

Appendix A

Historical Summary of lower Arroyo Grande Creek

Arroyo Grande Creek has a long history of flood impacts to agriculture and human habitation that dates back to the time of the early settlements in the mid-19th century. Historical accounts and a geomorphic analysis of the lower watershed and Cienega Valley suggest that much of the valley floor was at grade with the Creek and consisted of a broad thicket of willows and other riparian trees (Dvorsky, 2004). From the time of the earliest settlements, use of the valley for homesteading, agricultural production, dairies, and cattle ranching required clearing of vegetation and active management of the channel and floodplain. Management, in those days, consisting primarily of ditching the channel to provide a predictable flow path, building levees, removing willow thickets, and leveling the land. Much of these activities were carried out by individual landowners with little to no coordinated efforts between adjacent property owners.

The historic channel likely had a much wider active floodplain, as compared to the incised condition it is in today. The entire valley bottom most likely consisted of a series of active channels, flood channels, and abandoned channels with backwater wetlands that all occurred at, or near, the elevation of the current valley floor. The active channel was likely to be an ephemeral feature, shifting from one location to another based on sediment deposition, debris jams, or other obstructions. In some areas the channel was likely braided, where the floodplain was wide, and a single thread channel where constrictions such as bedrock outcrops narrowed the floodplain.

Several lines of evidence suggest that the channel exhibited these characteristics including remnant channel and floodplain areas observed on historic aerial photos and historic accounts from early settlers (Figure 2). Historic accounts from early settlers, presented below, are taken from a book by Robert Brown, a local historian, entitled, “Story of the Arroyo Grande Creek”, published in 2002:

“..When Francisco and Manuela Branch came here in 1837 to establish their home, the valley was described as a ‘thicket of swamp and willow and cottonwood, a monte, as it was called by the Spanish...”

“...The great adobe, built by Branch, was midway up the valley on a hill just below the present day Branch School. From that point on to the ocean the creek had no channel; it just spread out in the monte, creating bogs and ponds as it made its way to the sea.”

“W. H. Findley, who came here in 1875 said in a speech delivered in 1911: ‘A large part of this beautiful valley was still covered with primeval forests through which the flood waters of the

Arroyo Grande had been spreading for untold ages...we helped make the channel and reclaim the land. We felled the forests and built our homes..."

"As far as the creek is concerned, the early settler, Branch, did some clearing of the monte when he first arrived, but it wasn't until 1863-64 that nature extended a hand and lent assistance by sending the Central Coast a devastating drought. A lot of wetlands dried up and it was easier to channel the creek."

The historic accounts, along with an analysis of historic photos dating back to 1939 (Dvorsky, 2004) point to Arroyo Grande Creek being a completely different channel than it is today. Much of the existing channel has been straightened, confined, constricted, and deepened. Floodplain areas have been converted to agricultural fields and the associated riparian forests have been removed. Many of these changes occurred in the late 1800's and early 1900's as evidenced in these historic accounts (Brown, 2002):

"...The Arroyo Grande Creek became used as a boundary line and it kept shifting, it made good business sense to get a fixed line somewhere. The way the creek shifted around and tore up the land when it flooded, it was necessary to create a definite channel on the south side of the valley."

"The channel formed by Francis Branch and others basically flowed along the south side of the valley...A second ditch brought the creek water down to a farm....This ditch had been extended down the north side of the valley to lands...To divert water into their ditch, Beckett and Young had put up a temporary dam across the main creek. The heavy rainfall in 1883-84 was early and was followed by additional rains in October and November, which coming before the temporary dam had been removed for the winter, resulting in a strong flow of water down the ditch on the north side of the valley. So heavy was the flow that the main channel of the creek swung to the north side of town, where it had remained ever since."

"...The farmers all up and down the creek were working to straighten the creek and prevent further damage should another such flood ever come."

"While the amount of damage done is great, including the loss of practically all bridges and the washing out of roads, it has some compensation. The channel of the Arroyo Grande Creek was

never in better condition to carry future floods than it is now. The channel has been widened, many bad corners cut off and the creek bed is four to six feet deeper than it was...”

“...In the winter of 1969, before the dam, it became furious and frothy to the belly of the Harris Bridge, 30 feet above the gorge that Mr. Harris and some engineers had dynamited in the early part of the century, for the creek had a lethal history.”

Despite the best intentions and well-laid plans of land owners to control Arroyo Grande Creek and reduce impacts to adjacent farmlands and infrastructure, the history of the creek from settlement to present has been a series of devastating floods that have greatly impacted the residents of the area. Severe flood damage has been documented in the Arroyo Grande valley in 1883-84, 1893, 1895, 1907, 1909, 1911, 1914, 1936-37, 1943, 1952, and 2001. The valley avoided the significant flood events that occurred elsewhere on the central and south coast in 1969, 1983, and 1997, most likely due to flood storage in Lopez Reservoir.

The lower Arroyo Grande Creek, or Cienega Valley, is especially vulnerable to flooding because it lies at the downstream, lower gradient terminus of a highly erosive watershed. Much of the erosion occurring in the upper watershed is transported and delivered to the floodplains that make up the lower valley. Historically, much of the transported sediment was deposited onto broad floodplains of the lower alluvial valleys of Arroyo Grande Creek, Tar Springs Creek, and Los Berros Creek (Figure 3). Due to conversion of floodplain areas to agricultural and residential uses, much of the sediment that historically was deposited on the floodplain ends up being deposited in backwater areas behind bridges, beaver dams, or in lower gradient areas, such as the lower Arroyo Grande Creek Channel.

In the 1950's, severe flooding from Arroyo Grande Creek resulted in inundation of prime farmland in the Cienega Valley and significant impacts to existing infrastructure. At the time, Arroyo Grande and adjacent communities were primarily rural with a combined population of less than 5,000 residents. To reduce future economic impacts to the agricultural economy and the growing urban and rural residential population, the community organized the Arroyo Grande Creek Flood Control Project (Project). The Project, led jointly by the USDA-Soil Conservation Service/Arroyo Grande Resource Conservation District, was completed in 1961 to protect homes and farmland in La Ciénega Valley. (These organizations are now known as the USDA-Natural Resources Conservation Service and the Coastal San Luis RCD, respectively.)

The main feature of the Project was a levee system and trapezoidal channel that confined Arroyo Grande Creek from its confluence with Los Berros Creek downstream to the Pacific Ocean (Photo 1). In addition, the lower portion of Los Berros Creek from the Valley View Bridge to the confluence with Arroyo Grande Creek was diverted from its pre-1960 channel, which ran along the southern edge of La Cienega Valley, to its current confluence upstream of the Highway 1 Bridge. Runoff from the Meadow Creek watershed, which runs through Pismo Lake, was designed to enter Arroyo Grande Creek through a pair of flap gates near the Pismo Dunes State Vehicular Recreation Area. Maintenance of the Project, following construction, was the responsibility of Zone 1/IA, under the purview of the County Public Works Department. Landowners within the zone are assessed an annual fee to support management and maintenance of the flood control reach.



Photo 1. Constructed trapezoidal channel at UPRR bridge in 1958.

The original flood control channel was built in 1959 and was designed to carry a discharge of 7,500 cubic feet per second, which, at the time of the analysis, was determined to have a recurrence of once every 50 years. Maintenance of the flood control channel by the County since completion of the project in 1961 consisted primarily of vegetation and sediment removal to maintain the design geometry and capacity of the channel and routine maintenance of the levee system and associated infrastructure. The frequency of maintenance varied depending on rainfall and runoff conditions that preceded maintenance. Maintenance activities in recent years was restricted by a combination of lack of funding (Zone 1/1A maintenance funds had not risen appreciably since the creation of the special district) and

environmental concerns about the impacts of vegetation and sediment removal on aquatic and riparian habitat in the flood control reach.

Environmental concerns and restrictions increased following the listing of the California red-legged frog (*Rana aurora draytonii*), in 1996, and steelhead (*Oncorhynchus mykiss*), in 1997. Protection of critical habitat for these two species meant that past maintenance activities, authorized under the 1959 Operation and Maintenance Agreement with the NRCS and RCD, was no longer feasible. The agencies overseeing protection of sensitive species, including the U.S. Fish and Wildlife Service, NOAA Fisheries, and the California Department of Fish and Game, requested that a more comprehensive strategy be prepared to manage the flood control reach through a maintenance program that specifically protects aquatic habitat.

In the interim, Arroyo Grande was experiencing a development boom. During the late 1990's, 625 new home sites were approved in the City of Arroyo Grande in a period of 5 years. This number represents an increase of almost 10% in a city with only 6,750 housing units (US Census, 2000.). Much of the development, both proposed and existing, provides little in the way of stormwater management or Best Management Practices (BMP's) that limit runoff and reduce impacts to the hydrology of the watershed. Consequently, an increase in impervious surfaces within the watershed contributed to increased runoff to the flood control reach with increased risk of flooding. A flood estimated to occur once every 50 years in 1955 is now estimated to have a recurrence interval of 15-20 years due to changes in the hydrology of the lower watershed (defined as the watershed below Lopez Dam). In addition, much of the development occurred on steep, highly erodible soils. Sediment eroded from disturbed lands are eventually transported to the flood control reach, resulting in impacts to low lying agricultural land through increased flooding and flood risk.

In 1999, the US Army Corps of Engineers developed a study to assess the existing capacity of the flood control reach. The results suggested that the system currently has a reduced capacity of 1,700 cfs which equates to a recurrence interval of approximately 2-year to 5-years (USACE, 2001). The capacity of the as-built channel (the channel as built in 1961), according to the USACE model, was determined to be 6,500 cfs with an associated level of protection between the 10-year and 20-year runoff event. These results showed that even with 1961 geometry, where sediment has been removed, the capacity of the channel has been reduced by approximately 1,000 cfs, most likely due to changes in the levee geometry from settlement and erosion. The USACE study pointed to the need for a more detailed alternative assessment to define project opportunities and costs associated with improving overall capacity and flood protection.

On March 5, 2001, during a high intensity rain event, the levee was breached on the south side between the mouth and the Union Pacific railroad bridge (Photos 2 and 3). It was estimated by observers in the field at the time of the levee breach that the levee would have overtopped upstream of the 22nd Street bridge had the levee not breached and lowered the overall water surface. Hundreds of acres of farmland and several residences were flooded in the La Cienega Valley. Impacts from the flooding persisted beyond the winter season as many of the lower lying areas with clay soils located in the southern portion of the valley remained saturated. The northern levee remained intact, thereby protecting several residential developments, the Oceano Airport, and the regional wastewater treatment plant that services the communities of Arroyo Grande, Oceano and Grover Beach.



Photo 2. Oblique photo of flooding in the Cienega Valley following the levee breach of March 2001 (looking south).



Photo 3. Close-up view of the levee breach and flooding of farmland in March 2001 (looking at south levee from north levee).

In April of 2003, the County Board of Supervisors passed a “Resolution to Relinquish the Arroyo Grande and Los Berros Diversion Flood Control Channels and Appurtenant Structures to the State of California”. County Public Works Department staff recommended that maintenance responsibilities be turned over

to the State Department of Water Resources (DWR) because the County had not been able to maintain the channel due to regulatory requirements, inadequate funding from the Zone 1/1A assessments, and the cost of liability insurance. The State is mandated to accept this responsibility under Water Code Section 12878. In fall 2004, the responsible entity, the Division of Flood Management at DWR, initiated the process of establishing a new Maintenance Area for flood control along lower Arroyo Grande Creek.

In February of 2005, DWR issued a Statement of Necessary work with the goal of initiating maintenance work on the channel in July 2005. Because the State Water Code mandates that DWR maintain the channel by restoring it to its original 1958 design, DWR was faced with a difficult and expensive regulatory process in order to obtain the necessary environmental permits. Due to the presence of two federally listed species, restoring the original design would likely result in requirements to develop and implement costly mitigation measures to compensate for habitat loss that would be paid locally through the Zone 1/1A assessment process. There are no provisions in the Water Code which allows DWR to study or implement other acceptable flood control designs or alternatives that would also be more environmentally acceptable.

During late 2002 the SLOFCWCD allocated money for a Program Evaluation and Engineering Alternatives Analysis Study of the lower Arroyo Grande Creek flood control channel. This study was intended to evaluate a wide range of flood control alternative projects and provide a plan to manage flooding at the most downstream section of the creek. When the SLOFCWCD began the process of relinquishing maintenance of the channel over to the State, it also withdrew the funding for this study. The Zone 1/1A Advisory Committee, comprised of agriculturalists and other local residents, and various stakeholders, actively lobbied the County Board of Supervisors to restore this funding so that the plan could be developed. In June 2004, the SLOFCWCD approved to the RCD to conduct “The Erosion, Sedimentation, and Flooding Alternatives Study” (Alternatives Study). The County grant was matched by the State Coastal Conservancy, and augmented from the State Dept of Parks and Recreation Off-Highway Vehicles Division.

The County and the Zone 1/1A Task Force, consisting of Zone 1/1A property owners and stakeholder organizations, worked together over the ensuing months to organize a Proposition 218 election to raise sufficient funds to provide a basic level of flood channel maintenance without putting an oppressive financial burden on Zone 1/1A property owners. When the returned ballots were counted on June 8, 2006, the Prop 218 measure passed with more than 89% of the votes cast. As a result of the overwhelming passage of the Prop 218 measure for Zone 1/1A, on June 27, 2006, the County Board of Supervisors, acting as the SLOFCWCD, rescinded their 2003 resolution to relinquish the flood channel

to DWR. By keeping the maintenance responsibility local, channel maintenance can be conducted both in a more flexible and environmentally sensitive manner than would have been possible under DWR.

The consulting firm of Swanson Hydrology and Geomorphology (SH+G) was contracted by the RCD to conduct the Alternatives Study, and began work in February 2005. A Technical Advisory Team met with SH+G staff twice during 2005 to provide feedback and recommendations regarding which options to consider for analysis in the Alternatives Study, and to review preliminary results. The Technical Advisory Team consisted of representatives from U.S. Fish and Wildlife, California Department of Fish and Game, the Coastal Conservancy, NOAA/NMFS, Regional Water Quality Control Board, San Luis Obispo County Public Works and Environmental Planning Departments, City of Arroyo Grande, Oceano Community Services District, Central Coast Salmon Enhancement, Zone 1/1A Advisory Committee, and U.S. Army Corps of Engineers.

The Alternatives Study was completed in January 2006. The Alternatives Study focused in-depth on erosion sources, sedimentation and hydrology as they relate to recurring flooding in the lower reaches of the creek. The final study described six different “Alternatives”, or sets of feasible projects and management actions, that could be implemented to manage flooding in Zone 1/1A, and provided estimates of the degree of flood protection afforded by each Alternative. The Study also discussed and analyzed the projected benefits of necessary watershed-wide management activities, such as floodplain restoration, stream restoration, and sediment control, to diminish flood risk and reduce the frequency of dredging through the flood control reach.

With the 2006 passage of the Proposition 218 measure, funding was now available to develop and carry out a long-term management plan for the flood control channel. In fall 2007, SLO County Public Works drafted a Notice of Preparation and a Request for Qualifications for preparation of an environmental impact report/environmental assessment and assistance with regulatory permitting. Representatives of the Zone 1/1A Advisory Committee Task Force joined SLO County Public Works staff in reviewing applications, conducting interviews, and selecting a consulting firm to recommend to the SLO County Board of Supervisors for contract. The firm selected was the Morro Group, now SWCA, Inc., partnering with SH+G (now Waterways Consulting) to prepare a Waterway Management Program (WMP) that includes project actions described under Alternative 3c of the Alternatives Study combined with enhancement actions that improve habitat conditions in the flood control reach for steelhead, California red-legged frog, and other species that rely on the aquatic environment.

Appendix B

Preliminary Engineering Design Plans

ARROYO GRANDE CREEK CHANNEL SEDIMENT AND VEGETATION MANAGEMENT PLAN CONCEPTUAL PLANS

**CONCEPTUAL
NOT FOR CONSTRUCTION**

**PREPARED AT THE
REQUEST OF:
SAN LUIS OBISPO COUNTY
FLOOD CONTROL AND
WATER CONSERVATION
DISTRICT**

**COVER
SHEET**

**ARROYO GRANDE CREEK
CHANNEL SEDIMENT
AND VEGETATION
MANAGEMENT PLAN
CONCEPTUAL PLANS**

DESIGNED BY: B.M.S.
DRAWN BY: B.M.S.
CHECKED BY: M.W.W.
DATE: 9/21/09
JOB NO.: 08-707

BAR IS ONE INCH ON
ORIGINAL DRAWING.
ADJUST SCALES FOR
REDUCED PLOTS
0 1"

C1
1 OF 10

PROJECT DESCRIPTION

THESE PLANS PROVIDE DETAILS FOR THE REMOVAL OF SEDIMENT FROM ARROYO GRANDE AND LOS BERROS CREEK CHANNELS IN THE COUNTY OF SAN LUIS OBISPO. CONSTRUCTION ACTIVITIES WILL CONSIST OF EXCAVATION AND DISPOSAL OF SEDIMENT FROM THE CHANNEL FLOODPLAINS AND INSTALLATION OF LOG HABITAT STRUCTURES.

GRADING SUMMARY

TOTAL CUT VOLUME = 21,332 CY
TOTAL FILL VOLUME = 0 CY
NET CUT = 21,332 CY

THE ABOVE QUANTITIES ARE APPROXIMATE IN-PLACE VOLUMES CALCULATED AS THE DIFFERENCE BETWEEN EXISTING GROUND, AS MAPPED IN 2006, AND THE PROPOSED FINISH GRADE. EXISTING GROUND IS DEFINED BY THE TOPOGRAPHIC CONTOURS AND/OR SPOT ELEVATIONS ON THE PLAN. PROPOSED FINISH GRADE IS DEFINED AS THE DESIGN SURFACE ELEVATION OF EARTH TO BE CONSTRUCTED.

THE ABOVE QUANTITIES HAVE BEEN CALCULATED FOR PERMITTING PURPOSES ONLY AND HAVE NOT BEEN FACTORED TO INCLUDE ALLOWANCES FOR BULKING, CLEARING AND GRUBBING, SUBSIDENCE, SHRINKAGE, OVER EXCAVATION, AND RECOMPACTION, UNDERGROUND UTILITY AND SUBSTRUCTURE SPOILS AND CONSTRUCTION METHODS.

THE CONTRACTOR SHALL PERFORM AN INDEPENDENT EARTHWORK ESTIMATE FOR THE PURPOSE OF PREPARING BID PRICES FOR EARTHWORK. THE BID PRICE SHALL INCLUDE COSTS FOR ANY NECESSARY IMPORT AND PLACEMENT OF EARTH MATERIALS OR THE EXPORT AND PROPER DISPOSAL OF EXCESS EARTH MATERIALS.

PRIOR TO COMMENCEMENT OF CONSTRUCTION, CONTRACTOR SHALL PERFORM AN UPDATED CROSS SECTION SURVEY TO DETERMINE ACTUAL CONDITIONS.

GENERAL NOTES

- 1) PREPARED AT THE REQUEST OF:
SAN LUIS OBISPO COUNTY
FLOOD CONTROL AND WATER CONSERVATION DISTRICT
- 2) AERIAL MAPPING OF THE PROJECT AREA WAS PERFORMED BY:
CENTRAL COAST AERIAL MAPPING, INC.
710 FIERO LN #24
SAN LUIS OBISPO, CALIFORNIA 93401
(805)543-4307
JOB# 2005-841
PHOTOGRAPHY DATE: 3/10/2005
- 3) ELEVATION DATUM: NAVD 88, BASED ON NGS BENCHMARK X 532, PID "FV0421", ELEVATION= 13.5'
- 4) HORIZONTAL DATUM: HORIZONTAL COORDINATES CONSTRAINED TO NGS MONUMENT HPGN CA 05 05, PID "FV2048", NAD83, CALIFORNIA STATE PLAN ZONE 5
- 5) APN'S: T.B.D.
- 6) ELEVATIONS AND DISTANCES SHOWN ARE IN FEET AND DECIMALS THEREOF. CONTOUR INTERVAL IS 2 FEET.
- 7) PROPERTY LINES ARE NOT SHOWN HEREON.
- 8) ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE CURRENT EDITION OF THE STATE OF CALIFORNIA STANDARD SPECIFICATIONS FOR CONSTRUCTION OF LOCAL STREETS AND ROADS (HEREAFTER REFERRED TO AS "STANDARD SPECIFICATIONS", AND SHALL BE SUBJECT TO APPROVAL OF THE OWNER.
- 9) THE COUNTY PUBLIC WORKS DEPARTMENT SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. A QUALIFIED CIVIL ENGINEER WITH EXPERIENCE IN THE INSTALLATION OF FEATURES OF THE TYPE SHOWN ON THESE PLANS, SHALL PROVIDE INSPECTION SERVICES DURING THE CONSTRUCTION PROCESS.
- 10) CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTION LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL. NEITHER THE PROFESSIONAL ACTIVITIES OF CONSULTANT NOR THE PRESENCE OF CONSULTANT OR HIS OR HER EMPLOYEES OR SUB-CONSULTANTS AT A CONSTRUCTION SITE SHALL RELIEVE THE CONTRACTOR AND ITS SUBCONTRACTORS OF THEIR RESPONSIBILITIES INCLUDING, NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING OR COORDINATING ALL PORTIONS OF THE WORK OF CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND APPLICABLE HEALTH OR SAFETY REQUIREMENTS OF ANY REGULATORY AGENCY OR OF STATE LAW.

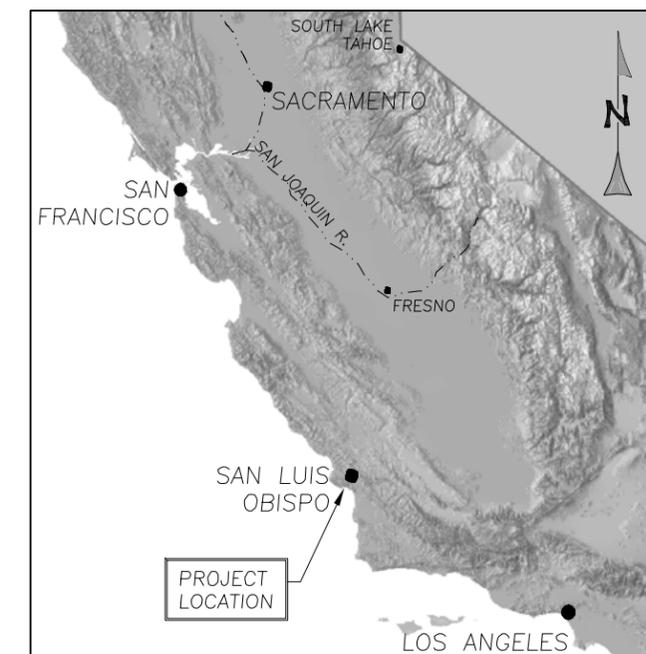
SECTION AND DETAIL CONVENTION

SECTION OR DETAIL IDENTIFICATION
(NUMBER OR LETTER)



REFERENCE SHEET FROM WHICH
DETAIL OR SECTION IS TAKEN.

REFERENCE SHEET ON WHICH
SECTION OR DETAIL IS SHOWN.



REGIONAL MAP
N.T.S.



VICINITY MAP
N.T.S.

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GENERAL NOTES CONT'D

11) EXISTING UNDERGROUND UTILITY LOCATIONS:

LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY THE APPROPRIATE UTILITY AGENCIES OR FROM FIELD MEASUREMENTS TO ABOVE GROUND FEATURES READILY VISIBLE AT THE TIME OF SURVEY. LOCATIONS SHOWN ARE APPROXIMATE. THE CONTRACTOR IS CAUTIONED THAT ONLY ACTUAL EXCAVATION WILL REVEAL THE DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND DEPTH OF UNDERGROUND UTILITIES.

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE LOCATION AND/OR PROTECTION OF ALL EXISTING AND PROPOSED PIPING, UTILITIES, TRAFFIC SIGNAL EQUIPMENT (BOTH ABOVE GROUND AND BELOW GROUND), STRUCTURES, AND ALL OTHER EXISTING IMPROVEMENTS THROUGHOUT CONSTRUCTION.

PRIOR TO COMMENCING FABRICATION OR CONSTRUCTION, CONTRACTOR SHALL DISCOVER OR VERIFY THE ACTUAL DIMENSIONS, SIZES, MATERIALS, LOCATIONS, AND ELEVATIONS OF ALL EXISTING UTILITIES AND POTHOLE THOSE AREAS WHERE POTENTIAL CONFLICTS ARE LIKELY OR DATA IS OTHERWISE INCOMPLETE.

CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION OPERATIONS, AND SHALL BE SOLELY RESPONSIBLE FOR THE COST OF REPAIR/REPLACEMENT OF ANY EXISTING UTILITIES DAMAGED DURING CONSTRUCTION. CONTRACTOR TO CALL UNDERGROUND SERVICE ALERT (1-800-642-2444) TO LOCATE ALL UNDERGROUND UTILITY LINES PRIOR TO COMMENCING CONSTRUCTION.

UPON LEARNING OF THE EXISTENCE AND/OR LOCATIONS OF ANY UNDERGROUND FACILITIES NOT SHOWN OR SHOWN INACCURATELY ON THE PLANS OR NOT PROPERLY MARKED BY THE UTILITY OWNER, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY OWNER AND THE CITY BY TELEPHONE AND IN WRITING.

UTILITY RELOCATIONS REQUIRED FOR THE CONSTRUCTION OF THE PROJECT FACILITIES WILL BE PERFORMED BY THE UTILITY COMPANY, UNLESS OTHERWISE NOTED.

PRIOR TO BEGINNING WORK, THE CONTRACTOR SHALL CONTACT ALL UTILITIES COMPANIES WITH REGARD TO WORKING OVER, UNDER, OR AROUND EXISTING FACILITIES AND TO OBTAIN INFORMATION REGARDING RESTRICTIONS THAT ARE REQUIRED TO PREVENT DAMAGE TO THE FACILITIES.

12) SHOULD THE CONTRACTOR DISCOVER ANY DISCREPANCIES BETWEEN THE CONDITIONS EXISTING IN THE FIELD AND THE INFORMATION SHOWN ON THESE DRAWINGS, HE SHALL NOTIFY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.

13) THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGN, PERMITTING, INSTALLATION, AND MAINTENANCE OF ANY AND ALL TRAFFIC CONTROL MEASURES DEEMED NECESSARY.

14) THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE GENERAL SAFETY DURING CONSTRUCTION. ALL WORK SHALL CONFORM TO PERTINENT SAFETY REGULATIONS AND CODES. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING, INSTALLING, AND MAINTAINING ALL WARNING SIGNS AND DEVICES NECESSARY TO SAFEGUARD THE GENERAL PUBLIC AND THE WORK, AND PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE PROVISIONS OF OSHA IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.

15) THE CONTRACTOR SHALL PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.

16) ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE ENGINEER SO THAT THE QUALITY OF WORK CAN BE CHECKED FOR APPROVAL.

17) THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. ALL MATERIALS SHALL BE STORED WITHIN APPROVED CONSTRUCTION AREAS.

18) THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AT HIS EXPENSE, ALL PERMITS AS REQUIRED BY THE LOCAL AGENCIES, INCLUDING BUT NOT LIMITED TO; ENCROACHMENT, GRADING AND LANE CLOSURES NOT PREVIOUSLY OBTAINED BY THE OWNER. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.

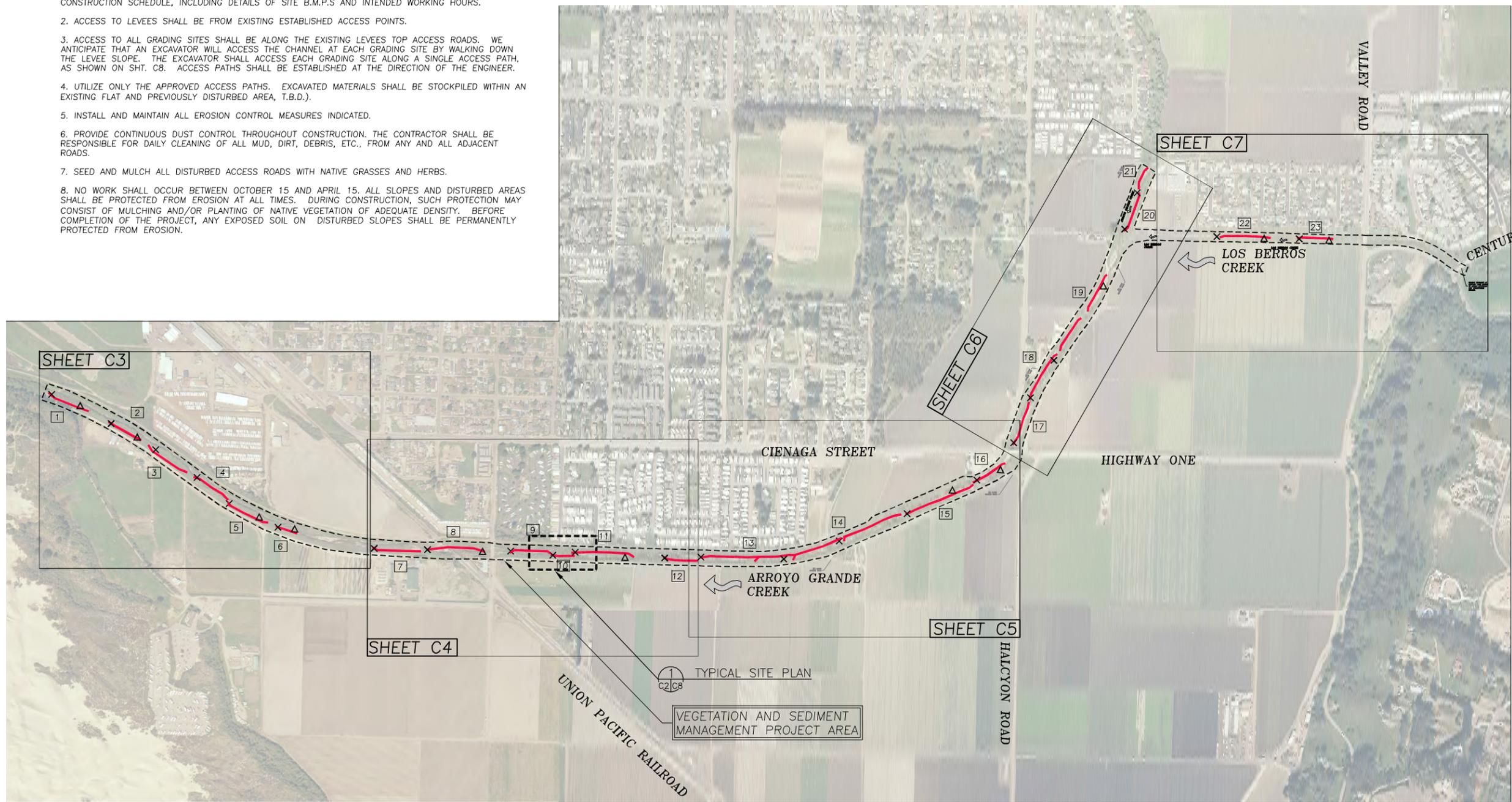
19) CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT, UNLESS OTHERWISE SPECIFIED IN THE PLANS.

20) NO CONSTRUCTION SHALL BE STARTED WITHOUT PLANS APPROVED BY THE COUNTY DEPARTMENT OF PUBLIC WORKS. THE DEPARTMENT OF PUBLIC WORKS SHALL BE NOTIFIED AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION AND OF THE TIME AND LOCATION OF THE PRE-CONSTRUCTION CONFERENCE. ANY CONSTRUCTION PERFORMED WITHOUT PRIOR NOTIFICATION TO THE DEPARTMENT OF PUBLIC WORKS WILL BE REJECTED AND WILL BE AT THE CONTRACTOR'S RISK.

21) THE CONTRACTOR SHALL NOT BEGIN ANY CONSTRUCTION WORK UNTIL THE PROJECT SCHEDULE AND WORK PLAN IS APPROVED BY THE ENGINEER.

EROSION CONTROL AND ACCESS NOTES

1. PRIOR TO COMMENCEMENT OF WORK, CONTRACTOR SHALL PROVIDE THE ENGINEER WITH A DETAILED CONSTRUCTION SCHEDULE, INCLUDING DETAILS OF SITE B.M.P.S AND INTENDED WORKING HOURS.
2. ACCESS TO LEVEES SHALL BE FROM EXISTING ESTABLISHED ACCESS POINTS.
3. ACCESS TO ALL GRADING SITES SHALL BE ALONG THE EXISTING LEVEES TOP ACCESS ROADS. WE ANTICIPATE THAT AN EXCAVATOR WILL ACCESS THE CHANNEL AT EACH GRADING SITE BY WALKING DOWN THE LEVEE SLOPE. THE EXCAVATOR SHALL ACCESS EACH GRADING SITE ALONG A SINGLE ACCESS PATH, AS SHOWN ON SHT. C8. ACCESS PATHS SHALL BE ESTABLISHED AT THE DIRECTION OF THE ENGINEER.
4. UTILIZE ONLY THE APPROVED ACCESS PATHS. EXCAVATED MATERIALS SHALL BE STOCKPILED WITHIN AN EXISTING FLAT AND PREVIOUSLY DISTURBED AREA, T.B.D.).
5. INSTALL AND MAINTAIN ALL EROSION CONTROL MEASURES INDICATED.
6. PROVIDE CONTINUOUS DUST CONTROL THROUGHOUT CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY CLEANING OF ALL MUD, DIRT, DEBRIS, ETC., FROM ANY AND ALL ADJACENT ROADS.
7. SEED AND MULCH ALL DISTURBED ACCESS ROADS WITH NATIVE GRASSES AND HERBS.
8. NO WORK SHALL OCCUR BETWEEN OCTOBER 15 AND APRIL 15. ALL SLOPES AND DISTURBED AREAS SHALL BE PROTECTED FROM EROSION AT ALL TIMES. DURING CONSTRUCTION, SUCH PROTECTION MAY CONSIST OF MULCHING AND/OR PLANTING OF NATIVE VEGETATION OF ADEQUATE DENSITY. BEFORE COMPLETION OF THE PROJECT, ANY EXPOSED SOIL ON DISTURBED SLOPES SHALL BE PERMANENTLY PROTECTED FROM EROSION.



PROJECT AREA OVERVIEW
SCALE: 1"=500'

LEGEND

- △ TYPE "A" LOG HABITAT STRUCTURE (11 TOTAL)
- × TYPE "B" LOG HABITAT STRUCTURE (24 TOTAL)
- 9 GRADING SITE IDENTIFICATION NUMBER
- PROPOSED GRADING SITE (SECONDARY CHANNEL)

CONCEPTUAL
NOT FOR CONSTRUCTION

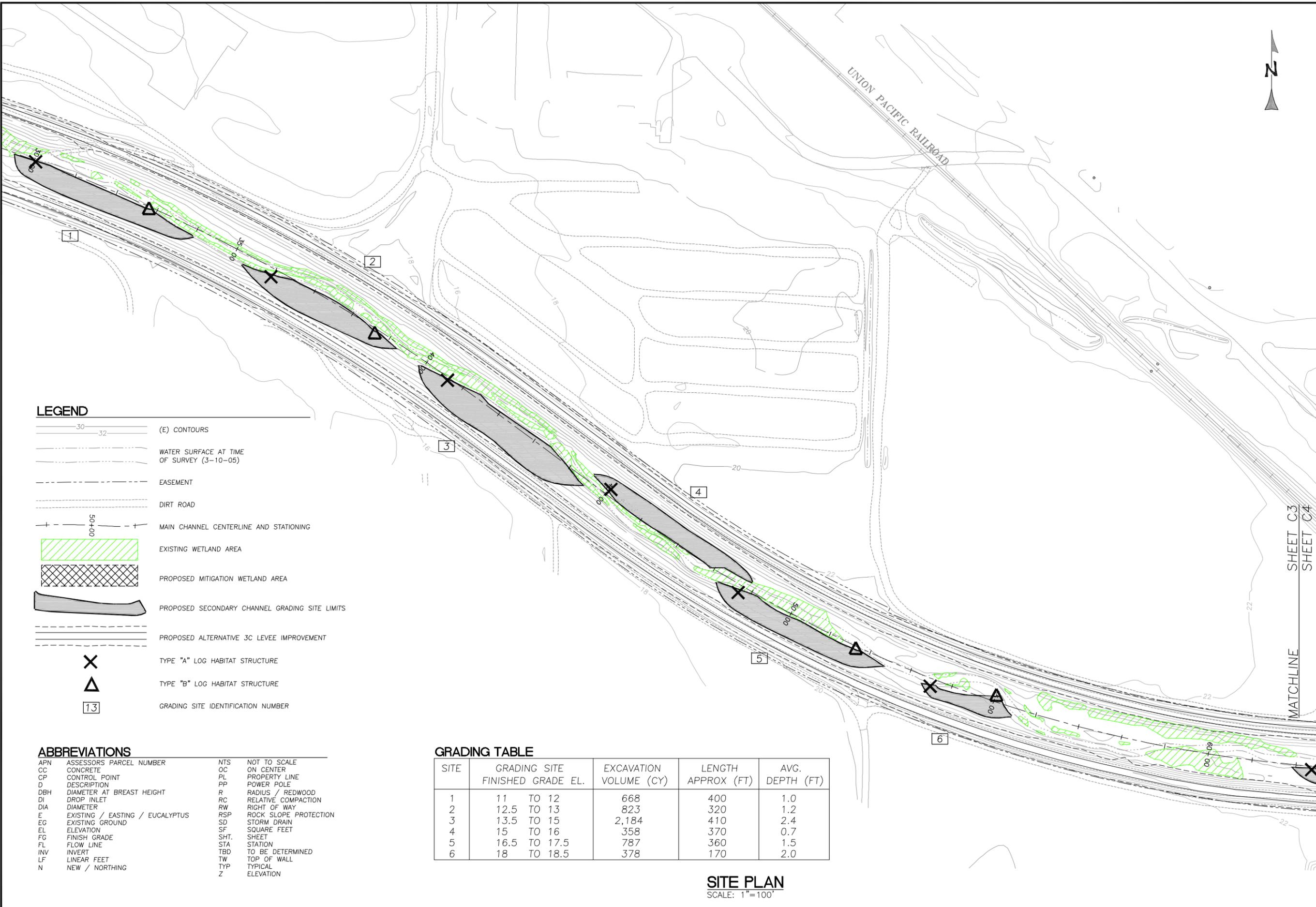
PREPARED AT THE REQUEST OF:
SAN LUIS OBISPO COUNTY
FLOOD CONTROL AND WATER CONSERVATION DISTRICT

PROJECT AREA OVERVIEW

ARROYO GRANDE CREEK CHANNEL SEDIMENT AND VEGETATION MANAGEMENT PLAN CONCEPTUAL PLANS

DESIGNED BY: B.M.S.
DRAWN BY: B.M.S.
CHECKED BY: M.W.W.
DATE: 9/21/09
JOB NO.: 08-707

BAR IS ONE INCH ON ORIGINAL DRAWING. ADJUST SCALES FOR REDUCED PLOTS
0 1"



LEGEND

- (E) CONTOURS
- WATER SURFACE AT TIME OF SURVEY (3-10-05)
- EASEMENT
- DIRT ROAD
- MAIN CHANNEL CENTERLINE AND STATIONING
- EXISTING WETLAND AREA
- PROPOSED MITIGATION WETLAND AREA
- PROPOSED SECONDARY CHANNEL GRADING SITE LIMITS
- PROPOSED ALTERNATIVE 3C LEVEE IMPROVEMENT
- TYPE "A" LOG HABITAT STRUCTURE
- TYPE "B" LOG HABITAT STRUCTURE
- GRADING SITE IDENTIFICATION NUMBER

ABBREVIATIONS

APN	ASSESSORS PARCEL NUMBER	NTS	NOT TO SCALE
CC	CONCRETE	OC	ON CENTER
CP	CONTROL POINT	PL	PROPERTY LINE
D	DESCRIPTION	PP	POWER POLE
DBH	DIAMETER AT BREAST HEIGHT	R	RADIUS / REDWOOD
DI	DROP INLET	RC	RELATIVE COMPACTION
DIA	DIAMETER	RW	RIGHT OF WAY
E	EXISTING / EASTING / EUCALYPTUS	RSP	ROCK SLOPE PROTECTION
EG	EXISTING GROUND	SD	STORM DRAIN
EL	ELEVATION	SF	SQUARE FEET
FG	FINISH GRADE	SHT.	SHEET
FL	FLOW LINE	STA	STATION
INV	INVERT	TBD	TO BE DETERMINED
LF	LINEAR FEET	TW	TOP OF WALL
N	NEW / NORTHING	TYP	TYPICAL
		Z	ELEVATION

GRADING TABLE

SITE	GRADING SITE FINISHED GRADE EL.	EXCAVATION VOLUME (CY)	LENGTH APPROX (FT)	AVG. DEPTH (FT)
1	11 TO 12	668	400	1.0
2	12.5 TO 13	823	320	1.2
3	13.5 TO 15	2,184	410	2.4
4	15 TO 16	358	370	0.7
5	16.5 TO 17.5	787	360	1.5
6	18 TO 18.5	378	170	2.0

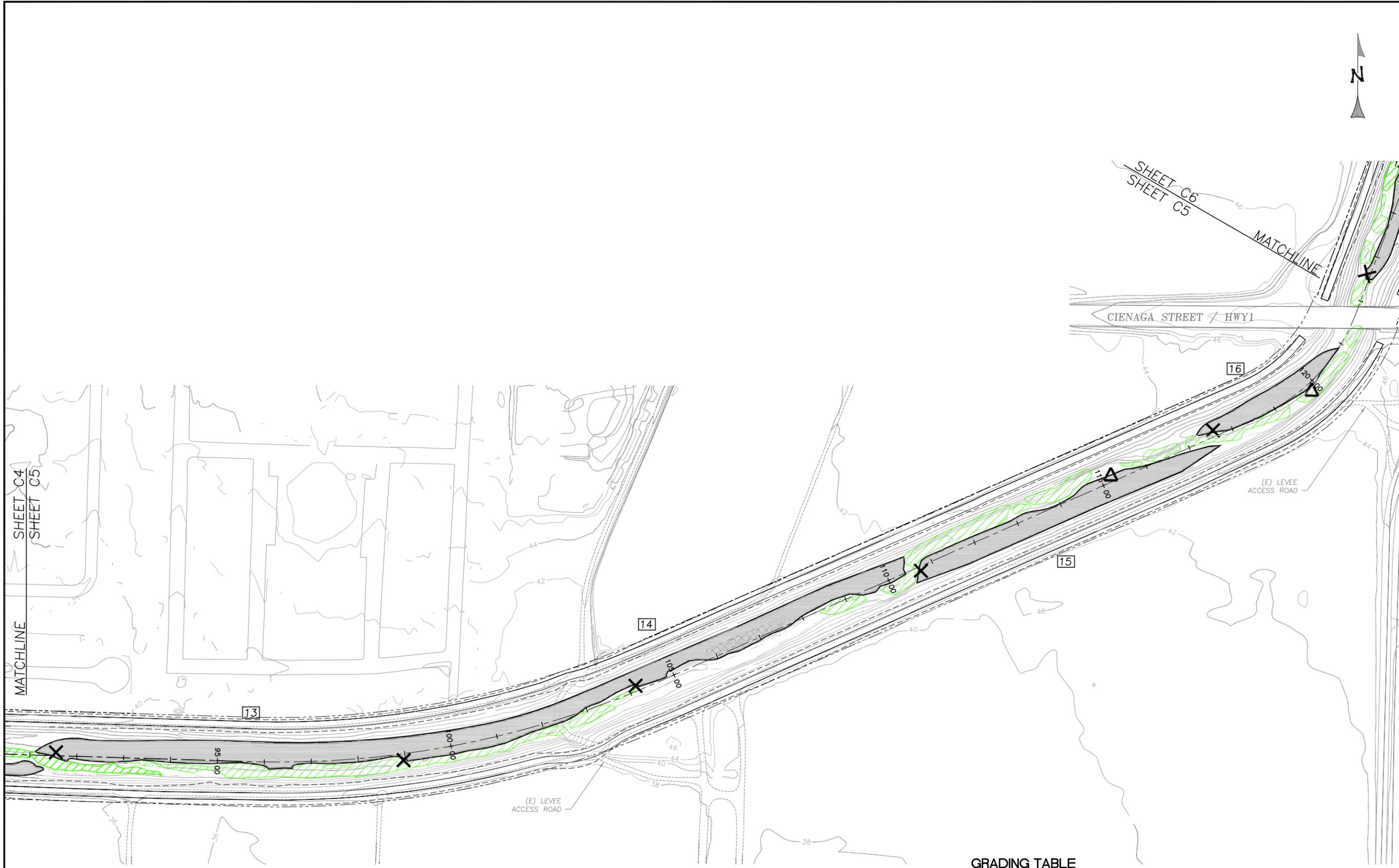
SITE PLAN
 SCALE: 1"=100'



SITE PLAN
SCALE: 1"=100'

GRADING TABLE

SITE	GRADING SITE FINISHED GRADE EL.	EXCAVATION VOLUME (CY)	LENGTH APPROX (FT)	AVG. DEPTH (FT)
7	21 TO 22	193	450	0.3
8	22 TO 24	1,121	560	1.1
9	24.5 TO 25.8	738	400	1.0
10	25.8 TO 26.1	498	210	1.4
11	26.2 TO 28.5	1,262	530	1.3
12	29 TO 29.2	243	300	0.6



SITE PLAN
SCALE: 1"=100'

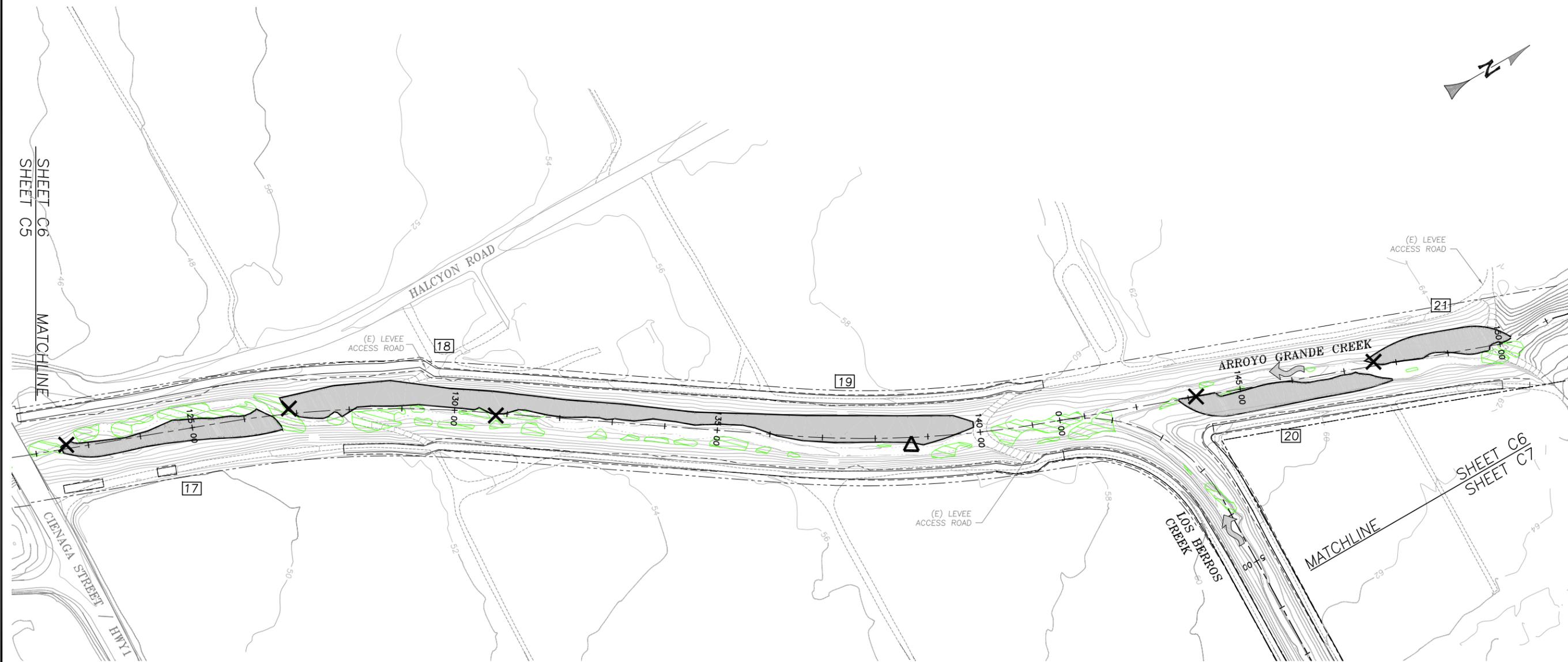
GRADING TABLE

SITE	GRADING SITE FINISHED GRADE EL.	EXCAVATION VOLUME (CY)	LENGTH APPROX (FT)	AVG. DEPTH (FT)
13	29.5 TO 31.5	2,700	830	1.8
14	31.5 TO 35	3,110	1,030	2.0
15	35.5 TO 37	1,309	660	1.2
16	37.5 TO 38.5	516	310	1.1

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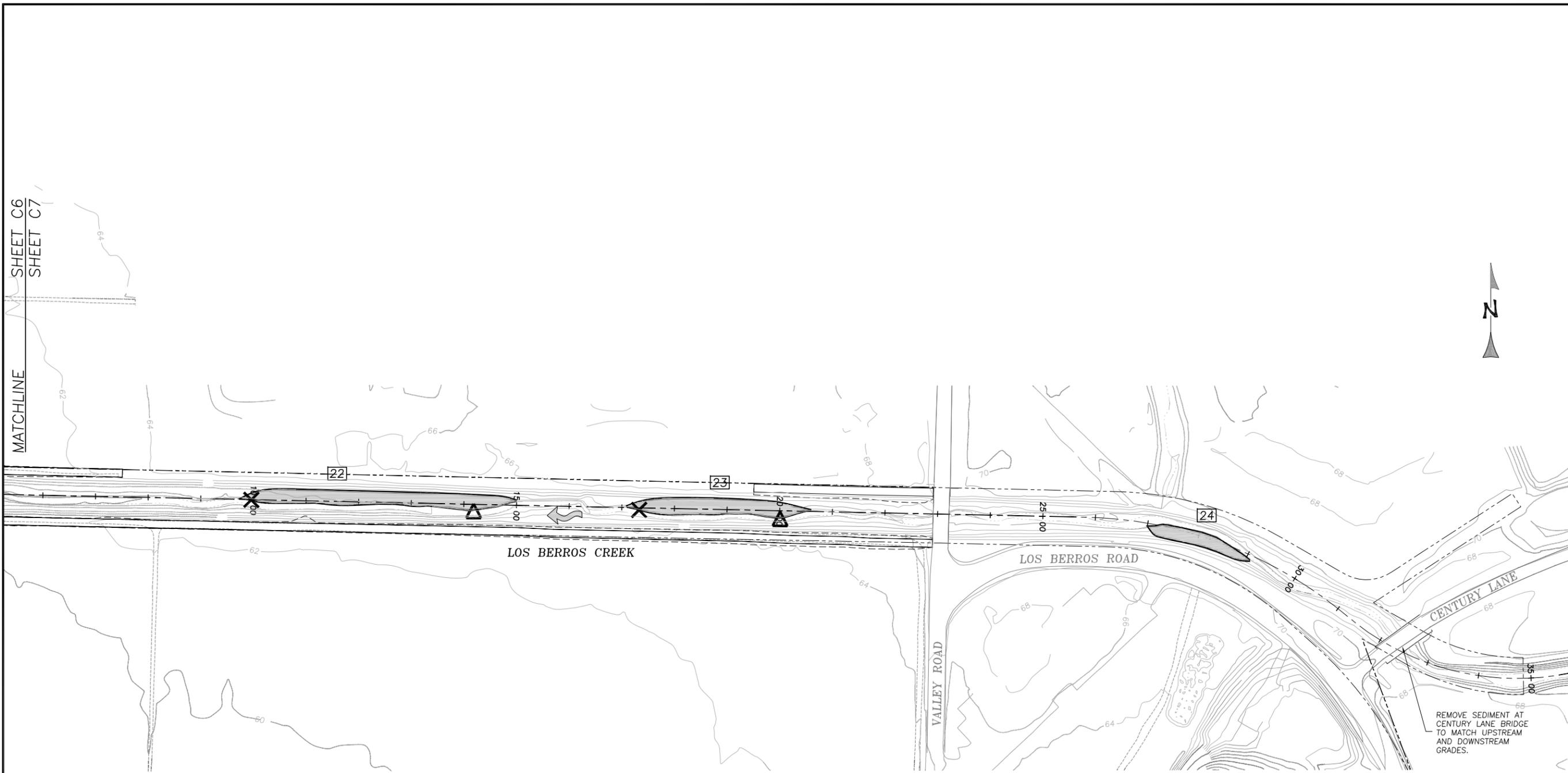
0 1" 5 OF 10



SITE PLAN
SCALE: 1"=100'

GRADING TABLE

SITE	GRADING SITE FINISHED GRADE EL.	EXCAVATION VOLUME (CY)	LENGTH APPROX (FT)	AVG. DEPTH (FT)
17	38.5 TO 40.5	605	400	1.2
18	40.5 TO 44	615	490	0.8
19	44 TO 46	504	800	0.5
20	47 TO 48	767	350	1.3
21	48.5 TO 49	532	250	1.3



SITE PLAN
SCALE: 1"=100'

REMOVE SEDIMENT AT CENTURY LANE BRIDGE TO MATCH UPSTREAM AND DOWNSTREAM GRADES.

MATCHLINE
SHEET C6
SHEET C7

GRADING TABLE

SITE	GRADING SITE FINISHED GRADE EL.	EXCAVATION VOLUME (CY)	LENGTH APPROX (FT)	AVG. DEPTH (FT)
22	52.5 TO 54.5	825	480	1.5
23	55.5 TO 56	592	320	1.7
24	60.2 TO 60.6	106	140	0.7

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0 1"

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CONCEPTUAL
NOT FOR CONSTRUCTION

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SITE PLAN
5 OF 5

ARROYO GRANDE CREEK CHANNEL SEDIMENT AND VEGETATION MANAGEMENT PLAN CONCEPTUAL PLANS

C7
7 OF 10

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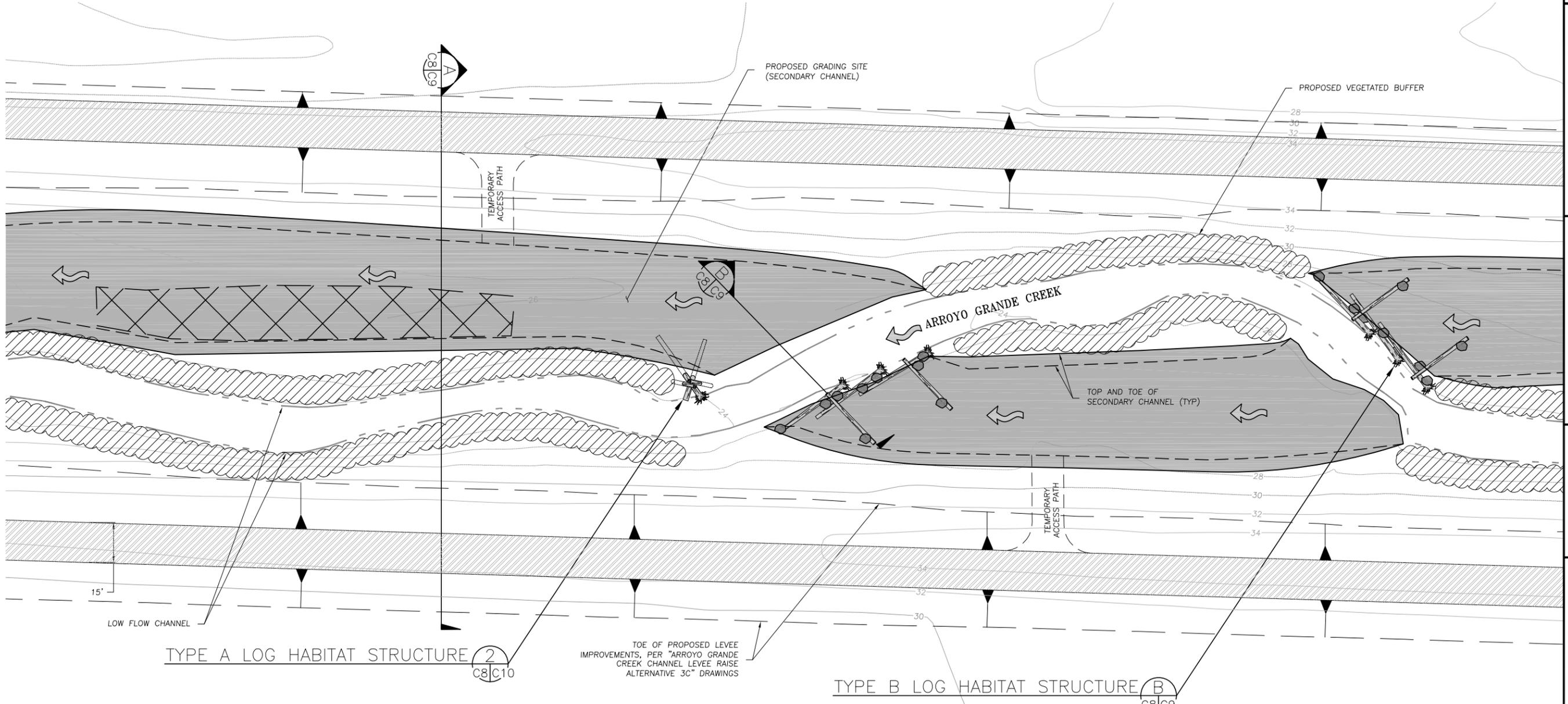
TYPICAL SITE
PLAN

ARROYO GRANDE CREEK
CHANNEL SEDIMENT
AND VEGETATION
MANAGEMENT PLAN
CONCEPTUAL PLANS

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ADJUST SCALES FOR
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0 1" 8
OF
10



- LEGEND**
- (E) CONTOURS
 - LOW FLOW CHANNEL AT TIME OF SURVEY (3-10-05)
 - PROPOSED MITIGATION WETLAND AREA
 - PROPOSED VEGETATED BUFFER
 - LEVEE TOP PER ALTERNATIVE 3C

TYPICAL SITE PLAN
SCALE: 1"=20'

TYPE A LOG HABITAT STRUCTURE 2
C8|C9

TYPE B LOG HABITAT STRUCTURE B
C8|C9

TOE OF PROPOSED LEVEE IMPROVEMENTS, PER "ARROYO GRANDE CREEK CHANNEL LEVEE RAISE ALTERNATIVE 3C" DRAWINGS

15'

LOW FLOW CHANNEL

PROPOSED GRADING SITE (SECONDARY CHANNEL)

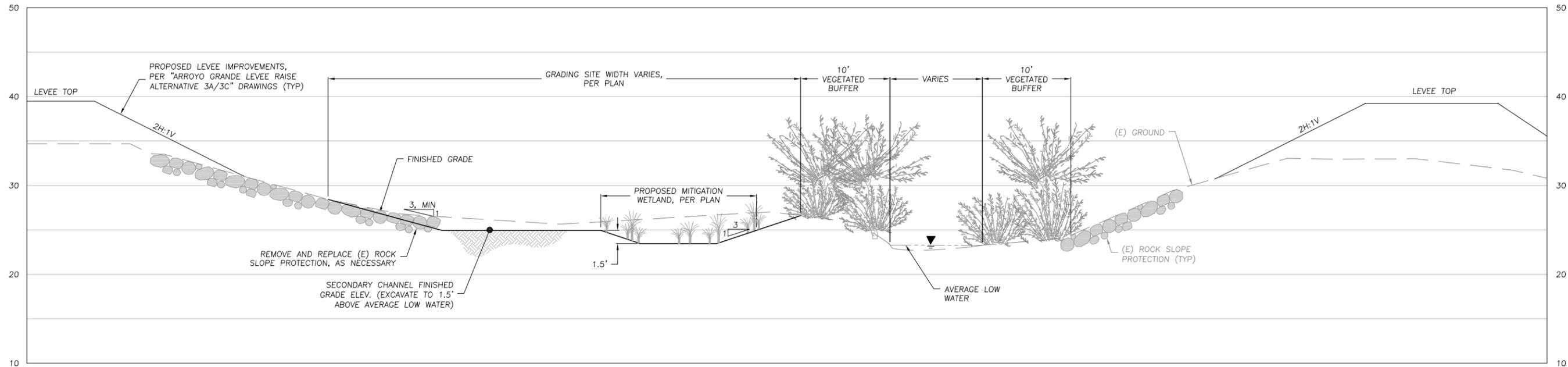
PROPOSED VEGETATED BUFFER

ARROYO GRANDE CREEK

TOP AND TOE OF SECONDARY CHANNEL (TYP)

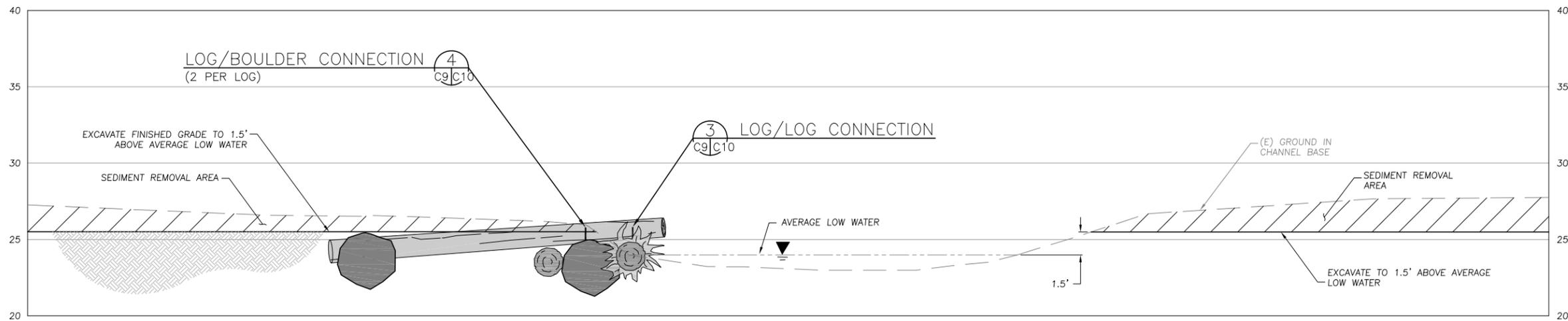
C8|C10

1
C2|C8



TYPICAL SECTION
SCALE: 1"=6'
A
C8/C9

- NOTES:**
1. REMOVE IMPOUNDED SEDIMENT BETWEEN PROPOSED VEGETATED BUFFER AND LEVEE TOE. EXCAVATED SLOPES SHALL NOT EXCEED 3H:1V. EXCAVATE TO 1.5 FEET ABOVE AVERAGE LOW WATER. DO NOT DISTURB EXISTING LOW FLOW CHANNEL.
 2. REMOVE VEGETATION FROM OUTSIDE OF VEGETATED BUFFER TO TOP OF LEVEE.



TYPE B LOG HABITAT STRUCTURE SECTION
SCALE: 1"=4'
B
C8/C9