

ZANKER FARM SALMONID RESTORATION PROJECT

PHASE I and II 100% DESIGN SUBMITTAL

October 31, 2023

California Department of Fish and Wildlife, Fisheries Restoration Grant Program Agreement Numbers: Q1940405-02 and Q2140407



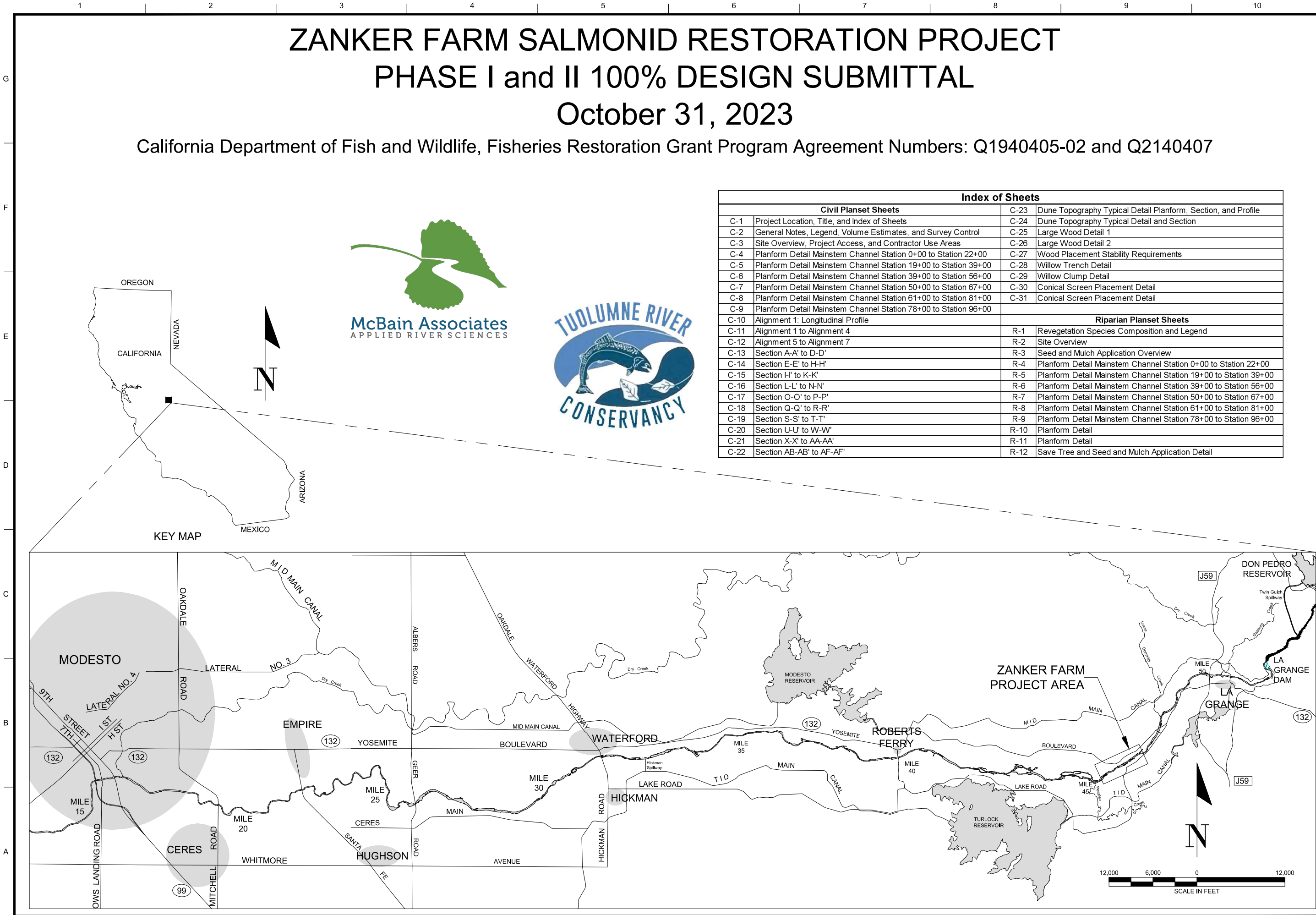
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ISSUE DATE:	October 31, 2023
PROJECT:	Zanker Farm
CONTRACT NO.:	FRGP Q1940405-02 & Q2140407
DRAWING SET:	100% Design Planset
DESIGNED BY:	MA and TRC
DRAWN BY:	N. Sabo, R. George
CHECKED BY:	F. Meyer, K. Harrison (P.E.)
APPROVED BY:	K. Harrison (P.E.)
SIZE:	22 x 34 in. (full scale), 11 x 17 in. (half scale)

TUOLUMNE RIVER CONSERVANCY
 6380 LANDMARK ROAD
 STOCKTON, CA 95215
 (209) 926-7194

Zanker Farm Restoration Project
 Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
 Project Location, Title, and
 Index of Sheets

SHEET ID
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GENERAL NOTES

- These plans are a graphical representation of the work to be performed for the Zanker Farm Restoration Project associated with California Department of Fish and Wildlife (CDFW) Fisheries Restoration Grant Program (FRGP) Agreement Numbers: Q1940405-02 and Q2140407.
 - References to the right or left bank on these plans are based on a reference point looking downstream.
 - All dimensions are shown in feet unless otherwise specified.
 - Existing contours within tree and brush areas may not meet 1 ft accuracy and should be considered approximate.
 - Finished ground contour interval is 1-foot unless otherwise noted.
 - It is the responsibility of the contractor and their subcontractor(s) to examine the project site prior to the commencement of work. The contractor shall become familiar with the conditions under which the work is to be performed, such as the nature and location of the work and the general and local conditions, particularly those affecting the availability of transportation; the disposal, handling, and storage of materials; availability of labor, water, and electricity; roads; the uncertainties of weather; the conditions of the ground; surface and subsurface materials; the uncertainties of streamflow in the Tuolumne River; the equipment and facilities needed primarily for and during the performance of the work, and the costs thereof. Any failure by the contractor and subcontractor(s) to acquaint themselves with all the available information will not relieve them from responsibility for properly estimating the difficulty and cost of successfully performing the work.
 - The consultant team and engineer of record (EOR) responsible for preparation of these plans and specifications will not be responsible or liable for unauthorized changes to or uses of these plans.
 - Should it appear that the work to be done, or any matter relative thereto, is not sufficiently detailed or explained on these plans, report, and/or attached specifications, the contractor shall contact the on-site project representative who will in turn contact the consultant team responsible for the plan preparation, prior to conducting work on that portion of the project.
 - Prior to construction, the contractor shall clear and grub vegetation within construction areas only. Areas within construction areas flagged as "save tree," "clump planting," or "large wood" by on-site project representative shall be left as-is.
 - Coarse sediment not immediately used during construction will be stockpiled at designated temporary stockpile areas for future phases of construction.
 - Sands and silts excavated from project areas or as a result of on-site coarse sediment sieving may be incorporated into constructed floodplain surfaces.
 - Because of the nature of the project, thoughtful grading is mandatory. The contours shown on the plans represent a general shape of the land, but the intent is that slopes, grade breaks, etc. be graded to natural flowing shapes that smoothly transition. As part of the scope of work, the contractor must work under the direction of the onsite representative to create natural-looking, irregular surface with small hummocks and depressions in the graded areas resembling the topography of a natural river.
 - Contractor is responsible for properly disposing of concrete, I-beams, and metal sheet pile in accordance with all applicable laws and regulations.
 - See Sheet C-26 for non-earthwork summary of material quantities (e.g. habitat wood, boulders..).
- SURVEY NOTES**
- A survey control point network was established by a professional land surveyor (PLS) with O'Dell Engineering on May 20, 2021. All subsequent surveys, including bathymetric surveys, were established from this control point network.
 - The contractor will be responsible for the protection of all existing survey monuments and other survey markers during construction.
 - Horizontal datum for survey control points is NAD 83 (2011), California State Plane Coordinates, Zone 3, United States (US) Survey Feet.
 - Vertical datum for survey control points is NAVD 88, US Survey Feet.
 - Data sources for the existing conditions terrain shown in these plans include:
 - LiDAR data collected in March 2012 and prepared by Photo Science, Inc. Flow at the time of the flight was 350 cfs downstream of La Grange Dam.

- Bathymetry data collected within the Zanker Farm Restoration Project area by McBain Associates in June and July 2021 and June and October 2022.
- Supplemental bathymetry and topography outside of Zanker Farm project area were collected by USFWS (October/November 2017), and McBain Associates (October 2017, July 2020 and October 2022).
- Bathymetry, topography, and terrestrial LiDAR data sets were combined into one existing terrain surface by McBain Associates for use with these plans.
- Aerial imagery is from National Agriculture Imagery Program 2020.

ENVIRONMENTAL & CULTURAL

- Avoidance and minimization and/or mitigation measures for plants and animals including the valley elderberry longhorn beetle (*Desmocerus californica dimorphus*) shall be followed. Measures are included in the environmental permits.
- Contractor is responsible for following all applicable federal, state, county, and local laws during construction, including all permits for construction. Contractor shall keep project-specific permits on site in an accessible location.
- Biologically and culturally sensitive areas will be flagged for protection from disturbance prior to construction.
- Contractor will notify the onsite representative and only work within any flagged or environmentally sensitive buffer areas when a monitor is on site.
- Discovery of cultural resources (i.e., pottery, bones) during construction will require all work to stop until a project archeologist is able to assess cultural resource discovery and authorize work to resume.
- Prevention of erosion and the release of sediment and other pollutants associated with construction of the Zanker Farm Restoration Project are described in the Best Management Practices (BMPs) within the Stormwater Pollution Prevention Plan (SWPPP). A printed copy of the SWPPP will remain in an accessible on-site location for the duration of construction.
- Gravel screening and washing must occur greater than 500 feet from the Tuolumne River. Gravel wash water must be routed to a sediment basin that is outside of the project grading footprint. The sediment basin must be filled in after construction and not disturbed.
- Limited mapping of blue elderberry plants has occurred. Surveys of individual blue elderberry plants will be performed prior to project implementation.

SAFETY AND SECURITY

- Prior to commencement of work the contractor shall provide a written safety plan to the client.
- The contractor must plan for flow in the Tuolumne River of 100 cfs or greater throughout construction.
- The contractor is responsible for the security of all equipment and materials.

ACCESS AND STAGING

- The contractor shall develop and maintain all construction access ramps, turnouts, roads, fences, gates, turnarounds, etc., as necessary to excavate, haul, and place fill and wood as designated.
- Any existing roads disturbed by construction activities should be reestablished after project construction unless otherwise directed by on-site project representative.

- Contractor may only store equipment, vehicles, stockpile, etc in the designated staging areas unless directed by the on-site representative and landowner.

UTILITIES

- The contractor shall field locate all existing utilities in the project area prior to commencing work. The contractor shall contact all appropriate agencies and the underground service alert to field locate all underground utilities.
- Contractor shall notify underground service alert (USA) at 1-800-227-2600 or 811, 48 hrs prior to any start of construction.

LEGEND - PLAN VIEW

- XXX--- Finished Ground Index Contours
- Intermediate --- Finished Ground Intermediate Contours
- XXX--- Existing Ground Index Contours
- Intermediate --- Existing Ground Intermediate Contours
- Design Modeled Edge of Water at 80 cfs
- Design Grading Boundaries
- Project Boundary
- River Mile
- Design Spot Elevation
- Survey Control
- Contractor Use Area
- Site Access
- Save Vegetation Area
- Blue Elderberry Locations
- Floodplains (Inundation Targets 300 cfs to 3,400 cfs)
- Side Channels
- In-channel Areas (Riffles and Gravel Bars)
- Remove Remnant Haul Road Debris
- Fine Spawning Gravel Mix
- Standard Spawning Gravel Mix
- Oversized Gravel Mix
- Riffle Thalweg Areas
- Riffle-Bar Dune Areas
- Delineated Wetland
- Willow Trench
- Boulder
- Log with Rootwad

LEGEND - SECTION & PROFILE

- Existing Ground
- Finished Ground
- 100% Design Water Surface Elevation at 80 cfs
- 100% Design Water Surface Elevation at 300 cfs
- Coarse Sediment Fill Per Specifications
- Coarse Sediment Cut Per Specifications

Salmonid Spawning Gravel Mixes as Specified in the Coarse Sediment Management Plan for the Lower Tuolumne River

Particle diameter (in)	Percent of Total	
	Standard Mix	Finer mix
2 1/2 to 5	20%	0%
2 1/2 to 4	0%	20%
1 1/4 to 2 1/2	35%	30%
5/8 to 1 1/4	30%	30%
5/16 to 5/8	15%	12%
1/8 to 5/16	0%	8%
D₈₄ (in)	2.8	2.4
D₅₀ (in)	1.4	1.3

Survey Control - Zanker Phase I and II Project

Point Number	Elevation (ft)	Description
103	156.31	BM3 ALUM DISC
15005	150.10	CP-5
15006	161.71	CP-6
15007	156.84	CP-7
5000	149.34	TCP-1
5001	148.29	TCP-2
5002	144.50	TCP-3
5003	143.47	TCP-4
5004	143.00	TCP-5
5005	144.98	TCP-6
5006	142.29	TCP-7
5007	142.81	TCP-8

Zanker Farm 100% Design Activity Area Earthwork Volumes

Project Area	Area (sq ft)	Cut (cu yd)	Fill (cu yd)	Net (cu yd)
IC-1	12,960	0	1,360	1,360 <Fill>
IC-2	31,340	130	4,910	4,780 <Fill>
IC-3	6,630	0	800	800 <Fill>
IC-4	43,100	0	6,910	6,910 <Fill>
IC-5	42,390	0	1,770	1,770 <Fill>
IC-6	21,740	0	1,730	1,730 <Fill>
IC-7	12,540	0	870	870 <Fill>
IC-8	29,650	0	2,080	2,080 <Fill>
IC-9	12,150	0	920	920 <Fill>
IC-10	17,790	0	1,210	1,210 <Fill>
IC-11	6,180	0	180	180 <Fill>
IC-12	7,860	0	320	320 <Fill>
IC-13	27,910	0	3,860	3,860 <Fill>
IC-14	11,120	0	420	420 <Fill>
IC-15	34,470	0	6,530	6,530 <Fill>
IC-16	46,450	0	6,380	6,380 <Fill>
IC-17	56,650	0	9,300	9,300 <Fill>
IC-18	13,260	0	1,540	1,540 <Fill>
IC-19	30,400	0	4,330	4,330 <Fill>
IC-20	7,740	0	1,330	1,330 <Fill>
IC-21	16,090	0	2,560	2,560 <Fill>
IC-22	7,220	0	760	760 <Fill>
IC-23	37,510	0	6,750	6,750 <Fill>
IC-24	8,970	0	1,170	1,170 <Fill>
IC-25	42,980	0	9,260	9,260 <Fill>
IC-26	13,890	0	2,170	2,170 <Fill>
IC-27	11,800	0	1,350	1,350 <Fill>
IC-28	11,010	0	990	990 <Fill>
IC-29	5,990	0	210	210 <Fill>
IC-30	6,990	0	470	470 <Fill>
IC-31	8,300	0	510	510 <Fill>
IC-32	8,600	0	730	730 <Fill>
IC-33	7,160	0	730	730 <Fill>
SC-1	1,830	200	0	200 <Cut>
SC-2	8,920	790	0	790 <Cut>
SC-3	42,100	3,770	0	3,770 <Cut>
SC-4	4,810	360	0	360 <Cut>
SC-5	83,660	22,000	0	22,000 <Cut>
SC-6	39,820	1,180	3,930	2,750 <Fill>
SC-7	107,380	1,070	13,890	12,820 <Fill>
SC-8	30,230	4,290	0	4,290 <Cut>
FP-1	3,840	410	0	410 <Cut>
FP-2	12,070	830	0	830 <Cut>
FP-3	7,150	180	0	180 <Cut>
FP-4	52,810	3,940	0	3,940 <Cut>
FP-5	46,000	1,640	0	1,640 <Cut>
FP-6	20,620	8,460	0	8,460 <Cut>
FP-7	36,710	13,060	0	13,060 <Cut>
FP-8	15,850	2,970	0	2,970 <Cut>
FP-9	8,260	1,360	0	1,360 <Cut>
FP-10	31,280	6,990	0	6,990 <Cut>
Peaslee Creek Gravel Augmentation	980	0	40	40 <Fill>
Remove Bridge**	4,750	660	0	660 <Cut>
Project Total	1,217,910	73,630	102,270	28,640 <Fill>

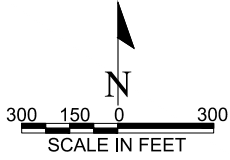
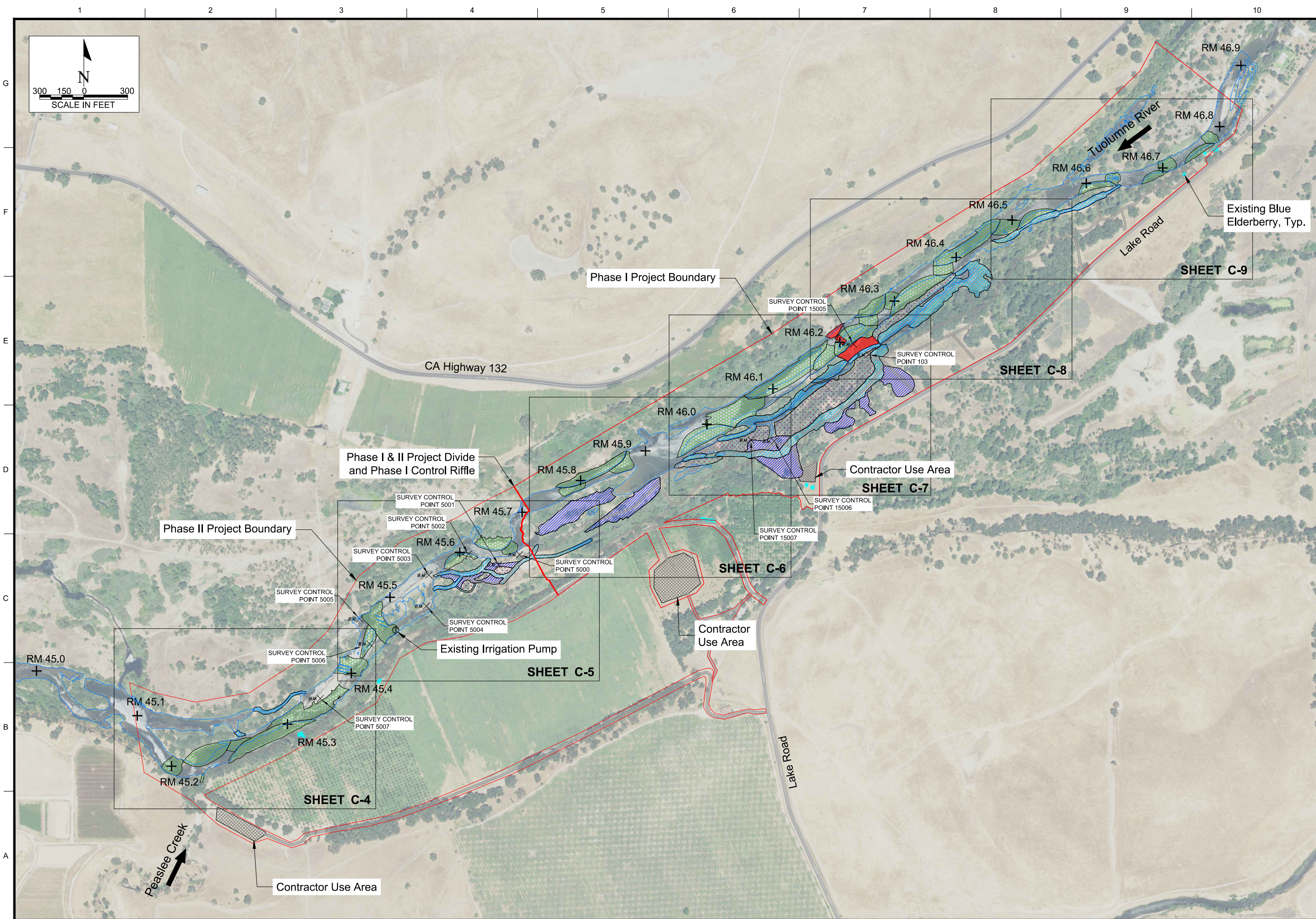
*Gravel mix specifications by volume for in-channel (IC) activity areas are presented on planform detail sheets C-4 to C-9. Gravel mixes consist of the fine or standard spawning mix (see table to the left) or the standard spawning mix augmented with oversized (6 inch to 12 inch) rock.
 **Remove remnant haul road debris consisting of approximately 450 feet of metal sheet pile, 23 steel I-beams within the mainstem channel, and 150 cu. yd. of concrete from the project site and dispose of by the contractor.



REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC DRAWN BY: N. Sabo, R. George CHECKED BY: F. Meyer, K. Harrison (P.E.) APPROVED BY: K. Harrison (P.E.) SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215 MCBAIN ASSOCIATES 860 7TH STREET ARCATA, CA 95521 (707) 826-7794	ISSUE DATE: October 31, 2023 PROJECT: Zanker Farm CONTRACT NO: FRGP 01940405-02 & Q2140407 DRAWING SET: 100% Design Plansheet
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Zanker Farm Restoration Project
 Phase I and II, 100% Design Plansheet
 Tuolumne River, La Grange, CA
 General Notes, Legend, Volume Estimates, and Survey Control



REV	DATE	DESCRIPTION

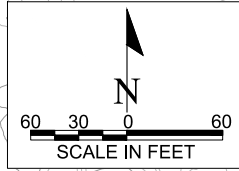
DESIGNED BY: MA and TRC	ISSUE DATE: October 31, 2023
DRAWN BY: N. Sabo, R. George	PROJECT: Zanker Farm
CHECKED BY: F. Meyer, K. Harrison (P.E.)	CONTRACT NO. / FRCP: 01940405-02 & 02140407
APPROVED BY: K. Harrison (P.E.)	DRAWING SET: 100% Design Planset
SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	

TUOLUMNE RIVER CONSERVANCY
6380 LANDMARK ROAD
STOCKTON, CA 95215

MCBAIN ASSOCIATES
860 7TH STREET
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(707) 828-7794

Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Site Overview, Project Access and
Contractor Use Areas

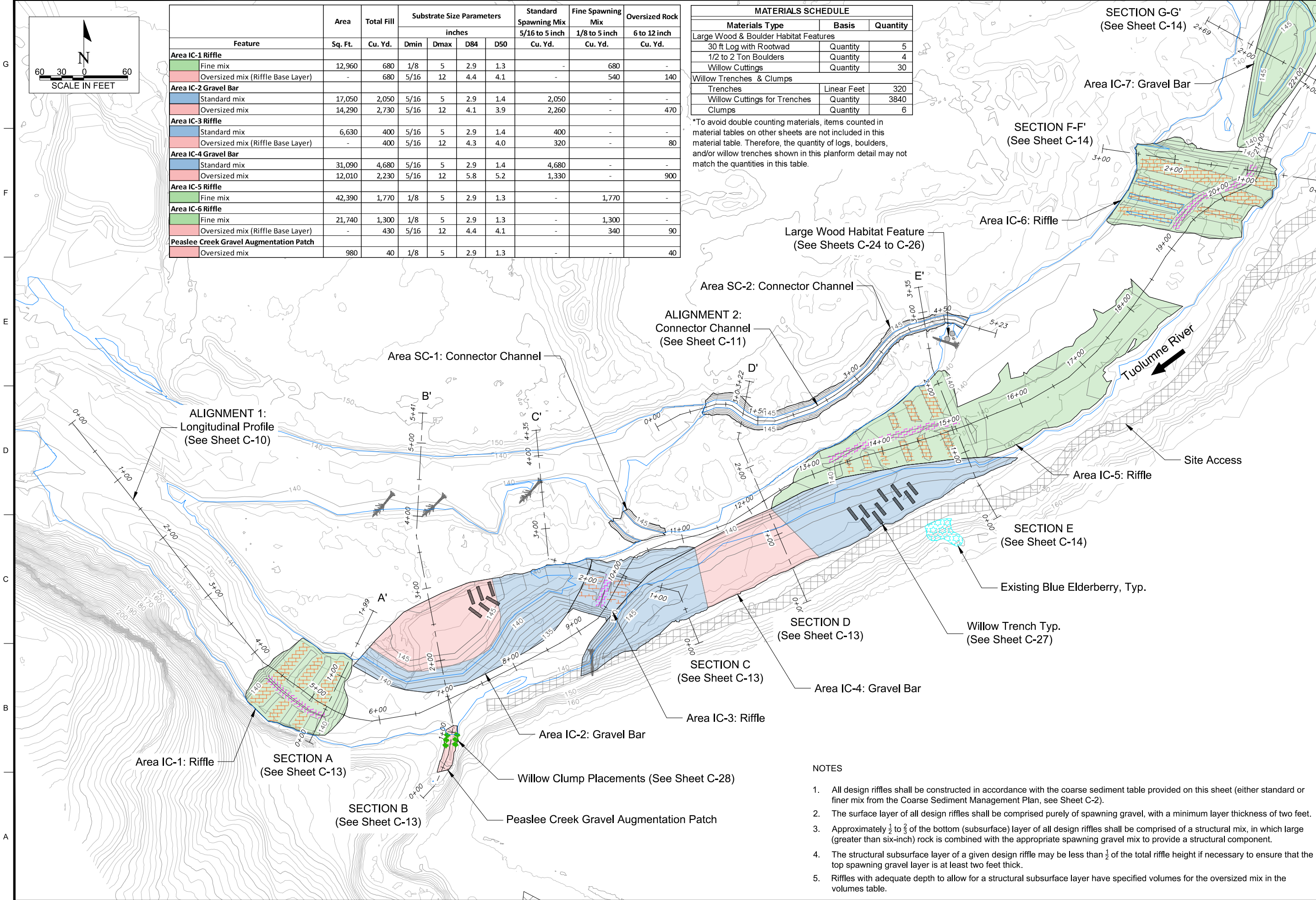
SHEET ID
C-3
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Feature	Area Sq. Ft.	Total Fill Cu. Yd.	Substrate Size Parameters inches				Standard Spawning Mix 5/16 to 5 inch Cu. Yd.	Fine Spawning Mix 1/8 to 5 inch Cu. Yd.	Oversized Rock 6 to 12 inch Cu. Yd.
			Dmin	Dmax	D84	D50			
Area IC-1 Riffle									
Fine mix	12,960	680	1/8	5	2.9	1.3	-	680	-
Oversized mix (Riffle Base Layer)	-	680	5/16	12	4.4	4.1	-	540	140
Area IC-2 Gravel Bar									
Standard mix	17,050	2,050	5/16	5	2.9	1.4	2,050	-	-
Oversized mix	14,290	2,730	5/16	12	4.1	3.9	2,260	-	470
Area IC-3 Riffle									
Standard mix	6,630	400	5/16	5	2.9	1.4	400	-	-
Oversized mix (Riffle Base Layer)	-	400	5/16	12	4.3	4.0	320	-	80
Area IC-4 Gravel Bar									
Standard mix	31,090	4,680	5/16	5	2.9	1.4	4,680	-	-
Oversized mix	12,010	2,230	5/16	12	5.8	5.2	1,330	-	900
Area IC-5 Riffle									
Fine mix	42,390	1,770	1/8	5	2.9	1.3	-	1,770	-
Area IC-6 Riffle									
Fine mix	21,740	1,300	1/8	5	2.9	1.3	-	1,300	-
Oversized mix (Riffle Base Layer)	-	430	5/16	12	4.4	4.1	-	340	90
Peaslee Creek Gravel Augmentation Patch									
Oversized mix	980	40	1/8	5	2.9	1.3	-	-	40

MATERIALS SCHEDULE		
Materials Type	Basis	Quantity
Large Wood & Boulder Habitat Features		
30 ft Log with Rootwad	Quantity	5
1/2 to 2 Ton Boulders	Quantity	4
Willow Cuttings	Quantity	30
Willow Trenches & Clumps		
Trenches	Linear Feet	320
Willow Cuttings for Trenches	Quantity	3840
Clumps	Quantity	6

*To avoid double counting materials, items counted in material tables on other sheets are not included in this material table. Therefore, the quantity of logs, boulders, and/or willow trenches shown in this planform detail may not match the quantities in this table.



SECTION G-G'
(See Sheet C-14)

SECTION F-F'
(See Sheet C-14)

Large Wood Habitat Feature
(See Sheets C-24 to C-26)

ALIGNMENT 2:
Connector Channel
(See Sheet C-11)

ALIGNMENT 1:
Longitudinal Profile
(See Sheet C-10)

SECTION D
(See Sheet C-13)

SECTION C
(See Sheet C-13)

SECTION A
(See Sheet C-13)

SECTION B
(See Sheet C-13)

SECTION E
(See Sheet C-14)



REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC	ISSUE DATE: October 31, 2023
DRAWN BY: N. Sabo, R. George	PROJECT: Zanker Farm
CHECKED BY: F. Meyer, K. Harrison (P.E.)	CONTRACT NO.: FRGP 01940405-02 & 02-140407
APPROVED BY: K. Harrison (P.E.)	DRAWING SET: 100% Design Plansheet
SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	

TUOLUMNE RIVER CONSERVANCY
6380 LANDMARK ROAD
STOCKTON, CA 95215

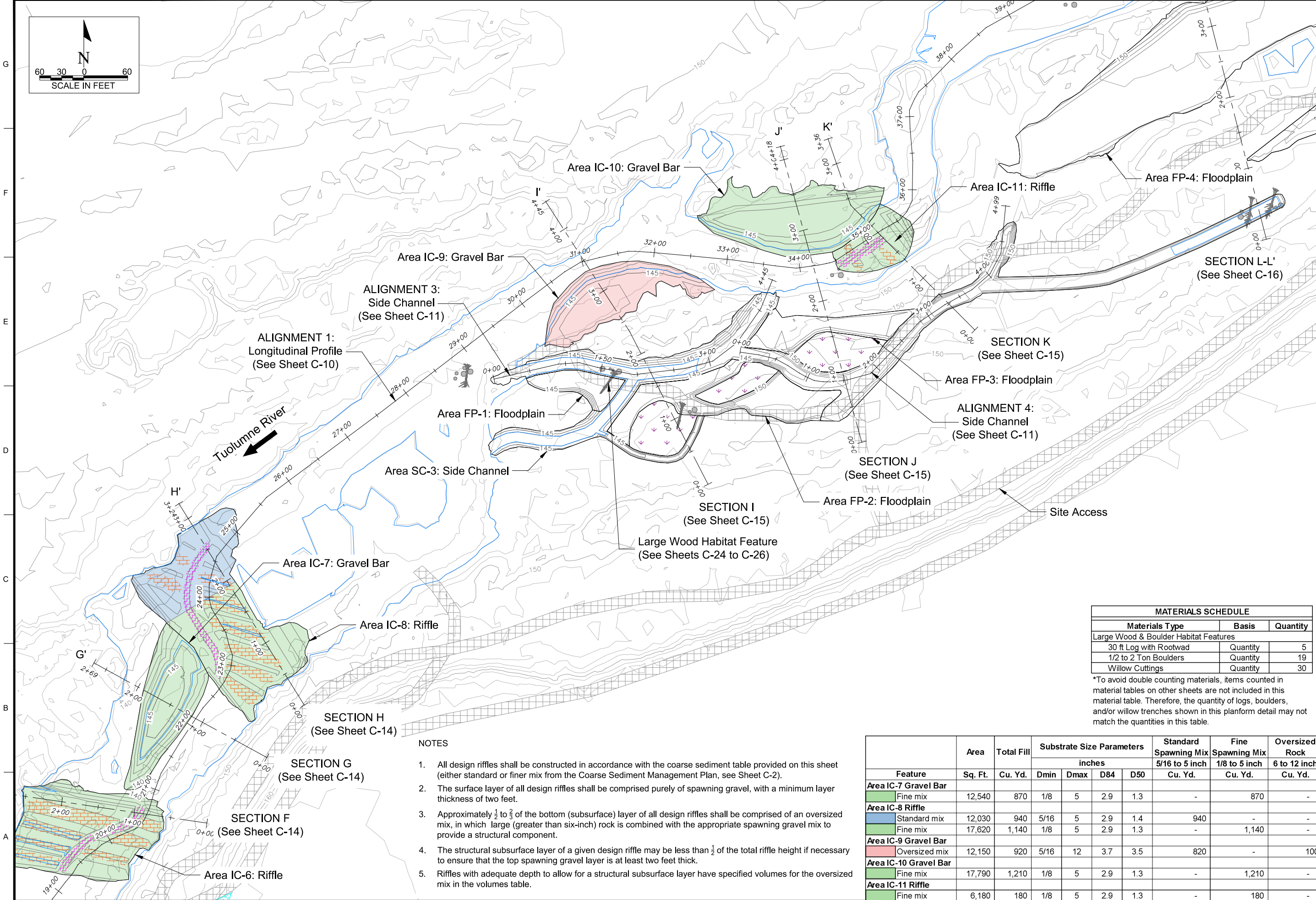
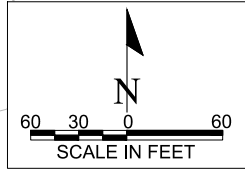
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Zanker Farm Restoration Project
Phase I and II, 100% Design Plansheet
Tuolumne River, La Grange, CA
Planform Detail Mainstem Channel
Station 0+00 to Station 22+00

SHEET ID
C-4
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NOTES

- All design riffles shall be constructed in accordance with the coarse sediment table provided on this sheet (either standard or finer mix from the Coarse Sediment Management Plan, see Sheet C-2).
- The surface layer of all design riffles shall be comprised purely of spawning gravel, with a minimum layer thickness of two feet.
- Approximately 1/2 to 2/3 of the bottom (subsurface) layer of all design riffles shall be comprised of a structural mix, in which large (greater than six-inch) rock is combined with the appropriate spawning gravel mix to provide a structural component.
- The structural subsurface layer of a given design riffle may be less than 1/2 of the total riffle height if necessary to ensure that the top spawning gravel layer is at least two feet thick.
- Riffles with adequate depth to allow for a structural subsurface layer have specified volumes for the oversized mix in the volumes table.



- NOTES**
- All design riffles shall be constructed in accordance with the coarse sediment table provided on this sheet (either standard or finer mix from the Coarse Sediment Management Plan, see Sheet C-2).
 - The surface layer of all design riffles shall be comprised purely of spawning gravel, with a minimum layer thickness of two feet.
 - Approximately $\frac{1}{2}$ to $\frac{2}{3}$ of the bottom (subsurface) layer of all design riffles shall be comprised of an oversized mix, in which large (greater than six-inch) rock is combined with the appropriate spawning gravel mix to provide a structural component.
 - The structural subsurface layer of a given design riffle may be less than $\frac{1}{2}$ of the total riffle height if necessary to ensure that the top spawning gravel layer is at least two feet thick.
 - Riffles with adequate depth to allow for a structural subsurface layer have specified volumes for the oversized mix in the volumes table.

MATERIALS SCHEDULE		
Materials Type	Basis	Quantity
Large Wood & Boulder Habitat Features		
30 ft Log with Rootwad	Quantity	5
1/2 to 2 Ton Boulders	Quantity	19
Willow Cuttings	Quantity	30

*To avoid double counting materials, items counted in material tables on other sheets are not included in this material table. Therefore, the quantity of logs, boulders, and/or willow trenches shown in this planform detail may not match the quantities in this table.

Feature	Area Sq. Ft.	Total Fill Cu. Yd.	Substrate Size Parameters inches				Standard Spawning Mix 5/16 to 5 inch Cu. Yd.	Fine Spawning Mix 1/8 to 5 inch Cu. Yd.	Oversized Rock 6 to 12 inch Cu. Yd.
			Dmin	Dmax	D84	D50			
Area IC-7 Gravel Bar	12,540	870	1/8	5	2.9	1.3	-	870	-
Area IC-8 Riffle	12,030	940	5/16	5	2.9	1.4	940	-	-
Area IC-9 Gravel Bar	17,620	1,140	1/8	5	2.9	1.3	-	1,140	-
Area IC-10 Gravel Bar	12,150	920	5/16	12	3.7	3.5	820	-	100
Area IC-11 Riffle	17,790	1,210	1/8	5	2.9	1.3	-	1,210	-
Area IC-11 Riffle	6,180	180	1/8	5	2.9	1.3	-	180	-



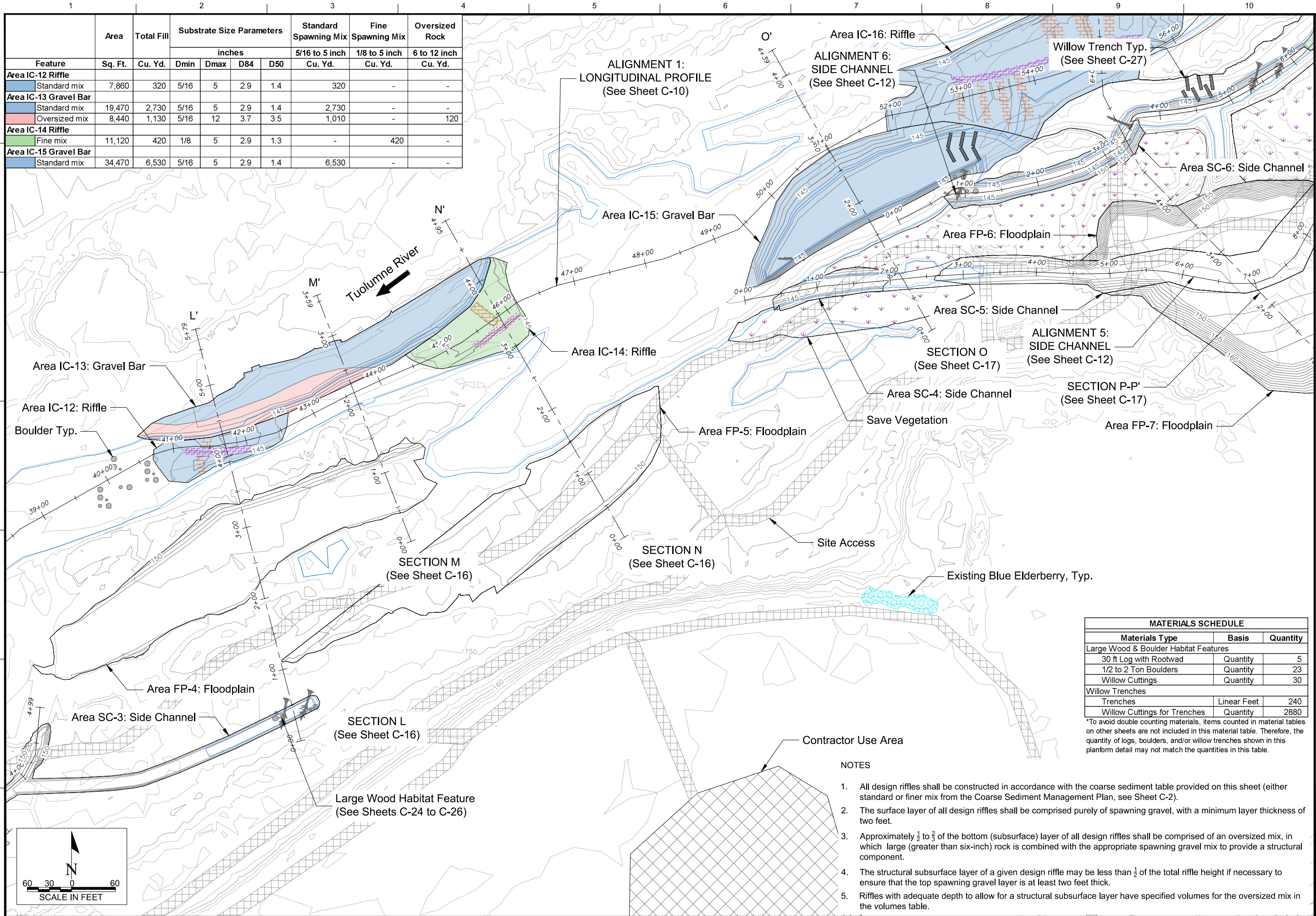
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Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Planform Detail Mainstem Channel
Station 19+00 to Station 39+00

SHEET ID
C-5
5 of 31

Feature	Area Sq. Ft.	Total Fill Cu. Yd.	Substrate Size Parameters inches				Standard Spawning Mix	Fine Spawning Mix	Oversized Rock
			Dmin	Dmax	D84	D50	5/16 to 5 inch Cu. Yd.	1/8 to 5 inch Cu. Yd.	6 to 12 inch Cu. Yd.
Area IC-12 Riffle									
Standard mix	7,860	320	5/16	5	2.9	1.4	320	-	-
Area IC-13 Gravel Bar									
Standard mix	19,470	2,730	5/16	5	2.9	1.4	2,730	-	-
Oversized mix	8,440	1,130	5/16	12	3.7	3.5	1,010	-	120
Area IC-14 Riffle									
Fine mix	11,120	420	1/8	5	2.9	1.3	-	420	-
Area IC-15 Gravel Bar									
Standard mix	34,470	6,530	5/16	5	2.9	1.4	6,530	-	-



REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC
 DRAWN BY: N. Sabo, R. George
 CHECKED BY: F. Meyer, K. Harrison (P.E.)
 APPROVED BY: K. Harrison (P.E.)
 SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)

TUOLUMNE RIVER CONSERVANCY
 6380 LANDMARK ROAD
 STOCKTON, CA 95215
 MCBAIN ASSOCIATES
 580 7TH STREET
 ARCADIA, CA 95521
 (707) 868-7194

Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
Platform Detail Mainstem Channel
 Station 39+00 to Station 56+00

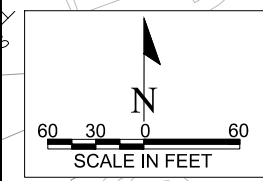
SHEET ID
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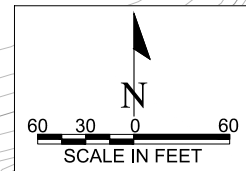
MATERIALS SCHEDULE		
Materials Type	Basis	Quantity
Large Wood & Boulder Habitat Features		
30 ft Log with Rootwad	Quantity	5
1/2 to 2 Ton Boulders	Quantity	23
Willow Cuttings	Quantity	30
Willow Trenches		
Trenches	Linear Feet	240
Willow Cuttings for Trenches	Quantity	2880

*To avoid double counting materials, items counted in material tables on other sheets are not included in this material table. Therefore, the quantity of logs, boulders, and/or willow trenches shown in this platform detail may not match the quantities in this table.

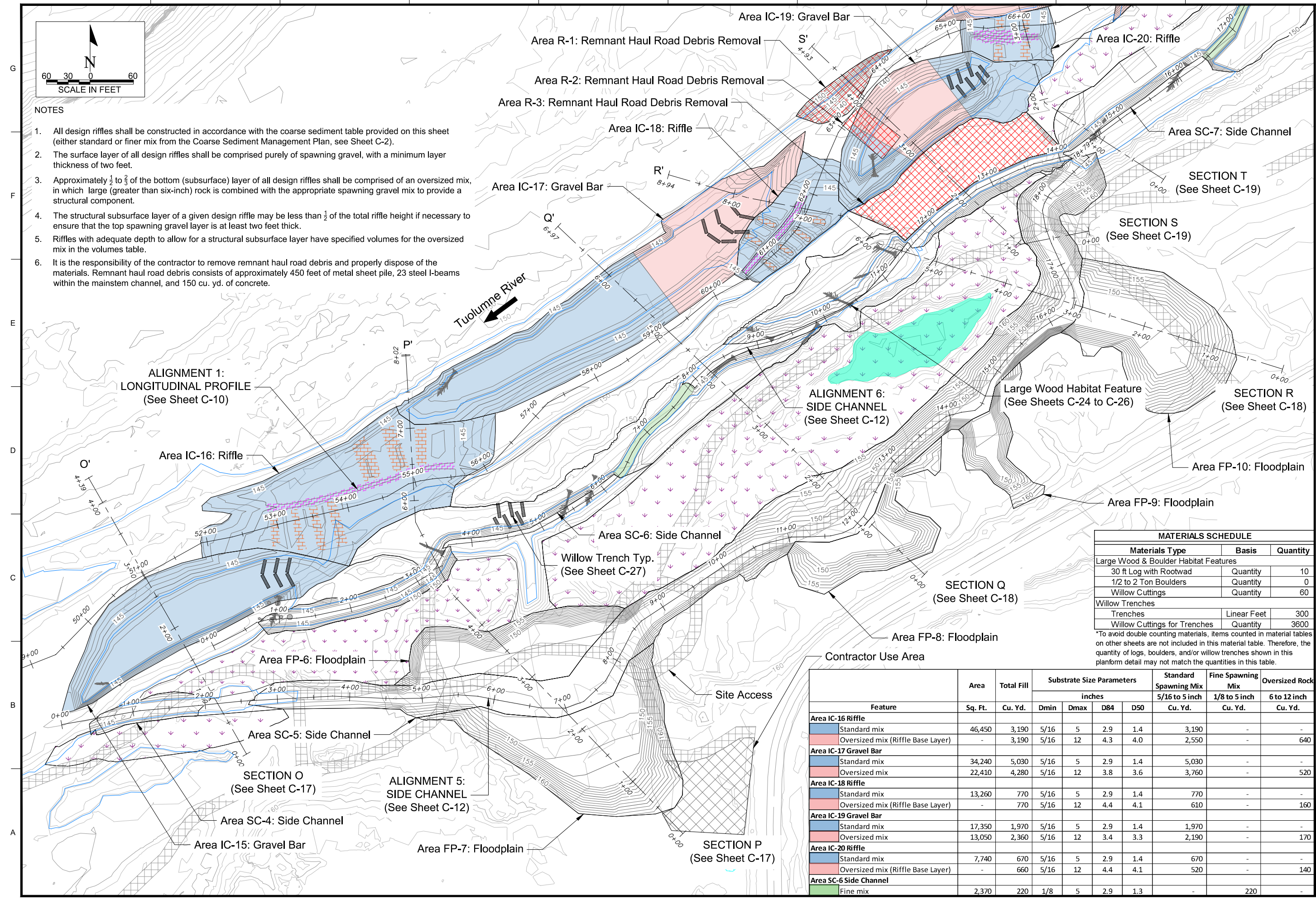
NOTES

- All design riffles shall be constructed in accordance with the coarse sediment table provided on this sheet (either standard or finer mix from the Coarse Sediment Management Plan, see Sheet C-2).
- The surface layer of all design riffles shall be comprised purely of spawning gravel, with a minimum layer thickness of two feet.
- Approximately $\frac{1}{2}$ to $\frac{2}{3}$ of the bottom (subsurface) layer of all design riffles shall be comprised of an oversized mix, in which large (greater than six-inch) rock is combined with the appropriate spawning gravel mix to provide a structural component.
- The structural subsurface layer of a given design riffle may be less than $\frac{1}{2}$ of the total riffle height if necessary to ensure that the top spawning gravel layer is at least two feet thick.
- Riffles with adequate depth to allow for a structural subsurface layer have specified volumes for the oversized mix in the volumes table.





- NOTES**
- All design riffles shall be constructed in accordance with the coarse sediment table provided on this sheet (either standard or finer mix from the Coarse Sediment Management Plan, see Sheet C-2).
 - The surface layer of all design riffles shall be comprised purely of spawning gravel, with a minimum layer thickness of two feet.
 - Approximately 1/2 to 2/3 of the bottom (subsurface) layer of all design riffles shall be comprised of an oversized mix, in which large (greater than six-inch) rock is combined with the appropriate spawning gravel mix to provide a structural component.
 - The structural subsurface layer of a given design riffle may be less than 1/2 of the total riffle height if necessary to ensure that the top spawning gravel layer is at least two feet thick.
 - Riffles with adequate depth to allow for a structural subsurface layer have specified volumes for the oversized mix in the volumes table.
 - It is the responsibility of the contractor to remove remnant haul road debris and properly dispose of the materials. Remnant haul road debris consists of approximately 450 feet of metal sheet pile, 23 steel I-beams within the mainstem channel, and 150 cu. yd. of concrete.



**ALIGNMENT 1:
LONGITUDINAL PROFILE**
(See Sheet C-10)

**ALIGNMENT 6:
SIDE CHANNEL**
(See Sheet C-12)

**ALIGNMENT 5:
SIDE CHANNEL**
(See Sheet C-12)

MATERIALS SCHEDULE

Materials Type	Basis	Quantity
Large Wood & Boulder Habitat Features		
30 ft Log with Rootwad	Quantity	10
1/2 to 2 Ton Boulders	Quantity	0
Willow Cuttings	Quantity	60
Willow Trenches		
Trenches	Linear Feet	300
Willow Cuttings for Trenches	Quantity	3600

*To avoid double counting materials, items counted in material tables on other sheets are not included in this material table. Therefore, the quantity of logs, boulders, and/or willow trenches shown in this planform detail may not match the quantities in this table.

Contractor Use Area

Feature	Area Sq. Ft.	Total Fill Cu. Yd.	Substrate Size Parameters				Standard Spawning Mix 5/16 to 5 inch Cu. Yd.	Fine Spawning Mix 1/8 to 5 inch Cu. Yd.	Oversized Rock 6 to 12 inch Cu. Yd.
			Dmin inches	Dmax inches	D84 inches	D50 inches			
Area IC-16 Riffle									
Standard mix	46,450	3,190	5/16	5	2.9	1.4	3,190	-	-
Oversized mix (Riffle Base Layer)	-	3,190	5/16	12	4.3	4.0	2,550	-	640
Area IC-17 Gravel Bar									
Standard mix	34,240	5,030	5/16	5	2.9	1.4	5,030	-	-
Oversized mix	22,410	4,280	5/16	12	3.8	3.6	3,760	-	520
Area IC-18 Riffle									
Standard mix	13,260	770	5/16	5	2.9	1.4	770	-	-
Oversized mix (Riffle Base Layer)	-	770	5/16	12	4.4	4.1	610	-	160
Area IC-19 Gravel Bar									
Standard mix	17,350	1,970	5/16	5	2.9	1.4	1,970	-	-
Oversized mix	13,050	2,360	5/16	12	3.4	3.3	2,190	-	170
Area IC-20 Riffle									
Standard mix	7,740	670	5/16	5	2.9	1.4	670	-	-
Oversized mix (Riffle Base Layer)	-	660	5/16	12	4.4	4.1	520	-	140
Area SC-6 Side Channel									
Fine mix	2,370	220	1/8	5	2.9	1.3	-	220	-

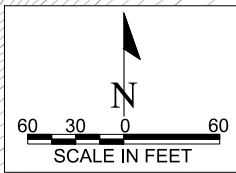


REV	DATE	DESCRIPTION

ISSUE DATE: October 31, 2023
 PROJECT: TUOLUMNE RIVER CONSERVANCY
 DRAWN BY: MA and TRC
 CHECKED BY: N. Sabo, R. George
 APPROVED BY: K. Harrison (P.E.)
 SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)

Zanker Farm Restoration Project
 Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
Planform Detail Mainstem Channel
 Station 50+00 to Station 67+00

SHEET ID
C-7
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NOTES

- All design riffles shall be constructed in accordance with the coarse sediment table provided on this sheet (either standard or finer mix from the Coarse Sediment Management Plan, see Sheet C-2).
- The surface layer of all design riffles shall be comprised purely of spawning gravel, with a minimum layer thickness of two feet.
- Approximately $\frac{1}{2}$ to $\frac{2}{3}$ of the bottom (subsurface) layer of all design riffles shall be comprised of an oversized mix, in which large (greater than six-inch) rock is combined with the appropriate spawning gravel mix to provide a structural component.
- The structural subsurface layer of a given design riffle may be less than $\frac{1}{2}$ of the total riffle height if necessary to ensure that the top spawning gravel layer is at least two feet thick.
- Riffles with adequate depth to allow for a structural subsurface layer have specified volumes for the oversized mix in the volumes table.
- It is the responsibility of the contractor to remove remnant haul road debris and properly dispose of the materials. Remnant haul road debris consists of approximately 450 feet of metal sheet pile, 23 steel I-beams within the mainstem channel, and 150 cu. yd. of concrete.



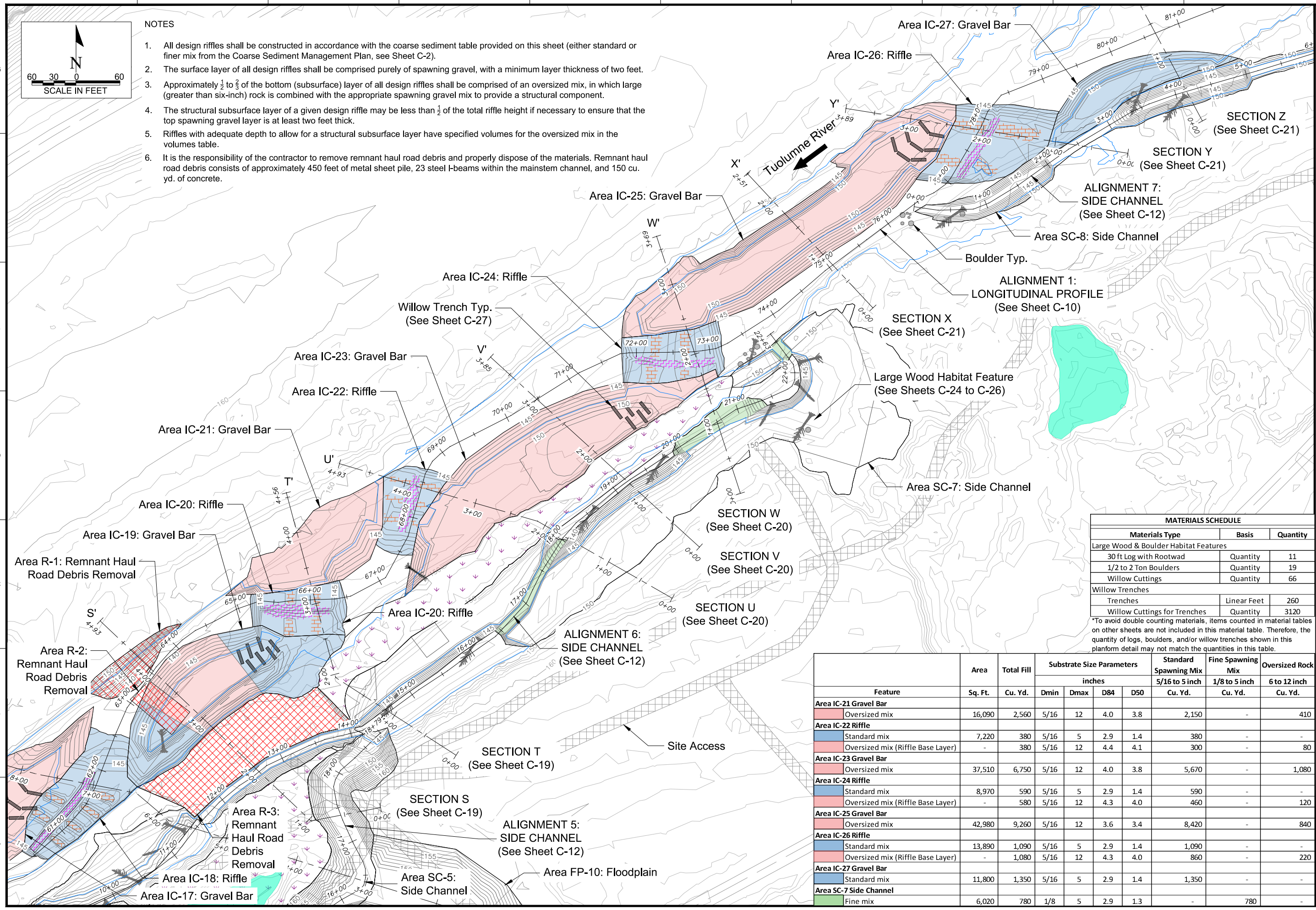
REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC	ISSUE DATE: October 31, 2023
DRAWN BY: N. Sabo, R. George	PROJECT: TUOLUMNE RIVER CONSERVANCY
CHECKED BY: F. Meyer, K. Harrison (P.E.)	CONTRACT NO: FRGP 0194045-02 & 0214047
APPROVED BY: K. Harrison (P.E.)	DRAWING SET: 100% Design Plansheet
SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	

TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215	MCBAIN ASSOCIATES 580 7TH STREET ARCATA, CA 95521 (707) 826-7794
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Zanker Farm Restoration Project
Phase I and II, 100% Design Plansheet
Tuolumne River, La Grange, CA
Planform Detail Mainstem Channel
Station 61+00 to Station 81+00

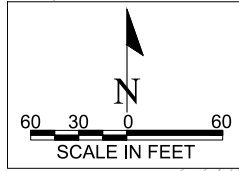
SHEET ID
C-8
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MATERIALS SCHEDULE		
Materials Type	Basis	Quantity
Large Wood & Boulder Habitat Features		
30 ft Log with Rootwad	Quantity	11
1/2 to 2 Ton Boulders	Quantity	19
Willow Cuttings	Quantity	66
Willow Trenches		
Trenches	Linear Feet	260
Willow Cuttings for Trenches	Quantity	3120

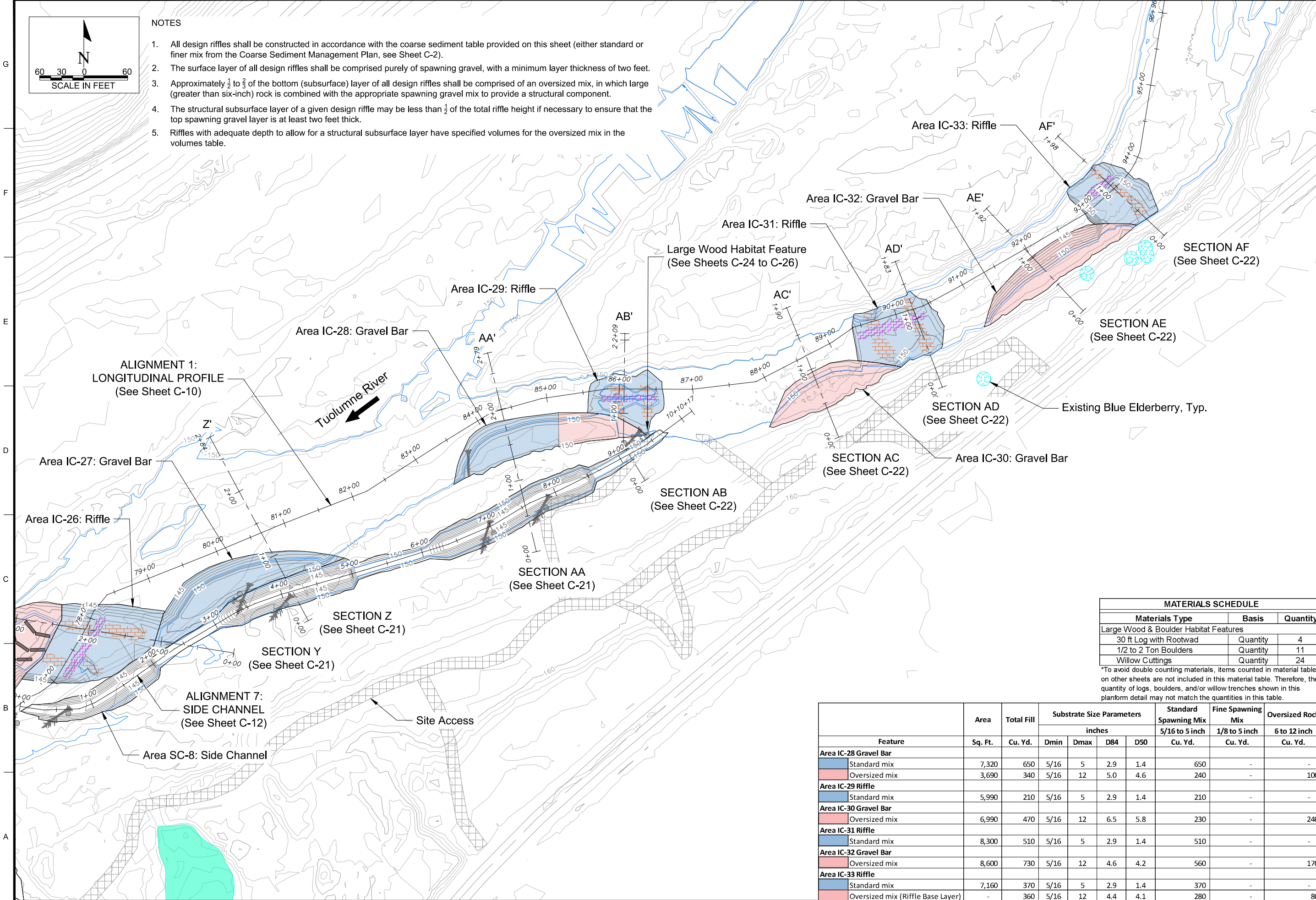
*To avoid double counting materials, items counted in material tables on other sheets are not included in this material table. Therefore, the quantity of logs, boulders, and/or willow trenches shown in this planform detail may not match the quantities in this table.

Feature	Area Sq. Ft.	Total Fill Cu. Yd.	Substrate Size Parameters inches				Standard Spawning Mix 5/16 to 5 inch Cu. Yd.	Fine Spawning Mix 1/8 to 5 inch Cu. Yd.	Oversized Rock 6 to 12 inch Cu. Yd.
			Dmin	Dmax	D84	D50			
Area IC-21 Gravel Bar									
Oversized mix	16,090	2,560	5/16	12	4.0	3.8	2,150	-	410
Area IC-22 Riffle									
Standard mix	7,220	380	5/16	5	2.9	1.4	380	-	-
Oversized mix (Riffle Base Layer)	-	380	5/16	12	4.4	4.1	300	-	80
Area IC-23 Gravel Bar									
Oversized mix	37,510	6,750	5/16	12	4.0	3.8	5,670	-	1,080
Area IC-24 Riffle									
Standard mix	8,970	590	5/16	5	2.9	1.4	590	-	-
Oversized mix (Riffle Base Layer)	-	580	5/16	12	4.3	4.0	460	-	120
Area IC-25 Gravel Bar									
Oversized mix	42,980	9,260	5/16	12	3.6	3.4	8,420	-	840
Area IC-26 Riffle									
Standard mix	13,890	1,090	5/16	5	2.9	1.4	1,090	-	-
Oversized mix (Riffle Base Layer)	-	1,080	5/16	12	4.3	4.0	860	-	220
Area IC-27 Gravel Bar									
Standard mix	11,800	1,350	5/16	5	2.9	1.4	1,350	-	-
Area SC-7 Side Channel									
Fine mix	6,020	780	1/8	5	2.9	1.3	-	780	-



NOTES

- All design riffles shall be constructed in accordance with the coarse sediment table provided on this sheet (either standard or finer mix from the Coarse Sediment Management Plan, see Sheet C-2).
- The surface layer of all design riffles shall be comprised purely of spawning gravel, with a minimum layer thickness of two feet.
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- Riffles with adequate depth to allow for a structural subsurface layer have specified volumes for the oversized mix in the volumes table.



ALIGNMENT 1:
LONGITUDINAL PROFILE
(See Sheet C-10)

Z'

Tuolumne River

Area IC-29: Riffle

Area IC-28: Gravel Bar

Area IC-27: Gravel Bar

Area IC-26: Riffle

SECTION Z
(See Sheet C-21)

SECTION Y
(See Sheet C-21)

ALIGNMENT 7:
SIDE CHANNEL
(See Sheet C-12)

Area SC-8: Side Channel

Site Access

SECTION AA
(See Sheet C-21)

SECTION AB
(See Sheet C-22)

SECTION AC
(See Sheet C-22)

SECTION AD
(See Sheet C-22)

SECTION AE
(See Sheet C-22)

SECTION AF
(See Sheet C-22)

Large Wood Habitat Feature
(See Sheets C-24 to C-26)

Area IC-31: Riffle

Area IC-32: Gravel Bar

Area IC-33: Riffle

Existing Blue Elderberry, Typ.

Area IC-30: Gravel Bar

MATERIALS SCHEDULE

Materials Type	Basis	Quantity
Large Wood & Boulder Habitat Features		
30 ft Log with Rootwad	Quantity	4
1/2 to 2 Ton Boulders	Quantity	11
Willow Cuttings	Quantity	24

*To avoid double counting materials, items counted in material tables on other sheets are not included in this material table. Therefore, the quantity of logs, boulders, and/or willow trenches shown in this planform detail may not match the quantities in this table.

Feature	Area Sq. Ft.	Total Fill Cu. Yd.	Substrate Size Parameters				Standard Spawning Mix 5/16 to 5 inch Cu. Yd.	Fine Spawning Mix 1/8 to 5 inch Cu. Yd.	Oversized Rock 6 to 12 inch Cu. Yd.
			Dmin	Dmax	D84	D50			
Area IC-28 Gravel Bar									
Standard mix	7,320	650	5/16	5	2.9	1.4	650	-	-
Oversized mix	3,690	340	5/16	12	5.0	4.6	240	-	100
Area IC-29 Riffle									
Standard mix	5,990	210	5/16	5	2.9	1.4	210	-	-
Area IC-30 Gravel Bar									
Oversized mix	6,990	470	5/16	12	6.5	5.8	230	-	240
Area IC-31 Riffle									
Standard mix	8,300	510	5/16	5	2.9	1.4	510	-	-
Area IC-32 Gravel Bar									
Oversized mix	8,600	730	5/16	12	4.6	4.2	560	-	170
Area IC-33 Riffle									
Standard mix	7,160	370	5/16	5	2.9	1.4	370	-	-
Oversized mix (Riffle Base Layer)	-	360	5/16	12	4.4	4.1	280	-	80



REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC	ISSUE DATE: October 31, 2023
DRAWN BY: N. Sabo, R. George	PROJECT: Zanker Farm
CHECKED BY: F. Meyer, K. Harrison (P.E.)	CONTRACT NO.: FRGP 0194045-02 & 0214047
APPROVED BY: K. Harrison (P.E.)	DRAWING SET: 100% Design Planset
SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	

Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Planform Detail Mainstem Channel
Station 78+00 to Station 96+00

SHEET ID
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REV	DATE	DESCRIPTION

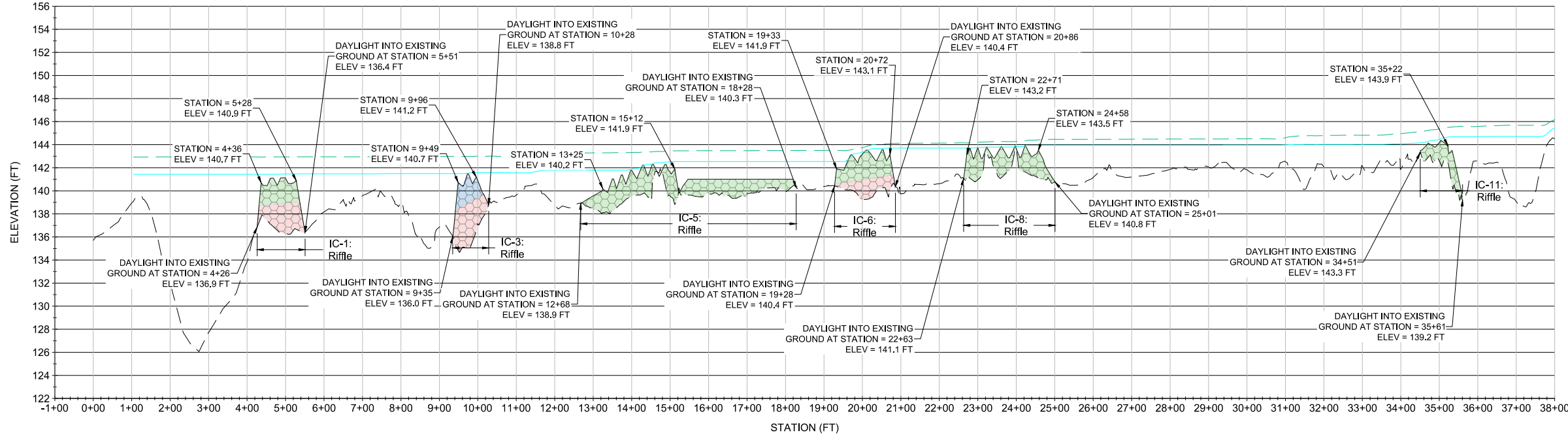
DESIGNED BY: MA and TRC	ISSUE DATE: October 31, 2023
DRAWN BY: N. Sabo, R. George	PROJECT: Zanker Farm
CHECKED BY: F. Meyer, K. Harrison (P.E.)	CONTRACT NO.: FRGP 01940405-02 & 02140407
APPROVED BY: K. Harrison (P.E.)	DRAWING SET: 100% Design Planset
SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	

TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215	MCBAIN ASSOCIATES 860 7TH STREET ARCATA, CA 95521 (707) 826-7794
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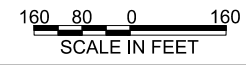
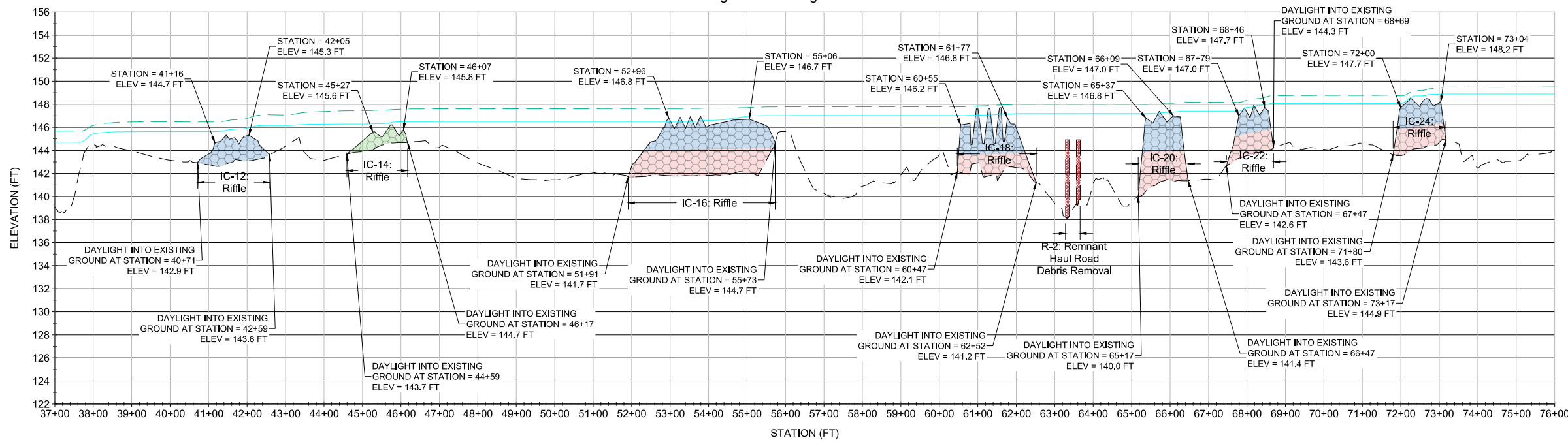
Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Alignment 1: Longitudinal Profile

SHEET ID
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Alignment 1: Longitudinal Profile



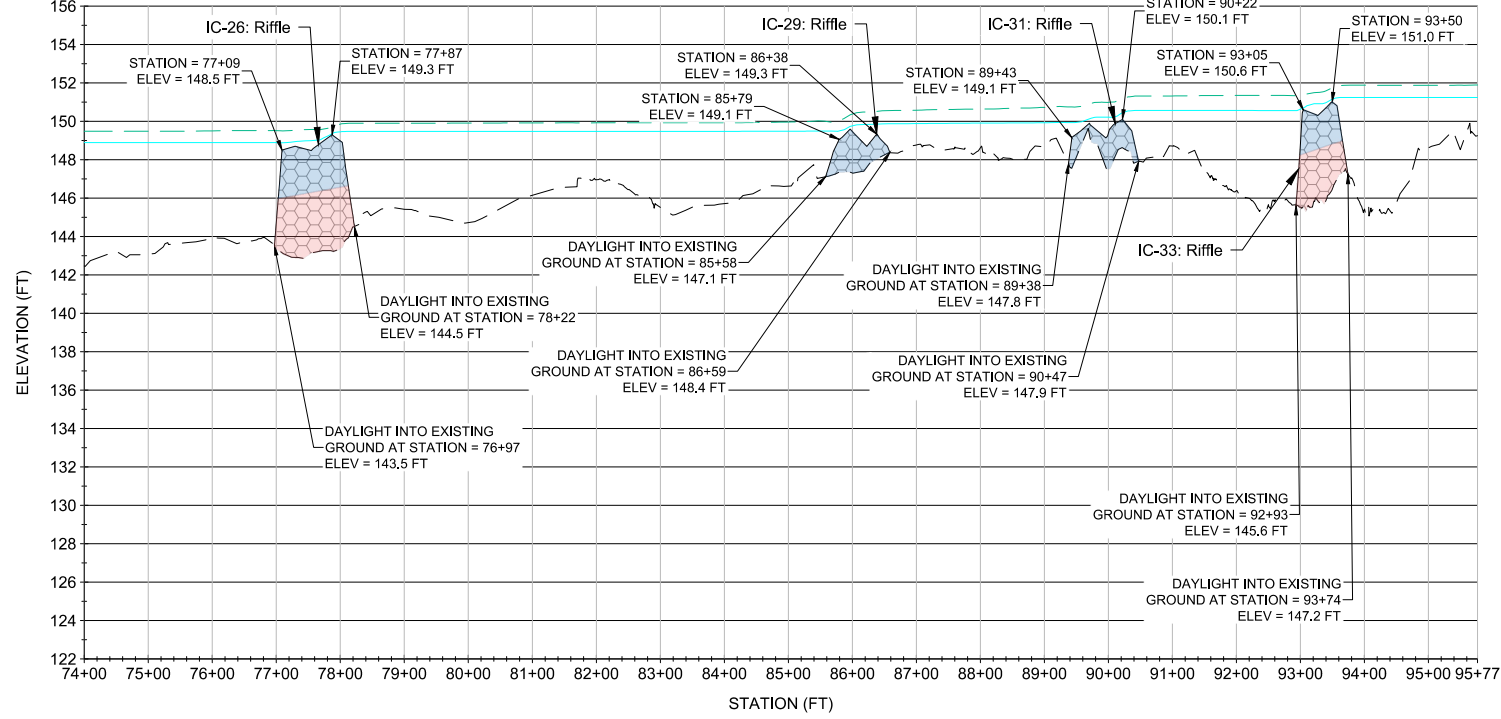
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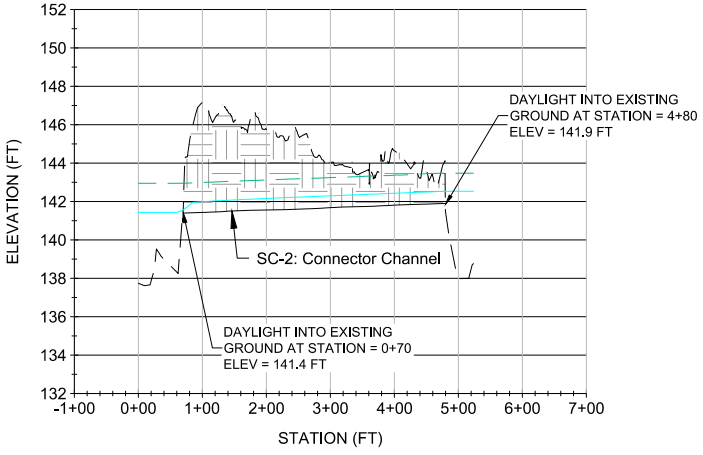
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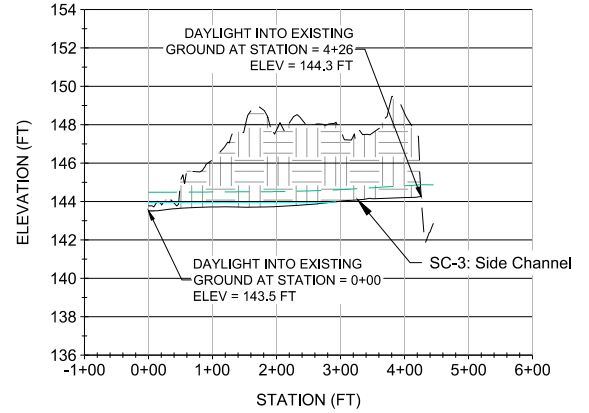
Alignment 1: Longitudinal Profile



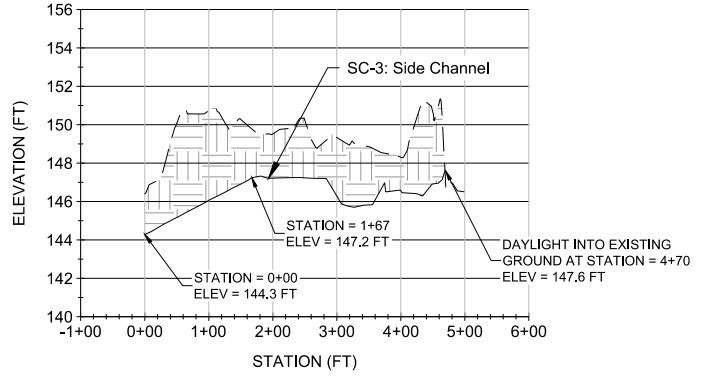
Alignment 2: Connector Channel



Alignment 3: Side Channel



Alignment 4: Side Channel



VERTICAL EXAGGERATION 10:1



REV	DATE	DESCRIPTION

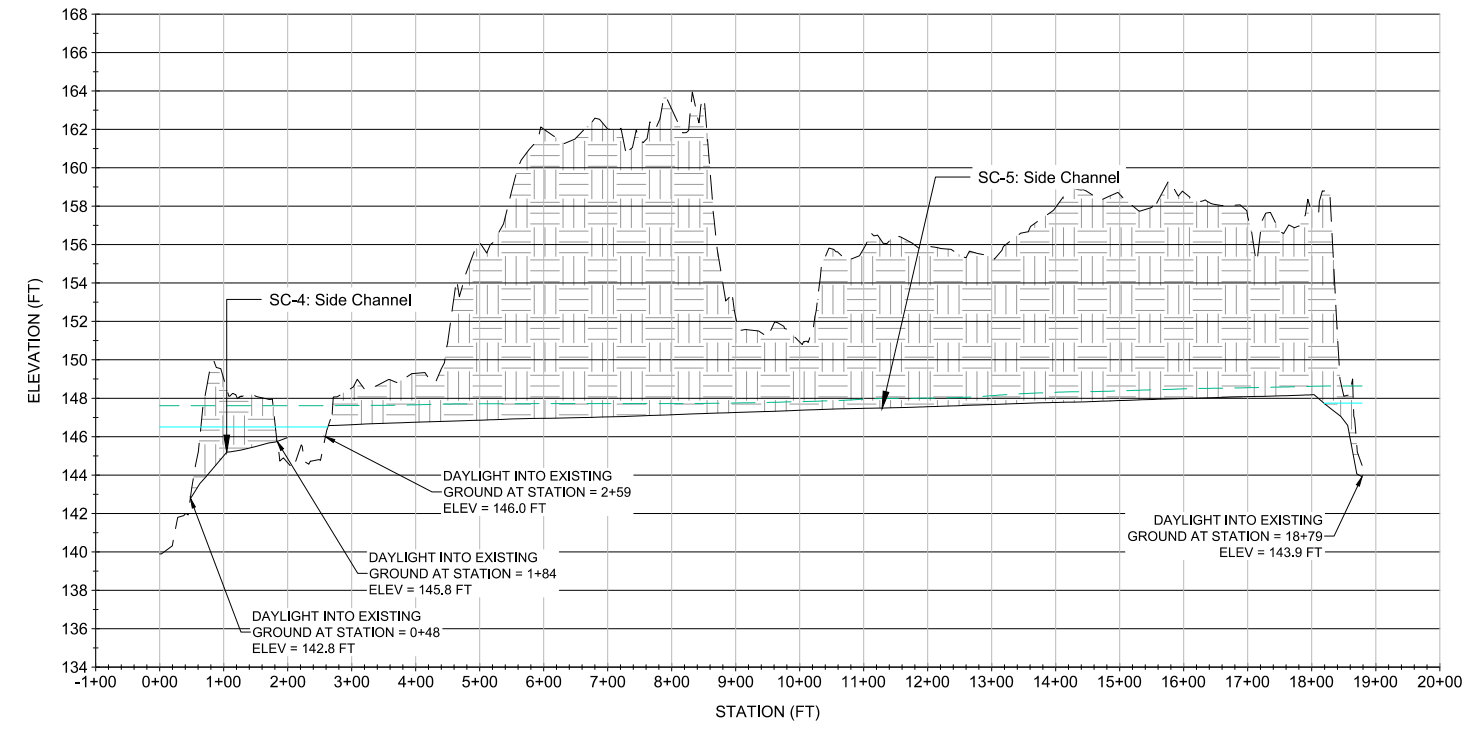
DESIGNED BY: MA and TRC	ISSUE DATE: October 31, 2023
DRAWN BY: N. Sabo, R. George	PROJECT: Zanker Farm
CHECKED BY: F. Meyer, K. Harrison (P.E.)	CONTRACT NO.: FRGP 01940405-02 & 02140407
APPROVED BY: K. Harrison (P.E.)	DRAWING SET: 100% Design Planset
SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	

Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Alignment 1 to Alignment 4

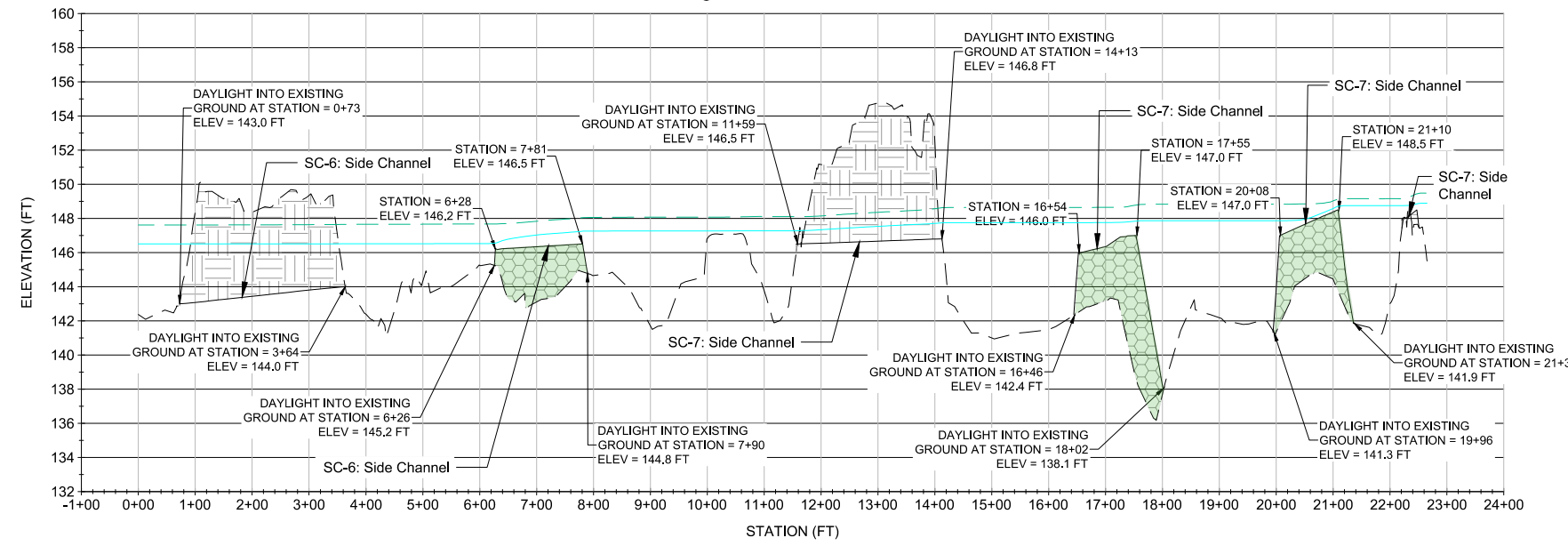
SHEET ID
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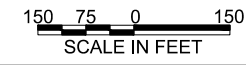
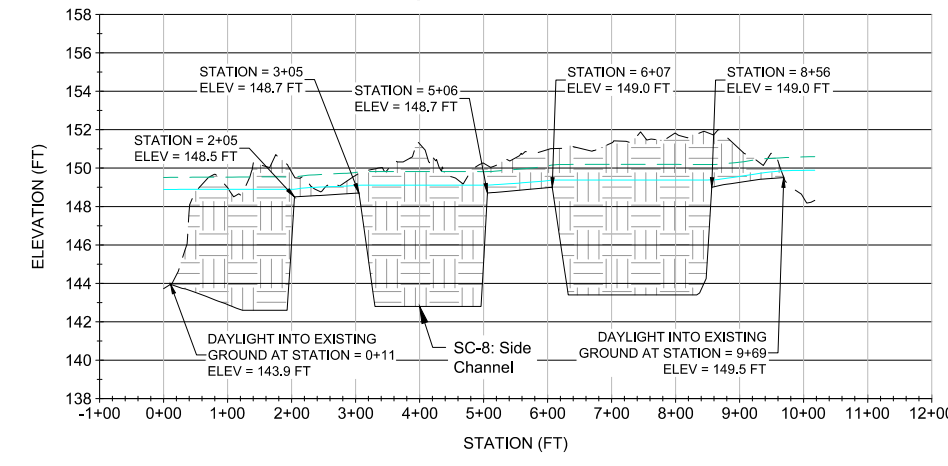
Alignment 5: Side Channel



Alignment 6: Side Channel



Alignment 7: Side Channel



VERTICAL EXAGGERATION 10:1



DESIGNED BY: MA and TRC DRAWN BY: N. Sabo, R. George CHECKED BY: F. Meyer, K. Harrison (P.E.) APPROVED BY: K. Harrison (P.E.) SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)		PROJECT: Zanker Farm CONTRACT NO: FRGP 01940405-02 & 02140407 DRAWING SET: 100% Design Plansheet	
TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215		MCBAIN ASSOCIATES 860 7TH STREET ARCADIA, CA 95521 (707) 868-7194	
Zanker Farm Restoration Project Phase I and II, 100% Design Plansheet Tuolumne River, La Grange, CA Alignment 5 to Alignment 7			
SHEET ID C-12 12 of 31		REV DATE DESCRIPTION	

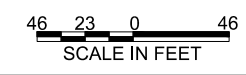
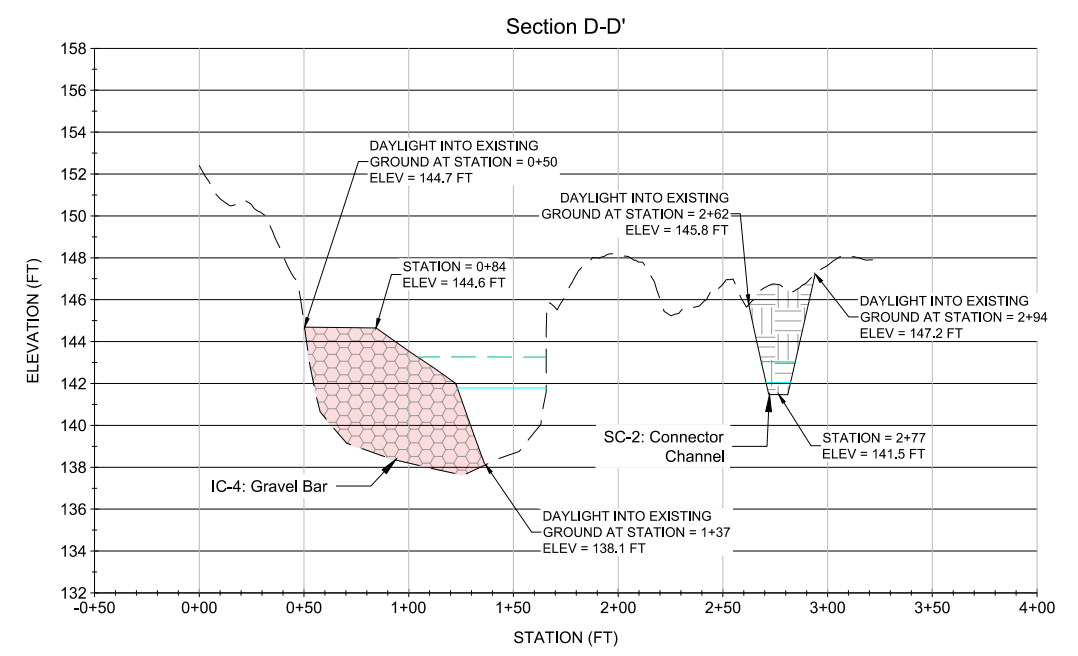
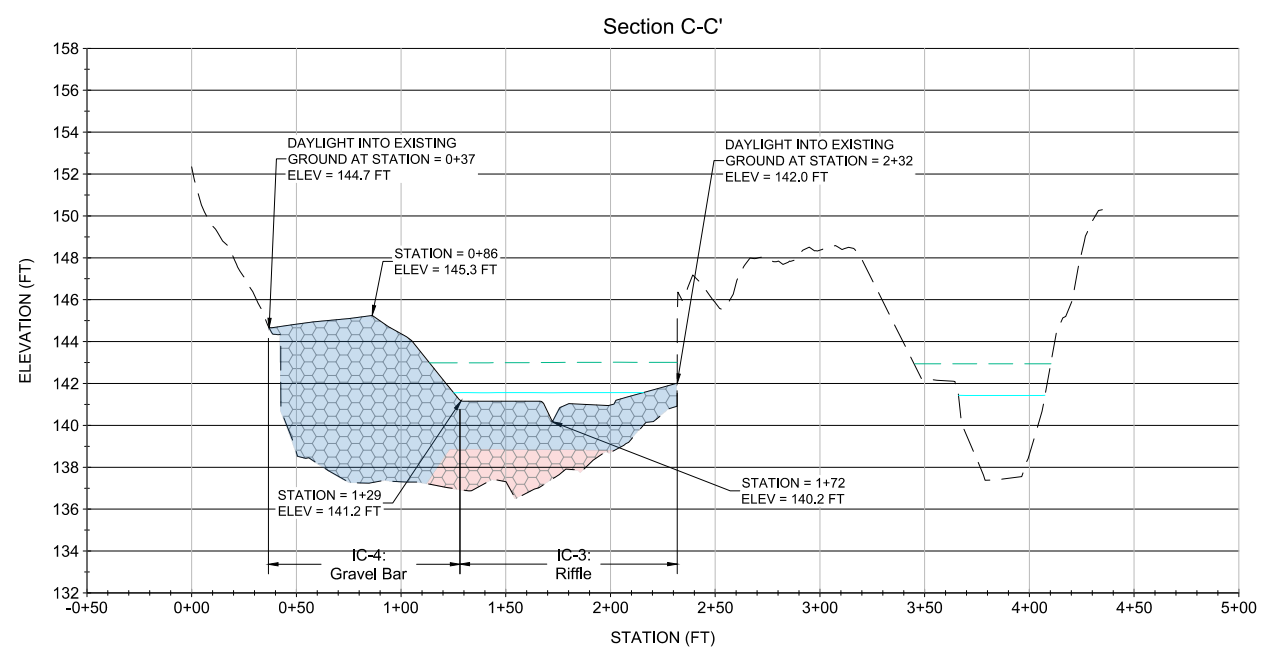
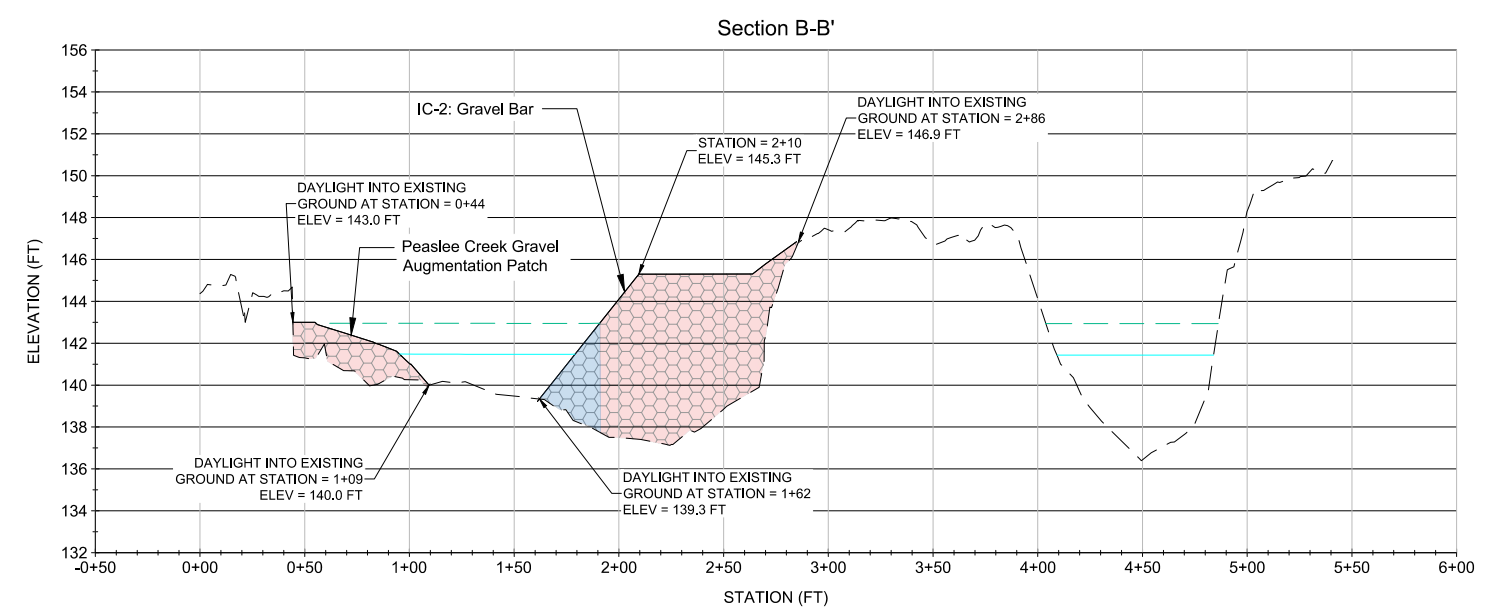
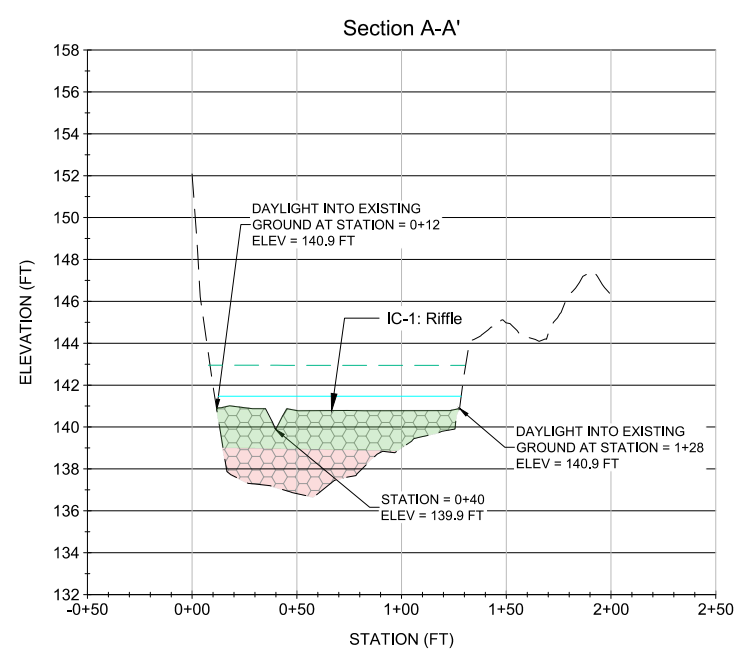


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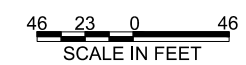
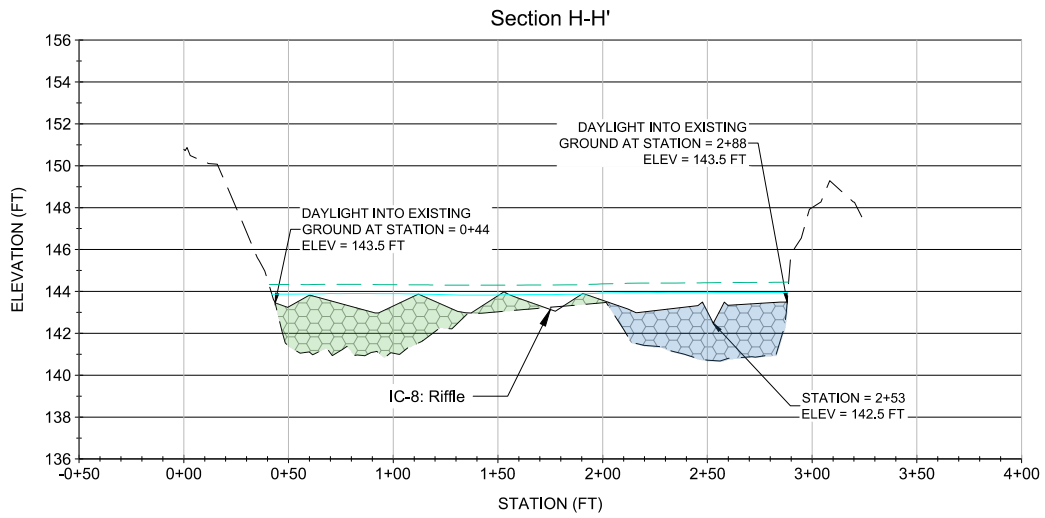
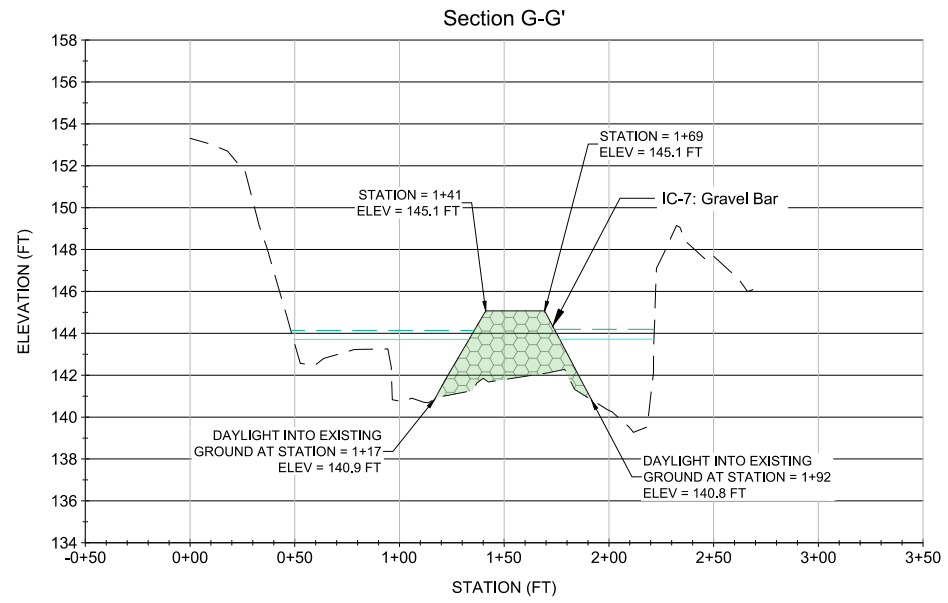
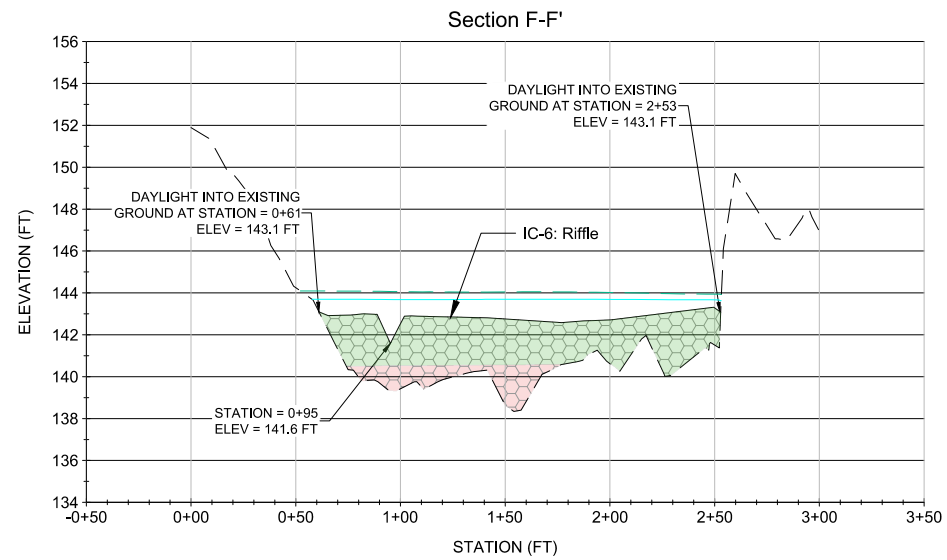
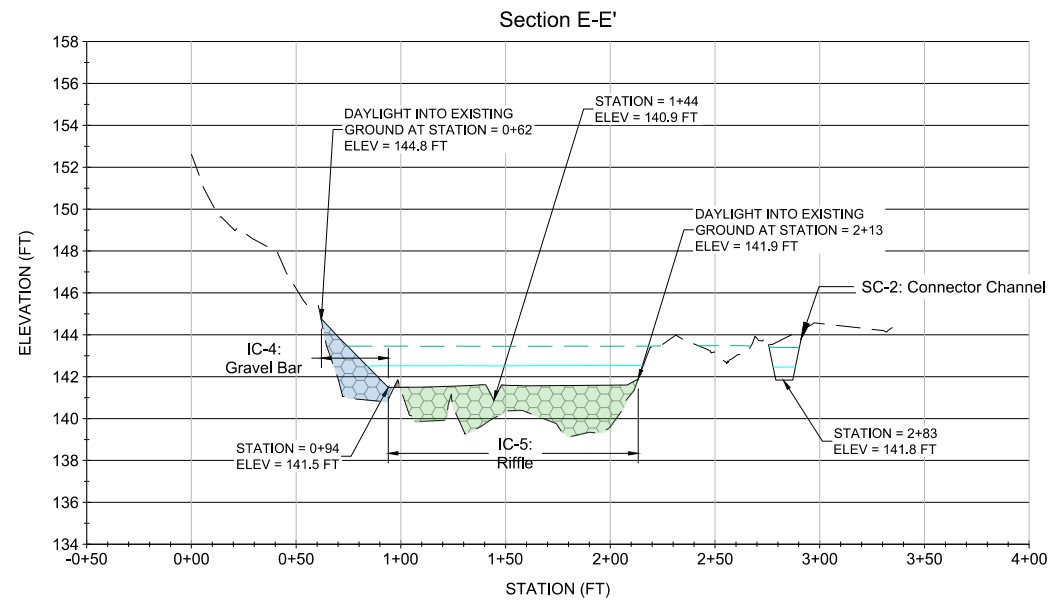
DESIGNED BY: MA and TRC DRAWN BY: N. Sabo, R. George CHECKED BY: F. Meyer, K. Harrison (P.E.) APPROVED BY: K. Harrison (P.E.) SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215 MCBAIN ASSOCIATES 860 7TH STREET ARCATA, CA 95521 (707) 826-7194	ISSUE DATE: October 31, 2023 PROJECT: Zanker Farm CONTRACT NO: FRCP 01940405-02 & 02140407 DRAWING SET: 100% Design Planset
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Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Section A-A' to D-D'

SHEET ID
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VERTICAL EXAGGERATION 10:1



VERTICAL EXAGGERATION 10:1



REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC DRAWN BY: N. Sabo, R. George CHECKED BY: F. Meyer, K. Harrison (P.E.) APPROVED BY: K. Harrison (P.E.) SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	ISSUE DATE: October 31, 2023 PROJECT: Zanker Farm CONTRACT NO.: FRCP 01940405-02 & 02140407 DRAWING SET: 100% Design Planset
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Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Section E-E' to H-H'

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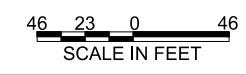
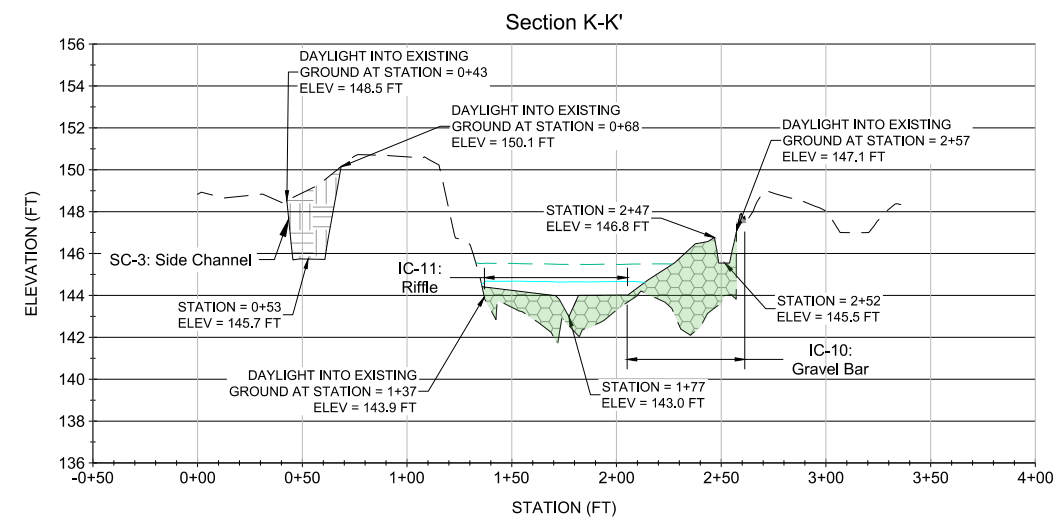
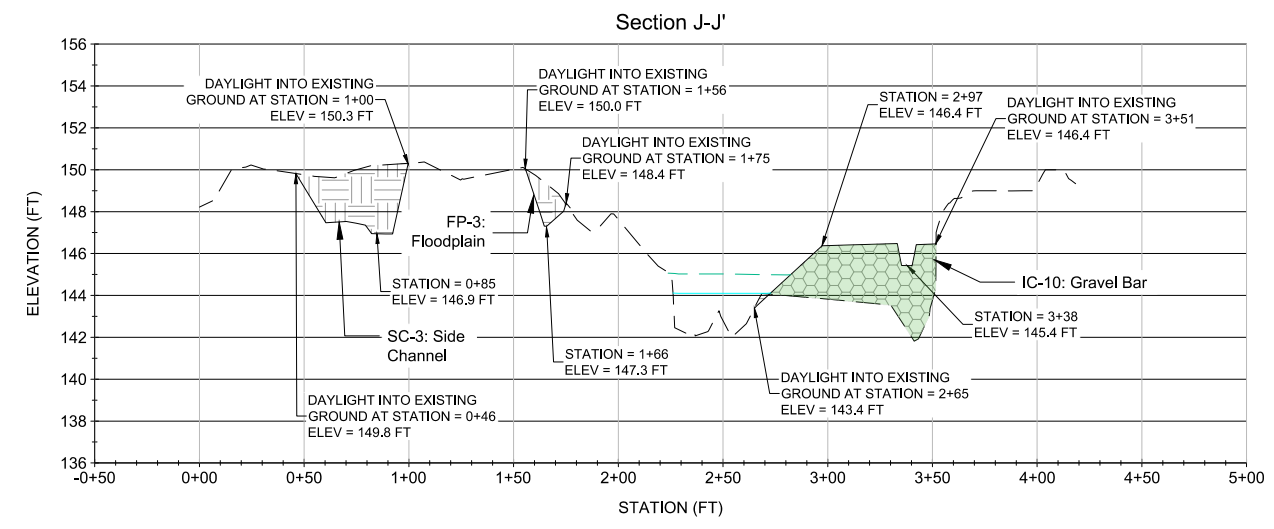
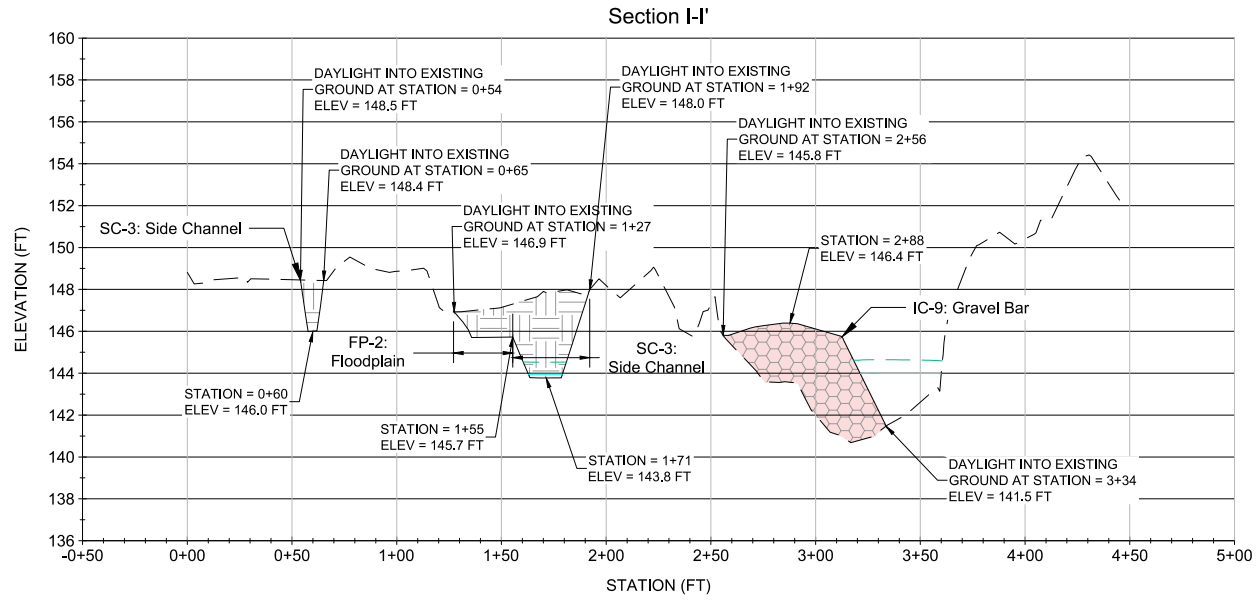


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 Phase I and II, 100% Design Plansheet
 Tuolumne River, La Grange, CA
 Section I-I' to K-K'

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VERTICAL EXAGGERATION 10:1

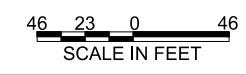
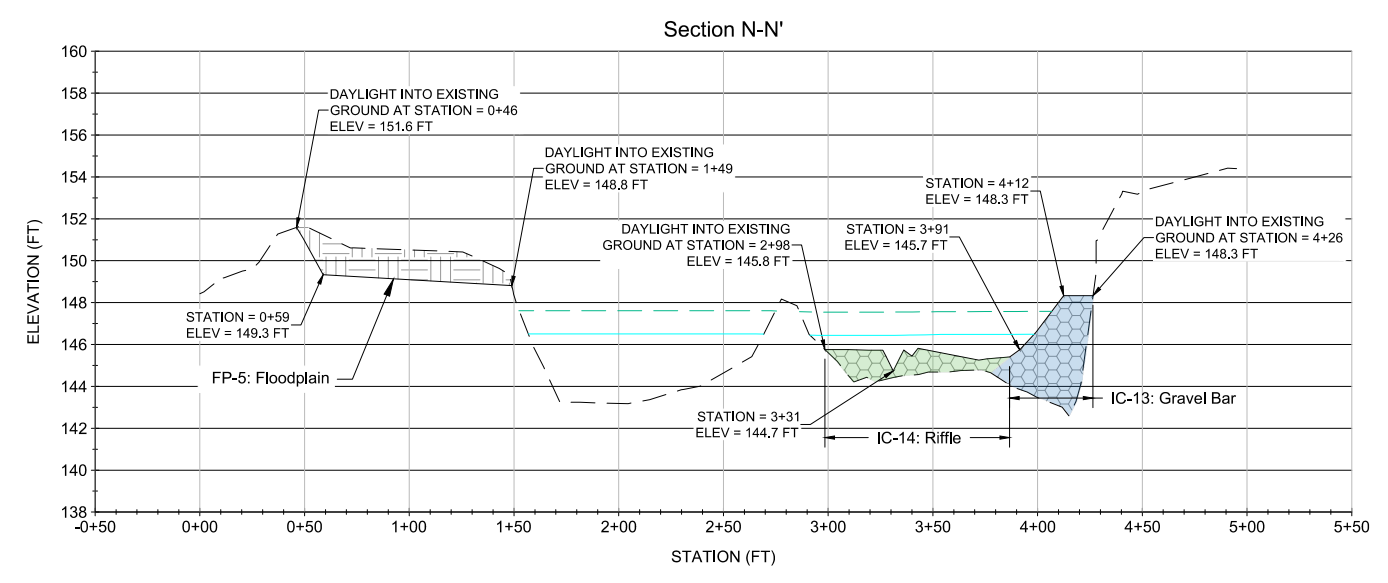
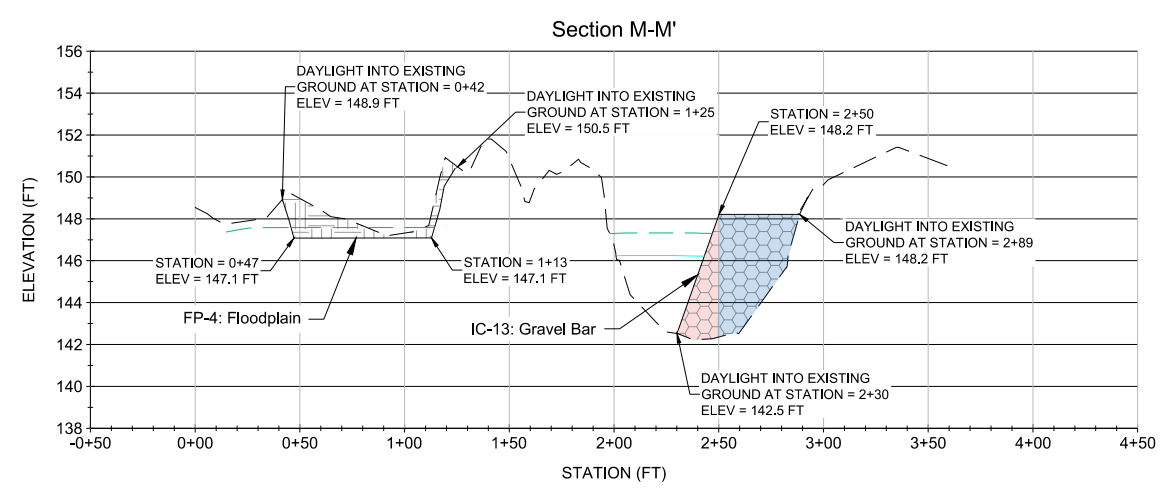
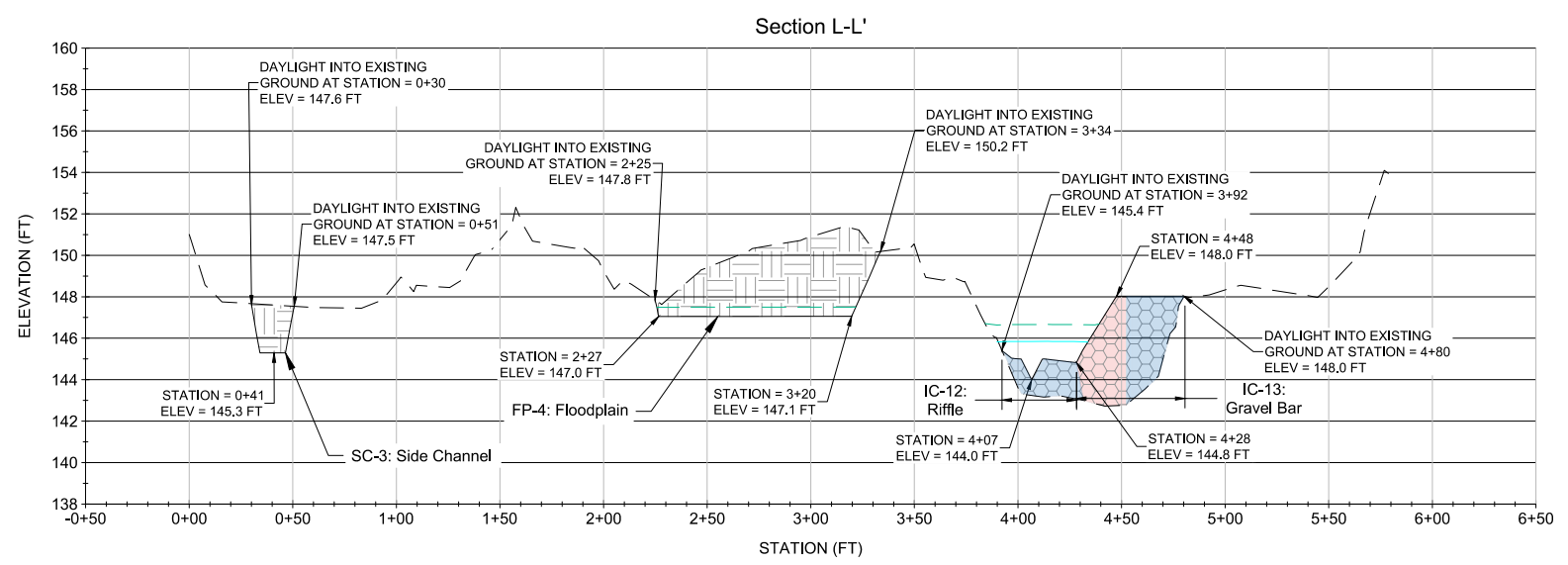


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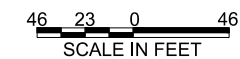
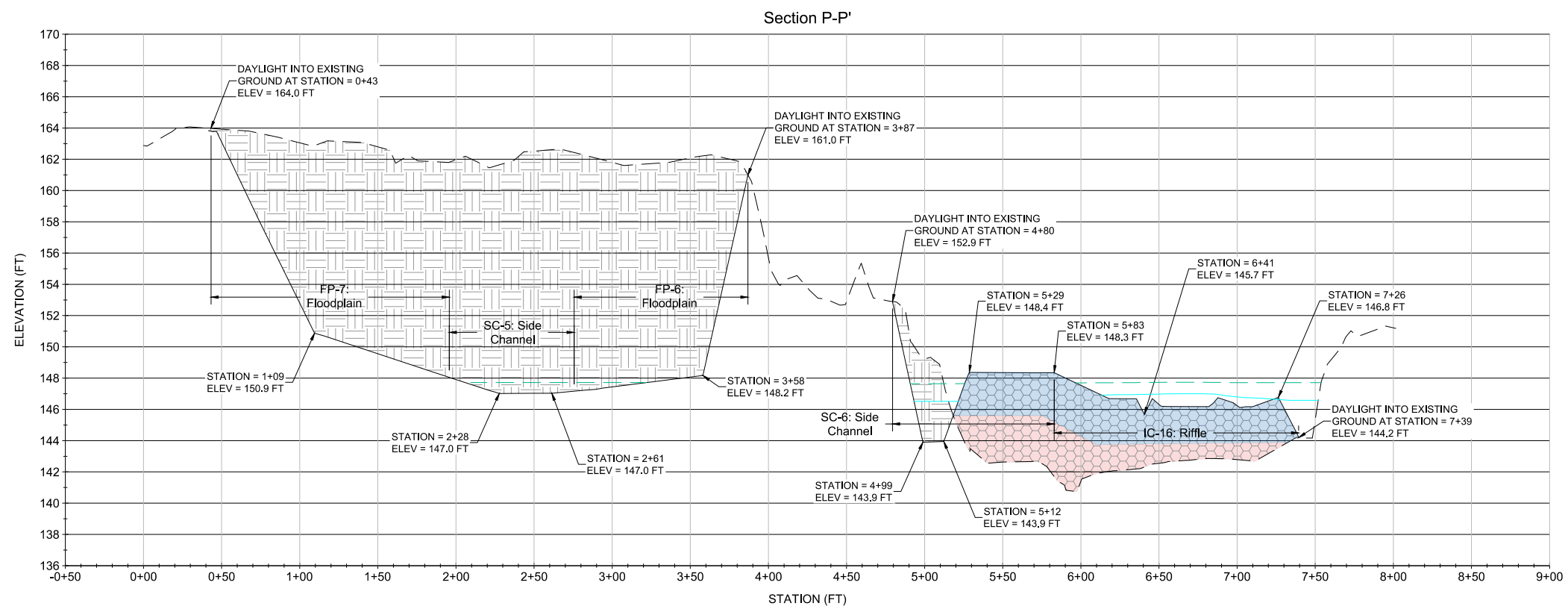
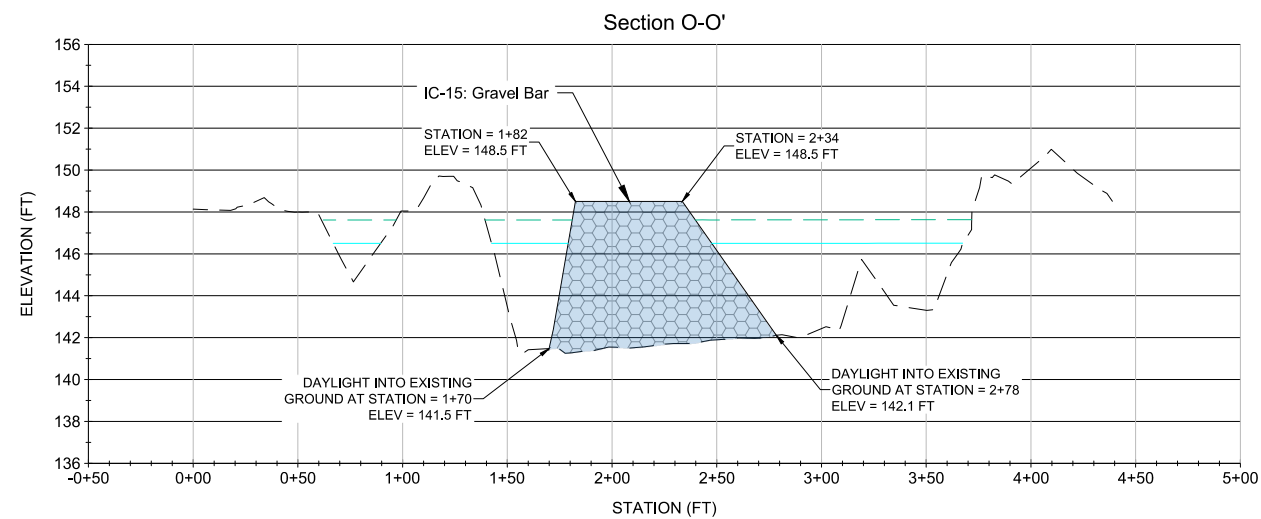
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 Tuolumne River, La Grange, CA
 Section L-L' to N-N'

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VERTICAL EXAGGERATION 10:1



VERTICAL EXAGGERATION 10:1



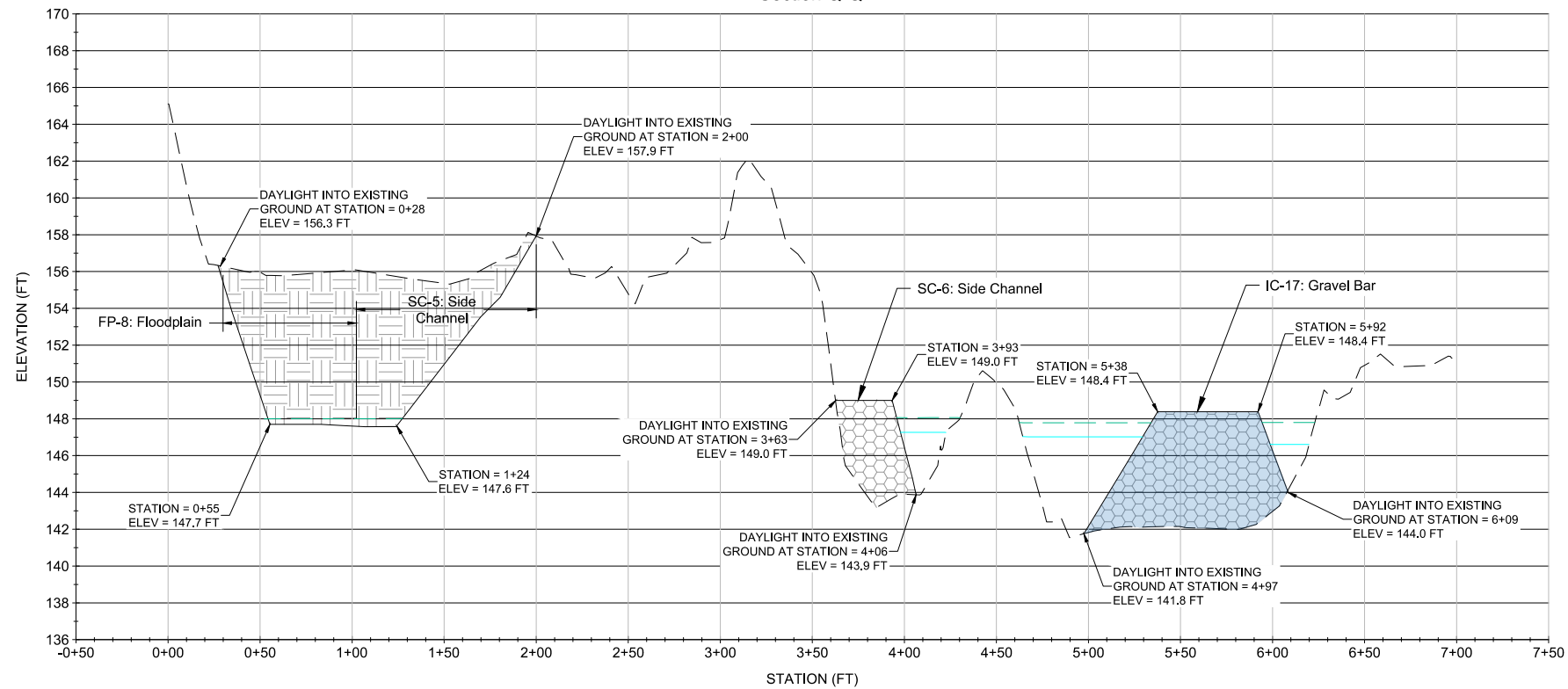
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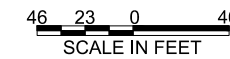
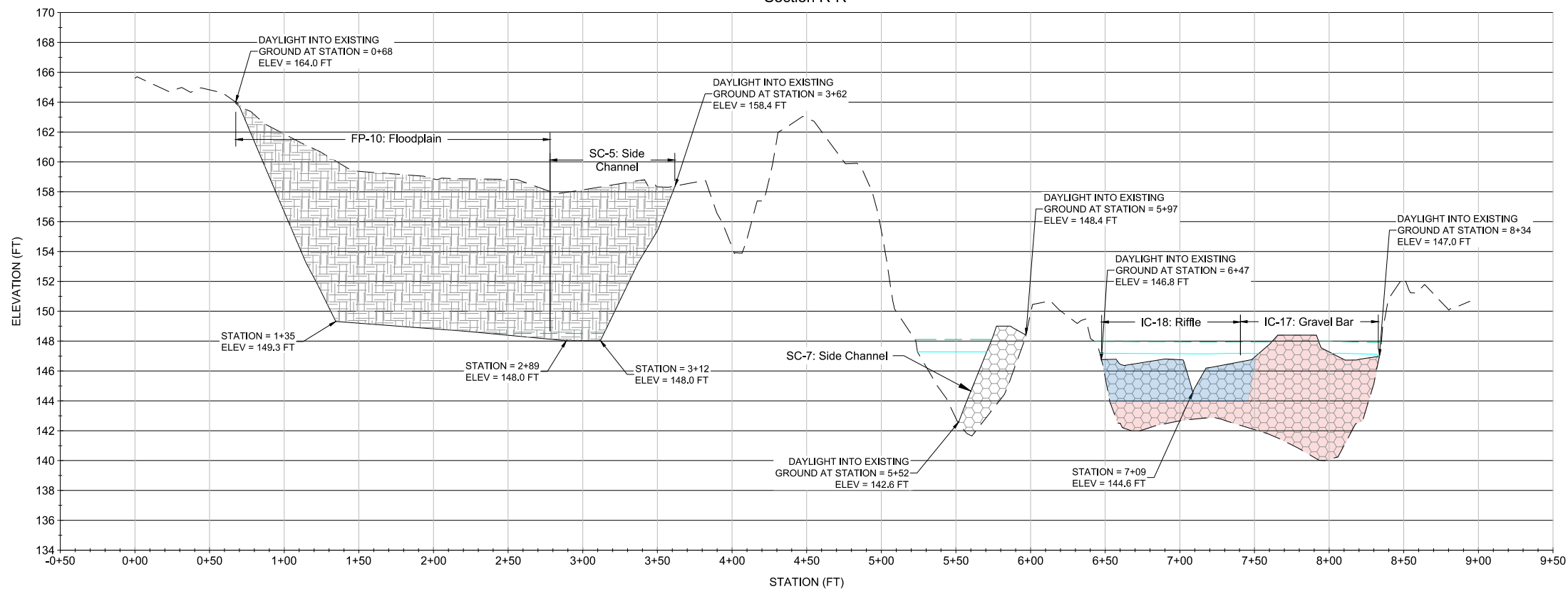
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Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
Section O-O' to P-P'

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Section Q-Q'



Section R-R'



VERTICAL EXAGGERATION 10:1



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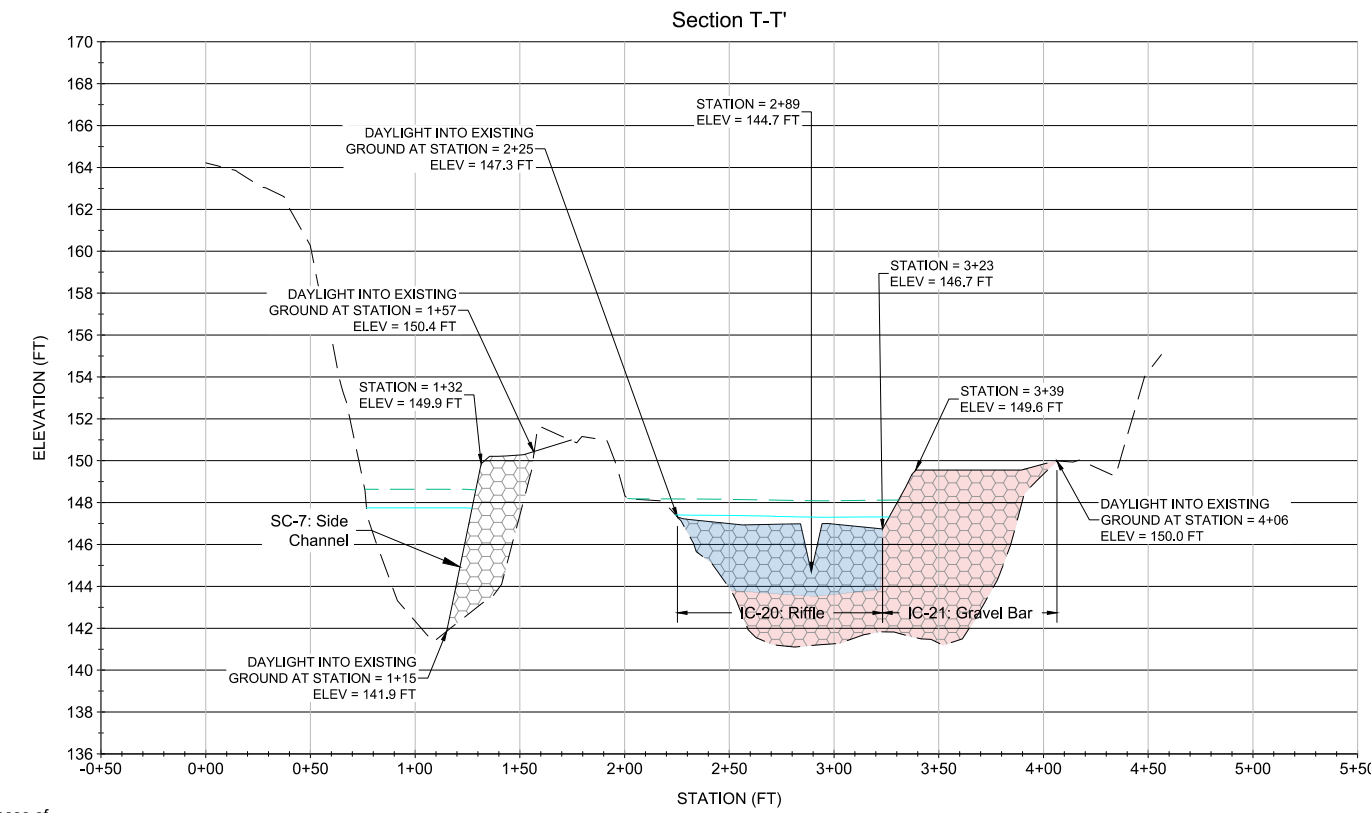
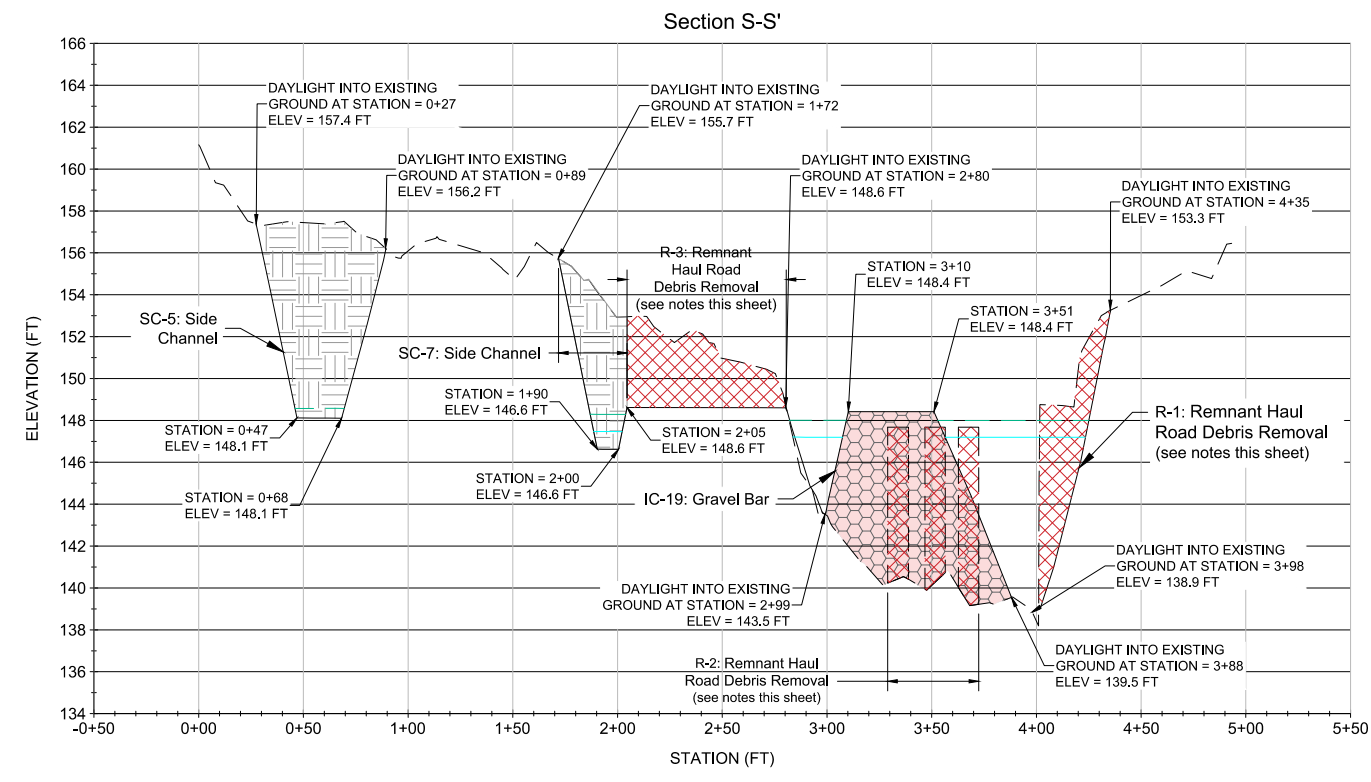
TUOLUMNE RIVER CONSERVANCY
6380 LANDMARK ROAD
STOCKTON, CA 95215

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580 7TH STREET
ARCATA, CA 95521
(707) 826-7194

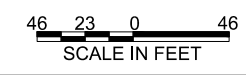
Zanker Farm Restoration Project
Phase I and II, 100% Design Plansheet
Tuolumne River, La Grange, CA
Section Q-Q' to R-R'

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G
F
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D
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- NOTES**
- It is the responsibility of the contractor to remove remnant haul road debris and properly dispose of the materials. Remnant haul road debris consists of approximately 450 feet of metal sheet pile, 23 steel I-beams within the mainstem channel, and approximately 150 cu. yd. of concrete.
 - Hatching shown in Section S-S' shows the approximate location of pilings in the mainstem channel and does not represent the exact location or scale of the pilings.



VERTICAL EXAGGERATION 10:1



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TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215	MCBAIN ASSOCIATES 860 7TH STREET ARCATA, CA 95521 (707) 826-7194

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Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Section S-S' to T-T'

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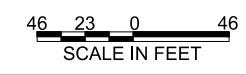
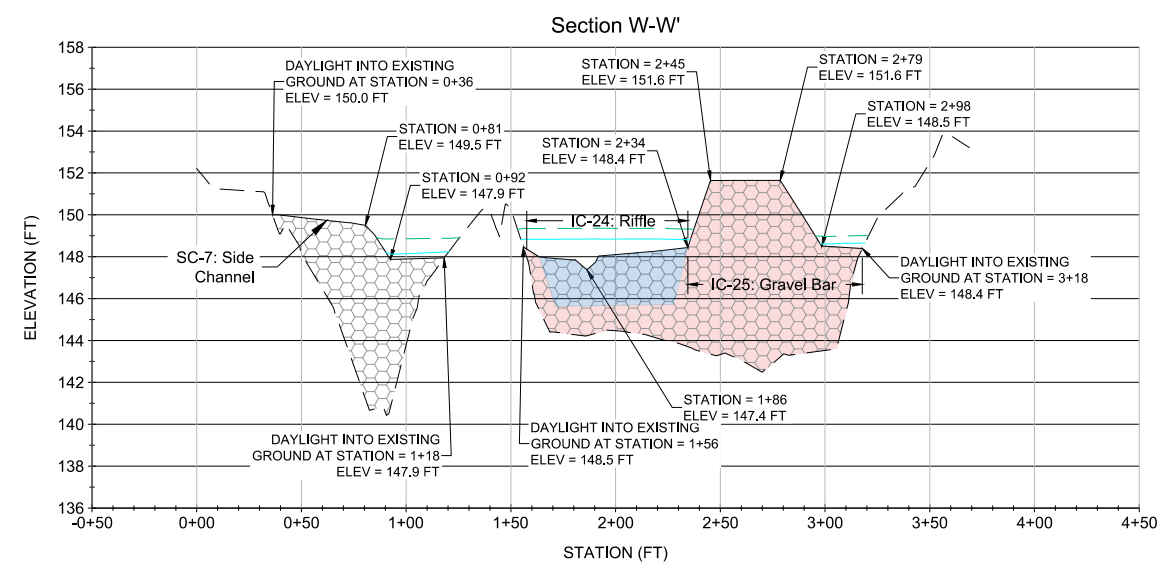
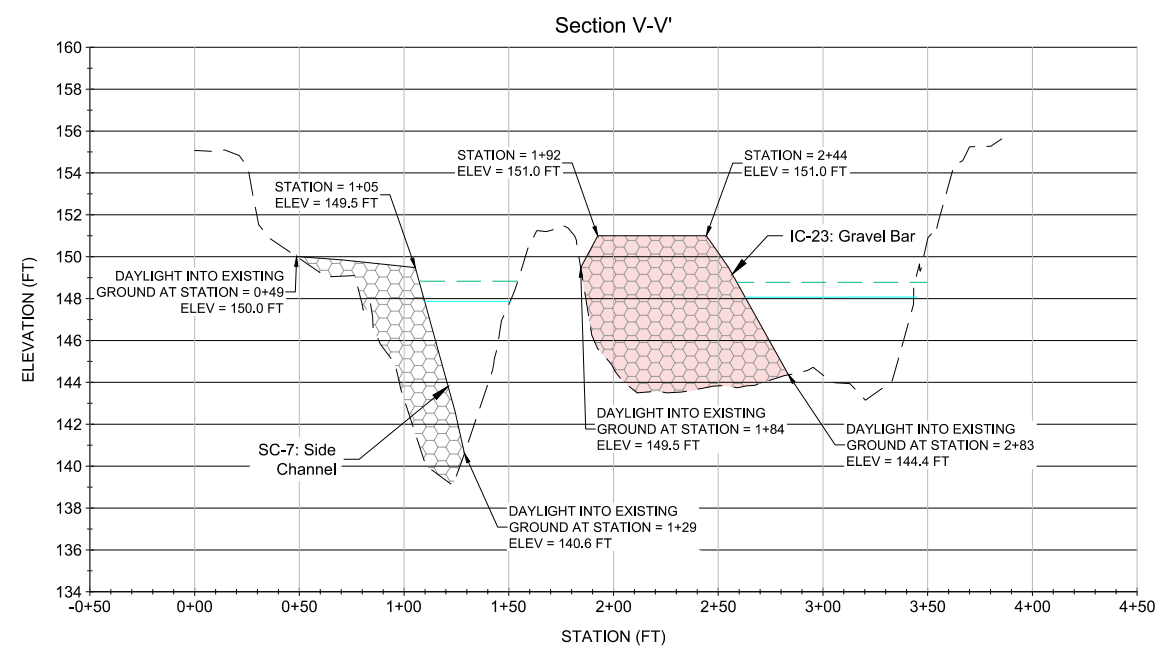
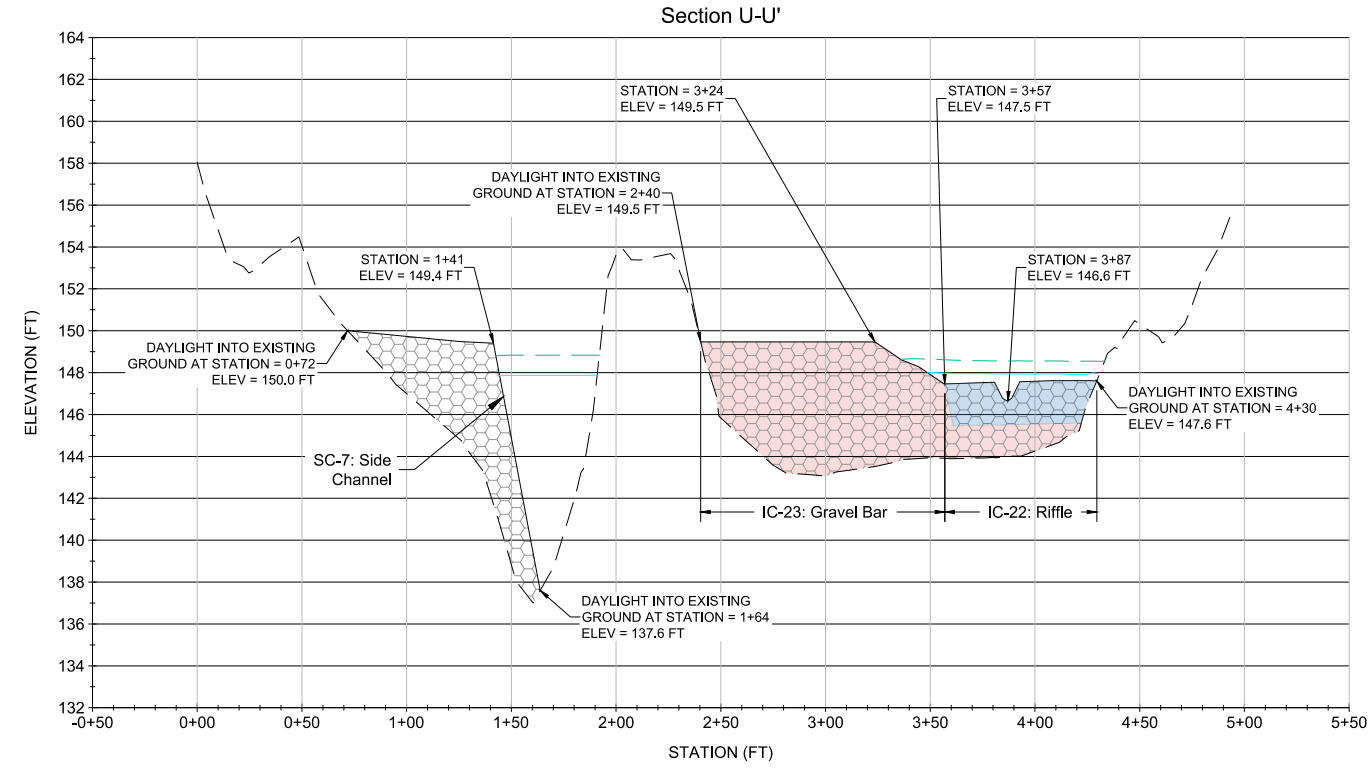


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TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215	MCBAIN ASSOCIATES 580 7TH STREET ARCADIA, CA 95521 (707) 868-7194

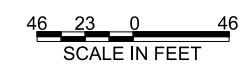
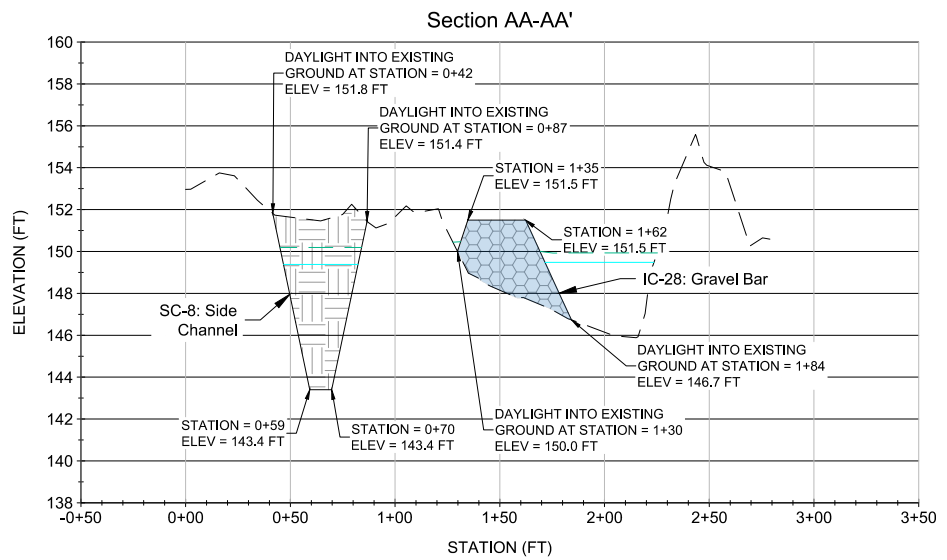
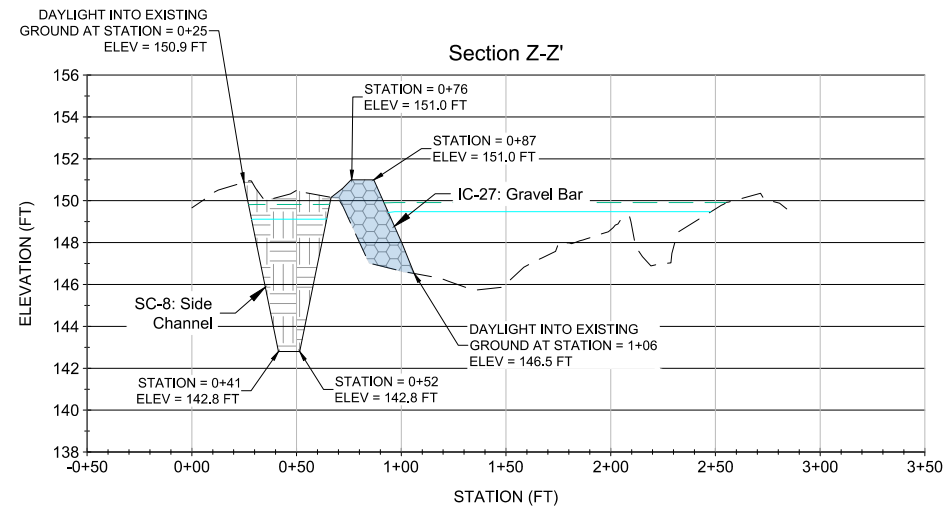
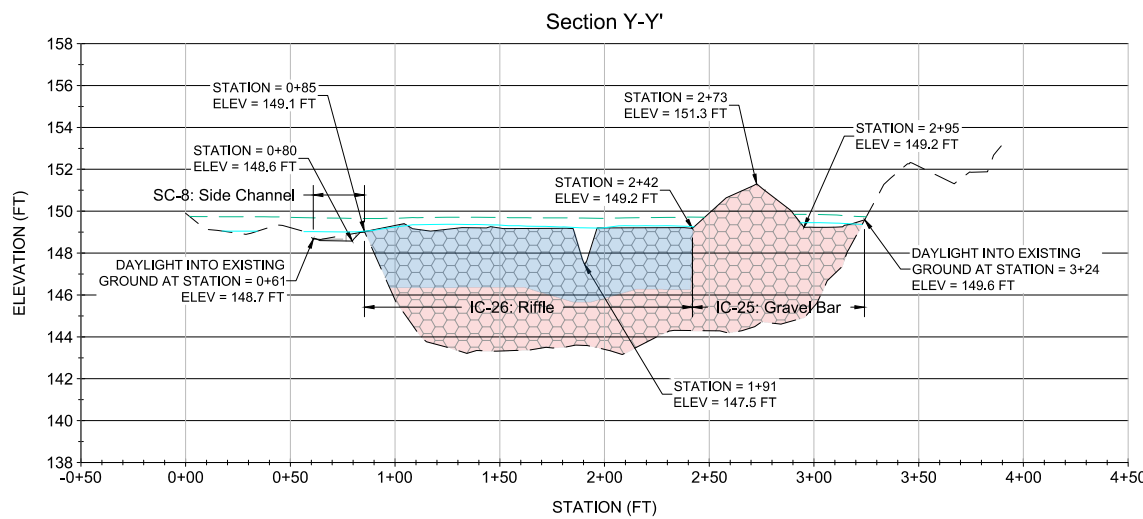
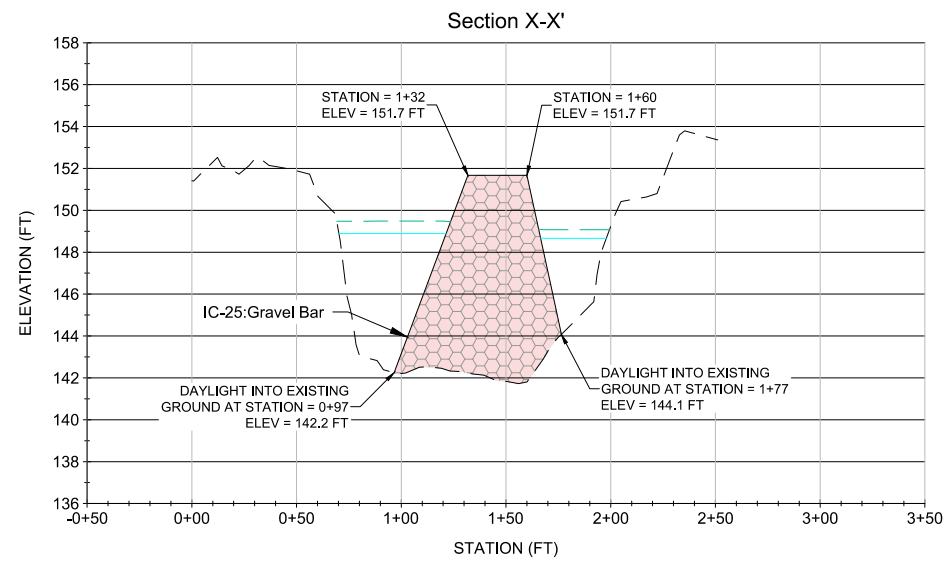
Zanker Farm Restoration Project
 Phase I and II, 100% Design Plansheet
 Tuolumne River, La Grange, CA
 Section U-U' to W-W'

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VERTICAL EXAGGERATION 10:1

G
F
E
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C
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VERTICAL EXAGGERATION 10:1



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CHECKED BY: F. Meyer, K. Harrison (P.E.)	CONTRACT NO.: FRGP 01940405-02 & 02140407
APPROVED BY: K. Harrison (P.E.)	DRAWING SET: 100% Design Planset
SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	

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6380 LANDMARK ROAD
STOCKTON, CA 95215

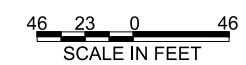
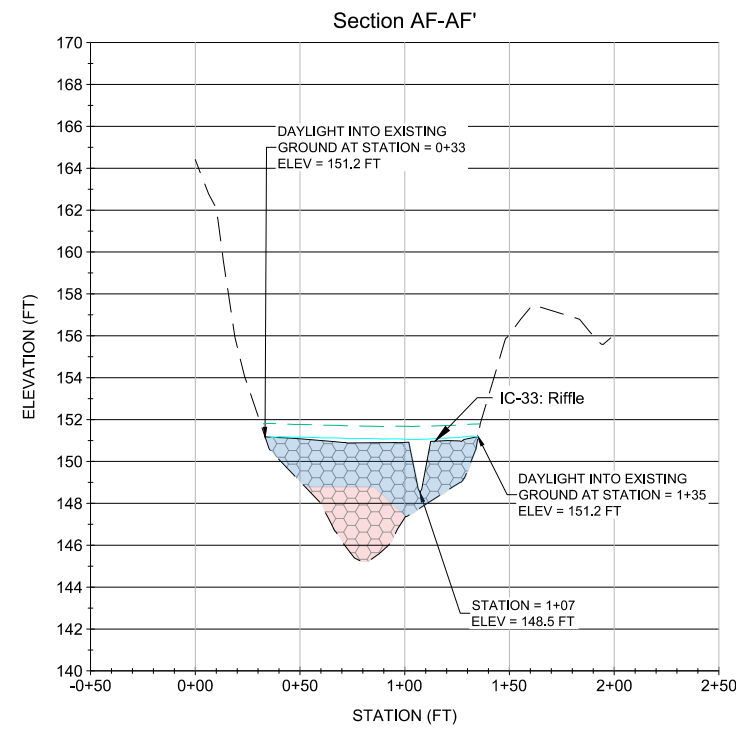
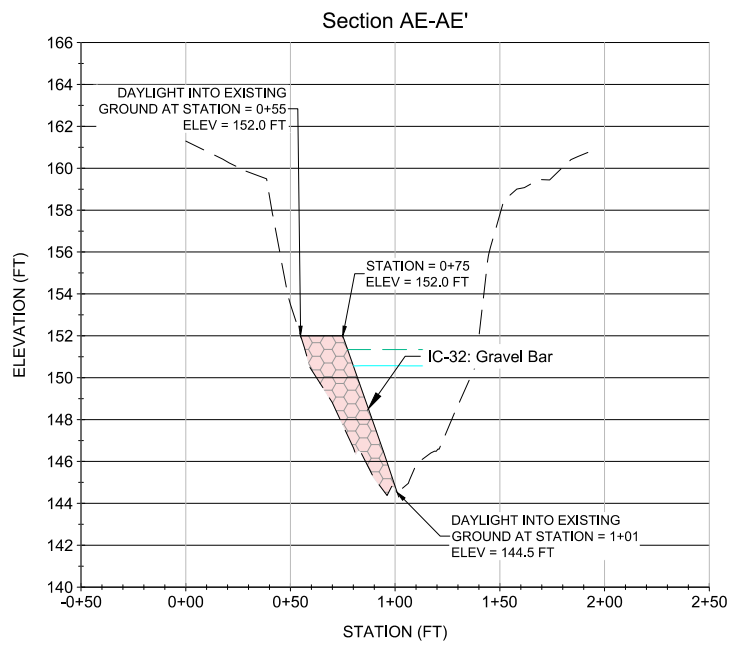
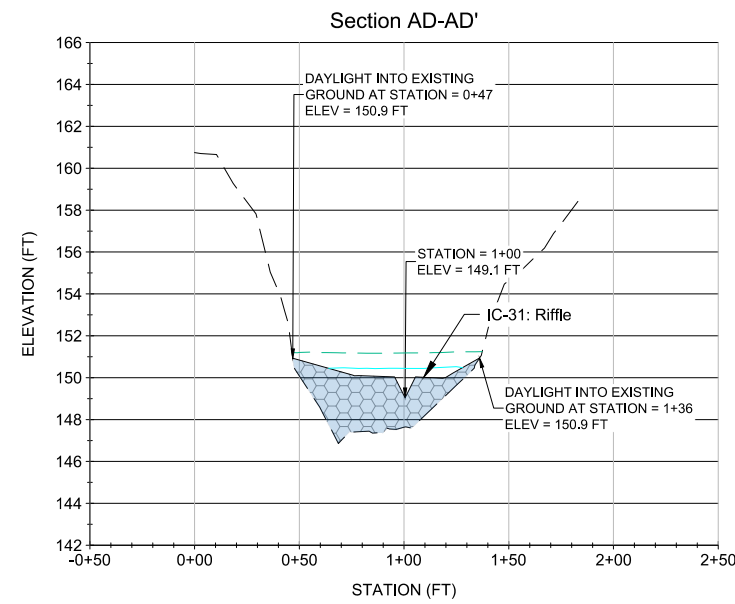
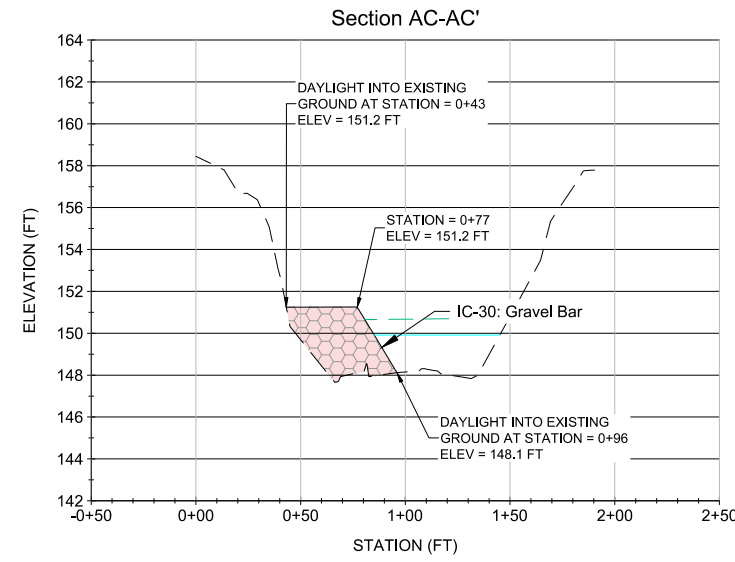
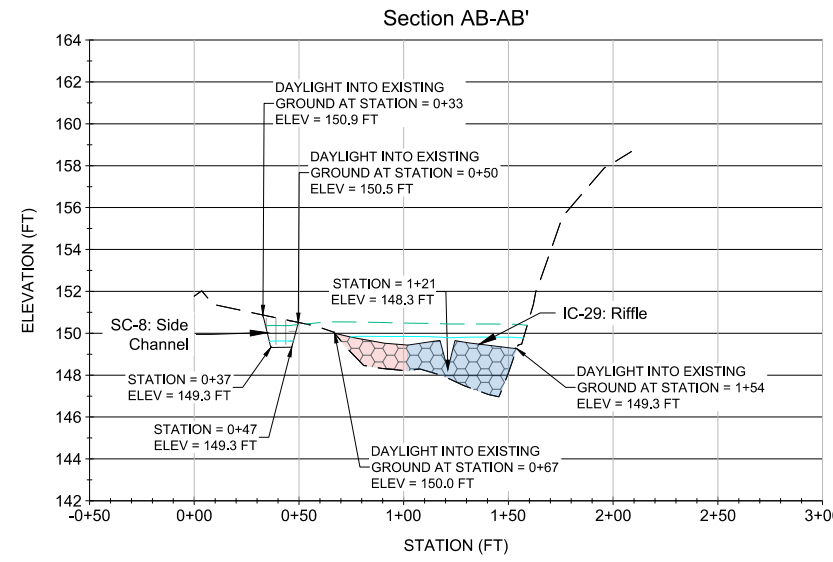
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ARCATA, CA 95521
(707) 826-7794

Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Section X-X' to AA-AA'

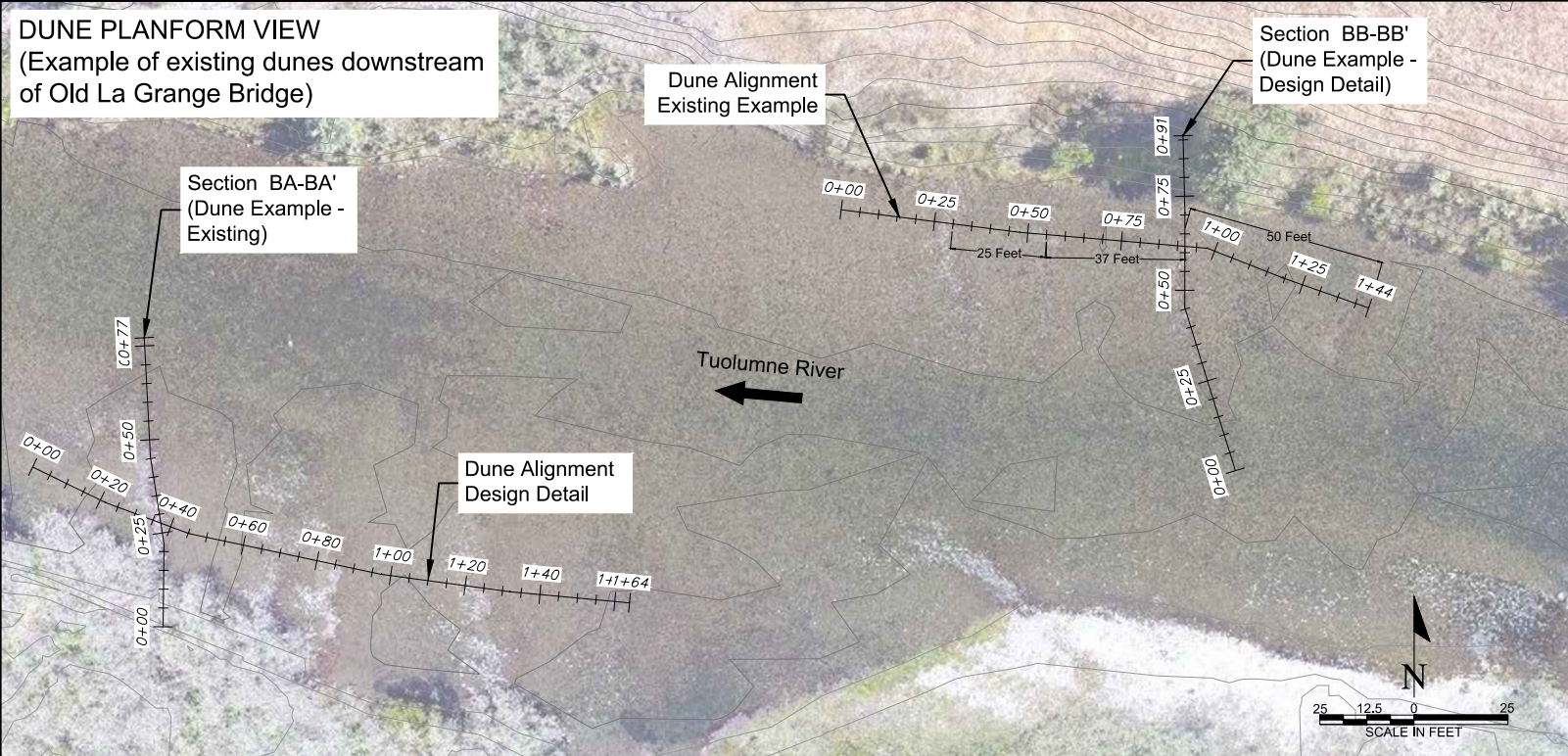
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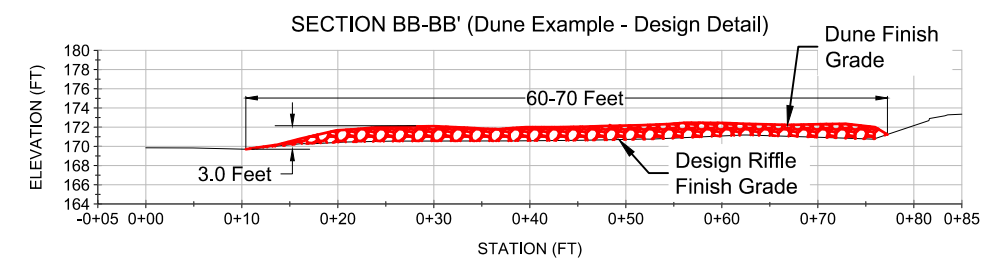
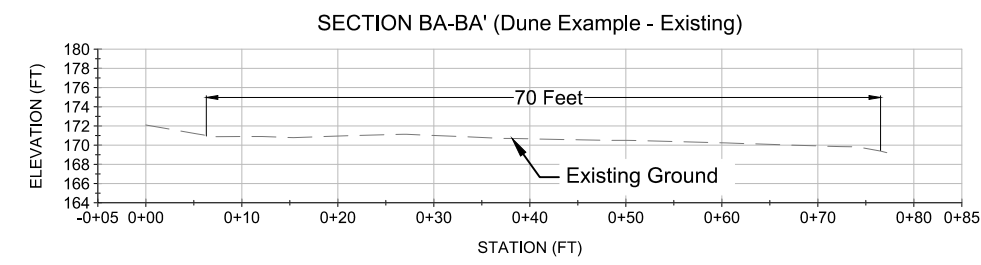
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Zanker Farm Restoration Project Phase I and II, 100% Design Planset Tuolumne River, La Grange, CA Section AB-AB' to AF-AF'		
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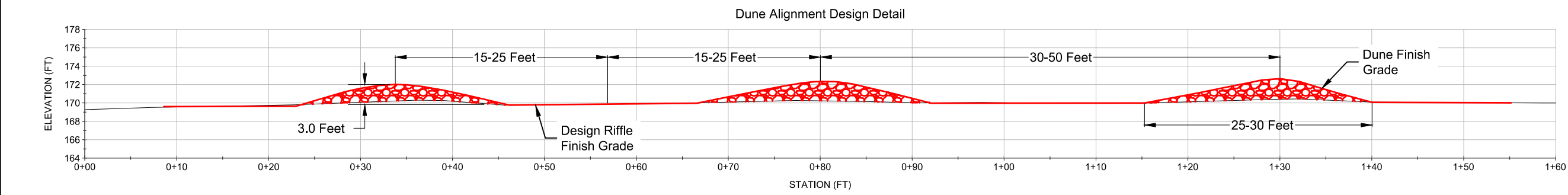
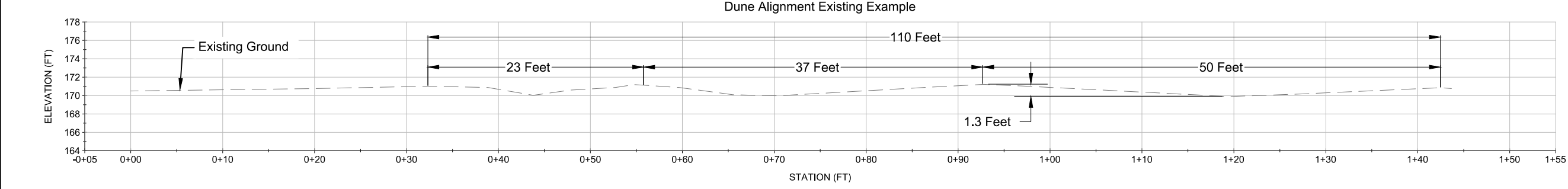
VERTICAL EXAGGERATION 10:1



DUNE SECTION DETAIL



DUNE ALIGNMENT DETAIL



DUNE CONSTRUCTION NOTES

1. Construct riffle to finish grade per grading plan.
2. Dunes shown on the plans represent a general shape, but the intent is that slopes, grade breaks, etc. be graded to natural flowing shapes that smoothly transition. Engineer of Record or authorized designee shall oversee construction of dunes.
3. Add coarse sediment (see specification for coarse sediment) extending from right or left bank out 60-70 feet perpendicular to flow (Section BB, this sheet).
 - 3.1. Dunes should not extend from right to left bank (e.g. across the entire river).
 - 3.2. Dunes should not exceed 50% of the total low flow channel width at 300 cfs.
4. Continue to add coarse sediment to dune until approximately 3.0 feet high and 25-30 feet wide. Note: Individual dunes may vary in height and width.
5. Space dunes 30-50 feet from peak to peak.
6. Add dunes in groups of 3-4 dunes per riffle.
7. Coarse sediment needed to construct 3-4 dunes ranges between 50 and 75 cubic yards.

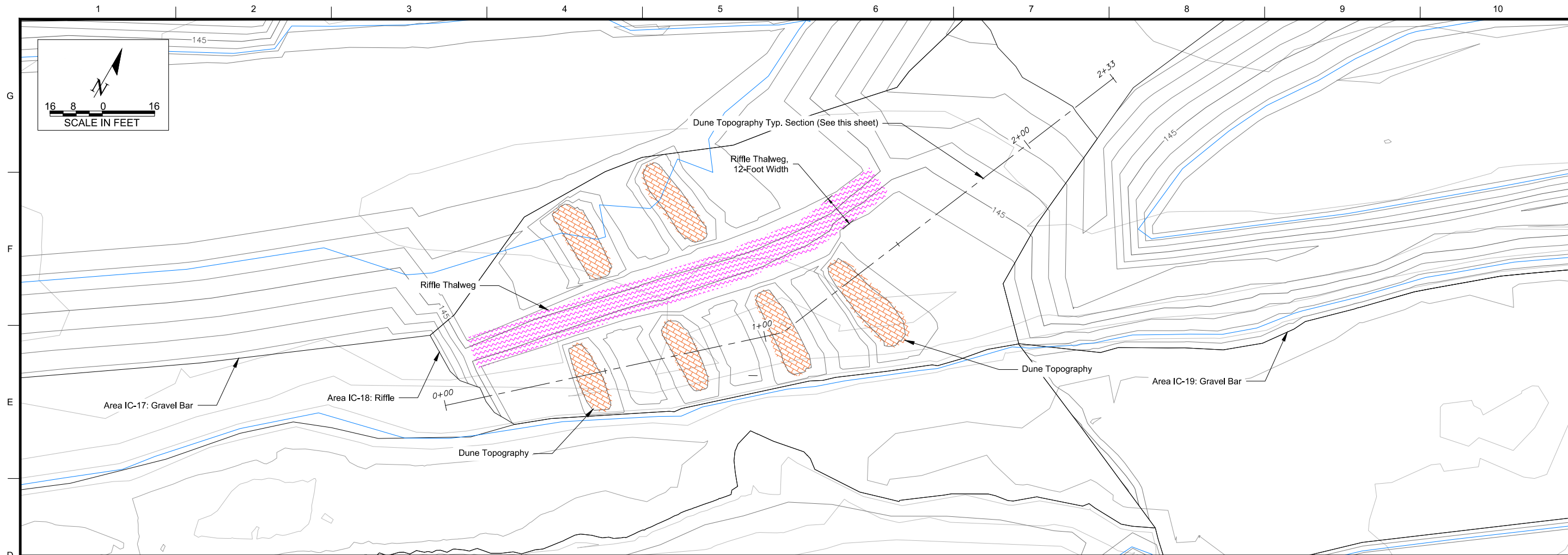


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Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Dune Topography Typical Detail
Planform, Section, and Profile

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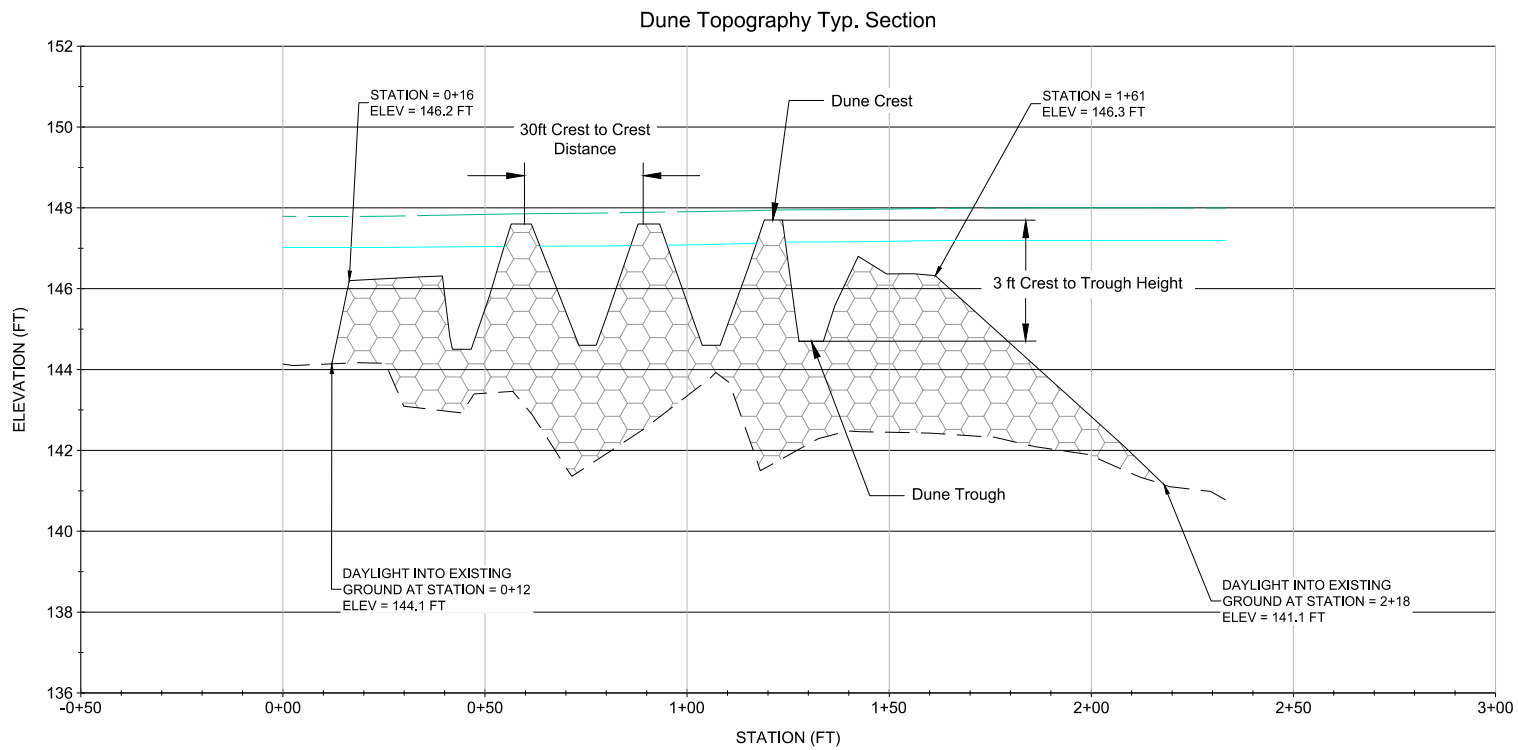


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 Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
Dune Topography Typical Detail and Section

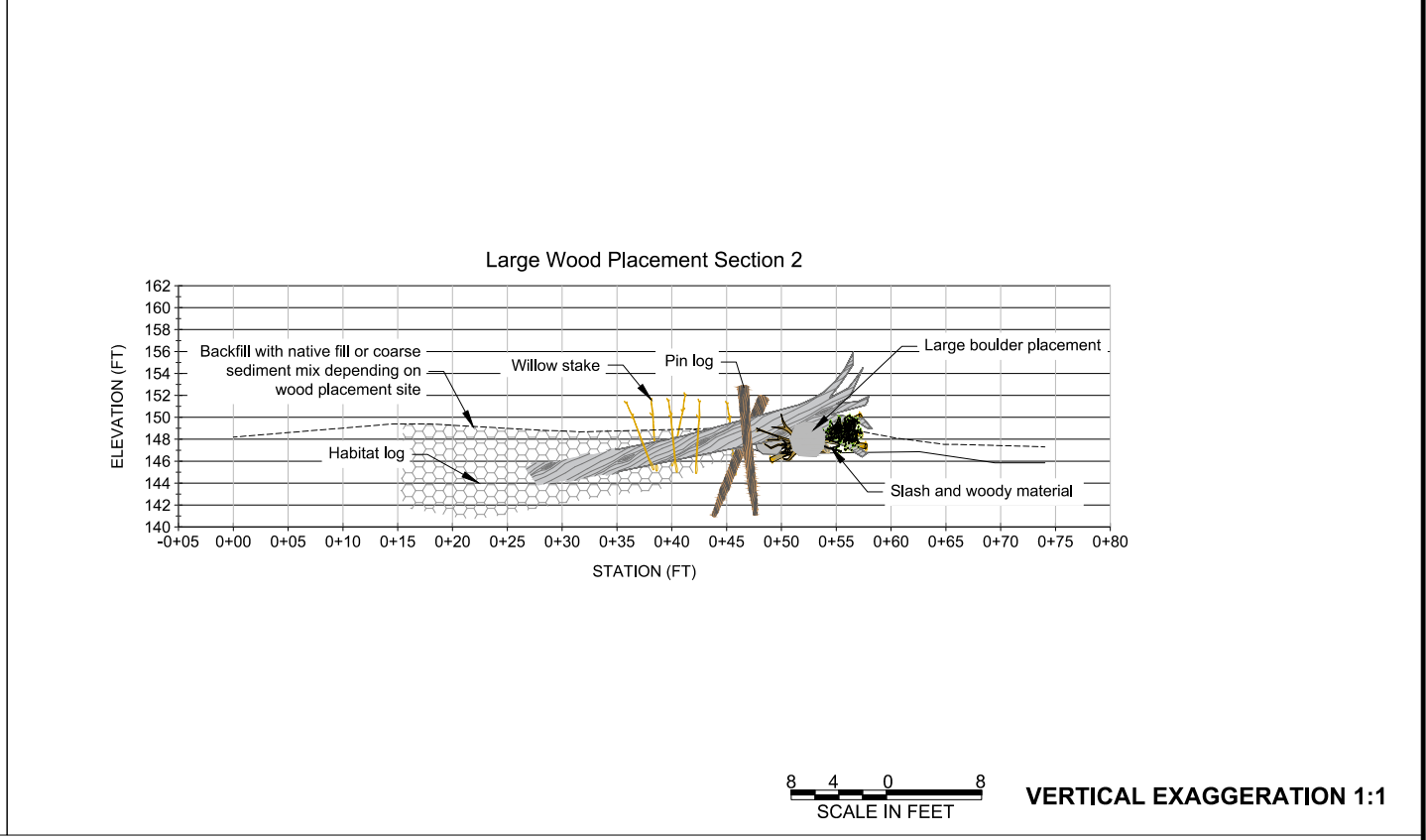
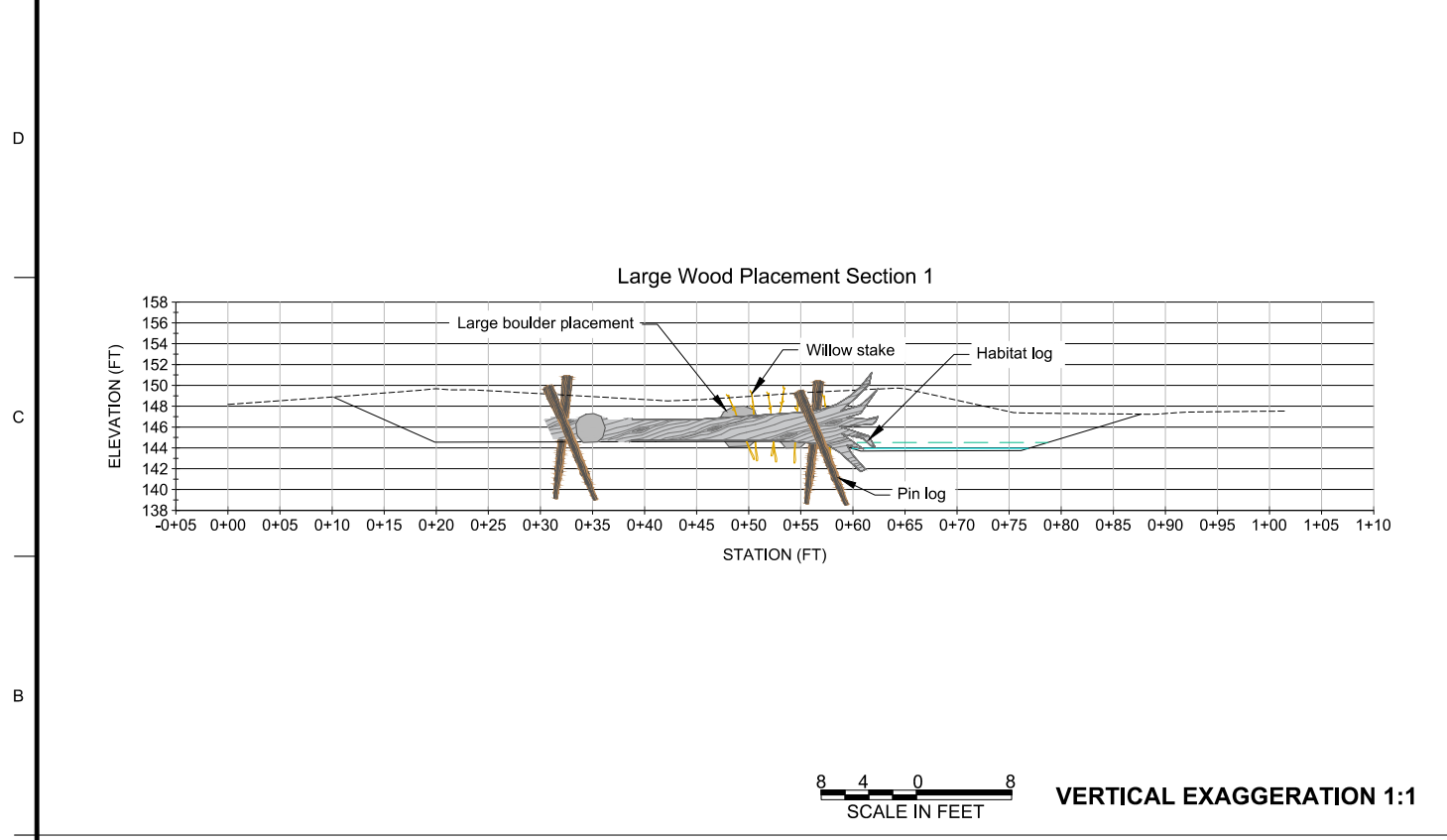
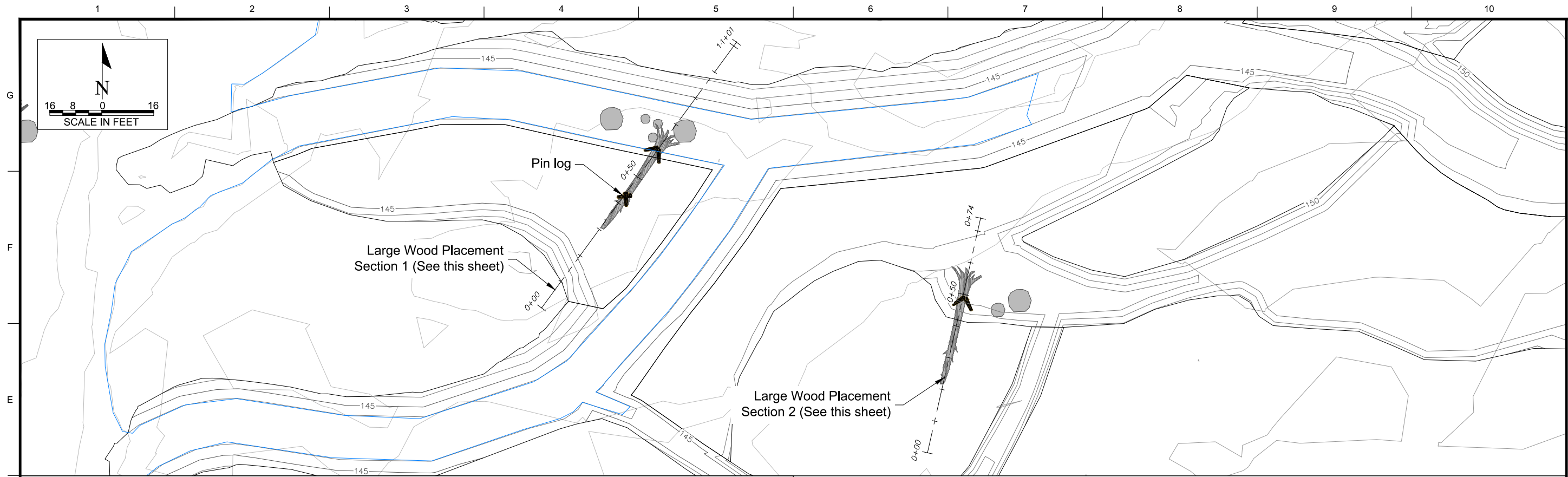
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24 12 0 24
 SCALE IN FEET

VERTICAL EXAGGERATION 10:1

- NOTES
- All design riffles shall be constructed using spawning gravel mix (either standard or finer mix from the Coarse Sediment Management Plan, see Sheet C-2) in accordance with the coarse sediment tables shown in these plans on Sheet C-4 to Sheet C-9.
 - The surface layer of all design riffles shall be comprised purely of spawning gravel, with a minimum layer thickness of two feet.
 - Approximately $\frac{1}{2}$ to $\frac{2}{3}$ of the bottom (subsurface) layer of all design riffles shall be comprised of an oversized mix, in which large (greater than six-inch) rock is combined with the appropriate spawning gravel mix to provide a structural component.
 - The structural subsurface layer of a given design riffle may be less than $\frac{1}{2}$ of the total riffle height if necessary to ensure that the top spawning gravel layer is at least two feet thick.



- WOOD PLACEMENT NOTES**
1. Placement of large wood habitat features will be directed by Engineer of Record or representative.
 2. Actual quantities and orientations of habitat logs, pin logs, and boulder ballast will vary by site and conditions encountered in the field.
 3. For details on determining the necessary burial depth and burial length of wood placements as well as quantities of pin logs and boulders required for stability, see Sheet C-27.
 4. For more information relating to the wood stability analysis, see the 100% Design Report.

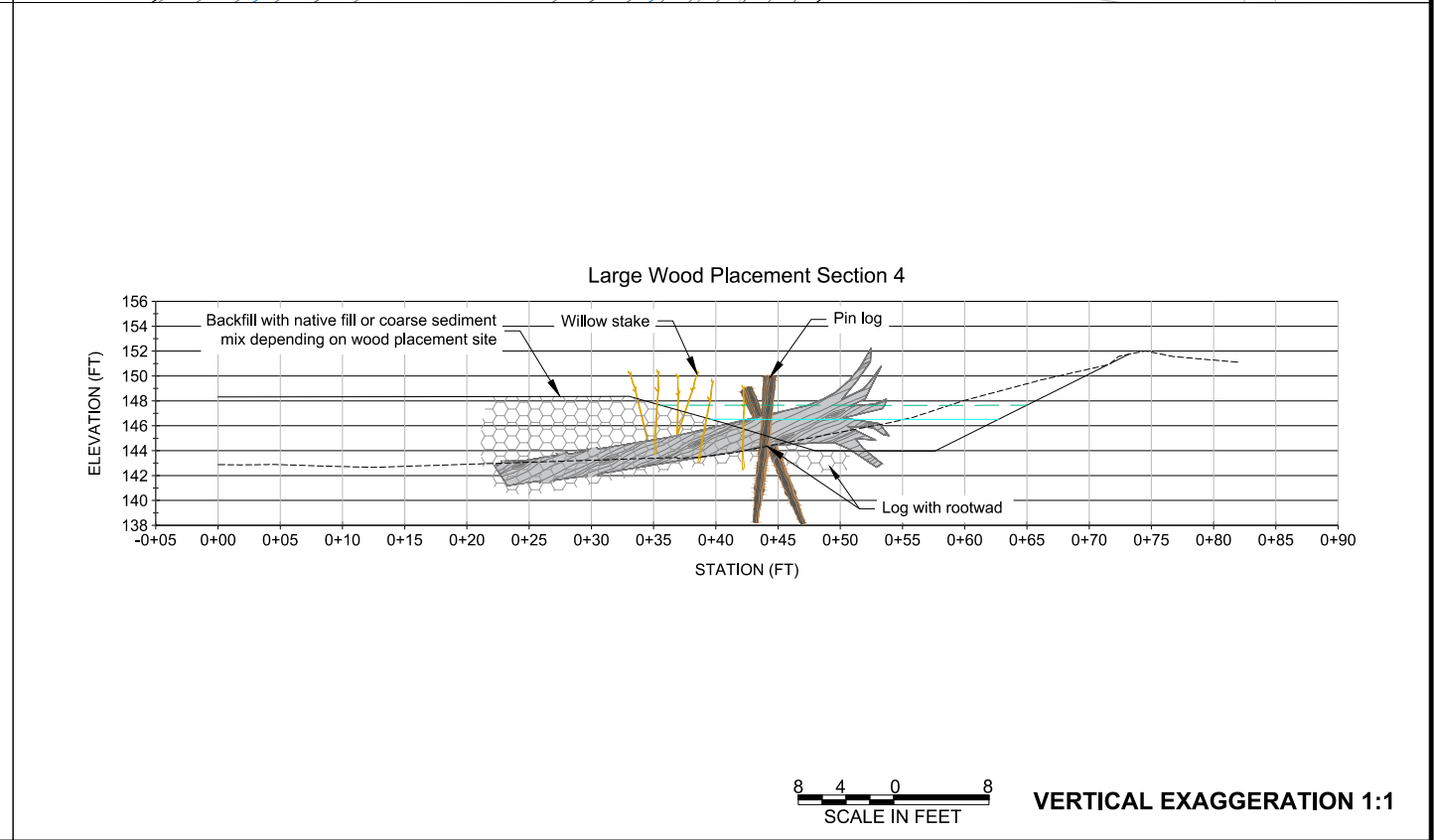
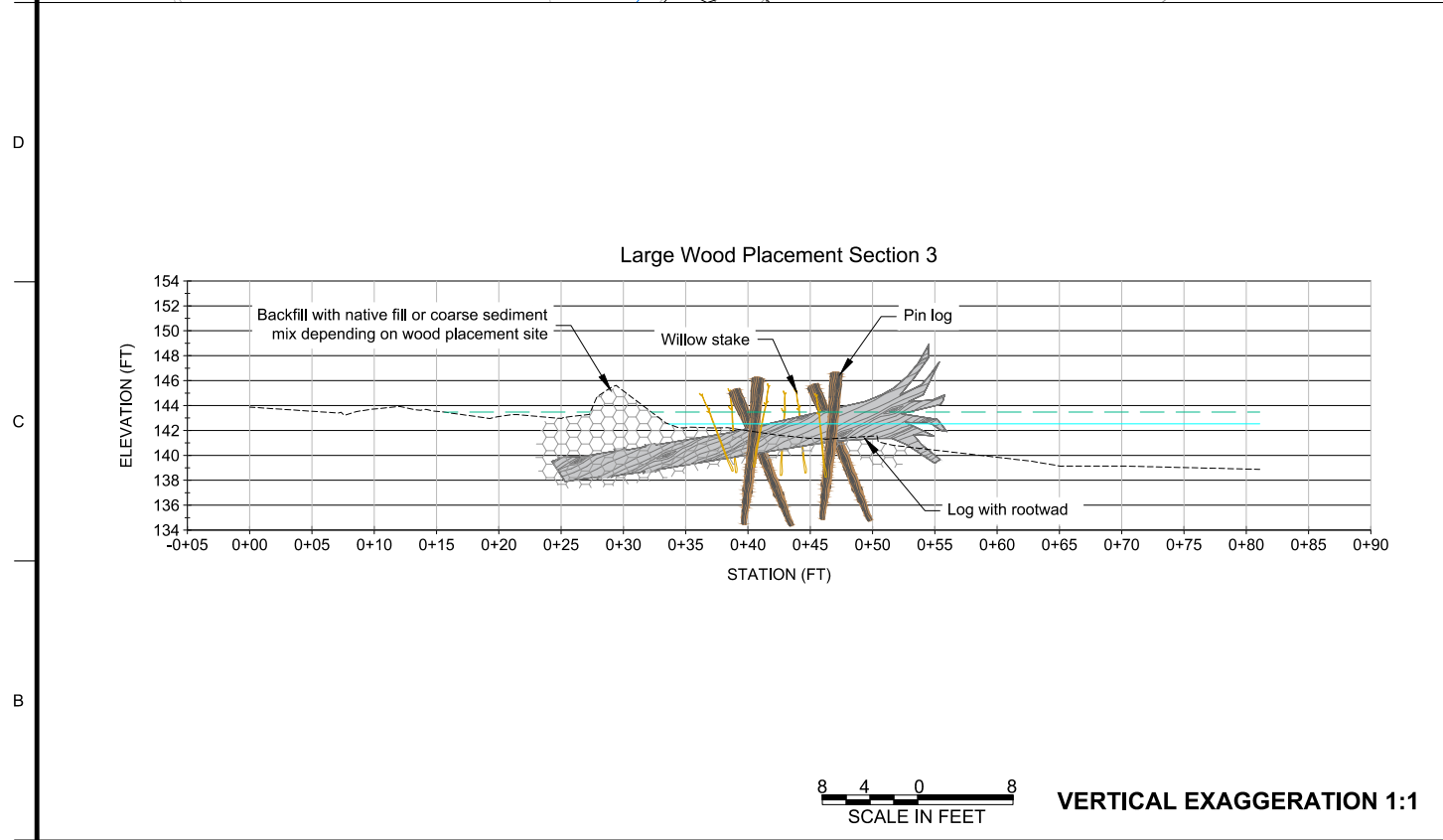
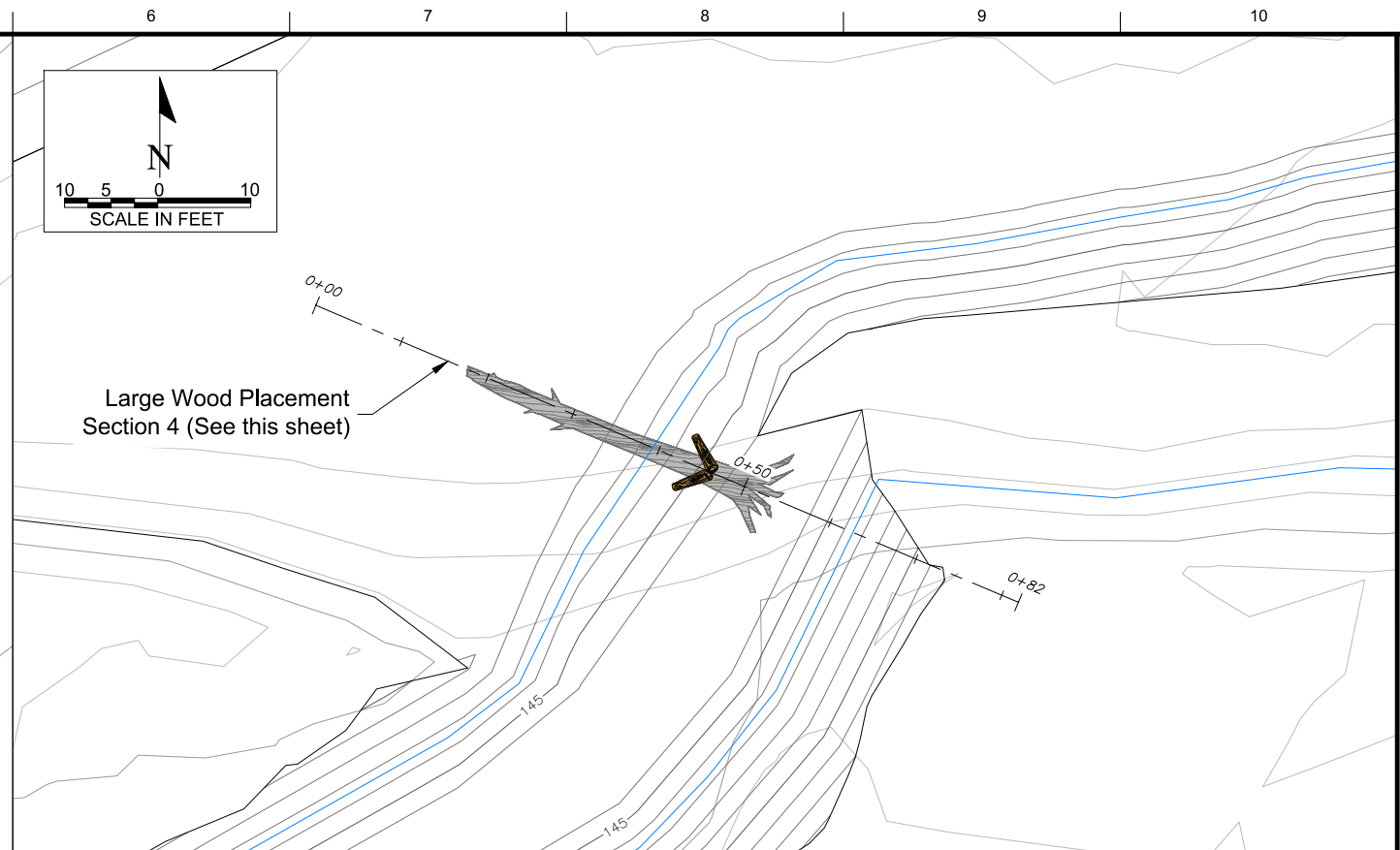
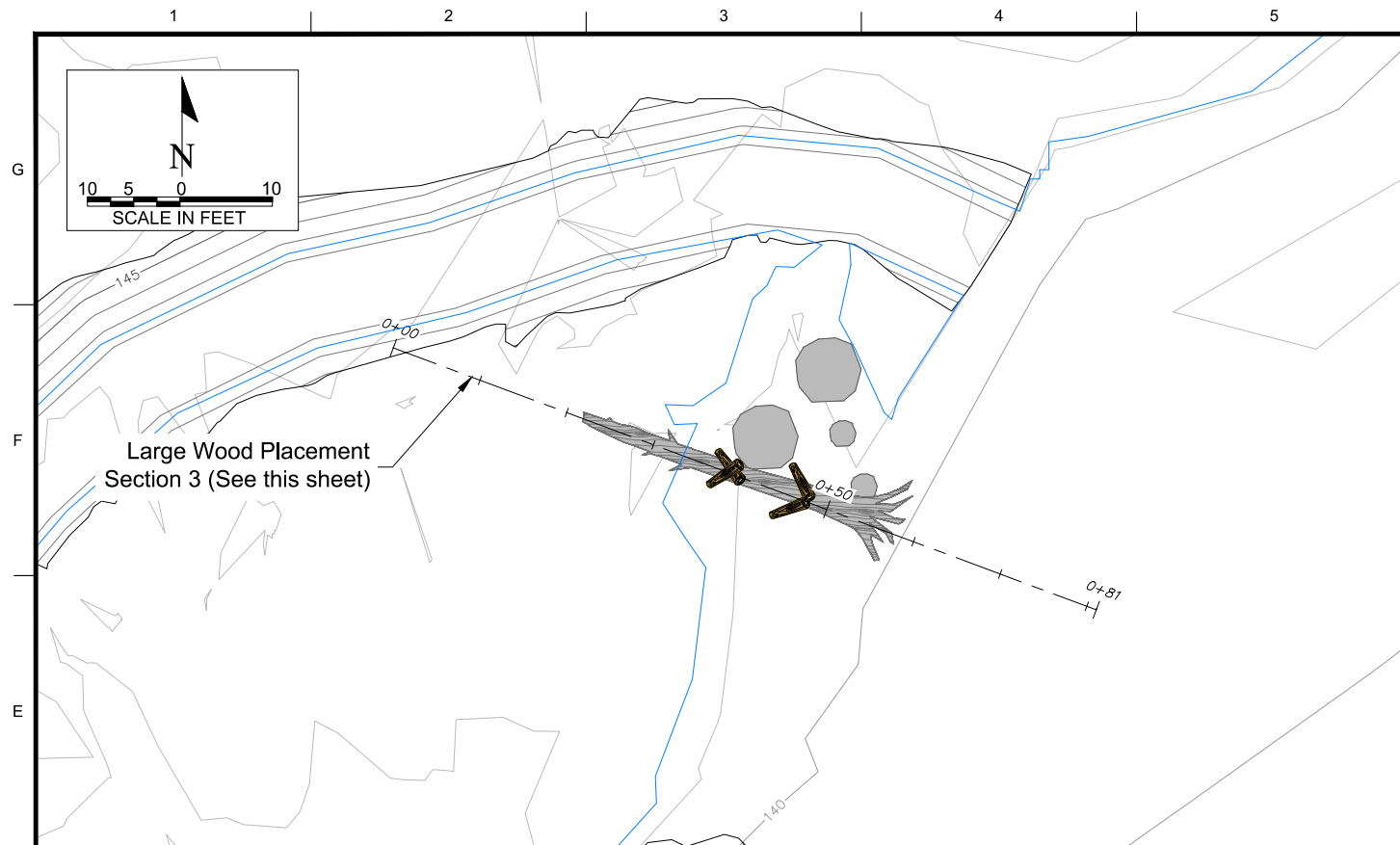


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Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Large Wood Detail

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- WOOD PLACEMENT NOTES**
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 3. For details on determining the necessary burial depth and burial length of wood placements as well as quantities of pin logs and boulders required for stability, see Sheet C-27.
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McBain Associates
APPLIED RIVER SCIENCE

REV	DATE	DESCRIPTION

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<p>TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215</p>	<p>MCBAIN ASSOCIATES 580 7TH STREET ARCATA, CA 95521 (707) 826-7794</p>
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Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Large Wood Detail 2

<p>SHEET ID C-26 26 of 31</p>
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Table 1. Resisting forces required for individual habitat log members within habitat wood structures for a range of embedment length and burial depth configurations.

Habitat Log Size	Embedded Length (ft)	Embedded Depth, Avg (ft)	Additional Resisting Force Required (lbf)		Description
			Vertical	Horizontal	
30 ft length, 2 ft diameter	0	0	7,190	770	Large log, unembedded
	15	1	4,660	Stable	Large log, low embedment
	15	2	2,230	Stable	Large log, low embedment
	15	3	150	Stable	Large log, low embedment
	20	1	3,950	Stable	Large log, medium embedment
	20	2	990	Stable	Large log, medium embedment
	20	3	Stable	Stable	Large log, medium embedment
	25	1	3,250	Stable	Large log, high embedment
	25	2	Stable	Stable	Large log, high embedment
	25	3	Stable	Stable	Large log, high embedment
20 ft length, 1.5 ft diameter	0	0	2,490	450	Small log, unembedded
	10	1	1,240	Stable	Small log, low embedment
	10	2	470	Stable	Small log, low embedment
	10	3	Stable	Stable	Small log, low embedment
	13	1	1,160	Stable	Small log, medium embedment
	13	2	Stable	Stable	Small log, medium embedment
	13	3	Stable	Stable	Small log, medium embedment
	15	1	940	Stable	Small log, high embedment
	15	2	Stable	Stable	Small log, high embedment
	15	3	Stable	Stable	Small log, high embedment
	20	0.5	1,530	Stable	Toe log, fully embedded

Table 2. Resisting forces supplied by individual pin logs and individual boulders used for ballast of varying size and embedment/positioning.

Pin Log Size	Embedded Length (ft)	Resisting Force Supplied (lbf)	
		Vertical	Horizontal
10 ft x 1 ft	5	450	2,940
15 ft x 1 ft	10	2,630	12,310
20 ft x 1.5 ft	15	12,640	56,140
Boulder Ballast Diameter	Position	Resisting Force Supplied (lbf)	
		Vertical	Horizontal
1 ft	Above	50	-
1 ft	Behind	-	50
2 ft	Above	420	-
2 ft	Behind	-	420
3 ft	Above	1,440	-
3 ft	Behind	-	1,440
5 ft	Above	6,690	-
5 ft	Behind	-	6,690

STABILITY NOTES

- Table 1 and 2 above provide examples of wood features requirements to meet stability for a 10-year flood with a 1.5 safety factor. Each wood feature may use a single stability mechanism (burial, boulders, or pin logs) or may use a combination of the stability mechanisms to achieve stability requirements.
- Vertical (buoyancy) stability of the wood feature is the limiting factor.
- Habitat logs are assumed to be placed at a 90° angle (perpendicular) to the direction of flow. This configuration represents the greatest possible horizontal driving force on the log. Logs placed at an angle less than 90° will experience a lower horizontal driving force and therefore still remain stable in the horizontal direction. Vertical forces on the log will remain the same as in Table 1.
- Pin logs are assumed to be placed at a 60° angle relative to the channel bottom (where 90° represents a completely vertical log). This was assumed to be a realistic angle needed to achieve pinning of habitat logs. If field conditions require a log to be placed at a lower angle than 60°, the supplied resisting forces will be lower than those presented in Table 2 and additional pin logs, boulder ballast, and/or burial depth/length of habitat logs is required.
- Pin logs shall be stripped of roots and branches and sharpened at one end.
- The force-balance calculations for individual habitat logs and toe logs are presented in Table 1. This table covers a range of possible embedded lengths and burial depths that may be encountered in the field, as well as a range of possible habitat log sizes. Table 2 provides possible sizes of pin logs and diameters of boulders. For a given wood feature, the required resisting forces (Table 1) shall be added together for each individual log within the wood feature. Then, the number of pin logs and boulders needed shall be calculated by summing the supplied resisting forces (Table 2) of each pin log and boulder. If the sum of supplied resisting forces (Table 2) for all stabilizing logs and boulder ballast used in the wood feature is greater than the required resisting forces (Table 1), then the feature is stable with a 1.5 safety factor. This methodology provides reasonable general guidelines for constructing each wood feature type and determining the number of pinning or ballasting members needed.
- Variability in field conditions may require deviation from the specifications presented in both Table 1 and Table 2. For example, if 10-foot pin logs cannot be driven 5 ft in depth at a given habitat feature site, additional pin logs and/or habitat log burial depth will be required.
- To construct, the Engineer of Record or designee will require elements from Table 2 be implemented until resisting force supplied equals the resisting force required in Table 1.
- When available, boulder and fill material should come from existing onsite sources.
- Boulder quantities presented in Table 3 are for boulders placed in the channel to provide habitat and velocity refugia, not boulder ballast used to provide resisting force for habitat logs. Quantities of boulder ballast will depend on the amount of ballast material required for individual habitat logs during construction as well as material availability.
- For more information relating to the wood stability analysis, see the 100% Design Report.

Table 3. Materials table for 100% design habitat features.

MATERIALS SCHEDULE - TOTAL PROJECT QUANTITIES		
Materials Type	Basis	Quantity
Large Wood & Boulder Habitat Features		
30 ft Log with Rootwad	Quantity	40
1/2 to 2 Ton Boulders	Quantity	76
Willow Cuttings	Quantity	240
Willow Trenches		
Trenches	Linear Feet	1,120
Willow Cuttings for Trenches	Quantity	13,440
Clumps	Quantity	6

REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC
 DRAWN BY: N. Sabo, R. George
 CHECKED BY: F. Meyer, K. Harrison (P.E.)
 APPROVED BY: K. Harrison (P.E.)
 SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)

TUOLUMNE RIVER CONSERVANCY
 6380 LANDMARK ROAD
 STOCKTON, CA 95215

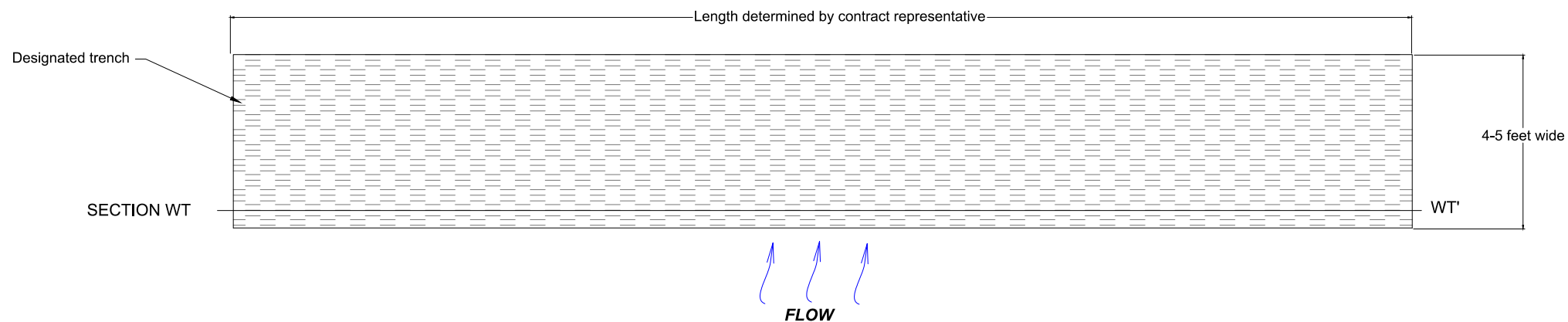
MCBAIN ASSOCIATES
 860 7TH STREET
 ARCALA, CA 95221
 (707) 868-7194

ISSUE DATE: October 31, 2023
 PROJECT: Zanker Farm
 CONTRACT NO: FRCP 0194045-02 & 0214047
 DRAWING SET: 100% Design Planset

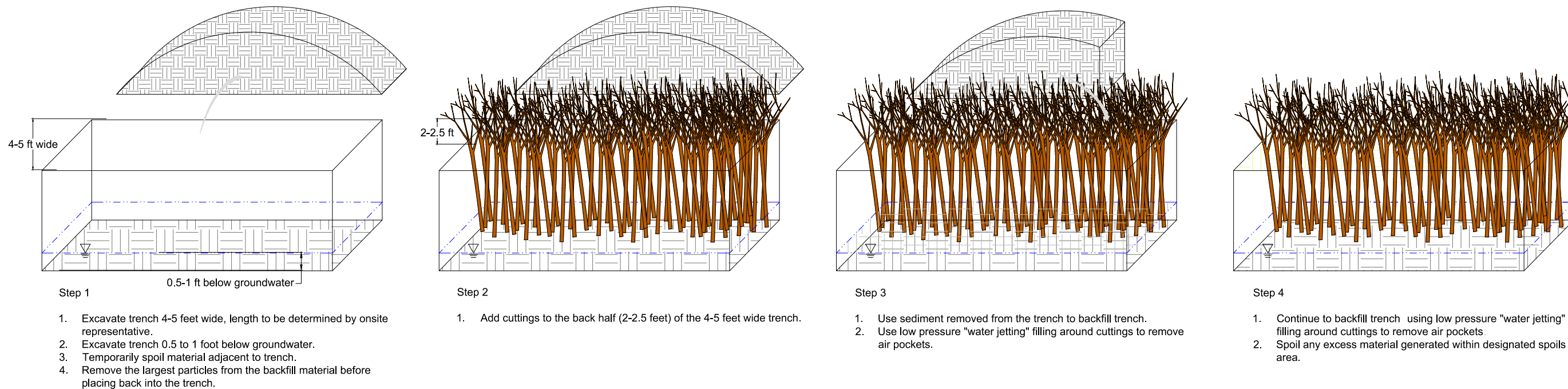
Zanker Farm Restoration Project
 Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
 Wood Placement Stability
 Requirements

SHEET ID
C-27
 27 of 31

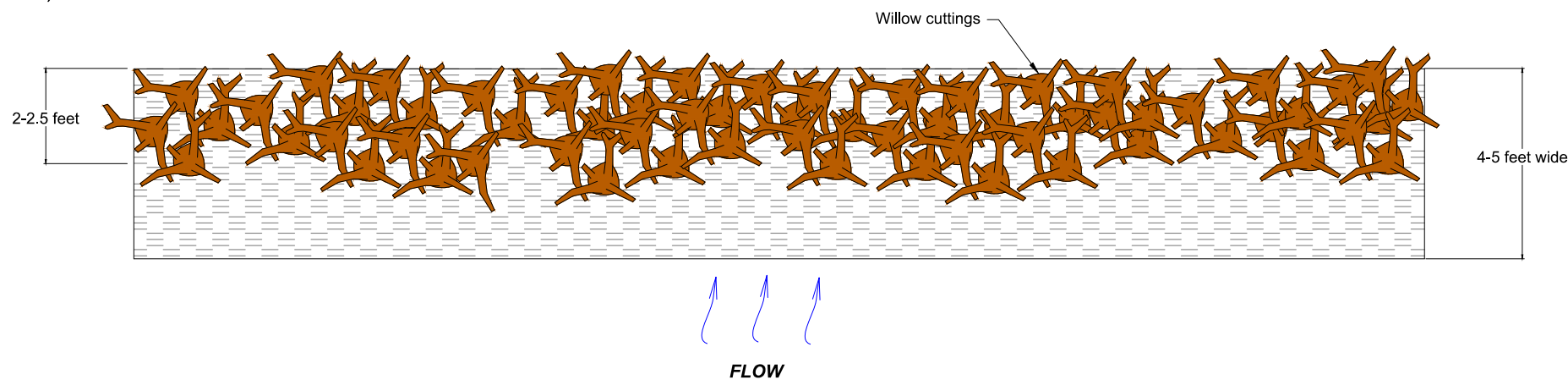
TRENCH PLANTING DETAIL (PLANFORM, POST-EARTHWORK)
NOT TO SCALE



TRENCH PLANTING CONSTRUCTION STEPS - SECTION VIEW WT - WT'
NOT TO SCALE



TRENCH PLANTING DETAIL (PLANFORM AS-BUILT)
NOT TO SCALE



NOTES

- An on-site project representative will flag willows within construction boundary to be salvaged for use in willow trench plantings.
- An on-site project representative will specify the temporary storage location for extracted willow cuttings.

Legend

Excavated/backfilled material

VERTICAL EXAGGERATION 10:1



REV	DATE	DESCRIPTION

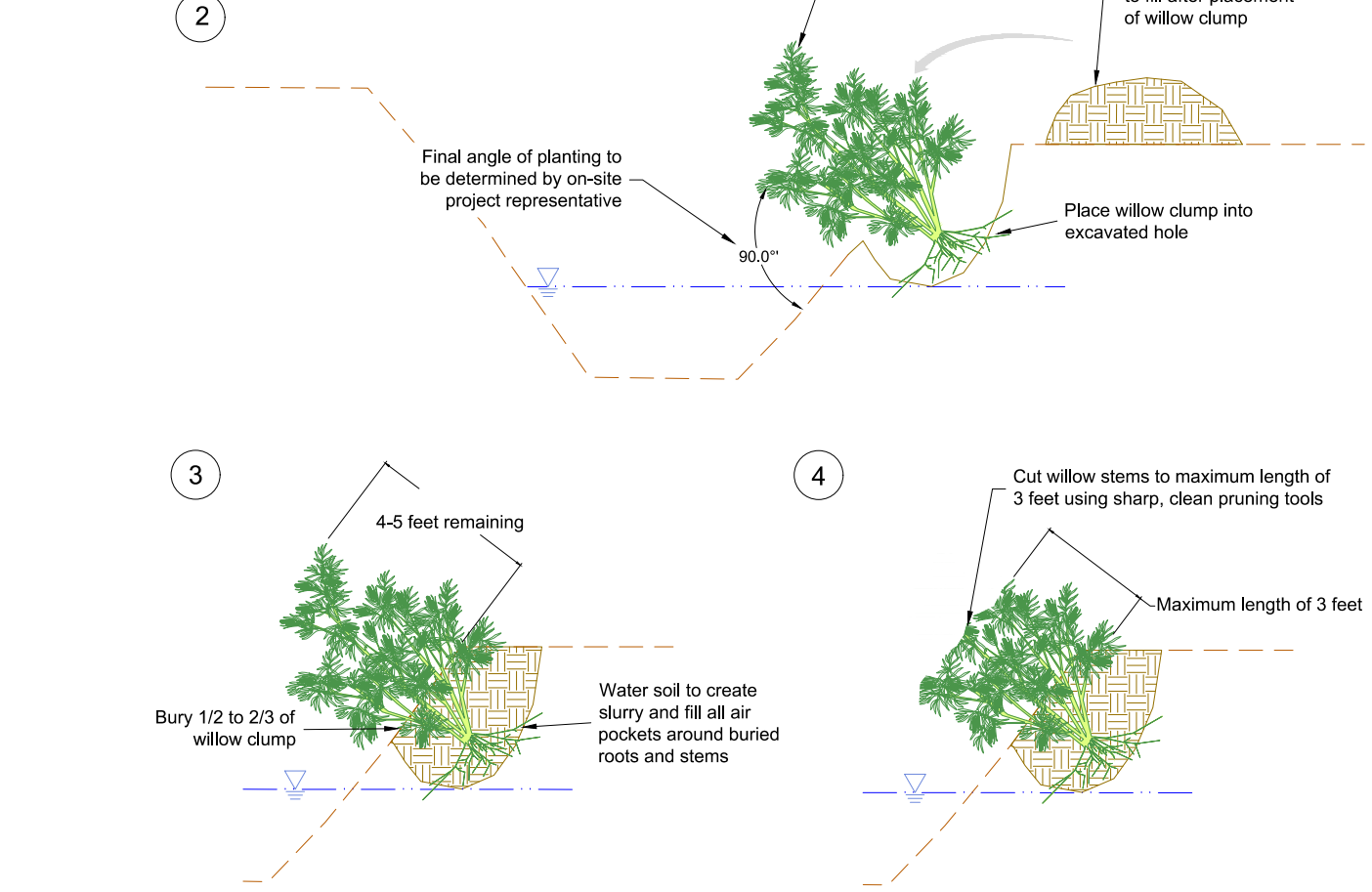
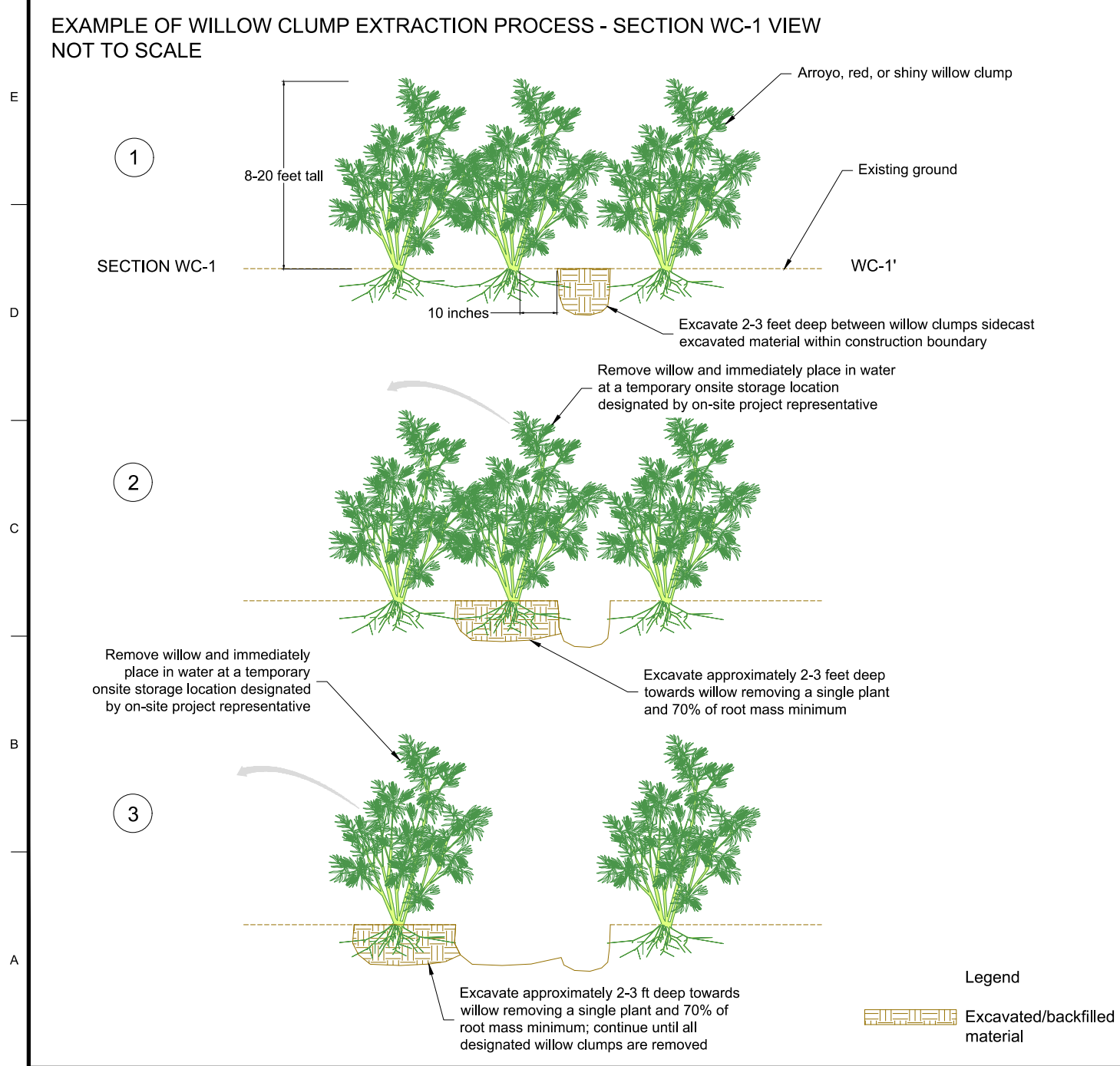
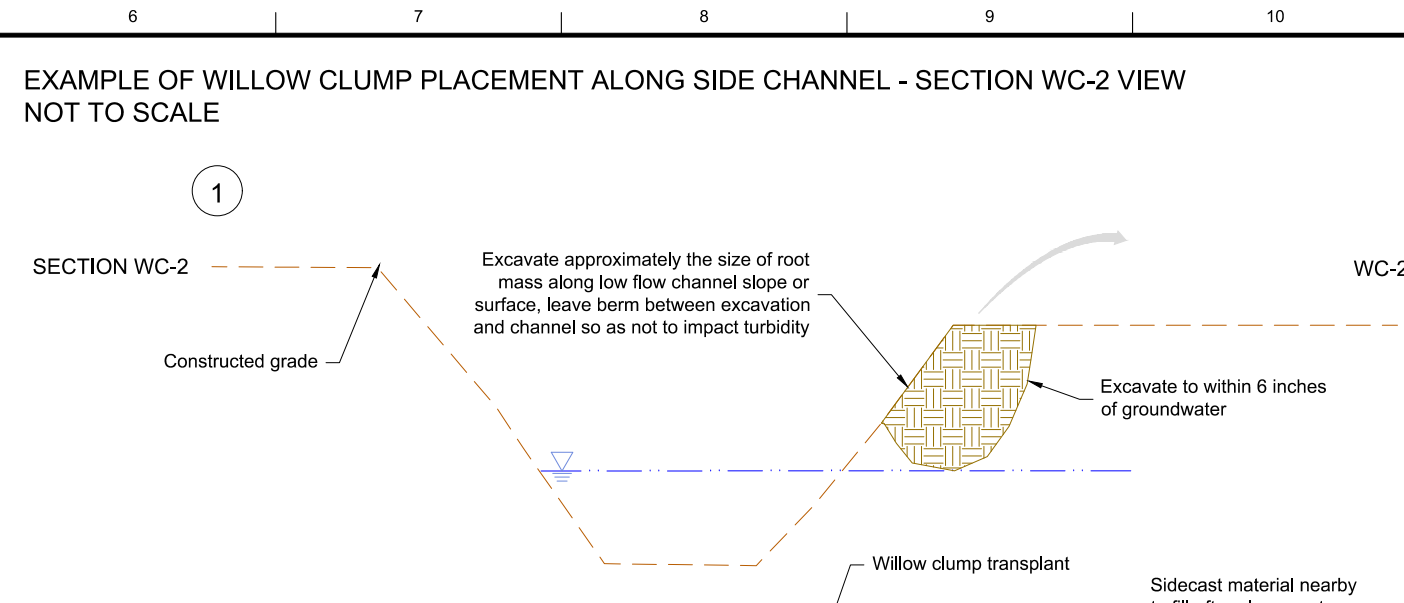
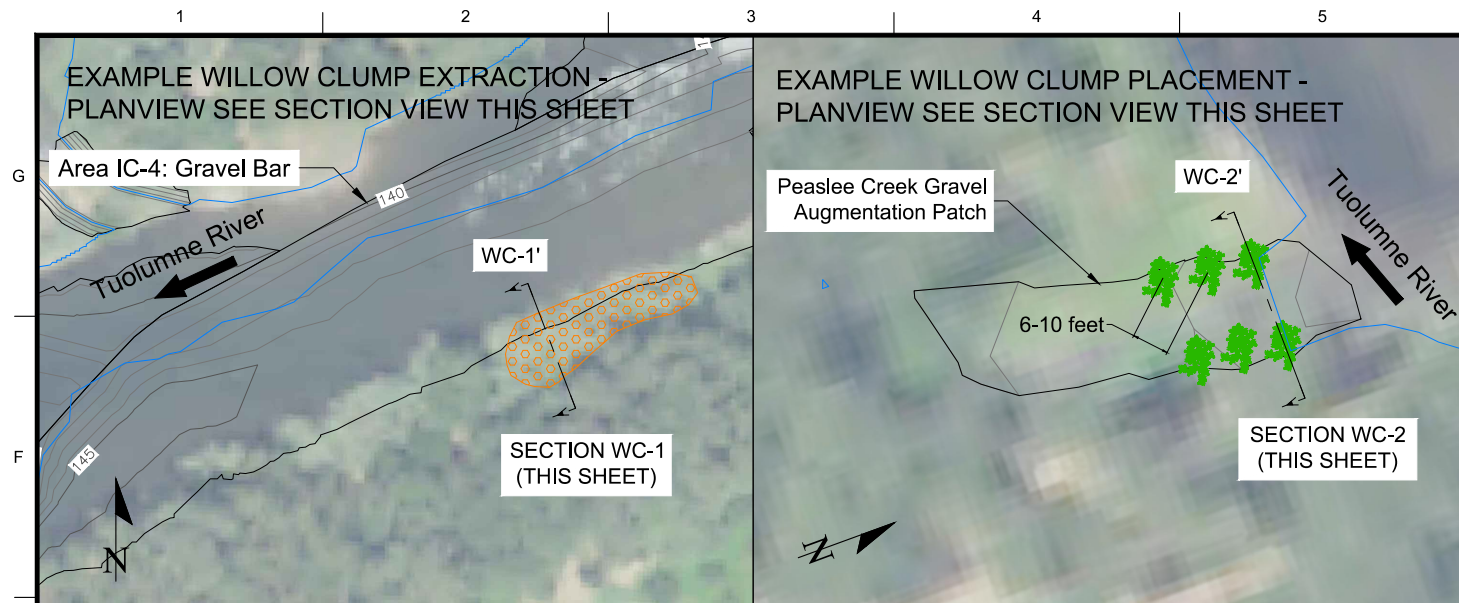
DESIGNED BY: MA and TRC	ISSUE DATE: October 31, 2023
DRAWN BY: N. Sabo, R. George	PROJECT: Zanker Farm
CHECKED BY: F. Meyer, K. Harrison (P.E.)	CONTRACT NO: FRGP 01940405-02 & 02140407
APPROVED BY: K. Harrison (P.E.)	DRAWING SET: 100% Design Planset
SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	

TUOLUMNE RIVER CONSERVANCY
6380 LANDMARK ROAD
STOCKTON, CA 95215

MCBAIN ASSOCIATES
580 7TH STREET
ARCATA, CA 95521
(707) 826-7794

Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Willow Trench Detail

SHEET ID
C-28
28 of 31



- NOTES**
1. Clump plantings are shown on the drawings as example of placement. An on-site project representative will flag willows within the construction boundary to be salvaged for clump plantings.
 2. An on-site project representative will specify the temporary storage location for extracted willow clumps.
 3. An on-site project representative will specify the locations where clump plantings shall be installed and the angle of the planting over the channel or alcove.
 4. After planting, salvaged willow clumps shall be thoroughly watered given supplemental irrigation.

McBain Associates
APPLIED RIVER SCIENCE

REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC
 DRAWN BY: N. Sabo, R. George
 CHECKED BY: F. Meyer, K. Harrison (P.E.)
 APPROVED BY: K. Harrison (P.E.)
 SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)

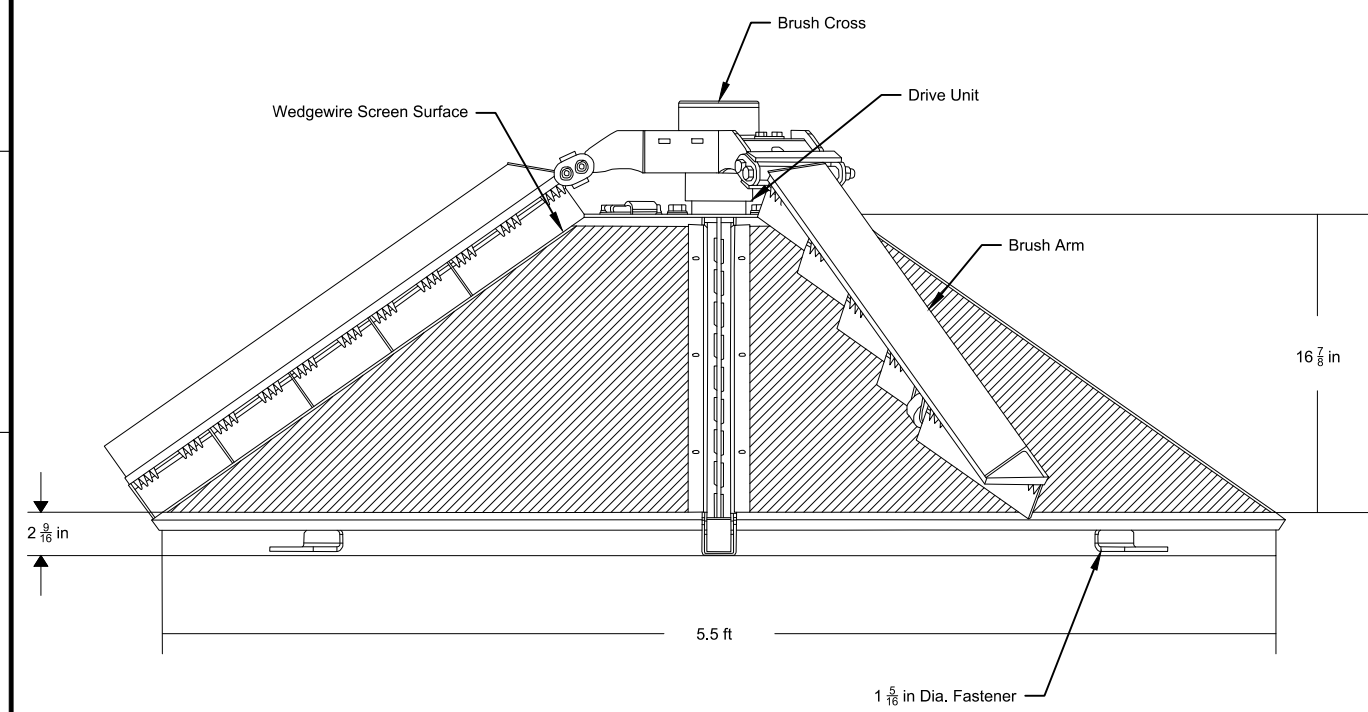
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 STOCKTON, CA 95215

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 980 7TH STREET
 ARCADIA, CA 95621
 (707) 868-7194

Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
Willow Clump Detail

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C-29
 29 of 31

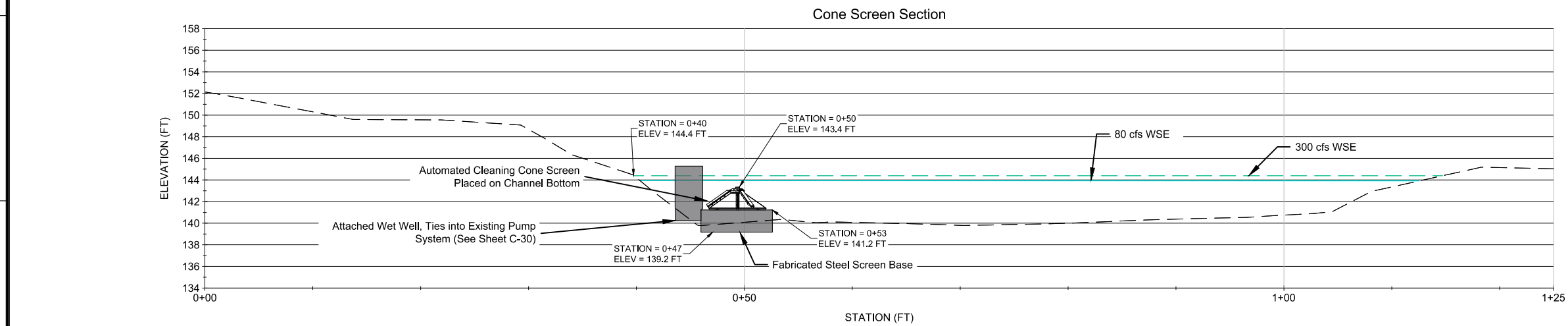
CONICAL SCREEN PROFILE VIEW



CONICAL SCREEN PLACEMENT PLANFORM



CONICAL SCREEN PLACEMENT SECTION VIEW



SHEET NOTES

- Per National Marine Fisheries Services fish screen design criteria, screen openings shall not exceed 0.0689 inches (1.75 mm) in width.
- Specifications shown in this sheet are for an ISI Intake Screens, Inc. C66-18 Cone Screen.

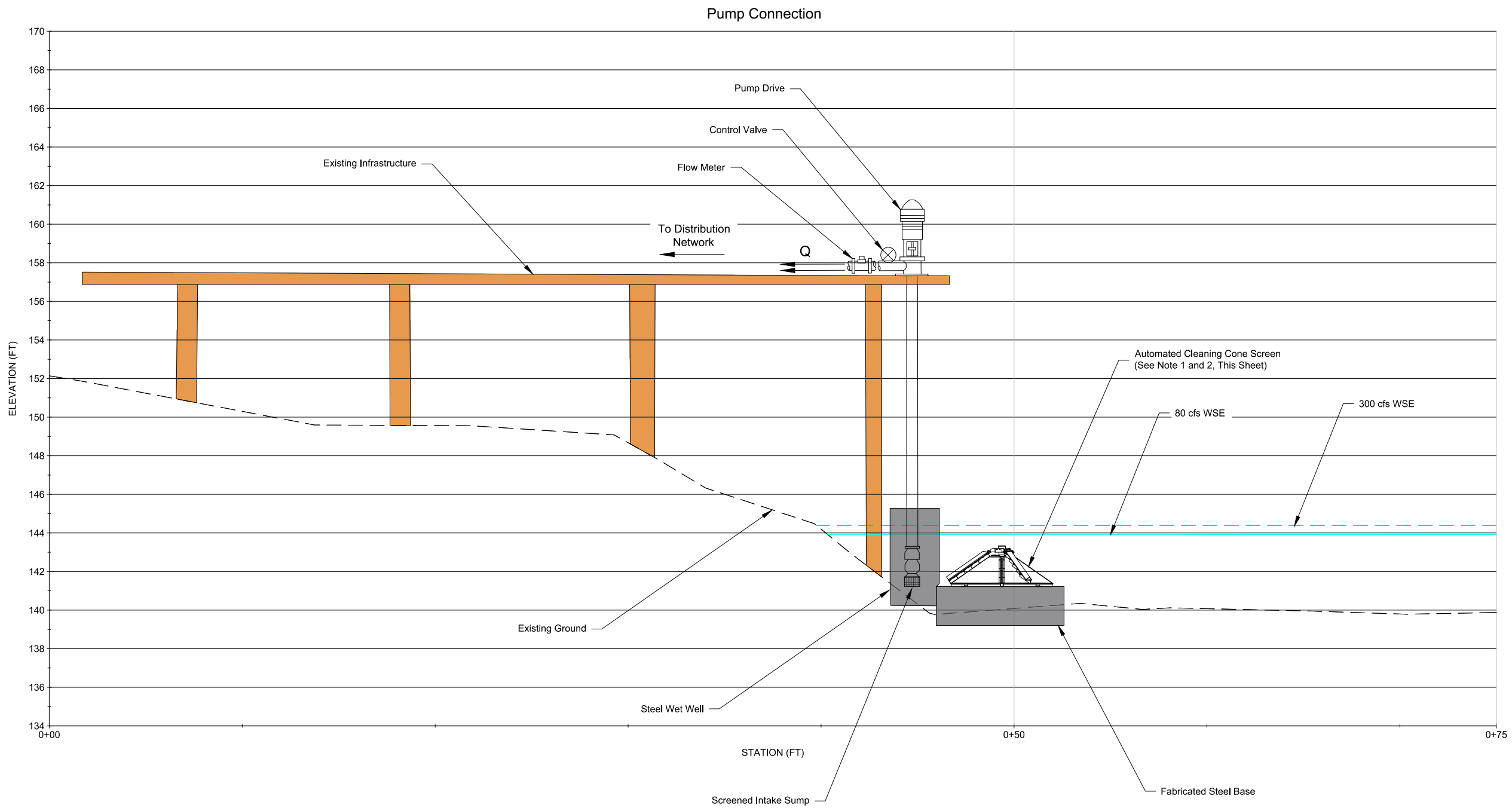


REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC	ISSUE DATE: October 31, 2023
DRAWN BY: N. Sabo, R. George	PROJECT: Zanker Farm
CHECKED BY: F. Meyer, K. Harrison (P.E.)	CONTRACT NO: FRGP 01940405-02 & 02140407
APPROVED BY: K. Harrison (P.E.)	DRAWING SET: 100% Design Planset
SIZE: 22 x 34 in (full scale), 11 x 17 in (half scale)	

Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
 Conical Screen Placement Detail

SHEET ID
C-30
 30 of 31



SHEET NOTES

1. Per National Marine Fisheries Services fish screen design criteria, screen openings shall not exceed 0.0689 inches (1.75 mm) in width.
2. Specifications shown in this sheet are for an ISI Intake Screens, Inc. C66 - 18 Cone Screen



REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC DRAWN BY: N. Sabo, R. George CHECKED BY: F. Meyer, K. Harrison (P.E.) APPROVED BY: K. Harrison (P.E.) SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	ISSUE DATE: October 31, 2023 PROJECT: Zanker Farm CONTRACT NO. FRGP: 01940405-02 & 02140407 DRAWING SET: 100% Design Planset
TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215	MCBAIN ASSOCIATES 580 7TH STREET ARCATTA, CA 95521 (707) 826-7794

Zanker Farm Restoration Project
 Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
**Conical Screen
 Placement Detail**

SHEET ID
C-31
 31 of 31

ZANKER REVEGETATION DESIGN SPECIES COMPOSITION AND LEGEND

Zone	Common Name	Scientific Name	Growth Form
Emergent/Channel Margin	Pacific willow	<i>Salix lasiandra</i>	Shrub to Tree
	black willow	<i>Salix gooddingii</i>	Shrub or Tree
	buttonbush	<i>Cephalanthus occidentalis</i>	Shrub
	common rush	<i>Juncus effusus</i>	Herb
	iris-leaved rush	<i>Juncus xiphioides</i>	Herb
	Mexican rush	<i>Juncus mexicanus</i>	Herb
	torrent sedge	<i>Carex nudata</i>	Herb
	whiteroot	<i>Carex barbarae</i>	Herb

Zone	Common Name	Scientific Name	Growth Form
Low Riparian	mugwort	<i>Artemisia douglasiana</i>	Herb
	whiteroot	<i>Carex barbarae</i>	Herb
	Pacific willow	<i>Salix lasiandra</i>	Tree
	red willow	<i>Salix laevigata</i>	Tree
	arroyo willow	<i>Salix lasiolepis</i>	Shrub, Small Tree
High Riparian	arroyo willow	<i>Salix lasiolepis</i>	Shrub, Small Tree
	black willow	<i>Salix gooddingii</i>	Shrub or Tree
	blue elderberry	<i>Sambucus nigra ssp. caerulea</i>	Shrub/Small Tree
	cottonwood	<i>Populus fremontii</i>	Tree
	deer grass	<i>Muhlenbergia rigens</i>	Herb
	mugwort	<i>Artemisia douglasiana</i>	Herb
	Oregon ash	<i>Fraxinus latifolia</i>	Tree
	Pacific willow	<i>Salix lasiandra</i>	Tree
	white alder	<i>Alnus rhombifolia</i>	Tree
whiteroot	<i>Carex barbarae</i>	Herb	

Zone	Common Name	Scientific Name	Growth Form
Riparian-Upland Transition	valley oak	<i>Quercus lobata</i>	Acorn

Zone	Common Name	Scientific Name	Growth Form
Upland	blue oak	<i>Quercus douglasii</i>	Acorn

Broadcast Seed Mix	Common Name	Scientific Name	Growth Form
Seed Mix	California brome	<i>Bromus carinatus</i>	Seed
	blue wildrye	<i>Elymus glaucus</i>	
	Three-week fescue	<i>Festuca microstachys</i>	
	Spanish lotus	<i>Acmispon americanus var. americanus</i>	
	miniature lupine	<i>Lupinus bicolor</i>	
	gum plant	<i>Grindelia camporum</i>	
	yarrow	<i>Achillea millefolium</i>	
	narrowleaf milkweed	<i>Asclepias fascicularis</i>	

LEGEND - PLAN VIEW

- XXX— Finished Grade Index Contours
- XXX— Existing Grade Index Contours
- Design Modeled Edge of Water at 80 cfs
- - - Design Planting Boundaries
- Project Boundary
- ▨ Contractor Use Area
- ▩ Site Access
- Save Vegetation Area
- Emergent/Channel Margin Planting
- Low Riparian Planting
- High Riparian Planting
- Transition Planting
- Upland Planting
- ▨ Seed and Mulch

LEGEND - PLAN VIEW

- Boulder
- Willow Clump
- ▨ Willow Trench
- Log with Rootwad
- Whole Tree, Toppled

NOTES:

- The Seed Mix will be used for all Seed and Mulch areas.

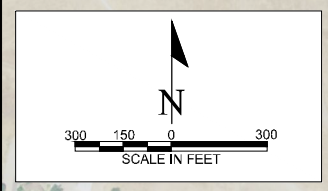
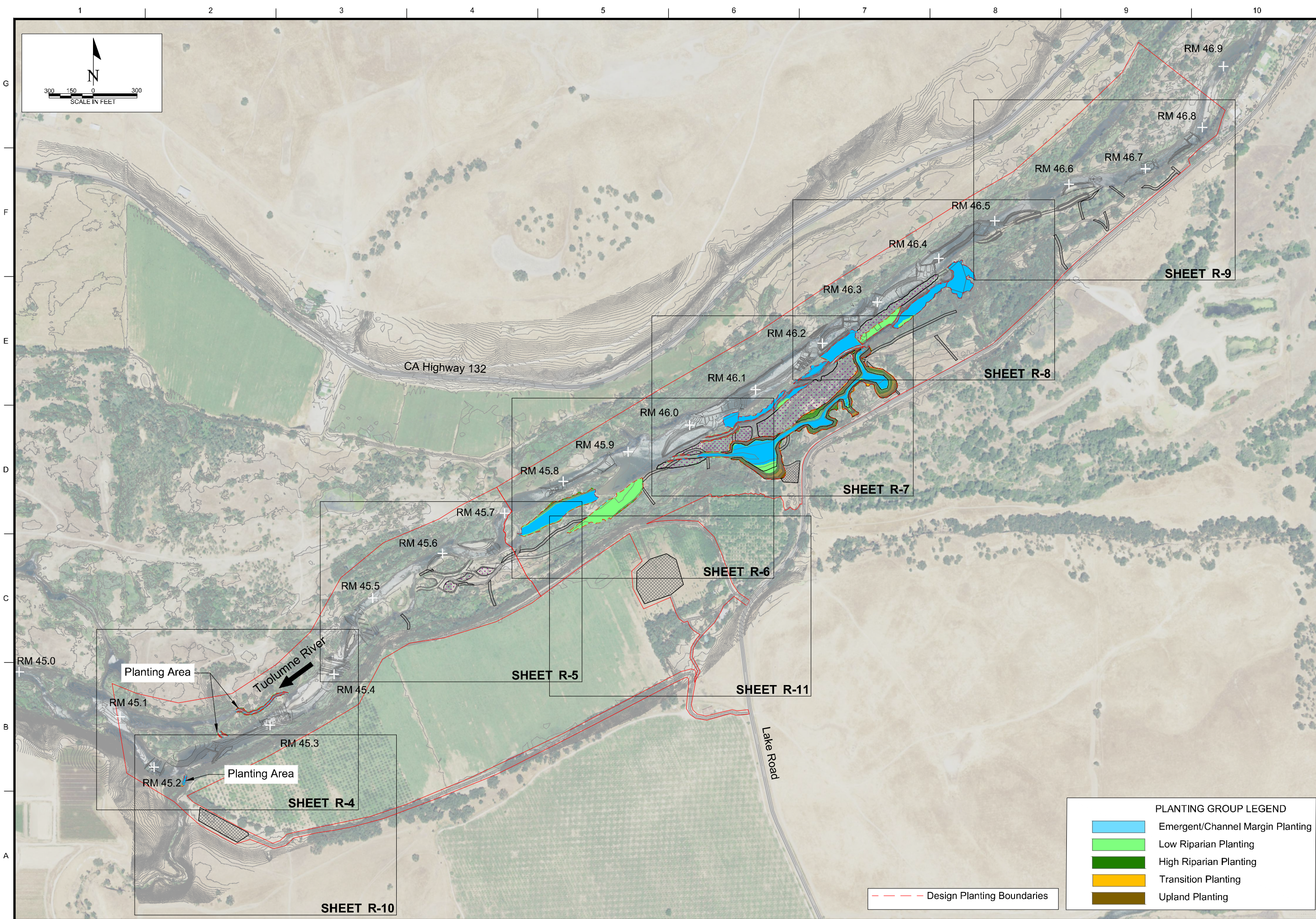


REV	DATE	DESCRIPTION

DESIGNED BY: M/A and TRC	ISSUE DATE: October 31, 2023
DRAWN BY: N. Sabo, R. George	PROJECT: Zanker Farm
CHECKED BY: F. Meyer, K. Harrison (P.E.)	CONTRACT NO.: FRGP 0194045-02 & 0214047
APPROVED BY: K. Harrison (P.E.)	DRAWING SET: 100% Design Plansheet
SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	

Zanker Farm Restoration Project
Phase I and II, 100% Design Plansheet
Tuolumne River, La Grange, CA
Revegetation Species Composition and Legend

SHEET ID
R-1
1 of 12



PLANTING GROUP LEGEND	
■	Emergent/Channel Margin Planting
■	Low Riparian Planting
■	High Riparian Planting
■	Transition Planting
■	Upland Planting

--- Design Planting Boundaries



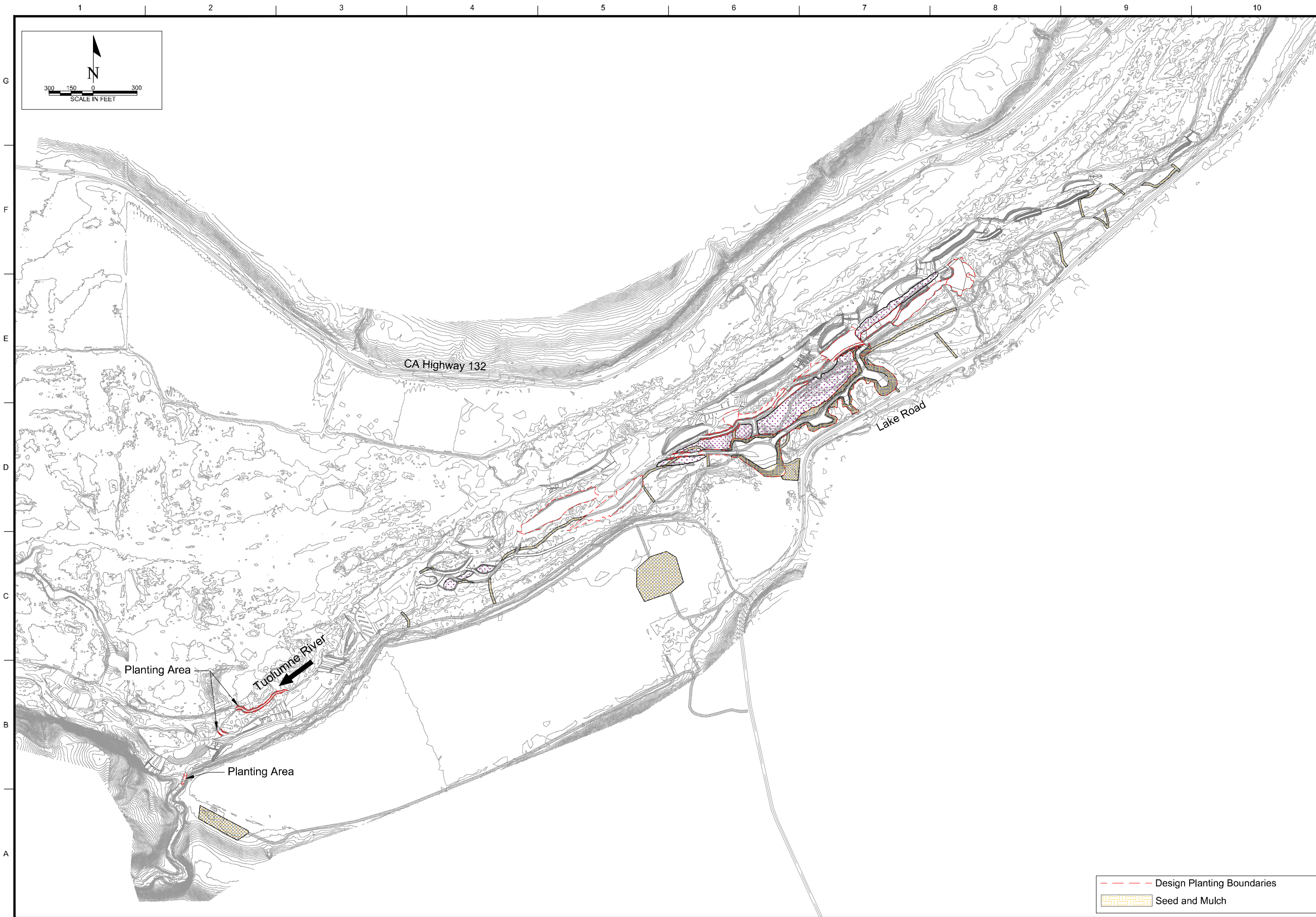
REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC
 DRAWN BY: N. Sabo, R. George
 CHECKED BY: F. Meyer, K. Harrison (P.E.)
 APPROVED BY: K. Harrison (P.E.)
 SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)

TUOLUMNE RIVER CONSERVANCY
 6380 LANDMARK ROAD
 STOCKTON, CA 95215
 MCBAIN ASSOCIATES
 390 7TH STREET E
 ARCADIA, CA 95621
 (707) 526-7794

Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
Site Overview

SHEET ID
R-2
 2 of 12



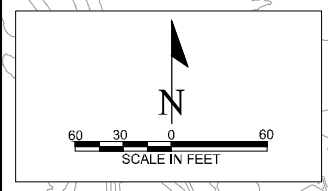
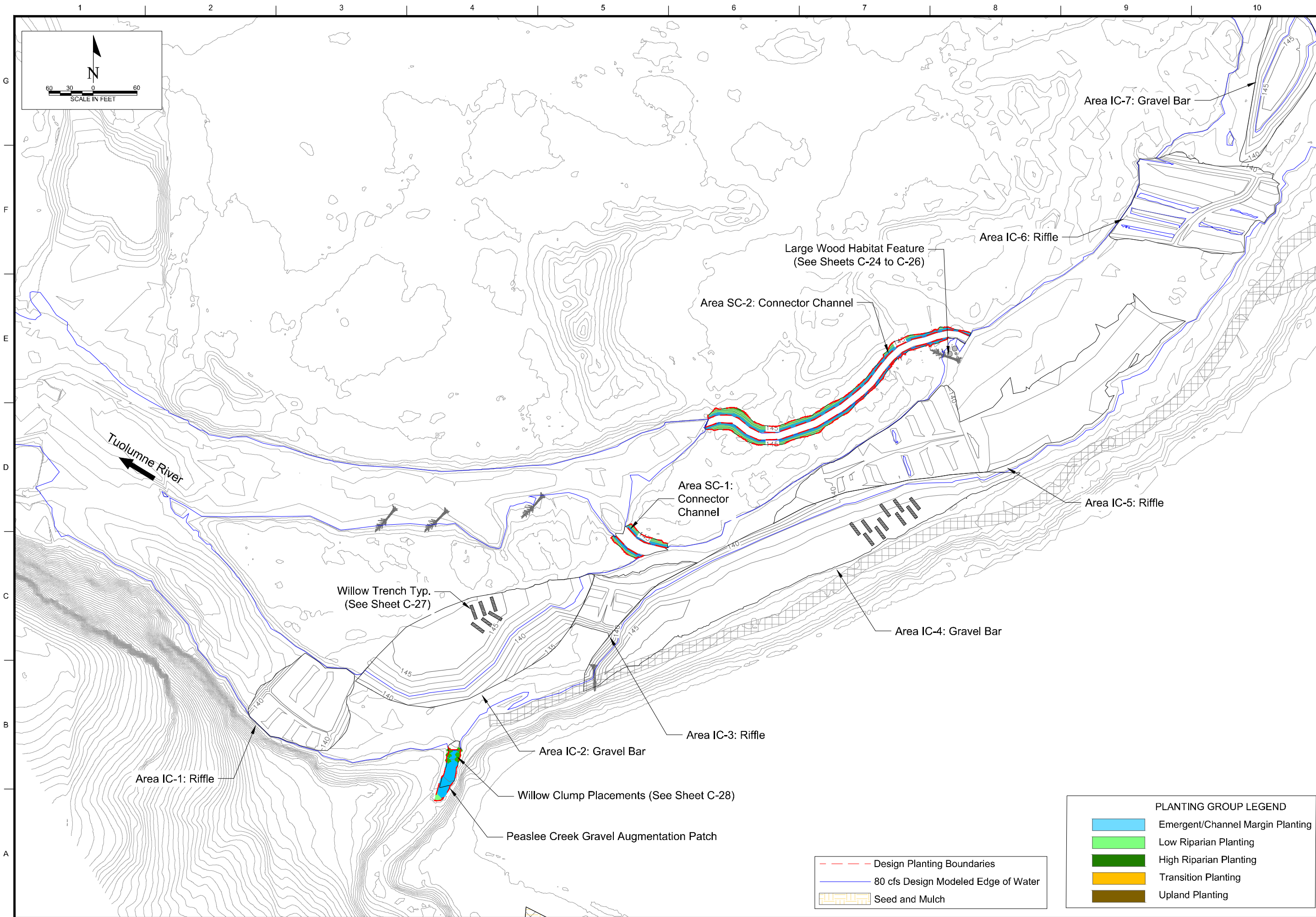
REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC DRAWN BY: N. Sabo, R. George CHECKED BY: F. Meyer, K. Harrison (P.E.) APPROVED BY: K. Harrison (P.E.) SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	ISSUE DATE: October 31, 2023 PROJECT: Zanker Farm CONTRACT NO: FRGP 0194045-02 & 02140-07 DRAWING SET: 100% Design Planset
TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215	MCBAIN ASSOCIATES 800 7TH STREET ARCATA, CA 95521 (707) 526-7794

Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
Tuolumne River, La Grange, CA
Seed and Mulch Application Overview

SHEET ID
R-3
3 of 12

	Design Planting Boundaries
	Seed and Mulch



REV	DATE	DESCRIPTION

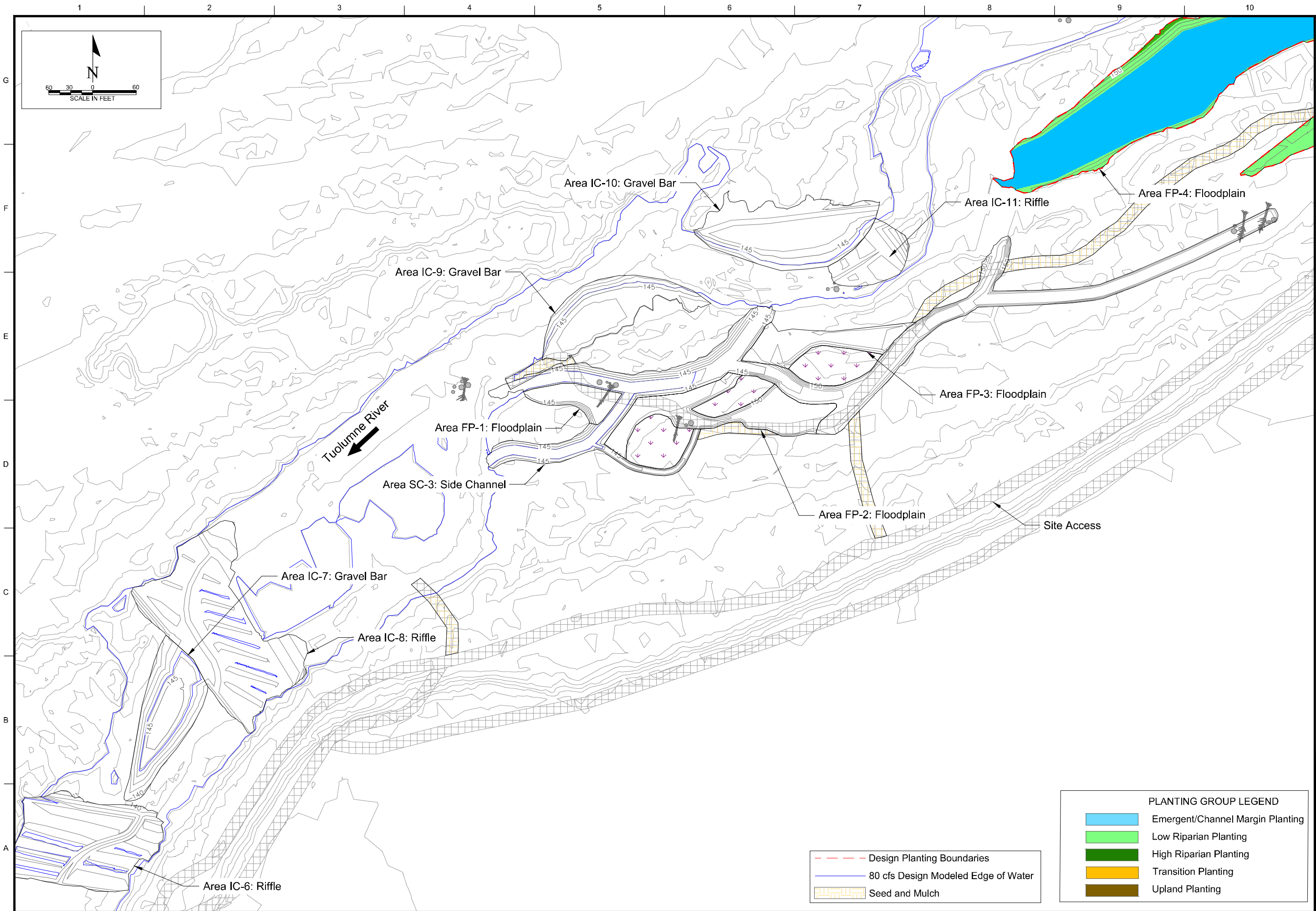
DESIGNED BY: MA and TRC DRAWN BY: N. Sabo, R. George CHECKED BY: F. Meyer, K. Harrison (P.E.) APPROVED BY: K. Harrison (P.E.) SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	ISSUE DATE: October 31, 2023 PROJECT: Zanker Farm CONTRACT NO.: FRGP 01980405-02 & 02140-07 DRAWING SET: 100% Design Planset
TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215	MCBAIN ASSOCIATES 800 7TH STREET ARCAATA, CA 95221 (707) 528-7794

Zanker Farm Restoration Project
 Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
 Planform Detail Mainstem Channel
 Station 0+00 to Station 22+00

SHEET ID
R-4
 4 of 12

- Design Planting Boundaries
- 80 cfs Design Modeled Edge of Water
- Seed and Mulch

- PLANTING GROUP LEGEND**
- Emergent/Channel Margin Planting
 - Low Riparian Planting
 - High Riparian Planting
 - Transition Planting
 - Upland Planting

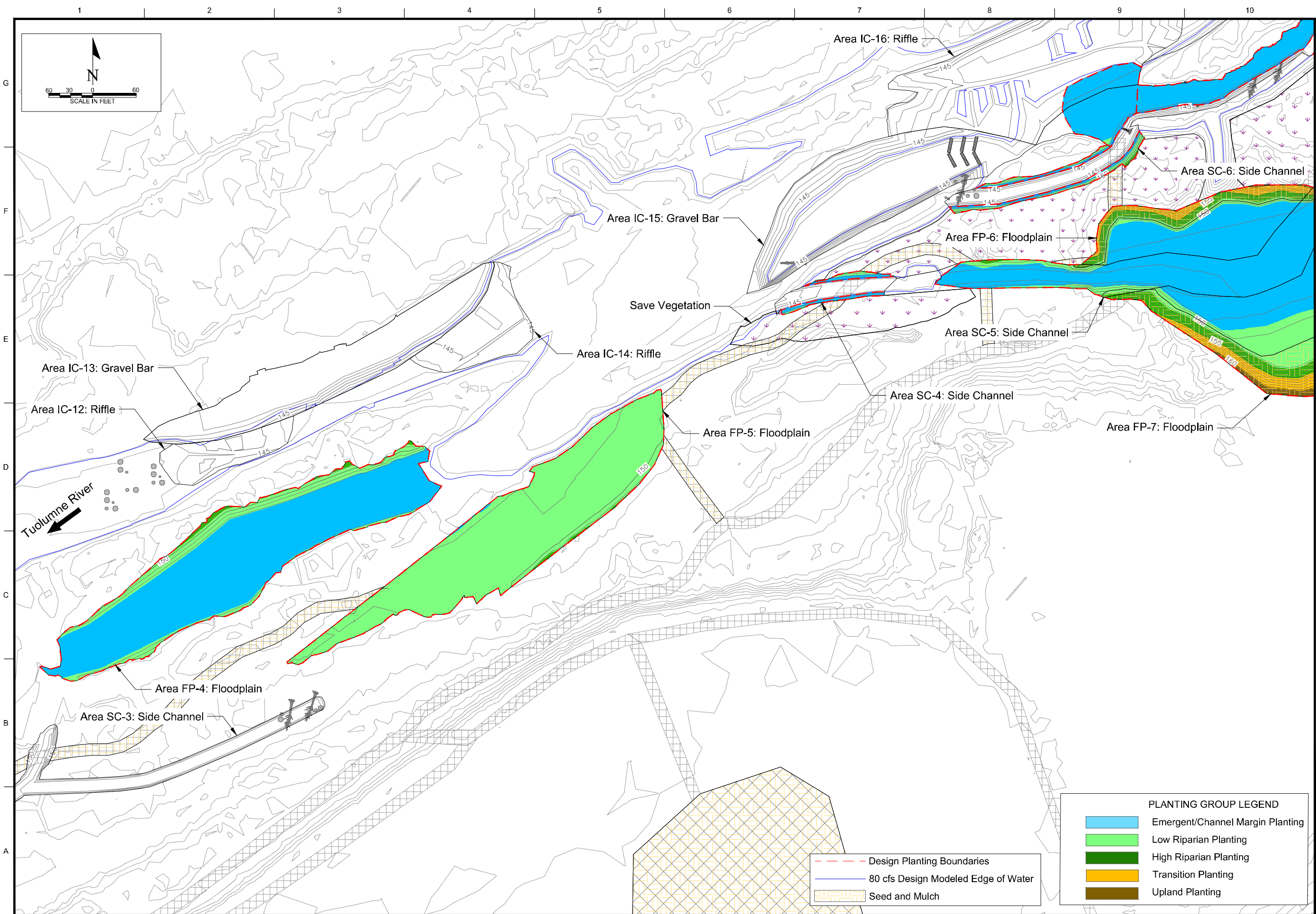


REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC DRAWN BY: N. Sabo, R. George CHECKED BY: F. Meyer, K. Harrison (P.E.) APPROVED BY: K. Harrison (P.E.) SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	ISSUE DATE: October 31, 2023 PROJECT: Zanker Farm CONTRACT NO.: FRGP 01980405-02 & 02140-07 DRAWING SET: 100% Design Planset
TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215	MCBAIN ASSOCIATES 800 7TH STREET ARCAATA, CA 95221 (707) 526-7794

Zanker Farm Restoration Project
 Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
 Planform Detail Mainstem Channel
 Station 19+00 to Station 39+00

SHEET ID
R-5
 5 of 12



REV	DATE	DESCRIPTION

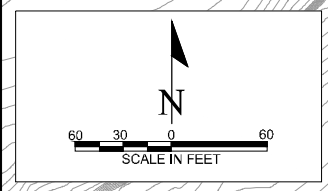
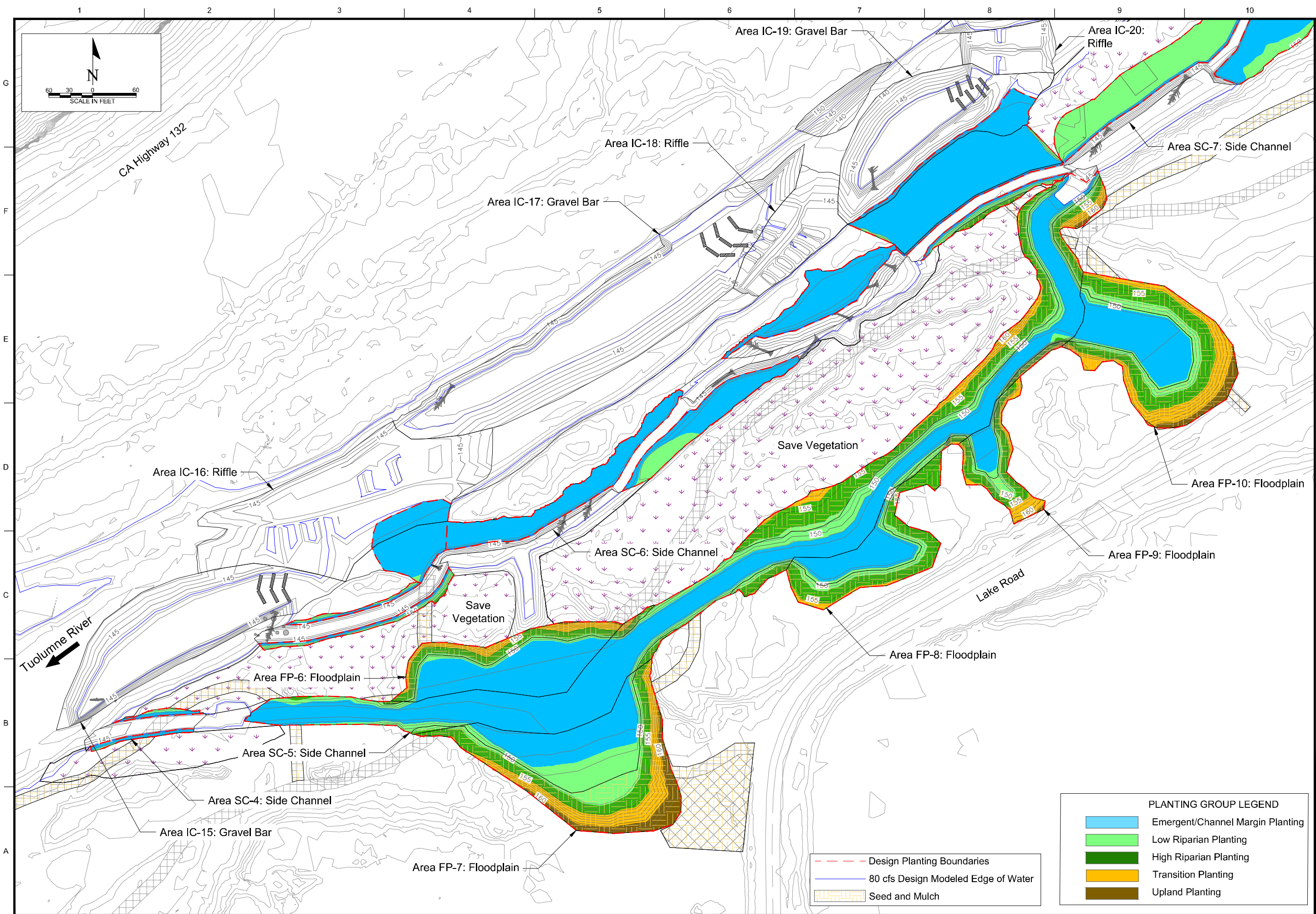
DESIGNED BY: MA and TRC	ISSUE DATE: October 31, 2023
DRAWN BY: N. Sabo, R. George	PROJECT: Zanker Farm
CHECKED BY: F. Meyer, K. Harrison (P.E.)	CONTRACT NO.: FRGP 01980405-02 & 02140-07
APPROVED BY: K. Harrison (P.E.)	DRAWING SET: 100% Design Plansheet
SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	

Zanker Farm Restoration Project
 Phase I and II, 100% Design Plansheet
 Tuolumne River, La Grange, CA
 Planform Detail Mainstem Channel
 Station 39+00 to Station 56+00

SHEET ID
R-6
 6 of 12

PLANTING GROUP LEGEND	
	Emergent/Channel Margin Planting
	Low Riparian Planting
	High Riparian Planting
	Transition Planting
	Upland Planting

	Design Planting Boundaries
	80 cfs Design Modeled Edge of Water
	Seed and Mulch



REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC
 DRAWN BY: N. Sabo, R. George
 CHECKED BY: F. Meyer, K. Harrison (P.E.)
 APPROVED BY: K. Harrison (P.E.)
 SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)

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 STOCKTON, CA 95215

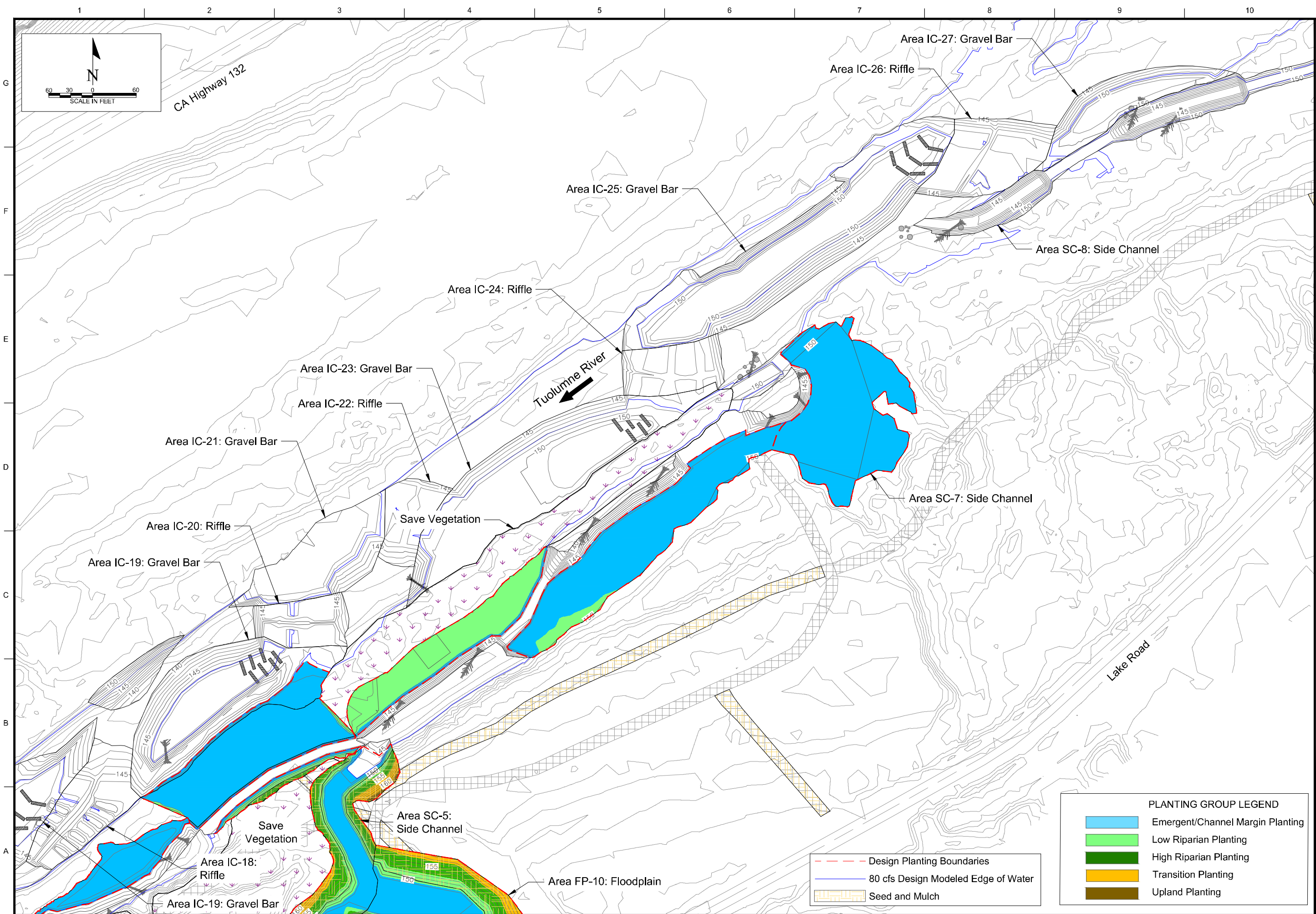
MCBAIN ASSOCIATES
 390 7TH STREET
 ARCAVA, CA 95321
 (707) 928-7794

Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
Planform Detail Mainstem Channel
 Station 50+00 to Station 67+00

SHEET ID
R-7
 7 of 12

- Design Planting Boundaries
- 80 cfs Design Modeled Edge of Water
- Seed and Mulch

- PLANTING GROUP LEGEND**
- Emergent/Channel Margin Planting
 - Low Riparian Planting
 - High Riparian Planting
 - Transition Planting
 - Upland Planting



REV	DATE	DESCRIPTION

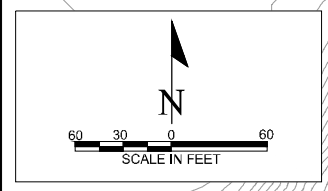
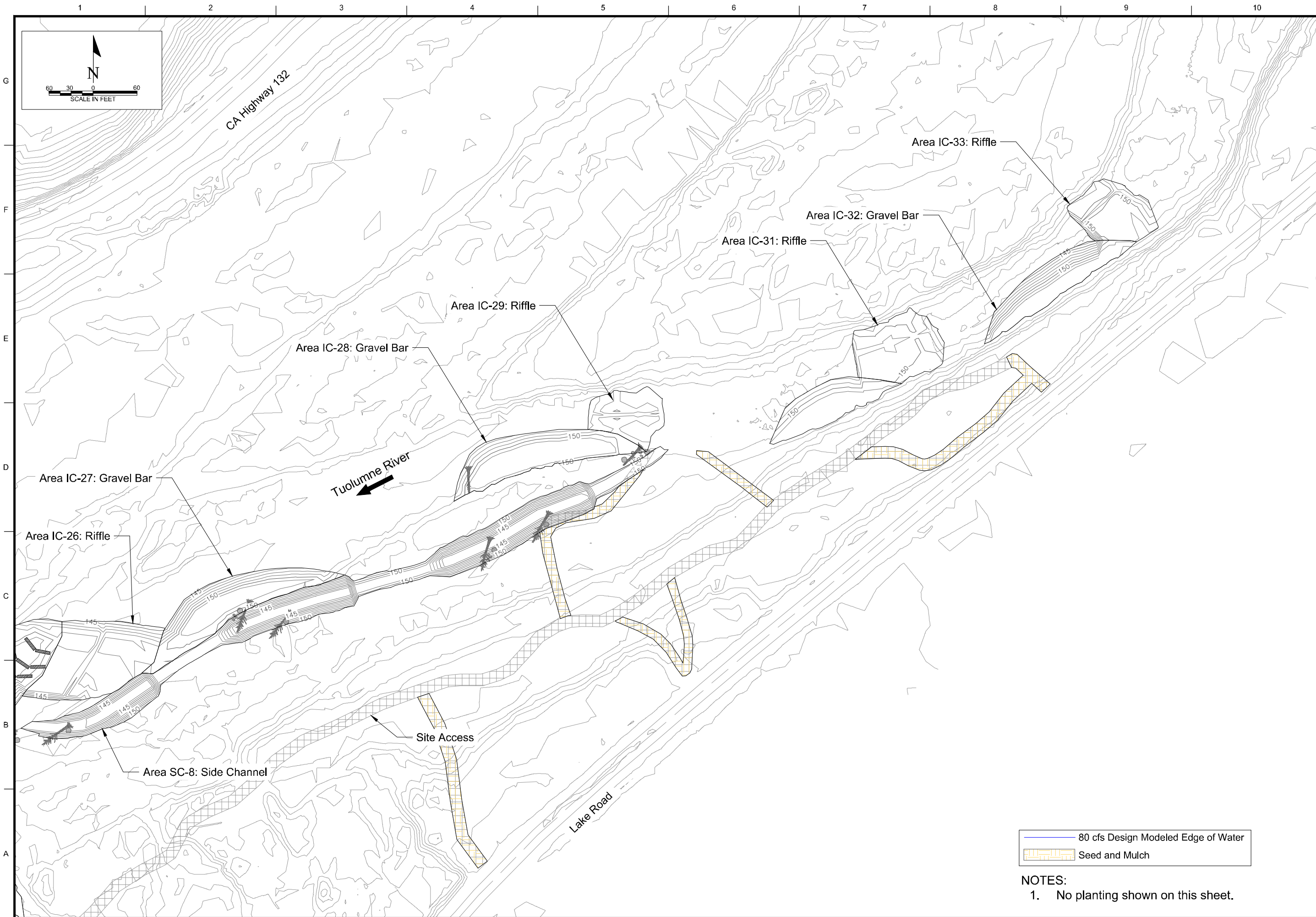
DESIGNED BY: MA and TRC DRAWN BY: N. Sabo, R. George CHECKED BY: F. Meyer, K. Harrison (P.E.) APPROVED BY: K. Harrison (P.E.) SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	ISSUE DATE: October 31, 2023 PROJECT: Zanker Farm CONTRACT NO.: FRGP 0194045-02 & 02140-07 DRAWING SET: 100% Design Planset
TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215	MCBAIN ASSOCIATES 3800 7TH STREET E ARCAVA, CA 95321 (707) 926-7794

Zanker Farm Restoration Project
 Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
 Planform Detail Mainstem Channel
 Station 61+00 to Station 81+00

SHEET ID
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PLANTING GROUP LEGEND	
	Emergent/Channel Margin Planting
	Low Riparian Planting
	High Riparian Planting
	Transition Planting
	Upland Planting

	Design Planting Boundaries
	80 cfs Design Modeled Edge of Water
	Seed and Mulch



REV	DATE	DESCRIPTION

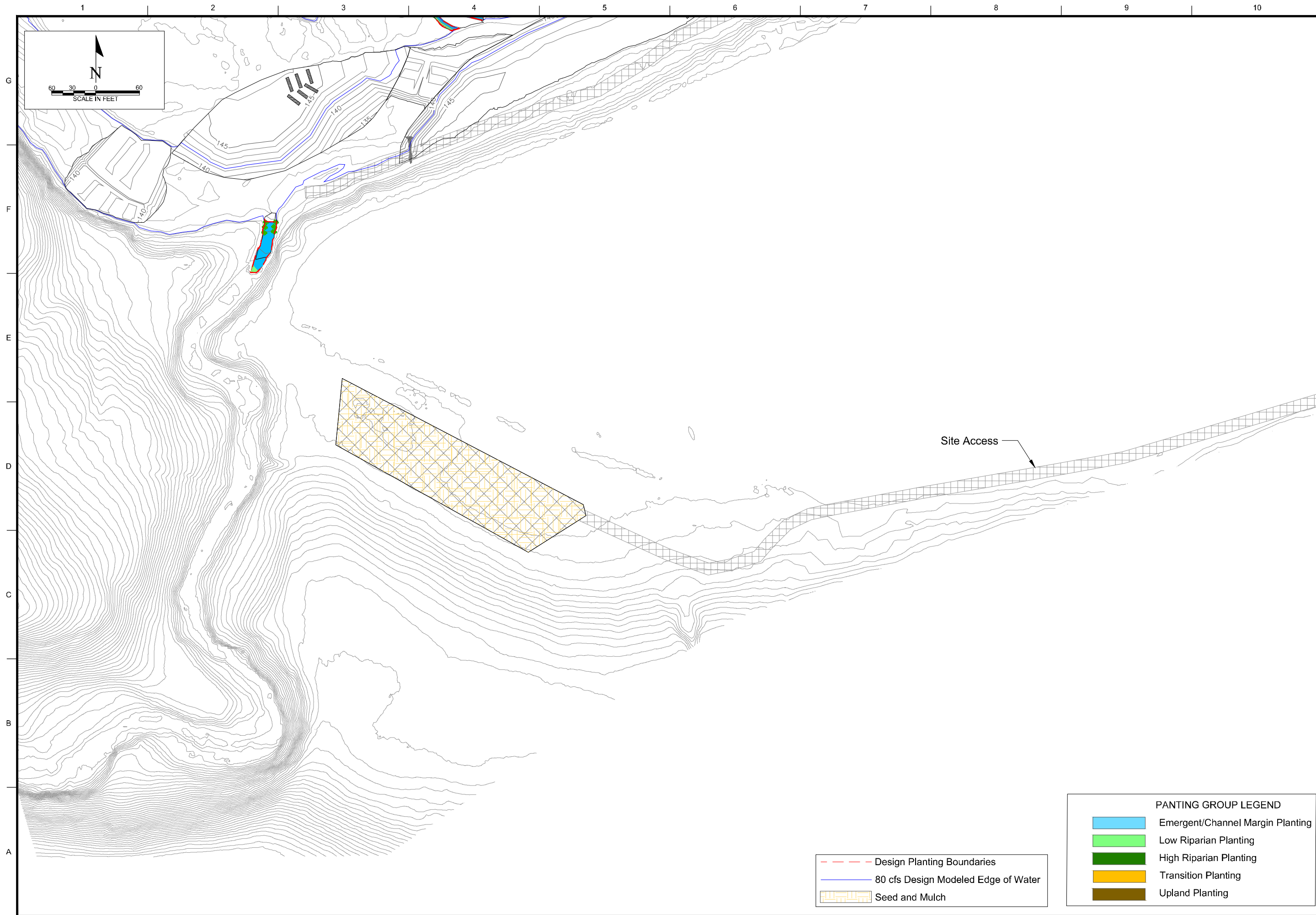
DESIGNED BY: MA and TRC DRAWN BY: N. Sabo, R. George CHECKED BY: F. Meyer, K. Harrison (P.E.) APPROVED BY: K. Harrison (P.E.) SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	ISSUE DATE: October 31, 2023 PROJECT: Zanker Farm CONTRACT NO.: FRGP 0194045-02 & 02140-07 DRAWING SET: 100% Design Planset
TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215	MCBAIN ASSOCIATES 800 7TH STREET ARCAVA, CA 95321 (707) 528-7794


Zanker Farm Restoration Project
 Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
 Planform Detail Mainstem Channel
 Station 78+00 to Station 96+00






SHEET ID
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- 80 cfs Design Modeled Edge of Water
- Seed and Mulch

NOTES:
 1. No planting shown on this sheet.



- - - - Design Planting Boundaries
 — 80 cfs Design Modeled Edge of Water
 Seed and Mulch

PANTING GROUP LEGEND	
	Emergent/Channel Margin Planting
	Low Riparian Planting
	High Riparian Planting
	Transition Planting
	Upland Planting



REV	DATE	DESCRIPTION

DESIGNED BY: MA and TRC
DRAWN BY: N. Sabo, R. George
CHECKED BY: F. Meyer, K. Harrison (P.E.)
APPROVED BY: K. Harrison (P.E.)
SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)

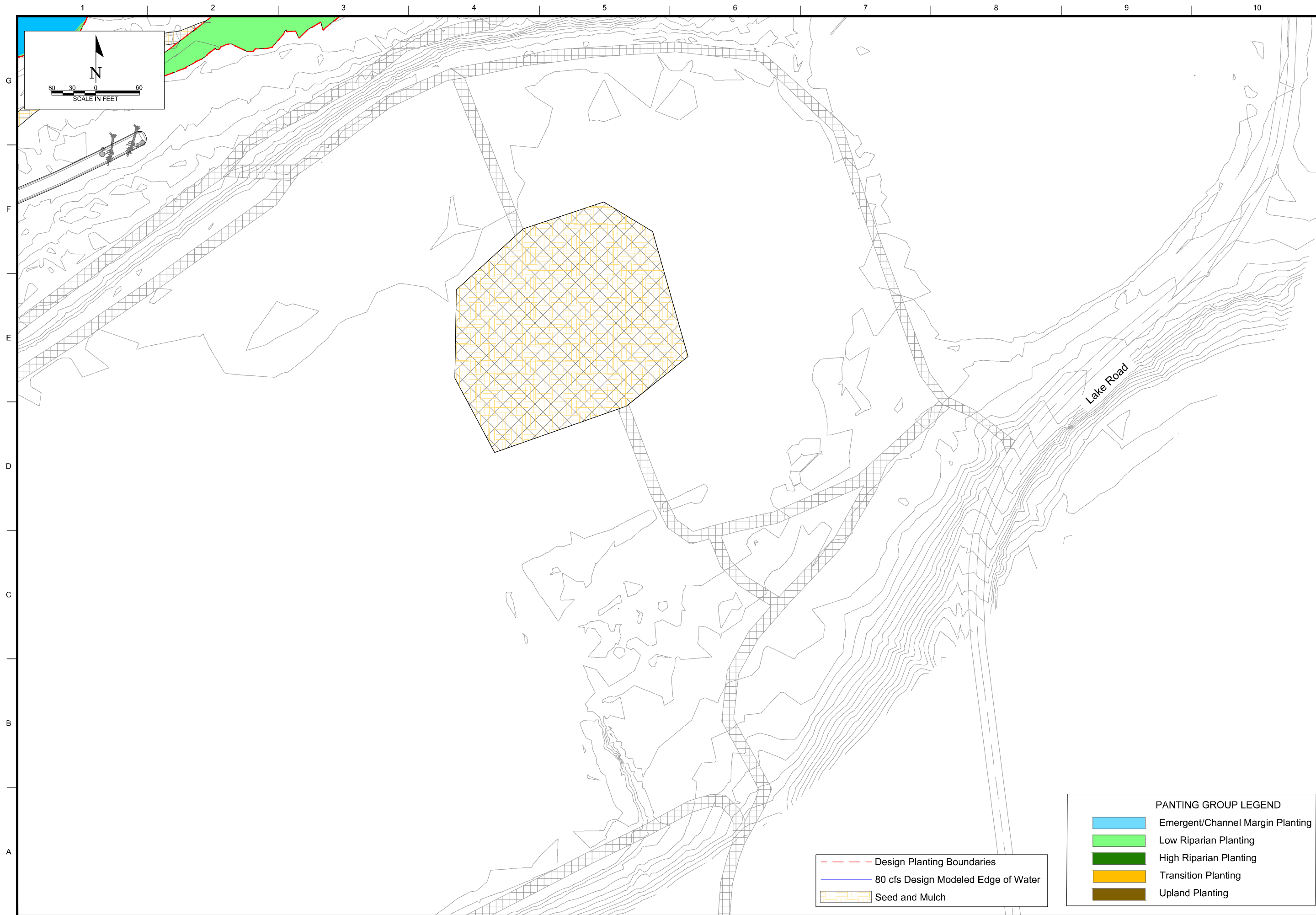
ISSUE DATE: October 31, 2023
PROJECT: Zanker Farm
CONTRACT NO.: FRGP 0194045-02 & 02140-07
DRAWING SET: 100% Design Planset

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 (707) 928-7794

Zanker Farm Restoration Project
Phase I and II, 100% Design Planset
 Tuolumne River, La Grange, CA
Planform Detail

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- - - - Design Planting Boundaries
 ——— 80 cfs Design Modeled Edge of Water
 Seed and Mulch

PANTING GROUP LEGEND	
	Emergent/Channel Margin Planting
	Low Riparian Planting
	High Riparian Planting
	Transition Planting
	Upland Planting



REV	DATE	DESCRIPTION

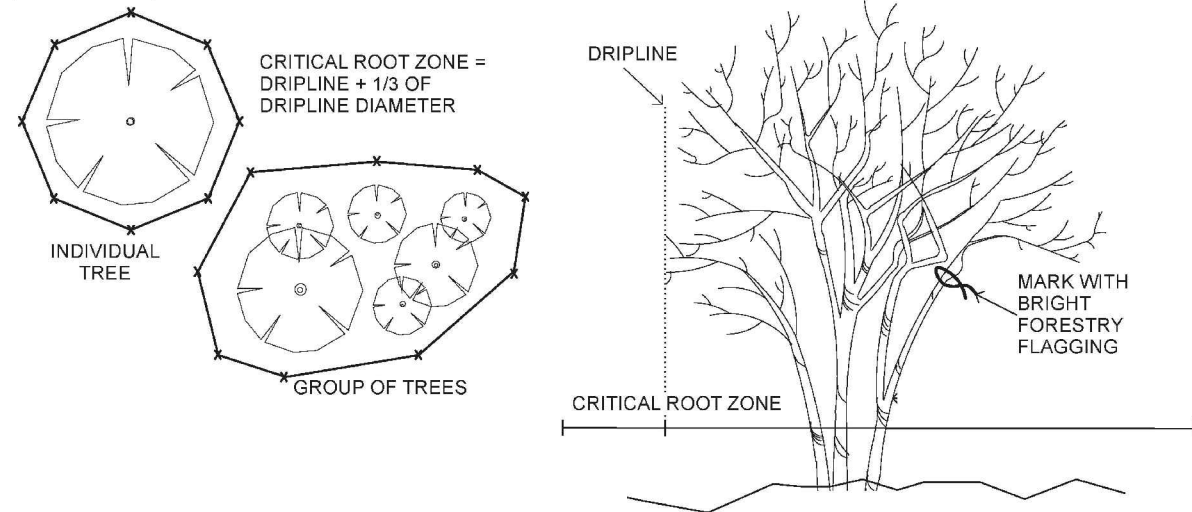
DESIGNED BY: MA and TRC	ISSUE DATE: October 31, 2023
DRAWN BY: N. Sabo, R. George	PROJECT: Zanker Farm
CHECKED BY: F. Meyer, K. Harrison (P.E.)	CONTRACT NO. FRGP: 01940405-02 & 02140407
APPROVED BY: K. Harrison (P.E.)	DRAWING SET: 100% Design Plansheet
SIZE: 22 x 34 in. (full scale), 11 x 17 in. (half scale)	
TUOLUMNE RIVER CONSERVANCY 6380 LANDMARK ROAD STOCKTON, CA 95215	
MCBAIN ASSOCIATES 800 7TH STREET ARCATA, CA 95521 (707) 526-7794	

Zanker Farm Restoration Project
Phase I and II, 100% Design Plansheet
 Tuolumne River, La Grange, CA
Planform Detail

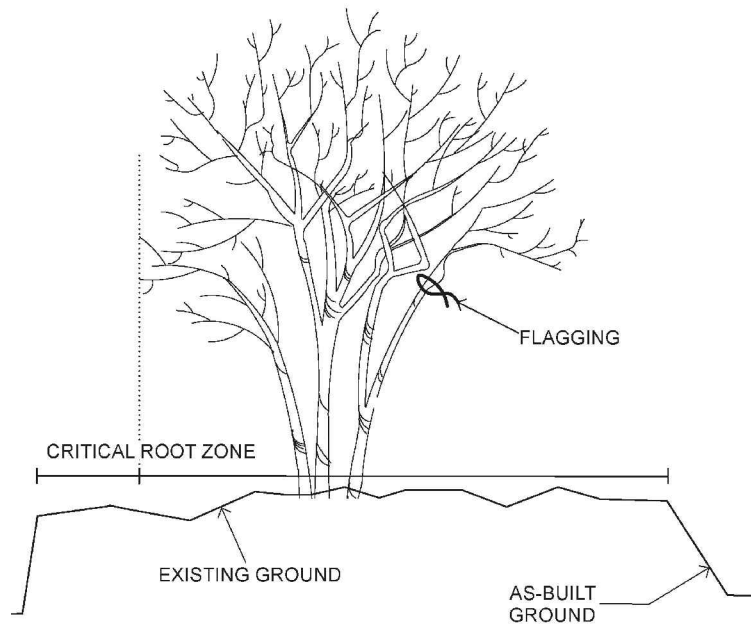
SHEET ID
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 11 of 12

SAVE TREE PROTECTION

EXISTING CONDITION (PLAN VIEW)

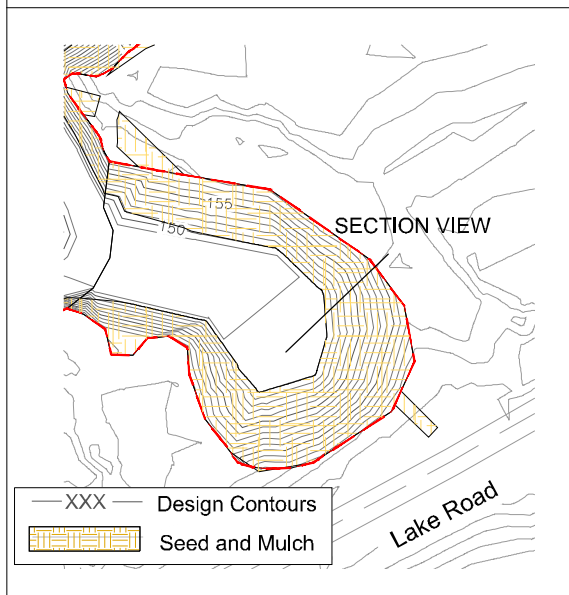


AS-BUILT CONDITION

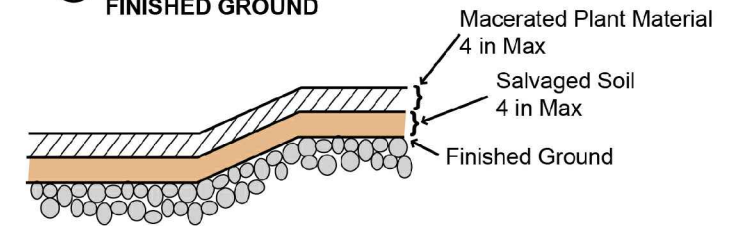


GROUND SURFACE PREPARATION (TYPICAL)

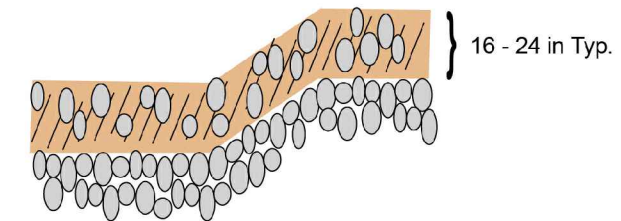
1 EXAMPLE OF SEED AND MULCH (PLAN VIEW)



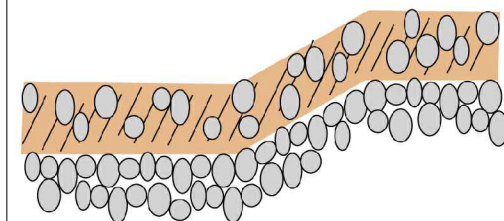
2 ADD SOIL AND MACERATED PLANT MATERIAL OVER FINISHED GROUND



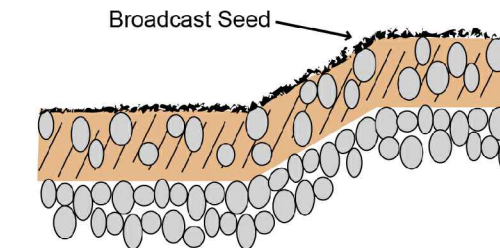
3 DECOMPACT/ RIP/ MIX 16 TO 24 INCHES



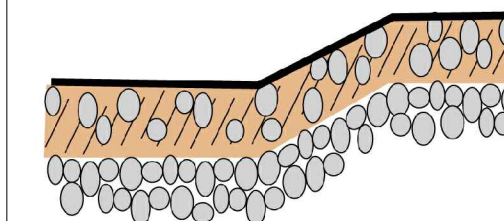
4 PLANT CONSTRUCTED SURFACES AS SHOWN IN PLANS (SEE PLANTING TYPICALS)



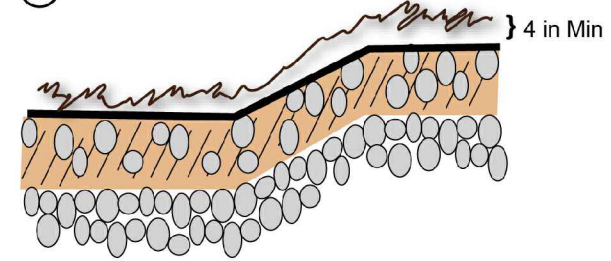
5 SPREAD SEED OVER DECOMPACTED AND PLANTED AREAS



6 DRAG (RAKE, ETC.) BROADCAST SEED



7 SPREAD MULCH OVER SEED



REV	DATE	DESCRIPTION

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Zanker Farm Restoration Project
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Tuolumne River, La Grange, CA
Save Tree and Seed and Mulch
Application

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R-12
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