100 0 50 100 200

1 inch = 100 ft.

PLANTING LEGEND

- WETLAND AND RIPARIAN MARGIN PLANTING ELEVATION 6' – 11' 8.10 AC (353,047 SF)
- UPLAND AND UPLAND MARGIN PLANTING ELEVATION 11' + 5.51 AC (240,099 SF)

SEE SHEET C12A FOR PLANTING PLAN NOTES AND DETAILS

LEGEND

- EXISTING PROPERTY LINE/ROW
- EXISTING EASEMENT
- EXISTING WATER LEVEL
- XT EXISTING UNDERGROUND ELECTRIC/TELEPHONE LINE
- EXISTING FENCE
- 185 EXISTING 5 FT. CONTOUR INTERVAL
- 184 EXISTING 1 FT. CONTOUR INTERVAL
- DIRECTION OF STORM WATER FLOW
- 185 PROPOSED 5FT. CONTOUR INTERVAL
- 184 PROPOSED 1FT. CONTOUR INTERVAL
- PROPOSED SEDIMENT FENCE

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REVEGETATION / PLANTING PLAN

OTTER POINT RESTORATION PROJECT – CONSTRUCTION DOCUMENT PLAN SET

DATE: 5/21/2010
DRAWN BY: KMH
PROJ. MGR: BAH
CHECKED BY: WJK
PROJECT NUMBER CREST 08–01
CASE FILE NUMBER

SHEET NUMBER C12 OF 15

MeyerD, Plotted: May 18, 2010 – 4:27pm, P:\HEN.005 CREST\dwg\Eng\Set\HEN.005–PLNT.dwg

Wetland and Riparian Margin Planting (6-11 feet in elevation, NAV88)

Plant plugs of the following herbs and stakes of willow species in hydrologically appropriate portions of the Otter Point project site:

Species	Common Name	Area (Ac.)	No. / Acre	Est. Quantity
Carex lyngbyei	Lyngbye's sedge	8.10	1,040	8,424
Carex obnupta	slough sedge	8.10	640	5,184
Scirpus microcarpus	smallfruit bulrush	8.10	1,440	11,664
Salix lasiandra	Pacific willow	8.10	840	6,804
Minimum Planting Density Per Acre			3,960	
Minimum Total Quantity Plantings				32,076

In addition, plant plugs no fewer than 6 of the plant species in the following table planted in appropriate densities in hydrologically appropriate portions of the Otter Point project site:

Species	Common Name	Area (Ac.)	No. / Acre	Est. Quantity
Eleocharis palustris	common spikerush	8.10	840	6,804
Schoenoplectus acutus	hardstem bulrush	8.10	640	5,184
Schoenoplectus tabernaemontani	softstem bulrush	8.10	840	6,804
Juncus balticus var. *balticus*	Baltic rush	8.10	200	1,620
Deschampsia caespitosa	tufted hairgrass	8.10	840	6,804
Sagittaria latifolia	wapato	8.10	840	6,804
Argentina egedii ssp. *egedii*	Pacific silverweed	8.10	840	6,804
Minimum Planting Density Per Acre			5,040	
Minimum Total Quantity Plantings				40,824

Wetland and Riparian Margin Seeding (6-11 feet in elevation, NAV88)

Broadcast seed of the following 3 species in hydrologically appropriate portions of the Otter Point project site:

Species	Common Name	Area (Ac.)	Lbs. / Acre	Est. Quantity
Carex lyngbyei	Lyngbye's sedge	8.10	8	65
Carex obnupta	slough sedge	8.10	8	65
Eleocharis palustris	common spikerush	8.10	6	49
Minimum Seeding Density Per Acre			22	
Minimum Total Lbs. Seed				179

In addition, seed no fewer than 2 of the following plant species to achieve the recommended lbs. seeding per acre:

Species	Common Name	Area (Ac.)	Lbs. / Acre	Est. Quantity
Scirpus microcarpus	smallfruit bulrush	8.10	9	73
Deschampsia caespitosa	tufted hairgrass	8.10	9	73
Juncus balticus var. *balticus*	Baltic rush	8.10	1	8
Sagittaria latifolia	wapato	8.10	1	8
Minimum Seeding Density Per Acre			20	
Minimum Total Lbs. Seed				162

Upland and Upland Margin Plantings (>11 feet in elevation, NAV88)

Plant containerized, native stock, consisting of the following species, in appropriate portions of the Otter Point project site:

Species	Common Name	Area (Ac.)	No. / Acre	Est. Quantity
Picea sitchensis	Sitka spruce	5.51	120	661
Minimum Planting Density Per Acre			120	
Minimum Total Quantity Plantings				661

Species	Common Name	Area (Ac.)	No. / Acre	Est. Quantity
Gaultheria shallon	salal	5.51	136	749
Physocarpus capitatus	ninebark	5.51	136	749
Lonicera involucrata	twinberry	5.51	136	749
Rosa nutkana	Nootka rose	5.51	136	749
Rubus spectabilis	salmonberry	5.51	136	749
Spiraea douglasii	rose spiraea	5.51	136	749
Minimum Planting Density Per Acre			816	
Minimum Total Quantity Plantings				4,494

Upland and Upland Margin Seeding (>11 feet in elevation, NAV88)

Broadcast seed of the following 3 species in hydrologically appropriate portions of the Otter Point project site:

Species	Common Name	Area (Ac.)	Lbs. / Acre	Est. Quantity
Juncus tenuis	slender rush	5.51	6	33
Bromus sitchensis	Sitka brome	5.51	4	22
Deschampsia caespitosa	tufted hairgrass	5.51	6	33
Minimum Seeding Density Per Acre			16	
Minimum Total Lbs. Seed				88

In addition, seed no fewer than 4 of the following plant species to achieve the recommended lbs. seeding per acre:

Species	Common Name	Area (Ac.)	Lbs. / Acre	Est. Quantity
Physocarpus capitatus	ninebark	5.51	4	22
Lonicera involucrata	twinberry	5.51	4	22
Rosa nutkana	Nootka rose	5.51	4	22
Rubus spectabilis	salmonberry	5.51	4	22
Spiraea douglasii	rose spiraea	5.51	4	22
Minimum Seeding Density Per Acre			20	
Minimum Total Lbs. Seed				110

NOTE: If a seed base is needed for seeding dispersal in the upland and upland margin areas, appropriate quantities of the above species can be mixed into a native red fescue (*Festuca rubra* var. *rubra*) seed base.

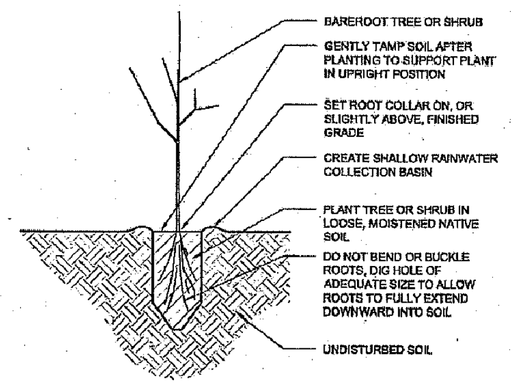
Upland and Upland Margin Seeding (>11 feet in elevation, NAV88)

Broadcast seed of the following three (3) species in hydrologically appropriate portions of the Otter Point project site: **11'+ elevation on cross dike**. Use Sunmark Seeds Streambank Mix or equivalent.

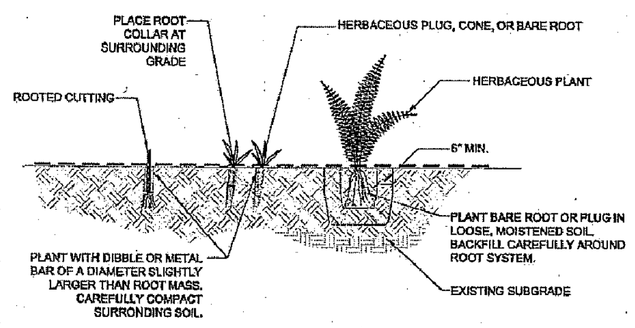
Species	Common Name	Area (Ac.)	Lbs. / Acre	Est. Quantity
Elymus glaucus	Blue Wildrye	5.51	30	165
Festuca rubra	Native Red Fescue	5.51	15	83
Bromus carinatus	California Brome	5.51	5	28
Minimum Seeding Density Per Acre			50	
Minimum Total Lbs. Seed				276

NOTE: If a seed base is needed for seeding dispersal in the upland and upland margin areas, appropriate quantities of the above species can be mixed into a native red fescue (*Festuca rubra* var. *rubra*) seed base.

NOTE: The National Park Service will be providing plant materials to the contractor to ensure the source and quality of stock



1 BAREROOT TREES AND SHRUBS
NTS



2 BAREROOT, PLUG, ROOTED CUTTING
NTS

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REVEGETATION PLANTING NOTES AND DETAILS

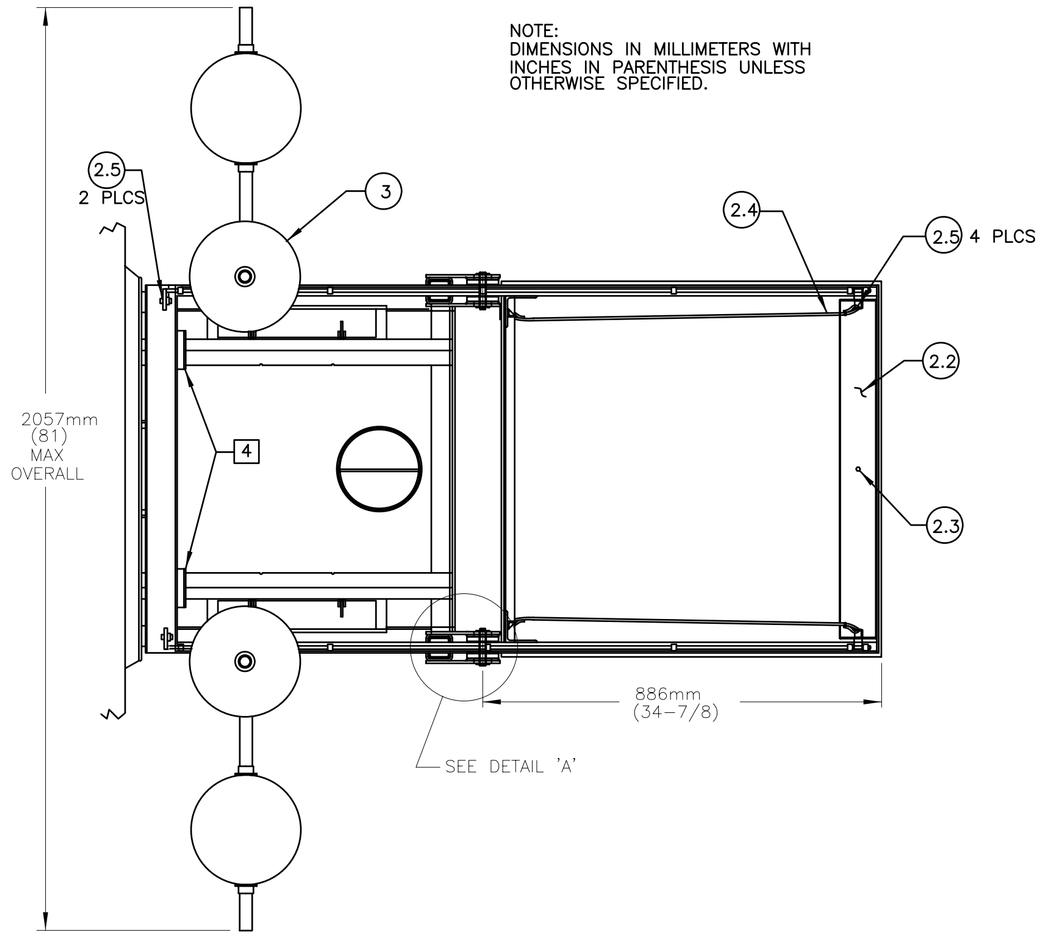
OTTER POINT RESTORATION PROJECT – CONSTRUCTION DOCUMENT PLAN SET

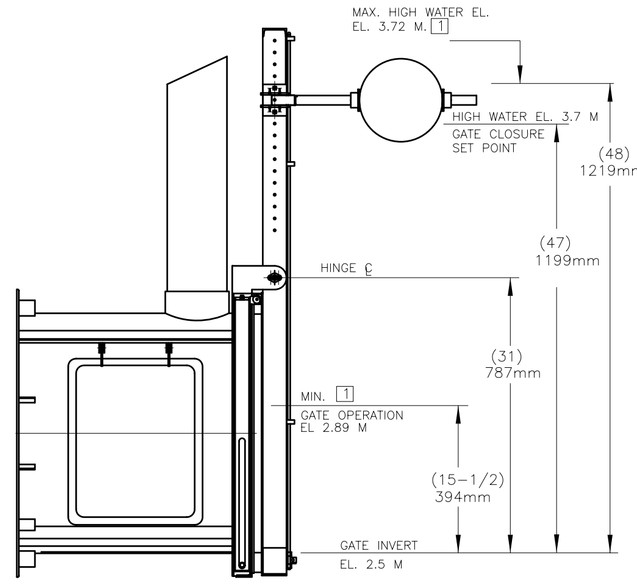
DATE: 5/21/2010
DRAWN BY: KMH
PROJ. MGR: BAH
CHECKED BY: WJK
PROJECT NUMBER CREST 08–01
CASE FILE NUMBER

SHEET NUMBER C12A
OF 15

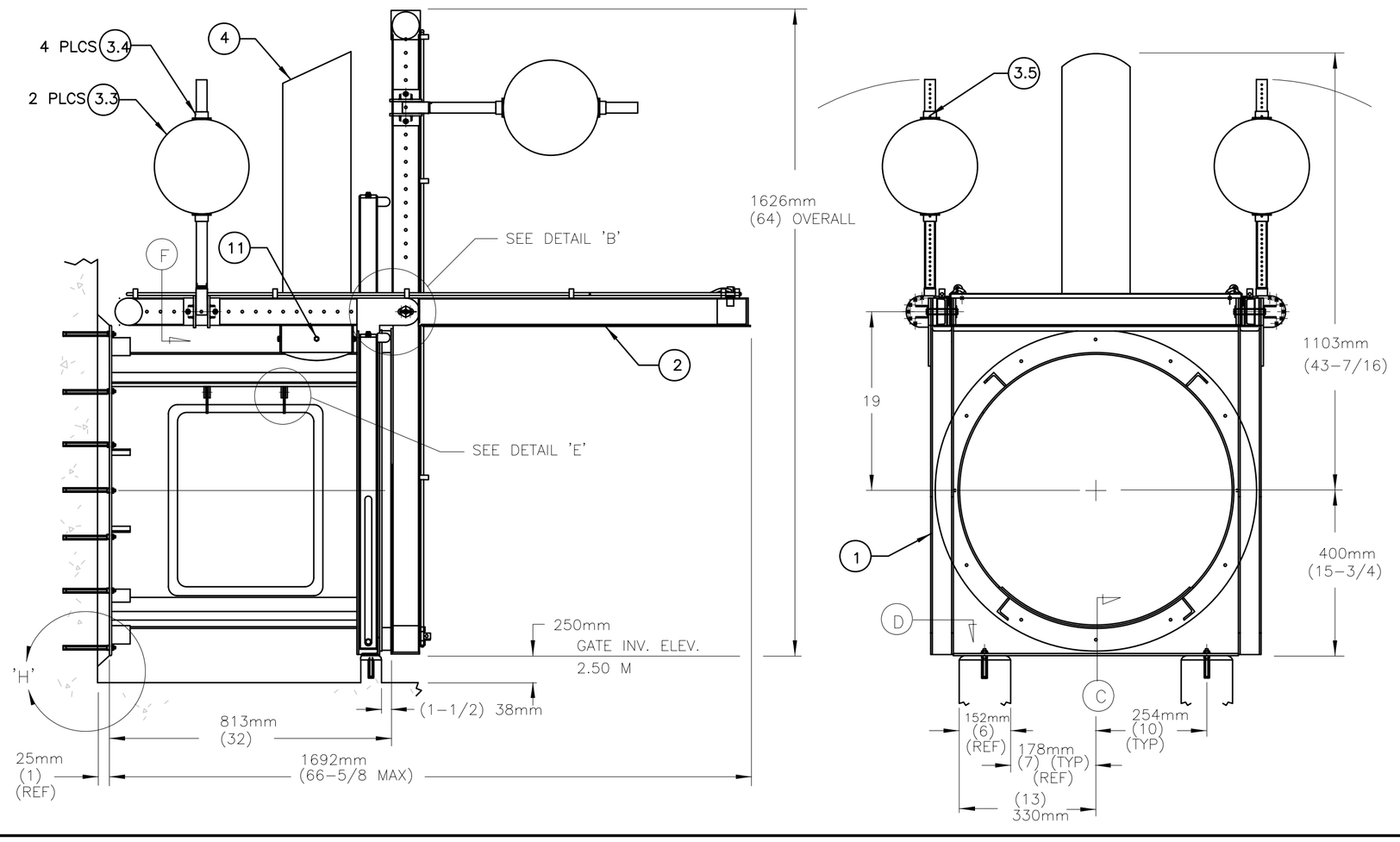
MeyerD, Plotted: May 18, 2010 – 4:41pm, P:\HEN.005 CREST\dwg\Eng\Set\HEN.005-PLNTA.dwg

NOTE:
DIMENSIONS IN MILLIMETERS WITH INCHES IN PARENTHESIS UNLESS OTHERWISE SPECIFIED.





(GATE SHOWN IN CLOSED POSITION)



MATERIAL KEY	FINISH KEY	PAINT KEY
	2. MILL 3. MACHINE	

ITEM	ITEM DESCRIPTION	MATERIAL KEY	FINISH KEY	PART NO. OR SIZE (FOR WATERMAN USE ONLY)	QTY/ GATE	TOTAL QTY
1	FRAME ASSEMBLY	–	–			
1.1	FRAME WELDMENT	17	2,3			
1.2	LATERAL DOOR	17	6K			
1.3	BUSHING	35	2,3			
1.4	SHOULDER SCREW	9A	2,3			
1.5	WASHER	15A	2			
1.6	WASHER	21	2			
1.7	HEX NUT,WASHER,LOCKWASHER	27,15A	2			
1.8	VERITCAL FLOAT	17	6L			
1.9	PIPE PLUG	9A	2			
1.10						
1.11						
1.12	FLOAT PIN	9A	2,3			
1.13	BUSHING	35	2,3			
1.14	COLLAR	9B	2,3			
1.15	WASHER	21	2			
1.16	COTTER PIN	9A	2			
1.17	FRONT GASKET	44	2,3			
1.18	WASHER	21	2,3			
1.19	HEX HEAD BOLT	15A	2			
1.20	WASHER	15A	2			
1.21						
1.22	HEX NUT, SELF-LOCKING	15A	2			
1.23	ISOLATION SLEEVE	35	2			
1.24	WASHER, LARGE O.D.	15A	2			
1.25						
1.26						
2	DOOR ASSEMBLY					
2.1	COVER	17	6K,2			
2.2	DOOR FLOAT	17	6L			
2.3	PIPE PLUG	9A	2			
2.4	ATTACHING CABLE	9A	2			
2.5	HEX HD SCREW, WASHER, LOCKWASHER & NUT	15A,27	2			
2.6	FLOAT RELEASE ROD	17	2,3			
2.7	SPRING PIN	9A	2			
2.8	BUSHING	46	2,3			
3	BACK FLOAT ASSEMBLY					
3.1	BACK FLOAT BRACKET	17	2,3			
3.2	FLOAT ARM	17	2,3			
3.3	FLOAT	43,35	2,3			
3.4	FLOAT STOP	17	2,3			
3.5	COTTER PIN	9B	2			
3.6	HEX HD BOLT, WASHER, LOCKWASHER, & HEX NUT	15A,27	2			
3.7	HEX HD BOLT, WASHER, LOCKWASHER, & HEX NUT	15A,27	2			
3.8	WASHER	21	2			
4	VACUUM BREAK VENT	19	2,3			
5	DOOR PIVOT PIN	9A	2,3			
6	CENTERING WASHERS	13	2,3			
7	SPACER WASHER	21	2,3			
8	COLLAR	9A	2,3			
9	WASHER	21	2			
10	COTTER PIN	9B	2			
11	HEX HEAD BOLT, WASHER, LOCKWASHER & NUT	15A,27	2			
20	ALL THREADED STUD	9B	2,3			
21	WASHER	15B	2			
22	WASHER	21	2,3			
23	ISOLATION SLEEVE	35	2			
24	HEX NUT	15B	2			
25	CONCRETE ANCHOR	STN STL	2			
26						
27						
28						
29						
30						
31						

REF.

(1) GATE REQUIRED AT ☐

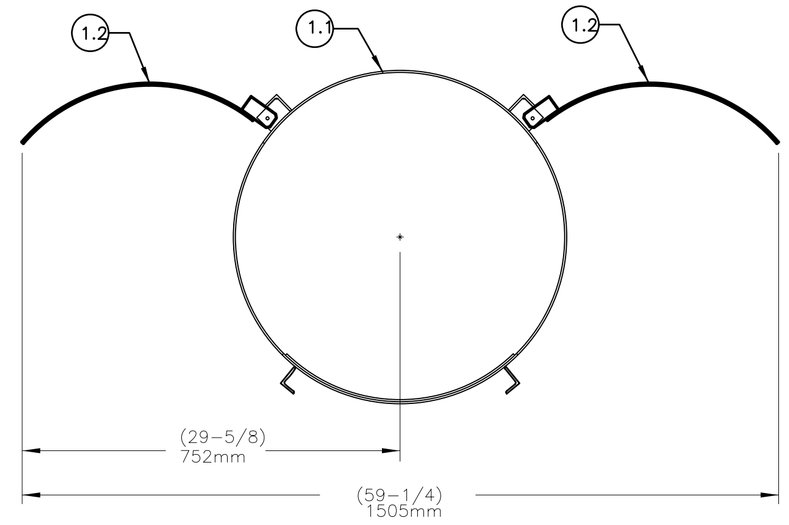
610mm (24") DIA. WATERMAN SELF-REGULATING TIDEGATE

FOR

WATERMAN INDUSTRIES
EXETER, CALIFORNIA 93221

REV. NO.	DATE	BY
REV. NO.	DATE	BY
REV. NO.	DATE	BY
REV. NO.	DATE	BY
REV. NO.	DATE	BY
REV. NO.	DATE	BY

JOB NO. | P.M.
QUOTE NO. | ITEM #
DRAWN BY | CHECKED BY
SCALE: NONE | DATE
DRAWING NO. | SHEET



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CONSTRUCTION DETAILS
WATERMAN SELF REGULATING TIDE GATE
OTTER POINT RESTORATION PROJECT – CONSTRUCTION DOCUMENT PLAN SET

DATE: 5/21/2010
DRAWN BY: KMH
PROJ. MGR: BAH
CHECKED BY: WJK
PROJECT NUMBER
CREST 08-01
CASE FILE NUMBER

SHEET NUMBER
C13A
OF 15

MeyerD, Plotted: May 18, 2010 – 4:24pm, P:\HEN.005 CREST\dwg\Eng\Set\HEN.005-DET2.dwg

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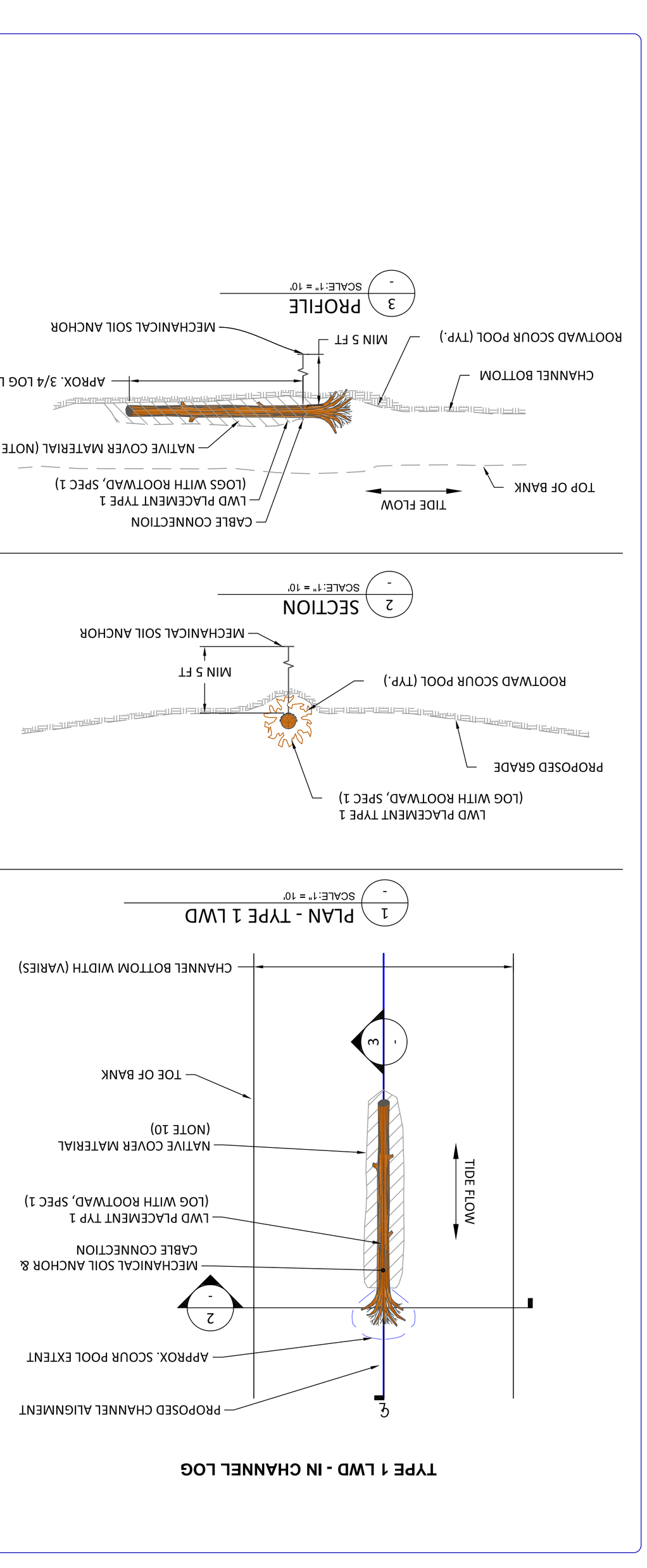
LARGE WOODY DEBRIS DETAILS

OTTER POINT RESTORATION PROJECT – CONSTRUCTION DOCUMENT PLAN SET

DATE: 3/01/2010
DRAWN BY: JG
PROJ. MGR: BAH
CHECKED BY: TD
PROJECT NUMBER
CREST 08-01
CASE FILE NUMBER

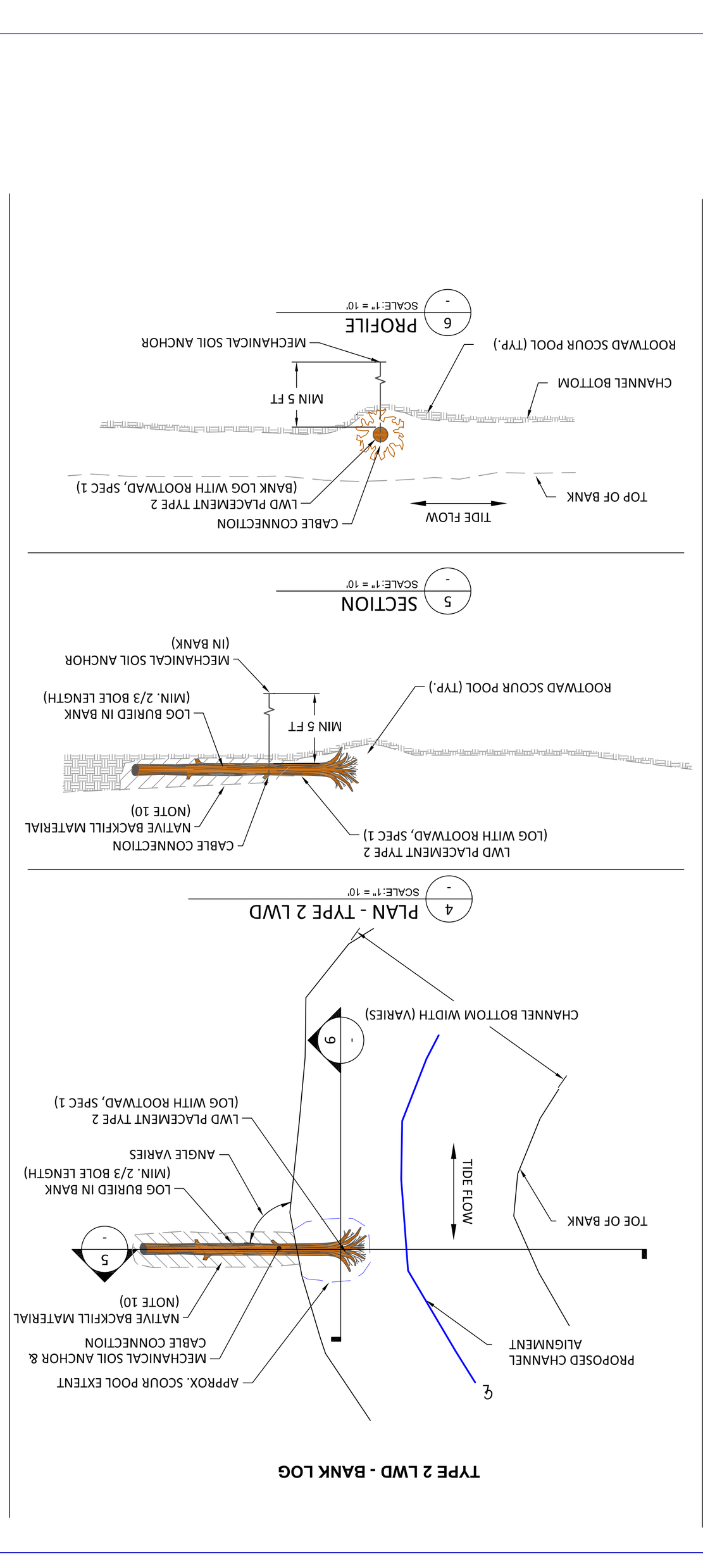
SHEET NUMBER
015
OF 16

TYPE 1 LWD - IN CHANNEL LOG

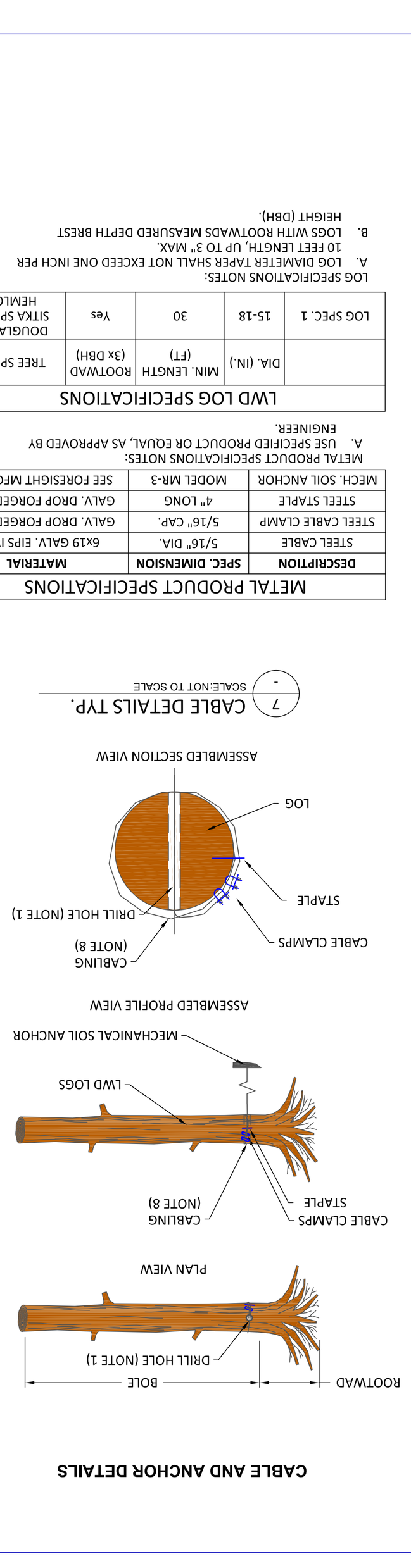


1 PLAN - TYPE 1 LWD
SCALE:1" = 10'

TYPE 2 LWD - BANK LOG



CABLE AND ANCHOR DETAILS



CONSTRUCTION SEQUENCE OF EVENTS FOR LWD PLACEMENT

1. LOGS MAY BE PREDRILLED. DRILL LOGS IN CENTER OF BOLE. HOLE DIAMETER NOT TO EXCEED 1.50 TIMES THE CABLE DIAMETER.
2. PLACE TYPE 1 LOGS PARALLEL WITH CHANNEL AS SHOWN IN DETAIL. ROOTWAD SHALL FACE AS SHOWN ON SHEET C-1.
2. PLACE TYPE 2 LOGS AT ANGLE TO CHANNEL AS SHOWN ON SHEET C-1.
3. EXCAVATE CHANNEL BOTTOM AS NECESSARY FOR ROOTWAD SO THAT BOLE HAS FULL CONTACT WITH CHANNEL BOTTOM.
4. EXCAVATE CHANNEL BANK AS NECESSARY FOR TYPE 2 LOG TO BE PLACED LEVEL WITH THE ROOTWAD ON THE CHANNEL BOTTOM. LOG IS BURIED INTO BANK AS SHOWN ON PLANS.
5. PROVIDE SUFFICIENT LENGTH OF CABLE TO INSTALL MECHANICAL SOIL ANCHOR, CABLE DRILLED LOGS, AND WRAP AND SECURE LOG AS SHOWN IN DETAIL.
6. DRIVE MECHANICAL SOIL ANCHOR TO A DEPTH NO LESS THAN THAT SHOWN ON PLANS AND AS INSTRUCTED BY MANUFACTURER INSTALLATION PROCEDURES.
7. ANCHOR STABILITY SHALL BE **PROOFED TO A LOAD NO LESS THAN 3,500 LB** CONSISTENT WITH METHODS RECOMMENDED BY THE MANUFACTURER.
8. ANCHOR LOAD LOCKED DEPTH SHALL BE NO LESS THAN THAT SHOWN ON PLANS. FINAL INSTALLATION TO BE APPROVED BY CONTRACTING OFFICER.
9. ONCE ANCHOR STABILITY IS SATISFACTORILY PROOFED, TIGHTLY WRAP CABLE ONE AND ONE-QUARTER TIMES THE LOG CIRCUMFERENCE AND SECURE TWO STRANDS OF CABLE WITH CABLE CLAMPS AND STAPLE END OF CABLE TO LOG.
10. BACKFILL OR COVER LWD AS SHOWN WITH NATIVE SOIL FROM CHANNEL EXCAVATION.

ESTIMATED QUANTITIES

(CONTRACTOR RESPONSIBLE FOR VERIFYING QUANTITIES)

DESCRIPTION	UNIT	QTY.
LARGE WOODY DEBRIS (LWD) LOG, SPEC 1	EA	46
STEEL CABLE	LF	650
STEEL CABLE CLAMP	EA	92
STEEL STAPLE	EA	46
MECHANICAL SOIL ANCHOR ASSEMBLIES	EA	46

ESTIMATED QUANTITIES NOTES:
A. STEEL CABLE LENGTH ASSUMES THE FOLLOWING:
7 FT FOR ANCHOR TO GROUND SURFACE, 7 FT FOR ATTACHMENT TO LWD.

METAL PRODUCT SPECIFICATIONS

DESCRIPTION	SPEC. DIMENSION	MATERIAL
STEEL CABLE	5/16" DIA.	6x19 GALV. EIPS IWRC
STEEL CABLE CLAMP	5/16" CAP.	GALV. DROP FORGED STEEL
STEEL STAPLE	4" LONG	GALV. DROP FORGED STEEL
MECH. SOIL ANCHOR	MODEL MR-3	SEE FORESIGHT MFG. SPEC

METAL PRODUCT SPECIFICATIONS NOTES:
A. USE SPECIFIED PRODUCT OR EQUAL, AS APPROVED BY ENGINEER.

LWD LOG SPECIFICATIONS

	DIA. (IN.)	MIN. LENGTH (FT)	ROOTWAD (3x DBH)	TREE SPECIES
LOG SPEC. 1	15-18	30	Yes	DOUGLAS FIR, SITKA SPRUCE, HEMLOCK

LOG SPECIFICATIONS NOTES:
A. LOG DIAMETER TAPER SHALL NOT EXCEED ONE INCH PER 10 FEET LENGTH, UP TO 3" MAX.
B. LOGS WITH ROOTWADS MEASURED DEPTH BREST HEIGHT (DBH).