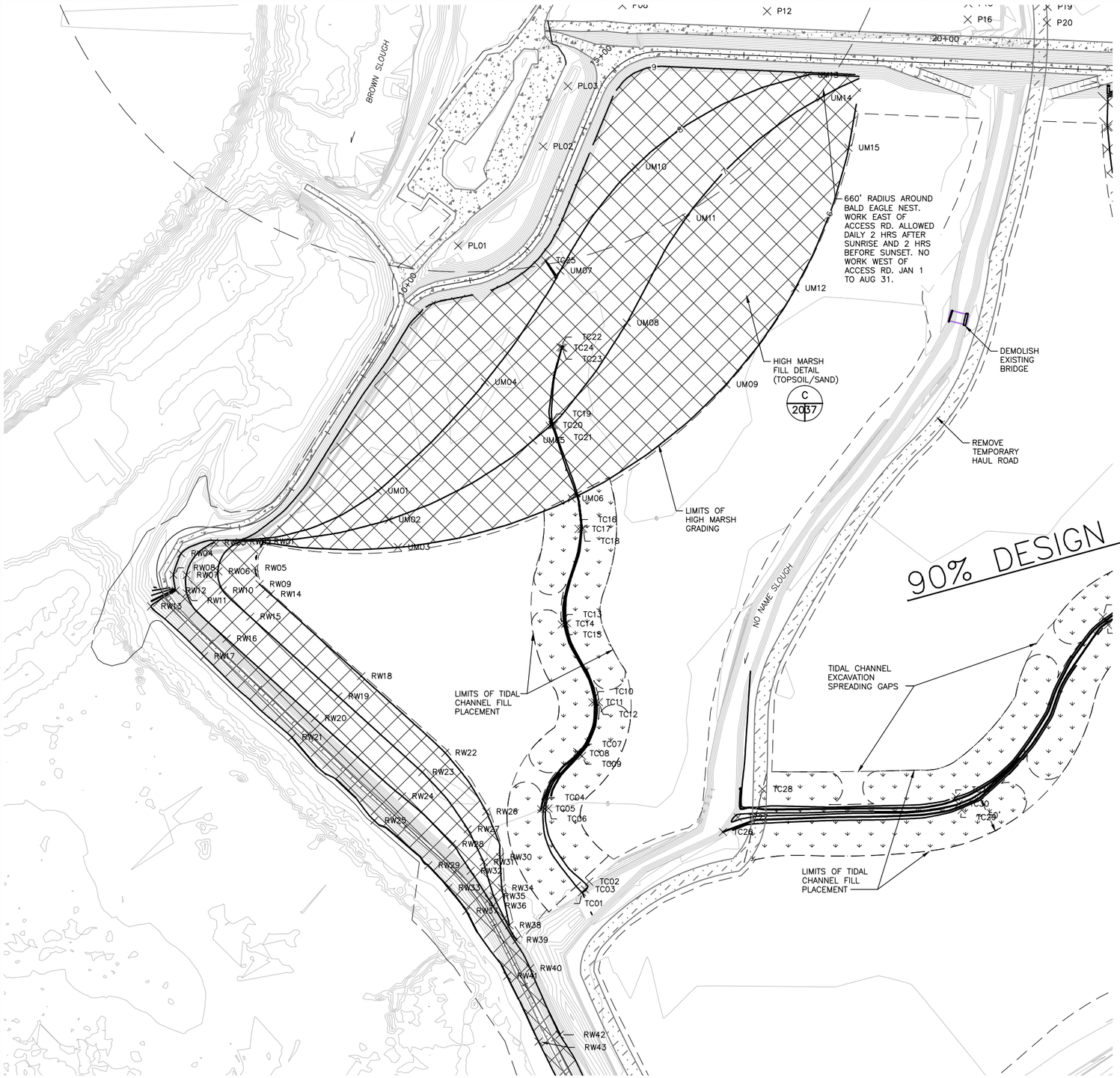
FIR ISLAND FARM

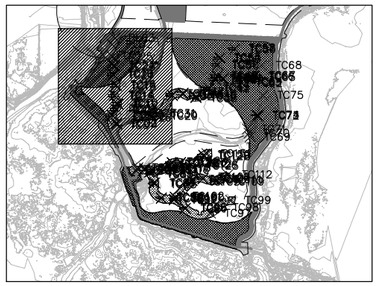
ECOSYSTEM RESTORATION
DRY SLOUGH TIDEGATE
PLAN AND DETAILS

PROJECT NO. ST:R4:11–3

SHEET 19 OF 43

FILENAME: I:\WIP\21-11\12318 Fir Island\CAD\R004\R004113c\R004113c019.dwg DATE: 11-06-2014 LOGIN: cmh




KEY PLAN

N

90% DESIGN – NOT FOR CONSTRUCTION

## NOTES

1. UPPER MARSH AREA TO BE GRADED WITH FILL FROM PROPOSED STORAGE POND EXCAVATION.
2. TIDAL CHANNELS OUTSIDE OF HIGH MARSH GRADING AREA TO BE EXCAVATED TO DEPTH SHOWN, AND SPOILS TO BE SPREAD ON EITHER SIDE PER DETAIL 3, SHEET 30.
3. ALL SEDIMENT CONTROL MEASURES SHALL BE IN PLACE BEFORE GROUND IS DISTURBED.
4. SPOIL MATERIAL FROM NO NAME SLOUGH DREDGING TO BE USED AS FILL IN HIGH MARSH GRADING.
5. TEMPORARY HAUL ROUTES SHALL BE FULLY REMOVED AND GRADE RESTORED TO EXISTING CONDITIONS PRIOR TO EXISTING DIKE BREACH.
6. GAPS IN TIDAL SPREAD AREAS SHALL BE MAINTAINED EVERY 200' TO FACILITATE DRAINAGE TO TIDAL CHANNEL. ALTERNATE SPACING TO EITHER SIDE OF TIDAL ALIGNMENTS.

## LEGEND

- TIDAL CUT AND SPREAD LIMITS
- HIGH MARSH GRADING
- HIGH MARSH GRADING
- SF — SILT FENCE
- × RW19 GRADING POINT

SITE PLAN

0 80 160 240

SCALE: 1" = 80'

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DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 38372 — REGISTERED PROFESSIONAL ENGINEER

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0 — 1"
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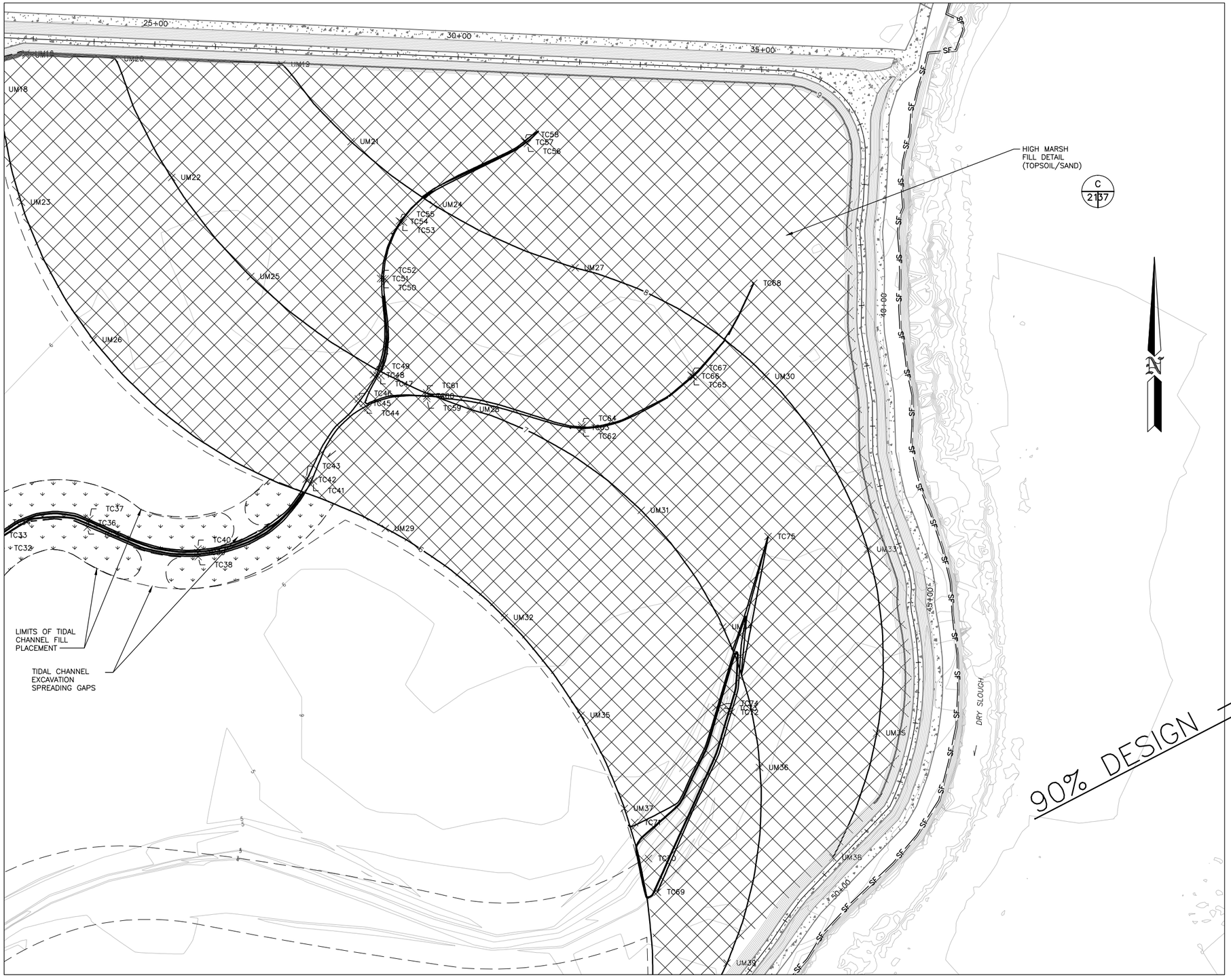
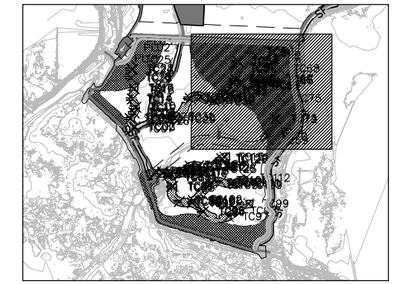
FIR ISLAND FARM
ECOSYSTEM RESTORATION
MARSH GRADING AND PILOT CHANNEL PLANS, NW AREA

PROJECT NO. ST:R4:11–3

SHEET 20 OF 36

FILENAME: I:\WIP\21-1\12318 Fir Island\CAD\R004\R004113\R004113c020.dwg DATE: 11-06-2014 LOGIN: cmh



KEY PLAN

## NOTES

1. UPPER MARSH AREA TO BE GRADED WITH FILL FROM PROPOSED STORAGE POND EXCAVATION.
2. TIDAL CHANNELS OUTSIDE OF HIGH MARSH GRADING AREA TO BE EXCAVATED TO DEPTH SHOWN, AND SPOILS TO BE SPREAD ON EITHER SIDE PER DETAIL 3, SHEET 30.
3. ALL SEDIMENT CONTROL MEASURES SHALL BE IN PLACE BEFORE GROUND IS DISTURBED.
4. SPOIL MATERIAL FROM NO NAME SLOUGH DREDGING TO BE USED AS FILL IN HIGH MARSH GRADING.
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6. GAPS IN TIDAL SPREAD AREAS SHALL BE MAINTAINED EVERY 200' TO FACILITATE DRAINAGE TO TIDAL CHANNEL. ALTERNATE SPACING TO EITHER SIDE OF TIDAL ALIGNMENTS.

90% DESIGN – NOT FOR CONSTRUCTION

## LEGEND

- TIDAL CUT AND SPREAD LIMITS
- HIGH MARSH GRADING
- HIGH MARSH GRADING
- SF — SILT FENCE
- × RW19 — GRADING POINT

SITE PLAN

0 80 160 240

SCALE: 1" = 80'

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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0 — 1"
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FIR ISLAND FARM

ECOSYSTEM RESTORATION

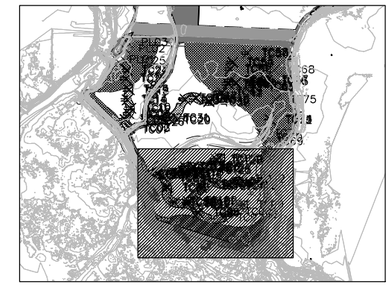
MARSH GRADING AND PILOT CHANNEL PLANS, NE AREA

PROJECT NO. ST:R4:11–3

SHEET 21 OF 36

FILENAME: I:\WIP\21-1\12318 Fir Island\CAD\R004\R004113c\R004113c021.dwg DATE: 11-06-2014 LOGIN: cmh

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



KEY PLAN

## NOTES

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90% DESIGN – NOT FOR CONSTRUCTION

## LEGEND

- TIDAL CUT AND SPREAD LIMITS
- HIGH MARSH GRADING
- HIGH MARSH GRADING
- SF — SILT FENCE
- × RW19 GRADING POINT

SITE PLAN
0 80 160 240
SCALE: 1" = 80'

WASHINGTON STATE
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0 — 1"
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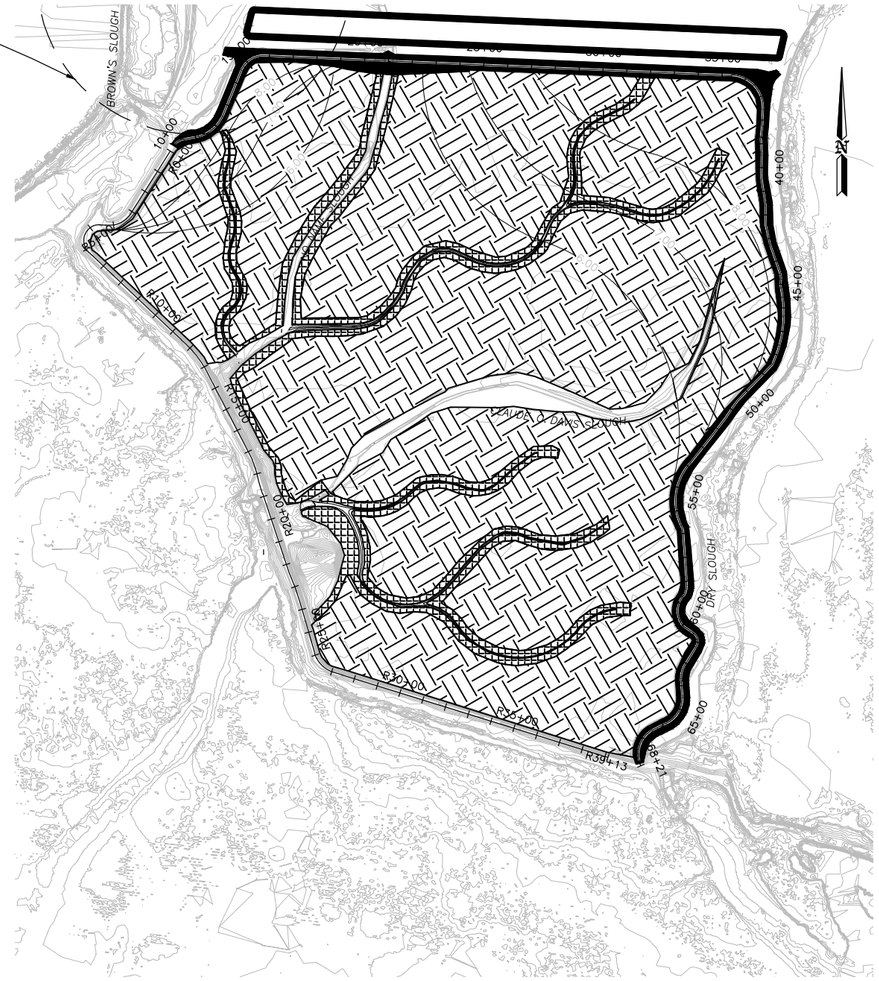
FIR ISLAND FARM
ECOSYSTEM RESTORATION
MARSH GRADING AND PILOT CHANNEL PLANS, NE AREA

PROJECT NO. ST:R4:11-3
SHEET 22 OF 36

FILENAME: I:\WIP\21-1\12318 Fir Island\CAD\R004\R004113\R004113c022.dwg DATE: 11-06-2014 LOGIN: cmh

660' RADIUS AROUND BALD EAGLE NEST. WORK EAST OF ACCESS RD. ALLOWED DAILY 2 HRS AFTER SUNRISE AND 2 HRS BEFORE SUNSET. NO WORK WEST OF ACCESS RD. JAN 1 TO AUG 31.




## NOTES

1. YEAR 1 SEEDING SHALL OCCUR BY SEPTEMBER 30.
2. THE DIKE & STORAGE POND SIDE SLOPES SEED MIX SHALL BE APPLIED IN YEAR 1 PER THE SPECIFICATIONS.
3. THE TESC SEED MIX SHALL BE APPLIED IN YEAR 1 BY HYDROSEED, PER SPECIFICATIONS.
4. THE SNOW GOOSE FORAGE SEED MIX SHALL BE APPLIED IN YEAR 1 PER THE SPECIFICATIONS.
5. 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.
6. UNLESS AUTHORIZED BY THE OWNER, CONSTRUCTION ACTIVITIES AND EQUIPMENT SHALL AVOID IMPACT TO SEEDED AREAS.

GRAPHIC SCALE
0 300 600 900

## SEEDING PLAN YEAR 1

SCALE: 1" = 300'-0"

SCALE: 1" = 300'

| LEGEND | SITE LOCATION | SCIENTIFIC NAME | COMMON NAME | UNIT TYPE | SEEDING RATE (lbs/acres) | ACRES | TOTAL lbs OF SEED | Notes |
|---|---|---|---|---|---|---|---|---|
| | DIKE & STORAGE POND SIDE SLOPES | *Triticum aestivum x Elytrigia elongata (hybrid)* | WHEATGRASS, STERILE1 | PLS | 10 | 7.8 | 78.1 | HYDROSEED DIKE SIDE SLOPES WITH WOOD CELLULOSE LONG-FIBER MULCH AND SLOW-RELEASE GRANUAL FERTILIZER ABOVE ELEVATION 9.0 FEET. THE STORATE POND SIDE SLOPES SHALL BE HYDROSEEDED WITH A WOOD CELLULOSE LONG-FIBER MULCH WITHOUT A SLOW-RELEASE GRANULAR FERTILIZER. |
| | | *Agrostis stolonifera* | CREEPING BENTGRASS | | 3 | | 23.4 | |
| | | *Festuca rubra* | FESCUE, CREEPING RED | | 15 | | 117.2 | |
| | | *Festuca trachyphylla* | FESCUE, HARD | | 10 | | 78.1 | |
| | | Lolium perenne 'Amazing GS' | RYEGRASS, 'AMAZING GS' PERENIAL | | 20 | | 156.2 | |
| | | *Lolium perenne ssp. multiflorum* | RYEGRASS, ANNUAL OR ITALIAN | | 20 | | 156.2 | |
| | TESC SEED MIX | *Triticum aestivum x Elytrigia elongata (hybrid)* | WHEATGRASS, STERILE1 | PLS | 10 | 11.7 | 116.5 | THE TESC SEED MIX SHALL BE APPLIED WITHIN 25 FEET OF CONSTRUCTED PILOT CHANNELS AND EXISTING DRAINAGES WITHIN THE RESTORATION FOOTPRINT |
| | | *Agrostis stolonifera* | CREEPING BENTGRASS | | 3 | | 35.0 | |
| | SNOW GOOSE FORAGE | *Triticum spp.* | WINTER WHEAT | PLS | 60 | 107.3 | 6,438.0 | THE SNOW GOOSE FORAGE MIX SHALL BE APPLIED TO THE INTERIOR OF THE REMAINDER OF THE RESTORATION FOOTPRINT USING A DRILL SEEDER OR OTHER SIMILAR MEANS. |
| PLS = PURE LIVE SEED | | | | | | | | |
| 1 STERILE WHEATGRASS SHALL BE A SINGLE-SEASON COVER CROP FOR EROSION CONTROL PURPOSES, SUCH AS REGREEN™ OR SIMILAR. | | | | | | | | |

660' RADIUS AROUND BALD EAGLE NEST. WORK EAST OF ACCESS RD. ALLOWED DAILY 2 HRS AFTER SUNRISE AND 2 HRS BEFORE SUNSET. NO WORK WEST OF ACCESS RD. JAN 1 TO AUG 31.

## NOTES

1. YEAR 2 SEEDING SHALL OCCUR BY APRIL 15.
2. YEAR 2 SEEDING SHALL OCCUR BY HYDROSEED WITH A WOOD CELLULOSE LONG-FIBER MULCH PER THE SPECIFICATIONS.
3. FOUR 1-ACRE SQUARE TEST PLOTS DIVIDED INTO ¼ ACRE QUADRENTS SHALL BE ESTABLISHED BY THE CONTRACTOR BETWEEN ELEVATIONS 5-6 FEET, 6-7 FEET, 7-8 FEET AND 8-9 FEET ALONG THE RESTORED ESTUARY TOPOGRAPHIC PROFILE PRIOR TO YEAR 2 SEEDING AND FIELD VERIFIED BY THE OWNER
4. INSTALL AND OPERATE TEMPORARY IRRIGATION SYSTEM PER THE SPECIFICATIONS.
5. REMOVE TEMPORARY IRRIGATION SYSTEM ENTIRELY FROM THE RESTORED MARSH AREAS PRIOR TO BEGINING THE DIKE BREACH IN YEAR 2.
6. 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.
7. ALL GRAVEL OR ROCK USED IN TEMPORARY HAUL ROADS, PARKING, OR STAGING AREAS SHALL BE COMPLETELY REMOVED AND DISPOSED OF OFF-SITE.
8. COMPACTED SOILS, AS A RESULT OF HEAVY EQUIPMENT TRAVEL, SHALL BE SCARIFIED OR THOROUGHLY TILLED TO REDUCE COMPACTION. THIS SHALL TAKE PLACE WITHIN THE RESTORATION AREA PRIOR TO YEAR 2 SEEDING.
9. 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.
10. UNLESS AUTHORIZED BY THE OWNER, CONSTRUCTION ACTIVITIES AND EQUIPMENT SHALL AVOID IMPACT TO SEEDED AREAS.

IRRIGATYION DIVERSION POINTS AND DIRECTIONS

1 ACRE TEST PLOT

GRAPHIC SCALE
0 300 600 900

## SEEDING PLAN YEAR 2

SCALE: 1" = 300'-0"

| LEGEND | SITE LOCATION | SCIENTIFIC NAME | COMMON NAME | UNIT TYPE | SEEDING RATE (lbs/acres) | ACRES | TOTAL lbs OF SEED | NOTES |
|---|---|---|---|---|---|---|---|---|
| | BASE MARSH SEED MIX | *Agrostis stolonifera* | CREEPING BENTGRASS | PLS | 3 | 97.5 | 292.5 | |
| | | *Distichlis spicata* | INLAND SALTGRASS | | 6 | | 585.0 | |
| | TEST LOTS NO. 1 (BASE MARSH SEED MIX ONLY) | *Agrostis stolonifera* | CREEPING BENTGRASS | PLS | 3 | 1.00 | 12.0 | |
| | | *Distichlis spicata* | INLAND SALTGRASS | | 6 | | 24.0 | |
| | TEST PLOTS NO. 2 (BASE MARSH SEED + NATIVE SEED) | *Agrostis stolonifera* | CREEPING BENTGRASS | PLS | 3 | 1.00 | 12.0 | |
| | | *Distichlis spicata* | INLAND SALTGRASS | | 6 | | 24.0 | |
| | | *Collected Native Seed Mix1* | TBD | SEED | TBD | | TBD | |
| | TEST PLOTS NO. 3 (NATIVE SEED ONLY) | *Collected Native Seed Mix1* | TBD | SEED | TBD | 1.00 | TBD | |
| | RECRUITMENT ONLY (NO SEED) | None | NONE | N/A | N/A | 9.6 | 0.0 | |
| PLS = PURE LIVE SEED | | | | | | | | |
| 1 NATIVE SEEED TO BE COLLECTED FROM ADJACENT HIGH MARSH ENVIRONMENT IN SKAGIT BAY AND SHALL BE FREE OF Typha sp. SEED. | | | | | | | | |

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|---|---|---|---|
| | 11/14 | 90% DESIGN SUBMITTAL | DRC |

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

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

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DRAWN BY CMH, EAA
DATE NOV 2014

FIR ISLAND FARM

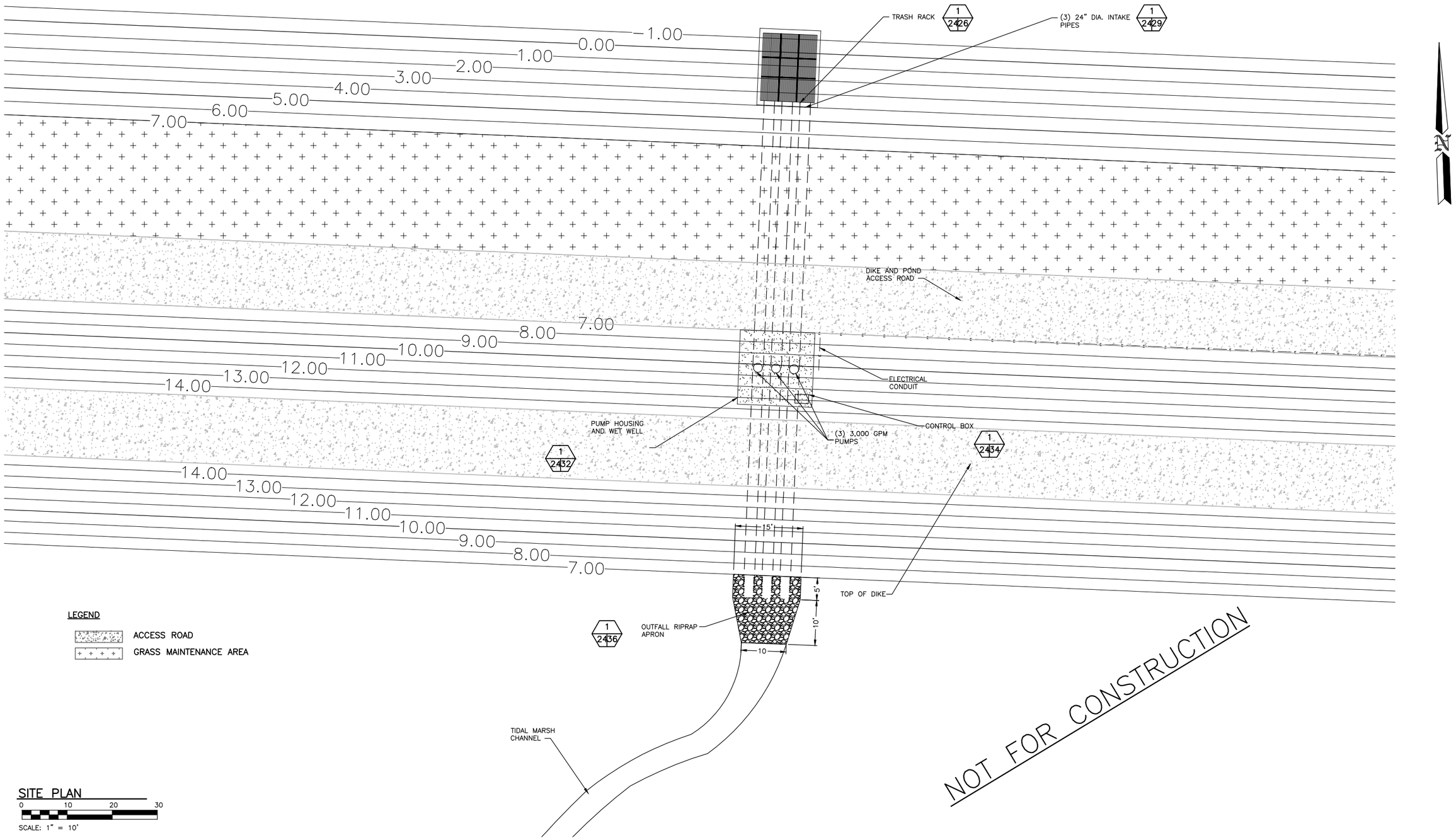
ECOSYSTEM RESTORATION

PLANTING AND SEEDING PLAN

PROJECT NO. ST:R4:11-3

SHEET 23 OF 36

FILENAME: I:\WEP\21-L\12318_FIR_ISLAND\CAD\R004\R004113\R004113c023.dwg DATE: 11-07-2014 LOGIN: cmh





SHANNON & WILSON, INC.
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# WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE

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

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

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

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DRAWN BY CMH, EAA
DATE NOV 2014

FIR ISLAND FARM

ECOSYSTEM RESTORATION

STORAGE POND PUMP STATION PLAN

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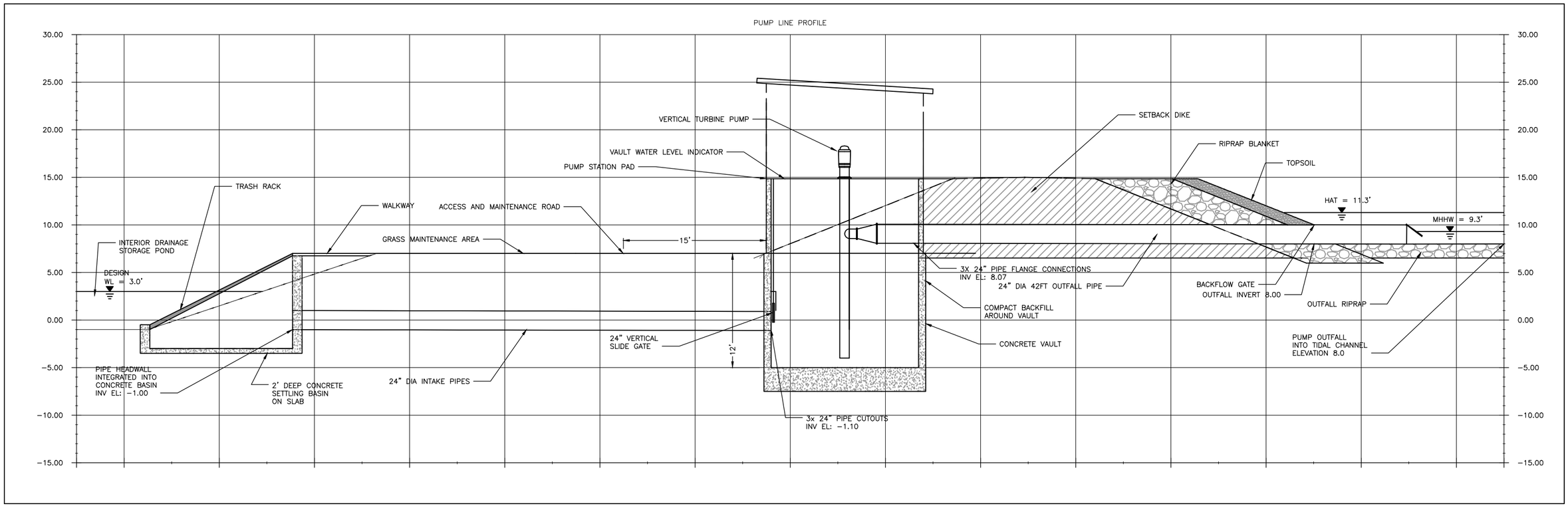
PROJECT NO. ST:R4:11-3

SHEET 24 OF 43


FILENAME: L:\WIP\21-1\12318 FIR ISLAND\CAD\R004\R004113c\R004113c024.dwg DATE: 11-07-2014 LOGIN: cmh




GRAPHIC SCALE

0 5 10 15

SCALE: 1" = 5'

90% DESIGN – NOT FOR CONSTRUCTION

*WASHINGTON STATE*

*DEPARTMENT OF FISH AND WILDLIFE*

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DATE NOV 2014

FIR ISLAND FARM

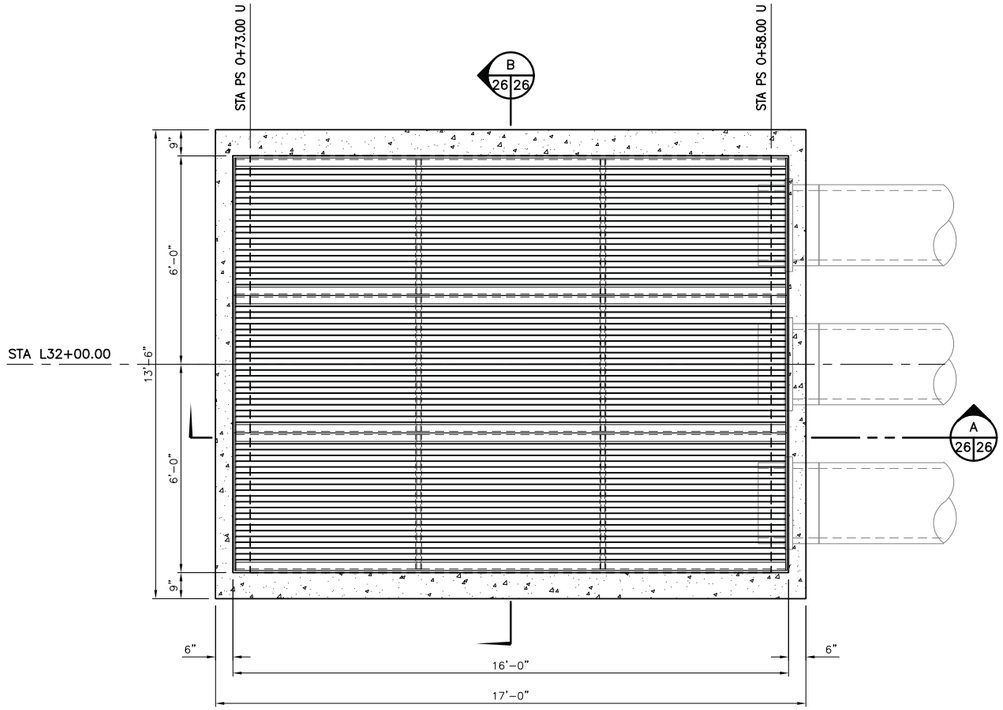
ECOSYSTEM RESTORATION

PUMP STATION PROFILE

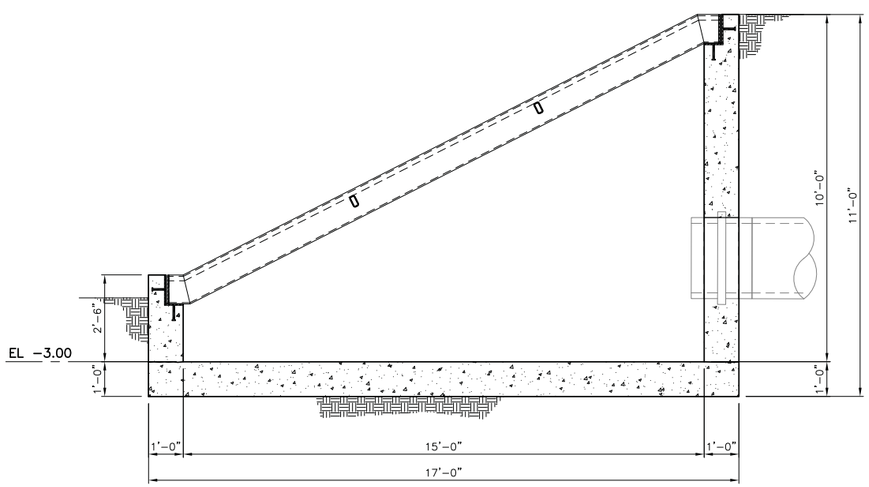
PROJECT NO. ST:R4:11–3

SHEET 25 OF 43

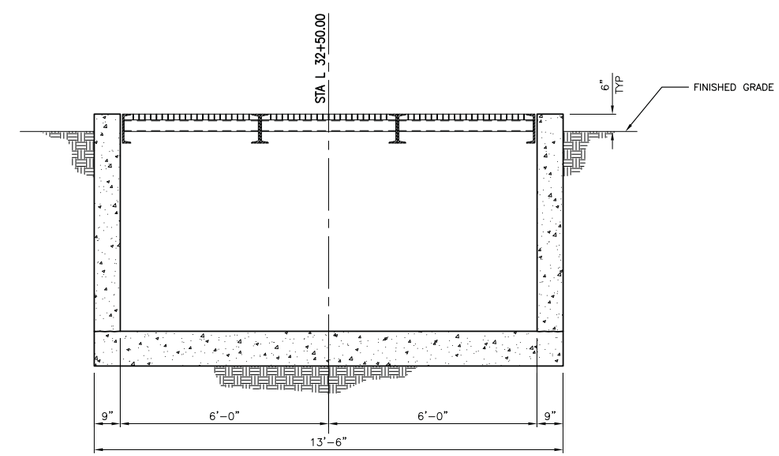
FILENAME: L:\WIP\21-1\12318_FIR ISLAND\CAD\R004\R004113\R004113c025.dwg DATE: 11-07-2014 LOGIN: cmh




PLAN
SCALE: 1/2" = 1'




SECTION A 26 26
SCALE: 1/2" = 1'




SECTION B 26 26
SCALE: 1/2" = 1'

GRAPHIC SCALE
0 2 4 6
SCALE: 1/2" = 1'

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Juleen J. Rogness, PE, SE, Associate
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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

PERRY R. COLE
STATE OF WASHINGTON
25508
STRUCTURAL ENGINEER
PROFESSIONAL ENGINEER
11/7/14

| SYM | DATE | REVISION DESCRIPTION | BY |
|---|---|---|---|

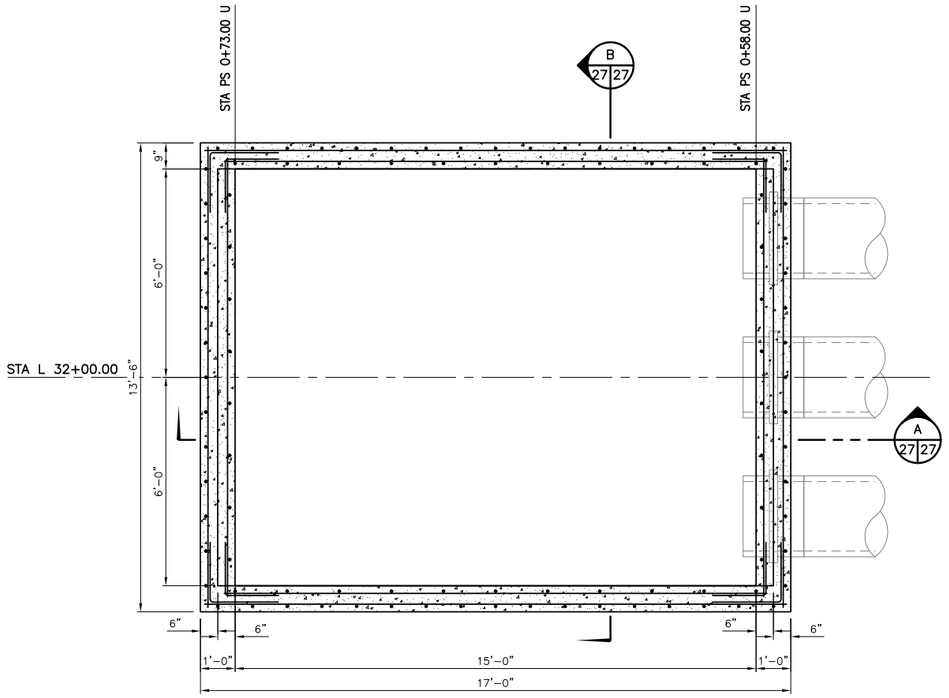
APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: .....
PROGRAM ..... DATE: .....

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

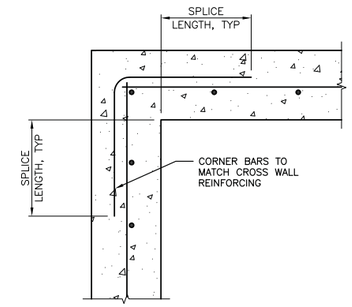
DESIGNED BY PRC
CHECKED BY PRC
DRAWN BY TTP
DATE 11/7/2014

FIR ISLAND
ECOSYSTEM RESTORATION
INTAKE
GENERAL ARRANGEMENT

PROJECT NO. ST:R4:11-3
SHEET 26 OF



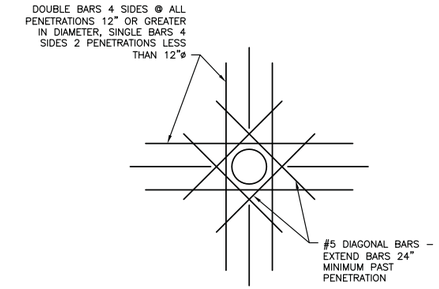

## INTAKE PLAN
SCALE: 1/2" = 1'



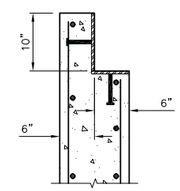

NOTES:
1. WALL SIZE & REINFORCING PER PLAN AND SECTION.
2. CORNER BARS SIZE & SPACING TO MATCH HORIZONTAL REINFORCING

## CORNER BAR DETAIL
SCALE: NONE

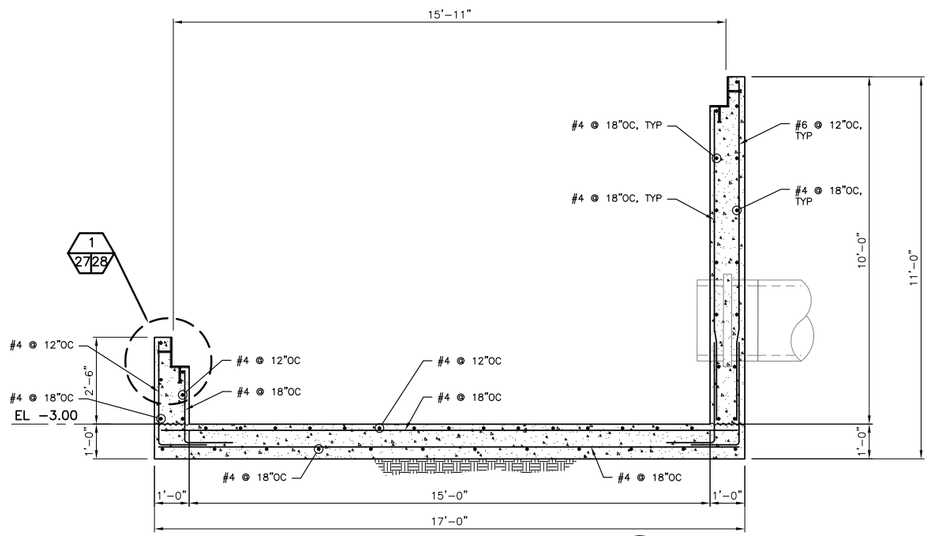
| DEVELOPMENT AND LAP SPLICE LENGTH | | |
|---|---|---|
| BAR | DEVELOPMENT LENGTH | SPLICE LENGTH |
| #4 | 12" | 15" |
| #5 | 15" | 20" |
| #6 | 22" | 28" |
| #7 | 37" | 48" |



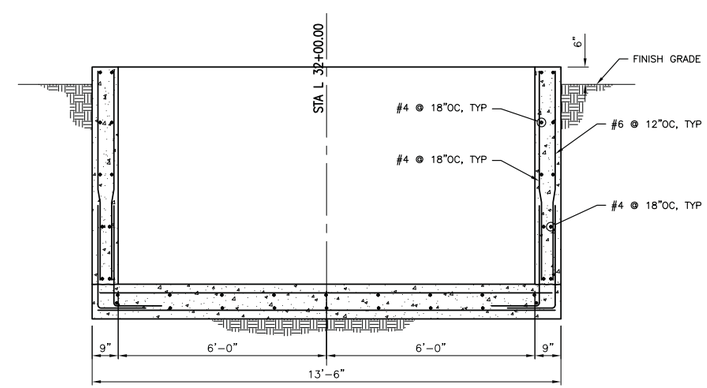

## REINF AT WALL PENETRATIONS
SCALE: NONE




## DETAIL
SCALE: 1" = 1'
1 27 27




## SECTION
SCALE: 1/2" = 1'
A 27 27




## SECTION
SCALE: 1/2" = 1'
B 27 27

GRAPHIC SCALE
0 2 4 6
SCALE: 1/2" = 1'

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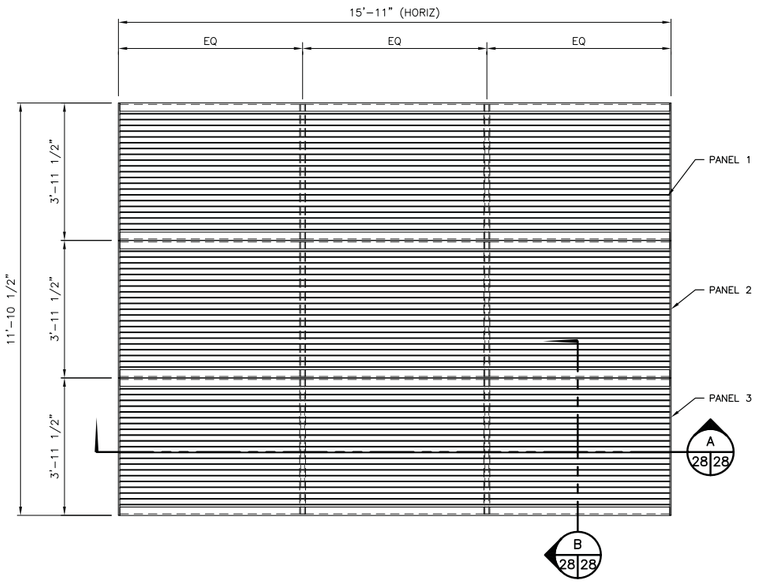
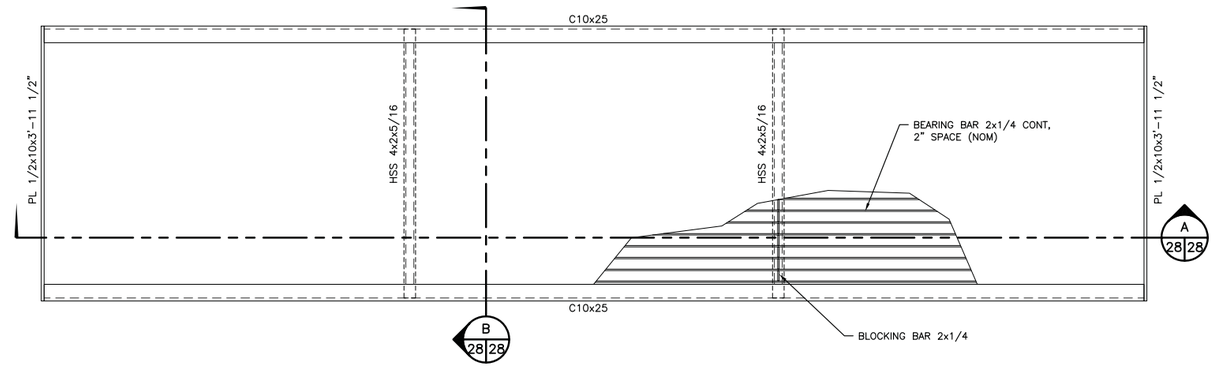
FIR ISLAND
ECOSYSTEM RESTORATION
INTAKE
CONCRETE SECTIONS AND DETAILS

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

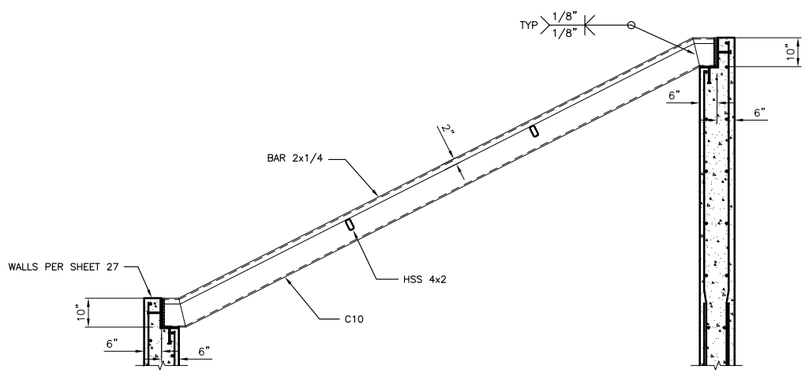



## TRASHRACK PLAN
SCALE: 1/2 = 1'

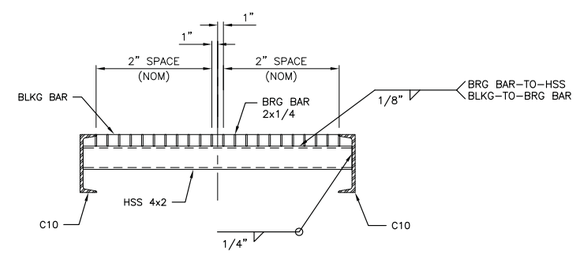



NOTE:
1. MAKE THREE PANELS.
2. FINISH IS HOT DIP GALVANIZED.

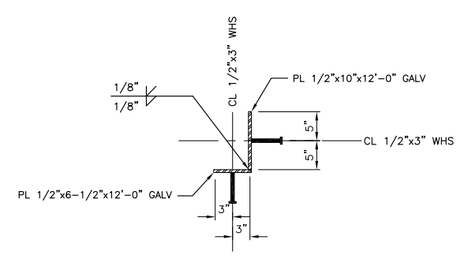
## PANEL PLAN
SCALE: 1" = 1'



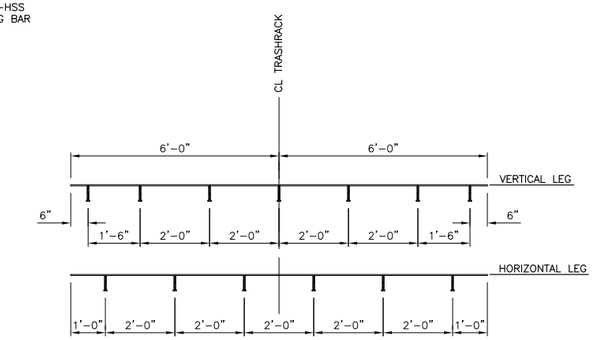

## SECTION
SCALE: 1/2" = 1'
A
28 28




## SECTION
SCALE: 1" = 1'
B
28 28




## DETAIL
SCALE: 1" = 1'
1
27 28




## WHS SPACING
SCALE: NONE

GRAPHIC SCALE
0 2 4 6
SCALE: 1/2" = 1'

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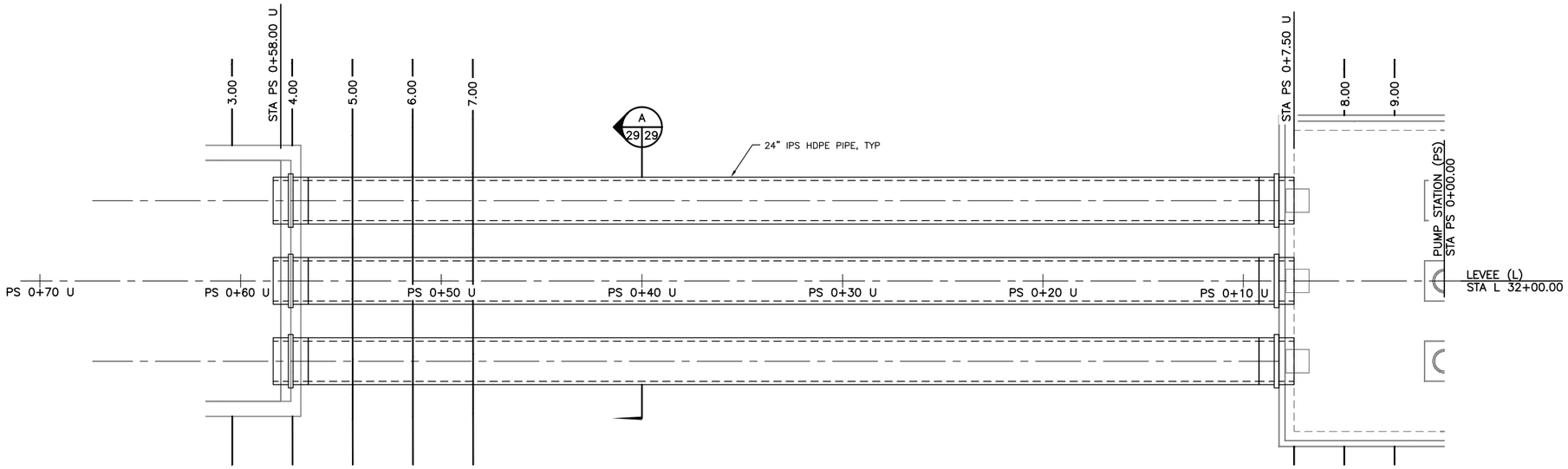
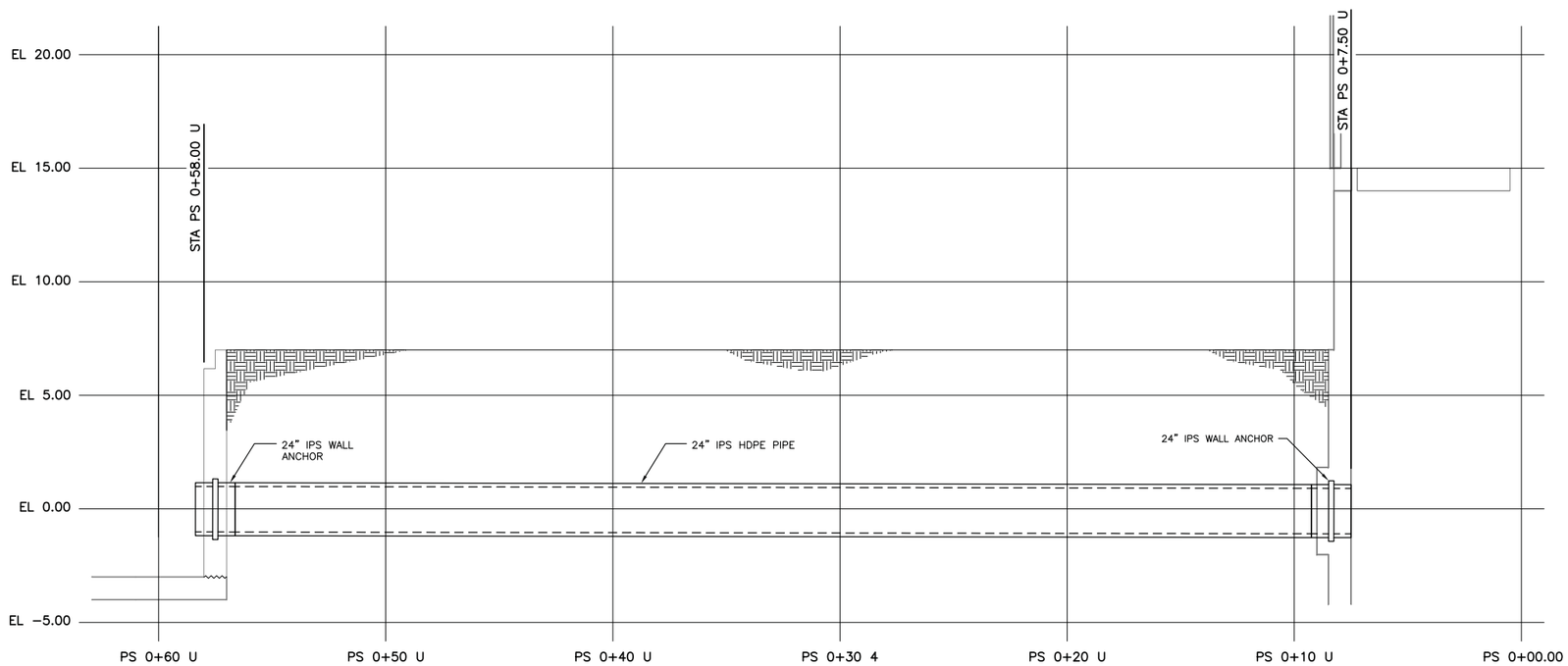
DATE 11/7/2014

FIR ISLAND
ECOSYSTEM RESTORATION
INTAKE
STEEL SECTIONS AND DETAILS

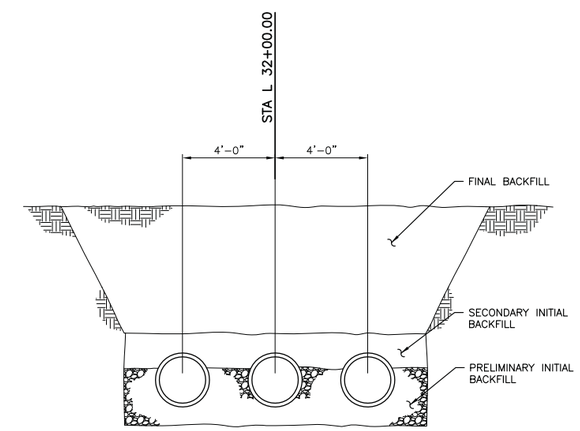
PROJECT NO. ST:R4:11-3
SHEET 28 OF




PLAN
SCALE: 1" = 3'




PROFILE
SCALE: 1" = 3'




SECTION STA PS 0+40 U (A 29 29)
SCALE: 1" = 3'

GRAPHIC SCALE
0 3 6 9
SCALE: 1" = 3'

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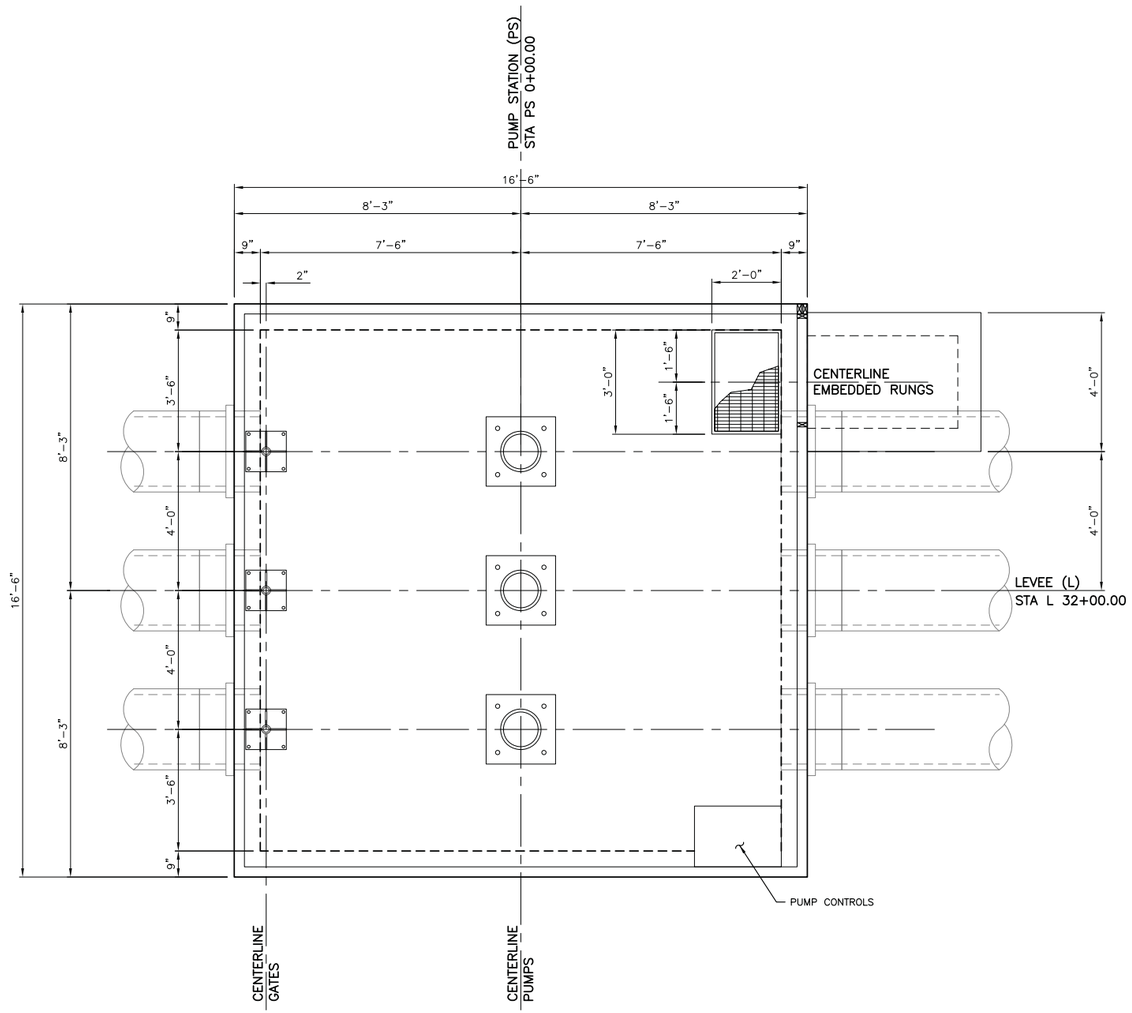
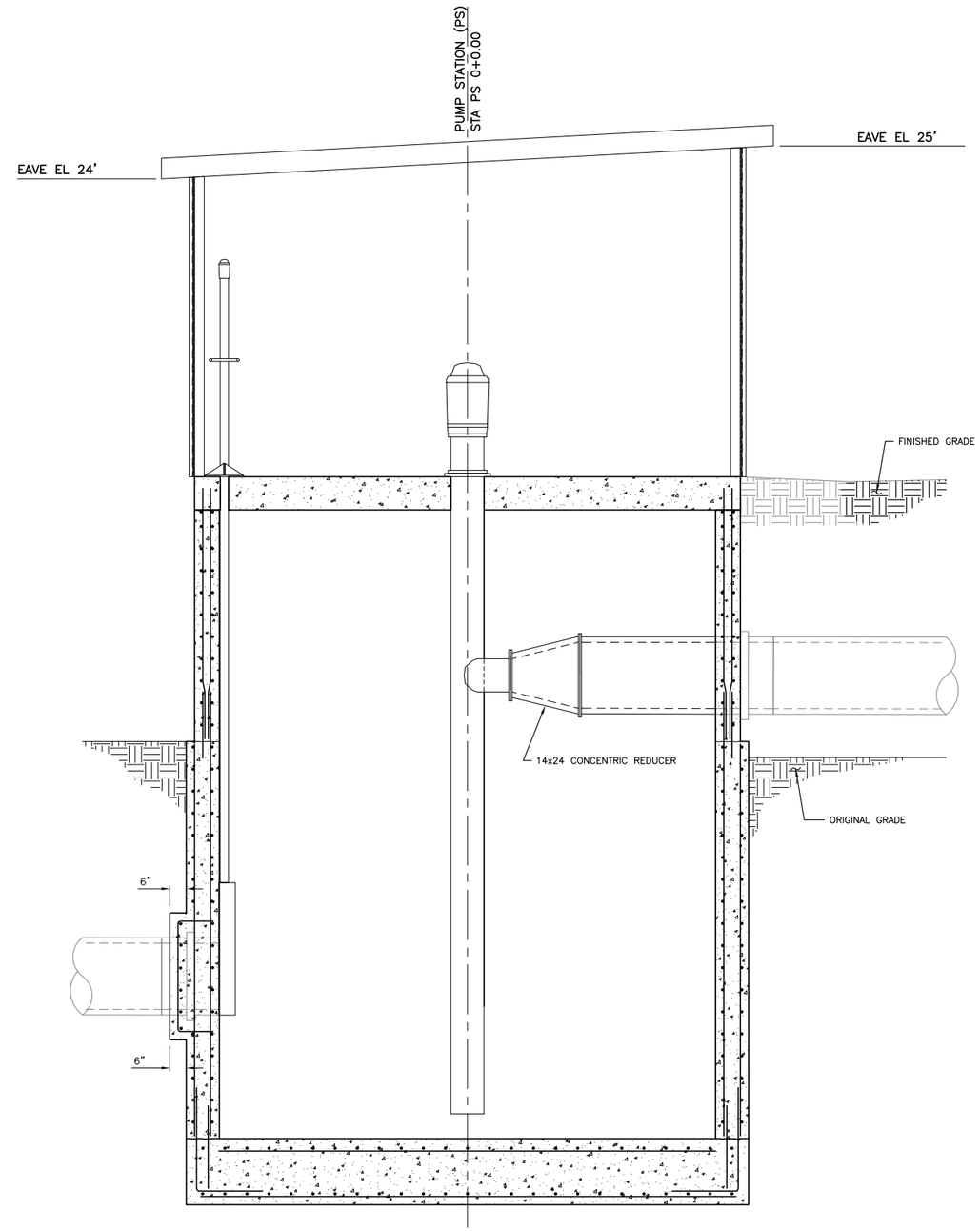
FIR ISLAND
ECOSYSTEM RESTORATION
INTAKE PIPELINES
PLAN AND PROFILE

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




PLAN
SCALE: 1/2" = 1'




SECTION
SCALE: 1/2" = 1'

1
30 30

GRAPHIC SCALE
0 2 4 6
SCALE: 1/2" = 1'

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

0 — 1"
BAR MEASURES
ONE INCH ON
ORIGINAL DRAWINGS

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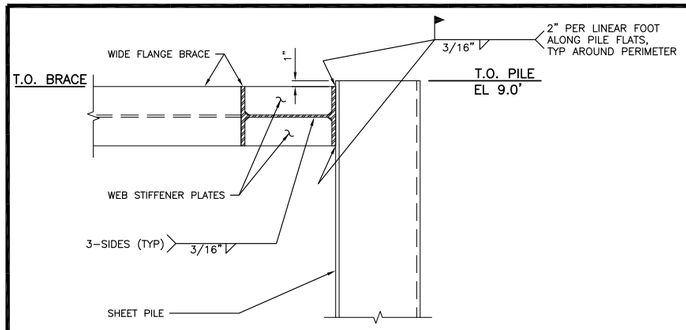
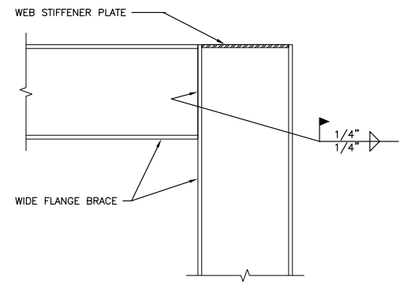
FIR ISLAND
ECOSYSTEM RESTORATION
PUMP HOUSE
GENERAL ARRANGEMENT

PROJECT NO.
ST:R4:11-3

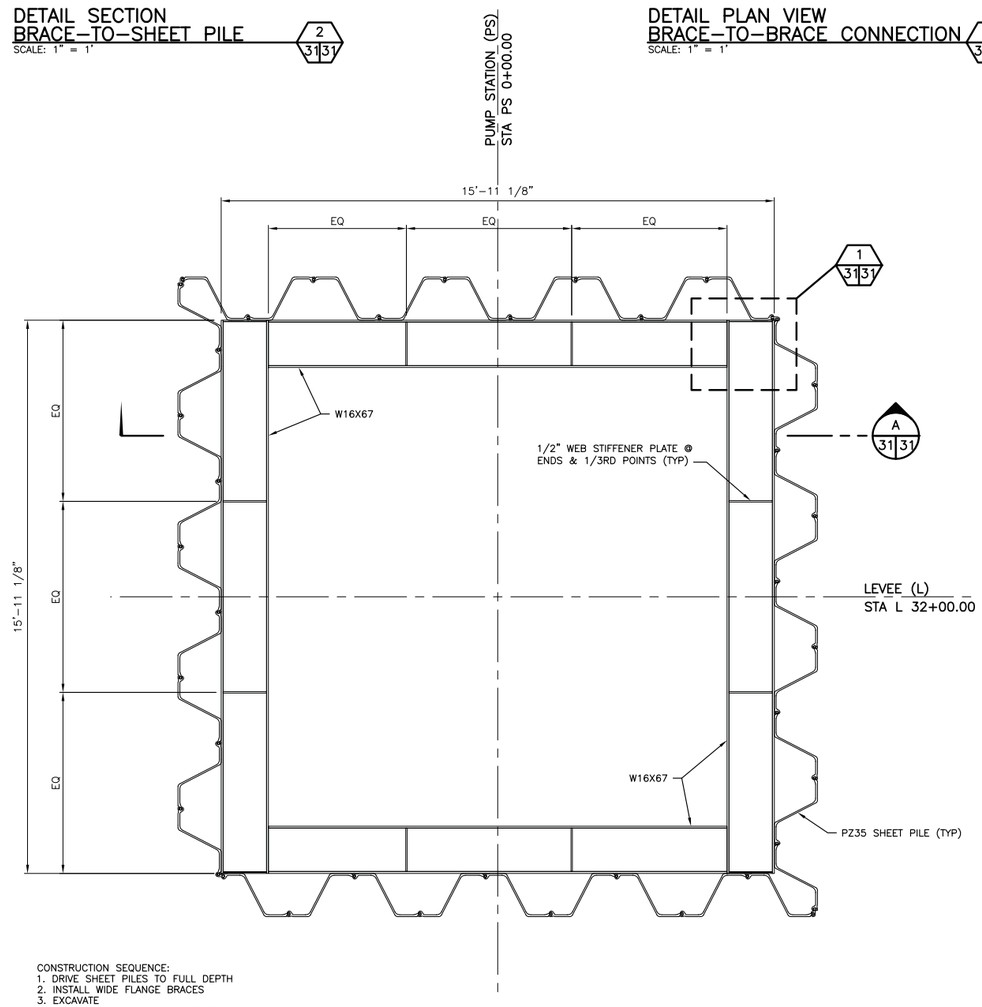
SHEET 30 OF




DETAIL SECTION
BRACE-TO-SHEET PILE (2 / 31|31)
SCALE: 1" = 1'

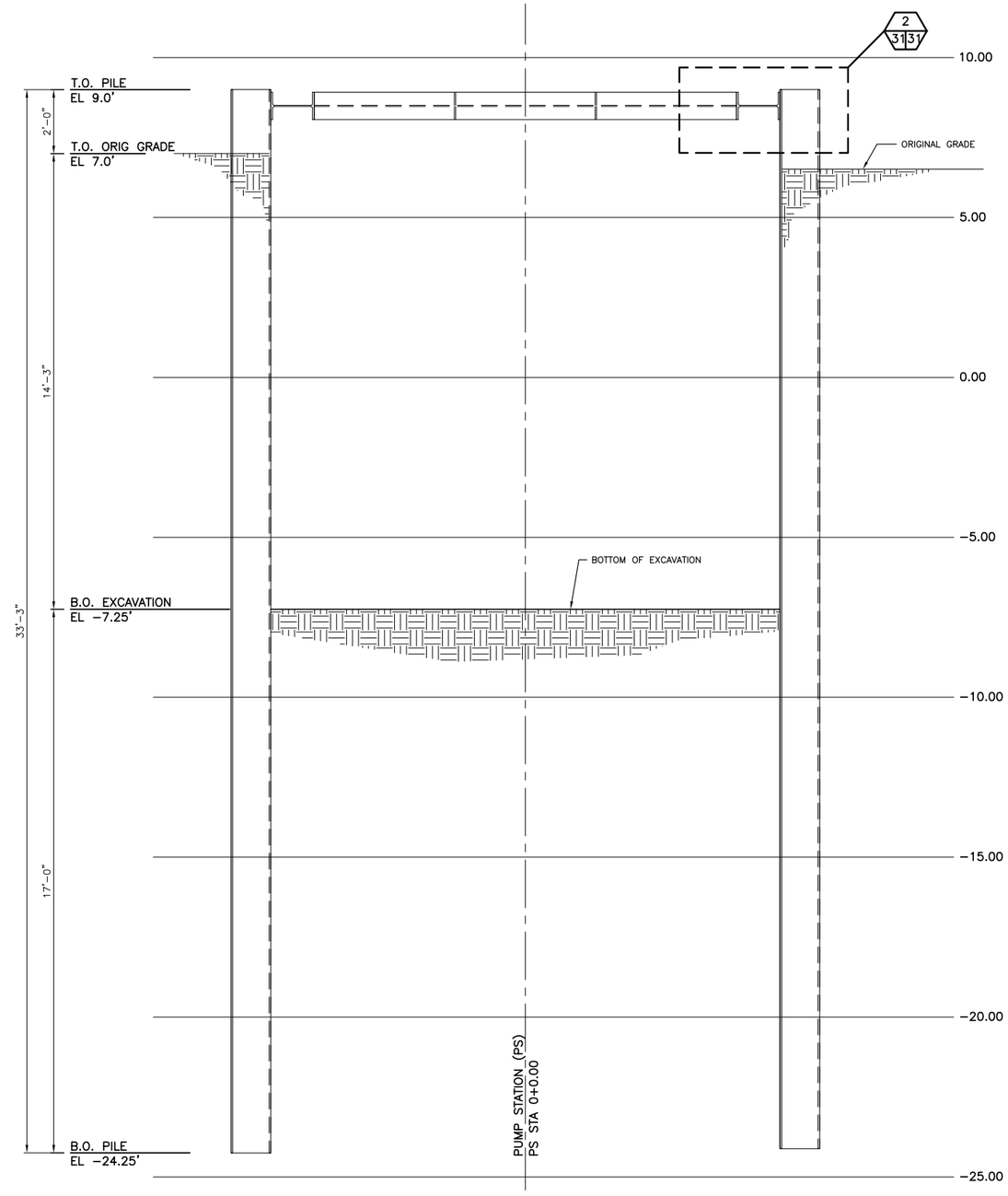



DETAIL PLAN VIEW
BRACE-TO-BRACE CONNECTION (1 / 31|31)
SCALE: 1" = 1'




CONSTRUCTION SEQUENCE:
1. DRIVE SHEET PILES TO FULL DEPTH
2. INSTALL WIDE FLANGE BRACES
3. EXCAVATE
4. POUR CONCRETE FOUNDATION SLAB & WALLS
5. REMOVE SHORING

PLAN
SCALE: 1/2" = 1'




SECTION (A / 31|31)
SCALE: 1/2" = 1'

GRAPHIC SCALE
0 2 4 6
SCALE: 1/2" = 1'

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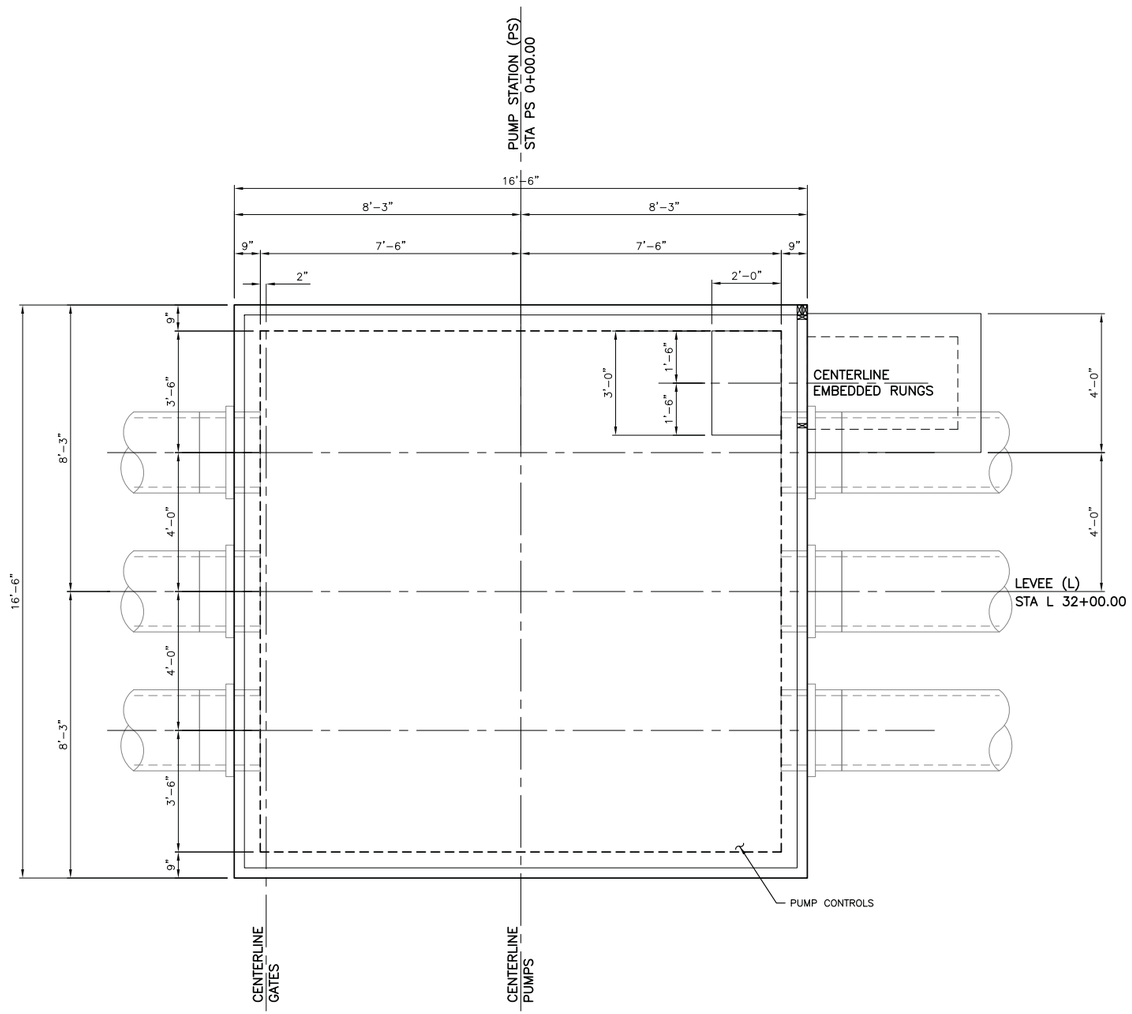
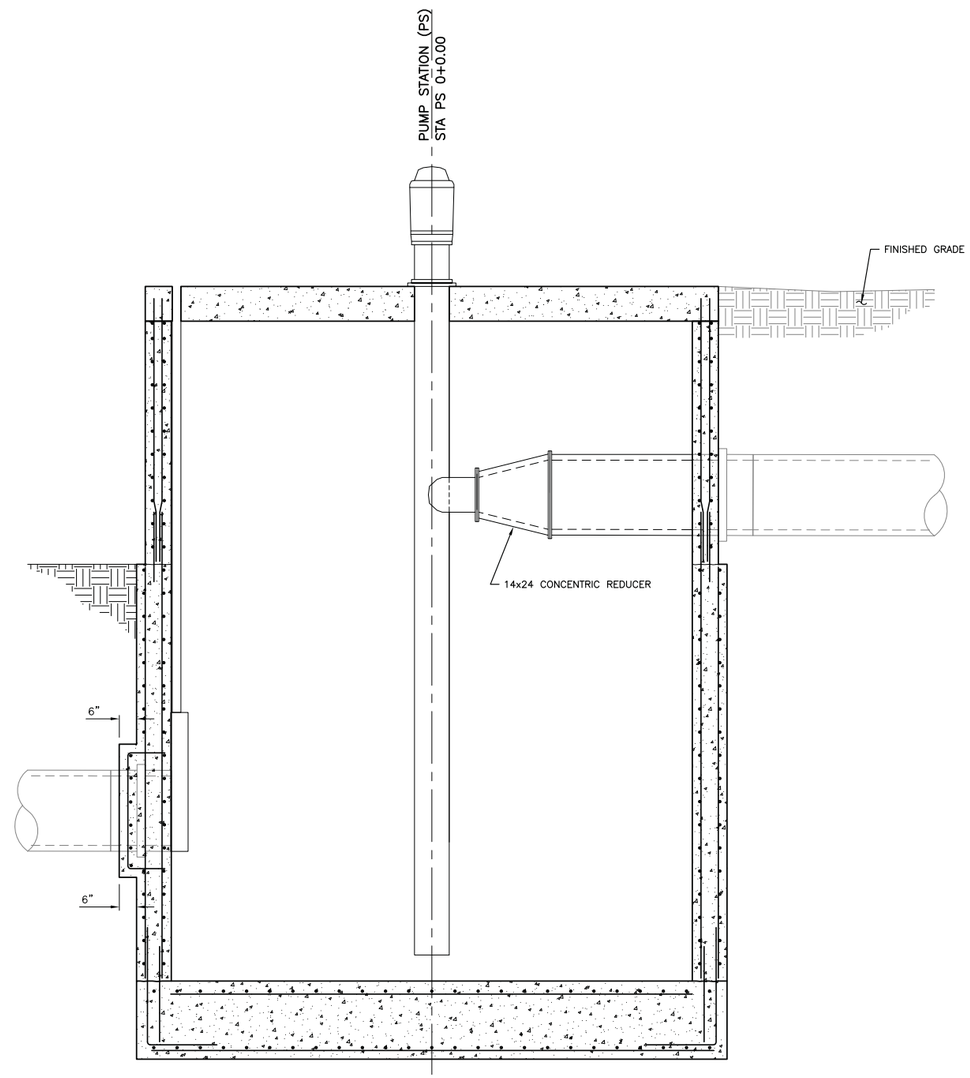
FIR ISLAND
ECOSYSTEM RESTORATION
PUMP HOUSE
SHORING

PROJECT NO. ST:R4:11-3
SHEET 31 OF




PLAN
SCALE: 1/2" = 1'




SECTION
SCALE: 1/2" = 1'

1
32 32

GRAPHIC SCALE
0 2 4 6
SCALE: 1/2" = 1'

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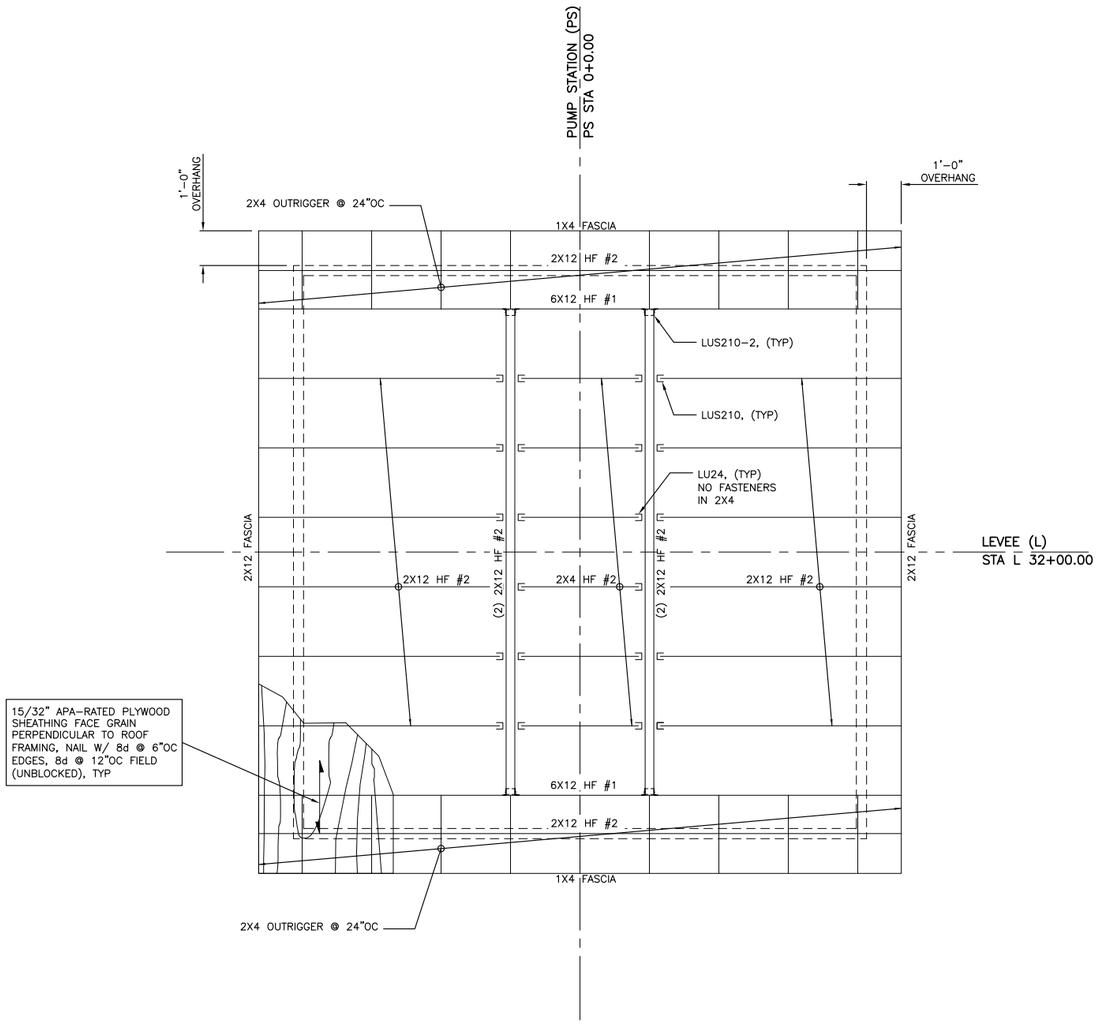
FIR ISLAND
ECOSYSTEM RESTORATION
PUMP HOUSE
SUBSTRUCTURE – SHEET 1

PROJECT NO.
ST:R4:11–3

SHEET 32 OF




PLAN – ROOF FRAMING
SCALE: 1/2" = 1'

GRAPHIC SCALE
0 2 4 6
SCALE: 1/2" = 1'

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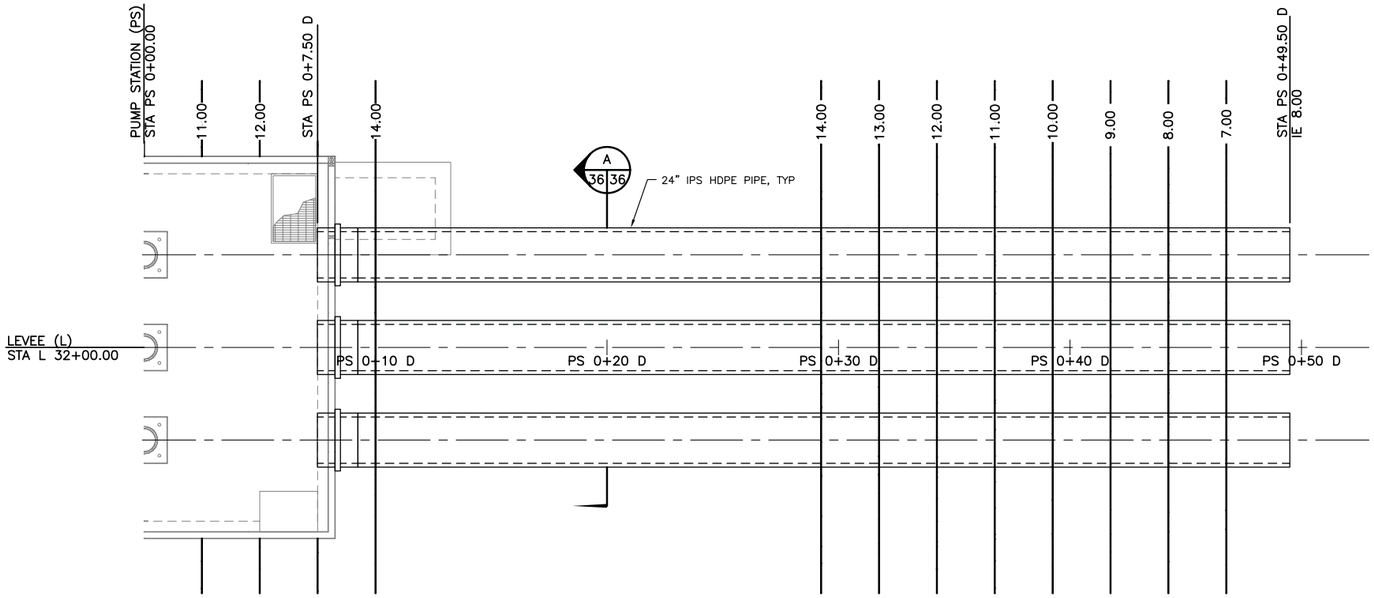
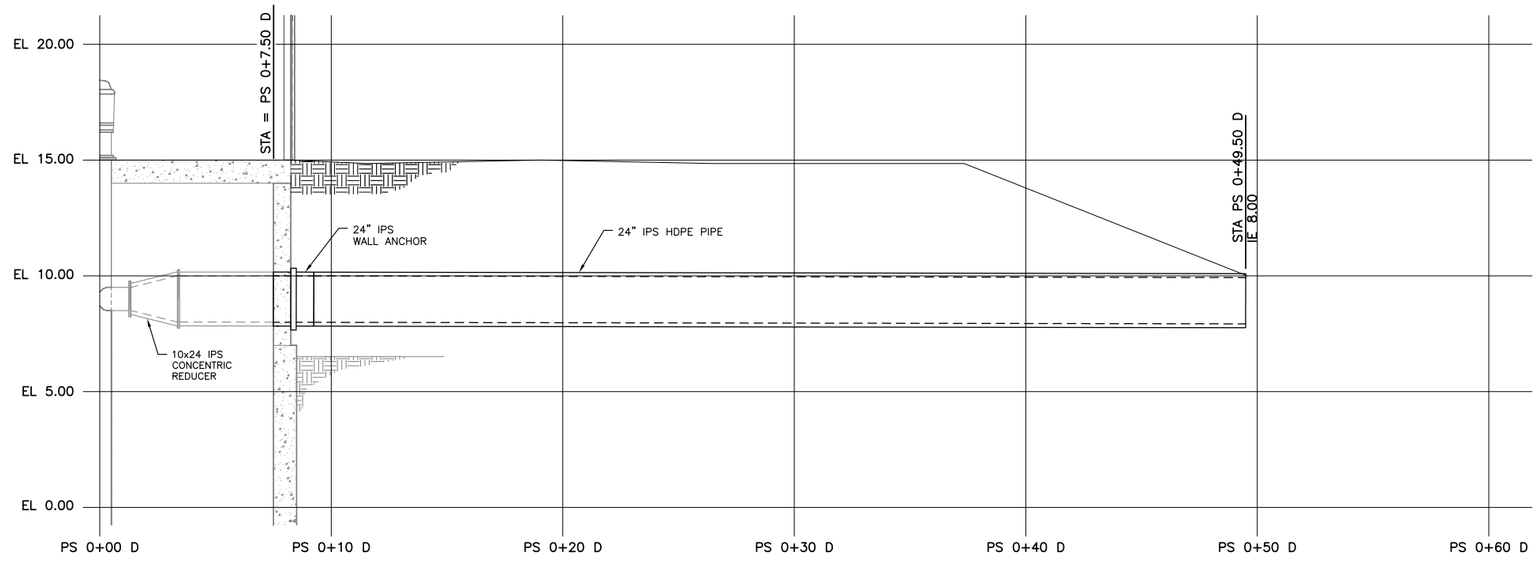
DATE 11/7/2014

FIR ISLAND
ECOSYSTEM RESTORATION
PUMP HOUSE
SUPER STRUCTURE

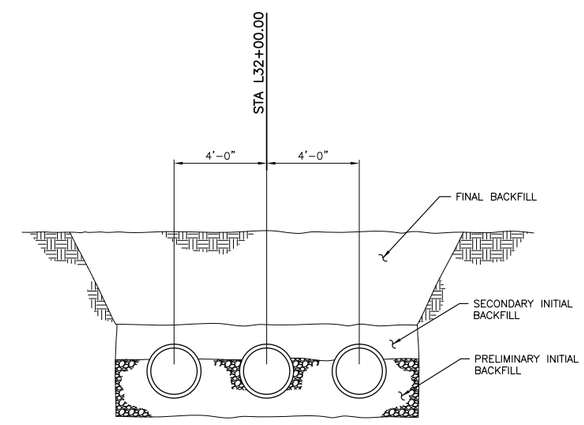
PROJECT NO. ST:R4:11-3
SHEET 34 OF




PLAN
SCALE: 1" = 3'




PROFILE
SCALE: 1" = 3'




SECTION STA PS 0+20 D (A 36 36)
SCALE: 1" = 3'

GRAPHIC SCALE
0 3 6 9
SCALE: 1" = 3'

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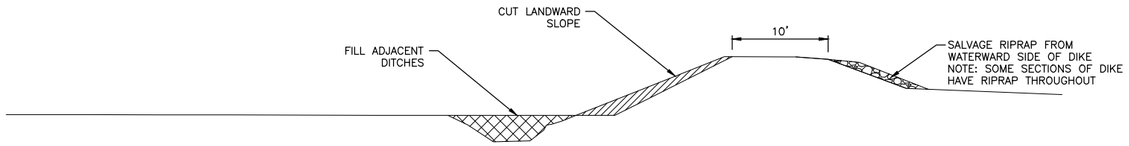
FIR ISLAND
ECOSYSTEM RESTORATION
DISCHARGE PIPELINES
PLAN AND PROFILE

PROJECT NO.
ST:R4:11-3

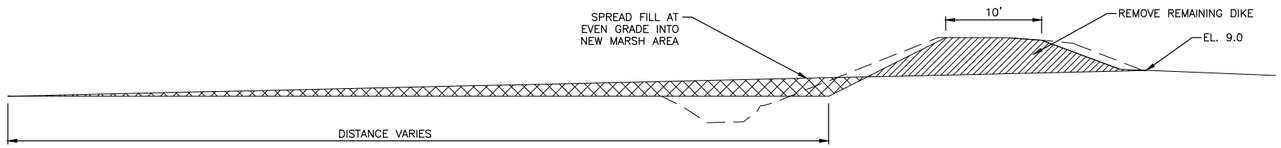
SHEET 36 OF




## TYPICAL EXISTING DIKE DEMOLITION AND DITCH FILL (A 39/37) (A 40/37)

0 10 20 30

SCALE: 1" = 10'




## TYPICAL EXISITNG DIKE DEMOLITION AND MARSH GRADING (B 39/37) (B 40/37)

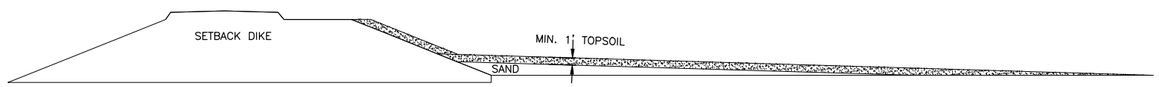
0 10 20 30

SCALE: 1" = 10'

**LEGEND**

CUT

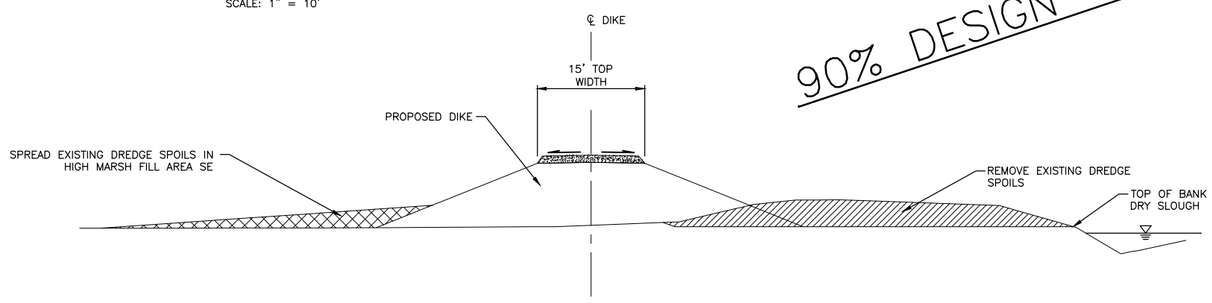
FILL




## TYPICAL HIGH MARSH FILL DETAIL (TOPSOIL/SAND) (C 17/37) (C 20/37) (C 21/37)

0 10 20 30

SCALE: 1" = 10'




## TYPICAL EXISTING SPOILS REMOVAL AND HIGH MARSH PLACEMENT (D 10/37) (D 11/37)

0 10 20 30

SCALE: 1" = 10'

90% DESIGN – NOT FOR CONSTRUCTION

**NOTE**

1. FINAL GRADING TO OCCUR IN DRY AT LOW TIDES ONLY
2. MAINTAIN MINIMUM DIKE ELEVATIONS TO PREVENT OVERTOPPING PRIOR TO SPREAD GRADING
3. SALVAGE ROCK FROM EXISTING DIKE HAUL TO xxxx STOCKPILE
4. MAINTAIN MINIMUM DIKE TOP WIDTH OF 10' TO PRESERVE DIKE STABILITY AND ACCESS PRIOR TO FINAL BREACHES

FILNAME: J:\WP\21-11\7318 Fir Island\CAD\800A\800411\800411-037.dgn DATE: 10-31-2014 LOGIN: cam

*WASHINGTON STATE*
*DEPARTMENT OF FISH AND WILDLIFE*

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

| SYM | DATE | REVISION DESCRIPTION | BY |
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| | 11/14 | 90% DESIGN SUBMITTAL | DRC |

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

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

0 — 1"
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CHECKED BY CAR
DRAWN BY CMH, EAA
DATE NOV 2014

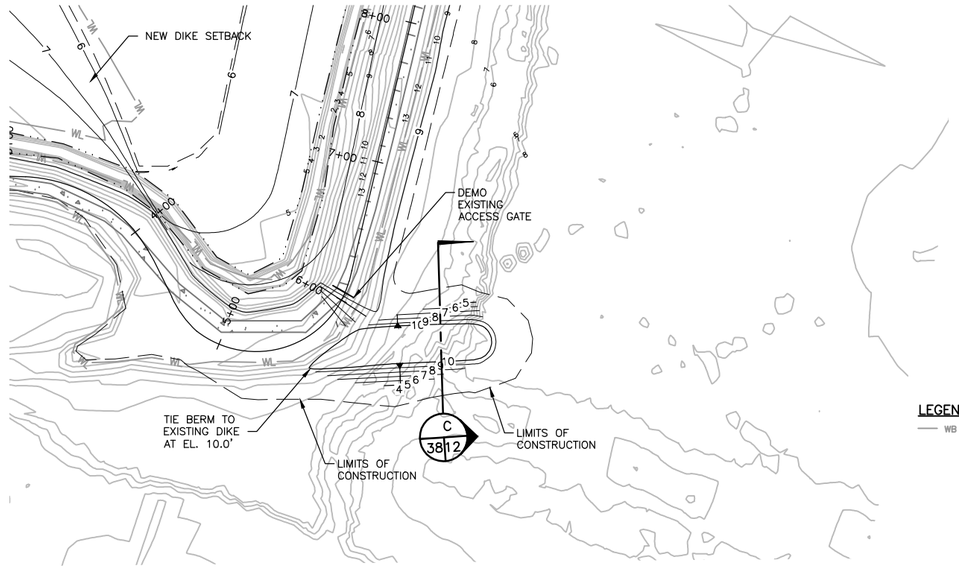
FIR ISLAND FARM

ECOSYSTEM RESTORATION

EXISTING DIKE RECOMMENDED DEMOLITION SEQUENCE

PROJECT NO. ST:R4:11–3

SHEET 37 OF 43




## SITE PLAN

0 50 100 150

SCALE: 1" = 50'

LEGEND

WB — EXISTING WETLANDS

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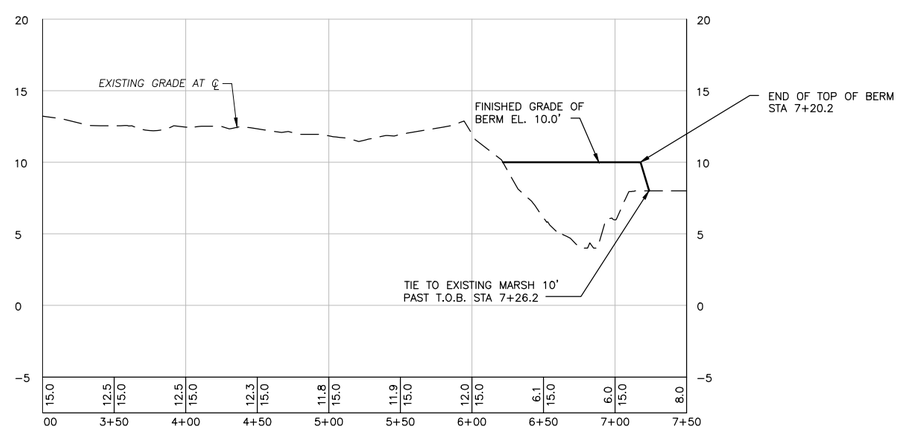
NOTES

1. EXTERIOR TIDAL EXCAVATION TO BE COMPLE PRIOR TO ESTUARINE TIDAL BERM CONSTRUCTION
2. ESTUARINE TIDAL BERM CONSTRUCTION TO BE COMPLETE PRIOR TO EXISTING DIKE BREACH.
3. BERM SHOULD BE CONSTRUCTED IN THE DRY. LOWER PORTIONS OF BERM SHALL BE CONSTRUCTED WHEN WATER LEVELS ARE AT OR BELOW MEAN LOW WATER.




## PROFILE

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

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DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE STATE OF WASHINGTON 39326 REGISTERED PROFESSIONAL ENGINEER

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0 — 1"
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FIR ISLAND FARM

ECOSYSTEM RESTORATION

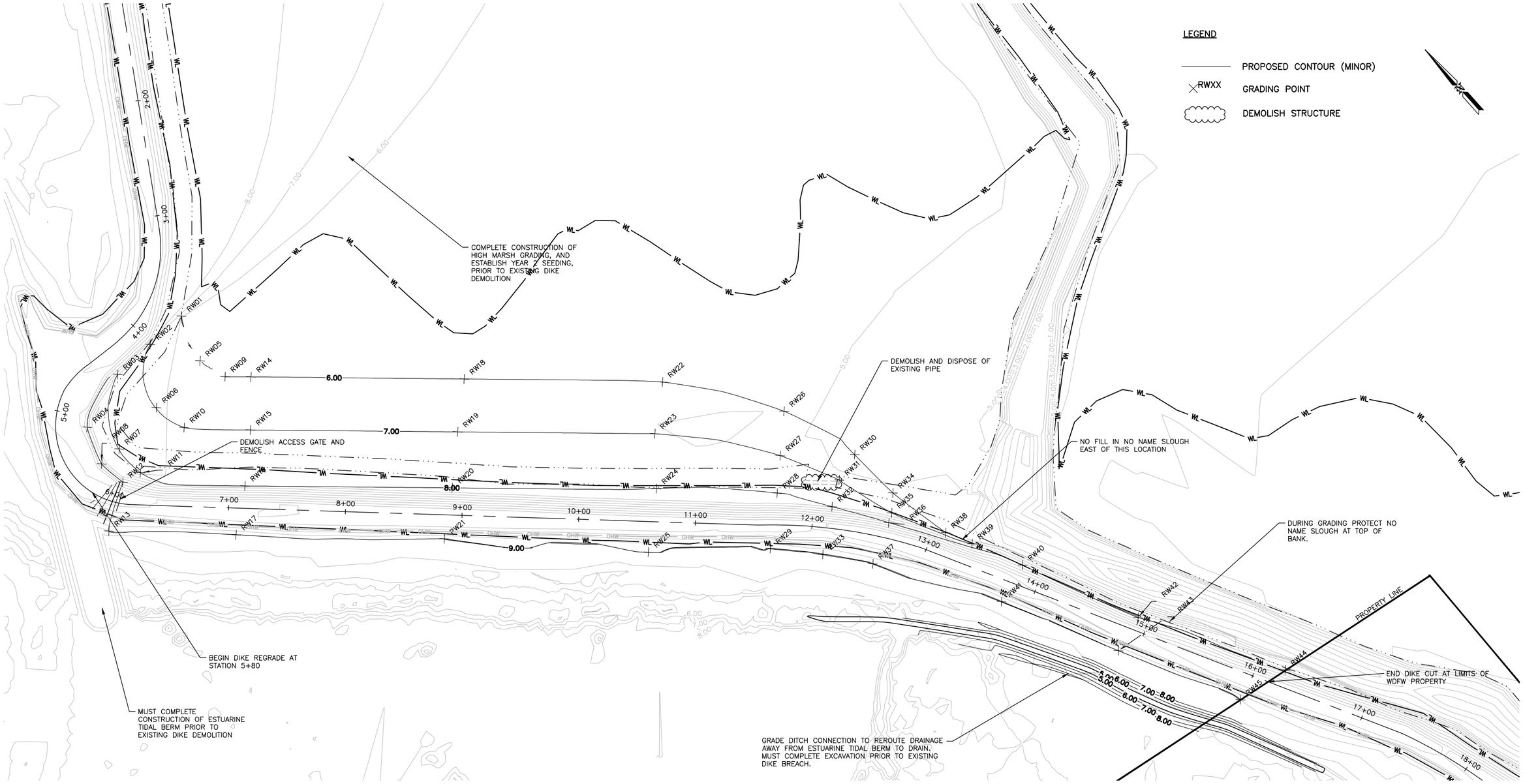
ESTUARINE TIDAL BERM

PLAN AND PROFILE

PROJECT NO. ST:R4:11–3

SHEET 38 OF 43

FILENAME: J:\WDA\21-J\19318 Fir Island\CAD\R09\A\R09411\3\R09411b038.dgn DATE: 10-31-2014 LOGIN: cmh




## NOTES

1. CONTRACTOR TO BEGIN DIKE DEMOLITION ONLY AFTER GRADING, SEEDING, AND REMOVAL OF TESC/ACCESS ACTIVITIES HAVE BEEN COMPLETED IN THE AREAS OF PROPOSED DIKE CONSTRUCTION, TIDEGATE CONSTRUCTION, HIGH MARSH GRADING, POND GRADING, AND ESTURINE BERM CONSTRUCTION.
2. INITIAL DIKE DEMOLITION TO PROGRESS PER DETAILS SHOWN ON SHEET 25.
3. CUT FARM SIDE OF EXISTING DIKE, LEAVING A MINIMUM TOP WIDTH OF 10'. USE SPOILS TO FILL DITCHES
4. UPON COMPLETION OF FILLING DITCHES BREACH DIKE WITH DEMOLITION OF EXISTING TIDEGATE ARRAY AT NO NAME SLOUGH REMOVE AND DISPOSE OF EXISTING GATES AND PIPES.
5. REMOVE AND HAUL EXISTING DIKE RIPRAP TO DESIGNATED STOCKPILE.
6. AFTER INITIAL BREACH AT TIDEGATES, CUT THE REMAINDER OF EXISTING DIKE AT WATERSIDE EL 9.0'
7. SPREAD MATERIAL EVENLY LANDWARD FROM EL 9.0' TO EXISTING GRADE IN NEW MARSH PER EXTENTS SHOWN.

SITE PLAN
0 40 80 120
SCALE: 1" = 40'

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

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

0 — 1"
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DATE NOV 2014

FIR ISLAND FARM
ECOSYSTEM RESTORATION
EXISTING DIKE DEMOLITION AND GRADING PLAN

PROJECT NO. ST:R4:11-3
SHEET 39 OF 43

FILENAME: J:\WPD\71-1\17319\Fir Island\CAD\DRDA\DD041113\DD041113-039.dwg DATE: 10-31-2014 LOGIN: cmh

## NOTES

1. CONTRACTOR TO BEGIN DIKE DEMOLITION ONLY AFTER GRADING, SEEDING, AND REMOVAL OF TESC/ACCESS ACTIVITIES HAVE BEEN COMPLETED IN THE AREAS OF PROPOSED DIKE CONSTRUCTION, TIDEGATE CONSTRUCTION, HIGH MARSH GRADING, POND GRADING, AND ESTURINE BERM CONSTRUCTION.
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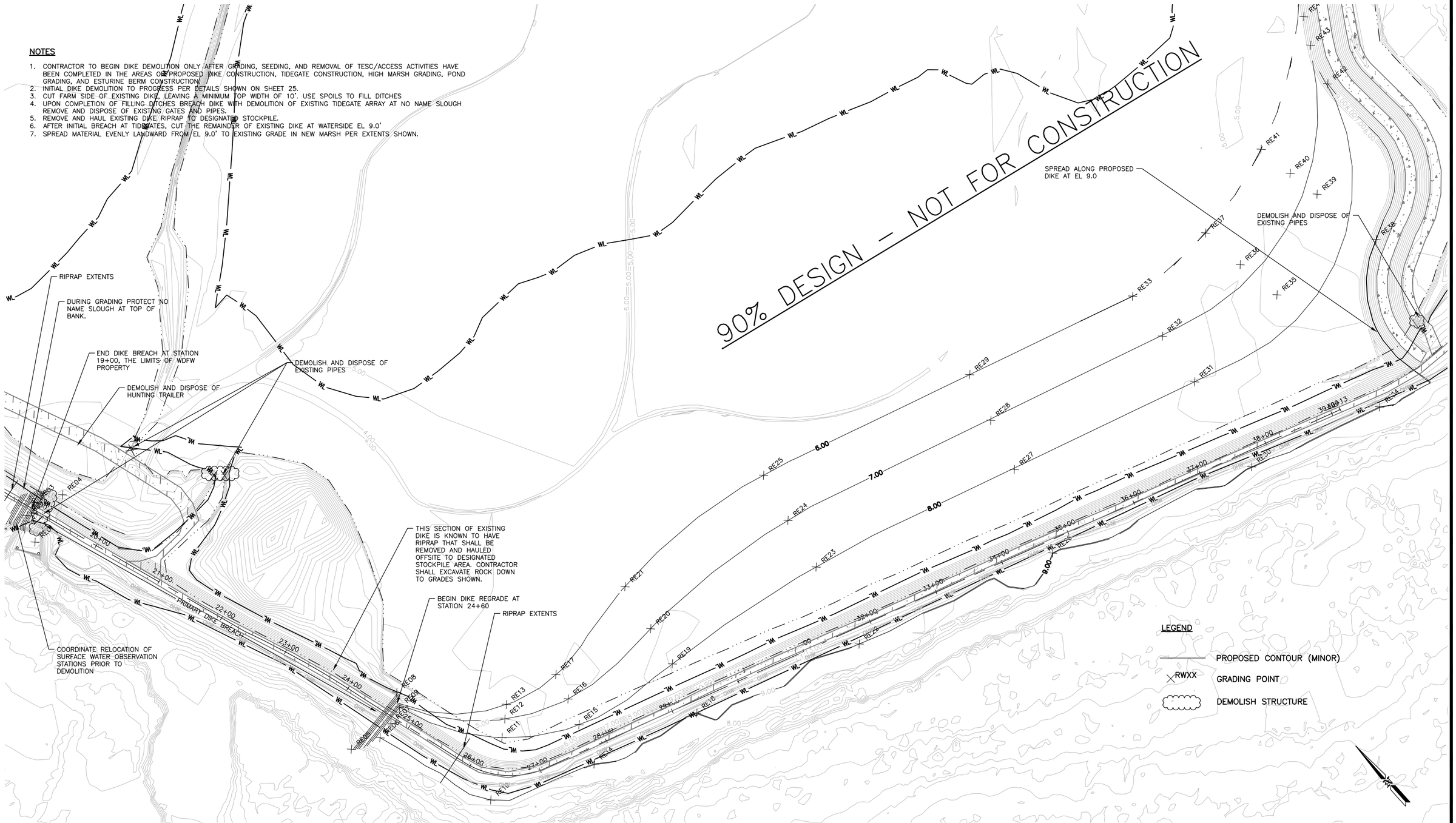


SITE PLAN

0 50 100 150

SCALE: 1" = 50'


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FIR ISLAND FARM

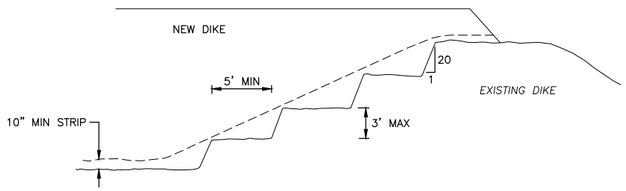
ECOSYSTEM RESTORATION

EXISTING DIKE DEMOLITION AND GRADING PLAN

PROJECT NO. ST:R4:11-3

SHEET 40 OF 43


FILENAME: J:\WFD\21-1\1731.8 Fir Island\C6P\0924\0924113-A\0924113-C40.dwg DATE: 10-31-2014 LOGIN: crch

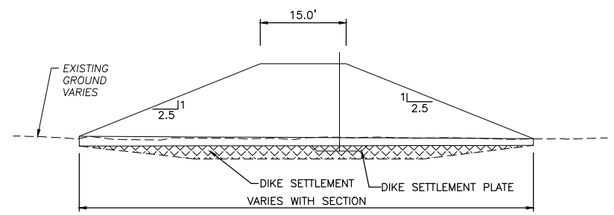



NOTES

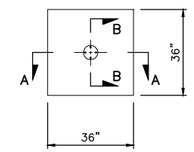
CLEAR AND GRUB SURFACE OF EXISTING DIKE

## DETAIL – DIKE TIE IN BENCH EXCAVATION (1 / X41)

NTS

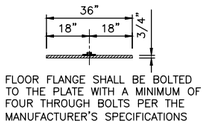



SECTION – TYPICAL DIKE



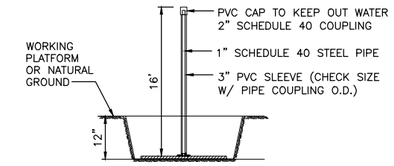

SETTLEMENT PLATE SHALL BE CONSTRUCTED OF PLYWOOD (EXTERIOR).

PLAN VIEW

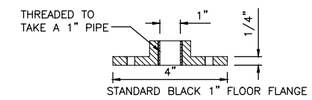



FLOOR FLANGE SHALL BE BOLTED TO THE PLATE WITH A MINIMUM OF FOUR THROUGH BOLTS PER THE MANUFACTURER'S SPECIFICATIONS

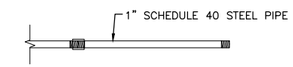
SECTION A–A




SETTLEMENT PLATE INSTALLATION




SECTION B–B




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

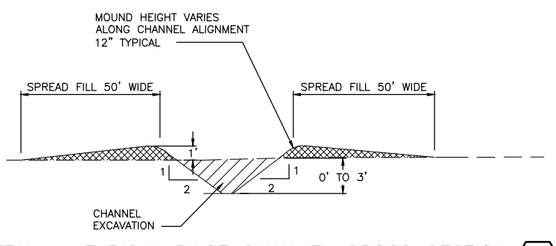
RISER PIPE & COUPLING

## DETAIL – SETTLEMENT PLATE DETAIL (4 / X41)

NTS

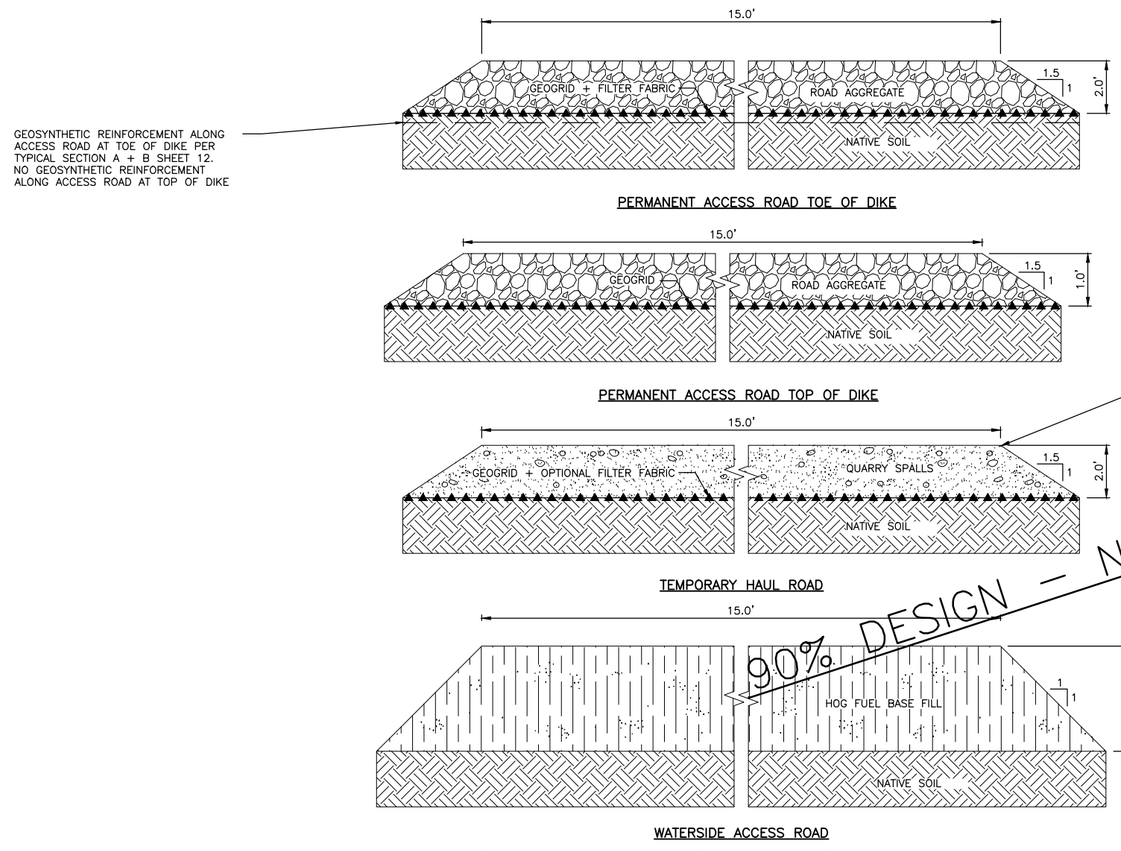
## DETAIL – DITCH FILL CROSS SECTIONS (2 / X41)

SCALE: 3" = 1'–0"




## DETAIL – TYPICAL PILOT CHANNEL CROSS SECTION (3 / X41)

SCALE: 3" = 1'–0"

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## DETAIL – MARSH ACCESS ALONG TIDAL MARSH CHANNELS (5 / X41)

NTS

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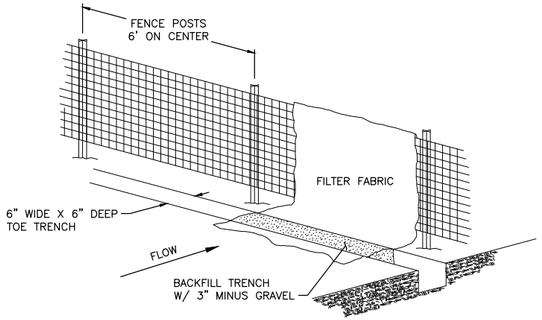
FIR ISLAND FARM
ECOSYSTEM RESTORATION
TYPICAL DETAILS I

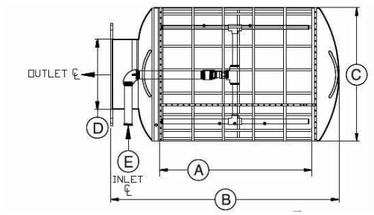
PROJECT NO. ST:R4:11–3

SHEET 41 OF 43

FILENAME: J:\WDFW21-1\19318 Fir Island\CAD\ROCA\R004113\R004113-041.dgn DATE: 10-31-2014 LOGIN: cmh




DETAIL – SILT FENCE (1 / X42)
NTS




DETAIL – TYP. PUMP INTAKE FISH SCREEN (2 / X42)
NTS

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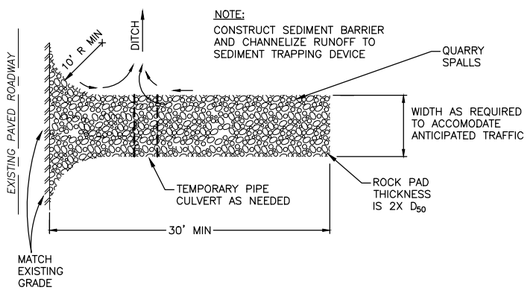
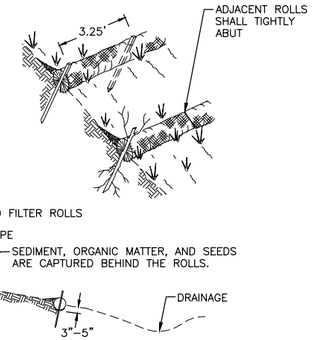


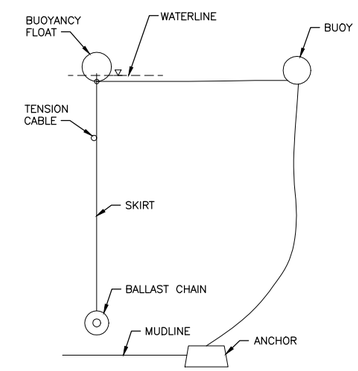

DETAIL – STABILIZED CONSTRUCTION ENTRANCE (3 / X42)
NTS

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.



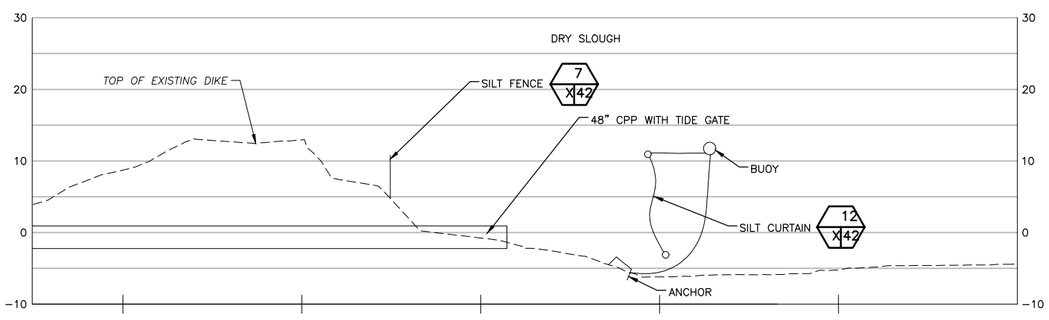

DETAIL – STRAW WATTLE (4 / X42)
NTS



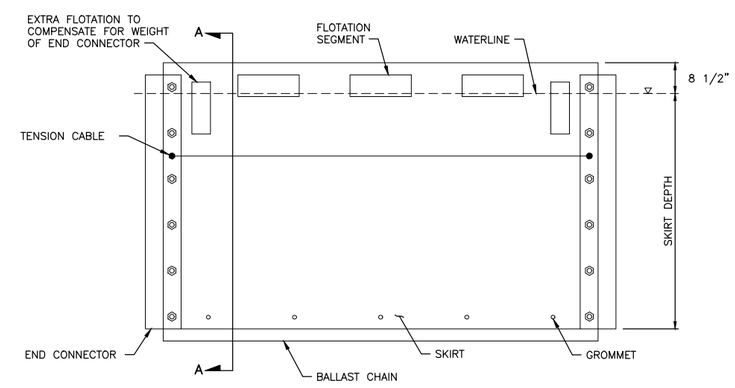

SECTION A–A

NOTES:

1. ANCHOR EVERY 100 FEET.
2. ALLOW APPROX. 1 FOOT CLEARANCE BETWEEN LOWER EDGE OF SKIRT AND MUD LINE.




DETAIL – TYP. SILT CURTAIN PLACEMENT (5 / X42)
SCALE: 1" = 10'–0"




DETAIL – TYP. FLOATING SILT CURTAIN DETAIL (6 / X42)
NTS

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

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0 — 1"
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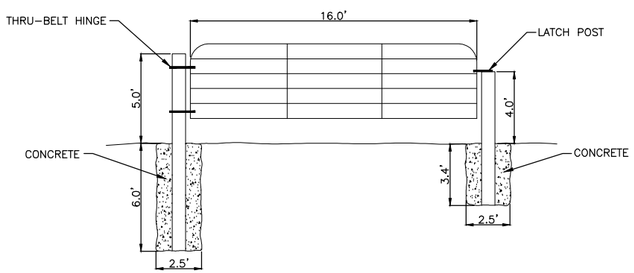
FIR ISLAND FARM
ECOSYSTEM RESTORATION
TYPICAL DETAILS II

PROJECT NO. ST:R4:11–3
SHEET 42 OF 43

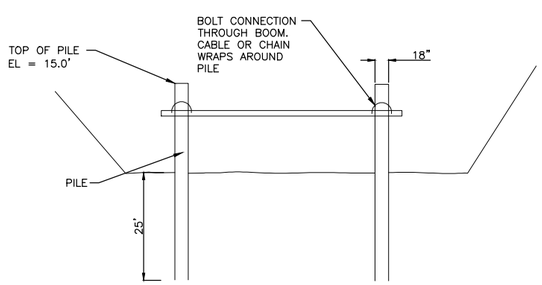
FILENAME: J:\WPD\31-11\13118.F0 DATE: 10-31-2014




DETAIL – ACCESS GATE (1 / X43)
SCALE: 1" = 4'-0"

NOTE:
-FOR MODEL TYPES 48" SIDE HINGE GATES.
-PHOTOS SHOW RIGHT SIDE HINGE
-STORAGE POND TO DRY SLOUGH TIDEGATES SHALL USE LEFT-SIDE HINGES

DETAIL – SIDE HINGE TIDEGATE (3 / X43)
NTS




DETAIL – LOG BOOM DEFLECTOR (2 / X43)
NTS

NOTE:
FOR MODEL TYPES 48" SIDE HINGE GATES.

DETAIL – TOP HINGE TIDEGATE (DRY SLOUGH) (4 / X43)
NTS

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE, STATE OF WASHINGTON, 43328, REGISTERED PROFESSIONAL ENGINEER

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FIR ISLAND FARM
ECOSYSTEM RESTORATION
TYPICAL DETAILS III

PROJECT NO. ST:R4:11-3
SHEET 43 OF 43