

Calapooia River Reach 3 Restoration, Stabilization, and Conservation Projects

PROJECT PARTNERS



LOCAL LANDOWNERS LOCATED IN REACH 3 OF THE CALAPOOIA RIVER NEAR BROWNSVILLE, OREGON.

PROJECT DESCRIPTION

PROPOSED RESTORATION, STABILIZATION, AND CONSERVATION PROJECTS ARE PROPOSED FOR REACH 3 OF THE CALAPOOIA RIVER. THE CALAPOOIA WATERSHED COUNCIL IS WORKING WITH LANDOWNERS TO ENHANCE RIVER AND FLOODPLAIN HABITAT IN REACH 3.

BENCHMARK

SURVEY CONTROL USED FOR THE PROJECT HAS THE FOLLOWING PROJECTION INFORMATION. THE HORIZONTAL DATUM IS NAD 83, STATE PLANE COORDINATES, OREGON ZONE NORTH, AND THE VERTICAL DATUM IS NAVD 88. THE BENCHMARK COORDINATES CORRESPOND TO THE TOP CENTER OF CONTROL MARKERS LISTED ON DRAWING.

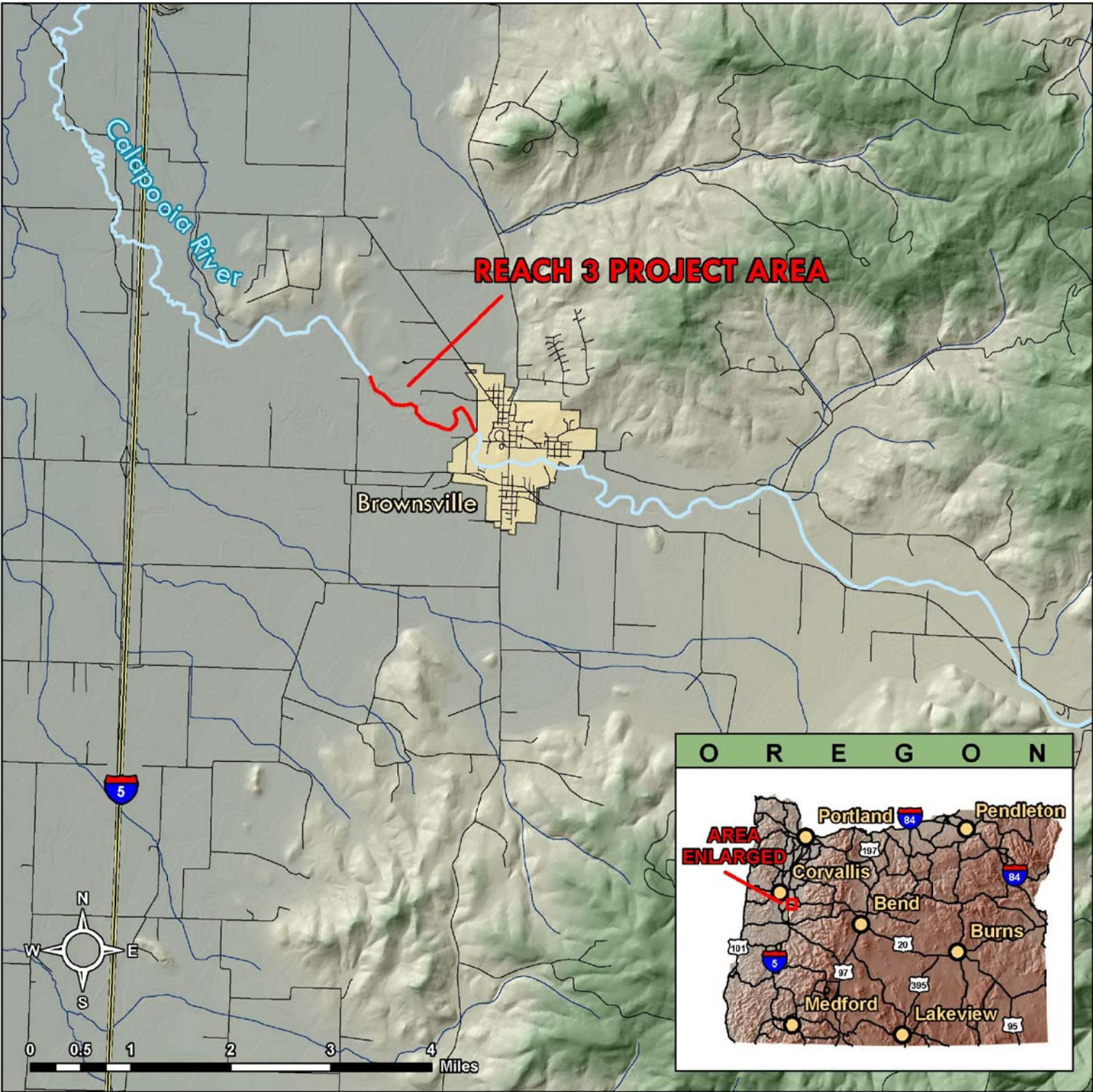
GENERAL NOTES

1. DUE TO THE INHERENT VARIABILITY AND DYNAMIC NATURE OF RIVERS, IT IS NECESSARY TO REVIEW CURRENT CONDITIONS PRIOR TO IMPLEMENTATION OF THE DESIGN DRAWINGS TO ENSURE SITE CONDITIONS MATCH CONDITIONS DEPICTED IN DRAWINGS.
2. RIVER DESIGN GROUP MAKES NO REPRESENTATION OF THE EXISTENCE OR NONEXISTENCE OF UTILITIES. CONTRACTOR IS RESPONSIBLE FOR CALLING THE OREGON UTILITY NOTIFICATION CENTER (800-332-2344) AT LEAST TWO BUSINESS DAYS PRIOR TO DIGGING.
3. EXCAVATION, TRENCHING, SHORING, AND SHIELDING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR PERFORMING THE WORK, THESE DRAWINGS ARE NOT INTENDED TO PROVIDE MEANS OR METHODS OF CONSTRUCTION.
4. PRESERVE AND PROTECT ALL VEGETATION TO THE FULLEST EXTENT POSSIBLE.
5. METHODS FOR WORK AREA ISOLATION, FISH REMOVAL, AND EROSION CONTROL SHALL BE SUBMITTED TO RIVER DESIGN GROUP FOR APPROVAL PRIOR TO COMMENCING WORK.
6. THE LANDOWNER IS RESPONSIBLE FOR PROCURING AND COMPLYING WITH ALL PERMITS AND EASEMENTS INCLUDING ALL FEDERAL, STATE, COUNTY, AND LOCAL PERMITS.
7. THESE DRAWINGS AND THE ASSOCIATED WRITTEN SPECIFICATIONS REPRESENT THE CONSTRUCTION DOCUMENTS. ANY DEVIATIONS FROM THESE DRAWINGS AND ASSOCIATED SPECIFICATIONS WITHOUT WRITTEN APPROVAL FROM RIVER DESIGN GROUP, INC. MAY RESULT IN NOT MEETING CONTRACT DOCUMENTS AND MAY RESULT IN NOT BEING ACCEPTED FOR PAYMENT.

DRAWING INDEX

- | | |
|-----|------------------------------|
| 1.0 | COVER PAGE AND NOTES |
| 1.1 | REACH OVERVIEW |
| 2.0 | PROJECT LAYOUT: SITE 1 |
| 2.1 | PROJECT LAYOUT: SITE 2 |
| 3.0 | LARGE WOOD HABITAT STRUCTURE |
| 3.1 | ENGINEERED DEBRIS JAM |

CALAPOOIA RIVER REACH 3 VICINITY MAP

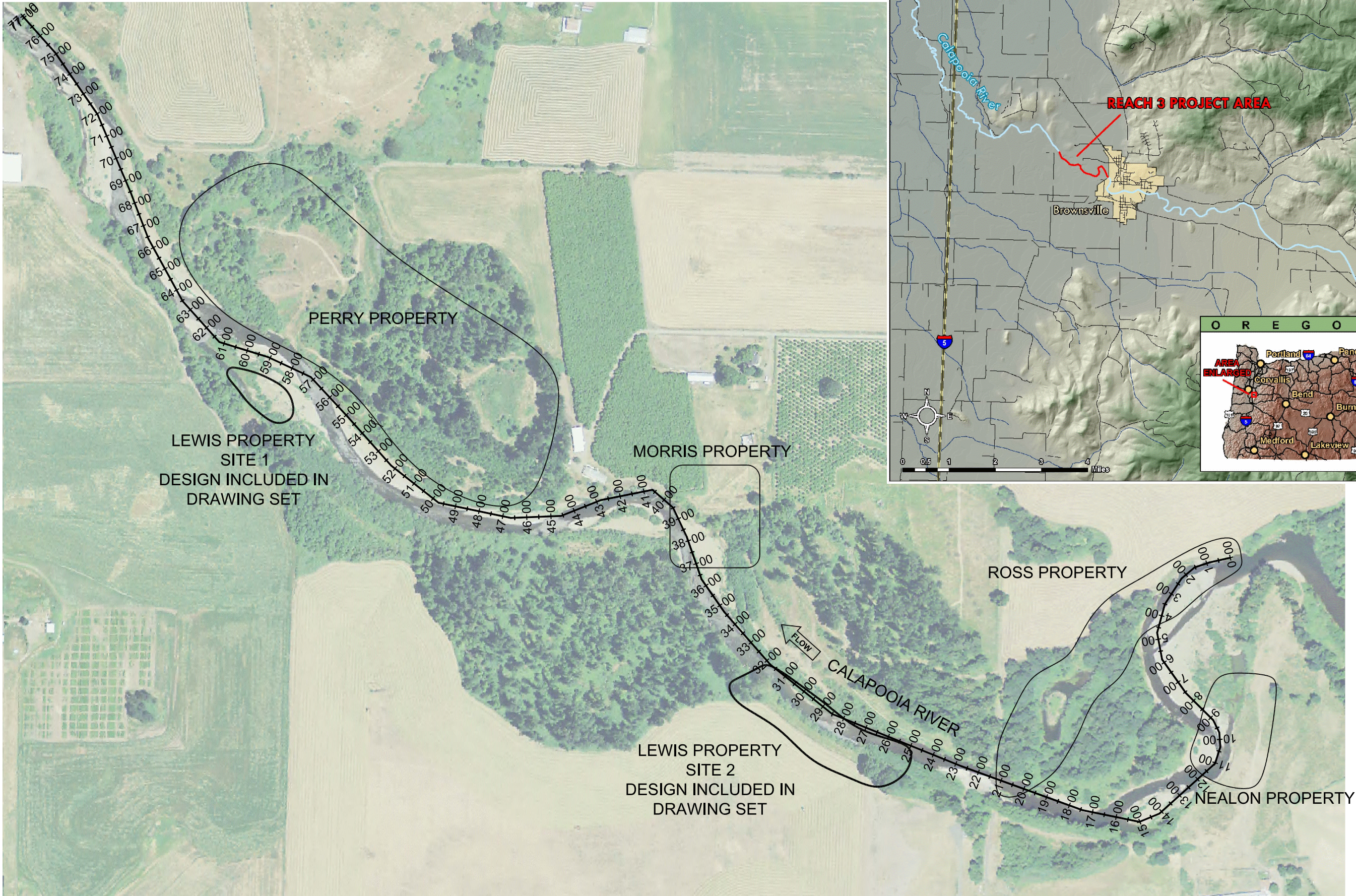


COVER PAGE AND NOTES

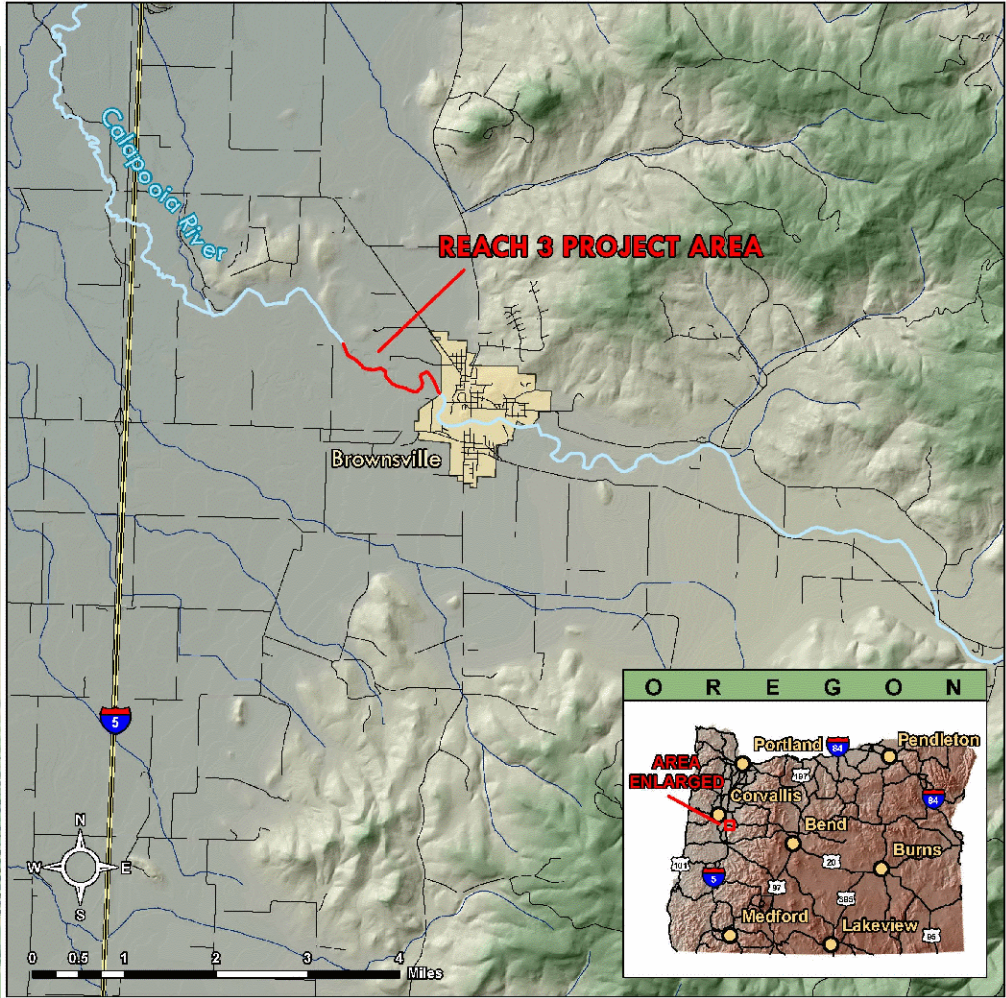
CALAPOOIA RIVER REACH 3 RESTORATION
CALAPOOIA WATERSHED COUNCIL - LEWIS PROPERTY

NO.	DATE	BY	DESCRIPTION	CHK
1	12/17/09	RB	90% DESIGN	TB

PROJECT NUMBER RDG-08-067
DRAWING NUMBER 1.0
Drawing 1 of 6



1 PROJECT SITES OVERVIEW
1" = 400'



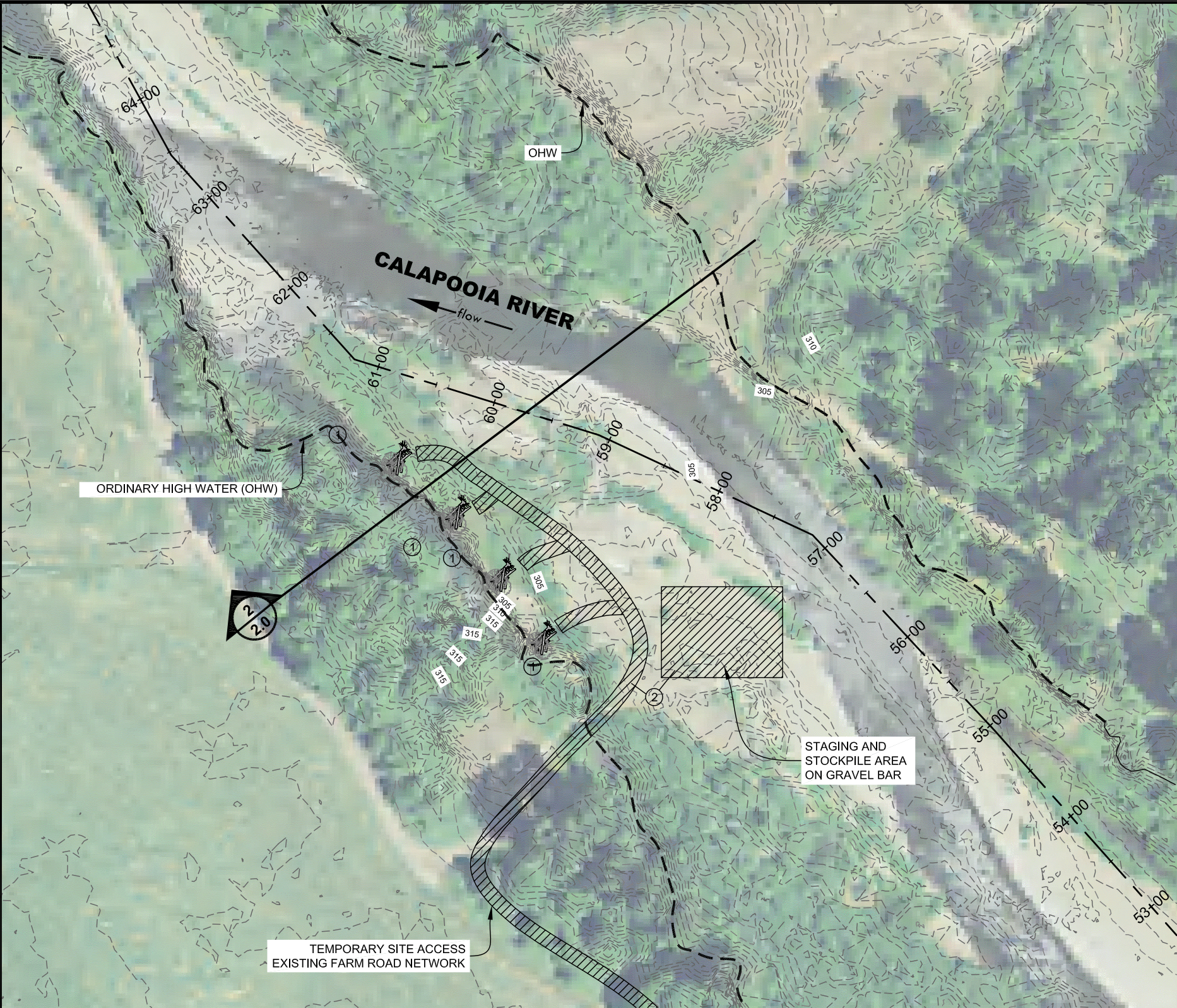
REACH OVERVIEW
CALAPOOVIA RIVER REACH 3 RESTORATION
CALAPOOVIA WATERSHED COUNCIL - LEWIS PROPERTY

NO.	DATE	BY	DESCRIPTION	CHK
1	12/17/09	RB	90% DESIGN	TB

PROJECT NUMBER
RDG-08-067

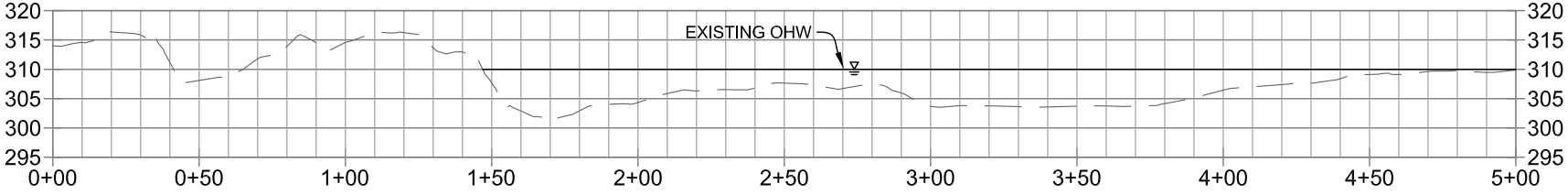
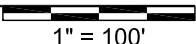
DRAWING NUMBER

1.1

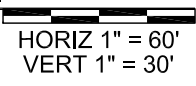


- NOTES:
1. CONTOURS ARE FROM WATERSHED SCIENCES LIDAR DATA ACQUIRED FALL 2008.
 2. AERIAL PHOTO IS 2009 NAIP IMAGE.

1 PROJECT LAYOUT



2 CHANNEL SECTION



PROJECT INTENT

THE PROJECT WILL INCLUDE PLACING FOUR LARGE WOOD HABITAT STRUCTURES IN AN EXISTING BACKWATER CHANNEL THAT IS CONNECTED TO THE CALAPOOVIA RIVER. THE BACKWATER CHANNEL IS CONNECTED TO THE CALAPOOVIA RIVER YEAR-ROUND. THE LARGE WOOD HABITAT STRUCTURES ARE EXPECTED TO PROVIDE COVER FOR JUVENILE AND ADULT FISH. THE BACKWATER PROVIDES HIGH FLOW REFUGIA HABITAT.

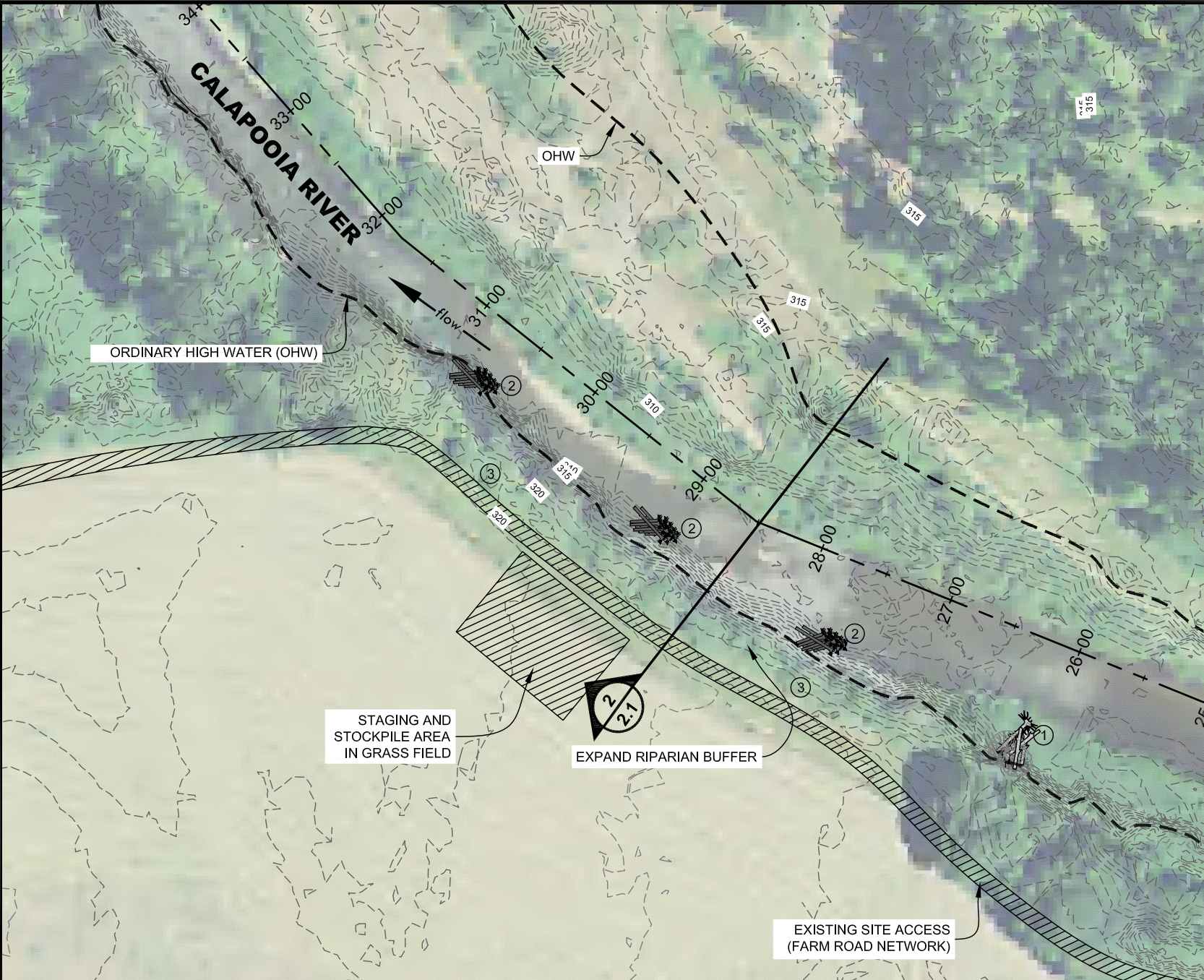
- PROJECT COMPONENTS**
- ① LARGE WOOD HABITAT STRUCTURE INSTALLATION. SEE DRAWING 3.0
 - ② REMOVE CONSTRUCTION DEBRIS, RECLAIM ACCESS ROUTES, AND SEED DISTURBED AREAS.

PROJECT MATERIALS/QUANTITIES

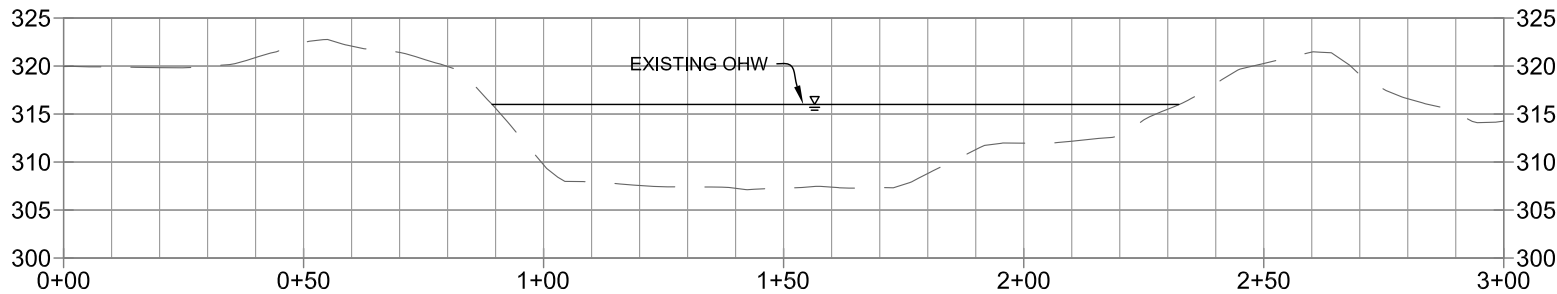
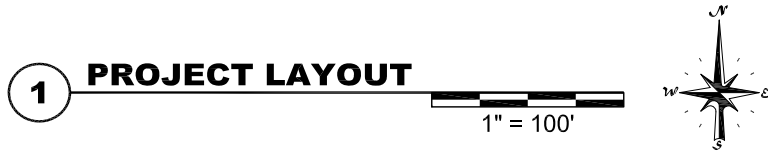
PROJECT EXCAVATION	40 CY
LARGE WOOD HABITAT STRUCTURES (4)	20 CY
SALVAGED SITE MATERIAL PLACEMENT	20 CY
ROOTWAD (20' X18", RWD 3' DIA)	12
TREE TOP (25' X >18")	8
BALLAST ROCK (0.75 CY TO 1.0 CY)	20
REBAR PINS (1"Ø X 3' LENGTH)	20
OFF SITE MATERIAL DISPOSAL	20 CY



LEWIS PROPERTY OFF CHANNEL HABITAT



- NOTES:
1. CONTOURS ARE FROM WATERSHED SCIENCES LIDAR DATA ACQUIRED FALL 2008.
 2. AERIAL PHOTO IS 2009 NAIP IMAGE.



LEWIS PROPERTY BANK TREATMENT LOCATION

PROJECT INTENT

THE PROJECT WILL INCLUDE PLACING THREE ENGINEERED DEBRIS JAMS AND ONE LARGE WOOD HABITAT STRUCTURE ON THE RIVER-LEFT BANK OF THE CALAPOOIA RIVER. THE THREE ENGINEERED DEBRIS JAMS WILL BE PLACED ON AN EXISTING VEGETATED RIPRAP BANK. THE STRUCTURES WILL PROVIDE BOTH IN-STREAM AND RIPARIAN COVER. STRUCTURES WILL BE LOCATED ADJACENT TO MATURE WILLOWS TO IMPROVE STRUCTURAL STABILITY AND HABITAT BENEFITS. THE LARGE WOOD HABITAT STRUCTURE WILL BE PLACED AT THE MOUTH OF A BACKWATER CHANNEL AT THE UPSTREAM END OF THE PROJECT AREA. THE HABITAT STRUCTURE WILL PROVIDE COVER FOR JUVENILE AND ADULT FISH YEAR-ROUND.

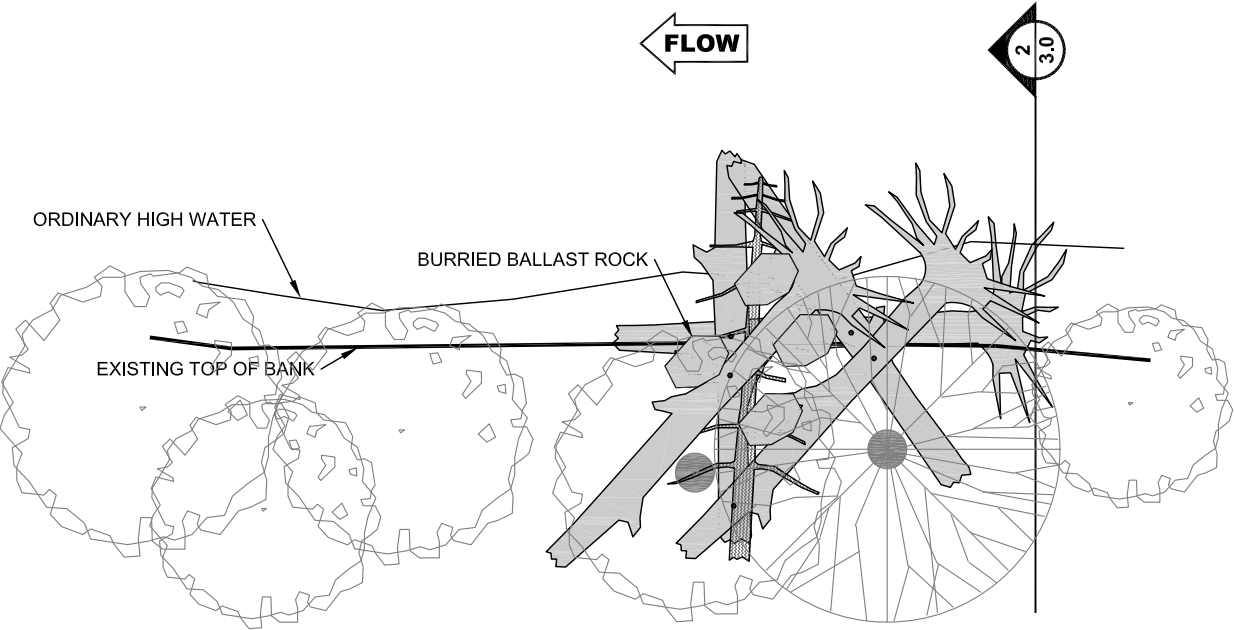
PROJECT COMPONENTS

- ① LARGE WOOD HABITAT STRUCTURE INSTALLATION. SEE DRAWING 3.0
- ② ENGINEERED DEBRIS JAM. SEE DRAWING 3.1
- ③ COMPLETE BUFFER AUGMENTATION PLANTING.

PROJECT MATERIALS/QUANTITIES

PROJECT EXCAVATION	60 CY
LARGE WOOD HABITAT STRUCTURES (1)	5 CY
ENGINEERED DEBRIS JAMS (3)	15 CY
SALVAGED SITE MATERIAL PLACEMENT	60 CY
ROOTWAD (20' X18", RWD 3' DIA)	15
TREE TOP (25' X >18")	20
BALLAST ROCK (0.75 CY TO 1.0 CY)	20
REBAR PINS (1"Ø X 3' LENGTH)	35
OFF SITE MATERIAL DISPOSAL	0 CY

NO.	DATE	BY	DESCRIPTION	CHK
1	12/17/09	RB	90% DESIGN	TB



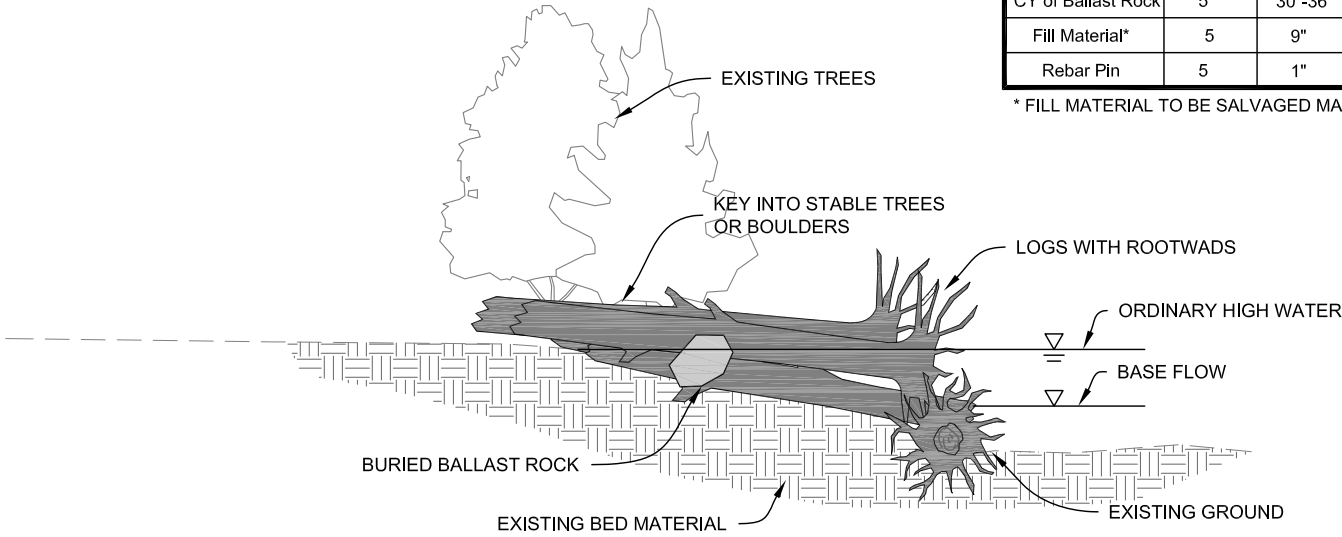
1 PLAN VIEW

1" = 10'

MATERIAL SCHEDULE (PER STRUCTURE)

Item	Quantity	Dia. (in)	Length (ft)	Rootwad (Y/N)
Rootwad Log	3	18	20	Yes - 3 ft Dia. Min.
Deflector Log	2	18	25	No
CY of Ballast Rock	5	30"-36"		
Fill Material*	5	9"		
Rebar Pin	5	1"	3	

* FILL MATERIAL TO BE SALVAGED MATERIAL OR PIT RUN



2 STRUCTURE PROFILE

HORIZ 1" = 10'
VERT 1" = 10'

DESIGN INTENT

THE LARGE WOOD HABITAT STRUCTURE IS INTENDED TO PROVIDE HABITAT DIVERSITY BY ENHANCING SCOUR POOLS, ACTING AS REFUGIA AREA DURING HIGH FLOW, CREATING NEAR-BANK FLOW PARTITION ZONES, AND POOL COVER.

CONSTRUCTION NOTES

LOGS FOR THE HABITAT STRUCTURES SHALL BE CEDAR, SPRUCE, PINE, OR FIR - APPROXIMATELY 15'-20' LONG AND 18" DIAMETER WITH 3' DIAMETER ROOTWADS. OTHER TYPES OF LOGS MAY BE USED IF APPROVED PRIOR TO CONSTRUCTION BY THE PROJECT ENGINEER.

LOGS SHALL BE ANCHORED TO EXISTING STABLE TREES. BALLAST ROCKS SHALL BE USED TO ANCHOR HABITAT LOGS WHEN STABLE TREES ARE NOT PRESENT OR INSUFFICIENT FOR STABILIZING STRUCTURES.

THE NUMBER OF LOGS AND ROOTWADS, THEIR ORIENTATION, AND BALLAST REQUIREMENTS FOR A PARTICULAR STRUCTURE WILL BE DETERMINED ON-SITE BY PROJECT ENGINEER BASED ON INDIVIDUAL SITE CHARACTERISTICS.

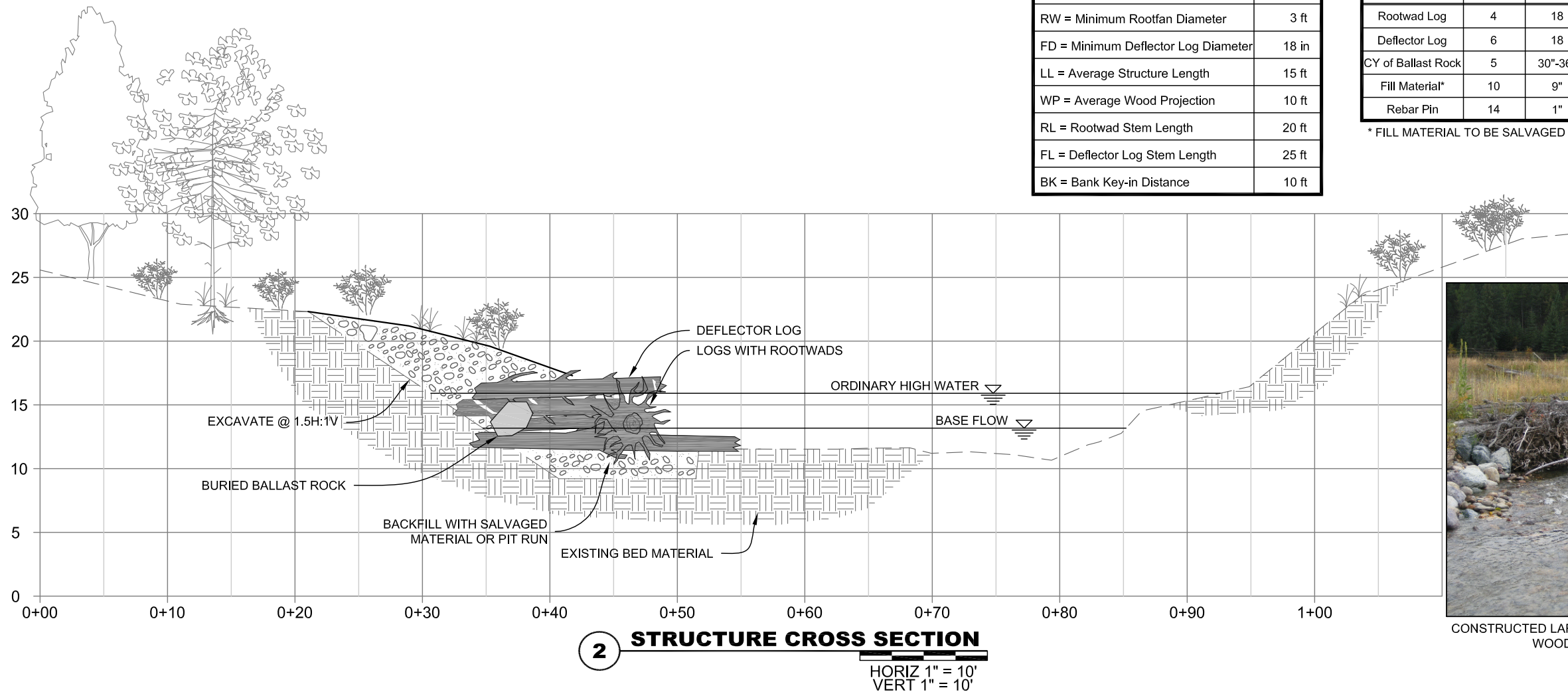
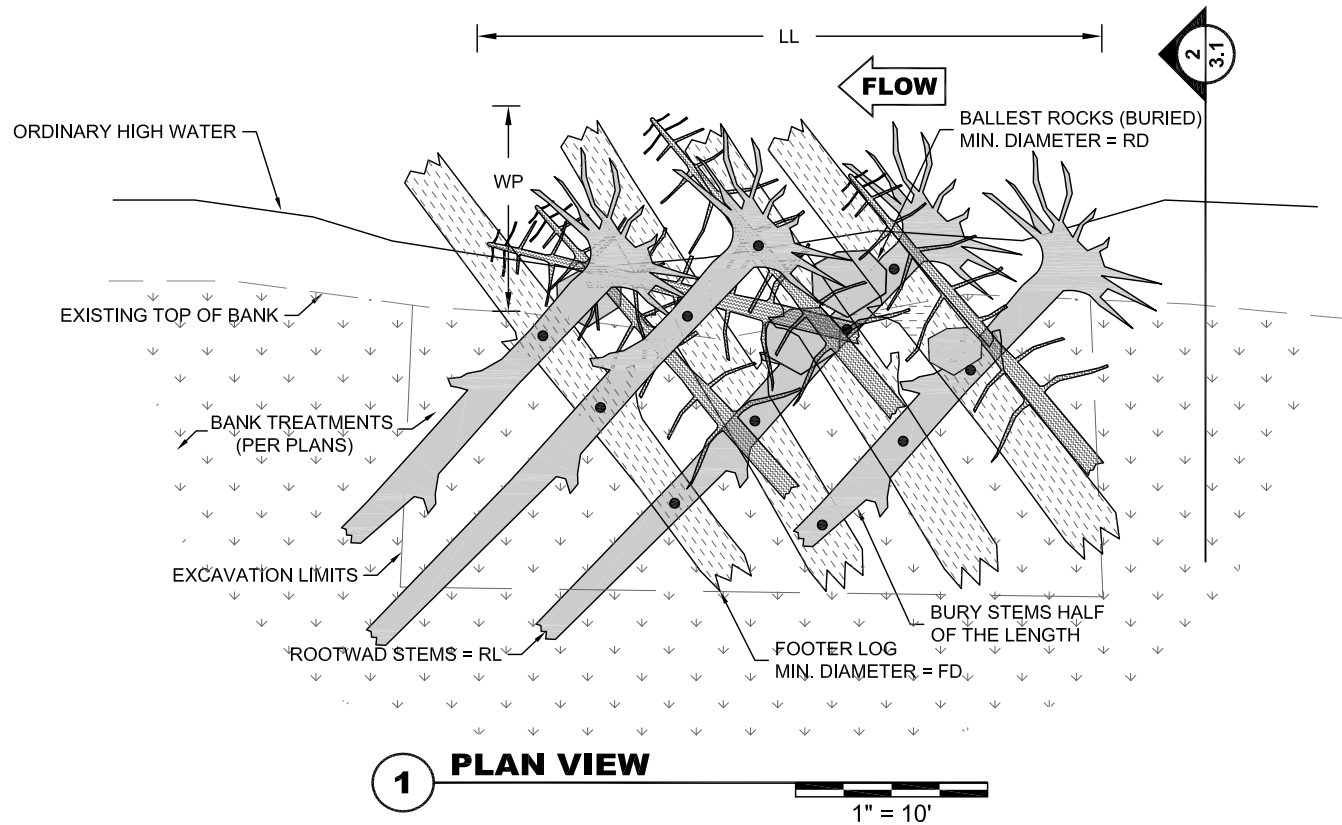


EXAMPLE LARGE WOOD HABITAT STRUCTURES

LARGE WOOD HABITAT STRUCTURE
CALAPOOIA RIVER REACH 3 RESTORATION
CALAPOOIA WATERSHED COUNCIL - LEWIS PROPERTY

NO.	DATE	BY	DESCRIPTION	CHK
1	12/17/09	RB	90% DESIGN	TB

PROJECT NUMBER RDG-08-067
DRAWING NUMBER 3.0
Drawing 5 of 6



DESIGN INTENT

THE INTENT OF THE ENGINEERED DEBRIS JAM IS TO PROVIDE BANK STABILIZATION BY REDUCING NEAR-BANK STRESS AND REDIRECTING FLOW AWAY FROM THE BANK. THE STRUCTURE IS DESIGNED TO ALLOW FISH PASSAGE AT ALL FLOW LEVELS AND DISSIPATE ENERGY IN THE FORM OF A DOWNSTREAM SCOUR POOL. STRUCTURE PERFORMANCE IS DEPENDENT UPON PLACEMENT WITHIN A SEQUENCE OF OTHER BANK STABILIZATION AND GRADE CONTROL STRUCTURES.

THE STRUCTURE IS DESIGNED TO BE NATURAL IN APPEARANCE AND INCORPORATE LARGE WOOD, ROCK, BIOENGINEERING, AND VEGETATION. THE STRUCTURE IS DESIGNED TO HAVE NO ABRUPT AFFECT ON THE WATER SURFACE PROFILE AT ALL FLOW LEVELS. THE STRUCTURE EXTENDS APPROXIMATELY 5-10 FEET INTO THE CHANNEL, LEAVING 30 TO 35 FEET OF THE CHANNEL WIDTH UNOBSTRUCTED FOR BEDLOAD AND DEBRIS TRANSPORT, AND RECREATIONAL PASSAGE. OVER TIME, THE STRUCTURE WILL DECOMPOSE AND/OR BECOME ABANDONED AND REPLACED BY RIPARIAN VEGETATION THAT WILL BE PLANTED IN AND AROUND THE STRUCTURE.

CONSTRUCTION NOTES

EXCAVATE TRENCH AND SET FOOTER LOGS AT SPECIFIED DEPTH. USE FOOTER LOGS WITH MINIMUM DIAMETER AND STEM LENGTH AS SPECIFIED. FOOTER LOGS SHALL NOT HAVE A ROOTFAN. IF POSSIBLE, BACKFILL UP TO TOP OF FOOTER LOGS WITH SPECIFIED ALLUVIAL BACKFILL. DOUSE BACKFILL PERIODICALLY WITH WATER TO IMPROVE COMPACTION AND MINIMIZE VOID SPACES.

SET ROOTWAD LOGS ON FOOTER LOGS. PLACE LOG STEMS SLOPING DOWNWARD INTO BANK FROM EDGE OF WATER. USE ROOTWADS WITH MINIMUM ROOTFAN DIAMETER AND STEM LENGTH AS SPECIFIED. BACKFILL WITH NATIVE MATERIAL UP TO TOP OF ROOTWAD LOGS AND PLACE BALLAST ROCKS ON TOP OF ROOTWAD LOGS AT LOCATIONS WHERE ROOTWAD LOGS INTERSECT FOOTER LOGS. DOUSE BACKFILL PERIODICALLY WITH WATER TO IMPROVE COMPACTION AND MINIMIZE VOID SPACES.

ADD ADDITIONAL TIER OF FOOTER LOGS AND ROOTWAD LOGS AS DESCRIBED ABOVE. COVER BALLAST ROCKS AND TOP OF STRUCTURE WITH VEGETATED SOIL LIFT AS SPECIFIED.

PLACE ADDITIONAL LOGS AND WOODY DEBRIS INTO TRENCH TO ACT AS DEFLECTOR LOGS AND ADDITIONAL BALLASTING. NUMBER AND SIZE OF HABITAT LOGS MAY VARY FROM STRUCTURES SHOWN.

THE CONSTRUCTION MANAGER SHALL INSPECT AND APPROVE ALL FOOTER LOGS AND ROOTWAD LOGS PRIOR TO BACKFILLING. NOTIFY CONSTRUCTION MANAGER OF ANY PROPOSED CHANGES PRIOR TO IMPLEMENTATION. THE CONSTRUCTION MANAGER RESERVES THE RIGHT TO MODIFY STRUCTURE DESIGN SPECIFICATIONS DURING CONSTRUCTION IF WARRANTED DUE TO UNFORESEEN CONDITIONS.

STRUCTURE DIMENSIONS

RD = Minimum Ballast Rock Diameter	2 ft
RW = Minimum Rootfan Diameter	3 ft
FD = Minimum Deflector Log Diameter	18 in
LL = Average Structure Length	15 ft
WP = Average Wood Projection	10 ft
RL = Rootwad Stem Length	20 ft
FL = Deflector Log Stem Length	25 ft
BK = Bank Key-in Distance	10 ft

MATERIAL SCHEDULE (PER STRUCTURE)

Item	Quantity	Dia. (in)	Length (ft)	Rootwad (Y/N)
Rootwad Log	4	18	20	Yes - 3 ft Dia. Min.
Deflector Log	6	18	25	Optional - 3-4 ft
CY of Ballast Rock	5	30"-36"		
Fill Material*	10	9"		
Rebar Pin	14	1"	3	

* FILL MATERIAL TO BE SALVAGED MATERIAL OR PIT RUN



CONSTRUCTED LARGE WOOD HABITAT STRUCTURE WITH ADDITIONAL WOOD ADDED FOR HABITAT ENHANCEMENT