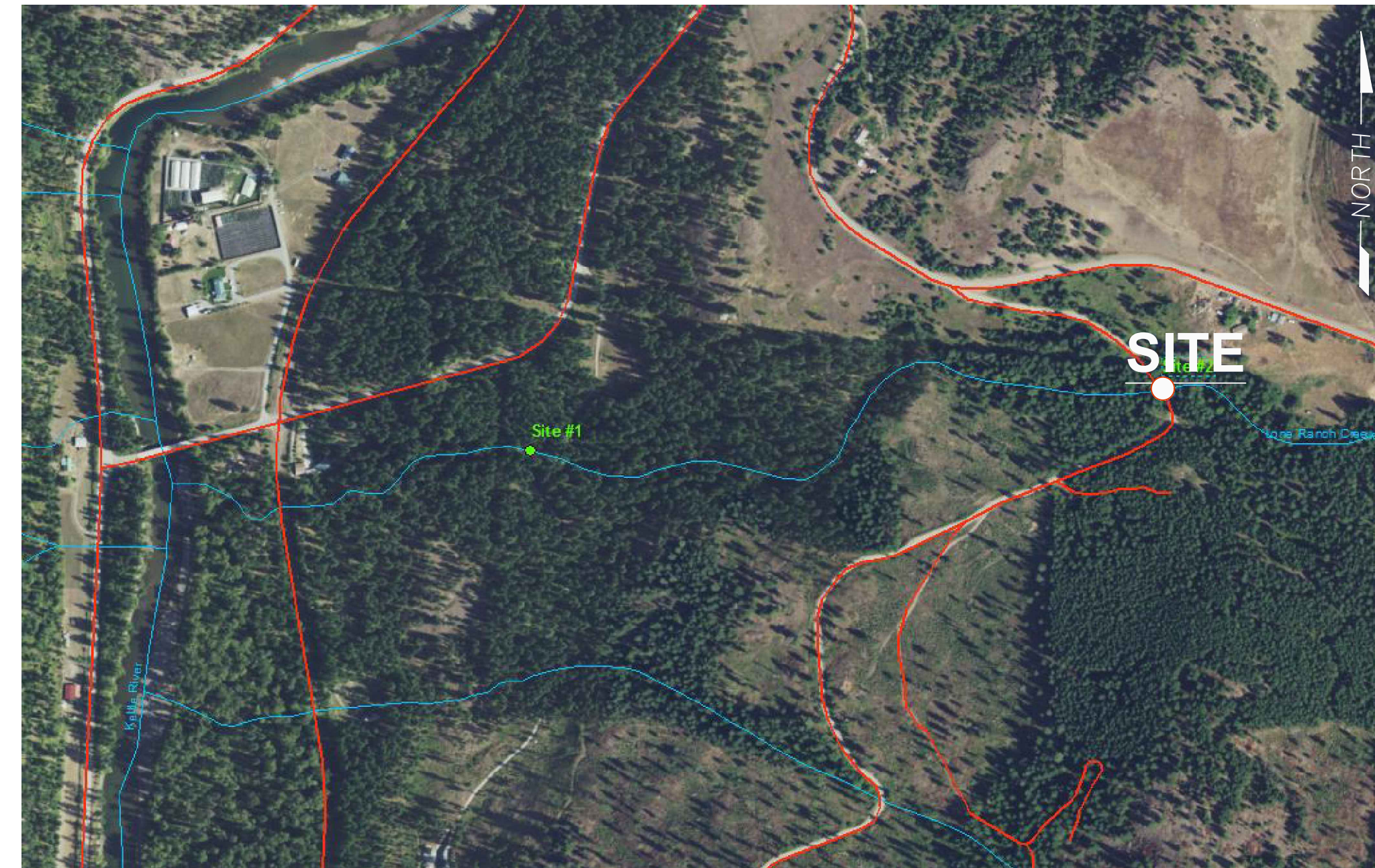
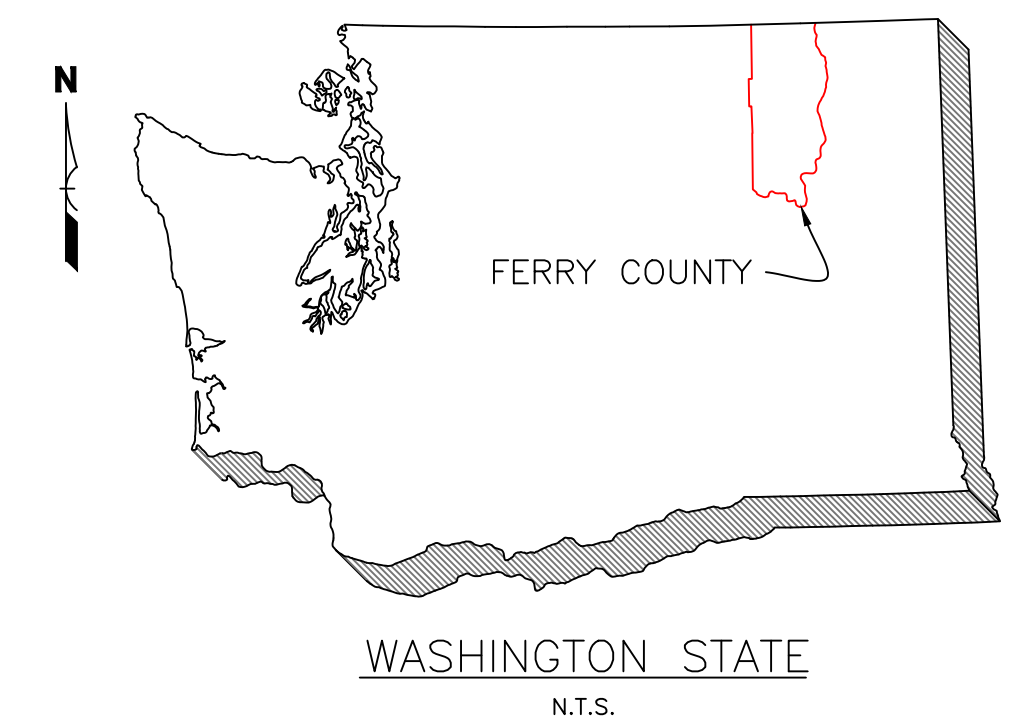




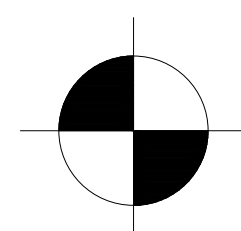
LONE RANCH CREEK, TRIBUTARY TO KETTLE RIVER CULVERT AND FILL REMOVAL PLAN FISH PASSAGE AND HABITAT RESTORATION PROJECT FERRY COUNTY, WA., WRIA: 60, SITE: 810714



Both sites are on BLM property on Lone Ranch Creek, a tributary to the Kettle River near Danville. Site #1 is on a forest access road for DNR/BLM. Site #2 is a county culvert on Day Creek Road. Lone Ranch Creek provides habitat for interior Columbia redband trout.

Sheet Index

- 1 COVER SHEET
- 2 EROSION CONTROL TYPICAL DETAILS
- 3 TEMPORARY DEWATERING PLAN
- 4 EXISTING PLAN VIEW (20 SCALE)
- 5 PROPOSED PLAN VIEW (10 SCALE)
- 6 STREAM PROFILE
- 7 STREAM SECTIONS (4+93 - 2+75)
- 8 STREAM SECTIONS (2+30 - 0+75)
- 9 ROAD PROFILE
- 10 CULVERT DETAILS
- 11 RESTORATION PLANTING TYPICAL DETAILS



Vertical Datum
ASSUMED

Project Control Points

Point	Northing	Easting	Elevation
REBAR #1	10067.1544	7818.3851	107.307
REBAR #2	9922.0465	8156.6692	114.943

SURVEY DISCLAIMER

THIS IS NOT A BOUNDARY SURVEY. ELEVATIONS SHOWN ARE BASED ON AN ASSUMED DATUM. TOPOGRAPHIC INFORMATION WAS GATHERED UNDER DIRECTION OF THE ENGINEER FOR THE SOLE PURPOSE OF DESIGN AND CONSTRUCTION OF THIS PROJECT. PROPERTY LINES, EASEMENTS, AND RIGHT OF WAY LOCATIONS DISPLAYED ARE APPROXIMATE BASED ON INFORMATION OBTAINED FROM RECORDED DOCUMENTS, FOR REFERENCE PURPOSES ONLY.



Inlet (4/15/2016); tree is growing around inlet, 50% plugged with debris



Outlet (4/15/2016)

Site #2 (County culvert on Day Creek Rd) Unable to measure pipe diameter due to high flow, but appeared to be 5 ft. with outfall drop (4+ ft). Bankfull width is approximately 11-12 ft. Slope is relatively flat (3-4%).

Directions to Site

From Curlew, travel north on Hwy 21 8 miles to Lone Ranch Creek Rd. (mp 189.16) Travel approximately 1.0 miles to Day Creek Road, turn right. Follow road 900 feet to crossing.

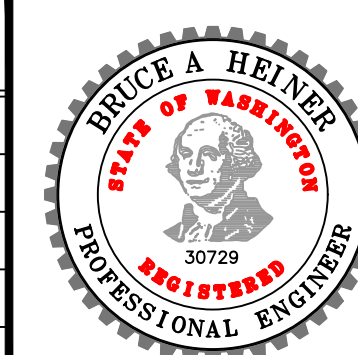
APPROVED FOR CONSTRUCTION

Donald C. Ponder, PE
Environmental Engineering Section Manager
Restoration Division, Habitat Program, WDFW



STATE OF WASHINGTON
DEPARTMENT OF FISH & WILDLIFE
HABITAT PROGRAM

SYM	DATE	BY:	REVISION DESCRIPTION



DESIGNED BY B. HEINER
CHECKED BY _____
DRAWN BY K. CORWIN
DATE _____

SCALE VERIFICATION
0 ——— 1 INCH
BAR MEASURES
ONE INCH ON
ORIGINAL DRAWINGS
0 10' 20' 30' 40'
Scale: 1" = 20'

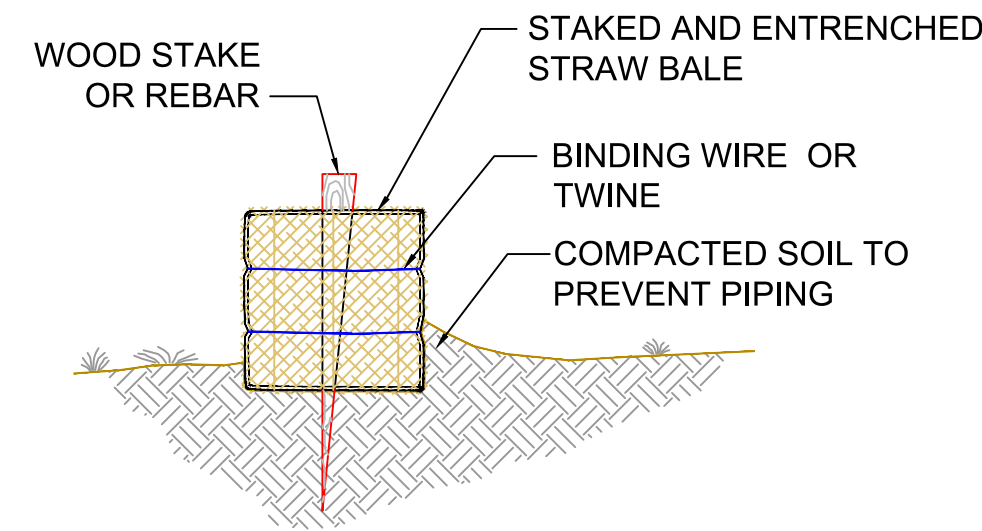
**LONE RANCH CREEK
FISH PASSAGE RESTORATION
SITE: 810714
COVER**

Date:
3 - 14 - 17
Sheet:
1 of 11

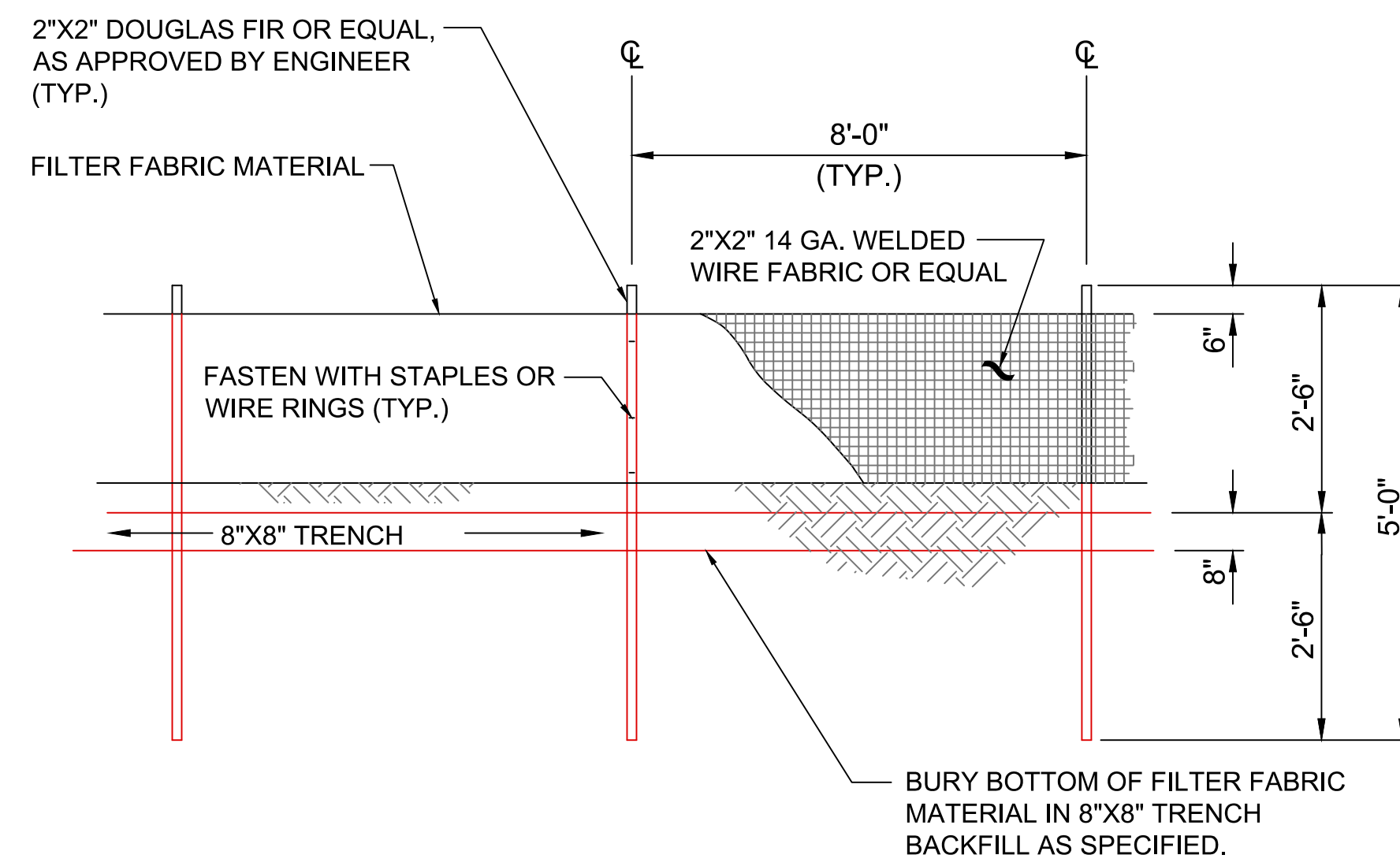
BALES SHALL BE PLACED IN A SINGLE ROW, LENGTHWISE ON THE CONTOUR, WITH ENDS OF ADJACENT BALES TIGHTLY ABUTTING ONE ANOTHER.

THE BARRIER SHALL BE ENTRENCHED AND BACKFILLED. A TRENCH SHALL BE A MINIMUM OF 4 INCHES. BACKFILL SOIL SHALL CONFORM TO THE GROUND LEVEL ON THE DOWNHILL SIDE AND SHALL BE BUILT UP 4 INCHES AGAINST THE UPHILL SIDE OF THE BARRIER. EACH BALE SHALL BE SECURELY ANCHORED BY AT LEAST 2 STAKES OR REBAR DRIVEN THROUGH THE BALE.

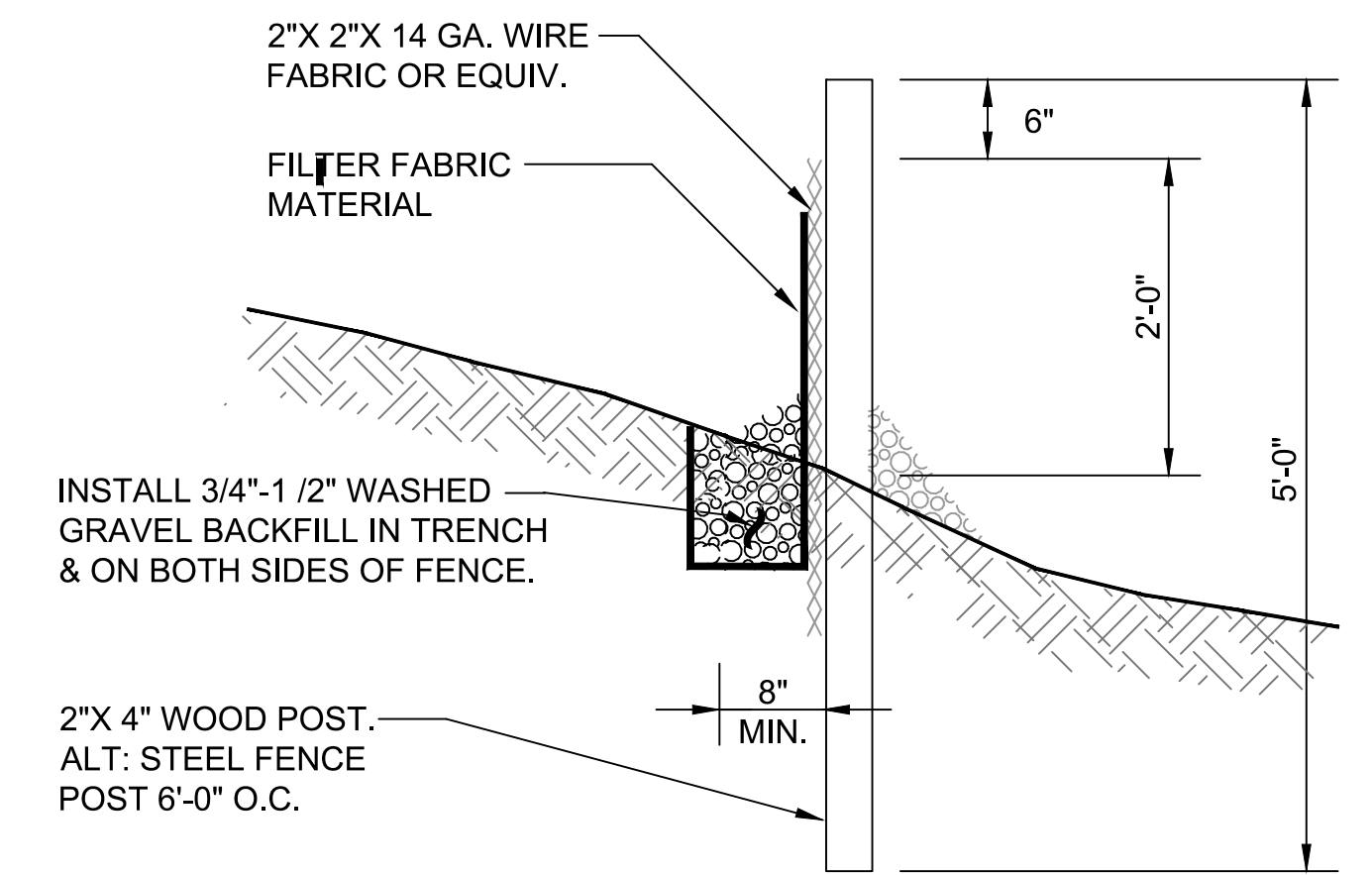
THE GAP BETWEEN THE BALES SHALL BE FILLED BY WEDGING WITH STRAW TO PREVENT WATER FROM ESCAPING BETWEEN THE BALES.



STRAW BALE BARRIER
SCALE: N.T.S.



TYPICAL SILT FENCE DETAIL
Scale: N.T.S.



TYPICAL SILT FENCE SECTION VIEW
Scale: N.T.S.

STANDARD EROSION CONTROL NOTES

SILT FENCES:

1. Filter fabric shall be purchased in a continuous roll cut to the length of the barrier to avoid use of joints. When joints are necessary, filter cloth shall be spliced together only at a support post, with a minimum 6 inch overlap, and securely fastened at both ends to post.
2. Posts shall be spaced a maximum of 6 feet apart and drilled-ven securely into the ground (minimum of 30 inches).
3. A trench shall be excavated approximately 8 inches wide and 12 inches deep along the line of posts and upslope from the barrier.
4. When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy-duty wire staples at least 1 inch long, tie wires or hog rings. The wire shall extend into the trench a minimum of 4 inches and shall not extend more than 36 inches above the original ground surface.
5. The standard strength filter fabric shall be stapled or wired to the fence, and 20 inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
6. When extra strength filter fabric and closer post spacing is used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of above notes applying.
7. Filter fabric fences shall not be removed before the upslope area has been permanently stabilized.
8. Filter fabric fences shall be inspected once a week and immediately after each rainfall and at least daily during prolonged rain-fall. Any required repairs shall be made immediately.

STOCK PILES:

1. Stockpiles shall be stabilized (with plastic covering or other approved device).
2. In any season, sediment leaching from stock piles must be positively prevented.

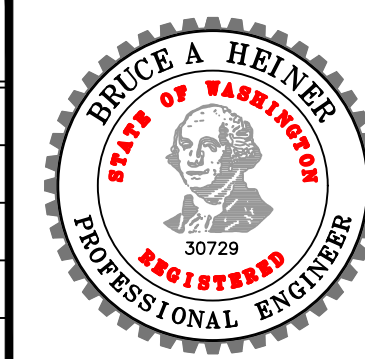
ACCESS:

1. Work area locations are accessible via unmaintained / unpaved farm roads by four wheel drive and tracked vehicles. Access routes will be marked by the engineer. Contractor shall make necessary improvements (Clearing, Grading, Placing temporary fill) to provide equipment access to each work area, and restore to pre-project conditions upon completion of the work.



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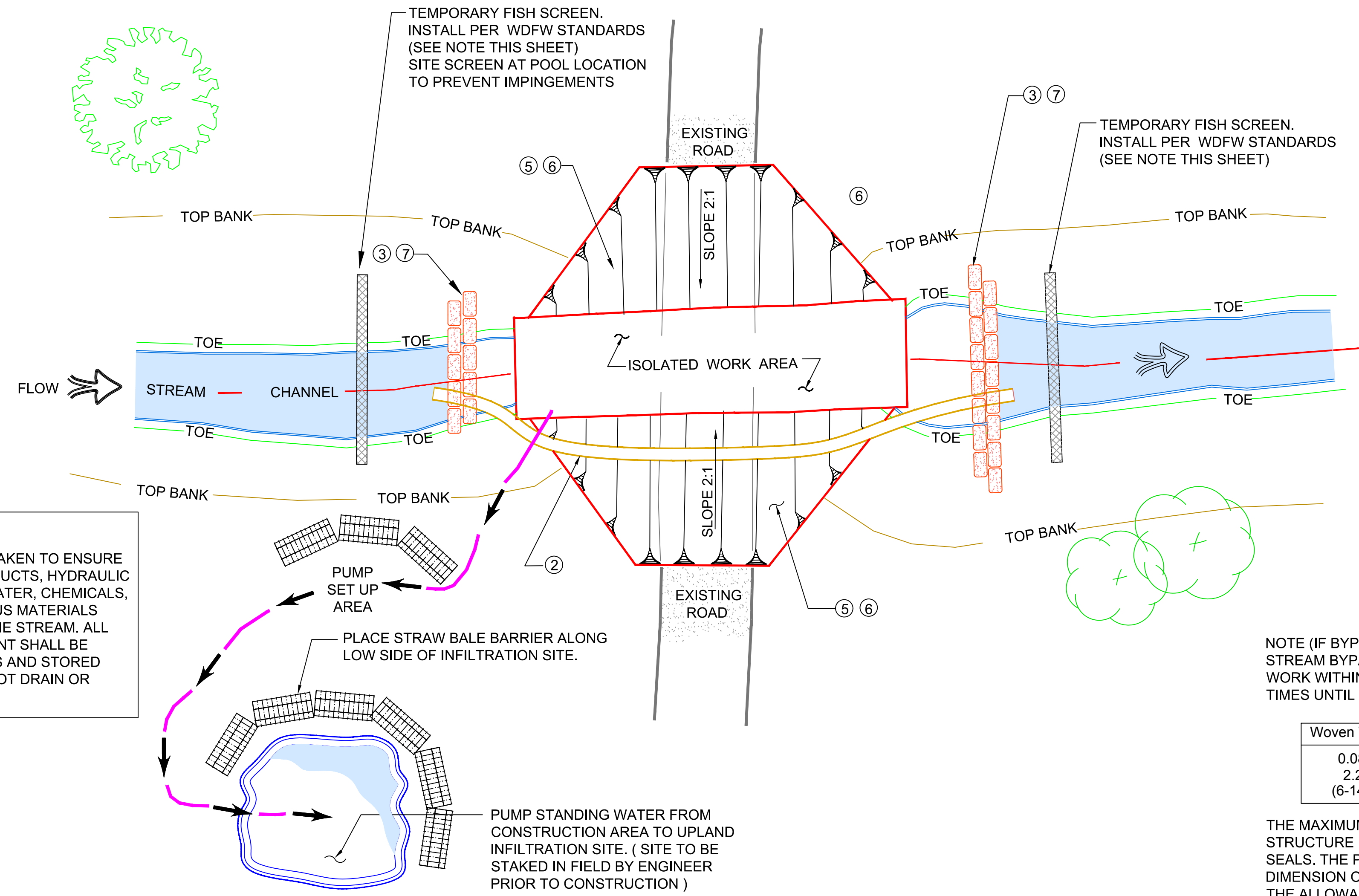


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CHECKED BY _____
DRAWN BY K. CORWIN
DATE _____

SCALE VERIFICATION
0 ——— 1 INCH
BAR MEASURES
ONE INCH ON
ORIGINAL DRAWINGS

**LONE RANCH CREEK
FISH PASSAGE RESTORATION
SITE: 810714
EROSION CONTROL
TYPICAL DETAILS**

Date:
3 - 14 - 17
Sheet:
2 of 11



Note: Remove all components and restore areas disturbed by de-watering facility following construction.

- ① ALL WORK SHALL BE IN ACCORDANCE WITH HPA.
- ② DURING CONSTRUCTION (IF REQUIRED) STREAM FLOW SHALL BE DIVERTED THROUGH BYPASS PIPE. DIVERSION SHALL BE APPROVED BY PROJECT ENGINEER PRIOR TO REMOVING EXISTING CULVERTS.
- ③ PLACE BAGS FILLED WITH PEA GRAVEL TO SEAL BYPASS INLET AND OUTLET (IF DIVERSION REQUIRED).
- ④ EXCAVATE EXISTING FILL.
- ⑤ PLACE NEW BED MATERIAL MIX AND REMOVE BYPASS PIPE (IF INSTALLED).
- ⑥ COVER ALL EXPOSED SOIL WITH STRAW MULCH AND GRASS SEED. (SEE SHEET 9 FOR PLANTINGS)
- ⑦ REMOVE DIVERSION BAGS AND FISH SCREENS BY HAND (IF INSTALLED).

NOTE:
EXTREME CARE SHALL BE TAKEN TO ENSURE THAT NO PETROLEUM PRODUCTS, HYDRAULIC FLUID, SEDIMENT, LADEN WATER, CHEMICALS, OR ANY OTHER DELETERIOUS MATERIALS ARE ALLOWED TO ENTER THE STREAM. ALL CONTAINERS AND EQUIPMENT SHALL BE MAINTAINED FREE OF LEAKS AND STORED SUCH THAT LEAKAGE CANNOT DRAIN OR LEACH INTO THE STREAM.

NOTE (IF BYPASS REQUIRED):
STREAM BYPASS TO BE INSTALLED AND ACTIVE PRIOR TO WORK WITHIN OHW. BYPASS TO REMAIN ACTIVE DURING ALL TIMES UNTIL CULVERT AND STREAM WORK IS COMPLETE.

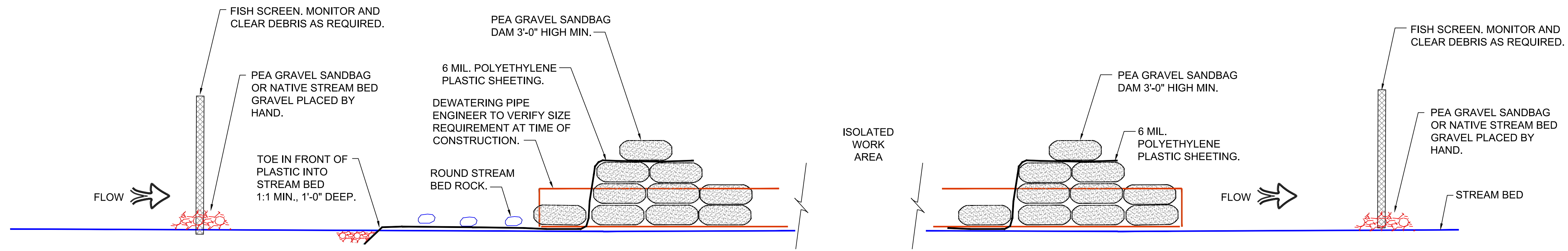
Woven Wire Mesh	Profile Bar	Perforated Plate
0.087 inch 2.2 mm (6-14 mesh)	1.75 mm	0.094 inch 2.4 mm (3/32 inch)

THE MAXIMUM OPENING APPLIES TO THE ENTIRE SCREEN STRUCTURE INCLUDING THE SCREEN MESH, GUIDES, AND SEALS. THE PROFILE BAR CRITERIA IS APPLIED TO THE NARROW DIMENSION OF RECTANGULAR SLOTS OR MESH. THE ALLOWABLE WOVEN WIRE MESH OPENINGS IS THE GREATEST OPEN SPACE DISTANCE BETWEEN MESH WIRES.

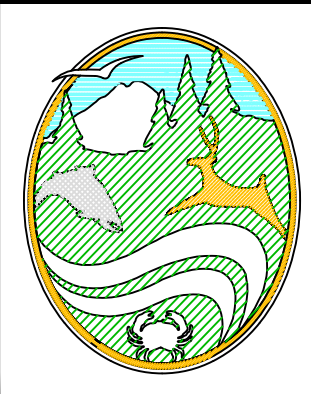
* VERIFY SCREENING MATERIAL MEETS PERMIT REQUIREMENTS.

Typical Dewatering Schematic
SCALE: N.T.S.

Screen Mesh Size, Shape, and Type of Material



Typical Dewatering Section (If Required)
Scale: N.T.S.



STATE OF WASHINGTON
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SCALE VERIFICATION
0 — 1 INCH
BAR MEASURES ONE INCH ON ORIGINAL DRAWINGS

LONE RANCH CREEK
FISH PASSAGE RESTORATION
SITE: 810714
TEMPORARY DEWATERING PLAN

Date:
3 - 14 - 17
Sheet:
3 of 11

WDFW TBM
REBAR #1
ELEV.= 107.31

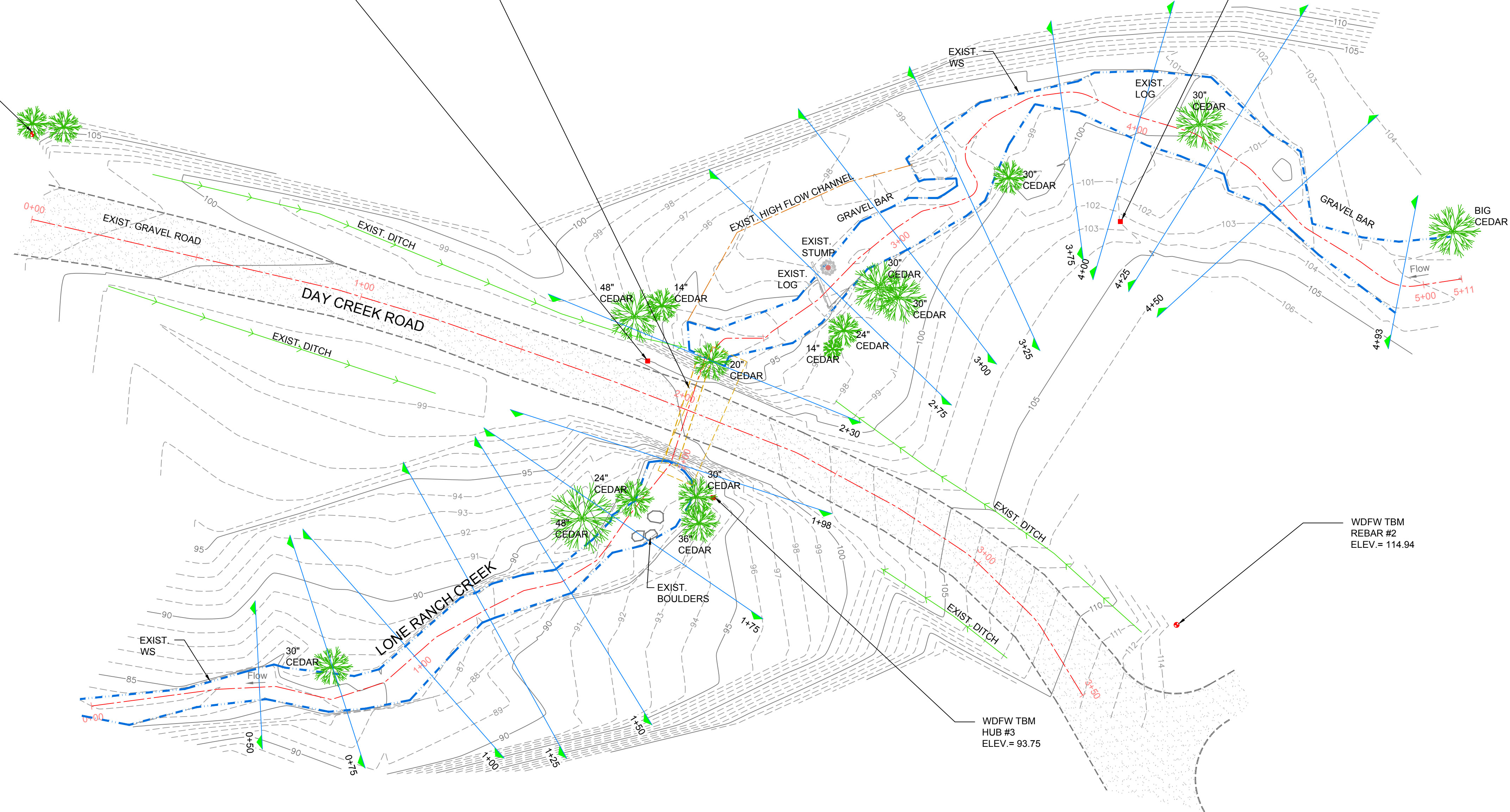
Ex. 33 LF 48" Dia. RND CMP CULVERT
INLET IE= 91.60
OUTLET OE= 90.42
SLOPE = 3.55%
TO BE REMOVED AND DISPOSED OF
BY CONTRACTOR.

WDFW TBM
HUB #1
ELEV.= 100.00

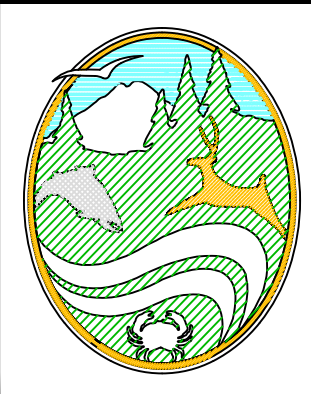
WDFW TBM
HUB #2
ELEV.= 103.43

WDFW TBM
REBAR #2
ELEV.= 114.94

WDFW TBM
HUB #3
ELEV.= 93.75



Note:
1. Datum is assumed.
2. Field verify and locate all ex. utilities prior to construction.
3. Water surface elevations are date of data collection.

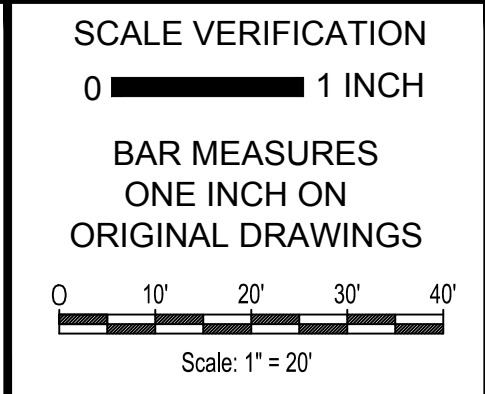


STATE OF WASHINGTON
DEPARTMENT OF FISH & WILDLIFE
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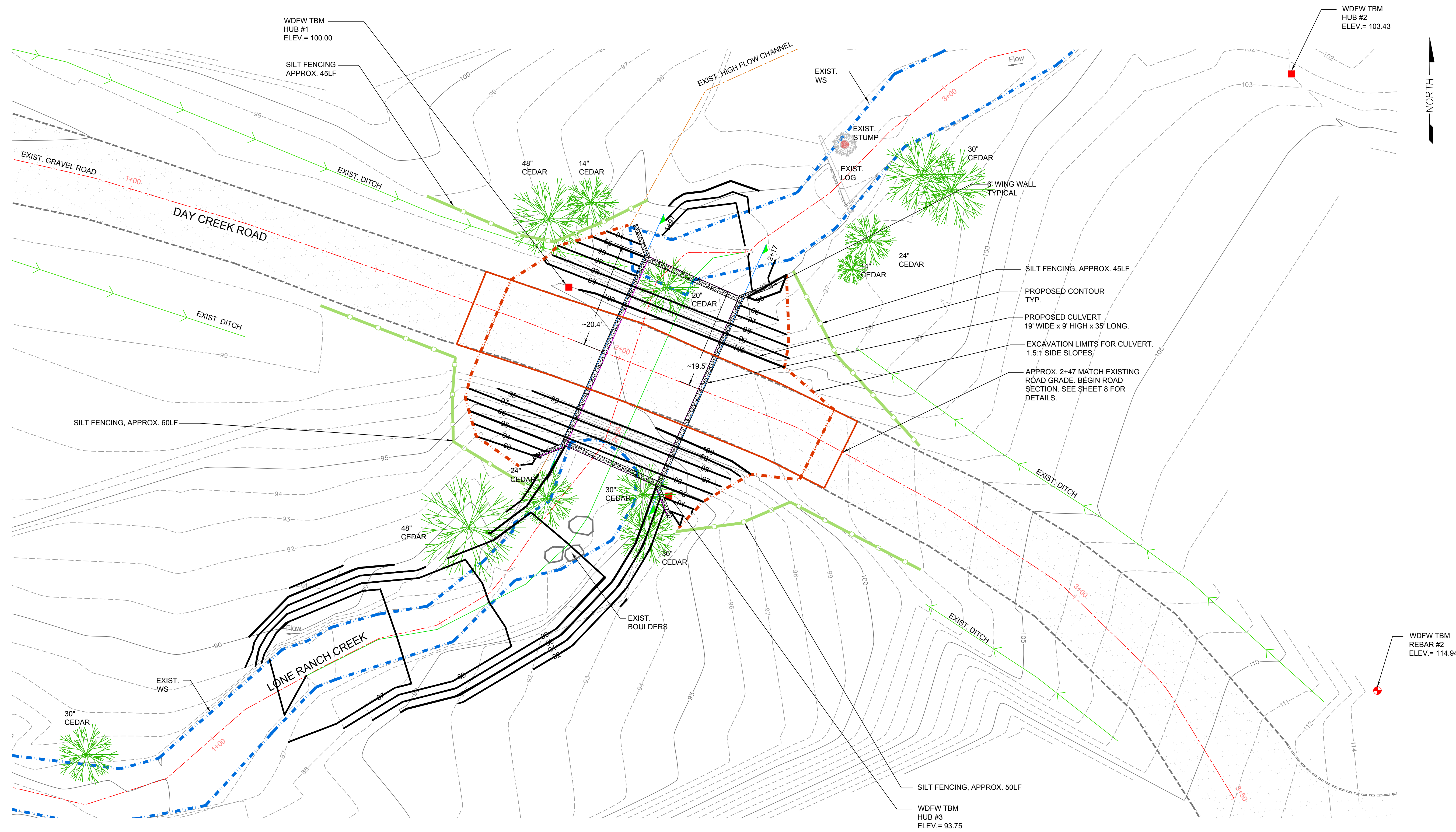


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LONE RANCH CREEK
FISH PASSAGE RESTORATION
SITE: 810714
EXISTING PLAN VIEW

Date:
3 - 14 - 17
Sheet:
4 of 11



- Note:
1. Datum is assumed.
 2. Field verify and locate all ex. utilities prior to construction.
 3. Water surface elevations are date of data collection.

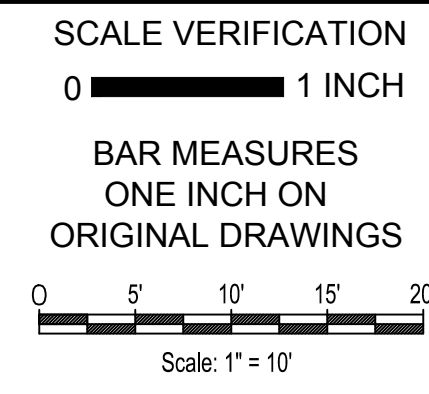


STATE OF WASHINGTON
DEPARTMENT OF FISH & WILDLIFE
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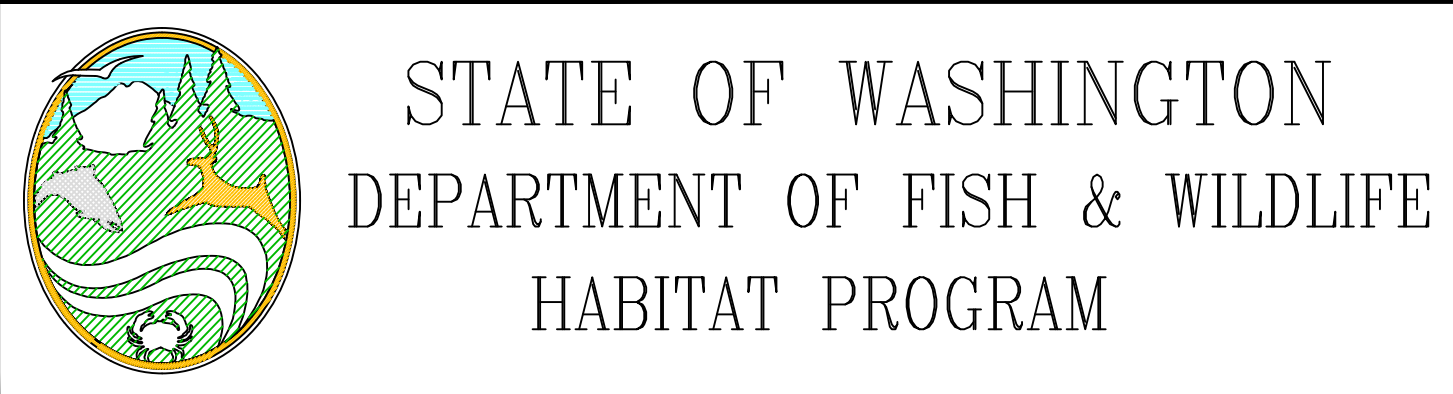
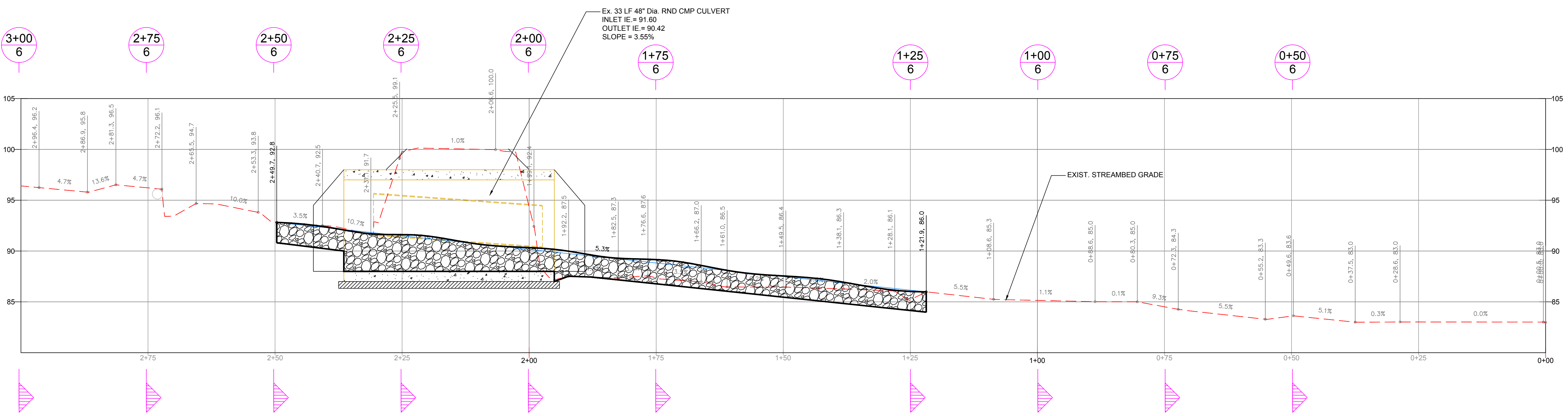
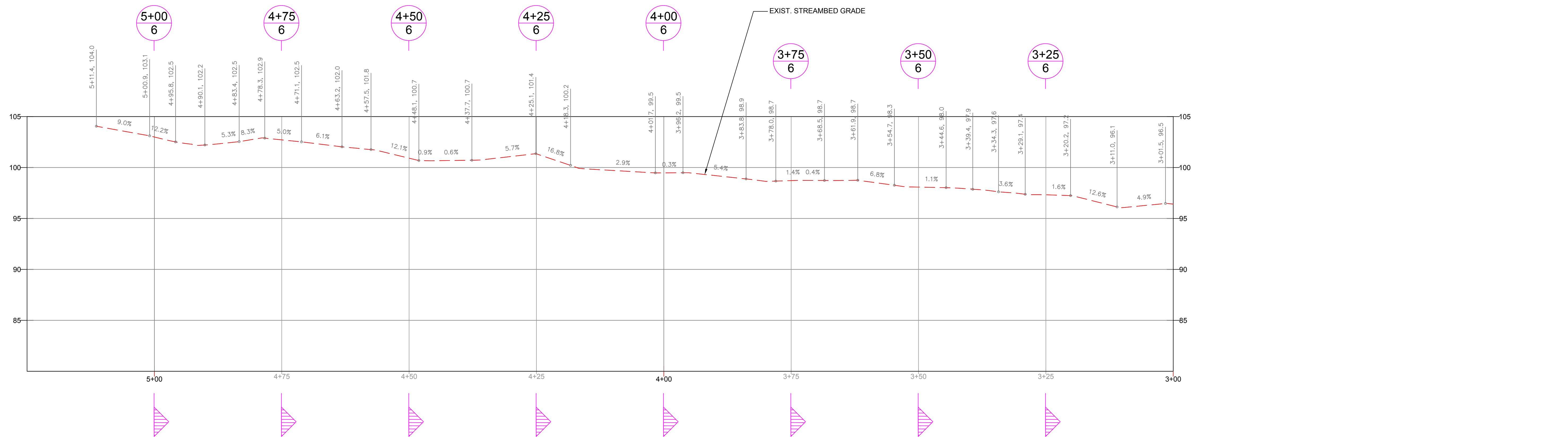


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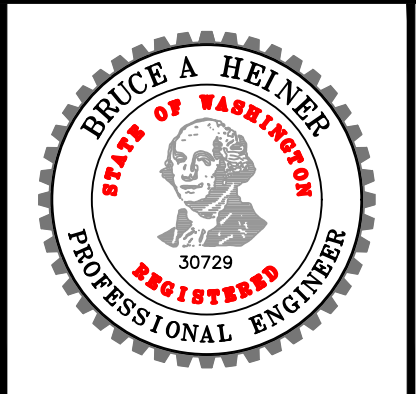


LONE RANCH CREEK
FISH PASSAGE RESTORATION
SITE: 810714
EXISTING PLAN VIEW

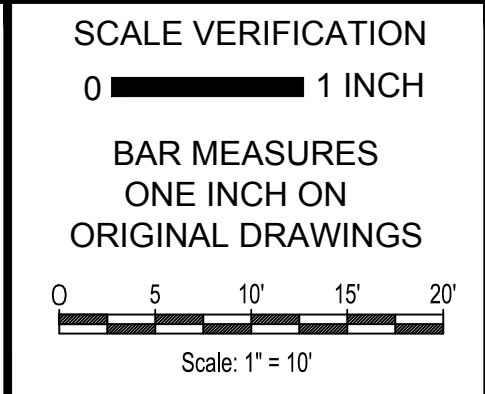
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3 - 14 - 17
Sheet:
5 of 11



SYM	DATE	BY:	REVISION DESCRIPTION

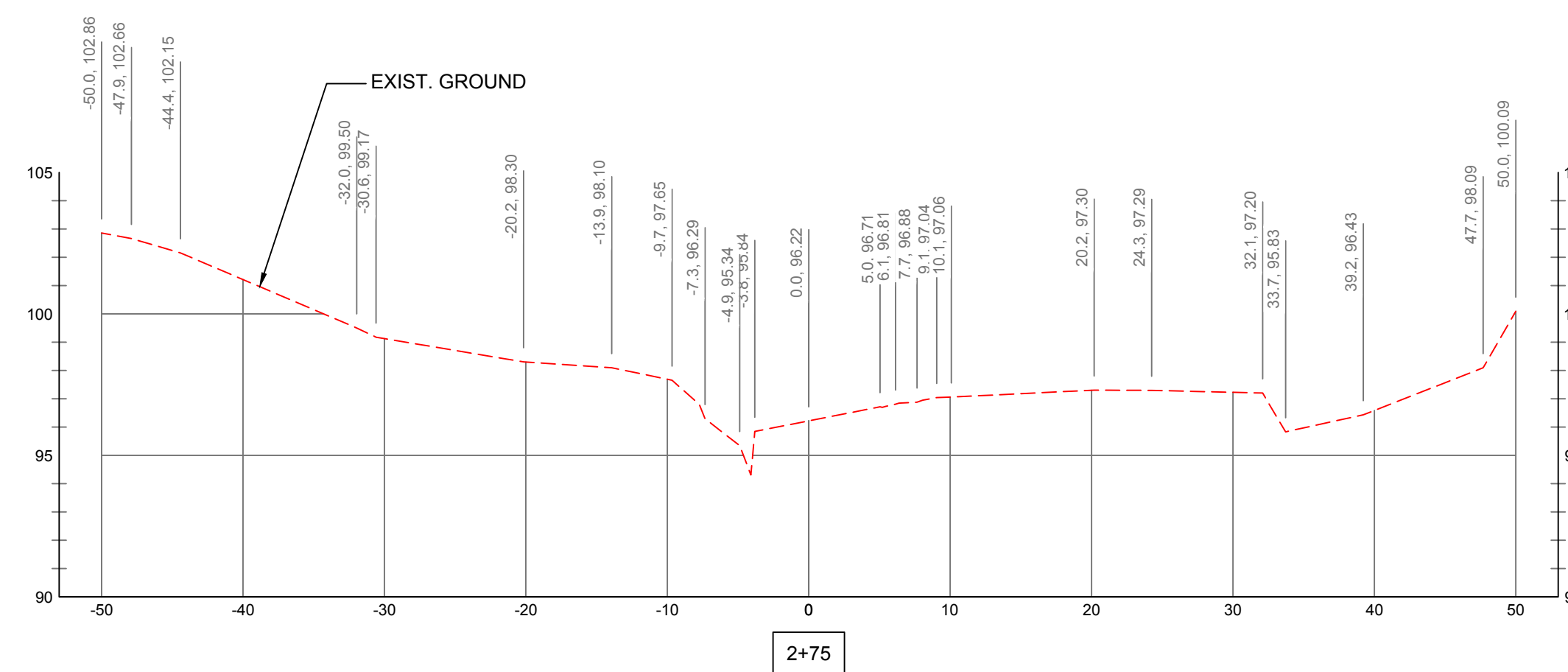
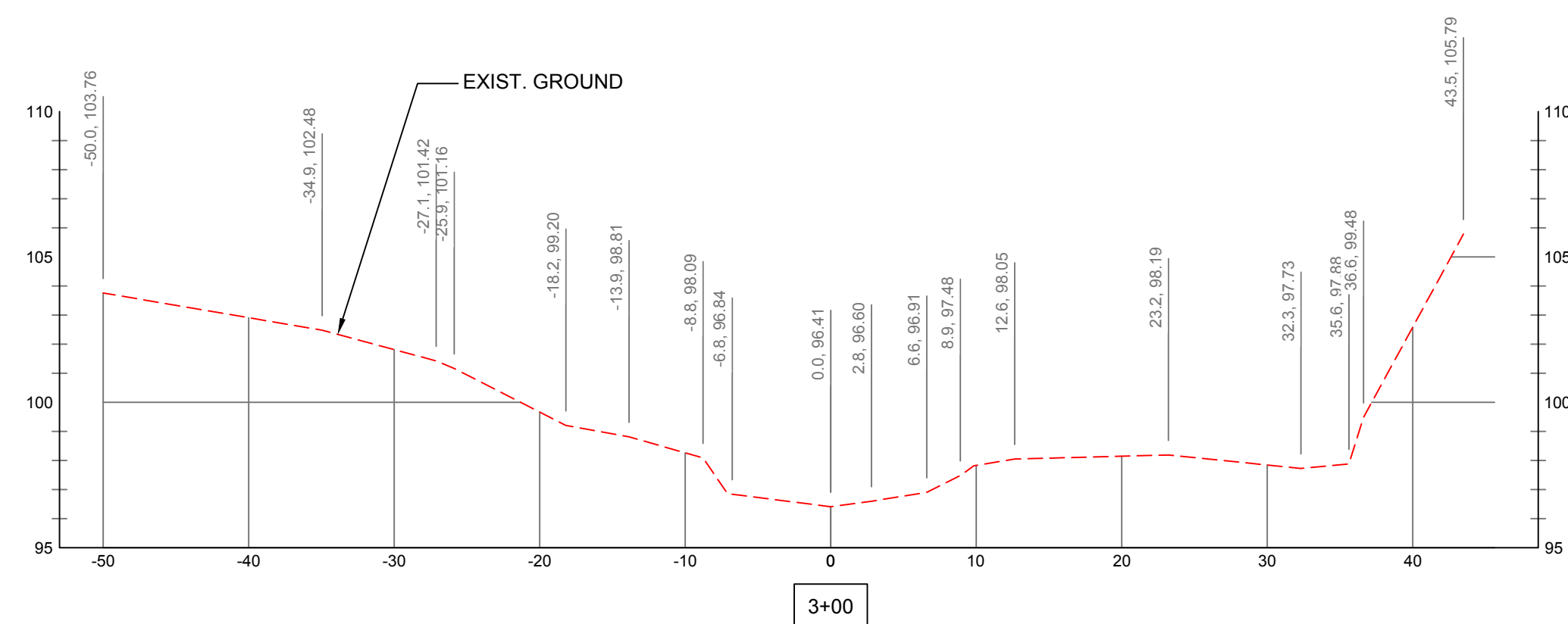
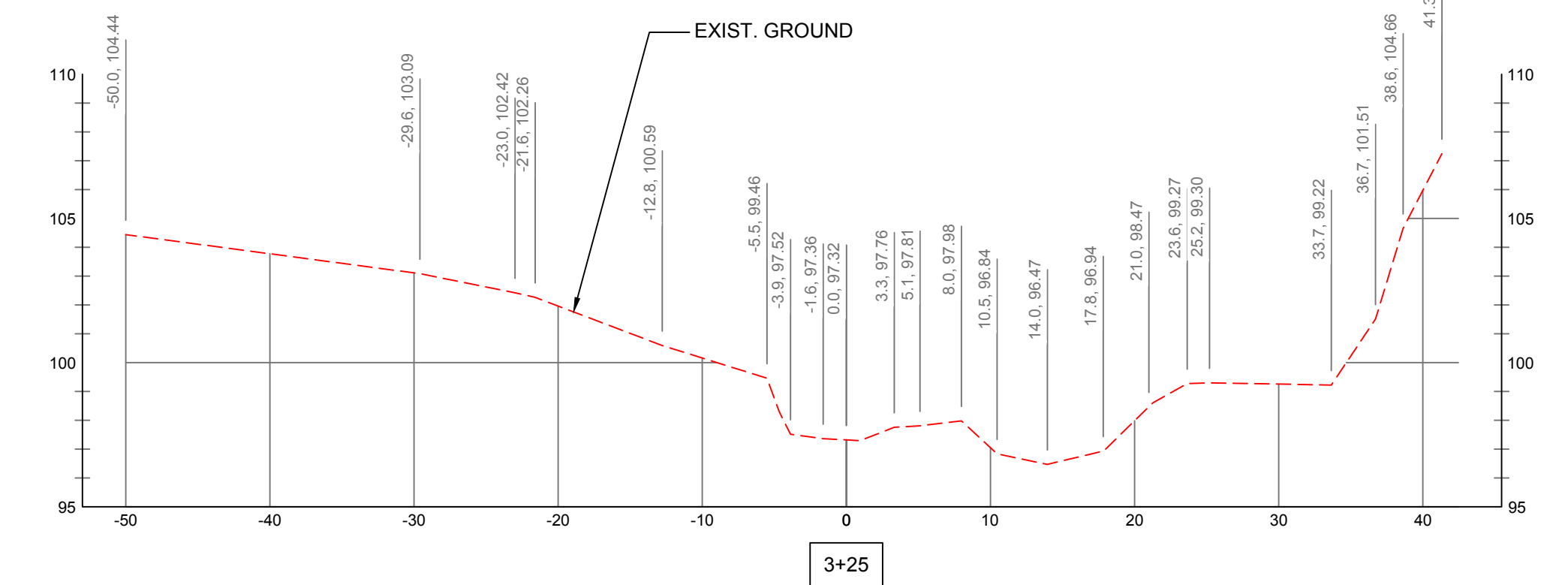
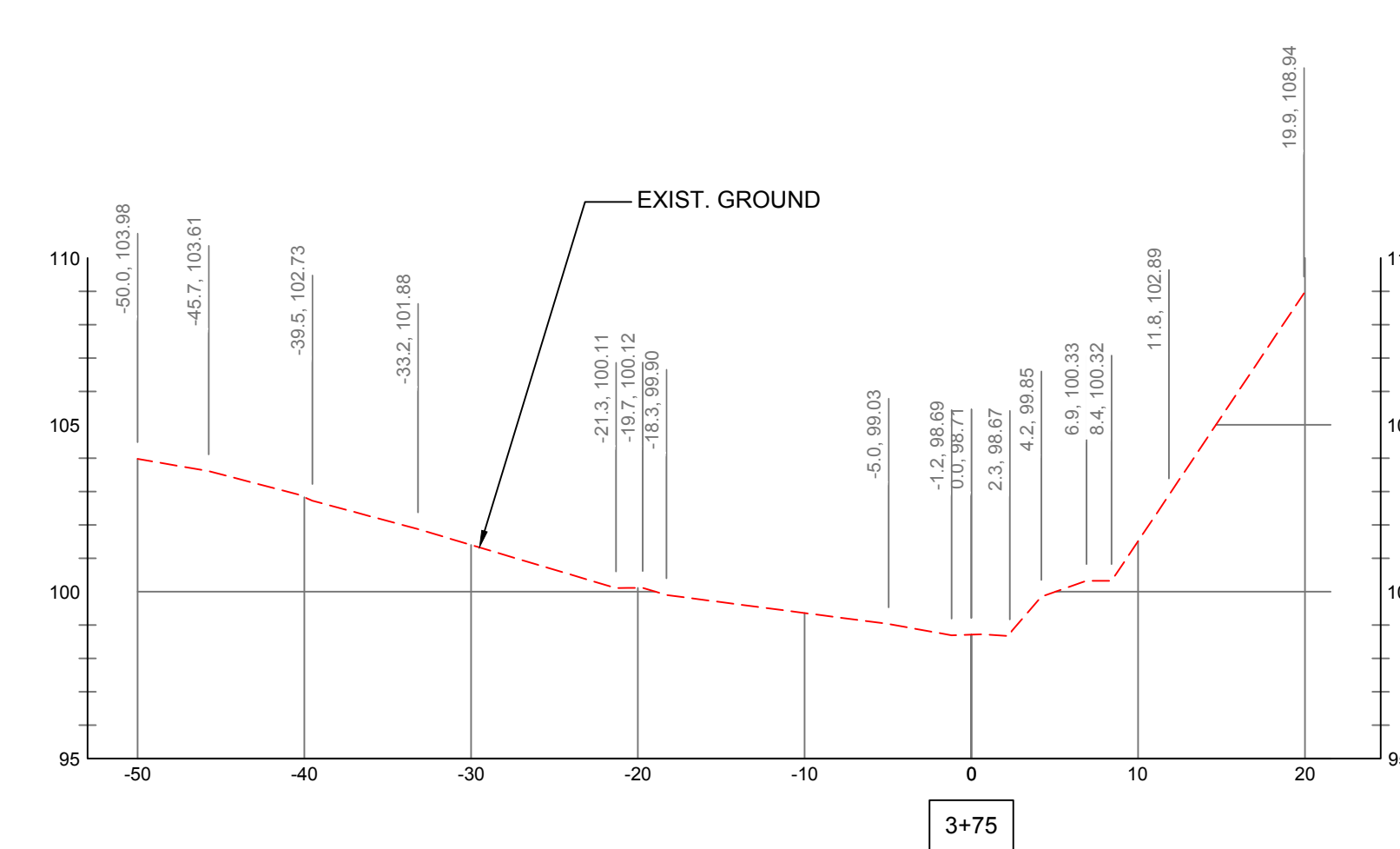
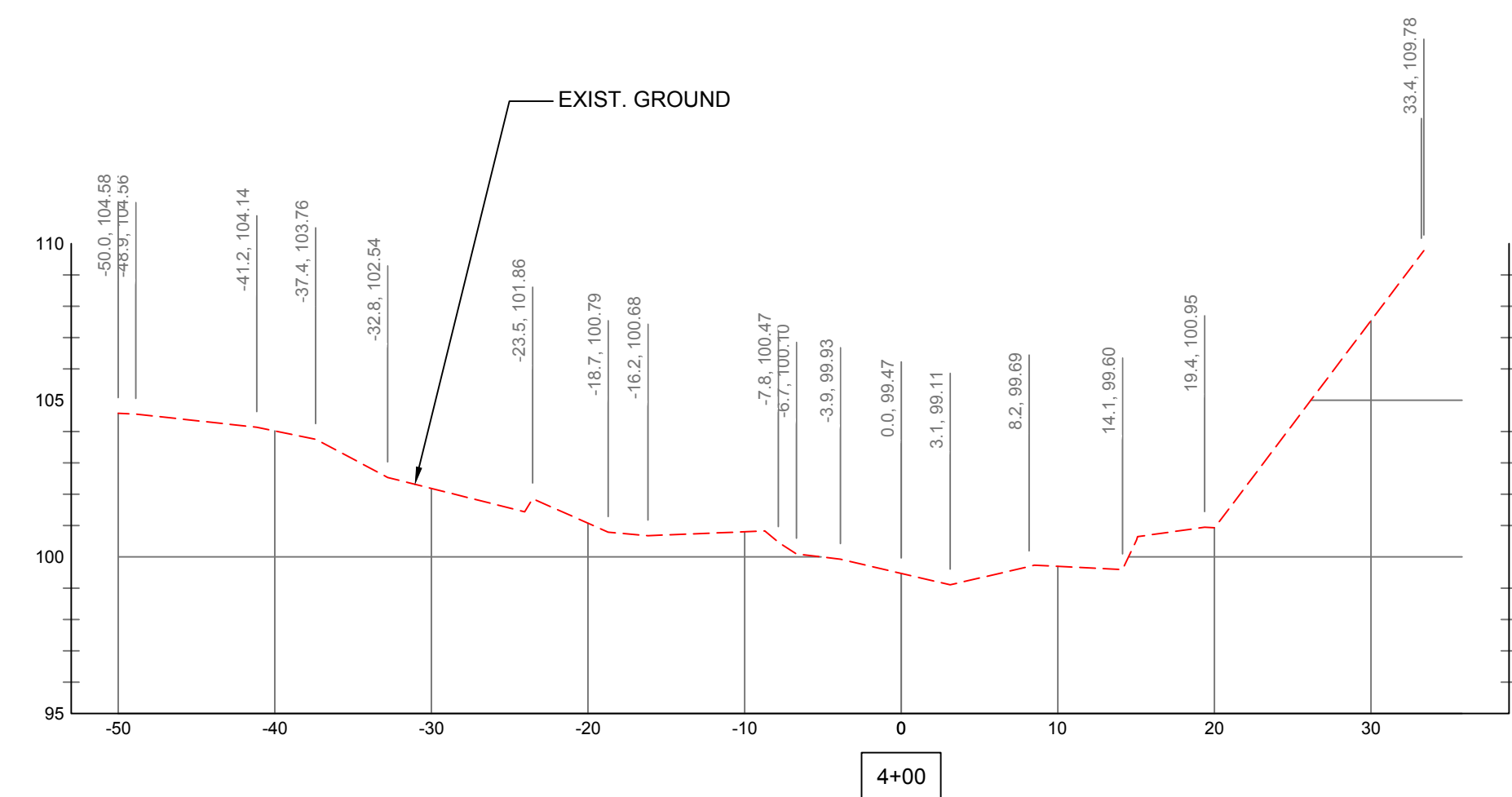
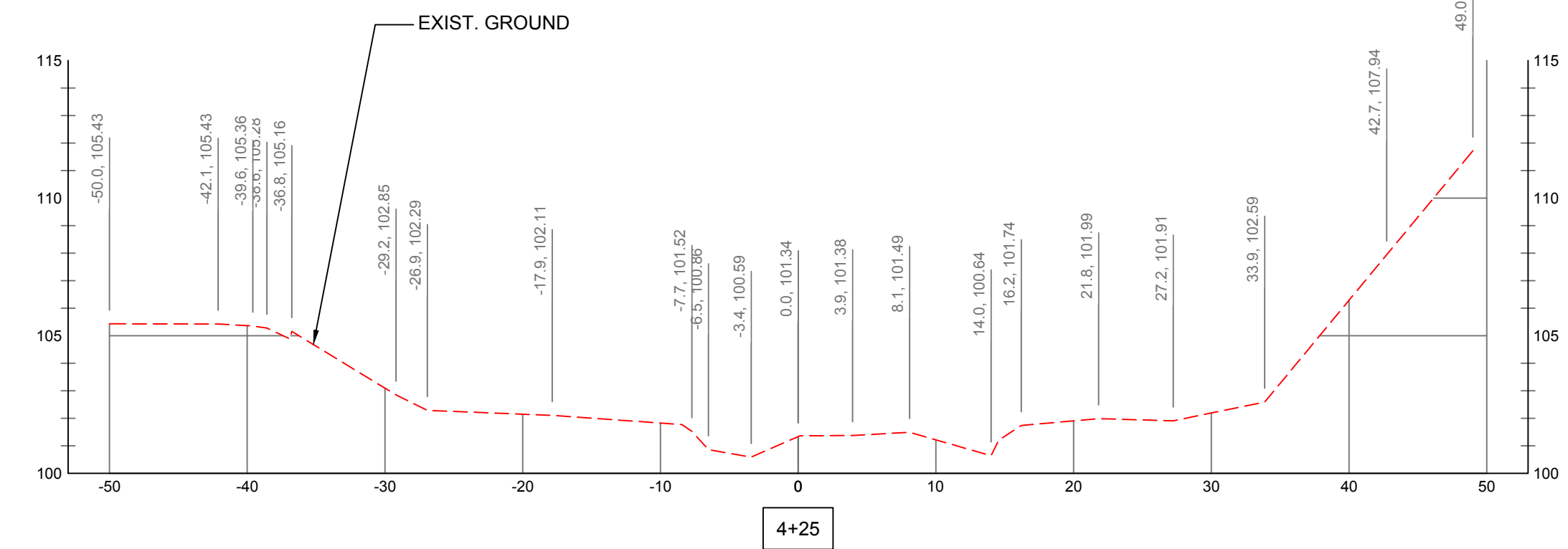
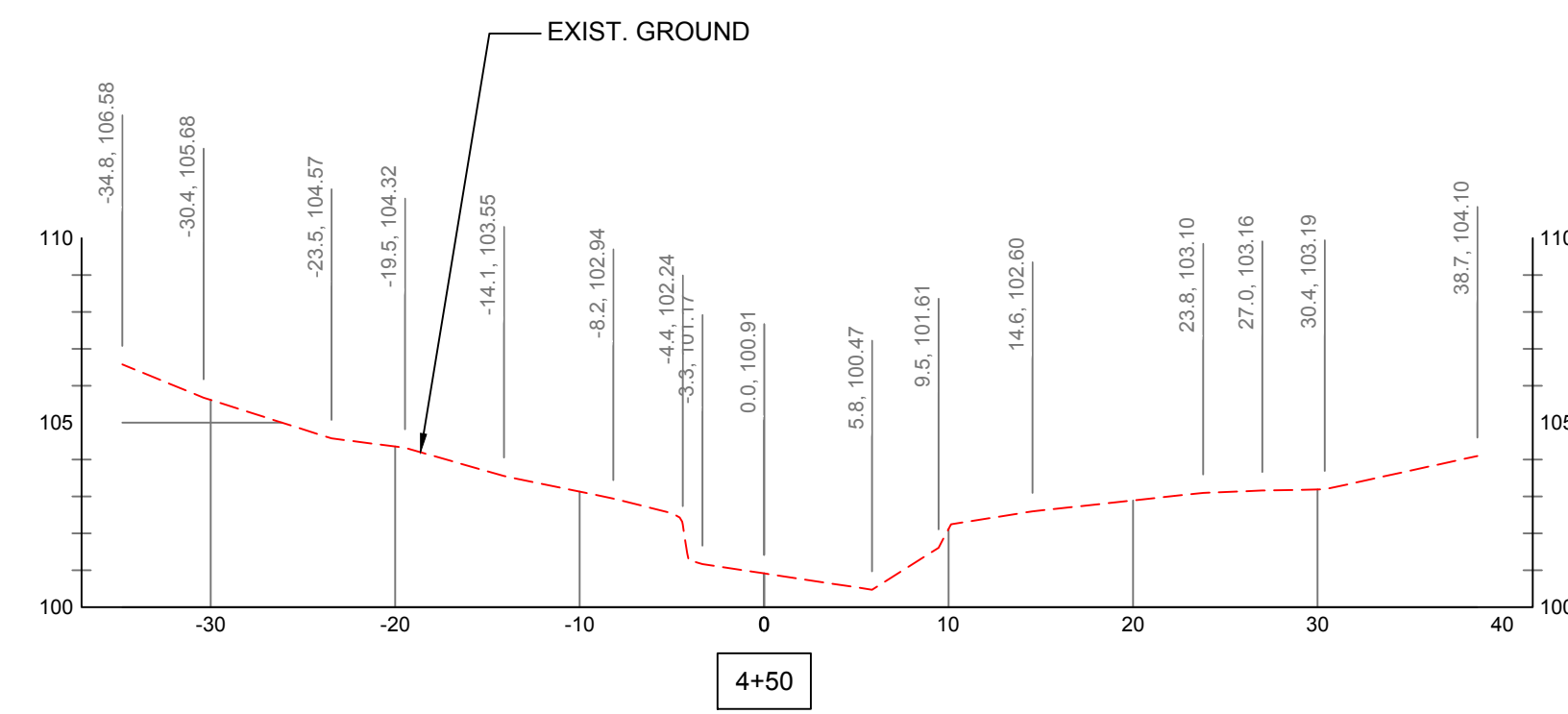
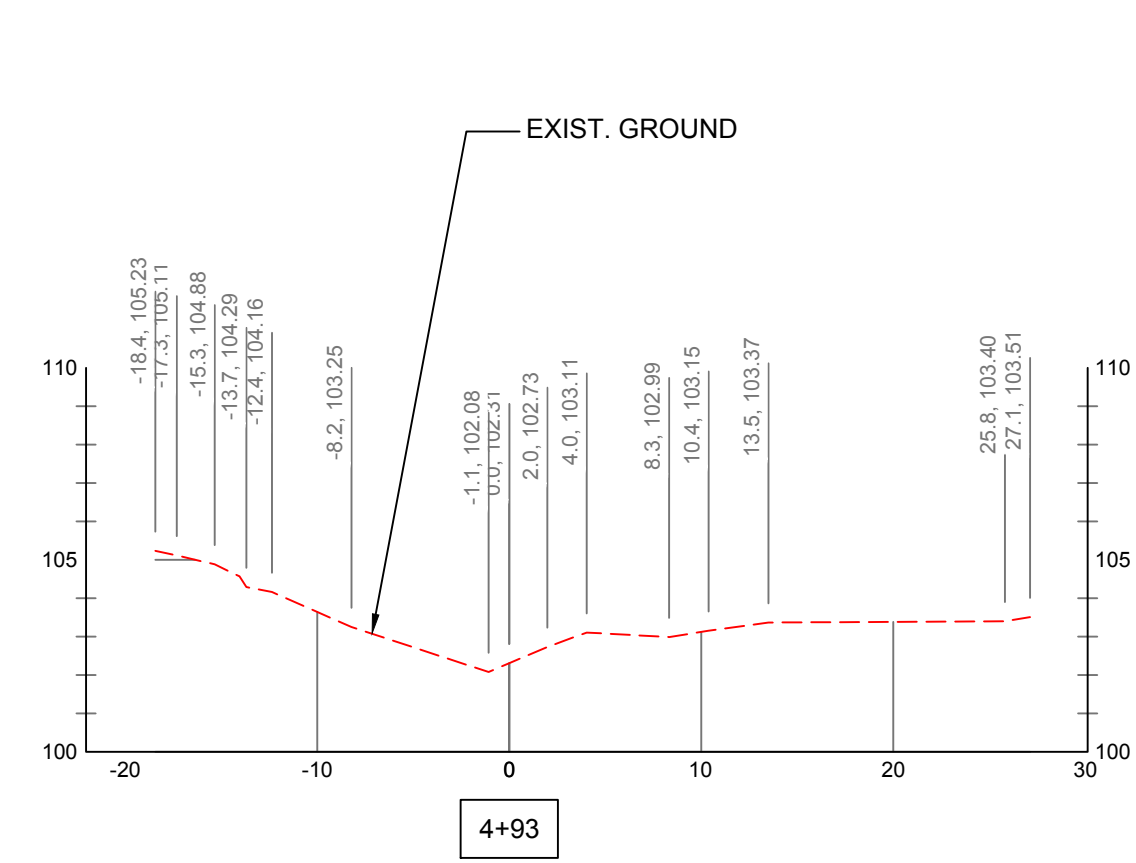


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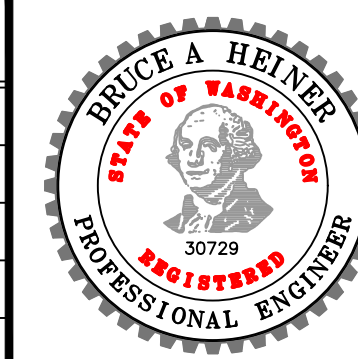
LONE RANCH CREEK
FISH PASSAGE RESTORATION
SITE: 810714
STREAM PROFILE

Date: 3 - 14 - 17
 Sheet: 6 of 11



STATE OF WASHINGTON
DEPARTMENT OF FISH & WILDLIFE
HABITAT PROGRAM

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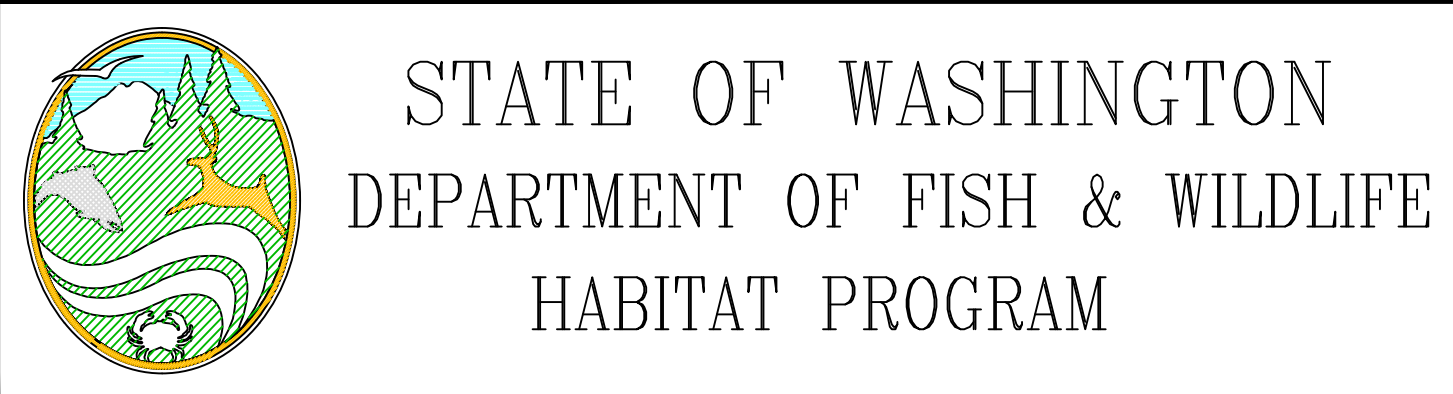
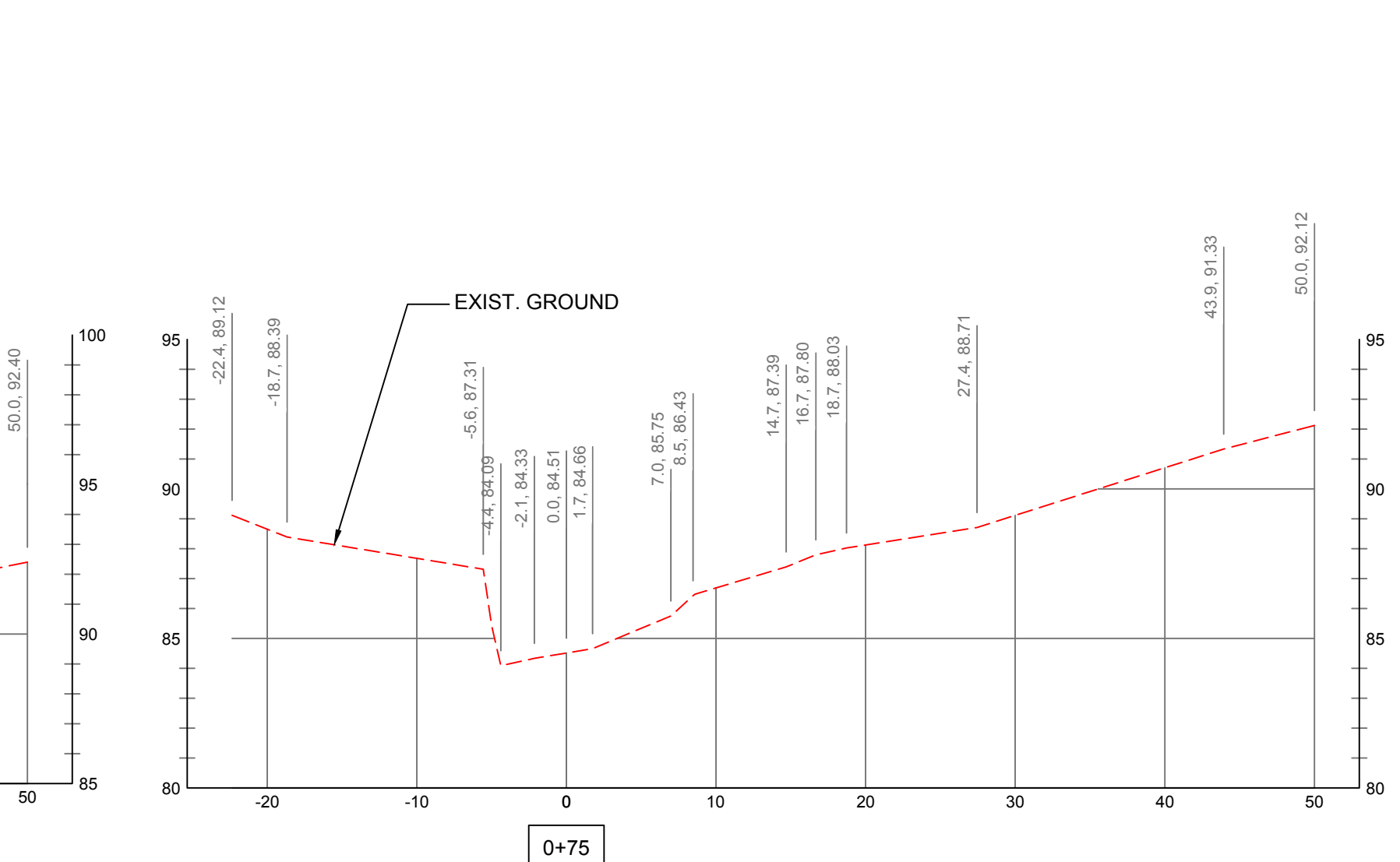
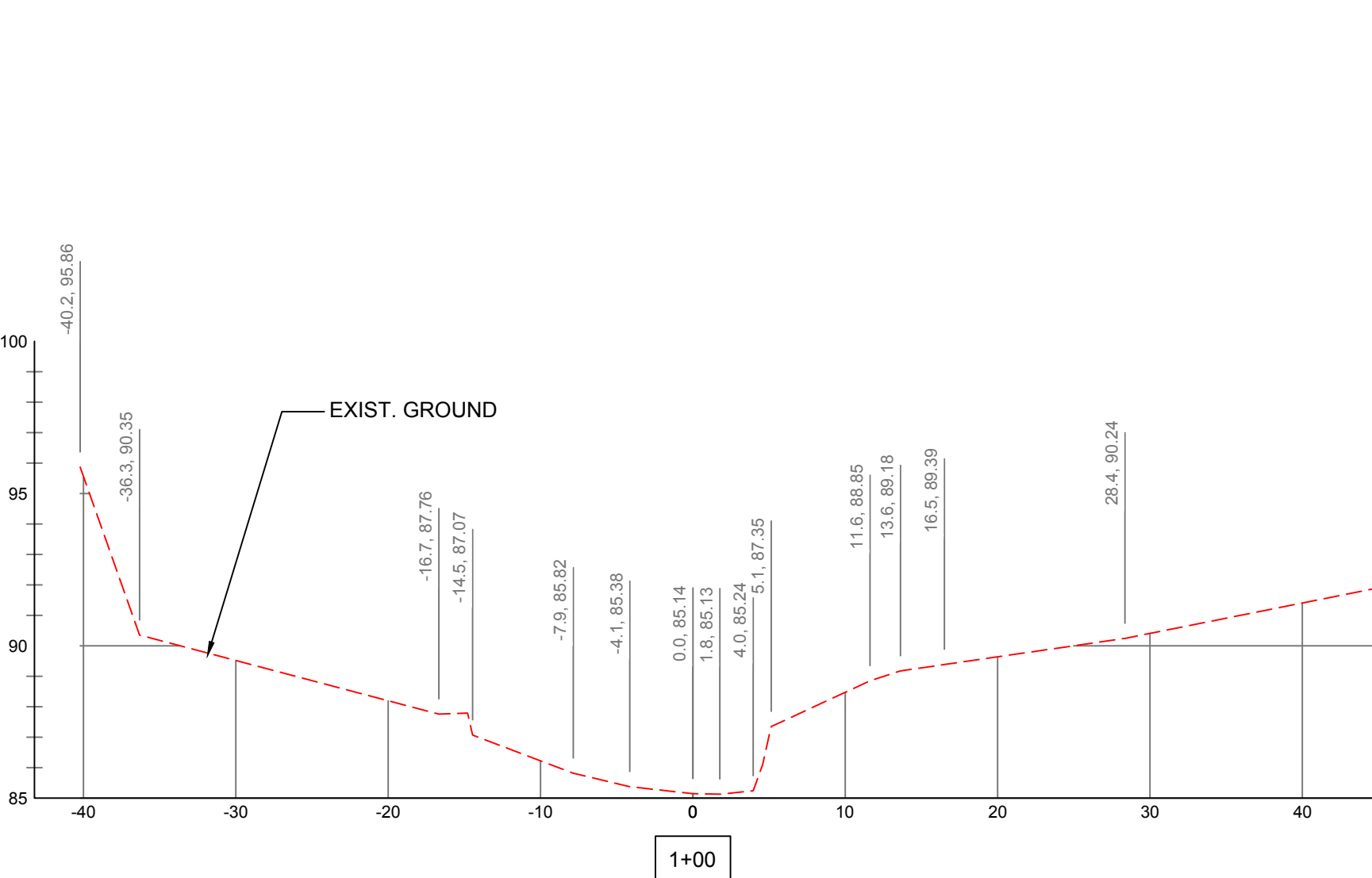
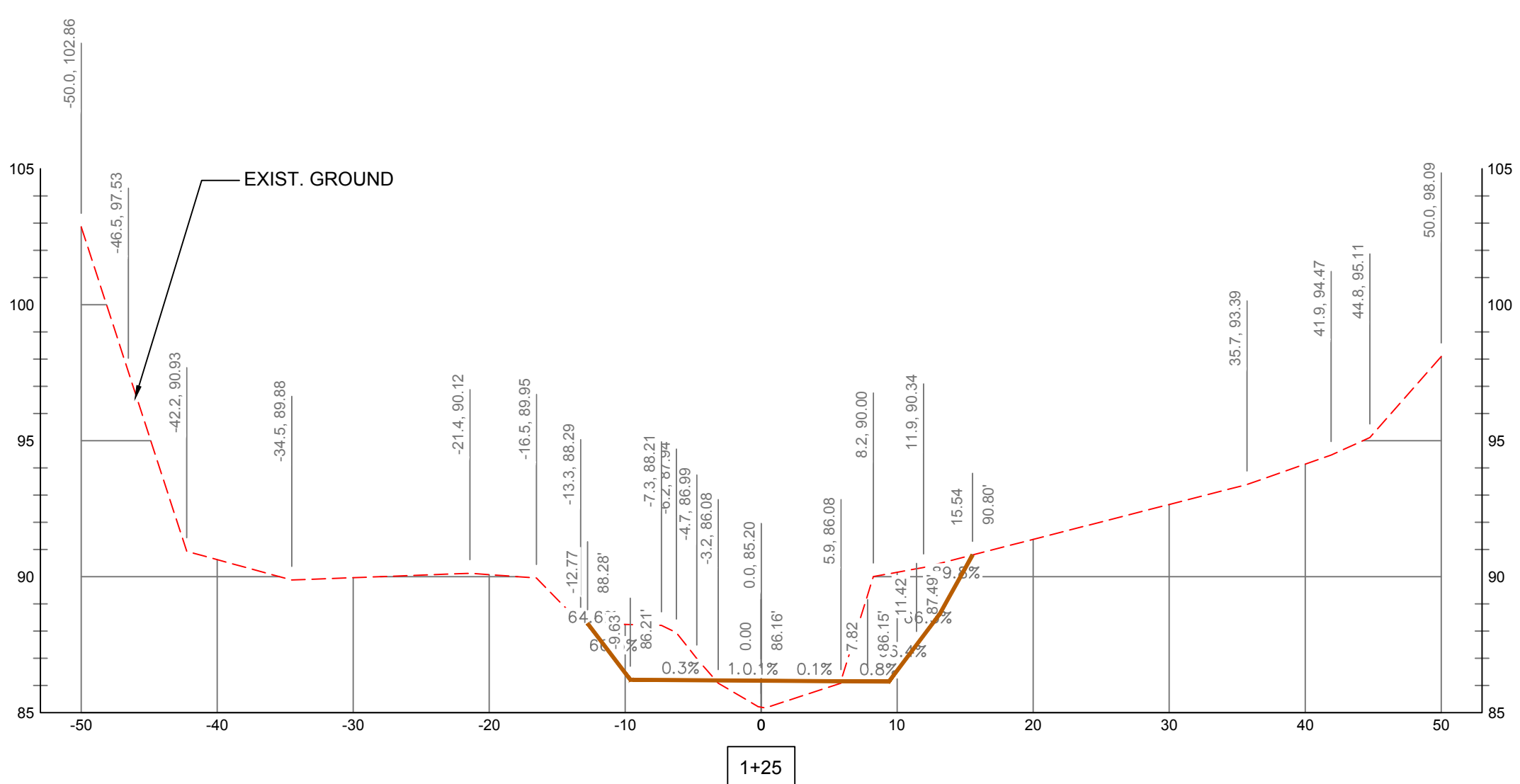
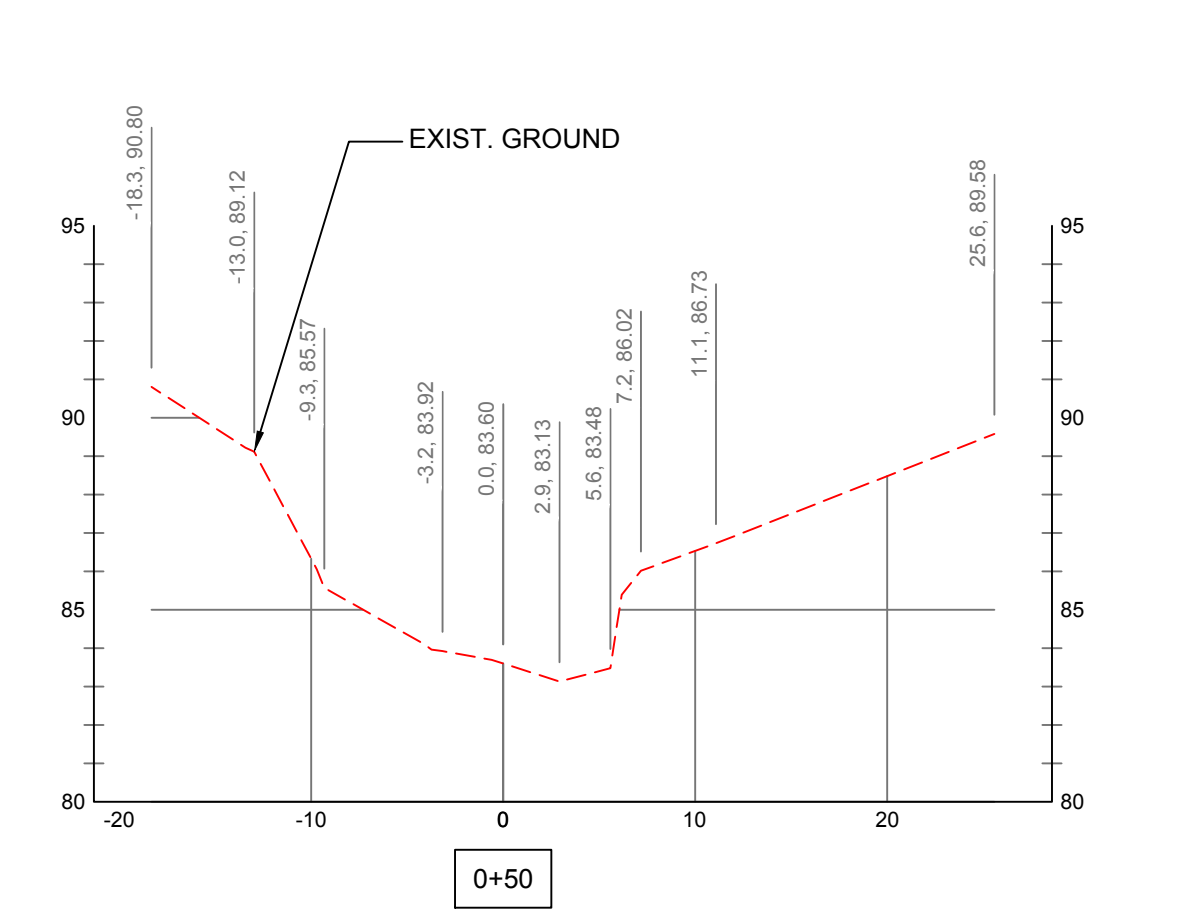
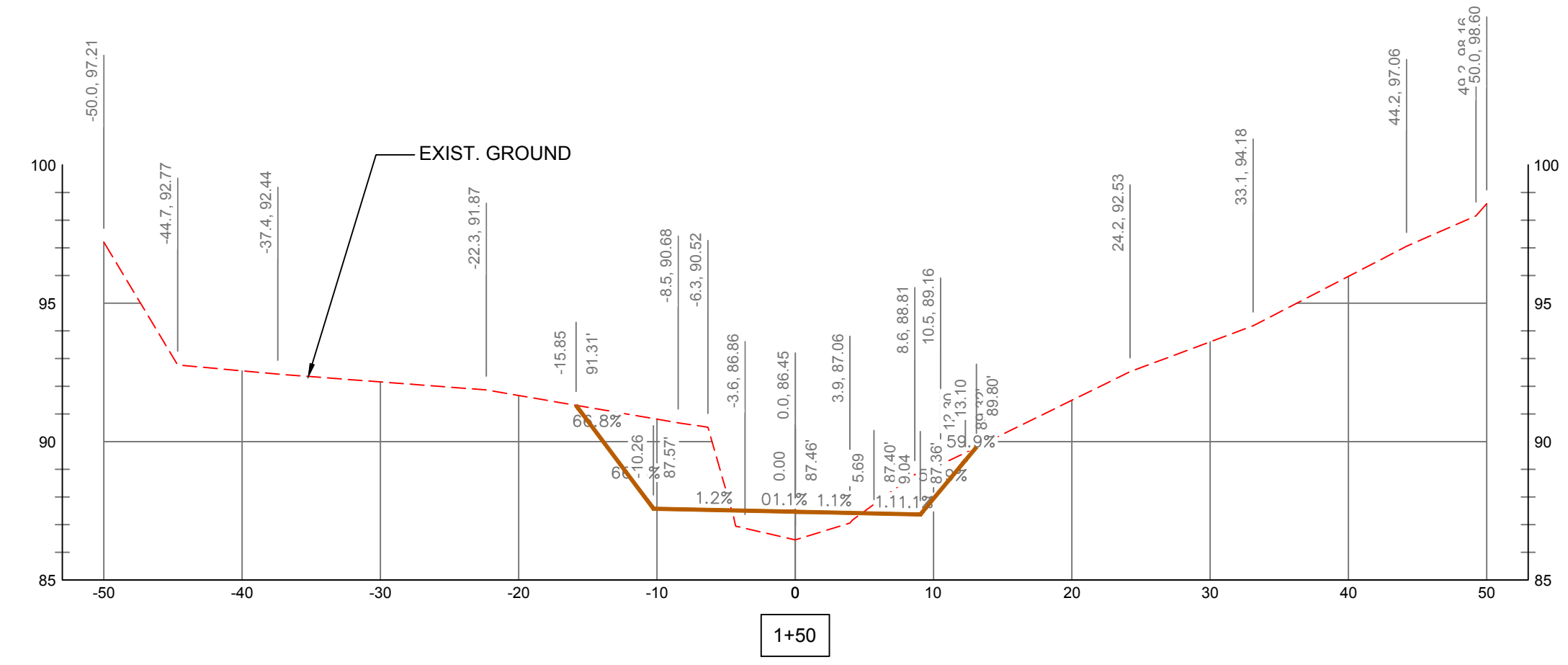
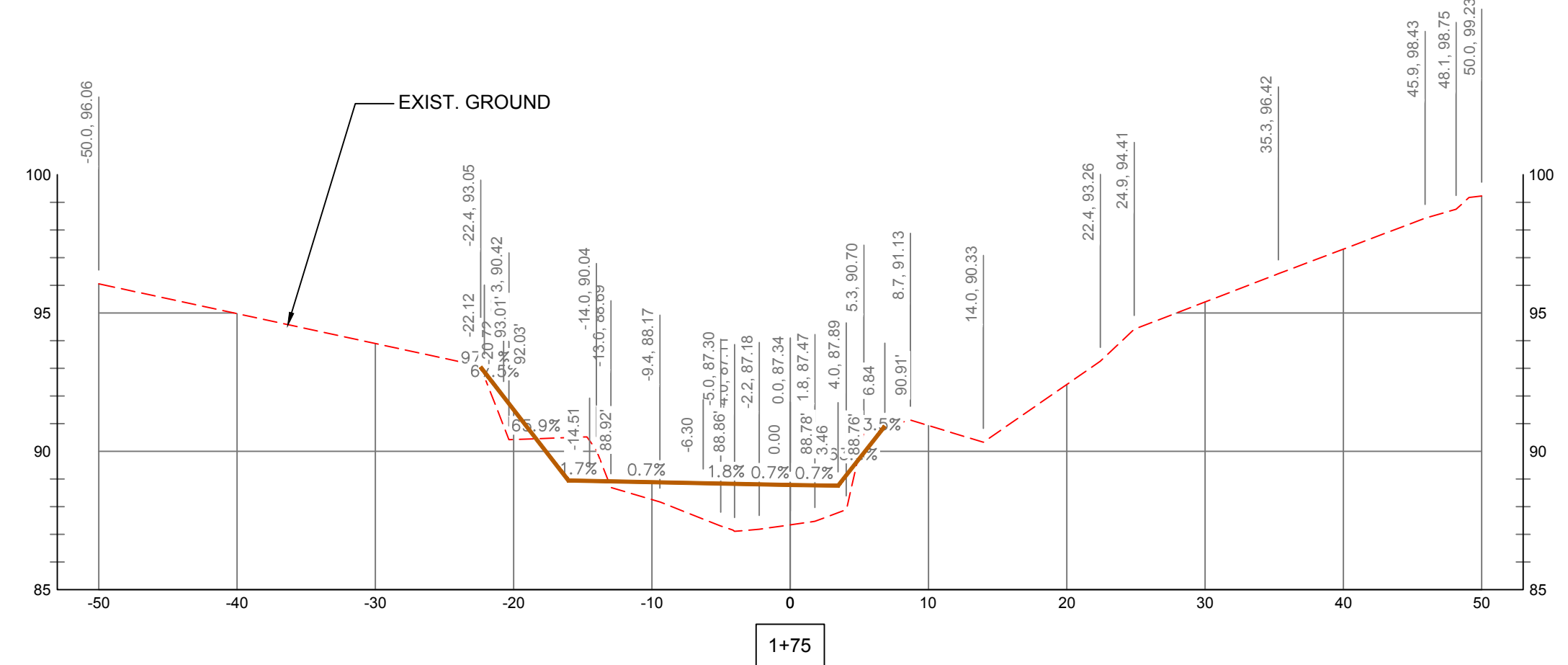
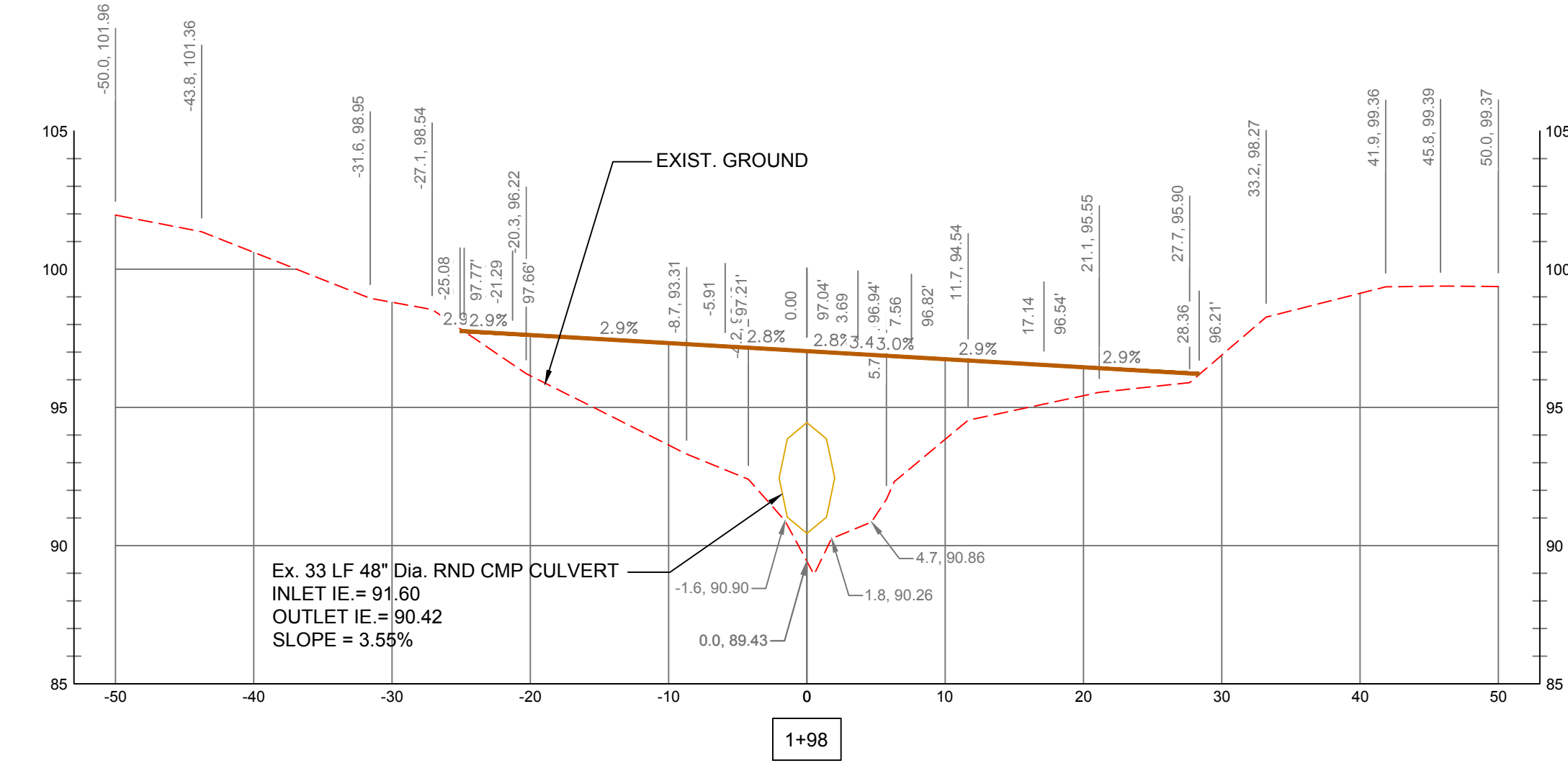
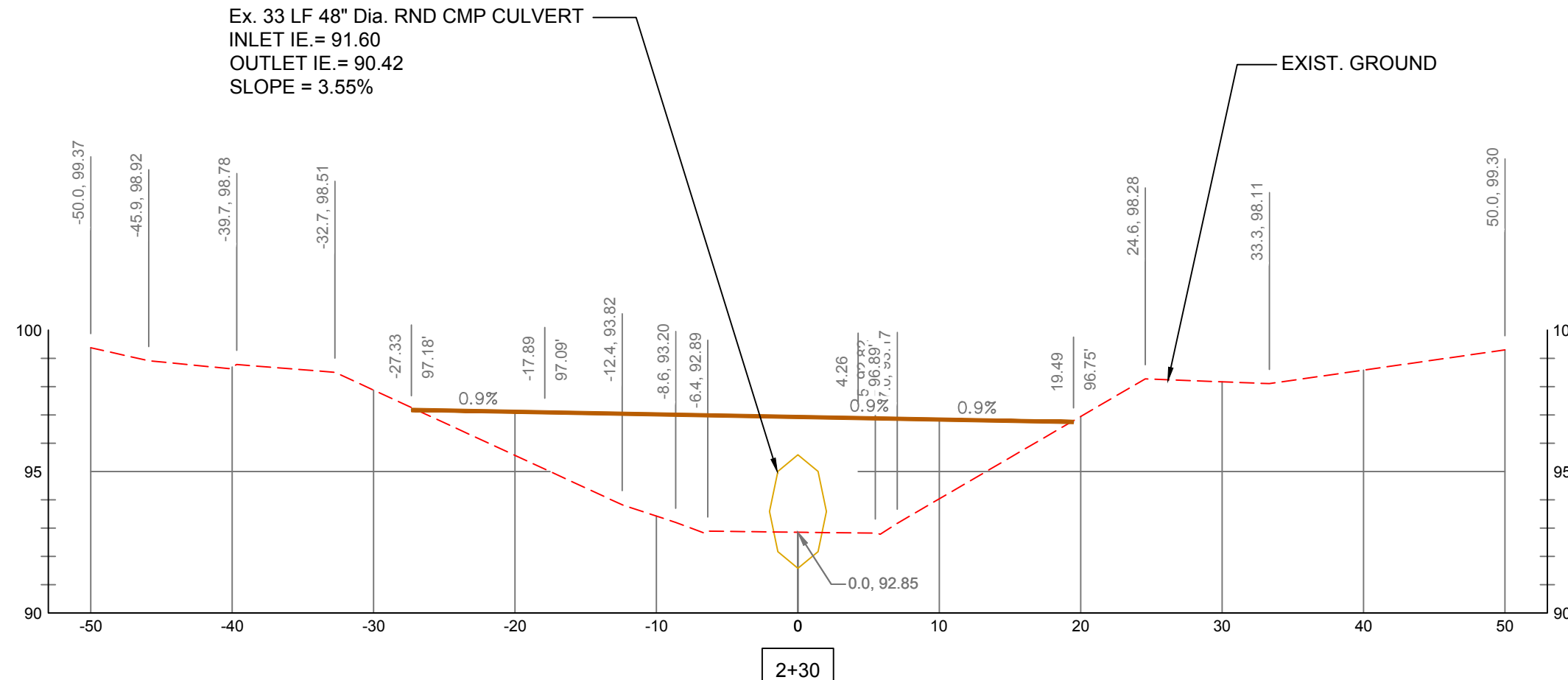
DESIGNED BY B. HEINER
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DRAWN BY K. CORWIN
DATE _____

SCALE VERIFICATION
0 1 INCH
BAR MEASURES
ONE INCH ON
ORIGINAL DRAWINGS

Scale: 1" = 10'

LONE RANCH CREEK
FISH PASSAGE RESTORATION
SITE: 810714
STREAM SECTIONS

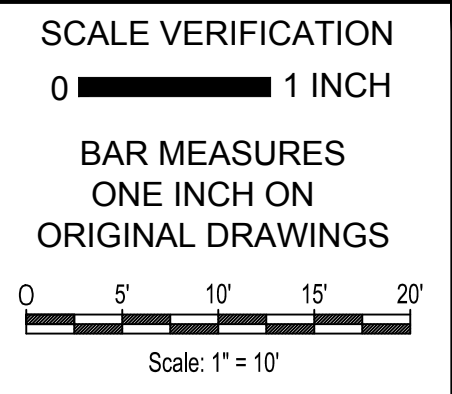
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3 - 14 - 17
Sheet:
7 of 11



SYM	DATE	BY:	REVISION DESCRIPTION

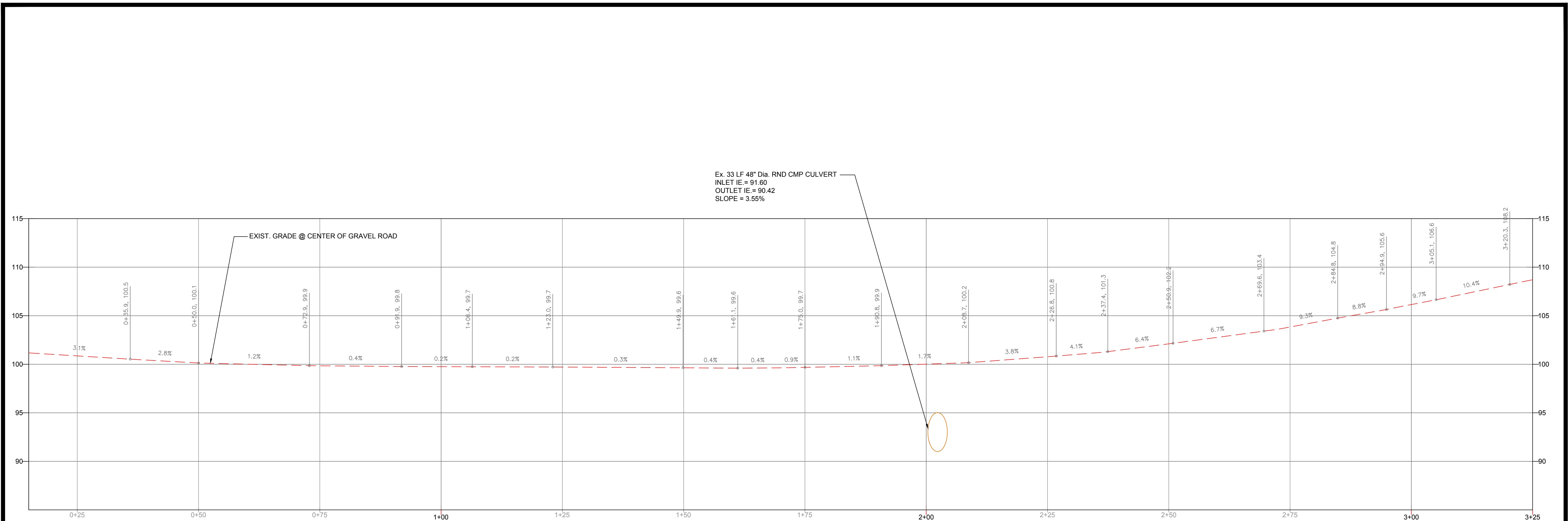


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DATE: _____



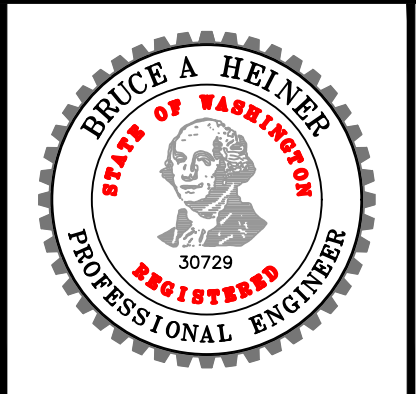
LONE RANCH CREEK
FISH PASSAGE RESTORATION
SITE: 810714
STREAM SECTIONS

Date: 3-14-17
Sheet: 8 of 11

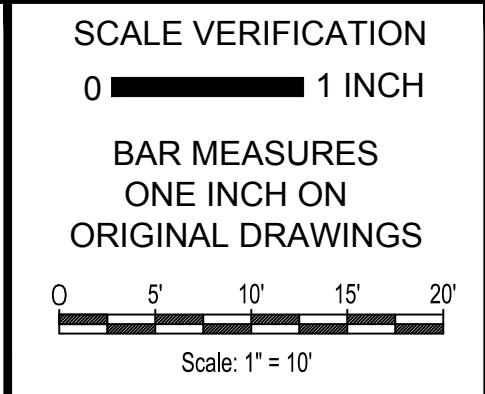


STATE OF WASHINGTON
 DEPARTMENT OF FISH & WILDLIFE
 HABITAT PROGRAM

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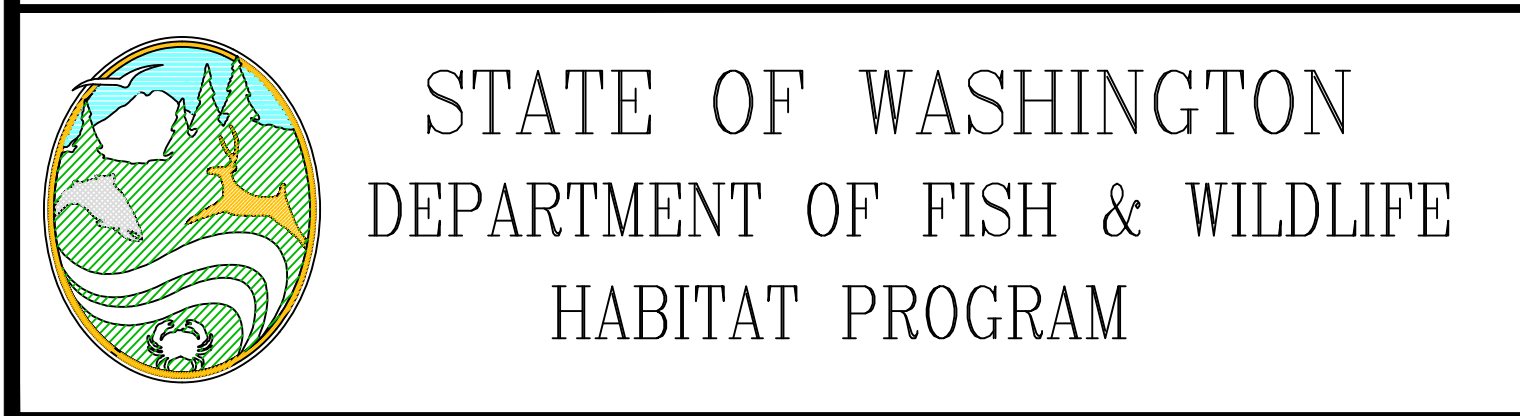
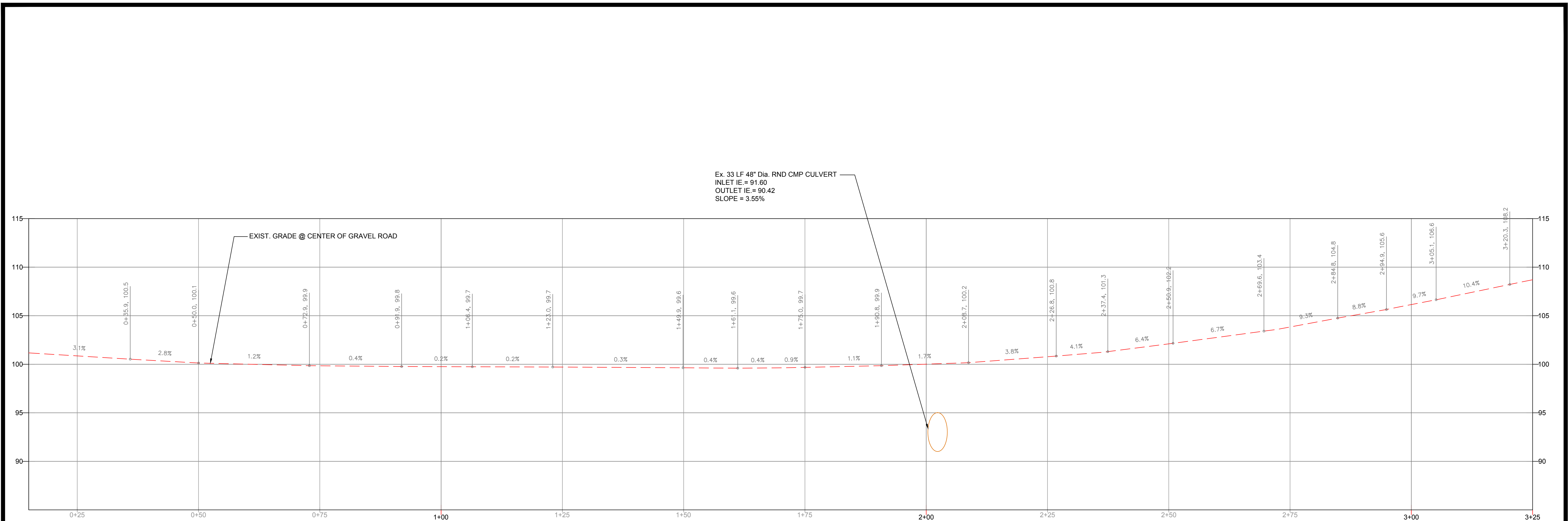
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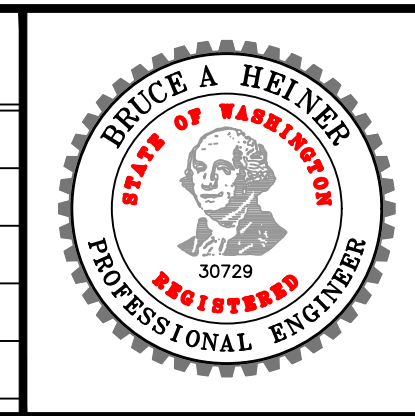
LONE RANCH CREEK
FISH PASSAGE RESTORATION
SITE: 810714
ROAD PROFILE

Date:
 3 - 14 - 17

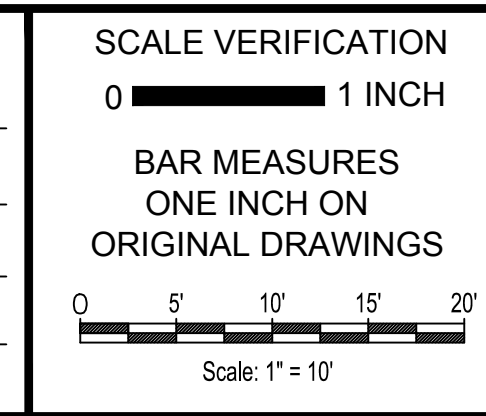
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 9 of 11



SYM	DATE	BY:	REVISION DESCRIPTION

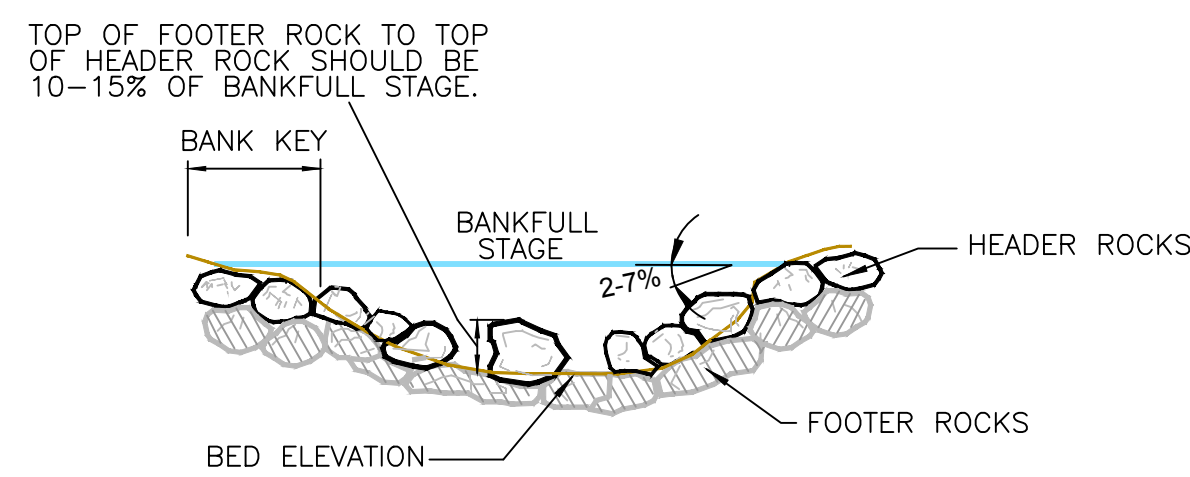


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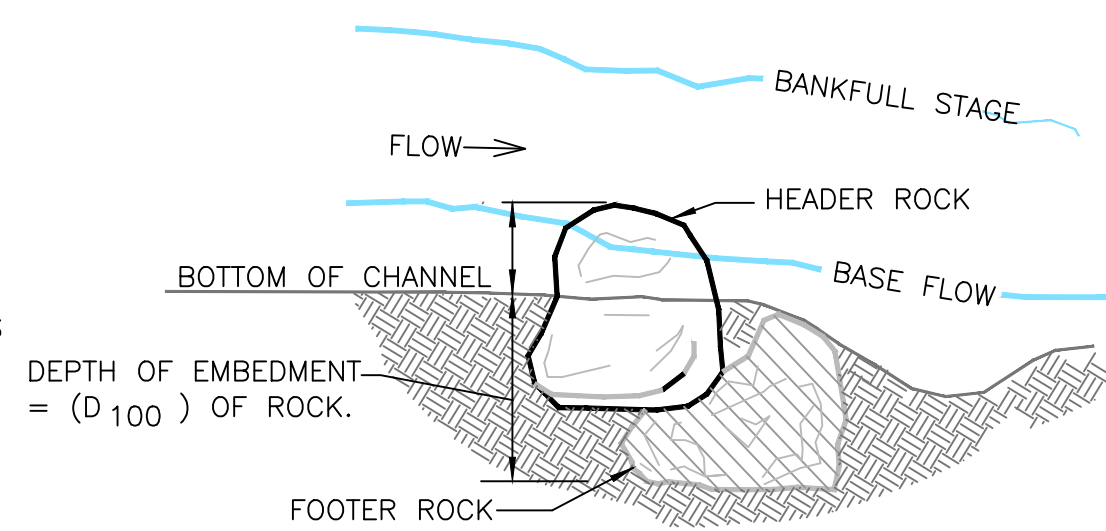
LONE RANCH CREEK
FISH PASSAGE RESTORATION
SITE: 810714
ROAD PROFILE

Date: 3 - 14 - 17
 Sheet: 9 of 11



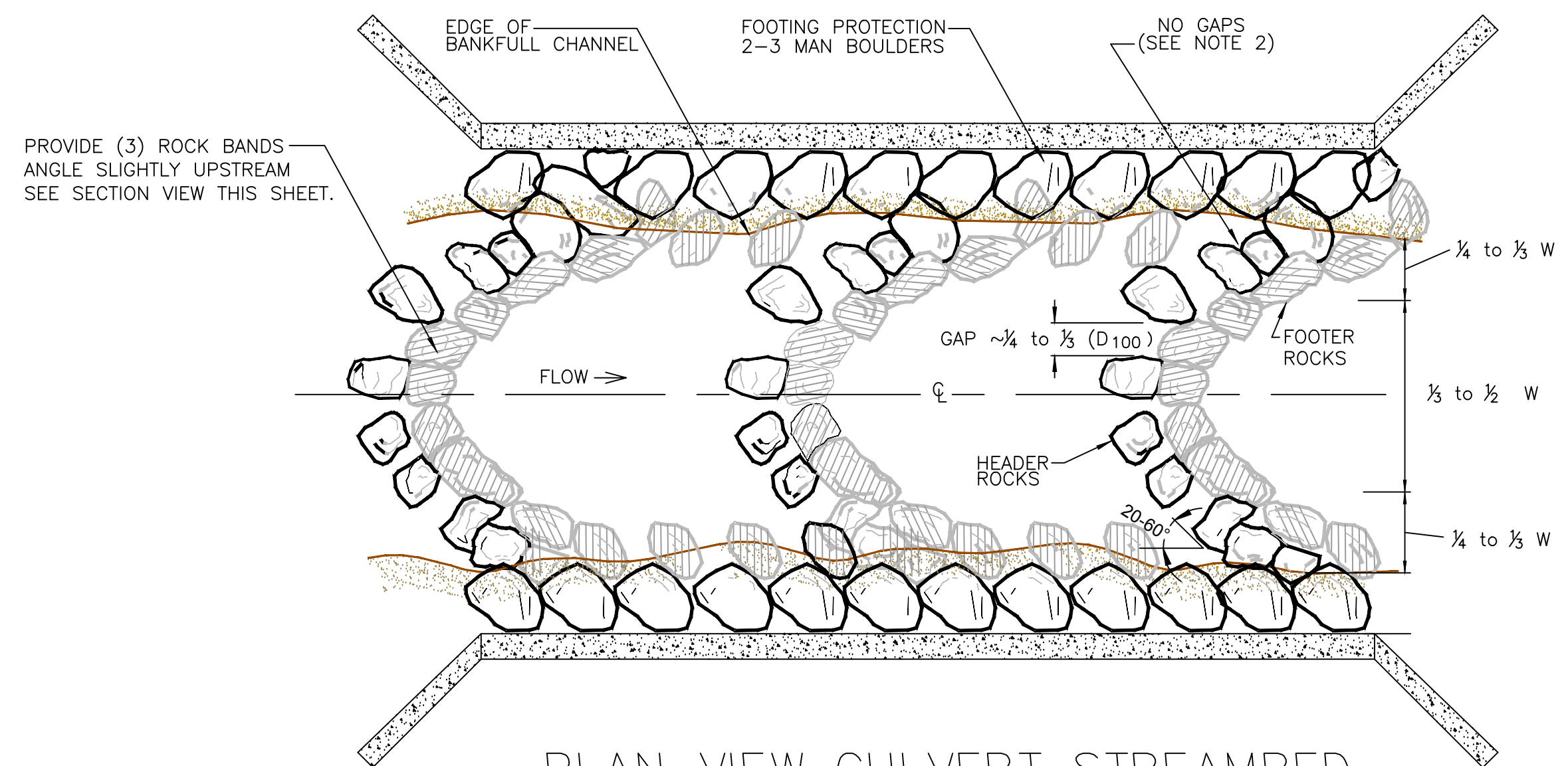
ROCK BAND SECTION VIEW

Scale: N.T.S.



ROCK BAND PROFILE VIEW

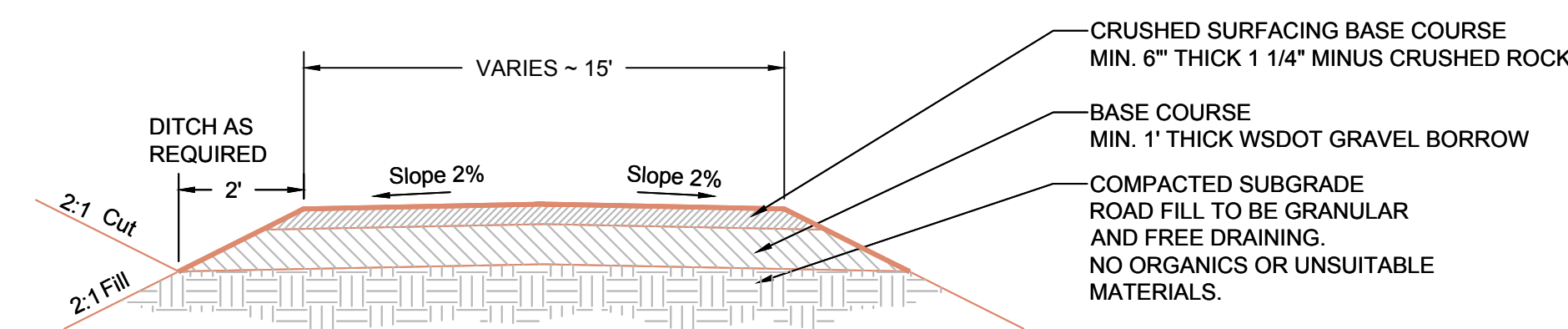
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PLAN VIEW CULVERT STREAMBED

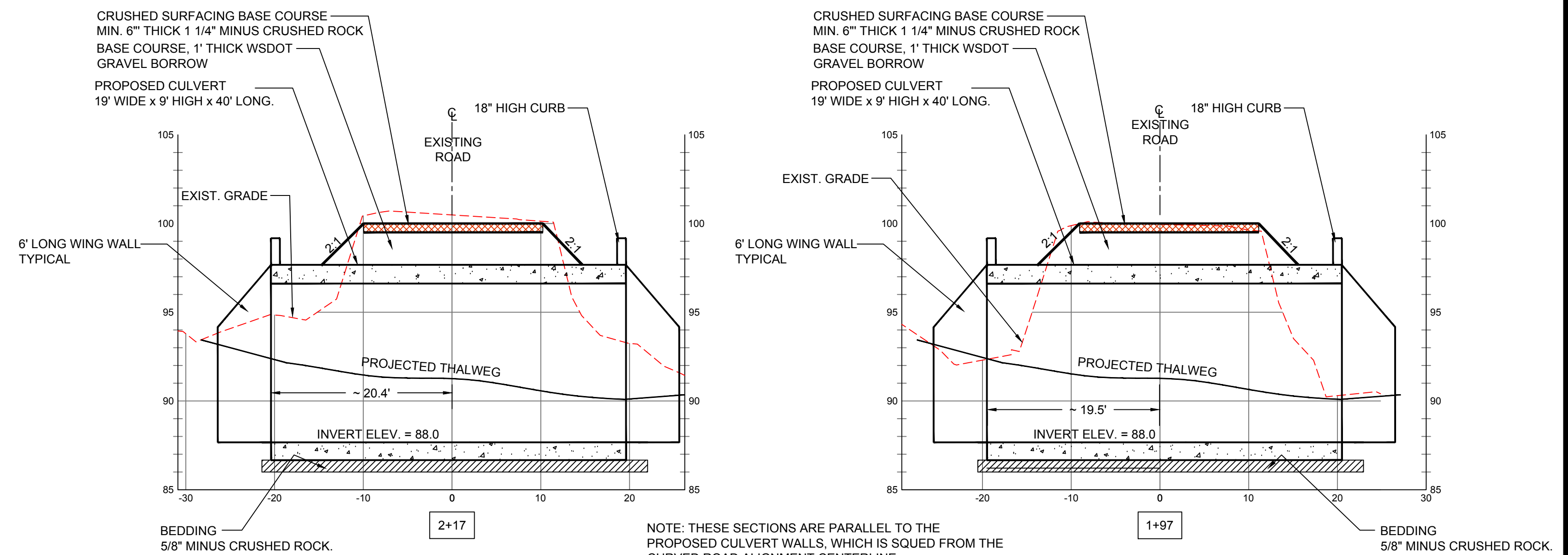
Scale: 1" = 5'

- GENERAL NOTES:**
1. D₁₀₀ = MAX. ROCK SIZE.
 2. AVOID GAPS BETWEEN HEADER ROCKS IN VICINITY OF BANKS.
 3. TYPICAL RECOMMENDED SLOPE OF THE TOP OF THE VANE IS BETWEEN 2 and 7% (50H:1V to 15H:1V). MAX. RECOMMENDED SLOPE IS 20% (5H:1V).



TYPICAL GRAVEL ROAD SECTION

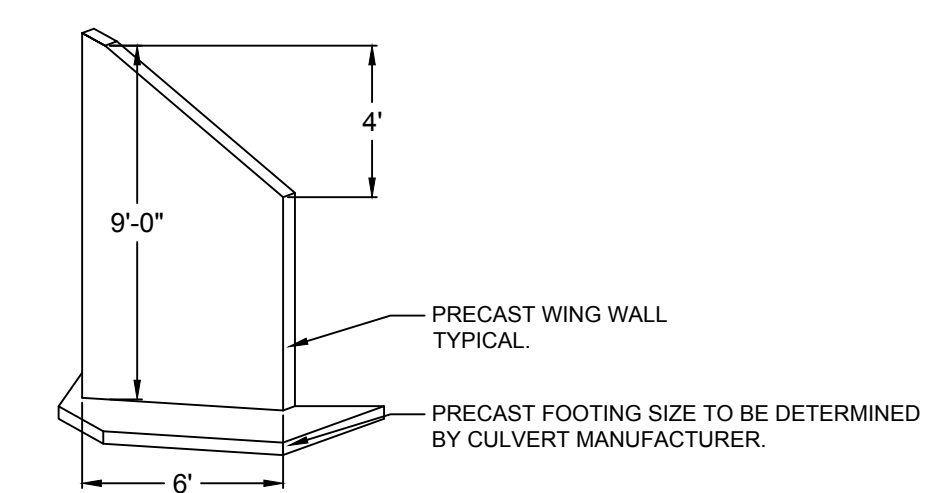
Scale: 1" = 4' Horiz. & Vert.



CULVERT SECTIONS AT PROJECTED WINGWALL EDGE

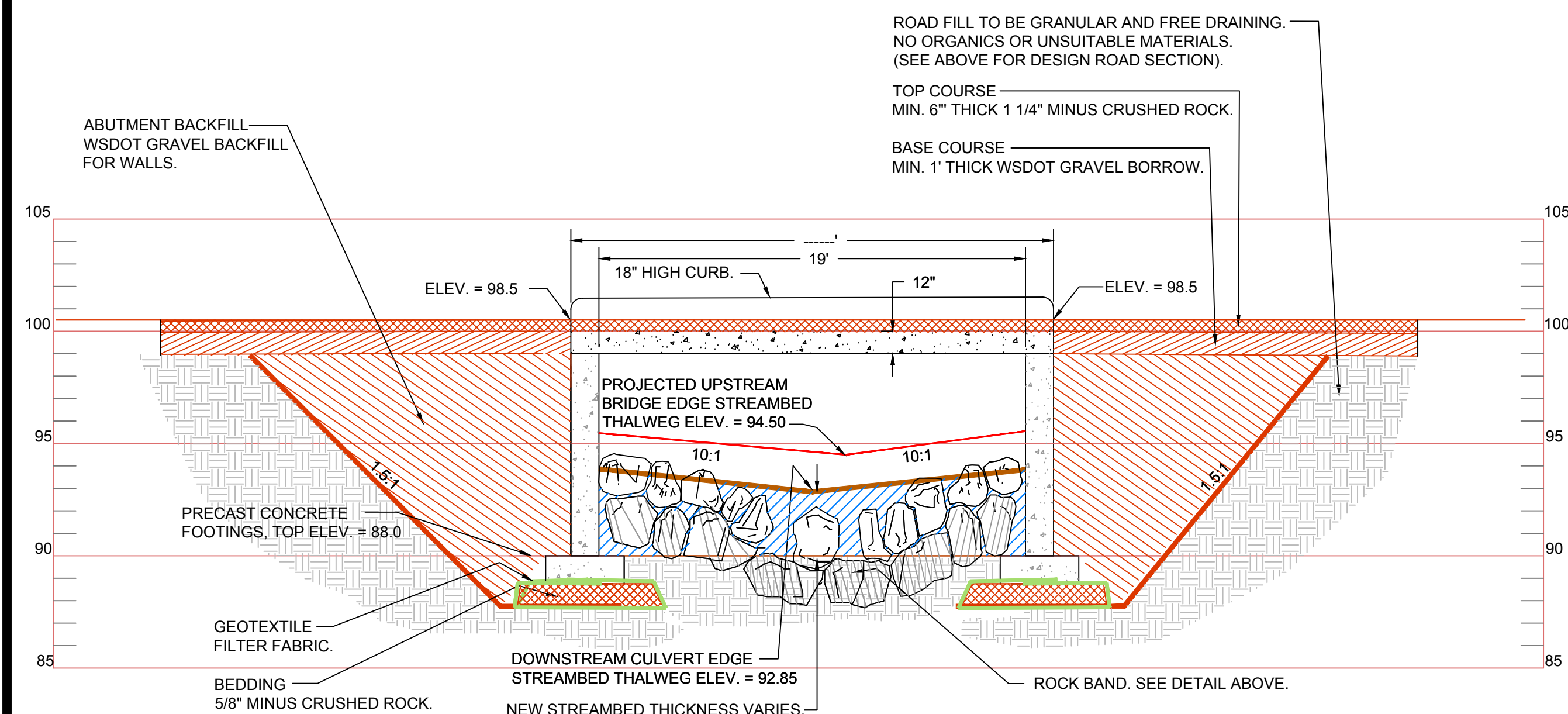
Scale: 1" = 10' Horiz., 1" = 5' Vert.

NOTE: THESE SECTIONS ARE PARALLEL TO THE PROPOSED CULVERT WALLS, WHICH IS SQUARED FROM THE CURVED ROAD ALIGNMENT CENTERLINE.



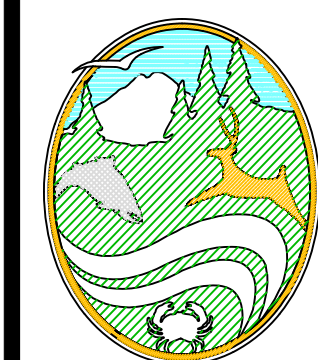
TYPICAL CULVERT "WINGWALL"

Note: Dimensions may Vary by Manufacturer. N.T.S.



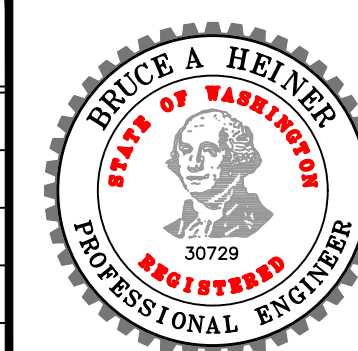
CULVERT SECTION AT DOWNSTREAM EDGE

Scale: 1" = 4' Horiz., 1" = 5' Vert.



STATE OF WASHINGTON
DEPARTMENT OF FISH & WILDLIFE
HABITAT PROGRAM

SYM	DATE	BY:	REVISION DESCRIPTION

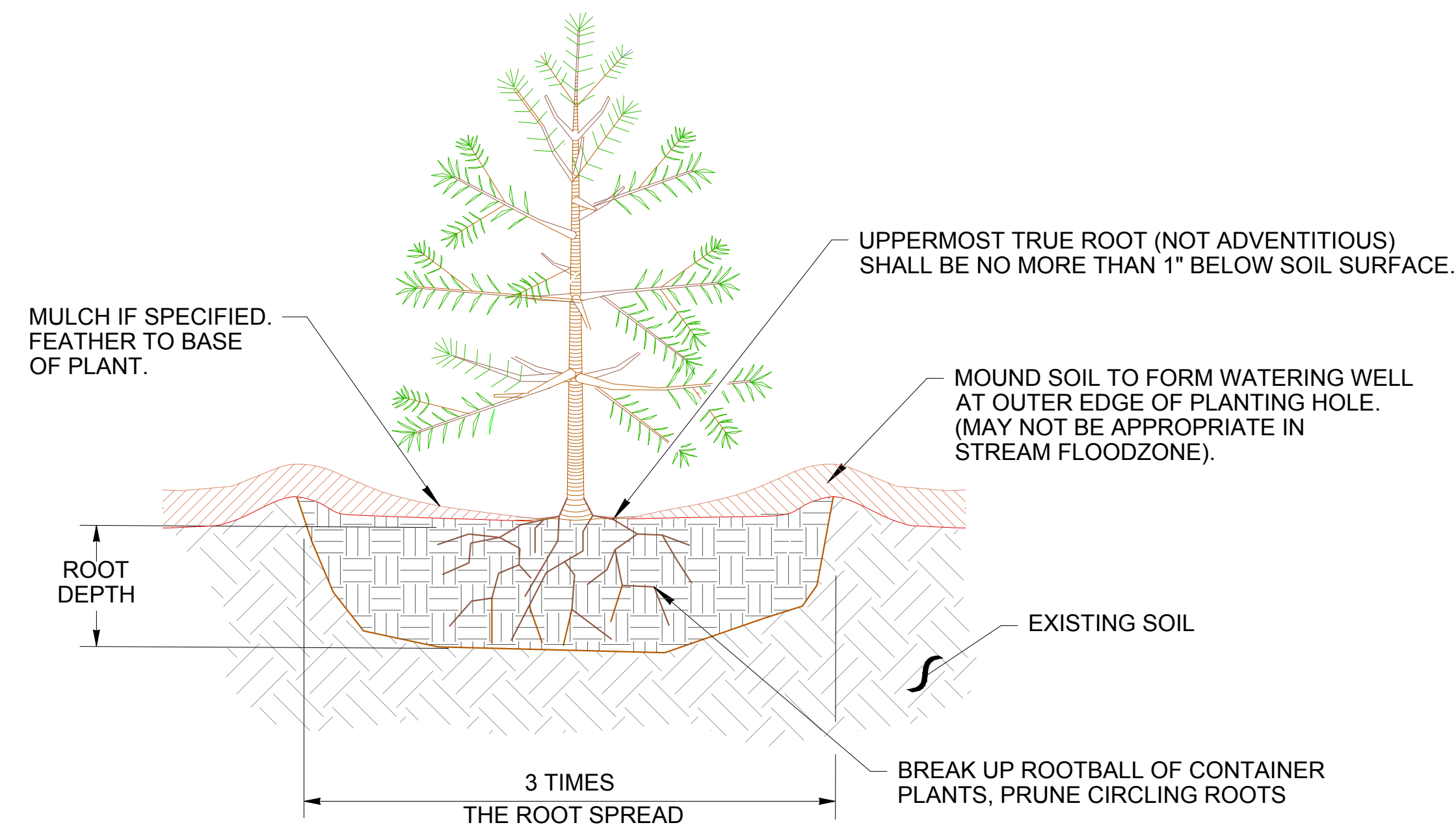


DESIGNED BY B. HEINER
CHECKED BY _____
DRAWN BY K. CORWIN
DATE _____

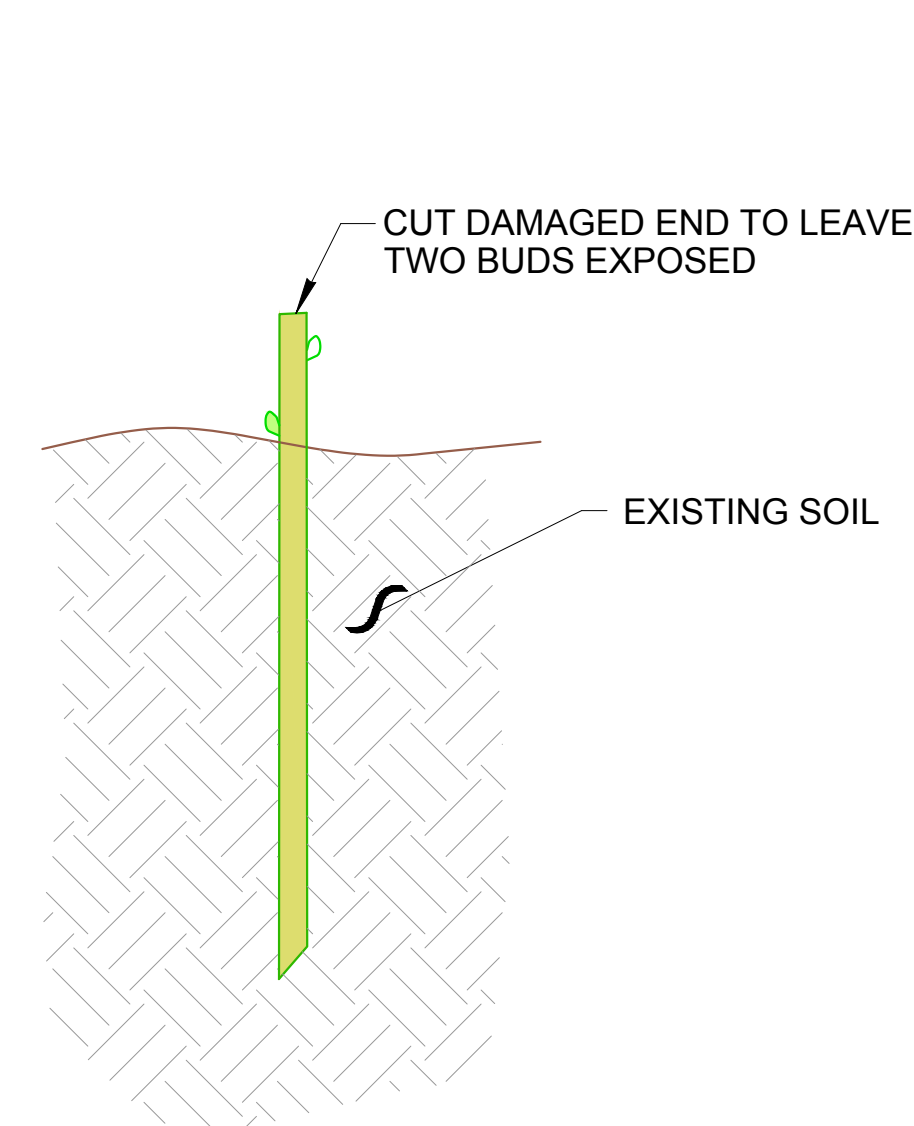
SCALE VERIFICATION
0 — 1 INCH
BAR MEASURES
ONE INCH ON
ORIGINAL DRAWINGS

LONE RANCH CREEK
FISH PASSAGE RESTORATION
SITE: 810714
CULVERT DETAILS

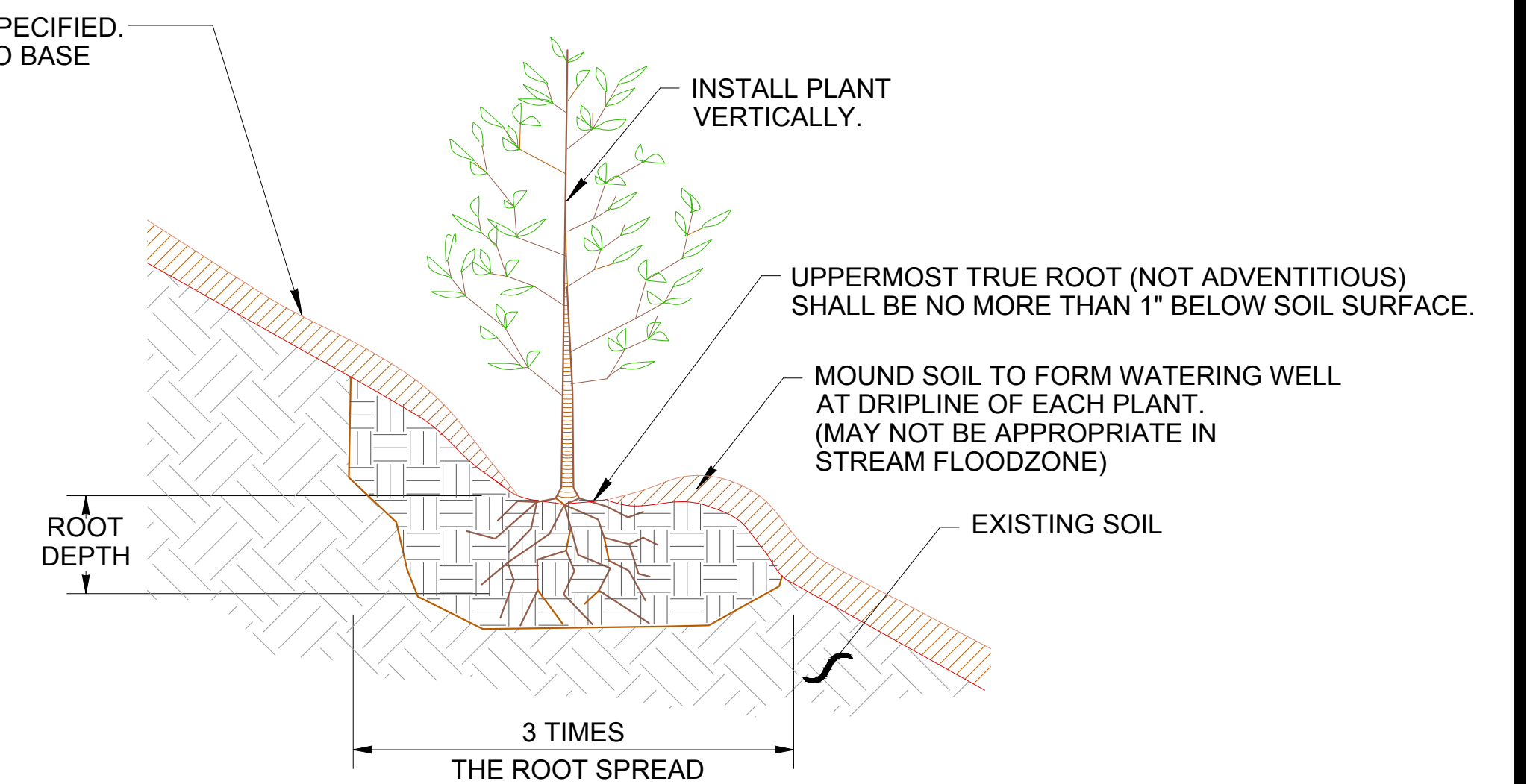
Date:
3 - 14 - 17
Sheet:
10 of 11



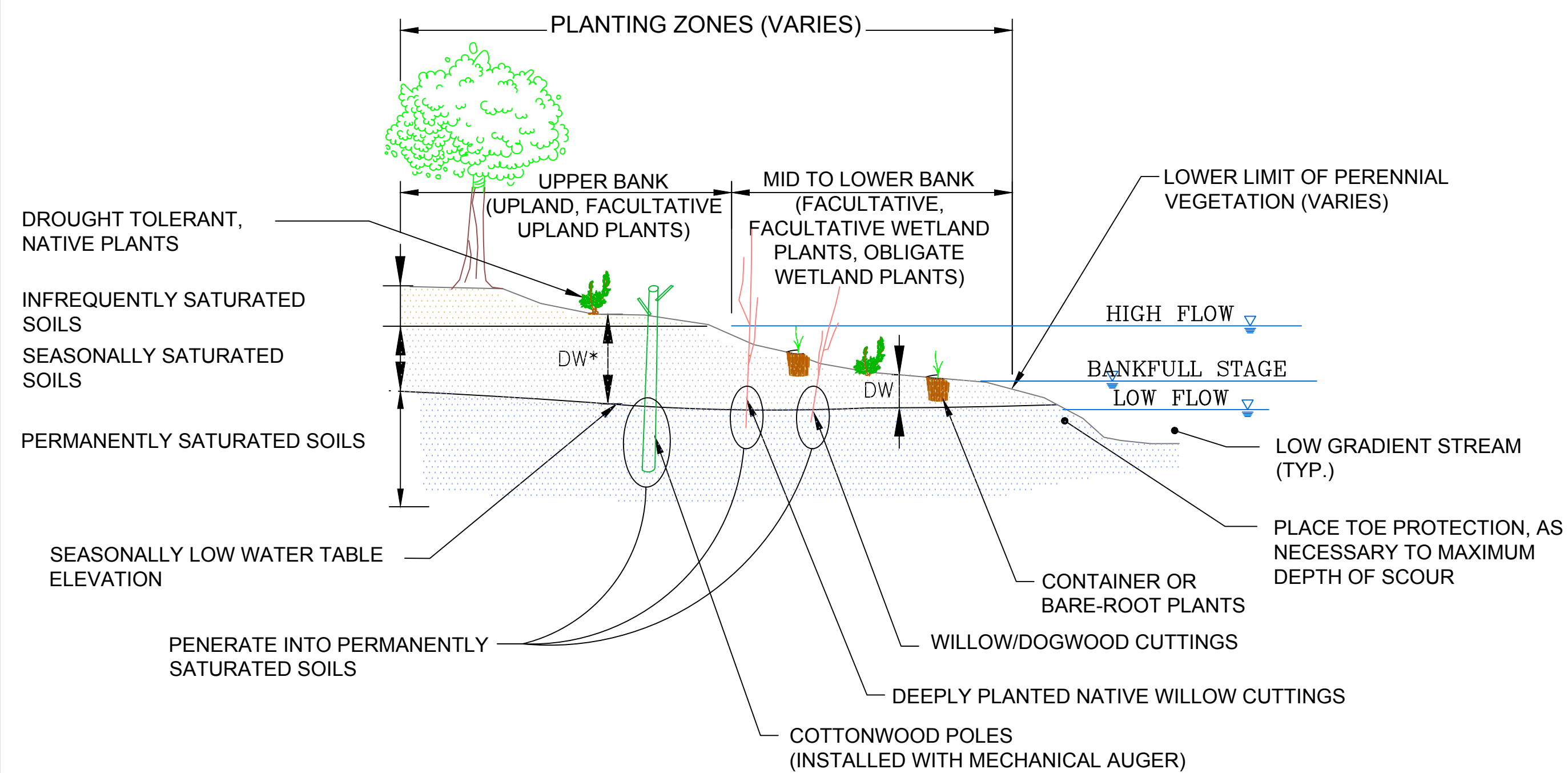
SHRUB, TREE AND GROUND COVER PLANTING DETAIL



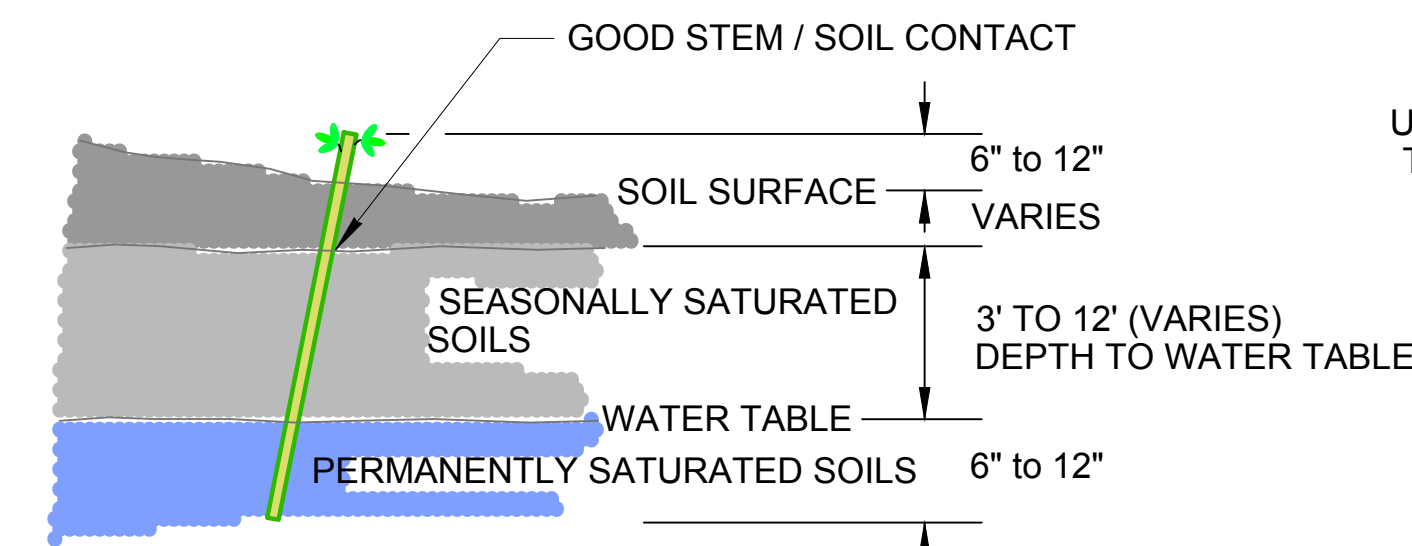
TYPICAL LIVE STAKE INSTALLATION



SLOPE PLANTING DETAIL
(INCLUDES ALL PLANTS ON SLOPES)

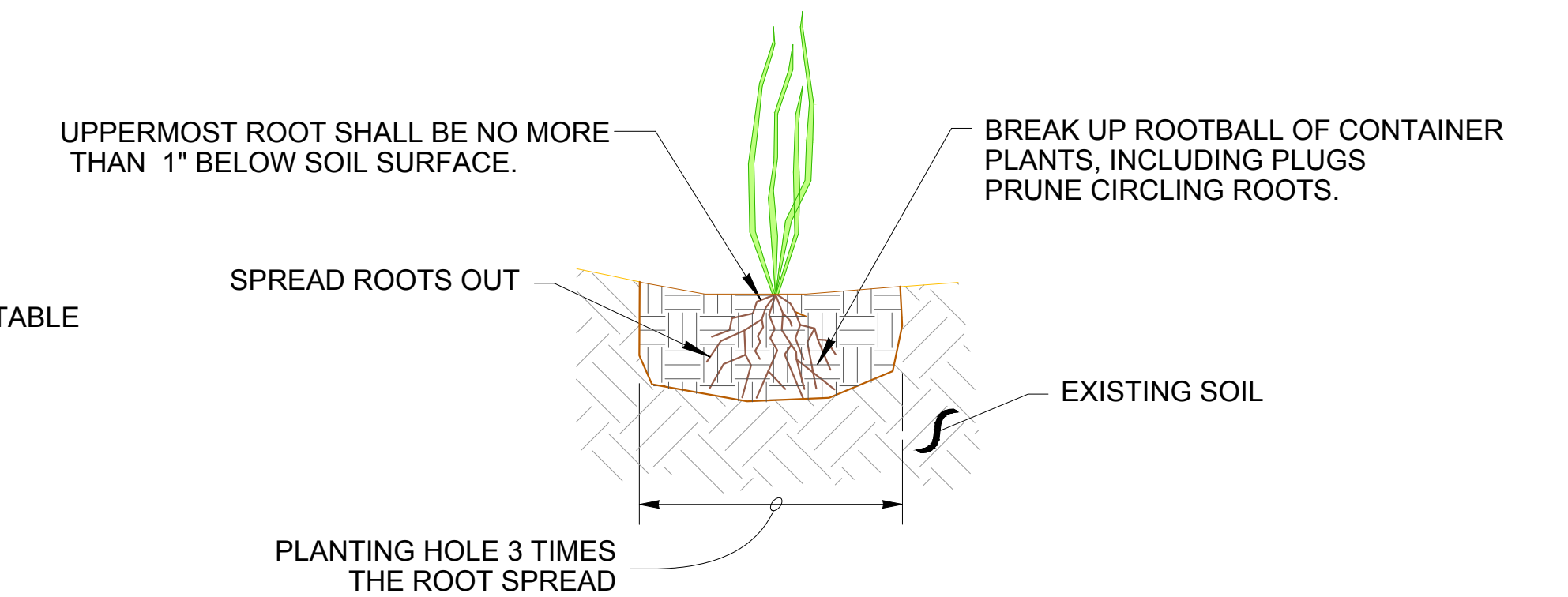


HYDROLOGY-BASED PLANTING ZONES AND TYPICAL WOODY PLANTING BANK TREATMENT



Notes:
1. Soak cuttings in water for 24 to 48 hours before planting

LIVE CUTTINGS PLANTED INTO STREAMBANK



EMERGENT PLANTING DETAIL

Lone Ranch Creek Restoration Planting Details

PLANTING DETAIL

Planting Zone	Species	Size	Spacing	Number Required
Upper Bank	Western larch	5 cubic inch	12 ft o.c.	10
	Ponderosa pine	5 cubic inch	12 ft o.c.	10
Mid to Lower Bank	Thinleaf alder	10 cubic inch	10 ft o.c.	20
	Red-osier dogwood	Live stake	5 ft o.c.	25
	Local, native willow	Live stake	5 ft o.c.	25

SEED MIX

Species*	Broadcast Rate (lbs/acre)
Sheep fescue	4
Streambank wheatgrass	4
Pubescent wheatgrass	6
TOTAL	14

*Substitutions must be pre-approved by WDFW

NOTES:

1. PLANTING ZONES PROVIDED ARE APPROXIMATE. APPROPRIATE PLANT SPECIES AND DISTRIBUTION VARY WITH EACH INDIVIDUAL SITE AND PLANT SPECIES CHARACTERISTICS. SEE APPENDIX H FOR ADDITIONAL PLANTING GUIDELINES.
2. USE OF EROSION CONTROL FABRIC IS SITE DEPENDENT. SEE APPENDIX H FOR EROSION CONTROL FABRIC APPLICATION, SELECTION, AND INSTALLATION GUIDELINES
3. HERBACEOUS PLANTINGS MIGHT BE APPROPRIATE WITH WOODY PLANTINGS



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DRAWN BY K. CORWIN
DATE _____

SCALE VERIFICATION
0 — 1 INCH
BAR MEASURES
ONE INCH ON
ORIGINAL DRAWINGS

LONE RANCH CREEK
FISH PASSAGE RESTORATION
RESTORATION PLANTING
TYPICAL DETAILS

Date:
3 - 14 - 17

Sheet:
11 of 11