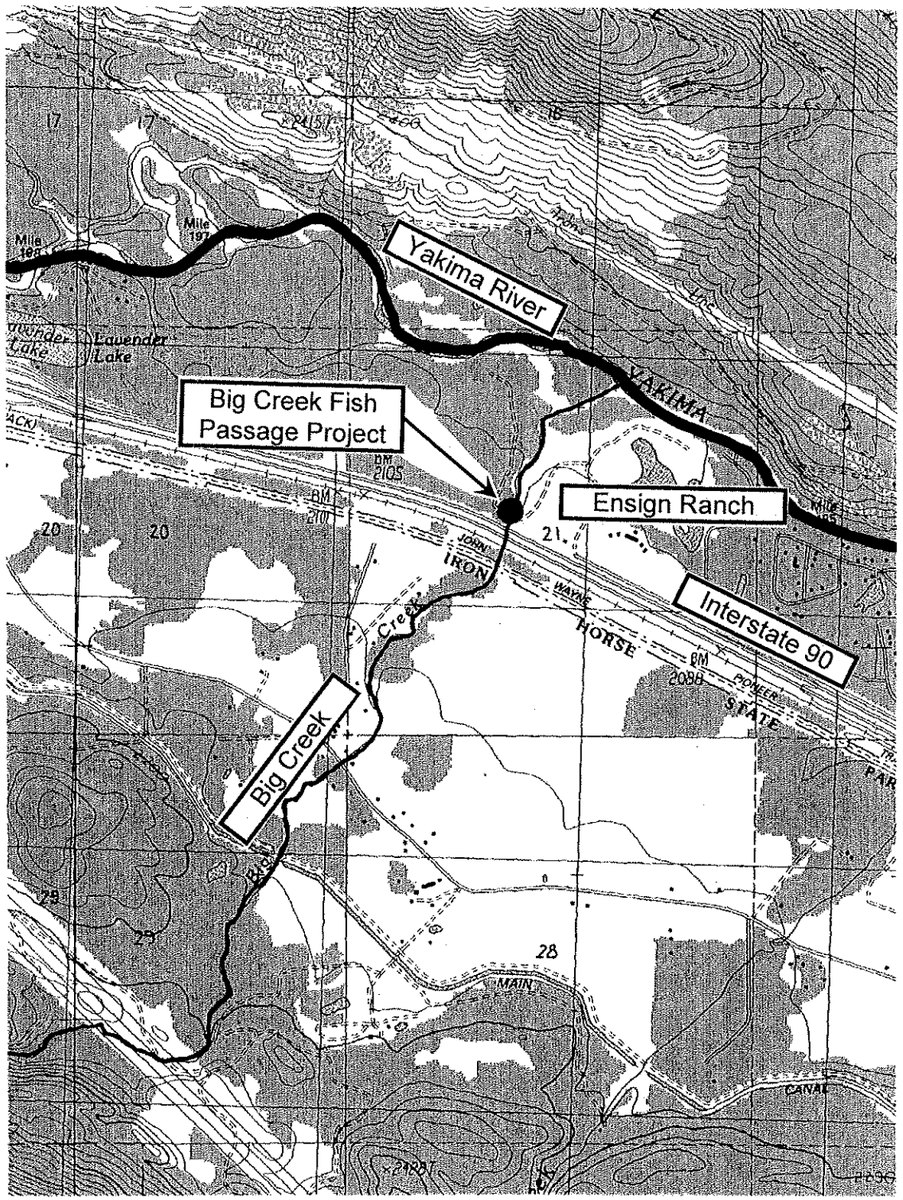

LOCATION FOR BIG CREEK PROJECT IS ABOUT 8 MILES WEST OF CLE ELUM, WASHINGTON, WITHIN THE LDS' ENSIGN RANCH. EXIT 78 FROM I-90, THEN GO WEST ALONG NORTH SIDE OF FREEWAY (FRONTAGE ROAD) TO ENSIGN RANCH ENTRANCE. PROJECT IS IN NW¼, SECTION 1, T20N, R14E.

MAP SCALE: 1" = 2,000' (FROM DeLORME 1999).

BIG CREEK FISH PASSAGE PROJECT

Yakama Indian Nation
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Toppenish, WA 98948

Kelly Clayton, Project Manager
509-945-7195 cell
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DRAWING LIST

PROJECT LOCATION ABOUT 8 MILES WEST OF CLE ELUM, WASHINGTON

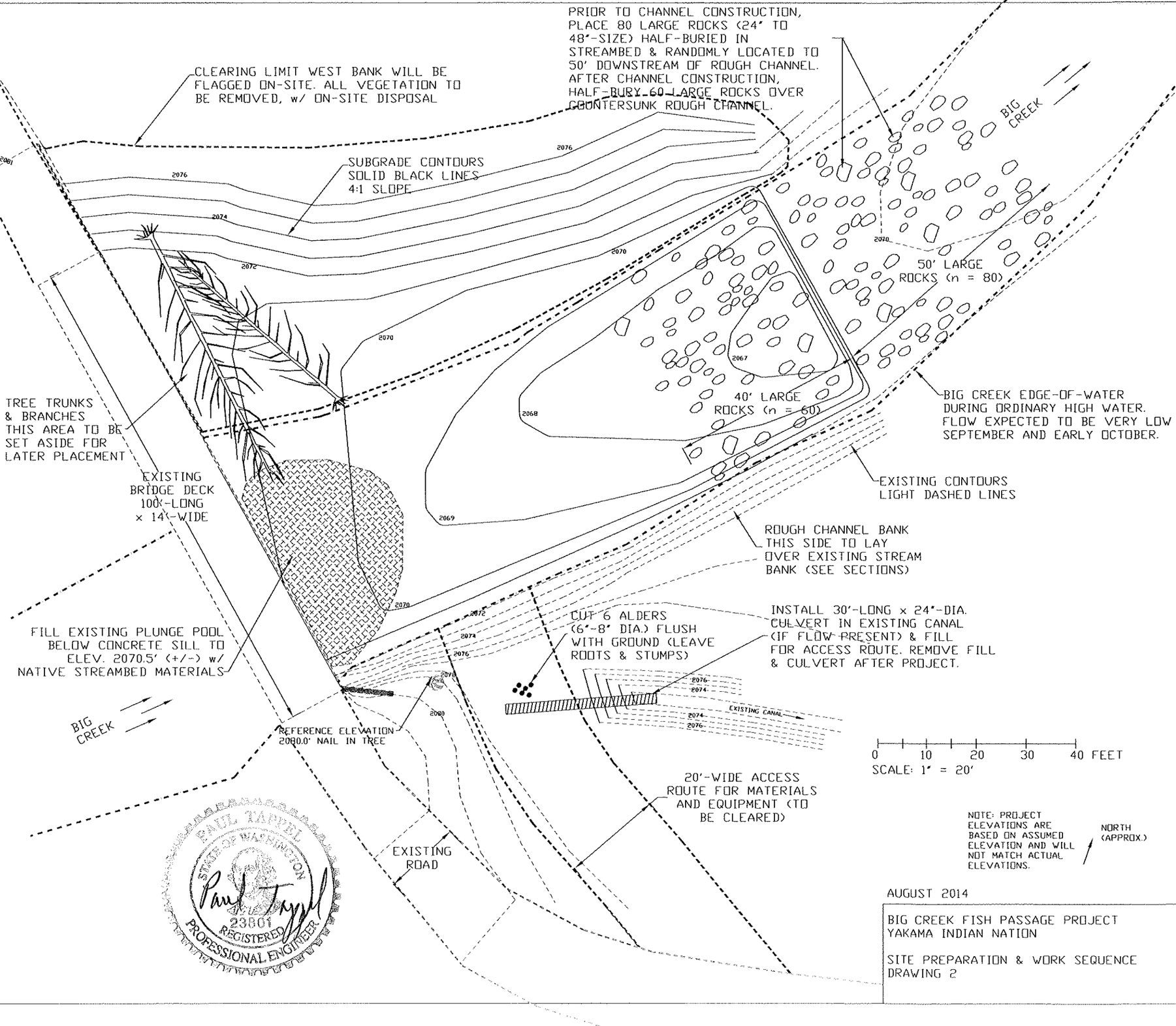
AUGUST 2014

BIG CREEK FISH PASSAGE PROJECT
YAKAMA INDIAN NATION

PROJECT LOCATION & DRAWING LIST
DRAWING 1

Work Sequence and Notes:

1. Clear and grade access route from existing Ensign Ranch road, as shown this drawing. Clearing debris shall be hauled to disposal location within ¼-mile of project (as directed by Ensign Ranch), piled semi-neatly, and mashed down. The existing bank may be graded for a more gradual ramp into creek bed (not shown).
2. Big Creek expected to have almost zero flow in September and early October, and this time period is required for rough channel construction (okay to start after Labor Day). Isolated pools of water would contain fish, and Contractor shall provide and operate a 2"-dia. trashpump to gradually pump any standing water out (release downstream).
3. Pumps used to de-water in-stream pools, and/or to bypass streamflow (if present), shall be equipped with a fish guard to prevent fish passage into the pump intake. Each pump intake shall be screened with maximum opening diameter 0.094" perforated plate, 0.069" profile bar, or 0.087" woven wire mesh. Minimum open area for these screens shall be 27%. Water velocity into the pump intake shall be less than 0.4 feet per second.
4. YIN and/or WDFW staff would monitor water drawdowns, and would have nets and buckets for fish capture and transport (to Yakima River). Contractor to coordinate water removal(s) with YIN and WDFW for drawdown of all water pools within work area.
5. The engineer will assist Contractor with subgrade layout, elevations, etc. The first work would be to excavate the existing streambed to generate sufficient cobble, gravel & sand materials to fill the existing plunge pool.
6. Excavation within existing stream channel shall be completed first (i.e. between edge-of-water lines shown this drawing), with some excavated materials stockpiled on-site. Stockpiled materials shall be used for shallow burial of the completed rough channel (Sta. 0+00 thru 0+40), and for a thin layer of gravel & sand to be spread over the entire rough channel (after other construction completed).
7. After subgrade preparation within edge-of-water lines shown this drawing, the west bank would be cleared and excavated as shown this drawing. All clearing debris shall be disposed on-site as described above. Excess excavated bank materials shall be hauled to disposal sites within ½-mile of bridge, dumped, and graded to blend with surrounding contours (Ensign Ranch will locate upland sites).
8. Build rough channel as shown on other drawings. The engineer has a step-by-step process previously used to efficiently build 60+ rough channels state-wide, and Contractor will be advised start-to-finish.
9. See Drawing 6 for additional notes related to site access, stockpile and staging areas, restoration of road surfaces disturbed by construction, etc.



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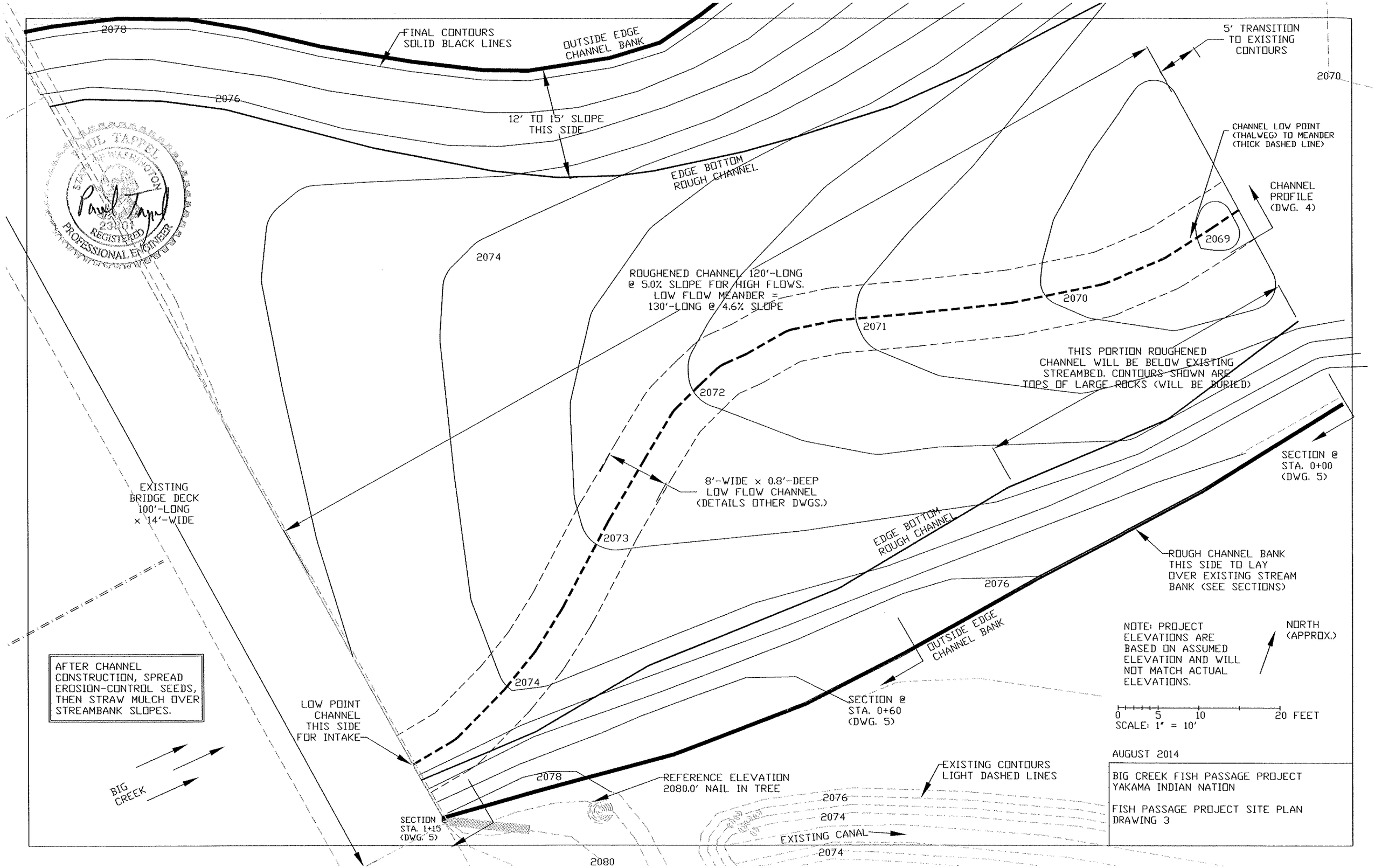
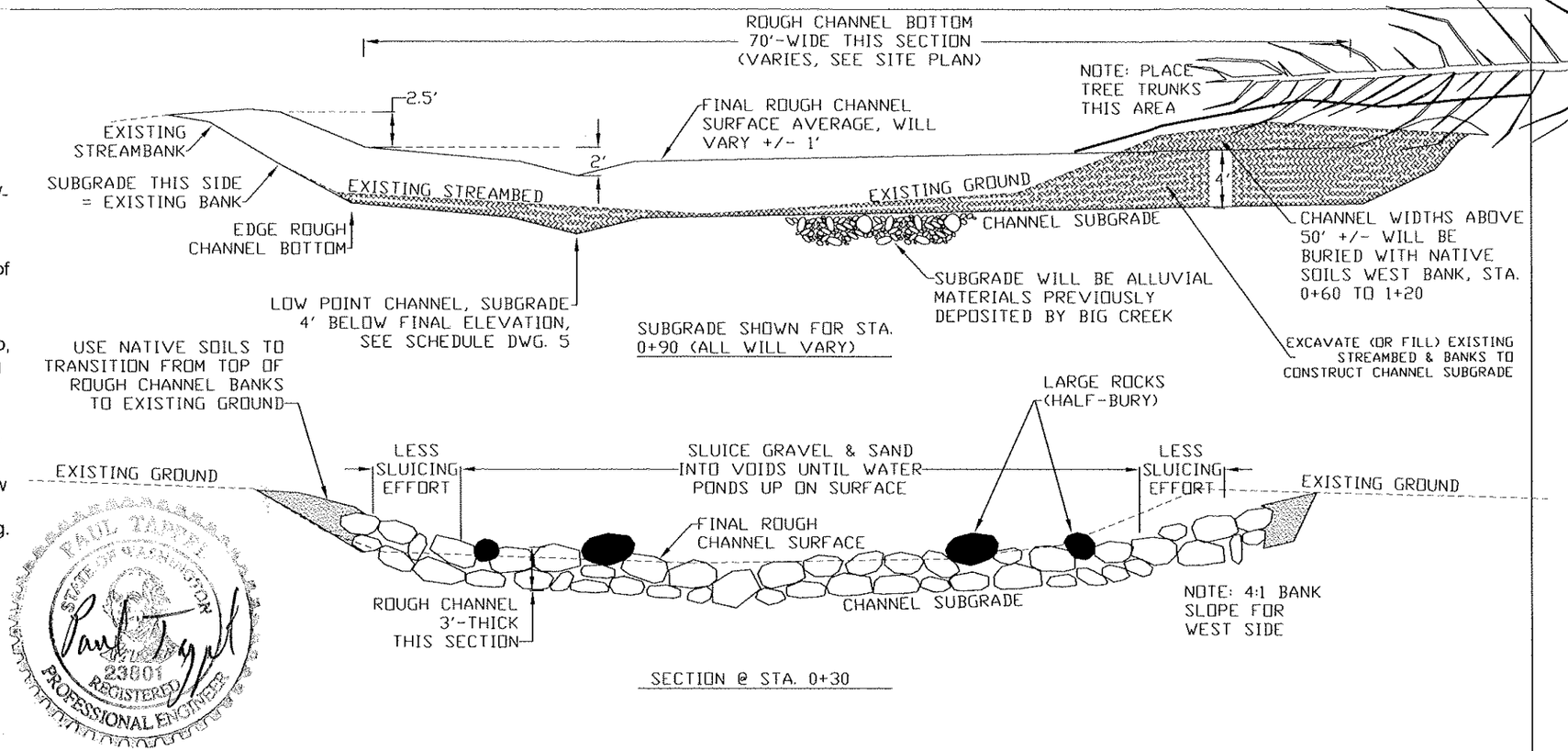
BIG CREEK FISH PASSAGE PROJECT
YAKAMA INDIAN NATION

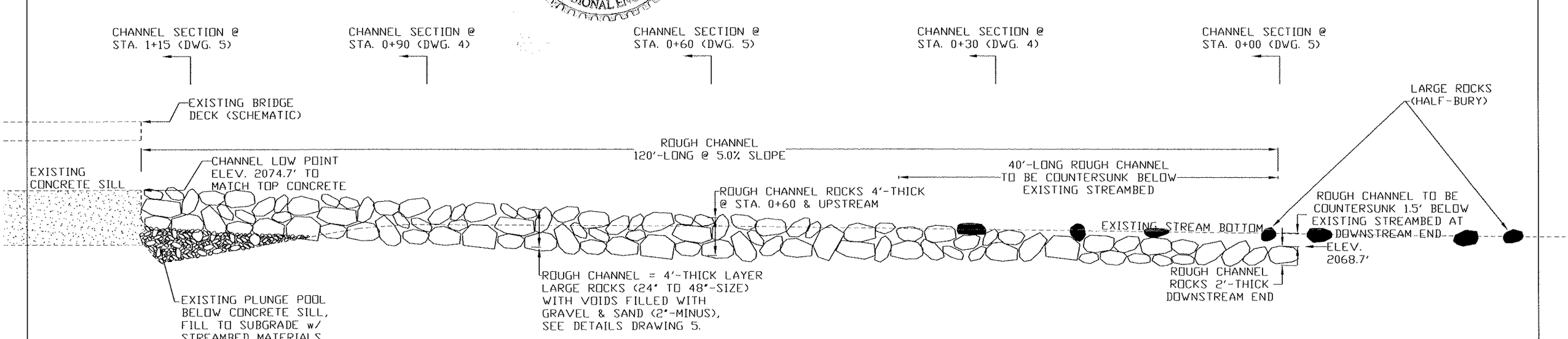
SITE PREPARATION & WORK SEQUENCE
DRAWING 2


2078
FINAL CONTOURS
SOLID BLACK LINES
OUTSIDE EDGE
CHANNEL BANK
5' TRANSITION
TO EXISTING
CONTOURS
2070
2076
12' TO 15' SLOPE
THIS SIDE
CHANNEL LOW POINT
(THALWEG) TO MEANDER
(THICK DASHED LINE)
EDGE BOTTOM
ROUGH CHANNEL
CHANNEL
PROFILE
(DWG. 4)
2074
2069
ROUGHENED CHANNEL 120'-LONG
@ 5.0% SLOPE FOR HIGH FLOWS.
LOW FLOW MEANDER =
130'-LONG @ 4.6% SLOPE
2070
2071
THIS PORTION ROUGHENED
CHANNEL WILL BE BELOW EXISTING
STREAMBED. CONTOURS SHOWN ARE
TOPS OF LARGE ROCKS (WILL BE BURIED)
2072
SECTION @
STA. 0+00
(DWG. 5)
8'-WIDE x 0.8'-DEEP
LOW FLOW CHANNEL
(DETAILS OTHER DWGS.)
EXISTING
BRIDGE DECK
100'-LONG
x 14'-WIDE
2073
EDGE BOTTOM
ROUGH CHANNEL
ROUGH CHANNEL BANK
THIS SIDE TO LAY
OVER EXISTING STREAM
BANK (SEE SECTIONS)
2076
OUTSIDE EDGE
CHANNEL BANK
NOTE: PROJECT
ELEVATIONS ARE
BASED ON ASSUMED
ELEVATION AND WILL
NOT MATCH ACTUAL
ELEVATIONS.
NORTH
(APPROX.)
2074
SECTION @
STA. 0+60
(DWG. 5)
0 5 10 20 FEET
SCALE: 1" = 10'
AFTER CHANNEL
CONSTRUCTION, SPREAD
EROSION-CONTROL SEEDS,
THEN STRAW MULCH OVER
STREAMBANK SLOPES.
LOW POINT
CHANNEL
THIS SIDE
FOR INTAKE
BIG
CREEK
2078
REFERENCE ELEVATION
2080.0' NAIL IN TREE
EXISTING CONTOURS
LIGHT DASHED LINES
2076
2074
EXISTING CANAL
2074
SECTION
STA. 1+15
(DWG. 5)
2080
AUGUST 2014
BIG CREEK FISH PASSAGE PROJECT
YAKAMA INDIAN NATION
FISH PASSAGE PROJECT SITE PLAN
DRAWING 3

Sequence to Construct Rough Channel:

1. Excavate and/or fill to re-grade existing streambed materials for rough channel subgrade. Subgrade to follow bottom of large rocks, and will slope up from low point across each section. See Station 0+90 section this drawing.
2. Place 2' to 4'-thick layer large rocks, with random distribution of sizes within the specified size range. Engineer will place tall metal stakes and rope lines for visual guidance to operator for rock placements. Tops of rocks shall be within +/- 1' of elevations indicated by on-site rope lines, with the top surfaces uneven across any section.
3. Large rocks along the channel bottom meander (low points) shall be within 0.5' of design elevation (4.6% slope) for a low flow channel width varying 6' to 8'-wide. Note the low flow meander shown on site plan (Drawing 3).
4. Leave a 4'-diameter void in downstream end rock layer to allow water to pond up, then use this water for recycle sluicing of gravel & sand into voids. This opening will be left after channel construction, and will quickly fill with native streambed materials.
5. Fill all voids between large rocks with gravel & sand (see chart on Drawing 5) by sluicing and shoveling. Creek water will be recycled for the sluice operations. Sluice gravel & sand until water ponds up on the surface, over the entire low flow channel bottom (45' to 95'-wide); sluicing does not need to be as thorough for streambank slopes (engineer will advise). See Station 0+30 section this drawing.





ROUGH CHANNEL PROFILE

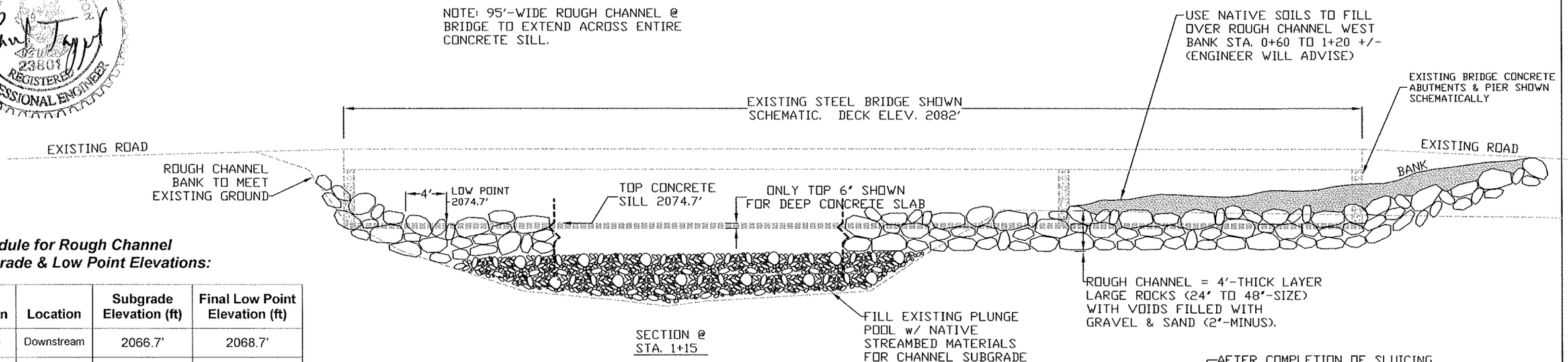
0 5 10 20 FEET
SCALE: 1" = 10'

AUGUST 2014

BIG CREEK FISH PASSAGE PROJECT
YAKAMA INDIAN NATION

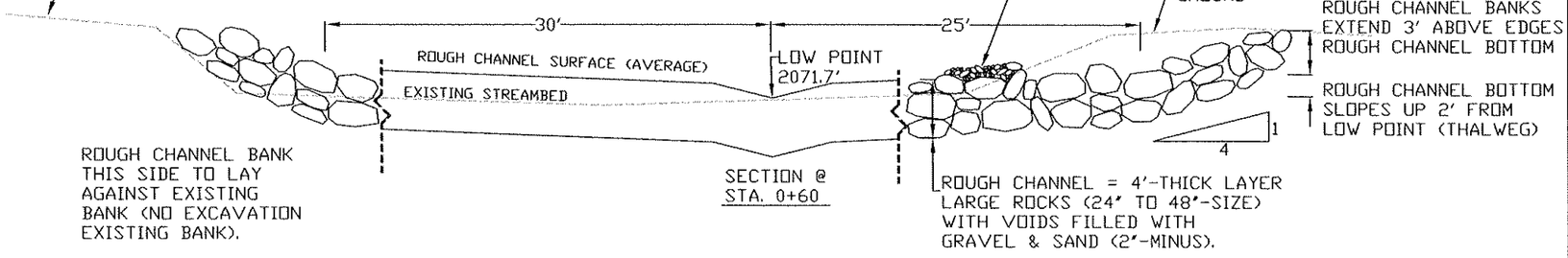
ROUGHENED CHANNEL PROFILE & DETAILS
DRAWING 4

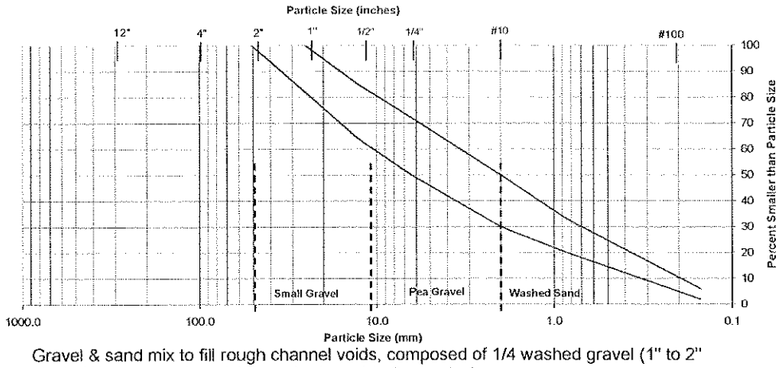
NOTE: 95'-WIDE ROUGH CHANNEL @ BRIDGE TO EXTEND ACROSS ENTIRE CONCRETE SILL.



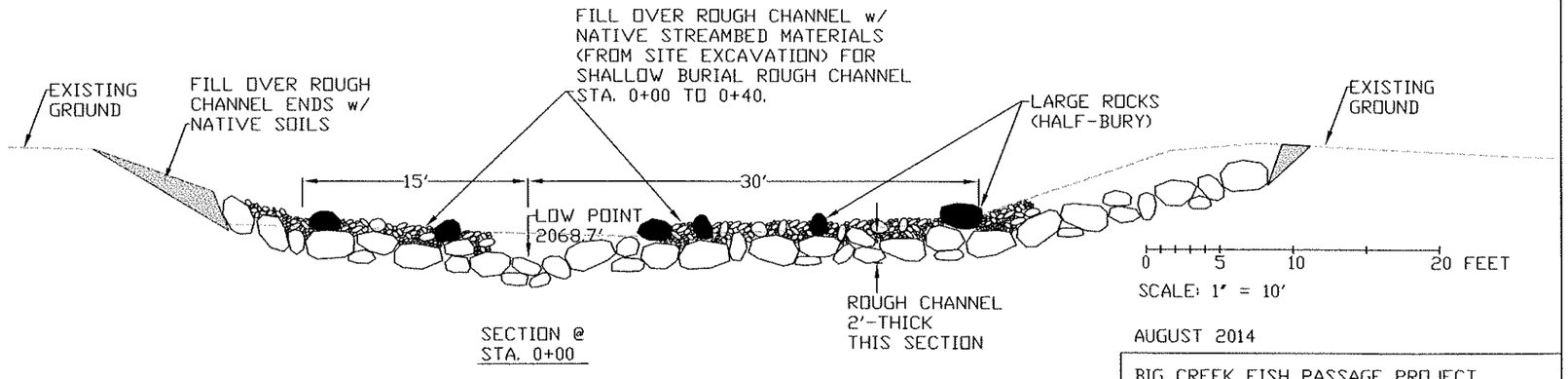
Schedule for Rough Channel Subgrade & Low Point Elevations:

Station	Location	Subgrade Elevation (ft)	Final Low Point Elevation (ft)
0+00	Downstream	2066.7'	2068.7'
0+20		2067.0'	2069.7'
0+40		2067.4'	2070.7'
0+60		2067.7'	2071.7'
0+80		2068.7'	2072.7'
1+00		2069.7'	2073.7'
1+20	Concrete sill	2070.7	2074.7'





Gravel & sand mix to fill rough channel voids, composed of 1/4 washed gravel (1" to 2" size), 1/4 pea gravel, and 1/2 washed sand (< 2 mm size).



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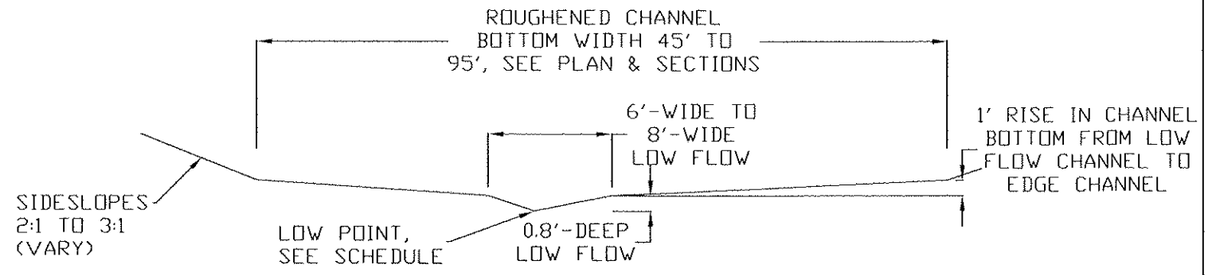
BIG CREEK FISH PASSAGE PROJECT
YAKAMA INDIAN NATION

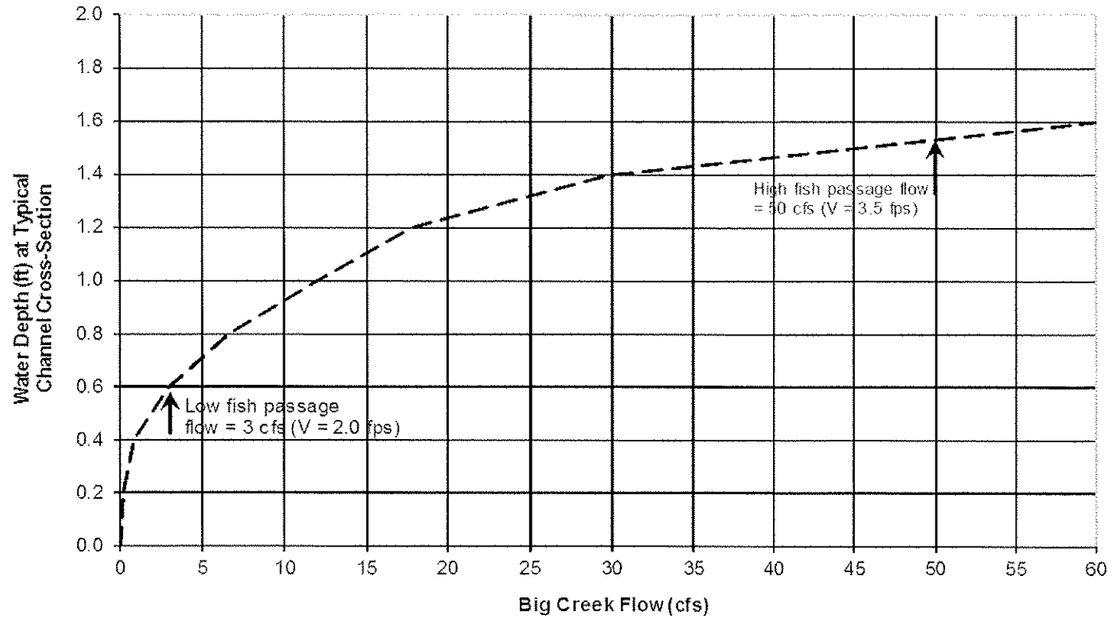
ROUGHENED CHANNEL SECTIONS
DRAWING 5

Notes for Project Construction:

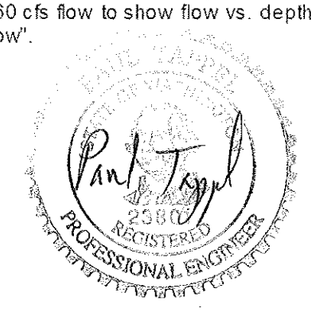
1. No on-site work, surveys, layout or technical review shall be done on Sundays.
2. Contractor shall coordinate with Ensign Ranch for sign-in protocol (check at the office) prior to project mobilization, and during the entire project.
3. Ensign Ranch will remain a spiritual and recreational destination for the public during the entire construction project. The road thru the project area, and the bridge, will need to remain open during the entire project construction except for short-term delays for equipment shuttles, etc. Public traffic is expected to be light and intermittent across the bridge. The Contractor shall place barricades across part of the road on both sides of the project, to advise vehicle drivers to proceed with caution across the bridge.
4. Access to the project site shall be along an unpaved construction road paralleling I-90, thru a white gate just south of the main entrance to Ensign Ranch. This route shall be used for all construction traffic, except for specific authorized loads of surplus excavated materials to be deposited at locations identified by Ensign Ranch (these loads may travel on paved roads).
5. Minor trimming of tree branches may be required along the construction access route (to be determined by Contractor); this work would be incidental to the project. Construction traffic would enter the Ensign Ranch road system in between several barns, then about ¼-mile west to the project site.
6. All roads traveled by Contractor will be photographed by the engineer, and at completion of construction these roads will be restored to at least pre-project conditions. The engineer will consult with Ensign Ranch to determine road repair requirements, and a change order would be negotiated with Contractor for this work (do not include in bid). Typical restoration would require blading the road(s) for suitable subgrade, then spread and compact crushed rock for final driving surfaces.
7. Stockpile areas near the project location would be available for stockpiles of streambed materials (280 cubic yards) and native soils (380 cubic yards). Minor clearing (incidental) may be required for these areas. After completion of work, the stockpile areas shall be returned to pre-project conditions, with respect to topsoil. For example, existing lawn areas near the bridge may be used for temporary stockpiles. After work is done, these areas would be cleaned off down to the original lawn elevation, and the YIN would spread grass seeds for re-establishment of these lawn areas.
8. One area for deposition of excess excavated materials from channel construction is near a house at the Ensign Ranch entrance; an existing low yard area could accept 100 to 150 cubic yards soils. Prior to placement of these soils, the existing topsoil would be stripped (incidental to project) and then would be used for the final ground surfaces.



DETAILS FOR LOW FLOW CHANNEL
& TYPICAL CROSS-SECTION DIMENSIONS



Rating curve for proposed Big Creek rough channel (5% slope) for downstream of existing Ensign Ranch bridge, with a low-flow channel 0.8'-deep entire length. The rating curve shown for rough channel only extends to 60 cfs flow to show flow vs. depth for flows between "low fish passage flow" and "high fish passage flow".



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BIG CREEK FISH PASSAGE PROJECT
YAKAMA INDIAN NATION

CONSTRUCTION PROJECT NOTES
DRAWING 6