# MAW – LONG ALEC CREEK – 40 FT BIAS STEEL BRIDGE

## RCO/SRFB PROJECT # 18–2346
## WRIA#60

### LEGAL DESCRIPTION:
LAT. N48.87353, LONG. W118.54533
E1/2, SW1/4. SW1/4, S17, T39, R34E
FERRY COUNTY, WA

### APPLICANT & OWNER:
STEVE MAW
22 EDGWOOD LANE
CURLEW, WA 99118
(509) 684–3283

### GENERAL NOTES:

1. THIS CULVERT REPLACEMENT IS A PROJECT SPONSORED BY THE FAMILY FOREST FISH PASSAGE PROGRAM (3F2P).

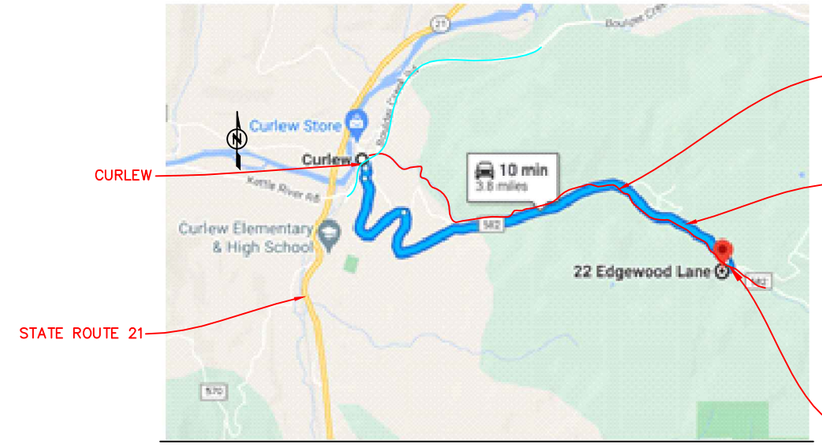
2. THE NEW DESIGN IS BASED ON A 30° SKEWED 14'x40' STEEL BRIDGE WITH A BANK FULL WIDTH OF 10.5' AND A 4.4% SLOPE UNDER THE BRIDGE. (SEE SHEET 2 FOR BANK FULL WIDTH CALCULATIONS.)

3. ACCESS MUST BE MAINTAINED FOR THE RESIDENTS DURING CONSTRUCTION. A TEMPOARY ACCESS ROAD IS SHOWN FROM APPROXIMATELY 210' EAST OF EDGEWOOD LANE TO APPROXIMATE STATION 1+50 OF THE DRIVEWAY. SEE SHEET 3.

4. THE 100 YEAR STORM FLOW RATE ACCORDING TO VERSION 4.6.2 OF USGS STREAMSTAT SERVICES IS 180 CFS, AND WITH AN ERROR FACTOR OF 1.969, THE DESIGN FLOW IS 354 CFS.

5. UPSTREAM GRADIENT IS 2.8% BETWEEN STATIONS 3+25 AND 3+70. DOWNSTREAM GRADIENT IS 3.0% BETWEEN STATIONS 0+55 AND 1+25.

6. THERE IS A TELEPHONE LINE BURIED IN THE DRIVEWAY. THERE ARE NO OTHER KNOWN UTILITIES IN THE CONSTRUCTION AREA. HOWEVER, THERE ARE OVERHEAD POWER LINES IN THE AREA. CONTRACTOR IS TO CONTACT THE UTILITY LOCATE COMPANY IN ACCORDANCE WITH CURRENT REGULATIONS.




### DIRECTIONS:
FROM REPUBLIC, GO .1 MI. ON BOULDER CREEK RD. TO LONG ALEC CREEK ROAD, GO 3.7 MILES TO EDGEWOOD LANE ON THE RIGHT TO THE PROJECT SITE.

### SPONSOR:
FERRY CONSERVATION DISTRICT
84 EAST DELAWARE
REPUBLIC, WA 99166
(509) 775–3473

### PREPARED BY:
RIVERSONG ENGINEERING
& CONSULTING
6734 RIVER WAY
FRUITLAND, WA. 99129
(509) 722–5165

### SEQUENCE

1. DIVERT STREAM IF NECESSARY.
2. INSTALL TEMPORARY BYPASS ROAD.
3. REMOVE EXISTING CULVERT(S).
4. EXCAVATE FOR ABUTMENTS.
5. INSTALL ABUTMENTS ON PROPER SUBGRADE.
6. BACKFILL ABUTMENTS, AS NECESSARY.
7. INSTALL RIP RAP
8. INSTALL STREAMBED MATERIAL.
9. WASH DOWN NEW STREAMBED.
10. INSTALL BRIDGE.
11. REGRADE DRIVE
12. REMOVE DIVERSION CHANNEL AND TEMP. ROAD.
13. SEED AND MULCH.

### DRAWING INDEX

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FRUITLAND, WA 99129
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3F2P – MAW
22 EDGEWOOD LANE
CURLEW, WN. 99118

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COVER SHEET

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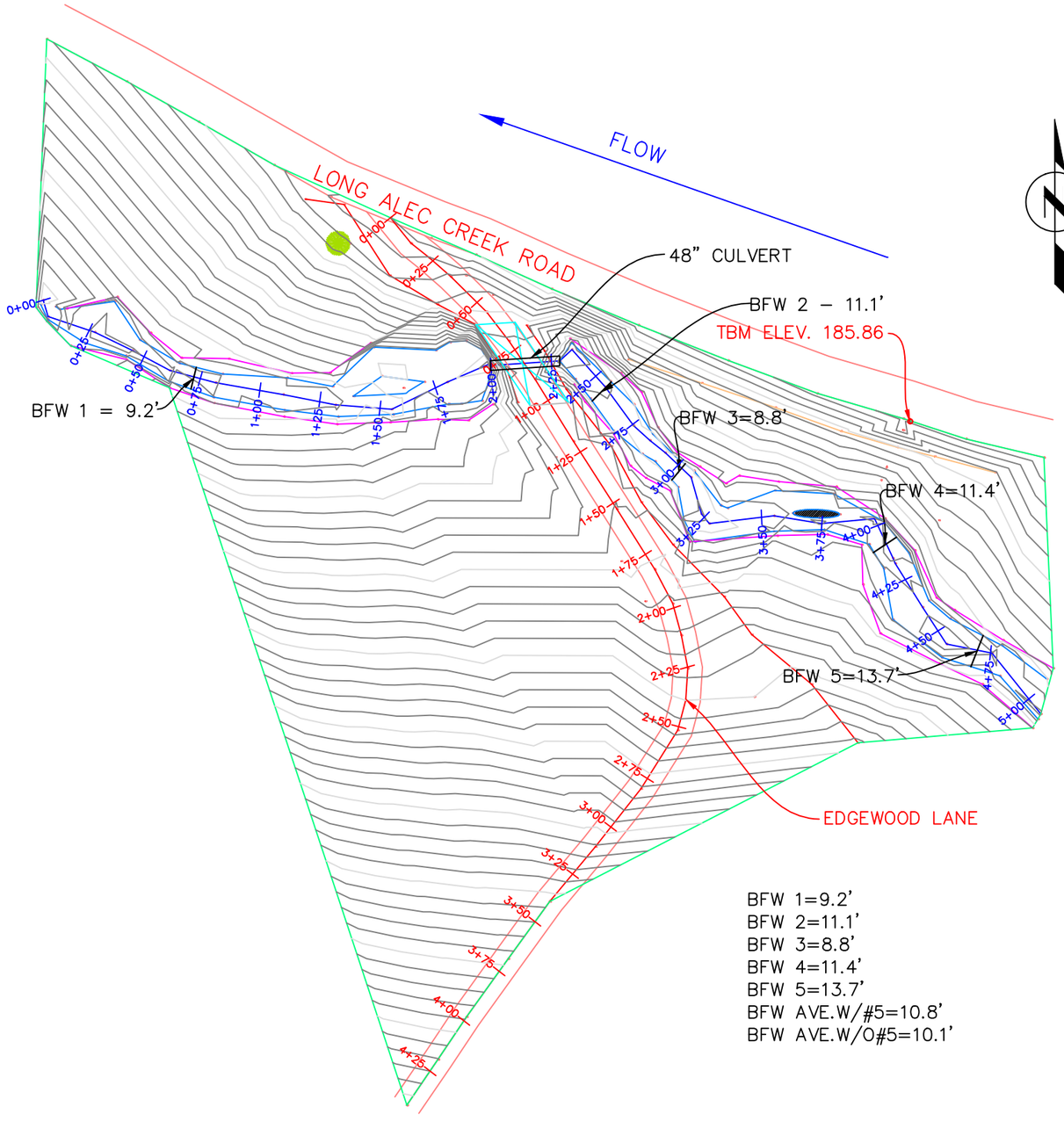


BFW 1=9.2'
BFW 2=11.1'
BFW 3=8.8'
BFW 4=11.4'
BFW 5=13.7'
BFW AVE.W/#5=10.8'
BFW AVE.W/O#5=10.1'

FIG 1 – EXISTING PLAN

0 25 50 75 100
SCALE

## CONTRACTOR NOTES:

1. CONTRACTOR IS TO MAINTAIN ACCESS FOR RESIDENTS DURING CONSTRUCTION EITHER WITH A TEMPORARY ACCESS ROAD AS SHOWN ON DRAWING 3 OR THROUGH SOME OTHER APPROVED APPROACH. ALL TEMPORARY MEASURES ARE TO BE REMOVED WHEN THE PERMANENT ROAD IS COMPLETE.

2. DESIGN ELEVATIONS ARE BASED ON A TEMPORARY BENCHMARK (TBM) LOCATED NEAR THE POWER POLE ON LONG ALEC ROAD, JUST EAST OF EDGEWOOD AVENUE AT ELEVATION 105.86. RELOCATE BENCHMARK TO A DIFFERENT LOCATION PRIOR TO THE START OF CONSTRUCTION IF REQUIRED.

3. STREAMBED AND RIP–RAP MATERIALS TO BE REVIEWED BY ENGINEER PRIOR TO HAULING.

4. CONTACT ENGINEER PRIOR TO START OF CONSTRUCTION. ENGINEER TO BE ON SITE DURING EXCAVATION FOR AND PLACEMENT OF ABUTMENTS AND AT START OF STREAMBED MATERIAL PLACEMENT.

5. THERE IS A TELEPHONE LINE BURIED IN THE DRIVE THAT MUST BE MAINTAINED DURING CONSTRUCTION.

6. CONTRACTOR IS TO FAMILIARIZE HIMSELF WITH THE OVERHEAD POWER LINES AND IS TO CONTACT THE UTILITY LOCATE COMPANY PRIOR TO CONSTRUCTION IN ACCORDANCE WITH CURRENT REGULATIONS.

7. ANY REMOVED TREES TO BE UTILIZED AS LARGE WOODY MATERIALS FOR BANK STABILIZATION ALONG THE ALTERED STREAMBED.

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EXISTING PLAN

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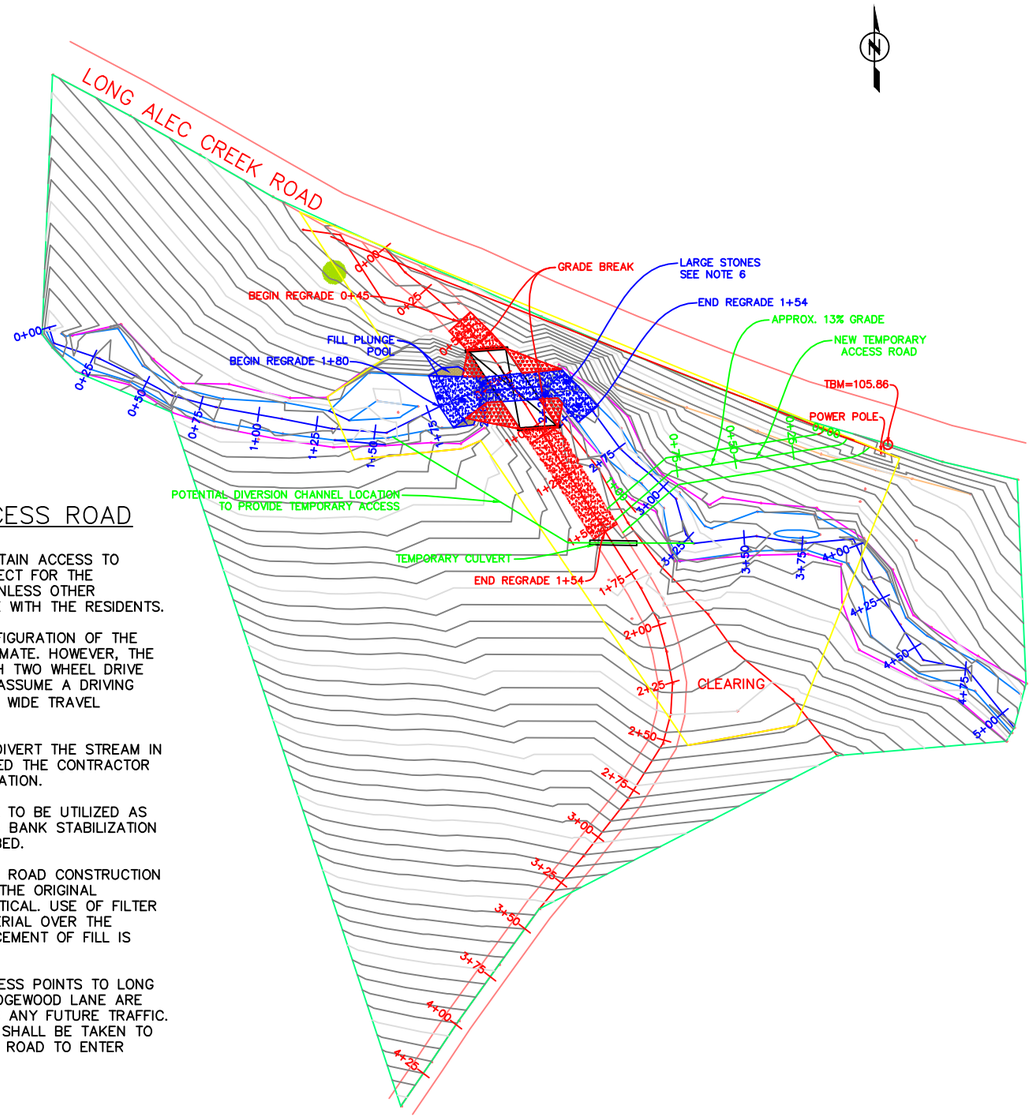


FIG 2 – NEW PLAN

0 25 50 75 100

## TEMPORARY ACCESS ROAD

1. CONTRACTOR IS TO MAINTAIN ACCESS TO RESIDENTS BEYOND THE PROJECT FOR THE DURATION OF THE PROJECT UNLESS OTHER ARRANGEMENTS CAN BE MADE WITH THE RESIDENTS.

2. THE LOCATION AND CONFIGURATION OF THE TEMPORARY ROAD IS APPROXIMATE. HOWEVER, THE ROAD MUST BE DRIVABLE WITH TWO WHEEL DRIVE VEHICLES IN RAIN OR SHINE. ASSUME A DRIVING SURFACE OF 3" MINUS X 10' WIDE TRAVEL SURFACE.

3. IT MAY BE POSSIBLE TO DIVERT THE STREAM IN SOME OTHER MANNER PROVIDED THE CONTRACTOR ASSUMES ALL COSTS OF VARIATION.

4. ANY REMOVED TREES ARE TO BE UTILIZED AS LARGE WOODY MATERIALS FOR BANK STABILIZATION ALONG THE ALTERED STREAMBED.

5. THE AREA OF TEMPORARY ROAD CONSTRUCTION IS TO BE BROUGHT BACK TO THE ORIGINAL CONDITION AS NEAR AS PRACTICAL. USE OF FILTER FABRIC OR SOME OTHER MATERIAL OVER THE STREAMBED BEFORE THE PLACEMENT OF FILL IS HIGHLY RECOMMENDED.

6. AT COMPLETION, THE ACCESS POINTS TO LONG ALEC CREEK ROAD AND TO EDGEWOOD LANE ARE TO BE MADE IMPASSABLE FOR ANY FUTURE TRAFFIC. EROSION CONTROL MEASURES SHALL BE TAKEN TO PREVENT SEDIMENT FROM THE ROAD TO ENTER LONG ALEC CREEK.

## CONSTRUCTION NOTES

1. CONTRACTOR IS TO INSTALL A NEW 14'X40' BRIDGE TO REPLACE A 48" CULVERT.

2. DESIGN ELEVATIONS ARE BASED ON A TEMPORARY BENCHMARK (TBM) LOCATED NEAR THE POWER POLE ON LONG ALEC ROAD, JUST EAST OF EDGEWOOD AVENUE AT ELEVATION 105.86. RELOCATE BENCHMARK TO A DIFFERENT LOCATION PRIOR TO THE START OF CONSTRUCTION IF REQUIRED.

3. STATIONING: THE GEOMETRIC CENTER OF THE NEW BRIDGE AND STREAM CL IS SET AT ROAD STATION 0+81.5 AND NEW STREAM STATION 2+13.

4. BRIDGE ALIGNMENT: NEW BRIDGE IS TO BE 8 INCHES SOUTHWEST OF THE CL OF THE EXISTING DRIVE AND CENTERED ON THE CULVERT. THE ENDS ARE SKEWED 30 DEGREES TO COMPENSATE FOR THE ANGLE OF THE CROSSING.

5. MINIMUM CLEARANCE BETWEEN STREAMBED AND BOTTOM OF BRIDGE GIRDERS ON UPSTREAM SIDE OF THE BRIDGE IS 6'–1".

6. INSTALL LARGE STONES (18" – 36") AT RANDOM SPACING OF 7 FT TO 10 FT ALONG STREAM BED. ORIENT LARGE ROCKS WITH LONG AXIS PARALLEL WITH STREAM. SEE FIGURE 4 – ROCK ORIENTATION DETAIL.

7. OVER–EXCAVATE AS NEEDED AND REGRADE ALTERED STREAMBED FROM APPROXIMATE STATION 1+80 TO APPROXIMATE STATION 2+56. SLOPE TO BE APPROX. 4.4%. IF REQUIRED, PLACE A MINIMUM OF 24 INCHES OF STREAMBED MATERIAL PER GRADATION SPECIFIED IN DRAWING 21011–4.

8. BEGIN ROAD REGRADING AT STATION 0+45. PLACE AT 5% GRADE ELEVATION 96.5 (STATION 0+56.5) TRANSITIONING FROM EXISTING TO 14 FT WIDE. ON THE EAST SIDE OF THE BRIDGE, CHANGE GRADE AT STATION 1+06.5 AND PLACE ROAD AT –5% TO DAYLIGHT (STA. 1+06.5 TO APPROX. STA. 1+54, TRANSITIONING IN WIDTH FROM 14 FT TO EXISTING. CROWN THE FINISHED ROAD SURFACE 2% (OPTIONAL).

9. ANY EXCESS MATERIAL TO BE HAULED OFF UNLESS AGREED TO OTHERWISE BY LAND OWNER. IF ALLOWED TO DISPOSE OF THE MATERIAL ON SITE AND IF DISPOSING IN VEGETATED AREA, SCRAPE AWAY TOPSOIL AND BURY SUBSOIL WASTE UNDER TOPSOIL.

10. RESEED ALL DISTURBED AREAS WITH NATIVE OR SITE APPROPRIATE GRASSES, SUCH AS CLOVER ALONG STREAMBANKS OR A WILDLIFE MIX, AS DIRECTED BY FCD. MULCH SEEDED AREAS WITH STRAW AND USE SILT FENCE AND COIR LOGS AS NEEDED TO PREVENT SEDIMENT FROM WASHING INTO STREAM FROM DISTURBED AREAS.

11. NATIVE WOODY PLANTING WILL BE PERFORMED BY FCD.

## DEWATER PROCEDURE:

1. HAVE FISH CAPTURE AND TRANSPORTATION EQUIPMENT READY AND ON THE JOBSITE. HAVE AN EXTRA PUMP ON SITE TO DEWATER EXCAVATION AREAS.

2. SAFELY CAPTURE AND REMOVE ALL FISH. CAPTURED FISH SHALL BE IMMEDIATELY AND SAFELY TRANSFERRED TO FREE–FLOWING WATER DOWNSTREAM OF THE PROJECT SITE.

3. ANY DEVICE USED FOR DIVERTING WATER FROM A FISH BEARING STREAM SHALL BE EQUIPPED WITH A FISHGUARD OF 3/32" MESH TO PREVENT PASSAGE OF FISH INTO THE DIVERSION DEVICE. THE SCREENED INTAKE SHALL HAVE ENOUGH SURFACE AREA TO ENSURE THAT THE VELOCITY THROUGH THE SCREEN IS LESS THAN 0.4 FPS. THE SCREEN SHALL BE MAINTAINED AND IN PLACE WHENEVER WATER IS BEING DIVERTED.

4. WASH. DEPT. OF FISH & WILDLIFE (WDFW) MAY BE AVAILABLE TO ASSIST IN FISH REMOVAL BEFORE CONSTRUCTION IF PERSONNEL ARE AVAILABLE. IF AT ANY TIME FISH ARE KILLED OR IN DISTRESS, OR WATER QUALITY PROBLEMS DEVELOP, IMMEDIATELY NOTIFY WASH. DEPT. OF ECOLOGY AT 1–800–258–5990 AND WDFW AT 509–684–2362, EXT. 10.

5. SANDBAG ACROSS CHANNEL UPSTREAM AND DOWNSTREAM OF THE WORK AREA AND INSTALL FISH BARRIER UPSTREAM OF THE COLLECTION SUMP.

6. INSTALL TEMPORARY DIVERSION PUMP AND DIVERT STREAM AROUND WORK AREA. OPTION – INSTALL DIVERSION CHANNEL OR PIPE AROUND EXISTING CULVERT IN LIEU OF DIVERSION PUMP.

7. REMOVE CULVERT AND INSTALL NEW ABUTMENTS, STREAMBED AND RIPRAP PER DRAWINGS.

8. USE DEWATER PUMP TO "WASH" NEW STREAMBED OF FINE SURFACE SEDIMENT. DISPOSE WASH WATER AWAY FROM STREAM.

9. INSTALL BRIDGE AND ROAD.

10. REMOVE TEMPORARY ROAD.

11. REMOVE SANDBAGS AND FISH BARRIER.

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NEW PLAN

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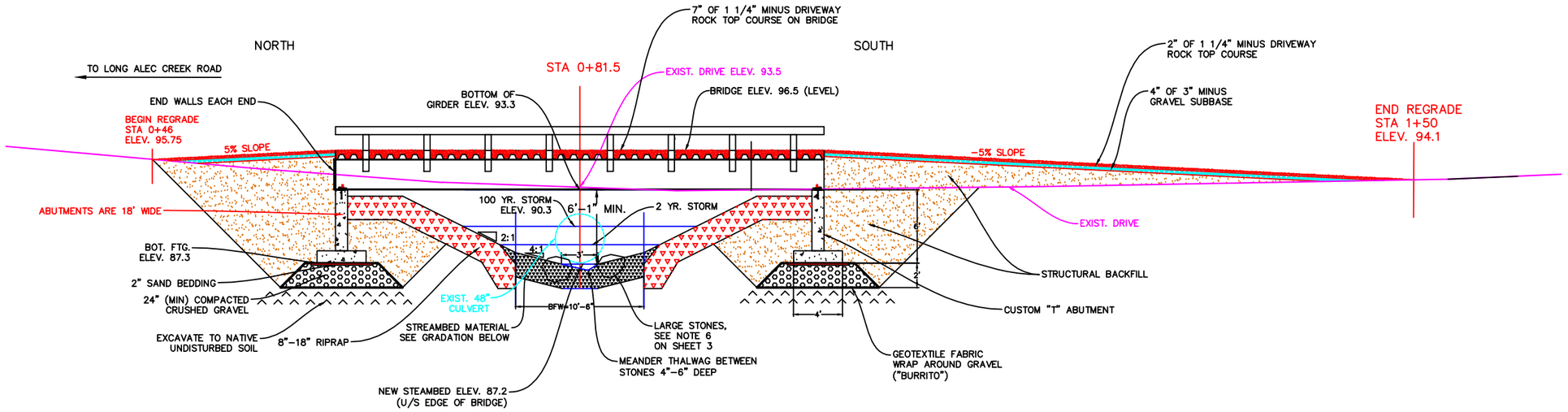


FIG. 3 – STREAM CROSS SECTION

14'x40' STEEL BRIDGE
LOOKING UPSTREAM FROM
UPSTREAM EDGE OF BRIDGE
(STREAM STA. 2+21)

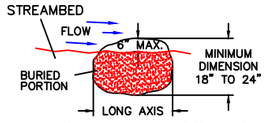


FIG 4 – LARGE ROCK
ROCK ORIENTATION DETAIL

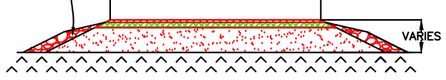


FIG. 6 – ROAD CROSS SECTION FROM 0+46 TO 0+61.5 AND 1+01.5 TO 1+50

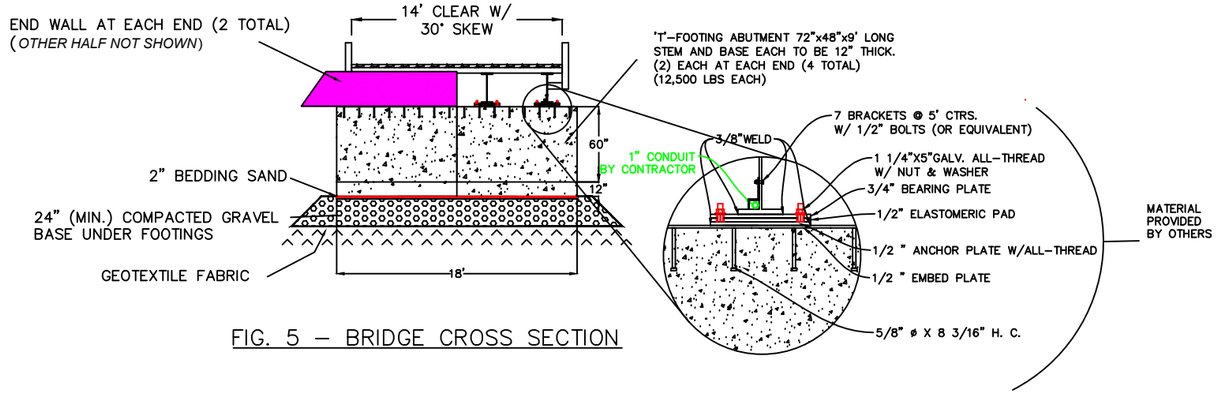


FIG. 5 – BRIDGE CROSS SECTION

## BRIDGE INSTALLATION NOTES:

1. PREMANUFACTURED BRIDGE IS TO BE 14'x40' AND RATED FOR HL93 WITH U80 OVERLOAD. ABUTMENTS ARE TO BE PRECAST W/ 4000 PSI CONCRETE W/ 5% AIR ENTRAINMENT. BRIDGE AND ABUTMENTS PROVIDED BY OTHERS. CONTRACTOR TO COORDINATE DELIVERY & OFF-LOADING WITH BRIDGE AND ABUTMENT SUPPLIERS.

2. THE STEEL BRIDGE SUPERSTRUCTURE SHALL BE ASSEMBLED AND INSTALLED IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 17TH EDITION, 2002, AND THE STRUCTURAL STEEL FABRICATING PLANT SHALL BE CERTIFIED UNDER THE AISC QUALITY CERTIFICATION PROGRAM FOR COMPLEX STEEL BRIDGES.

3. SHEAR (GUARD) RAILS SHALL COMPLY WITH WAC 296-54-531 (5) AND ARE TO INCLUDE REFLECTOR TABS AND END FLAIRS. CONTRACTOR TO PROVIDE YELLOW AND BLACK REFLECTIVE TAPE ON FLARED ENDS UNLESS OTHERWISE PROVIDED.

4. SEE BRIDGE MANUFACTURER'S SHOP DRAWINGS FOR MORE DETAILED INSTALLATION INSTRUCTIONS. MANUFACTURER'S SHOP DRAWING SHALL GOVERN SHOULD THERE BE CONFLICTS WITH THIS DESIGN.

5. MEANDER STREAM AND SLIGHTLY UNDULATE THE BOTTOM OF STREAM IN NEW STREAM BED.

6. CONTRACTOR TO INSTALL TELEPHONE LINE IN CONTRACTOR PROVIDED 1" SCH. 40 PVC CONDUIT. CUT END WALLS TO INSTALL CONDUIT. BRACKETS BY BRIDGE SUPPLIER.

MATERIALS:
1. STREAMBED MATERIAL:
   FINES = 8%; 0"-3" = 15%; 3"-6" = 31%; 6"-12" = 31%;
   ROUND RIVER ROCK 12"-24" = 15%
2. GEOTEXTILE FABRIC: TENCATI MIRAFI 135N OR EQUAL

## LEGEND:

- COMPACTED GRAVEL
- STREAMBED MATERIAL. SEE GRADATION ABOVE
- 8"-24" RIP-RAP
- BEDROCK OR FIRM UNDISTURBED SOIL
- STRUCTUAL FILL, SEE ENGINEER
- BEDDING SAND

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BRIDGE INSTALLATION

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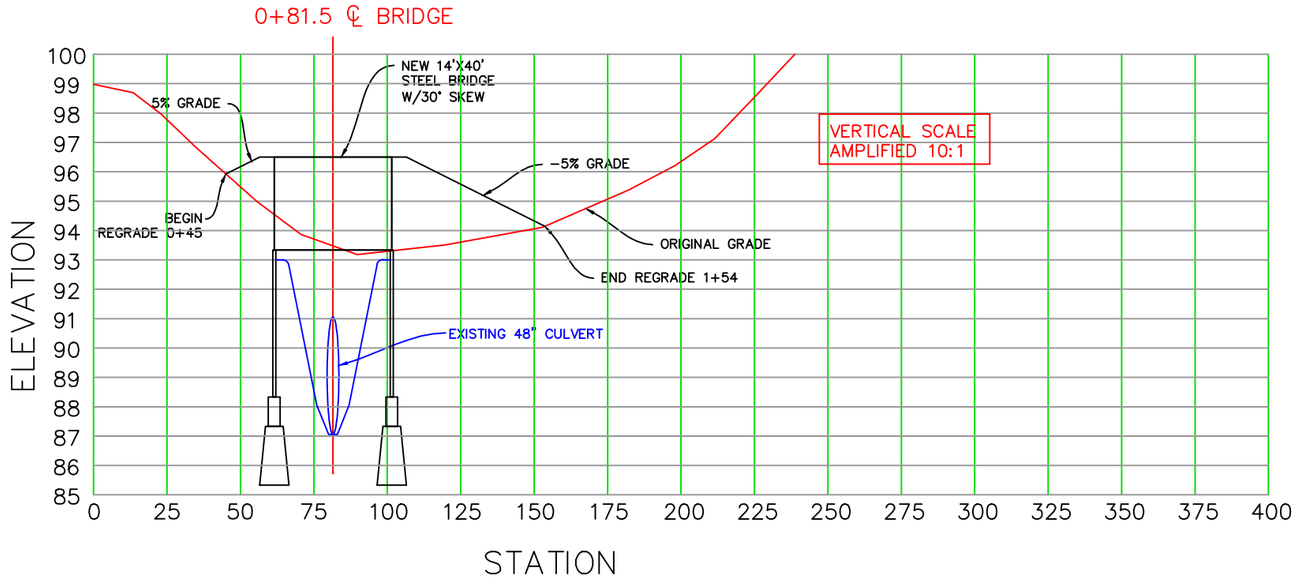


FIG. 7 ROAD PROFILE

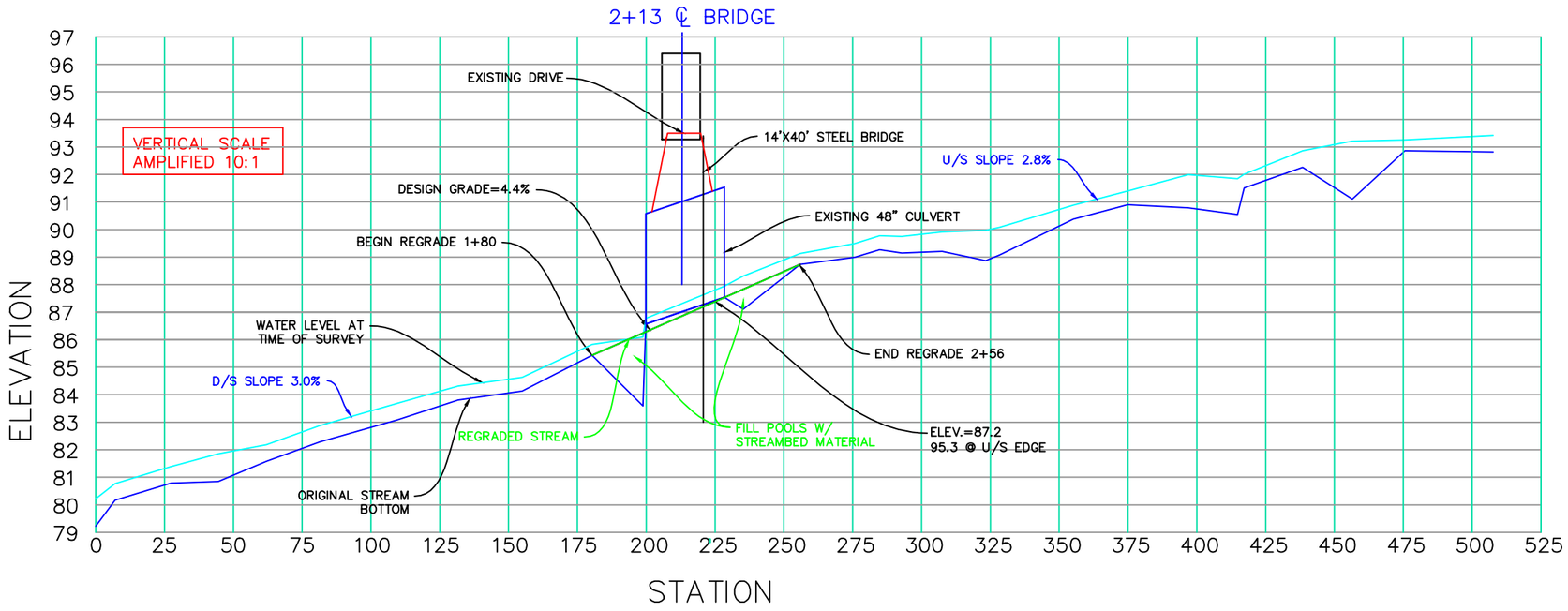


FIG. 8 STREAM PROFILE

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PROFILES

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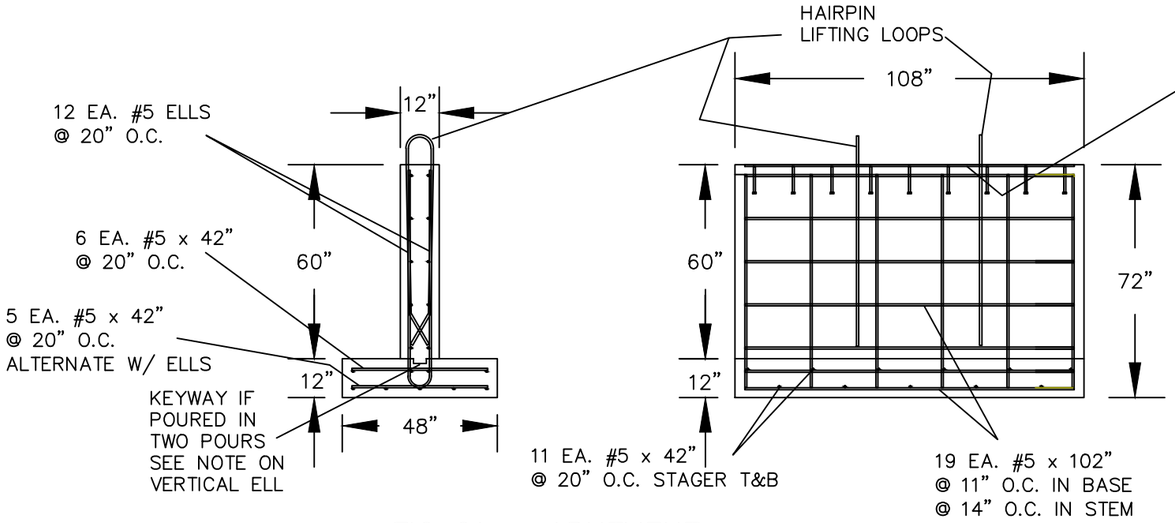



FIG C1 – ABUTMENT

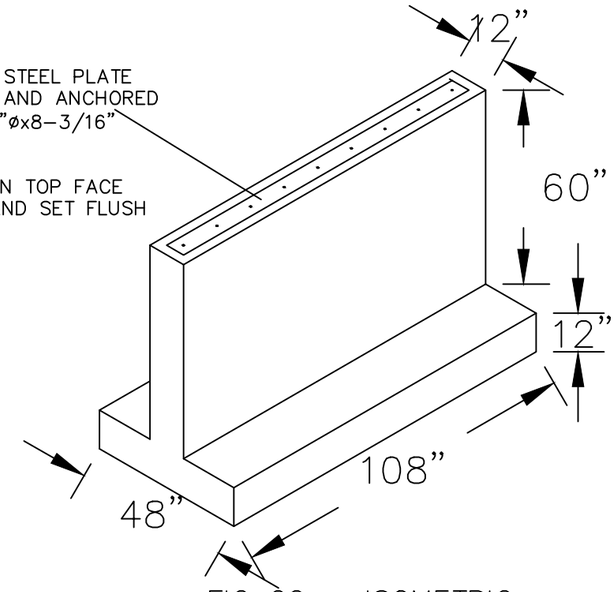



FIG C2 – ISOMETRIC

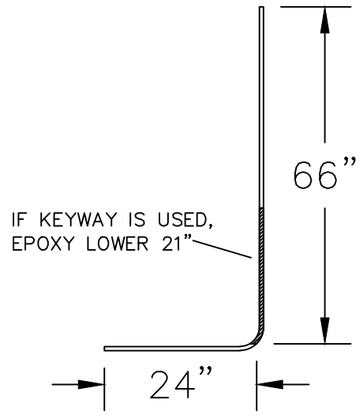



FIG. C3 – VERTICAL ELLS
12 EA. OVERLAP @ CENTER

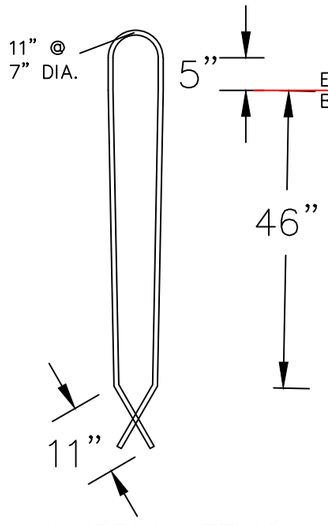



FIG. C4 – HAIRPIN LIFTING
LOOP 2 EA. #6 X 135"
(OR EQUIVALENT)

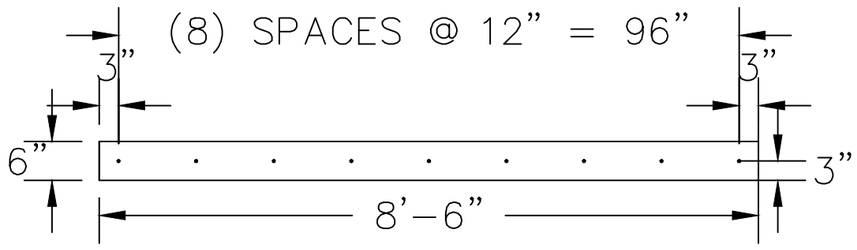
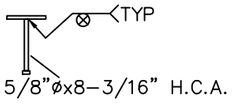



FIG C5 – SILL PLATE 1/2"x6" x 102"




NOTES:

1. THIS DESIGN IS FOR ONE ABUTMENT SEGMENT. TWO SEGMENTS ARE REQUIRED PER END, OR FOUR SEGMENTS ARE REQUIRED IN TOTAL.
2. CONCRETE MIX TO BE 6–SACK MIX (4,000 PSI) W/ 4%–7% AIR ENTRAINMENT.
3. REBAR TO BE GRADE 60
4. WEIGHT PER EACH SEGMENT = 12,500 POUNDS
5. ALL REBAR SPLICES SHALL BE A MINIMUM OF 40 BAR DIAMETERS.
6. ALTERNATIVES TO THE HAIRPIN LIFTING LOOP ARE PERMISSIBLE WITH PROPER DOCUMENTATION

| MATERIALS PER SEGMENT (4 REQUIRED) | | | |
|---|---|---|---|
| QUANTITY | MEMBERS | DESCRIPTION | LENGTH |
| 19 | LONG. BAR | #5 REBAR | 102" |
| 11 | CROSS BAR | #5 REBAR | 42" |
| 12 | ELLS | #5 REBAR | 90" |
| 2 | HAIRPIN | #6 REBAR | 135" |
| 1 | PLATE | 1/2"x6" A588 | 8'–6" |
| 9 | STUD | 5/8"ø H.C.A. | 8–3/16" |

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ABUTMENTS

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