WASHINGTON DEPARTMENT OF FISH AND WILDLIFE

SKAGIT WILDLIFE AREA
FIR ISLAND FARM
ECOSYSTEM RESTORATION
ST:R4:11-3

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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
BW	–	BOTTOM WIDTH
CB	–	CATCH BASIN
℄	–	CENTERLINE
CLR.	–	CLEARANCE
CONC	–	CONCRETE
CSBC	–	CRUSHED SURFACING BASE COURSE
CSTC	–	CRUSHED SURFACING TOP COURSE
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
INV	–	INVERT
LG	–	LONG
MFG.	–	MANUFACTURER'S
MHW	–	MEAN HIGH WATER
MHHW	–	MEAN HIGHER HIGH WATER
MLLW	–	MEAN LOWER LOW WATER
MISC.	–	MISCELLANEOUS
MOD.	–	MODEL
NNS	–	NO NAME SLOUGH
N	–	NORTH
NE	–	NORTHEAST
NW	–	NORTHWEST
OC	–	ON CENTER
OHW	–	ORDINARY HIGH WATER
OD	–	OUTSIDE DIAMETER
PAV'T	–	PAVEMENT (ASPHALT / CONCRETE)
ℙ	–	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
WHS	–	WELDED HEADED STUD
W.S.	–	WATER SURFACE
W	–	WEST

SHEET SYMBOLS

1 / 3 | 5 — DETAIL DESIGNATION; SHEET CALLED FROM; SHEET LOCATED ON

DETAIL

A / 6 | 7 — SECTION DESIGNATION; SHEET CALLED FROM; SHEET LOCATED ON

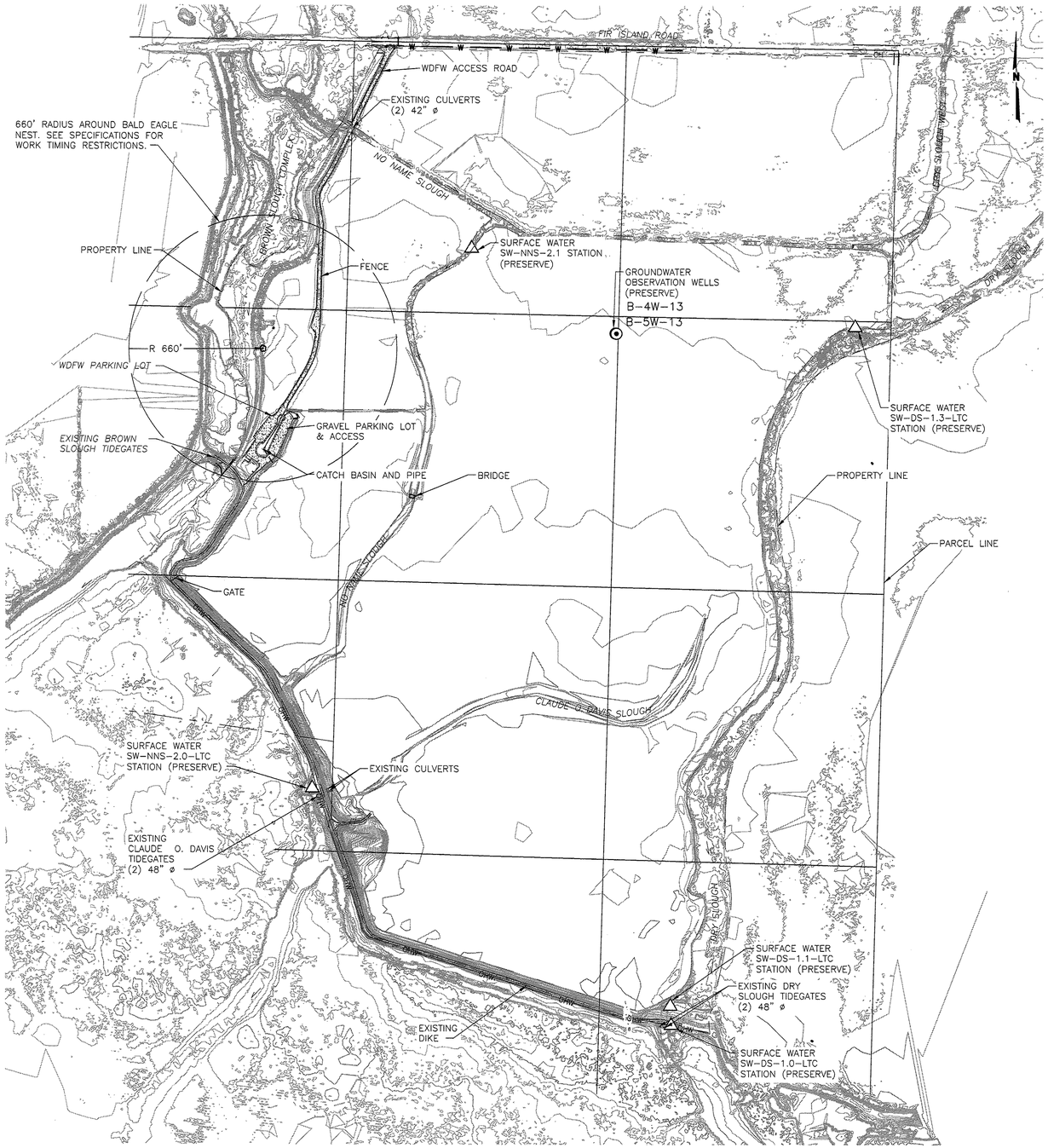
SECTION

1 A

NOTE REFERENCE
REFERENCE DESIGNATION TO NOTE APPEARING ON SAME SHEET

PROJECT NO.	
ST:R4:11-3	
SHEET	OF
1	54

FILENAME: J:\WIP\21-1\12318 FIR ISLAND\CAD\R004\R0041136\R0041136S001.dwg DATE: 03-16-2015 LOGIN: cmh



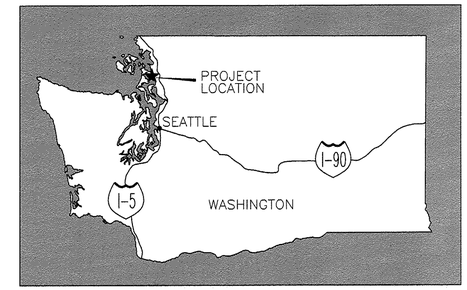
SITE PLAN

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.



LOCATION MAP

VICINITY MAP

0 2000 4000 6000

SCALE: 1" = 2000'

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
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P.O. Box 300303
Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 17 MAR 15
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

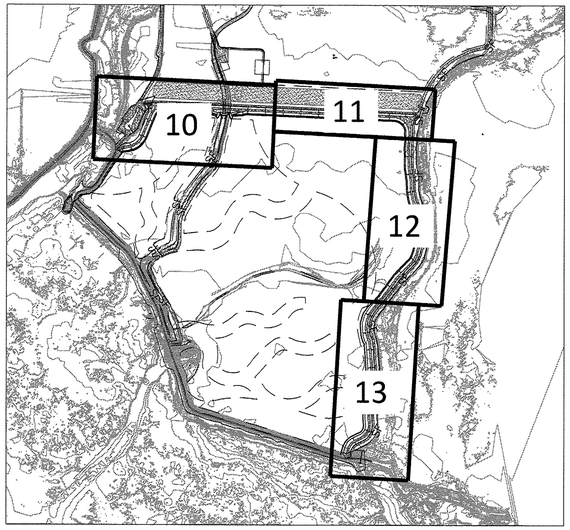
FIR ISLAND FARM
ECOSYSTEM RESTORATION
EXISTING SITE PLAN
LOCATION & VICINITY MAP

PROJECT NO. ST:R4:11-3

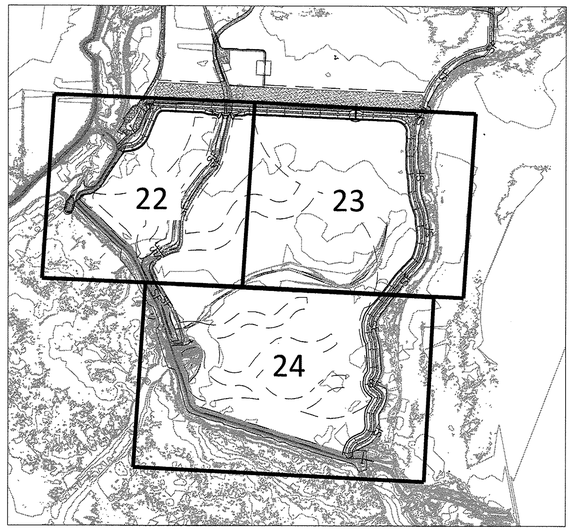
SHEET 2 OF 54

FILENAME: J:\WPA21-11\2738 FIR ISLAND\CAD\R004\R004113-3\R004113-S002.dwg DATE: 03-06-2015 LOGIN: cmh

KEY: PLAN AND PROFILE



KEY: GRADING PLANS



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 RECEIVE TRANSFER FROM THE OWNER OF THE 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, COMMUNICATIONS, 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 72 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 LENGTHS 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 ENGINEER.
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.

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

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

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: 17 MAR 15
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
GENERAL NOTES

PROJECT NO. ST:R4:11–3
SHEET 3 OF 54

FILENAME: L:\WP21-1\12318_FIR_ISLAND\CAD\R004\R004113-\R004113-003.dwg DATE: 03-02-2015 LOGIN: cmh

STATE OF WASHINGTON
DEPARTMENT OF FISH & WILDLIFE

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

(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°19'50.1130"
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'

0 400 800
200
SCALE IN FEET
JOB SCALE FACTOR 0.9999491

LEGEND

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

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

NOTE:
SURVEY POINTS WITH DESCRIPTIONS BEGIN
WERE NOT USED TO CREATE CONTOURS

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

FIELD BOOKS
400.58, 4-196-13

DISCLAIMER
AS A TOPOGRAPHICAL MAP ONLY.

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

STEVEN M. DABROWSKI
PLS 38957
MARCH 11, 2015

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: 3/11/2015
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY S. DABROWSKI
CHECKED BY S. DABROWSKI
DRAWN BY S. DABROWSKI
DATE 3/11/2015

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

PROJECT NO. ST:R4:11-3
SHEET 4 OF 54

DIKE SETBACK GRADING POINTS (SHEETS 14-18)												
	POINT 1 (F.G. SELECT FILL)			POINT 2		POINT 3		POINT 4		POINT 5 (F.G. SELECT FILL)		
STATION	NORTHING	EASTING	ELEVATION	NORTHING	EASTING	NORTHING	EASTING	NORTHING	EASTING	NORTHING	EASTING	ELEVATION
10+00	N/A	N/A	N/A	N/A	N/A	490943.9	1256103.4	N/A	N/A	N/A	N/A	N/A
11+00	491009.1	1256188.8	5.3	490985.5	1256193.2	490978.1	1256194.5	490970.7	1256195.9	490945.0	1256200.7	4.8
13+00	491125.3	1256297.7	5.6	491116.2	1256319.8	491113.3	1256326.7	491110.5	1256333.7	491100.9	1256357.1	5.3
14+00	491217.5	1256336.3	5.9	491208.7	1256357.9	491205.8	1256364.8	491203.0	1256371.7	491193.6	1256394.4	5.6
15+00	N/A	N/A	N/A	491299.1	1256405.6	491293.7	1256410.7	491288.2	1256415.8	491269.8	1256432.9	5.4
16+00	491351.0	1256505.2	5.1	491326.8	1256504.2	491319.3	1256503.9	491311.8	1256503.5	491286.4	1256502.6	5.3
18+00	491342.5	1256705.2	5.2	491318.3	1256704.2	491310.8	1256703.9	491303.3	1256703.5	491277.5	1256702.3	5.1
19+00	491338.1	1256804.9	5.2	491314.1	1256803.9	491306.6	1256803.5	491299.1	1256803.3	491274.0	1256802.2	5.4
21+00	491339.2	1257005.2	0.0	491305.6	1257003.7	491298.2	1257003.3	491290.7	1257003.1	491255.4	1257001.6	0.0
23+00	491321.5	1257204.5	5.1	491297.2	1257203.6	491289.7	1257203.2	491282.2	1257202.9	491257.7	1257201.9	5.6
25+00	491312.1	1257404.4	5.5	491288.7	1257403.4	491281.3	1257403.1	491273.8	1257402.7	491249.2	1257401.7	5.6
27+00	491303.3	1257604.2	5.6	491280.3	1257603.2	491272.8	1257602.9	491265.3	1257602.6	491240.6	1257601.5	5.5
29+00	491294.7	1257804.0	5.7	491271.8	1257803.0	491264.4	1257802.7	491256.9	1257802.4	491232.5	1257801.4	5.7
31+00	491285.9	1258003.8	5.9	491263.4	1258002.8	491255.9	1258002.5	491248.4	1258002.2	491224.1	1258001.2	5.7
33+00	491278.4	1258203.7	5.5	491254.9	1258202.7	491247.5	1258202.3	491240.0	1258202.0	491215.0	1258201.0	5.4
35+00	491269.1	1258403.4	5.8	491246.5	1258402.5	491239.0	1258402.1	491231.5	1258401.9	491207.2	1258400.8	5.7
36+00	491264.3	1258521.8	5.6	491228.6	1258503.1	491221.9	1258499.6	491215.3	1258496.2	491193.4	1258484.8	5.6
37+00	491163.9	1258604.6	6.0	491151.4	1258571.6	491148.8	1258564.5	491146.2	1258557.5	491137.4	1258534.3	5.5
38+00	491048.4	1258600.8	6.0	491049.5	1258578.5	491049.9	1258571.0	491050.3	1258563.5	491051.6	1258538.0	5.8
39+00	490952.1	1258594.8	6.0	490950.8	1258572.7	490950.3	1258565.2	490949.8	1258557.8	490948.4	1258534.6	6.0
40+00	490849.9	1258596.3	6.0	490850.3	1258574.2	490850.4	1258566.7	490850.5	1258559.2	490850.9	1258535.5	5.8
41+00	490755.7	1258604.6	6.0	490752.3	1258582.8	490751.1	1258575.3	490750.0	1258567.9	490746.2	1258543.9	5.8
42+00	490652.1	1258614.5	6.0	490651.9	1258592.4	490651.8	1258584.9	490651.8	1258577.4	490651.6	1258552.5	5.2
43+00	490559.8	1258628.4	6.0	490554.6	1258604.3	490553.1	1258597.0	490551.5	1258589.7	490546.1	1258564.0	4.9
44+00	490468.7	1258658.0	5.0	490460.5	1258634.7	490458.0	1258627.7	490455.5	1258620.6	490446.1	1258593.8	4.7
45+00	490360.1	1258679.7	5.0	490361.1	1258654.9	490361.3	1258647.4	490361.7	1258639.9	490362.7	1258613.7	4.5
46+00	490263.9	1258692.4	5.0	490262.7	1258667.8	490262.2	1258660.3	490261.9	1258652.8	490260.6	1258625.1	4.9
47+00	490157.8	1258687.0	5.0	490161.5	1258662.7	490162.6	1258655.2	490163.8	1258647.8	490167.5	1258622.7	5.1
48+00	490054.9	1258660.6	5.0	490063.4	1258637.5	490065.9	1258630.5	490068.5	1258623.4	490077.3	1258599.4	5.3
49+00	489962.7	1258597.9	5.0	489979.7	1258580.2	489984.9	1258574.7	489990.1	1258569.3	490008.0	1258550.7	5.3
50+00	489890.5	1258528.8	5.0	489907.5	1258511.0	489912.7	1258505.6	489917.9	1258500.1	489935.3	1258482.0	5.6
51+00	489818.9	1258467.6	5.0	489832.6	1258447.1	489836.7	1258440.9	489840.9	1258434.6	489854.9	1258413.6	5.3
52+00	489736.2	1258408.2	5.0	489751.0	1258388.6	489755.5	1258382.6	489760.1	1258376.6	489775.7	1258355.8	5.2
53+00	489656.7	1258346.2	5.0	489672.1	1258326.9	489676.7	1258321.0	489681.4	1258315.2	489696.6	1258295.8	5.0
54+00	489579.1	1258283.4	5.0	489594.3	1258264.1	489599.0	1258258.2	489603.6	1258252.3	489620.4	1258231.2	4.6
55+00	489502.1	1258245.3	5.0	489508.2	1258221.4	489510.0	1258214.1	489511.9	1258206.9	489518.6	1258180.4	4.3
56+00	489416.8	1258244.5	4.0	489412.1	1258217.7	489410.8	1258210.4	489409.6	1258203.0	489405.2	1258178.2	4.8
57+00	489318.1	1258273.3	4.0	489316.1	1258246.3	489315.6	1258238.8	489315.0	1258231.3	489313.1	1258205.1	5.2
58+00	489218.4	1258280.6	4.0	489216.4	1258253.5	489215.7	1258246.1	489215.3	1258238.6	489213.4	1258212.8	5.1
59+00	489120.8	1258287.7	4.0	489117.1	1258260.8	489115.8	1258253.4	489114.8	1258246.0	489111.6	1258219.6	4.6
60+00	489012.5	1258254.8	4.0	489021.8	1258229.3	489024.4	1258222.2	489027.0	1258215.2	489036.0	1258190.4	4.3
61+00	488951.4	1258264.8	4.0	488934.4	1258243.0	488929.8	1258237.0	488925.2	1258231.1	488910.0	1258211.6	5.0
62+00	488855.6	1258334.5	4.0	488858.6	1258307.4	488859.4	1258300.0	488860.3	1258292.5	488863.6	1258263.0	4.3
63+00	488754.7	1258280.1	4.0	488769.1	1258257.1	488773.0	1258250.7	488777.0	1258244.3	488791.2	1258221.5	4.3
64+00	488679.9	1258266.3	4.0	488677.9	1258239.2	488677.2	1258231.8	488676.6	1258224.3	488674.6	1258197.1	4.4
65+00	488565.0	1258257.4	4.0	488575.8	1258232.5	488578.8	1258225.7	488581.8	1258218.8	488592.5	1258194.1	4.6
66+00	488480.9	1258163.6	4.0	488507.0	1258155.6	488514.2	1258153.4	488521.4	1258151.2	488546.7	1258143.4	4.6
67+00	488437.6	1258101.1	4.0	488453.1	1258078.8	488457.4	1258072.7	488461.7	1258066.5	488477.4	1258044.0	3.9
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

STORAGE POND GRADING POINTS (SHEET 19)			
POINT	NORTHING	EASTING	ELEV. (F.G.)
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

HIGH MARSH GRADING POINTS (SHEETS 22-24)			
POINT	NORTHING	EASTING	ELEV. (F.G.)
UM01	490663.7	1256056.8	8.0
UM02	490620.5	1256073.1	7.0
UM03	490583.821	1256084.36	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	490917.114	1256421.46	7.0
UM09	490830.229	1256554.86	6.0
UM10	491148.0	1256441.9	8.0
UM11	491079.274	1256483.41	7.0
UM12	490982.931	1256658.75	6.0
UM13	491285.0	1256699.1	8.0
UM14	491261.264	1256705.14	7.0
UM15	491182.127	1256727.84	6.0
UM16	491265.6	1257190.9	8.0
UM17	491262.9	1257190.8	7.0
UM18	491201.083	1257249.33	6.0
UM19	491247.8	1257612.2	8.0
UM20	491256.9	1257337.2	7.0
UM21	491140.812	1257741.31	8.0
UM22	491085.255	1257484.83	7.0
UM23	491026.069	1257311.23	6.0
UM24	491039.773	1257902.42	8.0
UM25	490944.553	1257651.96	7.0
UM26	490782.326	1257497.86	6.0
UM27	490945.975	1258125.1	8.0
UM28	490772.11	1257978.07	7.0
UM29	490549.669	1257947.19	6.0
UM30	490744.274	1258418.11	8.0
UM31	490584.067	1258296.29	7.0
UM32	490423.954	1258104.82	6.0
UM33	490448.9	1258574.92	8.0
UM34	490461.037	1258387.91	7.0
UM35	490257.895	1258223.79	6.0
UM35B	490146.189	1258587.14	8.0
UM36	490100.701	1258473.68	7.0
UM37	490130.234	1258276.01	6.0
UM38	489941.084	1258519.24	8.0
UM39	489821.636	1258393.15	7.0
UM40	489609.602	1258235.24	6.0

EXISTING WEST DIKE REGRADE POINTS (SHEET 49)			
POINT	NORTHING	EASTING	ELEV. (F.G.)
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 50)			
POINT	NORTHING	EASTING	ELEV. (F.G.)
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	488700.3	1257810.5	6.0
RE34	488343.3	1257966.3	9.0
RE35	488510.8	1257970.9	8.0
RE36	488596.6	1257958.6	7.0
RE37	488705.4	1257940.0	6.0
RE38	488519.7	1258116.3	9.0
RE39	488565.1	1258106.4	8.0
RE40	488639.8	1258093.4	7.0
RE41	488737.6	1258072.3	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

NO NAME SLOUGH TIDEGATE PIPE POINTS (SHEET 10)			
POINT	NORTHING	EASTING	ELEV. INV.
NNSP1	491370.0	1257000.5	1.0
NNSP2	491369.6	1257009.5	1.0
NNSP3	491255.3	1256996.2	1.0
NNSP4	491254.9	1257005.4	1.0

PUMP STATION POINTS (SHEET 26)		
POINT	NORTHING	EASTING
PS1	491279.1	1258095.4
PS2	491278.4	1258111.8
PS3	491262.6	1258094.6
PS4	491261.9	1258111.1

DRY SLOUGH TIDEGATE PIPE POINTS (SHEET 13)			
POINT	NORTHING	EASTING	ELEV. INV.
DSP1	488404.2	1258173.5	0.3
DSP2	488310.0	1258160.2	0.1

TRASH RACK POINTS (SHEET 26)			
POINT	NORTHING	EASTING	ELEV. (F.G.)
TR1	491346.0	1258099.7	-0.5
TR2	491345.4	1258113.2	-0.5
TR3	491329.0	1258099.0	7.0
TR4	491328.4	1258112.4	7.0

POND/DRY SLOUGH TIDEGATE PIPE POINTS (SHEET 11)			
POINT	NORTHING	EASTING	ELEV. INV.
PDSP1	491318.2	1258646.3	1.0
PDSP2	491326.2	1258650.5	1.0
PDSP3	491300.8	1258679.0	1.0
PDSP4	491308.7	1258683.2	1.0

ESTUARINE TIDAL BERM POINTS (SHEET 48)			
POINT	NORTHING	EASTING	ELEV. (F.G.)
TB01	490431.7	1255659.5	10.0
TB02	490529.6	1255710.1	10.0

PUMP STATION OUTFALL PIPE POINTS (SHEET 26)			
POINT	NORTHING	EASTING	ELEV. INV.
PSOP1	491220.5	1258097.1	8.8
PSOP2	491220.3	1258101.1	8.8
PSOP3	491220.2	1258105.1	8.8

PARKING LOT DITCH REGRADE POINTS (SHEET 10)			
POINT	NORTHING	EASTING	ELEV. (F.G.)
PL01	491030.0	1256176.9	6.0
PL02	491178.6	1256303.9	5.0
PL03	491268.7	1256340.8	4.5

TIDAL CHANNEL GRADING POINTS (SHEETS 22-24)			
POINT	NORTHING	EASTING	ELEV. (F.G.)
TC03	490068.0	1256366.3	3.5
TC05	490188.5	1256306.6	4.1
TC08	490271.1	1256357.6	4.0
TC11	490347.5	1256381.7	4.8
TC14	490464.9	1256336.8	4.9
TC17	490606.6	1256361.1	5.0
TC20	490761.8	1256317.8	6.0
TC23	490877.6	1256331.9	7.0
TC26	490153.8	1256572.5	5.0
TC27	490175.6	1256594.8	2.7
TC28	490217.8	1256631.5	6.0
TC30	490195.9	1256925.1	3.1
TC33	490467.9	1257145.6	3.4
TC36	490492.2	1257294.2	3.6
TC39	490443.6	1257474.1	3.8
TC42	490563.5	1257656.7	4.0
TC45	490689.1	1257746.6	4.7
TC48	490735.6	1257768.8	4.9
TC51	490894.5	1257778.0	5.5
TC54	490988.5	1257808.0	5.9
TC57	491119.2	1258014.4	6.8
TC60	490701.3	1257850.9	6.0
TC63	490649.3	1258106.1	6.5
TC66	490734.0	1258287.7	7.0

TIDAL CHANNEL GRADING POINTS (SHEETS 22-24)			
POINT	NORTHING	EASTING	ELEV. (F.G.)
TC68	490887.2	1258389.1	8.0
TC77	489438.0	1256656.3	2.0
TC80	489435.6	1256757.4	3.1
TC83	489398.0	1256832.9	3.4
TC86	489244.5	1256889.9	3.7
TC89	489031.7	1256991.3	4.5
TC92	489012.1	1257171.6	4.7
TC95	488887.6	1257324.2	4.9
TC97	488821.4	1257677.0	5.0
TC98	488901.4	1257789.3	5.0
TC99	489001.2	1257959.5	5.5
TC101	489044.0	1257185.9	4.7
TC104	489278.8	1257420.0	4.9
TC107	489304.5	1257574.1	5.0
TC110	489283.0	1257770.4	5.2
TC112	489360.5	1257920.4	5.3
TC114	489418.0	1256869.2	3.3
TC117	489433.0	1257014.1	4.0
TC120	489524.7	1257143.5	4.2
TC123	489529.2	1257259.0	4.4
TC126	489499.8	1257409.2	4.7
TC129	489629.3	1257582.5	5.0
TC131	489655.1	1257626.1	5.2

NOTES

1. PROPOSED DIKE GRADING POINTS ASSOCIATED WITH POINTS SHOWN ON TYPICAL SETBACK DIKE SECTIONS SHEET 14
2. STORAGE POND, TIDAL CHANNELS, MARSH, EXISTING DIKE REGRADE (EAST AND WEST) GRADING POINTS ARE SHOWN ON GRADING PLANS FOR EACH CONSTRUCTED FEATURE'S PLAN SHEET.
3. PROPOSED SETBACK DIKE TIES TO EXISTING DIKE BENCH AT CENTERLINE LOCATIONS
   N: 490943.9
   E: 1256103.4
   AND
   N: 488341.9
   E: 1258061.6
4. DIKE GRADING POINTS 1 AND 5 REPRESENT DIKE SELECT FILL CATCH AND BOTTOM OF STRIPPING DEPTH
5. DIKE GRADING POINTS 2 AND 4 REPRESENT DIKE FILL POINTS AT TOP OF DIKE SELECT FILL AT TOP EDGE OF DIKE SELECT FILL SLOPE
6. DIKE GRADING POINT 3 REPRESENTS CENTERLINE OF DIKE SETBACK ALIGNMENT AT TOP OF DIKE SELECT FILL.

ALIGNMENT AND TIES

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

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

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER DLZ DATE: 17 Mar 16
PROGRAM DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

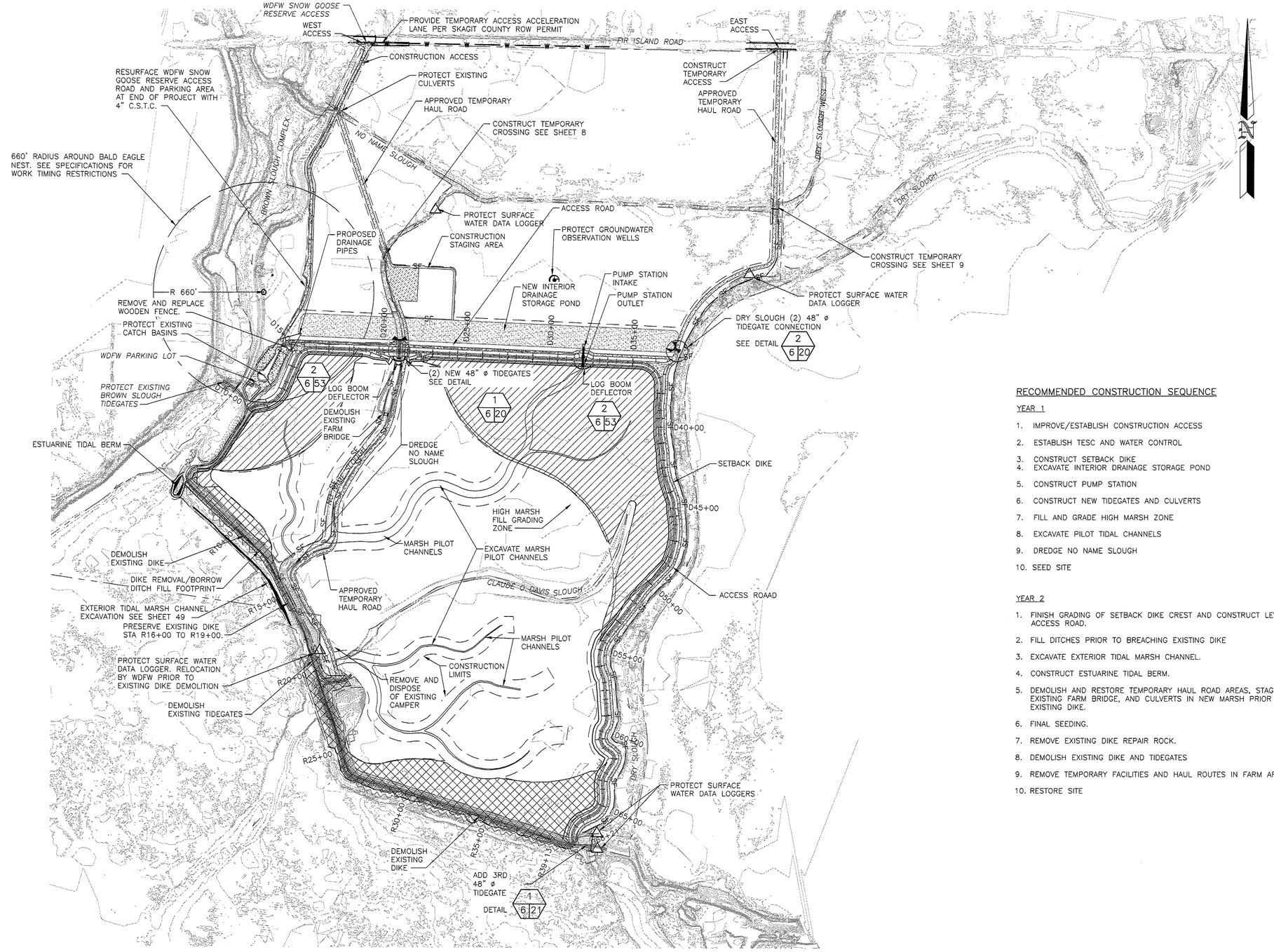
FIR ISLAND FARM
ECOSYSTEM RESTORATION
ALIGNMENT, TIES AND GRADING TABLES
—

PROJECT NO. ST:R4:11–3

FILENAME: I:\WIP\21-1\12318 FIR ISLAND\CAD\R004\R004113c\R004113c005.dwg DATE: 03-13-2015 LOGIN: cmh

LEGEND

- DIKE REMOVAL AND LOW MARSH 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
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 PILOT TIDAL CHANNELS
9. DREDGE NO NAME SLOUGH
10. SEED SITE

YEAR 2

1. FINISH GRADING OF SETBACK DIKE CREST AND CONSTRUCT LEVEE TOP ACCESS ROAD.
2. FILL DITCHES PRIOR TO BREACHING EXISTING DIKE
3. EXCAVATE EXTERIOR TIDAL MARSH CHANNEL.
4. CONSTRUCT ESTUARINE TIDAL BERM.
5. DEMOLISH AND RESTORE TEMPORARY HAUL ROAD AREAS, STAGING AREA EXISTING FARM BRIDGE, AND CULVERTS IN NEW MARSH PRIOR TO BREACHING EXISTING DIKE.
6. FINAL SEEDING.
7. REMOVE EXISTING DIKE REPAIR ROCK.
8. DEMOLISH EXISTING DIKE AND TIDEGATES
9. REMOVE TEMPORARY FACILITIES AND HAUL ROUTES IN FARM AREAS
10. RESTORE SITE

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 17 MAR 15
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

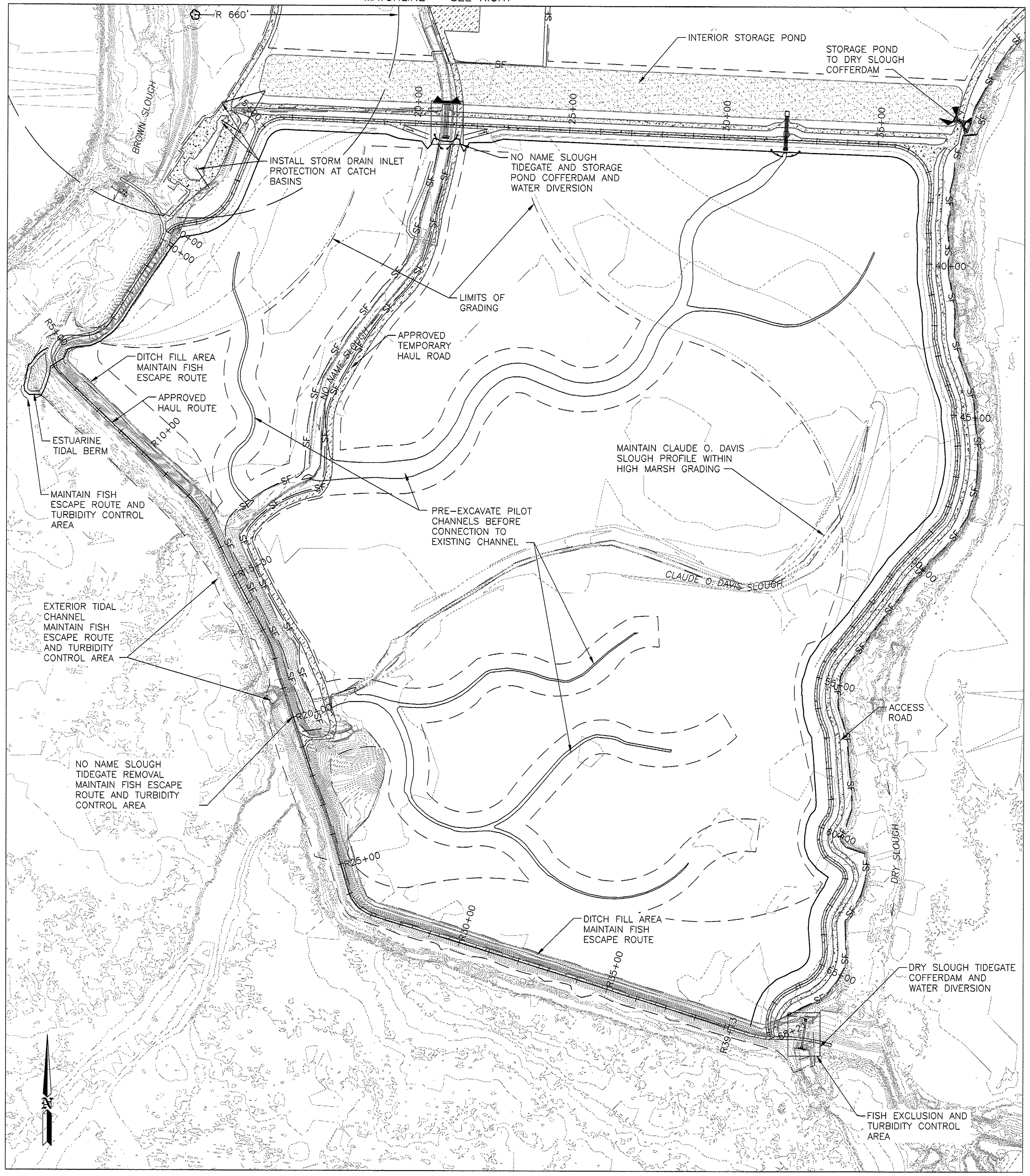
FIR ISLAND FARM
ECOSYSTEM RESTORATION
PROJECT SITE PLAN
–

PROJECT NO. ST:R4:11-3

SHEET 6 OF 54

FILENAME: L:\WPA21-11\23318_FIR_ISLAND\CAD\B03A\B0341113-A\B0341113-D006.dwg DATE: 03-16-2015 LOGIN: cmh

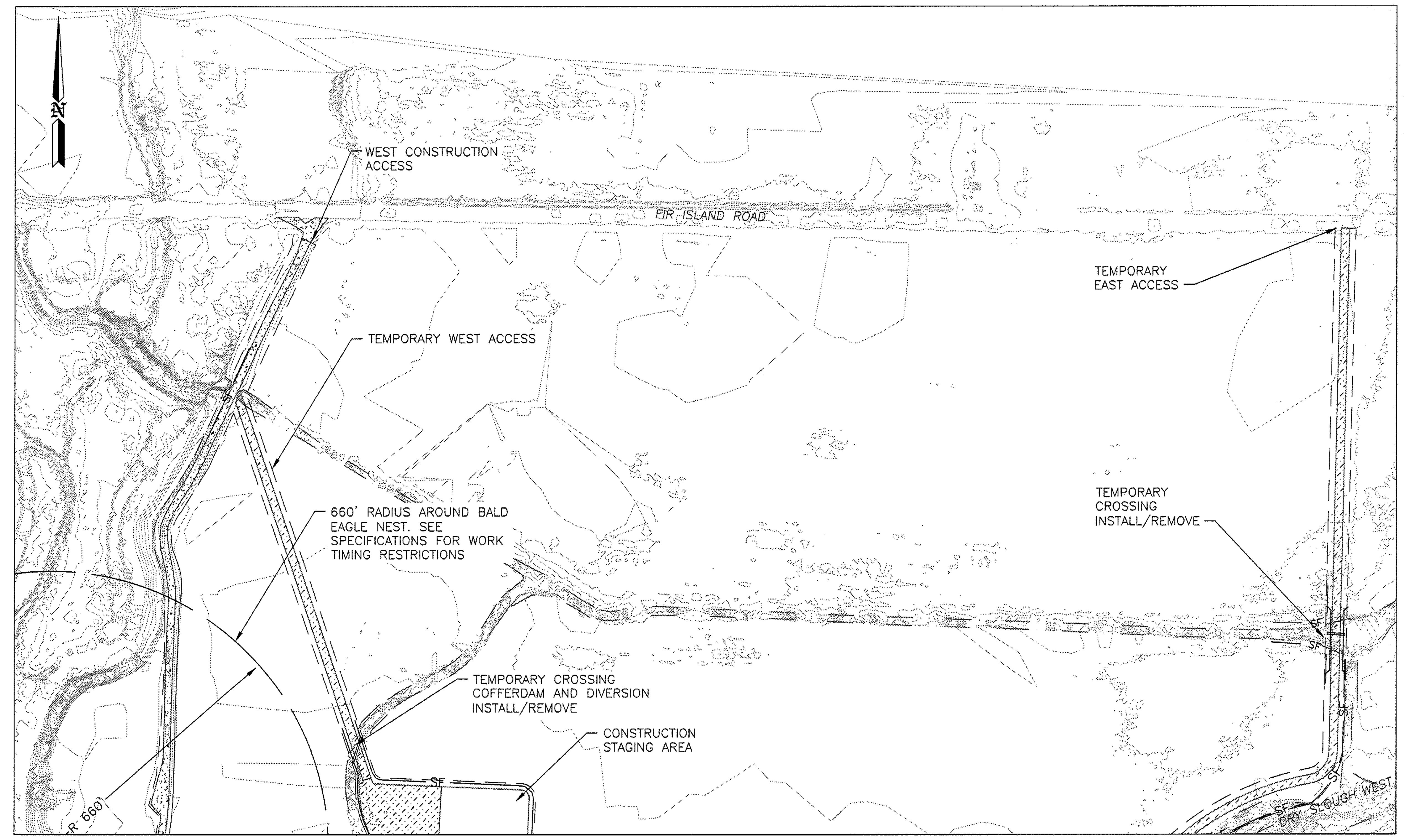
MATCHLINE – SEE RIGHT



SITE PLAN

0 200 400 600

SCALE: 1" = 200'



MATCHLINE – SEE LEFT

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 AND HAUL 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 TIDE EL. 4.5 OR IN THE DRY. AT MAIN DIKE BREACH STATION R19+00 TO R25+00, COFFERDAM AND FISH EXCLUSION ARE NOT REQUIRED.
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 ROAD SOUTH AND WEST OF DIKE SETBACK MUST BE COMPLETELY REMOVED AND RESTORED PRIOR TO EXISTING DIKE BREACH.
8. FISH SCREENS TO MEET REQUIREMENTS OF THE PERMITS. DEFISHING OF COFFERDAMMED AREAS AND AREAS WHERE WORK IN FISH BEARING WATERS IS TO OCCUR SHALL BE PERFORMED BY WDFW. PROVIDE MIN 5 DAYS NOTICE.
9. REFER TO SHEET 25 FOR TEMPORARY SEEDING MIX AND APPLICATION AREAS DURING YEAR 1.
10. ESTUARINE TIDAL BERM AND EXTERIOR TIDAL CHANNEL WORK, IF DONE AT LOW TIDE AND IN THE DRY, DOES NOT REQUIRE COFFERDAM. MAINTAIN FISH ESCAPE ROUTES.
11. APPROVED TEMPORARY HAUL ROADS AND STAGING AREA NORTH OF DIKE SETBACK MUST BE COMPLETELY REMOVED PRIOR TO COMPLETION OF CONSTRUCTION.

LEGEND

PERMANENT ACCESS ROAD

APPROVED TEMPORARY HAUL ROAD

—— SF —— SILT FENCE

— — — — LIMITS OF CONSTRUCTION

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WASHINGTON STATE

DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE · STATE OF WASHINGTON · 39324 · REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER .... DATE: 17MAR15

PROGRAM .... DATE: ....

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

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM

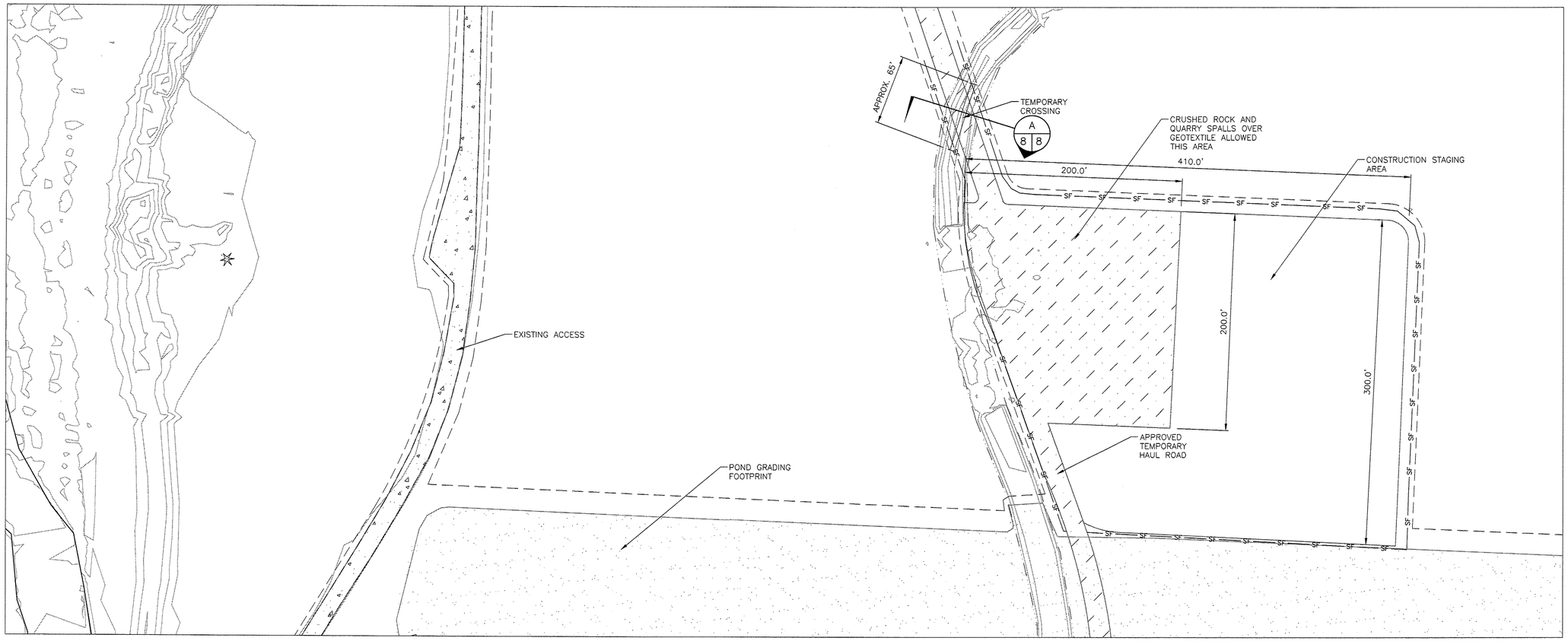
ECOSYSTEM RESTORATION

TEMPORARY EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO. ST:R4:11–3

SHEET 7 OF 54

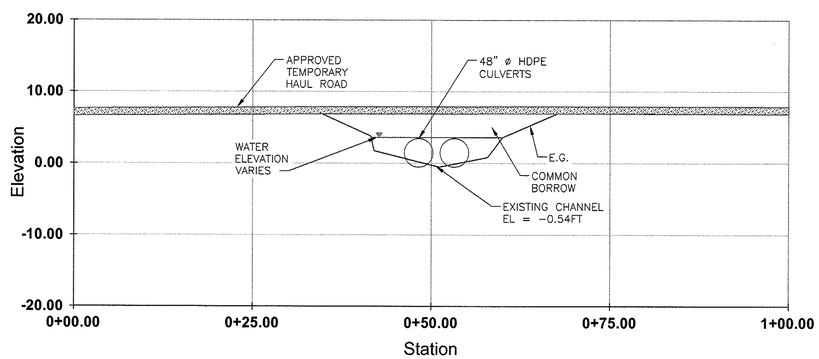
FILENAME: I:\WIP\21-1\12318 FIR ISLAND\CAD\R004\R004113c\R004113c007.dwg DATE: 03–13–2015 LOGIN: cmh



SITE LOCATION WEST ACCESS

0 50 100 150

SCALE: 1" = 50'

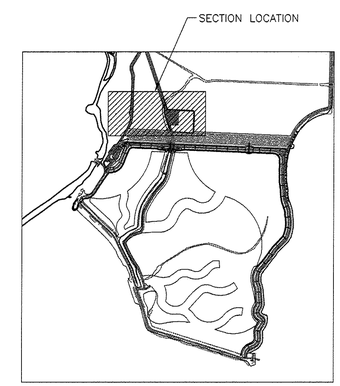


WEST ACCESS TEMPORARY CROSSING

A
8 8

0 10 20 30

SCALE: 1" = 10'
VERTICAL = HORIZONTAL



KEY MAP

NOTES

1. LOCATIONS AND INVERTS OF PIPES SHOWN FOR COMPARISON ONLY. CONTRACTOR RESPONSIBLE FOR FINAL LOCATION AND LENGTHS.
2. CONTRACTOR RESPONSIBLE FOR MAINTENANCE AND REPAIR OF TEMPORARY CROSSING DURING CONSTRUCTION AND COMPLETE REMOVAL AND RESTORATION OF CHANNEL BED AND BANKS PRIOR TO COMPLETION OF CONSTRUCTION.

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 21864 — PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER DATE: 1 Mar 15
PROGRAM DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

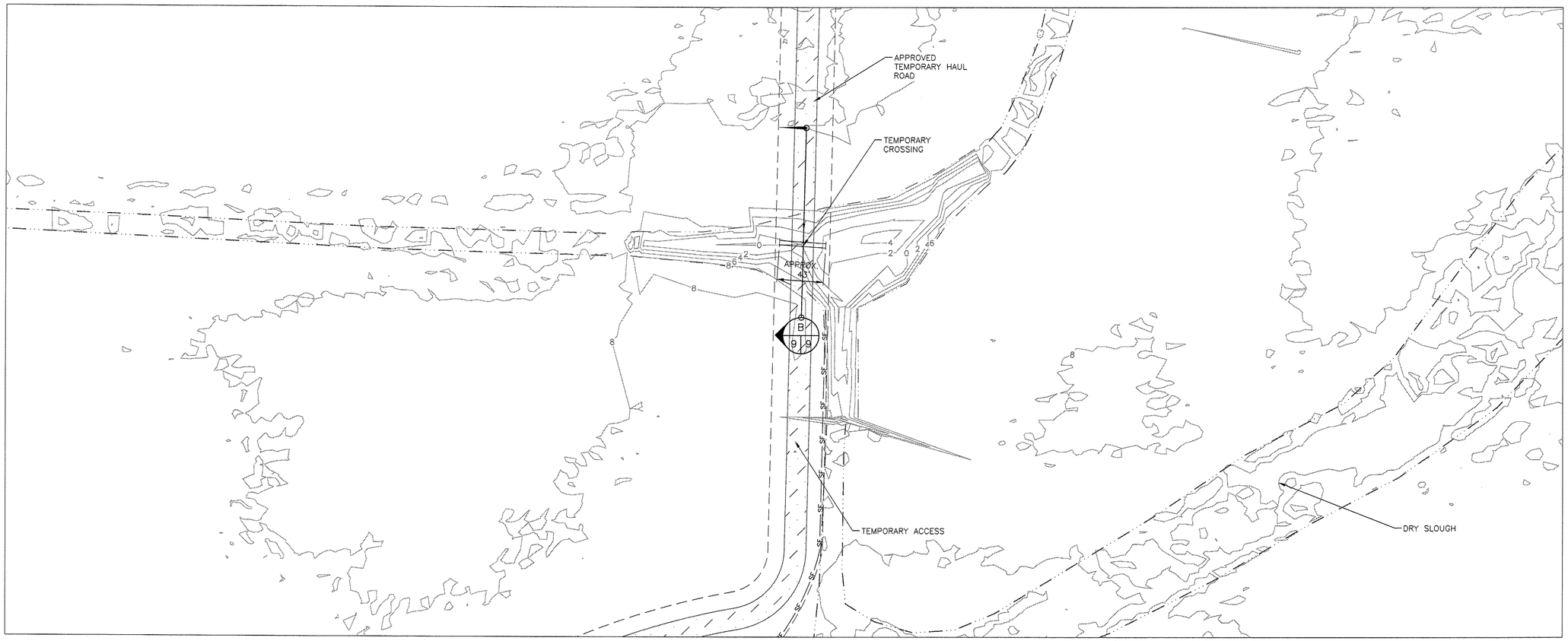
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
TEMPORARY WEST ACCESS
PLAN & SECTION

PROJECT NO. ST:R4:11-3

SHEET 8 OF 54

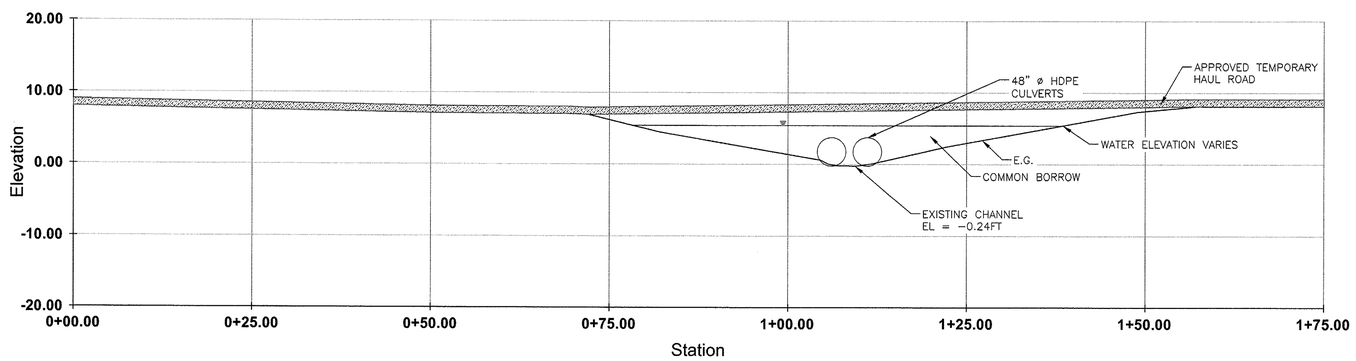
FILENAME: L:\WP\21-11\2318 FIR ISLAND\CAD\R004\R004113-A\R004113-008.dwg DATE: 03-09-2015 LOGIN: crch



SITE LOCATION EAST ACCESS

0 50 100 150

SCALE: 1" = 50'

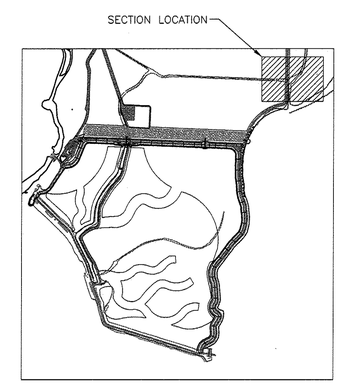


EAST ACCESS TEMPORARY CROSSING

B 9 9

0 10 20 30

SCALE: 1" = 10'
VERTICAL = HORIZONTAL



KEY MAP

NOTES

1. LOCATIONS AND INVERTS OF PIPES SHOWN FOR COMPARISON ONLY. CONTRACTOR RESPONSIBLE FOR FINAL LOCATION AND LENGTHS.
2. CONTRACTOR RESPONSIBLE FOR MAINTENANCE AND REPAIR OF TEMPORARY CROSSING DURING CONSTRUCTION AND COMPLETE REMOVAL AND RESTORATION OF CHANNEL BED AND BANKS PRIOR TO COMPLETION OF CONSTRUCTION.

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

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CHIEF ENGINEER DATE: 17 MAR 15
PROGRAM DATE:

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DESIGNED BY DRC
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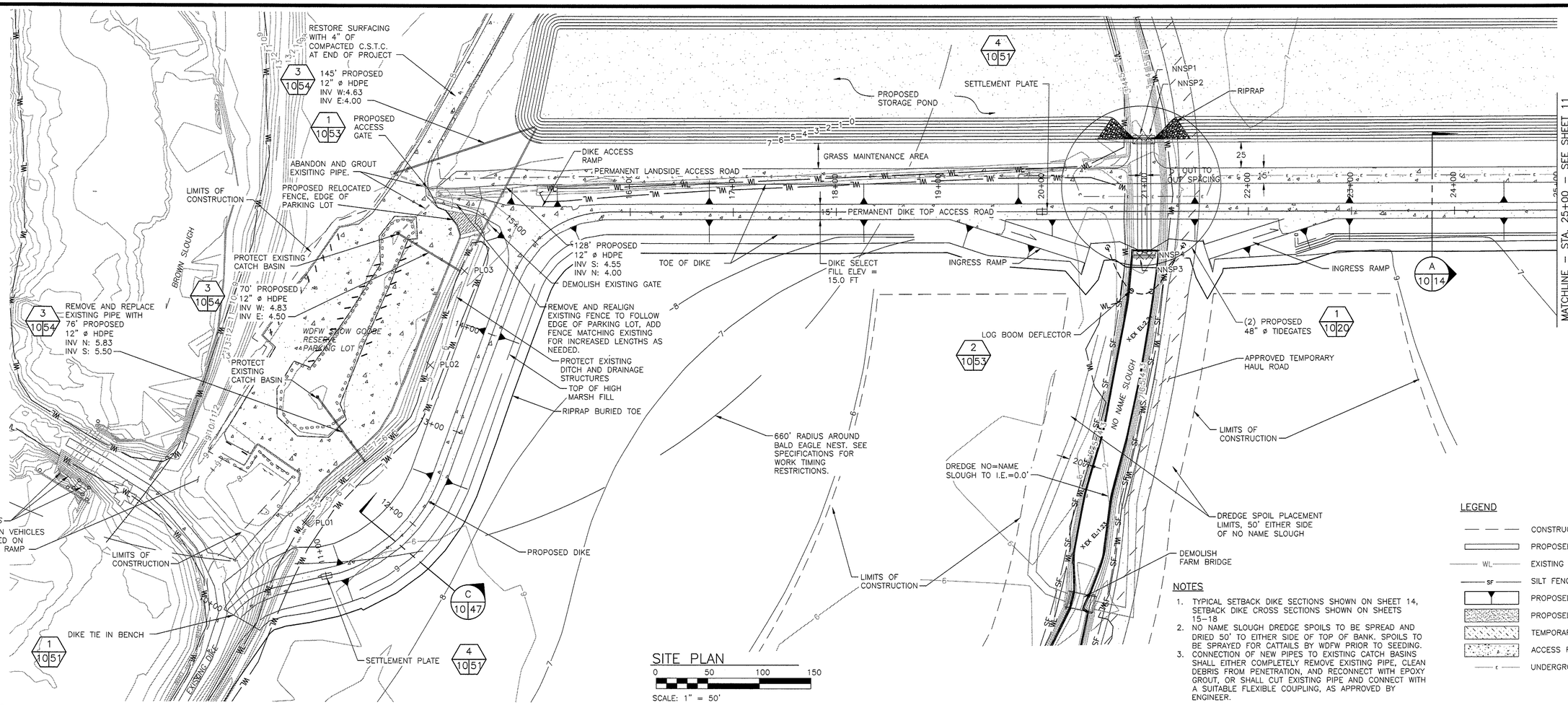
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
TEMPORARY EAST ACCESS
PLAN & SECTION

PROJECT NO. ST:R4:11-3

SHEET 9 OF 54

FILENAME: L:\WFA\21-1\12318_FIR ISLAND\CAD\8000\B0041113\B0041113-S009.dwg DATE: 03-11-2015 LOGIN: cmh



SITE PLAN

0 50 100 150

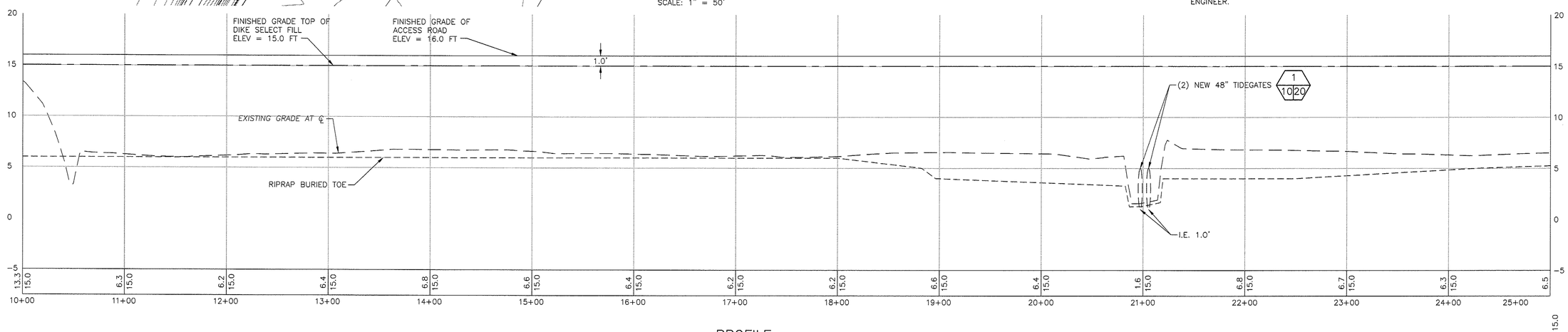
SCALE: 1" = 50'

NOTES

1. TYPICAL SETBACK DIKE SECTIONS SHOWN ON SHEET 14, SETBACK DIKE CROSS SECTIONS SHOWN ON SHEETS 15–18
2. NO NAME SLOUGH DREDGE SPOILS TO BE SPREAD AND DRIED 50' TO EITHER SIDE OF TOP OF BANK. SPOILS TO BE SPRAYED FOR CATTAILS BY WDFW PRIOR TO SEEDING.
3. CONNECTION OF NEW PIPES TO EXISTING CATCH BASINS SHALL EITHER COMPLETELY REMOVE EXISTING PIPE, CLEAN DEBRIS FROM PENETRATION, AND RECONNECT WITH EPOXY GROUT, OR SHALL CUT EXISTING PIPE AND CONNECT WITH A SUITABLE FLEXIBLE COUPLING, AS APPROVED BY ENGINEER.

LEGEND

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



PROFILE

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

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WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 35728 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 1 Mar 15
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM

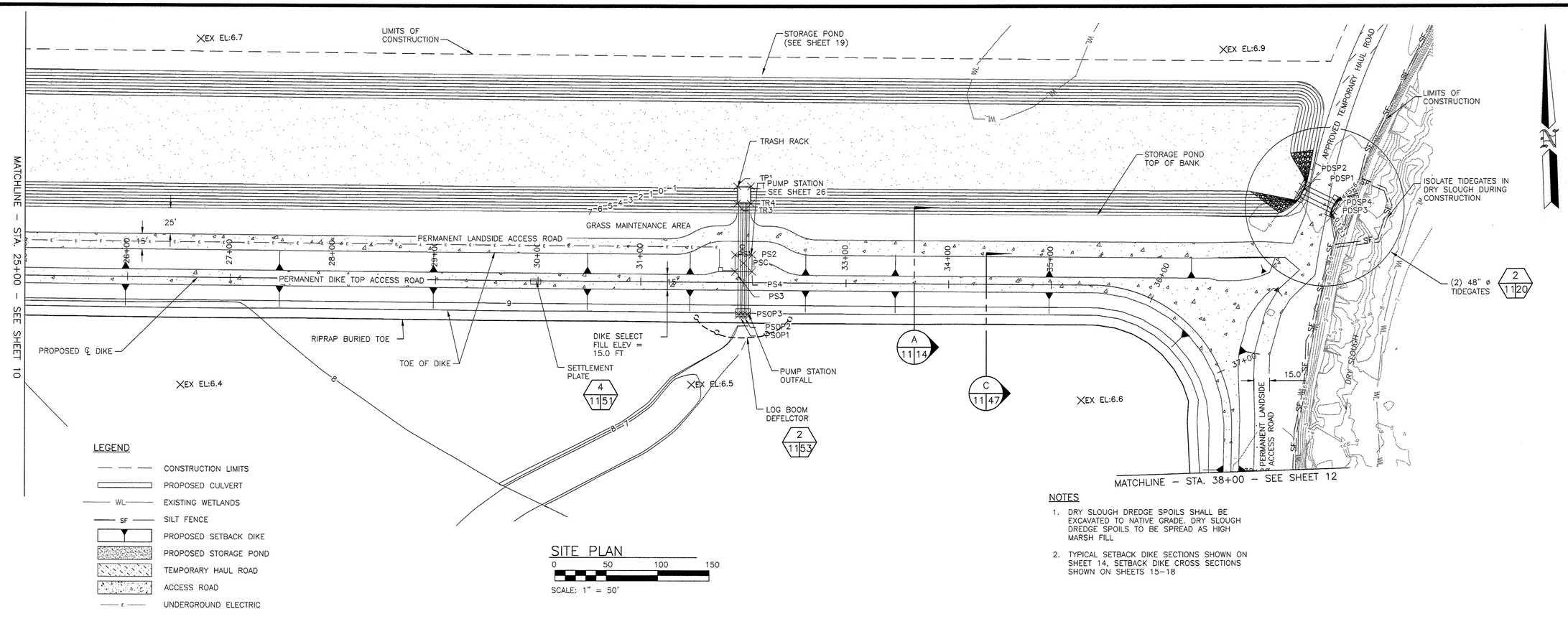
ECOSYSTEM RESTORATION

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

PROJECT NO. ST:R4:11–3

SHEET 10 OF 54

FILENAME: \\WSW21-1\WSW21-1\V2318 FIR ISLAND\CADD\DGN\D0411-3\D0411-3-010.dgn DATE: 03-16-2015 LOGIN: cmh



LEGEND

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

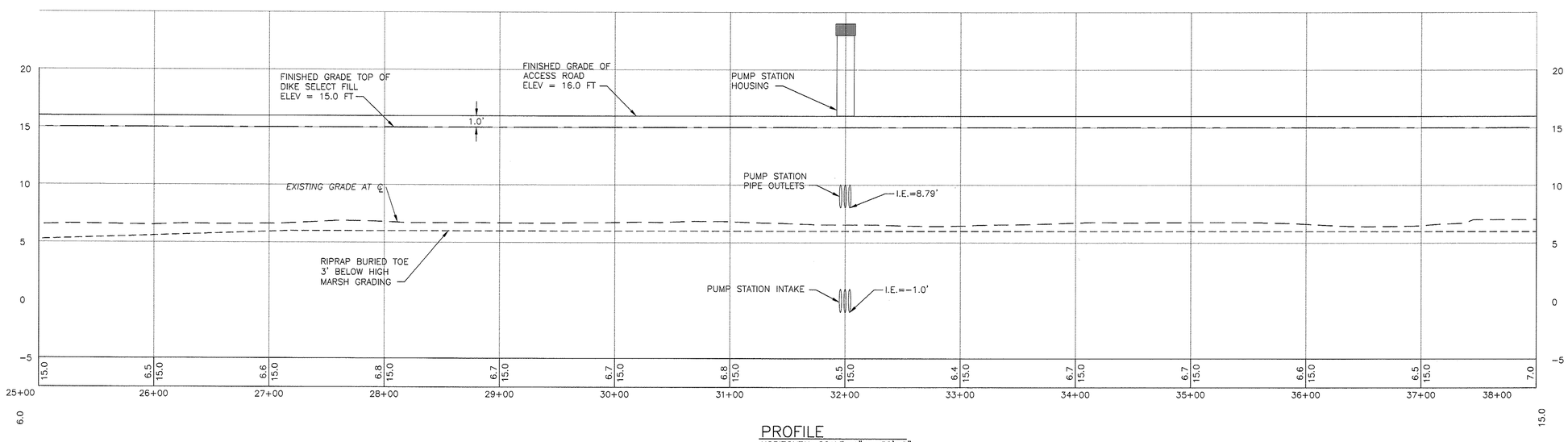
SITE PLAN

0 50 100 150

SCALE: 1" = 50'

NOTES

1. DRY SLOUGH DREDGE SPOILS SHALL BE EXCAVATED TO NATIVE GRADE. DRY SLOUGH DREDGE SPOILS TO BE SPREAD AS HIGH MARSH FILL
2. TYPICAL SETBACK DIKE SECTIONS SHOWN ON SHEET 14, SETBACK DIKE CROSS SECTIONS SHOWN ON SHEETS 15–18



PROFILE

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

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 18826 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 17 March 15
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

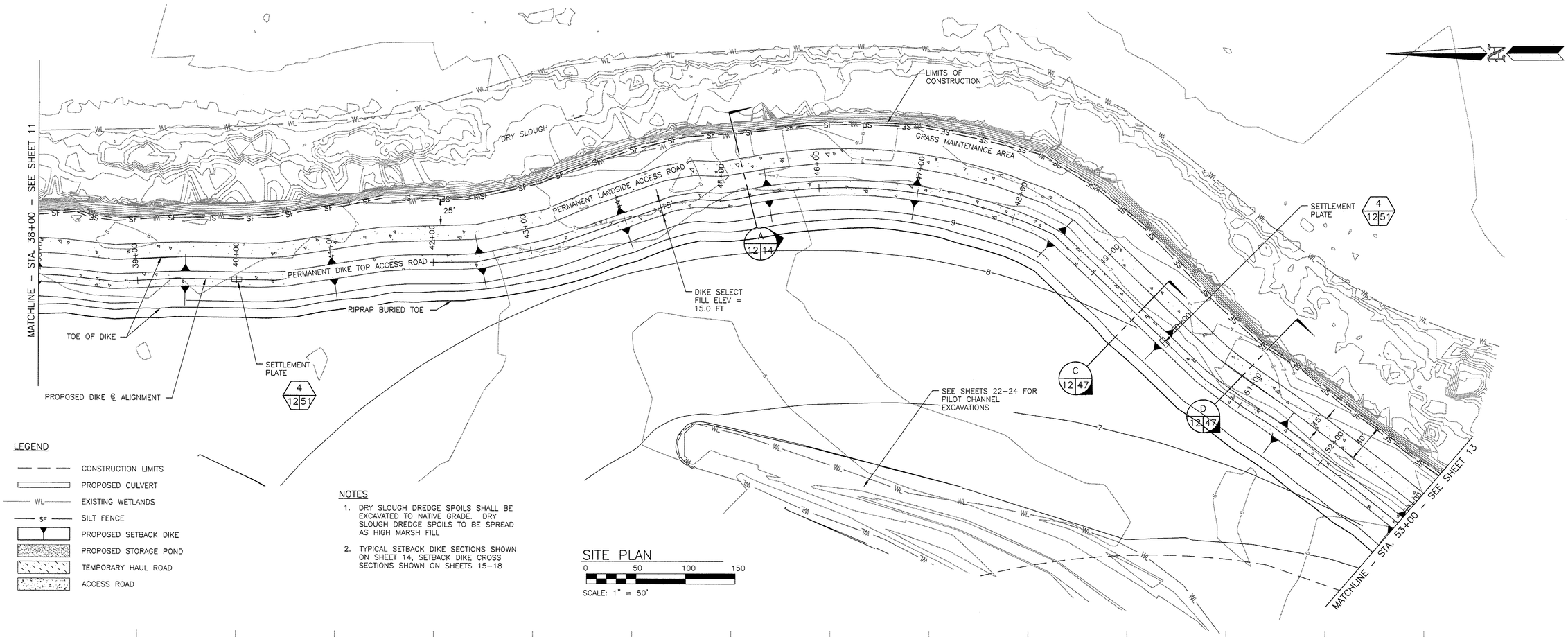
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

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

PROJECT NO. ST:R4:11-3

SHEET 11 OF 54

FILENAME: J:\WP2.21-1\V2318 FIR ISLAND\CAD\R03A\R0341113A\R0341113-011.dgn DATE: 03-16-2015 USER: cmh



LEGEND

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

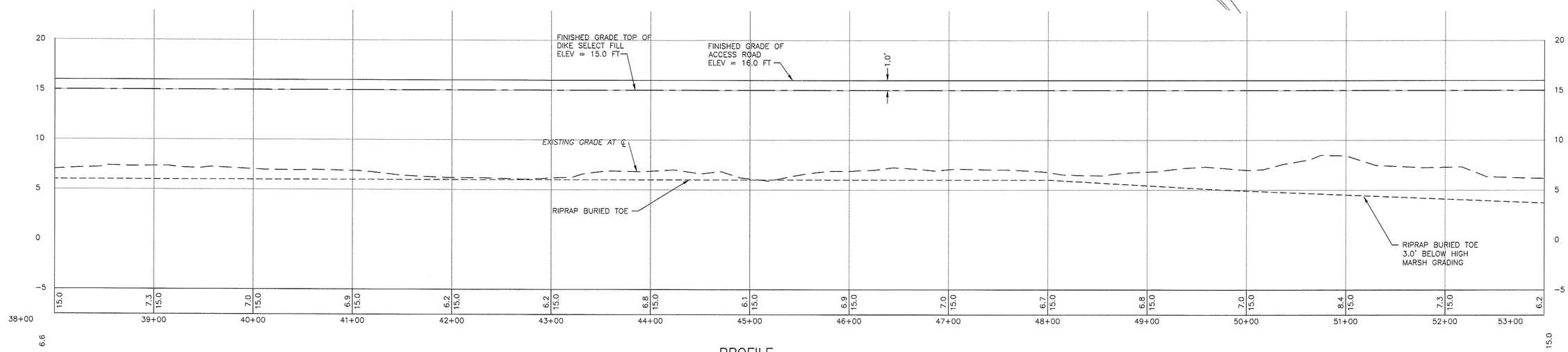
NOTES

1. DRY SLOUGH DREDGE SPOILS SHALL BE EXCAVATED TO NATIVE GRADE. DRY SLOUGH DREDGE SPOILS TO BE SPREAD AS HIGH MARSH FILL
2. TYPICAL SETBACK DIKE SECTIONS SHOWN ON SHEET 14, SETBACK DIKE CROSS SECTIONS SHOWN ON SHEETS 15–18

SITE PLAN

0 50 100 150

SCALE: 1" = 50'



PROFILE

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

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: 17 Mar 15

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

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

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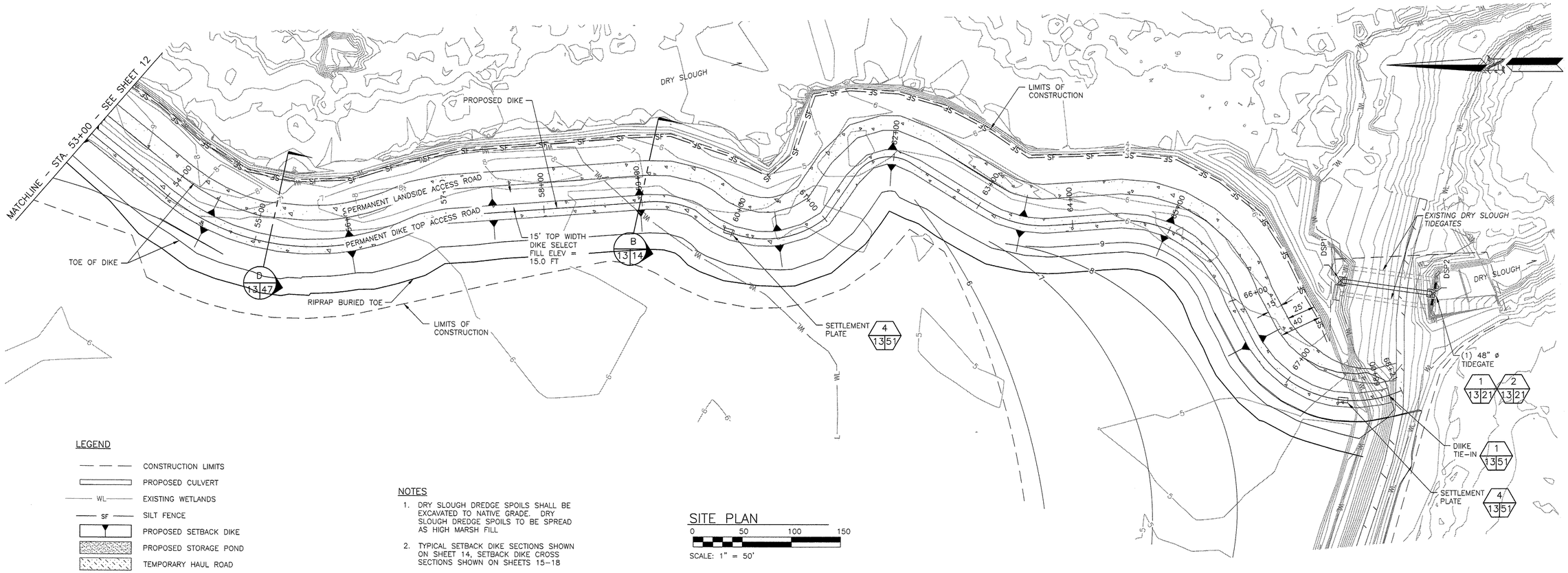
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

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

PROJECT NO. ST:R4:11–3

SHEET 12 OF 54

FILENAME: J:\WIFA\21-1\12318 FIR ISLAND\CAD\R004\R004113012.dwg DATE: 03-16-2015 LOGIN: cmh



LEGEND

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

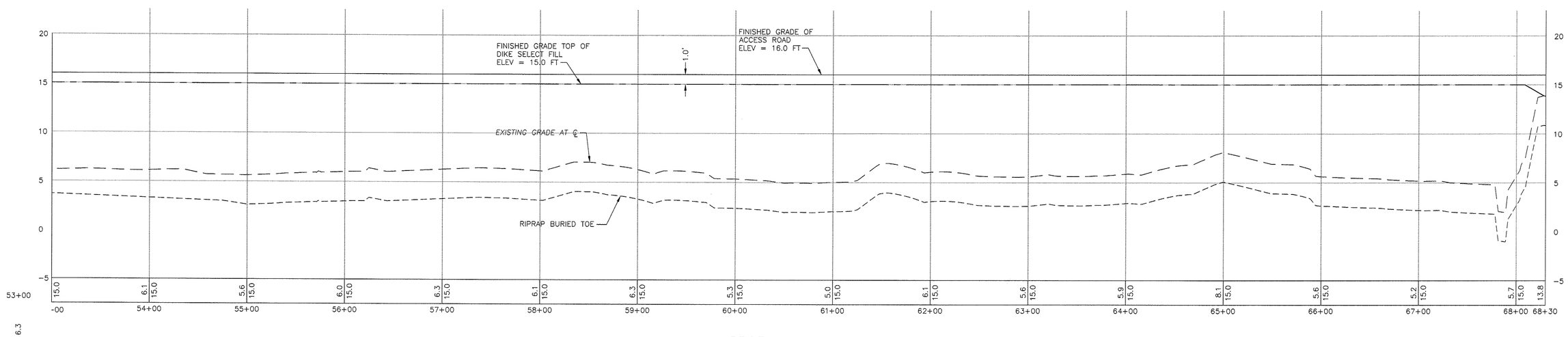
NOTES

1. DRY SLOUGH DREDGE SPOILS SHALL BE EXCAVATED TO NATIVE GRADE. DRY SLOUGH DREDGE SPOILS TO BE SPREAD AS HIGH MARSH FILL
2. TYPICAL SETBACK DIKE SECTIONS SHOWN ON SHEET 14, SETBACK DIKE CROSS SECTIONS SHOWN ON SHEETS 15–18

SITE PLAN

0 50 100 150

SCALE: 1" = 50'



PROFILE

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

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Seattle, Washington 98103
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FILENAME: L:\WIP\21-1\12318 FIR ISLAND\CAD\R00A\R004113A\R004113-013.dwg DATE: 03-16-2015 LOGIN: cmh

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 1 Mar 15
PROGRAM ..... DATE:

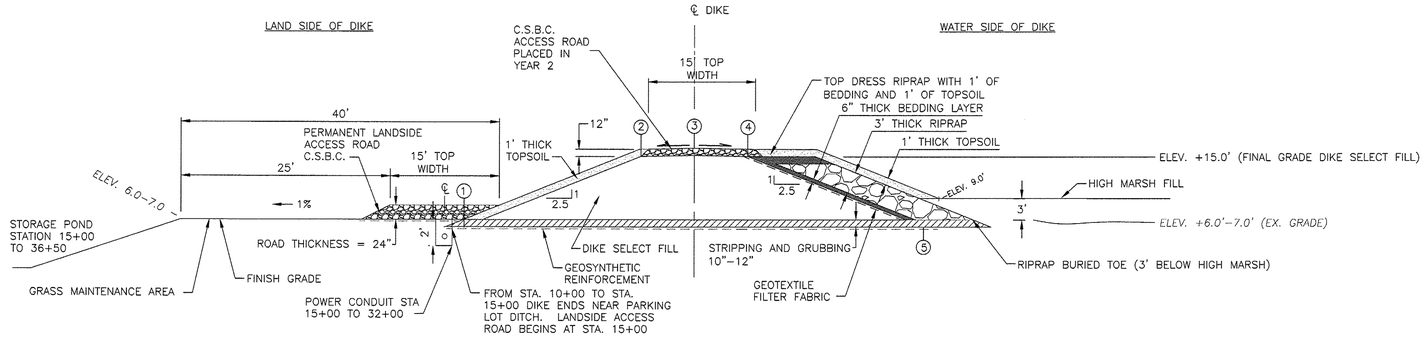
0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

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

PROJECT NO. ST:R4:11-3

SHEET 13 OF 54

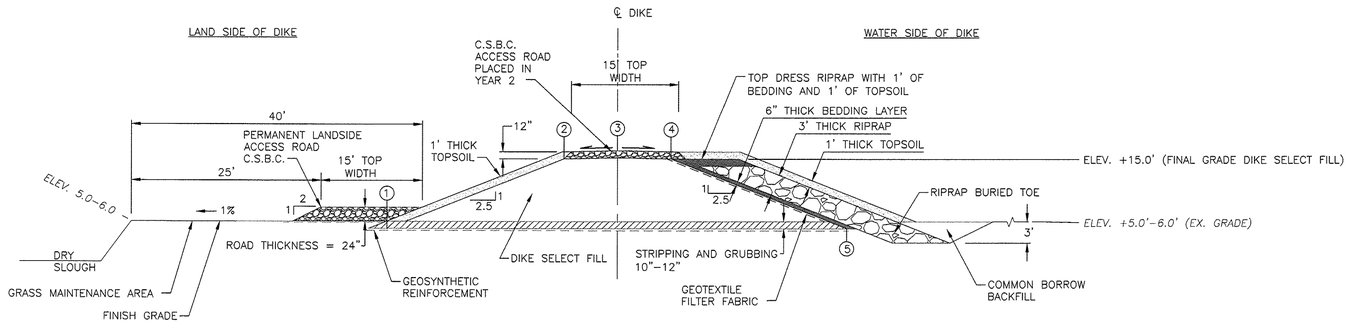


TYPICAL DIKE SECTION (HIGH MARSH GRADING) STA. 10+00 TO 54+00

A 10|14 A 11|14 A 12|14

0 10 20 30

SCALE: 1" = 10'



TYPICAL DIKE SECTION (NO HIGH MARSH GRADING) STA. 54+00 TO 63+00

B 13|14

0 10 20 30

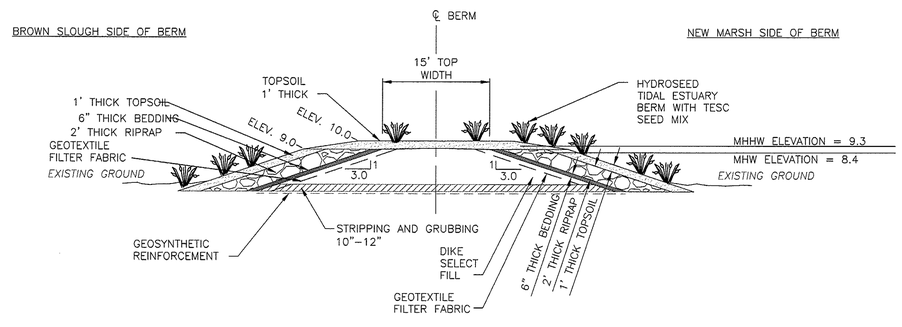
SCALE: 1" = 10'

LEGEND

- CRUSHED SURFACE BASE COURSE (C.S.B.C.)
- TOPSOIL
- RIPRAP
- BEDDING

NOTE

1. BACKFILL STRIPPING DEPTH WITH DIKE SELECT FILL.
2. SETBACK DIKE MATERIAL AND 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.
3. (5) = GRADING REFERENCE POINTS AS LISTED ON SHEET 5
4. DIKE GRADING POINTS (1) AND (5) REPRESENT DIKE SELECT FILL CATCH AND BOTTOM OF STRIPPING DEPTH
5. DIKE GRADING POINTS (2) AND (4) REPRESENT DIKE FILL POINTS AT TOP OF DIKE SELECT FILL AT TOP EDGE OF DIKE SELECT FILL SLOPE.
6. DIKE GRADING POINT (3) REPRESENTS CENTERLINE OF DIKE SETBACK ALIGNMENT AT TOP OF DIKE SELECT FILL.



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

C 48|14

0 10 20 30

SCALE: 1" = 10'

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

DAVID R. CLINE — STATE OF WASHINGTON — 38361 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 1 MAR 15
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

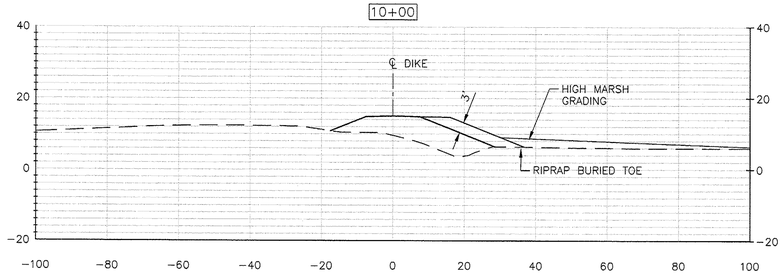
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

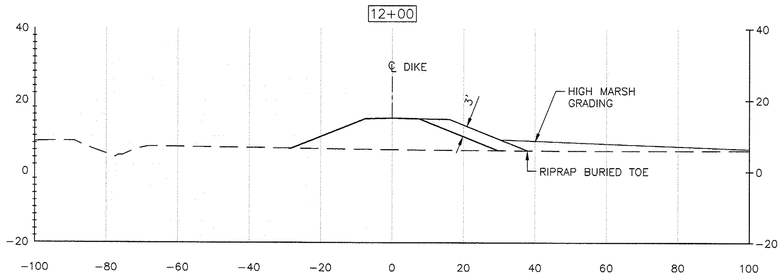
FIR ISLAND FARM
ECOSYSTEM RESTORATION
TYPICAL SETBACK DIKE DETAILS

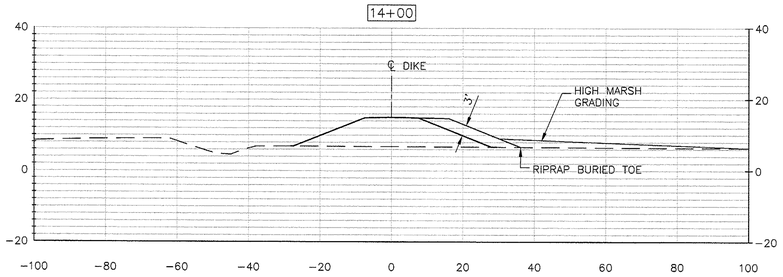
PROJECT NO. ST:R4:11-3

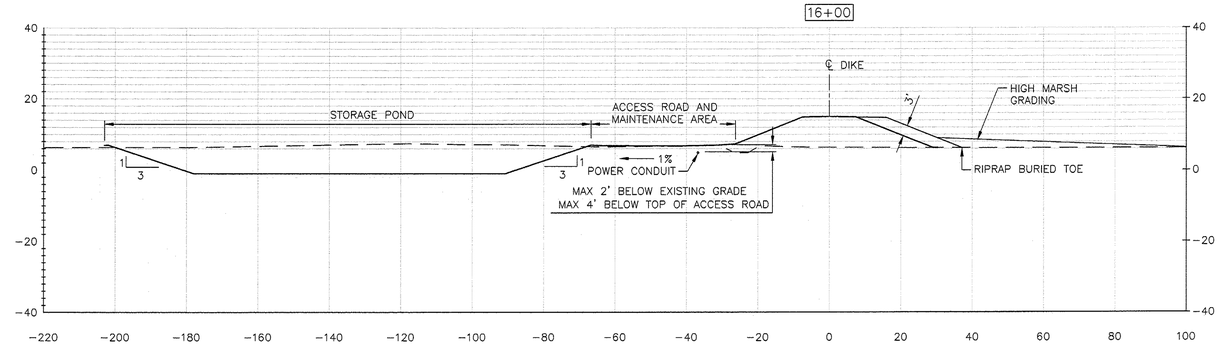
SHEET 14 OF 54

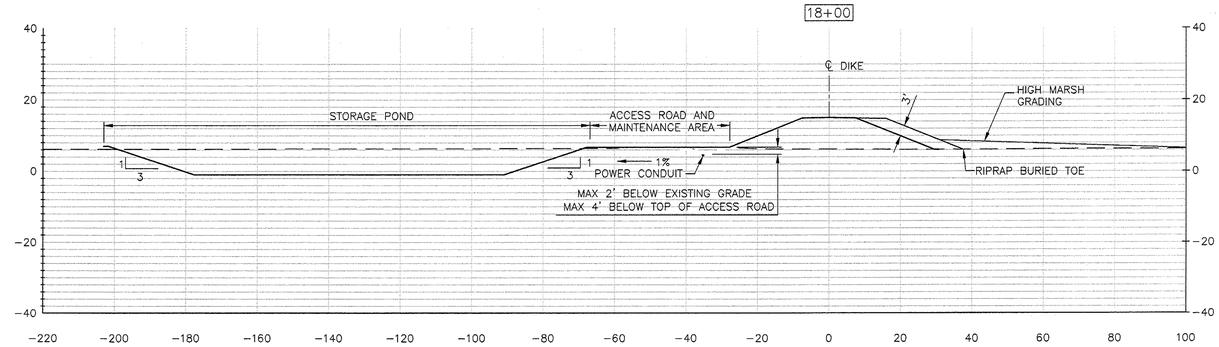
FILENAME: J:\WP92-1\V3318 Fir Island\CAD\R02A\R0241113-3\R0241113-014.dwg DATE: 03-12-2015 LOGIN: cmh

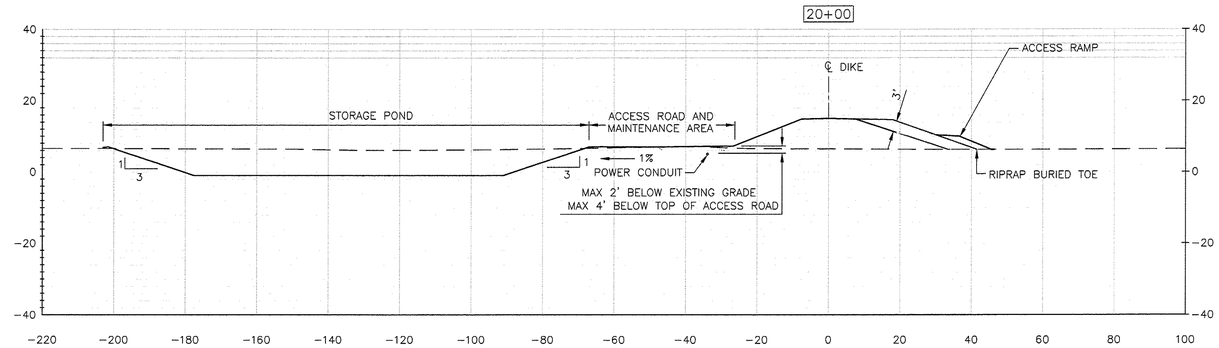


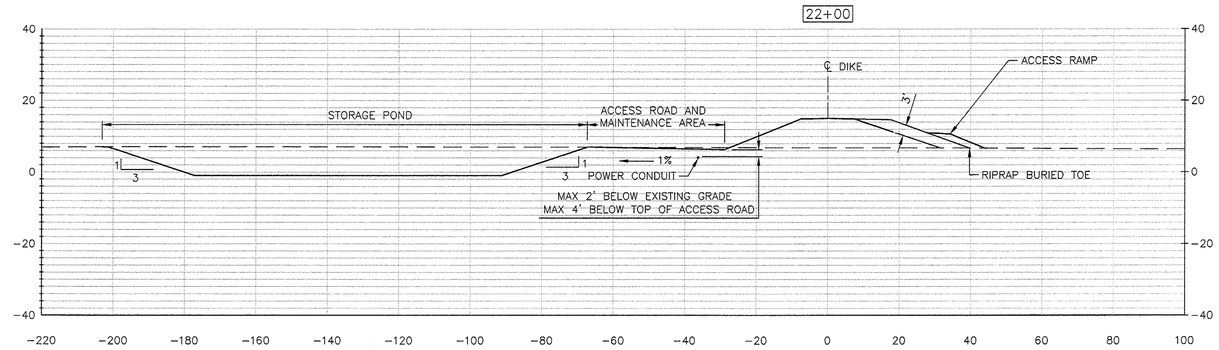












LEGEND

EXISTING GRADE

PROPOSED GRADE

NOTES

1. SECTIONS SHOW ONLY EXTENT OF DIKE SELECT FILL AND RIPRAP. SEE SHEET 14 FOR ACCESS ROADS AND TOPSOIL AND BEDDING LAYER.
2. STA 21+00, CONDUIT MOVES INTO DIKE EMBANKMENT AT NO NAME SLOUGH CROSSING.

GRAPHIC SCALE

0 20 40 60

SCALE: 1" = 20'

FILENAME: J:\WP72-1\72318 FIR IS\NO\C60\D30A\D0241113\D0241113-015.dwg DATE: 03-05-2015 LOGIN: cmh

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

WASHINGTON STATE

DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 12 Mar 15

PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM

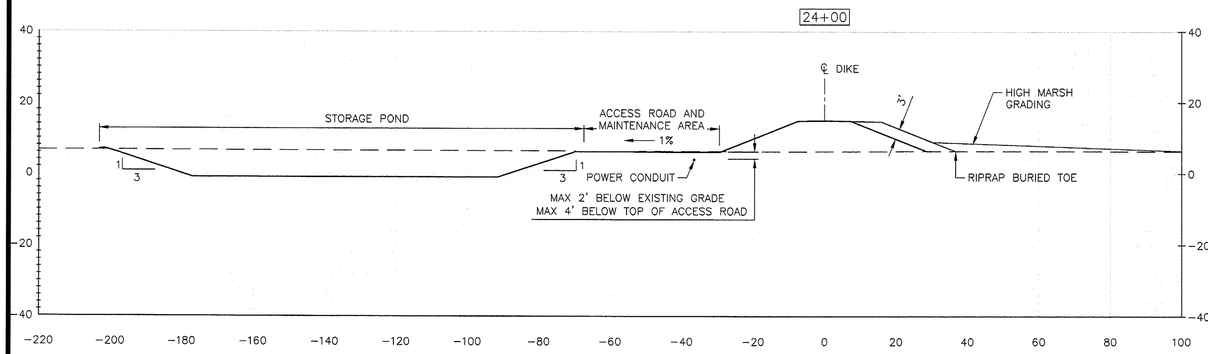
ECOSYSTEM RESTORATION

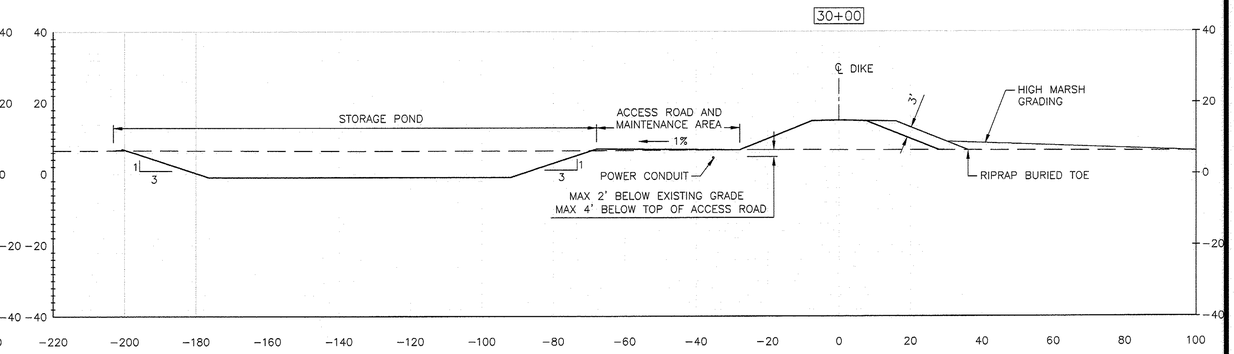
SETBACK DIKE CROSS SECTIONS

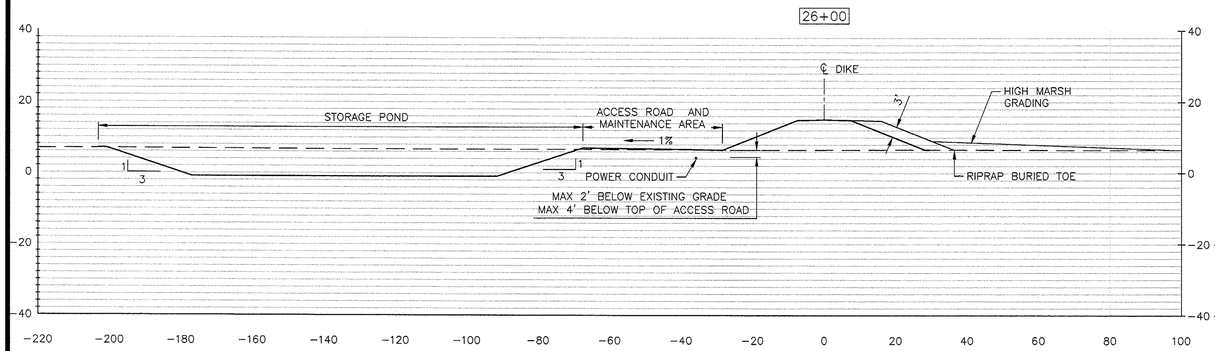
STATIONS 10+00 TO 22+00

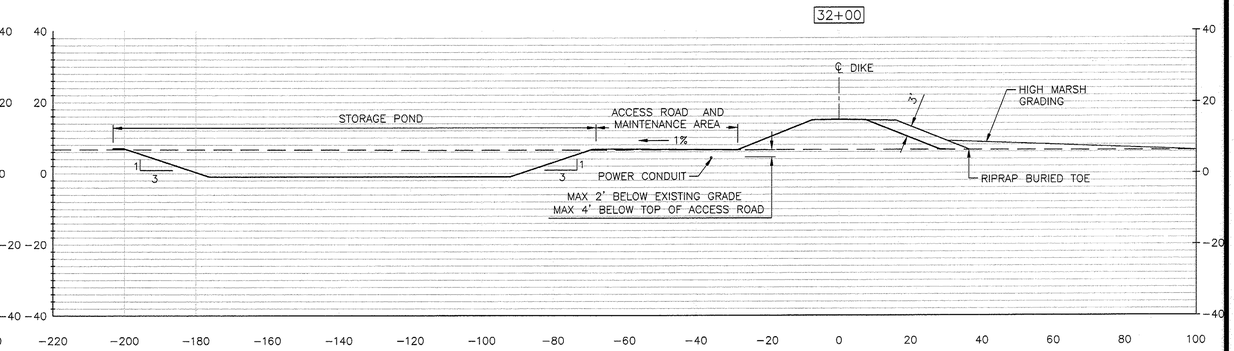
PROJECT NO. ST:R4:11-3

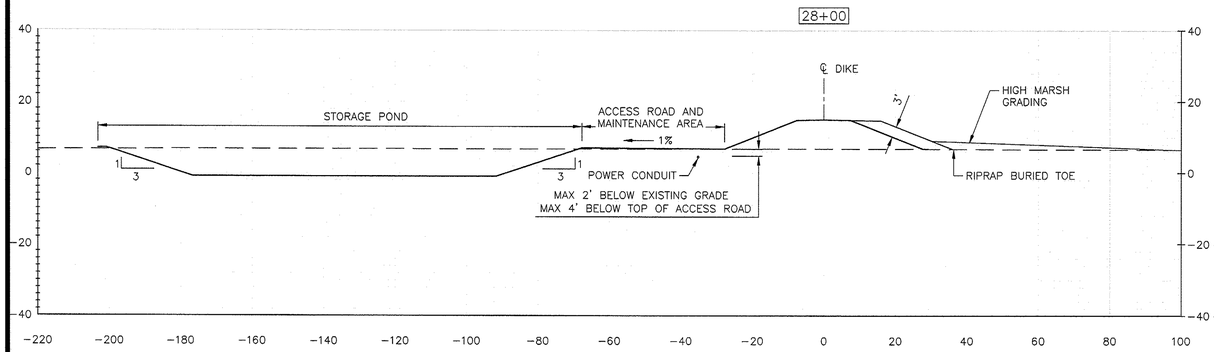
SHEET 15 OF 54

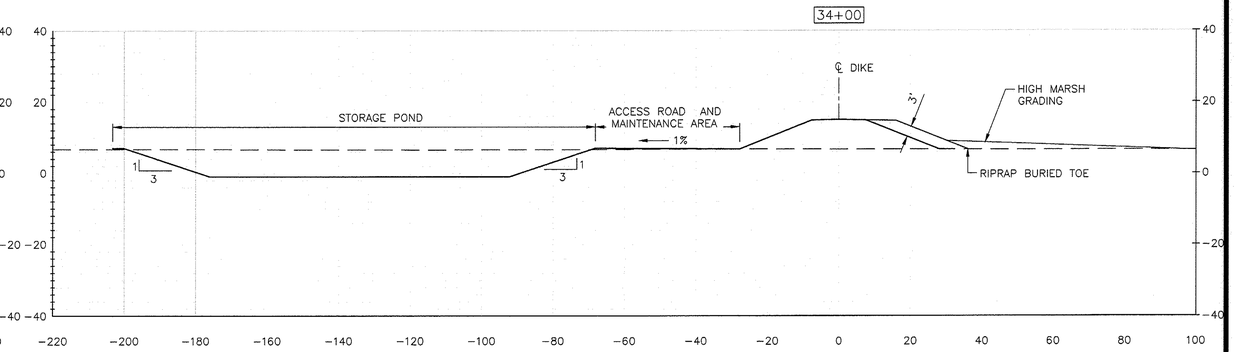


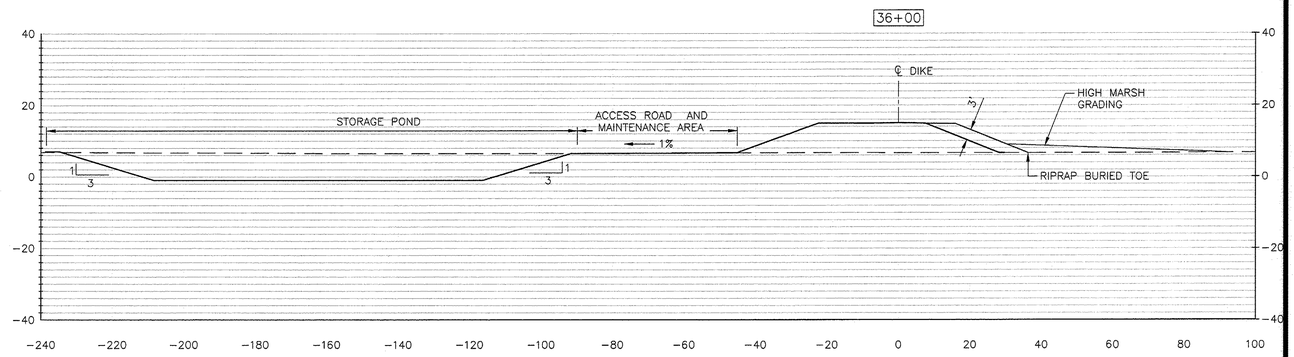












LEGEND

— — — EXISTING GRADE

——— PROPOSED GRADE

NOTES

1. SECTIONS SHOW ONLY EXTENT OF DIKE SELECT FILL AND RIPRAP. SEE SHEET 14 FOR ACCESS ROADS AND TOPSOIL AND BEDDING LAYER.

GRAPHIC SCALE

0 20 40 60

SCALE: 1" = 20'

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 7/17/15

PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

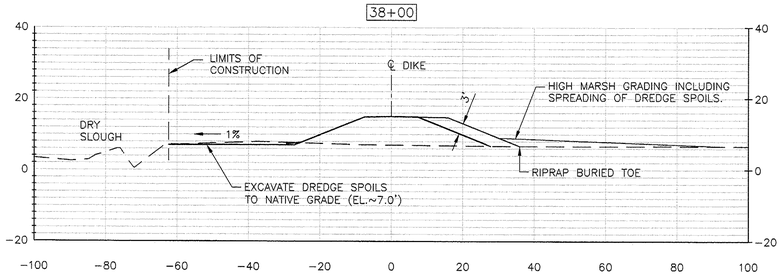
FIR ISLAND FARM
ECOSYSTEM RESTORATION
SETBACK DIKE CROSS SECTIONS
STATIONS 24+00 TO 36+00

PROJECT NO. ST:R4:11-3

SHEET 16 OF 54

FILENAME: J:\WPV\J-L\12318 FIR ISLAND\CAD\BRZA\B0041113\B0411313-0316.dwg DATE: 03-05-2015 LOGIN: cmh

38+00



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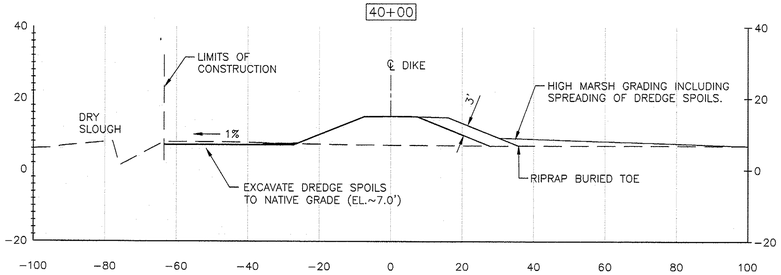

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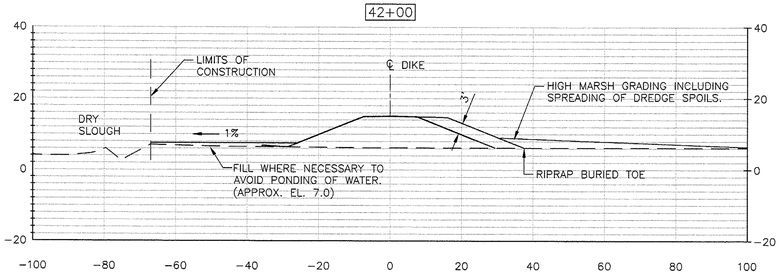
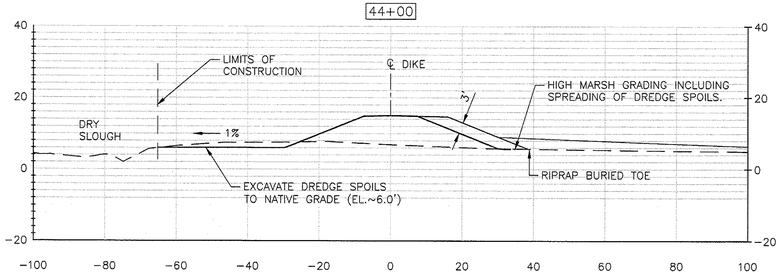
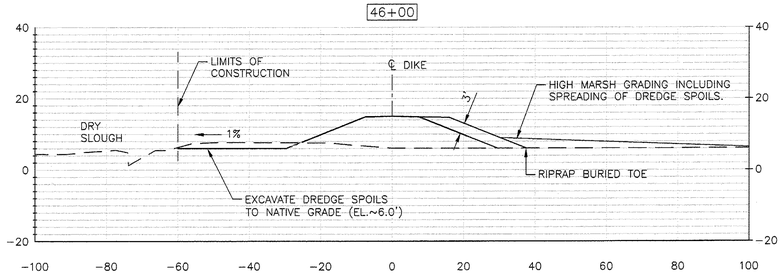


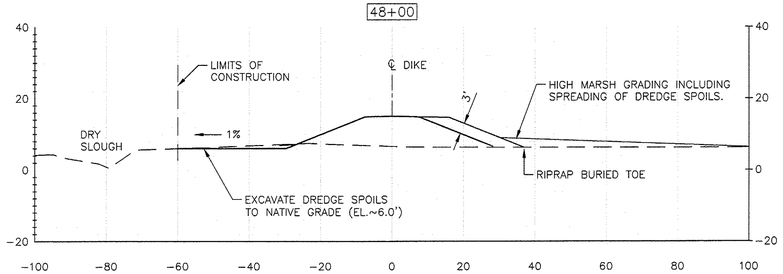
44+00



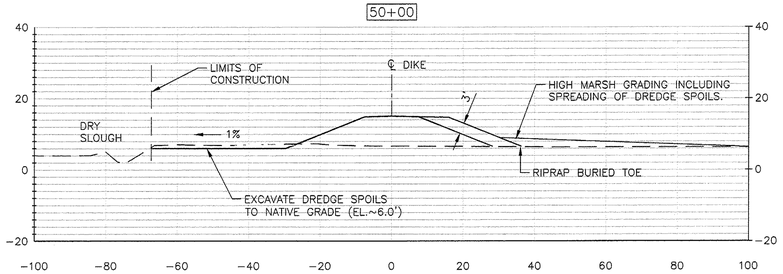
46+00



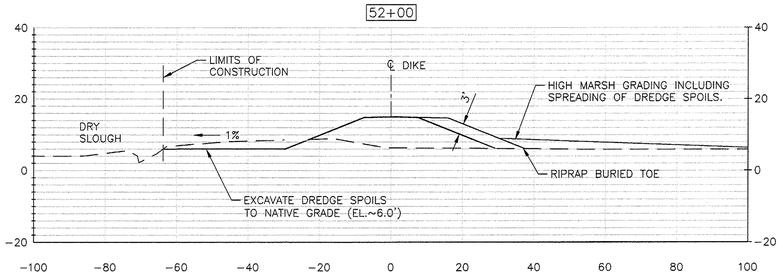
48+00



50+00



52+00



LEGEND

EXISTING GRADE

PROPOSED GRADE

GRAPHIC SCALE

0 20 40 60

SCALE: 1" = 20'

NOTES

1. SECTIONS SHOW ONLY EXTENT OF DIKE SELECT FILL AND RIPRAP. SEE SHEET 14 FOR ACCESS ROADS AND TOPSOIL AND BEDDING LAYER.
2. SPOILS FROM PAST DREDGING OF DRY SLOUGH ARE DEPOSITED ON NATIVE SOIL IN EXISTING CONDITIONS
3. DRY SLOUGH DREDGE SPOILS SHALL BE EXCAVATED TO SURROUNDING NATIVE GRADE AND SPREAD IN HIGH MARSH AREAS. SEE SHEET 47 FOR HIGH MARSH FILL DETAILS.

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 38392 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 1 Mar 15

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

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM

ECOSYSTEM RESTORATION

SETBACK DIKE CROSS SECTIONS

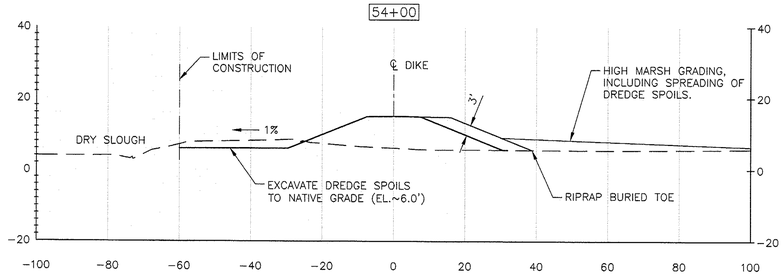
STATIONS 38+00 TO 52+00

PROJECT NO. ST:R4:11-3

SHEET 17 OF 54

FILENAME: L:\WP2K2-L\V2318 FIR ISLAND\CAD\800A\800411-3\A\800411-3017.dwg DATE: 03-06-2015 LOGIN: cmh

54+00



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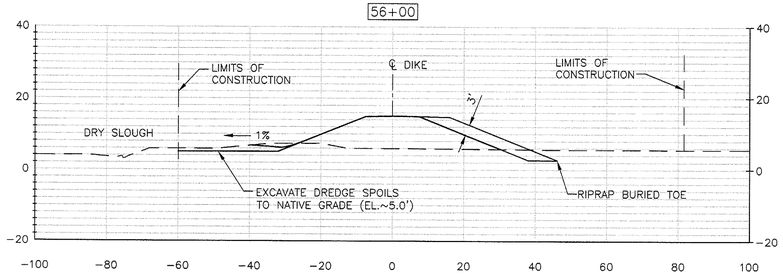

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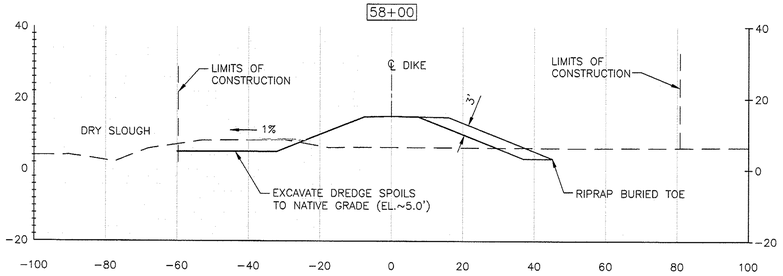

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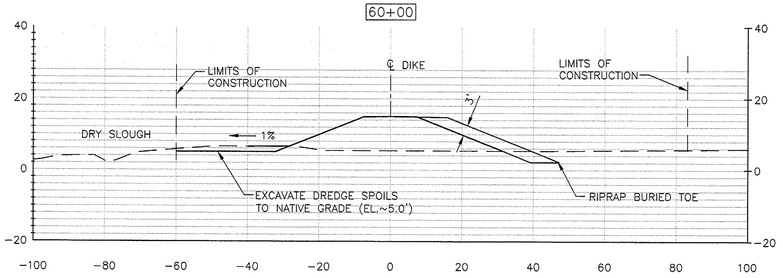
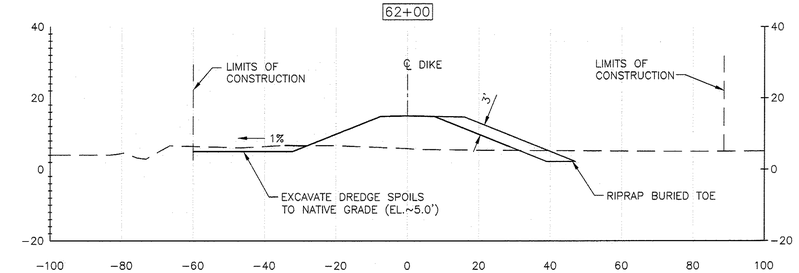
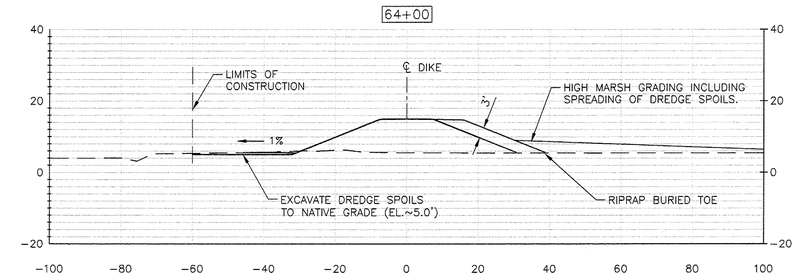


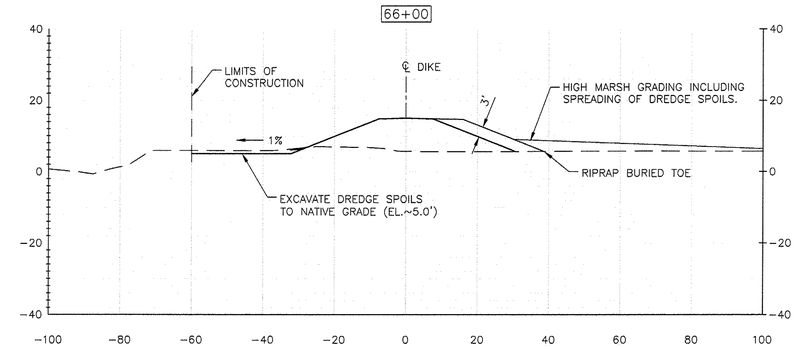
62+00



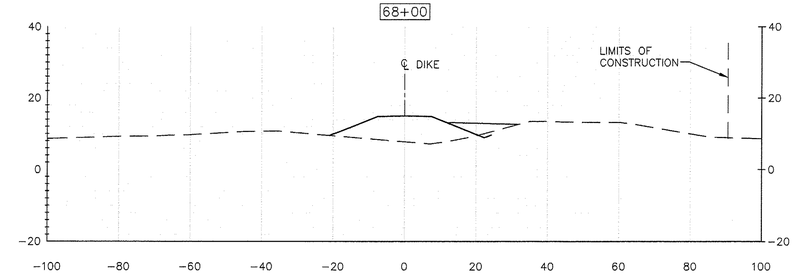
64+00



66+00



68+00



GRAPHIC SCALE

0 20 40 60

SCALE: 1" = 20'

LEGEND

EXISTING GRADE

PROPOSED GRADE

NOTES

1. SECTIONS SHOW ONLY EXTENT OF DIKE SELECT FILL AND RIPRAP. SEE SHEET 14 FOR ACCESS ROADS AND TOPSOIL AND BEDDING LAYER.
2. SPOILS FROM PAST DREDGING OF DRY SLOUGH ARE DEPOSITED ON NATIVE SOIL IN EXISTING CONDITIONS
3. DRY SLOUGH DREDGE SPOILS SHALL BE EXCAVATED TO SURROUNDING NATIVE GRADE AND SPREAD IN HIGH MARSH AREAS. SEE SHEET 47 FOR HIGH MARSH DETAILS

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 12/14/10
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

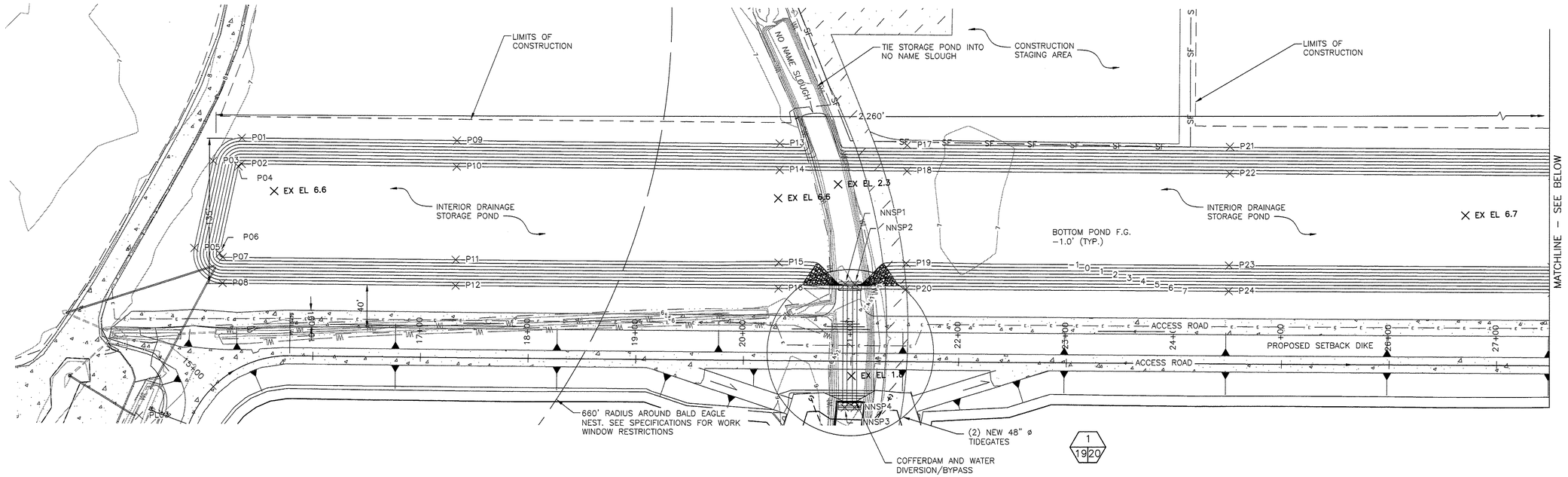
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

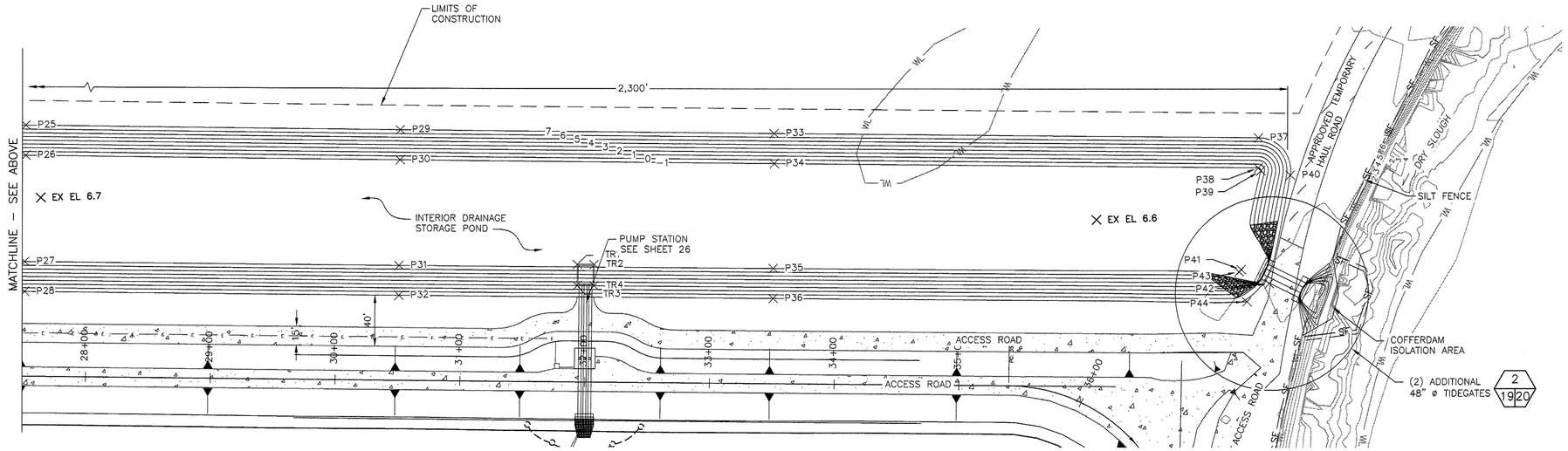
FIR ISLAND FARM
ECOSYSTEM RESTORATION
SETBACK DIKE CROSS SECTIONS
STATIONS 54+00 TO 68+00

PROJECT NO. ST:R4:11-3

SHEET 18 OF 54

FILENAME: J:\WPX\2-1\1793.B_FIR_ISLAND\CAD\800A\800411-5A\800411-5c018.dwg DATE 03-05-2015 LOGIN: cmh





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.

SITE PLAN

0 50 100 150

SCALE: 1" = 50'

LEGEND

- CONSTRUCTION LIMITS
- PROPOSED CULVERT
- WB — EXISTING WETLANDS
- SF — SILT FENCE
- PROPOSED SETBACK DIKE
- PROPOSED STORAGE POND
- TEMPORARY HAUL ROAD
- ACCESS ROAD
- X P100 — GRADING POINT

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WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 12/08/15

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

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM

ECOSYSTEM RESTORATION

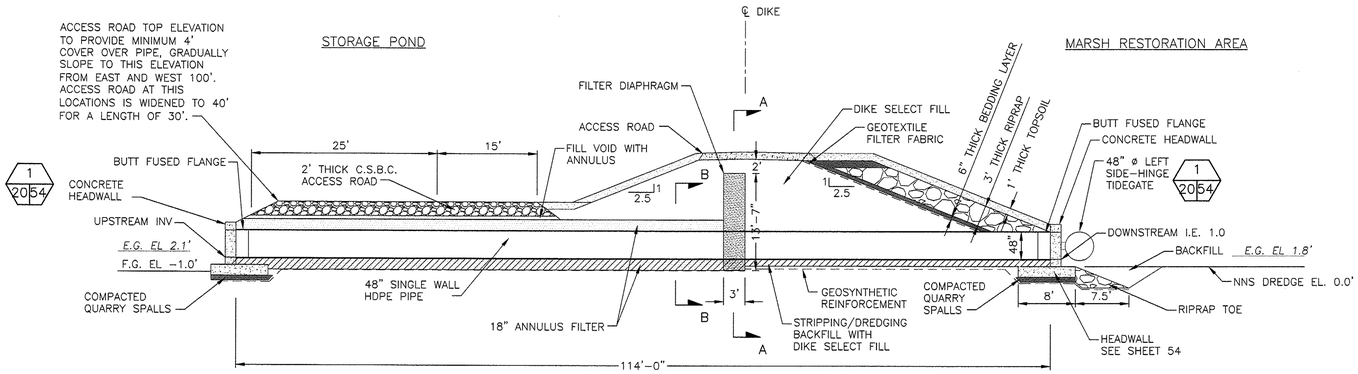
STORAGE POND GRADING PLAN

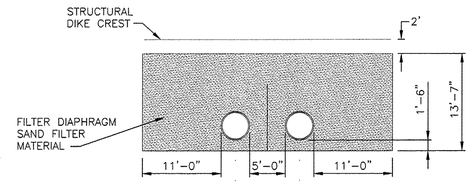
–

PROJECT NO. ST:R4:11-3

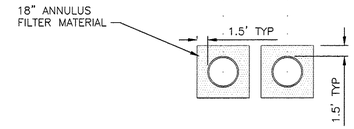
SHEET 19 OF 54

FILENAME: J:\MPA2-J:\12318 FIR ISLAND\CADD\DGN\D0241113-\D0241113-019.dgn DATE: 03-16-2015 LCDOW, cmh





SECTION A–A FILTER DIAPHRAGM DETAIL



SECTION B–B ANNULUS FILTER DETAIL

DETAIL – TYPICAL 48" ø TIDEGATE (NO NAME SLOUGH)

1 6 20 | 1 10 20 | 1 19 20

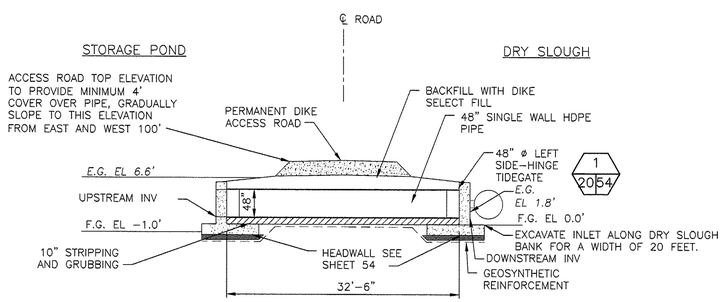
0 10 20 30

SCALE: 1" = 10'

NOTES

GATES SHOULD INCLUDE LATCH OR STOP TO KEEP GATES IN CLOSED AND OPEN POSITIONS.

TIDEGATE LOCATION	DETAIL #/SHT	PIPE O.D.	TYPE	UPSTREAM I.E.	DOWNSTREAM I.E.	LENGTH
NO NAME SLOUGH	1/20	4'-0"	SINGLE WALL HDPE	1.00	1.00	111'-7"
STORAGE POND TO DRY SLOUGH	2/20	4'-0"	SINGLE WALL HDPE	1.00	1.00	32'-9"



DETAIL – TYPICAL 48" ø TIDEGATE STORAGE POND TO DRY SLOUGH

2 6 20 | 2 11 20 | 2 19 20

0 10 20 30

SCALE: 1" = 10'

NOTES

GATES SHOULD INCLUDE LATCH OR STOP TO KEEP GATES IN CLOSED AND OPEN POSITIONS.

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 43584 — PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: 17 Mar 15

PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

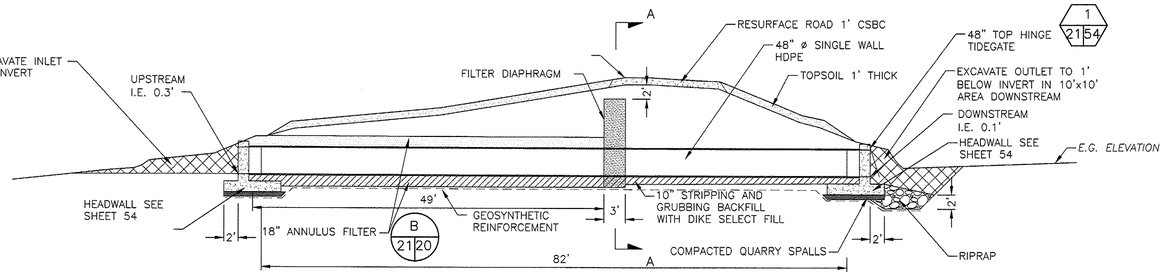
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
TIDEGATE INSTALLATIONS
PLAN AND DETAILS

PROJECT NO. ST:R4:11-3

SHEET 20 OF 54

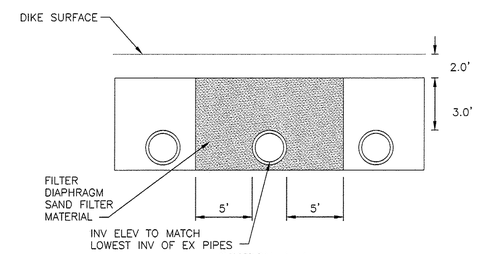
FILENAME: J:\WRV\71-1\V3118 Fir Island\CAD\DGNs\D0S41\D0S41\3-D0S41-D20.dgn DATE: 03-12-2015 LOGIN: cmh



DETAIL – DRY SLOUGH ADDITIONAL TIDEGATE 1 6 21 / 1 13 21

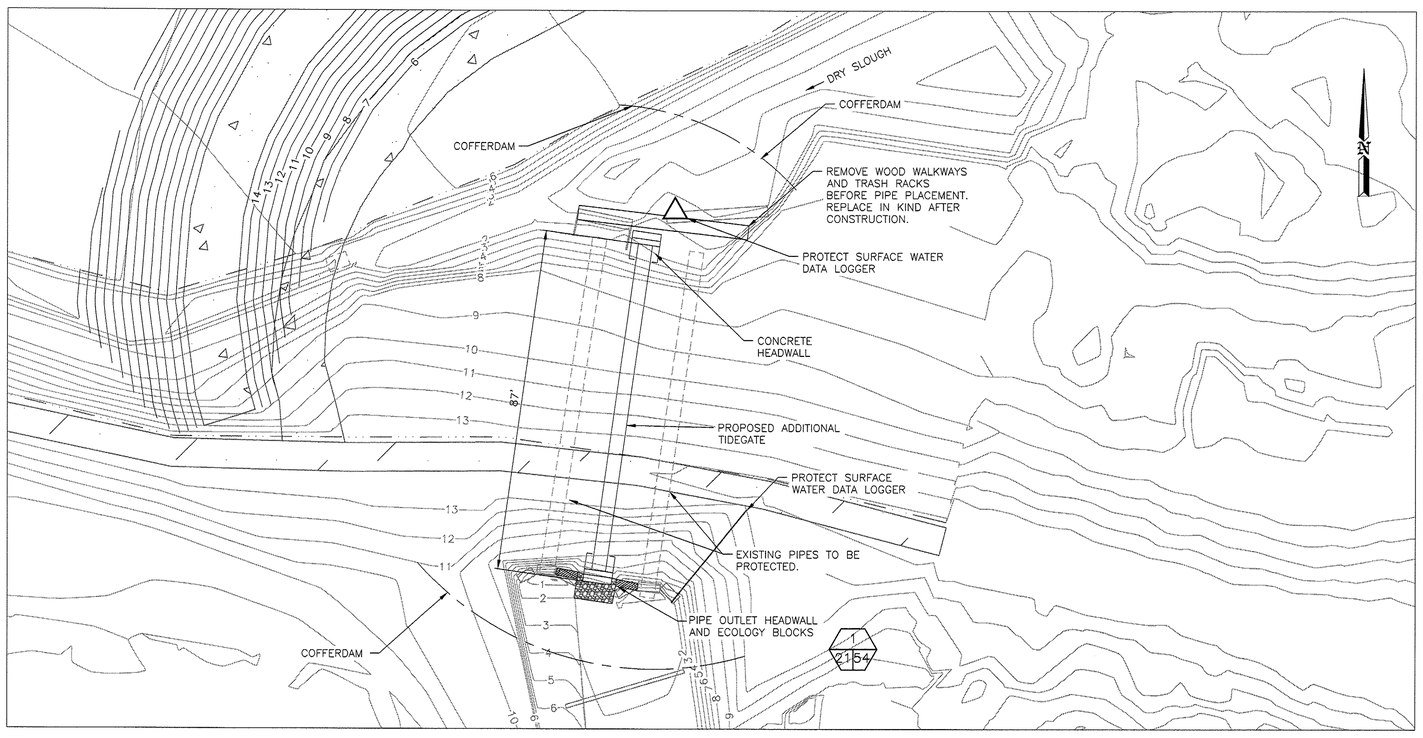
0 10 20 30

SCALE: 1" = 10'



SECTION A–A

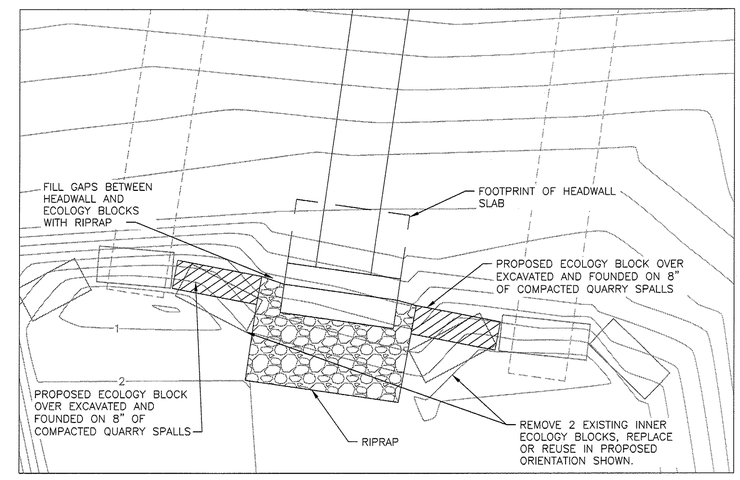
LOCATION	DETAIL #/SHT	PIPE O.D.	TYPE	UPSTREAM INVERT	DOWNSTREAM INVERT	LENGTH
DRY SLOUGH	1/21	4'–0"	SINGLE WALL HDPE	0.3	0.1	87'



DETAIL – TYPICAL 48" ø TIDEGATE (DRY SLOUGH) 2 X 21

0 20 40 60

SCALE: 1" = 20'



DETAIL – ECOLOGY BLOCK PLACEMENT (DRY SLOUGH) 3 X 21

NOTES

1. INSTALL 3RD TIDEGATE IN BETWEEN EXISTING TIDEGATES.
2. CONTRACTOR SHALL PROVIDE COFFERDAM SHORING AND DEWATERING PLAN FOR REVIEW AND APPROVAL PRIOR TO STARTING CONSTRUCTION.
3. CONTRACTOR SHALL PROTECT IN PLACE EXISTING TIDEGATES.
4. CONTRACTOR SHALL PLAN FOR UN–SURVEYED QUANTITY OF ROCK AND CONCRETE REMOVAL AND DISPOSAL FROM 3RD TIDEGATE TRENCH. SEE SPECIFICATION DIV. 1.
5. CONTRACTOR SHALL REMOVE CONCRETE AND ROCK FROM EXCAVATIONS, HAUL AND DISPOSE OF OFF SITE, AND REPLACE WITH COMPACTED DIKE SELECT FILL.
6. CONTRACTOR SHALL EXCAVATE FOR AND PLACE ECOLOGY BLOCKS SUCH THAT BACKFILLED PIPE TRENCH AND SLOPE MATCH EXISITNG GRADE AT NORTH EDGE OF BLOCK.

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 3 Mar 15
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

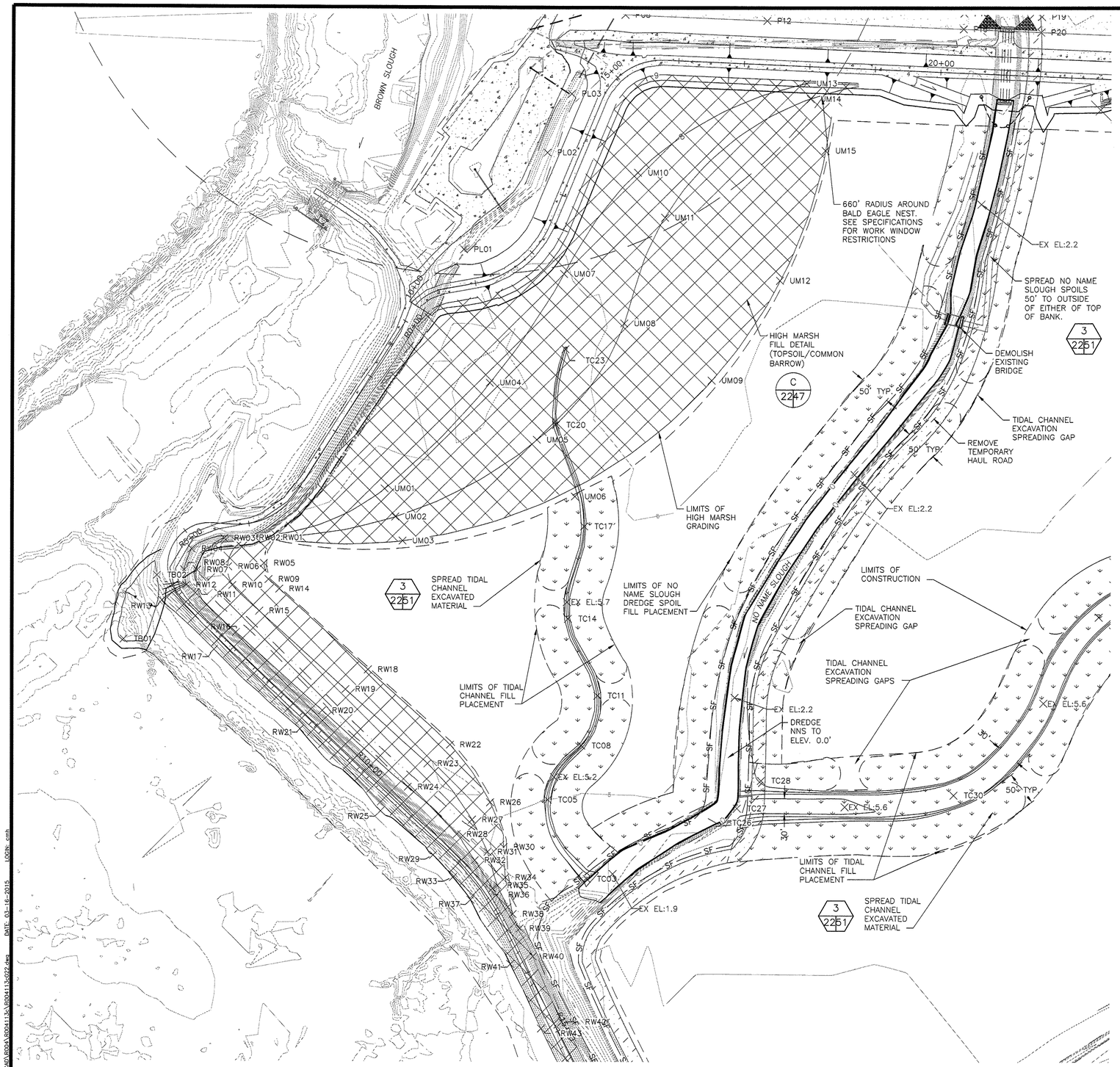
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

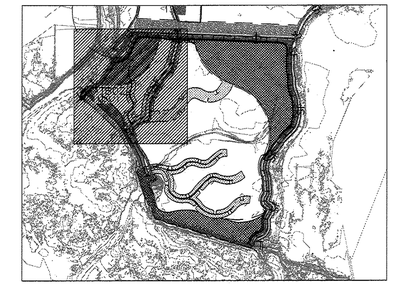
FIR ISLAND FARM
ECOSYSTEM RESTORATION
DRY SLOUGH TIDEGATE
PLAN AND DETAILS

PROJECT NO. ST:R4:11–3

SHEET 21 OF 54

FILENAME: J:\WRI\94-1\V2315_Fir_Island\CAD\R004\R004115\R004115-001.dwg DATE: 03-12-2015 LOGIN: cmh





KEY PLAN

NOTES

1. HIGH MARSH AREA TO BE GRADED WITH COMMON BORROW AND TOPSOIL FILL FROM THE PROPOSED STORAGE POND EXCAVATION.
2. TIDAL CHANNEL AREAS CAN BE ACCESSED VIA NATIVE GROUND OR BY APPROVED TEMPORARY MARSH PILOT CHANNEL ACCESS ROADS.
3. TIDAL CHANNELS OUTSIDE OF HIGH MARSH GRADING AREA TO BE EXCAVATED TO ELEVATION SHOWN ON SHEET 5, AND SPOILS TO BE SPREAD ON EITHER SIDE PER DETAIL 3, SHEET 51.
4. ALL SEDIMENT CONTROL MEASURES SHALL BE IN PLACE BEFORE GROUND IS DISTURBED, AND REMOVED PRIOR TO EXISTING DIKE BREACH.
5. TEMPORARY HAUL ROADS SHALL BE FULLY REMOVED, GRADED, SEDDED, AND RESTORED TO EXISTING CONDITIONS PRIOR TO EXISTING DIKE BREACH, PER SHEET 51.
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.
7. TOP WIDTH OF CHANNEL SHALL TRANSITION SMOOTHLY BETWEEN CHANNEL CENTERLINE POINTS.
8. NO NAME SLOUGH DREDGE SPOILS SHALL BE SPRAYED FOR CATTAILS BY WDFW AND ALLOWED TO DRY A MINIMUM OF 2 MONTHS. SPOIL AREAS SHALL THEN BE TILLED AND SEEDED.
9. TOPSOIL SHALL BE PLACED IN HIGH MARSH FILL AREAS AS SHOWN ON SHEET 47

LEGEND

- LIMITS OF TIDAL CHANNEL GRADING
- HIGH MARSH GRADING
- APPROVED TEMP HAUL ROAD
- SF — SILT FENCE
- × RW19 — GRADING POINT
- — — — LIMITS OF CONSTRUCTION

SITE PLAN

0 80 160 240

SCALE: 1" = 80'

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER — 17 MAR 15

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: 17 Mar 15

PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

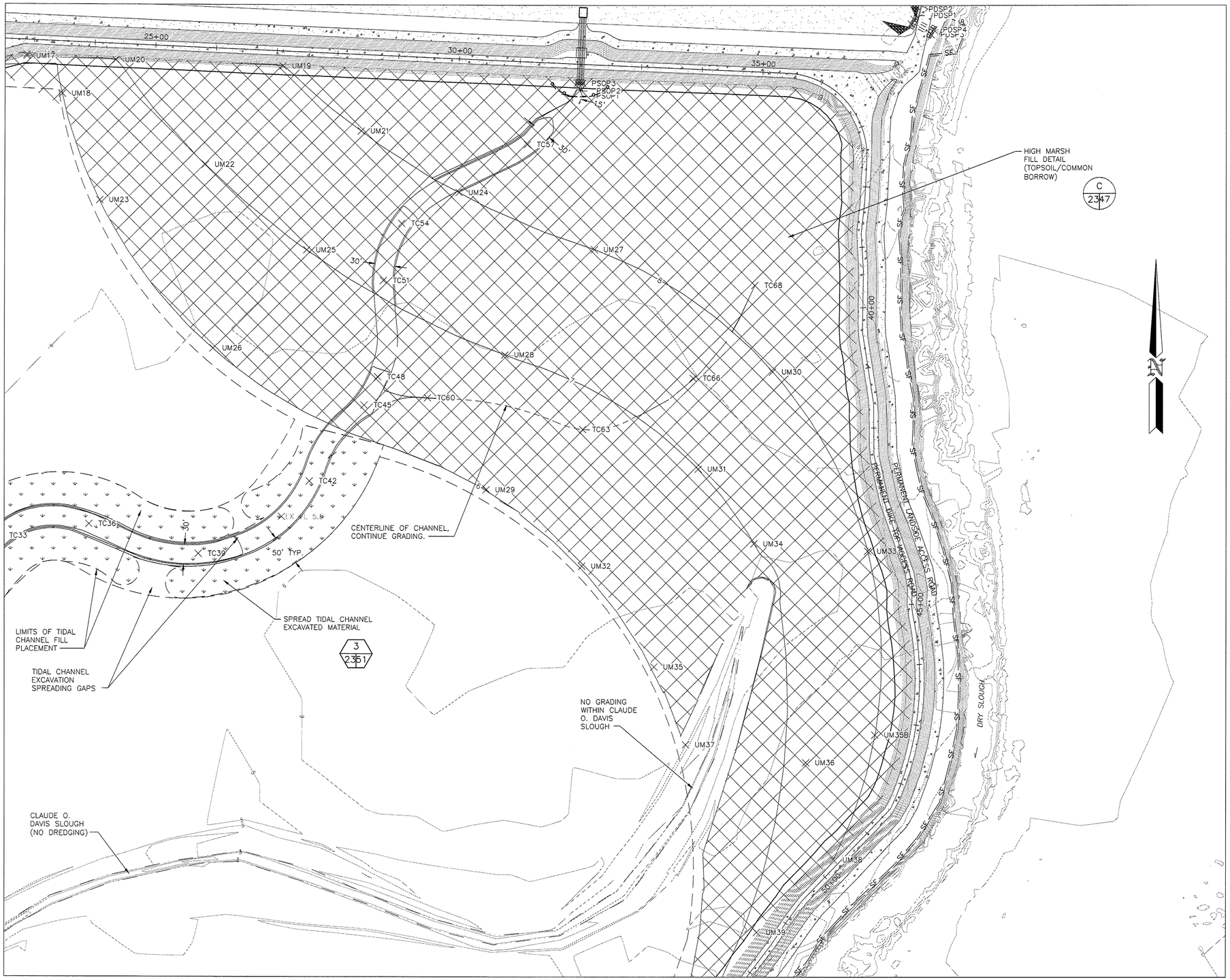
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

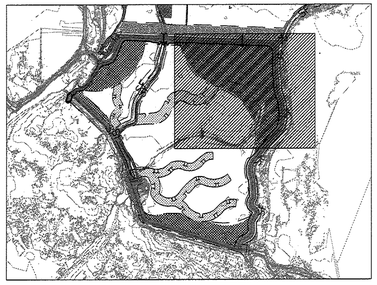
FIR ISLAND FARM
ECOSYSTEM RESTORATION
MARSH GRADING AND PILOT CHANNEL PLANS, NW AREA

PROJECT NO. ST:R4:11-3

SHEET 22 OF 54

FILENAME: I:\WP\01-11\2318_FIR_ISLAND\D02\A\D09411\A\D09411A5022.dwg DATE: 03-16-2015 LOGIN: cmh





KEY PLAN

NOTES

1. HIGH MARSH AREA TO BE GRADED WITH COMMON BORROW AND TOPSOIL FILL FROM THE PROPOSED STORAGE POND EXCAVATION.
2. TIDAL CHANNEL AREAS CAN BE ACCESSED VIA NATIVE GROUND OR BY APPROVED TEMPORARY MARSH PILOT CHANNEL ACCESS ROADS
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4. ALL SEDIMENT CONTROL MEASURES SHALL BE IN PLACE BEFORE GROUND IS DISTURBED, AND REMOVED PRIOR TO DIKE REMOVAL BREACH.
5. TEMPORARY HAUL ROADS SHALL BE FULLY REMOVED AND GRADE RESTORED TO EXISTING CONDITIONS PRIOR TO EXISTING DIKE BREACH, PER SHEET 51.
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.
7. TOP WIDTH OF CHANNEL SHALL TRANSITION SMOOTHLY BETWEEN CHANNEL CENTERLINE POINTS
8. TOPSOIL SHALL BE PLACED IN HIGH MARSH FILL AREAS AS SHOWN ON SHEET 47

LEGEND

- LIMITS OF TIDAL CHANNEL GRADING
- HIGH MARSH GRADING
- HAUL ROAD
- ACCESS ROAD
- SF — SILT FENCE
- × RW19 — GRADING POINT
- — — — LIMITS OF CONSTRUCTION

SITE PLAN

0 80 160 240

SCALE: 1" = 80'

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 36126 — PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 12/16/15
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

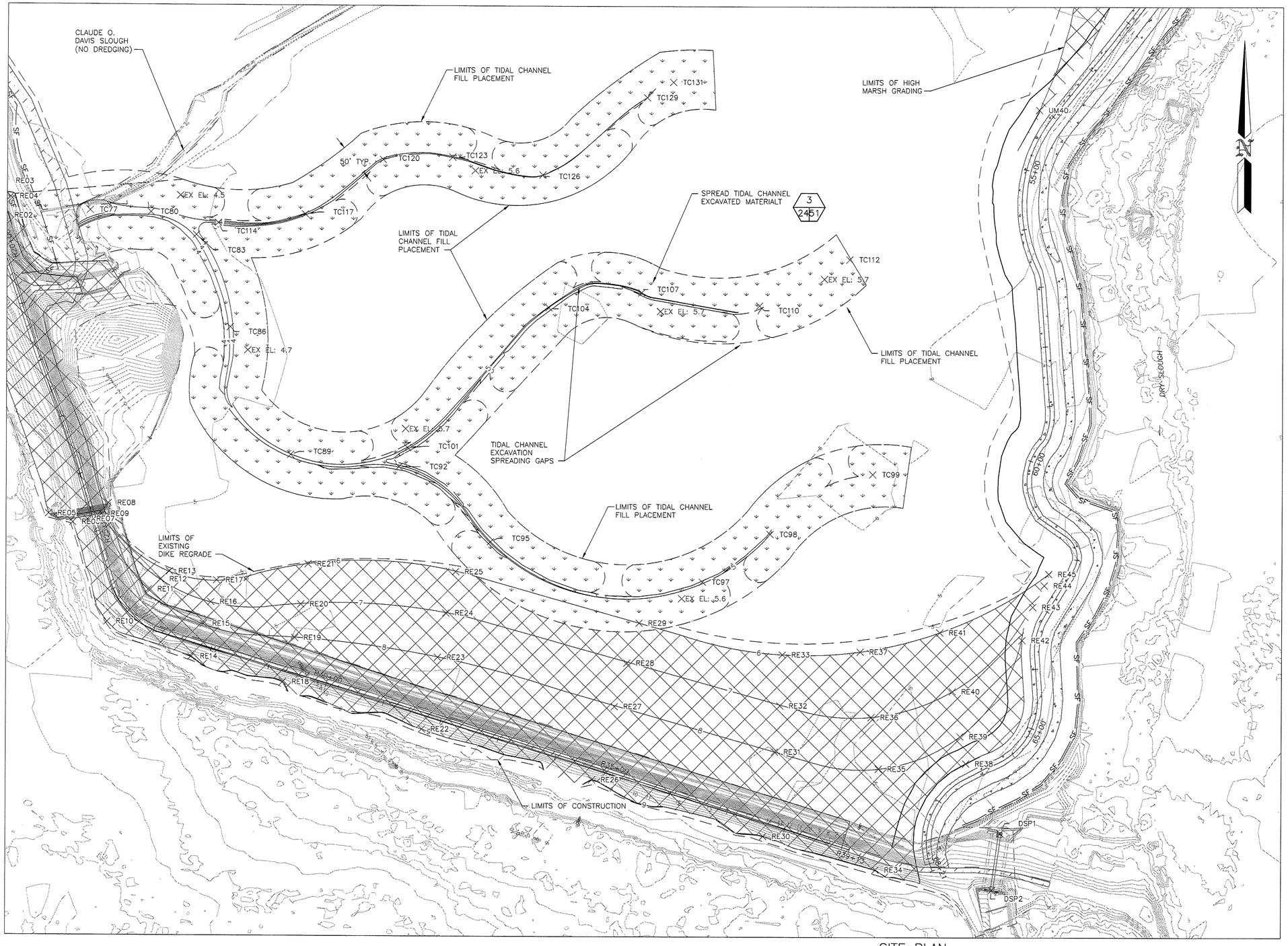
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
MARSH GRADING AND PILOT CHANNEL PLANS, NE AREA

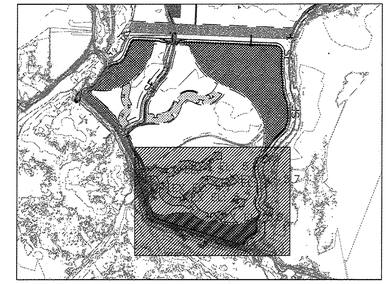
PROJECT NO. ST:R4:11-3

SHEET 23 OF 54

FILENAME: J:\WIP\21-1\21318 FIR ISLAND\CAD\800A\800A11\5A\800A11-5A03.dwg DATE: 03-16-2015 LOGIN: cmh



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



KEY PLAN

NOTES

1. HIGH MARSH AREA TO BE GRADED WITH COMMON BORROW AND TOPSOIL FILL FROM THE PROPOSED STORAGE POND EXCAVATION.
2. TIDAL CHANNEL AREAS CAN BE ACCESSED VIA NATIVE GROUND OR BY APPROVED TEMPORARY MARSH PILOT CHANNEL ACCESS ROADS.
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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.
7. TOP WIDTH OF CHANNEL SHALL TRANSITION SMOOTHLY BETWEEN CHANNEL CENTERLINE POINTS.
8. TOPSOIL SHALL BE PLACED IN HIGH MARSH FILL AREAS AS SHOWN ON SHEET 47

LEGEND

- LIMITS OF TIDAL CHANNEL GRADING
- HIGH MARSH GRADING
- HAUL ROAD
- ACCESS ROAD
- SF — SILT FENCE
- × RW19 — GRADING POINT
- — — — LIMITS OF CONSTRUCTION

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

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — 19344 — REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 17 Mar 16
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

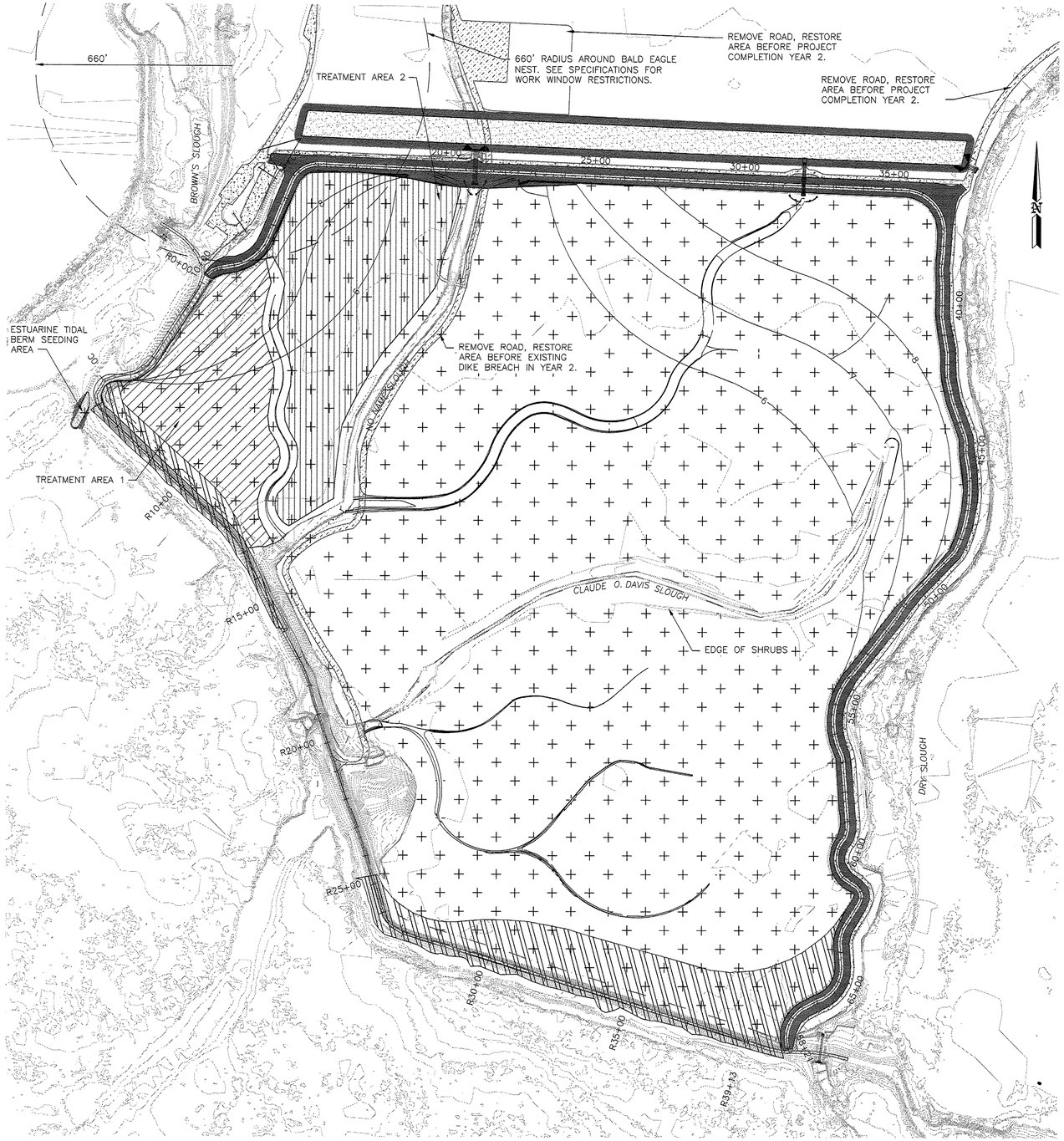
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
MARSH GRADING AND PILOT CHANNEL PLANS, SE AREA

PROJECT NO. ST:R4:11-3

SHEET 24 OF 54

FILENAME: I:\WRCV1-L\12318_FIR_ISLAND\DGN\A060411\A060411-S024.dwg DATE: 03-16-2015 LOGIN: cmh



GRAPHIC SCALE

0 200 400 600

SEEDING PLAN YEAR

SCALE: 1" = 200'-0"

PROJECT SEED MIXES

LEGEND	SEED MIX	SCIENTIFIC NAME	COMMON NAME	TYPE	SEEDING RATE (LBS/ACRE)	PERCENT BY WEIGHT	ACRES
	EXAMPLE FRESHWATER PASTURE SEED MIX*	*Festuca rubra*	FESCUE, CREEPING RED	PLS	15	100	119
		Lolium perenne	PERENNIAL RYEGRASS		15		
		Trifolium repens	WHITE CLOVER		6		
		Poa trivialis	ROUGH BLUEGRASS		4		
	DIKE AND STORAGE POND SIDE SLOPE SEED MIX*	*Triticum aestivum x Elytrigia elongata (hybrid)*	WHEATGRASS, STERILE **	PLS	10	100	7.8
		Agrostis stolonifera	CREEPING BENTGRASS		3		
		Festuca rubra	FESCUE, CREEPING RED		15		
		Festuca trachyphylla	FESCUE, HARD		10		
		Lolium perenne 'Amazing GS'	RYEGRASS, 'AMAZING GS' PERENIAL, OR EQUIVELENT		20		
		Lolium perenne ssp. multiflorum	RYEGRASS, ANNUAL OR ITALIAN		20		
	NATIVE SEED - TREATMENT AREA #1	*Eleocharis palustris*	COMMON SPIKERUSH	SEED	2-4	100	6
	NATIVE SEED - TREATMENT AREA #2	*Eleocharis palustris*	COMMON SPIKERUSH	SEED	3-5	25-30	10.2
		Schoenoplectus tabernaemontani (formerly Scirpus validus)	SOFTSTEM BULRUSH			25-30	
		Triglochin maritima	SEASIDE ARROWGRASS			40-50	
	ESTUARINE TIDAL BERM	*Eleocharis palustris*	COMMON SPIKERUSH	SEED	4	100	0.1
	DIKE DEMOLITION MATERIAL PLACEMENT * **	Native Recruitment only					

PLS = PURE LIVE SEED

* SEED MIXES SHALL BE BLENDED, MUTLI-SPECIES SEED MIXES

** STERILE WHEATGRASS SHALL BE A SINGLE-SEASON COVER CROP FOR EROSION CONTROL PURPOSES, SUCH AS REGREEN™ OR SIMILAR.

*** FILL PLACEMENT TO OCCUR DURING DIKE BREACH. AREA TO REVEGETATE THROUGH NATURAL RECRUITMENT ONLY IN YEAR 2.

SCHEDULE OF SEEDING ACTIVITIES

YEAR 1 (2015)		YEAR 2 (2016)	
SPRING	SUMMER	SPRING	SUMMER
FRESHWATER PASTURE SEEDING *	FRESHWATER PASTURE SEEDING **	FRESHWATER PASTURE SEEDING +	NATIVE SEEDING ++
	HYDROSEED DIKE & STORAGE POND SIDE SLOPES **		
	NATIVE SEED COLLECTION ***		

* TO BE COMPLETED BY WDFW.

** TO BE COMPLETED BY THE CONTRACTOR NO LATER THAN SEPTEMBER 30, 2015. AFTER HIGH MARSH GRADING COMPLETE.

*** NATIVE SEED MIX TO BE PROPOSED BY CONTRACTOR TO WDFW PRIOR TO JUNE 15, 2015 TO ALLOW FOR NATIVE SEED COLLECTION TO OCCUR BETWEEN JULY TO SEPTEMBER 2015.

+ TO BE COMPLETED BY THE CONTRACTOR, PRIOR TO RESUMING EARTHWORK IN 2016.

++ TEST AREAS TO BE COMPLETED BY THE CONTRACTOR PRIOR TO BREACHING THE DIKE. ESTUARINE TIDAL BERM TO BE SEEDED WITHIN TWO DAYS OF CONSTRUCTION.

NOTES

1. UNLESS AUTHORIZED BY WDFW, CONSTRUCTION ACTIVITIES AND EQUIPMENT SHALL NOT TRAVEL IN SEEDED AREAS.
2. IN AREA SOUTH AND WEST OF SETBACK DIKE, REMOVE ALL HAUL ROADS, ACCESS, STAGING, STOCKPILE AREAS, AND TEMPORARY CONSTRUCTION FACILITIES. COMPACTED SOILS, AS A RESULT OF HEAVY EQUIPMENT TRAVEL, SHALL BE SCARIFIED TO REDUCE COMPACTION. IN YEAR 2 PRIOR TO EXISTING DIKE BREACH. SEE SPECIFICATIONS.
3. ALL GRAVEL OR ROCK USED IN TEMPORARY ROADS, PARKING, OR STAGING AREAS SHALL BE COMPLETELY REMOVED AND DISPOSED OF OFF-SITE.
4. CATTAIL TYPHA SPRAYING IN CLAUDE O. DAVIS SLOUGH TO BE PERFORMED BY WDFW IN YEAR 1.
5. LIMITS OF CONSTRUCTION APPLY TO ALL CONSTRUCTION ACTIVITIES EXCEPT SEEDING. SEEDING AREAS AREA AS SHOWN ON THIS PLAN.

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

DAVID R. CLINE — STATE OF WASHINGTON — PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: 17 Mar 15

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

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

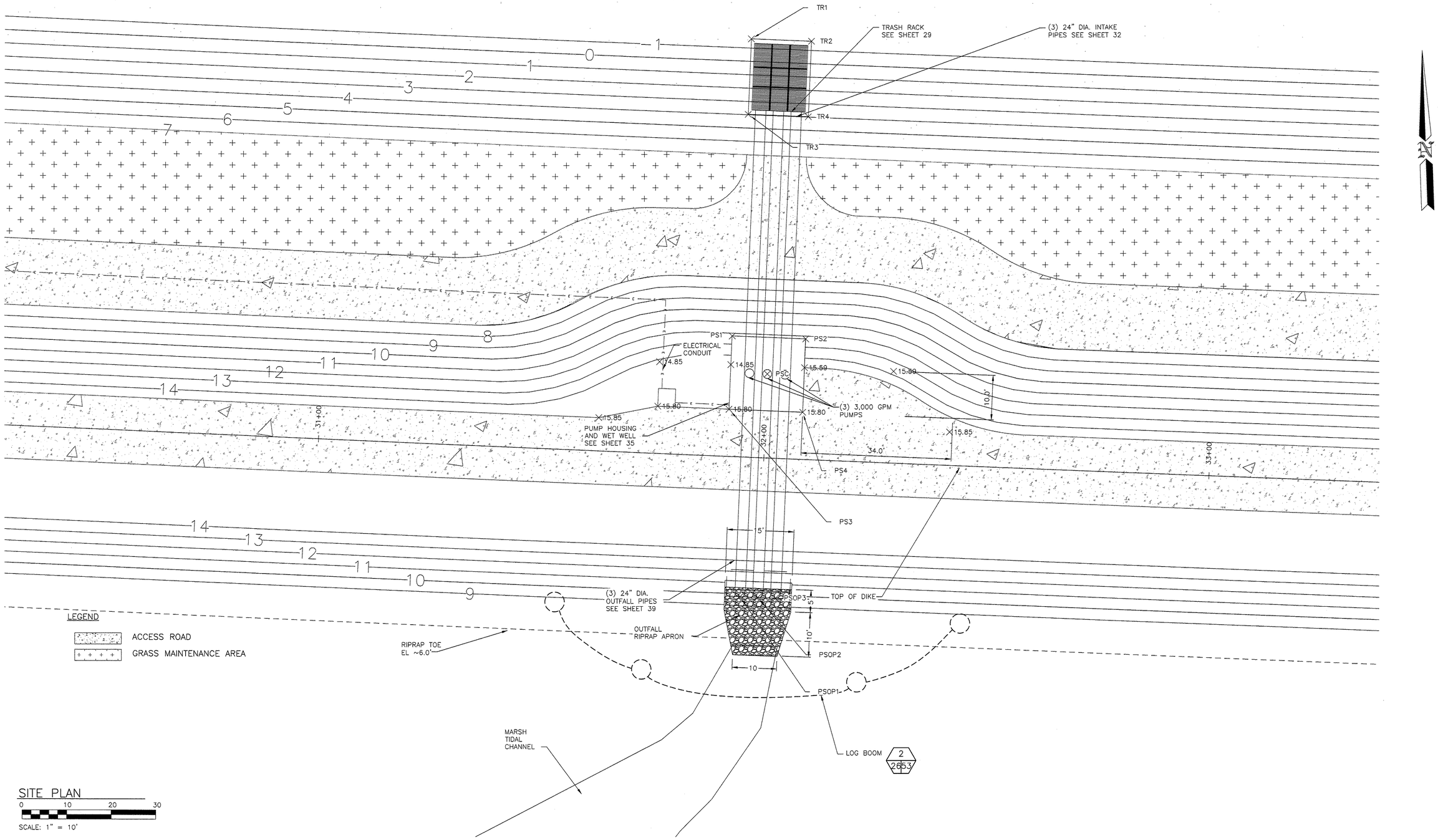
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
SEEDING PLAN

PROJECT NO. ST:R4:11-3

SHEET 25 OF 54

FILENAME: L:\WDFW\21-1\V2318.fir /Maps\CAD\600\2A\600411\3a\600411-3a-025.dwg DATE: 03-12-2015 LOGIN: cmh



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Geotechnical and Environmental Consultants
400 North 34th Street, Suite 100
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Seattle, Washington 98103
(206) 632-8020 FAX: (206) 633-6777

WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: 1 April 15

PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM

ECOSYSTEM RESTORATION

STORAGE POND PUMP STATION PLAN

PROJECT NO. ST:R4:11-3

SHEET 26 OF 54

FILENAME: L:\WIP\21-1\12318 FIR ISLAND\CAD\600A\600411-5\R04113-5R26.dwg DATE: 03-16-2015 LOGIN: cmh

GENERAL NOTES

1. CONSTRUCTION DOCUMENTS ARE NOT TO BE SCALED.
2. VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH CONSTRUCTION. ANY DIMENSIONAL DEVIATION FROM THAT SHOWN ON THE CONSTRUCTION DOCUMENTS, THAT MAY AFFECT THE INTENT OF DESIGN, SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION PROMPTLY AND RESOLUTION OBTAINED PRIOR TO PROCEEDING.
3. CONTRACTOR SHALL PROVIDE TEMPORARY BRACING AND/OR SHORING OF ANY STRUCTURE AND STRUCTURAL COMPONENTS UNTIL ALL FINAL CONNECTIONS HAVE BEEN COMPLETED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.
4. CONTRACTOR INITIATED CHANGES SHALL BE SUBMITTED IN WRITING TO THE ENGINEER FOR APPROVAL PRIOR TO FABRICATION OR CONSTRUCTION. CHANGES SHOWN ON SHOP DRAWINGS ONLY WILL NOT SATISFY THIS REQUIREMENT. ALL DEVIATIONS AND/OR MODIFICATIONS TO THESE DRAWINGS SHALL BE APPROVED BY THE ENGINEER OF RECORD IN WRITING PRIOR TO CHANGE OR MODIFICATION.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED TO DO THE WORK.
6. SHOP DRAWINGS AND MATERIAL DATA SHALL BE SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO ANY FABRICATION OR CONSTRUCTION AND ARE TO BE CHECKED AND APPROVED BY THE GENERAL CONTRACTOR PRIOR TO SUBMITTAL TO THE ENGINEER.
7. REFERENCE GEOTECHNICAL REPORT BY SHANNON & WILSON, INC., DATED NOVEMBER 7, 2014. FOR MORE COMPLETE INFORMATION.

   EARTH WORK MATERIAL BACKFILL AND COMPACTION SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT.

STRUCTURAL NOTES

REFERENCE CODE	2012 INTERNATIONAL BUILDING CODE	
	SEISMIC	
	RISK CATEGORY	= II
	SEISMIC DESIGN CATEGORY	= D
	IMPORTANCE FACTOR I_E	= 1.00
	S_s (MAPPED MAXIMUM CONSIDERED ACC)	= 1.151
	S_1 (MAPPED MAXIMUM CONSIDERED ACC)	= 0.453
	S_{DS} (SHORT PERIOD ACC)	= 0.798
	S_{D1} (1 SECOND PERIOD ACC)	= 0.467
	SITE CLASS	= D
	FOUNDATION	
	DESIGN ALLOWABLE BEARING PRESSURE = 1500 PSF	
	STATIC PASSIVE PRESSURE = 250 PSF/FT	
	BASE FRICTION COEFFICIENT = 0.25	
	ACTIVE PRESSURE = 40 PSF/FT	
	AT-REST PRESSURE = 60 PSF/FT	
	SEISMIC PRESSURE = 11H	
SHOP DRAWINGS	REINFORCING STEEL AND STEEL FABRICATION, SEE SPECIFICATIONS FOR COMPLETE LIST.	
STRUCTURAL TESTS	CYLINDER TESTS REQUIRED – SEE SPECIFICATIONS	
SPECIAL INSPECTION	CONCRETE, REINFORCING STEEL, BOLTING, WELDING	
	SEE SPEC INSPECTION TABLE	

CONCRETE FABRICATION

MATERIAL	QUANTITY	REMARKS
CONCRETE~ 4000 PSI 28 DAY COMPRESSIVE STRENGTH WITH 6% AIR ENTRAINMENT [EXCEPT WHERE SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS] SUBMIT CONCRETE MIX DESIGN FOR WRITTEN APPROVAL PRIOR TO ANY POUR NOTIFY ENGINEER AT LEAST 48 HOURS BEFORE PLACING CONCRETE FORMS TO REMAIN IN PLACE A MINIMUM OF 7 DAYS AFTER POUR UNLESS APPROVED BY THE ENGINEER CONCRETE SHALL REACH THE 4000 PSI 28 DAY COMPRESSIVE STRENGTH PRIOR TO TRANSPORT FOR PRECAST ITEMS FINISH OF CONCRETE AS SPECIFIED CYLINDER TESTS REQUIRED TO BE TAKEN BY CONTRACTOR	AS REQUIRED	SEE SPECIFICATIONS
CONCRETE REINFORCING STEEL 1. DEFORMED BAR ASTM A615 GRADE 60 2. WELDED BARS ASTM A706 GRADE 60		
COAT ALL EXPOSED REINFORCING WITH ZINC COATING		

METALS SCHEDULE

MATERIAL	QUANTITY	REMARKS
PLATES	AS REQUIRED	ASTM A36
ANGLES	AS REQUIRED	ASTM A36
W-SHAPES	AS REQUIRED	ASTM A572
HSS-RECTANGULAR	AS REQUIRED	A500 GRADE B (Fy = 46 KSI MINIMUM)
PIPE (STRUCTURAL)	AS REQUIRED	A53 GRADE B (Fy = 35 KSI MINIMUM) ~ SCH 40 STANDARD WEIGHT
CHANNELS	AS REQUIRED	ASTM A36
STRUCTURAL BARS	AS REQUIRED	ASTM A36
STAINLESS STEEL MATERIALS	AS REQUIRED	TYPE 316
PERFORATED PLATE	AS REQUIRED	ASTM 5052
STRUCTURAL TEES	AS REQUIRED	SEE W, M OR S SHAPES AS SPECIFIED
ALL STEEL MATERIALS TO BE GALVANIZED AFTER FABRICATION UNLESS NOTED OTHERWISE. ALUMINUM AND STAINLESS STEEL MATERIALS TO BE NATURAL FINISH UNLESS NOTED OTHERWISE.		
GENERAL MATERIALS LIST ~ NOT ALL MATERIALS WILL NECESSARILY BE USED ON THIS PROJECT		

CONNECTIONS

TYPE	REMARKS
MACHINE BOLTS	ASTM A307
HIGH STRENGTH BOLTS	ASTM A325
THREADED ROD	ASTM A36
HEADED SHEAR STUDS (WHS)	ASTM A108

SPECIAL INSPECTION SCHEDULE

ESTABLISHED PER 2012 IBC SECTION 109 & CHAPTER 17

ITEM	CONTINUOUS INSPECTION	PERIODIC INSPECTION	COMMENTS
SOILS			
GRADING, EXCAVATION & FILL			BY GEOTECHNICAL ENGINEER
FINAL FOUNDATION PREPARATION			BY GEOTECHNICAL ENGINEER
PREFAB. CONSTRUCTION			REF. NOTE 5
CONCRETE			
REINFORCING PLACEMENT		X	
REINFORCING WELDING		X	
ANCHOR BOLTS & INSERTS	X		
PREPARATION OF TEST SPECIMENS	X		
CONCRETE PLACEMENT	X		
ADHESIVE ANCHOR PLACEMENT	X		REF. NOTE 6
EMBEDDED PLATES		X	
CURING		X	
STRUCTURAL STEEL			
FABRICATION & ERECTION		X	REF. NOTE 7
HIGH STRENGTH BOLTING			REF. NOTE 8
SINGLE PASS FILLET WELDS ≤ 5/16"		X	REF. NOTE 9
FILLET WELDS > 5/16"	X		REF. NOTE 9
PARTIAL/COMPLETE PENETRATION WELD	X		REF. NOTE 10
OTHER WELDING			
WELDING OF ANCHORS AND STUDS		X	

INSPECTION SCHEDULE NOTES:

1. THE ITEMS CHECKED WITH AN "X" SHALL BE INSPECTED IN ACCORDANCE WITH IBC CHAPTER 17 BY A CERTIFIED SPECIAL INSPECTOR FROM AN ESTABLISHED TESTING AGENCY. FOR MATERIAL SAMPLING AND TESTING REQUIREMENTS, REFER TO PROJECT SPECIFICATIONS, THE STRUCTURAL NOTES AND THE NOTES BELOW. THE TESTING AGENCY SHALL SEND COPIES OF ALL STRUCTURAL TESTING AND INSPECTION REPORTS DIRECTLY TO THE ENGINEER. ANY MATERIALS WHICH FAIL TO MEET THE PROJECT SPECIFICATIONS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER. SPECIAL INSPECTION TESTING REQUIREMENTS APPLY EQUALLY TO ALL BIDDER DESIGNED COMPONENTS.
2. SPECIAL INSPECTION IS NOT REQUIRED FOR WORK PERFORMED BY AN APPROVED FABRICATOR PER IBC SECTION 1704.2.2.
3. CONTINUOUS SPECIAL INSPECTION MEANS THAT THE SPECIAL INSPECTOR IS ON THE SITE AT ALL TIMES OBSERVING THE WORK REQUIRING SPECIAL INSPECTION (IBC 1702). PERIODIC SPECIAL INSPECTION MEANS THAT THE SPECIAL INSPECTOR IS ON SITE AT TIME INTERVALS NECESSARY TO CONFIRM THAT ALL WORK REQUIRING SPECIAL INSPECTION IS IN COMPLIANCE.
4. INSPECTION REQUIREMENTS FOR SYSTEMS DESIGNED BY OTHERS SHALL BE DEFINED BY THE REGISTERED DESIGN PROFESSIONAL RESPONSIBLE FOR THEIR DESIGN.
5. INSPECTION FOR PREFABRICATED CONSTRUCTION SHALL BE THE SAME AS IF THE MATERIAL 5. USED IN THE CONSTRUCTION TOOK PLACE ON SITE. CONTINUOUS INSPECTION WILL NOT BE REQUIRED DURING PREFABRICATION IF THE APPROVED AGENCY CERTIFIES THE CONSTRUCTION AND FURNISHES EVIDENCE OF COMPLIANCE.
6. INSPECTION OF DRILLED CONCRETE ANCHORS, INCLUDING EXPANSION AND ADHESIVE ANCHORS, 6. SHALL INCLUDE VISUAL VERIFICATION OF DRILLED HOLE DEPTH, SPACING, EDGE DISTANCES AND HOLE CLEANING. FOR ADHESIVE ANCHORS, ADHESIVE INSTALLATION SHALL BE OBSERVED AND ADHESIVE PRODUCT SPECIFICATION AND PREPARATION SHALL BE VERIFIED.
7. INSPECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH IBC SECTION 1704.3.
8. INSPECTION OF BOLT INSTALLATION FOR PRETENSIONING IS PERMITTED TO BE PERFORMED ON A 8. PERIODIC BASIS WHEN USING THE TURN-OF-NUT METHOD WITH MATCHMARKING TECHNIQUES, THE DIRECT TENSION INDICATOR METHOD, OR THE ALTERNATE DESIGN FASTENER (TWIST-OFF BOLT) METHOD. JOINTS DESIGNATED AS SNUG TIGHT NEED ONLY PERIODIC INSPECTION.
9. ALL WELDS SHALL BE VISUALLY INSPECTED.
10. ALL COMPLETE PENETRATION WELDS SHALL BE TESTED ULTRASONICALLY OR BY USING ANOTHER APPROVED METHOD.
11. ALL SPECIAL INSPECTIONS SHALL BE PERFORMED BY THE CONTRACTORS TESTING FIRM APPROVED BY THE ENGINEER.

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

ROBB A. DIBBLE, STATE OF WASHINGTON, 37445, REGISTERED PROFESSIONAL ENGINEER
3/17/15

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

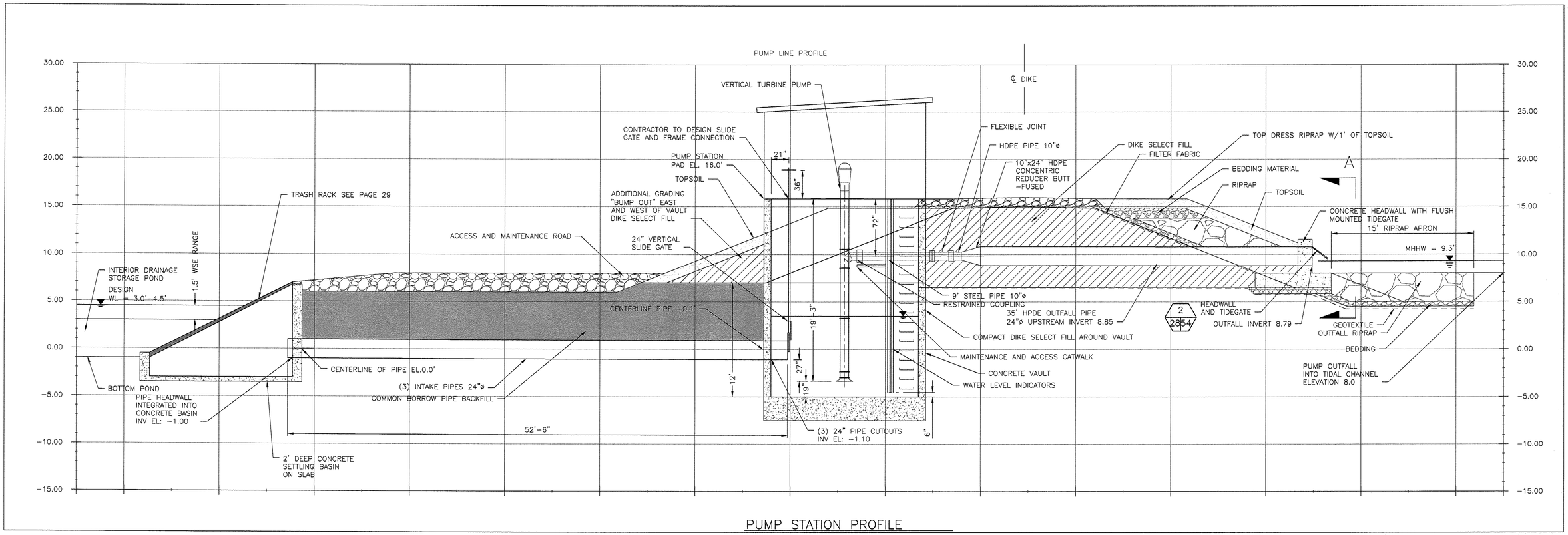
CHIEF ENGINEER ..... DATE: 17 Mar 15
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY PRC
CHECKED BY RAD
DRAWN BY TTP
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
STRUCTURAL NOTES

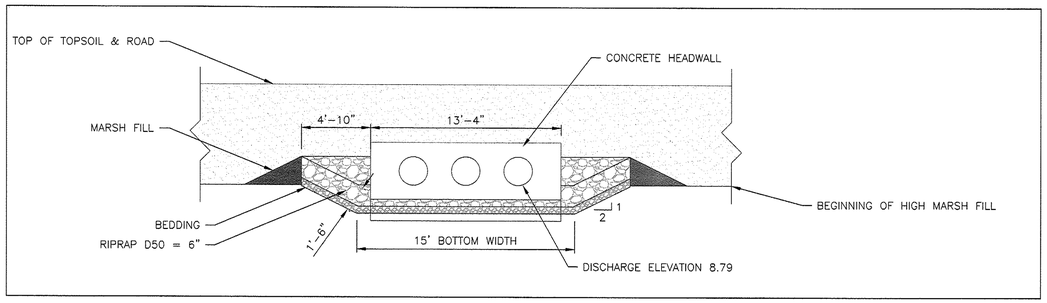
PROJECT NO. ST:R4:11-3



PUMP STATION PROFILE

0 5 10 15

SCALE: 1" = 5'



OUTFALL RIPRAP PLACEMENT ELEVATION A-A'

5 10 15

SCALE: 1" = 5'

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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DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: 1/27/2015

PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

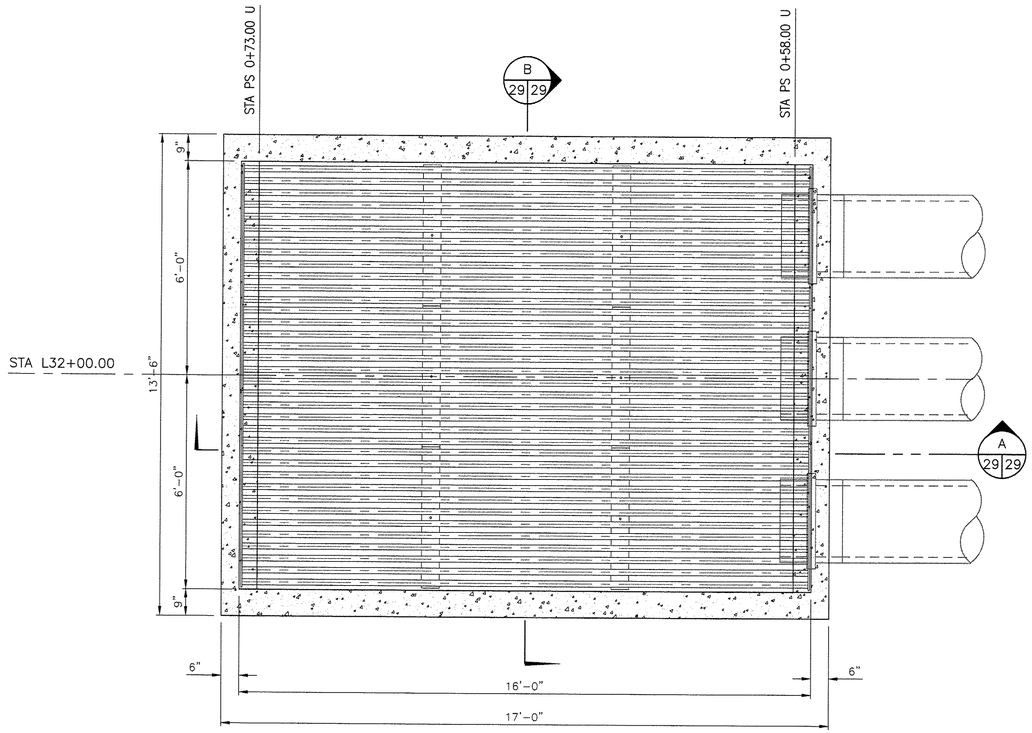
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
PUMP STATION PROFILE

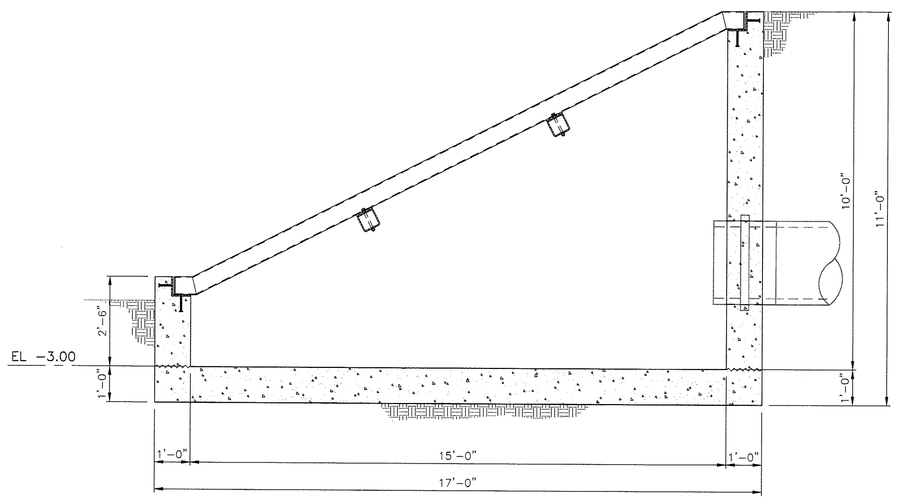
PROJECT NO. ST:R4:11-3

SHEET 28 OF 54

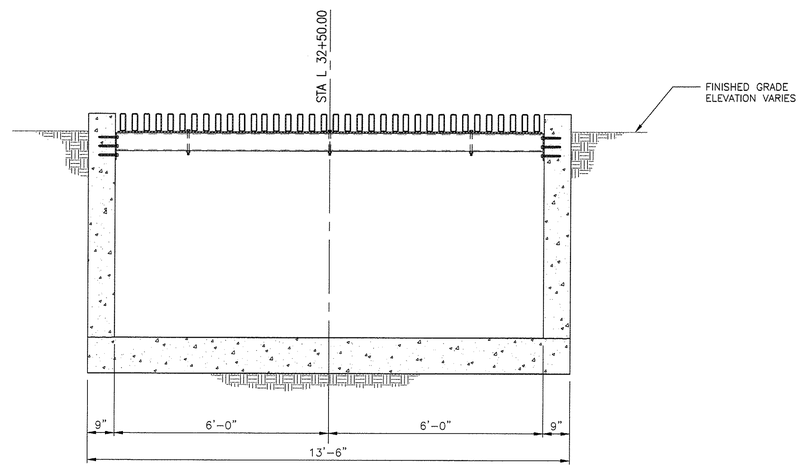
FILENAME: L:\WIP\21-LN\2318 FIR ISLAND\CAD\800A\600411\3A\600411\3-0728.dwg DATE: 03-16-2015 LOGIN: cmh



PLAN
SCALE: 1/2" = 1'



SECTION
SCALE: 1/2" = 1'
A
29 29



SECTION
SCALE: 1/2" = 1'
B
29 29

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

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ROBB A. DIBBLE
STATE OF WASHINGTON
37445
REGISTERED PROFESSIONAL ENGINEER
3/17/15

SYM	DATE	REVISION DESCRIPTION	BY

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CHIEF ENGINEER ..... DATE: 3/17/15
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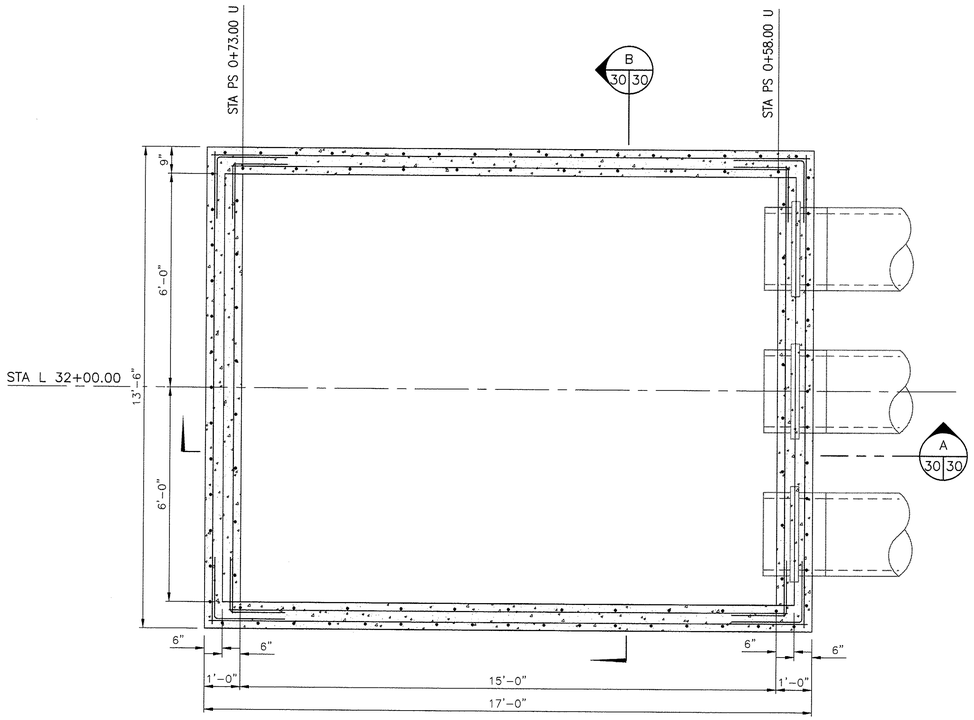
CHECKED BY RAD
DRAWN BY TTP
DATE MAR 2015

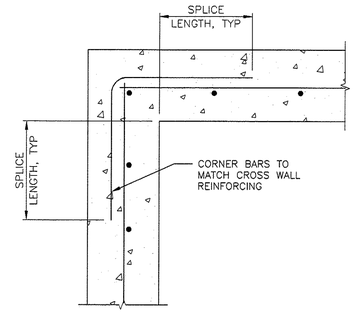
FIR ISLAND FARM
ECOSYSTEM RESTORATION
INTAKE GENERAL ARRANGEMENT

PROJECT NO. ST:R4:11-3

SHEET 29 OF 54



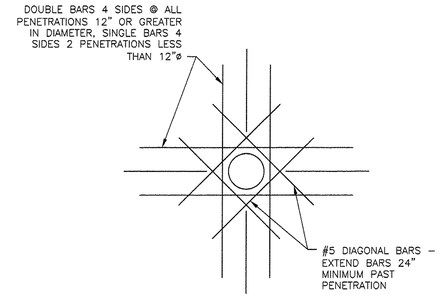
INTAKE PLAN
SCALE: 1/2" = 1'



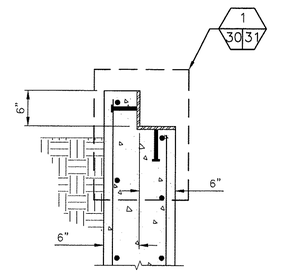
NOTES:
1. WALL SIZE & REINFORCING PER PLAN AND SECTION.
2. CORNER BARS SIZE & SPACING TO MATCH HORIZONTAL REINFORCING

CORNER BAR DETAIL
SCALE: NONE

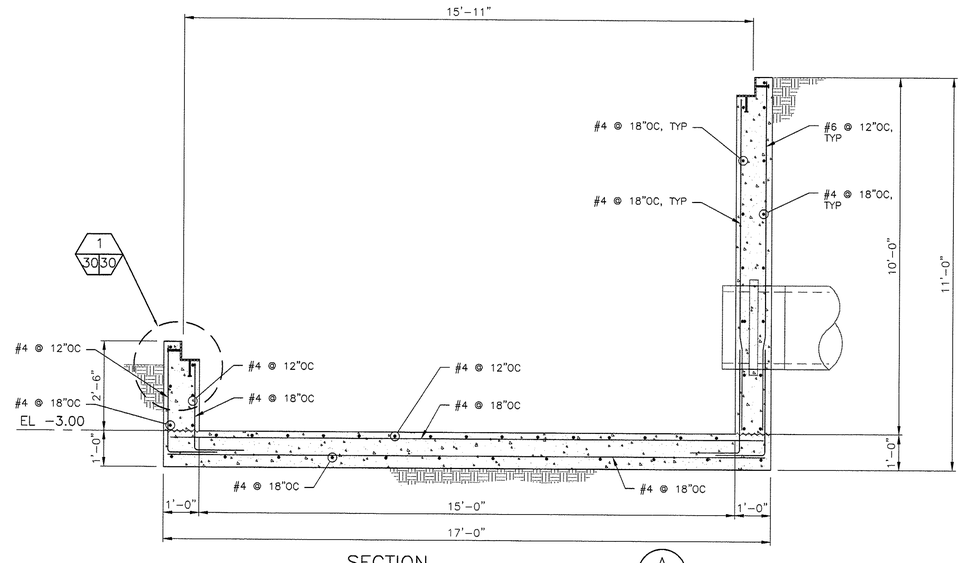
DEVELOPMENT AND LAP SPLICE LENGTH		
BAR	DEVELOPMENT LENGTH	SPLICE LENGTH
#4	12"	15"
#5	15"	20"
#6	22"	28"
#7	37"	48"



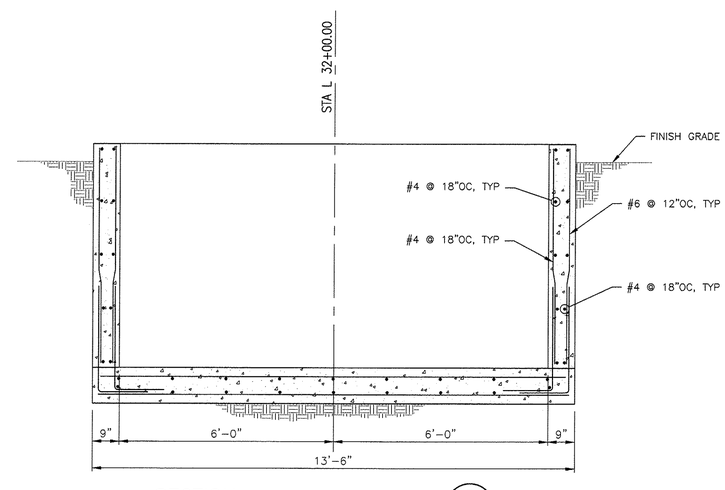
REINF AT WALL PENETRATIONS
SCALE: NONE



WALL DETAIL
SCALE: 1" = 1'-0"
1
30 30



SECTION
SCALE: 1/2" = 1'
A
30 30



SECTION
SCALE: 1/2" = 1'
B
30 30

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

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3/17/15

SYM	DATE	REVISION DESCRIPTION	BY
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PROGRAM ..... DATE:

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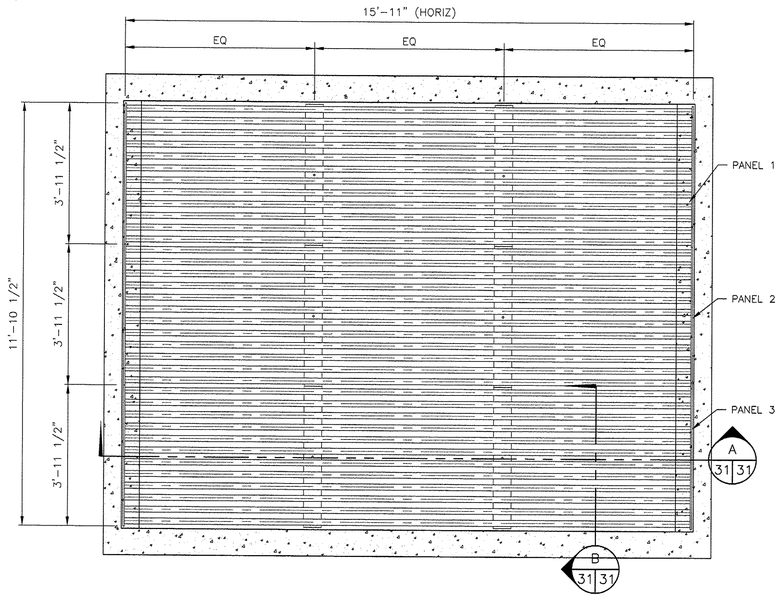
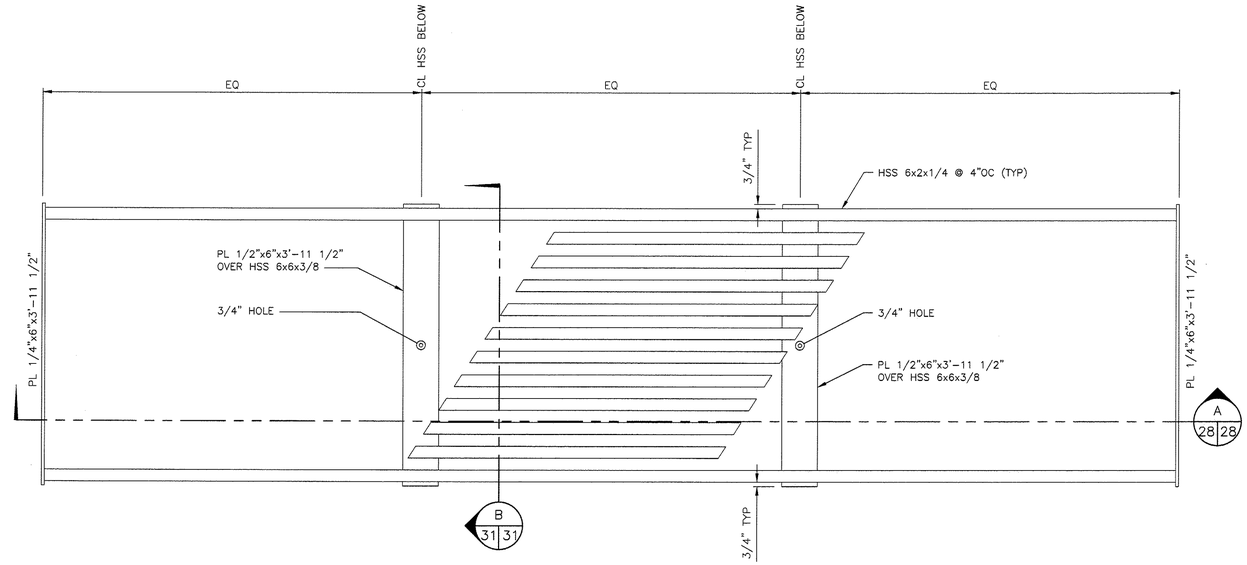
DRAWN BY TTP
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
INTAKE CONCRETE SECTIONS AND DETAILS

PROJECT NO. ST:R4:11-3
SHEET 30 OF 54

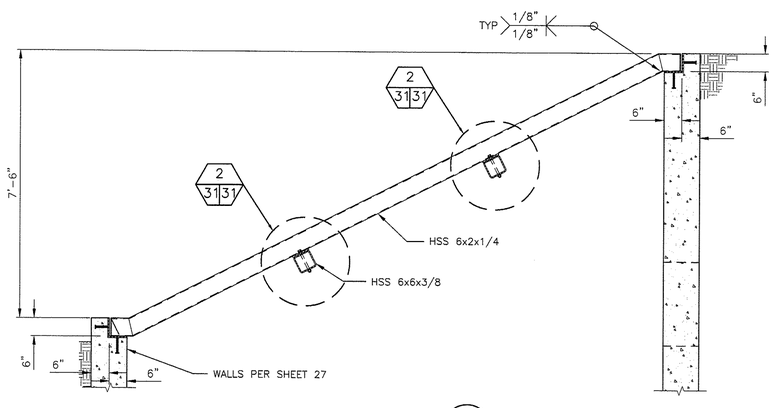


TRASHRACK PLAN
SCALE: 1/2 = 1'

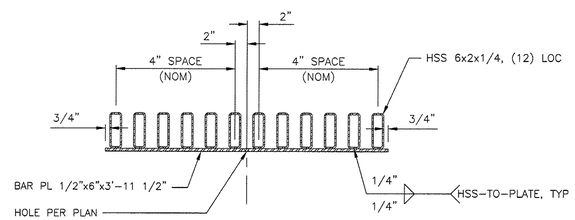


NOTE:
1. MAKE THREE PANELS.
2. FINISH IS HOT DIP GALVANIZED.

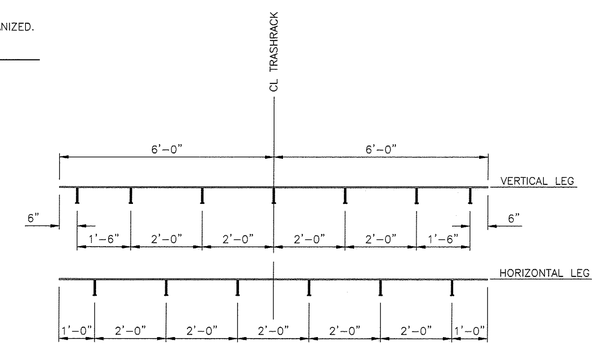
PANEL PLAN
SCALE: 1" = 1'



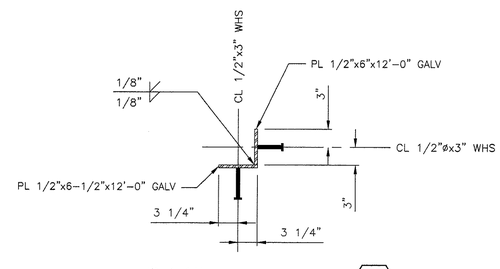
SECTION
SCALE: 1/2" = 1'
A 31 31



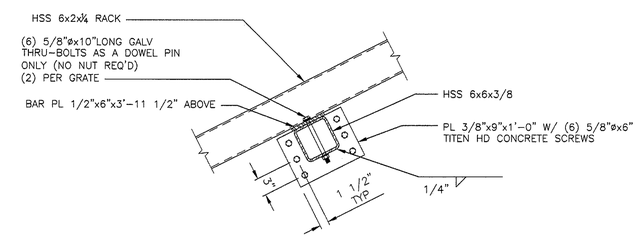
SECTION
SCALE: 1" = 1'
B 31 31



WHS SPACING
SCALE: NONE



DETAIL
SCALE: 1" = 1'
1 30 31



DETAIL
SCALE: 1" = 1'
2 31 31

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

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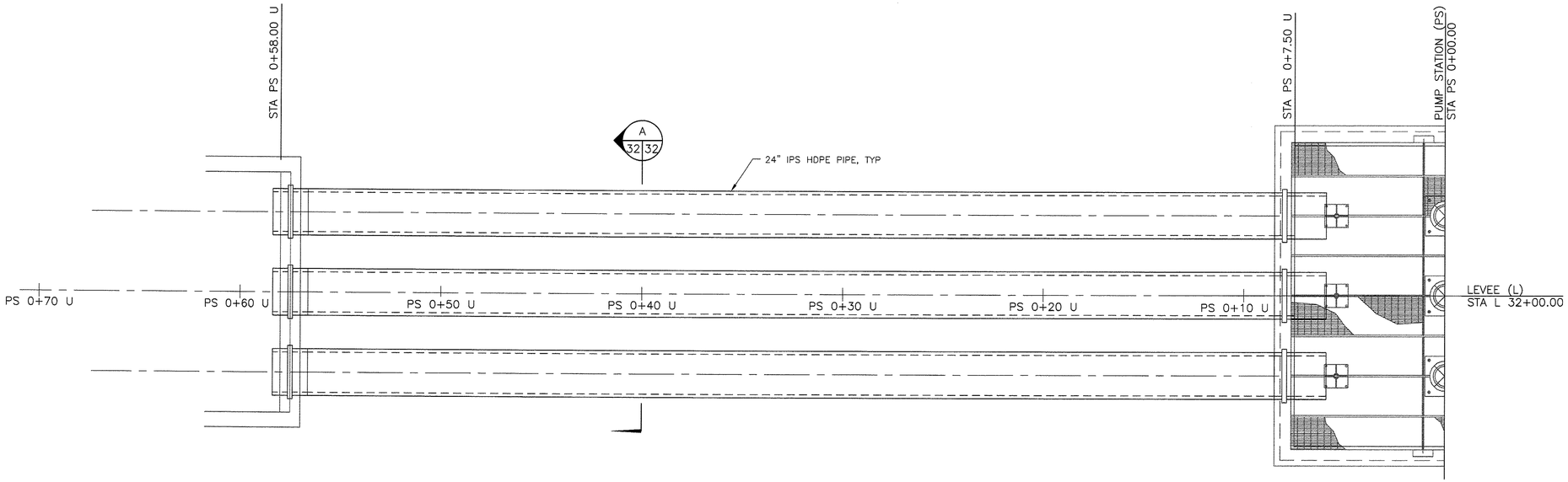
DATE MAR 2015

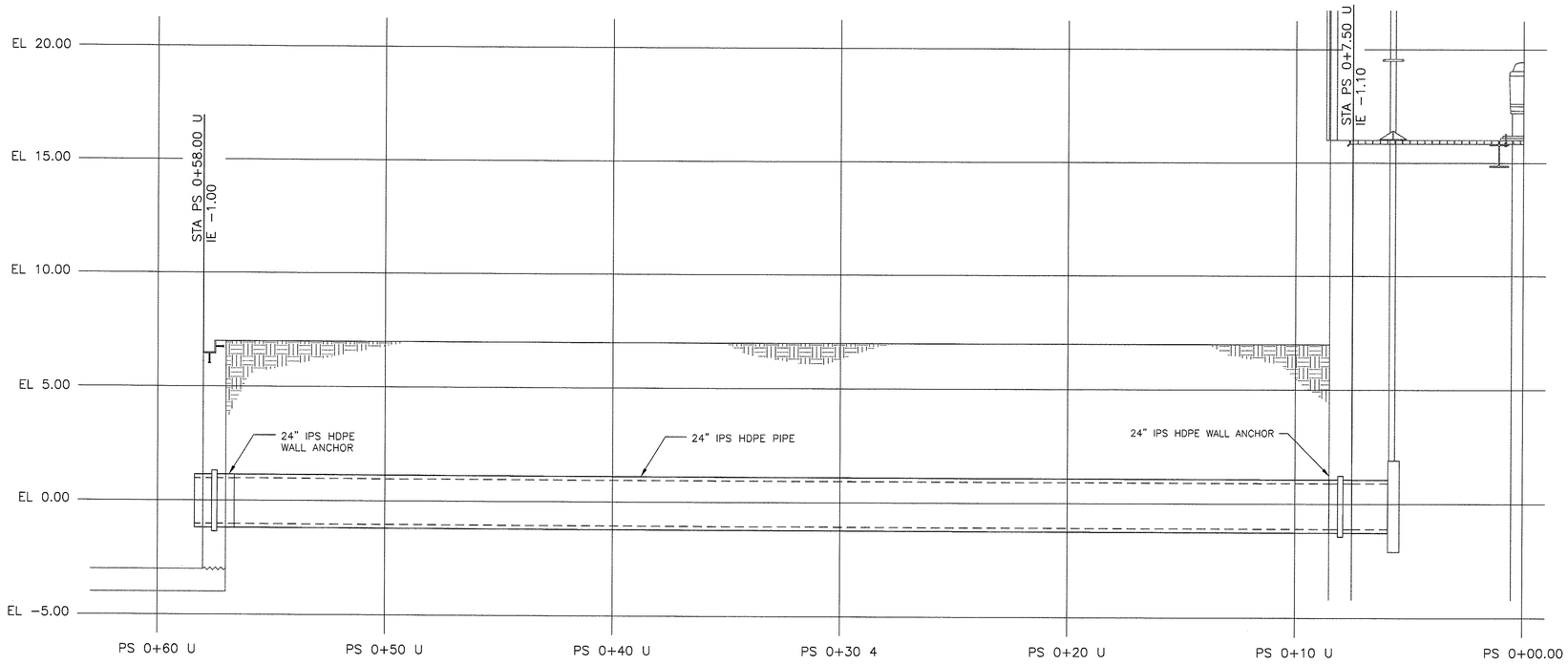
FIR ISLAND FARM
ECOSYSTEM RESTORATION
INTAKE STEEL SECTIONS AND DETAILS

PROJECT NO. ST:R4:11-3

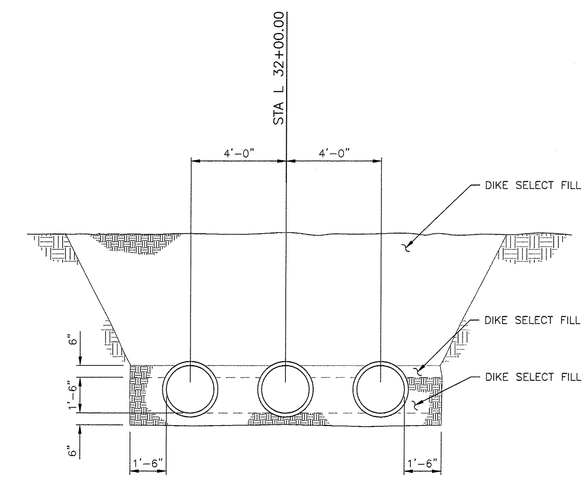
SHEET 31 OF 54



PLAN
SCALE: 1" = 3'



PROFILE
SCALE: 1" = 3'



SECTION STA PS 0+40 U (A 32 32)
SCALE: 1" = 3'

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

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3/17/15

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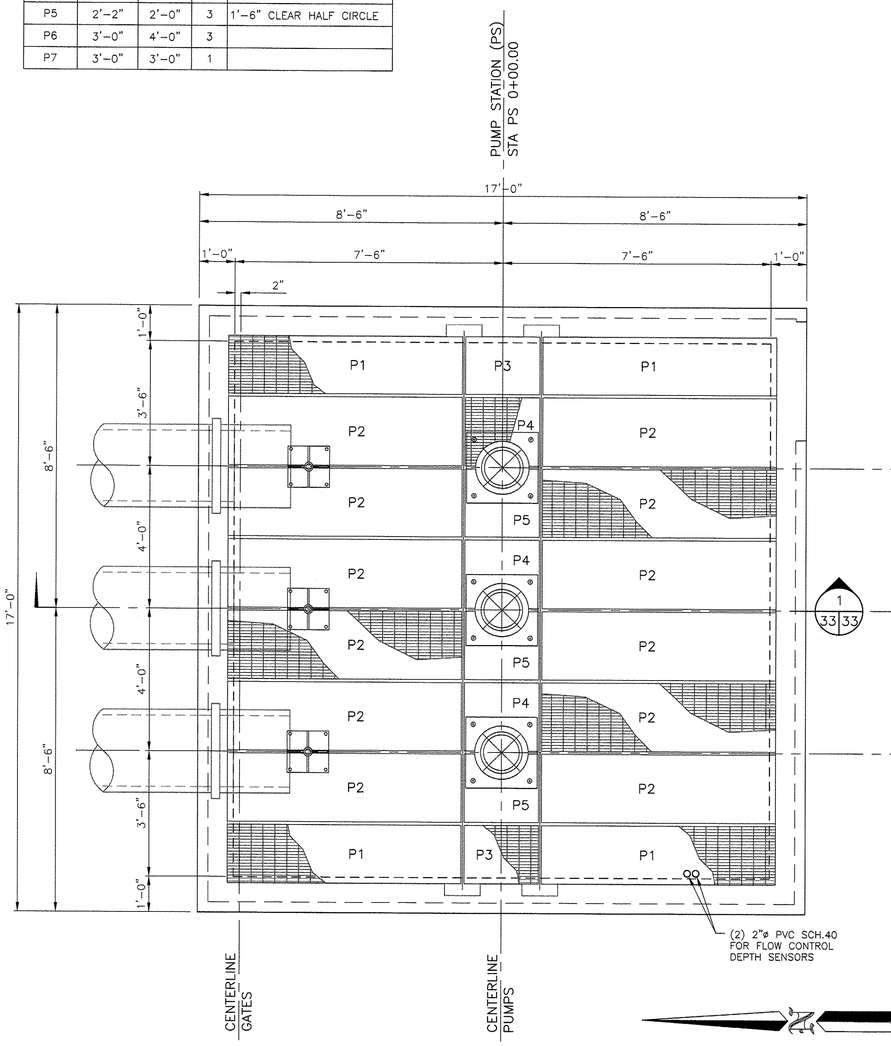
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
INTAKE PIPELINES PLAN AND PROFILE

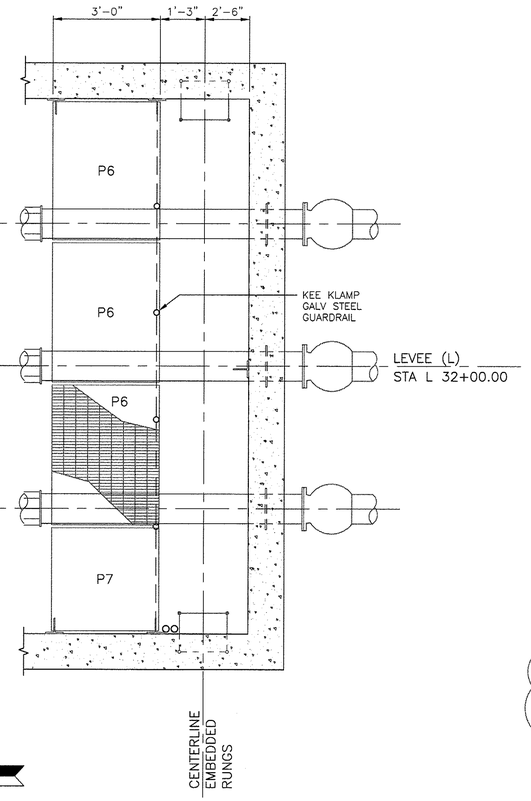
PROJECT NO. ST:R4:11−3
SHEET 32 OF 54

PANEL	NOMINAL DIMENSIONS		QTY	NOTE
	LENGTH	WIDTH		
P1	6'-7"	1'-8"	4	
P2	6'-7"	2'-0"	12	
P3	2'-2"	1'-8"	4	
P4	2'-2"	2'-0"	3	1'-6" CLEAR HALF CIRCLE
P5	2'-2"	2'-0"	3	1'-6" CLEAR HALF CIRCLE
P6	3'-0"	4'-0"	3	
P7	3'-0"	3'-0"	1	



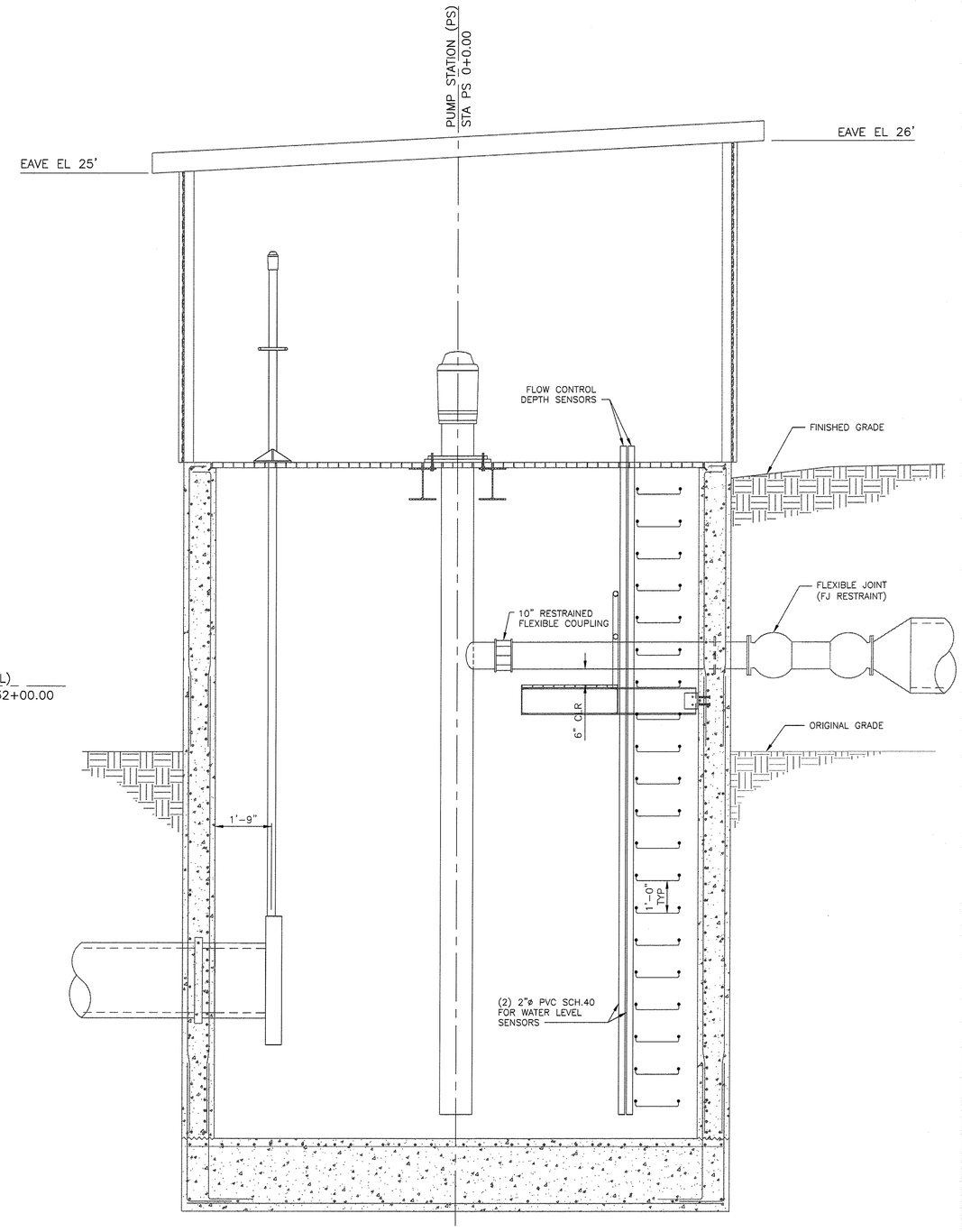
GRATING PLAN – EL 16'-0"
SCALE: 1/2" = 1'

NOTES:
1. T.O.G. EL 16'-0"
2. T.O.S. EL 15'-10"
3. STEEL BAR GRATING, 19-W-4 WITH 2"x3/16" BEARING BARS, GALVANIZED. ALL PANELS BANDED.



GRATING PLAN – EL 9'-0"
SCALE: 1/2" = 1'

NOTES:
1. T.O.G. EL 9'-0"
2. T.O.S. EL 8'-11"
3. STEEL BAR GRATING, 19-W-4 WITH 1"x3/16" BEARING BARS, GALVANIZED. ALL PANELS BANDED.



SECTION
SCALE: 1/2" = 1'
1
33 33

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

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Phone (425) 828-4200 • Fax (425) 827-6131
Robb A. Dibble, PE, Principal
Travis S. Colliander, PE, SE, Associate
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WWW.DIBBLEENGINEERS.COM

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

ROBB A. DIBBLE
STATE OF WASHINGTON
37445
REGISTERED PROFESSIONAL ENGINEER
3/7/15

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: 3/7/2015
PROGRAM ..... DATE:

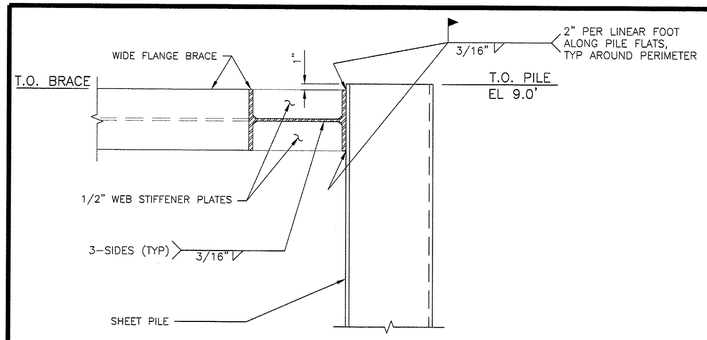
0 — 1"
BAR MEASURES
ONE INCH ON
ORIGINAL DRAWINGS

DESIGNED BY PRC
CHECKED BY RAD
DRAWN BY TTP
DATE MAR 2015

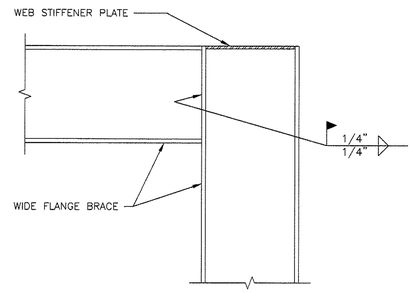
FIR ISLAND FARM
ECOSYSTEM RESTORATION
PUMP HOUSE GENERAL ARRANGEMENT

PROJECT NO. ST:R4:11-3

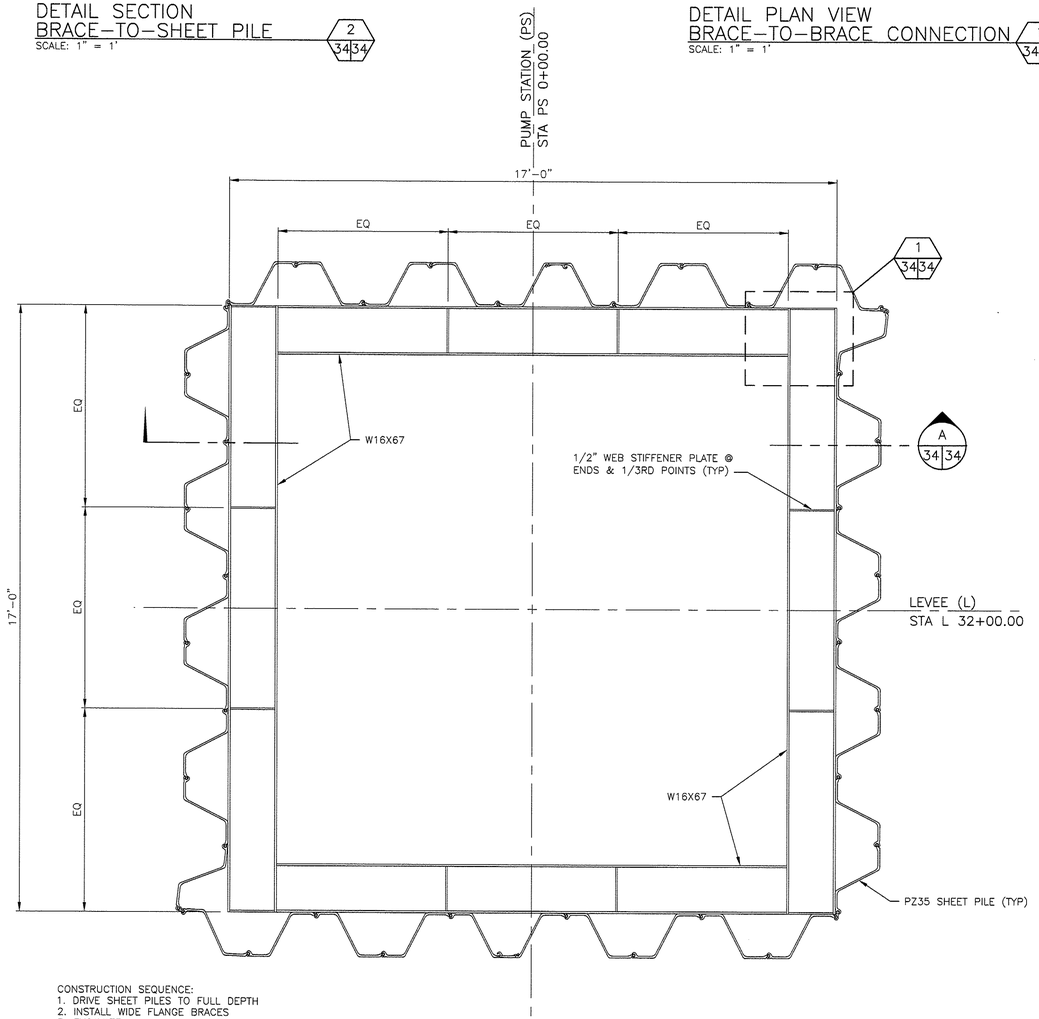
SHEET 33 OF 54



DETAIL SECTION
BRACE-TO-SHEET PILE 2 34|34
SCALE: 1" = 1'

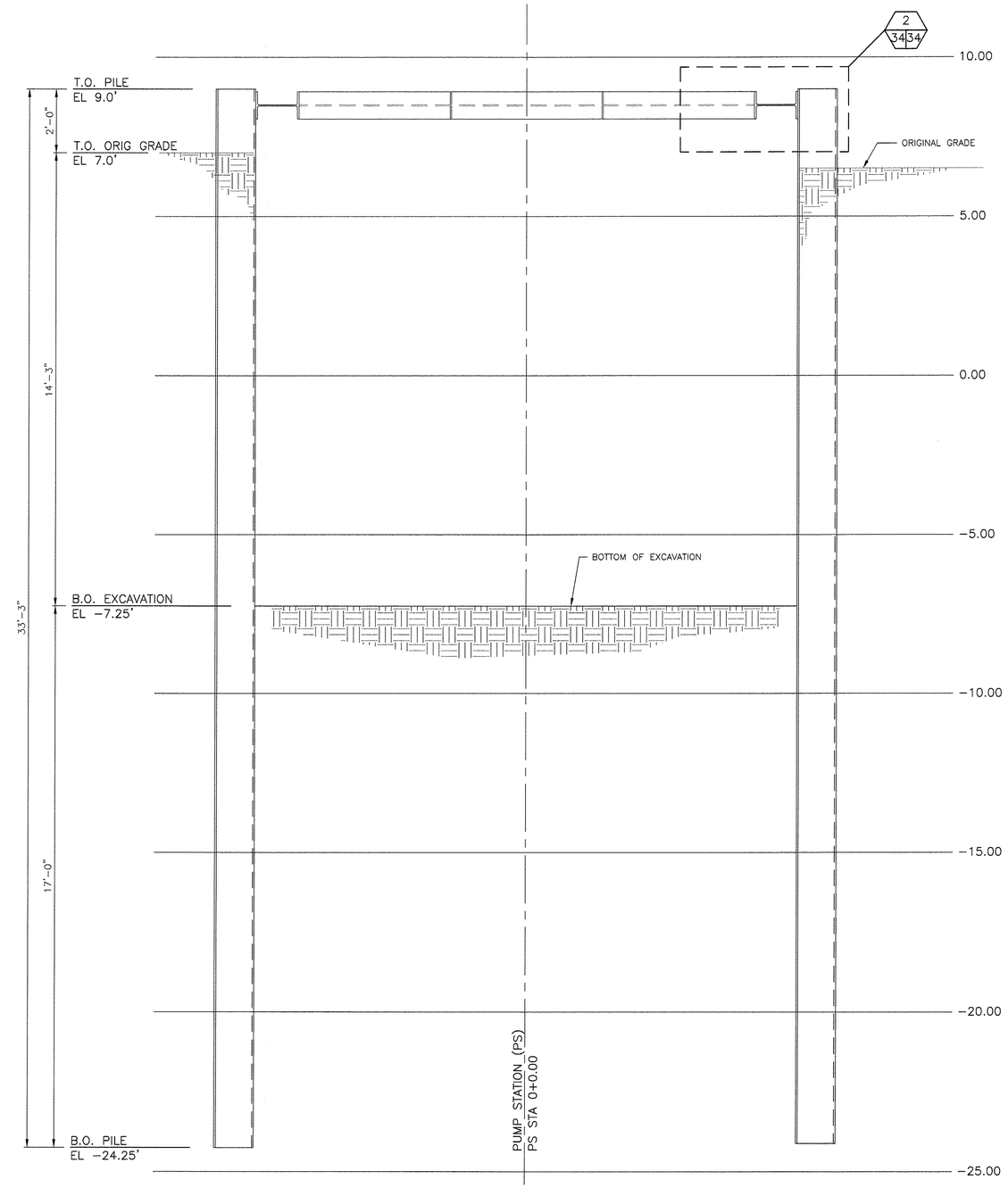


DETAIL PLAN VIEW
BRACE-TO-BRACE CONNECTION 1 34|34
SCALE: 1" = 1'



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

TEMPORARY SHORING PLAN
SCALE: 1/2" = 1'



SECTION A 34|34
SCALE: 1/2" = 1'

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

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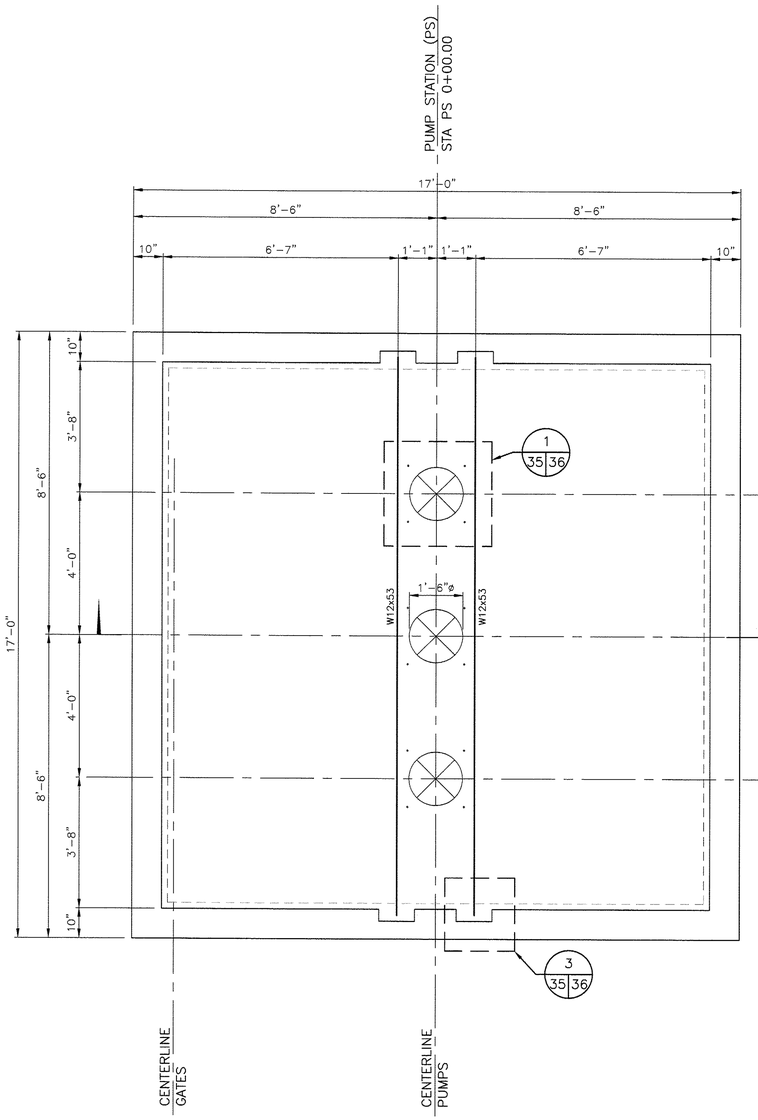
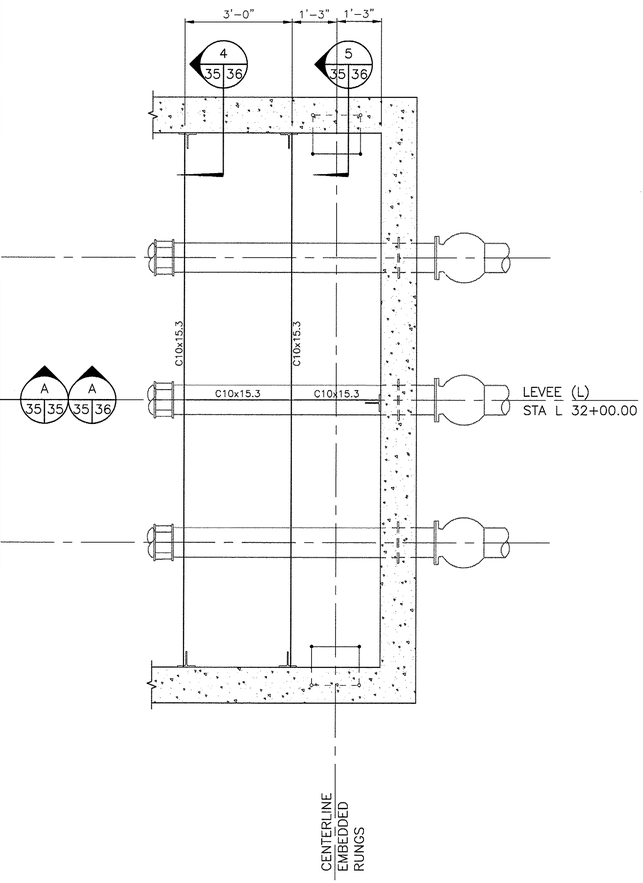
FIR ISLAND FARM
ECOSYSTEM RESTORATION
PUMP HOUSE TEMPORARY SHORING

PROJECT NO. ST:R4:11-3

SHEET 34 OF 54

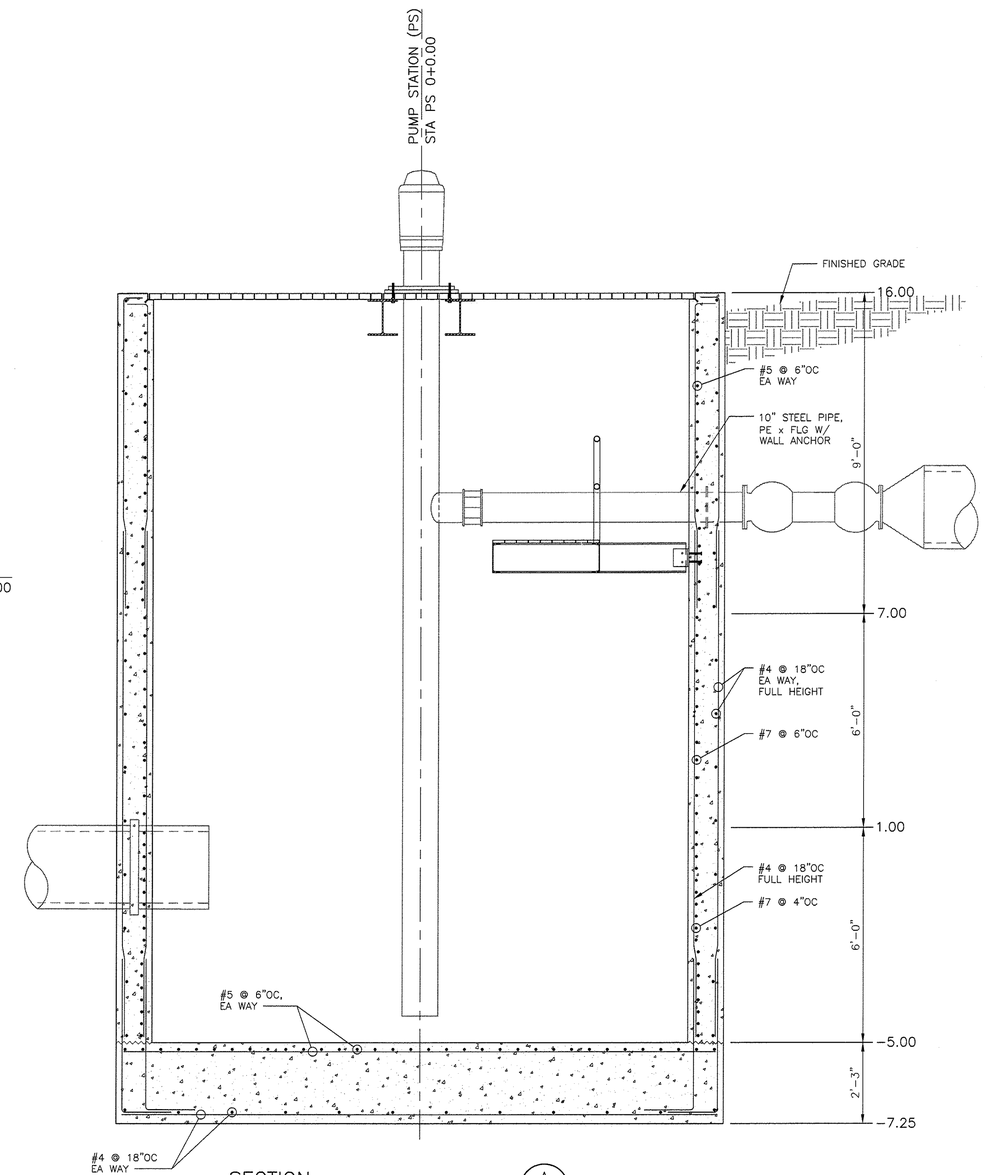


FRAMING PLAN – T.O.S. EL 15'-10"
SCALE: 1/2" = 1'



FRAMING PLAN – T.O.S. EL 9'-5"
SCALE: 1/2" = 1'

NOTE:
1. SEE SHEET 43 FOR ELECTRICAL.
2. CONTRACTOR COORDINATE CLEAR WIDTH AND BASE PLATE DIMENSIONS WITH PUMP BELL AND DISCHARGE PIPE DIMENSIONS. VERIFY COMPATIBILITY WITH ENGINEER BEFORE FORMING CONCRETE.



SECTION A 35 35
SCALE: 1/2" = 1'

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

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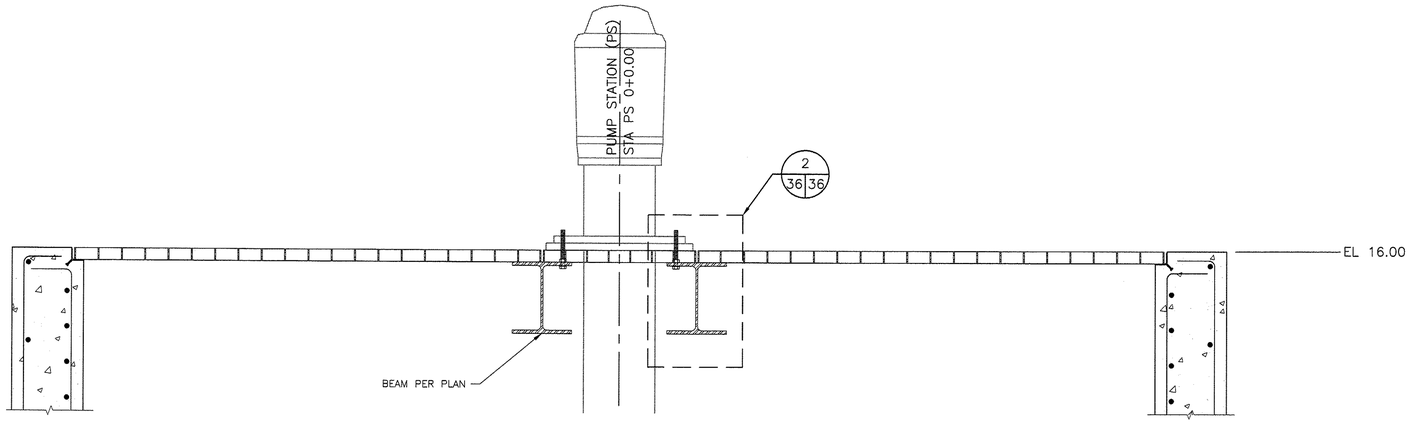
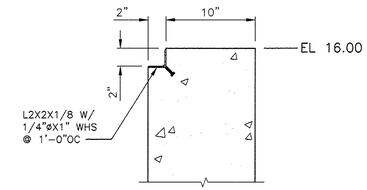
FIR ISLAND FARM
ECOSYSTEM RESTORATION
PUMP HOUSE
SUBSTRUCTURE – SHEET 1

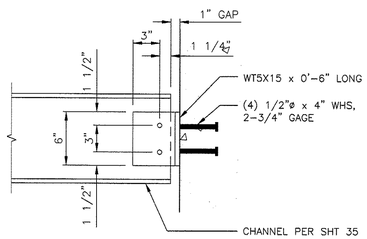
PROJECT NO. ST:R4:11-3
SHEET 35 OF 54



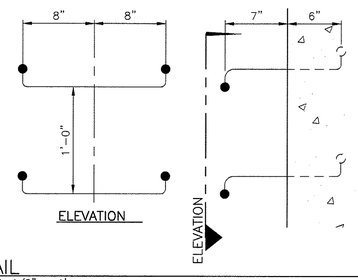
SECTION
SCALE: 1" = 1'
A
35 36



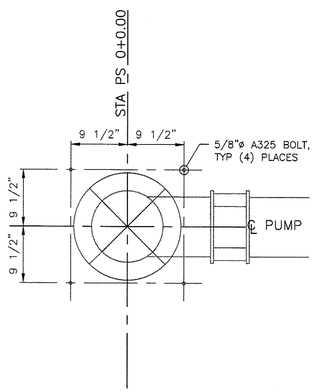
SECTION
SCALE: 1-1/2" = 1'
B
35 36



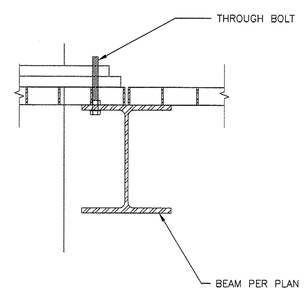
DETAIL
SCALE: 1-1/2" = 1'
4
35 36



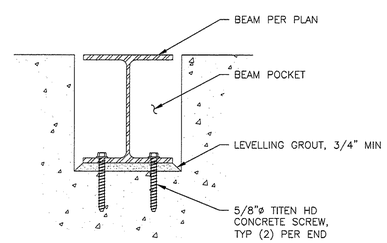
DETAIL
SCALE: 1-1/2" = 1'
5
35 36



DETAIL
SCALE: 1" = 1'
1
35 36

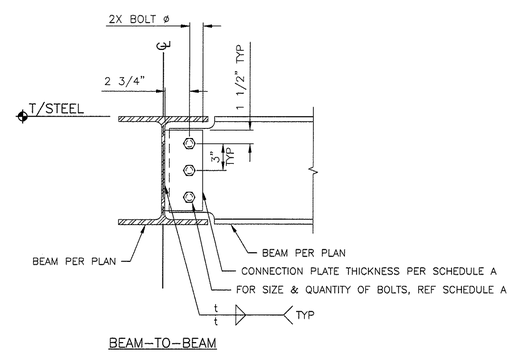


DETAIL
SCALE: 1-1/2" = 1'
2
36 36



NOTE:
1. MINIMUM POCKET LENGTH INTO WALL IS 6".

DETAIL
SCALE: 1-1/2" = 1'
3
35 36



BEAM-TO-BEAM

DETAIL
SCALE: 1-1/2" = 1'
4
32 33

STANDARD BOLTED CONNECTION SCHEDULE "A"

BEAM SIZE	BOLTS REQUIRED	MIN PLATE THICKNESS	WELD SIZE t	CONNECTION CAPACITY (SINGLE SHEAR)
C10	(2) 3/4"ø	1/4"	3/16"	16.3k
C12	(3) 3/4"ø	1/4"	3/16"	25.6k
W8	(2) 3/4"ø	1/4"	3/16"	16.3k
W10	(2) 3/4"ø	1/4"	3/16"	16.3k
W12	(3) 3/4"ø	1/4"	1/4"	25.6k

SCHEDULE NOTES:
1. FOR BEAM & COLUMN SIZE, REF PLAN.
2. PROVIDE STANDARD BOLT HOLES PER AISC.
3. CAPACITIES BASED ON AISC 13TH EDITION, TABLE 10-9A.
4. t = SIZE IN SCHEDULE A FOR SHOP WELDS;
FOR FIELD WELDS ADD 1/8" TO SIZE IN SCHEDULE A.

GRAPHIC SCALE
0 1 2 3
SCALE: 1" = 1'

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STATE OF WASHINGTON ROBB A. DIBBLE 37445 REGISTERED PROFESSIONAL ENGINEER
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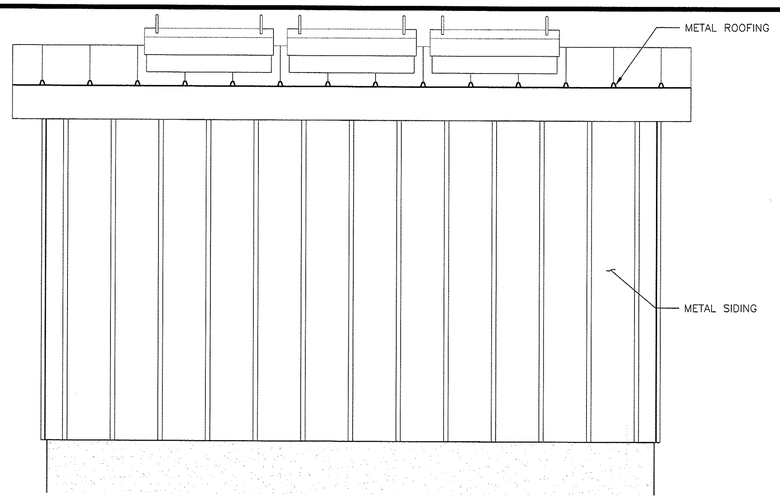
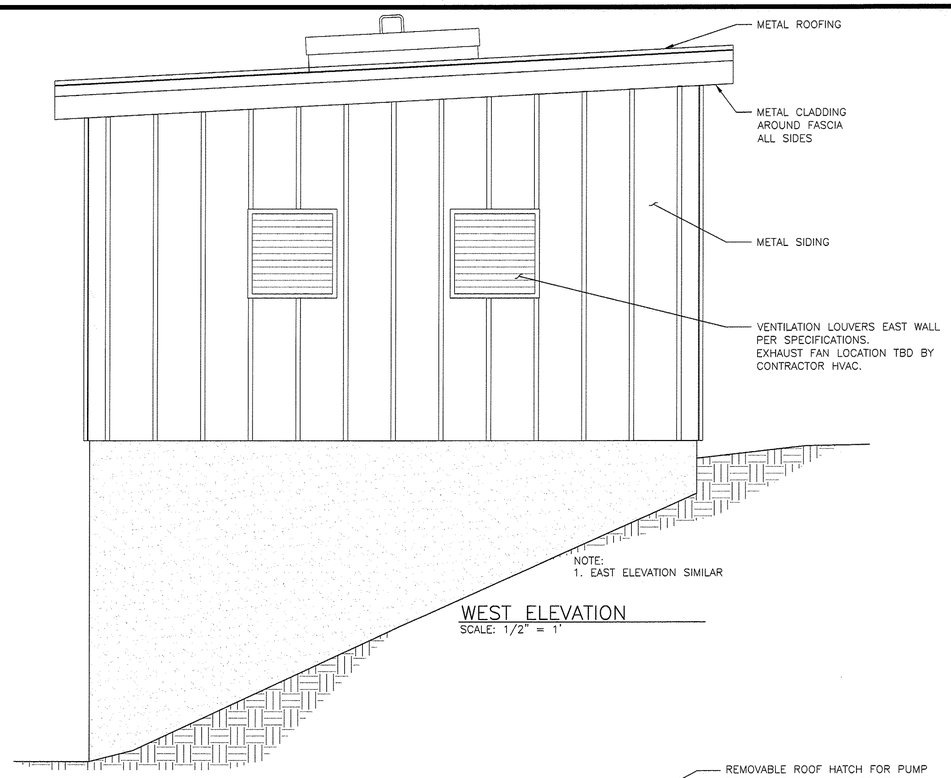
FIR ISLAND FARM
ECOSYSTEM RESTORATION
PUMP HOUSE
SUBSTRUCTURE - SHEET 2

PROJECT NO. ST:R4:11-3
SHEET 36 OF 54

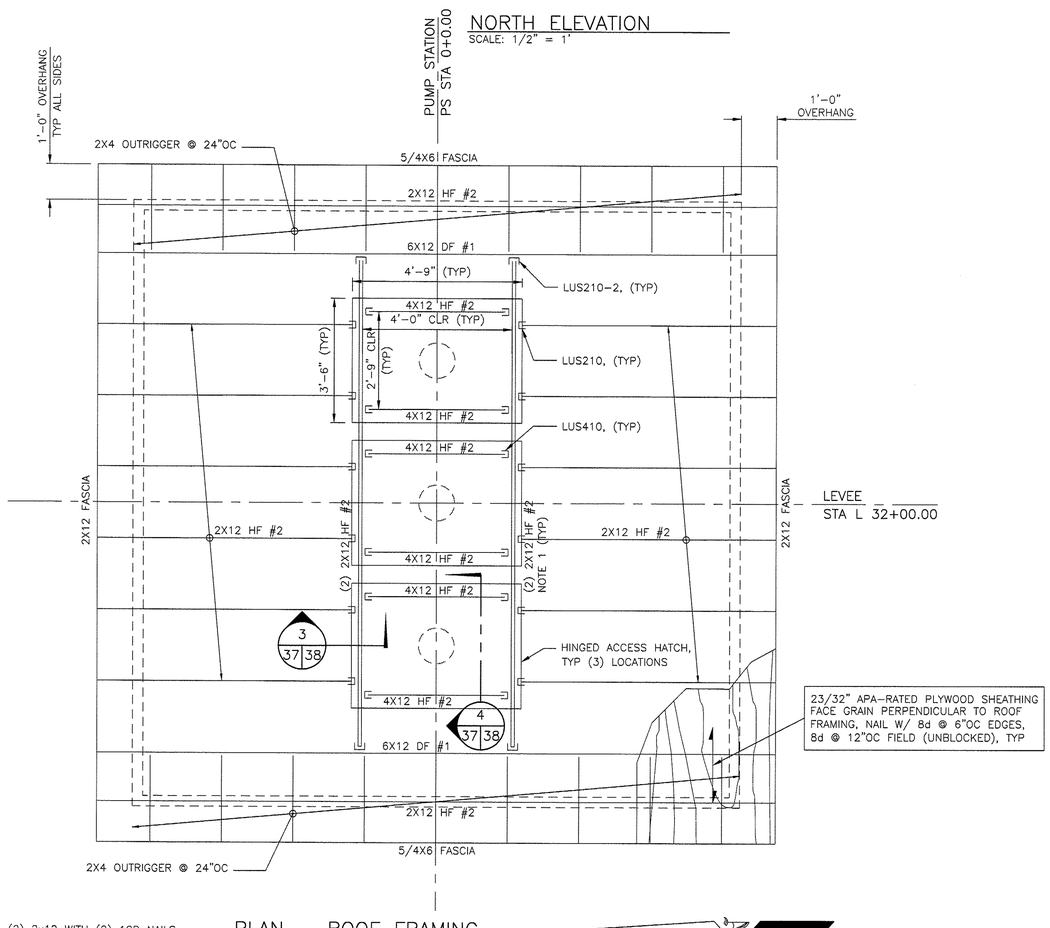


NORTH ELEVATION
SCALE: 1/2" = 1'



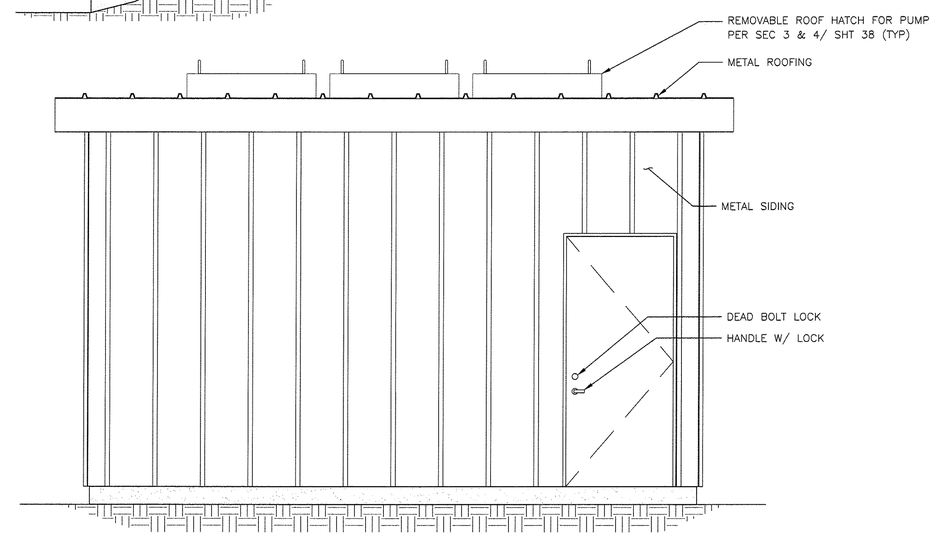
NOTE:
1. EAST ELEVATION SIMILAR

WEST ELEVATION
SCALE: 1/2" = 1'



NOTE:
1. STITCH NAIL (2) 2x12 WITH (2) 10D NAILS AT 12"OC, STAGGERED.

PLAN – ROOF FRAMING
SCALE: 1/2" = 1'



NOTE:
1. SEE SHEET 43 FOR ELECTRICAL

SOUTH ELEVATION
SCALE: 1/2" = 1'-0"

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

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FIR ISLAND FARM
ECOSYSTEM RESTORATION
PUMP HOUSE
SUPERSTRUCTURE – SHEET 1

PROJECT NO. ST:R4:11-3

SHEET 37 OF 54

SHEAR WALL HOLDOWN SCHEDULE

MODEL #	ANCHORAGE TYPE	FASTENERS	END STUD REQUIRED	CAPACITY (LBS)
DTT2Z	PAB4	(8) 1/4"ø x 2-1/2" SDS WOOD SCREWS	(2) 2x STUDS	2,145

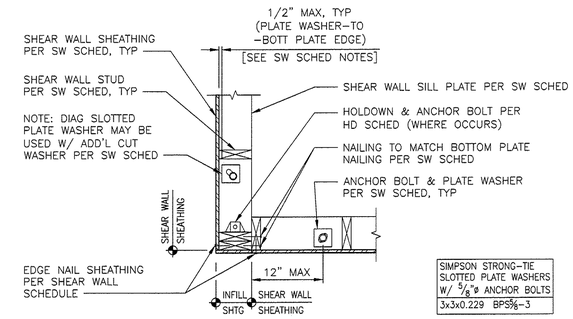
NOTES:
1. HOLDOWNS SPECIFIED ARE AS MANUFACTURED BY SIMPSON STRONG-TIE CO. INC.; ACCEPTABLE EQUIVALENT PRODUCT SUBSTITUTIONS ARE AVAILABLE FROM OTHER MANUFACTURERS WITH SER APPROVAL.
2. LOCATE ALL HOLDOWNS AT ENDS OF ALL SHEAR WALLS & FASTEN TO BUNDLED END STUDS.
3. BUNDLED END STUDS SHOULD BE STITCH-NAILED TOGETHER USING MINIMUM (2) 16D @ 10"OC, UNO.
4. ALL HOLDOWN ANCHOR BOLTS SHALL BE MIN 4" FROM CONCRETE WALL ENDS.
5. INSTALL ALL HOLDOWN HARDWARE PER MANUFACTURER'S INSTRUCTIONS & RECOMMENDATIONS.

WOOD-FRAMED SHEAR WALL SCHEDULE

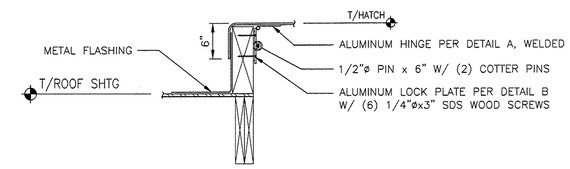
FOR HEM-FIR STUD FRAMING

SW TYPE	SW SHEATHING APA-RATED	NAIL SIZE & SPACING @ PANEL EDGES	RIM JOIST OR BLOCKING ATTACHMENT TO TOP PLATE BELOW	BOTTOM PLATE & EDGE MEMBER REQUIREMENTS		SILL PLATE REQUIREMENTS		SHEAR LOAD CAPACITY (PLF) (WIND)
				SHEAR NAILING TO WOOD FRAMING	FRAMING MEMBER AT ABUTTING PANEL EDGES	ANCHOR BOLT TO CONCRETE FOUNDATION	SILL ~P AT FOUNDATION	
SW-6	15/32" CD-EXT	0.131"ø x 2-1/2" @ 6"OC	CLIP @ 22"OC	0.148"ø x 3-1/4" @ 6"OC	2x4	5/8"ø @ 48"OC	P.T. 2x4	364

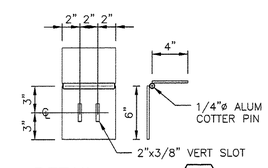
NOTES:
1. INSTALL PANELS EITHER HORIZONTALLY OR VERTICALLY
2. WHERE SHEATHING IS APPLIED ON BOTH SIDES OF WALL, PANEL EDGE JOINTS ON 2x FRAMING SHALL BE STAGGERED SO THAT JOINTS ON OPPOSITE SIDES ARE NOT LOCATED ON THE SAME STUDS.
3. BLOCKING IS REQUIRED AT ALL PANEL EDGES.
4. PROVIDE SHEAR WALL SHEATHING AND NAILING FOR ENTIRE LENGTH OF THE WALLS INDICATED ON THE PLANS. ENDS OF FULL HEIGHT WALLS ARE DESIGNATED BY WINDOWS, OR DOORWAYS OR AS DESIGNATED ON PLANS. HOLDOWN REQUIREMENTS PER PLANS.
5. SHEAR WALLS DESIGNATED AS PERFORATED SHEAR WALLS REQUIRE SHEATHING, SHEAR WALL NAILING, ETC. ABOVE AND BELOW ALL OPENINGS).
6. SHEATHING EDGE NAILING IS REQUIRED AT ALL HOLDOWN POSTS. EDGE NAILING MAY ALSO BE REQUIRED TO EACH STUD USED IN BUILT-UP HOLDOWN POSTS. ADDITIONAL INFORMATION PER HOLDOWN SCHEDULE & DETAILS.
7. INTERMEDIATE FRAMING TO BE 2X MINIMUM MEMBERS. ATTACH SHEATHING TO INTERMEDIATE FRAMING WITH 0.131"Ø x 2-1/2" NAILS AT 12"OC WHERE STUDS ARE SPACED AT 16"OC AND 0.131"Ø x 2-1/2" NAILS AT 6"OC WHERE STUDS ARE SPACED AT 24"OC.
8. BASED ON 0.131"Ø x 1-1/2" NAILS USED TO ATTACH FRAMING CLIPS DIRECTLY TO FRAMING. USE 0.131"Ø x 2-1/2" NAILS WHERE INSTALLED OVER SHEATHING.
9. FRAMING CLIPS: SIMPSON "A35" OR "LTP5" OR APPROVED EQUIVALENT.
10. ANCHOR BOLTS SHALL BE PROVIDED WITH HOT-DIPPED GALVANIZED STEEL PLATE WASHERS 3"x3"x0.229"(MIN). THE HOLE IN THE PLATE WASHER MAY BE DIAGONALLY SLOTTED 13/16"x1-3/4" PROVIDED A STANDARD CUT WASHER IS PLACED BETWEEN THE PLATE WASHER AND NUT. PLATE WASHER TO EXTEND TO WITHIN 1/2" OF THE EDGE OF THE SILL PLATE ON THE SIDE(S) WITH SHEATHING. EMBED ANCHOR BOLTS 7" MINIMUM INTO THE CONCRETE. [5/8"øx8" TITEN HD ANCHOR SCREWS MAY BE USE IN LIEU OF J-BOLTS AT EXISTING CONCRETE WITH PLATE WASHER & SPACING REQUIREMENTS PER SCHEDULE.]
11. PRESSURE TREATED MATERIAL CAN CAUSE EXCESSIVE CORROSION IN THE FASTENERS. PROVIDE HOT-DIPPED GALVANIZED (ELECTRO-PLATING IS NOT ACCEPTABLE) NAILS AND CONNECTOR PLATES (FRAMING ANGLES, ETC.) FOR ALL CONNECTORS IN CONTACT WITH PRESSURE TREATED FRAMING MEMBERS. ADDITIONAL INFORMATION PER STRUCTURAL NOTES.
12. AT ADJOINING PANEL EDGES, (2) 2x STUDS NAILED TOGETHER MAY BE USED IN PLACE OF SINGLE 3x STUD. DOUBLE 2x STUDS SHALL BE CONNECTED TOGETHER BY NAILING THE STUDS TOGETHER WITH 3" LONG NAILS OF THE SAME SPACING AND DIAMETER AS THE PLATE NAILING.
13. WHERE ABUTTING PANELS OR SILL PLATES REQUIRE 3x MINIMUM, NAIL STUDS TO 3x BOTTOM/SILL PLATES WITH EITHER (2) 0.148"øx4" END NAILS OR (4) 0.131"øx2-1/2" TOENAILS.
14. CONTACT THE STRUCTURAL ENGINEER OF RECORD FOR ADHESIVE OR EXPANSION BOLT ALTERNATIVES TO CAST-IN-PLACE ANCHOR BOLTS. SPECIAL INSPECTION MAY BE REQUIRED.



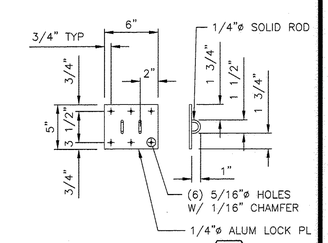
SECTION 2/38 38
SCALE: 3/4" = 1'



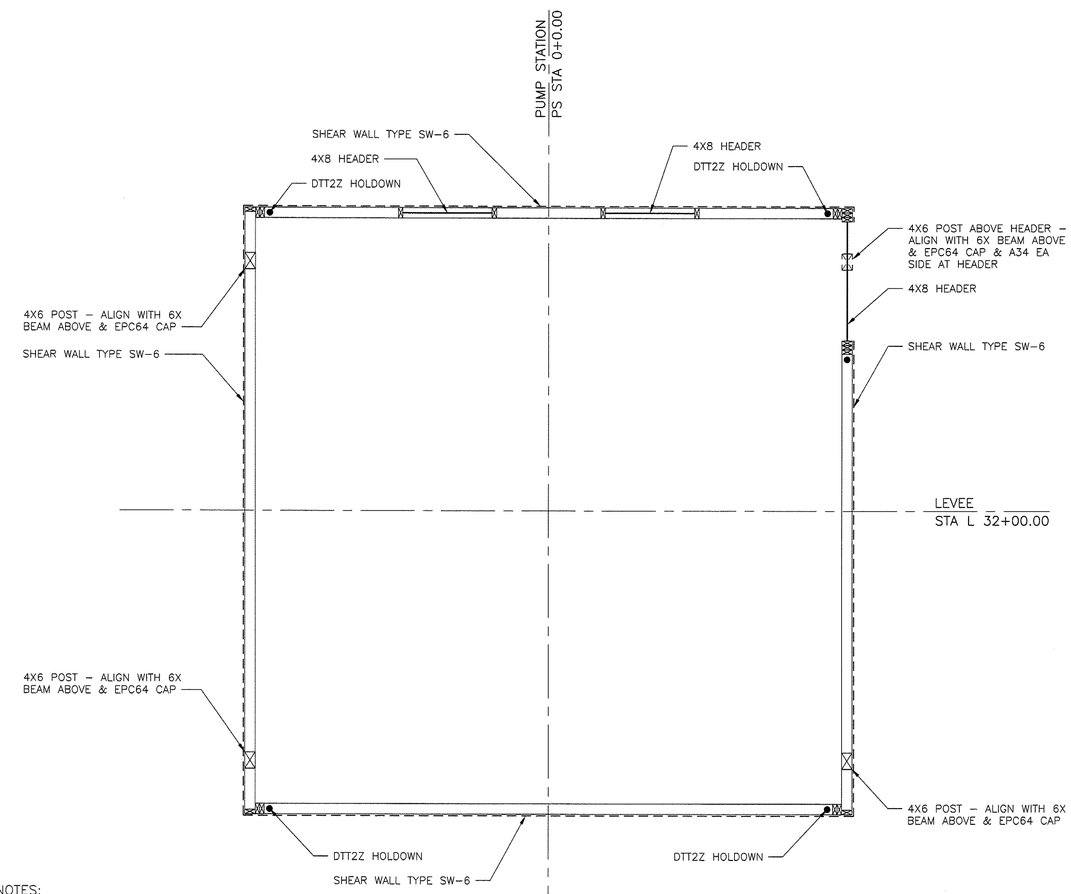
SECTION 3/37 38
SCALE: 1" = 1'



DETAIL A/38 38
SCALE: 1-1/2" = 1'

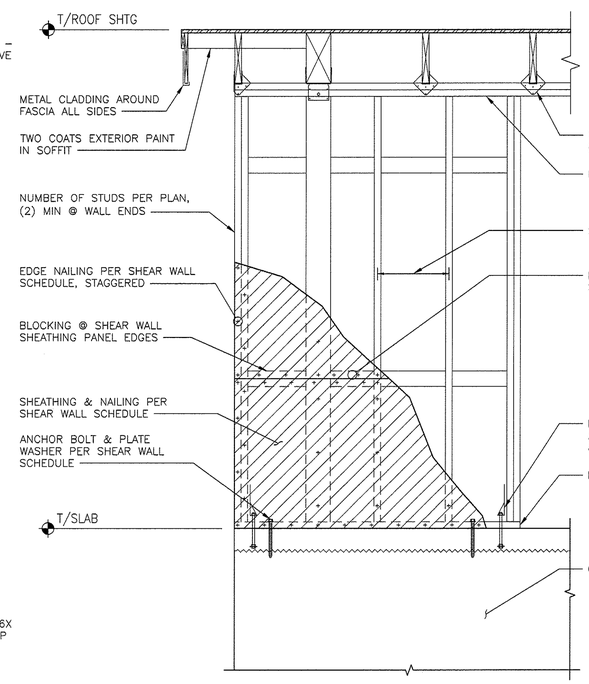


DETAIL B/38 38
SCALE: 1-1/2" = 1'

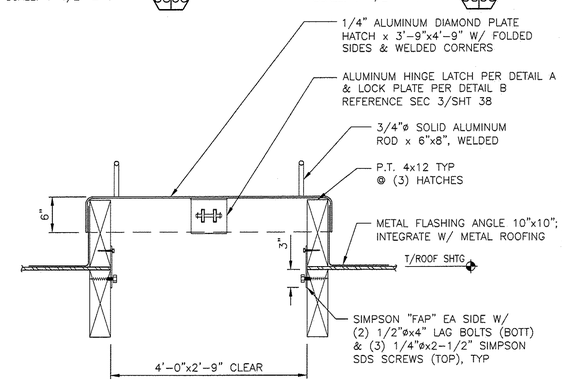


NOTES:
1. COORDINATE STUD LAYOUT TO ACCOMODATE ELECTRICAL PANELS AND PUMP CONTROLS. BORDER OPENINGS WITH DOUBLE STUDS.

PLAN - WALL FRAMING
SCALE: 1/2" = 1'



SECTION 1/38 38
SCALE: 3/4" = 1'



SECTION 4/37 38
SCALE: 1" = 1'

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

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ROBB A. DIBBLE, STATE OF WASHINGTON, 37445, REGISTERED PROFESSIONAL ENGINEER
5/1/15

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 7 MAY 15
PROGRAM ..... DATE: .....

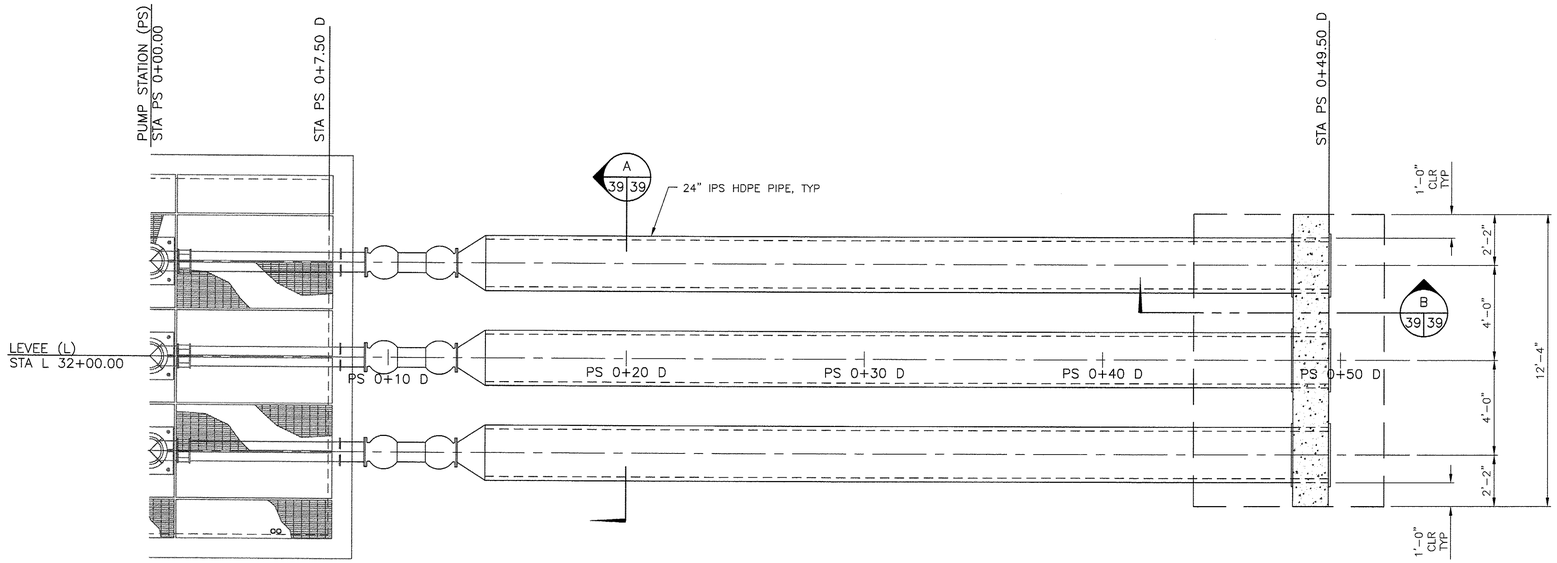
0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY PRC
CHECKED BY RAD
DRAWN BY TTP
DATE MAR 2015

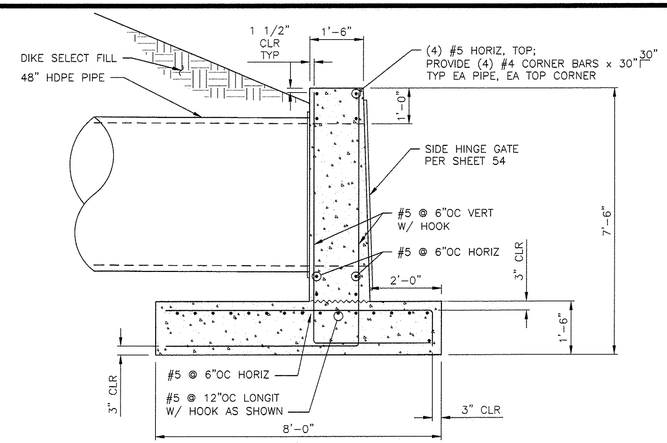
FIR ISLAND FARM
ECOSYSTEM RESTORATION
PUMP HOUSE
SUPERSTRUCTURE - SHEET 2

PROJECT NO. ST:R4:11-3

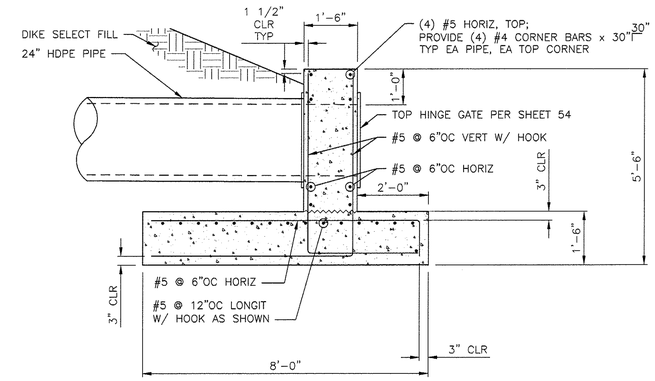
SHEET 38 OF 54



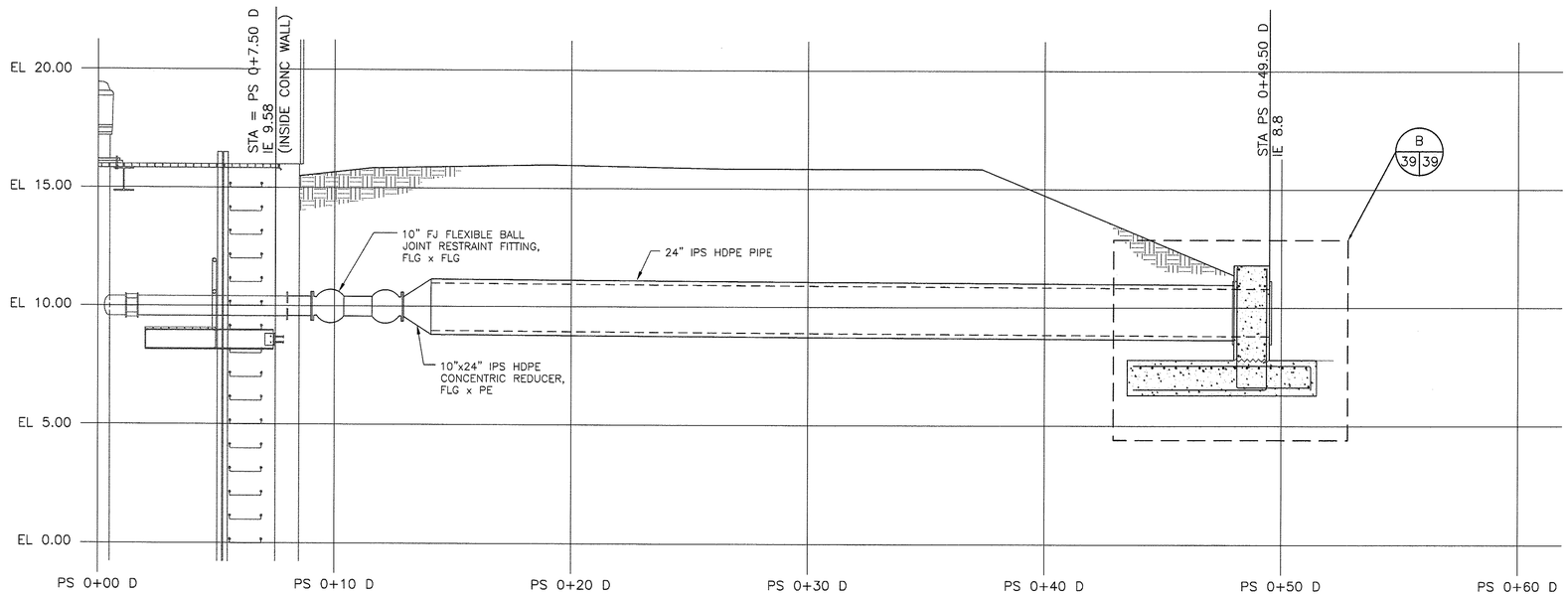
PLAN
SCALE: 1" = 3'



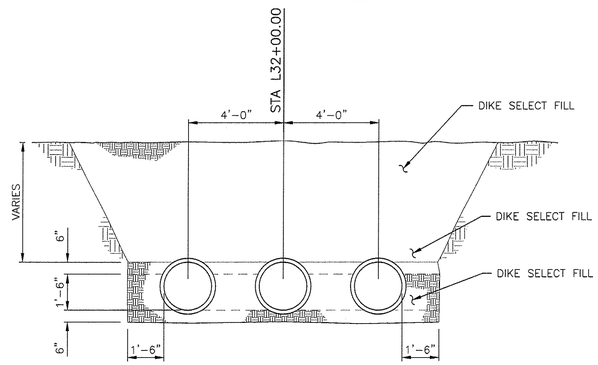
SECTION AT 48" PIPE
SCALE: 1" = 2'
1 / 54 39



SECTION AT 24" PIPE
SCALE: 1" = 2'
B / 39 39



PROFILE
SCALE: 1" = 3'



SECTION STA PS 0+20 D
SCALE: 1" = 3'
A / 39 39

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

DIBBLE ENGINEERS, INC.
PROFESSIONAL STRUCTURAL ENGINEERING SERVICES
1029 Market Street, Kirkland, WA 98033
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Robb A. Dibble, PE, Principal
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WWW.DIBBLEENGINEERS.COM

WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

ROBB A. DIBBLE, STATE OF WASHINGTON, 37445, REGISTERED PROFESSIONAL ENGINEER, 3/17/15

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: 3/17/2015
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

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CHECKED BY RAD
DRAWN BY TTP
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
DISCHARGE PIPELINES PLAN AND PROFILE

PROJECT NO. ST:R4:11-3
SHEET 39 OF 54

ELECTRICAL PLAN

———	CONDUIT AND WIRES. CONDUIT AND WIRES ARE 3/4" CONDUIT WITH 2#12, #12G UNLESS NOTED OTHERWISE.
— — — —	CONDUIT AND WIRES UNDERGROUND
	DUPLEX RECEPTACLE
WP	WEATHERPROOF DUPLEX RECEPTACLE
GFI	GROUND FAULT CIRCUIT INTERRUPTER DUPLEX RECEPTACLE
J	JUNCTION BOX
	PANEL
T	TRANSFORMER
M	METER

ELECTRICAL DIAGRAM

	TRANSFORMER
	LIGHT FIXTURE
R	RED INDICATING LIGHT
	CIRCUIT BREAKER
	CONTACT
C	CONTACTOR COIL
	SWITCH
	FUSE
PC	PHOTOCONTROL
TC	TIMECLOCK

ABBREVIATIONS

A	AMPS
AWG	AMERICAN WIRE GUAGE
BKR	BREAKER
C	CONDUIT
CKT	CIRCUIT
CO	CONDUIT ONLY
CT	CURRENT TRANSFORMER
CU	COPPER
G, GND	GROUND
KCM	THOUSAND CIRCULAR MILS
KVA	KILOVOLT AMPS
LCP	LIGHTING CONTROL PANEL
LP	LIGHTING POLE WITH LIGHT FIXTURES
MCB	MAIN CIRCUIT BREAKER
N	NEUTRAL
NEC	NATIONAL ELECTRIC CODE
PH	PHASE
PNL	PANEL
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
V	VOLTS
VF	VARIABLE FREQUENCY
W	WATTS, WIRE
WAC	WASHINGTON ADMINISTRATIVE CODE
WSEC	WASHINGTON STATE ENERGY CODE

ELCON ASSOCIATES, INC
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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DEAN C. RALPHS — STATE OF WASHINGTON — 37489 — REGISTERED PROFESSIONAL ENGINEER — 3/17/15

SYM	DATE	REVISION DESCRIPTION	BY
	02/15	DRAFT FINAL – NOT FOR CONSTRUCTION	JT

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: 17 Mar 15

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

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

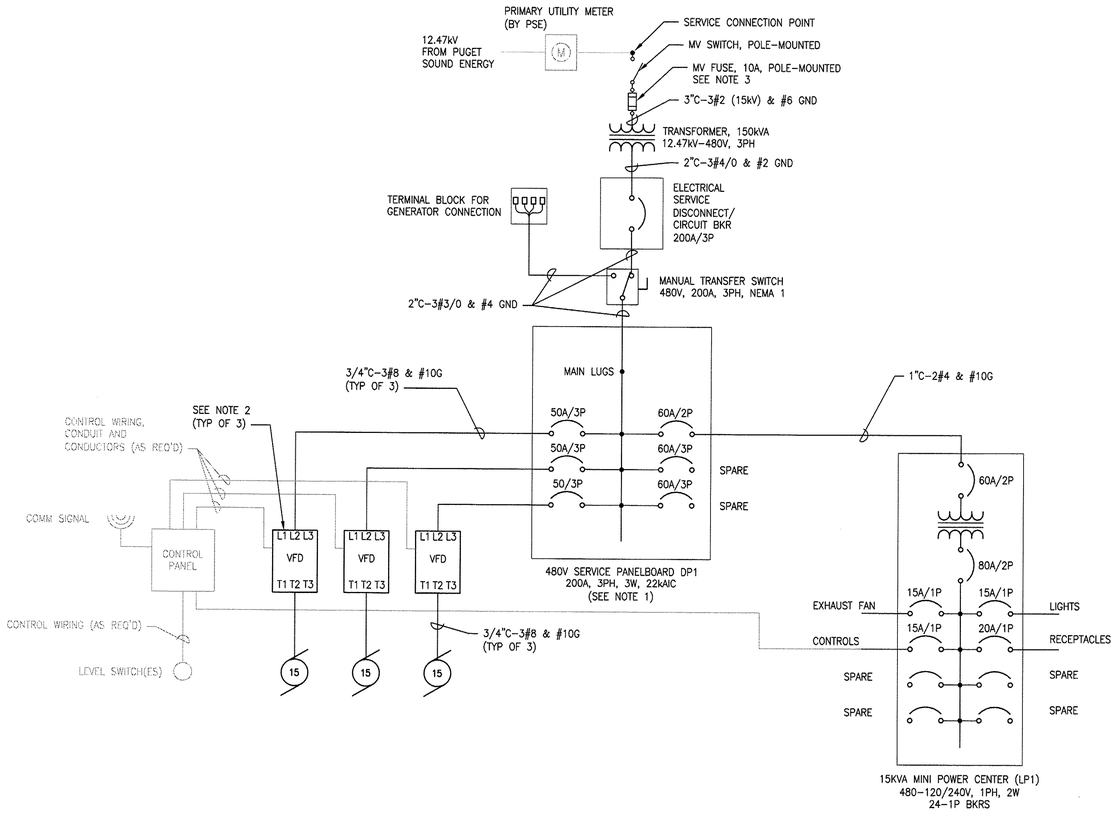
DESIGNED BY JWT
CHECKED BY SAB
DRAWN BY SAB
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
ELECTRICAL
LEGEND & ABBREVIATIONS

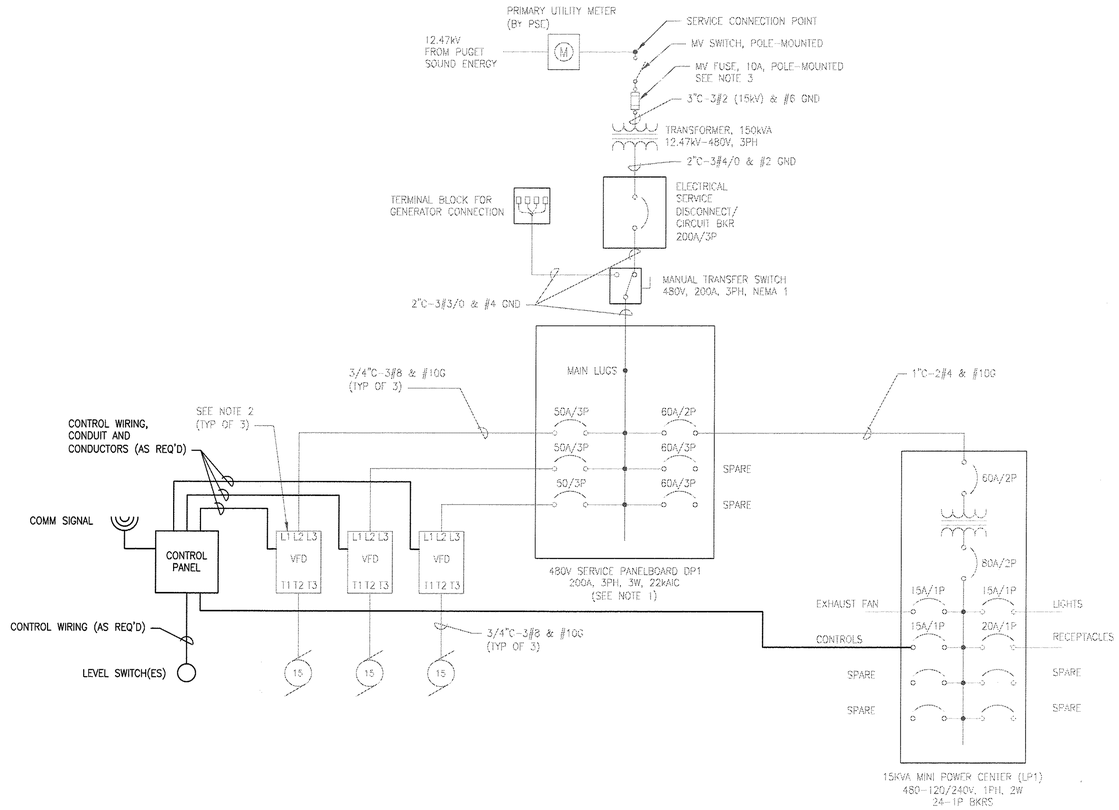
PROJECT NO. ST:R4:11-3

SHEET 40 OF 54

FILENAME: R:\5622-001 (00)\Drawings\R0411.3-S00.dwg DATE: 03-16-2015 LOGIN: jeff



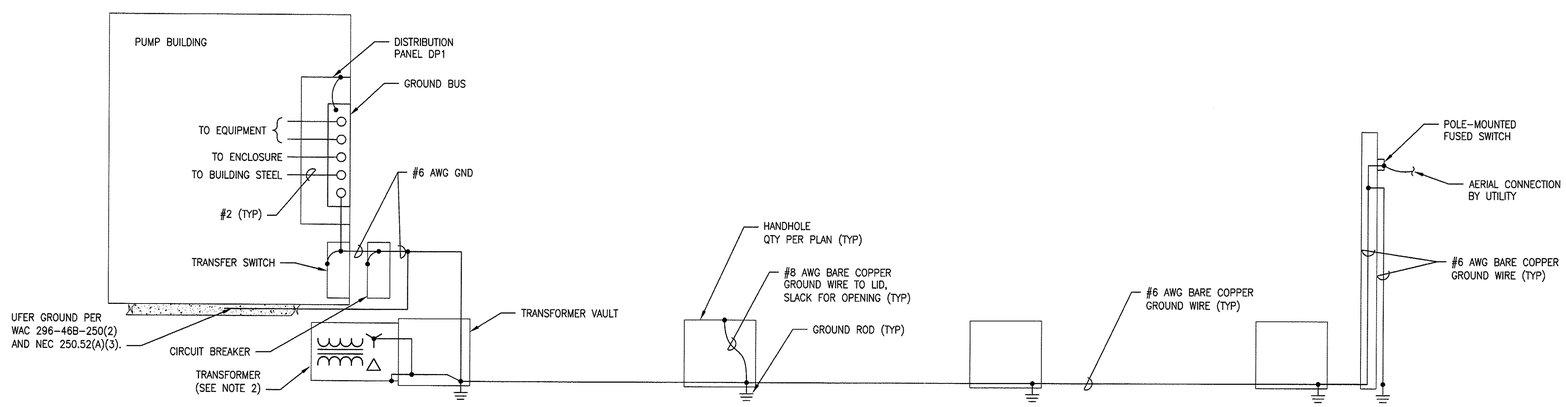
ONE LINE DIAGRAM
SCALE: NTS



CONTROL SCHEMATIC DIAGRAM
SCALE: NTS

NOTES:

1. CONNECT THREE CIRCUIT WIRES FOR 3-PHASE SERVICE. NEUTRAL WIRE IS NOT PROVIDED. 277V IS NOT REQUIRED.
2. BOND TRANSFORMER ENCLOSURE AND UNUSED NEUTRAL TO GROUND SYSTEM.
3. FUSE SIZE SHOWN BASED ON MAXIMUM LOAD. VERIFY COORDINATION WITH UTILITY PROTECTIVE DEVICE.



GROUNDING DIAGRAM
SCALE: NTS

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DEAN C. RALPHS, STATE OF WASHINGTON, 37489, REGISTERED PROFESSIONAL ENGINEER — 3/19/15

SYM	DATE	REVISION DESCRIPTION	BY
	02/15	DRAFT FINAL – NOT FOR CONSTRUCTION	JT

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: 19 Mar 15
PROGRAM ..... DATE: .....

0 — 1"
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ONE INCH ON
ORIGINAL DRAWINGS

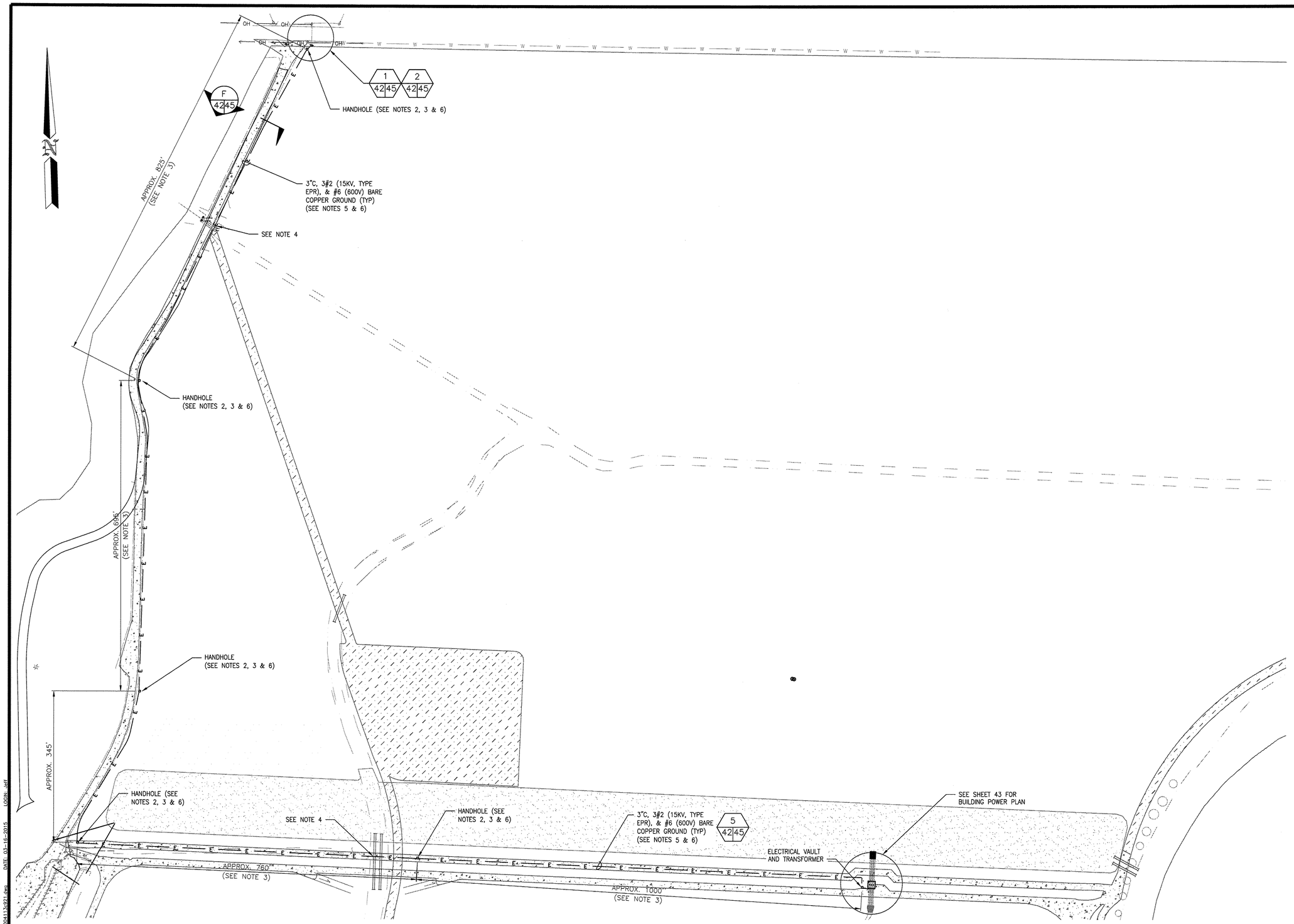
DESIGNED BY JWT
CHECKED BY SAB
DRAWN BY JWT
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
ELECTRICAL
DIAGRAMS

PROJECT NO.
ST:R4:11-3

SHEET 41 OF 54

FILENAME: R:\5662-001.00\Drawings\R0041132-S11.dwg DATE: 03-16-2015 LOGIN: jeff



NOTES:

1. INSTALL SCH 40 PVC CONDUIT 36" MIN. BELOW GRADE.
2. CONTRACTOR SHALL PROVIDE AND INSTALL HANDHOLE AND CONDUIT. CONDUITS SHALL BE INSTALLED THROUGH MOUSEHOLES OR KNOCKOUTS. CONTRACTOR SHALL SEAL CONDUITS AND PENETRATIONS AFTER CABLE INSTALLATION WITH WEATHERPROOF DUCT SEAL. SEE DETAIL 2, SHEET 45.
3. PROVIDE EXCAVATION FOR HANDHOLES AT APPROXIMATE DISTANCES SHOWN. DISTANCES MAY BE ADJUSTED DEPENDING ON CONDITIONS.
4. INSTALL CONDUIT 24" ABOVE TIDEGATE AND CULVERT. MAINTAIN MINIMUM 36" COVER. COORDINATE INSTALLATION WITH CIVIL.
5. RUN CONDUIT FROM FIR ISLAND ROAD TO HANDHOLE AT MAINTENANCE ROAD ALONG EDGE OF EXISTING ACCESS ROAD INSIDE (WEST OF) FENCE LINE. INSTALL CONDUIT ON DIKE ALONG CENTER OF MAINTENANCE ROAD. COORDINATE WITH CIVIL FOR EXACT LOCATIONS.
6. CONTRACTOR SHALL PROVIDE EXCAVATION, TRENCHES AND BACKFILL, HANDHOLES, INCLUDING ELECTRICAL VAULT, POWER AND GROUND CONDUCTORS, PRIMARY DISCONNECT SWITCH AND FUSES, AND TRANSFORMER.
7. INSTALL RED, PLASTIC, WARNING TAPE ABOVE CONDUIT IN TRENCH, MARKED "CAUTION – ELECTRIC CABLE BELOW" OR EQUIVALENT.
8. INSTALL POWER LINE MARKERS ABOVE GRADE EVERY 500' ALONG POWER ALIGNMENT.
9. CONDUIT LOCATION TO BE CONFIRMED BY ENGINEER PRIOR TO START OF EXCAVATIONS AN INSTALLATIONS.

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DEAN C. RALPHS — STATE OF WASHINGTON — 37489 — REGISTERED PROFESSIONAL ENGINEER — 3/19/15

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APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: 17 Mar 15

PROGRAM ..... DATE:

0 — 1"
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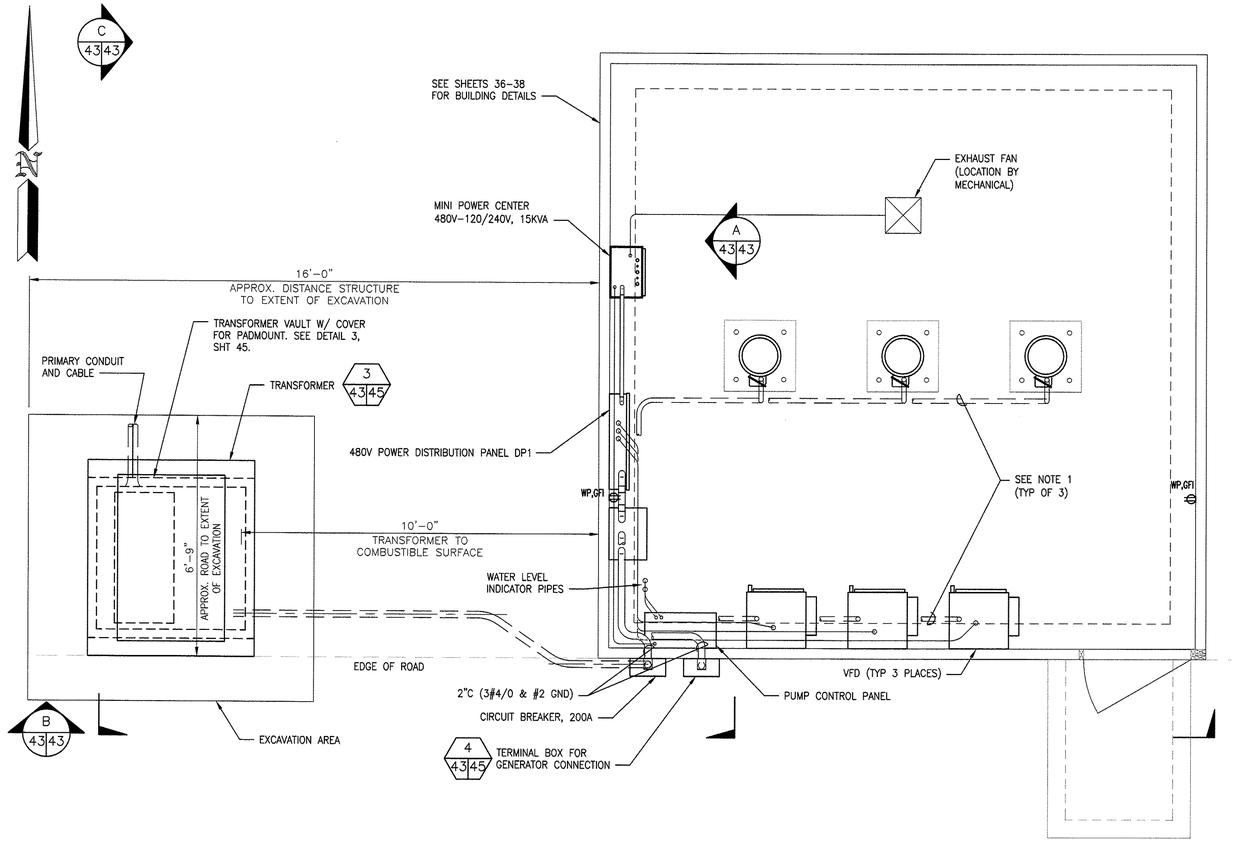
DESIGNED BY JWT
CHECKED BY SAB
DRAWN BY JWT
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
ELECTRICAL
SITE PLAN – FEEDER LAYOUT

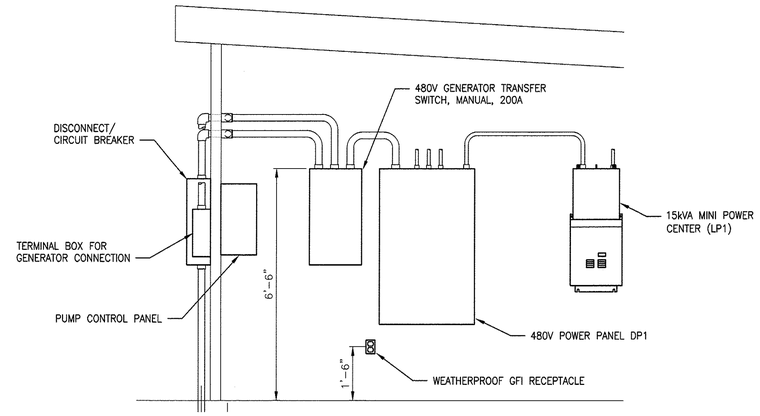
PROJECT NO. ST:R4:11-3

SHEET 42 OF 54

FILENAME: P:\5662-001\DWG\Drawings\1502411\3-921.dwg DATE: 03-16-2015 LOGIN: jeff



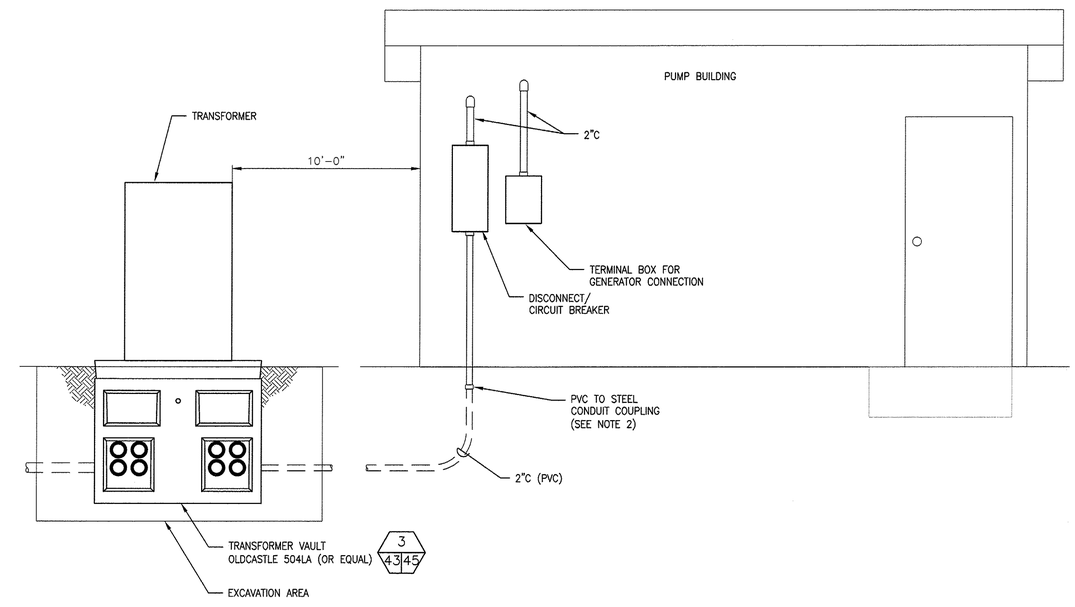
POWER PLAN
SCALE: 1/2" = 1'-0"



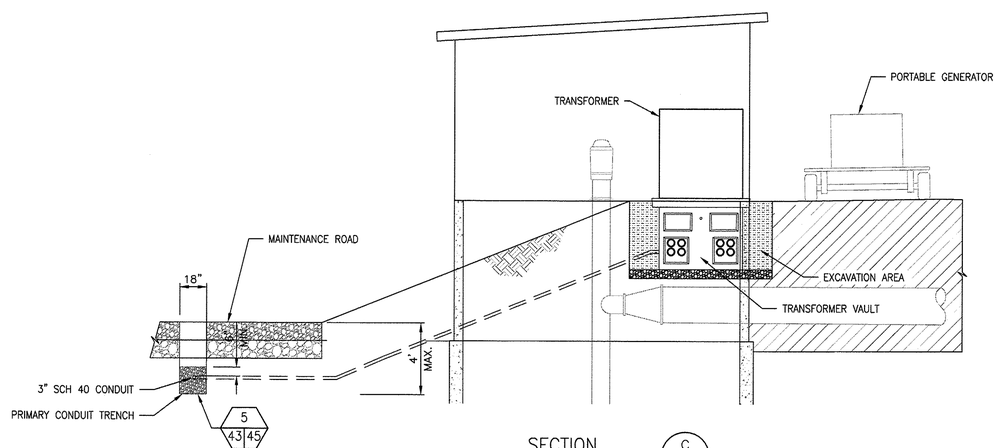
SECTION A 43 43
SCALE: 1/2" = 1'-0"

NOTES:

1. INSTALL CONDUIT UNDER GRATING ALONG FLOOR BEAMS FROM VFD'S TO PUMP MOTOR PENETRATIONS. INSTALL LIQUID-TIGHT FLEXIBLE METAL CONDUIT FROM END OF STEEL CONDUIT TO MOTOR BOX.
2. MAKE TRANSITION FROM PVC TO STEEL CONDUIT BELOW GRADE. METAL CONDUIT IN CONTACT WITH EARTH OR ENCASED IN CONCRETE SHALL BE WRAPPED IN 10 MIL TAPE MIN. 1/2 OVERLAP.
3. COORDINATE FINAL EQUIPMENT LAYOUT WITH WDFW ENGINEER BEFORE INSTALLATION.



SECTION B 43 43
SCALE: 1/2" = 1'-0"



SECTION C 43 43
SCALE: 1/4" = 1'-0"

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

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DEAN C. RALPH, STATE OF WASHINGTON, 37489, REGISTERED PROFESSIONAL ENGINEER — 3/12/15

SYM	DATE	REVISION DESCRIPTION	BY
	02/15	DRAFT FINAL - NOT FOR CONSTRUCTION	JT

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: 17 March 15
PROGRAM ..... DATE: .....

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DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
ELECTRICAL
PUMP HOUSE POWER PLAN

PROJECT NO. ST:R4:11-3
SHEET 43 OF 54

FILENAME: G:\5692-001\02\Drawings\0000113-5972.dwg DATE: 03-18-2015 LOGIN: JJH

LIGHTING CONTROL SCHEDULE

ROOM NO.	AREAS SERVED	CONTROL GROUP	FIXTURE TYPE	PANEL CIRCUIT NO.	LOAD WATTS	USER INTERFACE		MOTION SENSOR			DIMMING CONTROL TYPE	PHOTOCELL CONTROL			TIME BASED CONTROL		NOTES
						DEVICE	ON FUNCTION	TECHNOLOGY	INTEGRAL TO FIXTURE	OTHER MOUNTING		PROVIDE	DESIGN FC TARGET	INTEGRAL TO FIXTURE	PROVIDE	TIME SCHEDULE	
	ELEC/MECH SPACE	a	1		104	TWS	MANUAL				ND						WSEC C405.2.2 EXCEPTION 3
	MAIN ENTRY DOOR	b	2		37	TWS	AUTO	PIR	Y	n/a	ND	Y	10	Y			TWS PROVIDES MANUAL OVERRIDE 'OFF'.

NOTES:

1. SURFACE MOUNT LIGHT FIXTURES TO CEILING. INSTALL UNISTRUT (OR EQUAL) CHANNEL AS NEEDED TO FACILITATE INSTALLATION.
2. INSTALL OUTDOOR SCONCE FIXTURE 12" ABOVE DOOR.
3. INSTALL #12AWG THWN WIRE IN CONDUIT TO LIGHT FIXTURES. SLASHES INDICATE HOT, NEUTRAL, AND GROUND WIRES REQUIRED.
4. INSTALL LIGHTING CONTROL EQUIPMENT, CONDUIT AND WIRING PER LIGHTING CONTROL MANUFACTURER'S RECOMMENDATIONS.

LIGHTING CONTROLS LEGEND

PIR	PASSIVE INFRARED MOTION SENSOR
TWS	LINE VOLTAGE TOGGLE WALLSWITCH
C,W	REMOTE MOTION SENSOR(S) WITH CEILING OR WALL MOUNT. EITHER LINE VOLTAGE OR LOW VOLTAGE WITH POWER PACK RELAY.
ND	NON-DIMMING
Y	YES
FC	FOOTCANDLE

GENERAL NOTES FOR LIGHTING CONTROLS SCHEDULE (WSEC):

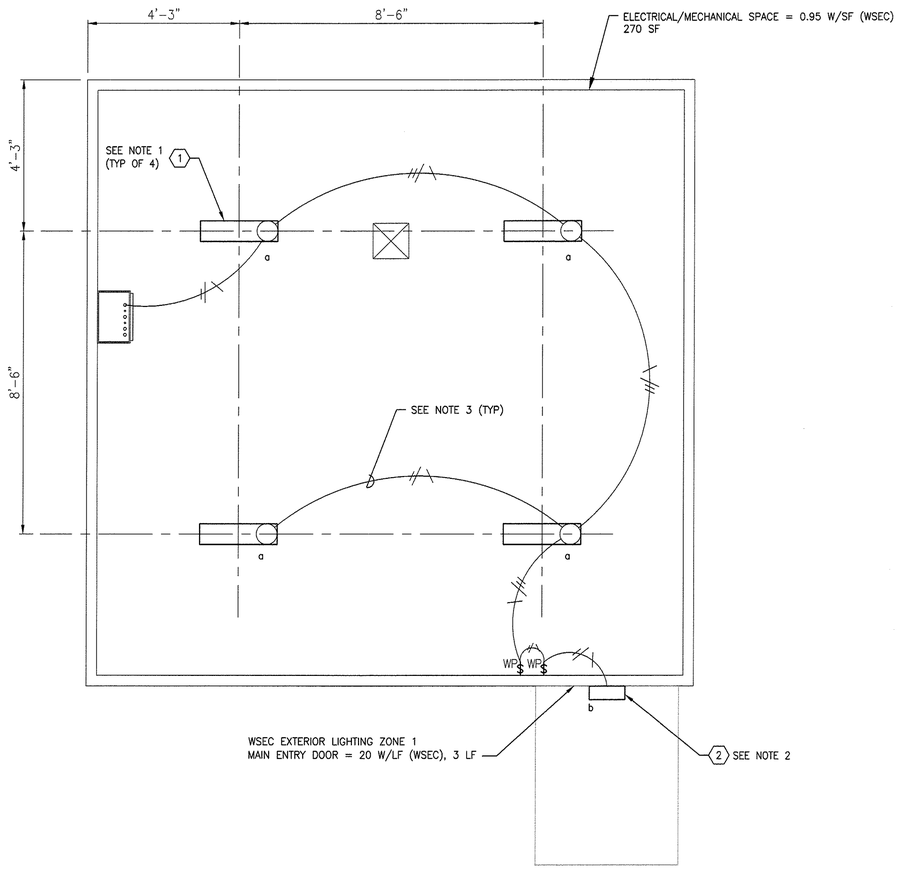
1. ALL MOTION SENSORS TO TIME OFF AFTER 15 MINUTES OF NON-ACTIVITY.
2. ALL LIGHTING CONTROL EQUIPMENT SHALL BE COMPLIANT WITH 2012 WSEC REQUIREMENTS.
3. ALL EQUIPMENT MUST BE RATED FOR 10 DEG F MINIMUM.

COMMISSIONING FOR LIGHTING CONTROLS (WA)

FOR LIGHTING CONTROLS THAT INCLUDE DAYLIGHT OR OCCUPANT SENSING AUTOMATIC CONTROLS, AUTOMATIC SHUT-OFF CONTROLS, OCCUPANCY SENSORS, OR AUTOMATIC TIME SWITCHES: THE LIGHTING CONTROLS SHALL BE TESTED, CALIBRATED AND ADJUSTED, SEQUENCES OF OPERATION SHALL BE TESTED TO ENSURE THAT THEY OPERATE IN ACCORD WITH SPECIFICATIONS AND APPROVED PLANS, AND A COMPLETE REPORT OF TEST PROCEDURES AND RESULTS SHALL BE FILED WITH THE OWNER IN ACCORDANCE WITH WASHINGTON STATE ENERGY CODE SECTION C408. COMMISSIONING TO BE PERFORMED BY LIGHTING CONTROL VENDOR REPRESENTATIVE OR OTHER QUALIFIED PERSON.

LUMINAIRE SCHEDULE

ITEM NO.	LAMP TYPE	VOLTS	LOAD (WATTS)	LUMINAIRE DESCRIPTION	LAMPS TYPE & COLOR TEMP	FINISH	MOUNTING	MANUFACTURER/ SERIES #
1	LED	120V	26	2' LENSED VAPORTITE FIXTURE, NON-CORROSIVE MOLDED FIBERGLASS REINFORCED POLYESTER HOUSING, NOMINAL 0.13" THICK DR ACRYLIC CREPE LENS, STAINLESS STEEL CAM LATCHES, INTEGRAL LED LIGHT BOARDS AND DRIVER, L70 50,000 HOUR LIFE, DESIGNED FOR USE AT 10°F MINIMUM, UL LISTED FOR WET LOCATIONS, NOMINAL 2265 TOTAL LUMINAIRE LUMENS	(1) 26W LED DRIVER (4000°K)	WHITE	SURFACE/ PENDANT	DAYBRITE #V2 OR APPROVED EQUAL
2	LED	120V	27	DIRECT FULL CUTOFF WALLPACK, NOMINAL 13-3/4" WIDE x 6-3/8" HIGH x 10" DEEP, DIE CAST AL HOUSING, INTEGRAL CAST AL HEAT SINK, PRECISION MOLDED ACRYLIC LENS WITH INTEGRAL OPTICS, TYPE 2 MEDIUM BEAMSPREAD, INTEGRAL LED LIGHT BOARD AND DRIVER, INTEGRAL MOTION/AMBIENT LIGHT SENSOR FOR LESS THAN 15' MOUNTING HEIGHTS, FULLY SEALED AND GASKETED, POLYESTER POWDER COAT FINISH, UL LISTED FOR WET LOCATIONS, NOMINAL 2296 TOTAL LUMINAIRE LUMENS	(1) 27W LED DRIVER (4000°K)	STANDARD COLOR	WALL	LITHONIA #DSXW1 LED OR APPROVED EQUAL



LIGHTING PLAN
SCALE: 1/2" = 1'-0"

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

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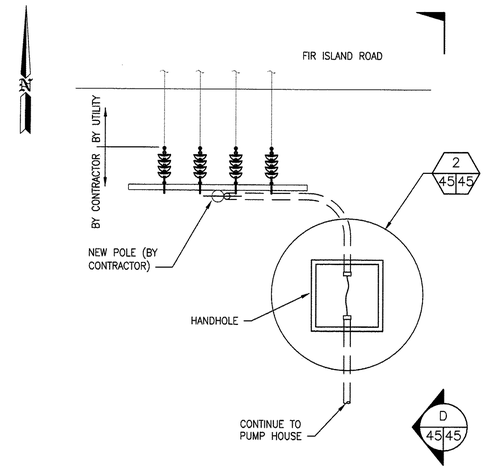
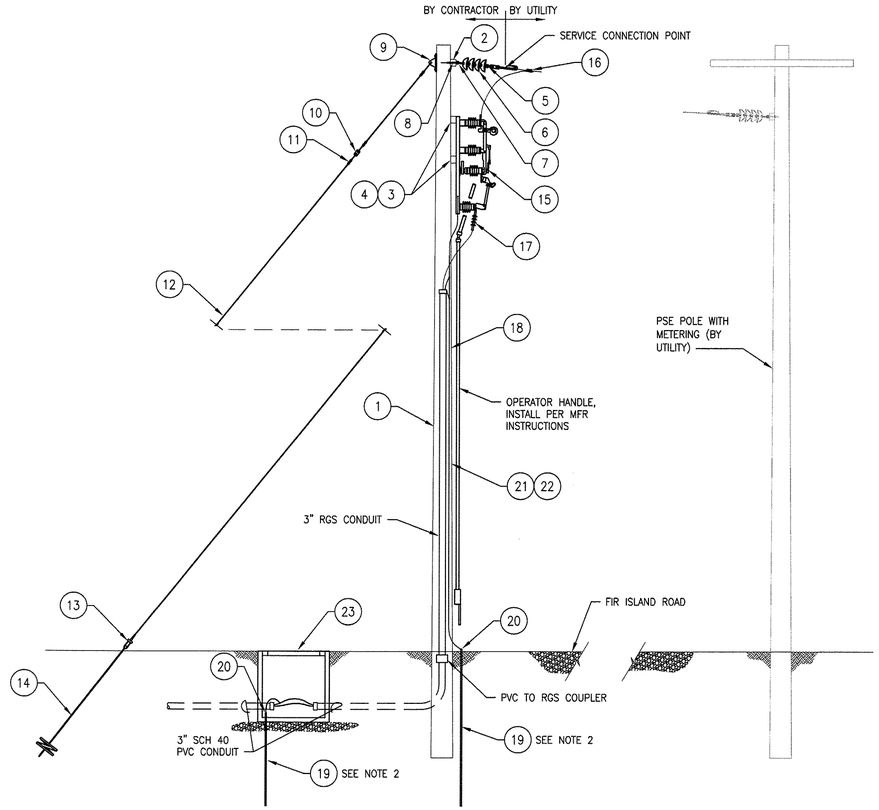
FIR ISLAND FARM
ECOSYSTEM RESTORATION
ELECTRICAL
PUMP HOUSE LIGHTING PLAN

PROJECT NO. ST:R4:11-3
SHEET 44 OF 54

FILENAME: G:\5602-001-00\Drawings\G09411-3-941.dwg DATE: 03-16-2015 LOGIN: Jeff



DETAIL (1 / 42 45)
SCALE: 1/4" = 1'-0"



ELEVATION (D / 45 45)
SCALE: 1/4" = 1'-0"
(SEE BILL OF MATERIAL FOR PART REFERENCES)

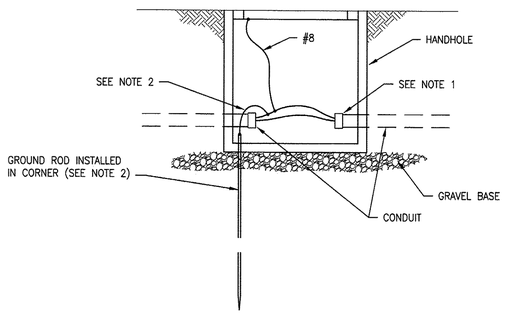
BILL OF MATERIALS
FOR ELEVATION "D"

ITEM No.	PIECE No.	QTY	DESCRIPTION	MFR/MODEL
1	–	1	POLE, WOOD, L=40', CIR=29" AT TOP, CLASS H-1, COASTAL DOUGLAS FIR	BELL LUMBER & POLE CO
2	–	1	CROSSARM, DOUBLE-ARM DEAD END ASSEMBLY 10-0" WITH BRACES	HUGHES BROS #2890-E
3	–	2	CROSSARM 8' – 0"	HUGHES BROS TYPE 04
4	–	1	REVERSIBLE BRACE, 446 SERIES	BROOKS MFR CO #446-60-30
5	–	4	SOCKET CLEVIS FOR ITEM 6, ANSI 52-3	LINDSEY #3187
6	–	16	SUSPENSION INSULATOR, 15KV, LITE GRAY, ANSI CLASS 52-3	LAPP INSULATOR CO
7	–	4	CLEVIS CONNECTIONS (EYE)	LINDSEY #3111
8	–	4	SHOULDER EYEBOLT, 5/8"	HUGHES BROS #2720.610-4
9	–	1	GUYING ATTACHMENT	HUGHES BROS. #B1912-A
10	–	1	GUY STRAIN INSULATOR	LAPP INSULATOR CO #8506-70
11	–	3	BOLTED GUY WIRE CLAMP	HUBBELL #6462
12	–	A/R	GUY WIRE, 3/8" EXTRA HIGH STRENGTH STEEL, CLASS A	SOUTHWIRE
13	–	1	DEADEND AUTOMATIC GUY WIRE CONNECTOR	HUBBELL #GDE5202
14	–	1	GUY ANCHOR, 3/4" ROD, 8000 FT-LB, TOUGH ONE HELIX ASS'Y	HUBBELL #C102-5207
15	–	3	POLE MOUNTED FUSED CUTOUT 15 KV WITH 10E (200E MAX) FUSE, TYPE SMD-20	S & C ALDUTI-RUPTER #135552
16	–	3	COPPER TO ALUMINUM TAP CONNECTOR , #2 AWG CU-#2 ACSR	
17	–	1	COLD SHRINK TERMINATION KIT, #2 AWG	3M ELECTRICAL #7622-S-2
18	–	A/R	GROUND WIRE, #6 AWG BARE CU	SOUTHWIRE
19	–	2	GROUND ROD, 3/4" X 10' – 0" CU	HUBBELL #8620
20	–	2	GROUND CONNECTOR, CU CABLE TO ROD	BURNDY #GRC34
21	–	2	CABLE GUARD, 8' W/MOUNTING STRAPS	HUBBELL #96KG12 & KS12
22	–	1	STAPLES, GALVANIZED (FOR GROUND WIRE)	HUBBELL #C2050463
23	–	1	HANDHOLE	OLDCASTLE #444-LA

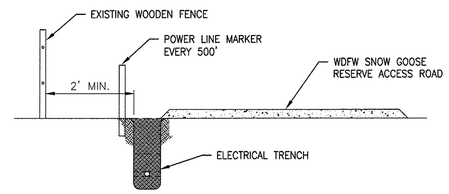
NOTE: ALL PARTS SHOWN ARE "OR ENGINEER APPROVED EQUAL"

NOTES:

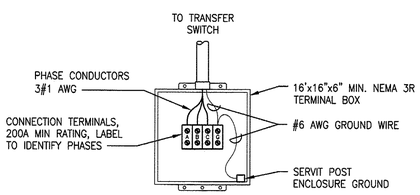
1. CONDUITS INSTALLED THROUGH MOUSEHOLES OR KNOCKOUTS. SEAL CONDUITS AFTER INSTALLATION OF CABLES.
2. INSTALL 10' x 3/4" COPPER CLAD STEEL GROUND ROD IN ALL HANDHOLES, ELECTRICAL VAULT, AND AT BASE OF NEW POLE.
3. EXCAVATE 8'x8'x4'-4" DEEP AREA FOR ELECTRICAL VAULT INSTALLATION. PLACE 6" DEEP GRAVEL IN BOTTOM OF EXCAVATION AS BASE FOR VAULT. INSTALL VAULT. AFTER VAULT PLACEMENT REFILL EXCAVATED SPACE WITH NATURAL SOILS PER AREA REQUIREMENTS.
4. FOR CONDUIT ALONG WDFW WEST ACCESS ROAD, DETAIL 5 APPLIES. FOR CONDUIT ALONG SETBACK DIKE ACCESS ROAD DETAIL DOES NOT SHOW 24" CSBC ABOVE DIKE SELECT FILL. CONTRACTOR TO ADJUST CONDUIT DEPTH ACCORDINGLY.
5. PRIMARY CONDUIT RUNNING EAST TO PUMP STATION SHALL BE BURIED IN THE CENTER OF THE ACCESS ROAD. CONDUIT SHALL BE INSTALLED PRIOR TO ROAD PLACEMENT TO AVOID DISTURBING FINAL GRADE. COORDINATE WITH EXCAVATION CONTRACTOR.



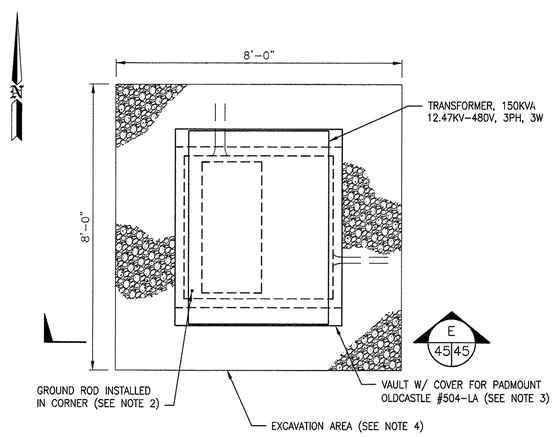
DETAIL (2 / 42 45) (2 / 45 45)
TYPICAL HANDHOLE
SCALE: 1/2" = 1'-0"



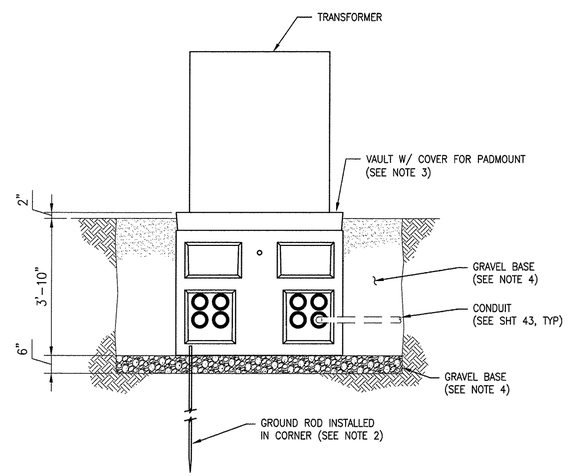
SECTION (F / 42 45)
NOT TO SCALE



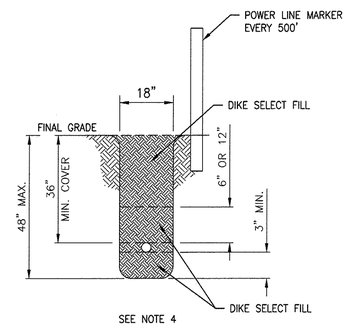
DETAIL (4 / 43 45)
GENERATOR CONNECTION BOX
SCALE: 1" = 1'-0"



DETAIL (3 / 43 45)
TRANSFORMER VAULT
SCALE: 1/2" = 1'-0"



SECTION (E / 45 45)
SCALE: 1/4" = 1'-0"



DETAIL (5 / 42 45) (5 / 43 45)
TYP. CABLE/CONDUIT TRENCH
SCALE: 1/2" = 1'-0"

ELCON ASSOCIATES, INC
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SEATTLE, WASHINGTON 98188
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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DEAN C. RALPHS, STATE OF WASHINGTON, 37489, REGISTERED PROFESSIONAL ENGINEER — 4/1/15

SYM	DATE	REVISION DESCRIPTION	BY
	02/15	DRAFT FINAL – NOT FOR CONSTRUCTION	JT

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: 4/1/15
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY JWT
CHECKED BY SAB
DRAWN BY JWT
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
ELECTRICAL
DETAILS

PROJECT NO. ST:R4:11-3

SHEET 45 OF 54

FILENAME: G:\5667-001\00\Drawings\0094113-9591.dwg DATE: 03-16-2015 LOGIN: JeffT

DE	DP1		SERVING: PUMP HOUSE	BUS RATING: 225 A	PHASES: 3
LOCATION:	PUMP HOUSE WALL – INTERIOR		SOURCE: 150kVA PSE	VOLTAGE: 480V	WIRES: 3
PANEL SC RATING:	22 KAIC	RMS		MAIN CB: MLO	FEED: TOP
C.B. SC RATING	22 KAIC	RMS	FEEDER SIZE: 3–#3/0 AWG & #4 GND		GROUND BUS: COPPER
MOUNTING/TYPE:	SURFACE	NEMA 3R		NO. OF POLES: 24	NEUTRAL BUS: NONE

CIRCUIT DESCRIPTION	LOAD (KVA)	C. B. AMP	C. B. CKT	L1 L2 L3	C. B. CKT	C. B. AMP	LOAD (KVA)	CIRCUIT DESCRIPTION
PUMP 1	17.5	50/3P	1		2	60/2P	15.0	MINI POWER CENTER
"			3		4			"
"			5		6			
PUMP 2	17.5	50/3P	7		8	60/3P		SPARE
"			9		10			"
"			11		12			"
PUMP 3	17.5	50/3P	13		14	60/3P		SPARE
"			15		16			"
"			17		18			"
SPACE			19		20			SPACE
			21		22			
			23		24			

TOTAL CONNECTED LOAD		TOTALS PER PHASE A	B	C	TOTAL DEMAND LOAD	
67.4 KVA	81.0 A	90.1A	90.1A	63.0A	71.7 KVA	86.3 A

SEE NOTE 2

PANELBOARD NAME:	LP1		SERVING: PUMP HOUSE	BUS RATING: 100 A	PHASES: 1
LOCATION:	PUMP HOUSE WALL		SOURCE: DP1	VOLTAGE: 120/240V	WIRES: 2
PANEL SC RATING:	22 KAIC	RMS		MAIN CB: 60A	FEED: TOP
C.B. SC RATING	22 KAIC	RMS	FEEDER SIZE: 3–#4 & #8 GND		GROUND BUS: COPPER
MOUNTING/TYPE:	SURFACE	NEMA 3R		NO. OF POLES: 24	NEUTRAL BUS: NONE

CIRCUIT DESCRIPTION	LOAD (KVA)	C. B. AMP	C. B. CKT	C. B. CKT	C. B. AMP	LOAD (KVA)	CIRCUIT DESCRIPTION
EXHAUST FAN	0.7	15A	1	2	15A	0.1	LIGHTS
CONTROL PANEL	1.0	15A	3	4	20A	0.2	RECEPTACLES
SPARE		15A	5	6	15A		SPARE
SPARE		15A	7	8	15A		SPARE
			9	10			
			11	12			
			13	14			
			15	16			
			17	18			
			19	20			
			21	22			
			23	24			

TOTAL CONNECTED LOAD		TOTAL DEMAND LOAD	
2.0 KVA	8.3 A	2.2 KVA	9.0 A

SEE NOTE 1

NOTES:

1. PANEL LP1 LOCATED IN MINI POWER CENTER.
2. LABEL PANEL WITH SHORT CIRCUIT CURRENT PER NEC 110.24. CALCULATED VALUE IS 22kA. PANEL SHALL BE SERVICE ENTRANCE RATED.

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DEAN C. RALPHS — STATE OF WASHINGTON — 37489 — REGISTERED PROFESSIONAL ENGINEER — 2/13/15

SYM	DATE	REVISION DESCRIPTION	BY
	02/15	DRAFT FINAL – NOT FOR CONSTRUCTION	JT

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: 17 MAR 15
PROGRAM ..... DATE: .....

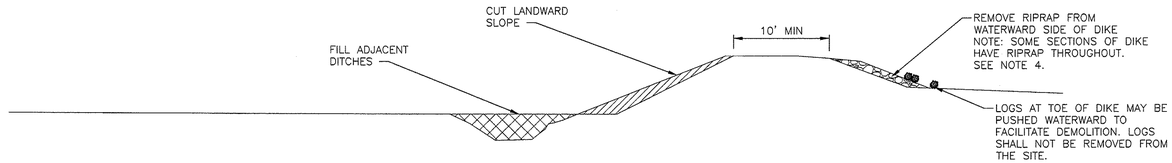
0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY JWT
CHECKED BY SAB
DRAWN BY JWT
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
ELECTRICAL
PANEL SCHEDULES

PROJECT NO. ST:R4:11–3

FILENAME: R:\5662-001 (0)\Drawings\V60411-5-931.dwg DATE: 03-16-2015 LOGIN: jeff

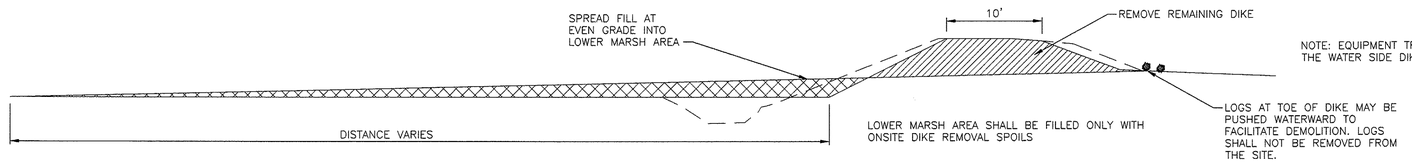


TYPICAL EXISTING DIKE DEMOLITION AND DITCH FILL

A 49/47 A 50/47

0 10 20 30

SCALE: 1" = 10'



NOTE: EQUIPMENT TRACKS OR WHEELS SHALL NOT ENCROACH WATERWARD OF THE WATER SIDE DIKE TOE DURING DEMOLITION

TYPICAL EXISITNG DIKE DEMOLITION AND MARSH GRADING

B 49/47 B 50/47

0 10 20 30

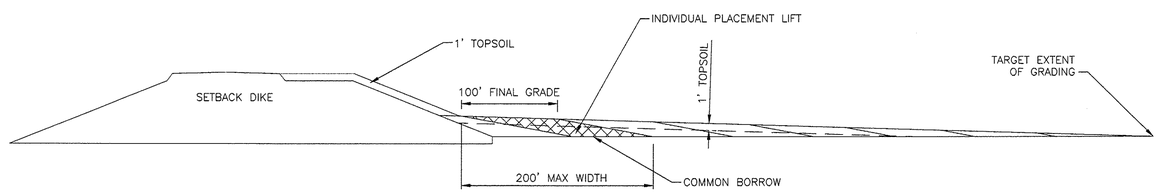
SCALE: 1" = 10'

LEGEND

FILL

CUT

EX GRADE



NOTE: HIGH MARSH FILL MATERIAL SOURCES ARE THE STORAGE POND, TIDAL CHANNEL EXCAVATIONS AND EXISTING DRY SLOUGH DREDGE SPOILS. 100' WIDE FILL LIFTS SHALL BE PLACED STARTING AT TOE OF DIKE AND EXTENDING OUTWARD, AND SHALL BE TRACK COMPACTED TO FINISH GRADES. LIFT SHALL SLOPE AT NO STEEPER THAN 20H:1V FROM EDGE OF LIFT TO NATIVE GRADE. UPPER 1 FOOT OF LIFT SHALL MEET TOPSOIL SPECIFICATIONS. LIFTS SHALL PROCEED TOWARDS TARGET GRADES UNTIL FILL MATERIAL IS EXHAUSTED. TOPSOIL TO BE DERIVED FROM STRIPPING AND STORAGE POND EXCAVATION OF COMMON BORROW. COMMON BORROW SHALL BE MIXED AS NEEDED, IF BEING PLACED AS TOPSOIL, TO MEET SPECIFICATIONS.

TYPICAL HIGH MARSH FILL PLACEMENT PROCEDURE

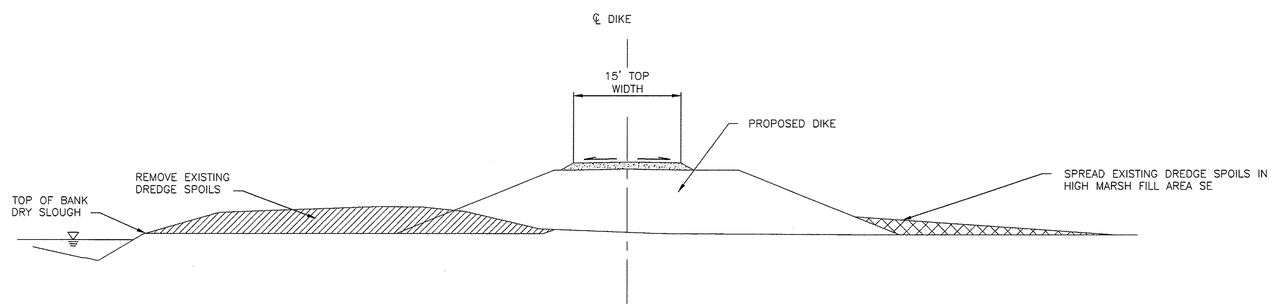
C 10/47 C 11/47 C 12/47 C 22/47 C 23/47

0 10 20 30

SCALE: 1" = 10'

NOTES

1. PRIOR TO DIKE DEMOLITION DITCH FILLING, DITCHES SHALL BE DEWATERED TO THALWEG. FILL ACTIVITIES SHALL PROCEED UPSTREAM TO DOWNSTREAM.
2. REMOVAL OF REMAINING DIKE AFTER DITCHES ARE FILLED SHALL OCCUR AT LOW TIDES BELOW MEAN LOW WATER. THIS REMAINING DIKE REMOVAL SHALL OCCUR WITHIN A MAXIMUM TWO WEEK PERIOD.
3. CONTRACTOR SHALL MAINTAIN MINIMUM DIKE ELEVATIONS TO PREVENT OVERTOPPING PRIOR TO REMOVAL OF DIKE.
4. REMOVE ROCK FROM EXISTING DIKE. HAUL TO OFFSITE DISPOSAL. SEE DIVISION 1 SPECIFICATIONS.
5. RIPRAP, ROCK AND SPALLS SHALL NOT BE USED IN DITCH FILLS OR MARSH FILLS.
6. MAINTAIN MINIMUM DIKE TOP WIDTH OF 10' TO PRESERVE DIKE STABILITY AND ACCESS PRIOR TO FINAL BREACHES.



TYPICAL EXISTING SPOILS REMOVAL AND HIGH MARSH PLACEMENT

D 12/47 D 13/47

0 10 20 30

SCALE: 1" = 10'

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: 11/18/15

PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

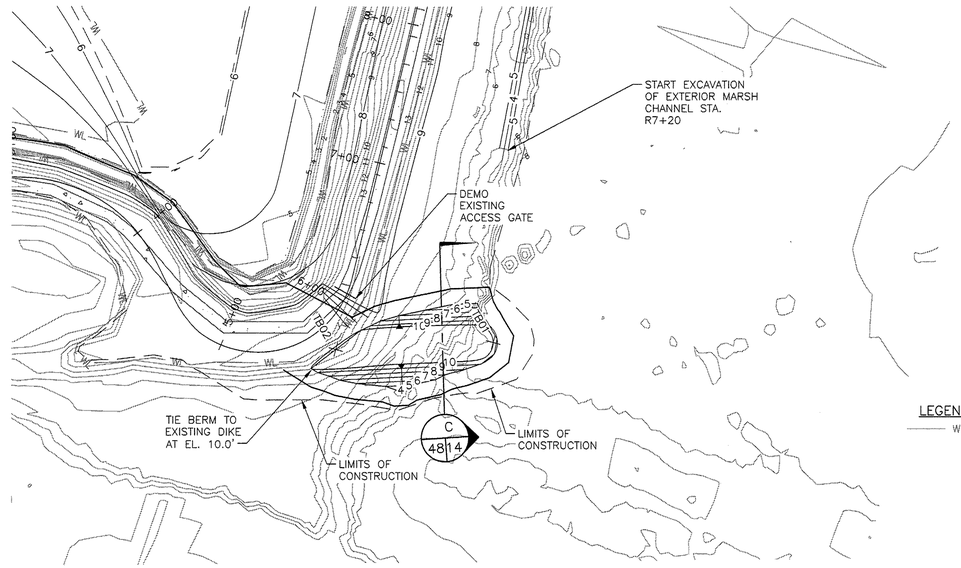
FIR ISLAND FARM

ECOSYSTEM RESTORATION
EXISTING DIKE RECOMMENDED DEMOLITION SEQUENCE

PROJECT NO. ST:R4:11-3

SHEET 47 OF 54

FILENAME: I:\WPC\1-1\72318 FIR ISLAND\CAD\60041\60041-3-047.dwg DATE: 03-16-2015 LOGIN: cmh



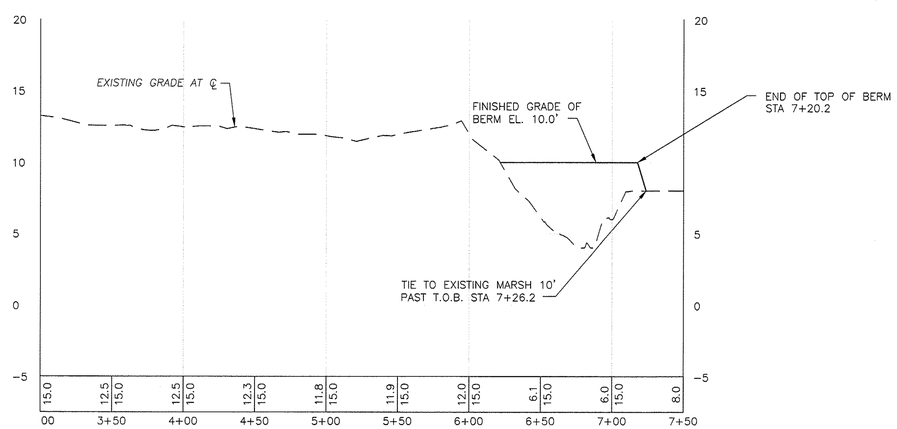
LEGEND

WL — EXISTING WETLAND BOUNDARY

SITE PLAN

0 50 100 150

SCALE: 1" = 50'



PROFILE

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

NOTES

1. EXTERIOR TIDAL MARSH CHANNEL EXCAVATION SHALL BE COMPLETED PRIOR TO ESTUARINE TIDAL BERM CONSTRUCTION SEE SHEET 49
2. ESTUARINE TIDAL BERM CONSTRUCTION TO BE COMPLETED PRIOR TO EXISTING DIKE BREACH.
3. FILL AND RIPRAP PROTECTION SHOULD BE CONSTRUCTED IN THE DRY. LOWER PORTIONS OF BERM SHALL BE CONSTRUCTED WHEN WATER LEVELS ARE AT OR BELOW MEAN LOW WATER.
4. BERM FOOTPRINT SHALL BE CLEARED AND GRUBBED OF ALL VEGETATION BEFORE CONSTRUCTION ACTIVITIES COMMENCE.
5. CONTRACTOR SHALL USE WATER QUALITY BMPs (INCLUDING BUT NOT LIMITED TO SILT CURTAIN) PER THE APPLICABLE PERMITS AND STANDARDS TO ENSURE SEDIMENT FROM STRIPPING, FILL, AND ROCK PLACEMENT DOES NOT LEAVE THE LIMITS OF CONSTRUCTION.

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION

CHIEF ENGINEER ..... DATE: 17 MAR 15

PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

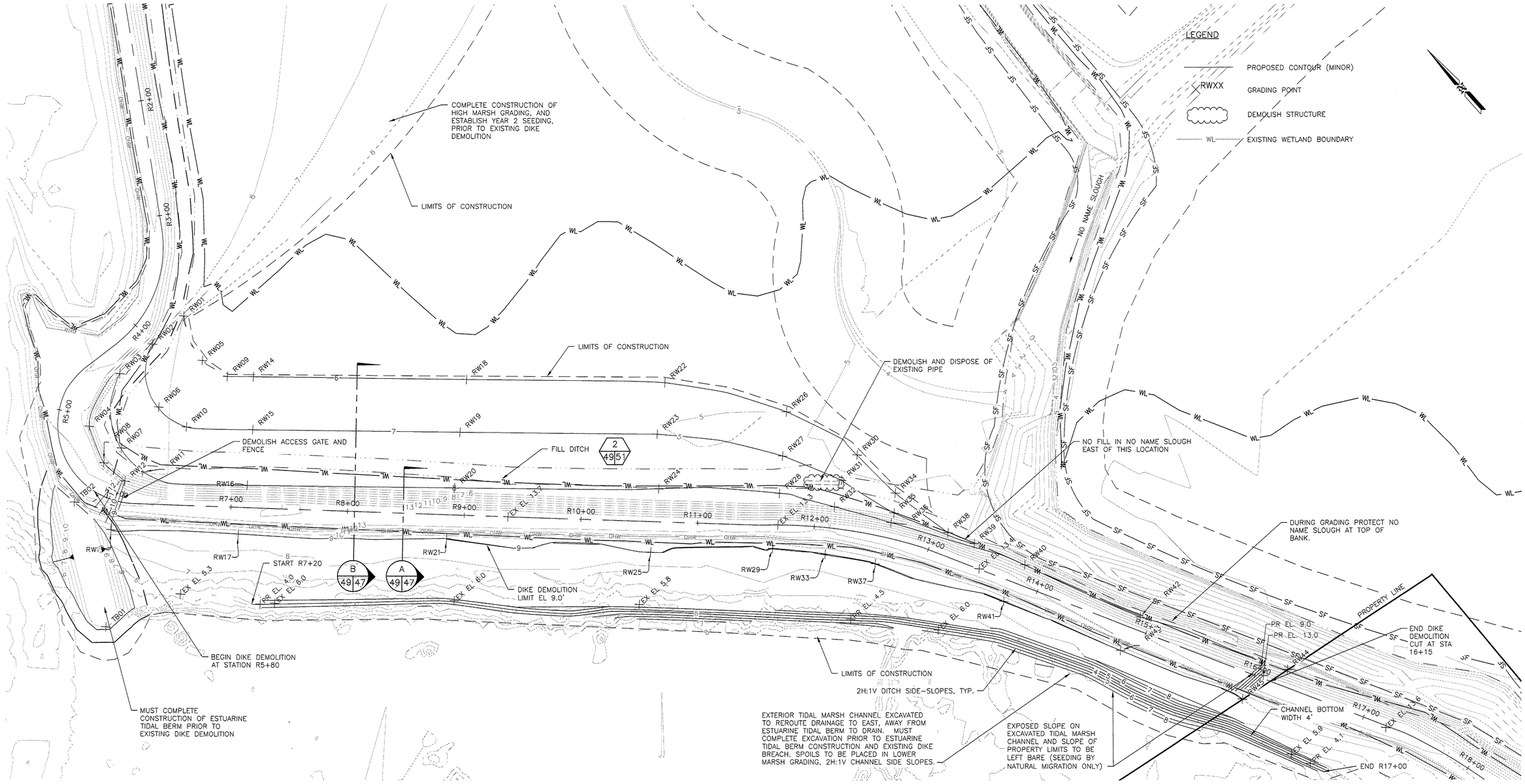
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
ESTUARINE TIDAL BERM
PLAN AND PROFILE

PROJECT NO. ST:R4:11-3

SHEET 48 OF 54

FILENAME: J:\WPA\21-1\1731B FIR ISLAND\CAD\B02A\B02A11-3-A\B02A11-3-048.dwg DATE: 03-10-2015 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 47.
3. CUT FARM SIDE OF EXISTING DIKE, LEAVING A MINIMUM TOP WIDTH OF 10'. USE SPOILS TO FILL DITCHES PER DETAIL 2 SHEET 51
4. DITCHES TO BE FILLED UPSTREAM TO DOWNSTREAM TO MINIMIZE DEWATERING EXTENTS. CONTRACTOR TO USE BMPs TO ENSURE SEDIMENT DOES NOT ENTER MAIN STEM OF NNS.
5. 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.
6. REMOVE AND HAUL EXISTING DIKE RIPRAP AND ROCK TO OFFSITE DISPOSAL LOCATION. SEE SPECIFICATIONS.
7. AFTER INITIAL BREACH AT TIDEGATES, CUT THE REMAINDER OF EXISTING DIKE AT WATERSIDE EL 9.0'
8. SPREAD MATERIAL EVENLY LANDWARD FROM EL 9.0' TO EXISTING GRADE IN LOWER MARSH PER EXTENTS SHOWN.

SITE PLAN

0 40 80 120

SCALE: 1" = 40'

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE
STATE OF WASHINGTON
REGISTERED PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER DRC DATE: 12/16/15
PROGRAM DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
EXISTING DIKE DEMOLITION, GRADING PLAN STA R6+00 TO R18+00

PROJECT NO. ST:R4:11-3

SHEET 49 OF 54

FILENAME: L:\WP\21-1\12318 FIR ISLAND\CAD\1200A\1200411S\1200411S-049.dgn DATE: 03-13-2015 LOGIN: cmh

NOTES

1. CONTRACTOR SHALL 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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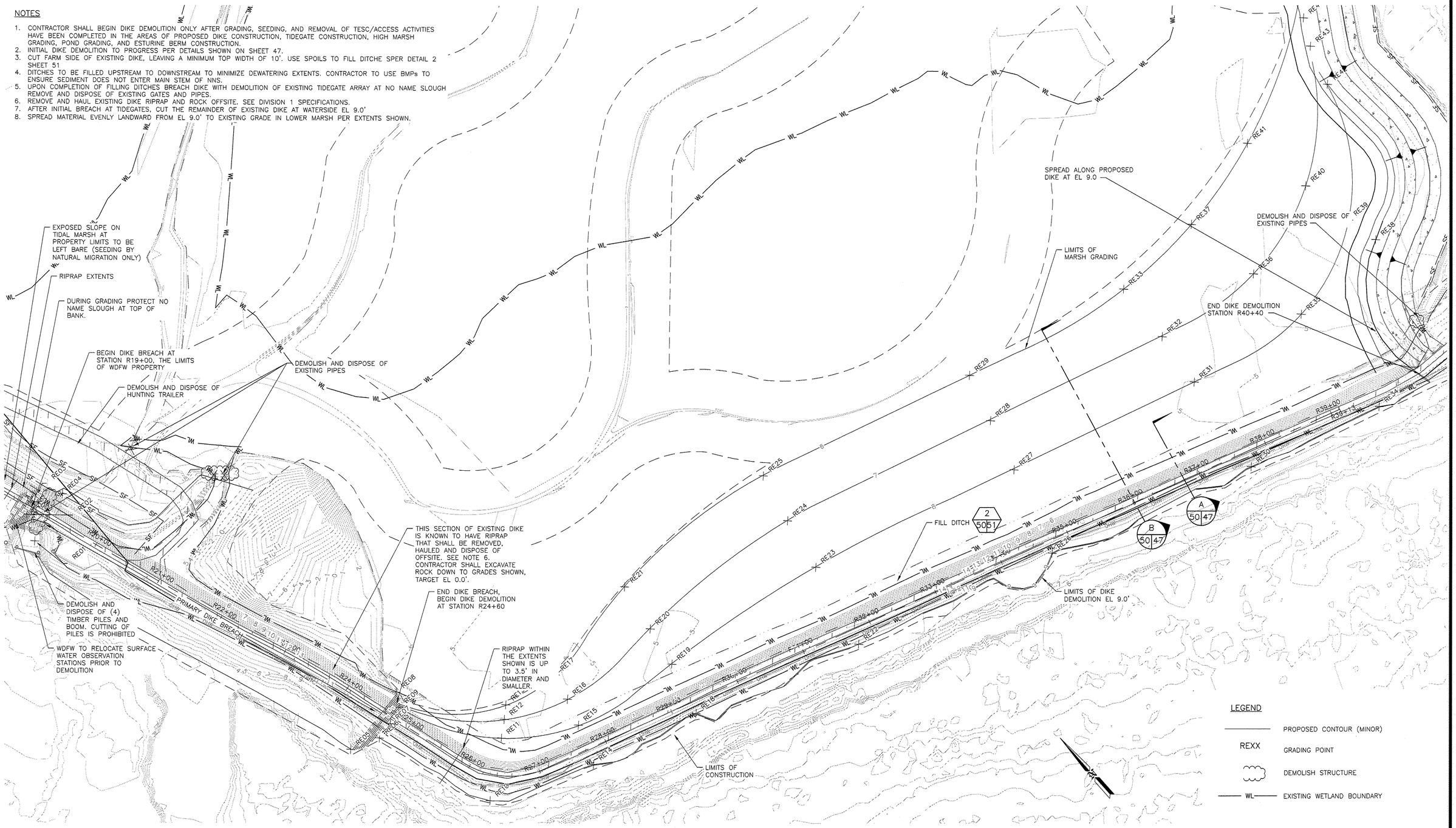
4. DITCHES TO BE FILLED UPSTREAM TO DOWNSTREAM TO MINIMIZE DEWATERING EXTENTS. CONTRACTOR TO USE BMPs TO ENSURE SEDIMENT DOES NOT ENTER MAIN STEM OF NNS.
5. UPON COMPLETION OF FILLING DITCHES BREACH DIKE WITH DEMOLITION OF EXISTING TIDEGATE ARRAY AT NO NAME SLOUGH REMOVE AND DISPOSE OF EXISTING GATES AND PIPES.
6. REMOVE AND HAUL EXISTING DIKE RIPRAP AND ROCK OFFSITE. SEE DIVISION 1 SPECIFICATIONS.
7. AFTER INITIAL BREACH AT TIDEGATES, CUT THE REMAINDER OF EXISTING DIKE AT WATERSIDE EL 9.0'
8. SPREAD MATERIAL EVENLY LANDWARD FROM EL 9.0' TO EXISTING GRADE IN LOWER MARSH PER EXTENTS SHOWN.



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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY

APPROVED AND RELEASED FOR CONSTRUCTION
CHIEF ENGINEER ..... DATE: 17 MAR 15
PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

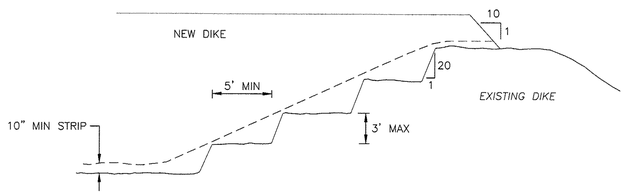
DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
EXISTING DIKE DEMOLITION, GRADING PLAN STA R18+00 TO R40+00

PROJECT NO. ST:R4:11-3

SHEET 50 OF 54

FILENAME: J:\WIP\71-1\71318 FIR ISLAND\CAD\R00A\R00411-5\R00411-5c050.dwg DATE: 03-16-2015 LOGIN: cmh



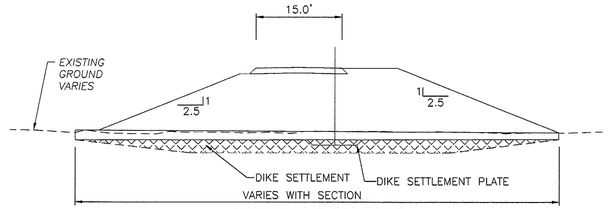
NOTES

CLEAR AND GRUB SURFACE OF EXISTING DIKE

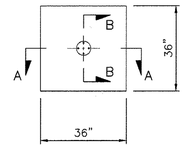
DETAIL – DIKE TIE IN BENCH EXCAVATION

NTS

1 / 10 51

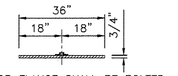


SECTION – TYPICAL DIKE



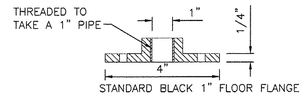
SETTLEMENT PLATE SHALL BE CONSTRUCTED OF PLYWOOD (EXTERIOR).

PLAN VIEW

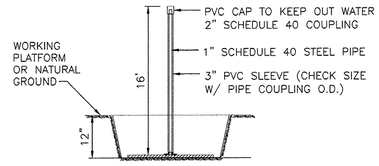


FLOOR FLANGE SHALL BE BOLTED TO THE PLATE WITH A MINIMUM OF FOUR THROUGH BOLTS PER THE MANUFACTURER'S SPECIFICATIONS

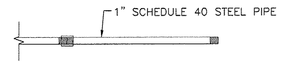
SECTION A–A



SECTION B–B



SETTLEMENT PLATE INSTALLATION



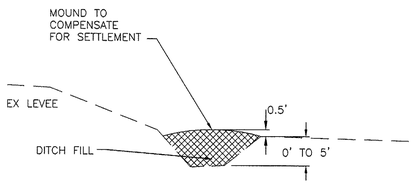
IN SEATING THE PLATE, THE TRENCH SHALL BE BACKFILLED AND COMPACTED WITH DIKE SELECT FILL COMPACTION SPECS.

RISER PIPE & COUPLING

DETAIL – SETTLEMENT PLATE DETAIL

NTS

4 / 10 51 | 4 / 11 51 | 4 / 12 51 | 4 / 13 51

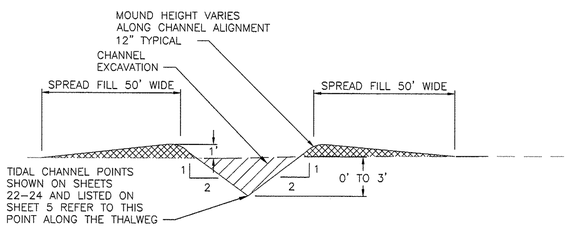


DETAIL – DITCH FILL CROSS SECTIONS

SCALE: 3" = 1'–0"

2 / 49 51 | 2 / 50 51

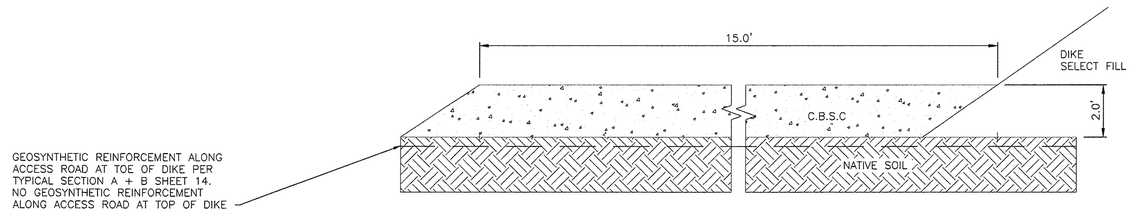
NOTE: TIDAL CHANNEL FROM PUMP STATION OUTLET TO NO NAME SLOUGH ON SHEETS 22 AND 23 HAS BOTTOM WIDTH OF 30'.



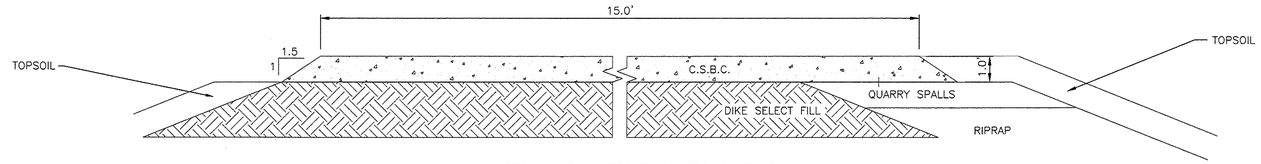
TYPICAL PILOT CHANNEL CROSS SECTION

SCALE: 3" = 1'–0"

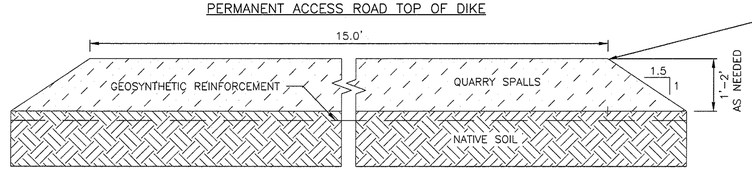
3 / 22 51 | 3 / 23 51 | 3 / 24 51



PERMANENT LANDSIDE ACCESS ROAD TOE OF DIKE



PERMANENT ACCESS ROAD TOP OF DIKE

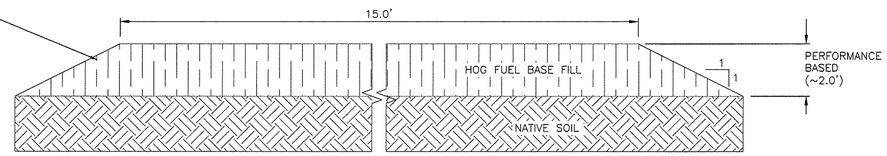


ALL APPROVED TEMPORARY HAUL ROADS WITHIN THE MARSH RESTORATION AREA SHALL BE COMPLETELY REMOVED, SUBSURFACE SCARIFIED, SEEDED AND AREA RESTORED PRIOR TO DIKE BREACH.

ALL APPROVED TEMPORARY HAUL ROADS WITHIN THE FARM AREAS TO BE COMPLETELY REMOVED AND AREA RESTORED PRIOR TO COMPLETION OF CONSTRUCTION.

APPROVED TEMPORARY HAUL ROAD

APPROVED TEMPORARY MARSH PILOT CHANNEL ACCESS ROADS MAY BE BUILT WITH HOG FUEL TO BE SCARIFIED, SEEDED AND RESTORED PRIOR TO DIKE BREACH. HOG FUEL SHALL BE SPREAD, TILLED, AND SCARIFIED AS PART OF TEMPORARY ROAD REMOVAL AND RESTORATION. ROCK AND QUARRY SPALL ACCESS ROADS ARE NOT ALLOWED OUTSIDE APPROVED AREAS.



APPROVED TEMPORARY MARSH PILOT CHANNEL ACCESS ROADS

DETAIL – ACCESS AND HAUL ROAD SECTIONS

NTS

5 / X 51

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WASHINGTON STATE DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 17 MAR 15

PROGRAM ..... DATE:

0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM

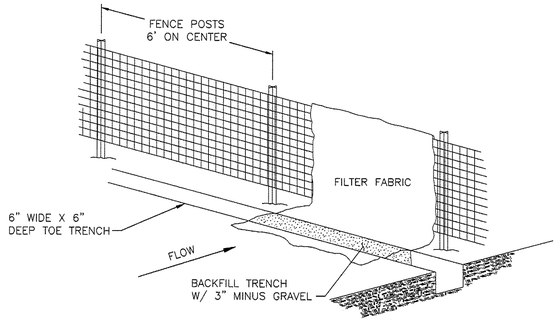
ECOSYSTEM RESTORATION

TYPICAL DETAILS I

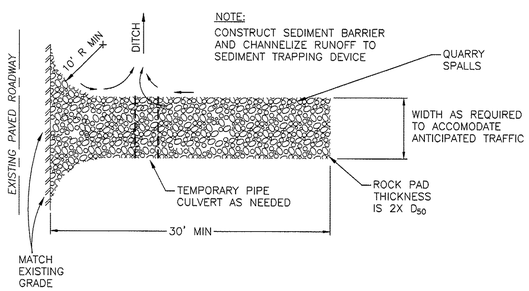
PROJECT NO. ST:R4:11–3

SHEET 51 OF 54

FILENAME: L:\WEW21-LV\2318 FIR ISLAND\CAD\R004\R004118\R004118-005.dwg DATE: 03-16-2015 LOGIN: cmh



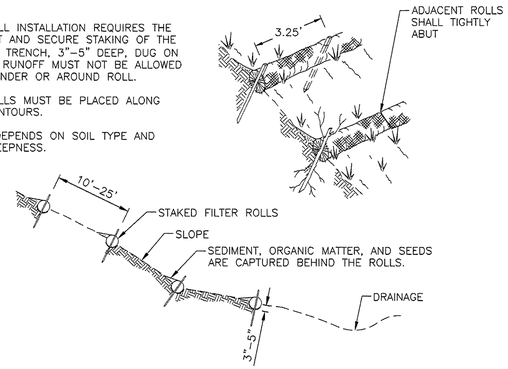
DETAIL – SILT FENCE
NTS
1 / X52



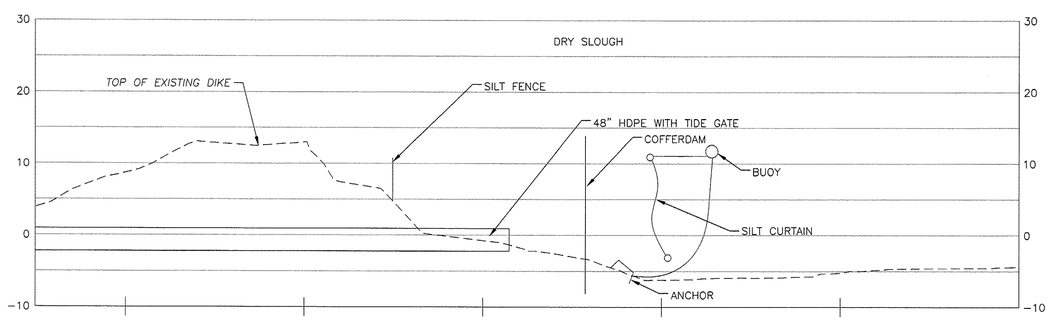
NOTE:
CONSTRUCT SEDIMENT BARRIER AND CHANNELIZE RUNOFF TO SEDIMENT TRAPPING DEVICE

DETAIL – STABILIZED CONSTRUCTION ENTRANCE
NTS
3 / X52

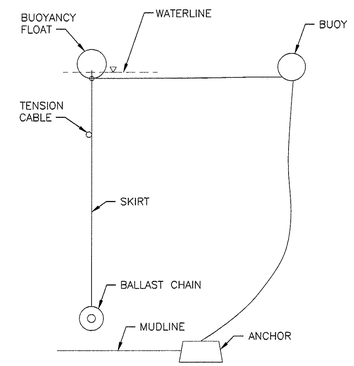
NOTES:
1. STRAW ROLL INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE ROLL IN A TRENCH, 3"–5" DEEP, DUG ON CONTOUR. RUNOFF MUST NOT BE ALLOWED TO RUN UNDER OR AROUND ROLL.
2. STRAW ROLLS MUST BE PLACED ALONG SLOPE CONTOURS.
3. SPACING DEPENDS ON SOIL TYPE AND SLOPE STEEPNESS.



DETAIL – STRAW WATTLE
NTS
4 / X52

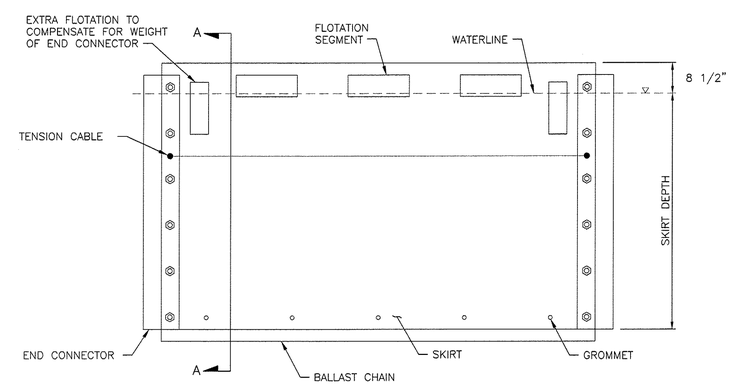


DETAIL – TYP. SILT CURTAIN PLACEMENT
SCALE: 1" = 10'–0"
5 / X52



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. FLOATING SILT CURTAIN DETAIL
NTS
6 / X52

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE
STATE OF WASHINGTON
PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 12 MAR 15
PROGRAM ..... DATE: .....

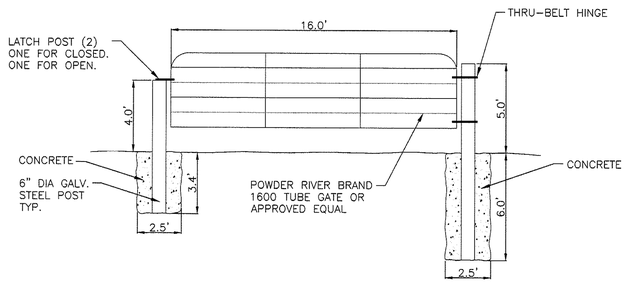
0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
TYPICAL DETAILS II

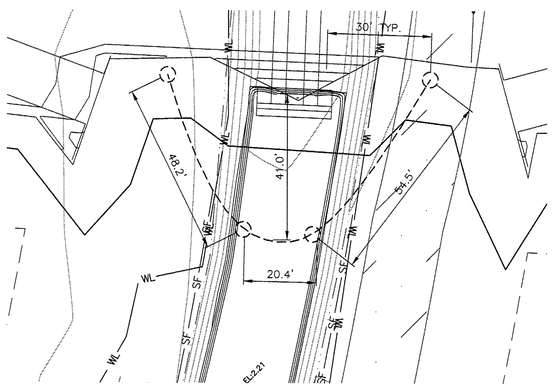
PROJECT NO. ST:R4:11–3
SHEET 52 OF 54

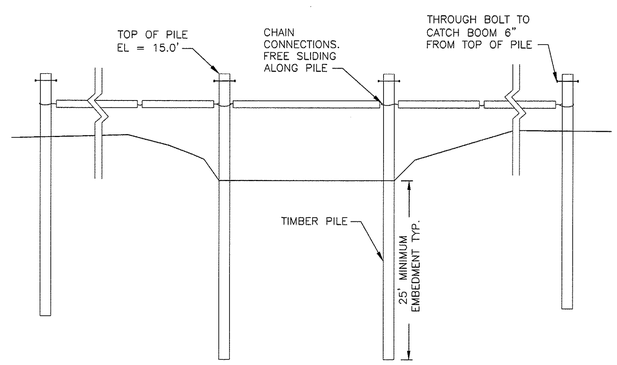
FILENAME: L:\WIP\21-1\12318 FIR ISLAND\CAD\800A\020411S\020411S2052.dwg DATE: 03-06-2015 LOGIN: cmh

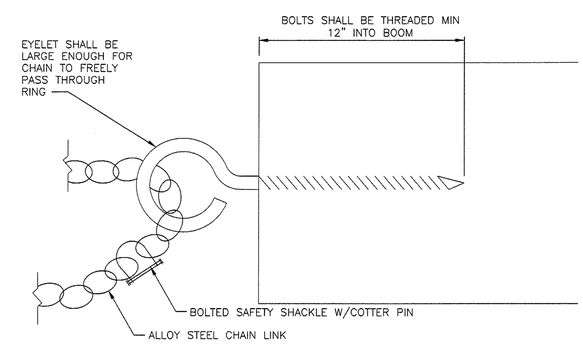


NOTE:
1. GATE SHALL BE POWDER COATED
2. HARDWARE SHALL BE HEAVY DUTY

DETAIL – ACCESS GATE (1 / X53)
SCALE: 1" = 4'-0"







NOTE:
1. WRAP CHAIN CONNECTIONS AROUND PILES LOOSELY TO ALLOW FREE MOVEMENT WITH TIDES, AND ATTACH CHAINS TO BOOMS WITH STAINLESS STEEL EYELET BOLTS.
2. BOOMS TO BE CONSTRUCTED FROM 10' SECTIONS OF 10" DIA LOGS.
3. NO NAME SLOUGH DEFELECTOR IS SHOWN. PUMP STATION DEFLECTOR TO BE CONSTRUCTED TO SAME DIMENSIONS

NOTE: ALLOY STEEL CHAIN, SHACKLE AND EYE BOLTS PAIRED TO PROVIDE MINIMUM WORKING LOAD OF 12,000 LBS

DETAIL – LOG BOOM DEFLECTOR (2 / 653) (2 / 1053) (2 / 1153)
NTS

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

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

SYM	DATE	REVISION DESCRIPTION	BY
		APPROVED AND RELEASED FOR CONSTRUCTION	

CHIEF ENGINEER ..... DATE: 12/18/18
PROGRAM ..... DATE:

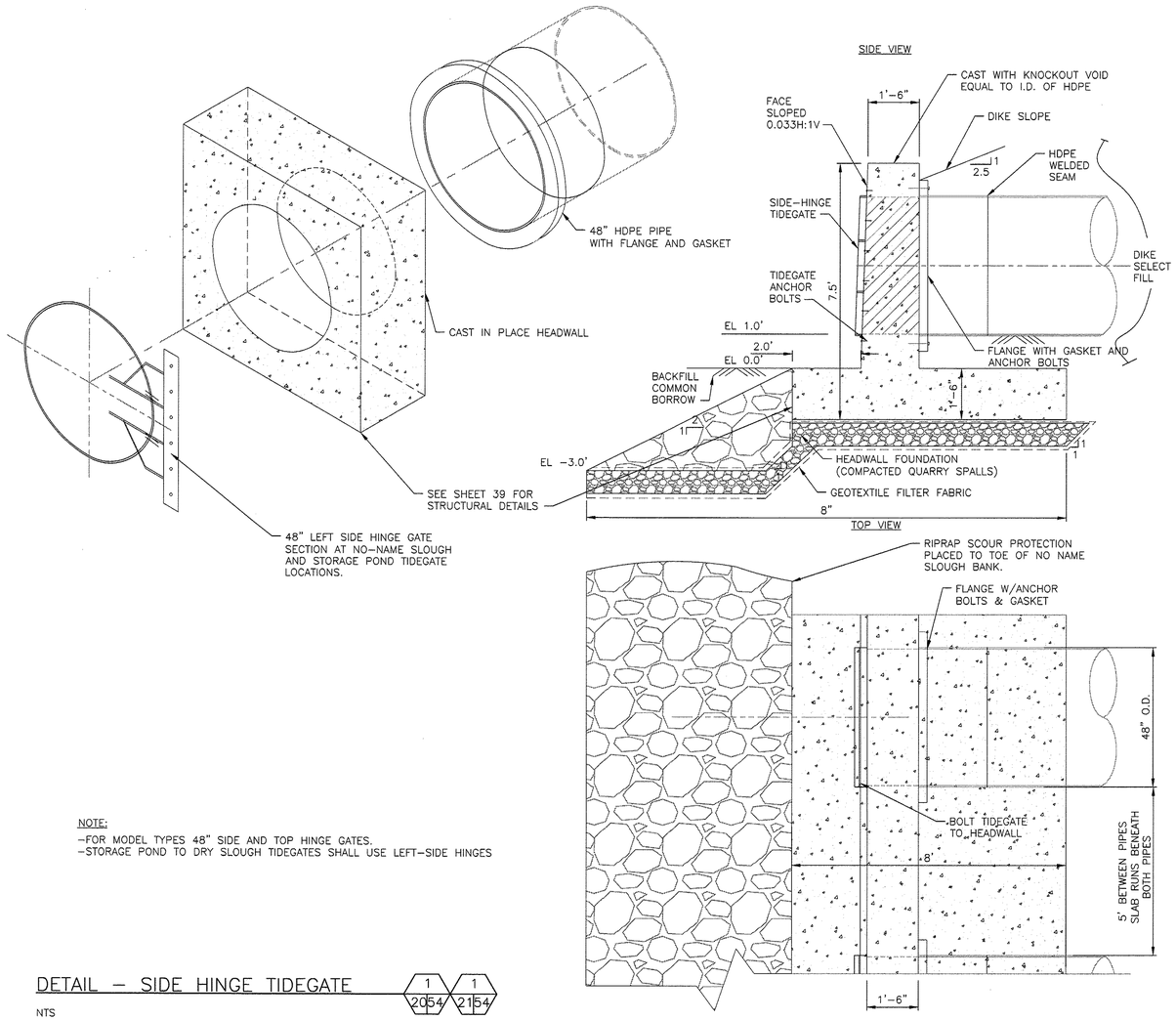
0 — 1"
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

DESIGNED BY DRC
CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
TYPICAL DETAILS III

PROJECT NO. ST:R4:11-3

SHEET 53 OF 54

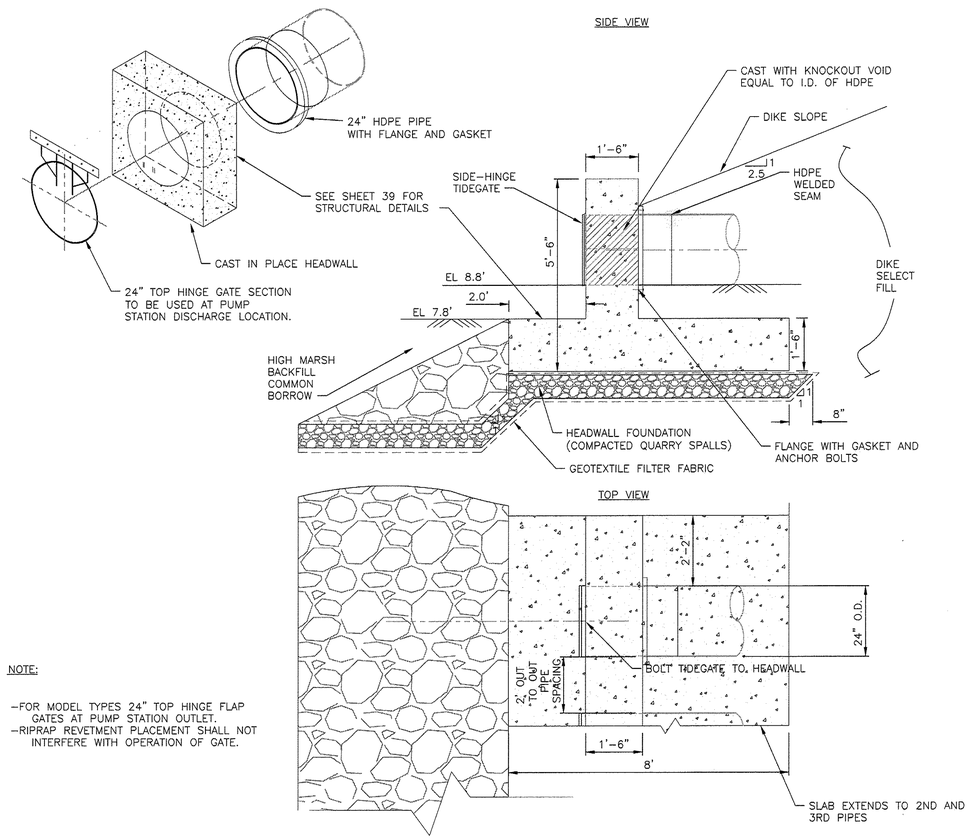


NOTE:

-FOR MODEL TYPES 48" SIDE AND TOP HINGE GATES.
-STORAGE POND TO DRY SLOUGH TIDEGATES SHALL USE LEFT-SIDE HINGES

DETAIL – SIDE HINGE TIDEGATE (1/2054) (1/2154)

NTS

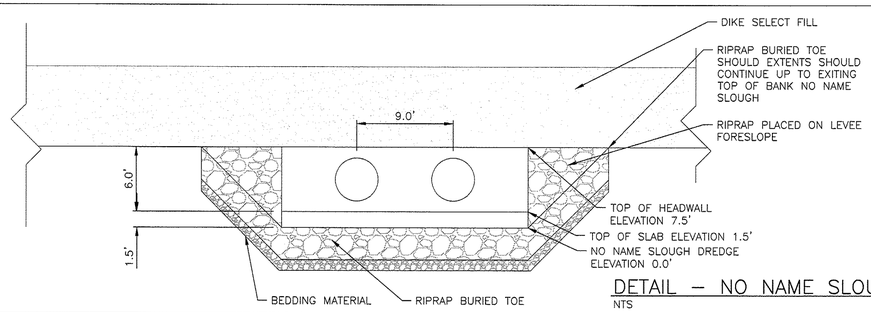


NOTE:

-FOR MODEL TYPES 24" TOP HINGE FLAP GATES AT PUMP STATION OUTLET.
-RIPRAP REVETMENT PLACEMENT SHALL NOT INTERFERE WITH OPERATION OF GATE.

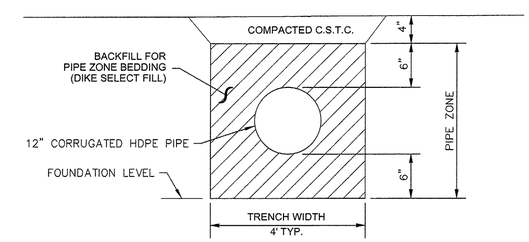
DETAIL – PUMP DISCHARGE 24" HDPE PIPE TOP HINGE TIDEGATE (2/2854)

NTS



DETAIL – NO NAME SLOUGH OUTFALL ELEVATION

NTS



DETAIL – TYPICAL STORM DRAIN PIPE INSTALLATION (3/1054)

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WASHINGTON STATE
DEPARTMENT OF FISH AND WILDLIFE

DAVID R. CLINE — STATE OF WASHINGTON — PROFESSIONAL ENGINEER

SYM	DATE	REVISION DESCRIPTION	BY

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PROGRAM ..... DATE:

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CHECKED BY CAR
DRAWN BY CMH
DATE MAR 2015

FIR ISLAND FARM
ECOSYSTEM RESTORATION
TYPICAL DETAILS IV

PROJECT NO. ST:R4:11-3

SHEET 54 OF 54