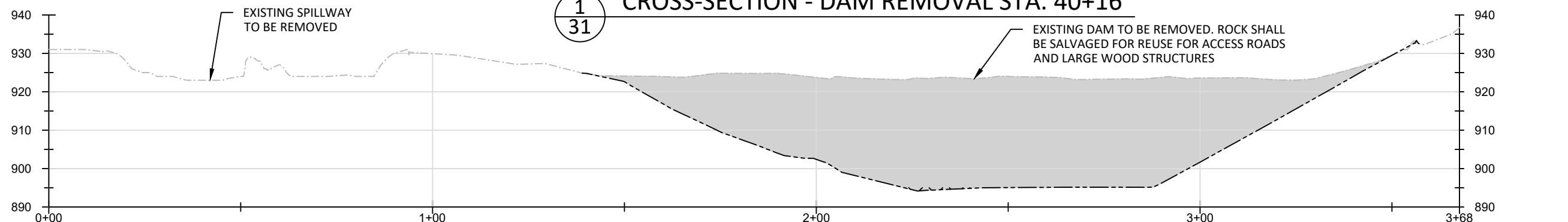
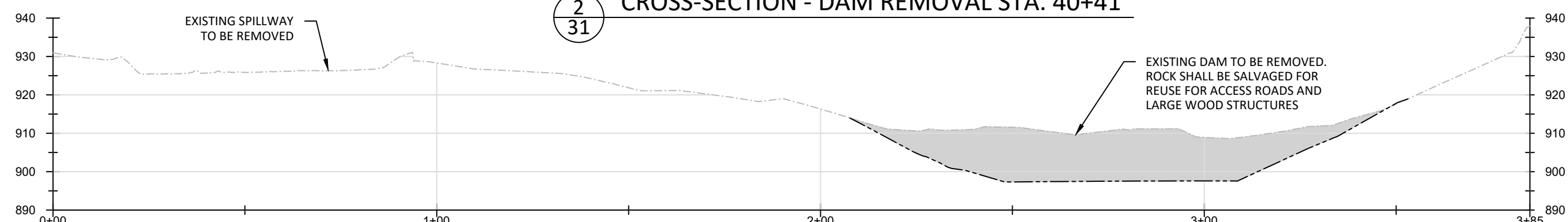


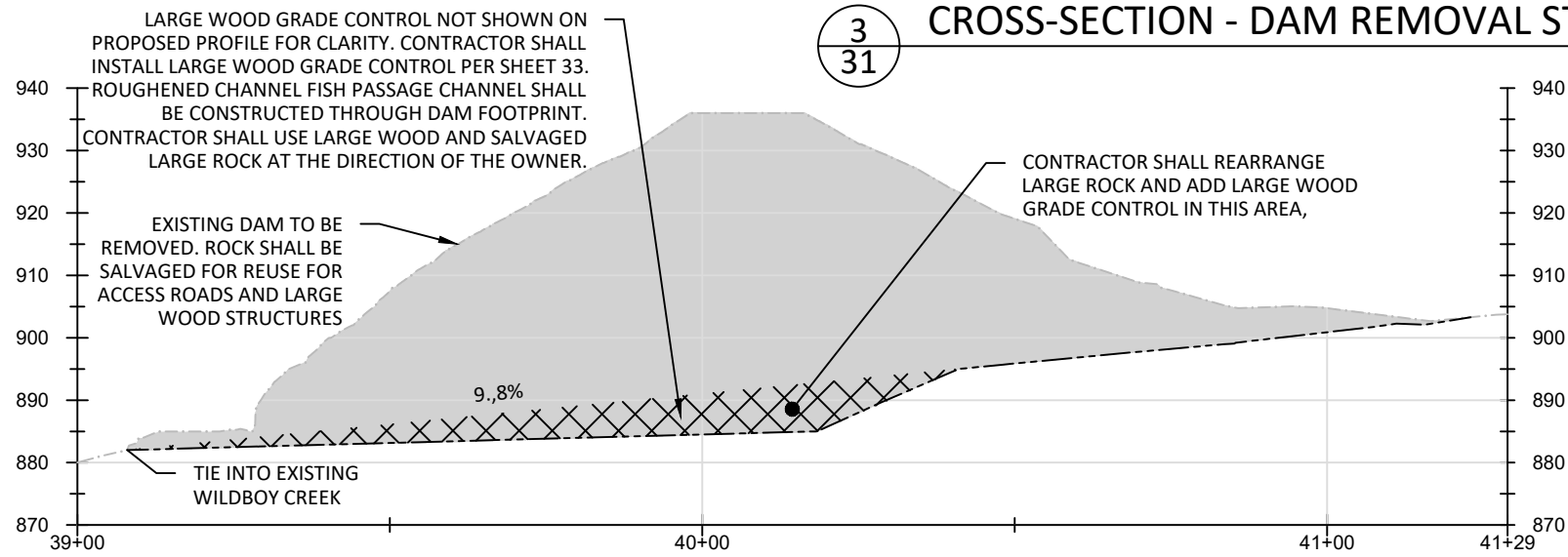
1
31
CROSS-SECTION - DAM REMOVAL STA. 40+16



2
31
CROSS-SECTION - DAM REMOVAL STA. 40+41



3
31
CROSS-SECTION - DAM REMOVAL STA. 40+67

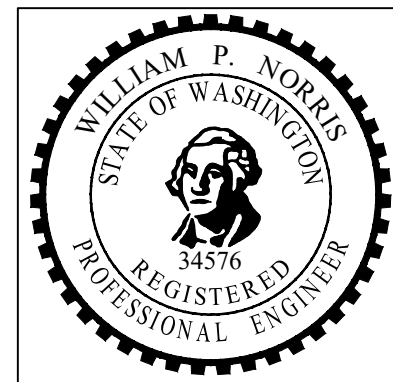
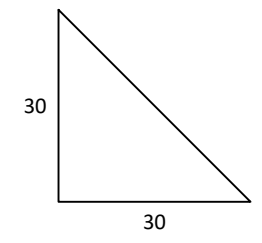


4
31
PROFILE VIEW - DAM REMOVAL STA. 39+00 TO STA. 41+29

NOTES:
ALL EXCAVATION CUT AND FILLS ARE PERMANENT

ALL CROSS-SECTIONS ARE ORIENTED LEFT TO RIGHT LOOKING DOWNSTREAM.

- LEGEND**
- EXISTING GRADE
 - - - - - ANTICIPATED DAM SUBGRADE
 - █ EXISTING DAM TO BE REMOVED
 - ⊗ DAM FOUNDATION MATERIAL



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

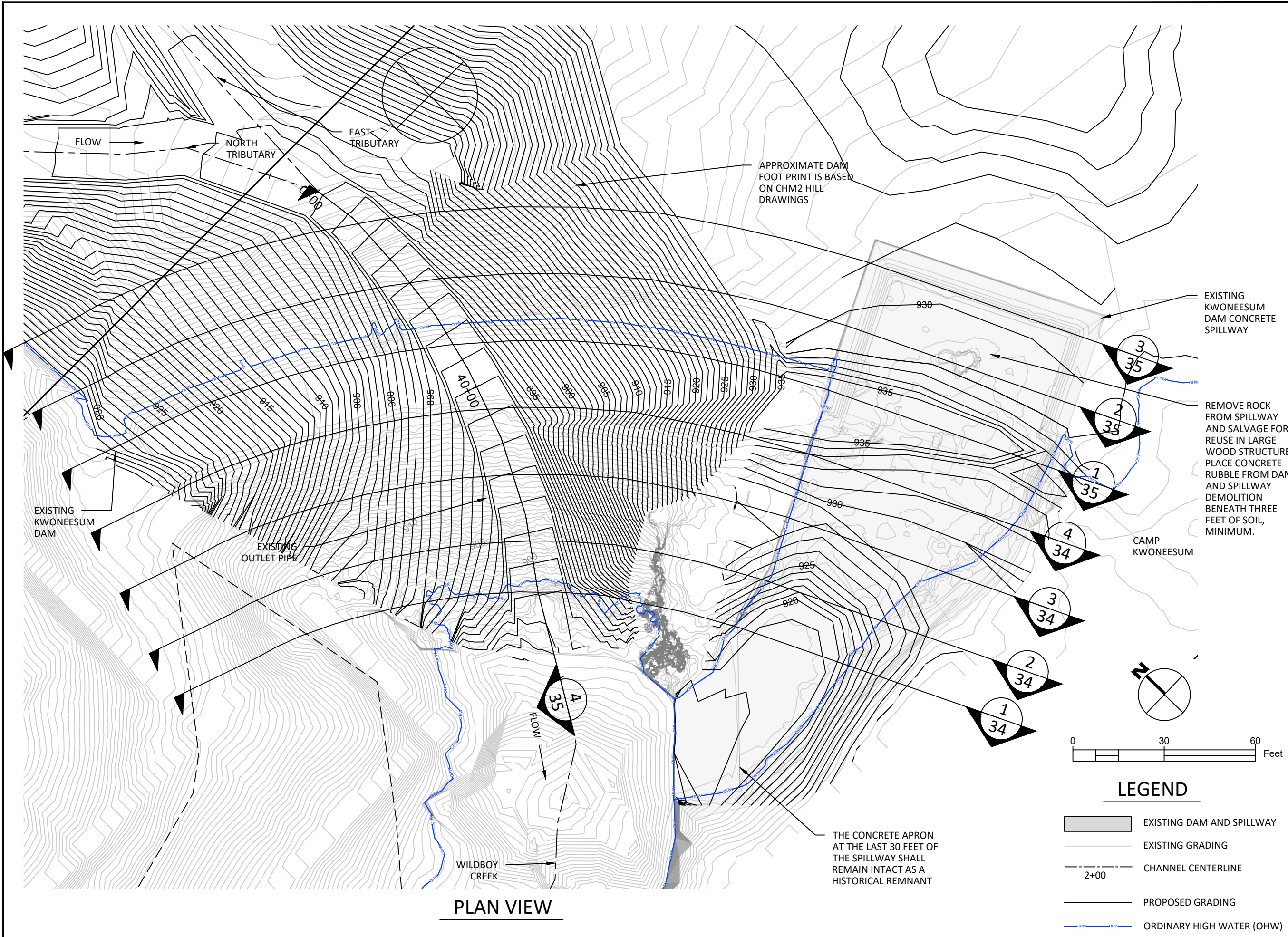
PARR
excellence
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Bingen, WA 98605
www.ers4life.com

CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA, 98665

SITE: KWONEESUM DAM REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR AND DAM - DAM SUBGRADE CROSS-SECTIONS

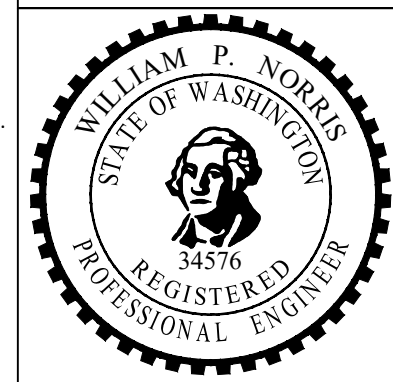
SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 31	Total Sheets: 80	



PLAN VIEW

Notes:

SHEET LOCATION



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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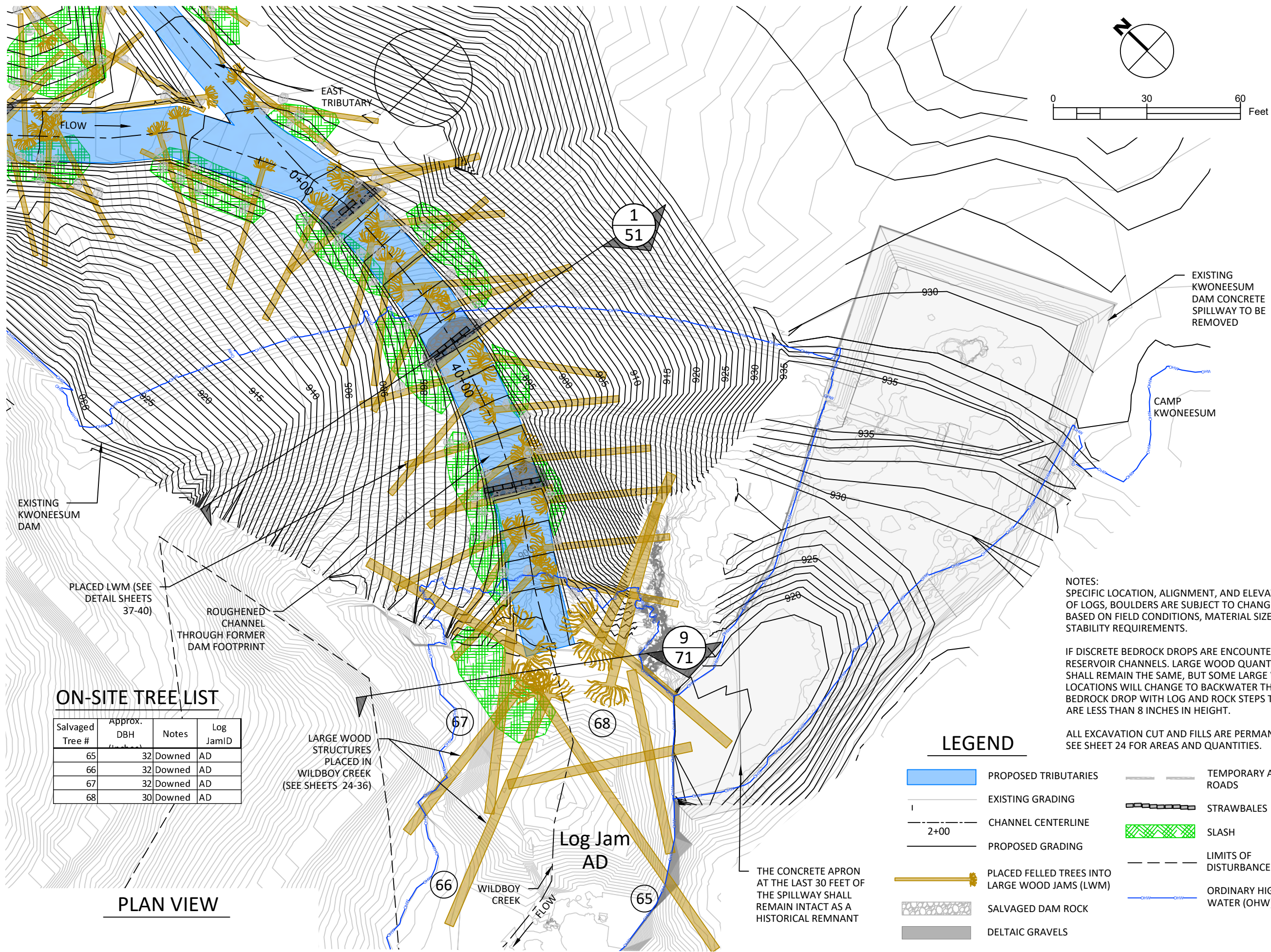
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Bingen, WA 98605 www.ers4life.com

CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA. 98665

SITE: KWONEESUM DAM REMOVAL DESIGN			
TITLE: KWONEESUM RESERVOIR AND DAM - DAM REMOVAL AREA GRADING PLAN			
SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 32	Total Sheets: 80	

LEGEND

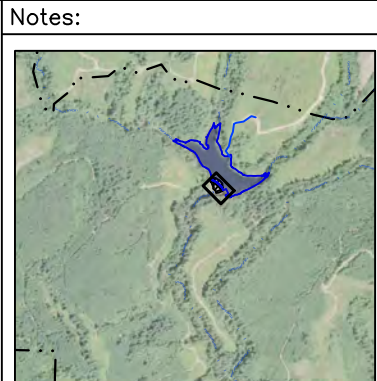
	EXISTING DAM AND SPILLWAY
	EXISTING GRADING
	CHANNEL CENTERLINE
	PROPOSED GRADING
	ORDINARY HIGH WATER (OHW)



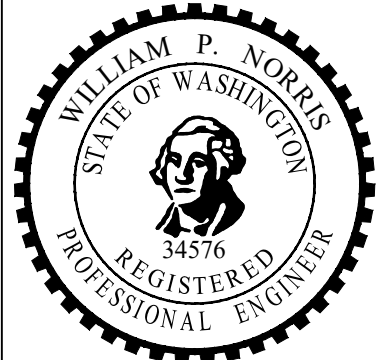
ON-SITE TREE LIST

Salvaged Tree #	Approx. DBH (inches)	Notes	Log Jam ID
65	32	Downed	AD
66	32	Downed	AD
67	32	Downed	AD
68	30	Downed	AD

PLAN VIEW



SHEET LOCATION



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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VANCOUVER, WA. 98665

SITE: KWONEESUM DAM REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR AND DAM - DAM REMOVAL AREA LARGE WOOD

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 33	Total Sheets: 80	

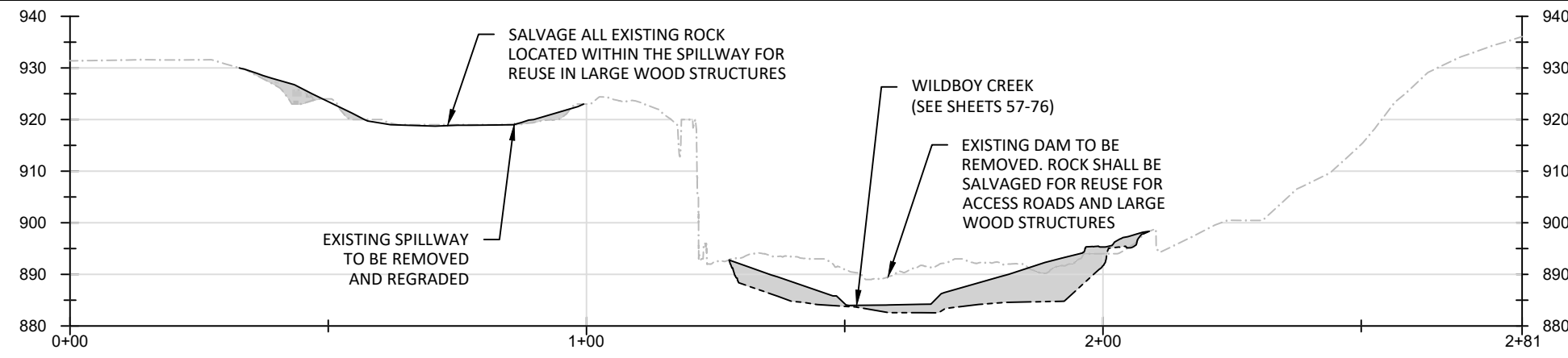
NOTES:
SPECIFIC LOCATION, ALIGNMENT, AND ELEVATIONS OF LOGS, BOULDERS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS, MATERIAL SIZE AND STABILITY REQUIREMENTS.

IF DISCRETE BEDROCK DROPS ARE ENCOUNTERED IN RESERVOIR CHANNELS. LARGE WOOD QUANTITIES SHALL REMAIN THE SAME, BUT SOME LARGE WOOD LOCATIONS WILL CHANGE TO BACKWATER THE BEDROCK DROP WITH LOG AND ROCK STEPS THAT ARE LESS THAN 8 INCHES IN HEIGHT.

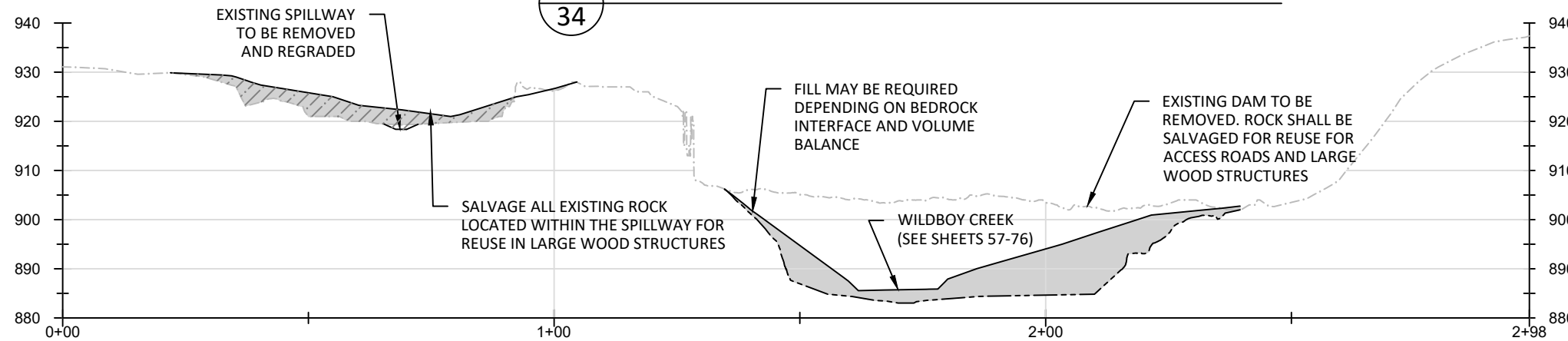
ALL EXCAVATION CUT AND FILLS ARE PERMANENT. SEE SHEET 24 FOR AREAS AND QUANTITIES.

LEGEND

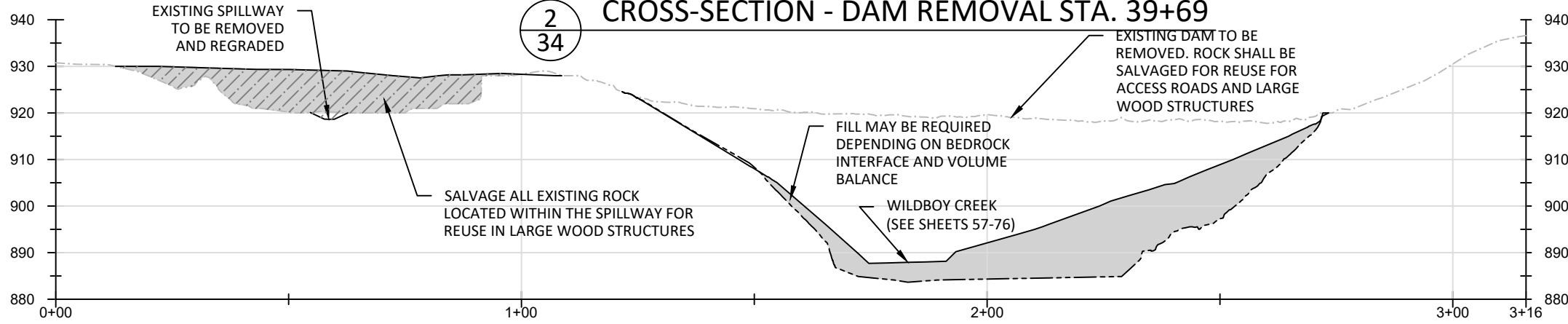
- PROPOSED TRIBUTARIES
- EXISTING GRADING
- CHANNEL CENTERLINE
- PROPOSED GRADING
- PLACED FELLED TREES INTO LARGE WOOD JAMS (LWM)
- SALVAGED DAM ROCK
- DELTAIC GRAVELS
- TEMPORARY ACCESS ROADS
- STRAWBALES
- SLASH
- LIMITS OF DISTURBANCE
- ORDINARY HIGH WATER (OH)



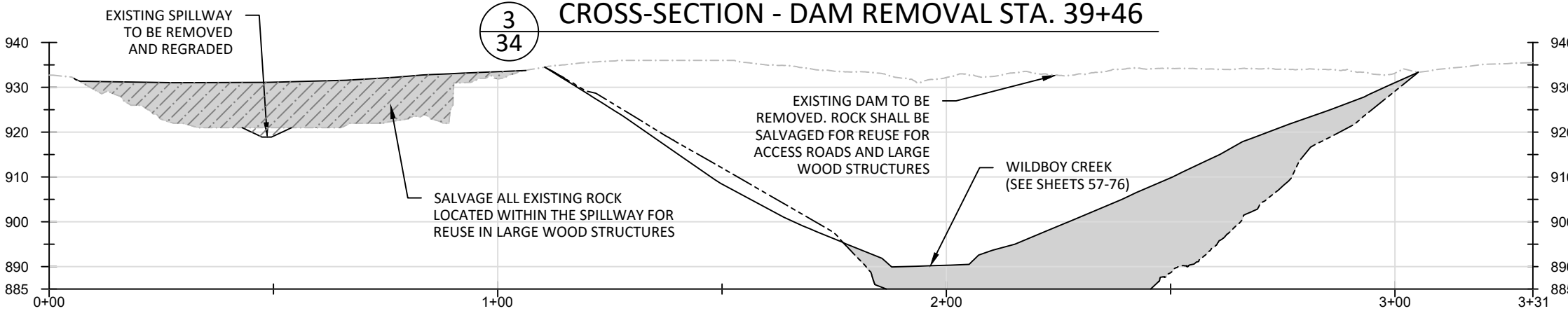
1
34
CROSS-SECTION - DAM REMOVAL STA. 39+29



2
34
CROSS-SECTION - DAM REMOVAL STA. 39+69



3
34
CROSS-SECTION - DAM REMOVAL STA. 39+46



4
34
CROSS-SECTION - DAM REMOVAL STA. 39+92

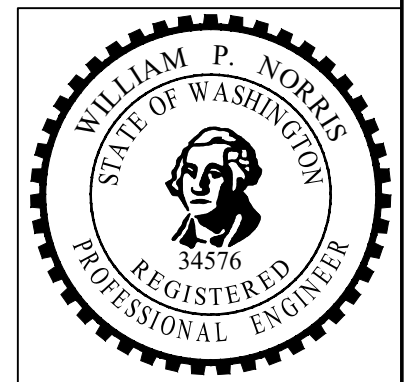
NOTES:
ALL EXCAVATION CUT AND FILLS ARE PERMANENT.

ALL CROSS-SECTIONS ARE ORIENTED LEFT TO RIGHT LOOKING DOWNSTREAM.

EXISTING DAM MATERIAL TO BE REMOVED, SORTED AND REPLACED WILL PROVIDE AN ARMOR LAYER WITH LARGER ROCK ALONG CHANNEL BOUNDARIES.

LEGEND

- EXISTING GRADE
- ORDINARY HIGH WATER (OHW)
- ANTICIPATED GRADE
- - - ANTICIPATED DAM SUBGRADE
- - - ACCESS ROAD SALVAGED ROCK
- █ EXISTING DAM MATERIAL TO BE REMOVED, SORTED AND REPLACED
- ▨ DAM FOUNDATION MATERIAL
- ▨ REGRADED SPILLWAY



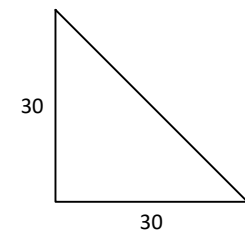
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2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

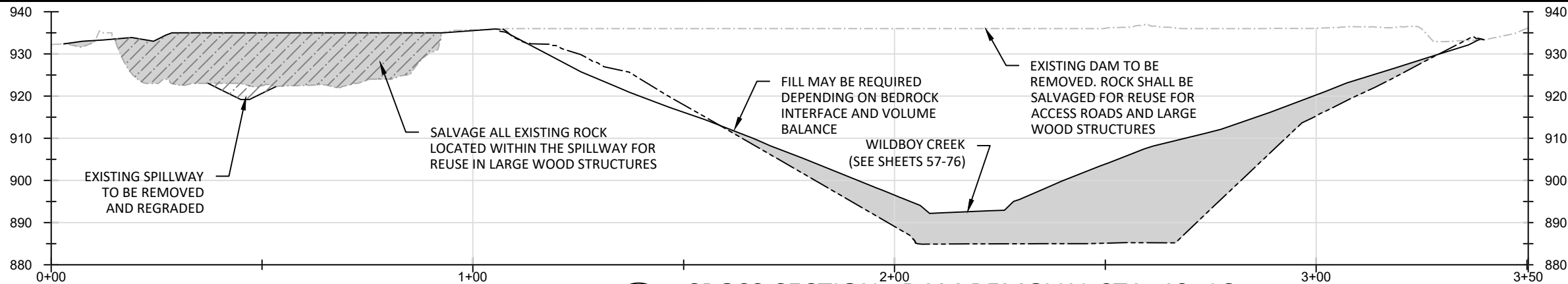
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Bingen, WA 98605
www.ers4life.com

CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA, 98665

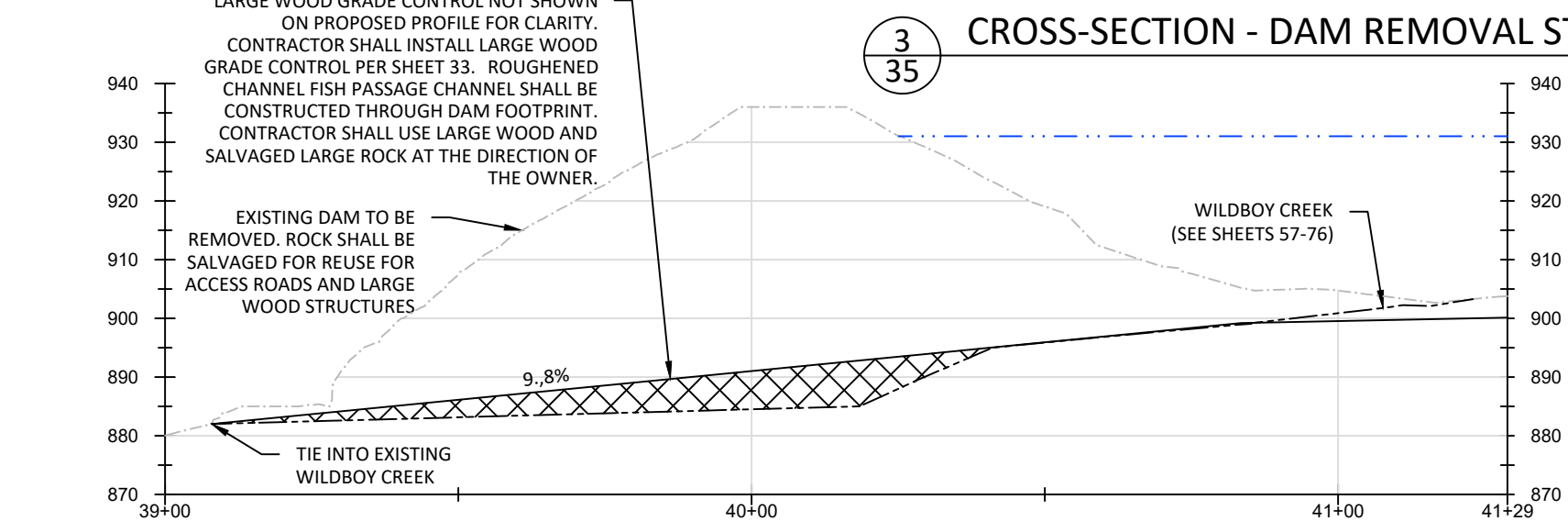
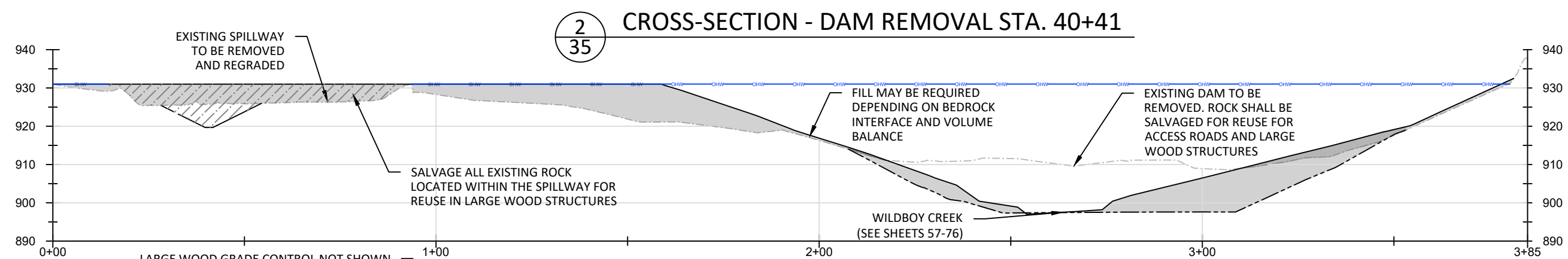
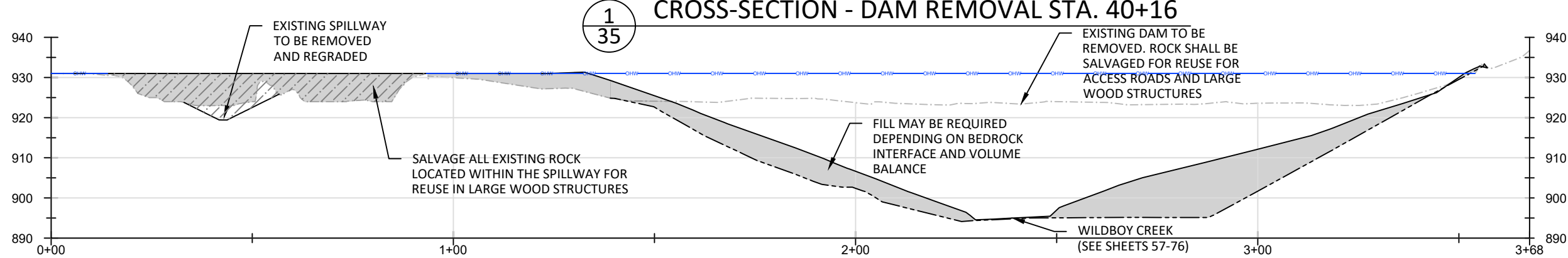
SITE: KWONEESUM DAM REMOVAL DESIGN
TITLE: KWONEESUM RESERVOIR AND DAM - DAM REMOVAL AREA CROSS-SECTIONS

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 34	Total Sheets: 80	



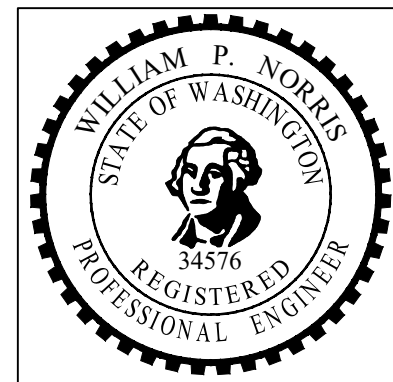
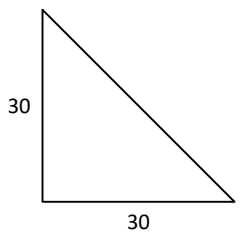


NOTES:
 ALL EXCAVATION CUT AND FILLS ARE PERMANENT.
 ALL CROSS-SECTIONS ARE ORIENTED LEFT TO RIGHT LOOKING DOWNSTREAM.
 EXISTING DAM MATERIAL TO BE REMOVED, SORTED AND REPLACED WILL PROVIDE AN ARMOR LAYER WITH LARGER ROCK ALONG CHANNEL BOUNDARIES.



LEGEND

- EXISTING GRADE
- OHW — ORDINARY HIGH WATER (OHW)
- ANTICIPATED GRADE
- - - ANTICIPATED DAM SUBGRADE
- - - ACCESS ROAD SALVAGED ROCK
- █ EXISTING DAM MATERIAL TO BE REMOVED, SORTED AND REPLACED
- ▣ DAM FOUNDATION MATERIAL
- ▨ REGRADED SPILLWAY



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

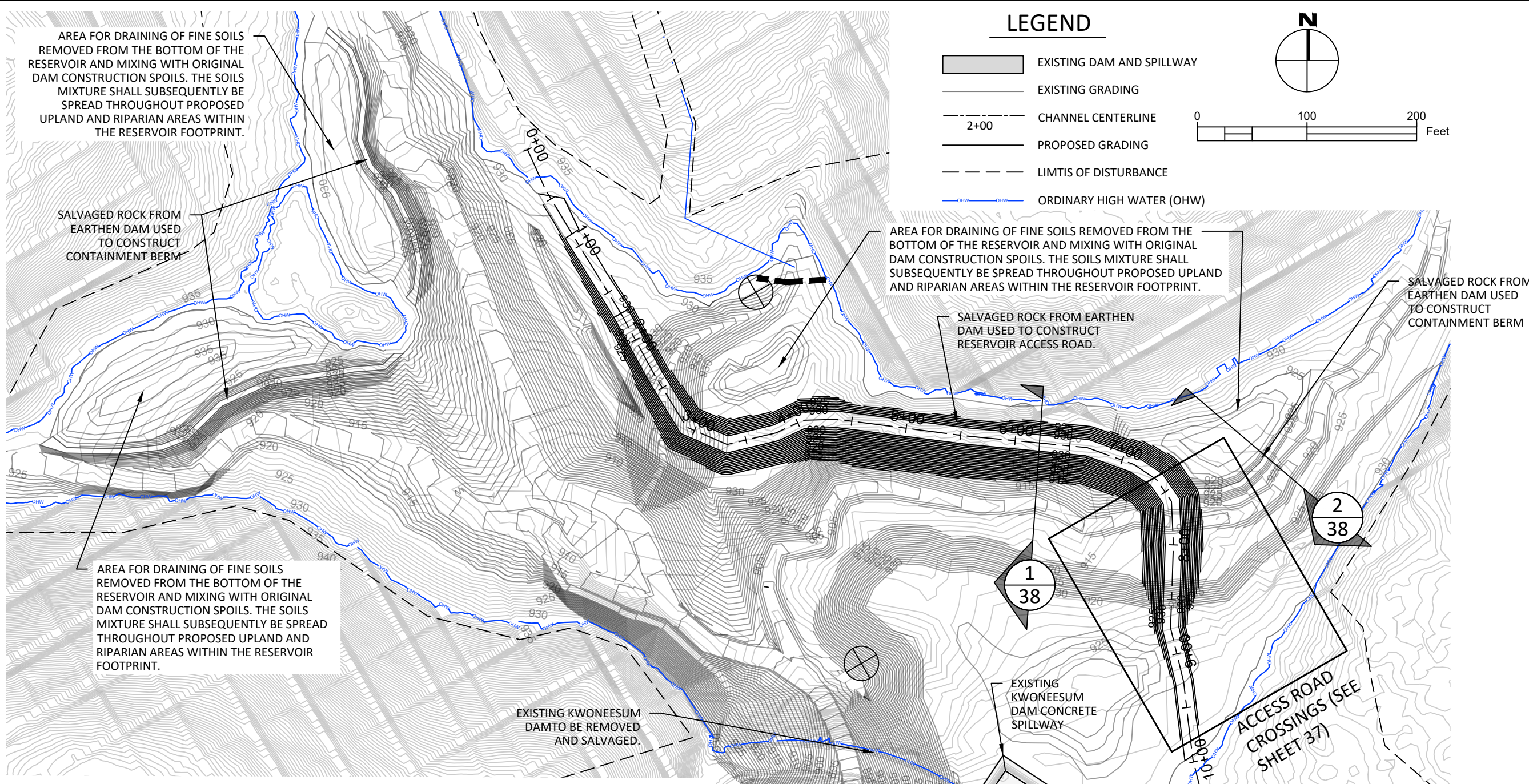
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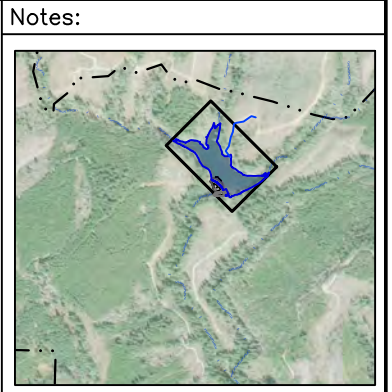
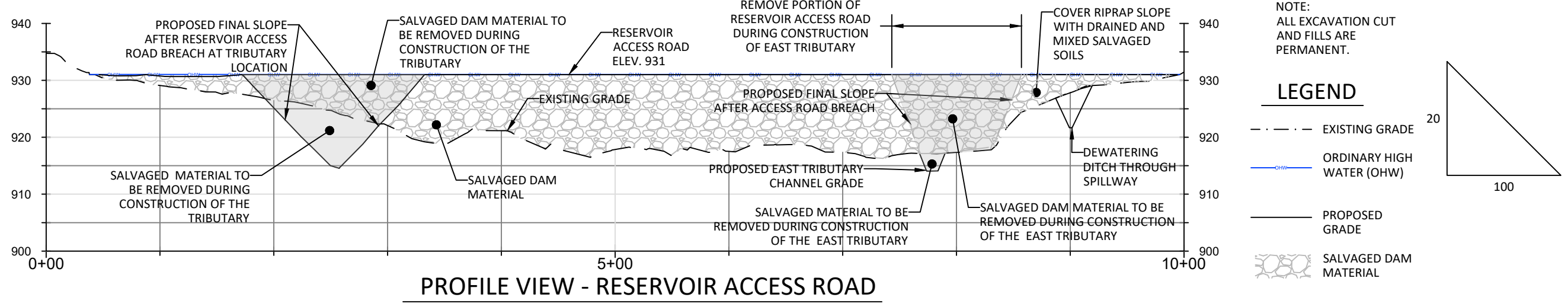
SITE: KWONEESUM DAM REMOVAL DESIGN
 TITLE: KWONEESUM RESERVOIR AND DAM – DAM REMOVAL AREA CROSS-SECTIONS

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 35	Total Sheets: 80	

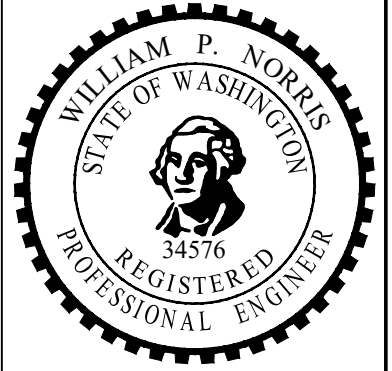
4
35
 CROSS-SECTION - DAM REMOVAL STA. 40+79



PLAN VIEW - RESERVOIR ACCESS ROAD



SHEET LOCATION



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

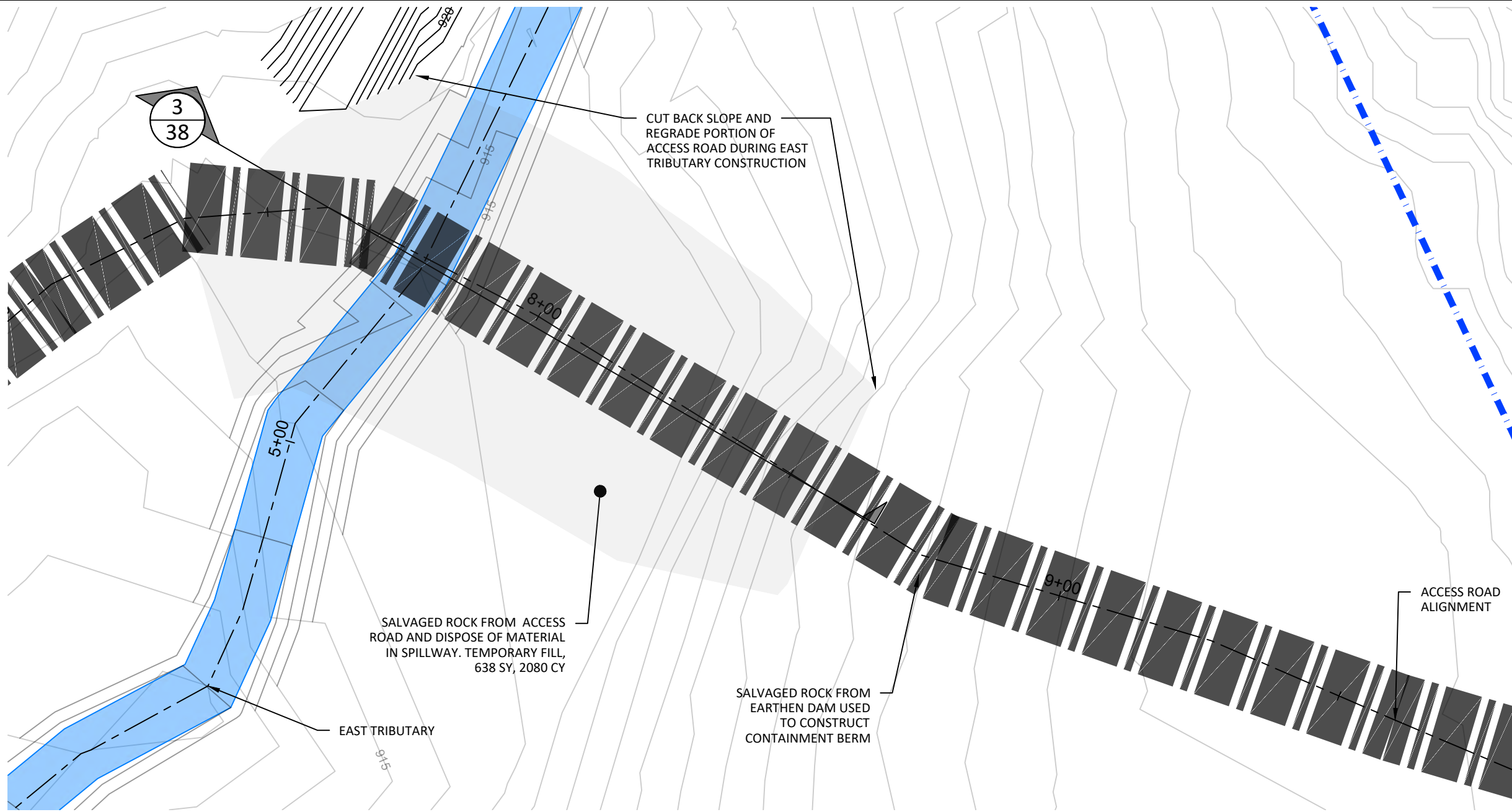
PARR excellence
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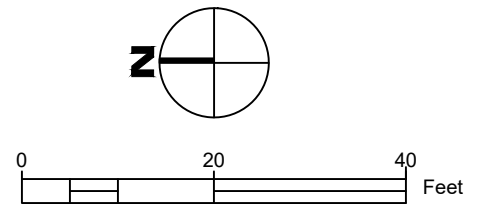
SITE: KWONEESUM DAM REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR AND DAM - CONTAINMENT ROAD PLAN AND PROFILE

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 36	Total Sheets: 80	

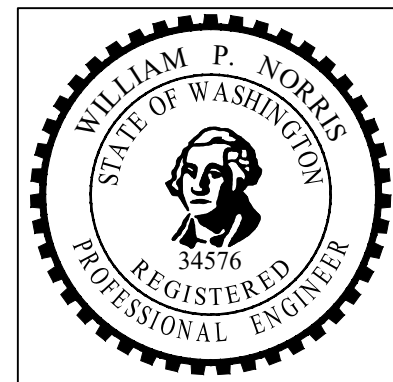


PLAN VIEW - RESERVOIR ACCESS ROAD AREA AND DECOMMISSIONING



LEGEND

- PROPOSED TRIBUTARIES
- EXISTING GRADING
- CHANNEL CENTERLINE
- 2+00
- PROPOSED GRADING (PERMANENT)



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

PARR
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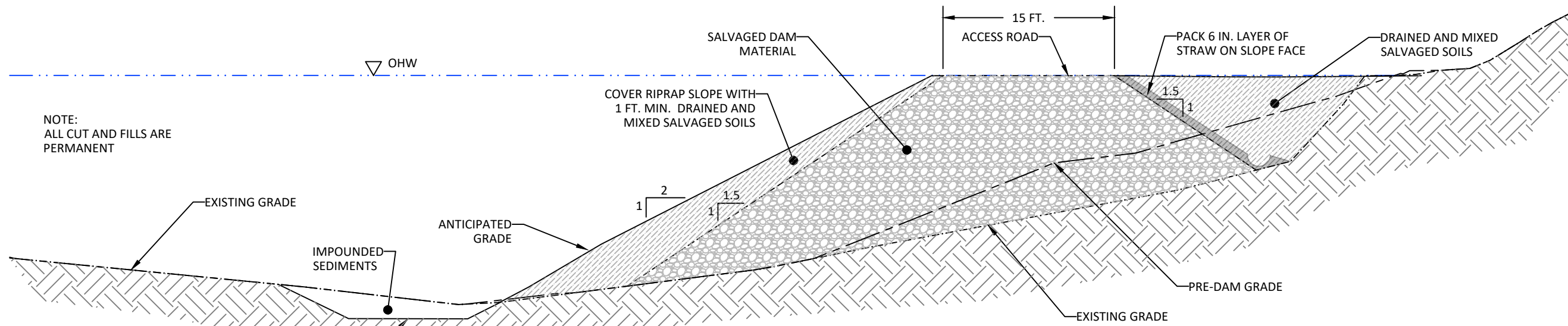
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Bingen, WA 98605 www.ers4life.com

CLIENT: **COWLITZ INDIAN TRIBE**
7700 26TH AVE
VANCOUVER, WA, 98665

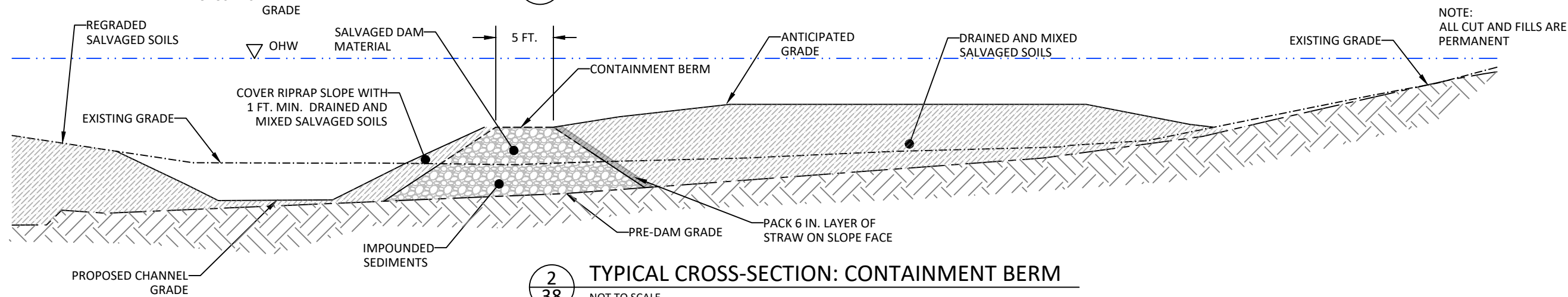
SITE: KWONEESUM DAM
REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR
AND DAM - CONTAINMENT
ROAD CROSSINGS

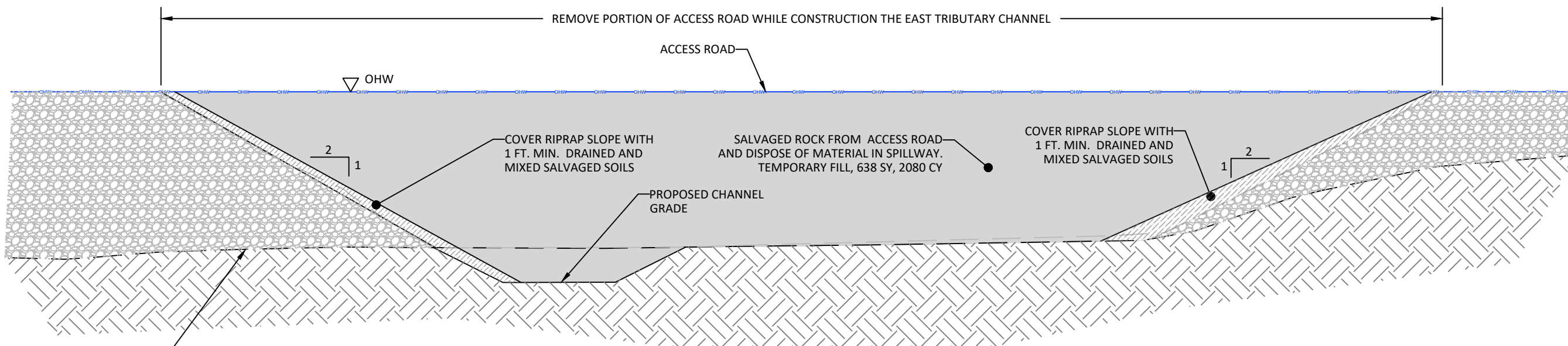
SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 37	Total Sheets: 80	



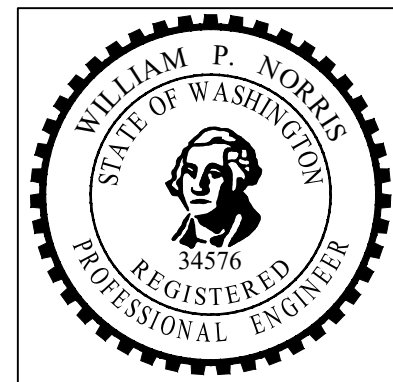
1
38
TYPICAL CROSS-SECTION: RESERVOIR ACCESS ROAD
NOT TO SCALE



2
38
TYPICAL CROSS-SECTION: CONTAINMENT BERM
NOT TO SCALE



3
38
TYPICAL CROSS-SECTION: RESERVOIR ACCESS ROAD DECOMMISSIONING
NOT TO SCALE



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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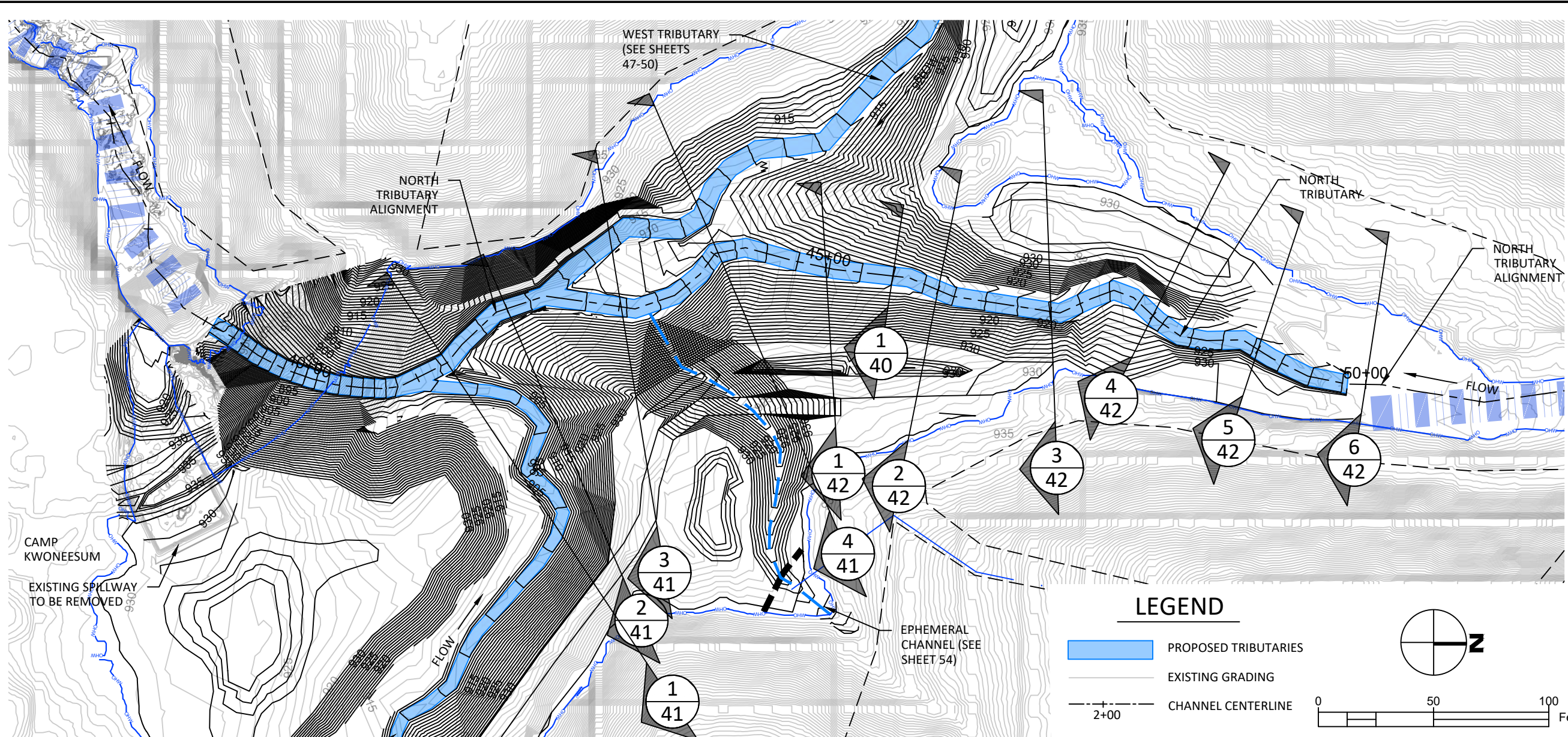
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CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA, 98665

SITE: KWONEESUM DAM
REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR
AND DAM - CONTAINMENT
ROAD CROSS-SECTIONS

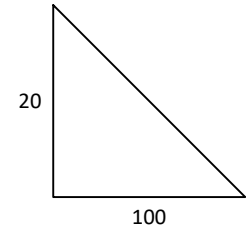
SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 38	Total Sheets: 80	



PLAN VIEW

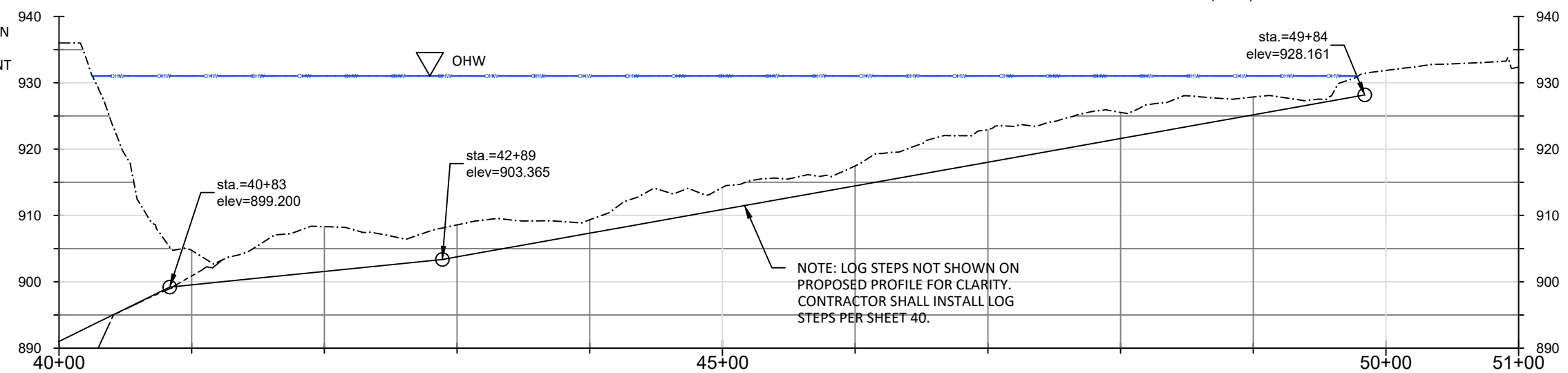
LEGEND

- PROPOSED TRIBUTARIES
 - EXISTING GRADING
 - CHANNEL CENTERLINE
 - PROPOSED GRADING
 - LIMITS OF DISTURBANCE
 - ORDINARY HIGH WATER (OHW)
- NOTE: ALL EXCAVATION CUT AND FILLS ARE PERMANENT



NOTE: ALL EXCAVATION CUT AND FILLS ARE PERMANENT

EAST TRIBUTARY (SEE SHEETS 43-46)



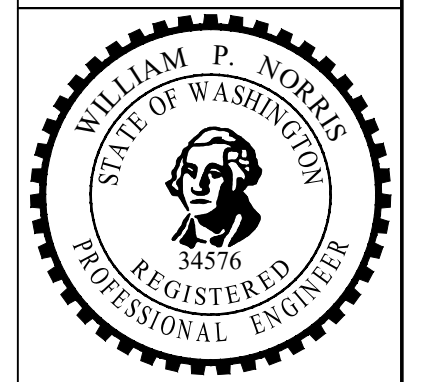
PROFILE VIEW - NORTH TRIBUTARY

LEGEND

- EXISTING GRADE
- ANTICIPATED DAM SUBGRADE
- PROPOSED GRADE
- ORDINARY HIGH WATER (OHW)

Notes:

SHEET LOCATION



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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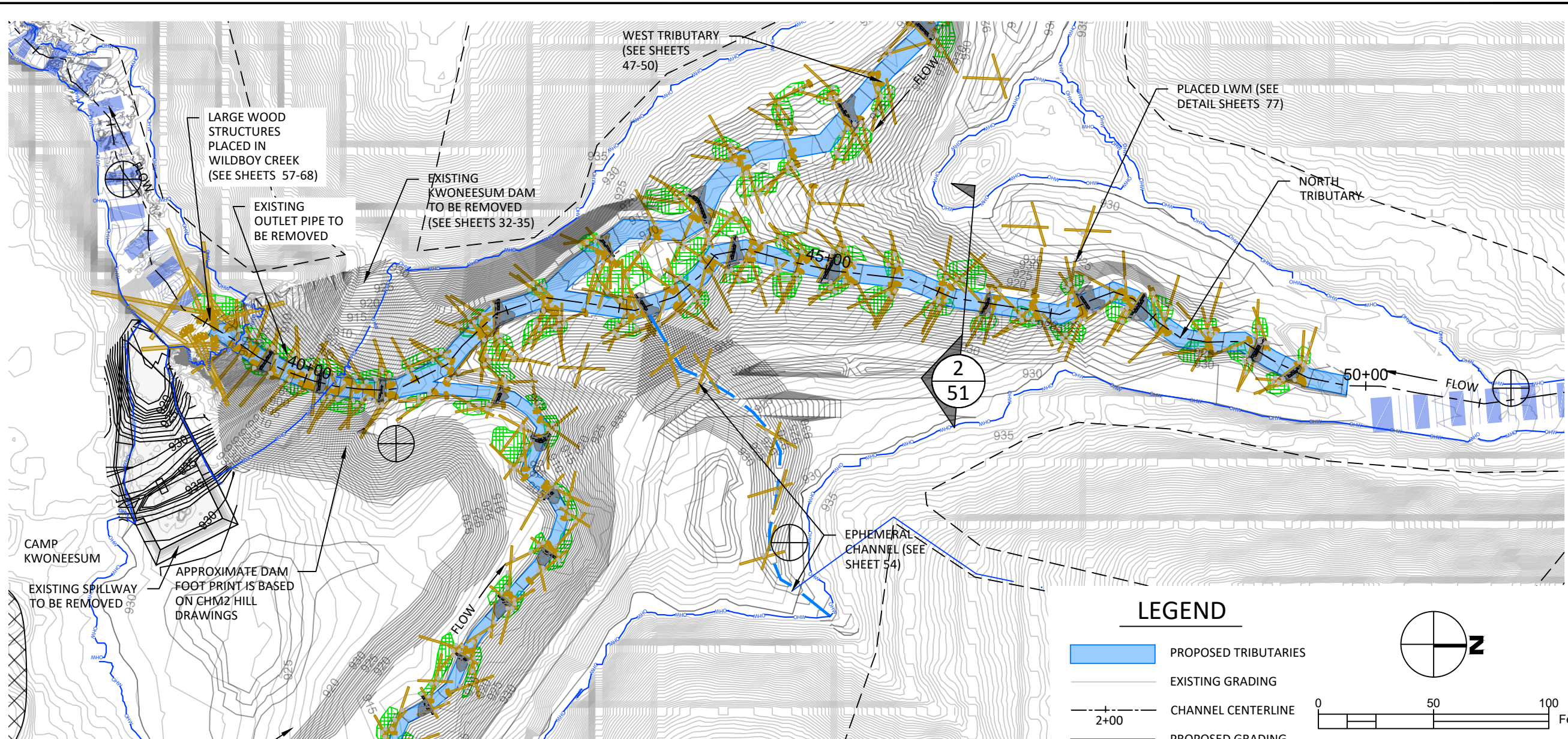
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CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA, 98665

SITE: KWONEESUM DAM REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR AND DAM-NORTH TRIB. GRADING PLAN AND PROFILE

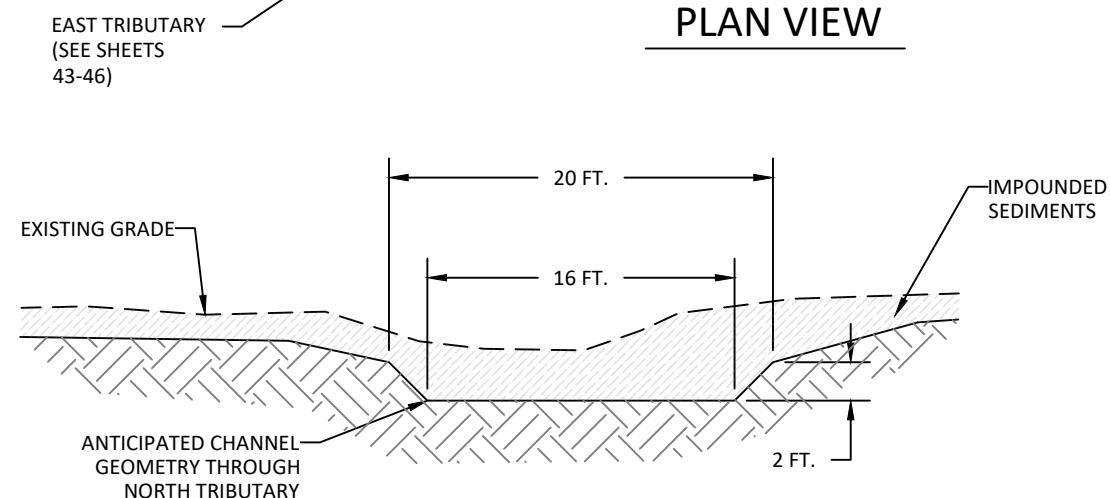
SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 39	Total Sheets: 80	



PLAN VIEW

LEGEND

- PROPOSED TRIBUTARIES
- EXISTING GRADING
- CHANNEL CENTERLINE
- PROPOSED GRADING
- LARGE WOOD MATERIAL (LWM)
- SALVAGED DAM ROCK
- SALVAGED DELTAIC GRAVELS
- PLACED SLASH
- LIMITS OF DISTURBANCE
- ORDINARY HIGH WATER (OHW)



1
40 **TYPICAL CROSS-SECTION: NORTH TRIBUTARY CHANNEL GEOMETRY**
NOT TO SCALE

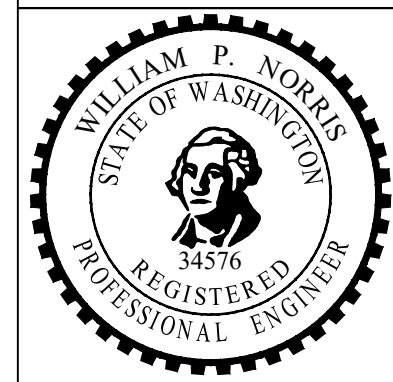
NOTE:
SPECIFIC LOCATION, ALIGNMENT, AND ELEVATIONS OF LOGS, BOULDERS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS MATERIAL SIZE AND STABILITY REQUIREMENTS.

IF DISCRETE BEDROCK DROPS ARE ENCOUNTERED IN RESERVOIR CHANNELS. LARGE WOOD QUANTITIES SHALL REMAIN THE SAME, BUT SOME LARGE WOOD LOCATIONS WILL CHANGE TO BACKWATER THE BEDROCK DROP WITH LOG AND ROCK STEPS THAT ARE LESS THAN 8 INCHES IN HEIGHT.

ALL EXCAVATION CUT AND FILLS ARE PERMANENT. SEE SHEET 24 FOR AREAS AND QUANTITIES.

Notes:

SHEET LOCATION



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

PARR
excellence

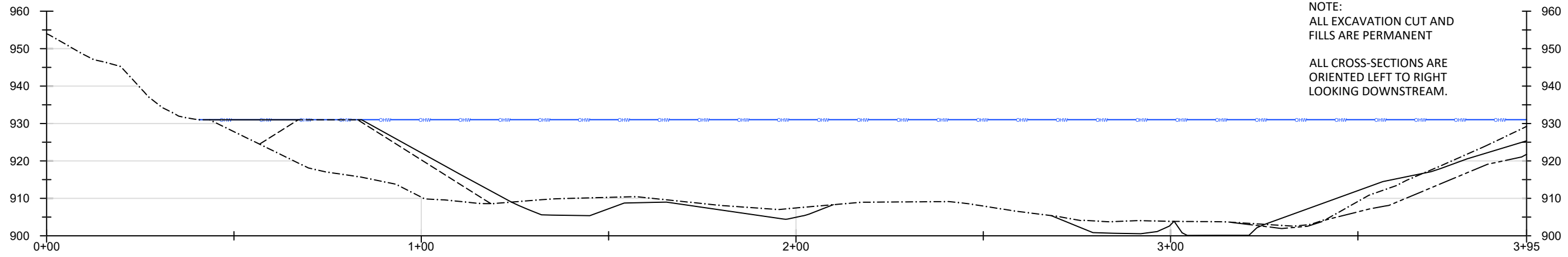
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CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA. 98665

SITE: KWONEESUM DAM REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR AND DAM-NORTH TRIB. LARGE WOOD

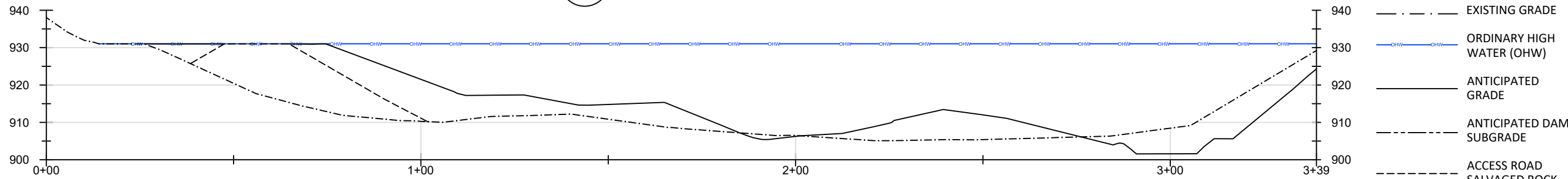
SCALE:	DATE:	DRAWN:	CHECKED:
	6/4/21	RP	BN
PROJ. NO:	DRAWING NO:	Total Sheets:	
-	40	80	



NOTE:
ALL EXCAVATION CUT AND
FILLS ARE PERMANENT

ALL CROSS-SECTIONS ARE
ORIENTED LEFT TO RIGHT
LOOKING DOWNSTREAM.

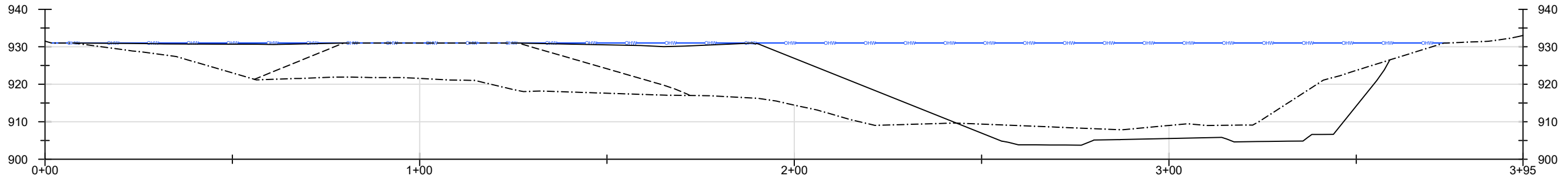
1
41 CROSS-SECTION STA. 41+25



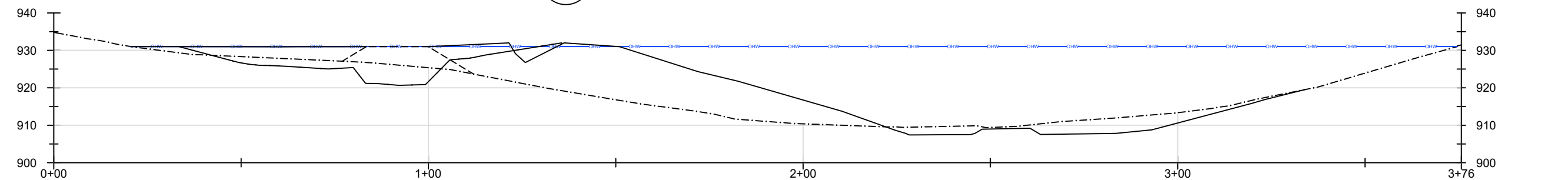
LEGEND

- EXISTING GRADE
- OHW
- ANTICIPATED GRADE
- ANTICIPATED DAM SUBGRADE
- ACCESS ROAD SALVAGED ROCK
- EXISTING DAM TO BE REMOVED

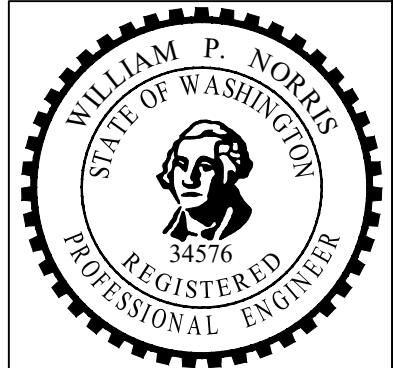
2
41 CROSS-SECTION STA. 42+00



3
41 CROSS-SECTION STA. 43+00



4
41 CROSS-SECTION STA. 44+00



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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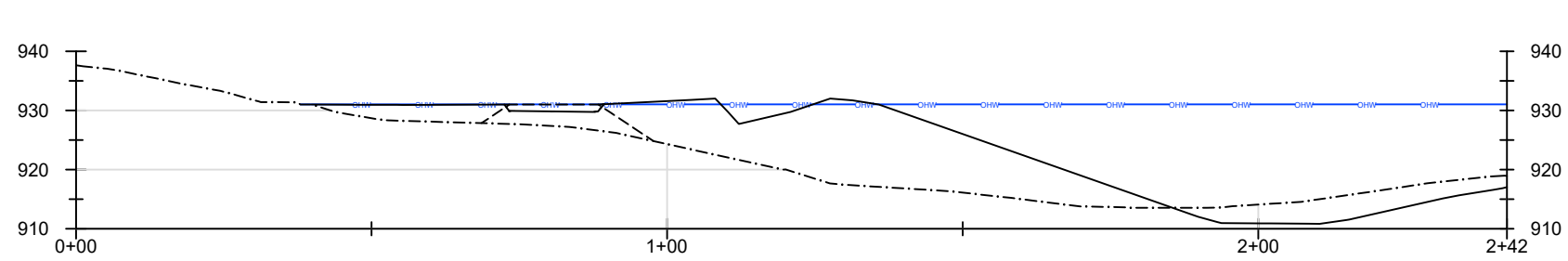
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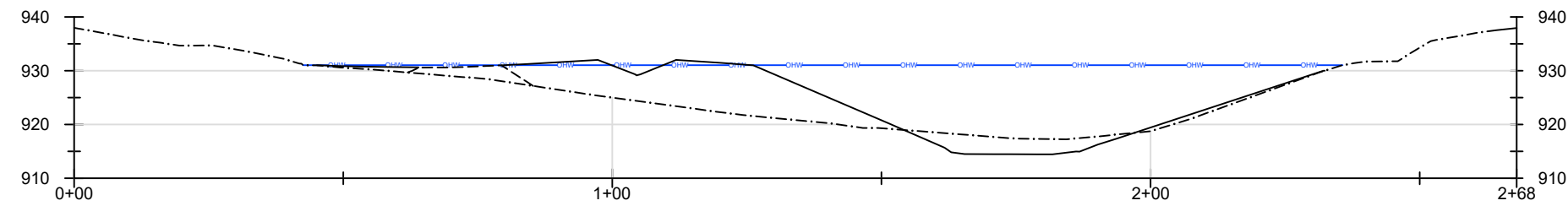
SITE: KWONEESUM DAM
REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR
AND DAM – NORTH TRIB.
GRADING CROSS-SECTIONS

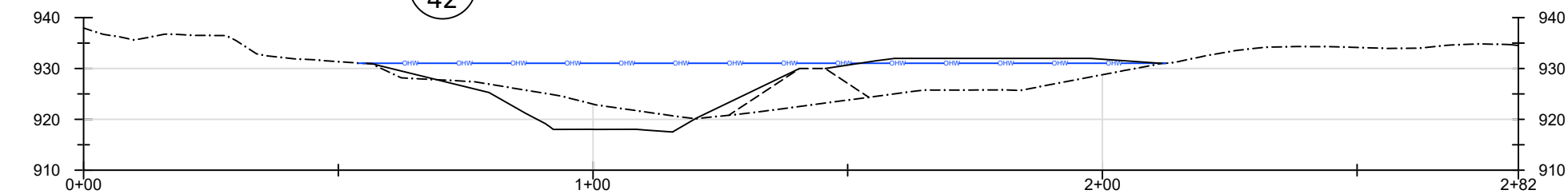
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PROJ. NO: -	DRAWING NO: 41	Total Sheets: 80	



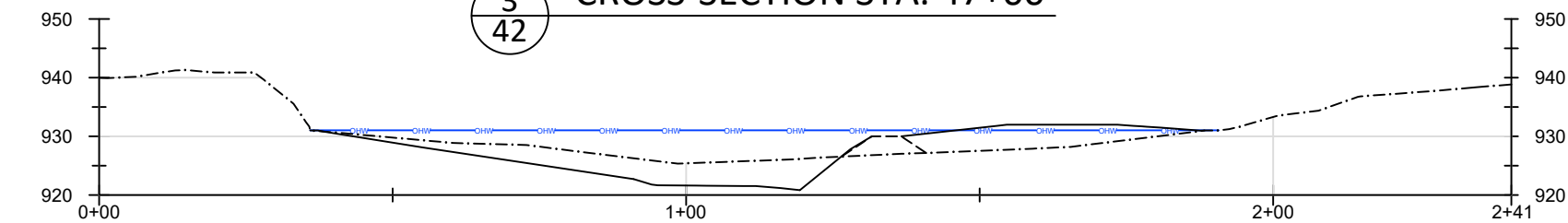
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42 CROSS-SECTION STA. 45+00



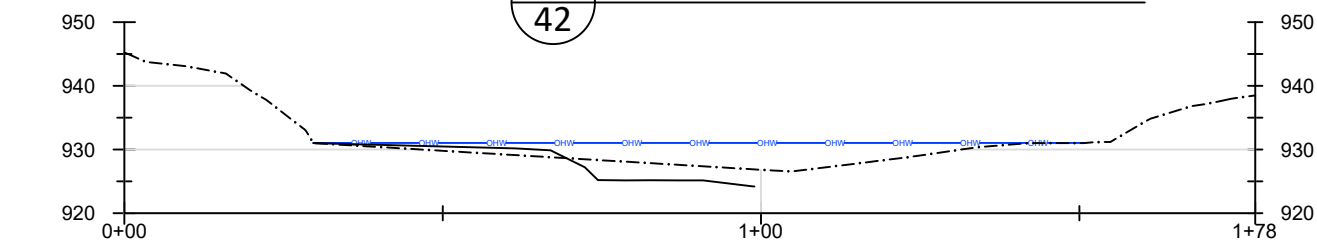
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42 CROSS-SECTION STA. 46+00



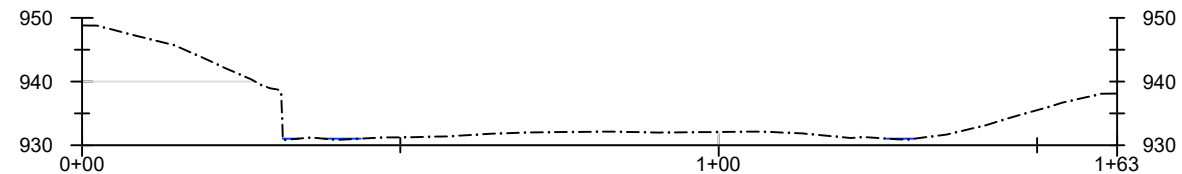
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42 CROSS-SECTION STA. 47+00



4
42 CROSS-SECTION STA. 48+00



5
42 CROSS-SECTION STA. 49+00



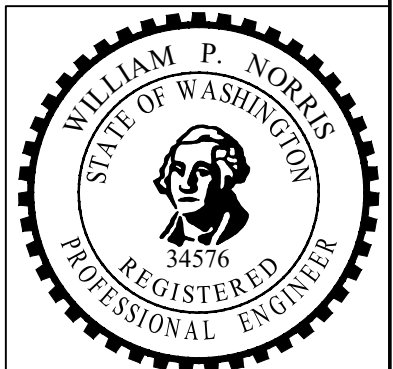
6
42 CROSS-SECTION STA. 50+00

LEGEND

- EXISTING GRADE
- ORDINARY HIGH WATER (OHW)
- ANTICIPATED GRADE
- ACCESS ROAD SALVAGED ROCK
- EXISTING DAM TO BE REMOVED

NOTE:
ALL EXCAVATION CUT AND
FILLS ARE PERMANENT

ALL CROSS-SECTIONS ARE
ORIENTED LEFT TO RIGHT
LOOKING DOWNSTREAM.



3	-	-	-
2	-	-	-
1	-	-	-
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

PARR
excellence

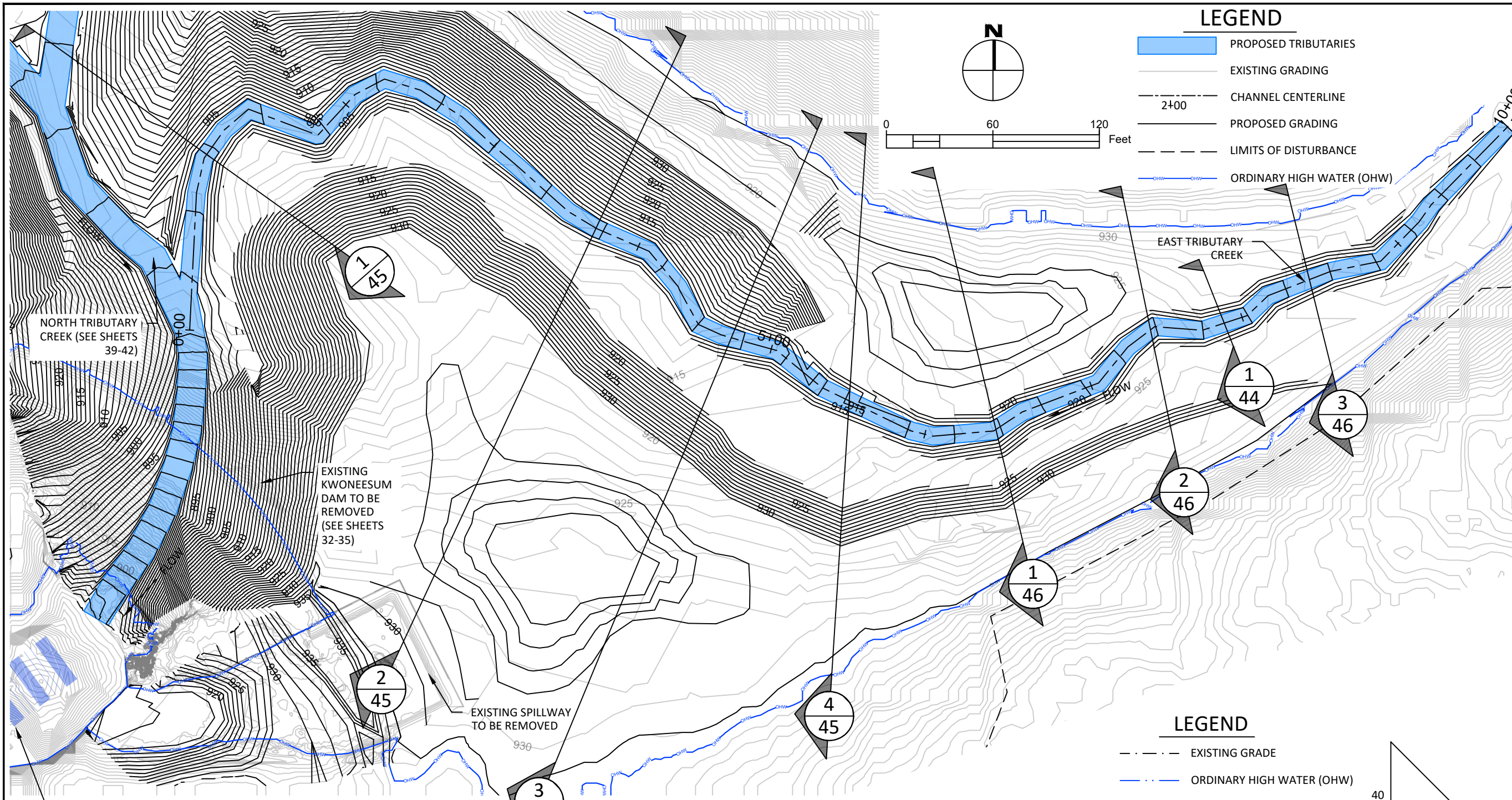
302 W. Steuben St. #6
Bingen, WA 98605 www.ers4life.com

CLIENT: **COWLITZ INDIAN TRIBE**
7700 26TH AVE
VANCOUVER, WA, 98665

SITE: **KWONEESUM DAM
REMOVAL DESIGN**

TITLE: **KWONEESUM RESERVOIR
AND DAM – NORTH TRIB.
GRADING CROSS-SECTIONS**

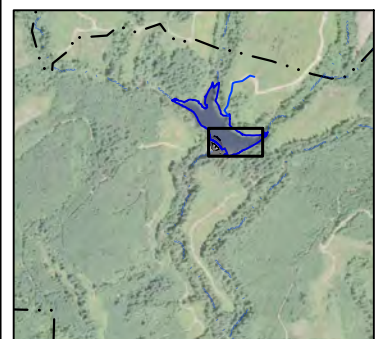
SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 42	Total Sheets: 80	



LEGEND

- PROPOSED TRIBUTARIES
- EXISTING GRADING
- CHANNEL CENTERLINE
- PROPOSED GRADING
- LIMITS OF DISTURBANCE
- ORDINARY HIGH WATER (OHW)

Notes:



SHEET LOCATION



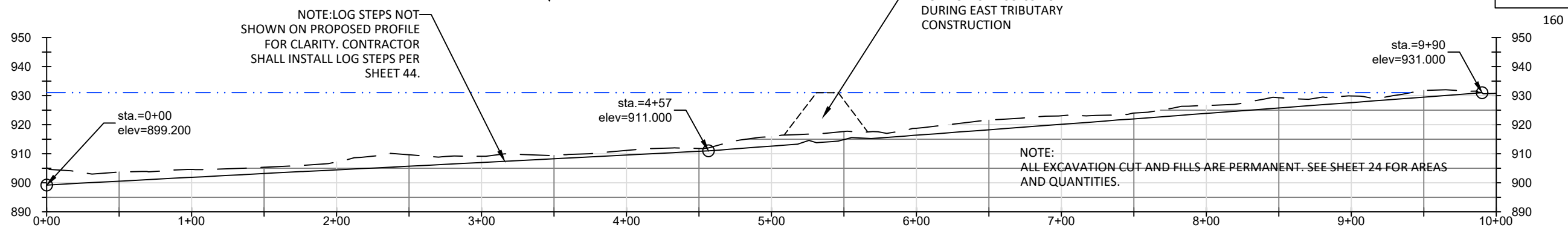
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REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

LEGEND

- EXISTING GRADE
- ORDINARY HIGH WATER (OHW)
- PROPOSED GRADE
- EXISTING DAM TO BE REMOVED

PLAN VIEW

CUT BACK SLOPE AND REGRADE PORTION OF ACCESS ROAD DURING EAST TRIBUTARY CONSTRUCTION



PROFILE VIEW - EAST TRIBUTARY

NOTE: LOG STEPS NOT SHOWN ON PROPOSED PROFILE FOR CLARITY. CONTRACTOR SHALL INSTALL LOG STEPS PER SHEET 44.

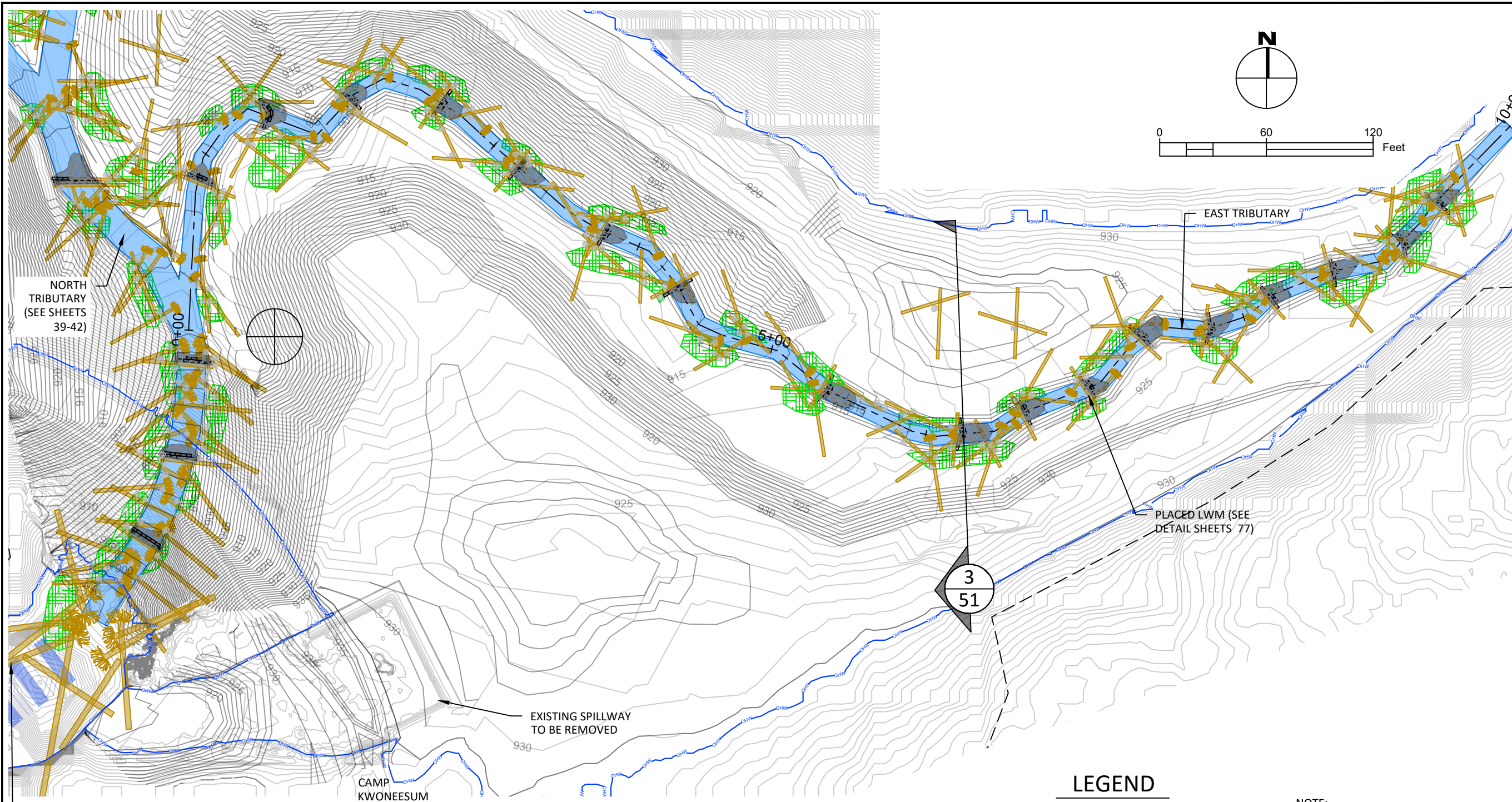
NOTE: ALL EXCAVATION CUT AND FILLS ARE PERMANENT. SEE SHEET 24 FOR AREAS AND QUANTITIES.

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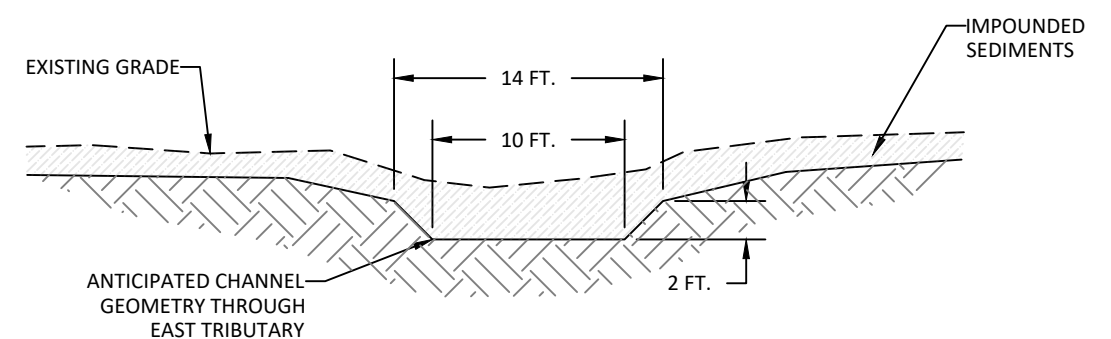
CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA, 98665

SITE: KWONEESUM DAM REMOVAL DESIGN
TITLE: KWONEESUM RESERVOIR AND DAM -EAST TRIB. GRADING PLAN AND PROFILE

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 43	Total Sheets: 80	



PLAN VIEW



1
44 **TYPICAL CROSS-SECTION: EAST TRIBUTARY CHANNEL GEOMETRY**
NOT TO SCALE

LEGEND

- PROPOSED TRIBUTARIES
- EXISTING GRADING
- CHANNEL CENTERLINE
- PROPOSED GRADING
- LARGE WOOD MATERIAL (LWM)
- SALVAGED DAM ROCK
- SALVAGED DELTAIC GRAVELS
- PLACED SLASH
- LIMITS OF DISTURBANCE
- ORDINARY HIGH WATER (OHW)

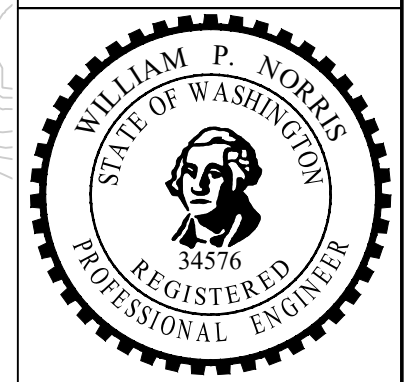
NOTE:
SPECIFIC LOCATION, ALIGNMENT, AND ELEVATIONS OF LOGS, BOULDERS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS MATERIAL SIZE AND STABILITY REQUIREMENTS.

IF DISCRETE BEDROCK DROPS ARE ENCOUNTERED IN RESERVOIR CHANNELS. LARGE WOOD QUANTITIES SHALL REMAIN THE SAME, BUT SOME LARGE WOOD LOCATIONS WILL CHANGE TO BACKWATER THE BEDROCK DROP WITH LOG AND ROCK STEPS THAT ARE LESS THAN 8 INCHES IN HEIGHT.

ALL EXCAVATION CUT AND FILLS ARE PERMANENT. SEE SHEET 24 FOR AREAS AND QUANTITIES.

Notes:

SHEET LOCATION



3			
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REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

PARR
excellence

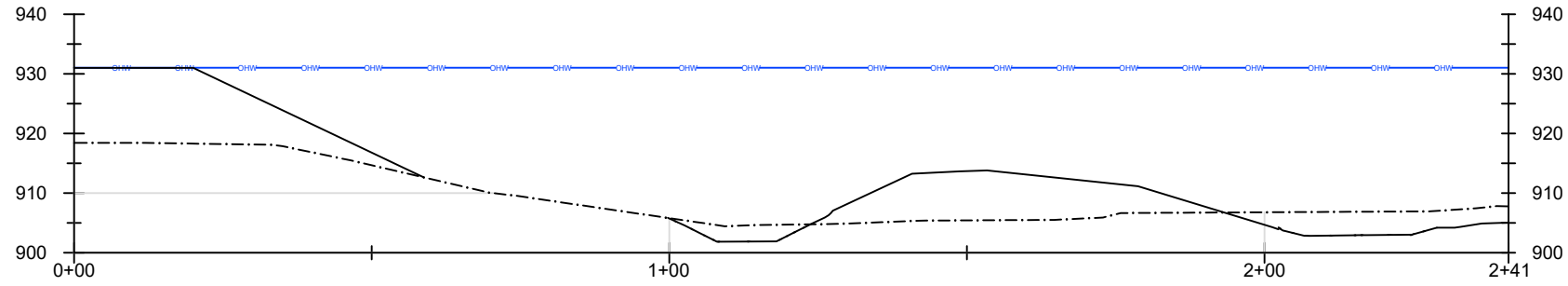
302 W. Steuben St. #6
Bingen, WA 98605
www.ers4life.com

CLIENT: **COWLITZ INDIAN TRIBE**
7700 26TH AVE
VANCOUVER, WA, 98665

SITE: **KWONEESUM DAM REMOVAL DESIGN**

TITLE: **KWONEESUM RESERVOIR AND DAM -EAST TRIB. LARGE WOOD**

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 44	Total Sheets: 80	



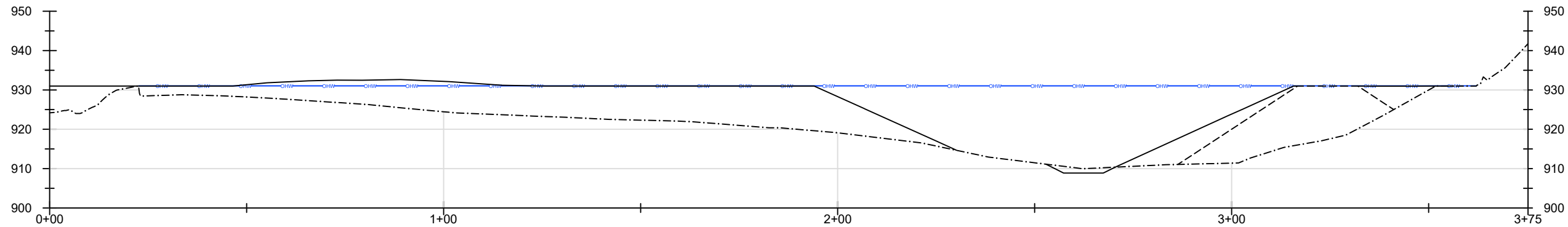
LEGEND

- - - - - EXISTING GRADE
- OHW — OHW ORDINARY HIGH WATER (OHW)
- ANTICIPATED GRADE
- - - - - ACCESS ROAD SALVAGED ROCK
- █ EXISTING DAM TO BE REMOVED

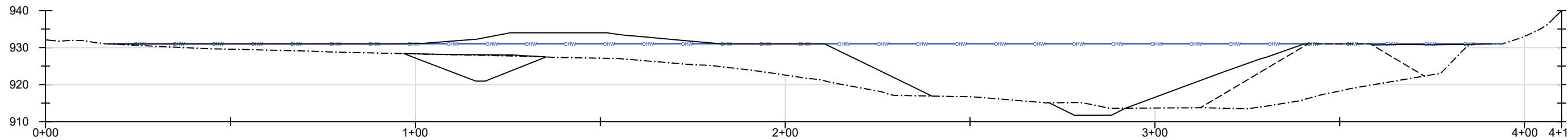
NOTE:
ALL EXCAVATION CUT AND
FILLS ARE PERMANENT

ALL CROSS-SECTIONS ARE
ORIENTED LEFT TO RIGHT
LOOKING DOWNSTREAM.

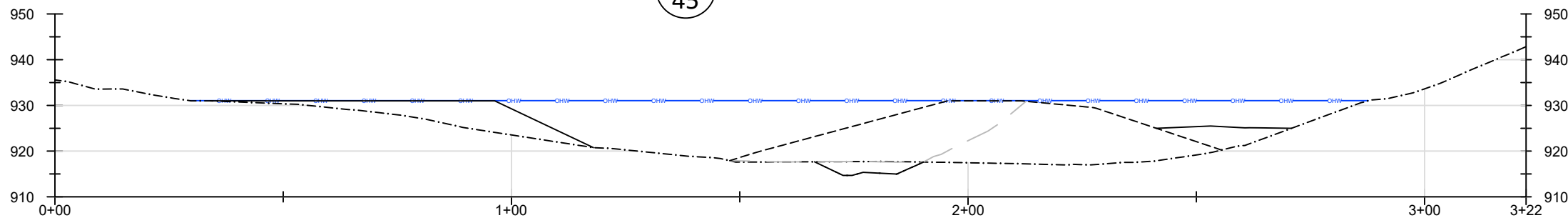
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45 CROSS-SECTION STA. 0+60



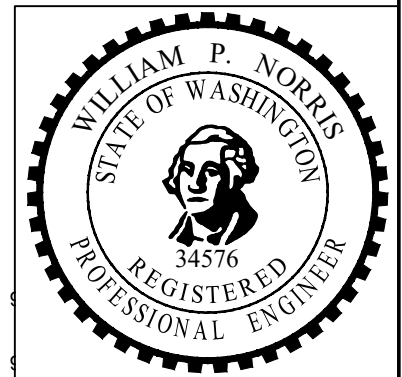
2
45 CROSS-SECTION STA. 2+00



3
45 CROSS-SECTION STA. 3+00



4
45 CROSS-SECTION STA. 4+00



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

PARR
excellence

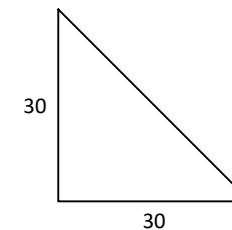
302 W. Steuben St. #6
Bingen, WA 98605 www.ers4life.com

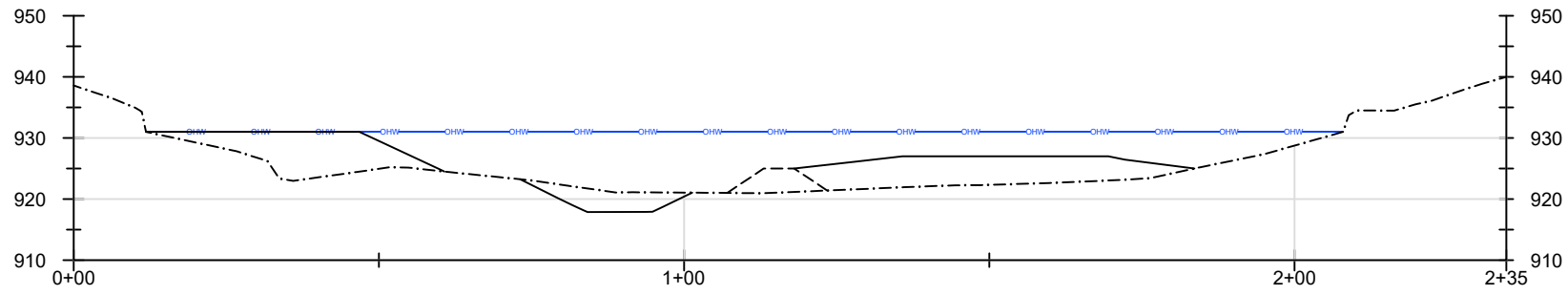
CLIENT: **COWLITZ INDIAN TRIBE**
7700 26TH AVE
VANCOUVER, WA, 98665

SITE: **KWONEESUM DAM
REMOVAL DESIGN**

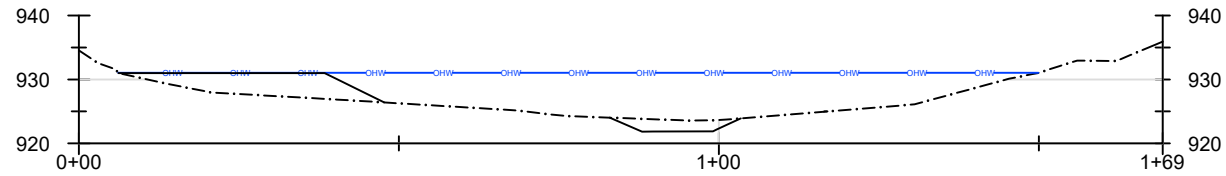
TITLE: **KWONEESUM RESERVOIR
AND DAM – EAST TRIB.
GRADING CROSS-SECTIONS**

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 45	Total Sheets: 80	

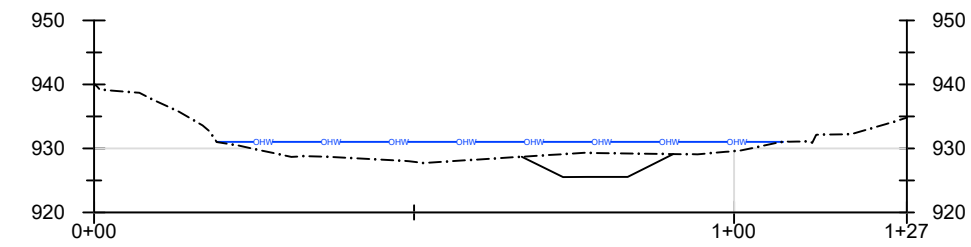




1
46 CROSS-SECTION STA. 5+00



2
46 CROSS-SECTION STA. 6+00



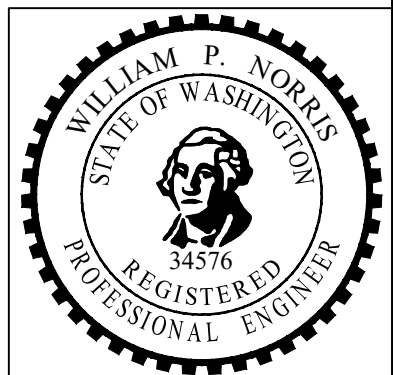
3
46 CROSS-SECTION STA. 7+00

LEGEND

- EXISTING GRADE
- ORDINARY HIGH WATER (OHW)
- ANTICIPATED GRADE
- ACCESS ROAD SALVAGED ROCK
- EXISTING DAM TO BE REMOVED

NOTE:
ALL EXCAVATION CUT AND FILLS ARE PERMANENT

ALL CROSS-SECTIONS ARE ORIENTED LEFT TO RIGHT LOOKING DOWNSTREAM.



3	-	-	-
2	-	-	-
1	-	-	-
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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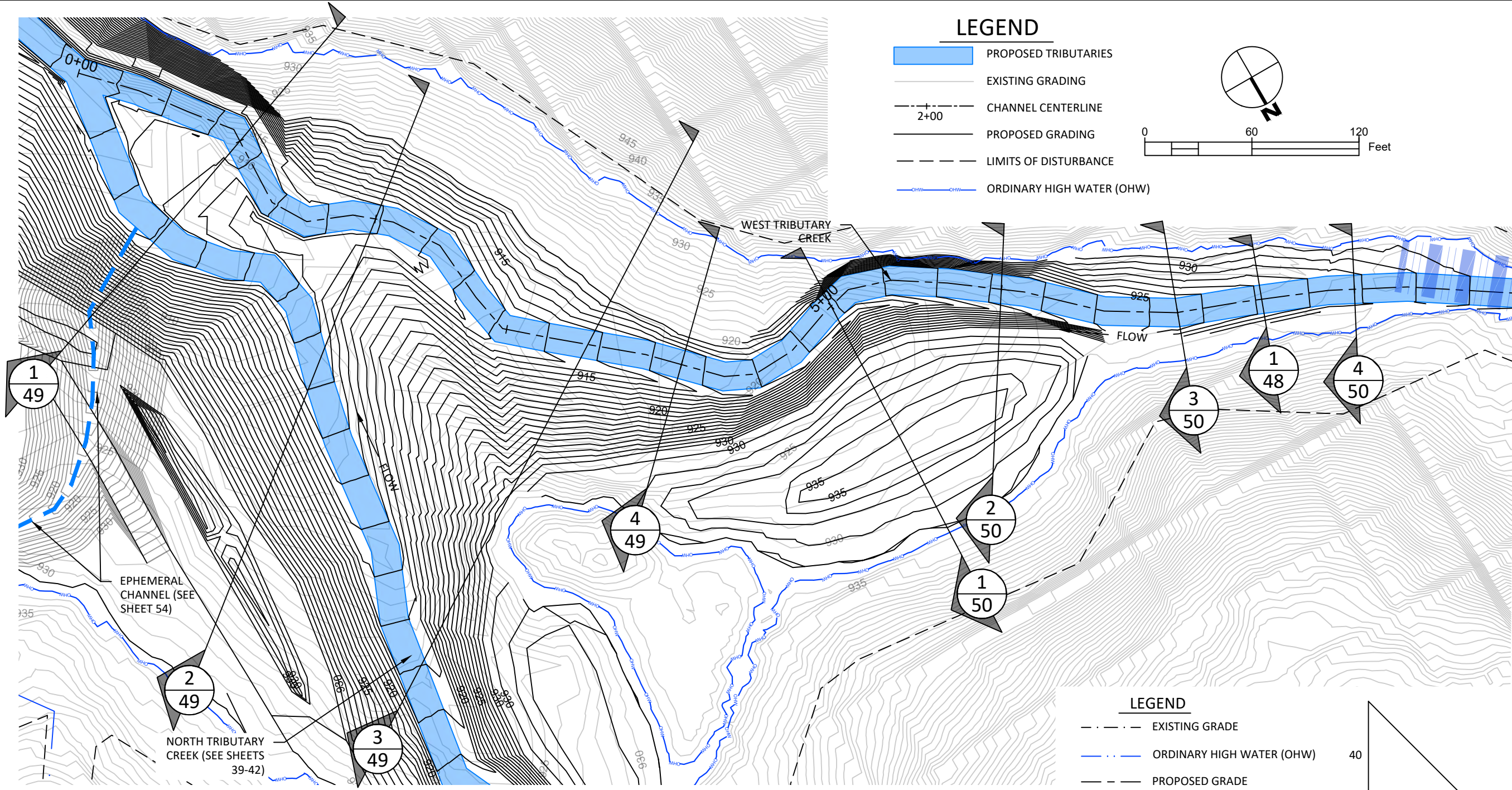
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Bingen, WA 98605 www.ers4life.com

CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA, 98665

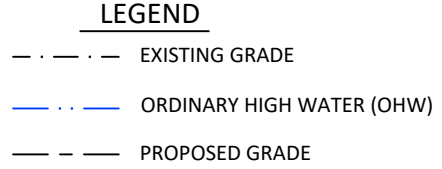
SITE: KWONEESUM DAM REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR AND DAM – EAST TRIB. GRADING CROSS-SECTIONS

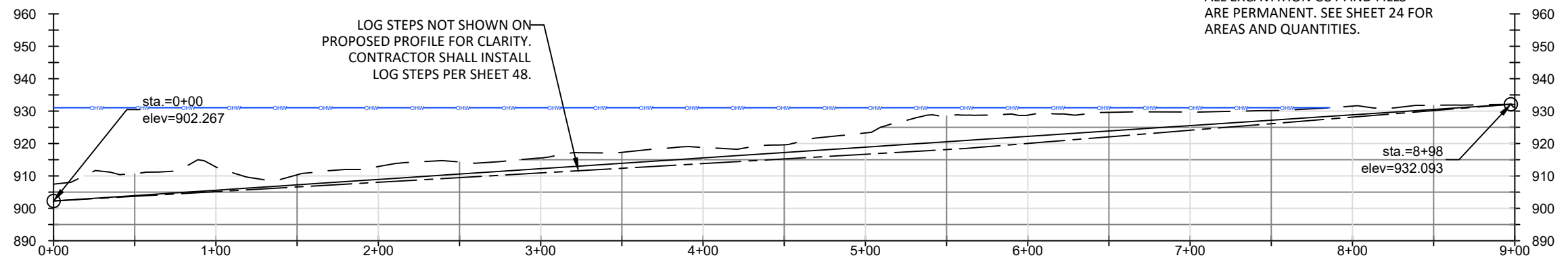
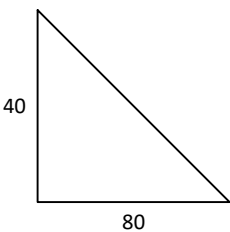
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PROJ. NO: -	DRAWING NO: 46	Total Sheets: 80	



PLAN VIEW



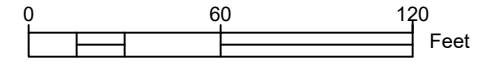
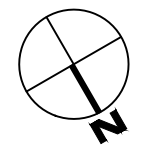
NOTE:
ALL EXCAVATION CUT AND FILLS
ARE PERMANENT. SEE SHEET 24 FOR
AREAS AND QUANTITIES.



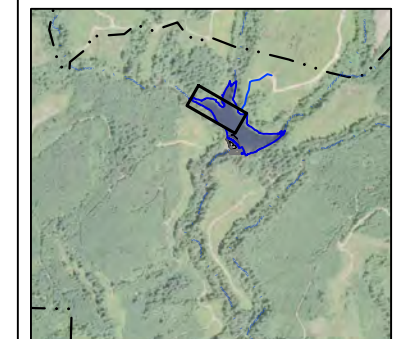
PROFILE VIEW - WEST TRIBUTARY

LEGEND

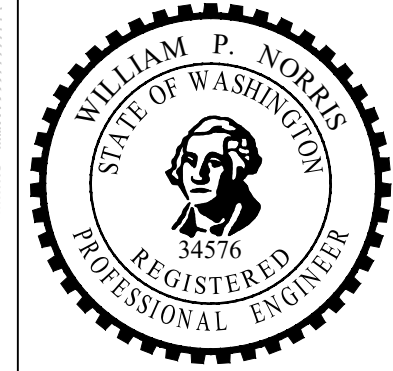
- PROPOSED TRIBUTARIES
- EXISTING GRADING
- CHANNEL CENTERLINE
- PROPOSED GRADING
- LIMITS OF DISTURBANCE
- ORDINARY HIGH WATER (OHW)



Notes:



SHEET LOCATION



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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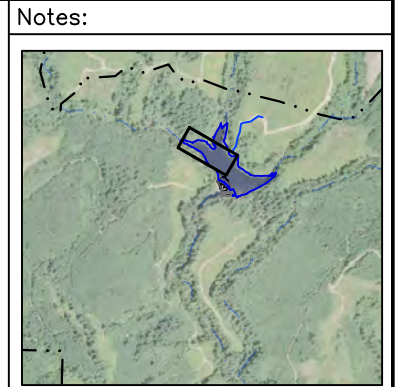
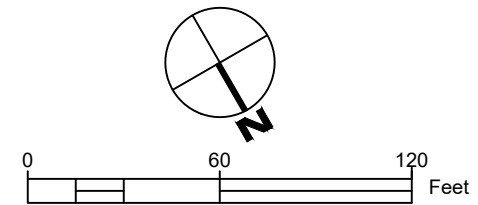
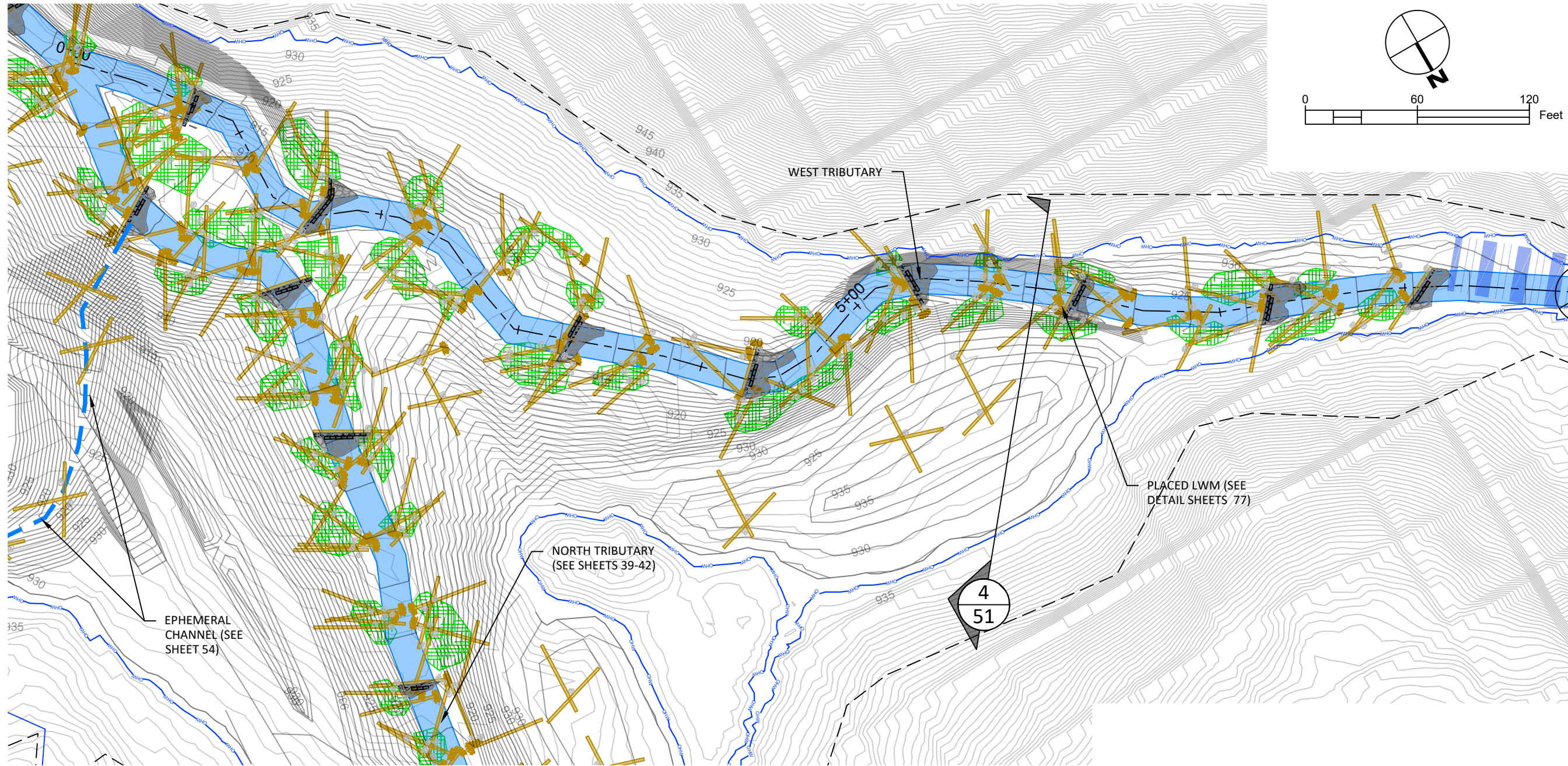
302 W. Steuben St. #6
Bingen, WA 98605 www.ers4life.com

CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA. 98665

SITE: KWONEESUM DAM
REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR
AND DAM - WEST TRIB.
GRADING PLAN AND
PROFILE

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 47	Total Sheets: 80	



SHEET LOCATION



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

LEGEND

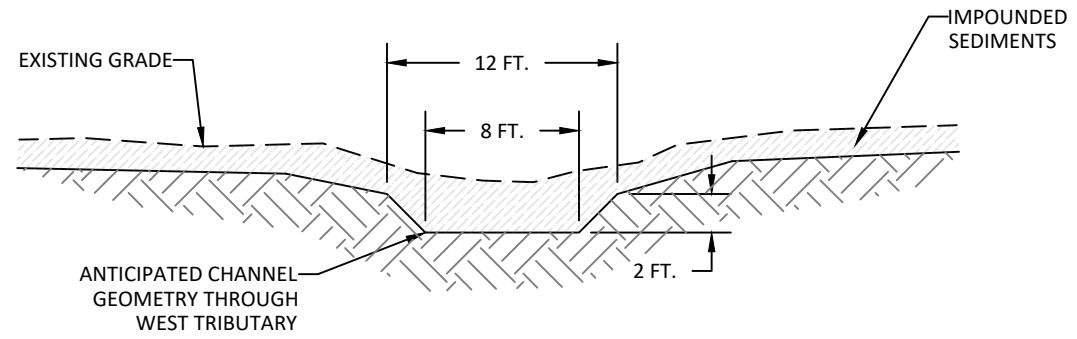
- PROPOSED TRIBUTARIES
- EXISTING GRADING
- CHANNEL CENTERLINE
- PROPOSED GRADING
- LARGE WOOD MATERIAL (LWM)
- SALVAGED DAM ROCK
- SALVAGED DELTAIC GRAVELS
- PLACED SLASH
- LIMITS OF DISTURBANCE
- ORDINARY HIGH WATER (OHW)

PLAN VIEW

NOTES:
 SPECIFIC LOCATION, ALIGNMENT, AND ELEVATIONS OF LOGS, BOULDERS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS MATERIAL SIZE AND STABILITY REQUIREMENTS.

IF DISCRETE BEDROCK DROPS ARE ENCOUNTERED IN RESERVOIR CHANNELS. LARGE WOOD QUANTITIES SHALL REMAIN THE SAME, BUT SOME LARGE WOOD LOCATIONS WILL CHANGE TO BACKWATER THE BEDROCK DROP WITH LOG AND ROCK STEPS THAT ARE LESS THAN 8 INCHES IN HEIGHT.

ALL EXCAVATION CUT AND FILLS ARE PERMANENT. SEE SHEET 24 FOR AREAS AND QUANTITIES.



1
48 TYPICAL CROSS-SECTION: WEST TRIBUTARY CHANNEL GEOMETRY
NOT TO SCALE

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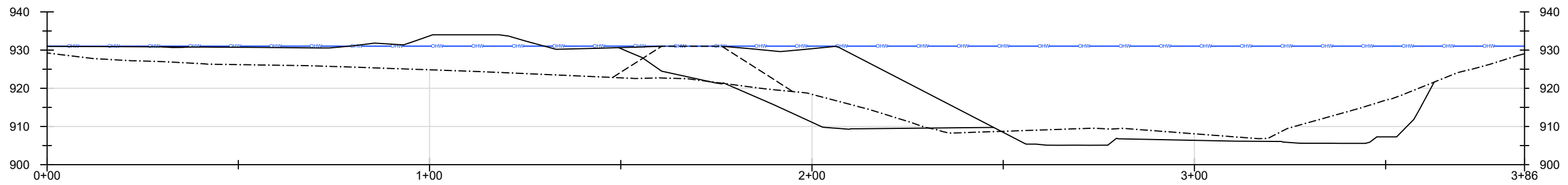
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Bingen, WA 98605 www.ers4life.com

CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA. 98665

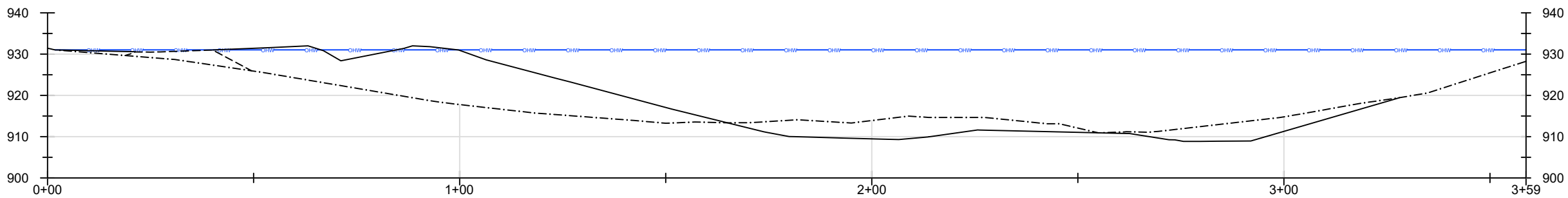
SITE: KWONEESUM DAM REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR AND DAM - WEST TRIB. LARGE WOOD

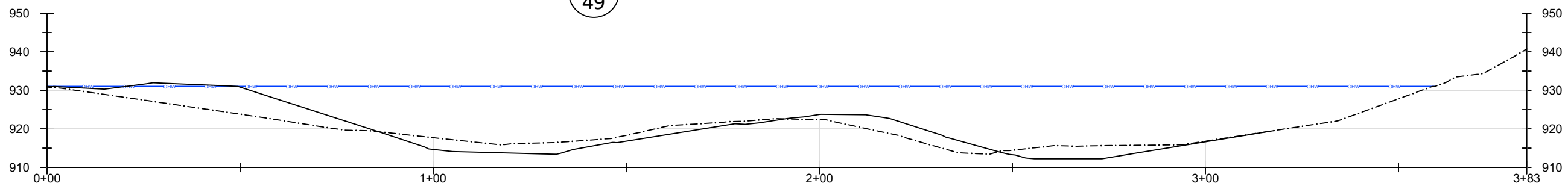
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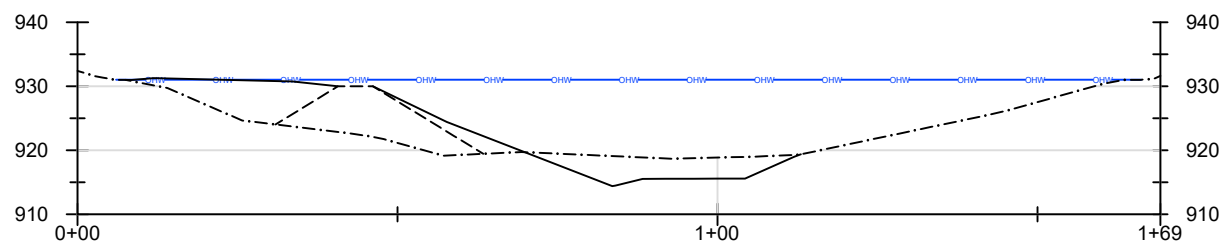
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49 CROSS-SECTION STA. 1+00



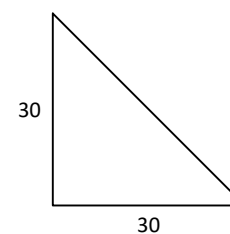
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49 CROSS-SECTION STA. 2+00



3
49 CROSS-SECTION STA. 3+00



4
49 CROSS-SECTION STA. 4+00

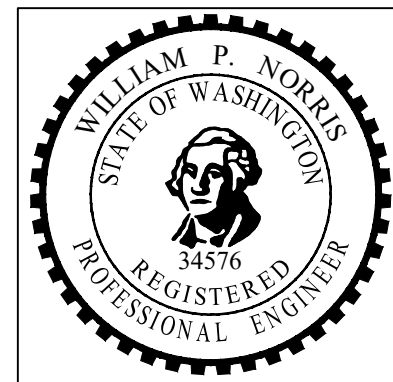


LEGEND

- EXISTING GRADE
- OHW — OHW — ORDINARY HIGH WATER (OHW)
- ANTICIPATED GRADE
- - - ACCESS ROAD SALVAGED ROCK
- █ EXISTING DAM TO BE REMOVED

NOTES:
ALL EXCAVATION CUT AND FILLS ARE PERMANENT.

ALL CROSS-SECTIONS ARE ORIENTED LEFT TO RIGHT LOOKING DOWNSTREAM.



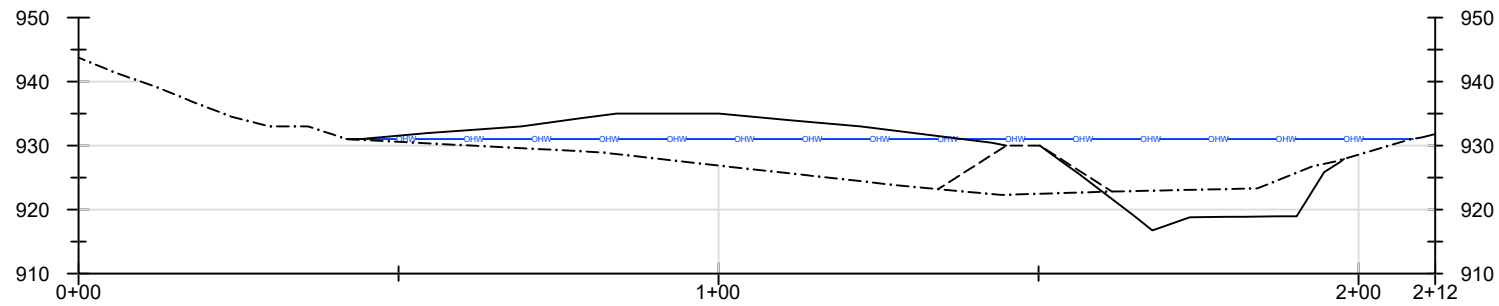
3			
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1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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Bingen, WA 98605
www.ers4life.com

CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA, 98665

SITE: KWONEESUM DAM REMOVAL DESIGN
TITLE: KWONEESUM RESERVOIR AND DAM – WEST TRIB. GRADING CROSS-SECTIONS

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 49	Total Sheets: 80	



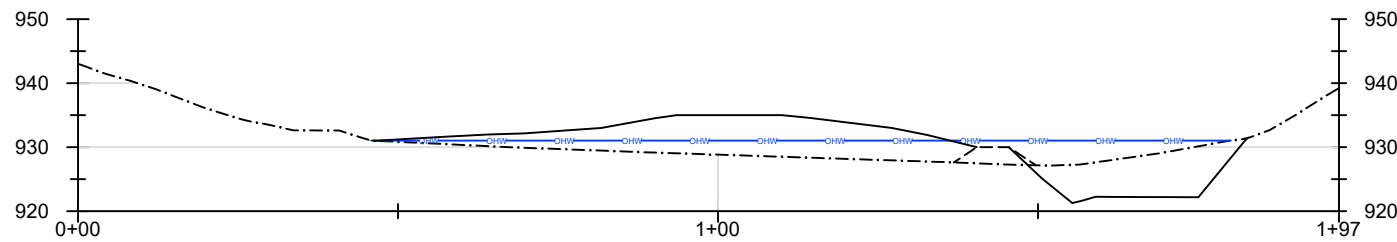
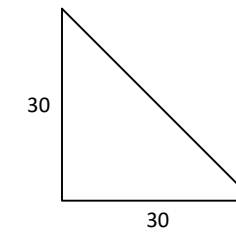
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50 CROSS-SECTION STA. 5+00

LEGEND

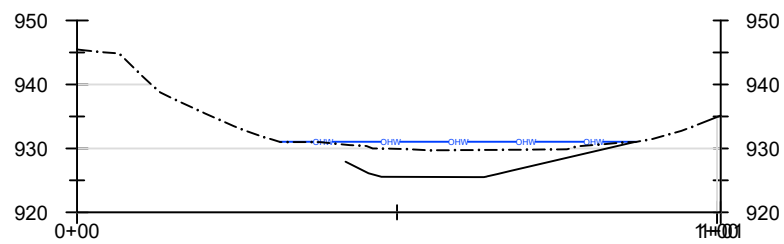
- - - - - EXISTING GRADE
- OHW — ORDINARY HIGH WATER (OHW)
- ANTICIPATED GRADE
- - - - - ACCESS ROAD SALVAGED ROCK

NOTES:
ALL EXCAVATION CUT AND
FILLS ARE PERMANENT.

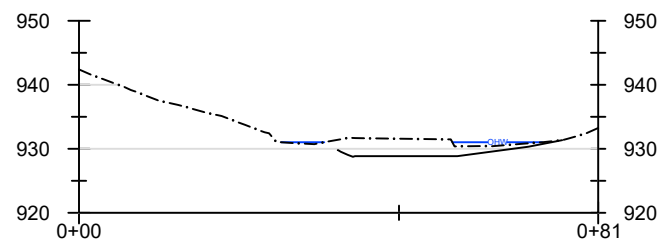
ALL CROSS-SECTIONS ARE
ORIENTED LEFT TO RIGHT
LOOKING DOWNSTREAM.



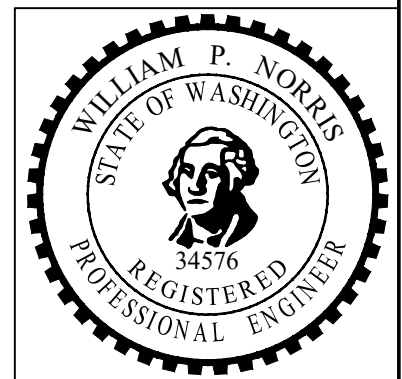
2
50 CROSS-SECTION STA. 6+00



3
50 CROSS-SECTION STA. 7+00



4
50 CROSS-SECTION STA. 8+00



3	-	-	-
2	-	-	-
1	-	-	-
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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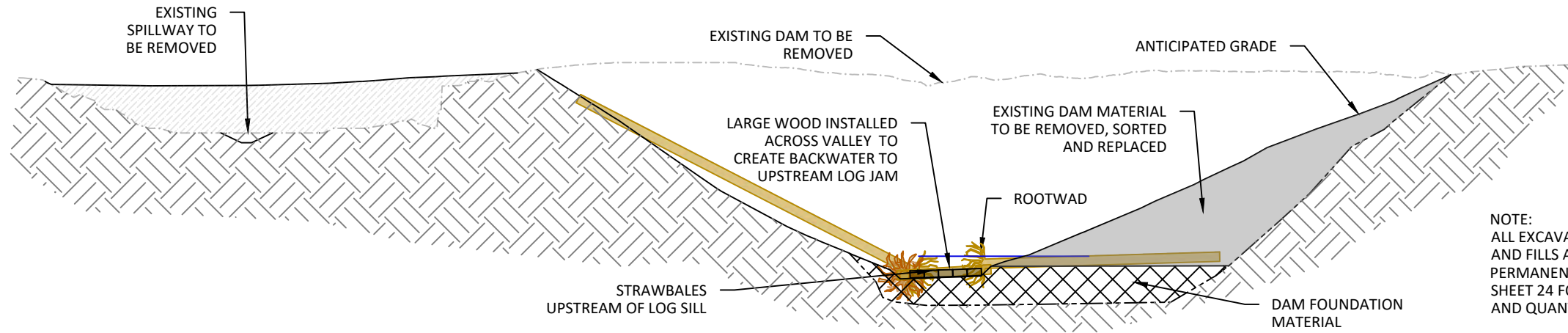
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Bingen, WA 98605
www.ers4life.com

CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA, 98665

SITE: KWONEESUM DAM
REMOVAL DESIGN

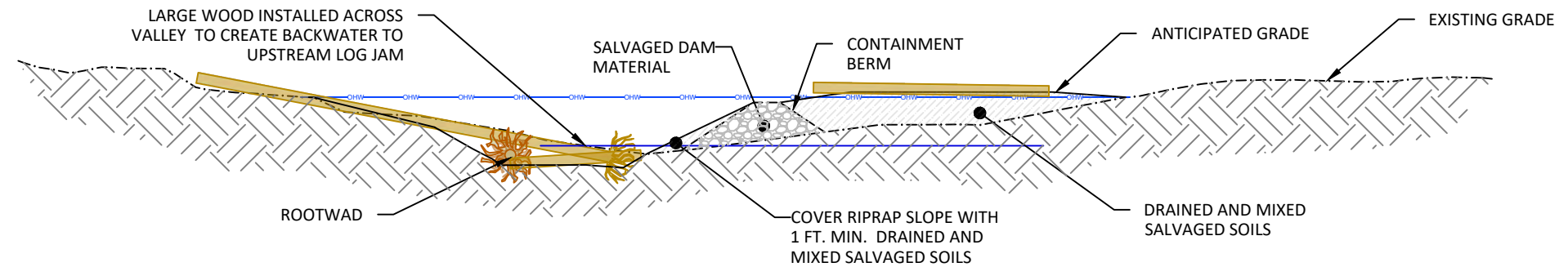
TITLE:
KWONEESUM RESERVOIR
AND DAM – WEST TRIB.
GRADING CROSS-SECTIONS

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 50	Total Sheets: 80	

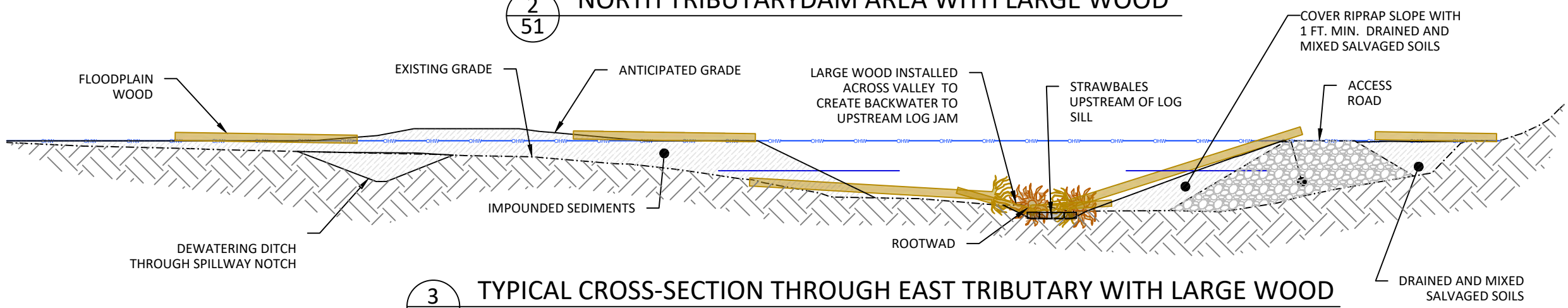


NOTE:
ALL EXCAVATION CUT
AND FILLS ARE
PERMANENT. SEE
SHEET 24 FOR AREAS
AND QUANTITIES.

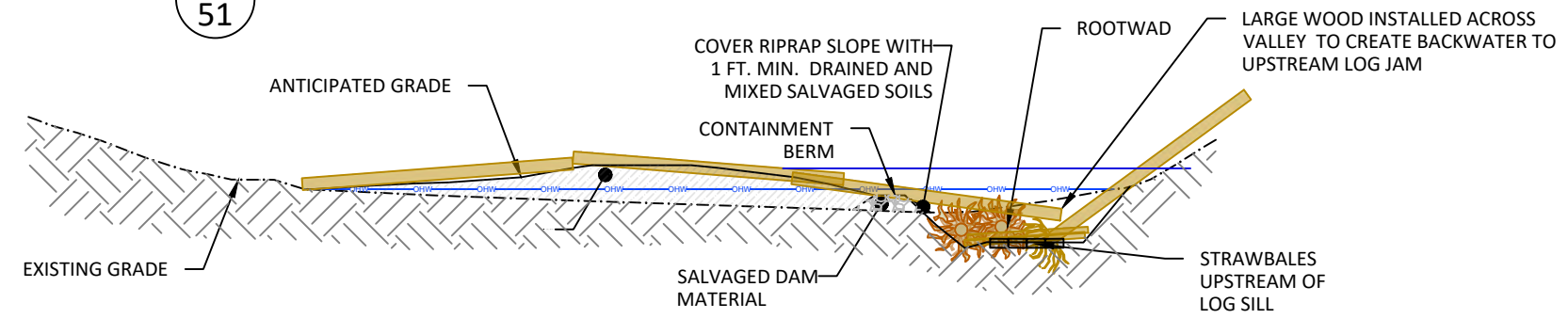
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51
TYPICAL CROSS-SECTION THROUGH DAM AREA WITH LARGE WOOD



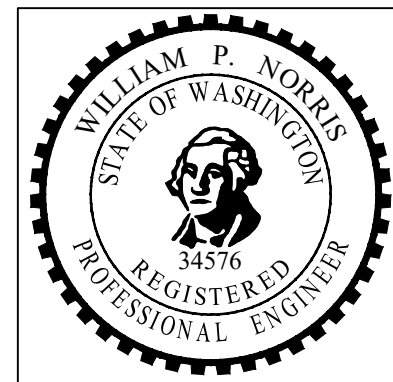
2
51
NORTH TRIBUTARY DAM AREA WITH LARGE WOOD



3
51
TYPICAL CROSS-SECTION THROUGH EAST TRIBUTARY WITH LARGE WOOD



4
51
TYPICAL CROSS-SECTION THROUGH WEST TRIBUTARY WITH LARGE WOOD



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

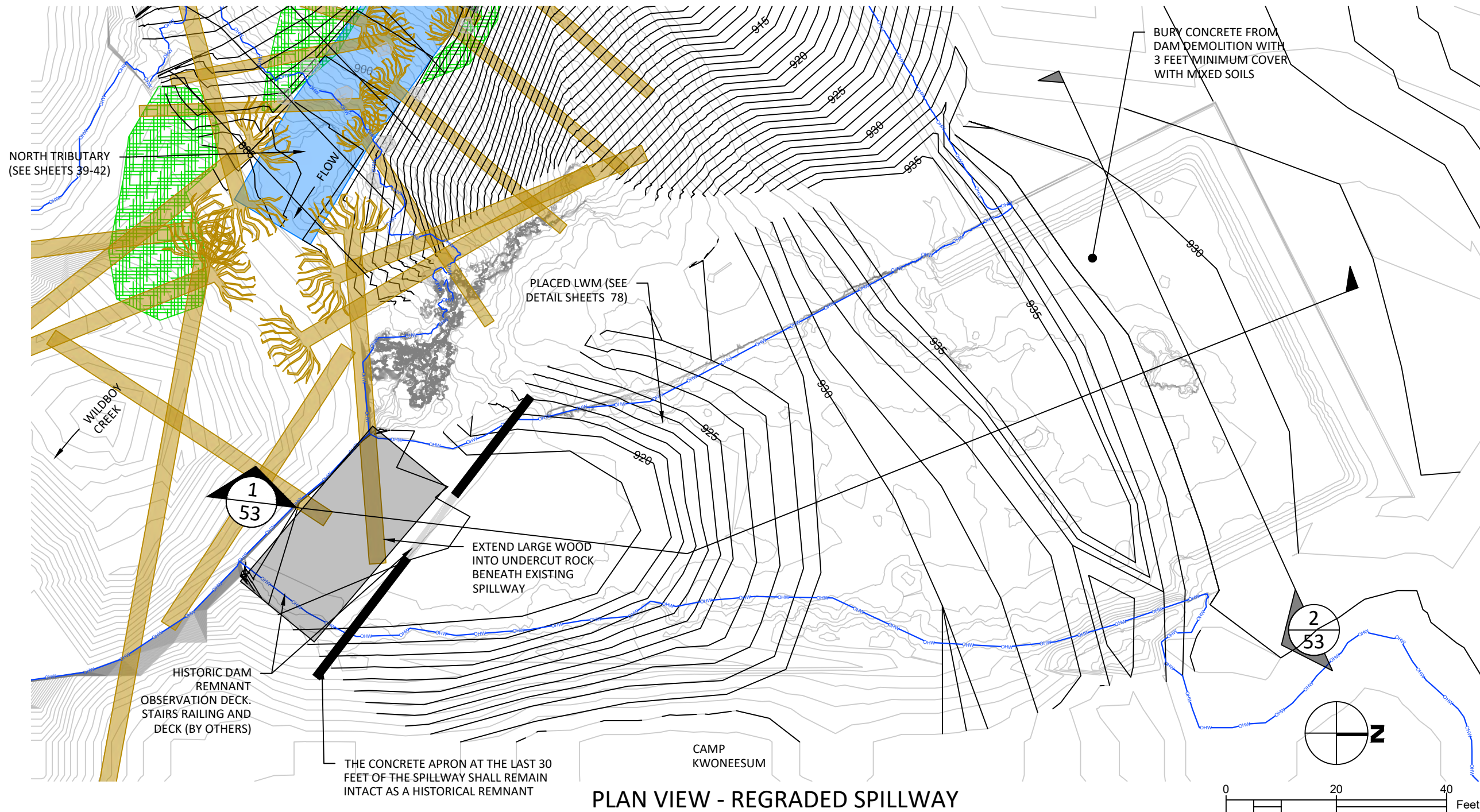
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Bingen, WA 98605
www.ers4life.com

CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA, 98665

SITE: KWONEESUM DAM
REMOVAL DESIGN

TITLE: KWONEESUM DAM AND
RESEVOIR - TYPICAL LARGE
WOOD CROSS-SECTIONS

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 51	Total Sheets: 80	



PLAN VIEW - REGRADED SPILLWAY

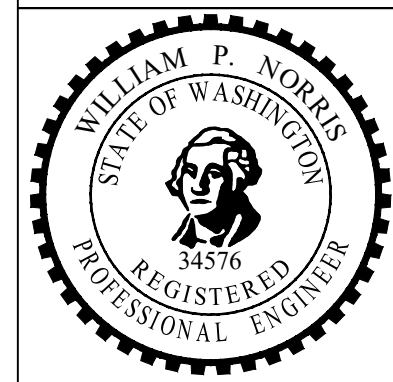
LEGEND

- | | | | |
|--|--|--|-----------------------------|
| | PROPOSED TRIBUTARIES | | EXISTING SPILLWAY FOOTPRINT |
| | EXISTING GRADING | | SPILLWAY CONCRETE (REMOVED) |
| | CHANNEL CENTERLINE | | SPILLWAY NOTCH DITCH |
| | PROPOSED GRADING | | TEMPORARY ACCESS ROADS |
| | PLACED FELLED TREES INTO LARGE WOOD JAMS (LWM) | | STRAWBALES |
| | FLOODPLAIN WOOD | | SLASH |
| | | | LIMITS OF DISTURBANCE |
| | | | ORDINARY HIGH WATER (OHW) |

NOTE:
EXCAVATION SHOWN IS
OUTSIDE JURISDICTIONAL
BOUNDARIES.

Notes:

SHEET LOCATION



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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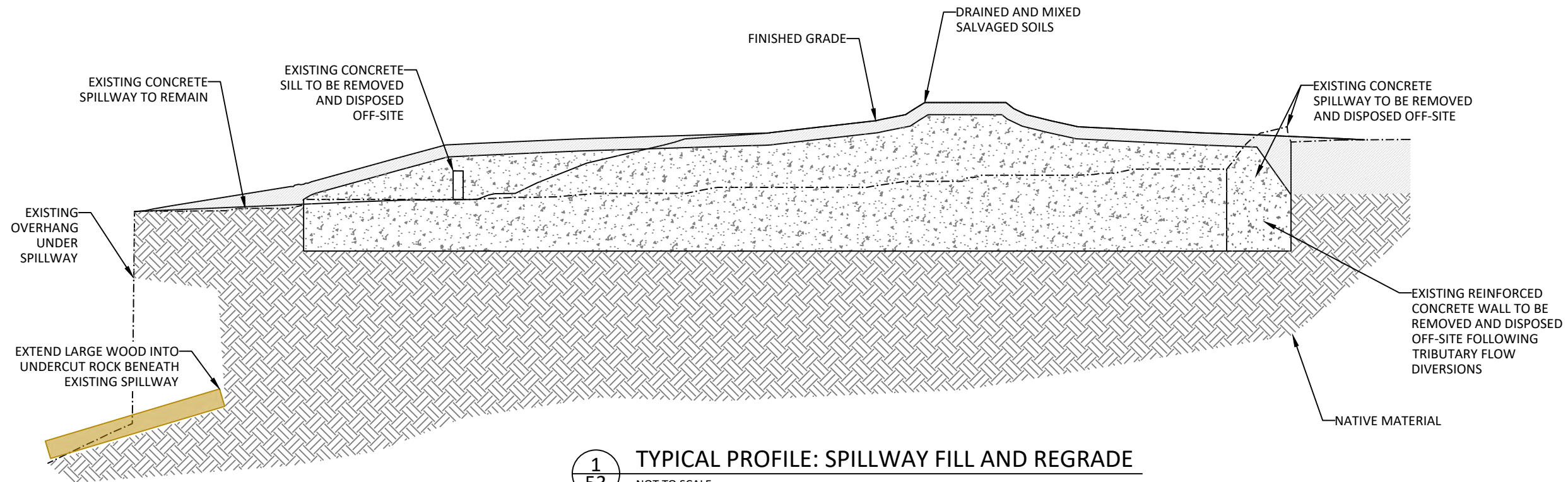
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VANCOUVER, WA, 98665

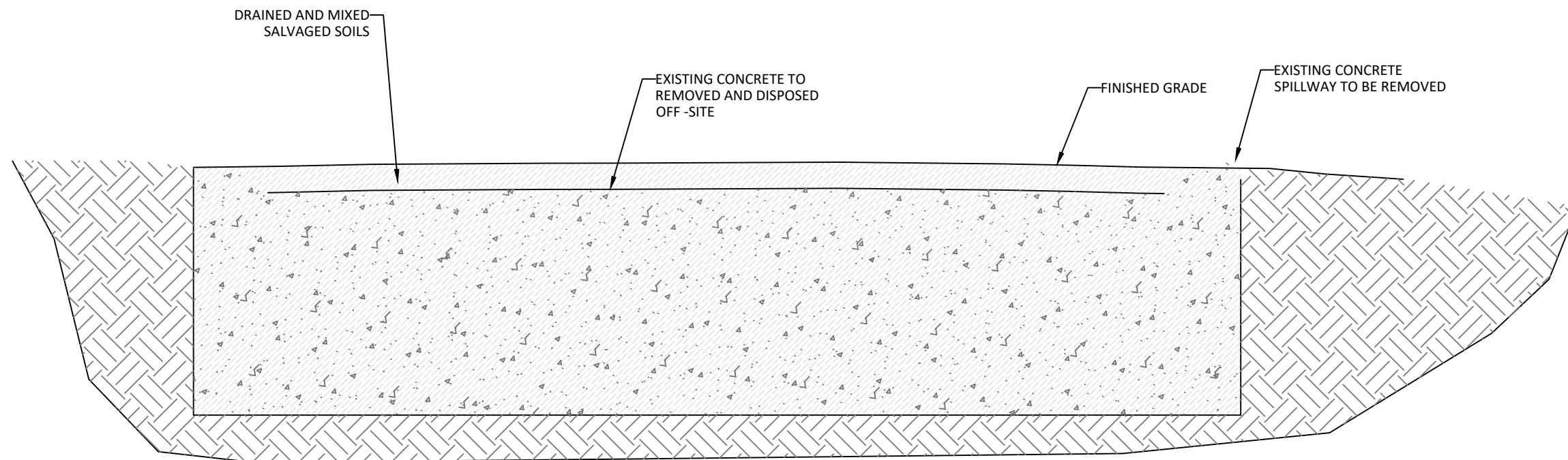
SITE: KWONEESUM DAM REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR AND DAM - SPILLWAY PLAN AND PROFILE

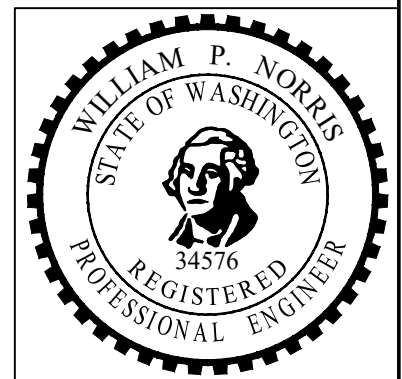
SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 52	Total Sheets: 80	



1
53
TYPICAL PROFILE: SPILLWAY FILL AND REGRADE
NOT TO SCALE



2
53
TYPICAL CROSS-SECTION: SPILLWAY FILL AND REGRADE
NOT TO SCALE



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

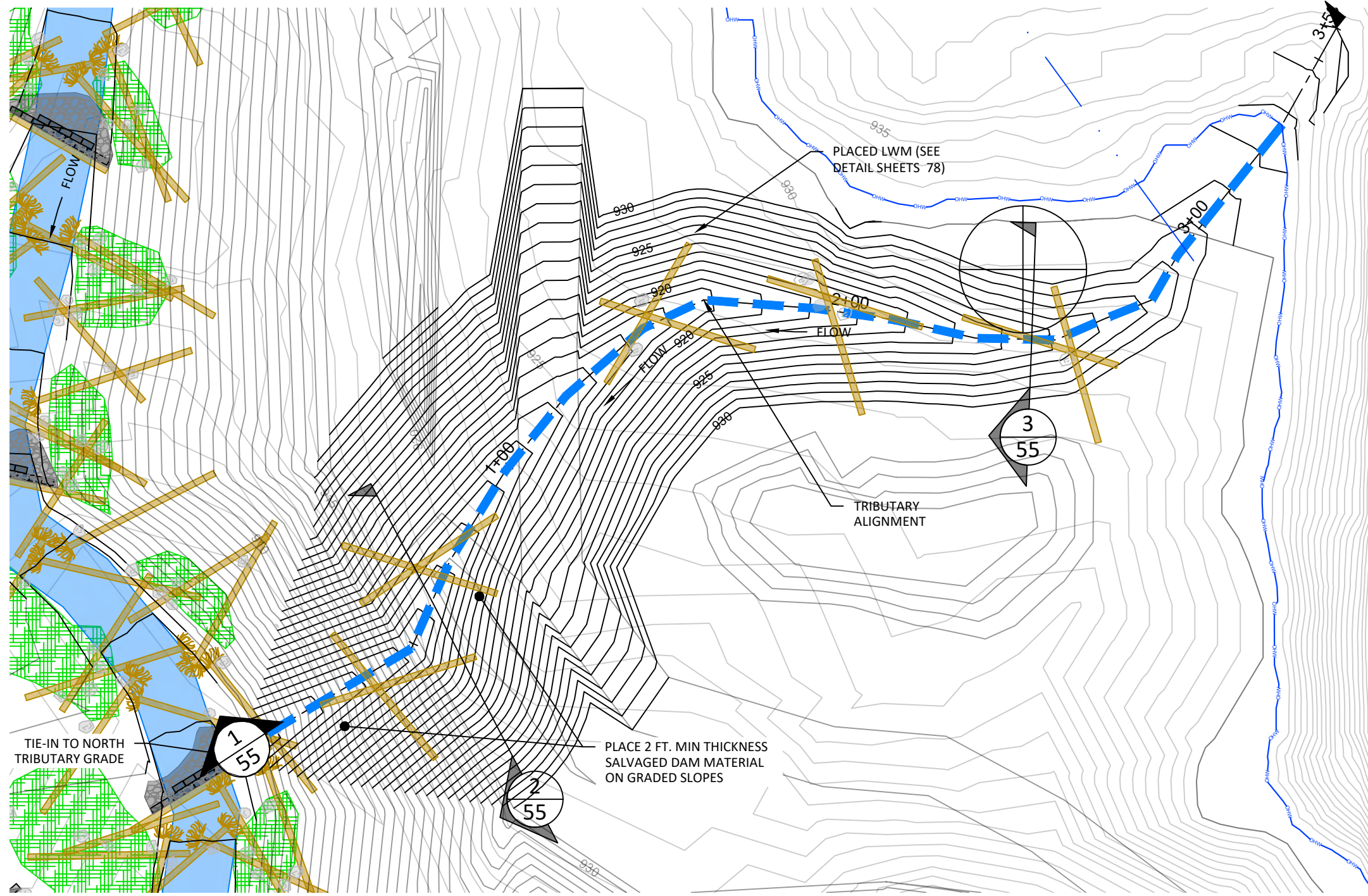
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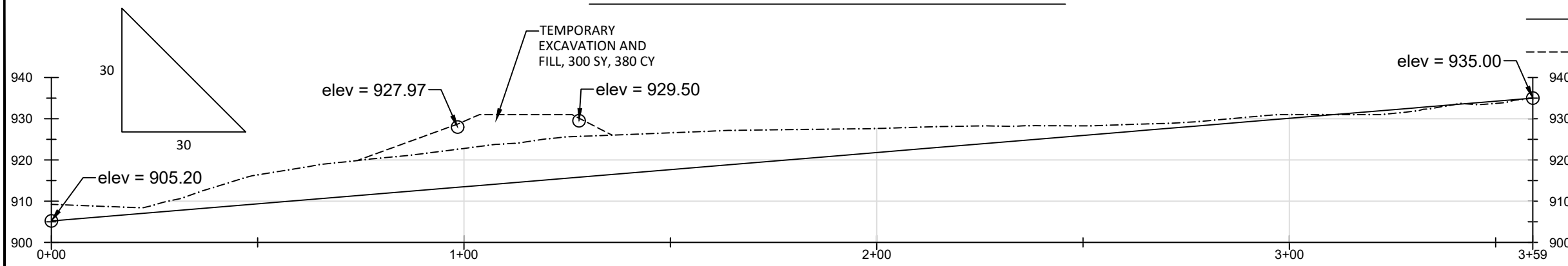
SITE: **KWONEESUM DAM
REMOVAL DESIGN**

TITLE: **KWONEESUM RESERVOIR
AND DAM - SPILLWAY
CROSS-SECTIONS**

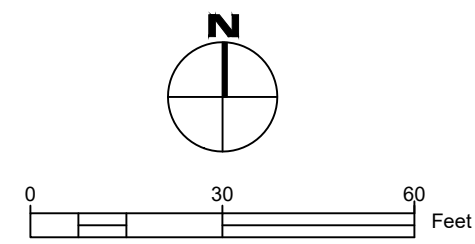
SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 53	Total Sheets: 80	



PLAN VIEW - EPHEMERAL TRIBUTARY



PROFILE VIEW - EPHEMERAL TRIBUTARY



LEGEND

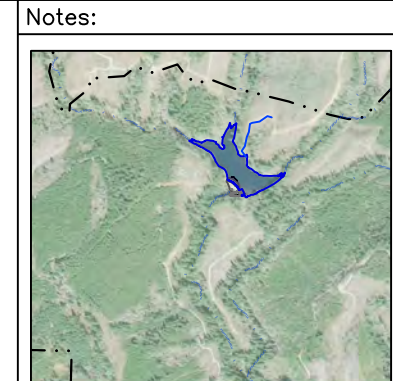
- PROPOSED TRIBUTARIES
- EXISTING GRADING
- CHANNEL CENTERLINE 2+00
- PROPOSED GRADING
- PLACED FELLED TREES INTO LARGE WOOD JAMS (LWM)
- FLOODPLAIN WOOD
- SLASH
- LIMITS OF DISTURBANCE
- ORDINARY HIGH WATER (OHW)

LEGEND

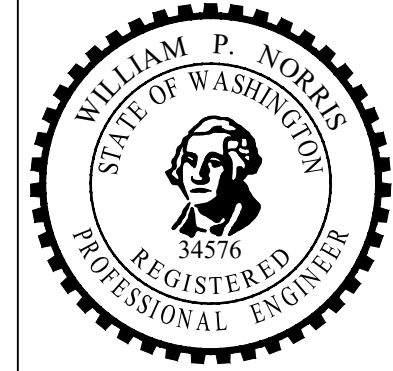
- EXISTING GRADE
- ANTICIPATED GRADE
- ACCESS ROAD SALVAGED ROCK

NOTE:
1979 GRADE TO BE DETERMINED IN FIELD.

ALL CROSS-SECTIONS ARE ORIENTED LEFT TO RIGHT LOOKING DOWNSTREAM.



SHEET LOCATION



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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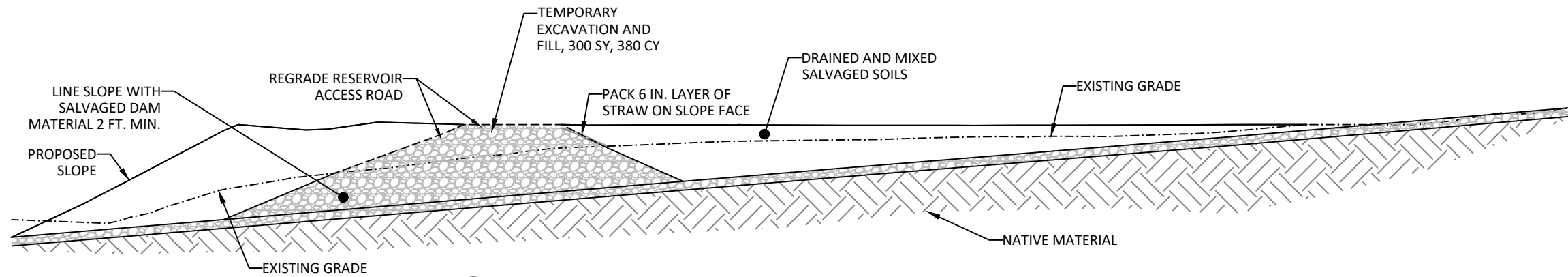
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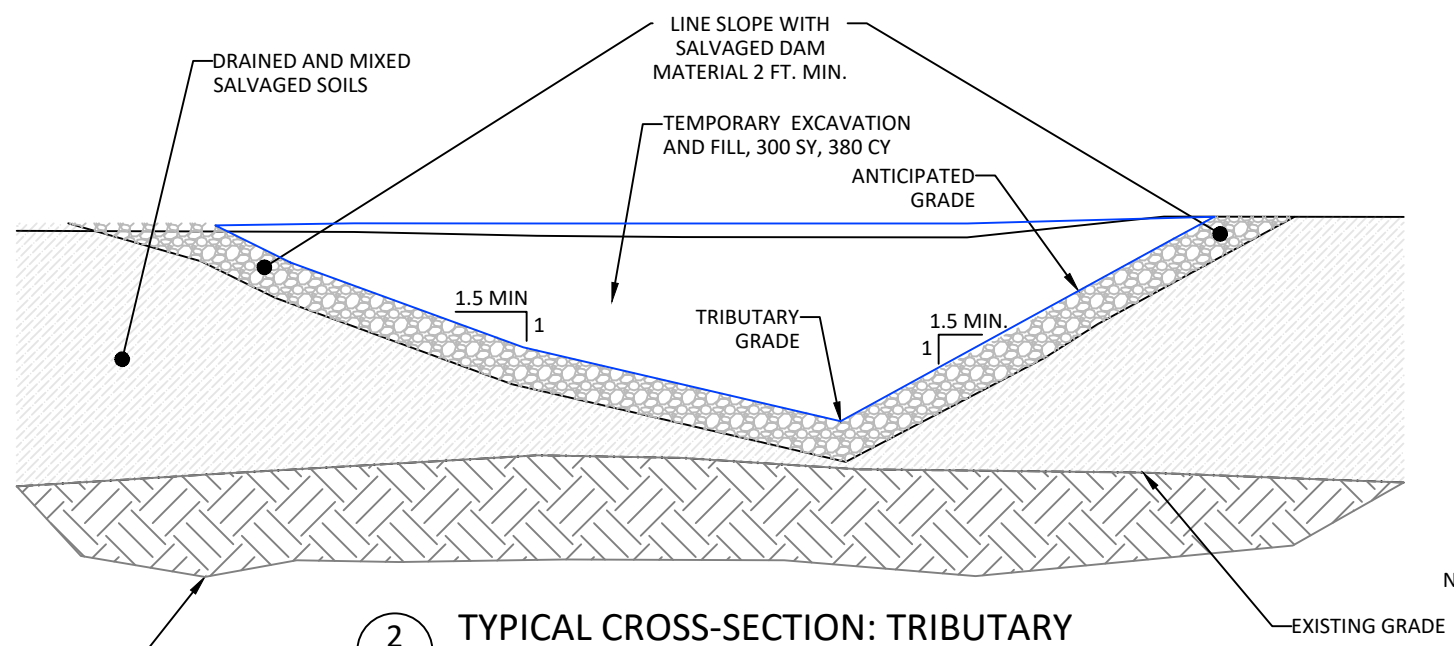
SITE: KWONEESUM DAM REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR AND DAM - TRIBUTARY PLAN VIEW

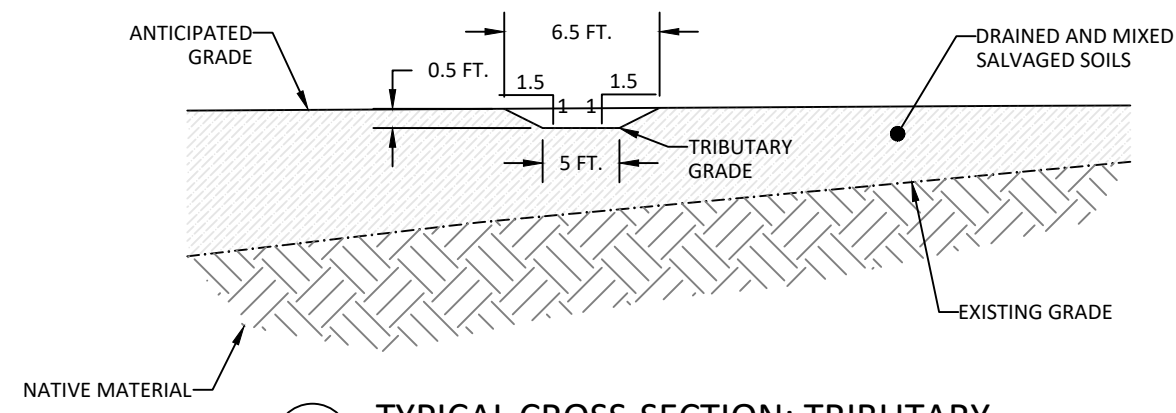
SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 54	Total Sheets: 80	



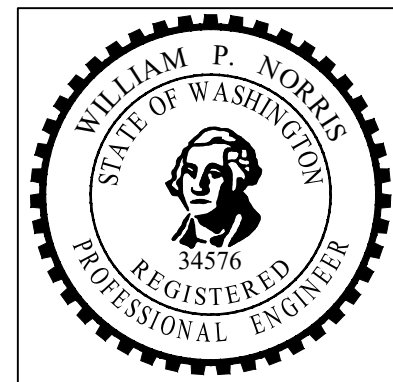
1
55 PROFILE VIEW: TRIBUTARY
NOT TO SCALE



2
55 TYPICAL CROSS-SECTION: TRIBUTARY
NOT TO SCALE



3
55 TYPICAL CROSS-SECTION: TRIBUTARY
NOT TO SCALE



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

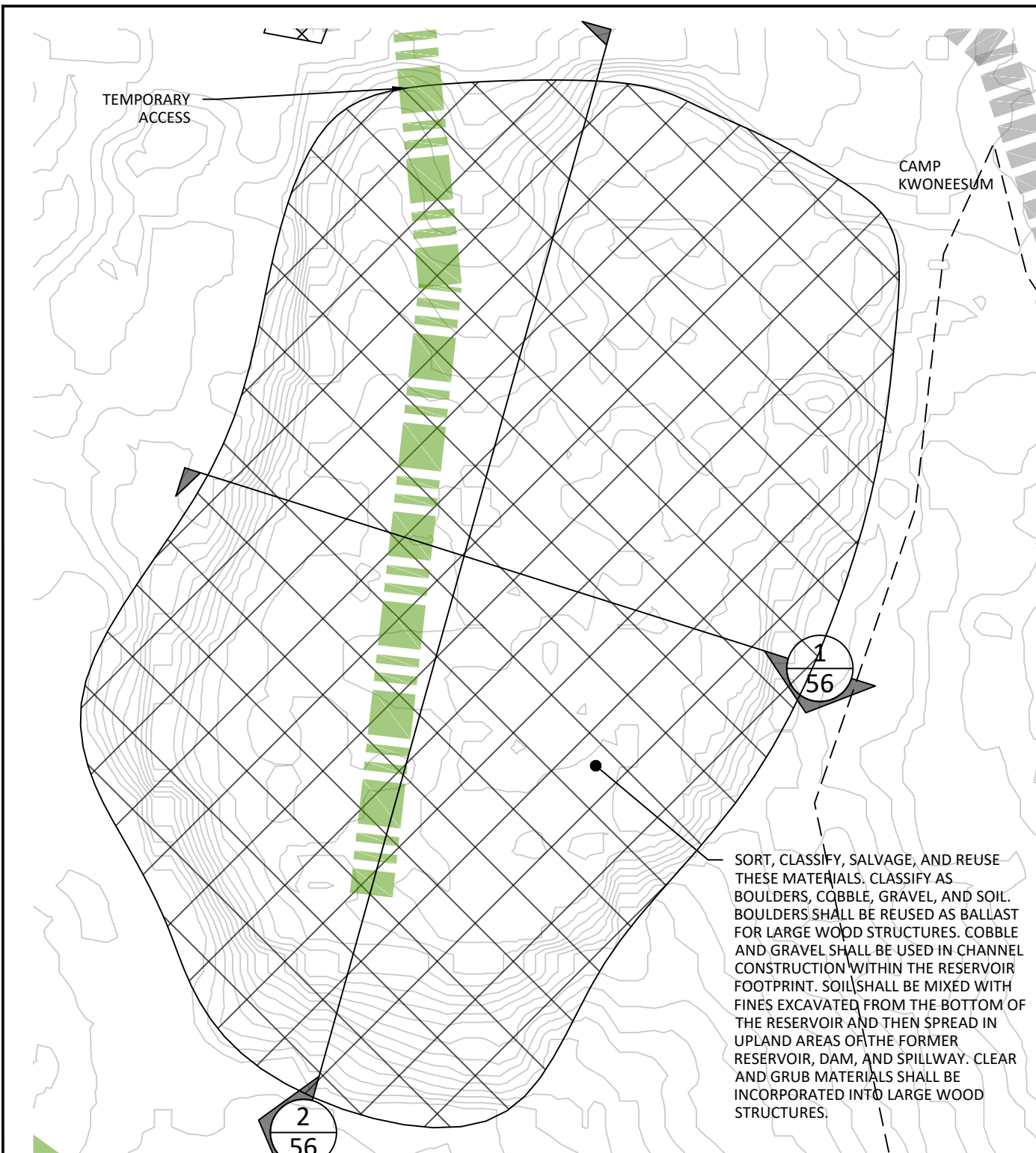
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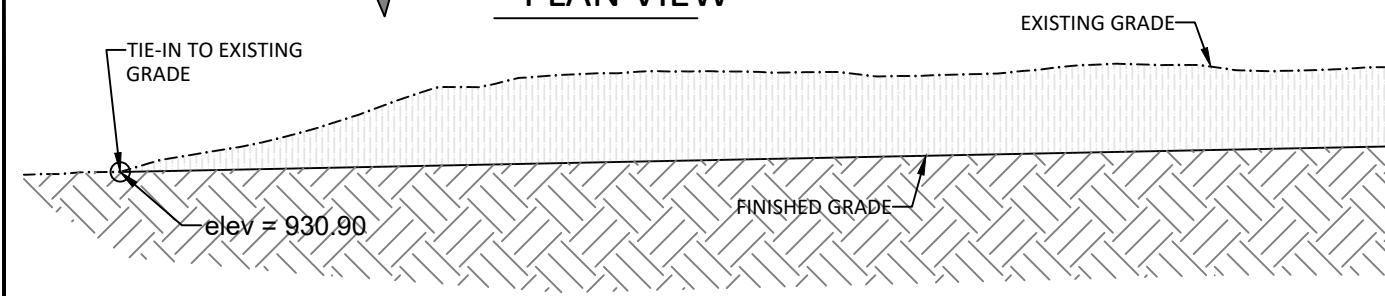
SITE: KWONEESUM DAM REMOVAL DESIGN

TITLE: KWONEESUM RESERVOIR AND DAM - TRIBUTARY CROSS-SECTIONS

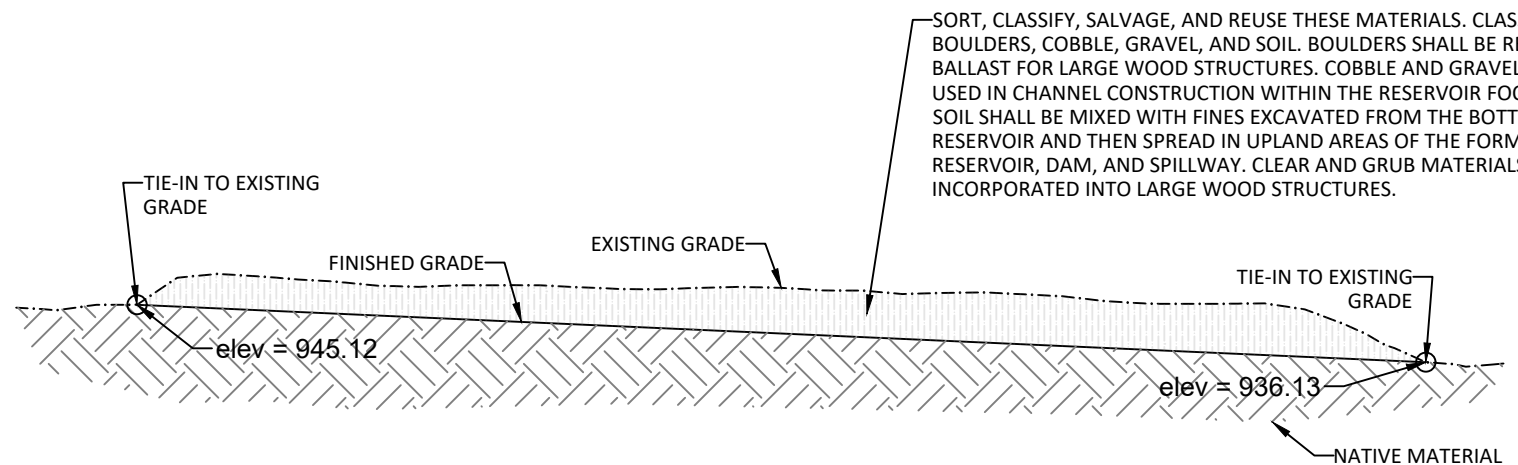
SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 55	Total Sheets: 80	



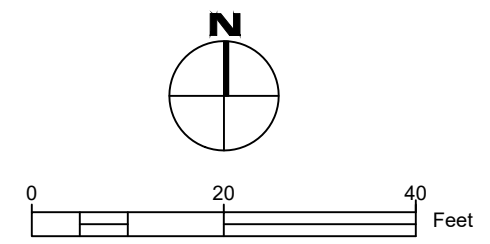
PLAN VIEW



2/56 TYPICAL SECTION: DAM CONSTRUCTION SPOILS PILE



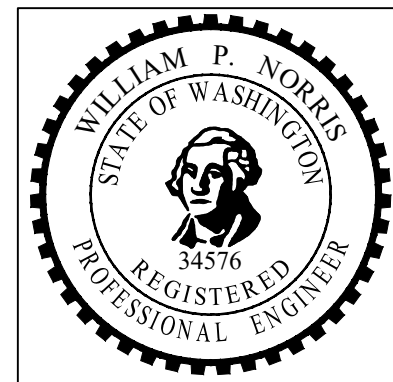
1/56 TYPICAL SECTION: DAM CONSTRUCTION SPOILS PILE



LEGEND

- EXISTING GRADING
- ▨ SALVAGED SPOILS
- ▩ TEMPORARY ACCESS
- - - LIMITS OF DISTURBANCE

NOTE:
EXCAVATION SHOWN IS
OUTSIDE JURISDICTIONAL
BOUNDARIES



3			
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REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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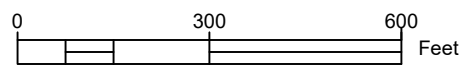
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CLIENT: COWLITZ INDIAN TRIBE
7700 26TH AVE
VANCOUVER, WA, 98665

SITE: KWONEESUM DAM
REMOVAL DESIGN

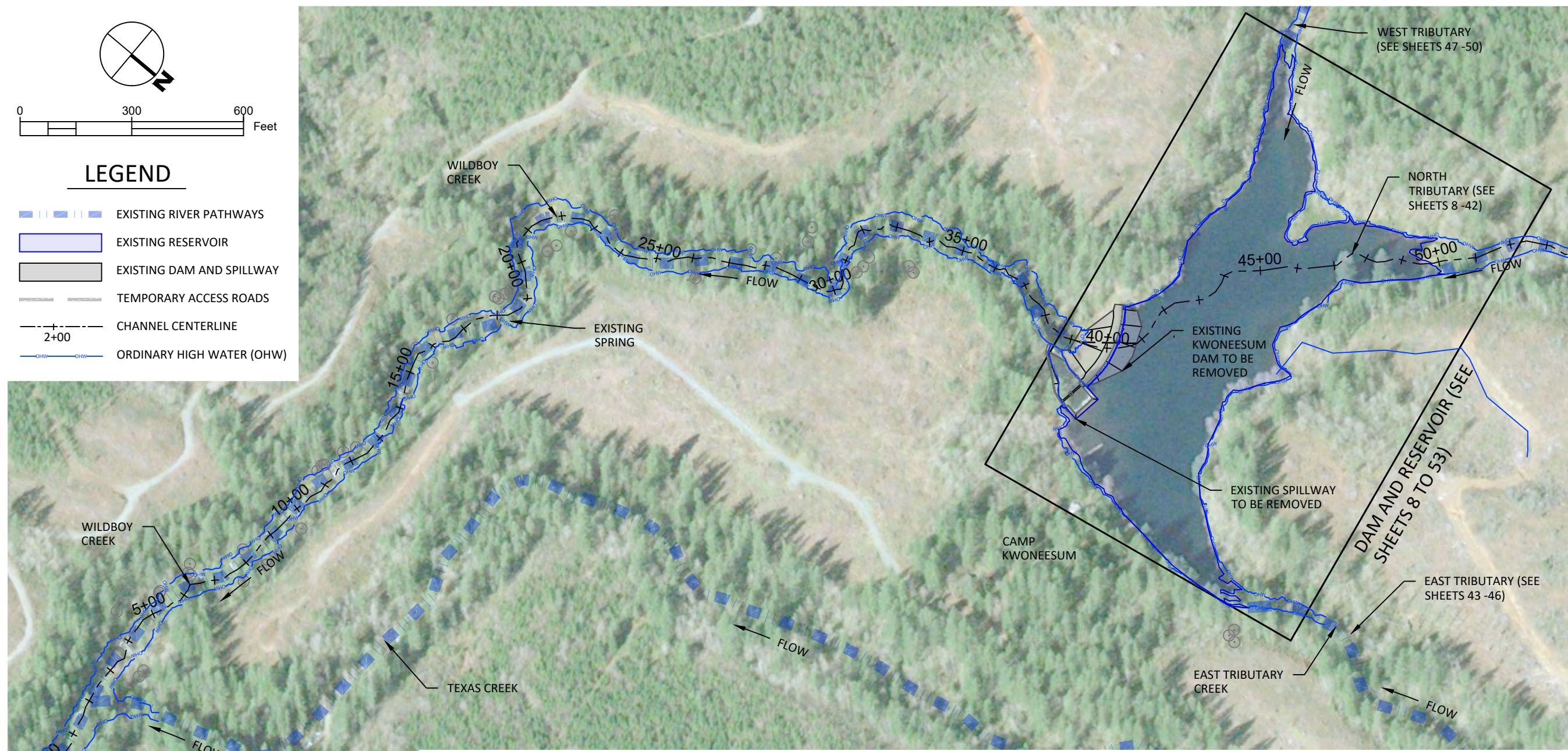
TITLE: KWONEESUM RESERVOIR
AND DAM - DAM
CONSTRUCTION SPOILS

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 56	Total Sheets: 80	

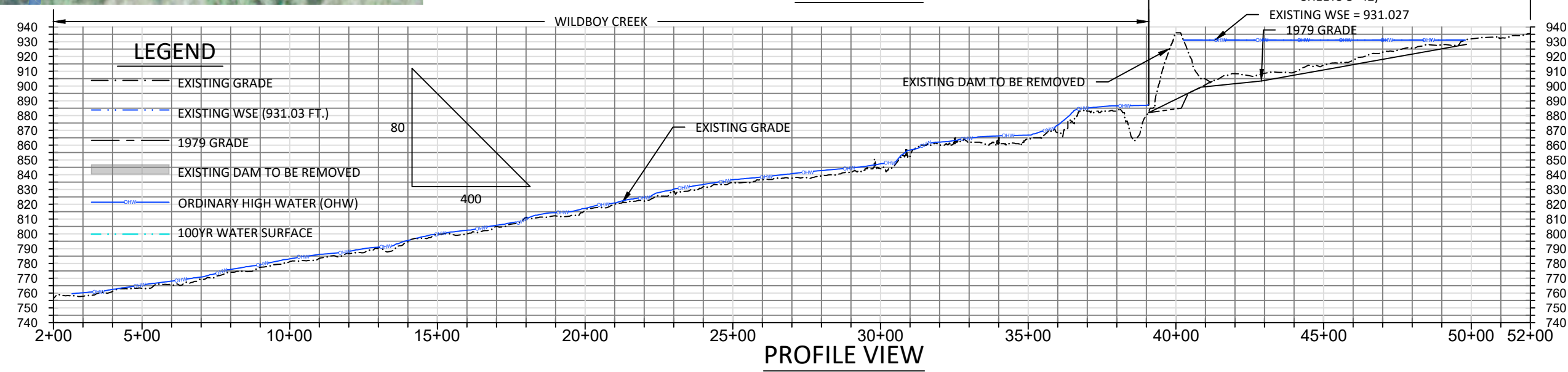


LEGEND

- EXISTING RIVER PATHWAYS
- EXISTING RESERVOIR
- EXISTING DAM AND SPILLWAY
- TEMPORARY ACCESS ROADS
- CHANNEL CENTERLINE
2+00
- ORDINARY HIGH WATER (OHW)

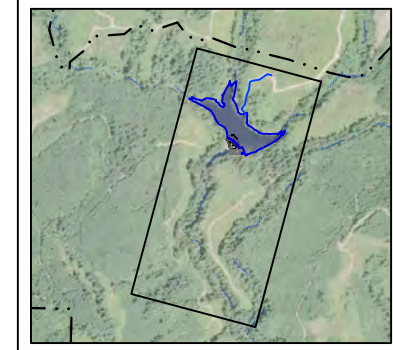


PLAN VIEW

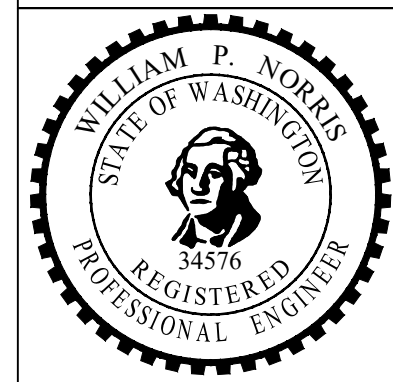


PROFILE VIEW

Notes:



SHEET LOCATION



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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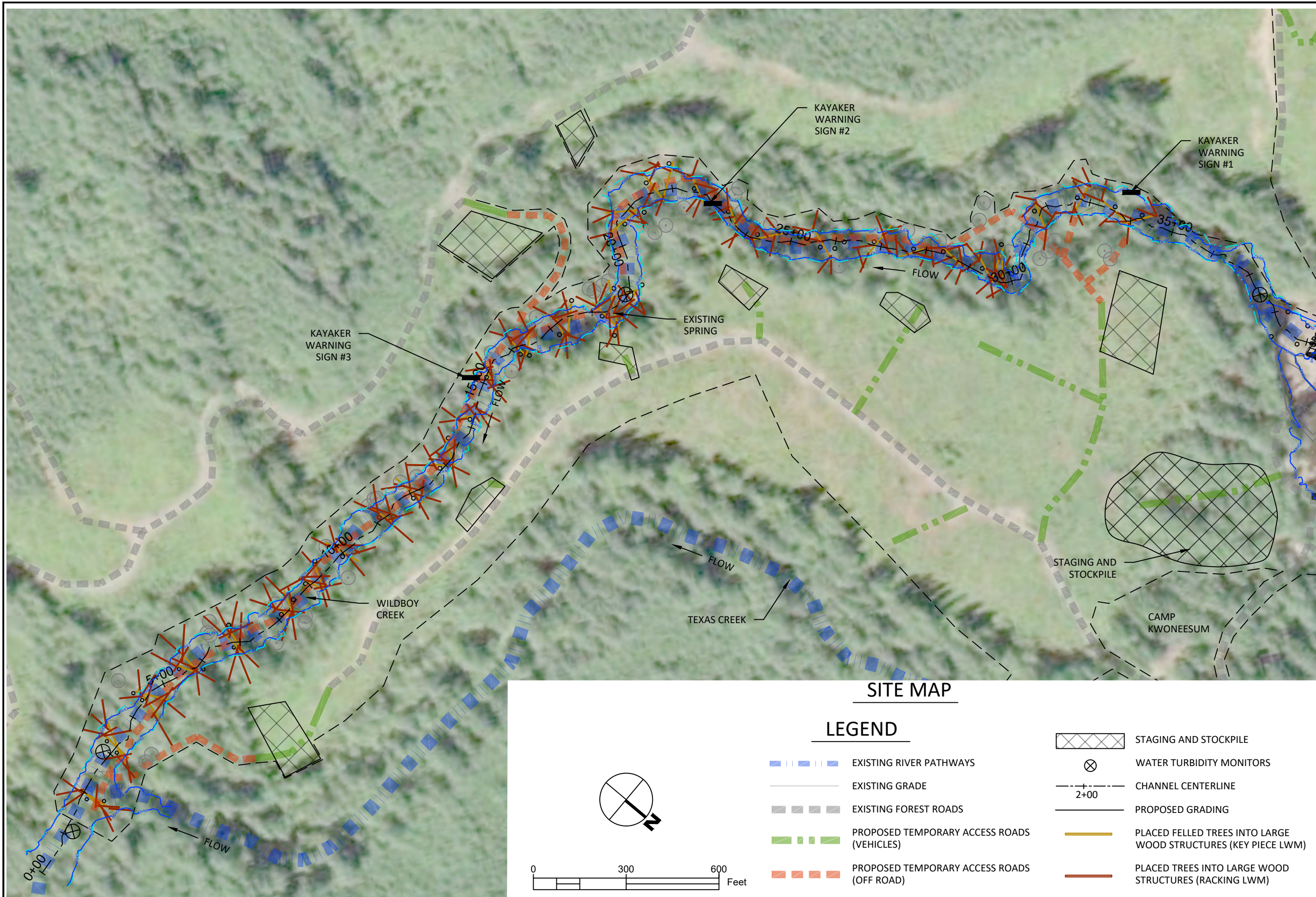
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VANCOUVER, WA, 98665

SITE: KWONEESUM DAM
REMOVAL DESIGN

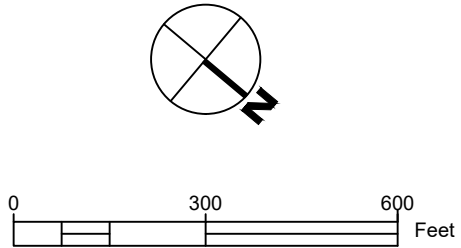
TITLE:
WILDBOY CREEK - EXISTING
CONDITIONS

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 57	Total Sheets: 80	

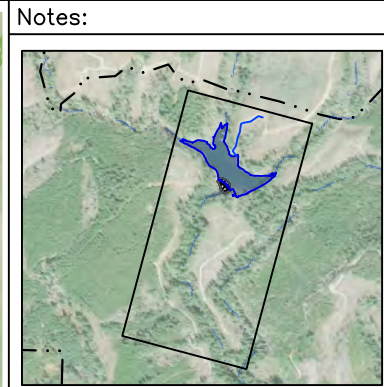


SITE MAP

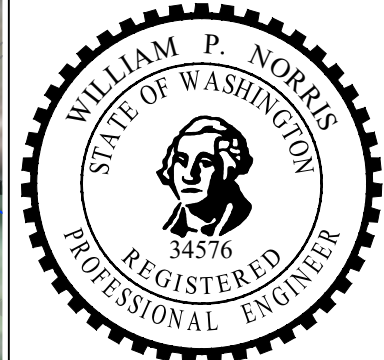
LEGEND



- EXISTING RIVER PATHWAYS
- EXISTING GRADE
- EXISTING FOREST ROADS
- PROPOSED TEMPORARY ACCESS ROADS (VEHICLES)
- PROPOSED TEMPORARY ACCESS ROADS (OFF ROAD)
- ORDINARY HIGH WATER (OHW)
- 100YR WATER SURFACE
- STAGING AND STOCKPILE
- WATER TURBIDITY MONITORS
- CHANNEL CENTERLINE
- PROPOSED GRADING
- PLACED FELLED TREES INTO LARGE WOOD STRUCTURES (KEY PIECE LWM)
- PLACED TREES INTO LARGE WOOD STRUCTURES (RACKING LWM)
- FELLED LARGE TREES FOR WILDBOY CREEK LOG JAMS
- KAYAKER WARNING SIGN



SHEET LOCATION



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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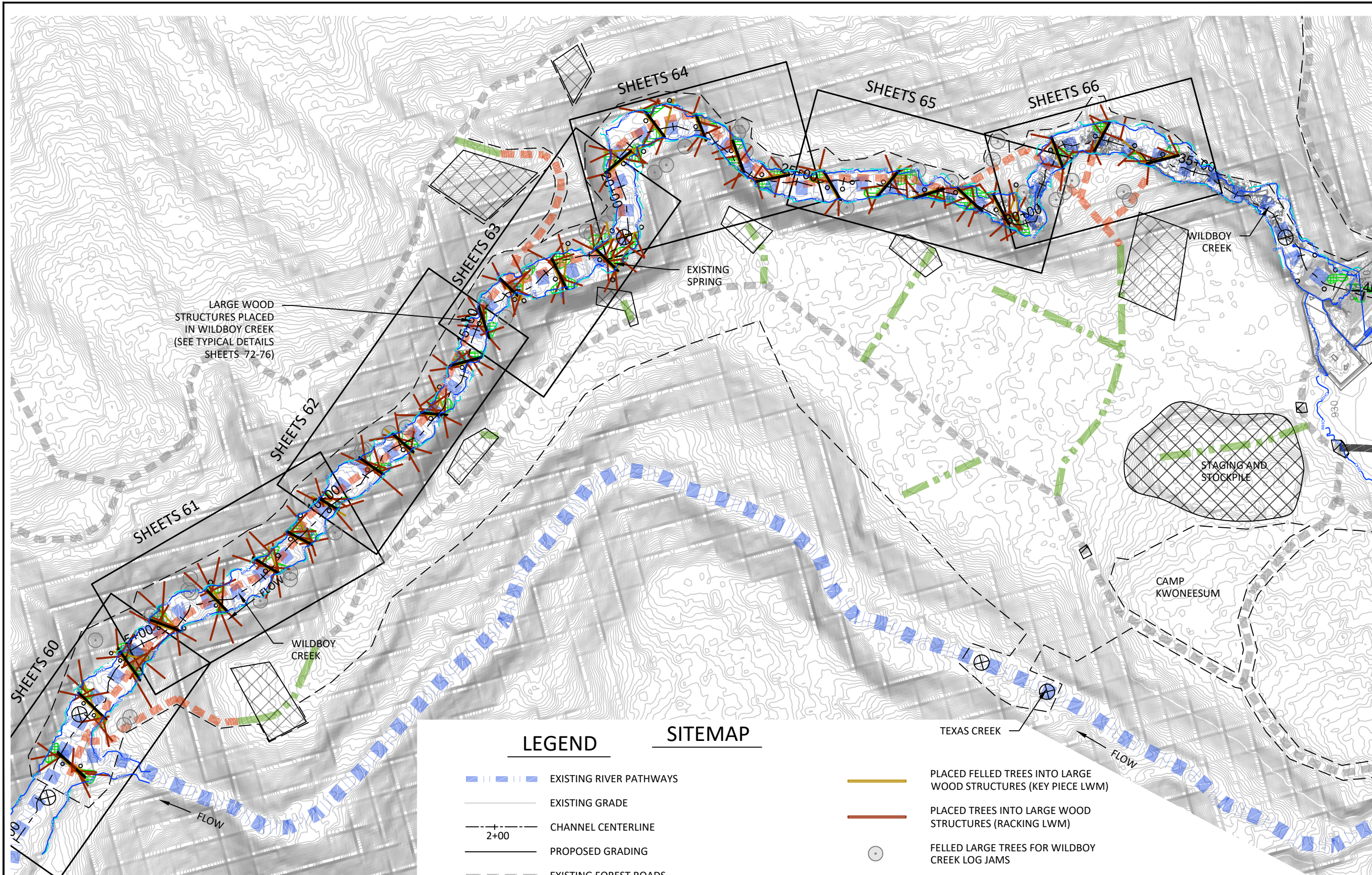
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SITE: **KWONEESUM DAM REMOVAL DESIGN**

TITLE: **WILDBOY CREEK - LARGE WOOD STRUCTURES**

SCALE:	DATE:	DRAWN:	CHECKED:
	6/4/21	RP	BN
PROJ. NO:	DRAWING NO:	Total Sheets:	
-	58	80	

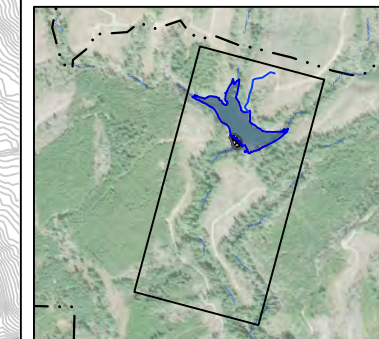


LARGE WOOD STRUCTURES PLACED IN WILDBOY CREEK (SEE TYPICAL DETAILS SHEETS 72-76)

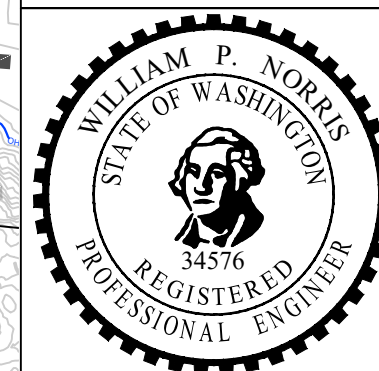
LEGEND **SITEMAP**

- EXISTING RIVER PATHWAYS
- EXISTING GRADE
- CHANNEL CENTERLINE
- PROPOSED GRADING
- EXISTING FOREST ROADS
- PROPOSED TEMPORARY ACCESS ROADS (VEHICLES)
- PROPOSED TEMPORARY ACCESS ROADS (OFF ROAD)
- STAGING AND STOCKPILE
- WATER TURBIDITY MONITORS
- PLACED FELLED TREES INTO LARGE WOOD STRUCTURES (KEY PIECE LWM)
- PLACED TREES INTO LARGE WOOD STRUCTURES (RACKING LWM)
- FELLED LARGE TREES FOR WILDBOY CREEK LOG JAMS
- SALVAGED DAM ROCK
- SALVAGED DELTAIC GRAVELS
- PLACED SLASH
- ORDINARY HIGH WATER (OHW)
- 100 YR WATER SURFACE

Notes:



SHEET LOCATION



3			
2			
1			
REV:	DESCRIPTION:	BY:	DATE:
STATUS: PRELIMINARY DESIGN			

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SITE: KWONEESUM DAM REMOVAL DESIGN

TITLE: WILDBOY CREEK - PROPOSED CONDITIONS

SCALE:	DATE: 6/4/21	DRAWN: RP	CHECKED: BN
PROJ. NO: -	DRAWING NO: 59	Total Sheets: 80	