Tucannon River Habitat Complexity, Floodplain, and Passage Improvement Project
River Miles 46.75 – 48.10 and 49.45 – 50.10

As-Built Record Drawings

Submitted to:

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Submitted by:

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October 2014

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1. INTRODUCTION

Partney Construction, Inc. contracted Tetra Tech, Inc. (Tetra Tech) to provide pre-construction staking, construction technical assistance, and post-construction as-built survey for the Tucannon River Habitat Complexity, Floodplain, and Passage Improvement Project (Project). The Project Areas (PA) are located on the Tucannon River from river mile (RM) 46.75 to RM 48.10 (PA 1) and from RM 49.45 to 50.10 (PA 3) within the Umatilla National Forest and the Washington Department of Fish and Wildlife (WDFW) Wooten Wildlife Area.

This As-Built Record Drawings Report is the product of the post-construction as-built survey effort completed in September 2014 and represents the Project as constructed. The Project was constructed by Partney Construction, Inc. between July and September 2014. This report presents the following:

- Section 1.1 – Project Location
- Section 1.2 – Project Description
- Section 2 – As-Built Summary, which includes:
- Section 2.1 – As-Built Field Survey
- Section 2.2 – Project Area 1 As-Built Description
- Section 2.3 – Project Area 3 As-Built Description

The construction of the Project included both aerial and land construction activities. The As-Built Record Drawings are presented in Appendix A.

1.1 PROJECT LOCATION

The Project is located between RM 46.75 to 48.10 (PA 3) and 49.45 to 50.10 (PA 1) on the Tucannon River (see Figure 1-1). The PAs are located within the Umatilla National Forest and the WDFW Wooten Wildlife Area and include portions of Township 9 North, Range 41 East, Section 32, Township 8 North, Range 41 East, Section 5, and Township 9 North , Range 41 East, Sections 20, 29, and 30. The Project Areas cover approximately 2 miles of the river and adjacent floodplain.

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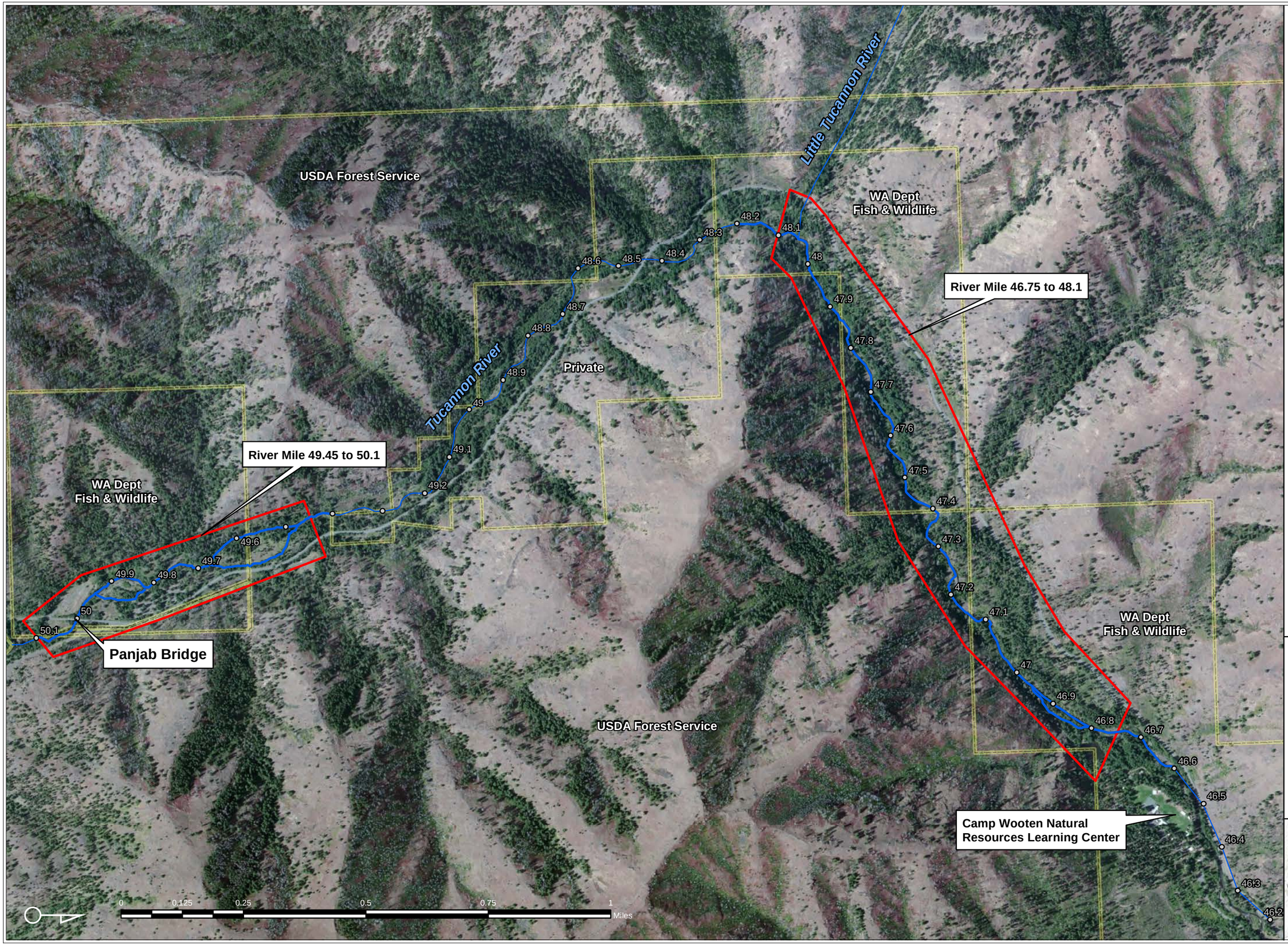
Figure 1-1. Tucannon River Project Areas



River Mile

USDA Forest Service Ownership Layer

Project Area Extents

Projection: Washington State Plane South NAD 83

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1.2 PROJECT DESCRIPTION

The purpose of the Project was to improve in-stream habitat complexity and floodplain connectivity within the Project Areas, which in turn provides better spawning and rearing habitat for Endangered Species Act (ESA) listed species. The proposed Project actions included placing large woody debris (LWD) and adding habitat boulders in PA 3, and placing LWD, excavating side channels, and adding habitat boulders in PA 1. The placement of LWD and habitat boulders in PA 3 focused on enhancing in-stream habitat. In PA 1, the Project included placement of LWD to enhance in-stream habitat, side channel excavation to increase floodplain connectivity and off-channel habitat, and additions of habitat boulders to provide in-stream habitat and improve fish passage near RM 50.10. Construction activities involved a combination of helicopter-placed materials (aerial phase) and land-placed materials in more accessible areas using conventional land-based equipment (ground phase).

The development of the Project was a collaborative effort between the Confederated Tribes of the Umatilla Indian Reservation and WDFW, the U.S. Department of Agriculture Forest Service, the Nez Perce Tribe, the Columbia Conservation District, and the Snake River Salmon Recovery Board. These Project partners provided technical assistance and helped secure resources (e.g., LWD and habitat boulders) for Project implementation. In addition, Project partners attended design review meetings and conducted site walks throughout specific proposed Project action locations in early December 2013.

2. AS-BUILT SUMMARY

Overall, the implementation of the Project was effective at immediately enhancing in-stream habitat complexity, restoring floodplain connectivity, and improving fish passage within the PAs. Data collected as part of the as-built survey demonstrate numerous locations of enhanced in-stream habitat complexity, restored flows throughout side channels in the floodplain, and improved fish passage downstream of Panjab Bridge. Specific information related to the data collected as part of the as-built field survey is described in Section 2.1. Information describing the construction of the Project is described in Sections 2.2 and 2.3.

2.1 AS-BUILT FIELD SURVEYS

The survey was performed in September 2014 to document the as-built conditions following the construction of the Project, which occurred July and September 2014. Horizontal and vertical positions were based upon data gathered from Global Positioning System (GPS) receivers using positions generated from real-time kinematic corrections from the previously established Project survey reference control points.

2.2 PROJECT AREA 1 (RM 49.45 – 50.10)

Work within PA 1 (refer to Habitat Complexity, Floodplain, and Passage Improvement Project – RM 49.45 to 50.10 within plan set in Appendix D of Volume II of the Final Design Report[1]) involved both helicopter and ground equipment phases. The majority of LWD was transported from staging areas to work locations by loading and hauling with conventional land-based equipment; however, a portion of the large trees were flown in via helicopter. Overall, the implementation of the Project was effective at immediately enhancing in-stream habitat complexity, restoring floodplain connectivity, and improving

[1] Tetra Tech, Inc. 2014. Final Design Report, Tucannon River Habitat Complexity, Floodplain, and Passage Improvement Project, River Miles 46.75 – 48.10 and 49.45 – 50.10. Submitted to The Confederated Tribes of the Umatilla Indian Reservation. January.

fish passage within PA 1. The As-Built Record Drawings are presented in Appendix A. The following provides additional documentation of various aspects of the as-built conditions:

Upper Side Channel:

The upper side channel was designed to only be a high-flow bypass channel that would be inundated seasonally, but not have flow immediately following construction. The invert elevation of the upper side channel was designed at 2,957.00 feet, and included two separate excavation extents (i.e., downstream and upstream excavation extents). The cross section of the designed upper side channel had a bottom width of 8 feet, with 2:1 side slopes to match existing grade.

After construction was completed, base flow was present immediately throughout the upper side channel. Although the presence of base flow in the upper side channel did provide immediate improvement in available habitat complexity, the as-built conditions did not meet the designed conditions. During construction, it was determined that the downstream designed excavation extent was not needed, and that change was approved by the engineer on site. Based on the as-built survey, the upstream designed excavation extent had an average bottom width of 6 feet, with 2:1 side slopes, resulting in a bottom width less than the design. The invert elevation of the upper side channel upstream excavation extent at the inlet was constructed at 2,955.95 feet, which is 1 foot lower than designed. This lower elevation allows approximately 10 to 15 cubic feet per second (cfs) of the base flow of the Tucannon River to enter the upper side channel. The deviations from the upper side channel upstream excavation extent has resulted in no longer functioning as designed, and because this change from the design was not modeled, potential flooding conditions have not been evaluated. With base flow present following construction in the upper side channel, the hydraulic conditions differ from what was designed.

Lower Side Channel:

The lower side channel was designed to accept between 20 and 30 percent of the base flow of the Tucannon River, with the invert elevation of the lower side channel designed at 2,934.39 feet. The cross section of the designed lower side channel had a bottom width of 6 feet, with 2:1 side slopes to match existing grade.

After construction was completed, the lower side channel had an average bottom width of 8.4 feet, with 2:1 side slopes, resulting in a bottom width greater than designed. The inlet of the side channel was constructed to provide an 11-foot bottom width, and the invert elevation of the lower side channel was constructed at 2,933.48 feet, which is approximately 1 foot lower than designed. With the lower invert elevation and wider channel, the lower side channel now accepts 30 to 50 percent of the base flow of the Tucannon River. This amount of flow is larger than designed, and because this change from the design was not modeled, potential flooding conditions have not been evaluated.

LWD Structures:

Many of the LWD structures were placed in the correct locations and with the correct specifications, with others that deviate from the design. Most of the structures have additional wood that was incorporated into the structures, but the additional wood will not likely reduce the function of the structures. Below are identified deviations from the design associated with LWD structures.

LWD 1 – This structure was not constructed as designed. The downstream toe log is broken in the middle. There are no rootwads in the center of the structure as designed. There are no rootwads on the upstream side of the toe logs and there are only boulders providing ballast for the toe logs. All rootwads are piled on either side of the channel, and a large opening is left in the center of the structure. With the opening in the middle of the structure it will not function as designed. Debris traveling downstream has a way through the structure, so the structure will not function as a "debris catcher." Most of the logs used in the structure are frayed and are overall in bad shape, as the structure was built and rebuilt at least three times. All of the top logs in the structure are not ballasted. The opening in the middle of the structure

appears to have created a potential juvenile fish passage barrier. There were boulders placed downstream of the toe logs, but the boulders may not be sufficiently buried for stability. Throughout the structure, the boulders were placed in positions that may not be effective for ballasting the structure. Based on the as-built survey, LWD 1 does not function as designed.

LWD 3 – There was a log placed from mid-channel to the right bank that diverts water away from the large boulder towards the right bank floodplain. This is a deviation from the design.

LWD 4 – The right bank side of the structure is not ballasted properly. There are extra logs on the left bank side of the structure that do not assist in the function of this structure.

LWD 6 – This structure has very small rootwads and may not function as designed.

LWD 7A – This structure was constructed 30 feet upstream from the designed location.

LWD 7B – This structure was constructed with wood smaller than designed.

LWD 8 – This structure has been constructed farther out in the active channel than designed.

LWD 10 – The logs in the structure are not placed in the correct positions or orientation per the design. The structure does not function as designed. The structure has not dissipated the high velocity in the main channel, rather redirected and narrowed the flow. The existing pool under this structure has been choked by logs; however, the structure will likely divert high flows from the campground.

LWD 11 – This structure comprises a series of four channel-spanning structures:

- The upstream structure is not built per the design. The channel spanning log is placed per design, but there are no logs acting as ballast for this log. The second log of the structure is placed behind the first log, not on top in the incorrect orientation. There is an additional log next to the second log that is not part of the original design. The third log of the structure looks to be placed first, and provides no ballasting for the other two logs. Structure will not likely produce the desired function.
- The second of four structures was not built per the design. The first log was placed per plan, and the second log was placed on top of the first log for ballast, but is placed in the wrong orientation. The third log of the structure has been placed behind the other two logs, and provides ballast. The structure will not likely produce the desired function.
- The third of four structures has not been built per the design. The first log has been placed with the rootwad on the bank, not in the active channel. The first log is broken in the middle. The second log is not placed on top of the first log, and provides no ballast, and has been placed in the wrong orientation. The third log has been placed behind the other two logs, and provides not ballast. The structure will not likely produce the desired function.
- The fourth of four structures has not been built per the design. The first log has been placed in the correct position. The second log has been placed downstream of the first log, and provides no ballast, and is in the wrong orientation. There is an extra log in the structure not in the design. The third log has been placed on the first log, but the rootwad should be farther upstream. The structure will not likely produce the desired function.

2.3 PROJECT AREA 3 (RM 46.75 – 48.10)

Work within PA 3 (refer to Habitat Complexity Project – RM 46.75 to 48.10 within plan set in Appendix D of Volume II of the Final Design Report) involved both helicopter and ground equipment phases. The majority of LWD was flown in and placed by helicopter. Overall, the implementation of the Project was effective at immediately enhancing in-stream habitat complexity within PA 3. The As-Built Record

Drawings are presented in Appendix A. The following provides additional documentation of various aspects of the as-built conditions:

LWD Structures:

Many of the LWD structures were constructed in the correct locations and with the correct specifications, with others that deviate from the design. Most of the structures have additional wood that was incorporated into the structures, but the additional wood will not likely reduce the function of the structures. Below are identified deviations from the design associated with LWD structures.

LWD 2 – The orientation of the logs in the structure is not per the design. There are no boulders providing ballast.

LWD 3 – The cross logs for this structure are not included in the design. The logs located on the left bank of the structure are not placed in the correct location or orientation, and do not have sufficient ballasting. The left bank is heavily disturbed upstream of the structure. There have been logs placed on the bank to stabilize the bank and to stabilize the existing logs, but does not appear to have accomplished the goal of stabilizing logs. There are boulders placed on the cross logs that are not part of the design. There are additional logs on the right bank and placed downstream of the structure that are not part of the design. Overall, there is not enough ballasting of the structure and the boulders used for ballasting are undersized.

Additional LWD structure between LWD 3 and LWD 4 – There is an additional structure that was not part of the design that was placed between LWD 3 and LWD 4 at a location that has an existing channel spanning log. There are two cross logs added here at stream grade that appear to have created a potential juvenile passage barrier. These cross logs do appear to be ballasted. Another cross log has been placed upstream of the existing channel spanning log that is only ballasted with logs and no boulders. There is a possibility that if this structure racks enough material it could push the water into the side channels located on the right bank of the river, which would direct flow toward Donnie Lake and Camp Wooten. This structure should not likely have been placed due to its potential influence on flooding conditions, and because this change from the design was not modeled, potential flooding conditions have not been evaluated.

LWD 4 – This structure has two cross logs added to the existing cross log. The design called for these logs to have the rootwads in the mid-channel, but they were not placed per the design. There is not a top log to ballast the cross logs per the design. There are additional logs placed downstream of the designed structure that were not part of the design. Several logs without rootwads have been added to the structure that was not part of the design, and do not have any ballast associated with them. The left bank side of the structure needs more ballasting for the top logs. Over 200 feet of the riparian vegetation of the left bank has been removed, as well as the foliage on the upper terrace. Several logs were placed on the left bank to mitigate the disturbance, but these logs have not been properly ballasted. Overall, the top logs of the structure need more ballasting. This structure has not been constructed per the design.

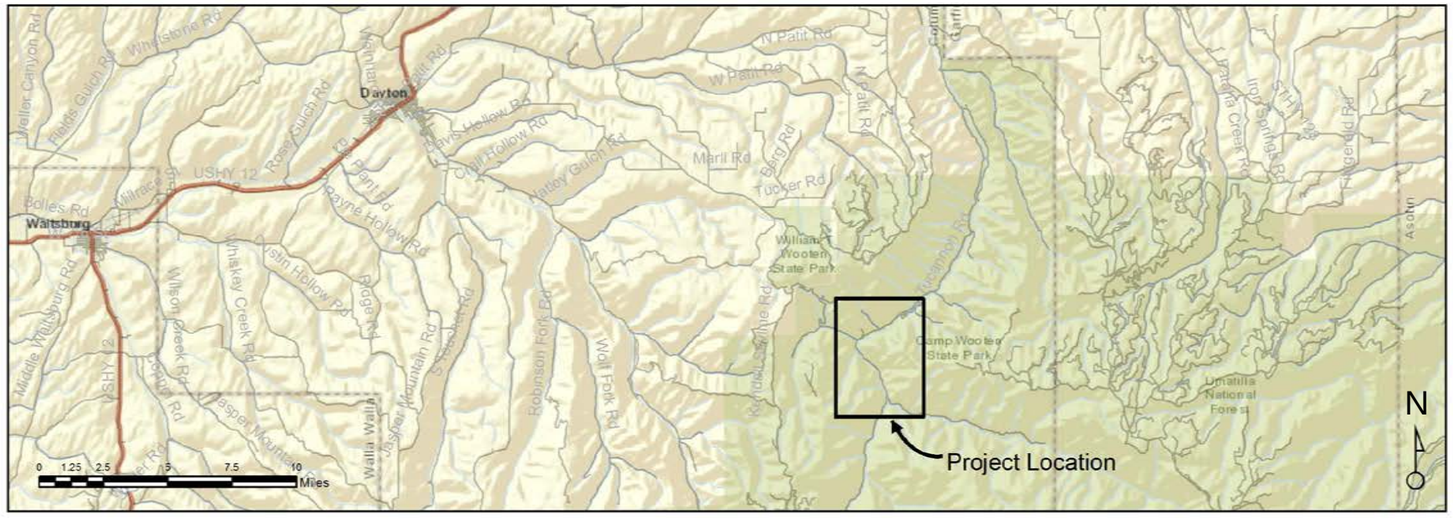
2.4 REVEGETATION AND CLEANUP

During the completion of the as-built field survey, it was noted that the majority of the disturbed areas within both PAs looked to have been seeded, but no plantings were provided in these areas. After construction, all areas within the construction areas were left clean of debris, and all temporary access locations were sufficiently reclaimed and access to these areas was sufficiently blocked from public access.

APPENDIX A – AS-BUILT RECORD DRAWINGS

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION
TUCANNON RIVER AS-BUILT SURVEY - RM 49.45 TO 50.10

Vicinity Map



Inset Map

SURVEY NARRATIVE:

THIS SURVEY WAS PERFORMED TO DOCUMENT THE AS-BUILT CONDITIONS FOLLOWING THE EXCAVATION OF SIDE CHANNELS AND THE FINAL CONFIGURATION OF THE PLACEMENT OF LWD STRUCTURES AFTER CONSTRUCTION EFFORTS WERE COMPLETED TO PERFORM THE ABOVE STATED ACTIONS.

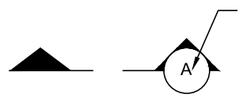
HORIZONTAL AND VERTICAL POSTITIONS ARE BASED UPON DATA GATHERED FROM GPS RECEIVERS USING POSITIONS GENERATED FROM REAL TIME KINEMATIC CORRECTIONS FROM PREVIOUSLY ESTABLISHED CONTROL POINTS.

I, ALEX STROM, A PROFESSIONAL ENGINEER IN THE STATE OF WASHINGTON HEREBY CERTIFY THAT THIS MAP CORRECTLY REPRESENTS A SURVEY CONDUCTED UNDER MY SUPERVISION IN SEPTEMBER 2014.

THE SIGNING OF THIS DRAWING SET DOES NOT CONSTITUTE AN ACCEPTANCE OF THE DESIGN AS CONSTRUCTED, ONLY A CERTIFICATION OF THE AS-BUILT SURVEY EFFORTS.

DRAWING REFERENCE

SECTIONS ARE REFRENCED IN THE FOLLOWING MANNER:



DRAWING INDEX

GENERAL

G1	COVER SHEET

CIVIL

C1 - C9	AS-BUILT SURVEY

DATUM:

HORIZONTAL DATUM: HARN (HPGN) Washington State Plane, South Zone, US Foot
VERTICAL DATUM: North American Vertical Datum (NAVD) 88

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK
		PLAN SET SIZE ANSI B (11x17)			
-	10/02/13	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 49.45 TO 50.10

COVER SHEET

DWG. NO.: G1

CREATED: 10/02/2013

SHEET: 1 OF 9

SCALE: NTS

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PLOT DETAILS: STROM, ALEX October 10, 2014 9:17 AM

LEGEND:

- PROPERTY BOUNDARY
- BANKFULL CHANNEL
- PROPOSED EXCAVATION AREA
- AS-BUILT EXCAVATION AREA
- AS-BUILT LWD
- EXISTING LWD
- AS-BUILT HABITAT BOULDER
- EXISTING BOULDER
- SHEET BOUNDARY

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CTUIR — CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION — Treaty of 1855

PLAN SET SIZE ANSI B (11x17)

REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK
-	10/02/13	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 49.45 TO 50.10

AS-BUILT OVERVIEW

DWG. NO.: C1

CREATED: 10/02/2013

SHEET: 2 OF 9

SCALE: 1" = 200'

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NOTES:

1. ALL WOOD SHOWN AS PLACED DURING CONSTRUCTION.

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- SIDE CHANNEL EXCAVATION AREA
- AS-BUILT LWD
- EXISTING LWD
- AS-BUILT HABITAT BOULDER
- EXISTING BOULDER
- AS-BUILT POINTS
- PROPOSED CONTOUR MAJOR - 5FT
- PROPOSED CONTOUR MINOR - 1FT
- EXISTING CONTOUR MAJOR - 5FT
- EXISTING CONTOUR MINOR - 1FT
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CAYUSE - WALLA WALLA - UMATILLA CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION Treaty of 1855

PLAN SET SIZE ANSI B (11x17)

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CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 49.45 TO 50.10

AS-BUILT DESIGN

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CREATED: 10/02/2013

SHEET: 3 OF 9

SCALE: 1" = 50'

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CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 49.45 TO 50.10

AS-BUILT DESIGN

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SHEET: 4 OF 9

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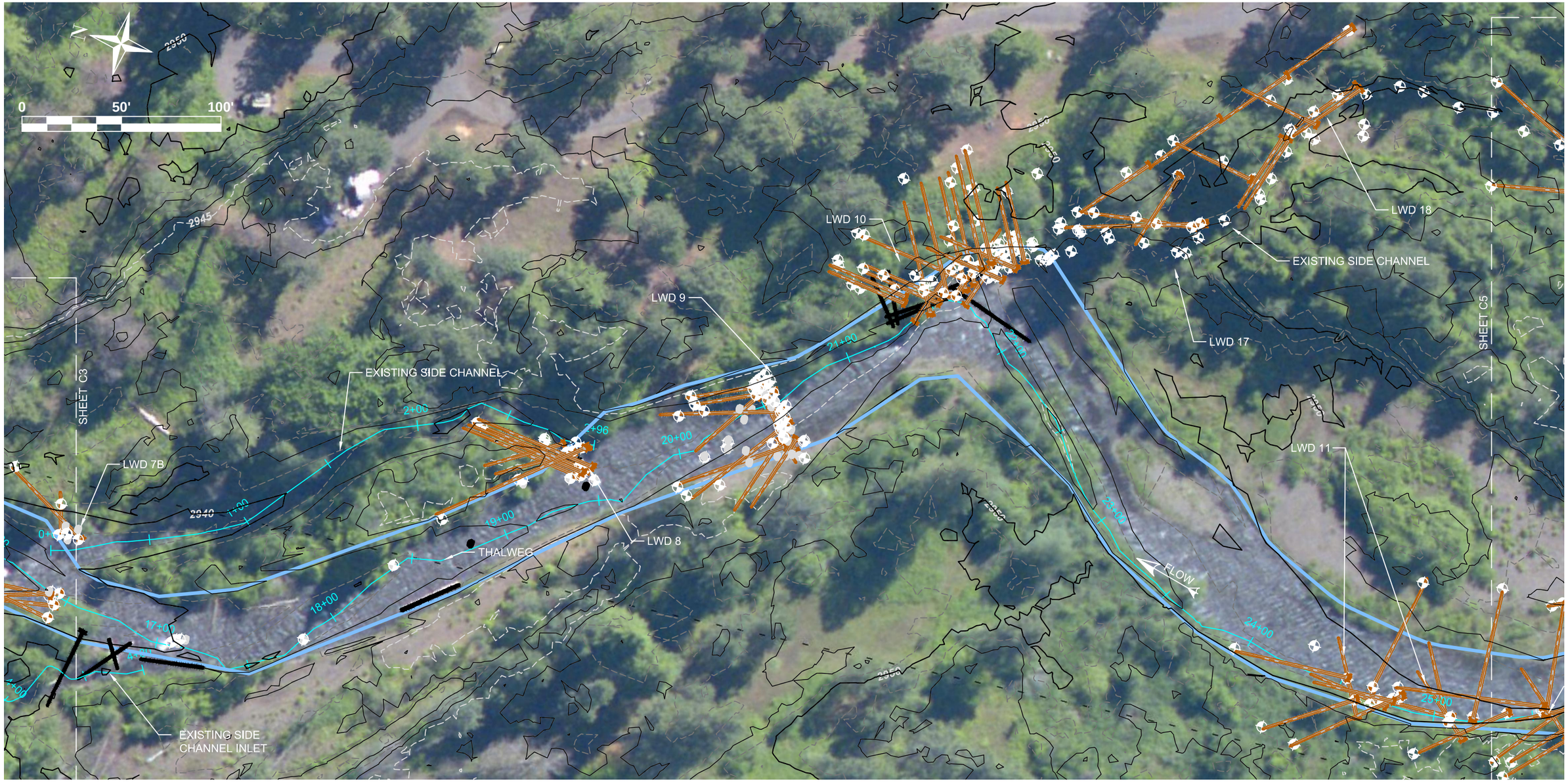

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REV.	DATE	PLAN SET SIZE ANSI B (11x17) REVISION DESCRIPTION	DRW	ENG	CHK
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CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 49.45 TO 50.10

AS-BUILT DESIGN

DWG. NO.: C4

CREATED: 10/02/2013

SHEET: 5 OF 9

SCALE: 1" = 50'

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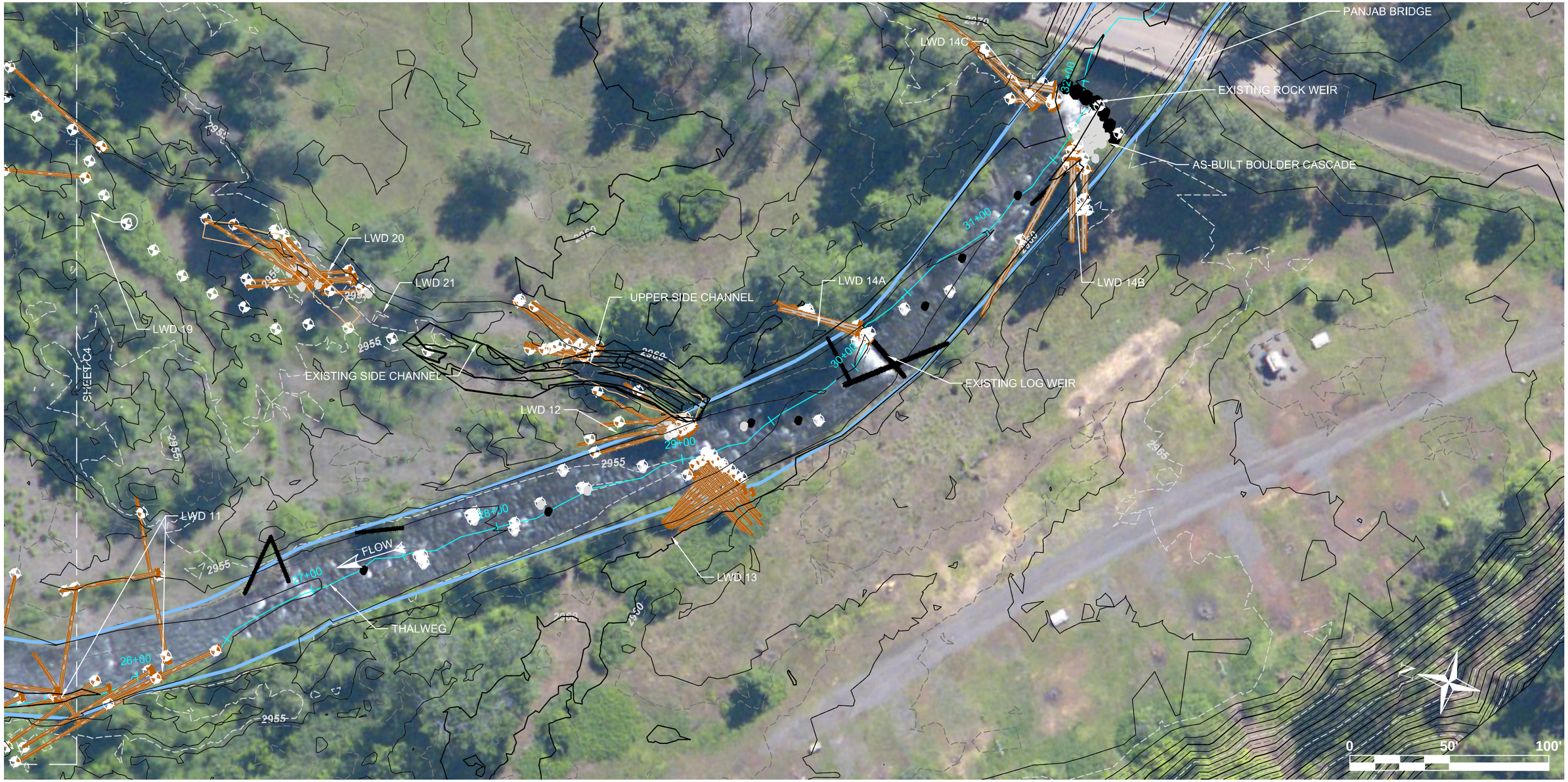

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CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 49.45 TO 50.10

AS-BUILT DESIGN

DWG. NO.: C5

CREATED: 10/02/2013

SHEET: 6 OF 9

SCALE: 1" = 50'

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CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 49.45 TO 50.10

PROPOSED DESIGN

DWG. NO.: C6

CREATED: 10/02/2013

SHEET: 7 OF 9

SCALE: 1" = 50'

Z:\PROJECTS\TUCANNON RIVER\WORKING DESIGN\ SHEET FILES\PROPOSED DESIGN PA1.DWG
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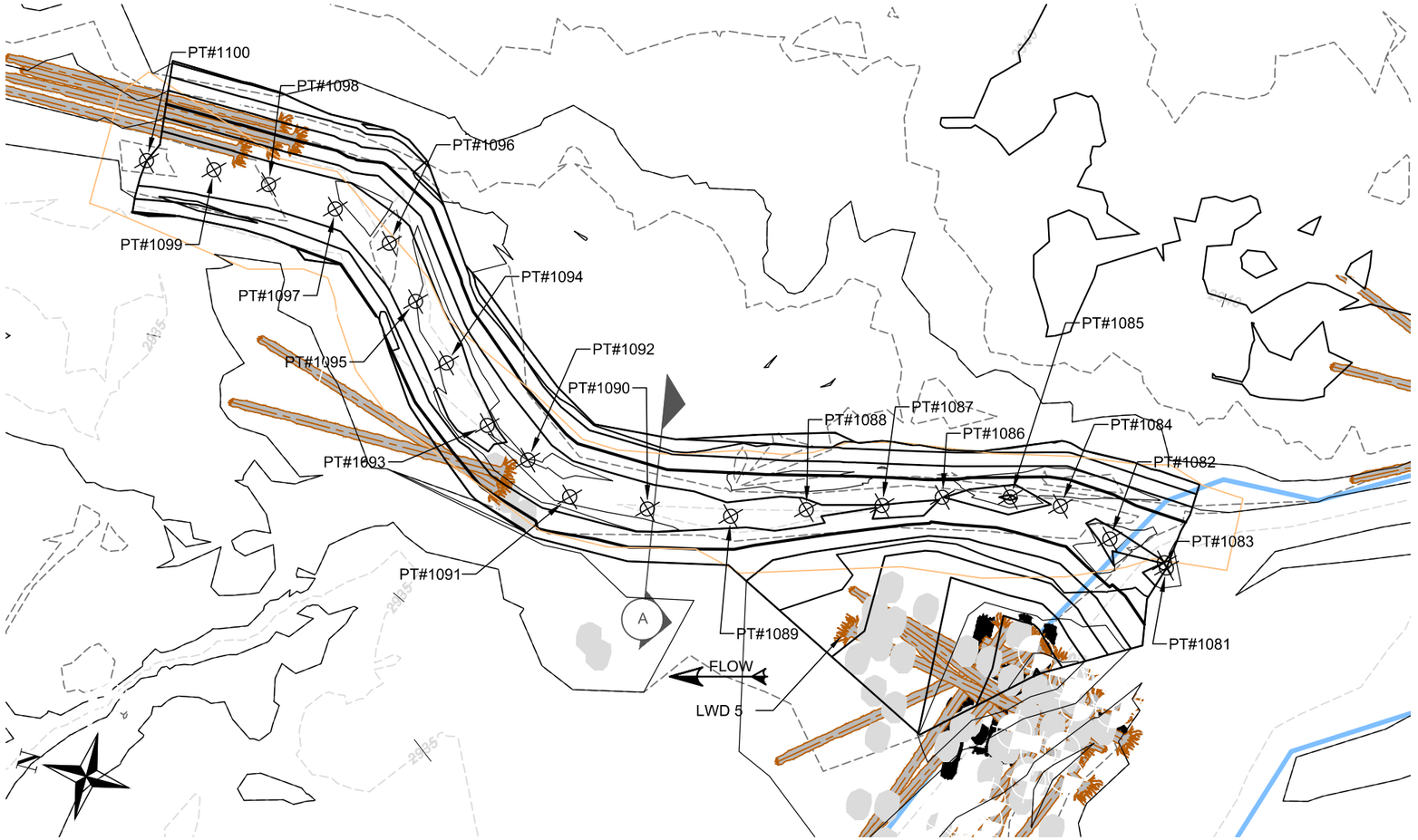
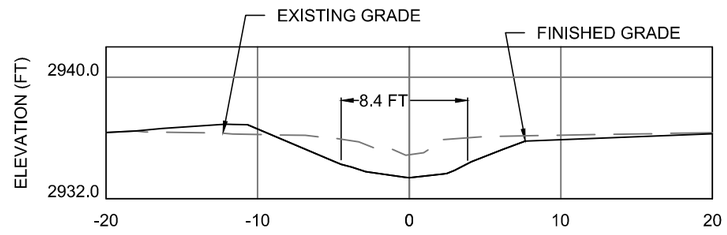


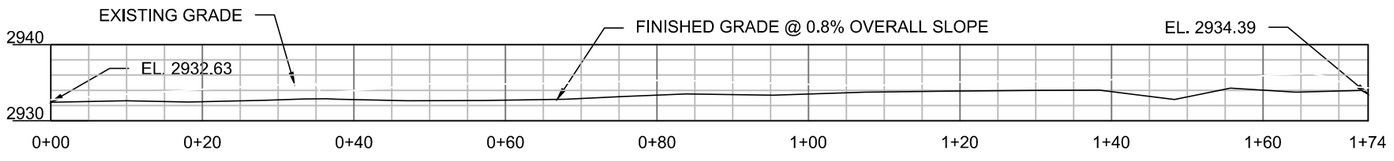
LOWER SIDE CHANNEL EXCAVATION - PLAN VIEW
SCALE: 1" = 20'

EXCAVATION POINTS			
PT #	NORTHING	EASTING	ELEVATION
1081	332367.59	2346786.84	2933.48
1082	332376.63	2346788.82	2933.74
1083	332368.06	2346787.54	2933.98
1084	332384.81	2346791.57	2934.28
1085	332392.20	2346790.95	2932.80
1086	332401.76	2346788.37	2934.03
1087	332409.91	2346784.94	2933.98
1088	332420.40	2346781.49	2933.88
1089	332430.79	2346777.74	2933.76
1090	332442.77	2346775.62	2933.34
1091	332454.14	2346774.39	2933.51
1092	332461.44	2346778.00	2933.18
1093	332468.44	2346781.34	2932.84
1094	332476.51	2346788.59	2932.65
1095	332483.17	2346796.06	2932.62
1096	332489.07	2346803.25	2932.82
1097	332497.95	2346806.97	2932.70
1098	332508.23	2346806.97	2932.45
1099	332516.50	2346806.99	2932.63
1100	332526.31	2346805.74	2932.42

LEGEND:
- BANKFULL CHANNEL
- PROPOSED EXCAVATION AREA
- AS-BUILT LWD
- AS-BUILT HABITAT BOULDER
- EXCAVATION POINTS
- AS-BUILT CONTOUR MAJOR - 5FT
- AS-BUILT CONTOUR MINOR - 1FT
- EXISTING CONTOUR MAJOR - 5FT
- EXISTING CONTOUR MINOR - 1FT



SECTION A-A - CROSS SECTION
SCALE: 1" = 10'



LOWER SIDE CHANNEL EXCAVATION - PROFILE VIEW
SCALE: 1" = 20' , 1H : 2V

NOTES:
1. LOWER SIDE CHANNEL QUANTITIES: 141.5 CY EXCAVATION FOR SIDE CHANNEL, 46.4 CY FILL FOR FLOODPLAIN CREATION. NET EXCAVATION OF 95.1 CY.
2. SPOILS FROM EXCAVATION WERE USED TO BURY LWD 5, AND TO CREATE FLOODPLAIN TERRACE ON BOTH SIDES OF CHANNEL.
3. LOWER SIDE CHANNEL SEEDED UPON COMPLETION.

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ALEX STROM, STATE OF WASHINGTON, 47025, REGISTERED PROFESSIONAL ENGINEER

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION, FISHERIES PROGRAM, Department of Natural Resources

CTUIR - WALLA WALLA - UMATILLA, CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION, Treaty of 1855

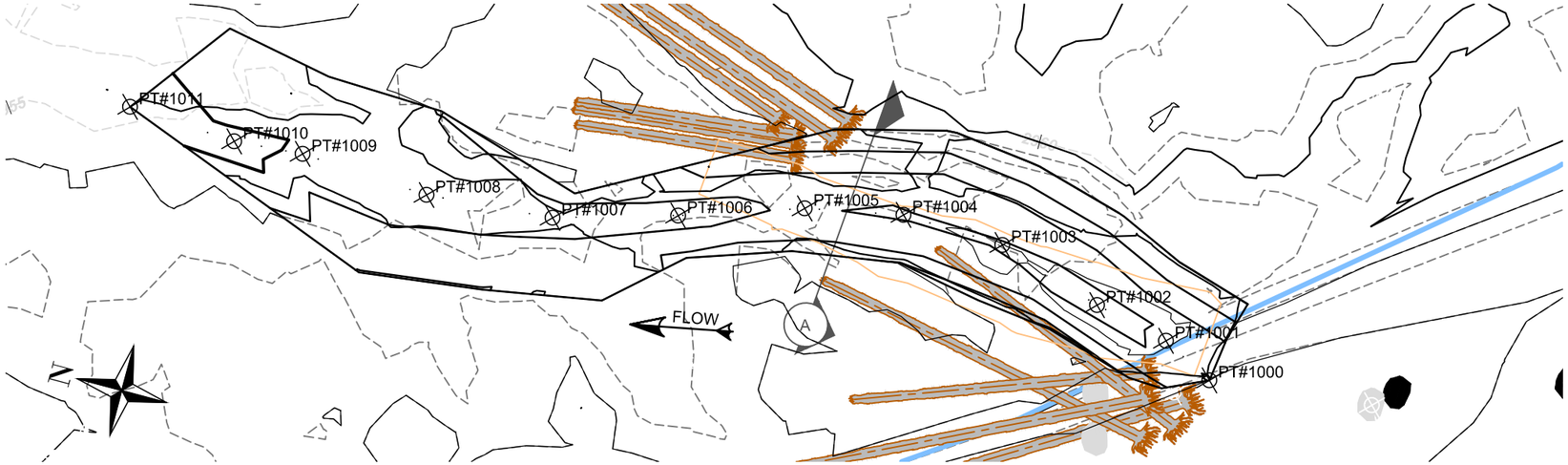
REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK
		PLAN SET SIZE ANSI B (11x17)			
-	10/02/13	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 49.45 TO 50.10

PROPOSED DESIGN

DWG. NO.: C7
CREATED: 10/02/2013
SHEET: 8 OF 9
SCALE: NTS

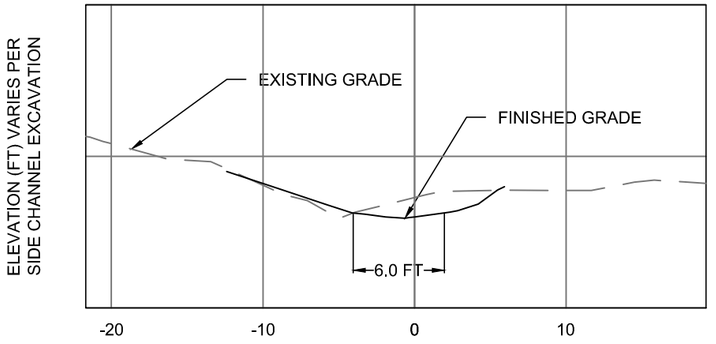
Z:\PROJECTS\TUCANNON RIVER\WORKING DESIGN\SHEET FILES\PROPOSED DESIGN PA1.DWG
PLOT DETAILS: STROM.ALEX October 10, 2014 9:32 AM TT-BOTH-MAIN-COLOR.ctb



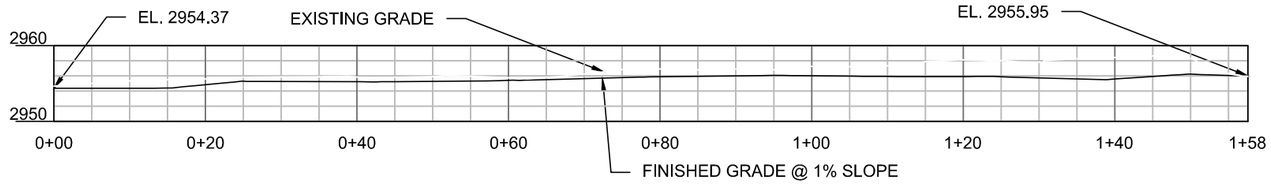
UPPER SIDE CHANNEL EXCAVATION - PLAN VIEW
SCALE: 1" = 20

EXCAVATION POINTS			
PT #	NORTHING	EASTING	ELEVATION
1000	331096.25	2347125.46	2955.95
1001	331103.48	2347129.15	2956.23
1002	331113.95	2347131.45	2955.49
1003	331128.76	2347136.10	2955.91
1004	331143.03	2347136.57	2955.50
1005	331156.45	2347133.91	2956.06
1006	331173.10	2347128.42	2955.84
1007	331189.78	2347123.64	2955.38
1008	331207.45	2347122.16	2955.21
1009	331225.47	2347123.21	2955.28
1010	331235.06	2347122.44	2954.37
1011	331250.17	2347123.32	2954.37

NOTES:
1. UPPER SIDE CHANNEL QUANTITIES: 50.3 CY OF CHANNEL EXCAVATION, 16.4 CY OF FILL FOR FLOODPLAIN CREATION. NET EXCAVATION OF 33.9 CY.
2. SPOILS FROM EXCAVATION SHALL USED IN NEARBY LWD STRUCTURES AND FOR FLOODPLAIN CREATION.
3. UPPER SIDE CHANNEL SEEDED UPON COMPLETION.



SECTION A-A - CROSS SECTION (TYP)
SCALE: 1" = 10'



UPPER SIDE CHANNEL EXCAVATION - PROFILE VIEW
SCALE: 1" = 20' , 1H : 2V

LEGEND:
- BANKFULL CHANNEL
- PROPOSED EXCAVATION AREA
- AS-BUILT LWD
- AS-BUILT HABITAT BOULDER
- EXCAVATION POINTS
- AS-BUILT CONTOUR MAJOR - 5FT
- AS-BUILT CONTOUR MINOR - 1FT
- EXISTING CONTOUR MAJOR - 5FT
- EXISTING CONTOUR MINOR - 1FT

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ALEX STROM — STATE OF WASHINGTON — 47025 — REGISTERED PROFESSIONAL ENGINEER

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION — FISHERIES PROGRAM — Department of Natural Resources

CAYUSE - WALLA WALLA - UMATILLA — CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION — Treaty of 1855

REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK
		PLAN SET SIZE ANSI B (11x17)			
-	10/02/13	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 49.45 TO 50.10

AS-BUILT DESIGN

DWG. NO.: C8

CREATED: 10/02/2013

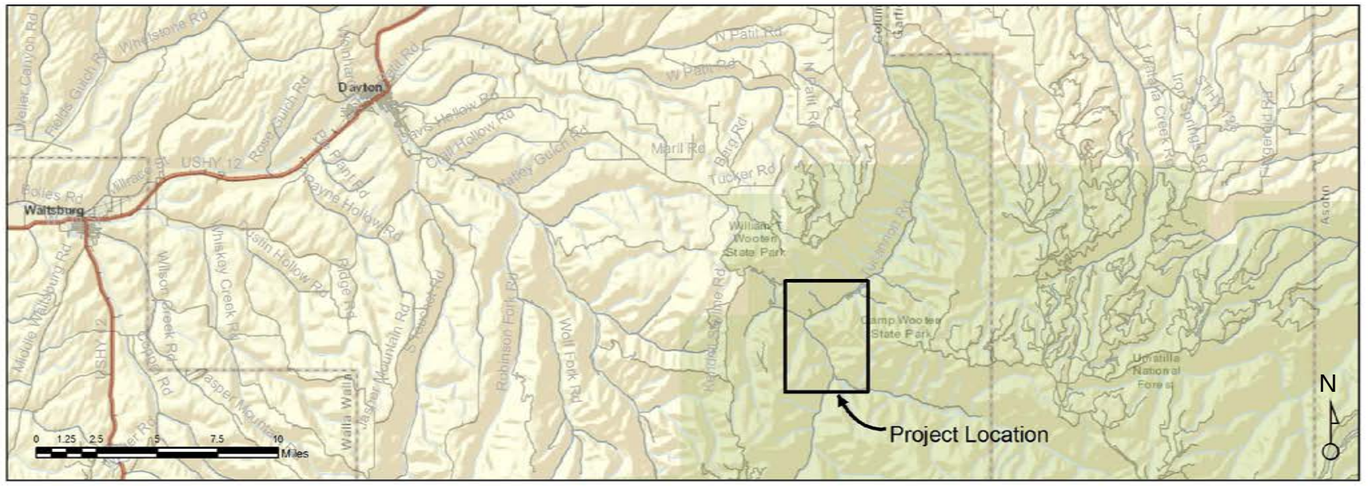
SHEET: 9 OF 9

SCALE: NTS

Z:\PROJECTS\TUCANNON RIVER\WORKING DESIGN\SHEET FILES\PROPOSED DESIGN PA1.DWG
PLOT DETAILS: STROM, ALEX October 10, 2014 9:33 AM TT-BOTH-MAIN-COLOR.ctb

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION
TUCANNON RIVER AS-BUILT SURVEY - RM 46.75 TO 48.10

Vicinity Map



Inset Map

SURVEY NARRATIVE:

THIS SURVEY WAS PERFORMED TO DOCUMENT THE AS-BUILT CONDITIONS FOLLOWING THE EXCAVATION OF SIDE CHANNELS AND THE FINAL CONFIGURATION OF THE PLACEMENT OF LWD STRUCTURES AFTER CONSTRUCTION EFFORTS WERE COMPLETED TO PERFORM THE ABOVE STATED ACTIONS.

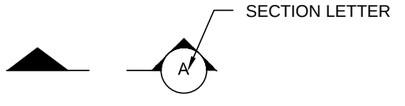
HORIZONTAL AND VERTICAL POSTITIONS ARE BASED UPON DATA GATHERED FROM GPS RECEIVERS USING POSITIONS GENERATED FROM REAL TIME KINEMATIC CORRECTIONS FROM PREVIOUSLY ESTABLISHED CONTROL POINTS.

I, ALEX STROM, A PROFESSIONAL ENGINEER IN THE STATE OF WASHINGTON HEREBY CERTIFY THAT THIS MAP CORRECTLY REPRESENTS A SURVEY CONDUCTED UNDER MY SUPERVISION IN SEPTEMBER 2014.

THE SIGNING OF THIS DRAWING SET DOES NOT CONSTITUTE AN ACCEPTANCE OF THE DESIGN AS CONSTRUCTED, ONLY A CERTIFICATION OF THE AS-BUILT SURVEY EFFORTS.

DRAWING REFERENCE

SECTIONS ARE REFRENCED IN THE FOLLOWING MANNER:



DRAWING INDEX

GENERAL

G1 COVER SHEET

CIVIL

C1 - C8 AS-BUILT SURVEY

DATUM:

HORIZONTAL DATUM: HARN (HPGN) Washington State Planes, South Zone, US Foot
VERTICAL DATUM: North American Vertical Datum (NAVD) 88

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REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK
		PLAN SET SIZE ANSI B (11x17)			
-	10/02/14	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 46.75 TO 48.10

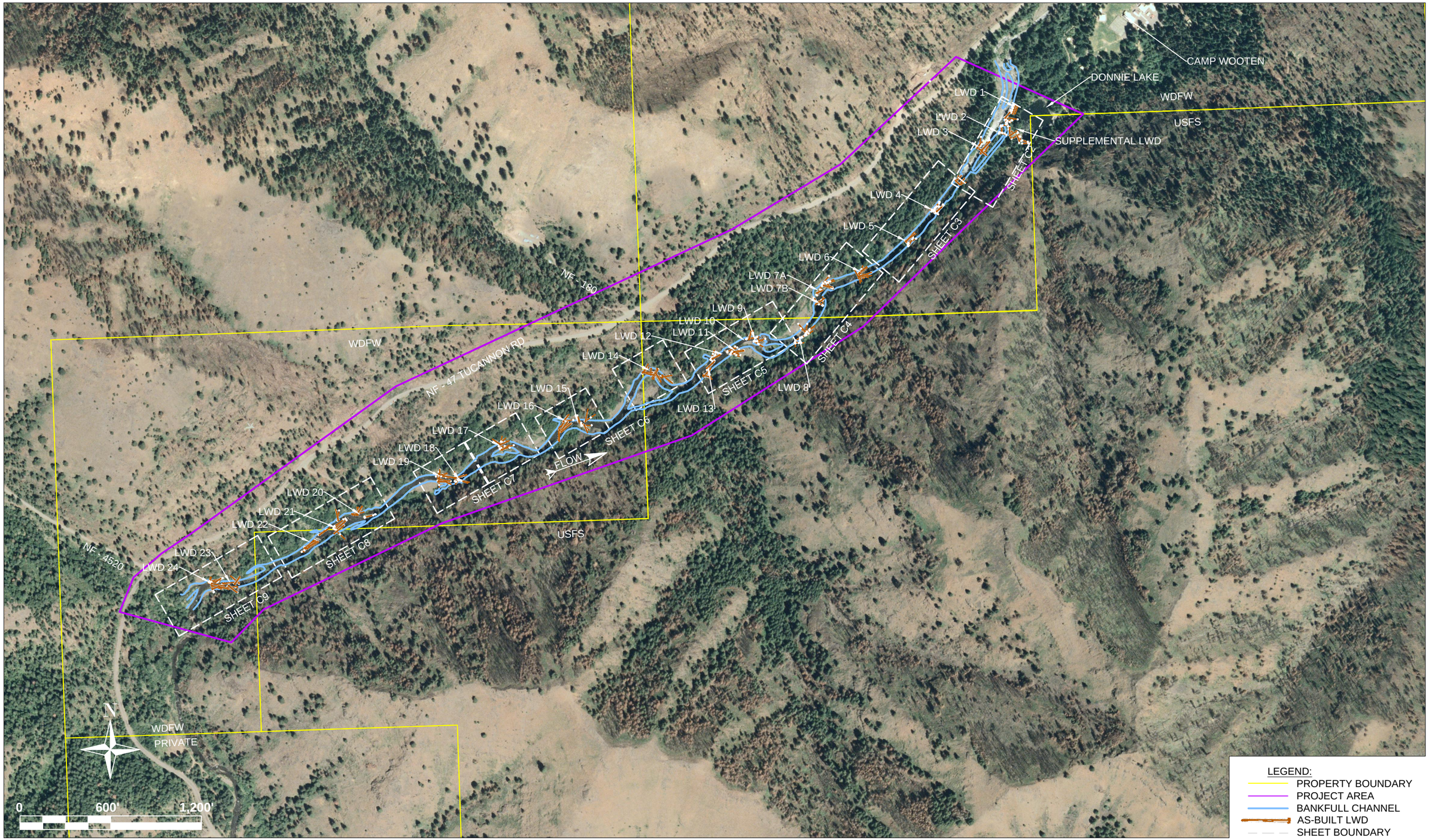
COVER SHEET

DWG. NO.: G1

CREATED: 10/02/2013

SHEET: 1 OF 10

SCALE: NTS



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ALEX STAMM
STATE OF WASHINGTON
47025
REGISTERED
PROFESSIONAL ENGINEER

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION
Treaty of 1855
FISHERIES PROGRAM
Department of Natural Resources

CAYUSE - WALLA WALLA - UMATILLA
CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION
Treaty of 1855

REV.	DATE	PLAN SET SIZE ANSI B (11x17) / REVISION DESCRIPTION	DRW	ENG	CHK
-	10/02/14	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 46.75 TO 48.10

AS-BUILT OVERVIEW

DWG. NO.: C1

CREATED: 10/02/2013

SHEET: 2 OF 10

SCALE: 1" = 600'

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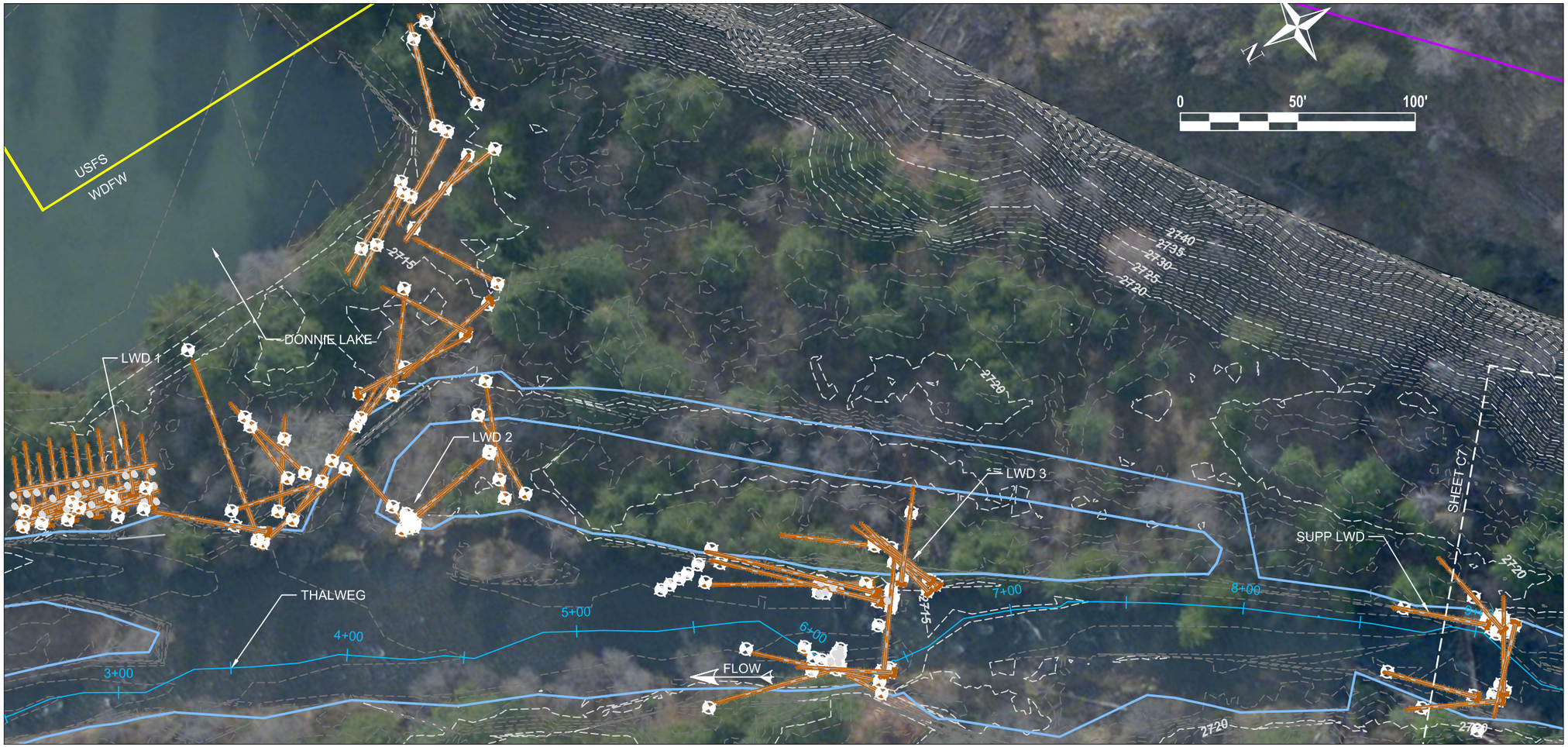

NOTES:

1. WOOD SHOWN AS PLACED DURING CONSTRUCTION.

LEGEND:

- PROPERTY BOUNDARY
- PROJECT AREA
- BANKFULL CHANNEL
- AS-BUILT LWD
- AS-BUILT HABITAT BOULDER
- AS-BUILT POINT
- EXISTING CONTOUR MAJOR - 5FT
- EXISTING CONTOUR MINOR - 1FT
- SHEET BOUNDARY

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ALEX STROM — STATE OF WASHINGTON — 47025 — REGISTERED PROFESSIONAL ENGINEER — 10/02/14

REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK
		PLAN SET SIZE ANSI B (11x17)			
-	10/02/14	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 46.75 TO 48.10

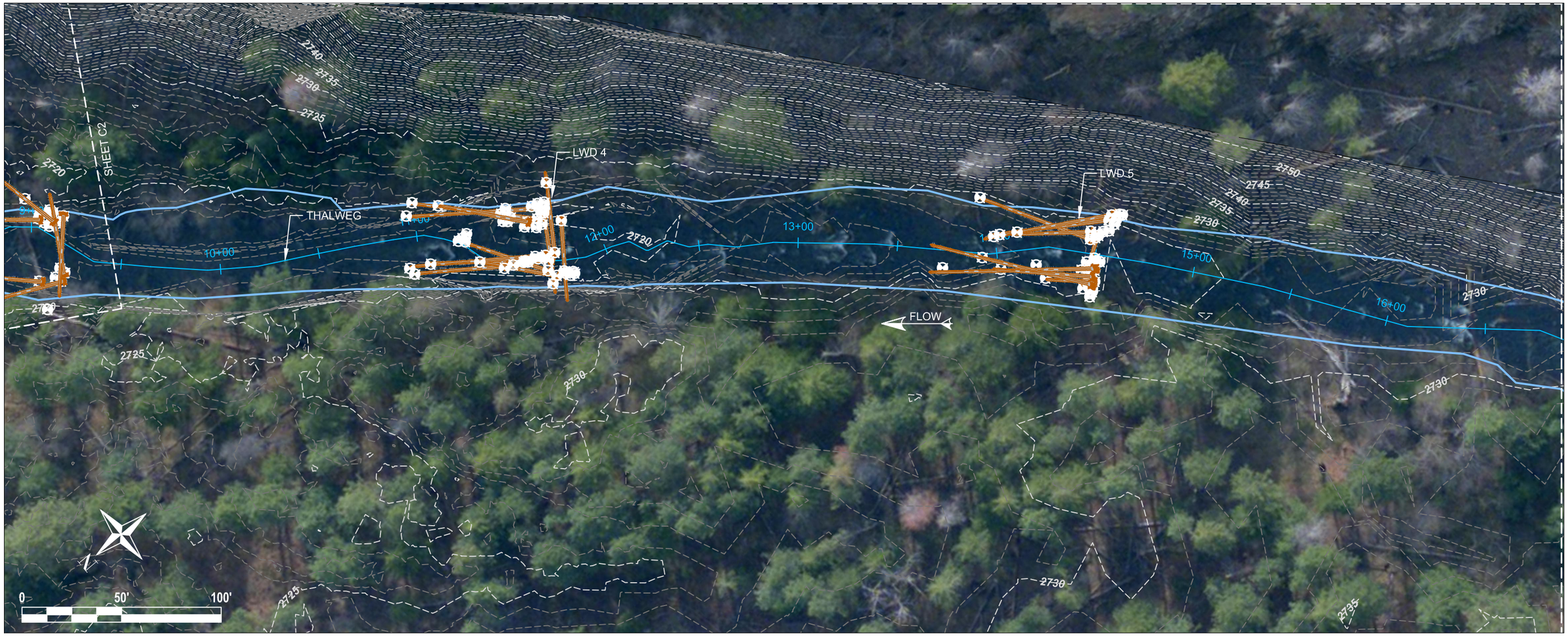
AS-BUILT DESIGN

DWG. NO.: C2

CREATED: 10/02/2013

SHEET: 3 OF 10

SCALE: 1" = 50'



NOTES:

1. WOOD SHOWN AS PLACED DURING CONSTRUCTION.

LEGEND:

- PROPERTY BOUNDARY
- PROJECT AREA
- BANKFULL CHANNEL
- AS-BUILT LWD
- AS-BUILT HABITAT BOULDER
- AS-BUILT POINT
- EXISTING CONTOUR MAJOR - 5FT
- EXISTING CONTOUR MINOR - 1FT
- SHEET BOUNDARY

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ALEX STAMM — STATE OF WASHINGTON — 47025 — REGISTERED PROFESSIONAL ENGINEER — 10/02/14

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION — FISHERIES PROGRAM — Department of Natural Resources

CTUIR - WALLA WALLA - UMATILLA — CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION — Treaty of 1855

REV.	DATE	PLAN SET SIZE ANSI B (11x17) REVISION DESCRIPTION	DRW	ENG	CHK
-	10/02/14	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 46.75 TO 48.10

AS-BUILT DESIGN

DWG. NO.: C3

CREATED: 10/02/2013

SHEET: 4 OF 10

SCALE: 1" = 50'

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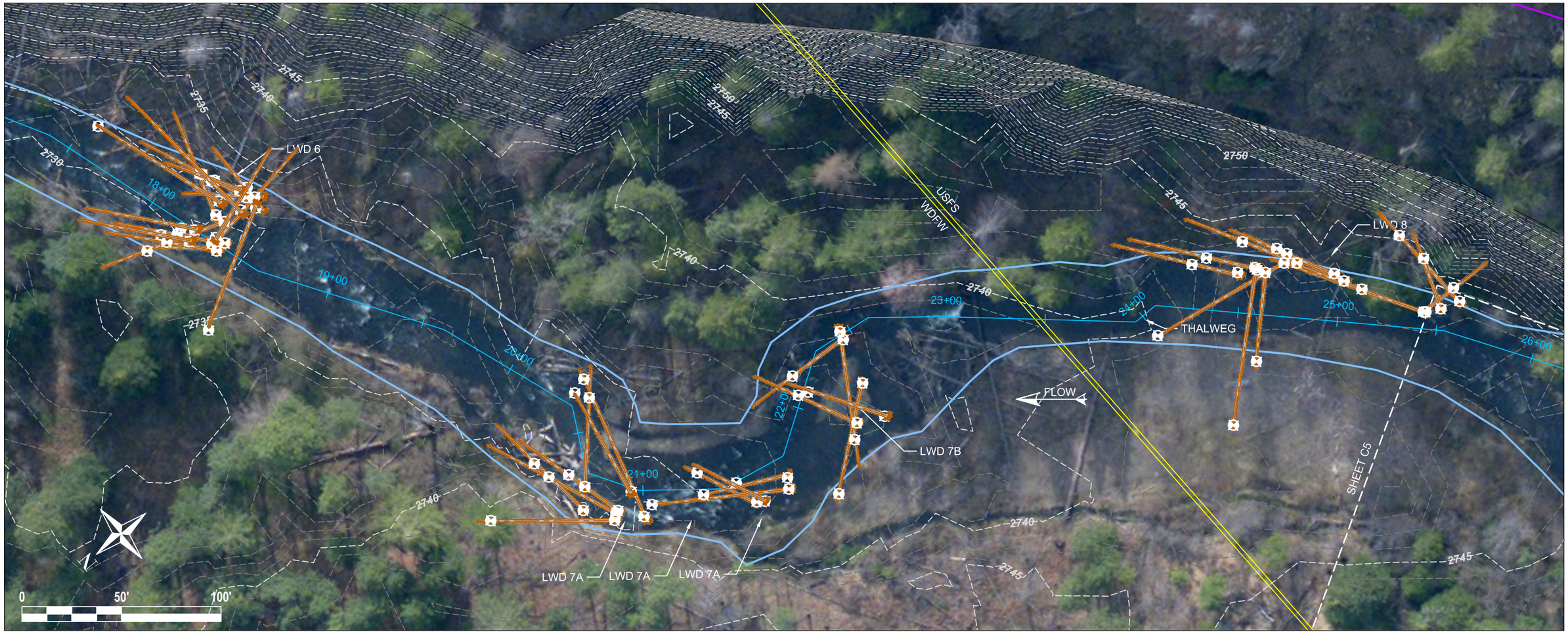

NOTES:

1. WOOD SHOWN AS PLACED DURING CONSTRUCTION.

LEGEND:

- PROPERTY BOUNDARY
- PROJECT AREA
- BANKFULL CHANNEL
- AS-BUILT LWD
- AS-BUILT HABITAT BOULDER
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- EXISTING CONTOUR MINOR - 1FT
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ALEX STROM — STATE OF WASHINGTON — 47025 — REGISTERED PROFESSIONAL ENGINEER — 10/02/14

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION — FISHERIES PROGRAM — Department of Natural Resources

CTUIR - WALLA WALLA - UMATILLA — CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION — Treaty of 1855

REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK
		PLAN SET SIZE ANSI B (11x17)			
-	10/02/14	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 46.75 TO 48.10

AS-BUILT DESIGN

DWG. NO.: C4

CREATED: 10/02/2013

SHEET: 5 OF 10

SCALE: 1" = 50'

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PLOT DETAILS: STROM, ALEX October 3, 2014 12:28 PM TT-BOTH-MAIN-COLOR.ctb

NOTES:

1. WOOD SHOWN AS PLACED DURING CONSTRUCTION.

LEGEND:
- PROPERTY BOUNDARY
- PROJECT AREA
- BANKFULL CHANNEL
- AS-BUILT LWD
- AS-BUILT HABITAT BOULDER
- AS-BUILT POINT
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ALEX STROM 47025 REGISTERED PROFESSIONAL ENGINEER 10/02/14

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION FISHERIES PROGRAM Treaty of 1855 Department of Natural Resources

CTUIR - WALLA WALLA - UMATILLA CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION Treaty of 1855

REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK
		PLAN SET SIZE ANSI B (11x17)			
-	10/02/14	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 46.75 TO 48.10

AS-BUILT DESIGN

DWG. NO.: C5

CREATED: 10/02/2013

SHEET: 6 OF 10

SCALE: 1" = 50'

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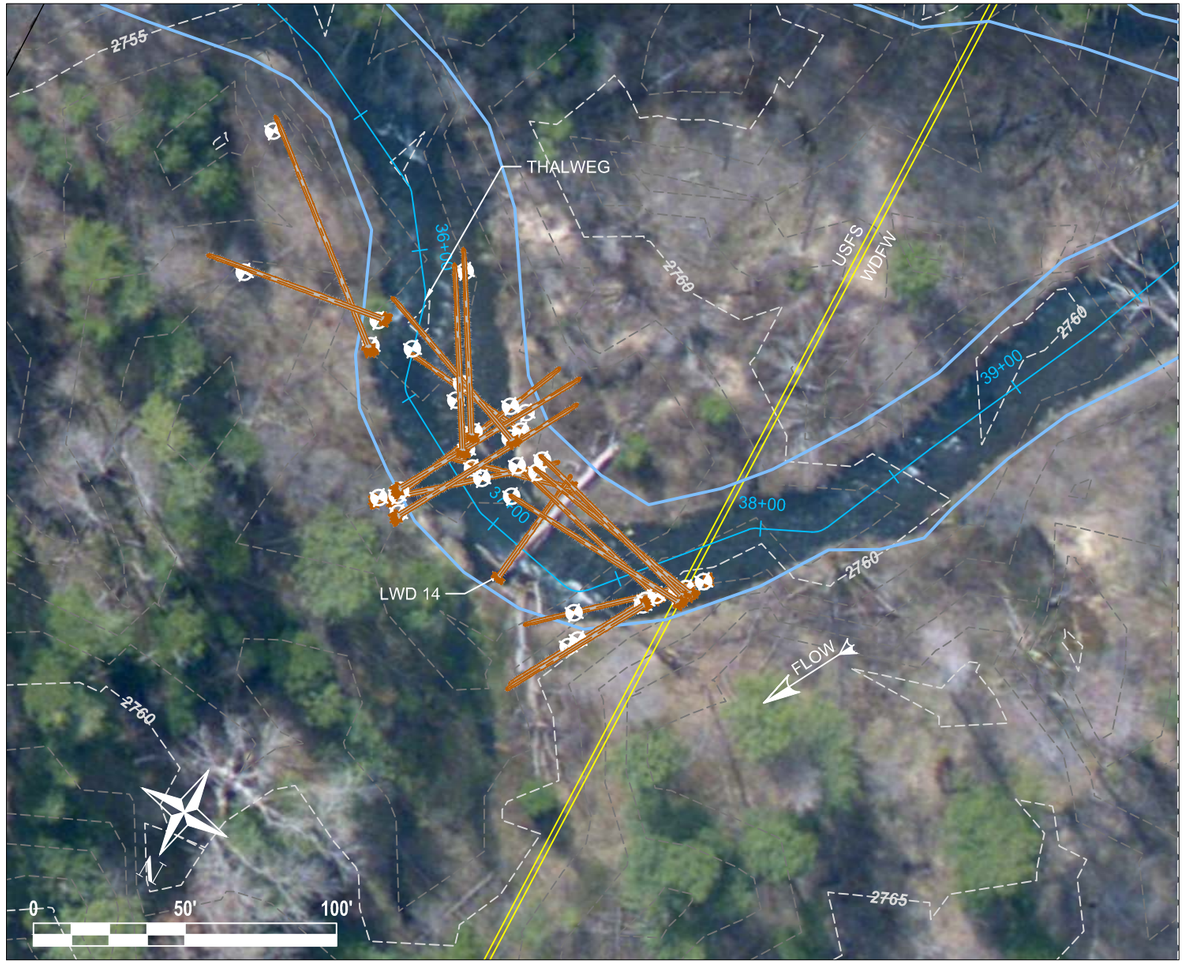

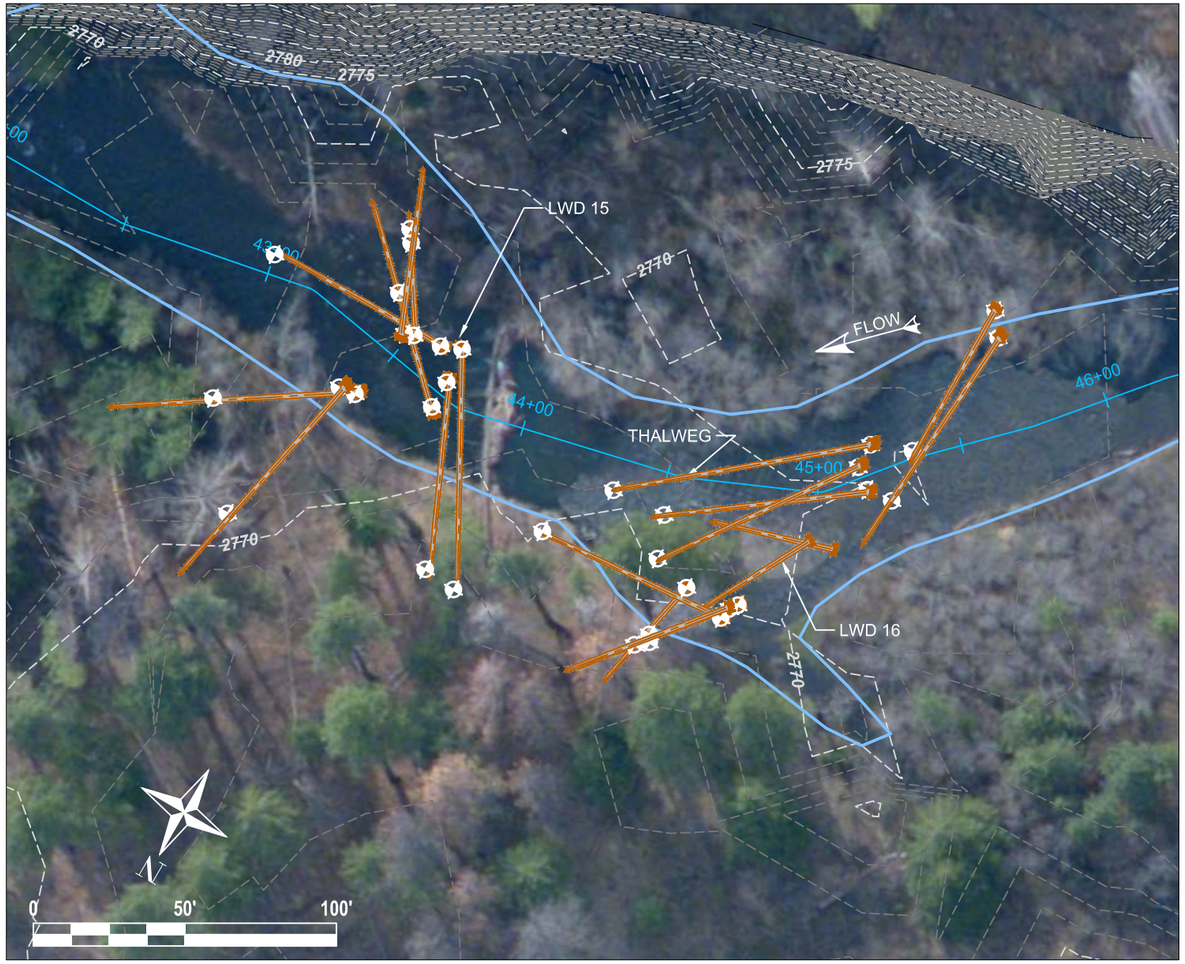

NOTES:

1. WOOD SHOWN AS PLACED DURING CONSTRUCTION.

LEGEND:

- PROPERTY BOUNDARY
- PROJECT AREA
- BANKFULL CHANNEL
- AS-BUILT LWD
- AS-BUILT HABITAT BOULDER
- AS-BUILT POINT
- EXISTING CONTOUR MAJOR - 5FT
- EXISTING CONTOUR MINOR - 1FT
- SHEET BOUNDARY

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ALEX STROM — STATE OF WASHINGTON — 47025 — REGISTERED PROFESSIONAL ENGINEER — 10/02/14

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION — FISHERIES PROGRAM — Department of Natural Resources

CTUIR — CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION — Treaty of 1855

REV.	DATE	PLAN SET SIZE ANSI B (11x17) REVISION DESCRIPTION	DRW	ENG	CHK
-	10/02/14	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 46.75 TO 48.10

AS-BUILT DESIGN

DWG. NO.: C6

CREATED: 10/02/2013

SHEET: 7 OF 10

SCALE: 1" = 50'

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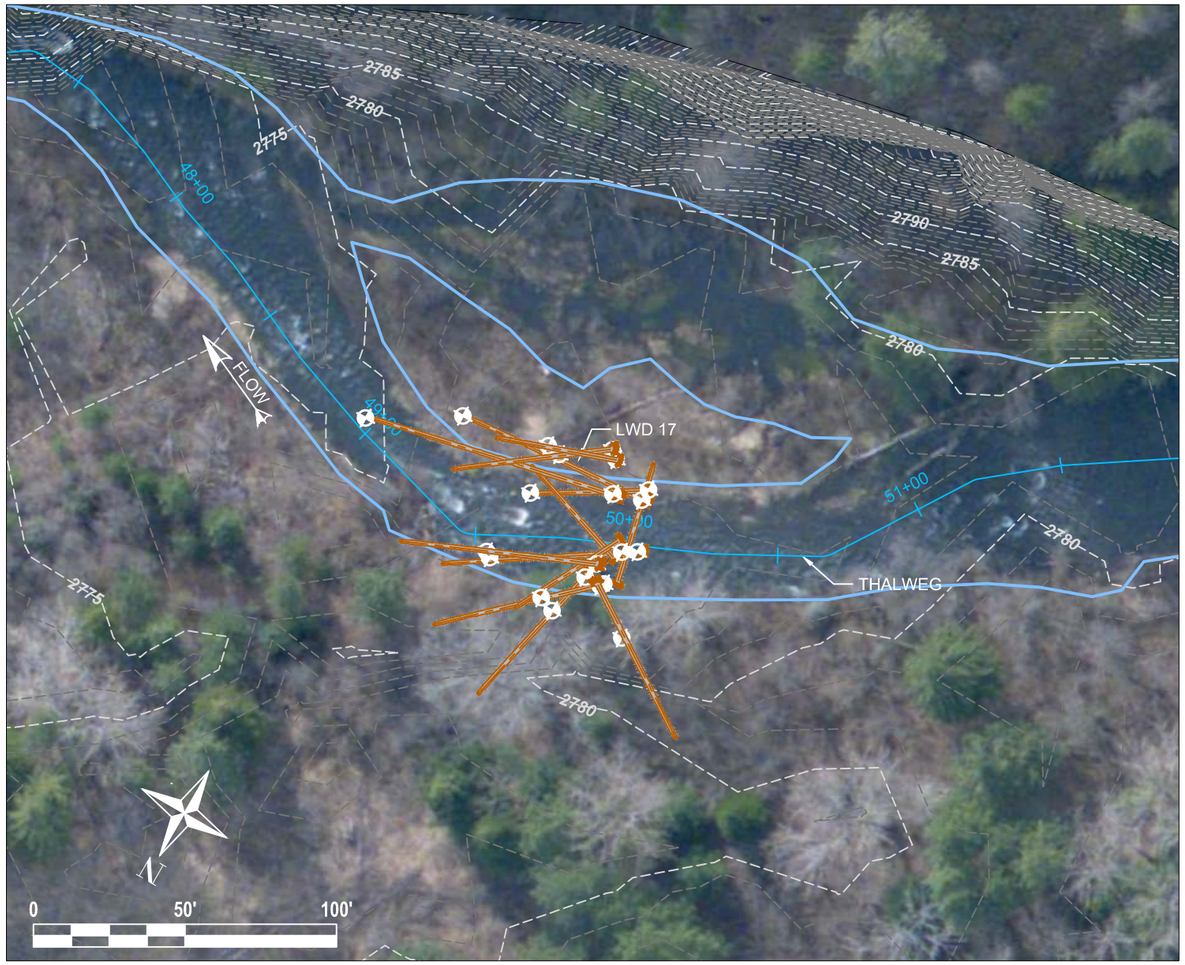

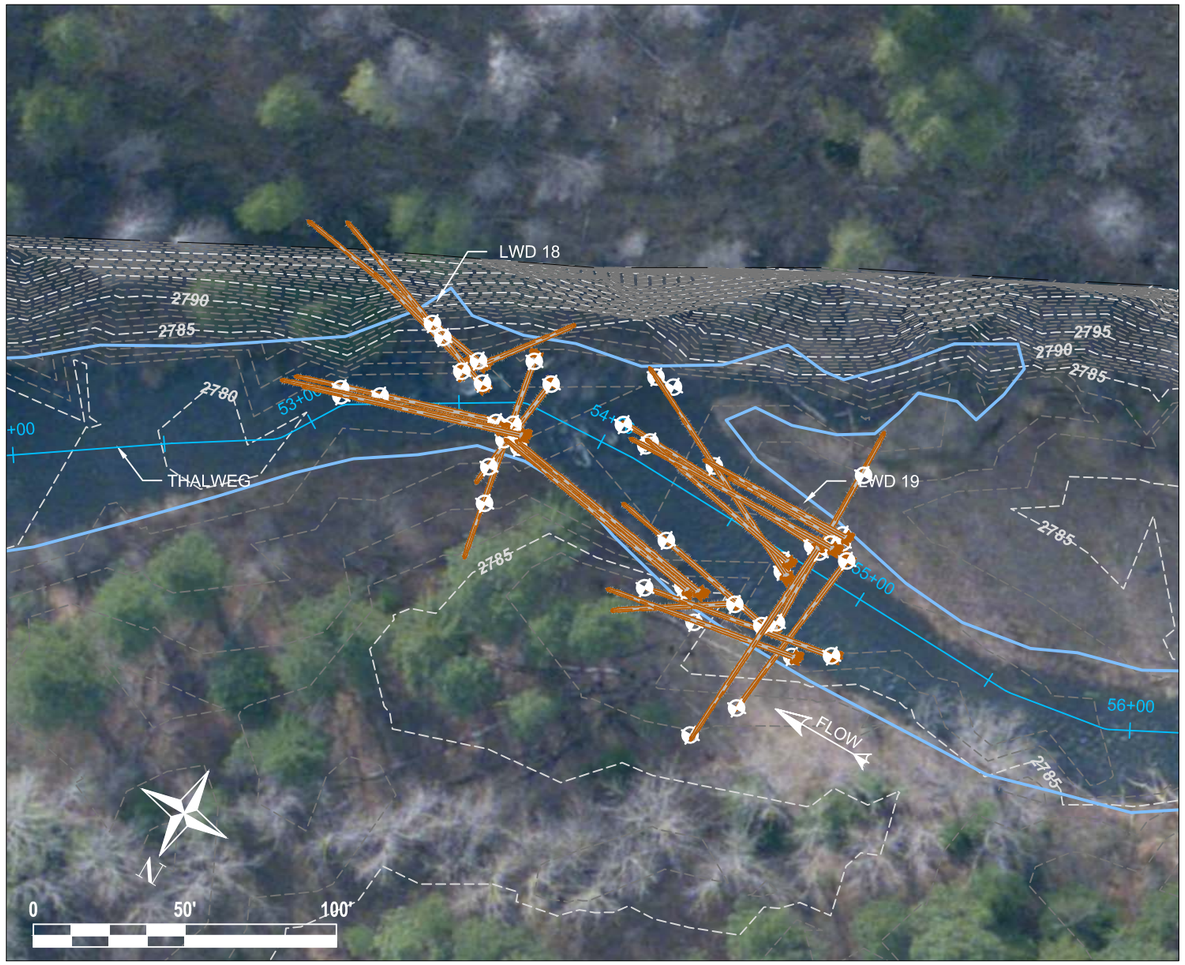

NOTES:

1. WOOD SHOWN AS PLACED DURING CONSTRUCTION.

LEGEND:

- PROPERTY BOUNDARY
- PROJECT AREA
- BANKFULL CHANNEL
- AS-BUILT LWD
- AS-BUILT HABITAT BOULDER
- AS-BUILT POINT
- EXISTING CONTOUR MAJOR - 5FT
- EXISTING CONTOUR MINOR - 1FT
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CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION — FISHERIES PROGRAM — Department of Natural Resources

CAYUSE - WALLA WALLA - UMATILLA — CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION — Treaty of 1855

REV.	DATE	PLAN SET SIZE ANSI B (11x17) / REVISION DESCRIPTION	DRW	ENG	CHK
-	10/02/14	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 46.75 TO 48.10

AS-BUILT DESIGN

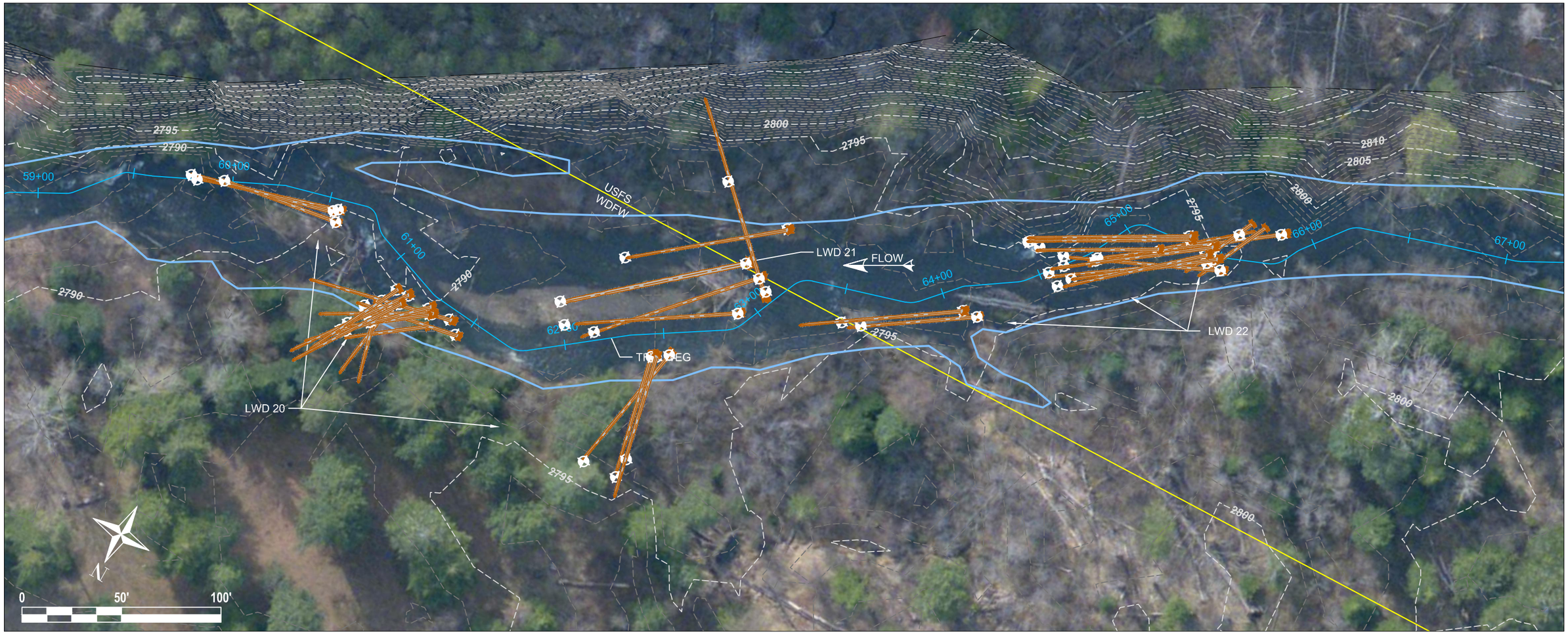
DWG. NO.: C7

CREATED: 10/02/2013

SHEET: 8 OF 10

SCALE: 1" = 50'

Z:\PROJECTS\TUCANNON RIVER\WORKING DESIGN\SHEET FILES\PROPOSED DESIGN PA3.DWG
PLOT DETAILS: STROM, ALEX October 3, 2014 12:28 PM TT-BOTH-MAIN-COLOR.CTB



NOTES:

1. WOOD SHOWN AS PLACED DURING CONSTRUCTION.

LEGEND:

- PROPERTY BOUNDARY
- PROJECT AREA
- BANKFULL CHANNEL
- AS-BUILT LWD
- AS-BUILT HABITAT BOULDER
- AS-BUILT POINT
- EXISTING CONTOUR MAJOR - 5FT
- EXISTING CONTOUR MINOR - 1FT
- SHEET BOUNDARY

LWD 22 - LOG PLACEMENT SEQUENCING

TETRA TECH
www.tetratech.com
19803 North Creek Parkway
Bothell, Washington 98011
Phone: 425-482-7600 Fax: 425-482-7652

ALEX STROM 47025 REGISTERED PROFESSIONAL ENGINEER

REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK
		PLAN SET SIZE ANSI B (11x17)			
-	10/02/14	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 46.75 TO 48.10

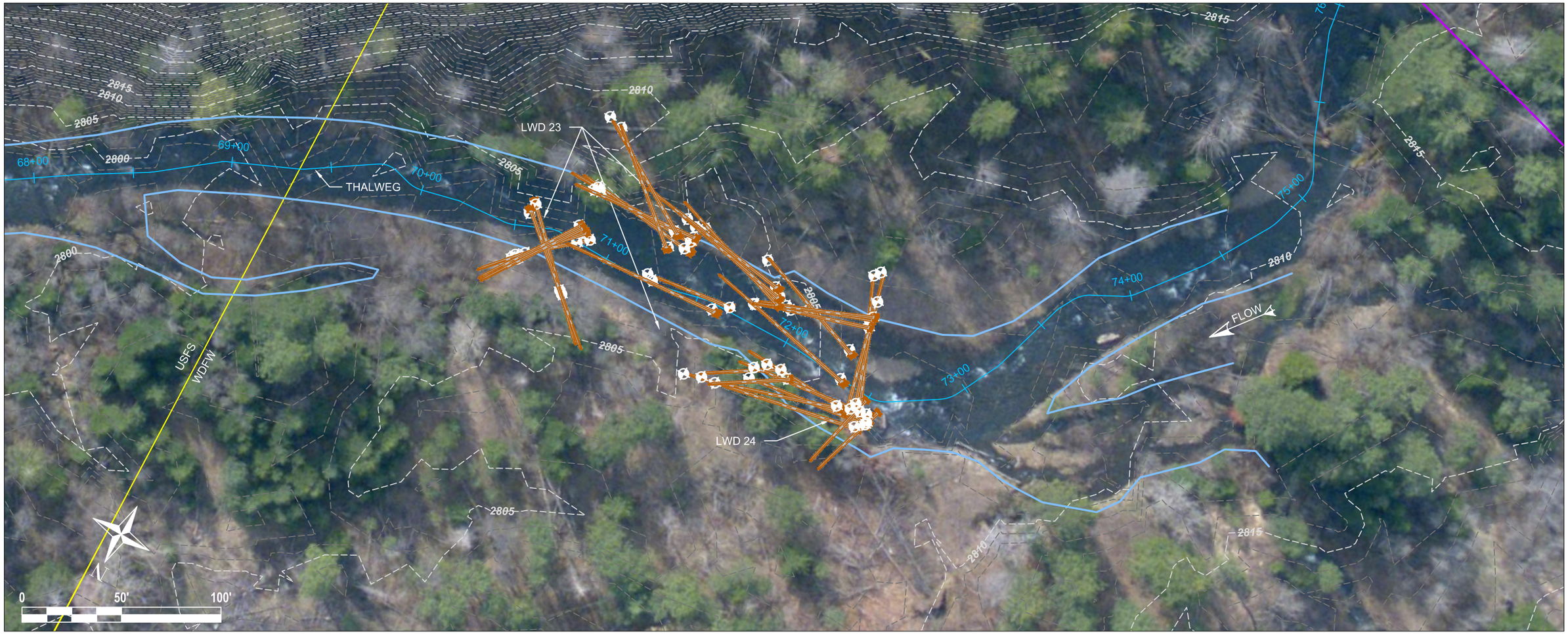
AS-BUILT DESIGN

DWG. NO.: C8

CREATED: 10/02/2013

SHEET: 9 OF 10

SCALE: 1" = 50'



NOTES:

1. WOOD SHOWN AS PLACED DURING CONSTRUCTION.

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ALEX STROM — STATE OF WASHINGTON — 47025 — REGISTERED PROFESSIONAL ENGINEER — 10/02/14

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION — FISHERIES PROGRAM — Department of Natural Resources

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION — CAYUSE - WALLA WALLA - UMATILLA — Treaty of 1855

PLAN SET SIZE ANSI B (11x17)

REV.	DATE	REVISION DESCRIPTION	DRW	ENG	CHK
-	10/02/14	AS-BUILT SURVEY DRAWINGS		ATS	

CTUIR - TUCANNON RIVER
AS-BUILT SURVEY
RM 46.75 TO 48.10

AS-BUILT DESIGN

DWG. NO.: C9

CREATED: 10/02/2013

SHEET: 10 OF 10

SCALE: 1" = 50'

Z:\PROJECTS\TUCANNON RIVER\WORKING DESIGN\SHEET FILES\PROPOSED DESIGN PA3.DWG
PLOT DETAILS: STROM, ALEX October 3, 2014 12:29 PM TT-BOTH-MAIN-COLOR.ctb