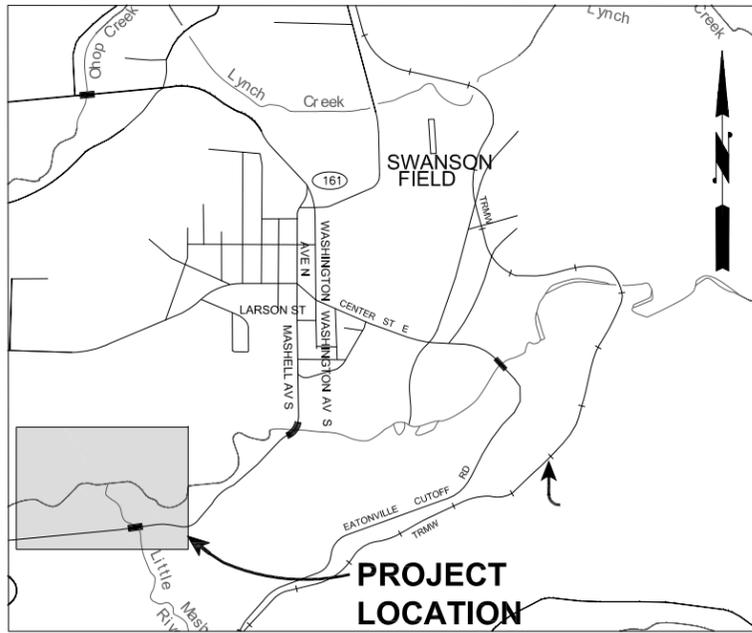


MASHEL RIVER RESTORATION PROJECT REACH 7

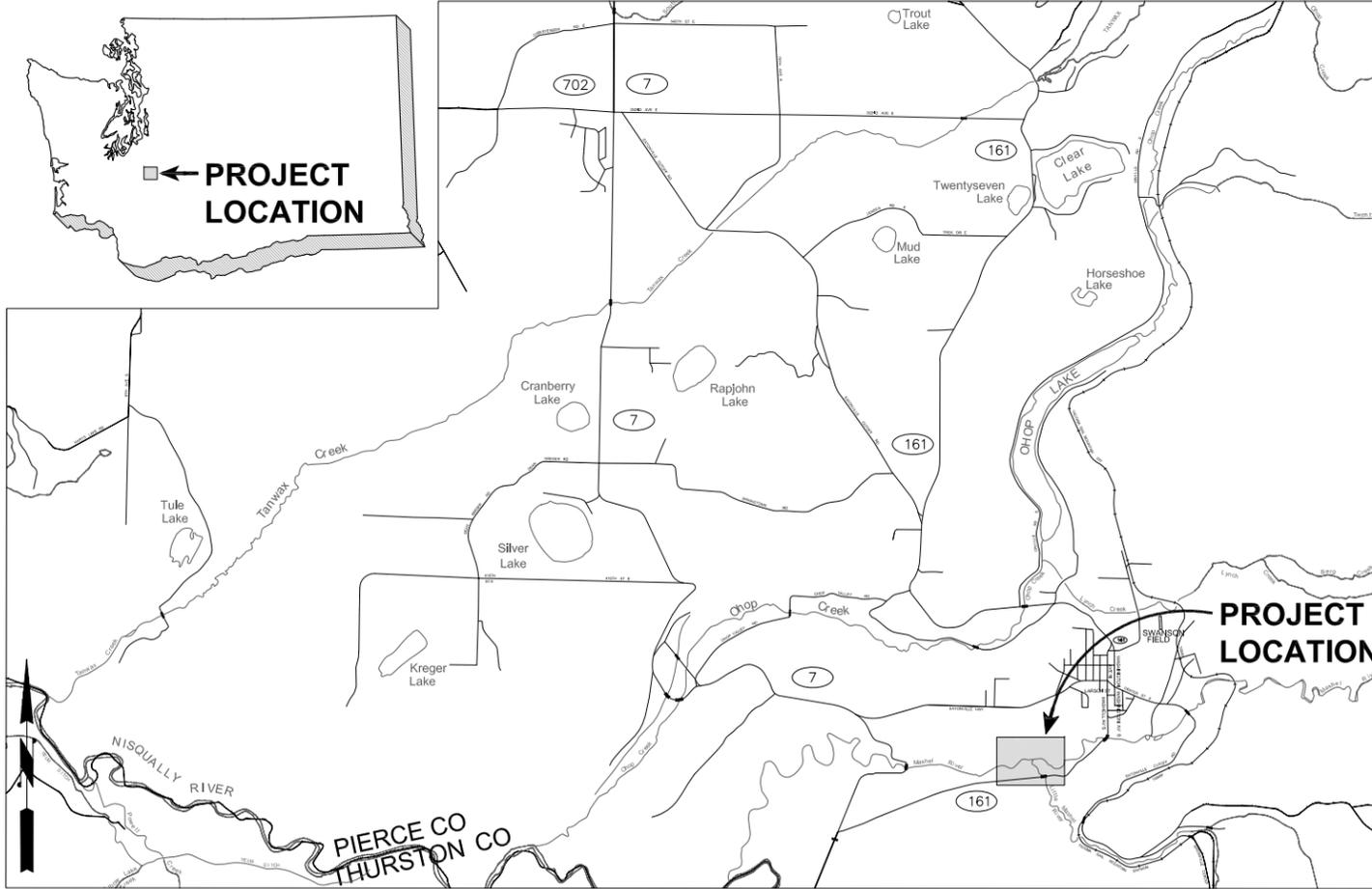
SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP (SPSSEG)

EATONVILLE, WASHINGTON

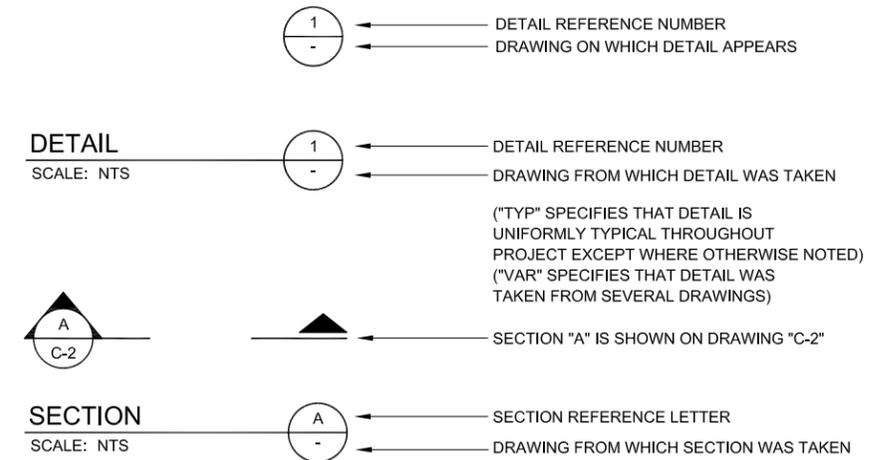


LOCATION MAP
SCALE: N.T.S.

SHEET INDEX		
SHT NO.	DWG NO.	SHEET DESCRIPTION
1	G-1	VICINITY MAP AND SHEET INDEX
2	G-2	GENERAL NOTES AND LEGEND
3	C-1	EXISTING CONDITIONS
4	C-2	REACH 7 SITE ACCESS PLAN
5	C-3	REACH 7 SITE CONSTRUCTION PLAN
6	C-4	ELJ TYPE 1 PLAN AND SECTIONS
7	C-5	ELJ TYPE 1 LAYERING PLAN
8	C-6	ELJ TYPE 2 PLAN AND SECTIONS
9	C-7	ELJ TYPE 2 LAYERING PLAN
10	C-8	ELJ TYPE 3 PLAN AND SECTIONS
11	C-9	ELJ TYPE 3 LAYERING PLAN
12	C-10	ELJ TYPE 4 PLAN AND SECTIONS
13	C-11	LWD BANK ROUGHENING STRUCTURE PLAN AND SECTIONS
14	C-12	CHANNEL PROFILES AND ALIGNMENTS



VICINITY MAP
SCALE: N.T.S.



DETAIL AND SECTION REFERENCING

DRAFT 70% DESIGN - NOT FOR CONSTRUCTION

Path: C:\proj\2007\07-03774-000\CAD\Drawings\Masheh River Reach 7\G-1.dwg
Plot Date: 5/28/2009 1:49 PM
Cad User: Laura Turnidge

No.	REVISION	BY	APP'D	DATE



2200 Sixth Avenue
Suite 1100
Seattle, Washington
98121-1820
206-441-9080
206-441-9108 FAX
<http://www.herreralnc.com>



DESIGNED: B. SCOTT	DRAWN: W. WIESZCZCINSKI
DESIGNER: -	DRAWN: -
DESIGNED: -	CHECKED: C. BRUMMER
DESIGNER: -	APPROVED: M. SPILLANE
SCALE: AS NOTED	

MASHEL RIVER RESTORATION
SOUTH PUGET SOUND
SALMON ENHANCEMENT GROUP
VICINITY MAP AND SHEET INDEX

DATE: MAY 2009
PROJECT NO: 07-03774-000
DRAWING NO: G-1
SHEET NO: 1 OF 14

ONE INCH
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY
© 2009 Herrera Environmental, Inc. All rights reserved.

GENERAL CONSTRUCTION NOTES:

- THE WORK INCLUDES CONSTRUCTION OF ENGINEERED LOG JAMS (ELJS) AS SHOWN ON THE DRAWINGS.
- ENGINEER IS DEFINED AS THE OWNER, OWNER'S REPRESENTATIVE, OWNER'S BIOLOGISTS, OR OWNER'S ENGINEER.
- THE CONTRACTOR SHALL STAKE FOR APPROVAL BY THE ENGINEER, THE LOCATIONS OF ELJS INCLUDING LENGTHS, WIDTHS, ORIENTATION AND ELEVATIONS; TEMPORARY ACCESS ROADS; AND TEMPORARY LOG AND SOIL STOCKPILE AREAS.
- THE CONTRACTOR SHALL STAKE CLEARING LIMITS FOR APPROVAL BY THE ENGINEER AT LEAST 3 WORKING DAYS PRIOR TO COMMENCING CLEARING ACTIVITIES. CLEARING LIMITS FOR CONSTRUCTION OF TEMPORARY ACCESS ROADS AND ELJS SHALL BE LIMITED TO THE AREA REQUIRED FOR SAFE EQUIPMENT OPERATION AND TO MINIMIZE THE AREA OF DISTURBANCE. CLEARING LIMITS SHALL NOT BE EXPANDED UNLESS APPROVED BY THE ENGINEER.
- ALTERATION OR DISTURBANCE OF THE CHANNEL, FLOODPLAIN, AND ANY BANK AND FLOODPLAIN VEGETATION SHALL BE MINIMIZED TO THAT NECESSARY TO CONSTRUCT THE PROJECT. THE CONTRACTOR SHALL KEEP DISTURBED AREAS WITHIN THE PROJECT CONSTRUCTION LIMITS SHOWN ON DRAWINGS, AND SHALL NOT EXTEND THESE LIMITS UNLESS APPROVED BY THE ENGINEER.
- THE CONTRACTOR SHALL PROVIDE 24 HOURS ADVANCE NOTICE TO THE ENGINEER PRIOR TO ANY REQUIRED INSPECTION.
- CONSTRUCTION MATERIAL STAGING AREAS SHALL BE LOCATED AS SHOWN ON THE DRAWINGS. CONSTRUCTION MATERIALS SHALL NOT BE STORED OUTSIDE OF IDENTIFIED STAGING AREAS, UNLESS APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL PROTECT MATERIALS FROM DAMAGE AT ALL TIMES.
- NO EQUIPMENT SHALL BE STORED OVERNIGHT BELOW THE ORDINARY HIGH WATER MARK (OHWM).
- EQUIPMENT USED FOR THIS PROJECT SHALL BE FREE OF EXTERNAL PETROLEUM-BASED PRODUCTS WHILE WORKING NEAR ANY SURFACE WATER OR WETLANDS. ACCUMULATION OF SOILS OR DEBRIS SHALL BE REMOVED FROM THE DRIVE MECHANISMS (WHEELS, TRACKS, TIRES, ETC.) AND UNDERCARRIAGE OF EQUIPMENT PRIOR TO ITS WORKING BELOW THE OHWM.
- ALL EQUIPMENT OPERATING IN AREAS OTHER THAN EXISTING UNIMPROVED ACCESS ROADS SHALL USE ONLY BIODEGRADABLE, VEGETABLE BASED HYDRAULIC FLUIDS.
- EQUIPMENT SHALL BE CHECKED AT THE BEGINNING OF EACH WORK SHIFT FOR LEAKS, AND ANY NECESSARY REPAIRS SHALL BE COMPLETED PRIOR TO COMMENCING WORK ACTIVITIES.
- THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT NO PETROLEUM PRODUCTS, HYDRAULIC FLUID, SEDIMENTS, SEDIMENT-LADEN WATER, CHEMICALS, OR ANY OTHER TOXIC OR DELETERIOUS MATERIALS ARE ALLOWED TO ENTER OR LEACH INTO THE RIVER, WETLANDS OR THE PROJECT SITE FROM EQUIPMENT OR SUPPLIES USED DURING CONSTRUCTION.
- CONTRACTOR SHALL LIMIT MACHINERY MOVEMENT TO THE PROJECT LIMITS DEFINED ON THE DRAWINGS OR IDENTIFIED AS ACCEPTABLE BY THE ENGINEER.
- IF AT ANY TIME, AS A RESULT OF PROJECT ACTIVITIES, FISH ARE OBSERVED IN DISTRESS, A FISH KILL OCCURS, OR WATER QUALITY PROBLEMS DEVELOP (INCLUDING EQUIPMENT LEAKS OR SPILLS), OPERATIONS SHALL CEASE AND THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY. WASHINGTON DEPARTMENT OF FISH AND WILDLIFE AND WASHINGTON DEPARTMENT OF ECOLOGY SHALL BE CONTACTED IMMEDIATELY BY THE ENGINEER OR BY HIS/HER DESIGNEE. WORK SHALL NOT RESUME UNTIL FURTHER APPROVAL BY OWNERS REPRESENTATIVE.
- EROSION AND SEDIMENT CONTROL METHODS SHALL BE USED TO PREVENT SILT-LADEN WATER FROM ENTERING THE RIVER. MINIMUM EROSION AND SEDIMENT CONTROL METHODS ARE SHOWN ON DRAWING C-3. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE ENGINEER 5 WORKING DAYS PRIOR TO CONSTRUCTION, A TEMPORARY EROSION AND SEDIMENT CONTROL (TESC) PLAN ADDRESSING SITE SPECIFIC EROSION AND SEDIMENT CONTROL TECHNIQUES AND METHODS.
- IF HIGH FLOW CONDITIONS THAT MAY CAUSE SILTATION, EROSION OR A DANGEROUS WORK ENVIRONMENT ARE ENCOUNTERED DURING CONSTRUCTION, WORK SHALL STOP UNTIL THE FLOW SUBSIDES.
- KEY LOGS SHALL BE DECKED IN THE STAGING AREA FOR INSPECTION BY ENGINEER AND ORGANIZED BY LOG TYPE, DIAMETER AND LENGTH. LOG TYPE IDENTIFICATION SHALL BE PAINTED ON ALL LOGS IN A PLACE VISIBLE FOR INSPECTION PRIOR TO PLACEMENT WITH LEAD-FREE, BLAZE-ORANGE SURVEY MARKING PAINT.
- LOGS PLACED IN ELJ STRUCTURE SHALL BE PLACED AS CLOSE TO WOOD PILES AS POSSIBLE UNLESS OTHERWISE NOTED IN THE DRAWINGS OR DIRECTED BY ENGINEER.
- ELJS SHALL BE CONSTRUCTED WITH A LOG CORE (KEY MEMBERS AND RACKING), SLASH AND NATIVE ALLUVIUM BALLAST. EXCAVATION SPOILS WILL BE USED AS ALLUVIUM BACKFILL/BALLAST AROUND THE LOG CORE OF EACH ELJ.
- TREES AND BRUSH NOT SHOWN ON THE DRAWINGS WILL BE ENCOUNTERED DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL STOCKPILE ALL TREES AND BRUSH IDENTIFIED BY THE ENGINEER, PRIOR TO AND DURING CONSTRUCTION ACTIVITIES, FOR USE AS RACKING AND SLASH MATERIALS IN THE ELJS, AND AS FOR USE IN AREAS AS SHOWN ON THE DRAWINGS AND AS DIRECTED BY THE ENGINEER TO CREATE ROUGH FINISHED GRADED SURFACES. CERTAIN VEGETATION MAY BE FLAGGED BY THE SPSSEG FOR SALVAGE, AND CARE SHOULD BE TAKEN TO PROTECT THOSE PLANTS FROM DEHYDRATION.
- RACKING AND SLASH MATERIAL FOR USE IN THE ELJS SHALL BE COMPRISED OF TREES, LIMBS, ROOTS, BRUSH AND TOPS GENERATED DURING CLEARING ACTIVITIES. SLASH MATERIAL MAY BE OF VARIOUS SIZES <12" DIAMETER. SLASH MATERIALS SHALL NOT CONTAIN COBBLES, MATERIAL PASSING A FOUR INCH SIEVE SHALL NOT EXCEED 10% OF THE TOTAL SLASH MATERIAL BY VOLUME AND SHALL NOT CONTAIN SILTY OR CLAYEY MATERIAL THAT WILL IN THE OPINION OF THE ENGINEER CAUSE EXCESSIVE TURBIDITY WHEN THE WATERS OF THE RIVER CONTACT THE MATERIAL.
- BASIS OF BEARINGS IS THE WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, N.A.D. 83/91.
- ELEVATIONS ARE BASED ON NAVD 88.
- VERTICAL ELEVATIONS ARE APPROXIMATE AND MAY VARY.
- HORIZONTAL SURVEY DATA ASSUMED TO BE ±5' HORIZONTAL ACCURACY.
- PHOTOGRAPHS DOCUMENTING EXISTING CONDITIONS SHALL BE TAKEN BY THE CONTRACTOR IN THE PRESENCE OF THE ENGINEER AND SUBMITTED TO THE SPSSEG PROJECT MANAGER 3 WORKING DAYS PRIOR TO INITIATING WORK.
- PROJECT CULTURAL ASSESSMENT SHALL BE COMPLETED BY SPSSEG PRIOR TO CONSTRUCTION.

WORK SEQUENCE NOTES:

- THIS WORK SEQUENCE IS PRESENTED FOR A GENERAL UNDERSTANDING OF THE PROJECT AND ITS CONSTRAINTS IN RELATION TO CONSTRUCTION OF ENGINEERED LOG JAMS (ELJS) AND RELATED SITE ACTIVITY. THE CONTRACTOR IS RESPONSIBLE FOR DEVELOPING A DETAILED WORK SEQUENCE AND PHASING PLAN WHICH SHALL INCLUDE CONSTRUCTION OF TEMPORARY FACILITIES, CONSTRUCTION OF THE ELJS, INCORPORATION OF ALL EXISTING AND NEW MATERIALS AS DEPICTED ON THE PLANS AND IN THE SPECIFICATIONS, AND REMOVAL OF ALL TEMPORARY FACILITIES, AND RESTORATION OF THE SITE.
- THE CONSTRUCTION SEQUENCE DETAILED IN THE DRAWINGS SHALL NOT BE ALTERED BY THE CONTRACTOR UNLESS APPROVED IN ADVANCE BY THE ENGINEER. THE CONTRACTOR SHALL SUBMIT A DETAILED WORK SEQUENCE AND PHASING PLAN FOR APPROVAL BY THE ENGINEER 5 WORKING DAYS PRIOR TO COMMENCING. THE PLAN SHALL INCLUDE CLEARING; EXCAVATION, BACKFILLING AND GRADING; CONSTRUCTION OF TEMPORARY FACILITIES, ELJS AND NEW CHANNELS; FLOW DIVERSIONS; PLANT SALVAGE; AND REMOVAL OF TEMPORARY FACILITIES. ALL WORK SHALL BE SEQUENCED AND PERFORMED IN MANNER THAT MINIMIZES IMPACTS TO THE RIVER AND THE WORK SITE.
- IN GENERAL, THE WORK SHALL BE SEQUENCED AND PERFORMED IN A MANNER THAT MINIMIZES IMPACTS TO THE RIVER, EXISTING VEGETATION AND THE WORK SITE.
- THE CONTRACTOR MAY DECIDE WHETHER TO COMPLETE THE WORK IN THE UPSTREAM AND DOWNSTREAM WORK AREAS SEQUENTIALLY OR SIMULTANEOUSLY. HOWEVER THIS PROJECT WILL BE CONSTRAINED BY AN IN WATER WORK WINDOW, OUTSIDE OF WHICH NO IN WATER WORK MAY OCCUR.
- IN WATER WORK WILL BE RESTRICTED TO THE DATES SET FORTH IN THE PROJECT HPA PERMIT AND THE 404 PERMIT.

ORDER OF WORK:

- DELINEATE AND INSPECT ACCESS AND STAGING AREAS. STAKE ACCESS ROAD ALIGNMENTS, ELJ LOCATIONS, CLEARING LIMITS, AND TEMPORARY FLOW DIVERSION MEASURES FOR APPROVAL BY THE ENGINEER.
- INSTALL TESC MEASURES AS SHOWN ON DRAWING C-3.
- ESTABLISH AND IMPROVE UPLAND STAGING AREAS.
- CLEAR AND CONSTRUCT TEMPORARY ACCESS ROADS TO ACCESS WORK AREAS.
- CONSTRUCT TEMPORARY BRIDGE CROSSINGS AS NECESSARY TO ALLOW CONSTRUCTION OF ELJS AND TEMPORARY FLOW DIVERSION MEASURES.
- CONSTRUCT TEMPORARY FLOW DIVERSION MEASURES TO DIRECT RIVER FLOW AWAY FROM WORK AREA. BEGIN WATER MANAGEMENT ACTIVITIES AS REQUIRED TO DEWATER WORK AREA.
- COORDINATE WITH FISH REMOVAL CREWS TO ASSIST WITH THE INSTALLATION OF FISH BLOCKNETS IN RIVER AND CLEARING CONSTRUCTION AREA OF FISH.
- POT-HOLE EACH STRUCTURE TO 10 FEET BELOW EXISTING GRADE. EACH POT-HOLE TO BE INSPECTED BY THE ENGINEER PRIOR TO COMPLETING ELJ EXCAVATION.
- EXCAVATE AND CONSTRUCT ELJS AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER. SEQUENCE CONSTRUCTION OF TEMPORARY FLOW DIVERSION MEASURES TO ALLOW CONSTRUCTION OF ELJS IN THE DRY. ALL SUBGRADE ELEVATIONS SHALL BE CONFIRMED AND VERIFIED WITH THE ENGINEER PRIOR TO PLACEMENT OF LOGS AND BACKFILL MATERIAL.
- REMOVE TEMPORARY FLOW DIVERSION MEASURES AND RESTORE CHANNEL TO PRECONSTRUCTION CONDITIONS TO RETURN RIVER TO ORIGINAL COURSE, ENGAGING ELJS WITH RIVER FLOW AND REMOVE TEMPORARY BRIDGE CROSSINGS.
- DECOMPACT TEMPORARY ACCESS ROADS.
- PLACE A 2" THICK BLANKET OF SEED-FREE MULCH ON ALL DISTURBED AREAS WITHIN 200 FEET OF THE OHWM.
- REMOVE ALL REMAINING TEMPORARY FACILITIES AND TESC CONTROLS.
- ELJS AND OTHER AREAS DISTURBED DUE TO CONSTRUCTION ACTIVITIES TO BE PLANTED BY OTHERS.

LEGEND:

PLAN SHEETS

	EXISTING 2' CONTOURS		EXPOSED BEDROCK
	PROPERTY LINES		ELJ TYPE 1
	EXISTING ROAD		ELJ TYPE 2
	EXISTING VEGETATION		ELJ TYPE 3
	ORDINARY HIGH WATER MARK		ELJ TYPE 4
	AVERAGE ANNUAL FLOW CHANNEL EXTENTS		LWD BANK ROUGHENING STRUCTURE
	EXISTING FLOODPLAIN SIDE CHANNEL		ENGINEERED LOG JAM
	EXISTING RIPRAP CHANNEL BANK		
	PROJECT LIMITS		
	TEMPORARY FLOW DIVERSION CHANNEL		
	TEMPORARY PUSH UP DAM		
	TEMPORARY WATER CROSSING		
	TEMPORARY ACCESS ROAD		
	CONSTRUCTION STAGING AREAS		
	GRADING CONTROL POINT (1)		
	SIDE CHANNEL EXCAVATION (CENTERLINE AND TOE OF BANKS)		

DETAIL SHEETS

	IMPORTED BALLAST MATERIAL OR EXISTING RIPRAP		KEY LOGS
	NATIVE ALLUVIUM BACKFILL MATERIAL		TIMBER PILE
	TOPSOIL TYPE A		RACKING MATERIAL
	EXISTING CHANNEL ALLUVIUM		LOG TYPE ID (LOG TYPE P1)
	EXISTING SEDIMENTARY BEDROCK		STRUCTURE CONTROL POINT
	EXCAVATION LIMITS		LOG SEQUENCE ORDER
	CONSTRUCTION KEY NOTE (3)		SLOPE
	SALVAGED BRUSH		

DRAFT 70% DESIGN - NOT FOR CONSTRUCTION

Path: C:\proj\2007\07-03774-000\CAD\Drawings\Mashel River Reach 7\G-2.dwg
 Plot Date: 5/28/2009 1:49 PM
 Cad User: Laura Turnidge

No.	REVISION	BY	APP'D	DATE

HERRERA
 ENVIRONMENTAL CONSULTANTS
 2200 Sixth Avenue Suite 1100
 Seattle, Washington 98121-1820
 206-441-9080
 206-441-9108 FAX
<http://www.herreralnc.com>

SOUTH PUGET SOUND

ENHANCEMENT GROUP

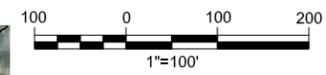
DESIGNED: B. SCOTT	DRAWN: W. WIESZCZECINSKI
DESIGNER: -	DRAWN: -
DESIGNED: -	CHECKED: C. BRUMMER
SCALE: AS NOTED	APPROVED: M. SPILLANE

MASHEL RIVER RESTORATION
 SOUTH PUGET SOUND
 SALMON ENHANCEMENT GROUP
GENERAL NOTES AND LEGEND

DATE: MAY 2009
PROJECT NO: 07-03774-000
DRAWING NO: G-2
SHEET NO: 2 OF 14

© 2009 Herrera Environmental, Inc. All rights reserved.

ONE INCH AT FULL SCALE, IF NOT ONE INCH SCALE ACCORDINGLY



NOTES:

1. THIS DRAWING SHOWS THE EXISTING CONDITIONS AND THE REACH CONSTRUCTION AREAS IN RELATION TO NEARBY ROADWAYS, THE MASHEL RIVER, ACCESS POINTS AND OTHER RELEVANT LANDMARKS.
2. TOPOGRAPHY AND AERIAL PHOTOGRAPHY SHOWN IS BASED ON 2004 LIDAR DATA AND 2006 ORTHOPHOTOGRAPHY AND DOES NOT REFLECT ACTUAL SITE CONDITIONS FOLLOWING THE JANUARY 2009 FLOOD.
3. WETLAND AND OHWM DELINEATION TO BE COMPLETED BY SPSSEG PRIOR TO CONSTRUCTION.
4. PARCEL BOUNDARIES, TOPOGRAPHIC SURVEY, AND AERIAL PHOTO OF SITE PROVIDED BY SPSSEG.

DRAFT 70% DESIGN - NOT FOR CONSTRUCTION

Path: O:\proj\2007\07-03774-000\CADD\Drawings\Mashel River Reach 7\C-1.dwg
Cad User: Laura Turnidge
Plot Date: 5/28/2009 1:50 PM

No.	REVISION	BY	APP'D	DATE



2200 Sixth Avenue
Suite 1100
Seattle, Washington
98121-1820
206-441-9080
206-441-9108 FAX
<http://www.herreralnc.com>



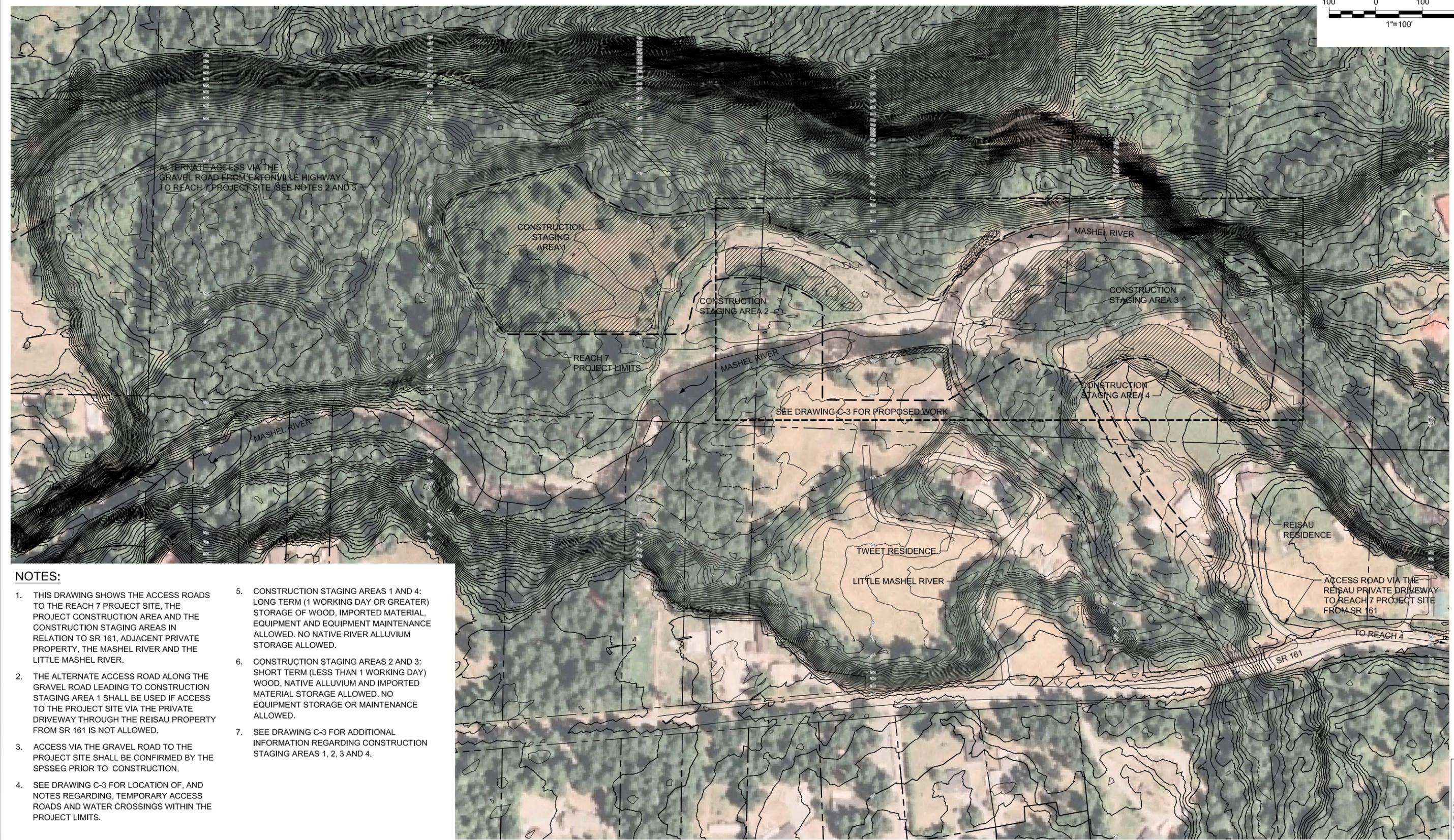
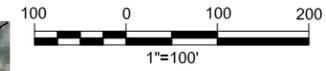
DESIGNED: B. SCOTT	DRAWN: W. WIESZCZECINSKI
DESIGNER: -	DRAWN: -
DESIGNED: -	CHECKED: C. BRUMMER
SCALE: AS NOTED	APPROVED: M. SPILLANE

MASHEL RIVER RESTORATION
SOUTH PUGET SOUND
SALMON ENHANCEMENT GROUP

EXISTING CONDITIONS

DATE: MAY 2009	
PROJECT NO: 07-03774-000	
DRAWING NO: C-1	
SHEET NO: 3	OF 14

ONE INCH
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY
© 2009 Herrera Environmental, Inc. All rights reserved.



NOTES:

1. THIS DRAWING SHOWS THE ACCESS ROADS TO THE REACH 7 PROJECT SITE, THE PROJECT CONSTRUCTION AREA AND THE CONSTRUCTION STAGING AREAS IN RELATION TO SR 161, ADJACENT PRIVATE PROPERTY, THE MASHEL RIVER AND THE LITTLE MASHEL RIVER.
2. THE ALTERNATE ACCESS ROAD ALONG THE GRAVEL ROAD LEADING TO CONSTRUCTION STAGING AREA 1 SHALL BE USED IF ACCESS TO THE PROJECT SITE VIA THE PRIVATE DRIVEWAY THROUGH THE REISAU PROPERTY FROM SR 161 IS NOT ALLOWED.
3. ACCESS VIA THE GRAVEL ROAD TO THE PROJECT SITE SHALL BE CONFIRMED BY THE SPSSEG PRIOR TO CONSTRUCTION.
4. SEE DRAWING C-3 FOR LOCATION OF, AND NOTES REGARDING, TEMPORARY ACCESS ROADS AND WATER CROSSINGS WITHIN THE PROJECT LIMITS.
5. CONSTRUCTION STAGING AREAS 1 AND 4: LONG TERM (1 WORKING DAY OR GREATER) STORAGE OF WOOD, IMPORTED MATERIAL, EQUIPMENT AND EQUIPMENT MAINTENANCE ALLOWED. NO NATIVE RIVER ALLUVIUM STORAGE ALLOWED.
6. CONSTRUCTION STAGING AREAS 2 AND 3: SHORT TERM (LESS THAN 1 WORKING DAY) WOOD, NATIVE ALLUVIUM AND IMPORTED MATERIAL STORAGE ALLOWED. NO EQUIPMENT STORAGE OR MAINTENANCE ALLOWED.
7. SEE DRAWING C-3 FOR ADDITIONAL INFORMATION REGARDING CONSTRUCTION STAGING AREAS 1, 2, 3 AND 4.

DRAFT 70% DESIGN - NOT FOR CONSTRUCTION

Path: C:\proj\2007\07-03774-000\CAD\Drawings\Mashel River Reach 7\C-2.dwg
Cad User: Laura Turnidge
Plot Date: 5/28/2009 1:50 PM

No.	REVISION	BY	APP'D	DATE



2200 Sixth Avenue
Suite 1100
Seattle, Washington
98121-1820
206-441-9080
206-441-9108 FAX
<http://www.herrerainc.com>



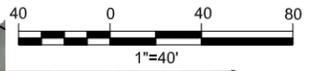
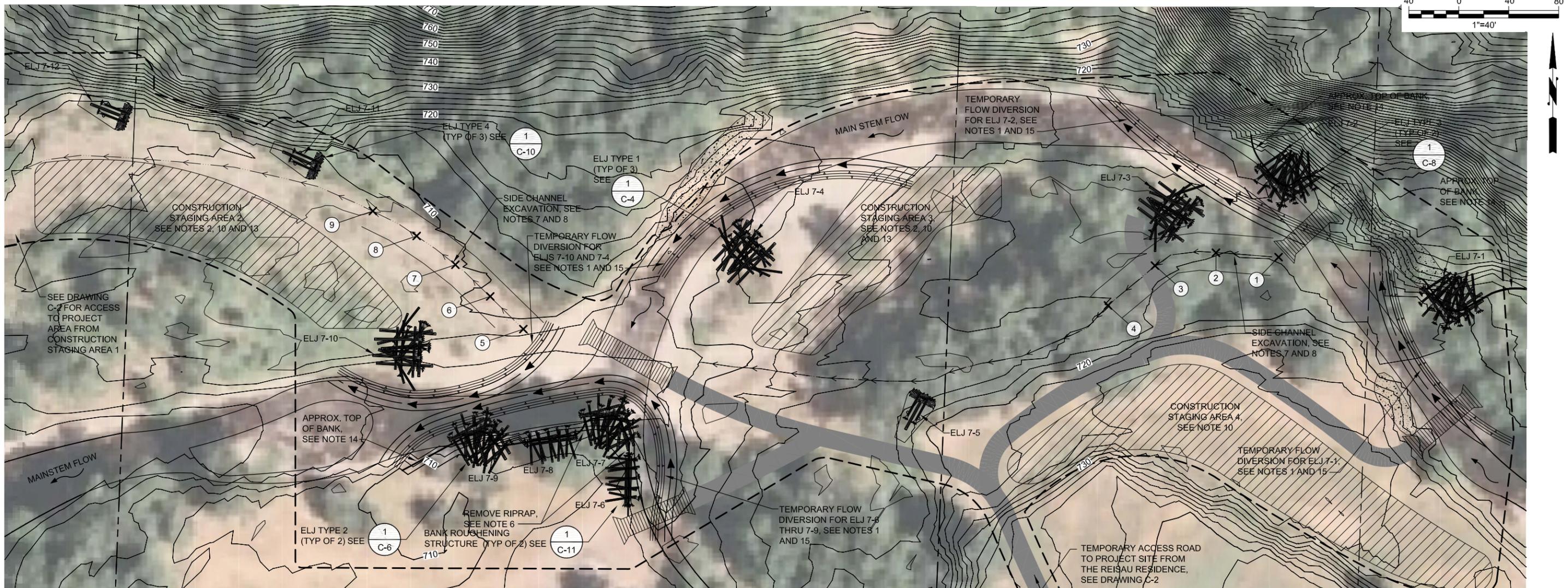
DESIGNED: B. SCOTT	DRAWN: W. WIESZCZCINSKI
DESIGNER: -	DRAWN: -
DESIGNED: -	CHECKED: C. BRUMMER
SCALE: AS NOTED	APPROVED: M. SPILLANE

MASHEL RIVER RESTORATION
SOUTH PUGET SOUND
SALMON ENHANCEMENT GROUP

REACH 7 SITE ACCESS PLAN

DATE: MAY 2009
PROJECT NO: 07-03774-000
DRAWING NO: C-2
SHEET NO: 4 OF 14

ONE INCH
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY
© 2009 Herrera Environmental, Inc. All rights reserved.



NOTES:

1. LOCATION AND EXTENT OF TEMPORARY FLOW DIVERSION MEASURES, TEMPORARY ACCESS ROADS, AND TEMPORARY WATER CROSSINGS SHOWN ARE APPROXIMATE AND SHALL BE VERIFIED AND APPROVED BY THE ENGINEER PRIOR TO INITIATING CONSTRUCTION ACTIVITIES.
2. CONSTRUCTION STAGING AREAS 2 AND 3 SHOWN ON EXPOSED GRAVEL BAR MAY BE USED ONLY AFTER TEMPORARY FLOW DIVERSION MEASURES ARE IN PLACE AND OPERATIONAL AND VERIFIED BY THE ENGINEER.
3. LOCATION AND ORIENTATION OF NEW STRUCTURES SHOWN IS APPROXIMATE AND IS BASED ON SITE CONDITIONS FOLLOWING THE JANUARY 2009 FLOOD. FINAL STRUCTURE PLACEMENT SHALL BE VERIFIED AND APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION.
4. SEE STRUCTURE DETAIL SHEETS FOR LOCATION OF STRUCTURE CONTROL POINTS. SEE DRAWING C-12 FOR GRADING AND STRUCTURE CONTROL POINT TABLES.
5. EROSION AND SEDIMENT CONTROL BMPs SHALL BE IMPLEMENTED AS NEEDED AND AS DIRECTED BY THE ENGINEER.
6. RIPRAP REMOVED TO CONSTRUCT ELJS 7-6, 7-7, 7-8, AND 7-9 SHALL BE USED AS LOG BALLAST MATERIAL WITHIN THE INTERIOR CORE OF THOSE ELJS.
7. EXISTING HIGH FLOW SIDE CHANNELS SHALL BE EXCAVATED AND GRADED SUCH THAT THEY ARE ENGAGED DURING AVERAGE ANNUAL PEAK FLOWS. ALIGNMENT OF SIDE CHANNEL EXCAVATION SHOWN IS APPROXIMATE AND SHALL BE VERIFIED AND APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION. SEE DRAWING C-12 FOR TYPICAL CROSS-SECTION OF SIDE CHANNEL EXCAVATION. TEMPORARILY STOCKPILE SPOILS IN CONSTRUCTION STAGING AREAS 2 AND 3 FOR USE AS ELJ BACKFILL MATERIAL.
8. NEWLY EXCAVATED SIDE CHANNELS MAY BE USED AS TEMPORARY ACCESS ROAD.
9. ANY RIPRAP AND CONCRETE DEBRIS LESS THAN 3-FEET IN ANY DIMENSION AND FREE OF REBAR FOUND WITHIN THE PROJECT SITE SHALL BE STOCKPILED AND USED AS BALLAST MATERIAL FOR ELJ CONSTRUCTION. ANY METAL DEBRIS OR OTHER DELETERIOUS MATERIAL FOUND WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR.
10. PROTECT EXISTING TREES AND SHRUBS WITHIN ALL CONSTRUCTION STAGING AREAS FROM DAMAGE. NO CLEARING OR GRUBBING ALLOWED. RESTORE STAGING AREAS TO PRECONSTRUCTION CONDITION AT THE CONCLUSION OF CONSTRUCTION INCLUDING DECOMPACTING AND REGRADING GRAVEL BARS AS NECESSARY. FOLLOWING COMPLETION OF CONSTRUCTION PLACE STRAW MULCH AND SEED ALL DISTURBED AREAS WITHIN CONSTRUCTION STAGING AREA 1, AND PLACE A 2-INCH THICK BLANKET OF BARK MULCH ON ALL DISTURBED AREAS WITHIN CONSTRUCTION STAGING AREA 4
11. TEMPORARY ACCESS ROAD ALIGNMENTS SHOWN ARE APPROXIMATE AND SHALL BE ROUTED TO MINIMIZE DISTURBANCE TO EXISTING VEGETATION. WHERE GRADING AND CLEARING IS NECESSARY CONTRACTOR SHALL LIMIT ACTIVITIES TO MINIMIZE DISTURBANCES. TEMPORARY ACCESS ROADS SHALL BE USED ONLY FOR CONSTRUCTION OF NEW CHANNELS AND ELJS.
12. LARGE COBBLES AND BOULDERS WILL BE ENCOUNTERED DURING EXCAVATION FOR ALL ELJS. BEDROCK WILL BE ENCOUNTERED DURING EXCAVATION FOR ELJS 7-1, 7-2, 7-3 AND 7-4 AND DEPTH TO BEDROCK BELOW EXISTING GRADE VARIES AT THOSE ELJ LOCATIONS.
13. TEMPORARILY STOCKPILE ALLUVIUM EXCAVATED FOR ELJ CONSTRUCTION ON EXPOSED LOW FLOW GRAVEL BAR.
14. TAPER ELJ BACKFILL INTO BANK AS DIRECTED BY ENGINEER.
15. RESTORE CHANNEL TO PRECONSTRUCTION CONDITION AT THE CONCLUSION OF CONSTRUCTION.

DRAFT 70% DESIGN - NOT FOR CONSTRUCTION

Path: C:\proj\2007\07-03774-000\CADD\Drawings\Machel River Reach 7\C-3.dwg
 Plot Date: 5/28/2009 1:51 PM
 Cad User: Laura Turnidge

No.	REVISION	BY	APP'D	DATE

HERRERA
 ENVIRONMENTAL
 CONSULTANTS
 2200 Sixth Avenue
 Suite 1100
 Seattle, Washington
 98121-1820
 206-441-9080
 206-441-9108 FAX
<http://www.herreralnc.com>

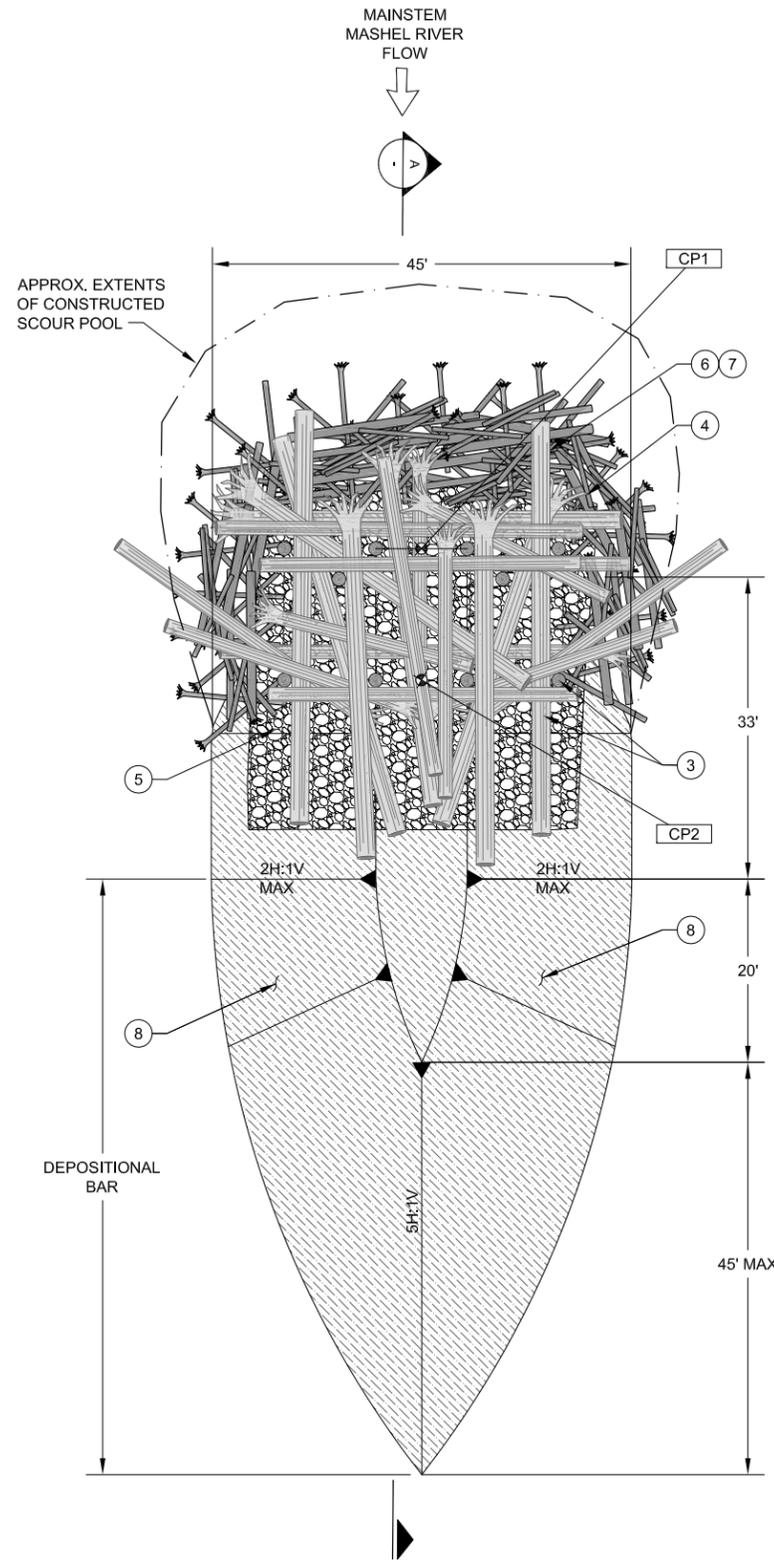
SOUTH PUGET SOUND
Salmon
 ENHANCEMENT
 GROUP

DESIGNED: B. SCOTT	DRAWN: W. WIESZCZECINSKI
DESIGNER: -	DRAWN: -
DESIGNED: -	CHECKED: C. BRUMMER
SCALE: AS NOTED	APPROVED: M. SPILLANE

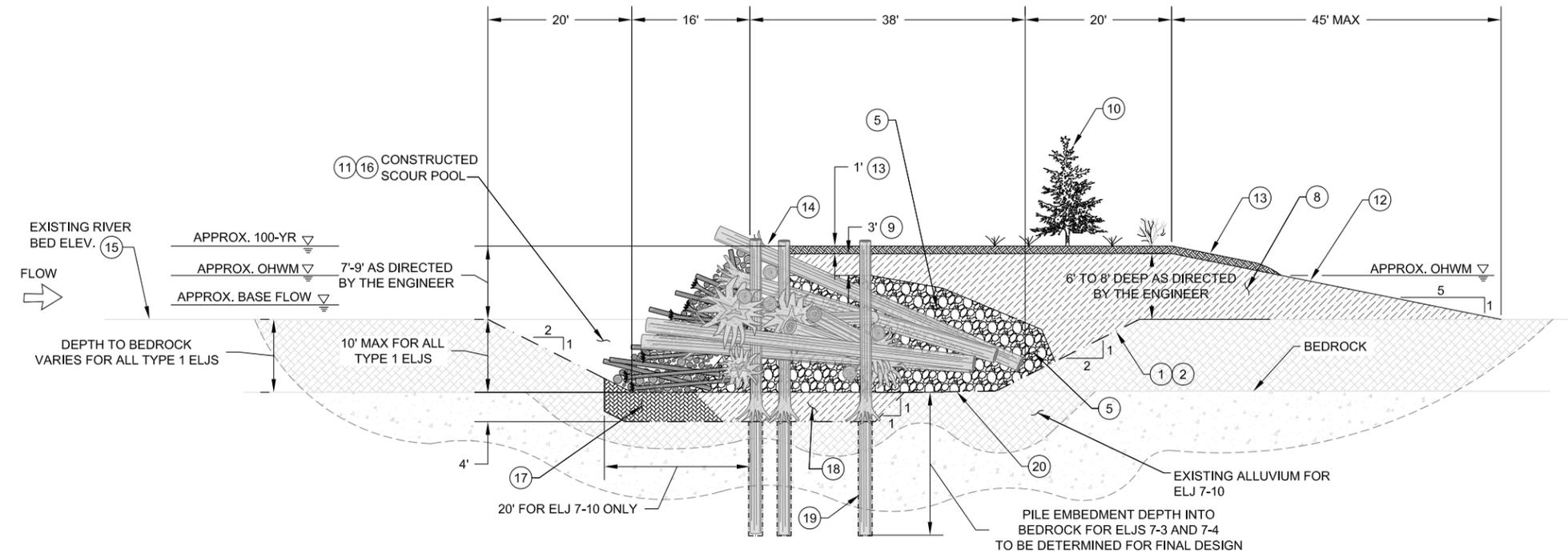
MACHEL RIVER RESTORATION
 SOUTH PUGET SOUND
 SALMON ENHANCEMENT GROUP
REACH 7 SITE CONSTRUCTION PLAN

DATE: MAY 2009	
PROJECT NO: 07-03774-000	
DRAWING NO: C-3	
SHEET NO: 5	OF 14

ONE INCH
 AT FULL SIZE, IF NOT ONE
 INCH SCALE ACCORDINGLY
 © 2009 Herrera Environmental, Inc. All rights reserved.



TYPE 1 ELJ PLAN VIEW
SCALE: 1" = 10'

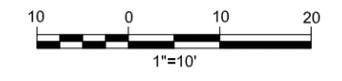


TYPE 1 ELJ SECTION
SCALE: 1" = 10'

CONSTRUCTION KEY NOTES

- 1 APPROXIMATE STRUCTURE EXCAVATION LIMITS.
- 2 EXCAVATED SIDE SLOPE AT DOWNSTREAM END OF STRUCTURE VARIES BASED ON CONSTRUCTION ACCESS NEEDS.
- 3 PLACE PILES AND KEY MEMBERS ACCORDING TO STRUCTURE LAYERING PLAN.
- 4 SMALL WOODY DEBRIS AND SLASH EMBEDDED INTO FLANKS OF STRUCTURES IN AND AROUND INTERFACE OF KEY LOGS AND RACKING LOGS PRIOR TO BACKFILLING, EXTENDING FROM BASE OF STRUCTURE TO 3- FEET ABOVE EXISTING GRADE.
- 5 COORDINATE WITH WITH ENGINEER PRIOR TO PLACING IMPORTED HEAVY LOOSE RIPRAP FOR LOG BALLAST.
- 6 COORDINATE WITH ENGINEER PRIOR TO PLACING RACKING LOGS.
- 7 RACKING LOG SHALL EXTEND THROUGH LOG LAYERS 1, 2, 3, 4 AND 5.
- 8 CONSTRUCT DEPOSITIONAL BAR WITH NATIVE ALLUVIUM THAT IS EXCAVATED FOR PLACEMENT OF KEY LOGS AND IMPORTED BALLAST MATERIAL. CONSTRUCT FLANKS OF STRUCTURE AND DEPOSITIONAL BAR WITH NATIVE ALLUVIUM BACKFILL MATERIAL ACCORDING TO THE SLOPE SHOWN ON THESE DETAILS.
- 9 MAINTAIN A MINIMUM DEPTH OF 3- FEET OF NATIVE ALLUVIUM BACKFILL MATERIAL OVER TOP OF IMPORTED BALLAST MATERIAL.
- 10 PLANTING TOP OF ELJ TO BE COMPLETED BY OTHERS.
- 11 DO NOT BACKFILL UPSTREAM OF STRUCTURE. LEAVE AS A POOL.
- 12 ADJUST FINAL GRADE OF DEPOSITIONAL BAR ON DOWNSTREAM SIDE OF STRUCTURE AS NEEDED TO PLACE ALL EXCESS ALLUVIUM.
- 13 12" OF IMPORTED TOPSOIL AND 2" OF MULCH TO BE PLACED ABOVE OHWM AS DIRECTED BY ENGINEER.
- 14 PLACE SALVAGED BRUSH ALONG EDGE OF STRUCTURE BETWEEN SOIL AND RACKING LOGS TO PREVENT BLEEDING SOIL FROM THE STRUCTURE.

- 15 CONTRACTOR SHALL DETERMINE EXCAVATION DEPTH AND STRUCTURE HEIGHT BASED ON EXISTING RIVER BED ELEVATION.
- 16 FILL BOTTOM OF CONSTRUCTED SCOUR POOL WITH RACKING MATERIAL.
- 17 FOR ELJ 7-10 CONSTRUCT SCOUR APRON TO DIMENSIONS SHOWN USING IMPORTED STREAMBED BOULDERS OR CHANNEL ARMOR MATERIAL AS DIRECTED BY THE ENGINEER. NO SCOUR APRON WILL BE CONSTRUCTED FOR ELJS 7-3 AND 7-4.
- 18 FOR ELJ 7-10 LOCALLY EXCAVATE FROM BOTTOM OF STUCTURE EXCAVATION ELEVATION TO ACHIEVE PILE EMBEDMENT SHOWN. PLACE PILE LOG ROOTWAD ON BOTTOM OF HOLE. BACKFILL WITH NATIVE ALLUVIUM AND COMPACT USING BACKSIDE OF EXCAVATOR BUCKET.
- 19 FOR ELJS 7-3 AND 7-4 IF BEDROCK IS ENCOUNTERED PRIOR TO REACHING MAX EXCAVATION DEPTH SHOWN, THEN TIMBER PILES SHALL BE DRIVEN OR PLACED INTO VERTICAL DRILLED ROCK SHAFTS THROUGH SEDIMENTARY BEDROCK. TRIM PILES ON THREE SIDES AND FIELD FIT TO SHAFT DIAMETER.
- 20 FOR ELJS 7-3 AND 7-4 EXCAVATE TO BEDROCK OR TO DIMENSION SHOWN, WHICH EVER IS ENCOUNTERED FIRST. IF BEDROCK IS ENCOUNTERED PRIOR TO REACHING MAX EXCAVATION DEPTH, THEN DRILL AND PLACE PILES AND PLACE KEY LOGS ON BEDROCK. PLACE BACKFILL TO DIMENSIONS SHOWN.



DRAFT 70% DESIGN - NOT FOR CONSTRUCTION

Path: C:\proj\2007\07-03774-000\CAD\Drawings\Mashesel River Reach 7\C-4.dwg
Cad User: Laura Turnidge
Plot Date: 5/28/2009 1:52 PM

No.	REVISION	BY	APP'D	DATE

HERRERA
ENVIRONMENTAL
CONSULTANTS

2200 Sixth Avenue
Suite 1100
Seattle, Washington
98121-1820
206-441-9080
206-441-9108 FAX
<http://www.herreralnc.com>



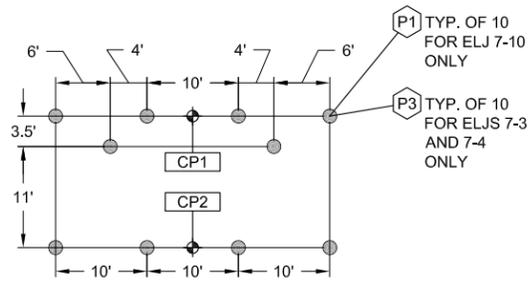
DESIGNED: B. SCOTT	DRAWN: W. WIESZCZECINSKI
DESIGNED: -	DRAWN: -
DESIGNED: -	CHECKED: C. BRUMMER
SCALE: AS NOTED	APPROVED: M. SPILLANE

MASHSEL RIVER RESTORATION
SOUTH PUGET SOUND
SALMON ENHANCEMENT GROUP

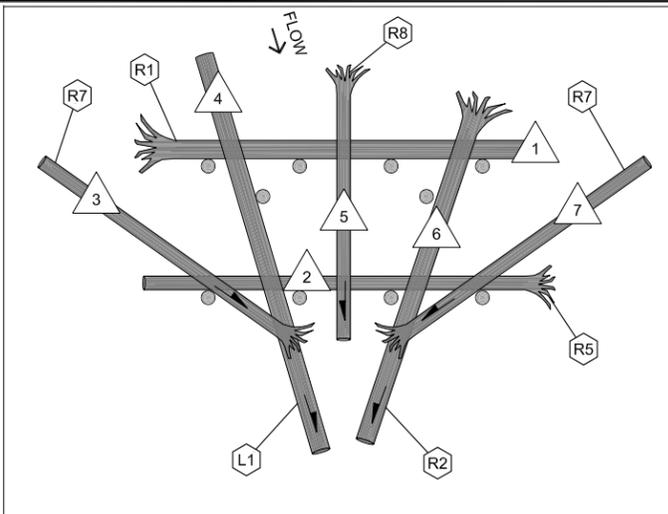
ELJ TYPE 1 PLAN AND SECTIONS

DATE: MAY 2009
PROJECT NO: 07-03774-000
DRAWING NO: C-4
SHEET NO: 6 OF 14

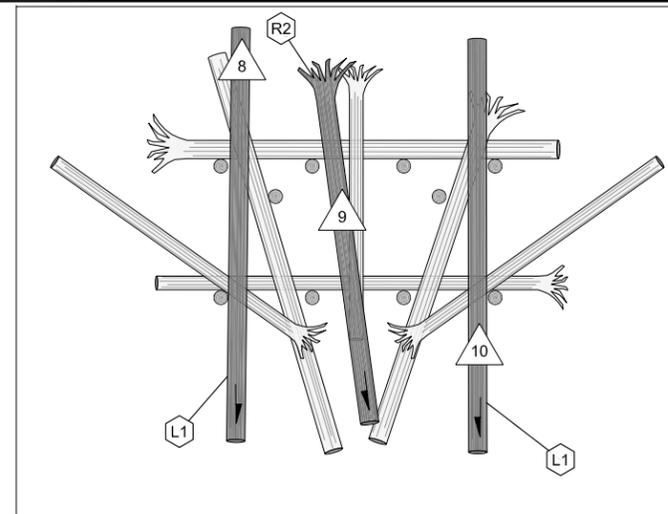
ONE INCH AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY
© 2009 Herrera Environmental, Inc. All rights reserved.



PILE LAYER



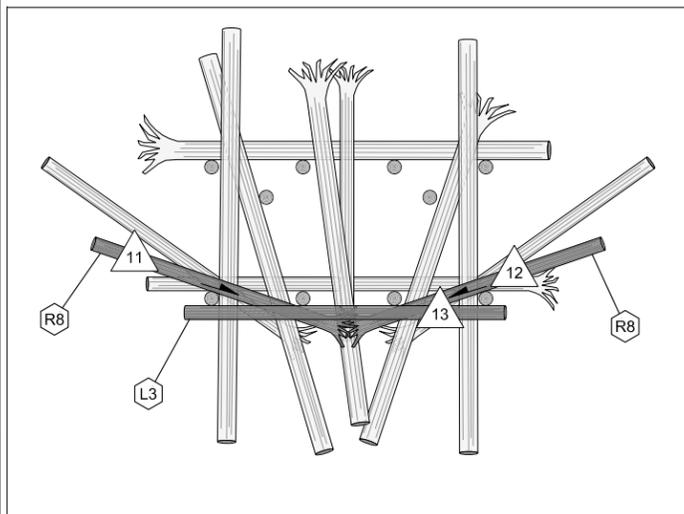
LAYER 1



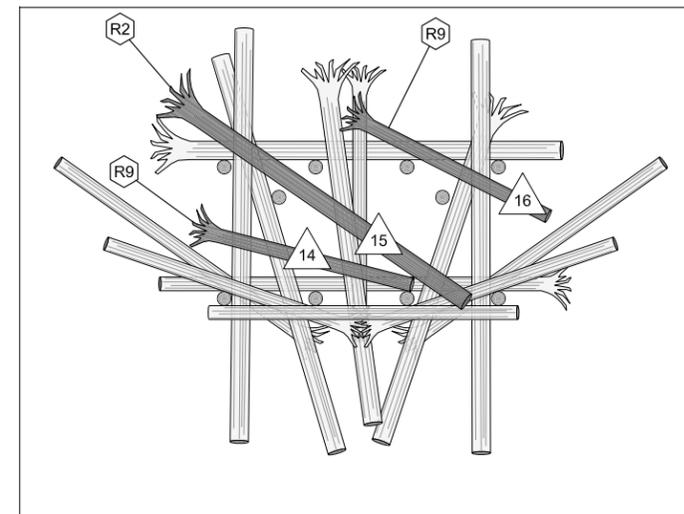
LAYER 2

GENERAL NOTES:

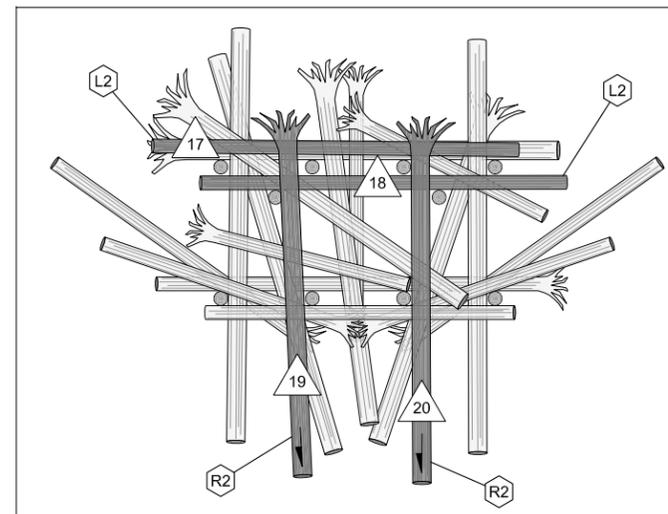
1. FINAL STRUCTURE LOCATION AND ORIENTATION SHALL BE FIELD VERIFIED BY THE ENGINEER PRIOR TO THE CONTRACTOR STAKING PILE LOCATIONS.
2. PILE LOCATIONS SHALL BE STAKED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO PILE INSTALLATION.
3. PILE LOCATIONS ARE SYMMETRICAL ABOUT THE STRUCTURE CONTROL POINT.
4. PILE LOCATIONS SHALL BE BASED ON THE LOCATION OF THE STRUCTURE CONTROL POINT AND SHALL BE WITHIN 6 INCHES OF THE LOCATION SHOWN ON THE DRAWINGS.
5. PILE DIAMETERS SHALL BE MEASURED AT BUTT ENDS.
6. PILES SHALL BE UNTREATED DOUGLAS FIR MEETING ASTM D25 REQUIREMENTS.
7. LOG MATERIALS SHALL BE PLACED AT THE LOCATIONS, ELEVATIONS AND ORIENTATIONS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.
8. TRIM LOGS TO FIT AS REQUIRED.
9. TRIM PILES A MINIMUM OF 18 INCHES AND A MAXIMUM OF 24 INCHES ABOVE FINAL GRADE.
10. EXCAVATION LIMITS VARY DEPENDING ON THE LOCAL SOIL CONDITIONS AND THE CONSTRUCTION TECHNIQUES EMPLOYED.
11. INSTALL LOGS, RACKING LOGS, SLASH, IMPORTED BALLAST MATERIAL AND NATIVE BACKFILL MATERIAL AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
12. SEE DRAWING C-12 FOR STRUCTURE CONTROL POINT COORDINATES.



LAYER 3



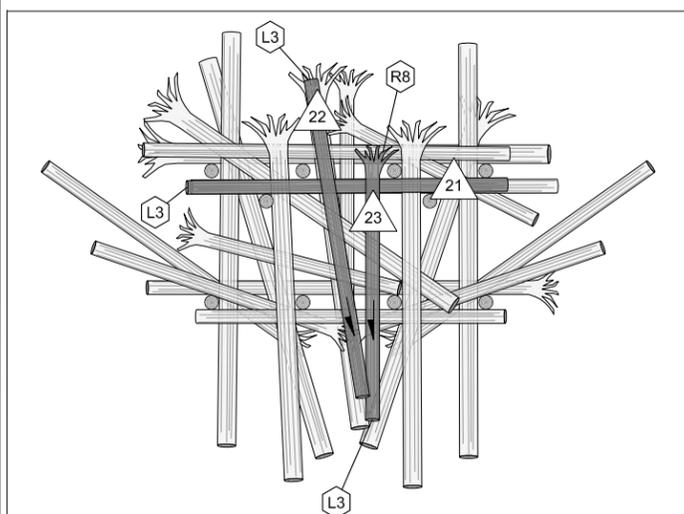
LAYER 4



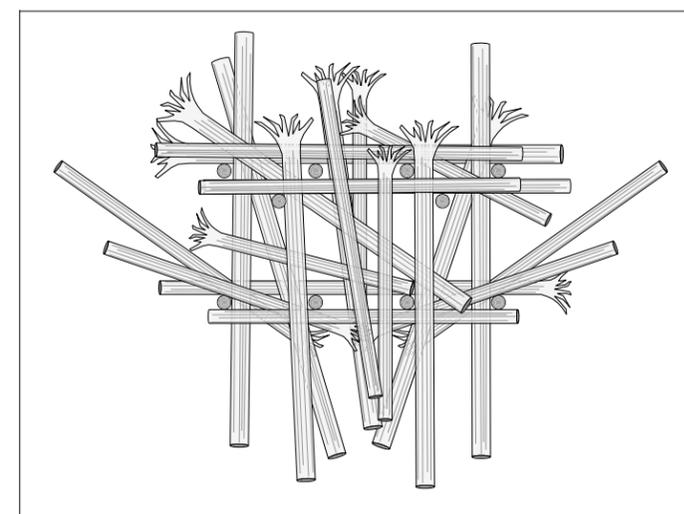
LAYER 5

ELJ CONSTRUCTION SEQUENCE NOTES:

1. INSTALL PILES TO SPECIFIED DEPTH.
2. INSTALL LAYER 1 LOGS, RACKING LOGS, SLASH AND FIRST LIFT OF IMPORTED OF BALLAST MATERIAL.
3. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
4. INSTALL LAYER 2 AND LAYER 3 LOGS, RACKING LOGS, SLASH AND SECOND LIFT OF IMPORTED BALLAST MATERIAL.
5. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
6. INSTALL LAYER 4 AND LAYER 5 LOGS, RACKING LOGS, SLASH AND THIRD LIFT OF IMPORTED BALLAST MATERIAL.
7. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
8. INSTALL LAYER 6 LOGS AND FOURTH LIFT OF IMPORTED BALLAST MATERIAL.
9. COMPLETELY BACKFILL REMAINDER OF STRUCTURE INTERIOR AND CONSTRUCT DEPOSITIONAL BAR WITH NATIVE BACKFILL MATERIAL TO GRADE AND EXTENTS SHOWN ON STRUCTURE PLAN.
10. PLACE TOPSOIL AND MULCH OVER TOP OF STRUCTURE AS SHOWN ON STRUCTURE PLAN.



LAYER 6



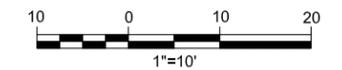
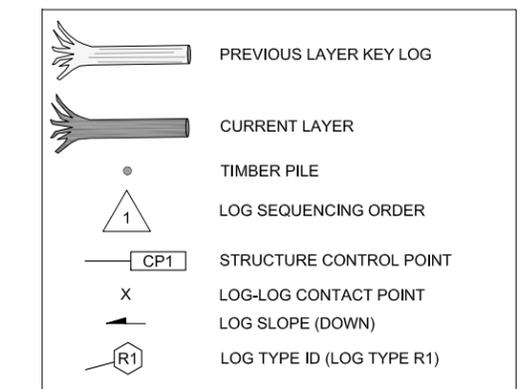
COMPLETE DRAFT 70% DESIGN - NOT FOR CONSTRUCTION

LOG SCHEDULE - ELJ TYPE 1:

LOG TYPE	MINIMUM DIAMETER (IN)	LENGTH (FT)	ROOTWAD	TOTAL QTY PER ELJ
P1	18	25	X	10
P3	18	30-40		10
R1	24	45	X	1
R2	24	40	X	5
R5	18	45	X	1
R7	18	35	X	2
R8	18	30	X	4
R9	18	25	X	2
L1	24	45		3
L2	18	40		2
L3	18	35		3
RACKING	4-16	15-30		0
SLASH	-	-		0

NOTE: P1 LOGS SHALL BE USED IN ELJ 7-10 ONLY. P3 LOGS SHALL BE USED IN ELJ 7-3 AND 7-4 ONLY.

LEGEND:



© 2009 Herrera Environmental, Inc. All rights reserved. AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY.

Path: O:\proj\2007\07-03774-000\CAD\Drawings\Masel River Reach 7\C-5.dwg
Plot Date: 5/28/2009 1:52 PM
Cad User: Laura Turnidge

No.	REVISION	BY	APP'D	DATE

HERRERA
ENVIRONMENTAL CONSULTANTS
2200 Sixth Avenue Suite 1100
Seattle, Washington 98121-1820
206-441-9080
206-441-9108 FAX
<http://www.herreralnc.com>

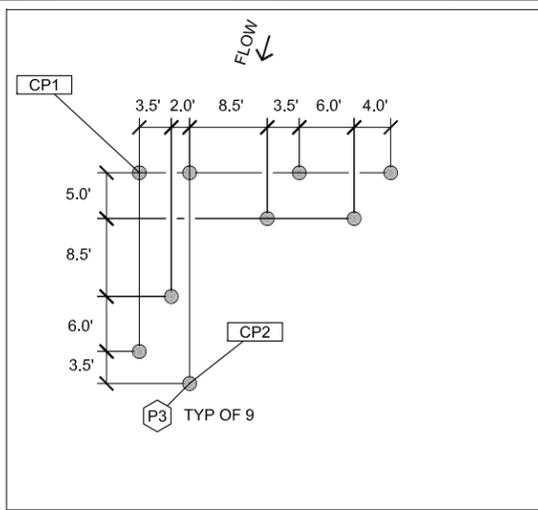
SOUTH PUGET SOUND
Salmon
ENHANCEMENT GROUP

DESIGNED: B. SCOTT	DRAWN: W. WIESZCZECINSKI
DESIGNER: -	DRAWN: -
DESIGNED: -	CHECKED: C. BRUMMER
SCALE: AS NOTED	APPROVED: M. SPILLANE

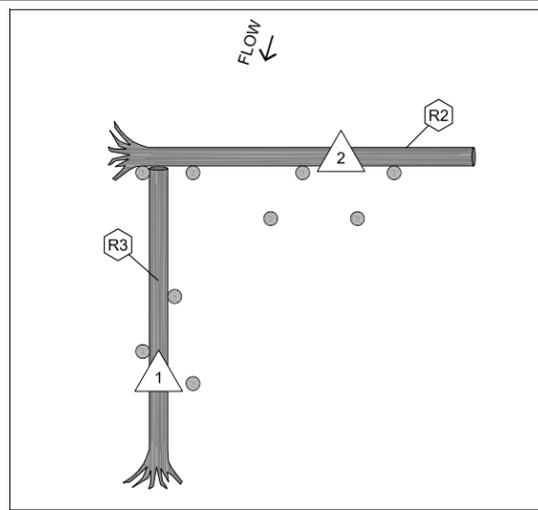
MASHEL RIVER RESTORATION
SOUTH PUGET SOUND
SALMON ENHANCEMENT GROUP

ELJ TYPE 1 LAYERING PLAN

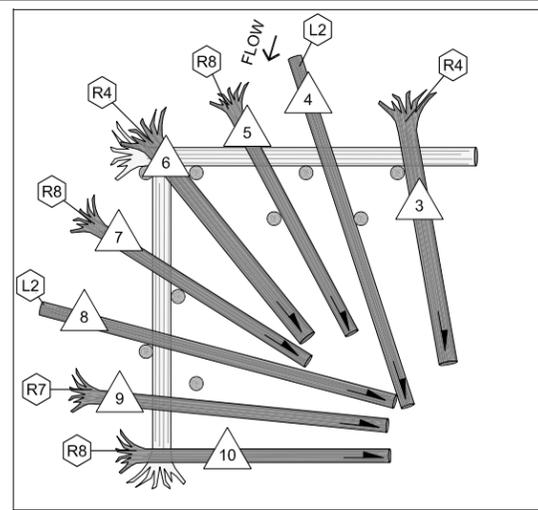
DATE: MAY 2009
PROJECT NO: 07-03774-000
DRAWING NO: C-5
SHEET NO: 7 OF 14



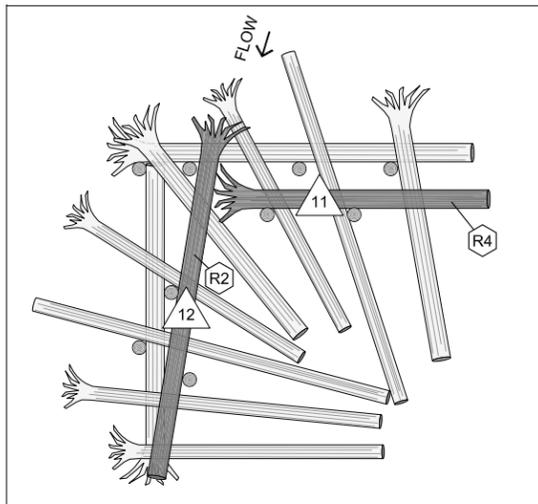
LAYER 0



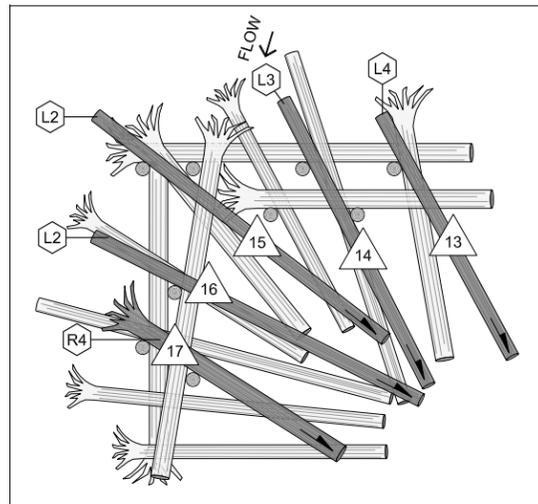
LAYER 1



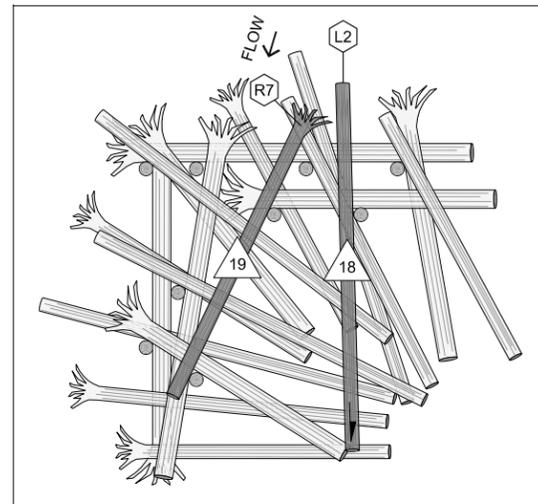
LAYER 2



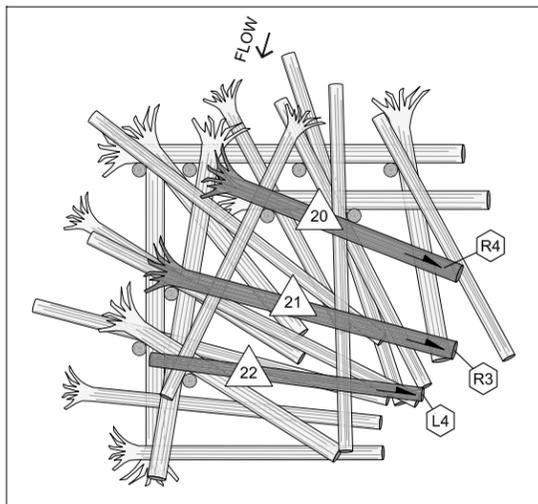
LAYER 3



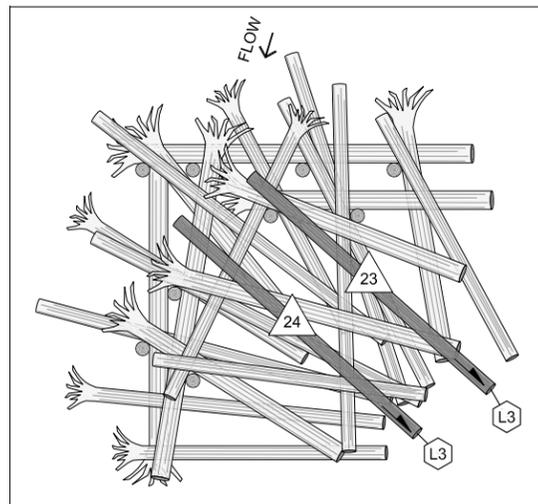
LAYER 4



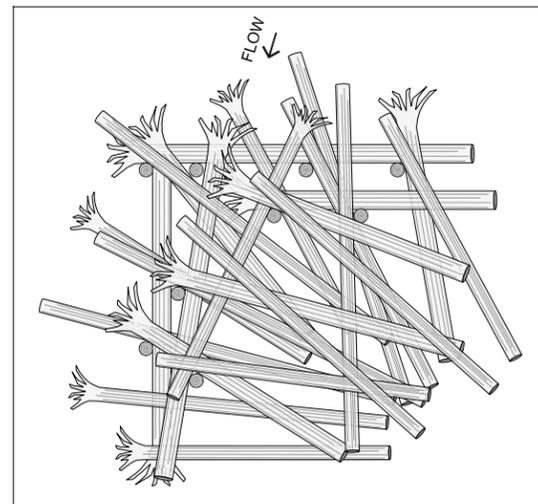
LAYER 5



LAYER 6



LAYER 7



COMPLETE

GENERAL NOTES:

1. FINAL STRUCTURE LOCATION AND ORIENTATION SHALL BE FIELD VERIFIED BY THE ENGINEER PRIOR TO THE CONTRACTOR STAKING PILE LOCATIONS.
2. PILE LOCATIONS SHALL BE STAKED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO PILE INSTALLATION.
3. PILE LOCATIONS ARE SYMMETRICAL ABOUT THE STRUCTURE CONTROL POINT.
4. PILE LOCATIONS SHALL BE BASED ON THE LOCATION OF THE STRUCTURE CONTROL POINT AND SHALL BE WITHIN 6 INCHES OF THE LOCATION SHOWN ON THE DRAWINGS.
5. PILE DIAMETERS SHALL BE MEASURED AT BUTT ENDS.
6. PILES SHALL BE UNTREATED DOUGLAS FIR MEETING ASTM D25 REQUIREMENTS.
7. LOG MATERIALS SHALL BE PLACED AT THE LOCATIONS, ELEVATIONS AND ORIENTATIONS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.
8. TRIM LOGS TO FIT AS REQUIRED.
9. TRIM PILES A MINIMUM OF 18 INCHES AND A MAXIMUM OF 24 INCHES ABOVE FINAL GRADE.
10. EXCAVATION LIMITS VARY DEPENDING ON THE LOCAL SOIL CONDITIONS AND THE CONSTRUCTION TECHNIQUES EMPLOYED.
11. INSTALL LOGS, RACKING LOGS, SLASH, IMPORTED BALLAST MATERIAL AND NATIVE BACKFILL MATERIAL AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
12. SEE DRAWING C-12 FOR STRUCTURE CONTROL POINT COORDINATES.

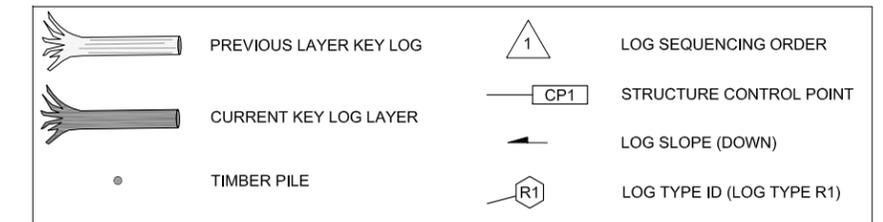
ELJ CONSTRUCTION SEQUENCE NOTES:

1. INSTALL PILES TO SPECIFIED DEPTH.
2. INSTALL LAYER 1 AND LAYER 2 LOGS, RACKING LOGS, SLASH AND FIRST LIFT OF IMPORTED OF BALLAST MATERIAL.
4. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
5. INSTALL LAYER 3 AND LAYER 4 LOGS, RACKING LOGS, SLASH AND SECOND LIFT OF IMPORTED BALLAST MATERIAL.
6. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
7. INSTALL LAYER 5 AND LAYER 6 LOGS, RACKING LOGS, SLASH AND THIRD LIFT OF IMPORTED BALLAST MATERIAL.
8. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
9. INSTALL LAYER 7 LOGS AND FOURTH LIFT OF IMPORTED BALLAST MATERIAL.
10. COMPLETELY BACKFILL REMAINDER OF STRUCTURE INTERIOR AND CONSTRUCT DEPOSITIONAL BAR WITH NATIVE BACKFILL MATERIAL TO GRADE AND EXTENTS SHOWN ON STRUCTURE PLAN.
11. PLACE TOPSOIL AND MULCH OVER TOP OF STRUCTURE AS SHOWN ON STRUCTURE PLAN.

LOG SCHEDULE - ELJ TYPE 2:

LOG TYPE	MINIMUM DIAMETER (IN)	LENGTH (FT)	ROOTWAD	TOTAL QTY PER ELJ
P1	18	25	X	9
R2	24	40	X	2
R3	24	35	X	2
R4	24	30	X	5
R7	18	35	X	2
R8	18	30	X	3
L2	18	40		5
L3	18	35		3
L4	18	30		2
RACKING	4-16	15-30	OPTIONAL	40
SLASH				30 CY

LEGEND:



DRAFT 70% DESIGN - NOT FOR CONSTRUCTION

Path: O:\proj\2007\07-03774-000\CADD\Drawings\Mashel River Reach 7\C-7.dwg
Cad User: Laura Turnidge
Plot Date: 5/28/2009 1:52 PM

No.	REVISION	BY	APP'D	DATE



2200 Sixth Avenue
Suite 1100
Seattle, Washington
98121-1820
206-441-9080
206-441-9108 FAX
<http://www.herreralc.com>



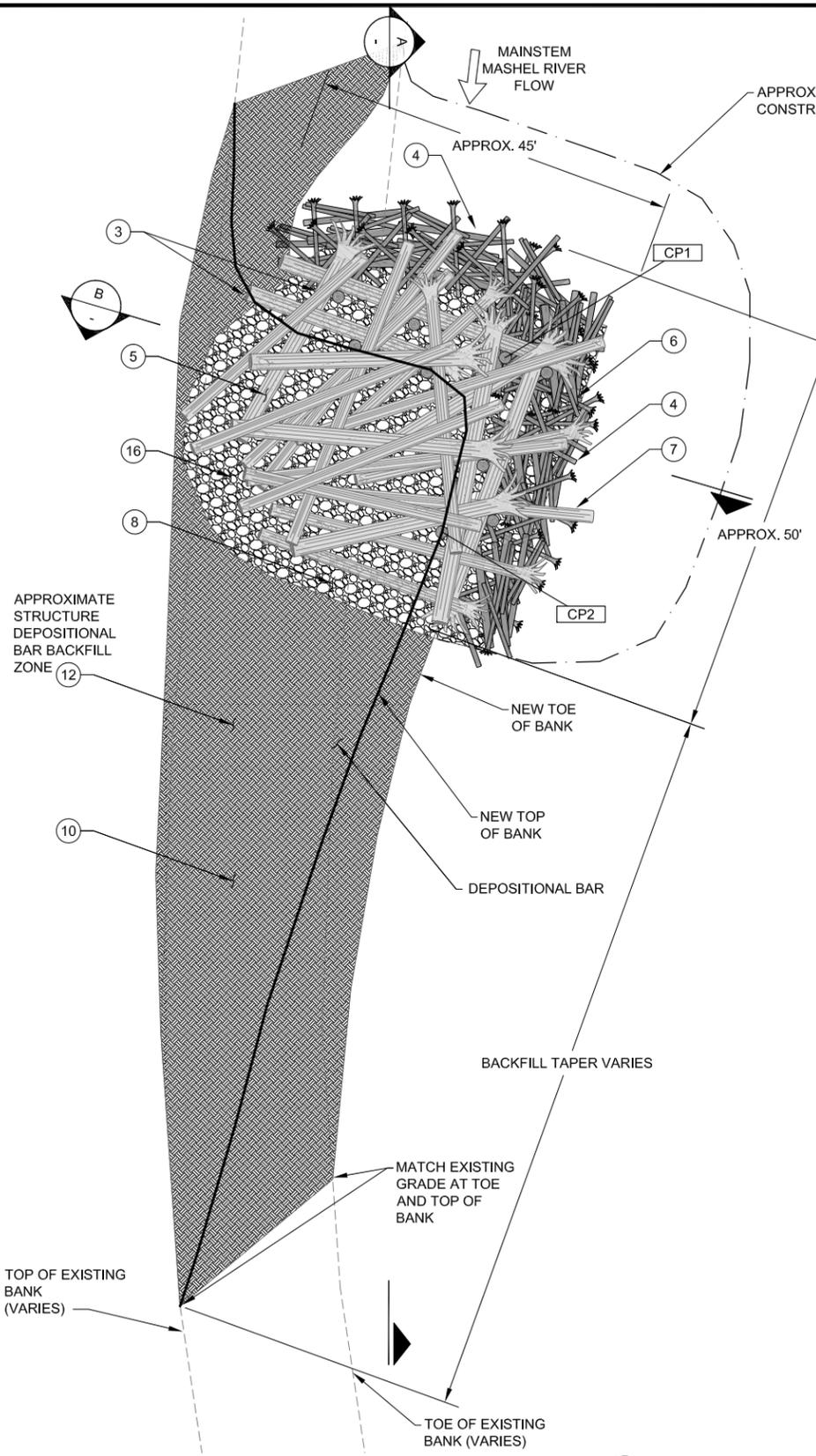
DESIGNED: B. SCOTT	DRAWN: W. WIESZCZECINSKI
DESIGNER: -	DRAWN: -
DESIGNED: -	CHECKED: C. BRUMMER
SCALE: AS NOTED	APPROVED: M. SPILLANE

MASHEL RIVER RESTORATION
SOUTH PUGET SOUND
SALMON ENHANCEMENT GROUP

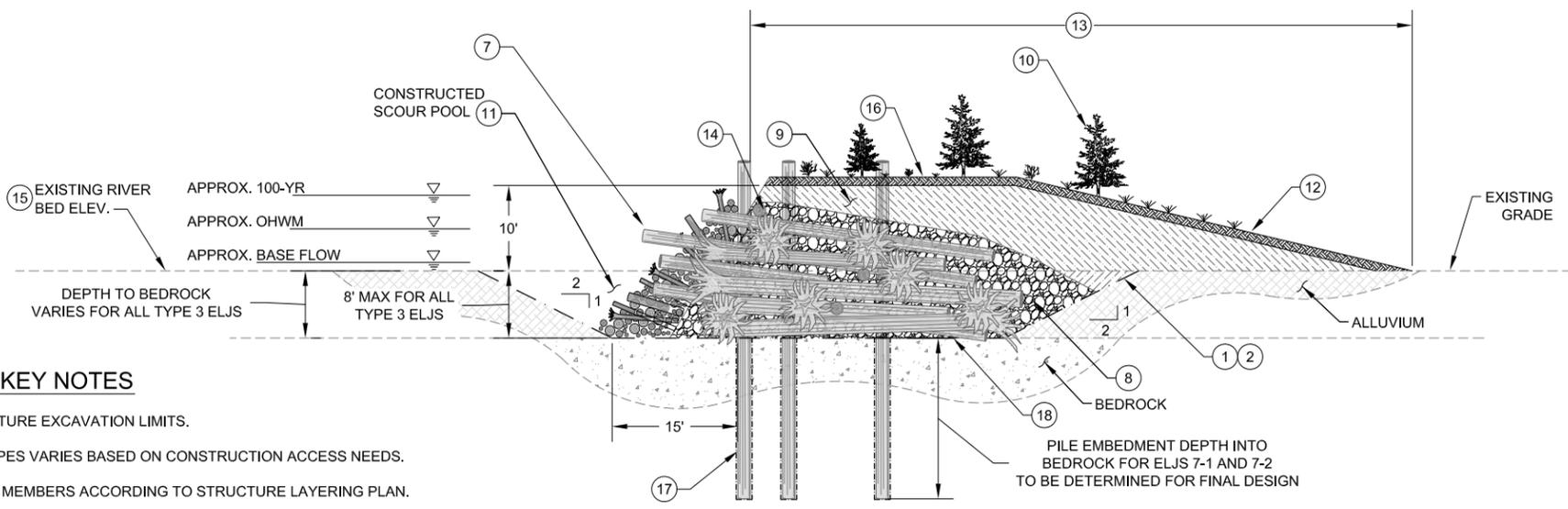
ELJ TYPE 2 LAYERING PLAN

DATE: MAY 2009
PROJECT NO: 07-03774-000
DRAWING NO: C-7
SHEET NO: 9
OF 14

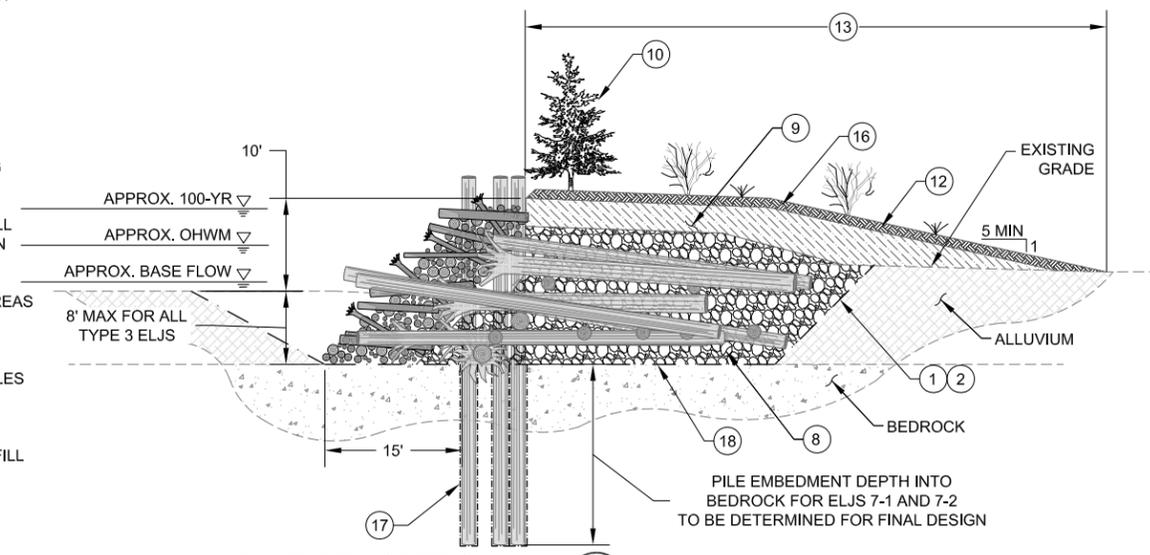
© 2009 Herrera Environmental, Inc. All rights reserved.
ONE INCH
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY



ELJ TYPE 3 PLAN VIEW
SCALE: 1"=10'



ELJ TYPE 3 SECTION
SCALE: 1" = 10'



ELJ TYPE 3 SECTION
SCALE: 1" = 10'

CONSTRUCTION KEY NOTES

- 1 APPROXIMATE STRUCTURE EXCAVATION LIMITS.
- 2 EXCAVATED SIDE SLOPES VARIES BASED ON CONSTRUCTION ACCESS NEEDS.
- 3 PLACE PILES AND KEY MEMBERS ACCORDING TO STRUCTURE LAYERING PLAN.
- 4 SMALL WOODY DEBRIS AND SLASH AND WILLOW WATTLES EMBEDDED INTO FLANKS OF STRUCTURES IN AND AROUND INTERFACE OF KEY LOGS AND RACKING LOGS PRIOR TO BACKFILLING, EXTENDING FROM BASE TO 3-FEET ABOVE EXISTING GRADE.
- 5 COORDINATE WITH ENGINEER PRIOR TO PLACING EXISTING RIPRAP AND IMPORTED HEAVY LOOSE RIPRAP FOR LOG BALLAST.
- 6 COORDINATE WITH ENGINEER PRIOR TO PLACING RACKING LOGS.
- 7 LAYERS 2, 3, 4, 5 AND 6 SHALL EXTEND THROUGH RACKING MATERIAL.
- 8 PLACE LOG BALLAST MATERIAL FROM THE TOE UP TO THE TOP OF THE STRUCTURE AT MATERIAL ANGLE OF REPOSE (APPROX 1.5H:1V) AT DOWNSTREAM END OF STRUCTURE.
- 9 MAINTAIN A MINIMUM DEPTH OF 3-FEET OF NATIVE ALLUVIUM BACKFILL MATERIAL OVER TOP OF IMPORTED BALLAST MATERIAL.
- 10 PLANTING TOP OF STRUCTURE AND DISTURBED BANK TO BE CONDUCTED BY OTHERS.
- 11 DO NOT BACKFILL UPSTREAM OF STRUCTURE, LEAVE AS POOL.
- 12 ADJUST FINAL GRADE ON BANK SIDE AND DOWNSTREAM SIDE OF STRUCTURE AS NEEDED TO PLACE ALL SUITABLE EXCESS EXCAVATED ALLUVIUM.
- 13 DIMENSION WILL VARY ALONG STRUCTURE TO TRANSITION TO EXISTING GRADE.
- 14 PLACE SALVAGED BRUSH ALONG EDGE OF STRUCTURE BETWEEN SOIL AND RACKING LOGS TO PREVENT BLEEDING SOIL FROM STRUCTURE.
- 15 EXISTING RIVER BED ELEVATION VARIES FOR EACH STRUCTURE. CONTRACTOR SHALL VERIFY WITH ENGINEER THE EXCAVATION DEPTH AND STRUCTURE HEIGHT BASED ON EXISTING RIVER BED ELEVATION AT EACH SITE.
- 16 12" OF TOPSOIL AND 2" OF MULCH TO BE PLACED ABOVE OHWM OVER EXCAVATED AREAS AS DIRECTED BY ENGINEER.
- 17 TIMBER PILES SHALL BE DRIVEN OR PLACED INTO VERTICAL DRILLED ROCK SHAFTS THROUGH SEDIMENTARY BEDROCK AND EXISTING ALLUVIUM IF NECESSARY. TRIM PILES ON THREE SIDES AND FIELD FIT TO SHAFT DIAMETER.
- 18 EXCAVATE TO BEDROCK OR TO DIMENSION SHOWN, WHICH EVER IS ENCOUNTERED FIRST, THEN DRILL AND PLACE PILES AND PLACE KEY LOGS AS SHOWN. PLACE BACKFILL TO DIMENSIONS SHOWN.

DRAFT 70% DESIGN - NOT FOR CONSTRUCTION

Path: C:\proj\2007\07-03774-000\CAD\Drawings\Mashel River Reach 7\C-8.dwg
Plot Date: 5/28/2009 1:52 PM
Cad User: Laura Turnidge

No.	REVISION	BY	APP'D	DATE

HERRERA
ENVIRONMENTAL CONSULTANTS
2200 Sixth Avenue
Suite 1100
Seattle, Washington
98121-1820
206-441-9080
206-441-9108 FAX
<http://www.herrerainc.com>

SOUTH PUGET SOUND
Salmon
ENHANCEMENT GROUP

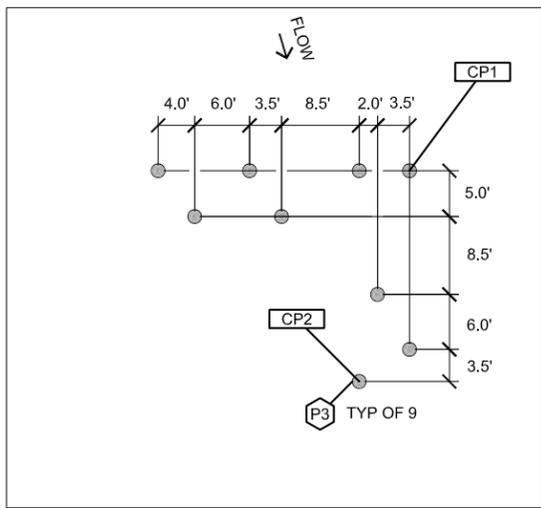
DESIGNED: B. SCOTT	DRAWN: W. WIESZCZECINSKI
DESIGNER: -	DRAWN: -
DESIGNED: -	CHECKED: C. BRUMMER
SCALE: AS NOTED	APPROVED: M. SPILLANE

MASHSEL RIVER RESTORATION
SOUTH PUGET SOUND
SALMON ENHANCEMENT GROUP
ELJ TYPE 3 PLAN AND SECTIONS

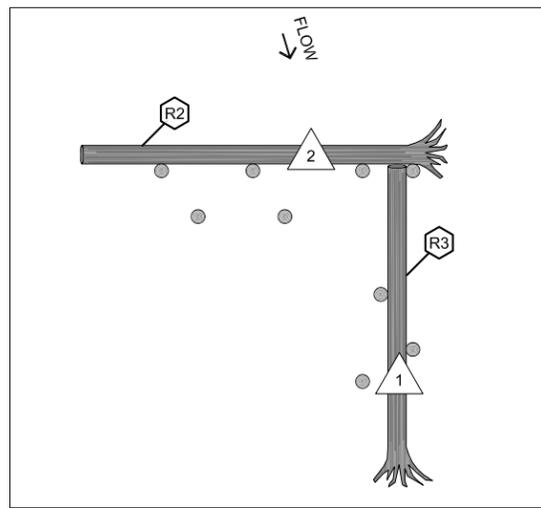
DATE: MAY 2009
PROJECT NO: 07-03774-000
DRAWING NO: C-8
SHEET NO: 10 OF 14

ONE INCH
AT FULL SIZE, IF NOT ONE
INCH SCALE ACCORDINGLY
© 2009 Herrera Environmental, Inc. All rights reserved.

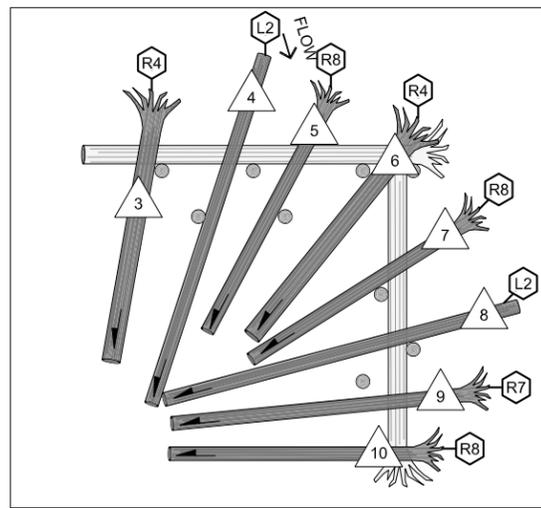
Path: C:\proj\2007\07-03774-000\CAD\Drawings\Mashel River Reach 7\C-9.dwg
 Cad User: Laura Turnidge
 Plot Date: 5/28/2009 1:56 PM



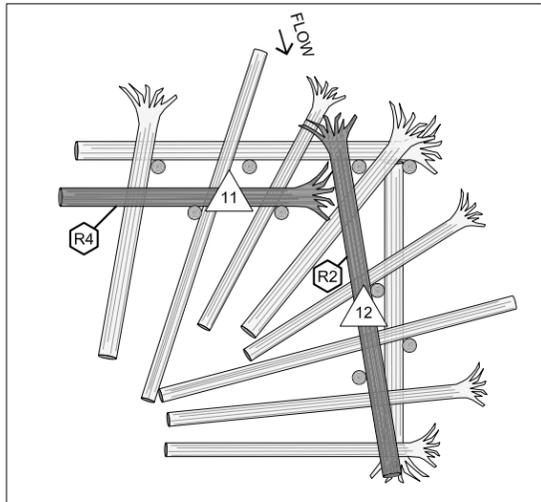
LAYER 0



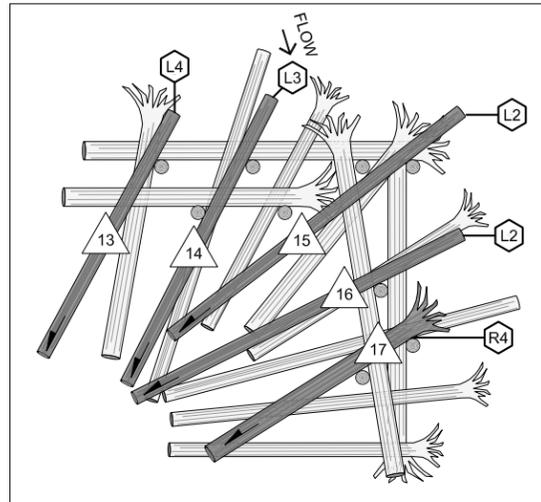
LAYER 1



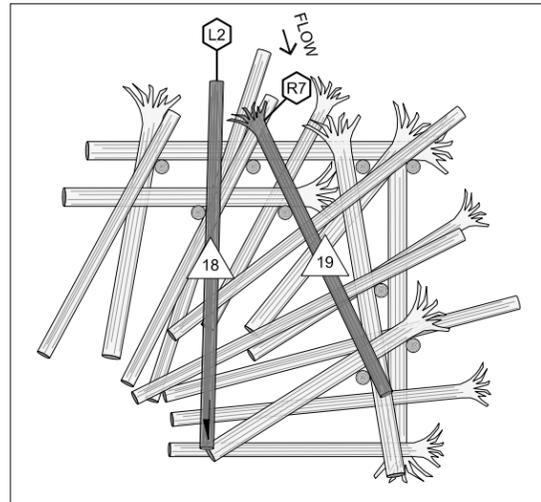
LAYER 2



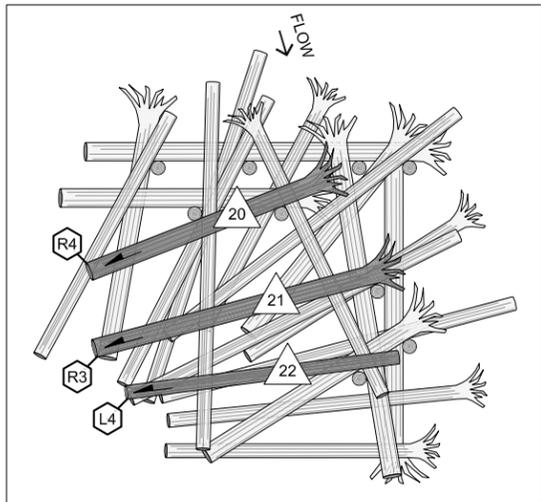
LAYER 3



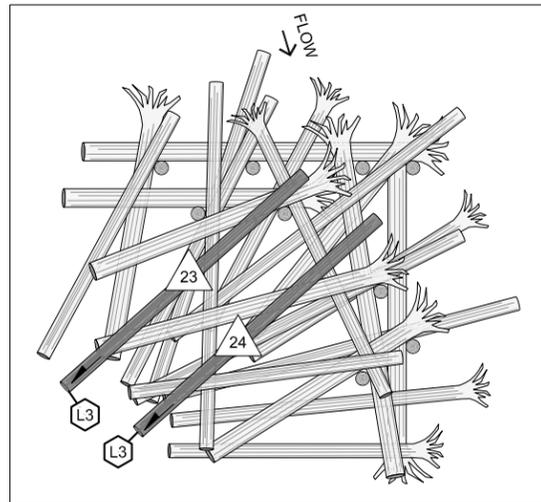
LAYER 4



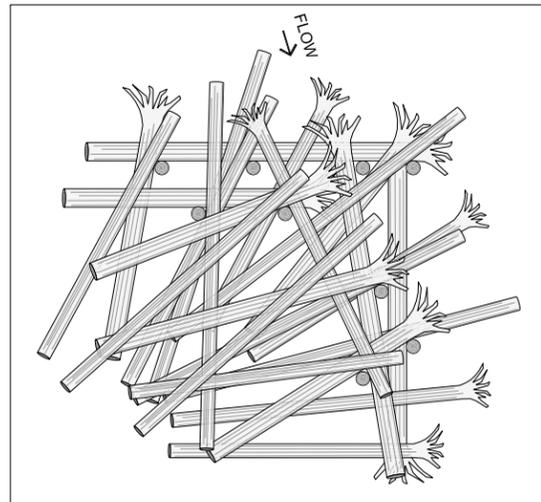
LAYER 5



LAYER 6



LAYER 7



COMPLETE

GENERAL NOTES:

1. FINAL STRUCTURE LOCATION AND ORIENTATION SHALL BE FIELD VERIFIED BY THE ENGINEER PRIOR TO THE CONTRACTOR STAKING PILE LOCATIONS.
2. PILE LOCATIONS SHALL BE STAKED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO PILE INSTALLATION.
3. PILE LOCATIONS ARE SYMMETRICAL ABOUT THE STRUCTURE CONTROL POINT.
4. PILE LOCATIONS SHALL BE BASED ON THE LOCATION OF THE STRUCTURE CONTROL POINT AND SHALL BE WITHIN 6 INCHES OF THE LOCATION SHOWN ON THE DRAWINGS.
5. PILE DIAMETERS SHALL BE MEASURED AT BUTT ENDS.
6. PILES SHALL BE UNTREATED DOUGLAS FIR MEETING ASTM D25 REQUIREMENTS.
7. LOG MATERIALS SHALL BE PLACED AT THE LOCATIONS, ELEVATIONS AND ORIENTATIONS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.
8. TRIM LOGS TO FIT AS REQUIRED.
9. TRIM PILES A MINIMUM OF 18 INCHES AND A MAXIMUM OF 24 INCHES ABOVE FINAL GRADE.
10. EXCAVATION LIMITS VARY DEPENDING ON THE LOCAL SOIL CONDITIONS AND THE CONSTRUCTION TECHNIQUES EMPLOYED.
11. INSTALL LOGS, RACKING LOGS, SLASH, IMPORTED BALLAST MATERIAL AND NATIVE BACKFILL MATERIAL AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
12. SEE DRAWINGS C-12 FOR STRUCTURE CONTROL POINT COORDINATES.

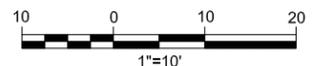
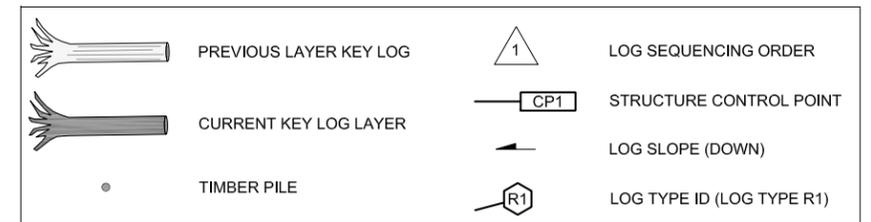
ELJ CONSTRUCTION SEQUENCE NOTES:

1. INSTALL PILES TO SPECIFIED DEPTH.
2. INSTALL LAYER 1 AND LAYER 2 LOGS, RACKING LOGS, SLASH AND FIRST LIFT OF IMPORTED OF BALLAST MATERIAL.
4. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
5. INSTALL LAYER 3 AND LAYER 4 LOGS, RACKING LOGS, SLASH AND SECOND LIFT OF IMPORTED BALLAST MATERIAL.
6. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
7. INSTALL LAYER 5 AND LAYER 6 LOGS, RACKING LOGS, SLASH AND THIRD LIFT OF IMPORTED BALLAST MATERIAL.
8. FILL ALL VOIDS IN BALLAST MATERIAL WITH NATIVE BACKFILL MATERIAL.
9. INSTALL LAYER 7 LOGS AND FOURTH LIFT OF IMPORTED BALLAST MATERIAL.
10. COMPLETELY BACKFILL REMAINDER OF STRUCTURE INTERIOR AND CONSTRUCT DEPOSITIONAL BAR WITH NATIVE BACKFILL MATERIAL TO GRADE AND EXTENTS SHOWN ON STRUCTURE PLAN.
11. PLACE TOPSOIL AND MULCH OVER TOP OF STRUCTURE AS SHOWN ON STRUCTURE PLAN.

LOG SCHEDULE - ELJ TYPE 3:

LOG TYPE	MINIMUM DIAMETER (IN)	LENGTH (FT)	ROOTWAD	TOTAL QTY PER ELJ
P3	18	30-40		9
R2	24	40	X	2
R3	24	35	X	2
R4	24	30	X	5
R7	18	35	X	2
R8	18	30	X	3
L2	18	40		5
L3	18	35		3
L4	18	30		2
RACKING	4-16	15-30	OPTIONAL	40
SLASH				30 CY

LEGEND:



DRAFT 70% DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE

HERRERA
 ENVIRONMENTAL CONSULTANTS
 2200 Sixth Avenue Suite 1100
 Seattle, Washington 98121-1820
 206-441-9080
 206-441-9108 FAX
<http://www.herrerainc.com>

SOUTH PUGET SOUND
Salmon

ENHANCEMENT GROUP

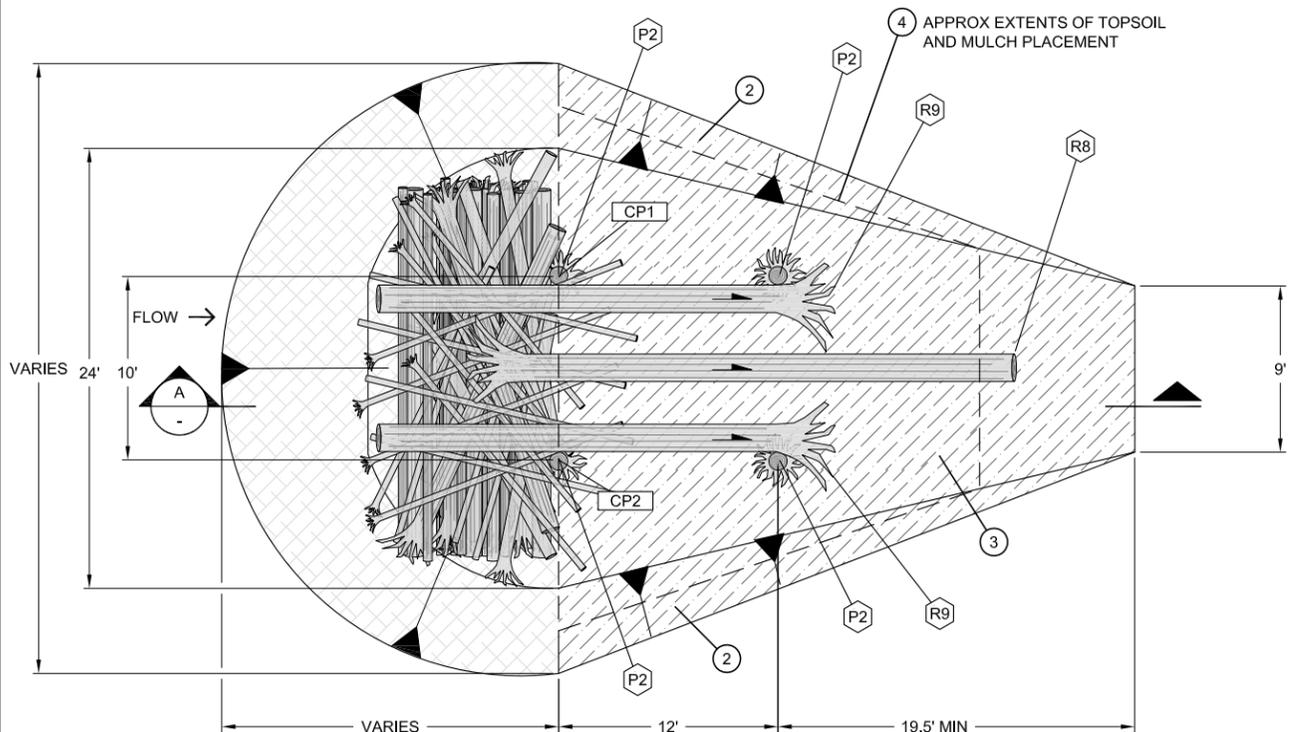
DESIGNED: B. SCOTT	DRAWN: W. WIESZCZECINSKI
DESIGNER: -	DRAWN: -
DESIGNED: -	CHECKED: C. BRUMMER
SCALE: AS NOTED	APPROVED: M. SPILLANE

MASHEL RIVER RESTORATION
SOUTH PUGET SOUND
SALMON ENHANCEMENT GROUP

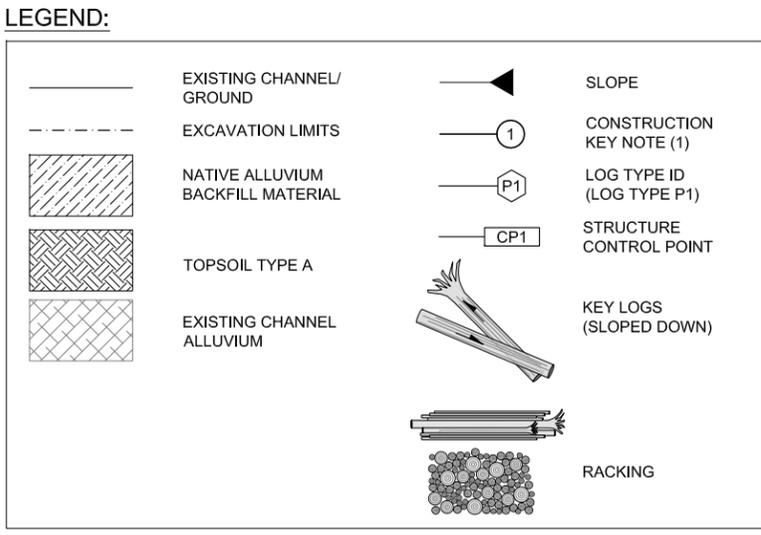
ELJ TYPE 3 LAYERING PLAN

DATE: MAY 2009
PROJECT NO: 07-03774-000
DRAWING NO: C-9
SHEET NO: 11
OF 14

© 2009 Herrera Environmental, Inc. All rights reserved.
 ONE INCH
 AT FULL SIZE, IF NOT ONE
 INCH SCALE ACCORDINGLY

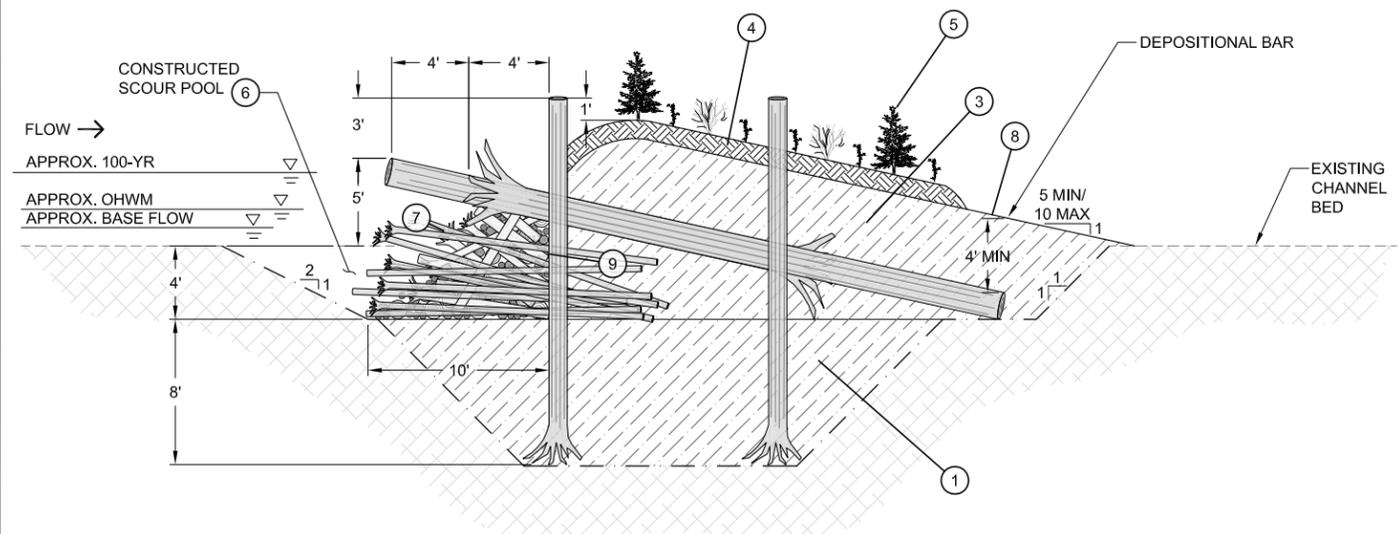


PLAN - ELJ TYPE 4
SCALE: 1"=5'

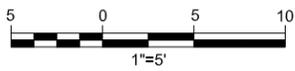


- GENERAL NOTES:**
1. FINAL STRUCTURE LOCATION AND ORIENTATION SHALL BE FIELD VERIFIED BY THE ENGINEER PRIOR TO THE CONTRACTOR STAKING PILE LOCATIONS.
 2. PILE LOCATIONS SHALL BE STAKED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO PILE INSTALLATION.
 3. PILE LOCATIONS ARE SYMMETRICAL ABOUT THE STRUCTURE CONTROL POINTS.
 4. PILE LOCATIONS SHALL BE BASED ON THE LOCATION OF THE STRUCTURE CONTROL POINT AND SHALL BE WITHIN 6 INCHES OF THE LOCATION SHOWN ON THE DRAWINGS.
 5. PILE DIAMETERS SHALL BE MEASURED AT BUTT ENDS.
 6. PILES SHALL BE UNTREATED DOUGLAS FIR MEETING ASTM D25 REQUIREMENTS.
 7. LOG MATERIALS SHALL BE PLACED AT THE LOCATIONS, ELEVATIONS AND ORIENTATIONS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.
 8. TRIM LOGS TO FIT AS REQUIRED.
 9. TRIM PILES A MINIMUM OF 18 INCHES AND A MAXIMUM OF 24 INCHES ABOVE FINAL GRADE.
 10. EXCAVATION LIMITS VARY DEPENDING ON THE LOCAL SOIL CONDITIONS AND THE CONSTRUCTION TECHNIQUES EMPLOYED.
 11. INSTALL LOGS, RACKING LOGS, SLASH, IMPORTED BALLAST MATERIAL AND NATIVE BACKFILL MATERIAL AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
 12. EXISTING RIVER BED ELEVATION VARIES FOR EACH STRUCTURE. CONTRACTOR SHALL DETERMINE EXCAVATION DEPTH AND STRUCTURE HEIGHT BASED ON EXISTING RIVER BED ELEVATION AT EACH STRUCTURE.
 13. SEE DRAWING C-12 FOR STRUCTURE CONTROL POINT COORDINATES.

- CONSTRUCTION KEY NOTES:**
1. BACKFILL AROUND PILES TO DEPTH AND EXTENTS SHOWN WITH ALLUVIUM EXCAVATED FOR ELJ CONSTRUCTION AND AS DIRECTED BY THE ENGINEER. COMPACT ALLUVIUM WITH BACKSIDE OF EXCAVATOR BUCKET PRIOR TO PLACING KEY LOGS.
 2. BACKFILL SIDES OF ELJ DEPOSITIONAL BAR WITH ALLUVIUM EXCAVATED FOR ELJ CONSTRUCTION. COMPACT ALLUVIUM WITH BACKSIDE OF EXCAVATOR BUCKET FOLLOWING LOG PLACEMENT.
 3. BACKFILL OVER KEY LOGS WITH NATIVE ALLUVIUM TO DEPTH AND EXTENTS SHOWN.
 4. PLACE 12" OF IMPORTED TOPSOIL AND 2" OF MULCH OVER NATIVE ALLUVIUM ALONG TOP OF ELJ AND DEPOSITIONAL BAR AS SHOWN. TOPSOIL AND MULCH TO BE PLACED ABOVE OHWM AS DIRECTED BY ENGINEER.
 5. PLACEMENT OF SEED AND PLANTS ALONG TOP AND FLANKS OF ELJ TO BE COMPLETED BY OTHERS.
 6. DO NOT BACKFILL SCOUR POOL. EXCAVATE CHANNEL TO CONNECT SIDE CHANNEL THALWEG TO ELJ SCOUR POOL AS DIRECTED BY ENGINEER.
 7. RACKING AND SLASH MATERIAL PLACEMENT SHALL BE COORDINATED WITH LOG PLACEMENT PLACEMENT TO ENSURE RACKING MEMBERS AND SLASH IS PLACED BENEATH LOGS, BETWEEN PILES AND EMBEDDED IN SUBSTRATE DOWNSTREAM OF THE PILES.
 8. GRADE AND EXTENTS OF DEPOSITIONAL BAR SHOWN IS THE MINIMUM TO SATISFY LOG BALLAST REQUIREMENTS. FINAL GRADE AND EXTENTS WILL VARY. ADJUST FINAL GRADE OF DEPOSITIONAL BAR ON DOWNSTREAM SIDE OF ELJ AS NEEDED TO DISPOSE OF EXCESS ALLUVIUM AND AS DIRECTED BY ENGINEER.
 9. PLACE SLASH AND SALVAGED BRUSH ALONG FACE AND SIDES OF ELJ BETWEEN ALLUVIUM BACKFILL MATERIAL AND RACKING LOGS TO PREVENT SOIL BLEEDING.



SECTION - ELJ TYPE 4
SCALE: 1"=5'



LOG SCHEDULE - ELJ TYPE 4:

LOG TYPE	MINIMUM DIAMETER (IN)	LENGTH (FT)	ROOTWAD	TOTAL QTY PER ELJ
P2	12	25	X	4
R8	18	30	X	1
R9	18	25	X	2
RACKING	4-16	15-30	OPTIONAL	25
SLASH				15 CY

DRAFT 70% DESIGN - NOT FOR CONSTRUCTION

Path: C:\proj\2007\07-03774-000\CAD\Drawings\Mashel River Reach 7\C-10.dwg
 Plot Date: 5/28/2009 1:53 PM
 Plot Style Table: Herrera.ctb
 Plotter: Adobe PDF

No.	REVISION	BY	APP'D	DATE


 2200 Sixth Avenue
 Suite 1100
 Seattle, Washington
 98121-1820
 206-441-9080
 206-441-9108 FAX
<http://www.herreralnc.com>

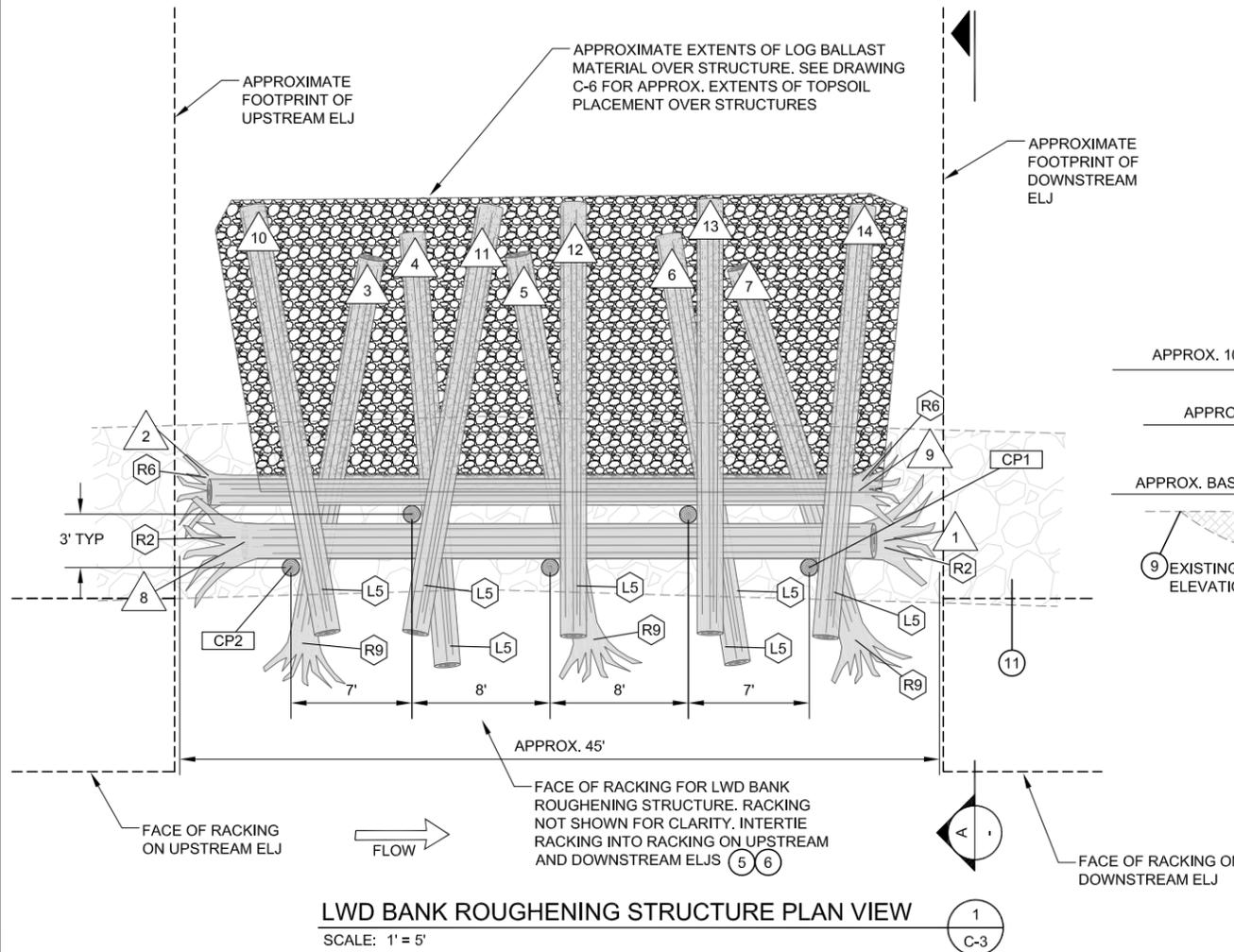


DESIGNED: B. SCOTT	DRAWN: W. WIESZCZECINSKI
DESIGNED: -	DRAWN: -
DESIGNED: -	CHECKED: C. BRUMMER
SCALE: AS NOTED	APPROVED: M. SPILLANE

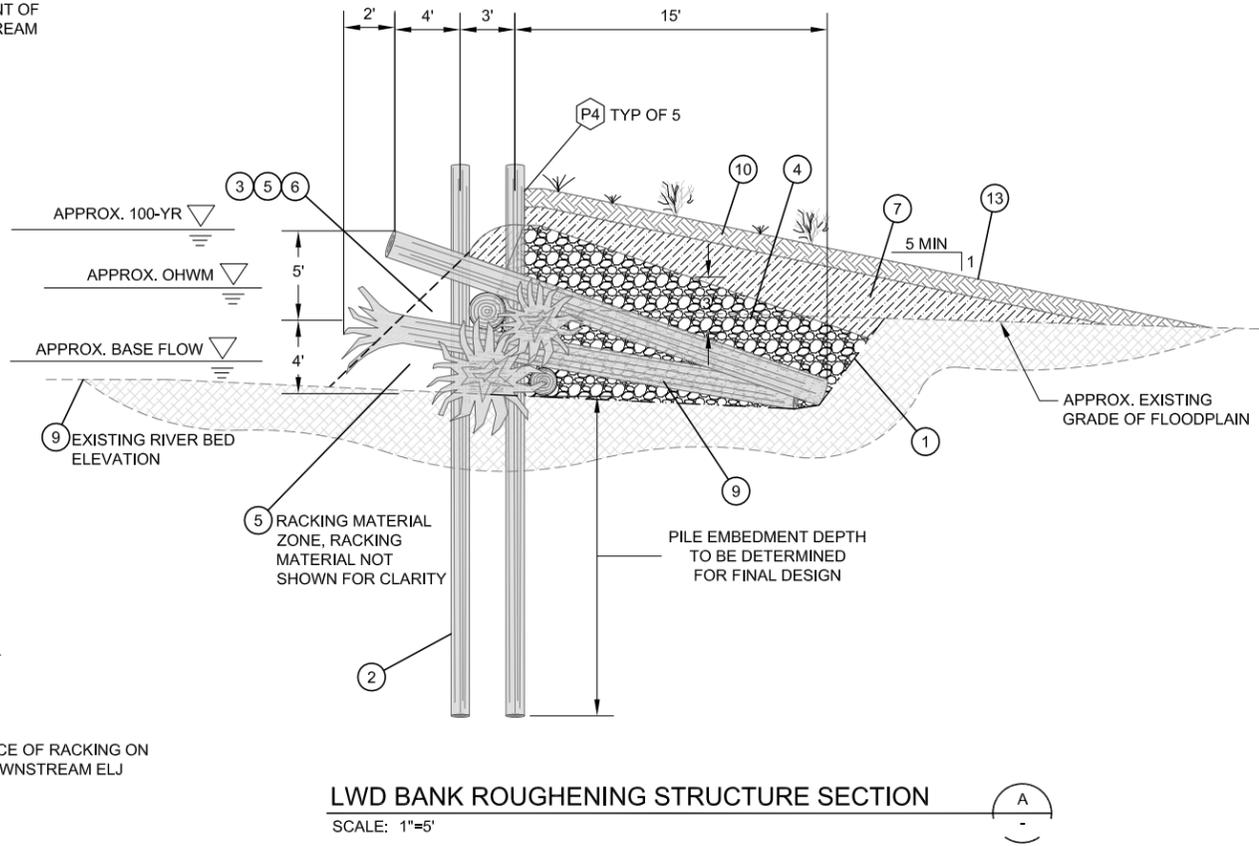
MASHEL RIVER RESTORATION
 SOUTH PUGET SOUND
 SALMON ENHANCEMENT GROUP
 ELJ TYPE 4 PLAN AND SECTIONS

DATE: MAY 2009
PROJECT NO: 07-03774-000
DRAWING NO: C-10
SHEET NO: 12 OF 14

© 2009 Herrera Environmental, Inc. All rights reserved.
 ONE INCH
 AT FULL SIZE, IF NOT ONE
 INCH SCALE ACCORDINGLY



LWD BANK ROUGHENING STRUCTURE PLAN VIEW
SCALE: 1"=5'



LWD BANK ROUGHENING STRUCTURE SECTION
SCALE: 1"=5'

- GENERAL NOTES:**
1. FINAL STRUCTURE LOCATION AND ORIENTATION SHALL BE FIELD VERIFIED BY THE ENGINEER PRIOR TO THE CONTRACTOR STAKING PILE LOCATIONS.
 2. PILE LOCATIONS SHALL BE STAKED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO PILE INSTALLATION.
 3. PILE LOCATIONS ARE SYMMETRICAL ABOUT THE STRUCTURE CONTROL POINTS.
 4. PILE LOCATIONS SHALL BE BASED ON THE LOCATION OF THE STRUCTURE CONTROL POINT AND SHALL BE WITHIN 6 INCHES OF THE LOCATION SHOWN ON THE DRAWINGS.
 5. PILE DIAMETERS SHALL BE MEASURED AT BUTT ENDS.
 6. PILES SHALL BE UNTREATED DOUGLAS FIR MEETING ASTM D25 REQUIREMENTS.
 7. LOG MATERIALS SHALL BE PLACED AT THE LOCATIONS, ELEVATIONS AND ORIENTATIONS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE ENGINEER.
 8. TRIM LOGS TO FIT AS REQUIRED.
 9. TRIM PILES A MINIMUM OF 18 INCHES AND A MAXIMUM OF 24 INCHES ABOVE FINAL GRADE.
 10. EXCAVATION LIMITS VARY DEPENDING ON THE LOCAL SOIL CONDITIONS AND THE CONSTRUCTION TECHNIQUES EMPLOYED.
 11. INSTALL LOGS, RACKING LOGS, SLASH, IMPORTED BALLAST MATERIAL AND NATIVE BACKFILL MATERIAL AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER.
 12. LARGE COBBLES AND BOULDERS WILL BE ENCOUNTERED DURING STRUCTURE EXCAVATION AND PILE SHAFT DRILLING.

CONSTRUCTION KEY NOTES

- 1 APPROXIMATE STRUCTURE EXCAVATION LIMITS.
- 2 TIMBER PILES SHALL BE DRIVEN INTO VERTICAL DRILLED SHAFTS.
- 3 SMALL WOODY DEBRIS AND SLASH EMBEDDED INTO FACE OF STRUCTURE IN AND AROUND INTERFACE OF KEY LOGS AND RACKING LOGS PRIOR TO BACKFILLING, EXTENDING FROM BASE TO 3- FEET ABOVE EXISTING GRADE.
- 4 COORDINATE WITH ENGINEER PRIOR TO PLACING LOG BALLAST MATERIAL. BACKFILL OVER KEY LOGS WITH BALLAST MATERIAL TO DEPTH AND EXTENTS SHOWN. FILL VOIDS IN BALLAST MATERIAL WITH NATIVE ALLUVIUM TO A MINIMUM DEPTH OF 1-FOOT ABOVE THE TOP THE IMPORTED BALLAST MATERIAL.
- 5 COORDINATE WITH ENGINEER PRIOR TO PLACING RACKING AND SLASH MATERIAL. RACKING AND SLASH MATERIAL PLACEMENT SHALL BE COORDINATED WITH LOG PLACEMENT PLACEMENT TO ENSURE RACKING MEMBERS AND SLASH IS PLACED BENEATH LOGS AND BETWEEN PILES.
- 6 KEY LOGS SHALL EXTEND THROUGH RACKING MATERIAL.
- 7 ADJUST FINAL GRADE ON BANK SIDE OF STRUCTURE AS NEEDED TO PLACE ALL EXCESS EXCAVATED ALLUVIUM.
- 8 PLACE SALVAGED BRUSH ALONG FACE OF STRUCTURE BETWEEN SOIL AND RACKING LOGS TO PREVENT BLEEDING SOIL FROM STRUCTURE.
- 9 EXISTING RIVER BED AND BANK ELEVATION VARIES FOR EACH STRUCTURE. CONTRACTOR SHALL VERIFY WITH ENGINEER THE EXCAVATION DEPTH AND STRUCTURE HEIGHT BASED ON EXISTING RIVER BED AND BANK ELEVATION AT EACH STRUCTURE.
- 10 PLACE 12" OF IMPORTED TOPSOIL AND 2" OF MULCH OVER NATIVE ALLUVIUM ALONG TOP OF STRUCTURE AS SHOWN.
- 11 REMOVE RIPRAP, CONCRETE DEBRIS AND LARGE BOULDERS ALONG BANK IN VICINITY OF STRUCTURE TO USE AS LOG BALLAST MATERIAL.
- 12 PLANTING TOP OF STRUCTURE AND DISTURBED BANK TO BE CONDUCTED BY OTHERS.
- 13 SLOPE BACKFILL AS SHOWN TO MATCH EXISTING GRADE.

LOG SCHEDULE - LWD BANK ROUGHENING STRUCTURE

LOG TYPE	MINIMUM DIAMETER (IN)	LENGTH (FT)	ROOTWAD	TOTAL QTY PER ELJ
P4	12	25		5
R2	24	40	X	2
R6	18	40	X	2
R9	18	25	X	3
L5	18	25		7
RACKING	4-16	15-30	OPTIONAL	30
SLASH				15 CY

LEGEND:

	EXISTING CHANNEL/GROUND		SLOPE
	EXCAVATION LIMITS		KEYNOTE
	IMPORTED BALLAST MATERIAL		LOG TYPE ID (LOG TYPE P1)
	NATIVE ALLUVIUM BACKFILL MATERIAL		STRUCTURE CONTROL POINT
	TOP SOIL TYPE A		KEY LOGS (SLOPED DOWN)
	EXISTING CHANNEL ALLUVIUM		RACKING
	LOG SEQUENCING ORDER		

Scale: 1"=5' (0 to 10 feet)

DRAFT 70% DESIGN - NOT FOR CONSTRUCTION

Path: C:\proj\2007\07-03774-000\CAD\Drawings\Masheh River Reach 7\C-11.dwg
Plot Date: 5/28/2009 1:53 PM
Cad User: Laura Turnidge

No.	REVISION	BY	APP'D	DATE

HERRERA ENVIRONMENTAL CONSULTANTS
2200 Sixth Avenue Suite 1100
Seattle, Washington 98121-1820
206-441-9080
206-441-9108 FAX
http://www.herreralnc.com

SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP

DESIGNED: B. SCOTT	DRAWN: W. WIESZCZECINSKI
DESIGNER: -	DRAWN: -
DESIGNED: -	CHECKED: C. BRUMMER
DESIGNER: -	APPROVED: M. SPILLANE
SCALE: AS NOTED	

MASHEL RIVER RESTORATION SOUTH PUGET SOUND SALMON ENHANCEMENT GROUP
LWD BANK ROUGHENING STRUCTURE PLAN AND SECTIONS

DATE: MAY 2009
PROJECT NO: 07-03774-000
DRAWING NO: C-11
SHEET NO: 13 OF 14

© 2009 Herrera Environmental, Inc. All rights reserved.
ONE INCH AT FULL SIZE, IF NOT ONE INCH SCALE ACCORDINGLY

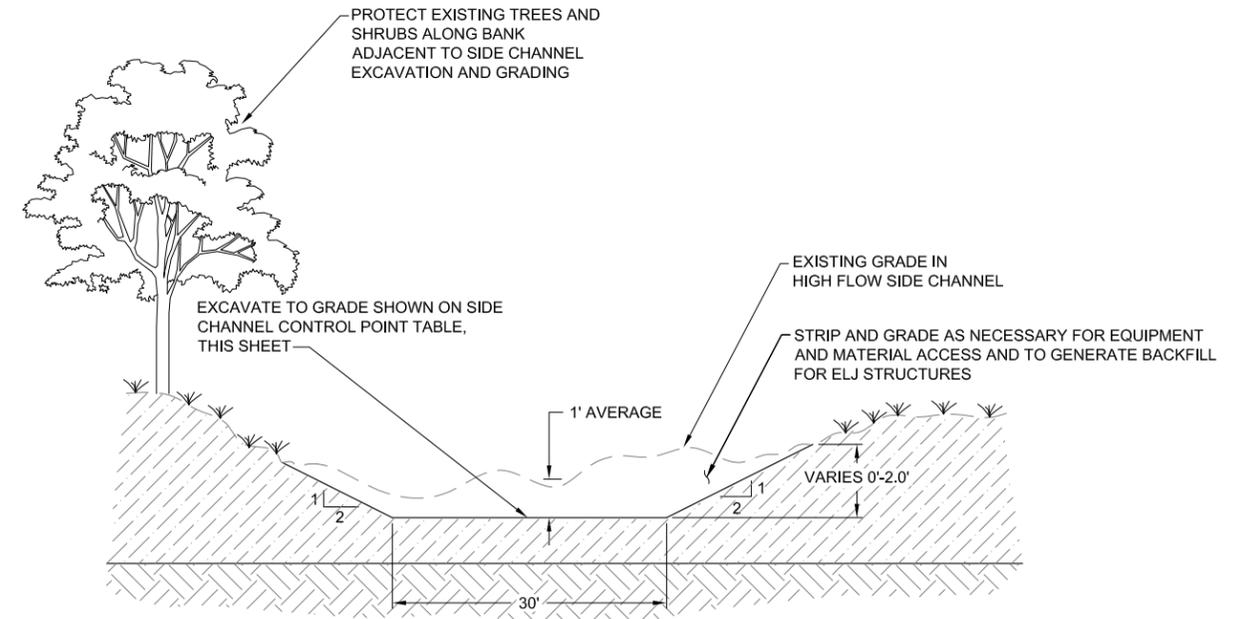
SIDE CHANNEL GRADING CONTROL POINT TABLE			
CONTROL POINT	ELEVATION (FEET IN NAVD 88)	NORTHING	EASTING
1	716.5		
2	716.33		
3	716.17		
4	716.0		
5	708.5		
6	708.38		
7	708.25		
8	708.13		
9	708.0		

NOTE: TABLE TO BE COMPLETED FOR FINAL DESIGN

STRUCTURE CONTROL POINT TABLE

ELJ	CONTROL POINT	NORTHING	EASTING
7-1	1		
7-2	1		
7-3	1		
7-4	2		
7-5	2		
7-6	2		
7-7	2		
7-8	2		
7-9	1		
7-10	1		
7-11	1		
7-12	1		

NOTE: TABLE TO BE COMPLETED FOR FINAL DESIGN



SECTION - TYPICAL SIDE CHANNEL EXCAVATION

SCALE: NTS

A
C-3

Path: C:\proj\2007\07-03774-000\CAD\Drawings\Mashel River Reach 7\C-12.dwg
 Plot Date: 5/28/2009 1:53 PM
 Plot Style Table: Herrera.ctb
 Cad User: Laura Turnidge
 Plotter: Adobe PDF

DRAFT 70% DESIGN - NOT FOR CONSTRUCTION

No.	REVISION	BY	APP'D	DATE



2200 Sixth Avenue
Suite 1100
Seattle, Washington
98121-1820
206-441-9080
206-441-9108 FAX
<http://www.herrerainc.com>



DESIGNED: B. SCOTT	DRAWN: W. WIESZCZECINSKI
DESIGNED: -	DRAWN: -
DESIGNED: -	CHECKED: C. BRUMMER
SCALE: AS NOTED	APPROVED: M. SPILLANE

MASHEL RIVER RESTORATION
SOUTH PUGET SOUND
SALMON ENHANCEMENT GROUP
CHANNEL PROFILES AND ALIGNMENTS

DATE: MAY 2009
PROJECT NO: 07-03774-000
DRAWING NO: C-12
SHEET NO: 14 OF 14

ONE INCH
 AT FULL SIZE, IF NOT ONE
 INCH SCALE ACCORDINGLY
 © 2009 Herrera Environmental, Inc. All rights reserved.