

BUCK GULCH FISH PASSAGE IMPLEMENTATION - 65% DESIGN PLANS

HUMBOLDT COUNTY, CA

BUCK GULCH FISH
PASSAGE
IMPLEMENTATION - 65%
DESIGN PLANS

HUMBOLDT COUNTY, CA

Stillwater Sciences

2855 TELEGRAPH AVENUE, SUITE 400
BERKELEY, CA 94705 P: (510) 848-8098

GENERAL NOTES, TERMS, & CONDITIONS:

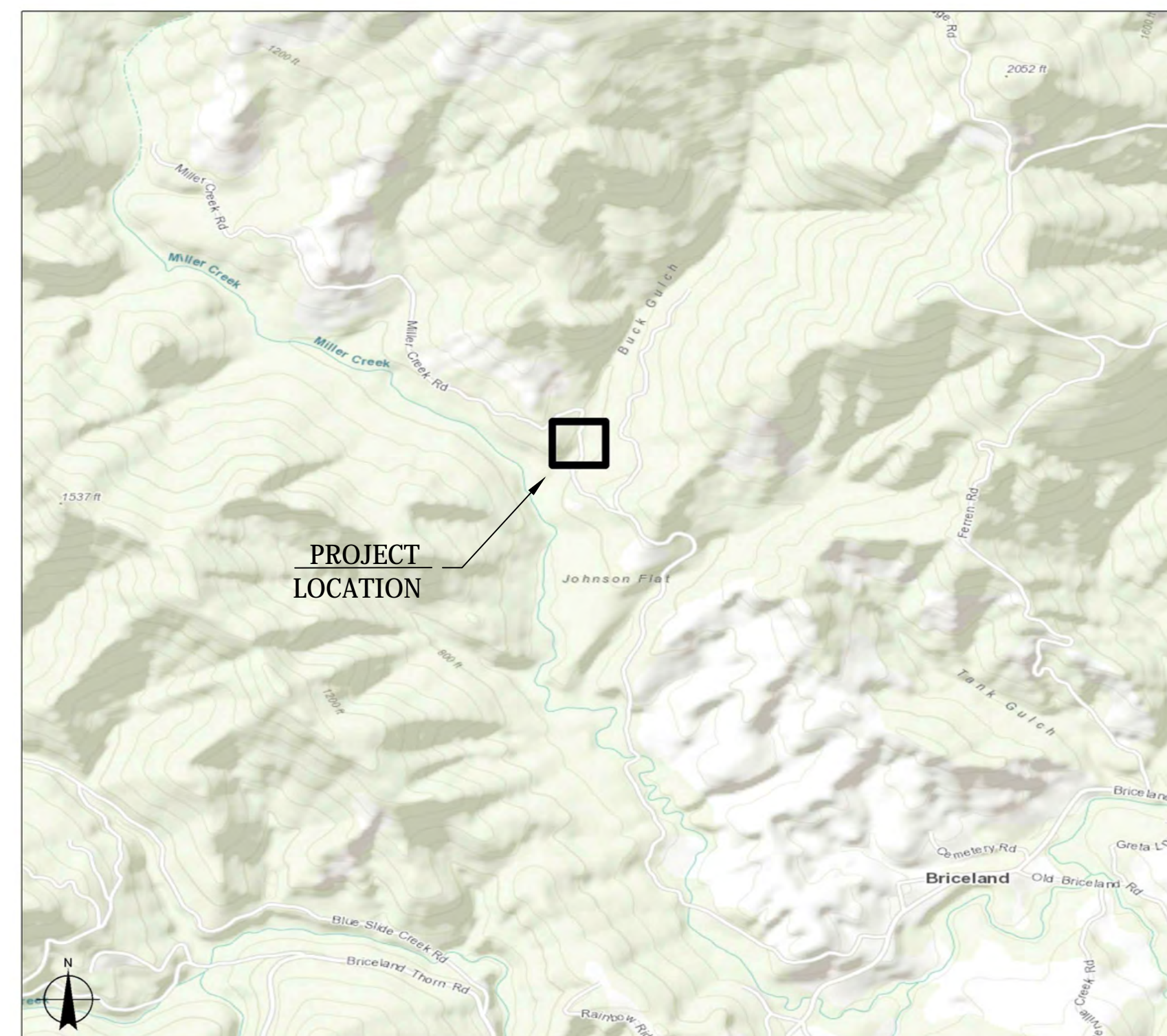
- DESIGN INTENT: THESE DRAWINGS REPRESENT THE GENERAL DESIGN INTENT TO BE IMPLEMENTED AND CONTRACTOR IS RESPONSIBLE FOR ALL ITEMS SHOWN ON THESE PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE PROJECT MANAGER FOR ANY CLARIFICATIONS OR FURTHER DETAILS NECESSARY TO ACCOMMODATE ACTUAL SITE CONDITIONS. ANY DEVIATION FROM THESE PLANS WITHOUT ERWIG'S REPRESENTATIVE APPROVAL ARE AT THE CONTRACTOR'S OWN RISK AND EXPENSE. NOTIFY PROJECT MANAGER IMMEDIATELY OF ANY UNEXPECTED AND CHANGED CONDITIONS, SAFETY HAZARDS, AND ENVIRONMENTAL PROBLEMS ENCOUNTERED.
- JOB SITE CONDITIONS AND CONTRACTOR RESPONSIBILITY. CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR SITE CONDITIONS DURING THE COURSE OF THE CONSTRUCTION OF THIS PROJECT, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY, AND ALL ENVIRONMENTAL PROTECTION ELEMENTS, WHETHER SHOWN ON THESE DRAWINGS OR NOT. CONTRACTOR SHALL FOLLOW ALL APPLICABLE CONSTRUCTION AND SAFETY REGULATIONS. THESE REQUIREMENTS SHALL APPLY CONTINUOUSLY AND WILL NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE ERWIG OR THE ENGINEER (STILLWATER SCIENCES) HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPT FROM LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE ERWIG OR ENGINEER.
- DAMAGE. CONTRACTOR SHALL EXERCISE CARE TO AVOID DAMAGE TO EXISTING PUBLIC AND PRIVATE PROPERTY, INCLUDING NATIVE TREES AND SHRUBS, AND OTHER PROPERTY IMPROVEMENTS. IF CONTRACTOR CAUSES DAMAGES TO SUCH ITEMS, HE SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT IN LIKE NUMBER, KIND, CONDITION, AND SIZE. ANY SUCH COST MAY BE DEDUCTED BY OWNER FROM MONIES DUE CONTRACTOR UNDER THIS CONTRACT.
- LIMITS OF WORK, ACCESS, STAGING AND MOBILIZATION AREAS. THE APPROXIMATE LIMITS OF WORK ARE SHOWN ON THE DRAWINGS. EXACT LIMITS OF WORK, POINTS OF INGRESS-EGRESS, CREEK CHANNEL ACCESS, MOBILIZATION, STAGING, AND WORK AREAS WILL BE FLAGGED IN THE FIELD BY THE ENGINEER. EQUIPMENT MAINTENANCE AND FUELING MUST OCCUR OUTSIDE OF THE CHANNEL AREA AS DESCRIBED IN THE ENVIRONMENTAL PERMITS FOR THE PROJECT.
- WORK IN STREAM CHANNELS AND STREAM DIVERSIONS. ALL WORK INVOLVING USE OF HEAVY EQUIPMENT MUST BE COMPLETED FROM TOP OF BANK UNLESS A SPECIFIC POINT OF CREEK CHANNEL ACCESS HAS BEEN APPROVED AND IS SHOWN ON THE PLANS, AND THEN ONLY IN NON-LIVE WATER AS DEFINED BY CDFW. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING THE DEWATERING PLAN DEPICTED IN THIS PLAN SET.
 - CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND DISPOSING OF ALL WATER CONTROL STRUCTURES AND EQUIPMENT.
 - THE CONTRACTOR SHALL FURNISH, INSTALL, AND OPERATE ALL OTHER NECESSARY MACHINERY, APPLIANCES, AND EQUIPMENT TO DIVERT FLOWING WATER AROUND WORK AREAS, AND TO KEEP EXCAVATIONS AND TRENCHES REASONABLY FREE FROM WATER DURING CONSTRUCTION. CONTRACTOR SHALL DISPOSE OF THE WATER SO AS NOT TO CAUSE INJURY TO PUBLIC OR PRIVATE PROPERTY, OR TO CAUSE A NUISANCE OR A MENACE TO THE PUBLIC, OR TO DEGRADE WATER QUALITY. HE SHALL AT ALL TIMES HAVE ON HAND SUFFICIENT PUMPING EQUIPMENT AND MACHINERY IN GOOD WORKING CONDITION FOR ALL ORDINARY EMERGENCIES AND SHALL HAVE AVAILABLE AT ALL TIMES COMPETENT MECHANICS FOR THE OPERATION OF ALL PUMPING EQUIPMENT. IF THE CONTRACTOR CHOOSES TO USE A PUMPING SYSTEM FOR ANY PORTION OF THE WATER CONTROL WORK, HE SHALL HAVE ADEQUATE BACK-UP EQUIPMENT TO INSURE THE CONTINUOUS OPERATION OF THE EQUIPMENT.
 - THE CONTRACTOR SHALL AT ALL TIMES PROVIDE FOR THE ADEQUATE RETURN FLOW OF DIVERSIONS BELOW THE PROJECT SITE. THE CONTRACTOR MAY TEMPORARILY DIVERT WATER DURING CONSTRUCTION, AS OUTLINED IN THE APPROVED STREAM DIVERSION AND WATER CONTROL PLAN. THIS MAY INCLUDE FOR INSTANCE, VISQUEEN AND STRAW BALE OR SAND BAG DIVERSION DIKES AND PIPING SYSTEMS. RETURN FLOW SHALL BE FILTERED THROUGH FILTER CLOTH, STRAW BALES AND/OR THROUGH A SERIES OF STILLING BASINS WHEN REQUIRED.
 - TURBID DEWATERING FLOWS SHALL BE PUMPED INTO A HOLDING FACILITY OR SPRAYED OVER A LARGE AREA OUTSIDE THE STREAM CHANNEL TO ALLOW FOR NATURAL FILTRATION OF SEDIMENTS. AT NO TIME SHALL TURBID WATER FROM THE HOLDING FACILITY BE ALLOWED BACK INTO THE STREAM CHANNEL UNTIL WATER IS CLEAR OF SILT.
 - ALL HEAVY EQUIPMENT MUST HAVE A SUPPLY OF SORBENT PADS AVAILABLE TO CLEAN-UP GREASE, OIL, OR FUEL THAT DRIPS OR SPILLS INTO THE STREAM CHANNEL. SORBENT BOOMS MUST BE PLACED DOWNSTREAM FROM LOCATIONS WHERE MACHINERY IS EXPECTED TO CROSS THE STREAM CHANNEL. USED PADS AND BOOMS ARE TO BE DISPOSED OF PROPERLY AT CONTRACTOR'S EXPENSE.
- EARTHWORK QUANTITIES. CONTRACTOR IS RESPONSIBLE FOR ALL EARTHWORK, INCLUDING GRADING, PROVISION AND PLACEMENT OF ROCK MEETING SIZE LIMITS, AS SHOWN ON DRAWINGS, AND DISPOSAL OF ALL EXCESS SOIL AND RUBBLE. EARTHWORK QUANTITIES, INCLUDING GRADING, PLACED ROCK RIP-RAP AND OFF-HAUL QUANTITY ESTIMATES PROVIDED BY THE ENGINEER ARE ESTIMATES ONLY. ERWIG AND ENGINEER DO NOT, EXPRESSLY OR OTHERWISE BY IMPLICATION, EXTEND ANY WARRANTY TO EARTHWORK CALCULATIONS
- THE FOLLOWING PERMITS ARE REQUIRED FOR THIS PROJECT. THE CONTRACTOR SHALL BE GIVEN COPIES OF ALL THE PERMITS, SHALL BECOME FAMILIAR WITH THE PERMIT REQUIREMENTS, AND SHALL BE RESPONSIBLE FOR ADHERENCE TO AND CONFORMANCE WITH ALL PERMIT CONDITIONS.
 - SEC. 404 PERMIT ISSUED BY US ARMY CORPS OF ENGINEERS
 - 1601/1603 STREAMBED ALTERATION AGREEMENT ISSUED BY CA DEPT. FISH & WILDLIFE
 - WATER QUALITY CERTIFICATION, BY NORTH COAST REGIONAL WATER QUALITY CONTROL BOARD
 - US FISH AND WILDLIFE SERVICE CONSULTATION AND IMPLEMENTATION RECOMMENDATIONS
 - NATIONAL MARINE FISHERIES SERVICE CONSULTATION AND IMPLEMENTATION RECOMMENDATIONS.
- AREAS TO BE GRADED SHALL BE CLEARED OF ALL VEGETATION INCLUDING ROOTS AND OTHER UNSUITABLE MATERIAL FOR A STRUCTURAL FILL, THEN SCARIFIED TO A DEPTH OF 6 INCHES PRIOR TO PLACING OF ANY FILL.
- AREAS WITH EXISTING SLOPES WHICH ARE TO RECEIVE FILL MATERIAL SHALL BE KEYED AND BENCHED.
- FILL MATERIAL SHALL BE SPREAD IN LIFTS NOT EXCEEDING 6 INCHES IN COMPACTED THICKNESS, MOISTENED OR DRIED AS NECESSARY TO NEAR OPTIMUM MOISTURE CONTENT AND COMPACTED BY AN APPROVED METHOD. FILL MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 90% MAXIMUM DENSITY AS DETERMINED BY 1957 ASTM D - 1557 - 91 MODIFIED PROCTOR (AASHO) TEST OR SIMILAR APPROVED METHODS.
- CUT SLOPES SHALL NOT EXCEED A GRADE OF 1.5 HORIZONTAL TO 1 VERTICAL. FILL AND COMBINATION FILL AND CUT SLOPES SHALL NOT EXCEED 2 HORIZONTAL TO 1 VERTICAL. SLOPES OVER THREE FEET IN VERTICAL HEIGHT SHALL BE PLANTED WITH APPROVED PERENNIAL OR TREATED WITH EQUALLY APPROVED EROSION CONTROL MEASURES PRIOR TO FINAL INSPECTION.
- BEST MANAGEMENT PRACTICES FOR CONSTRUCTION ACTIVITIES: ERODED SEDIMENTS AND OTHER POLLUTANTS MUST BE RETAINED ONSITE AND MAY NOT BE TRANSPORTED FROM THE SITE VIA SHEET FLOW, SWALES, AREA DRAINS, NATURAL DRAINAGE COURSES, OR WIND. STOCKPILES OF EARTH AND OTHER CONSTRUCTION RELATED MATERIALS MUST BE PROTECTED FROM BEING TRANSPORTED FROM THE SITE BY THE FORCES OF WIND OR WATER. FUELS, OILS, SOLVENTS, AND OTHER TOXIC MATERIALS MUST BE STORED IN ACCORDANCE WITH THEIR LISTING AND ARE NOT TO CONTAMINATE THE SOIL AND SURFACE WATERS. ALL APPROVED STORAGE CONTAINERS ARE TO BE PROTECTED FROM THE WEATHER. SPILLS MAY NOT BE WASHED INTO THE DRAINAGE SYSTEM. EXCESS OR WASTE CONCRETE MAY NOT BE WASHED INTO PUBLIC WAY OR ANY OTHER DRAINAGE SYSTEM. PROVISIONS MUST BE MADE TO RETAIN CONCRETE WASTES ON SITE UNTIL THEY CAN BE DISPOSED AS A SOLID WASTE. TRASH AND CONSTRUCTION RELATED SOLID WASTE MUST BE DEPOSITED INTO A COVERED WASTE RECEPTACLE TO PREVENT CONTAMINATION OF RAINWATER AND DISPERSAL BY WIND. SEDIMENTS AND OTHER MATERIAL MAY NOT BE TRACKED FROM TO THE SITE BY VEHICLE TRAFFIC.

LANDOWNER

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| Sheet List Table | |
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VICINITY MAP



EARTHWORK ESTIMATES:

EARTHWORK BALANCED ON SITE




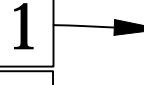
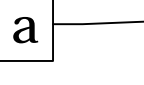


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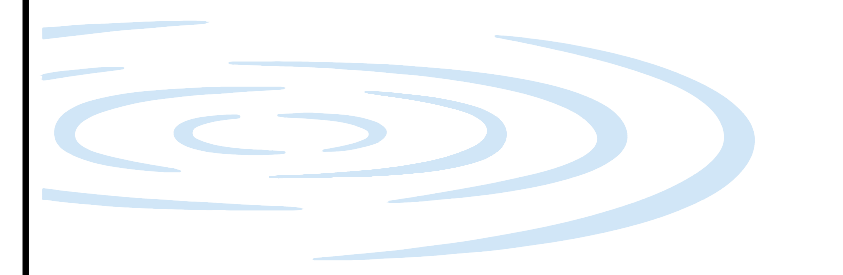
90 TONS 1-2 TON BOULDERS
30 TONS 1/4-TON BOULDERS
100 TONS 6"-12" ROCK ARMOR
75 TONS 3" MINUS BASE ROAD ROCK

TREES:

3 TREES REMOVED WITH 12" DBH OR GREATER; 5
TREES REMOVED WITH 4-6" DBH; ALL SUITABLE
REMOVED TREES USED FOR ONSITE INSTREAM
HABITAT

ABBREVIATIONS AND SYMBOLS:

- <E> EXISTING
- <P> PROPOSED
-  EXISTING TREE (SURVEYED)
-  EXISTING TREE (APPROXIMATE LOCATION)
-  EXISTING POOL (APPROXIMATE LOCATION)
-  LARGE WOOD FEATURE NUMBER
-  INDIVIDUAL LOG OR ROOTWAD DESIGNATION
-  FIGURE # ON SHEET
-  SHEET #

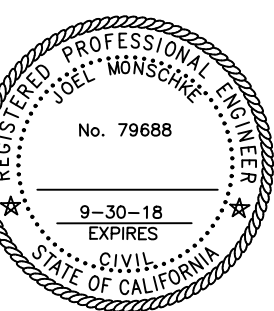


PROJECT NUMBER: 546.47

SCALE: AS NOTED

DATE: 3/20/2018

DESIGN: JM
DRAWN: RBT
CHECKED: CL
APPROVED: JM



TITLE SHEET

SHEET 1 OF 6

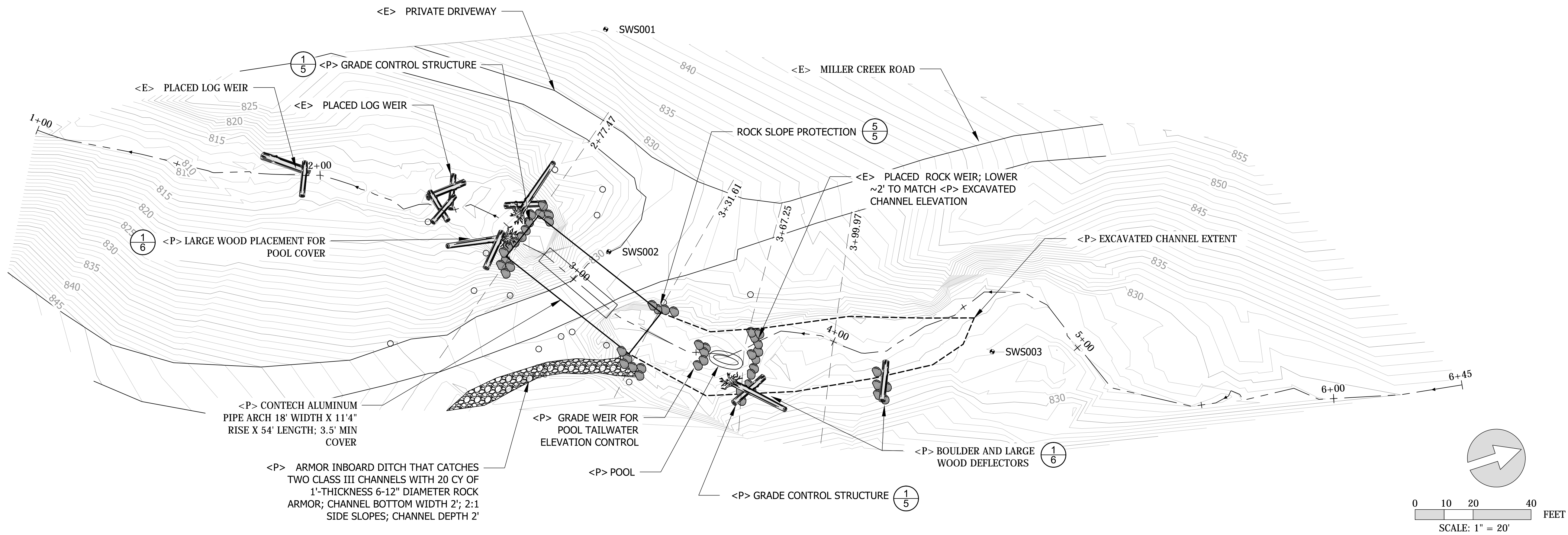
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BUCK GULCH FISH
PASSAGE
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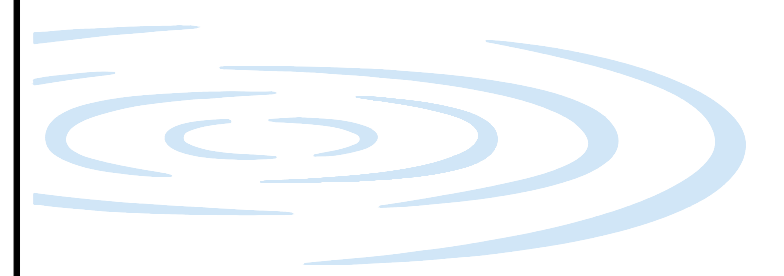
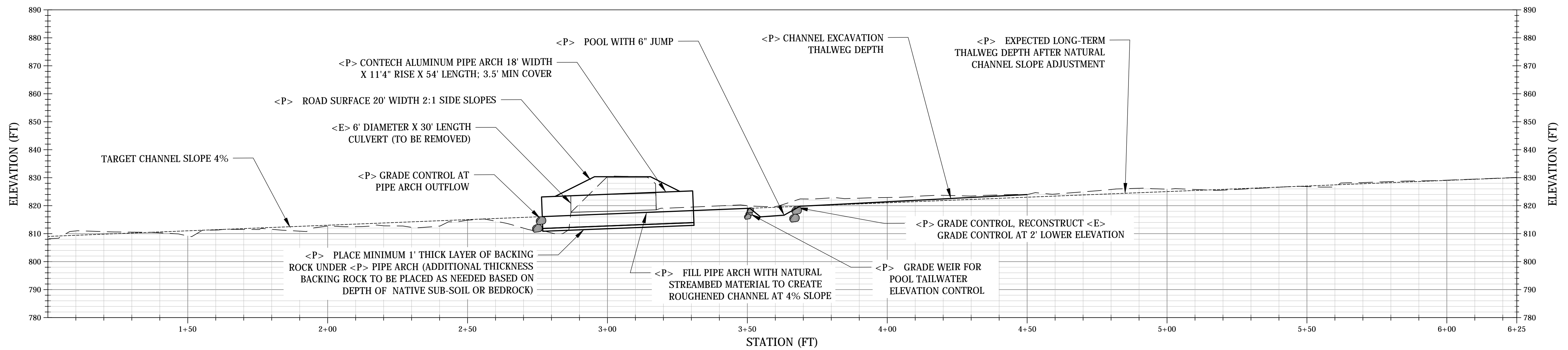
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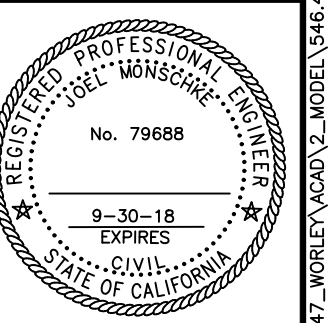


BUCKS GULCH LONGITUDINAL PROFILE



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CHECKED: CL
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EXISTING & PROPOSED -
PLAN & PROFILE

SHEET 2 OF 6

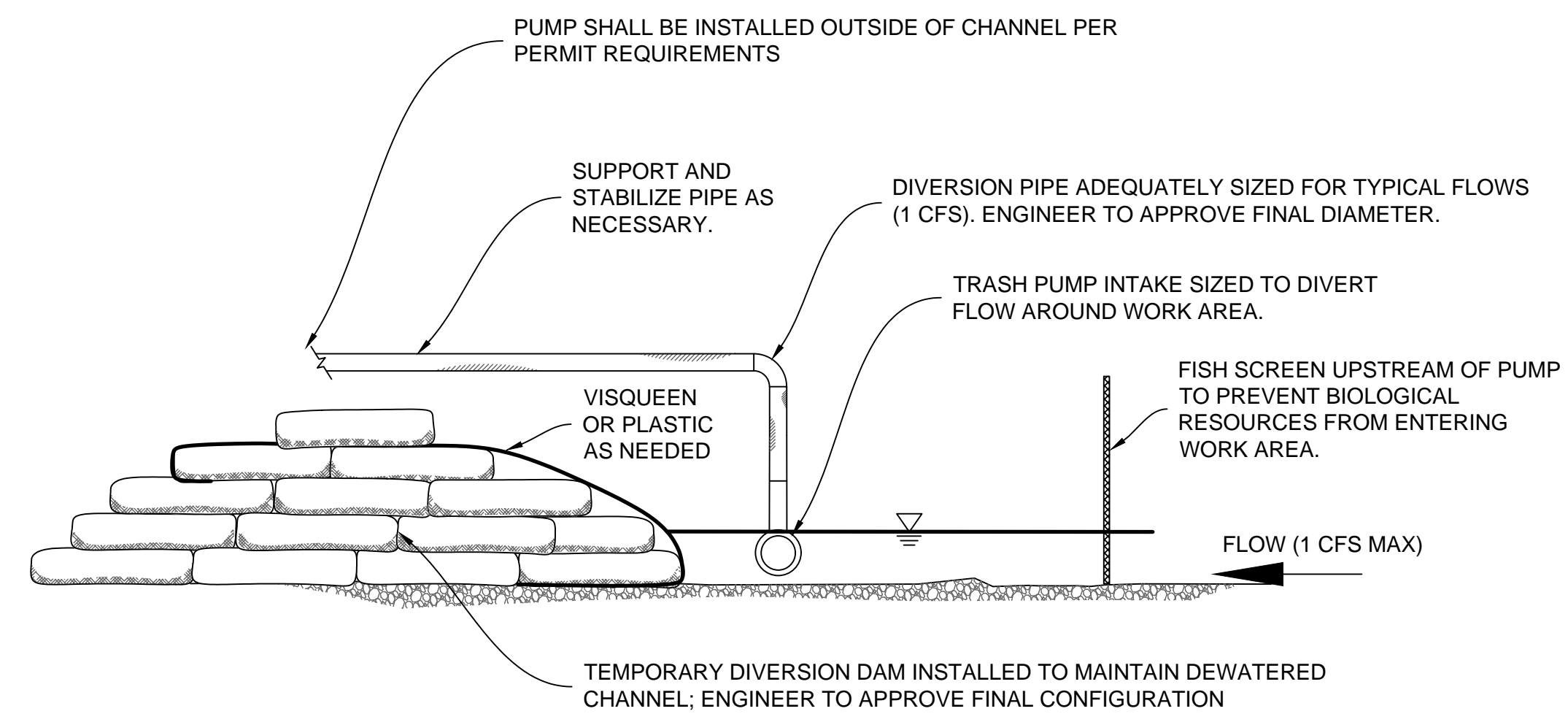
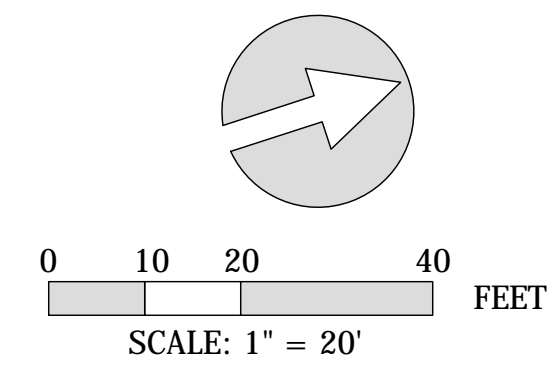
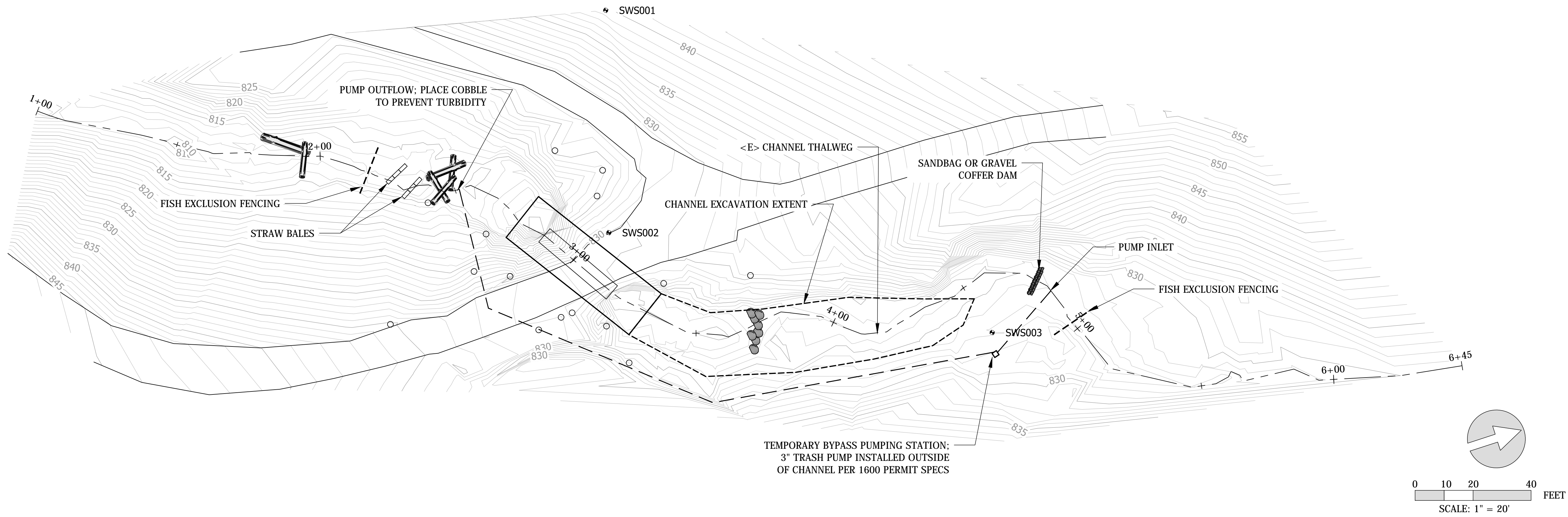
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**BUCK GULCH FISH
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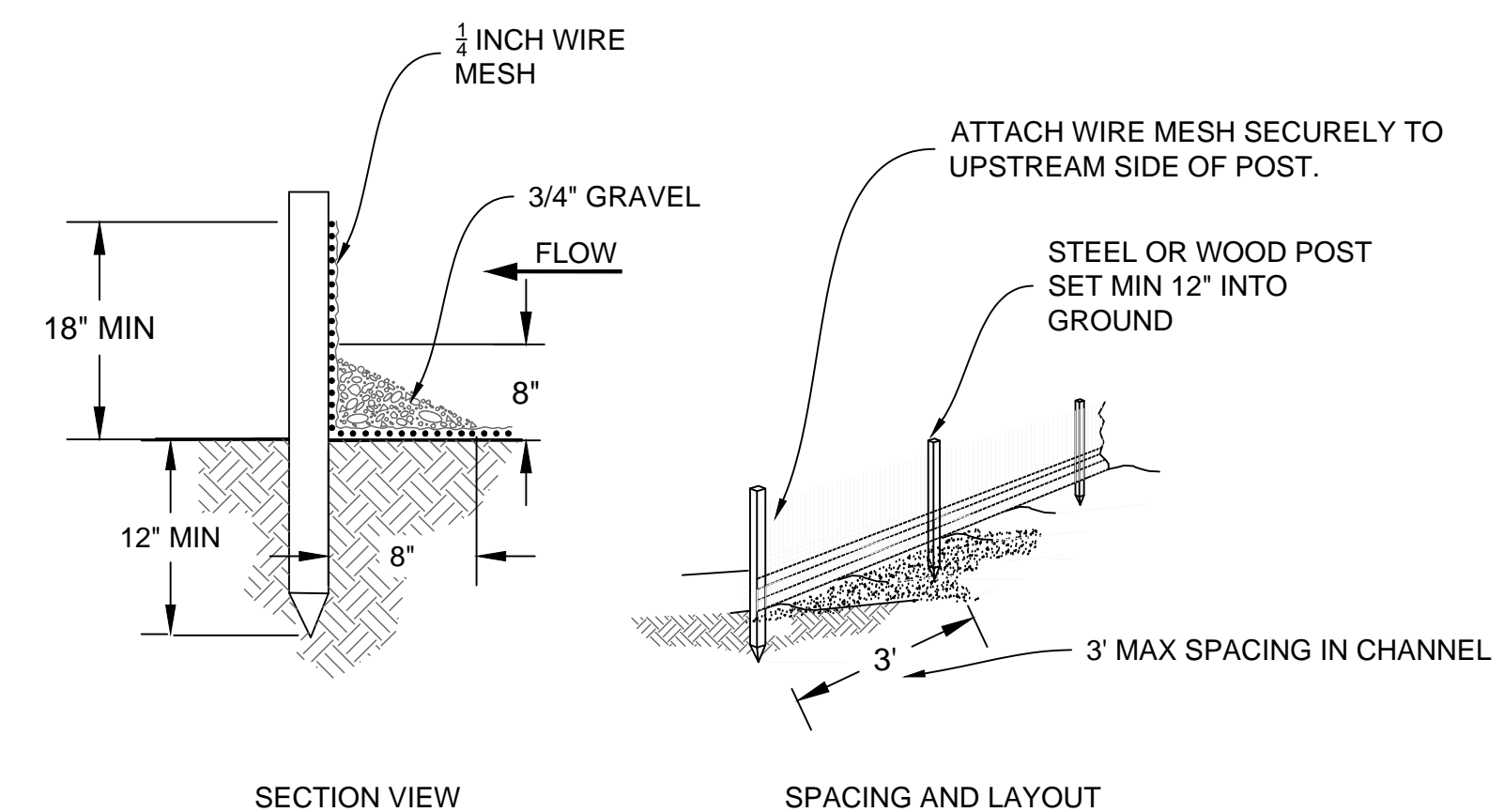
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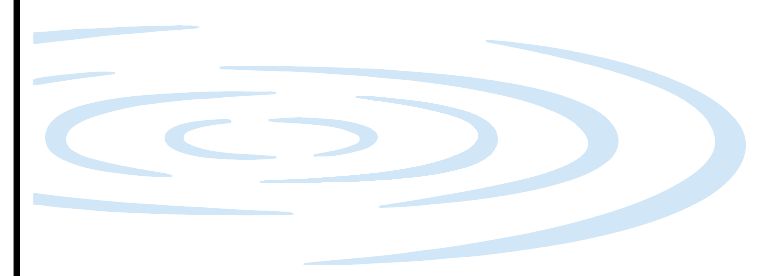
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1 COFFER DAM AND PUMP INTAKE
NTS

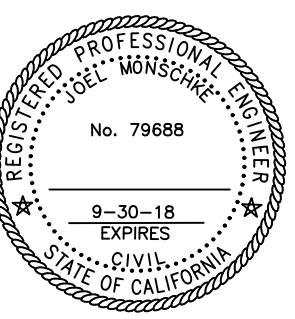


2 FISH EXCLUSIONARY FENCING
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DEWATERING PLAN

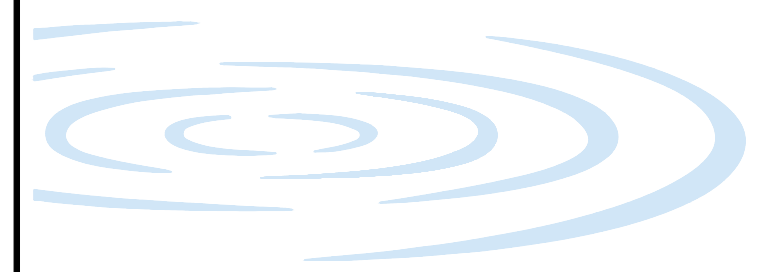
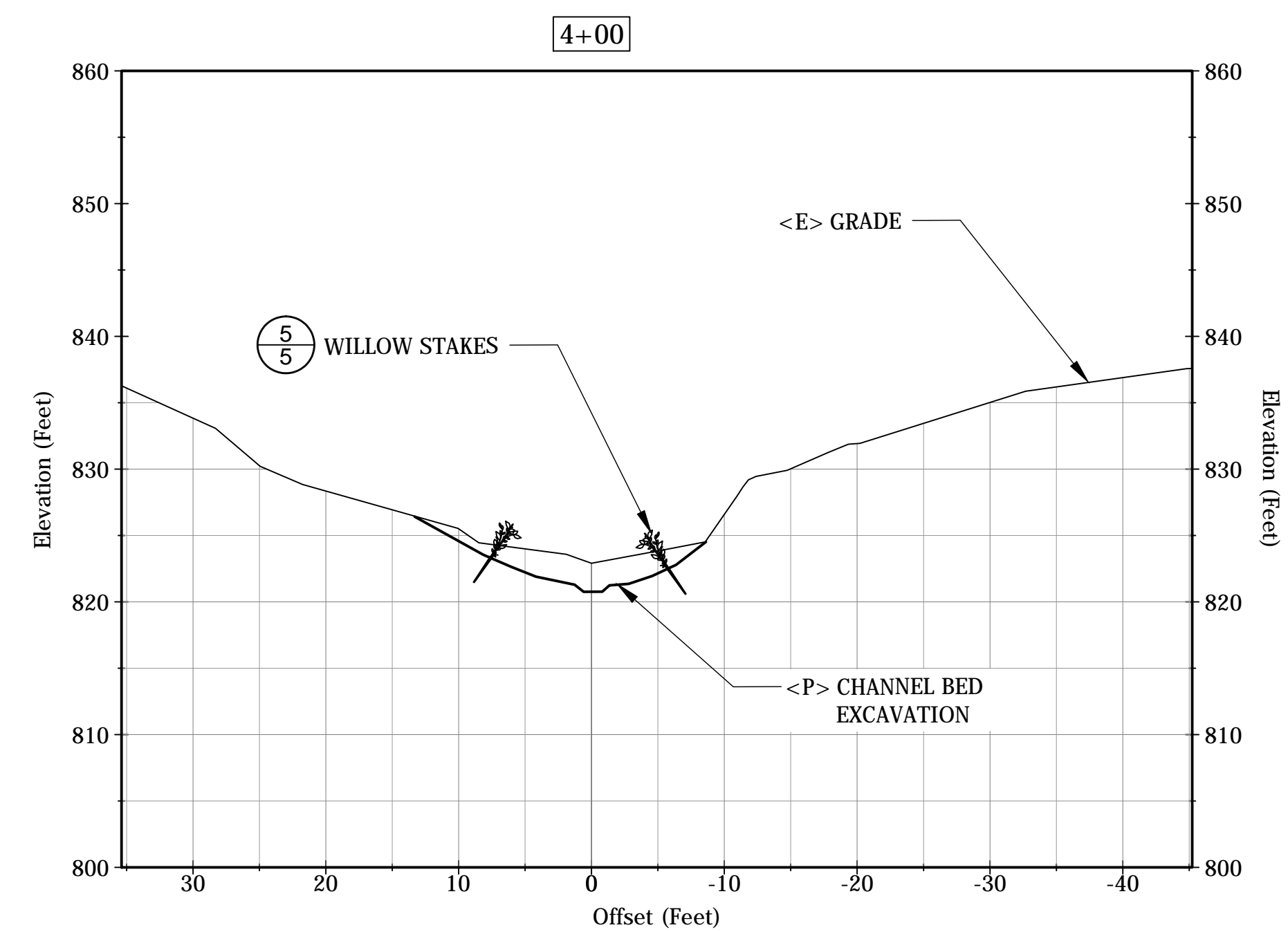
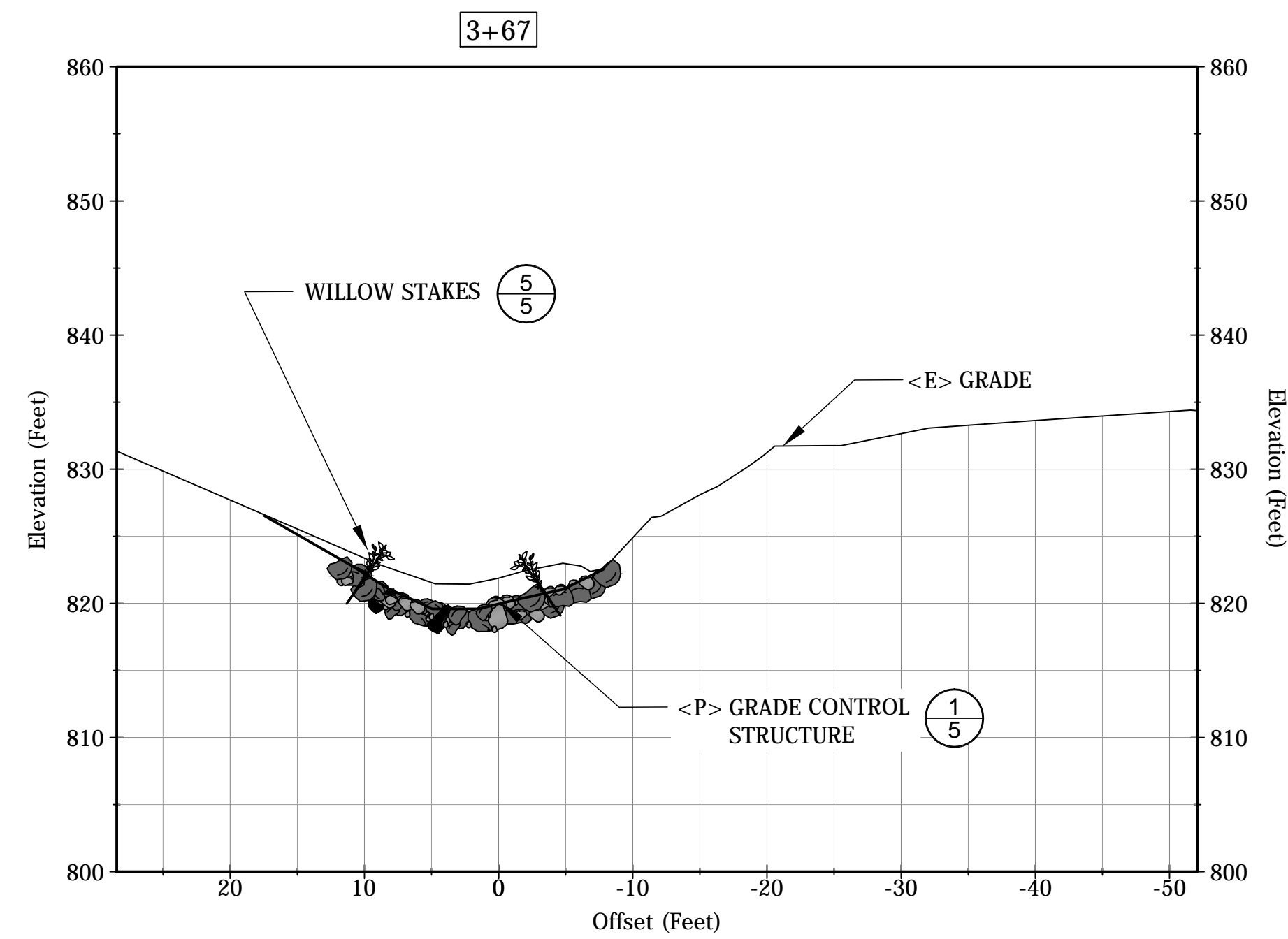
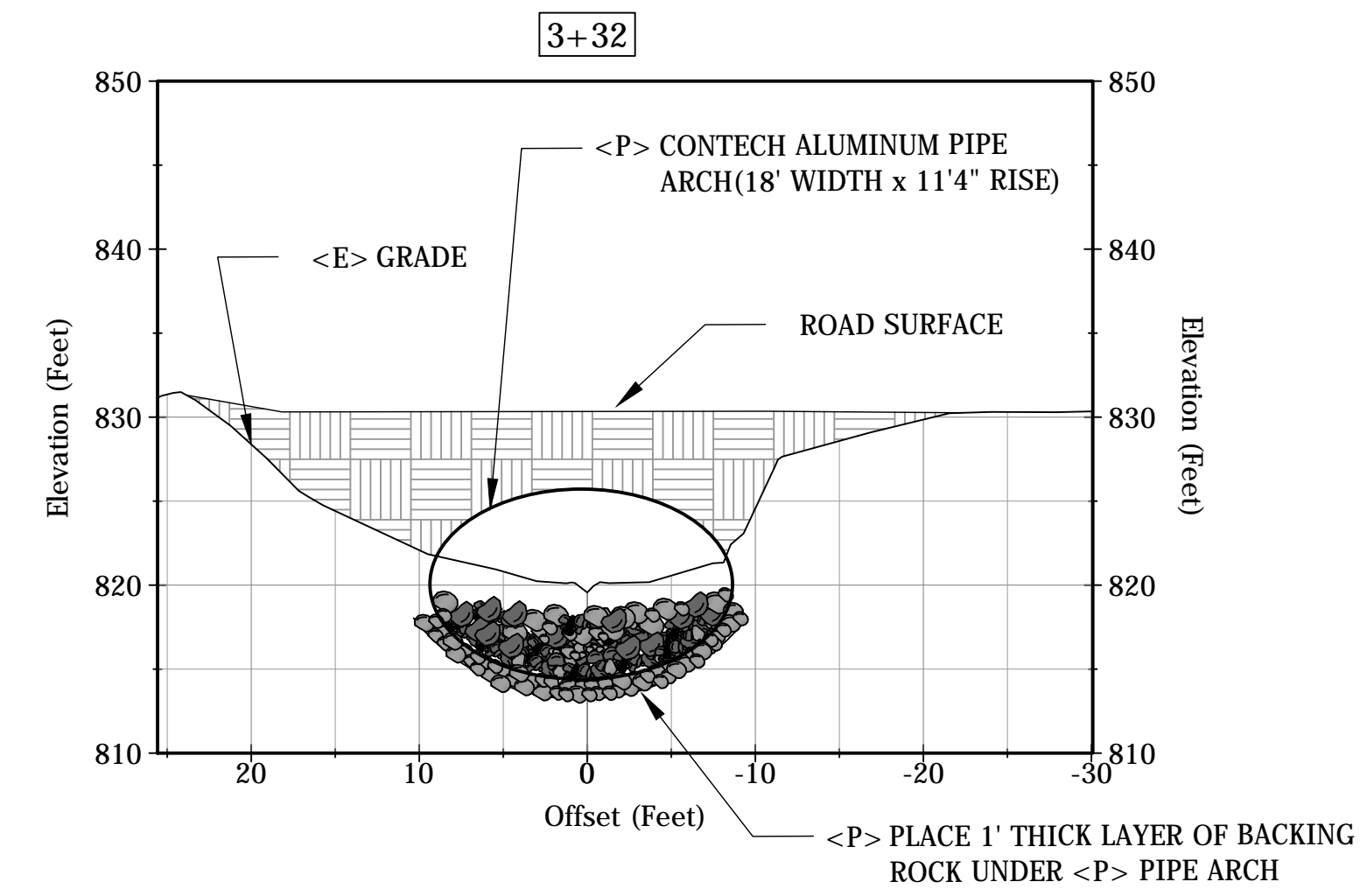
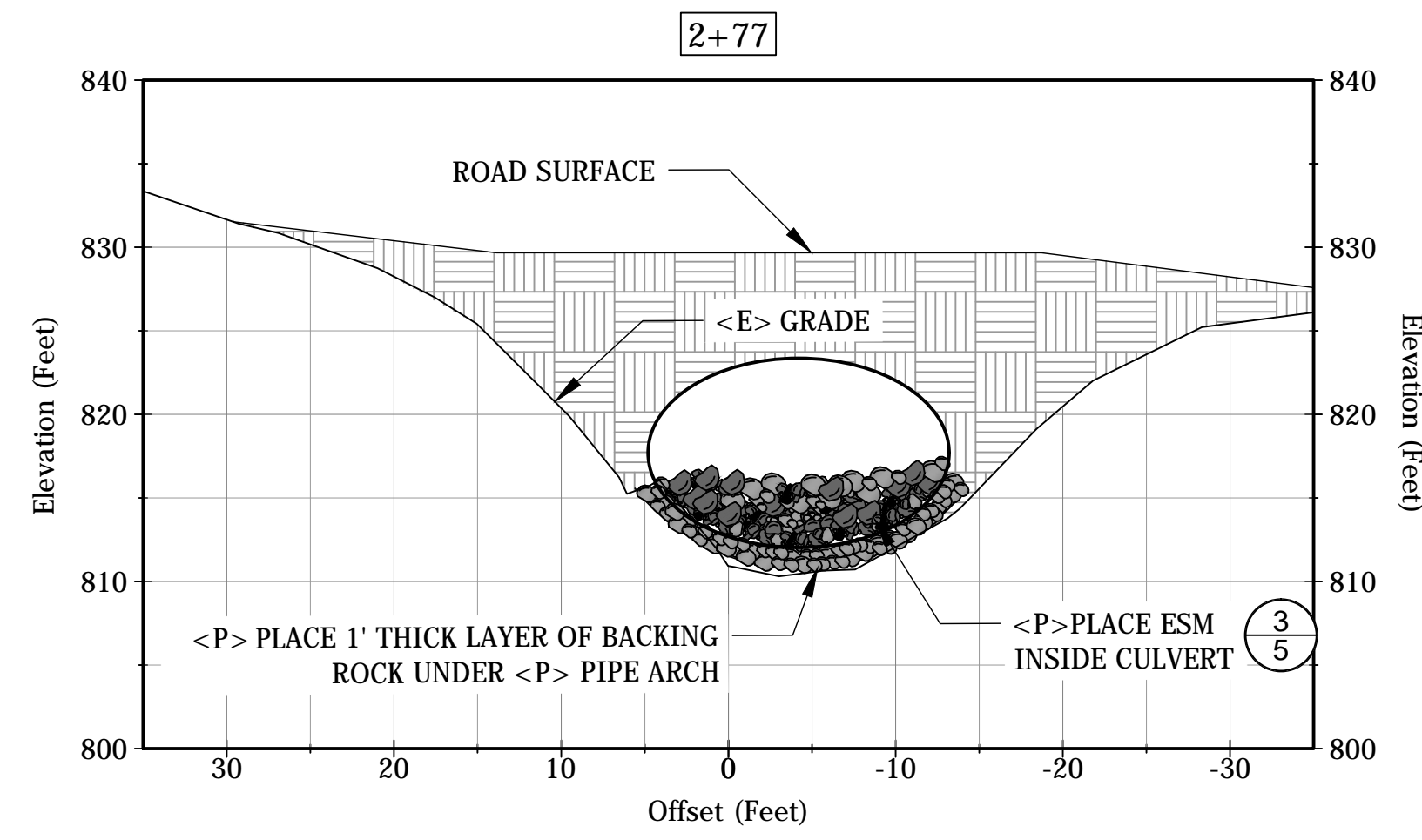
SHEET 3 OF 6

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CHANNEL
CROSS-SECTIONS

SHEET 4 OF 6

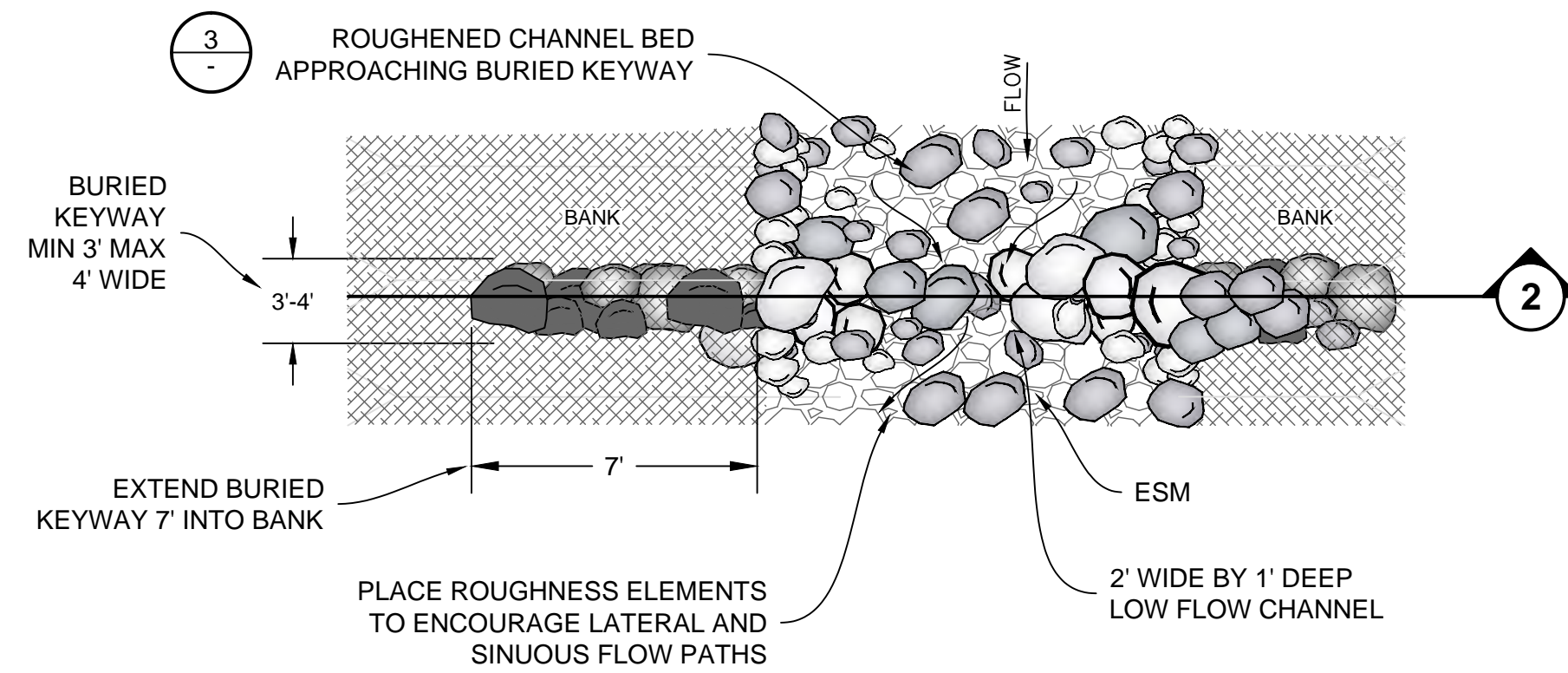
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**BUCK GULCH FISH PASSAGE
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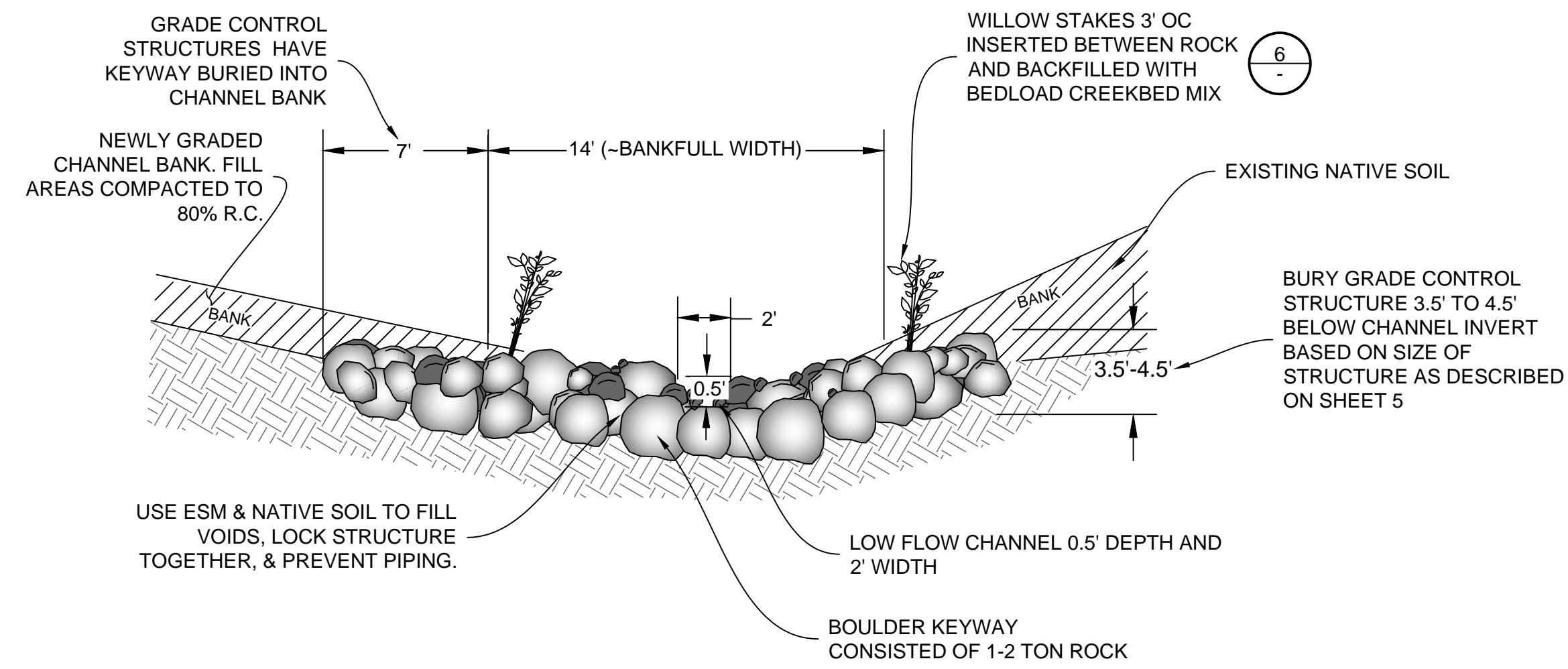
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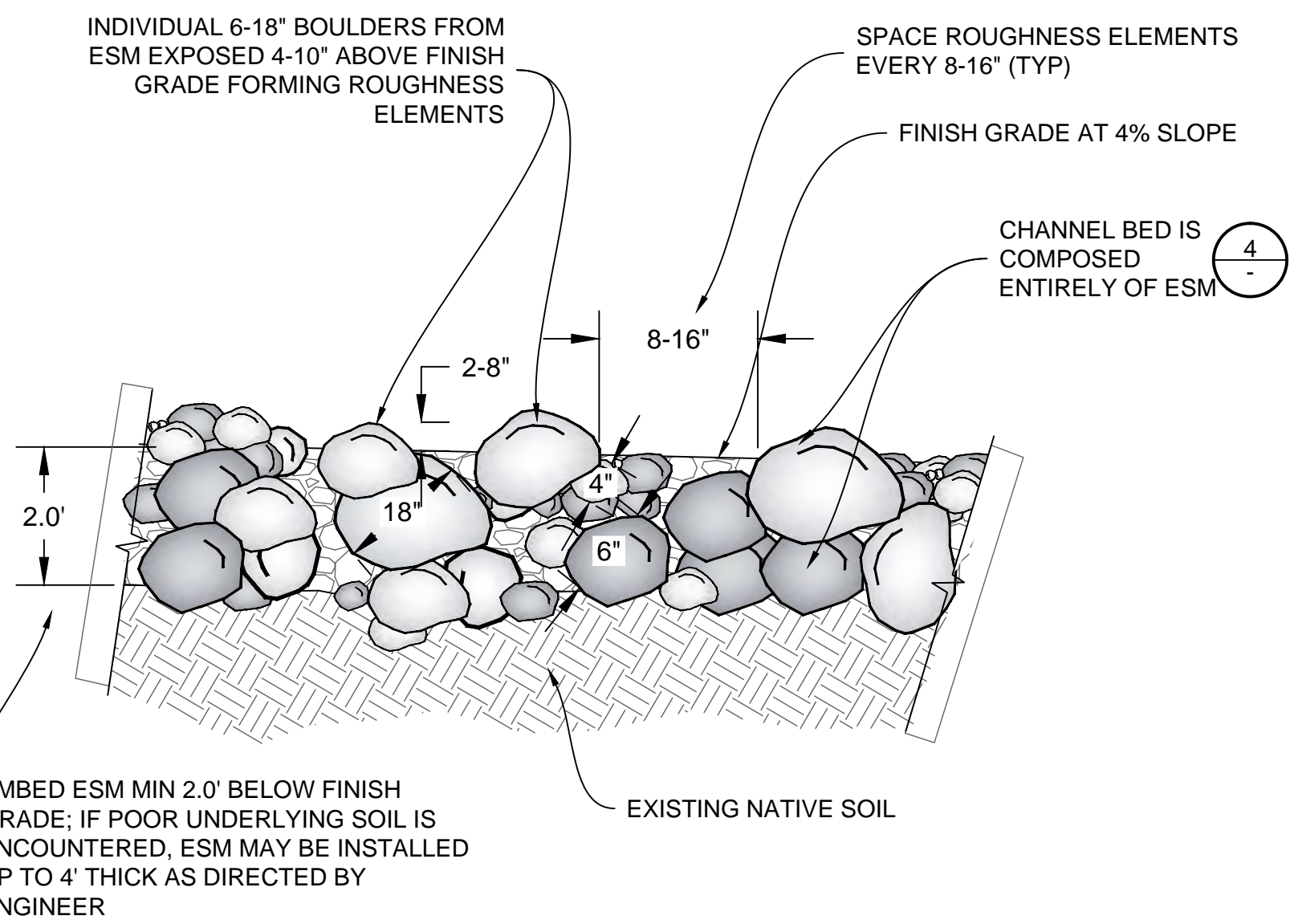
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1 LARGE GRADE CONTROL STRUCTURE AND ROUGHENED CHANNEL PLAN VIEW
NTS



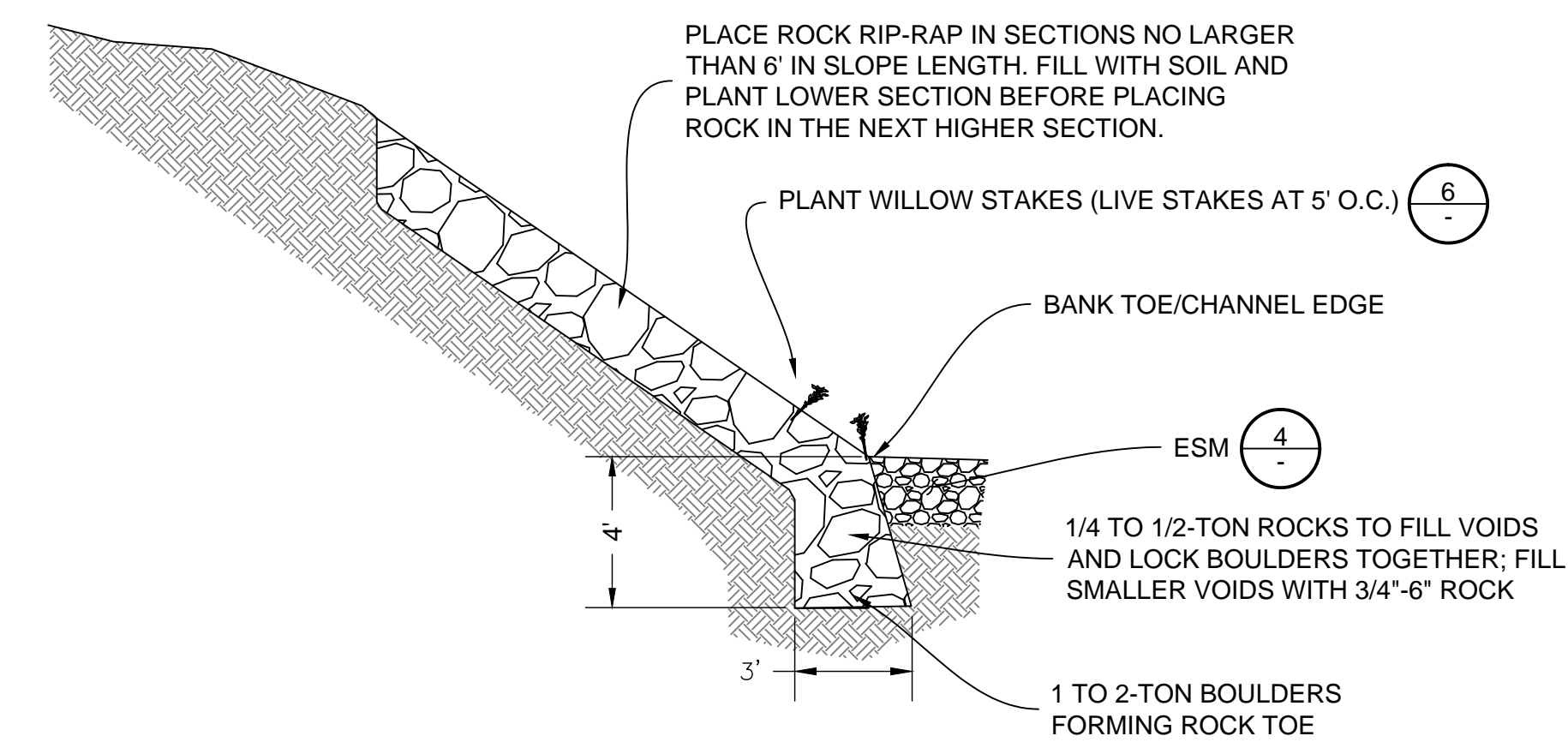
2 BURIED BOULDER KEYWAY SECTION VIEW
NTS



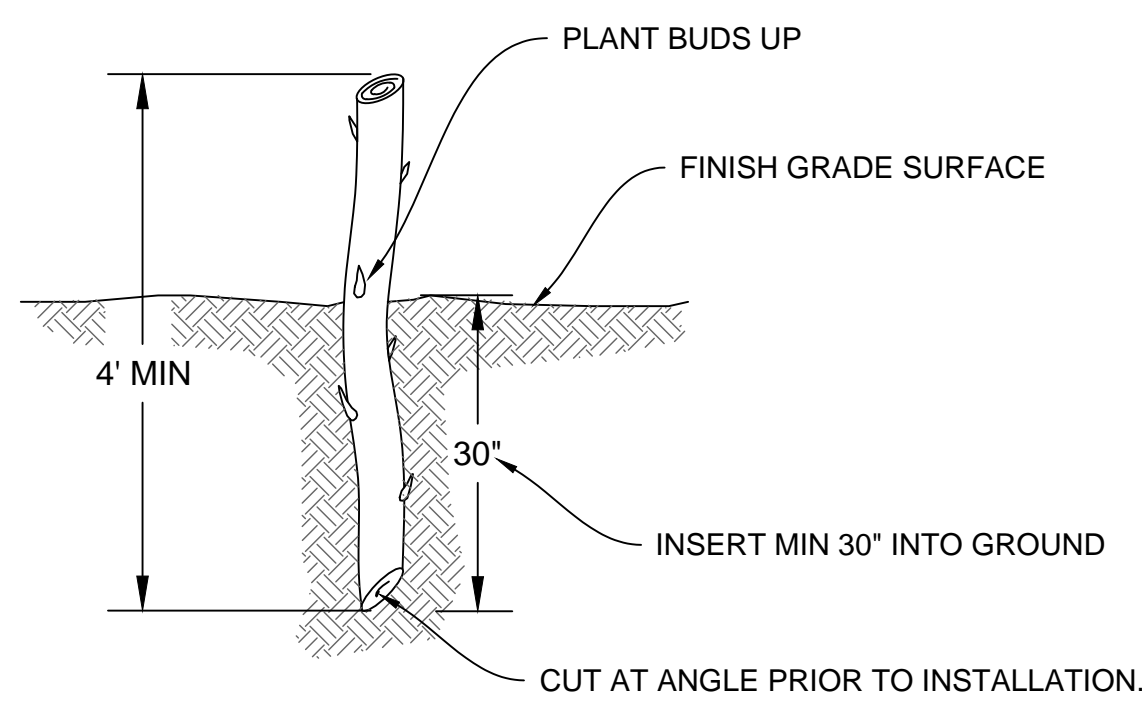
3 ROUGHENED CHANNEL BED SIDE VIEW (ESM)
NTS

| ENGINEERED STREAMBED MATERIAL (ESM)* | |
|---|----------|
| SIZE (INCHES) | %PASSING |
| ANCHOR BOULDERS | |
| D84 | 15"-18" |
| 1-2 TON - 30" - 60" | D50 10" |
| | D30 6" |
| GRADE CONTROL STRUCTURES | |
| • INDIVIDUALLY PLACED 1-2 TON ROCK. | D16 1" |
| • BACKFILL WITH ESM | D0 SAND |
| *ESM SHALL CONTAIN A MIN OF 10% AND MAX OF 15% NATIVE ON-SITE SOIL. | |
| RSP FOR AROUND ARCH INLET AND OUTLET | |
| 1 - 2 TON - 24" - 60" | |

4 ROCK SIZING AND VOLUME
NTS

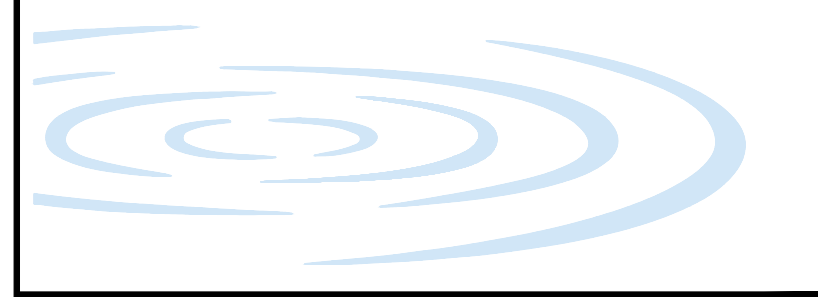


5 WILLOW PLANTED RSP
NTS



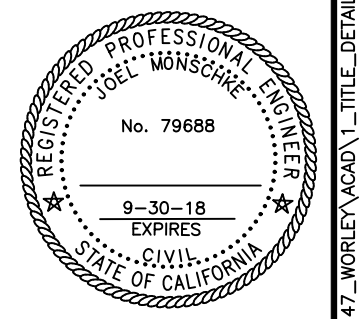
6 WILLOW STAKES
NTS

- NOTE:**
1. WILLOW STAKE SPECIES SHALL BE A MIX OF SPECIES PRESENT AT AND ADJACENT TO THE WORK SITE.
 2. MRC WILL PROVIDE WILLOW.
 3. EACH STAKE SHALL BE 1.5" - 3" THICK AT THE BOTTOM TO FACILITATE ROOT GROWTH AFTER TREATMENT WITH ROOTING HORMONE.
 4. INSERT MIN 30" INTO GROUND
 5. FOR WILLOW STAKES IN ROCK STRUCTURES, INSTALL STAKES AND ROCK CONCURRENTLY AND THEN BACKFILL WITH NATIVE SOIL TO PROMOTE ROOTING.



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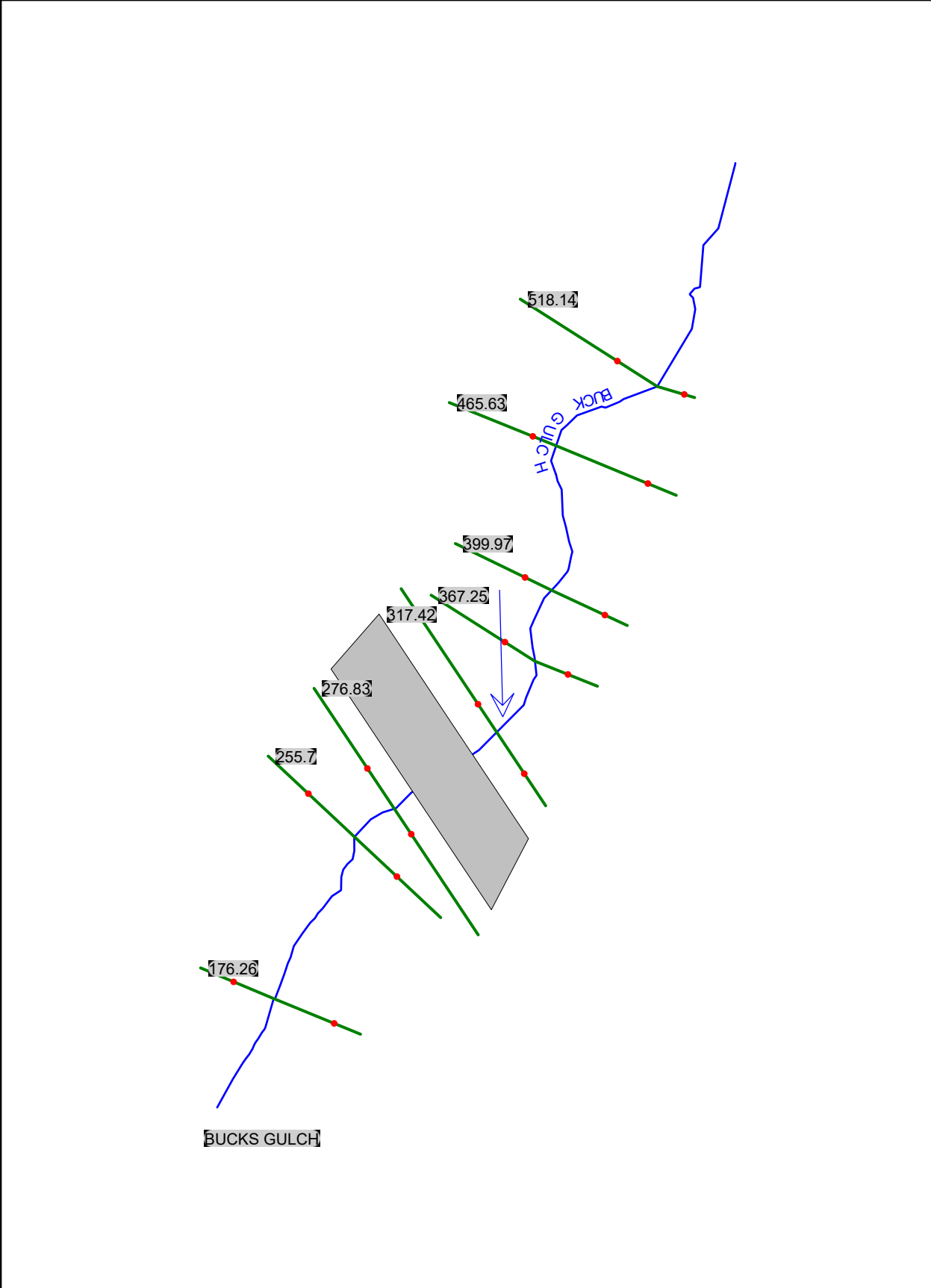


DETAILS 1

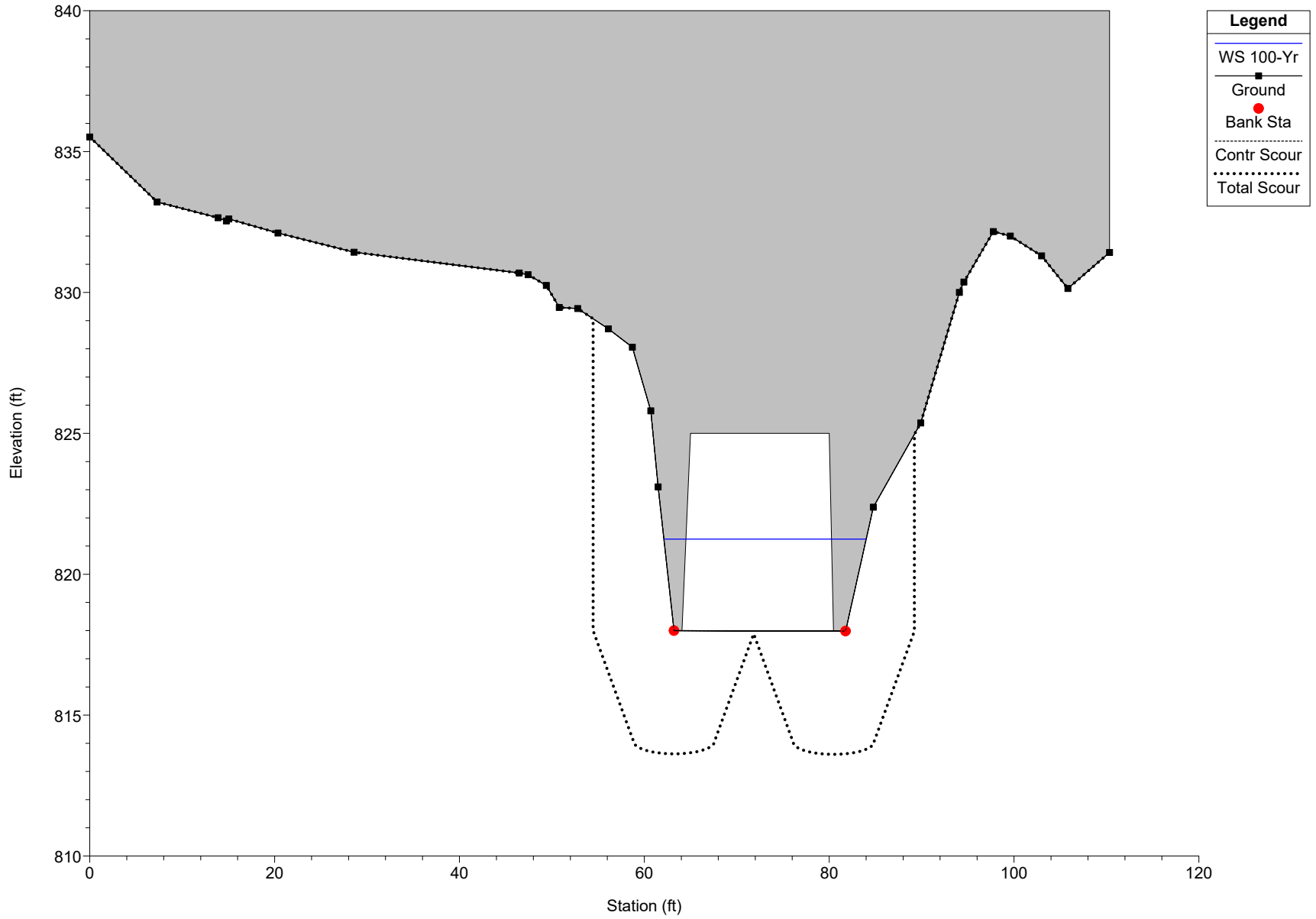
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Appendix B

HEC-RAS Hydraulic Model Outputs



Bridge Scour RS = 280



HEC-RAS Plan: Existing River: BUCK GULCH Reach: BUCKS GULCH

| Reach | River Sta | Profile | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|-------------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| BUCKS GULCH | 518.14 | Summer | 1.00 | 825.44 | 825.94 | | 825.96 | 0.015295 | 1.17 | 0.85 | 3.44 | 0.42 |
| BUCKS GULCH | 518.14 | 30% | 4.00 | 825.44 | 826.30 | | 826.34 | 0.013075 | 1.56 | 2.56 | 5.97 | 0.42 |
| BUCKS GULCH | 518.14 | Winter | 7.00 | 825.44 | 826.52 | | 826.56 | 0.011926 | 1.74 | 4.03 | 7.49 | 0.42 |
| BUCKS GULCH | 518.14 | 2% | 48.00 | 825.44 | 827.67 | | 827.77 | 0.012890 | 2.62 | 18.32 | 19.70 | 0.48 |
| BUCKS GULCH | 518.14 | 2-Yr | 120.00 | 825.44 | 828.36 | | 828.55 | 0.014688 | 3.46 | 34.79 | 29.62 | 0.54 |
| BUCKS GULCH | 518.14 | 5-Yr | 230.00 | 825.44 | 828.95 | | 829.24 | 0.015396 | 4.37 | 54.61 | 36.53 | 0.58 |
| BUCKS GULCH | 518.14 | 10-Yr | 300.00 | 825.44 | 829.30 | | 829.62 | 0.014034 | 4.62 | 68.13 | 39.58 | 0.57 |
| BUCKS GULCH | 518.14 | 25-Yr | 380.00 | 825.44 | 829.88 | | 830.16 | 0.009664 | 4.39 | 92.27 | 44.51 | 0.49 |
| BUCKS GULCH | 518.14 | 50-Yr | 440.00 | 825.44 | 830.66 | | 830.85 | 0.004819 | 3.71 | 129.07 | 49.96 | 0.36 |
| BUCKS GULCH | 518.14 | 100-Yr | 540.00 | 825.44 | 831.16 | | 831.37 | 0.004223 | 3.82 | 154.74 | 51.86 | 0.35 |
| | | | | | | | | | | | | |
| BUCKS GULCH | 465.63 | Summer | 1.00 | 824.59 | 825.15 | | 825.17 | 0.014649 | 1.21 | 0.83 | 2.95 | 0.40 |
| BUCKS GULCH | 465.63 | 30% | 4.00 | 824.59 | 825.51 | | 825.56 | 0.017083 | 1.81 | 2.21 | 4.82 | 0.47 |
| BUCKS GULCH | 465.63 | Winter | 7.00 | 824.59 | 825.73 | | 825.79 | 0.018337 | 1.98 | 3.54 | 7.25 | 0.50 |
| BUCKS GULCH | 465.63 | 2% | 48.00 | 824.59 | 826.67 | 826.37 | 826.83 | 0.026598 | 3.20 | 14.99 | 20.23 | 0.66 |
| BUCKS GULCH | 465.63 | 2-Yr | 120.00 | 824.59 | 827.33 | | 827.57 | 0.024026 | 3.94 | 30.43 | 27.53 | 0.66 |
| BUCKS GULCH | 465.63 | 5-Yr | 230.00 | 824.59 | 828.04 | 827.53 | 828.34 | 0.019131 | 4.41 | 52.17 | 33.49 | 0.62 |
| BUCKS GULCH | 465.63 | 10-Yr | 300.00 | 824.59 | 828.08 | | 828.57 | 0.030217 | 5.60 | 53.53 | 33.77 | 0.78 |
| BUCKS GULCH | 465.63 | 25-Yr | 380.00 | 824.59 | 829.56 | | 829.74 | 0.005910 | 3.37 | 112.65 | 44.57 | 0.37 |
| BUCKS GULCH | 465.63 | 50-Yr | 440.00 | 824.59 | 830.51 | | 830.64 | 0.002968 | 2.80 | 156.93 | 48.59 | 0.28 |
| BUCKS GULCH | 465.63 | 100-Yr | 540.00 | 824.59 | 831.03 | | 831.16 | 0.002871 | 2.96 | 182.54 | 50.76 | 0.27 |
| | | | | | | | | | | | | |
| BUCKS GULCH | 399.97 | Summer | 1.00 | 822.91 | 823.25 | 823.23 | 823.32 | 0.076333 | 2.06 | 0.48 | 2.83 | 0.88 |
| BUCKS GULCH | 399.97 | 30% | 4.00 | 822.91 | 823.51 | 823.48 | 823.62 | 0.061540 | 2.69 | 1.48 | 4.96 | 0.87 |
| BUCKS GULCH | 399.97 | Winter | 7.00 | 822.91 | 823.66 | 823.62 | 823.80 | 0.058888 | 2.97 | 2.36 | 6.62 | 0.88 |
| BUCKS GULCH | 399.97 | 2% | 48.00 | 822.91 | 824.49 | 824.38 | 824.73 | 0.039205 | 3.90 | 12.31 | 17.03 | 0.81 |
| BUCKS GULCH | 399.97 | 2-Yr | 120.00 | 822.91 | 825.02 | 824.92 | 825.50 | 0.042352 | 5.55 | 21.60 | 18.22 | 0.90 |
| BUCKS GULCH | 399.97 | 5-Yr | 230.00 | 822.91 | 825.54 | 825.54 | 826.38 | 0.049458 | 7.31 | 31.46 | 19.37 | 1.01 |
| BUCKS GULCH | 399.97 | 10-Yr | 300.00 | 822.91 | 826.75 | | 827.17 | 0.015381 | 5.18 | 57.96 | 24.48 | 0.59 |
| BUCKS GULCH | 399.97 | 25-Yr | 380.00 | 822.91 | 829.37 | | 829.49 | 0.002385 | 2.79 | 136.26 | 35.20 | 0.25 |
| BUCKS GULCH | 399.97 | 50-Yr | 440.00 | 822.91 | 830.39 | | 830.49 | 0.001528 | 2.53 | 175.72 | 41.01 | 0.21 |
| BUCKS GULCH | 399.97 | 100-Yr | 540.00 | 822.91 | 830.90 | | 831.02 | 0.001616 | 2.78 | 197.00 | 42.77 | 0.22 |
| | | | | | | | | | | | | |
| BUCKS GULCH | 367.25 | Summer | 1.00 | 821.43 | 821.65 | | 821.69 | 0.034671 | 1.40 | 0.72 | 4.23 | 0.60 |
| BUCKS GULCH | 367.25 | 30% | 4.00 | 821.43 | 821.86 | | 821.94 | 0.042927 | 2.27 | 1.76 | 5.85 | 0.73 |
| BUCKS GULCH | 367.25 | Winter | 7.00 | 821.43 | 821.99 | 821.92 | 822.11 | 0.045541 | 2.74 | 2.55 | 6.67 | 0.78 |
| BUCKS GULCH | 367.25 | 2% | 48.00 | 821.43 | 822.74 | 822.74 | 823.11 | 0.063349 | 4.86 | 9.88 | 13.80 | 1.01 |
| BUCKS GULCH | 367.25 | 2-Yr | 120.00 | 821.43 | 823.34 | 823.34 | 823.90 | 0.056403 | 5.99 | 20.03 | 18.50 | 1.02 |
| BUCKS GULCH | 367.25 | 5-Yr | 230.00 | 821.43 | 824.86 | | 825.17 | 0.012393 | 4.44 | 51.81 | 23.40 | 0.53 |

HEC-RAS Plan: Existing River: BUCK GULCH Reach: BUCKS GULCH (Continued)

| Reach | River Sta | Profile | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|-------------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| BUCKS GULCH | 367.25 | 10-Yr | 300.00 | 821.43 | 826.76 | | 826.90 | 0.002904 | 2.96 | 102.48 | 30.42 | 0.27 |
| BUCKS GULCH | 367.25 | 25-Yr | 380.00 | 821.43 | 829.37 | | 829.43 | 0.000732 | 2.04 | 195.84 | 41.21 | 0.15 |
| BUCKS GULCH | 367.25 | 50-Yr | 440.00 | 821.43 | 830.39 | | 830.45 | 0.000548 | 1.97 | 240.17 | 45.14 | 0.13 |
| BUCKS GULCH | 367.25 | 100-Yr | 540.00 | 821.43 | 830.90 | | 830.98 | 0.000636 | 2.22 | 263.62 | 47.02 | 0.14 |
| | | | | | | | | | | | | |
| BUCKS GULCH | 331.28 | Summer | 1.00 | 819.29 | 819.51 | 819.51 | 819.57 | 0.121566 | 1.96 | 0.51 | 4.70 | 1.05 |
| BUCKS GULCH | 331.28 | 30% | 4.00 | 819.29 | 819.68 | 819.68 | 819.77 | 0.091055 | 2.49 | 1.61 | 8.34 | 1.00 |
| BUCKS GULCH | 331.28 | Winter | 7.00 | 819.29 | 819.76 | 819.76 | 819.90 | 0.086457 | 2.93 | 2.39 | 9.31 | 1.02 |
| BUCKS GULCH | 331.28 | 2% | 48.00 | 819.29 | 820.75 | 820.43 | 820.94 | 0.020934 | 3.52 | 13.62 | 13.45 | 0.62 |
| BUCKS GULCH | 331.28 | 2-Yr | 120.00 | 819.29 | 822.57 | 821.13 | 822.68 | 0.004168 | 2.56 | 46.91 | 21.54 | 0.31 |
| BUCKS GULCH | 331.28 | 5-Yr | 230.00 | 819.29 | 824.90 | 821.84 | 824.97 | 0.001572 | 2.21 | 103.91 | 26.89 | 0.20 |
| BUCKS GULCH | 331.28 | 10-Yr | 300.00 | 819.29 | 826.77 | 822.16 | 826.83 | 0.000834 | 1.91 | 156.87 | 30.29 | 0.15 |
| BUCKS GULCH | 331.28 | 25-Yr | 380.00 | 819.29 | 829.37 | 822.51 | 829.40 | 0.000381 | 1.56 | 246.40 | 40.42 | 0.10 |
| BUCKS GULCH | 331.28 | 50-Yr | 440.00 | 819.29 | 830.39 | 822.75 | 830.43 | 0.000323 | 1.56 | 291.58 | 47.48 | 0.10 |
| BUCKS GULCH | 331.28 | 100-Yr | 540.00 | 819.29 | 830.90 | 823.12 | 830.95 | 0.000392 | 1.78 | 317.97 | 58.72 | 0.11 |
| | | | | | | | | | | | | |
| BUCKS GULCH | 317.42 | | Culvert | | | | | | | | | |
| | | | | | | | | | | | | |
| BUCKS GULCH | 276.83 | Summer | 1.00 | 810.39 | 815.00 | | 815.00 | 0.000000 | 0.02 | 58.68 | 20.48 | 0.00 |
| BUCKS GULCH | 276.83 | 30% | 4.00 | 810.39 | 815.20 | | 815.20 | 0.000002 | 0.06 | 62.73 | 21.07 | 0.01 |
| BUCKS GULCH | 276.83 | Winter | 7.00 | 810.39 | 815.33 | | 815.33 | 0.000005 | 0.11 | 65.48 | 21.26 | 0.01 |
| BUCKS GULCH | 276.83 | 2% | 48.00 | 810.39 | 816.04 | | 816.04 | 0.000136 | 0.59 | 80.93 | 22.46 | 0.06 |
| BUCKS GULCH | 276.83 | 2-Yr | 120.00 | 810.39 | 816.79 | | 816.81 | 0.000488 | 1.22 | 98.31 | 23.81 | 0.11 |
| BUCKS GULCH | 276.83 | 5-Yr | 230.00 | 810.39 | 817.61 | | 817.67 | 0.001061 | 1.94 | 118.45 | 25.28 | 0.16 |
| BUCKS GULCH | 276.83 | 10-Yr | 300.00 | 810.39 | 818.03 | | 818.11 | 0.001415 | 2.32 | 129.25 | 26.04 | 0.18 |
| BUCKS GULCH | 276.83 | 25-Yr | 380.00 | 810.39 | 818.45 | | 818.56 | 0.001802 | 2.71 | 140.39 | 26.80 | 0.21 |
| BUCKS GULCH | 276.83 | 50-Yr | 440.00 | 810.39 | 818.74 | | 818.88 | 0.002078 | 2.97 | 148.23 | 27.32 | 0.22 |
| BUCKS GULCH | 276.83 | 100-Yr | 540.00 | 810.39 | 819.17 | | 819.34 | 0.002532 | 3.37 | 160.03 | 28.08 | 0.25 |
| | | | | | | | | | | | | |
| BUCKS GULCH | 255.7 | Summer | 1.00 | 814.71 | 814.98 | | 815.00 | 0.035169 | 1.12 | 0.89 | 7.34 | 0.57 |
| BUCKS GULCH | 255.7 | 30% | 4.00 | 814.71 | 815.15 | | 815.19 | 0.034507 | 1.70 | 2.36 | 10.27 | 0.62 |
| BUCKS GULCH | 255.7 | Winter | 7.00 | 814.71 | 815.27 | | 815.32 | 0.034556 | 1.83 | 3.83 | 14.91 | 0.64 |
| BUCKS GULCH | 255.7 | 2% | 48.00 | 814.71 | 815.84 | | 816.01 | 0.029860 | 3.38 | 14.21 | 19.56 | 0.70 |
| BUCKS GULCH | 255.7 | 2-Yr | 120.00 | 814.71 | 816.43 | | 816.75 | 0.027565 | 4.53 | 26.49 | 21.91 | 0.73 |
| BUCKS GULCH | 255.7 | 5-Yr | 230.00 | 814.71 | 817.10 | | 817.56 | 0.025585 | 5.47 | 42.09 | 24.66 | 0.74 |
| BUCKS GULCH | 255.7 | 10-Yr | 300.00 | 814.71 | 817.45 | | 817.99 | 0.024804 | 5.88 | 51.04 | 26.11 | 0.74 |
| BUCKS GULCH | 255.7 | 25-Yr | 380.00 | 814.71 | 817.81 | | 818.42 | 0.024172 | 6.26 | 60.66 | 27.58 | 0.74 |
| BUCKS GULCH | 255.7 | 50-Yr | 440.00 | 814.71 | 818.07 | | 818.72 | 0.023855 | 6.46 | 68.08 | 29.25 | 0.75 |
| BUCKS GULCH | 255.7 | 100-Yr | 540.00 | 814.71 | 818.46 | | 819.17 | 0.023169 | 6.77 | 79.73 | 31.18 | 0.75 |

HEC-RAS Plan: Existing River: BUCK GULCH Reach: BUCKS GULCH (Continued)

| Reach | River Sta | Profile | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|-------------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| BUCKS GULCH | 176.26 | Summer | 1.00 | 811.64 | 812.00 | 811.95 | 812.02 | 0.040060 | 1.33 | 0.75 | 5.36 | 0.62 |
| BUCKS GULCH | 176.26 | 30% | 4.00 | 811.64 | 812.19 | 812.12 | 812.24 | 0.040039 | 1.90 | 2.11 | 8.78 | 0.68 |
| BUCKS GULCH | 176.26 | Winter | 7.00 | 811.64 | 812.29 | 812.22 | 812.37 | 0.040013 | 2.32 | 3.02 | 9.24 | 0.72 |
| BUCKS GULCH | 176.26 | 2% | 48.00 | 811.64 | 813.01 | 812.89 | 813.28 | 0.040054 | 4.20 | 11.43 | 14.28 | 0.83 |
| BUCKS GULCH | 176.26 | 2-Yr | 120.00 | 811.64 | 813.64 | 813.51 | 814.12 | 0.040008 | 5.60 | 21.43 | 17.13 | 0.88 |
| BUCKS GULCH | 176.26 | 5-Yr | 230.00 | 811.64 | 814.30 | 814.18 | 815.03 | 0.040002 | 6.85 | 33.56 | 19.56 | 0.92 |
| BUCKS GULCH | 176.26 | 10-Yr | 300.00 | 811.64 | 814.66 | 814.56 | 815.49 | 0.040020 | 7.33 | 40.94 | 21.47 | 0.94 |
| BUCKS GULCH | 176.26 | 25-Yr | 380.00 | 811.64 | 814.99 | 814.90 | 815.95 | 0.040013 | 7.87 | 48.29 | 22.65 | 0.95 |
| BUCKS GULCH | 176.26 | 50-Yr | 440.00 | 811.64 | 815.22 | 815.13 | 816.27 | 0.040010 | 8.22 | 53.53 | 23.46 | 0.96 |
| BUCKS GULCH | 176.26 | 100-Yr | 540.00 | 811.64 | 815.56 | 815.51 | 816.75 | 0.040025 | 8.73 | 61.86 | 24.68 | 0.97 |

HEC-RAS Plan: Proposed River: BUCK GULCH Reach: REACH 1

| Reach | River Sta | Profile | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| REACH 1 | 518.14 | Summer | 1.00 | 825.44 | 825.91 | | 825.94 | 0.020497 | 1.31 | 0.76 | 3.26 | 0.48 |
| REACH 1 | 518.14 | 30% | 4.00 | 825.44 | 826.22 | 826.05 | 826.28 | 0.021946 | 1.90 | 2.10 | 5.41 | 0.54 |
| REACH 1 | 518.14 | Winter | 7.00 | 825.44 | 826.40 | 826.20 | 826.47 | 0.022220 | 2.20 | 3.19 | 6.66 | 0.56 |
| REACH 1 | 518.14 | 2% | 48.00 | 825.44 | 827.52 | | 827.67 | 0.019927 | 3.08 | 15.56 | 18.15 | 0.59 |
| REACH 1 | 518.14 | 2-Yr | 120.00 | 825.44 | 828.30 | | 828.51 | 0.016842 | 3.65 | 32.95 | 27.65 | 0.58 |
| REACH 1 | 518.14 | 5-Yr | 230.00 | 825.44 | 828.88 | | 829.20 | 0.017649 | 4.57 | 52.04 | 35.92 | 0.62 |
| REACH 1 | 518.14 | 10-Yr | 300.00 | 825.44 | 829.14 | | 829.53 | 0.018394 | 5.06 | 61.88 | 38.20 | 0.65 |
| REACH 1 | 518.14 | 25-Yr | 380.00 | 825.44 | 829.41 | | 829.87 | 0.018922 | 5.52 | 72.49 | 40.51 | 0.67 |
| REACH 1 | 518.14 | 50-Yr | 440.00 | 825.44 | 829.61 | | 830.10 | 0.018984 | 5.79 | 80.42 | 42.16 | 0.68 |
| REACH 1 | 518.14 | 100-Yr | 540.00 | 825.44 | 829.92 | | 830.47 | 0.018394 | 6.12 | 94.15 | 44.83 | 0.68 |
| | | | | | | | | | | | | |
| REACH 1 | 465.63 | Summer | 1.00 | 823.84 | 824.22 | 824.17 | 824.27 | 0.055705 | 1.87 | 0.54 | 2.86 | 0.76 |
| REACH 1 | 465.63 | 30% | 4.00 | 823.84 | 824.48 | | 824.58 | 0.051373 | 2.56 | 1.56 | 4.88 | 0.80 |
| REACH 1 | 465.63 | Winter | 7.00 | 823.84 | 824.62 | 824.57 | 824.76 | 0.052313 | 3.00 | 2.34 | 5.83 | 0.83 |
| REACH 1 | 465.63 | 2% | 48.00 | 823.84 | 825.47 | 825.47 | 825.95 | 0.060140 | 5.57 | 8.62 | 9.13 | 1.01 |
| REACH 1 | 465.63 | 2-Yr | 120.00 | 823.84 | 826.36 | 826.36 | 827.01 | 0.053273 | 6.47 | 18.55 | 14.25 | 1.00 |
| REACH 1 | 465.63 | 5-Yr | 230.00 | 823.84 | 827.34 | 827.14 | 827.87 | 0.037721 | 5.82 | 39.53 | 27.66 | 0.86 |
| REACH 1 | 465.63 | 10-Yr | 300.00 | 823.84 | 827.75 | | 828.27 | 0.031515 | 5.82 | 51.57 | 31.43 | 0.80 |
| REACH 1 | 465.63 | 25-Yr | 380.00 | 823.84 | 828.13 | | 828.68 | 0.027357 | 5.93 | 64.09 | 34.15 | 0.76 |
| REACH 1 | 465.63 | 50-Yr | 440.00 | 823.84 | 828.39 | | 828.95 | 0.025330 | 6.02 | 73.14 | 35.98 | 0.74 |
| REACH 1 | 465.63 | 100-Yr | 540.00 | 823.84 | 828.83 | | 829.39 | 0.023088 | 6.01 | 89.88 | 41.46 | 0.72 |
| | | | | | | | | | | | | |
| REACH 1 | 399.97 | Summer | 1.00 | 821.18 | 821.54 | 821.47 | 821.57 | 0.031575 | 1.39 | 0.72 | 4.02 | 0.58 |
| REACH 1 | 399.97 | 30% | 4.00 | 821.18 | 821.77 | 821.68 | 821.84 | 0.034204 | 2.02 | 1.98 | 6.64 | 0.65 |
| REACH 1 | 399.97 | Winter | 7.00 | 821.18 | 821.90 | 821.80 | 822.00 | 0.034441 | 2.42 | 2.89 | 7.41 | 0.68 |
| REACH 1 | 399.97 | 2% | 48.00 | 821.18 | 822.81 | | 823.11 | 0.031693 | 4.39 | 10.93 | 10.30 | 0.75 |
| REACH 1 | 399.97 | 2-Yr | 120.00 | 821.18 | 823.63 | | 824.16 | 0.034180 | 5.88 | 20.42 | 12.85 | 0.82 |
| REACH 1 | 399.97 | 5-Yr | 230.00 | 821.18 | 824.35 | 824.23 | 825.23 | 0.041647 | 7.55 | 30.48 | 15.10 | 0.94 |
| REACH 1 | 399.97 | 10-Yr | 300.00 | 821.18 | 824.71 | 824.67 | 825.78 | 0.044471 | 8.30 | 36.15 | 16.22 | 0.98 |
| REACH 1 | 399.97 | 25-Yr | 380.00 | 821.18 | 825.10 | 825.10 | 826.33 | 0.045350 | 8.92 | 42.61 | 17.29 | 1.00 |
| REACH 1 | 399.97 | 50-Yr | 440.00 | 821.18 | 825.38 | 825.38 | 826.71 | 0.044848 | 9.24 | 47.61 | 18.07 | 1.00 |
| REACH 1 | 399.97 | 100-Yr | 540.00 | 821.18 | 825.83 | 825.83 | 827.27 | 0.044160 | 9.63 | 56.10 | 19.75 | 1.01 |
| | | | | | | | | | | | | |
| REACH 1 | 367.25 | Summer | 1.00 | 819.53 | 819.79 | 819.79 | 819.86 | 0.102198 | 2.14 | 0.47 | 3.22 | 0.99 |
| REACH 1 | 367.25 | 30% | 4.00 | 819.53 | 820.00 | 820.00 | 820.16 | 0.084256 | 3.22 | 1.24 | 3.95 | 1.01 |
| REACH 1 | 367.25 | Winter | 7.00 | 819.53 | 820.16 | 820.16 | 820.37 | 0.076156 | 3.70 | 1.89 | 4.47 | 1.00 |
| REACH 1 | 367.25 | 2% | 48.00 | 819.53 | 821.20 | 821.20 | 821.70 | 0.060399 | 5.65 | 8.50 | 8.66 | 1.00 |
| REACH 1 | 367.25 | 2-Yr | 120.00 | 819.53 | 822.06 | 822.06 | 822.75 | 0.054730 | 6.66 | 18.01 | 13.36 | 1.01 |

HEC-RAS Plan: Proposed River: BUCK GULCH Reach: REACH 1 (Continued)

| Reach | River Sta | Profile | Q Total | Min Ch El | W.S. Elev | Crit W.S. | E.G. Elev | E.G. Slope | Vel Chnl | Flow Area | Top Width | Froude # Chl |
|---------|-----------|---------|---------|-----------|-----------|-----------|-----------|------------|----------|-----------|-----------|--------------|
| | | | (cfs) | (ft) | (ft) | (ft) | (ft) | (ft/ft) | (ft/s) | (sq ft) | (ft) | |
| REACH 1 | 367.25 | 5-Yr | 230.00 | 819.53 | 822.86 | 822.86 | 823.75 | 0.049118 | 7.58 | 30.33 | 16.98 | 1.00 |
| REACH 1 | 367.25 | 10-Yr | 300.00 | 819.53 | 823.24 | 823.24 | 824.26 | 0.047448 | 8.10 | 37.03 | 18.17 | 1.00 |
| REACH 1 | 367.25 | 25-Yr | 380.00 | 819.53 | 823.63 | 823.63 | 824.77 | 0.046260 | 8.59 | 44.24 | 19.41 | 1.00 |
| REACH 1 | 367.25 | 50-Yr | 440.00 | 819.53 | 823.88 | 823.88 | 825.12 | 0.046141 | 8.94 | 49.20 | 20.22 | 1.01 |
| REACH 1 | 367.25 | 100-Yr | 540.00 | 819.53 | 824.28 | 824.28 | 825.64 | 0.044660 | 9.35 | 57.72 | 21.54 | 1.01 |
| REACH 1 | 331.28 | Summer | 1.00 | 817.98 | 818.29 | 818.04 | 818.29 | 0.000258 | 0.18 | 5.67 | 18.88 | 0.06 |
| REACH 1 | 331.28 | 30% | 4.00 | 817.98 | 818.40 | 818.10 | 818.40 | 0.001570 | 0.52 | 7.62 | 18.99 | 0.15 |
| REACH 1 | 331.28 | Winter | 7.00 | 817.98 | 818.47 | 818.15 | 818.48 | 0.002737 | 0.77 | 9.06 | 19.06 | 0.20 |
| REACH 1 | 331.28 | 2% | 48.00 | 817.98 | 819.08 | 818.58 | 819.17 | 0.008664 | 2.30 | 20.91 | 19.69 | 0.39 |
| REACH 1 | 331.28 | 2-Yr | 120.00 | 817.98 | 819.82 | 819.07 | 819.99 | 0.010160 | 3.37 | 35.61 | 20.43 | 0.45 |
| REACH 1 | 331.28 | 5-Yr | 230.00 | 817.98 | 820.72 | 819.64 | 821.00 | 0.010138 | 4.22 | 54.50 | 21.36 | 0.47 |
| REACH 1 | 331.28 | 10-Yr | 300.00 | 817.98 | 821.24 | 819.96 | 821.56 | 0.009839 | 4.57 | 65.71 | 21.88 | 0.46 |
| REACH 1 | 331.28 | 25-Yr | 380.00 | 817.98 | 821.80 | 820.28 | 822.17 | 0.009440 | 4.86 | 78.15 | 22.46 | 0.46 |
| REACH 1 | 331.28 | 50-Yr | 440.00 | 817.98 | 822.20 | 820.51 | 822.60 | 0.009136 | 5.04 | 87.32 | 22.87 | 0.45 |
| REACH 1 | 331.28 | 100-Yr | 540.00 | 817.98 | 822.86 | 820.87 | 823.29 | 0.008742 | 5.26 | 102.65 | 24.03 | 0.45 |
| REACH 1 | 331.27 | | Culvert | | | | | | | | | |
| REACH 1 | 276.83 | Summer | 1.00 | 814.33 | 815.05 | | 815.05 | 0.000819 | 0.36 | 2.82 | 7.80 | 0.10 |
| REACH 1 | 276.83 | 30% | 4.00 | 814.33 | 815.32 | | 815.33 | 0.002470 | 0.76 | 5.26 | 10.66 | 0.19 |
| REACH 1 | 276.83 | Winter | 7.00 | 814.33 | 815.48 | | 815.49 | 0.003396 | 0.99 | 7.11 | 12.39 | 0.23 |
| REACH 1 | 276.83 | 2% | 48.00 | 814.33 | 816.26 | | 816.35 | 0.009362 | 2.41 | 19.92 | 19.26 | 0.42 |
| REACH 1 | 276.83 | 2-Yr | 120.00 | 814.33 | 816.93 | | 817.13 | 0.012055 | 3.61 | 33.25 | 20.57 | 0.50 |
| REACH 1 | 276.83 | 5-Yr | 230.00 | 814.33 | 817.62 | | 817.98 | 0.014797 | 4.77 | 48.24 | 22.53 | 0.57 |
| REACH 1 | 276.83 | 10-Yr | 300.00 | 814.33 | 817.97 | | 818.42 | 0.016112 | 5.33 | 56.33 | 23.63 | 0.61 |
| REACH 1 | 276.83 | 25-Yr | 380.00 | 814.33 | 818.32 | | 818.86 | 0.017388 | 5.87 | 64.72 | 24.72 | 0.64 |
| REACH 1 | 276.83 | 50-Yr | 440.00 | 814.33 | 818.56 | | 819.16 | 0.018120 | 6.22 | 70.72 | 25.47 | 0.66 |
| REACH 1 | 276.83 | 100-Yr | 540.00 | 814.33 | 818.90 | | 819.62 | 0.019548 | 6.78 | 79.59 | 26.54 | 0.69 |
| REACH 1 | 255.7 | Summer | 1.00 | 814.71 | 814.98 | | 815.00 | 0.035169 | 1.12 | 0.89 | 7.34 | 0.57 |
| REACH 1 | 255.7 | 30% | 4.00 | 814.71 | 815.15 | | 815.19 | 0.034507 | 1.70 | 2.36 | 10.27 | 0.62 |
| REACH 1 | 255.7 | Winter | 7.00 | 814.71 | 815.27 | | 815.32 | 0.034556 | 1.83 | 3.83 | 14.91 | 0.64 |
| REACH 1 | 255.7 | 2% | 48.00 | 814.71 | 815.84 | | 816.01 | 0.029860 | 3.38 | 14.21 | 19.56 | 0.70 |
| REACH 1 | 255.7 | 2-Yr | 120.00 | 814.71 | 816.43 | | 816.75 | 0.027565 | 4.53 | 26.49 | 21.91 | 0.73 |
| REACH 1 | 255.7 | 5-Yr | 230.00 | 814.71 | 817.10 | | 817.56 | 0.025585 | 5.47 | 42.09 | 24.66 | 0.74 |
| REACH 1 | 255.7 | 10-Yr | 300.00 | 814.71 | 817.45 | | 817.99 | 0.024804 | 5.88 | 51.04 | 26.11 | 0.74 |
| REACH 1 | 255.7 | 25-Yr | 380.00 | 814.71 | 817.81 | | 818.42 | 0.024172 | 6.26 | 60.66 | 27.58 | 0.74 |

HEC-RAS Plan: Proposed River: BUCK GULCH Reach: REACH 1 (Continued)

| Reach | River Sta | Profile | Q Total (cfs) | Min Ch El (ft) | W.S. Elev (ft) | Crit W.S. (ft) | E.G. Elev (ft) | E.G. Slope (ft/ft) | Vel Chnl (ft/s) | Flow Area (sq ft) | Top Width (ft) | Froude # Chl |
|---------|-----------|---------|------------------|-------------------|-------------------|-------------------|-------------------|-----------------------|--------------------|----------------------|-------------------|--------------|
| REACH 1 | 255.7 | 50-Yr | 440.00 | 814.71 | 818.07 | | 818.72 | 0.023855 | 6.46 | 68.08 | 29.25 | 0.75 |
| REACH 1 | 255.7 | 100-Yr | 540.00 | 814.71 | 818.46 | | 819.17 | 0.023169 | 6.77 | 79.73 | 31.18 | 0.75 |
| REACH 1 | 176.26 | Summer | 1.00 | 811.64 | 812.00 | 811.95 | 812.02 | 0.040060 | 1.33 | 0.75 | 5.36 | 0.62 |
| REACH 1 | 176.26 | 30% | 4.00 | 811.64 | 812.19 | 812.12 | 812.24 | 0.040039 | 1.90 | 2.11 | 8.78 | 0.68 |
| REACH 1 | 176.26 | Winter | 7.00 | 811.64 | 812.29 | 812.22 | 812.37 | 0.040013 | 2.32 | 3.02 | 9.24 | 0.72 |
| REACH 1 | 176.26 | 2% | 48.00 | 811.64 | 813.01 | 812.89 | 813.28 | 0.040054 | 4.20 | 11.43 | 14.28 | 0.83 |
| REACH 1 | 176.26 | 2-Yr | 120.00 | 811.64 | 813.64 | 813.51 | 814.12 | 0.040008 | 5.60 | 21.43 | 17.13 | 0.88 |
| REACH 1 | 176.26 | 5-Yr | 230.00 | 811.64 | 814.30 | 814.19 | 815.03 | 0.040002 | 6.85 | 33.56 | 19.56 | 0.92 |
| REACH 1 | 176.26 | 10-Yr | 300.00 | 811.64 | 814.66 | 814.55 | 815.49 | 0.040020 | 7.33 | 40.94 | 21.47 | 0.94 |
| REACH 1 | 176.26 | 25-Yr | 380.00 | 811.64 | 814.99 | 814.91 | 815.95 | 0.040013 | 7.87 | 48.29 | 22.65 | 0.95 |
| REACH 1 | 176.26 | 50-Yr | 440.00 | 811.64 | 815.22 | 815.14 | 816.27 | 0.040010 | 8.22 | 53.53 | 23.46 | 0.96 |
| REACH 1 | 176.26 | 100-Yr | 540.00 | 811.64 | 815.56 | 815.51 | 816.75 | 0.040025 | 8.73 | 61.86 | 24.68 | 0.97 |