

RECLAMATION

Managing Water in the West

Environmental Assessment

Firebaugh Canal Water District 2nd Lift Canal Lining Project

September 2012



U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region
Regional Office
Sacramento, CA

September 2012

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitment to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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List of Acronyms and Abbreviations

AFY	Acre-feet per year
APE	Area of Potential Effect
BDRP	Bay Delta Restoration Program
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
CVP	Central Valley Project
Delta	Sacramento-San Joaquin Delta
DMC	Delta-Mendota Canal
DOI	Department of the Interior
EA	Environmental Assessment
FCWD	Firebaugh Canal Water District
FONSI	Finding of No Significant Impact
GBP	Grassland Bypass Project
GDA	Grassland Drainage Area
HDPE	High Density Polyethylene
IFAP	Interim Federal Action Plan
ITA	Indian Trust Assets
GHG	greenhouse gas
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
Reclamation Service	Bureau of Reclamation U.S. Fish and Wildlife Service

Section 1 Introduction

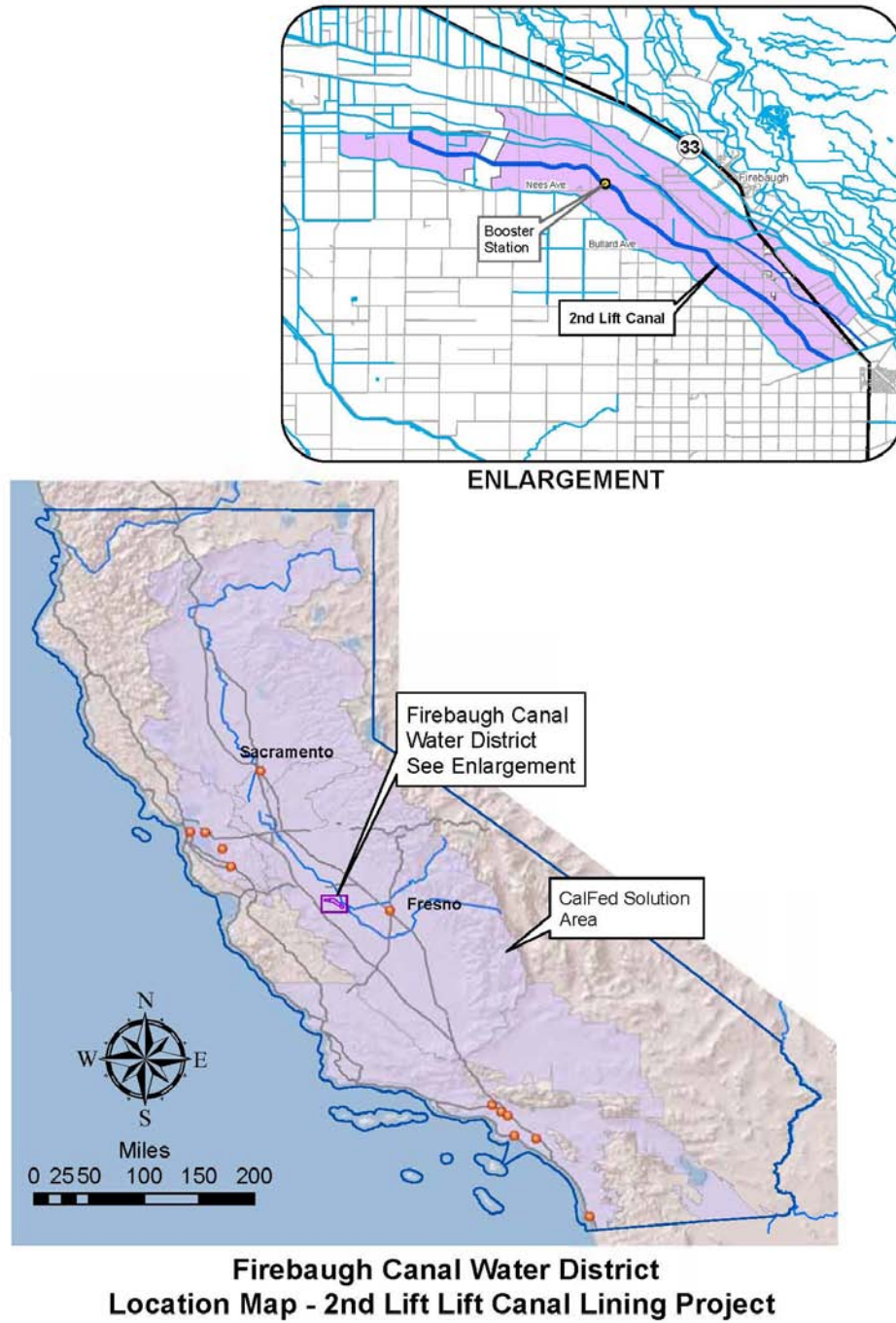
1.1 Background

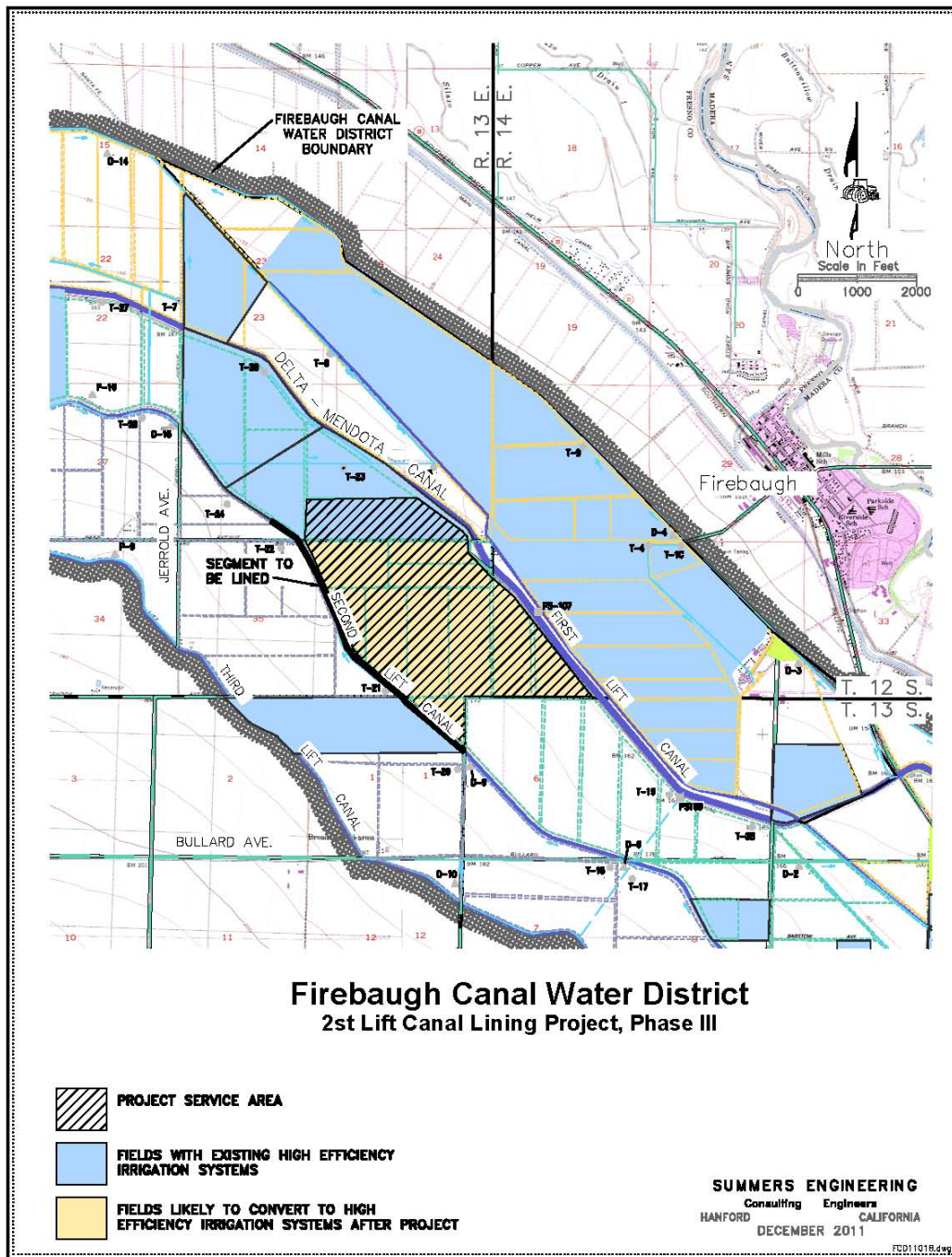
In conformance with the National Environmental Policy Act of 1969 (NEPA), as amended, the Bureau of Reclamation (Reclamation) has prepared this Environmental Assessment (EA) to evaluate and disclose any potential environmental impacts associated with implementation of the Firebaugh Canal Water District's (FCWD) 2nd Lift Canal Lining Phase III Project (Figure 1). Reclamation proposes to disburse grant funds to FCWD to support construction of the Proposed Action. The Proposed Action is located west of the community of Firebaugh within the FCWD, which encompasses approximately 22,000 acres on the Westside of the San Joaquin Valley in Fresno, California. The 2nd Lift Canal lining would begin at Douglas Avenue and continue to FCWD's 2nd lift booster station (Figure 2).

Reclamation proposes to provide a Department of the Interior (DOI) Bay-Delta Restoration Program: Agricultural Water Conservation and Efficiency (BDRP) grant to the FCWD to support implementation of the Proposed Action. To facilitate and coordinate Federal responses to the California water supply crisis, six Federal agencies signed the California Bay-Delta Memorandum of Understanding (MOU) on September 29, 2009. The MOU creates a partnership among Federal agencies, the State of California, and other local authorities to develop long and short term actions that contribute to a sustainable water supply and ecosystem. An Interim Federal Action Plan (IFAP) describes in detail, actions to be taken to address the current water crisis. The IFAP specifically addresses water conservation and the alignment and coordination of Federal water conservation programs to leverage limited resources and maximize benefits of water conservation in areas served by the Central Valley Project (CVP) and State Water Project. To meet these objectives, Reclamation and the Natural Resources Conservation Service are partnering to provide complementary funding opportunities for improving water supply reliability through water conservation or improved water management and improving energy efficiency.

The Proposed Action consists of providing grant funds for a BDRP Agricultural Water Conservation and Efficiency project which would include the lining of 2.2 miles of existing earthen channel with concrete to reduce seepage from the District's 2nd Lift Canal. In addition to the canal lining, an existing booster station on the 2nd Lift Canal would be eliminated and a new check structure with SCADA-integrated controls would be constructed.

Figure 1





FCWD was formed originally as Firebaugh Canal Company, a pre-1914 mutual water company with riparian water rights from the San Joaquin River. The FCWD has approximately 40 miles of canals and 36 miles of laterals. When Friant Dam was completed in 1942, the FCWD exchanged its water right for CVP water through the Delta Mendota Canal (DMC) and the Mendota Pool.

Currently the unlined canal loses approximately 145 acre feet per year (AFY) through seepage to a perched saline sink. This amounts to two percent of the water conveyed by the 2nd Lift Canal and 0.6 percent of the FCWD's total annual water supply. FCWD lies within the Grassland Drainage Area (GDA) and is a participating agency in the Grassland Bypass Project (GBP), through which subsurface drain water generated within the region is discharged to the San Joaquin River. Most of the GDA is underlain with a saline perched water table, which is managed with on-farm tile systems and regional deep drains. Deep percolation from irrigation and seepage from unlined canal systems is collected by the tile systems and regional drains, where it is managed and eventually discharged to the San Joaquin River. To manage these discharges, FCWD participated in the development of an In-Valley Drainage Solution such that no subsurface drain water leaves the GDA boundary. Because the regional perched water table is high in salts, boron, and selenium, it is not usable for irrigation.

Two complementary plans (the San Luis Unit Feature Re-Evaluation and the Westside Regional Drainage Plan) have been developed to implement the In-Valley Drainage Solution. Both plans contain a solution chain that includes source control (such as seepage reduction) to reduce drainage production, recirculation (as a management tool), drainage reuse (to reduce drainage volume), and, ultimately, drainage treatment and salt disposal. Implementation of the Proposed Action would reduce seepage losses by approximately 145 AFY which results in a reduction of an estimated 21 pounds of selenium, 2,100 pounds of boron, and 650 tons of salt each year. The Proposed Action fits in the source control category, by reducing the volume of subsurface drainage produced through seepage reduction.

The Proposed Action would not result in a change to the acreage served by the FCWD facilities nor would the system's capacity be increased.

This EA describes the existing environmental resources in the Proposed Action area, evaluates the effects of the No Action and Proposed Action alternatives on the resources, and proposes measures to avoid, minimize or mitigate any adverse effects. This EA was prepared in accordance with NEPA, Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1508), and DOI regulations (43 CFR Part 46). Reclamation has also prepared a Finding of No Significant Impact (FONSI), which explains why the Proposed Action would not have any significant effects on the human or natural environment.

1.2 Need for the Action

The United States faces an increasing set of water resource challenges. Aging infrastructure, rapid population growth, depletion of groundwater resources, impaired water quality associated with particular land uses and land covers, water needs for both human and environmental uses, and climate variability and change all play a role in determining the amount of fresh water available at any given place and time. Water shortages and water-use conflicts have become more commonplace in many areas of the United States, even in normal water years. As competition for water resources grow for irrigation of crops, growing cities and communities, energy production, and the environment the need for information and tools to aid water resource managers also grows. Water issues and challenges are increasing across the nation, but particularly in the western United States due to prolonged drought.

The purpose of the Proposed Action is for Reclamation to further the goals and objectives of the BDRP Program as they apply to water supply reliability through management operations within the FCWD. Reclamation intends to do so by providing grant funding for lining 2.2 miles of existing earthen channel with concrete to reduce seepage losses in the 2nd Lift Canal.

1.3 Potential Resource Issues

This EA analyzes the affected environment of the Proposed Action and No Action alternatives in order to determine the potential impacts and cumulative effects to the following environmental resources:

- Air Quality
- Water Resources
- Biological Resources

1.4 Resources Not Analyzed in Detail

Effects on several environmental resources were examined and found to be minor. For this reason, the following resources were eliminated from further discussion from this EA: Aesthetic Resources; Cultural Resources; Environmental Justice; Geology, Soils, Seismicity, and Minerals; Global Climate Change; Hazards and Hazardous Materials; Indian Trust Assets; Land Use and Agriculture; Noise; Socioeconomics, Population, and Housing; Recreation; Transportation and Circulation; and Utilities, Public Services, and Service Systems.

1.4.1 Cultural Resources/Indian Sacred Sites

No significant impacts to historic properties would result from the Proposed Action. Since all construction activities would be within the existing 2nd Lift Canal, the canal is the only cultural resource present in the area of potential effects. The proposed construction activities are consistent with the intended use and function of the 2nd Lift Canal and its contribution to the overall FCWD's main distribution system. Reclamation consulted with the California State Historic Preservation Officer under Section 106 of the National Historic Preservation Act, receiving concurrence on a finding of no adverse effect on August 15, 2012.

Executive Order 13007 applies to sacred sites on Federal lands, identified by federally-recognized Indian tribes. There are no identified Indian Sacred Sites within the action area of the Proposed Action and therefore, this project would not inhibit use or access to Indian Sacred Sites.

1.4.2 Indian Trust Assets

There are no Indian reservations, rancherias, or allotments in the project area. The Proposed Action does not have a potential to affect Indian Trust Assets.

1.4.3 Environmental Justice

No significant changes in agricultural communities or practices would result from the Proposed Action, other than potential changes to individual irrigation systems. These changes are not likely to affect agricultural employment, which employs a higher proportion of low-income and minority workers than are employed in the general workforce. Accordingly, the Proposed Action would not have any significant or disproportionately negative impact on low-income or minority individuals within the project area.

Section 2 Alternatives Including Proposed Action

2.1 No Action Alternative

The No Action Alternative would consist of Reclamation not providing grant funding to facilitate water conservation measures at FCWD. Although it is possible that FCWD may find alternative sources of funding for the Proposed Action, for the purposes of this EA, the consequence of Reclamation not funding the Proposed Action would be no construction of the Proposed Action. The irrigation system currently in place would continue to operate. FCWD would continue to provide irrigation service to the FCWD and its users via the unlined 2nd lift canal. Deep percolation from irrigation and seepage from the unlined canal would continue to be collected by the tile systems and regional drains, managed and eventually discharged into the San Joaquin River.

2.2 Proposed Action Alternative

The Proposed Action Alternative consists of providing grant funds to replace approximately 2.2 miles of an existing earthen channel with a concrete lined canal. The existing channel is a primary lift canal for FCWD with a capacity of 110 cubic feet per second (cfs) for this reach of the canal. Full water allocation is 85,000 AFY. The canal's operating season is approximately 340 days, supplying water for irrigation needs. Because the canal is unlined, it loses approximately 145 AFY through seepage to a perched saline sink.

The Proposed Action would raise the canal banks and place concrete lining on 2.2 miles of main lift canal, eliminate an existing booster station on the 2nd Lift Canal, reducing the District's electrical consumption by almost 22,000 Kwh, and construct a new check structure with SCADA-integrated controls.

Construction Activities would include (see Appendix A for construction drawings):

- Cleanout and Site Preparation: The existing canal would be dewatered and cleaned of silt and debris. Sufficient time would be provided to allow the existing channel to dry. During this process, the existing booster pump station and an existing check structure would be demolished and removed from the site. One to three excavators would be used to perform this work and a dump truck would be used to haul removed features from the site.

- Earthwork: The existing channel would be backfilled and compacted to the final design grade according to the drawings. Backfill would be performed in lifts to ensure proper soil density and moisture levels. Surveyed construction stakes would be placed along the project alignment and final grade would be checked against those stakes. If high groundwater conditions inhibit proper grading and compaction in the canal invert, a dewatering interceptor line and/or soil conditioning (such as lime treating) may be used. Approximately 76,000 cubic yards of fill would be placed and compacted to form the final cross-section. Fill would be placed with excavators and scrapers and compacted with rollers. Water trucks would be used to manage fugitive dust and maintain moisture level.
- Prism Excavation and Placement of Lining: The channel prism would be excavated to the appropriate lines and grade according to the drawings. Concrete lining would be placed in accordance with the drawings and specifications. Excavation would be completed by a specialized trencher and the excavated material would be graded into the canal bank by a scraper. A paving sled built to fit the canal geometry would be pulled by the trencher or other construction equipment to place the lining along the canal alignment at a uniform thickness. At existing culverts or other structures, the paving sled would be removed from the canal approximately 20 feet upstream of the feature. At these locations, hand-placed lining would be installed to make a smooth transition to the culvert. Concrete trucks would follow the paving sled on both sides to provide the concrete for the lining.
- Turnout installations: Where turnouts are located, the concrete lining would be removed and a precast concrete gate structure and canal gate would be placed such that the invert of the gate is near the canal invert. A 24-inch high density polyethylene (HDPE) corrugated or PVC pipe would be installed to connect the gate to existing turnout boxes for water deliveries. Hand-placed transition lining would be poured to make a smooth transition from the canal to the gate structure. An excavator or backhoe would be used for this work.
- New Check Structure: A new, reinforced concrete check structure would be constructed to replace the structure demolished during clean-out operations. The new structure would include automated water level control gates and be integrated with the District's SCADA system.

Section 3 Affected Environment & Environmental Consequences

The Proposed Action is located within the FCWD in Fresno County in the San Joaquin Valley, California. The County is bounded by the Sierra Nevada Mountains to the east and the Pacific Coastal Range to the west. The region is characterized by flat valley lowland agriculture, with a climate that is cool and moist in the winter and hot and dry in the summer.

The Proposed Action would line approximately 2.2 miles of an existing earthen channel with concrete from Douglas Avenue to the 2nd Lift booster station. Full water allocation is 85,000 AFY. The canal's operating season is approximately 340 days, supplying water for irrigation purposes. Currently the unlined canal loses approximately 145 AFY through seepage to a perched saline sink. This lost water is not only unavailable for irrigation uses, but also contributes to the discharge of saline subsurface drain water to the San Joaquin River system. Additionally, the existing earthen canal promotes the growth of aquatic vegetation which inhibits the use of high-efficiency irrigation systems (such as sub-surface drip).

The average annual water supply to FCWD is 85,000 AF in a non critical water year and 58,000 AF in a critical (drought) water year. The water use within the FCWD boundaries is virtually 100 percent for agricultural irrigation and is obtained through an exchange contract with Reclamation via the DMC. There are 22,000 acres developed to irrigate crop land within the FCWD and approximately 35 water users. The majority of the crops grown consist of cotton, alfalfa, tomatoes, wheat, barley, melons, pomegranates, pistachios, asparagus and onions. The FCWD typically delivers 100 percent of its allocation and does not anticipate a significant change in demand in the future.

The FCWD has approximately 40 miles of canals and 36 miles of laterals. Approximately 15 miles of FCWD's canals and laterals have been lined since 2000. All lined canals have performed as expected and the FCWD and its users have benefited. In recent years, FCWD has spent more than \$6 million on infrastructure projects to line and pipe canal laterals and about 60 percent of the FCWD's irrigated land has converted to drip and other high-efficiency irrigation systems. The FCWD participated in a regional water use study which estimated the typical on-farm efficiency at between 80 percent and 90 percent. This study evaluated crop evapotranspiration requirements, leaching and drainage requirements, irrigation methods, and actual water deliveries.

3.1 Air Quality

Section 176(c) of the Clean Air Act (CAA) (42 U.S.C. 7506(c)) requires that any entity of the federal government that engages in, supports, or in any way provided financial support for, licenses or permits, or approves any activity to demonstrate that the action conforms to the applicable State Implementation Plan (SIP) required under Section 110(a) of the CAA (42 U.S.C. 7401(a)) before the action is otherwise approved. In this context, conformity means that such federal actions must be consistent with a SIP's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of those standards. Each federal agency must determine that any action that is proposed by the agency and that is subject to the regulations implementing the conformity requirements will, in fact, conform to the applicable SIP before the action is taken.

On November 30, 1993, the U.S. Environmental Protection Agency (EPA) promulgated final general conformity regulations at 40 CFR 93 Subpart B for all federal activities except those covered under transportation conformity. The general conformity regulations apply to a proposed federal action in a non-attainment or maintenance area if the total direct and indirect emissions of the relevant criteria pollutant(s) and precursor pollutant(s) caused by the Proposed Action equal or exceed certain threshold amounts, thus requiring the federal agency to make a determination of general conformity.

3.1.1 Affected Environment

The San Joaquin Valley Air Basin (SJVAB) is within the management area of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The SJVAB experiences episodes of poor atmospheric mixing caused by inversion layers formed when temperature increases with elevation above ground, or when a mass of warm, dry air settles over a mass of cooler air near the ground. NAAQS and California Ambient Air Quality Standards (CAAQS) have been established for the following criteria pollutants: carbon monoxide (CO), ozone (O₃), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), inhalable particulate matter between 2.5 and 10 microns in diameter (PM₁₀), particulate matter less than 2.5 microns in diameter (PM_{2.5}), and lead. The CAAQS also set standards for sulfates, hydrogen sulfide and visibility.

The SJVAB has reached NAAQS and CAAQS attainment status for all criteria pollutants except for O₃, PM₁₀ (CAAQS only), and PM_{2.5}. As a result, the emissions of most concern are O₃ (which includes precursors such as volatile organic compounds [VOC] and nitrogen oxides ([NO_x]), PM₁₀ and PM_{2.5}. Table 3-1 below shows the attainment status and *de minimis* threshold for general conformity for the criteria pollutants of most concern.

Table 3-1. SJVAB Attainment Status and <i>De Minimis</i> Thresholds for Federal Conformity Determinations		
Pollutant	Attainment Status^a	(tons/year)
VOC (as ozone precursor)	Nonattainment ^b	10 ^c
NO _x (as ozone precursor)	Nonattainment ^b	10 ^c
PM ₁₀	Nonattainment (CAAQS) Attainment (NAAQS)	15 ^d
PM _{2.5}	Nonattainment	100 15 ^d
^a Source: http://www.arb.ca.gov/desig/adm/adm.htm ^b The SJVAB is designated as Extreme for O ₃ NAAQS ^c 40 CFR 93.153 ^d SJVAPCD Threshold		

3.1.2 Environmental Consequences

No Action

There would be no effect on conditions and trends in air quality within the SJVAB under the No Action Alternative.

Proposed Action

Construction emissions would vary from day to day and by activity, depending on the timing and intensity of construction, and wind speed and direction. Generally, air quality impacts from the Proposed Action would be localized in nature and decrease with distance. Ground disturbing activities would result in the temporary emissions of fugitive dust and vehicle combustion pollutants during the following activities:

- Earthwork (site preparation, structure removal, channel grading, trenching, compacting and stockpiling)
- Construction equipment and haul truck engine emissions

Calculated emissions from the Proposed Action were estimated using the 2007 URBEMIS software (version 9.2.4), which incorporates emission factors from both the EMFAC2007 and OFFROAD2007 models for reactive organic gases (ROG)¹, NO_x, PM₁₀, and PM_{2.5}. Total project emissions are presented in Table 3-2 below.

¹ The term “volatile organic compounds” are synonymous with ‘reactive organic gases’ for the purposes of this document since both terms refer to hydrocarbon compounds that contribute to ozone formation.

Table 3-2. Estimated Project Emissions^a	
Pollutant	Construction (tons/year)
ROG/VOC	0.39
NO _x	2.77
PM ₁₀	0.22
PM _{2.5}	0.16
^a Source: URBEMIS version 9.2.4	

As shown in Table 3-2, the Proposed Action has been estimated to emit less than the *de minimis* threshold for NO_x and ROG/VOC as O₃ precursors and PM_{2.5}; therefore, a federal general conformity analysis report is not required. In addition, PM₁₀ emissions from the Proposed Action have been estimated to be well below the SJVAPCD threshold of 15 tons/year. The estimated emissions for PM₁₀ and PM_{2.5} assumes that dust suppression measures, such as applying water to limit fugitive dust, would be implemented. However, if dust suppression measures aren't implemented, the estimated emissions for PM_{2.5} (0.25 tons/year) and PM₁₀ (0.62 tons/year) would still be well below the respective thresholds.

3.2 Water Resources

3.2.1 Affected Environment

The FCWD's water supply is almost entirely surface water from the DMC and the Mendota Pool. FCWD lies within the GDA and is a participating agency in the GBP. The GBP consolidates subsurface drain water from the GDA into a single channel (Grassland Bypass Channel) and into the San Luis Drain, where it is discharged into Mud Slough, approximately eight miles upstream of the San Joaquin River. Under the current conditions the 2nd Lift Canal contributes to the shallow water table in the form of seepage. A portion of this deep percolation is collected by the adjacent subsurface drainage system, and another portion is likely collected by deep drainage and drainage systems further down slope, contributing to the subsurface drainage production of the region.

The FCWD is underlain by a shallow saline aquifer which is high in dissolved salts, boron, and selenium, all of which are considered constituents of concern by the Central Valley Regional Water Quality Control Board. This shallow water table is managed through on-farm subsurface (tile) drainage systems and regional deep drains that intercept seepage from irrigation and unlined canal systems. The FCWD pumps approximately 4,000 AFY from shallow groundwater wells. These wells are operated primarily to reduce the production of subsurface drainage within the watershed. Currently the 2nd Lift Canal contributes to approximately 130 AF of subsurface irrigation water per year into the groundwater through seepage.

3.2.2 Environmental Consequences

No Action

Under the No Action Alternative, no changes would occur to the existing operations or the FCWD's surface water supply. Under the No Action Alternative, groundwater resources would continue to be utilized consistent with the current conditions.

Proposed Action

The Proposed Action would reduce water lost to seepage by lining 2.2 miles of existing canal. The estimated conserved volume is 145 AFY (a reduction of an estimated 21 pounds of selenium, 2,100 pounds of boron, and 650 tons of salt each year). The estimated conserved amount equates to 2 percent of the water conveyed by the 2nd Lift Canal and 0.6 percent of the FCWD's total annual water supply.

The Proposed Action would also reduce suspended silt and aquatic growth in the canal which would increase the quality of the water delivered to water users. The increase in water quality would reduce wear on the pump stations as well as the number of backwash cycles of filter stations. Although the existing, unlined channel does not prohibit the installation of a high-efficiency irrigation system, the aquatic growth and suspended silt does discourage their installation. By eliminating these issues the Proposed Action could potentially encourage the installation of high-efficiency irrigation systems such as buried drip systems. Drip systems would accurately measure the volume of water required for a crop's roots, eliminating surface runoff and the associated contaminants. Additionally, drip irrigation systems allow for the application of fertilizers and other materials directly through the drip tape eliminating the need for surface spraying and the associated potential for drift, further improving the regional water use efficiency and conservation efforts.

The Proposed Action would not result in short-term or long-term adverse impacts to surface water or resources dependent on surface water. The Proposed Action would not result in short-term or long-term adverse impacts to groundwater resources.

3.3 Biological Resources

3.3.1 Affected Environment

The FCWD encompasses approximately 22,000 acres on the Westside of the San Joaquin Valley in Fresno, California. The majority of the crops grown within the FCWD consist of cotton, alfalfa, tomatoes, wheat, barley, melons, pomegranates, pistachios, asparagus and onions. Development of land to irrigate crops has been the historic land use within in the FCWD. Currently the Proposed Action area is annually excavated, graded, and sprayed for maintenance purposes resulting in the absence of sufficient habitat criteria required to support special-status species.

The following table includes federally listed, proposed and candidate species potentially occurring within the Proposed Action area. This list was generated from the U.S. Fish and Wildlife's (Service) website in August 2012 for the Firebaugh USGS 7.5-minute quadrangle.

Table 3-3: Federally Listed Species Identified as Potentially Occurring in the Firebaugh USGS 7.5-minute Quadrangle

Common Name	Scientific Name	Federal Status	Potential habitat in Proposed Action Area
INVERTEBRATES			
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp	T	No
<i>Desmocerus californicus dimorphus</i>	Valley elderberry longhorn beetle	T	No
AMPHIBIANS			
<i>Rana draytonii</i>	California red-legged frog	T	No
FISH			
<i>Hypomesus transpacificus newberryi</i>	Delta smelt	T	No
<i>Oncorhynchus mykiss</i>	Central Valley steelhead	T	No
REPTILES			
<i>Gambelia sila</i>	Blunt-nosed leopard lizard	E	No
<i>Thamnophis gigas</i>	Giant garter snake	T	No

Table 3-3: Federally Listed Species Identified as Potentially Occurring in the Firebaugh USGS 7.5-minute Quadrangle

Common Name	Scientific Name	Federal Status	Potential habitat in Proposed Action Area
MAMMALS			
<i>Dipodomys ingens</i>	Giant kangaroo rat	E	No
<i>Dipodomys nitratoide exillis</i>	Fresno kangaroo rat	E	No
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	E	No
Key: (PE) Proposed Endangered – Proposed in the Federal Register as being in danger of extinction (PT) Proposed Threatened – Proposed as likely to become endangered within the foreseeable future (E) Endangered– Listed in the Federal Register as being in danger of extinction (T) Threatened – Listed as likely to become endangered within the foreseeable future (C) Candidate – Candidate which may become a proposed species			

3.3.2 Environmental Consequences

No Action

Under the No Action Alternative, biological resources would not change from their current conditions.

Proposed Action

The Proposed Action would line approximately 2.2 miles of existing earthen channel with concrete. Currently the unlined canal loses approximately 145 AFY through seepage to a perched saline sink. The reduction in the amount of seepage to the local perched water table would reduce the production of subsurface drain water which is currently discharged to the San Joaquin River and eventually to San Joaquin/Sacramento Delta.

The Proposed Action would involve the placement of compacted embankment and excavation of earth as required to trim the canal to the required cross-section. All work would be performed within the footprint of the existing canal and no adjacent lands would be impacted. Lands surrounding the Proposed Action are either actively farmed or contain farm support facilities (such as shops and farm houses).

The Proposed Action area is annually excavated, graded, and sprayed for maintenance purposes resulting in the absence of sufficient habitat criteria required to support special-status species. Based on the habitat requirements of the listed species that could potentially occur within the Proposed Action area, the Proposed Action does not provide suitable habitat for the Vernal pool fairy shrimp, Valley elderberry longhorn beetle, Blunt-nosed leopard lizard, California red-legged frog, delta smelt, Central Valley steelhead, Giant kangaroo rat, and the Fresno kangaroo rat. Therefore, these species are not discussed in this section.

Though occurrences of neither listed sensitive species nor migratory birds have been observed during the implementation of previous projects within the FCWD area, an analysis of potential impacts and associated avoidance measures for both giant garter snake and San Joaquin kit fox are discussed below due to the Proposed Action area providing a potential migratory corridor that could conceivably be utilized by these species.

Giant Garter Snake

Crops that have been known to provide suitable habitat for giant garter snake (i.e. rice) have not been grown in the FCWD for at least the last 30 years. Although the Proposed Project area does not contain suitable giant garter snake habitat, it could potentially be a movement corridor for snakes. Documented sightings of giant garter snake occurred in the Mendota Pool area, some 6 to 10 miles southeast of the Proposed Action area. Potential impacts to the giant garter snake could be a disruption in their migration if the Proposed Action were to be constructed during the migratory season. However, construction would occur during the non-migratory season (October 1-April 30) when giant garter snakes are dormant and would not be migrating. Since the Proposed Action area does not provide habitat for giant garter snakes, but could potentially provide a migratory corridor utilized by the species, limiting work to the inactive period reduces the potential for impact. In addition, there are no wetlands within the Proposed Action area that would attract giant garter snakes. The Proposed Action area would be restored to pre-project conditions and, therefore, no indirect effects would occur as a result of the Proposed Action. Avoidance and minimization measures as described below would be implemented by FCWD to further avoid and minimize any potential project impacts to giant garter snakes. Reclamation has determined that the Proposed Action would have no effect on giant garter snake.

Avoidance and Minimization Measures for Giant Garter Snake

The following Avoidance and Minimization Measures would be applied for giant garter snake. Since giant garter snake habitat is not being directly impacted, there are no mitigation or conservation measures, or compensation/set-asides proposed.

- The Proposed Action area will be surveyed for giant garter snakes 24 hours before construction activities. Survey of the Proposed Action project area will be repeated if a lapse in construction activity for two weeks or greater has occurred. If a snake is encountered during construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed.
- After completion of construction activities, removal of any temporary fill and construction debris will be completed.

- The disturbed areas will be restored to pre-project conditions.
- Confine movement of heavy equipment to existing roadways.
- Clearing of vegetation will not occur under the Proposed Action.
- Construction personnel will receive environmental awareness training that instructs workers to recognize giant garter snake and its habitat(s).

San Joaquin Kit Fox

Although the Proposed Project area does not contain suitable habitat for San Joaquin kit fox, it could potentially be utilized as a movement corridor. The Proposed Action area would be restored to pre-project conditions and, therefore, no indirect effects would occur as a result of the Proposed Action. Avoidance and minimization measures would be implemented by FCWD if there is detection of the species utilizing the Proposed Action area as a migratory corridor. Reclamation has determined that the Proposed Action would have no effect on San Joaquin kit fox.

Avoidance and Minimization Measures for San Joaquin Kit Fox

The following Avoidance and Minimization Measures would be applied for San Joaquin kit fox. Since kit fox habitat is not being directly impacted, there are no mitigation or conservation measures, or compensation/set-asides proposed.

- All project-related vehicle traffic will be restricted to established roads, construction areas, and other designated areas. In order to reduce impacts by project-related vehicles, workers will observe the following:
 - Maintain a daytime speed of 20-mph throughout the site
 - Minimize construction to the extent possible at night and when kit foxes would be most active.
- Inadvertent entrapment will be prevented via the following activities:
 - Cover all excavated, steep-walled holes or trenches more than two feet deep with plywood or similar materials at the close of each working day.
 - Construct one or more escape ramps of earthen-fill or wooden planks if the trenches cannot be closed.
 - Thoroughly inspect all construction pipes, culverts, or similar structures with a diameter of four inches or greater that are stored at a construction site overnight before the pipe is subsequently buried, capped or otherwise used in any way.
 - All food-related trash items will be disposed of in securely closed containers and removed at least once a week from the project site.

The Proposed Action would not result in a significant change in the surrounding environment and would not result in short-term or long-term adverse impacts to biological resources. However, by reducing the seepage contribution to the local perched water table, the Proposed Action would reduce the production of subsurface drain water which is currently discharged to the San Joaquin River and eventually to San Joaquin/Sacramento Delta thus providing possible habitat benefits in the surrounding area. In addition, the FCWD has completed multiple canal lining projects within the district. These previous projects objectives were successful and no impacts to species were documented.

3.4 Cumulative Impacts

Currently, there are no other known foreseeable development projects located in the vicinity of the Proposed Action area. Project operations would not be altered due to the Proposed Action and therefore would not contribute to any long-term effects on environmental resources. The Proposed Action would not result in cumulative impacts to any of the resources described within this EA.

Section 4 Consultation and Coordination

4.1 Public Review Period

Reclamation intends to sign a FONSI for this project, and will make the EA available for a two-week period from September 5 to September 19, 2012. Any comments received will be addressed in the FONSI. Additional analysis will be prepared if substantive comments identify impacts that were not previously analyzed or considered.

4.2 Endangered Species Act (16 USC. 1521 et seq.)

Section 7 of this Act requires Federal agencies to ensure that all federally associated activities within the United States do not jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of the critical habitat of these species. Action agencies must consult with the USFWS, which maintains current lists of species that have been designated as threatened or endangered, to determine the potential impacts a project may have on protected species. Reclamation determined that the Proposed Action would have no effect on federally proposed or listed threatened and endangered species or their proposed or designated critical habitat. No further consultation is required under Section 7 of the Endangered Species Act.

4.3 National Historic Preservation Act (16 USC 470 et seq.)

The NHPA of 1966, as amended, is the primary Federal legislation outlining the Federal government's responsibility to cultural resources. Specifically, Section 106 of the NHPA requires "[t]he head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking." The process for implementing Section 106 of the NHPA is found at 36 CFR Part 800. Reclamation consulted with the California State Historic Preservation Officer on a finding of no adverse effect for the Proposed Action, receiving concurrence on a finding of no adverse effect on August 15, 2012.

Section 5 References

U.S. Fish and Wildlife Service. List of Species that Potentially Occur within USGS
7.5-minute Firebaugh Quadrangle. August 2012.

Appendix A: Construction Drawings

FIREBAUGH CANAL WATER DISTRICT

MENDOTA

CALIFORNIA

LOCATION MAP

SECOND LIFT CANAL LINING PROJECT PHASE III: DOUGLAS AVE. TO LIFT STATION

SUMMERS ENGINEERING INC.

Consulting Engineers

HANFORD

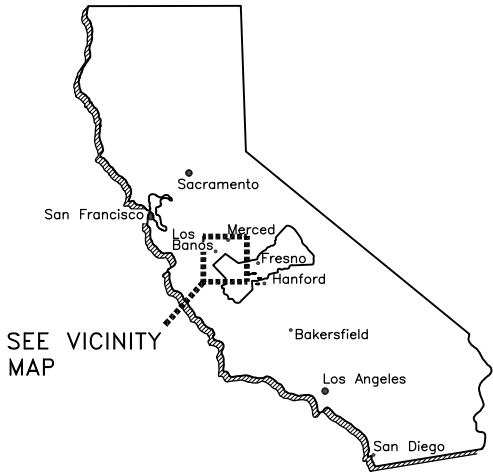
CALIFORNIA

OCTOBER 2012

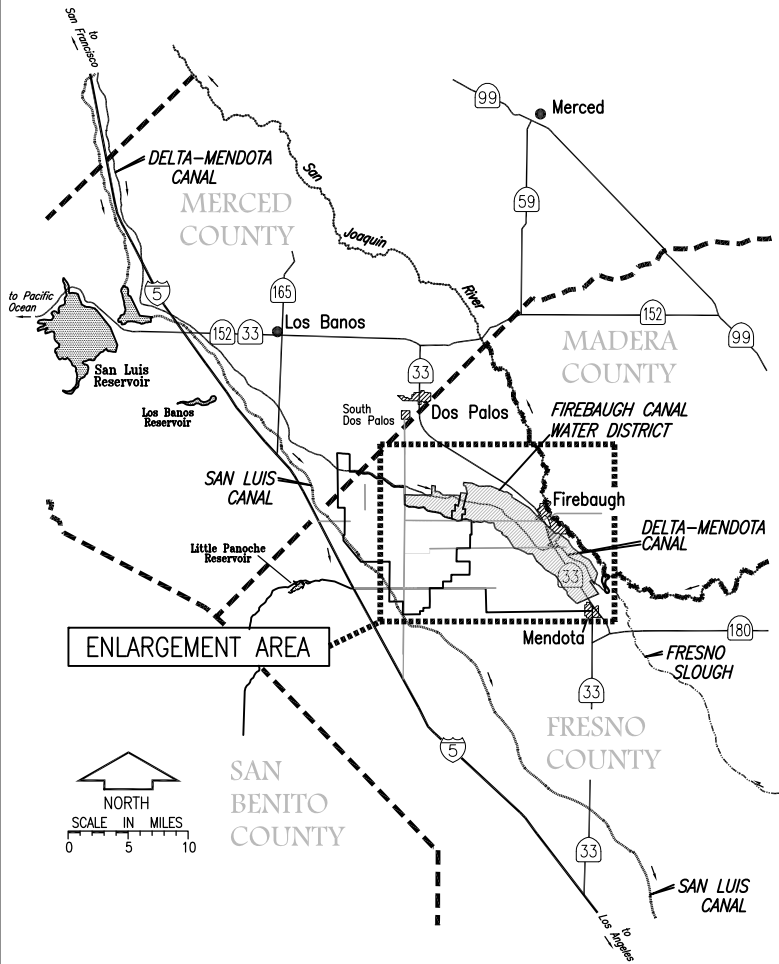
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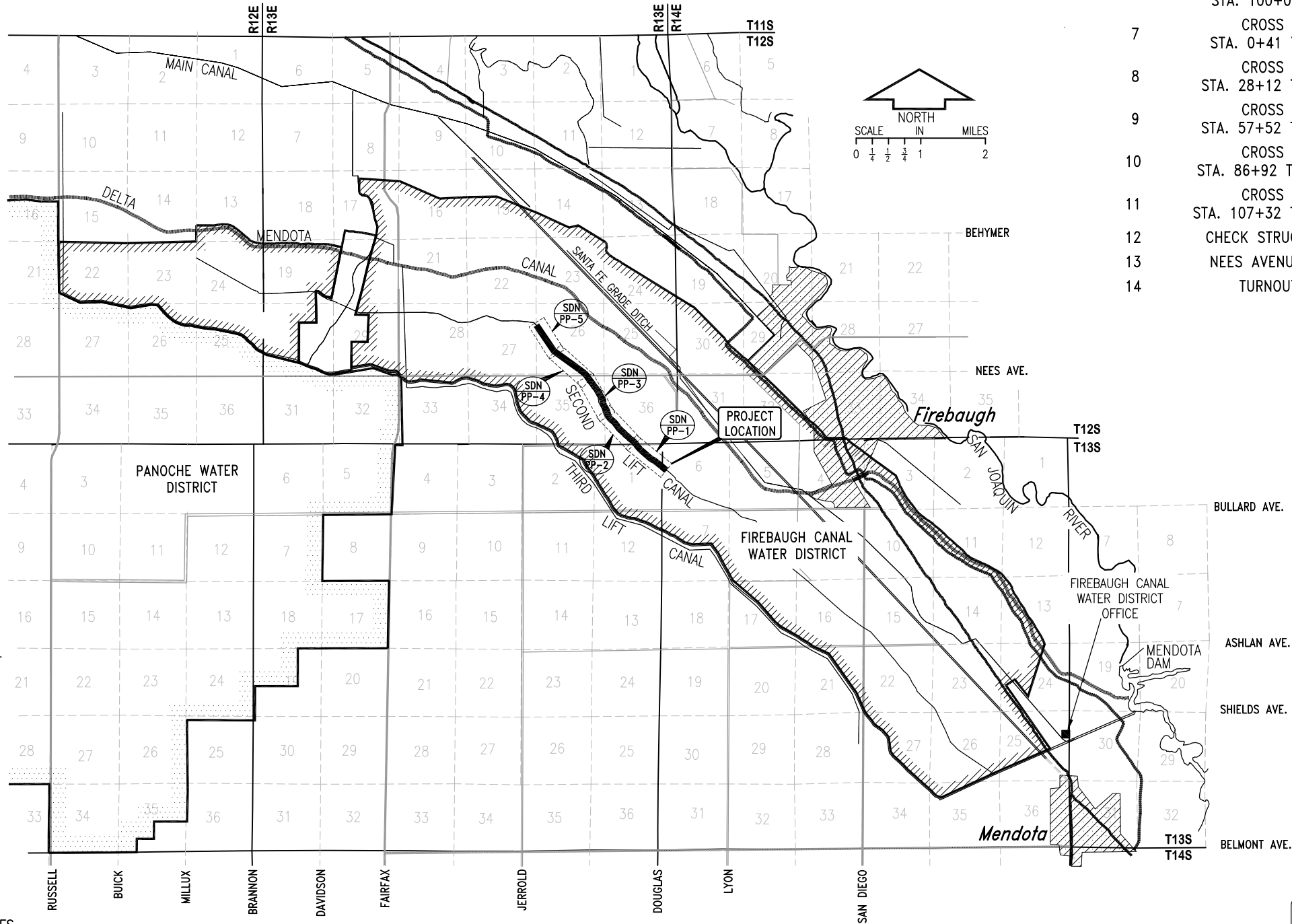
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1	LOCATION MAP	L-1
2	CANAL PLAN & PROFILE STA. 0+00 TO 25+00	PP-1
3	CANAL PLAN & PROFILE STA. 25+00 TO 50+00	PP-2
4	CANAL PLAN & PROFILE STA. 50+00 TO 75+00	PP-3
5	CANAL PLAN & PROFILE STA. 75+00 TO 100+00	PP-4
6	CANAL PLAN & PROFILE STA. 100+00 TO 115+80	PP-5
7	CROSS SECTIONS STA. 0+41 TO STA. 23+17	CS-1
8	CROSS SECTIONS STA. 28+12 TO STA. 52+49	CS-2
9	CROSS SECTIONS STA. 57+52 TO STA. 82+07	CS-3
10	CROSS SECTIONS STA. 86+92 TO STA. 103+37	CS-4
11	CROSS SECTIONS STA. 107+32 TO STA. 115+62	CS-5
12	CHECK STRUCTURE DETAILS	CK-1
13	NEES AVENUE HEADWALLS	SP-1
14	TURNOUT DETAILS	TO-1



STATE OF CALIFORNIA



VICINITY MAP



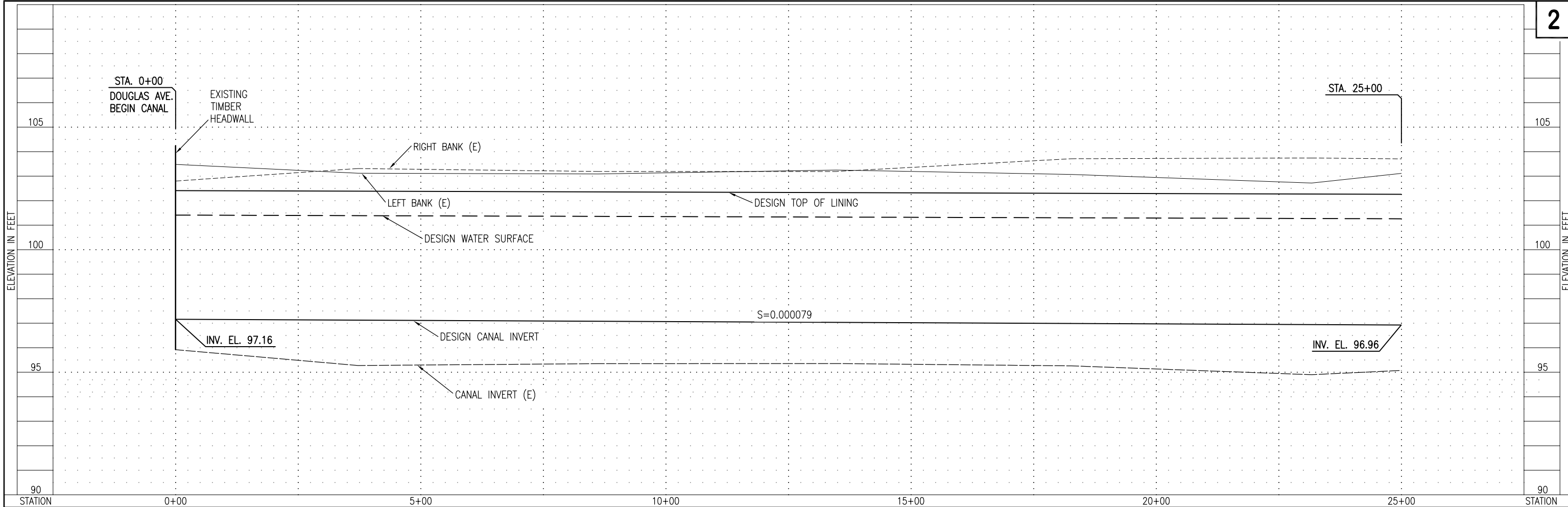
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SDN = SEE DRAWING NUMBER

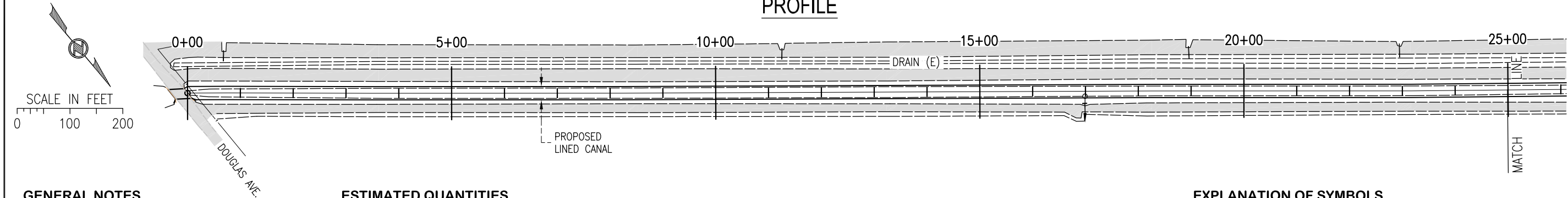
CAUTION : OVERHEAD POWER LINES
IN THIS AREA

CALL USA AT LEAST 48 HOURS PRIOR TO ANY
EXCAVATION 1-800-642-2444

THE LOCATIONS SHOWN ON THE DRAWINGS FOR EXISTING AND/OR NEW PIPE, VALVES, CONNECTIONS AND APPURTENANCES, GAS MAINS, WATER MAINS, UNDERGROUND AND OVERHEAD TELEPHONE CABLES, UNDERGROUND AND OVERHEAD ELECTRICAL SERVICES, AND OTHER UTILITIES WERE DETERMINED FROM RECORDS AVAILABLE TO THE ENGINEER AND MAY HAVE BEEN ALTERED IN THE FIELD. THE CONTRACTOR SHALL CONTACT THE RESPONSIBLE UTILITY AND VERIFY LOCATIONS BEFORE EXCAVATING.



PROFILE



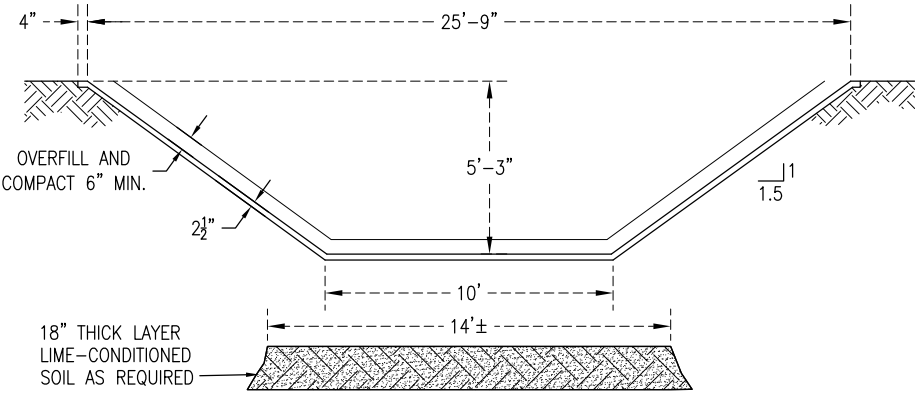
GENERAL NOTES

- 1. FINAL TURNOUT LOCATION SHALL BE DETERMINED IN THE FIELD BY THE DISTRICT. SEE DWG. NO. MD-1 FOR TURNOUT DETAILS.
- 2. ALL CONCRETE LINING SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI. A MINIMUM OF 5½ SACKS OF CEMENT TO EACH CUBIC YARD OF CONCRETE SHALL BE USED. CEMENT SHALL BE TYPE II AND CONFORM TO ASTM C-150. THE MAXIMUM NOMINAL SIZE OF THE COURSE AGGREGATE SHALL BE ¾". NOVOMESH 950, NYCONXL OR APPROVED EQUAL SHALL BE ADDED TO EACH CUBIC YARD OF CONCRETE AT THE RATE RECOMMENDED BY THE MANUFACTURER.
- 3. THE CANAL PAD SHALL BE COMPACTED TO 85% MAXIMUM DRY DENSITY PER ASTM D-1557.
- 4. WHERE REQUIRED, LIME TREATMENT AND/OR SOIL-CEMENT SHALL BE THOROUGHLY MIXED INTO THE CANAL FLOOR AND COMPACTED TO OBTAIN A MINIMUM COMPRESSIVE STRENGTH OF 300 PSI.

ESTIMATED QUANTITIES

COMPACTED EMBANKMENT	76,300 CUBIC YARDS
LINED CANAL	11,562 LINEAR FEET
TURNOUT INSTALLATION	6 EACH
PUMP TURNOUT INSTALATION	2 EACH

HYDRAULIC DATA	
DESIGN FLOW RATE	120 CFS
WATER DEPTH	4.25 FEET
DESIGN FLOW AREA	69.6 SQ. FT.
HYDRAULIC RADIUS	2.75 FEET
HYDRAULIC GRADE	0.0000787
LINE SLOPE	



DETAIL A

TYPICAL CANAL SECTION

EXPLANATION OF SYMBOLS

- TURNOUT, SDN TO-1
- NEW PUMP TURNOUT, SDN TO-1
- SDN SEE DRAWING NUMBER
- (E) EXISTING

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FIREBAUGH CANAL WATER DISTRICT
MENDOTA CALIFORNIA

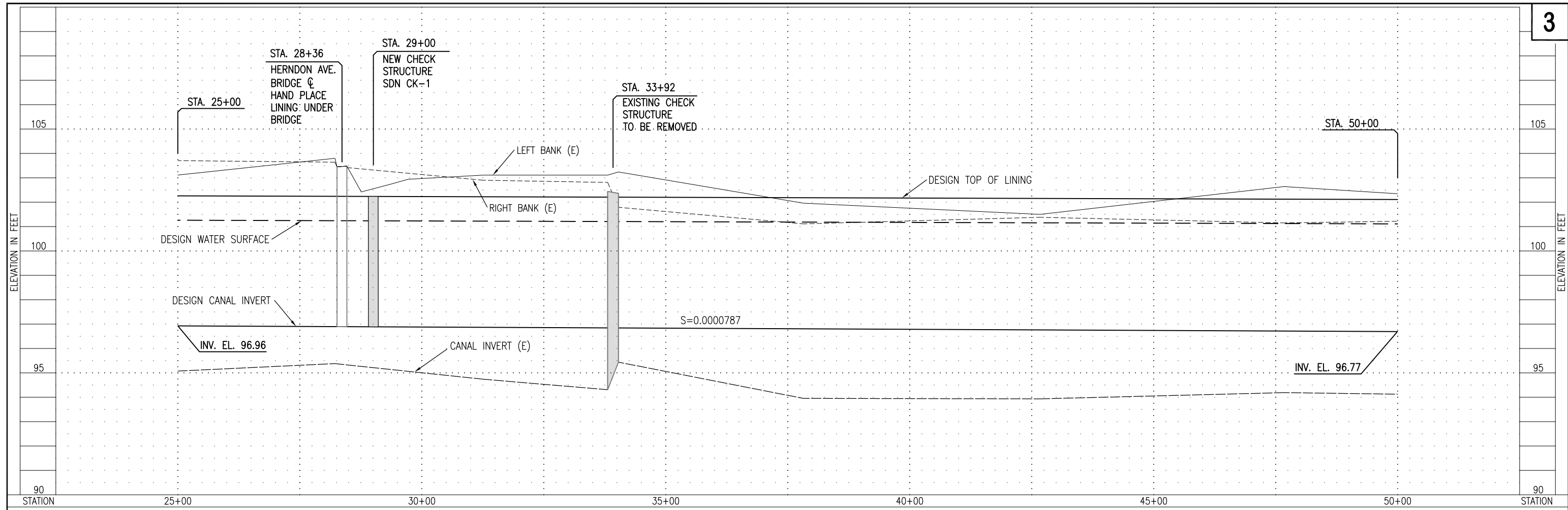
2nd LIFT CANAL LINING PROJECT
PHASE III

CANAL PLAN AND PROFILE
STA 0+00 TO STA 25+00

SUMMERS ENGINEERING INC.
HANFORD Consulting Engineers CALIFORNIA

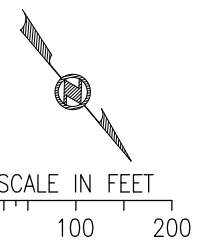
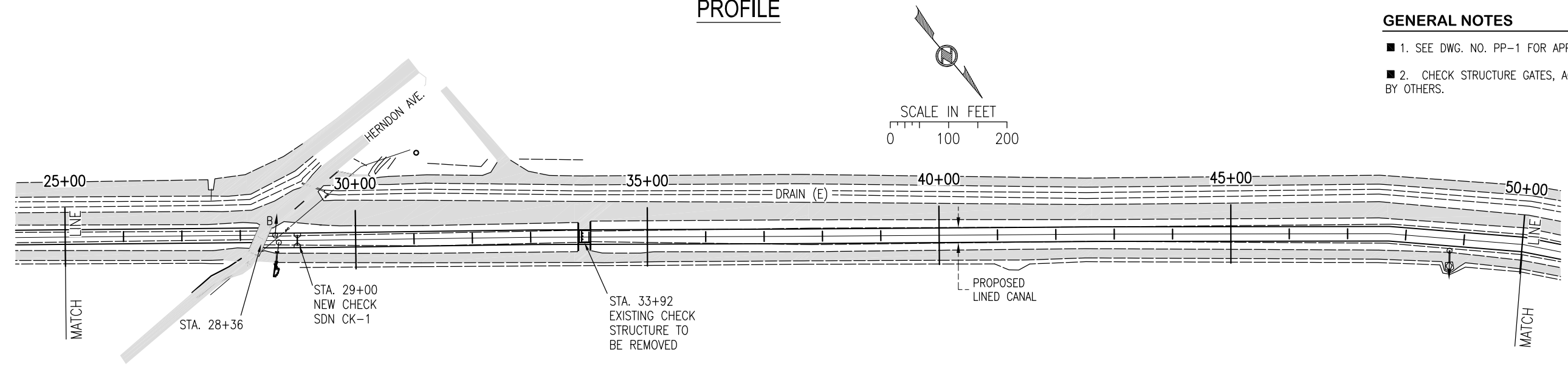
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NO.	DATE	MADE	CHKD.	APPD.

DATE APRIL 2012	APPROVED
DRAWN KY	DRAWING NO. PP-1
CHECKED JCL	SHEET 1 OF 5
DRAWING NAME: FCD12006.DWG	



PROFILE

- GENERAL NOTES**
- 1. SEE DWG. NO. PP-1 FOR APPLICABLE GENERAL NOTES.
 - 2. CHECK STRUCTURE GATES, ACTUATORS, AND INTEGRATION BY OTHERS.



- EXPLANATION OF SYMBOLS**
- TURNOUT, SDN TO-1
 - NEW PUMP TURNOUT, SDN TO-1
 - SDN SEE DRAWING NUMBER
 - (E) EXISTING

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FIREBAUGH CANAL WATER DISTRICT
MENDOTA CALIFORNIA

2nd LIFT CANAL LINING PROJECT
PHASE III

**CANAL PLAN AND PROFILE
STA 25+00 TO STA 50+00**

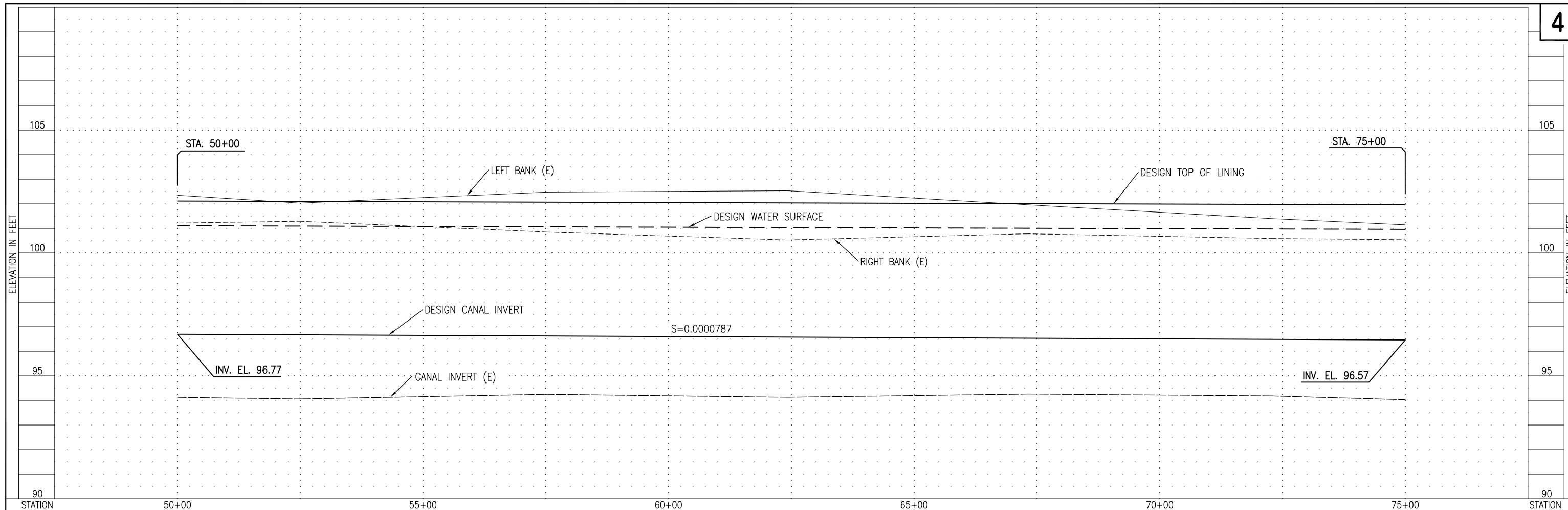
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HANFORD Consulting Engineers CALIFORNIA

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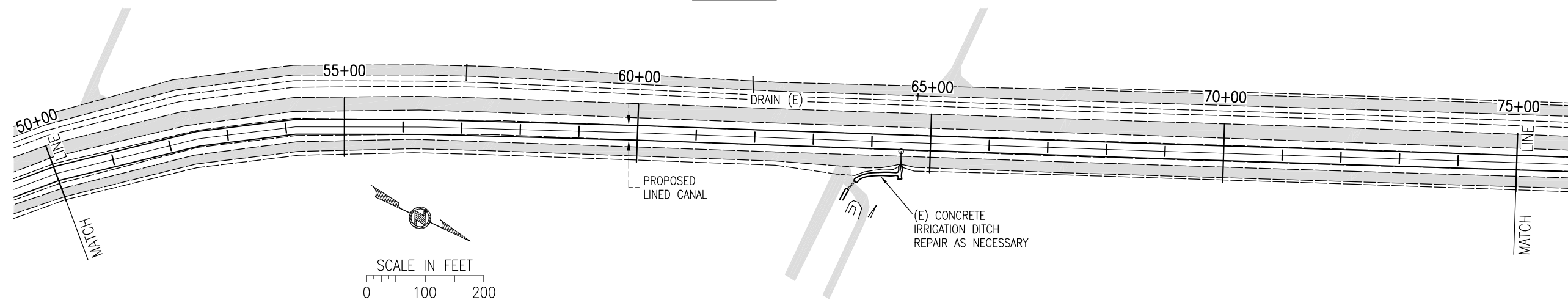
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NO.	DATE	MADE	CHKD.	APPD.

REVISIONS



PROFILE



GENERAL NOTES

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EXPLANATION OF SYMBOLS

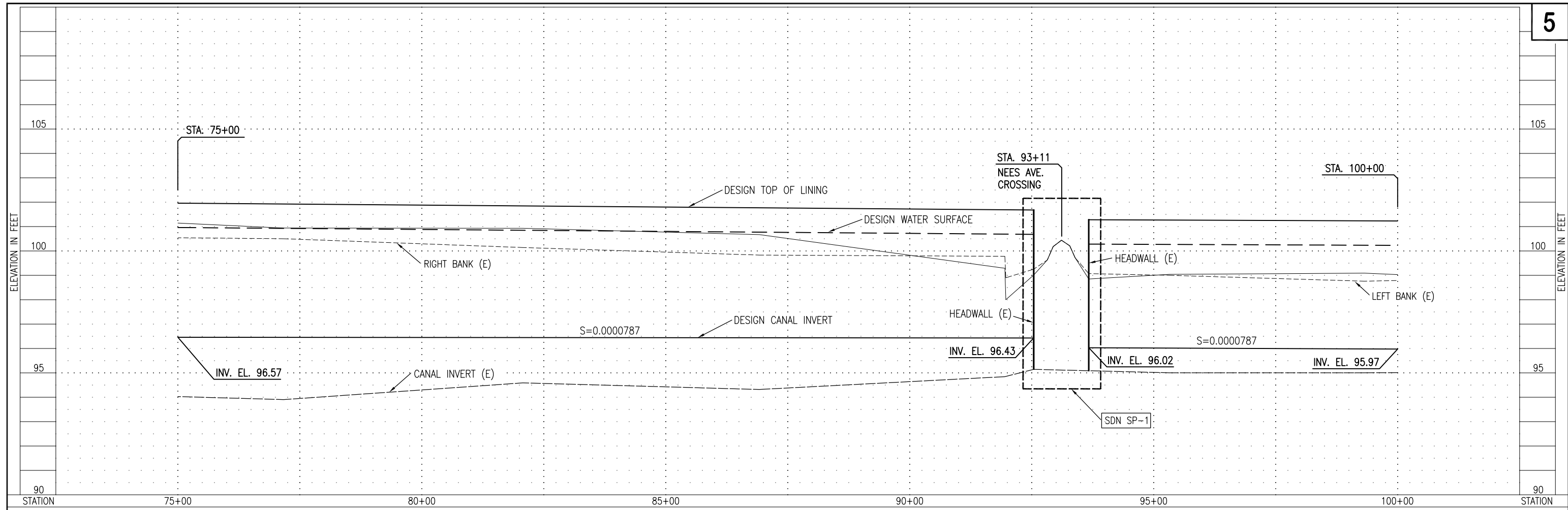
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Caution : Overhead Power Lines
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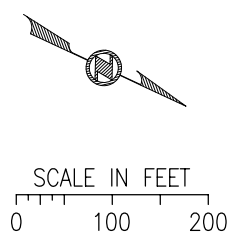
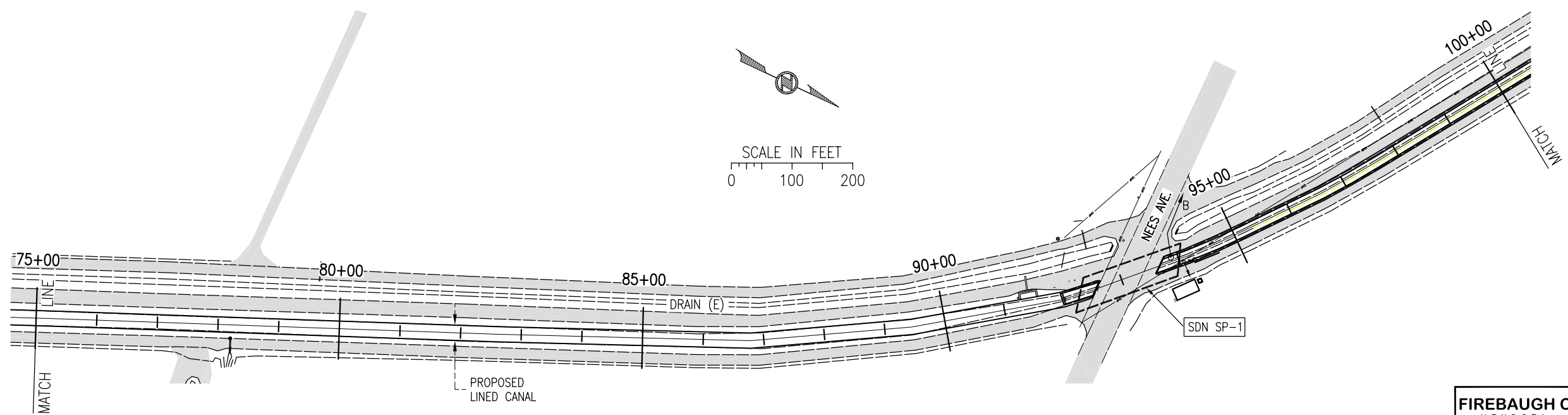
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					SUMMERS ENGINEERING INC. HANFORD Consulting Engineers CALIFORNIA	
					DATE APRIL 2012	APPROVED
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PROFILE



GENERAL NOTES

- 1. SEE DWG. NO. PP-1 FOR APPLICABLE GENERAL NOTES.

EXPLANATION OF SYMBOLS

- TURNOUT, SDN TO-1
- NEW PUMP TURNOUT, SDN TO-1
- SDN SEE DRAWING NUMBER
- (E) EXISTING

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MENDOTA CALIFORNIA

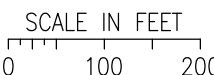
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CANAL PLAN AND PROFILE
STA 75+00 TO STA 100+00

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HANFORD Consulting Engineers CALIFORNIA

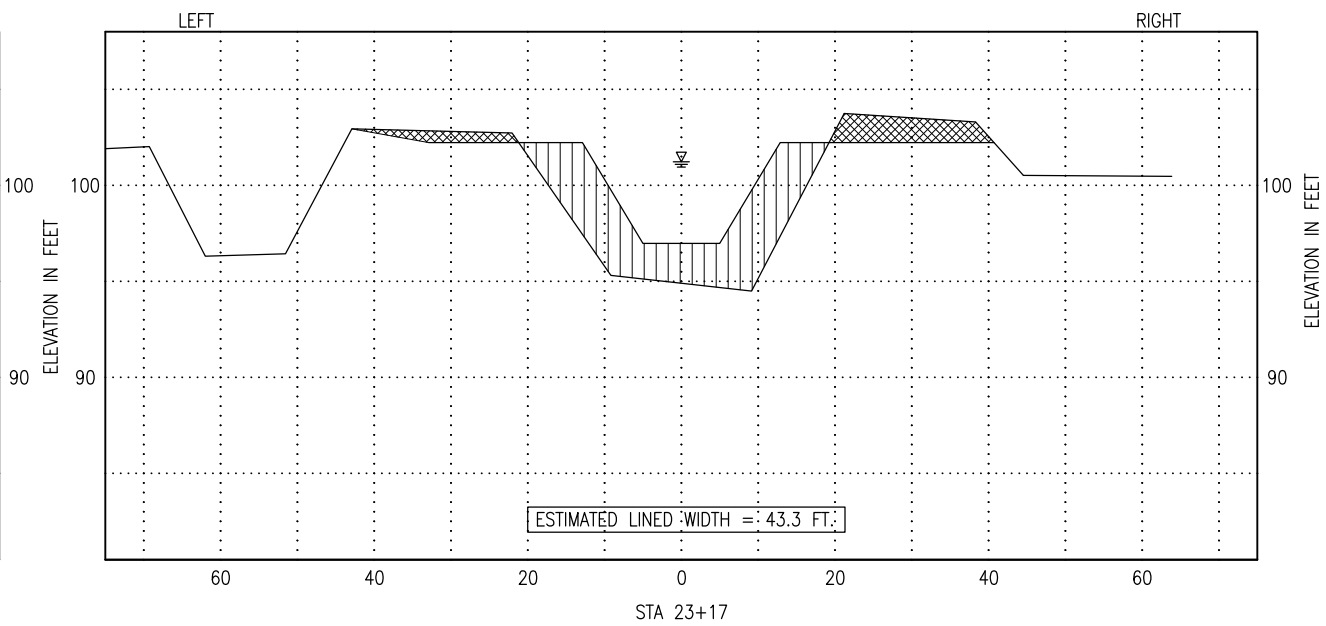
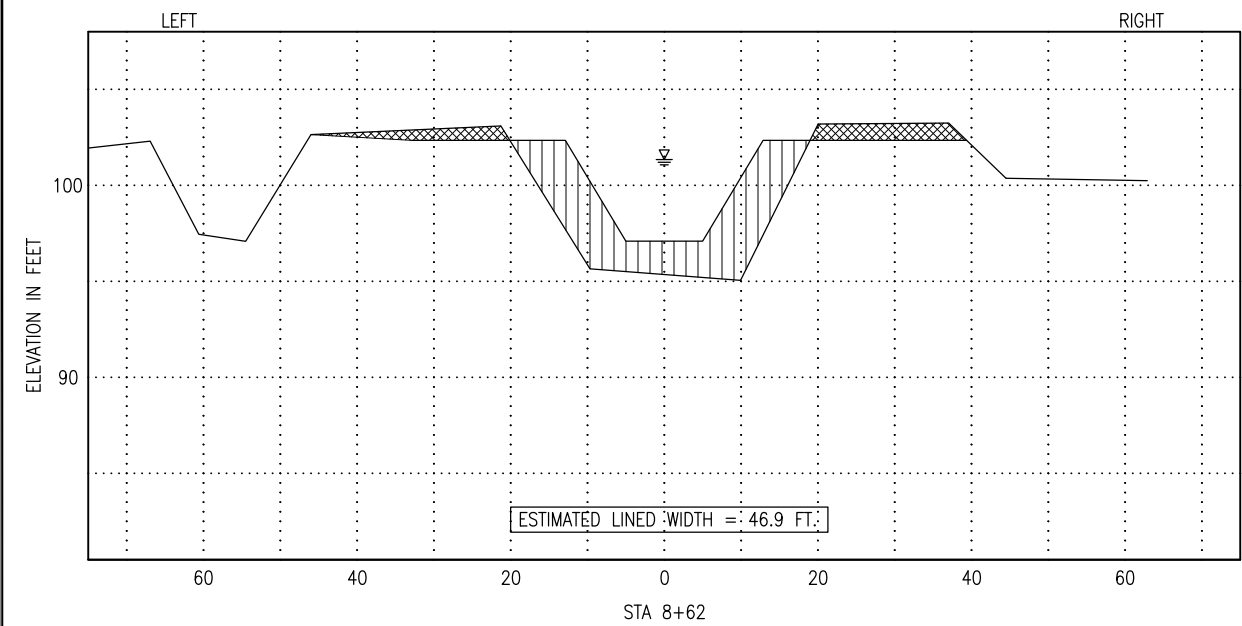
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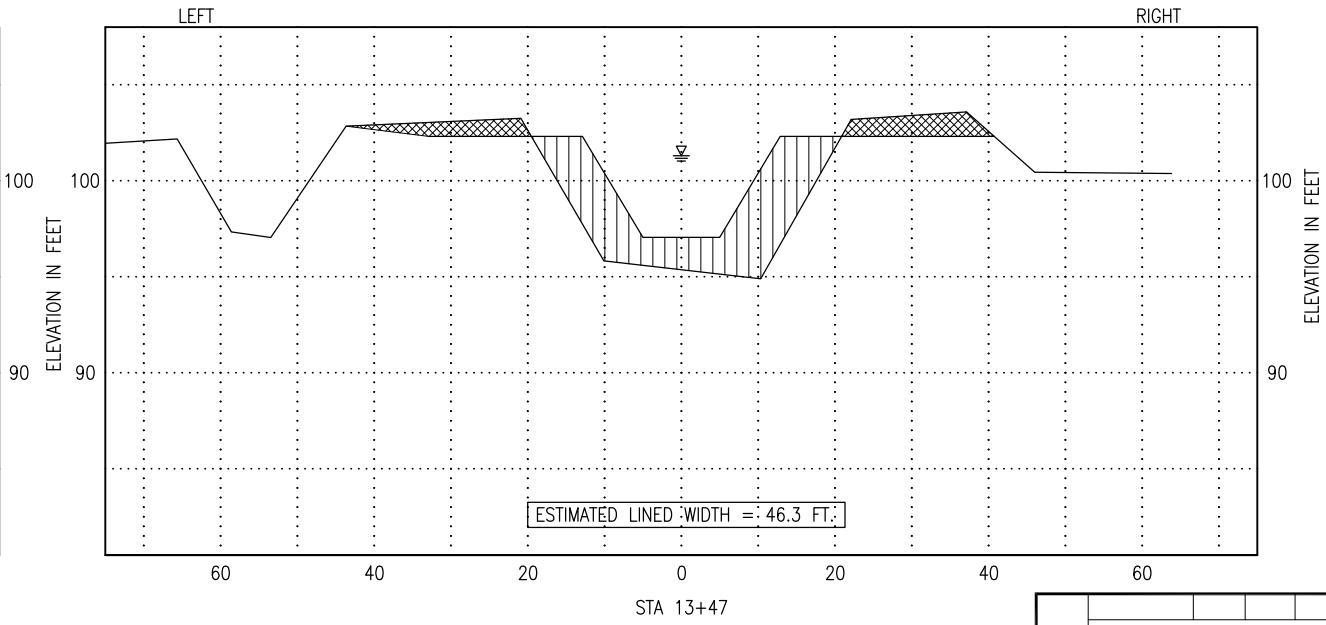
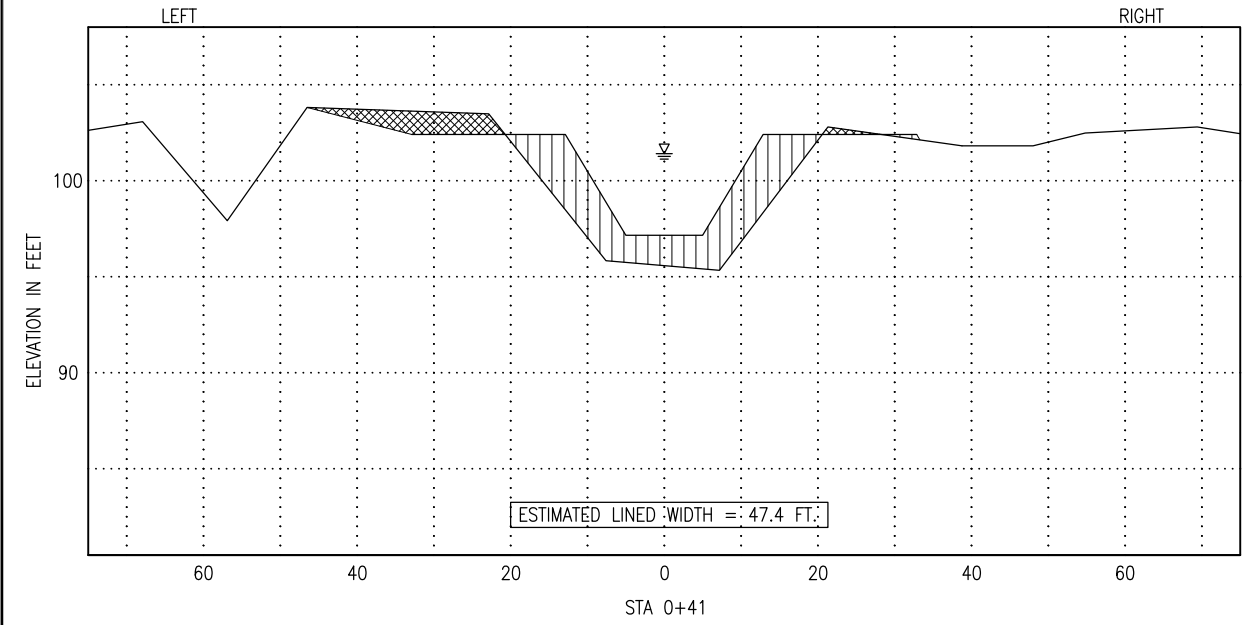
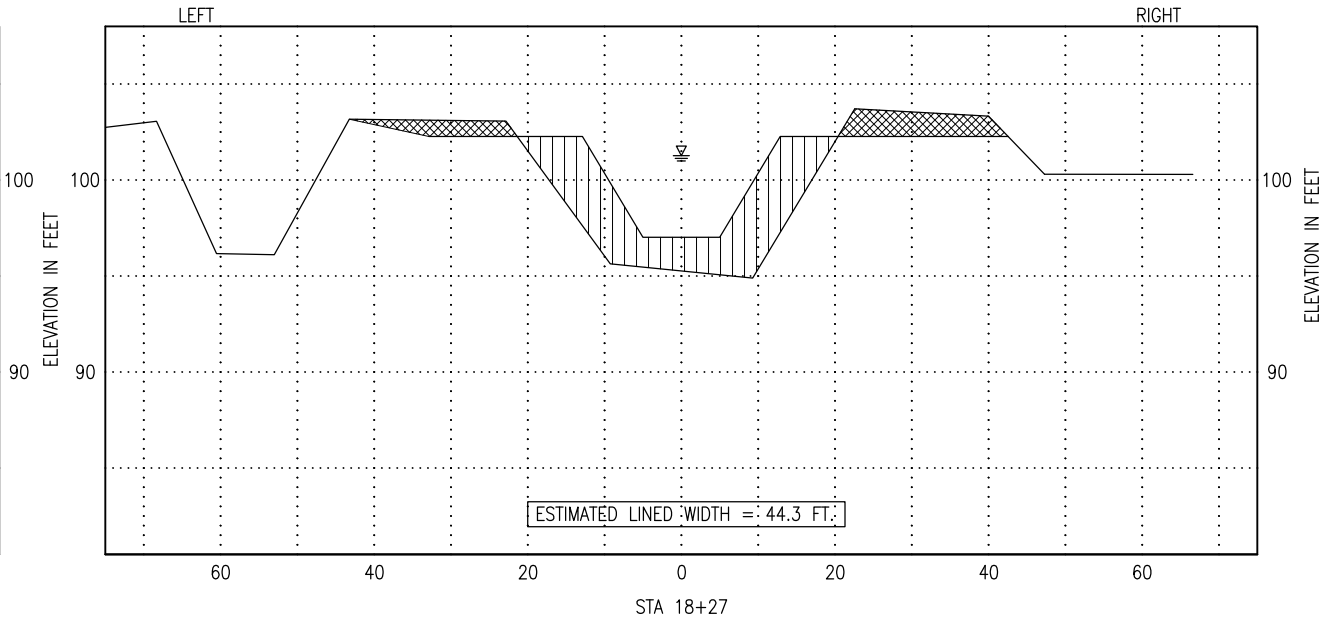
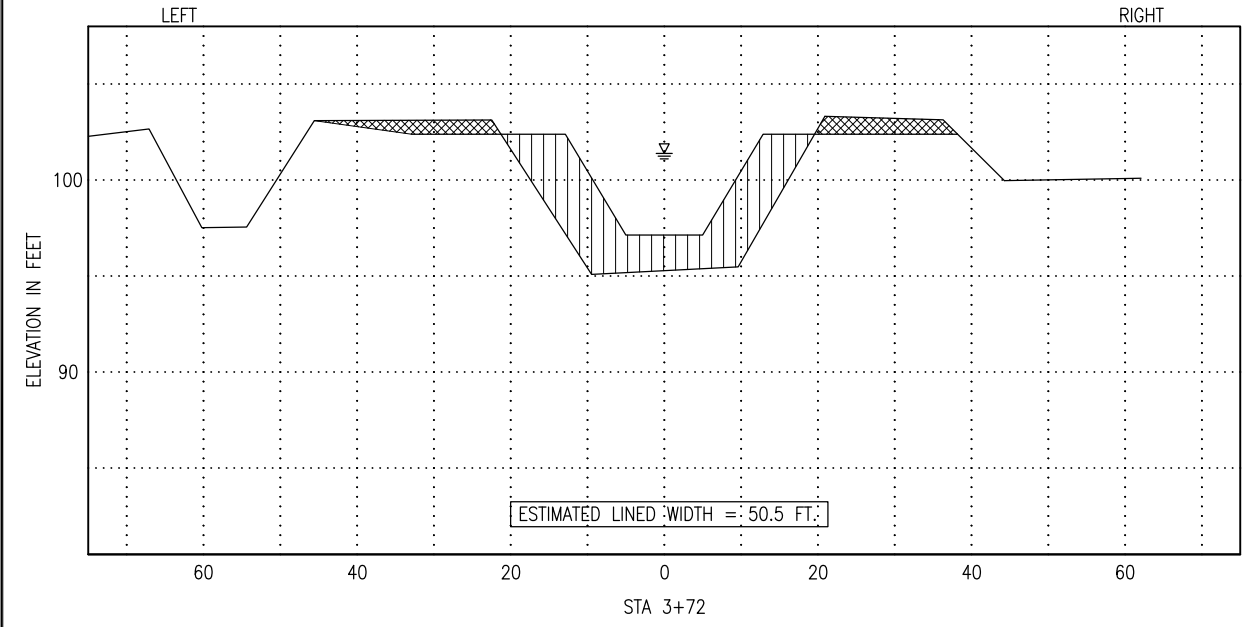
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EXPLANATION OF SYMBOLS

FILL AREA

CUT AREA



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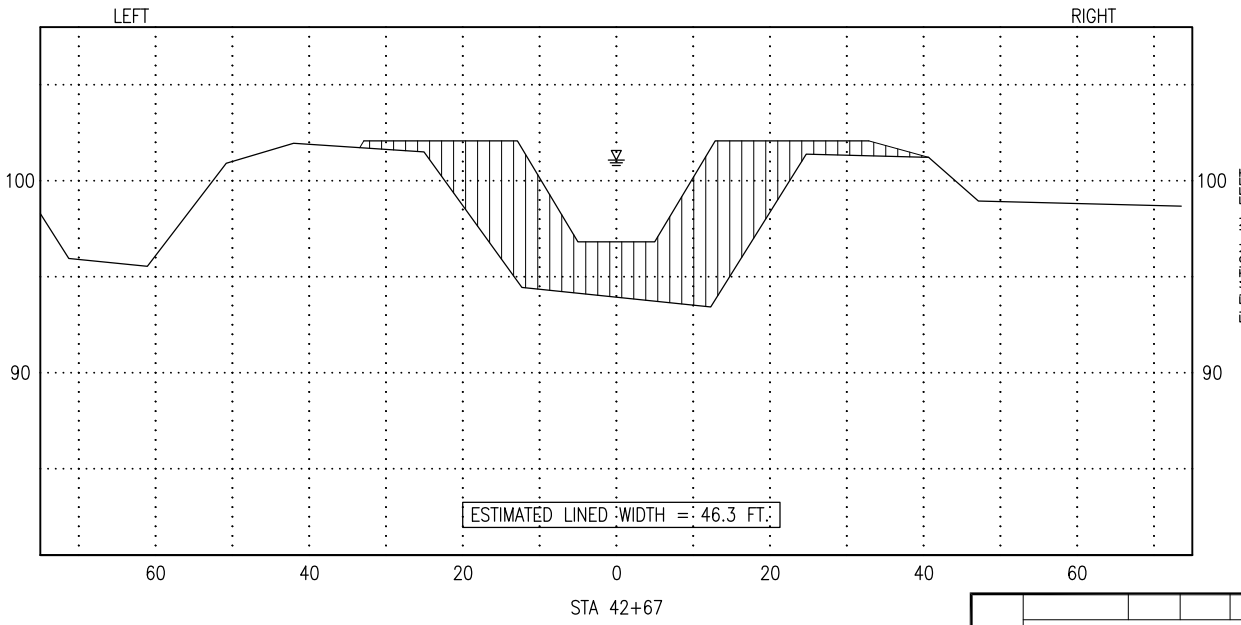
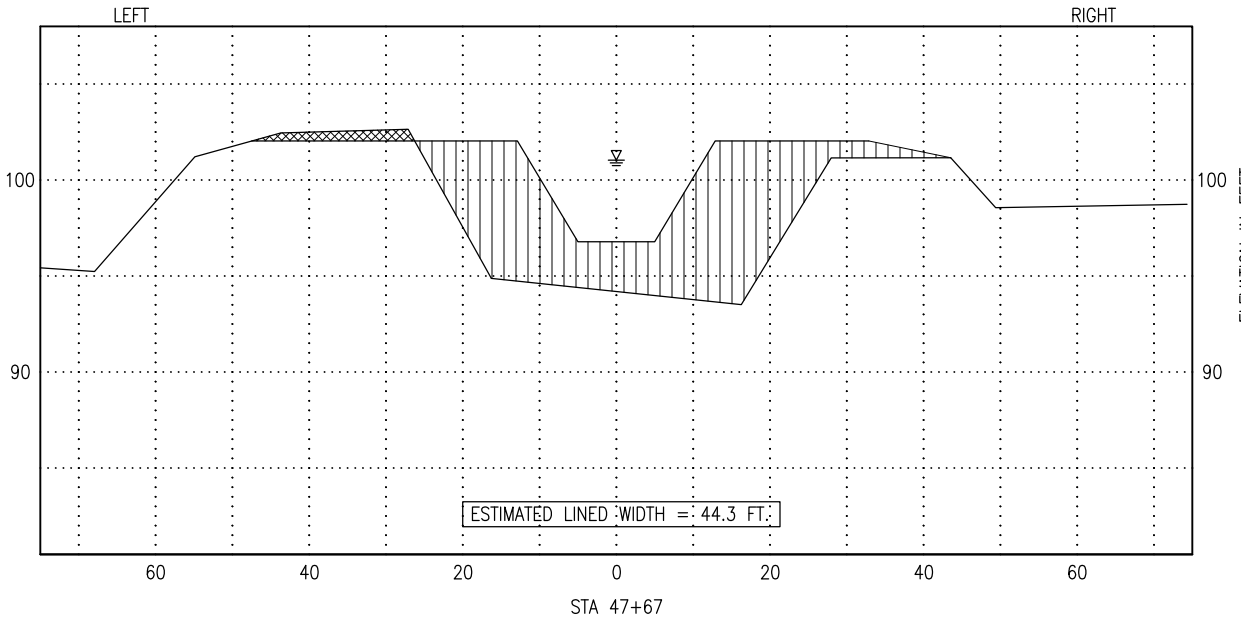
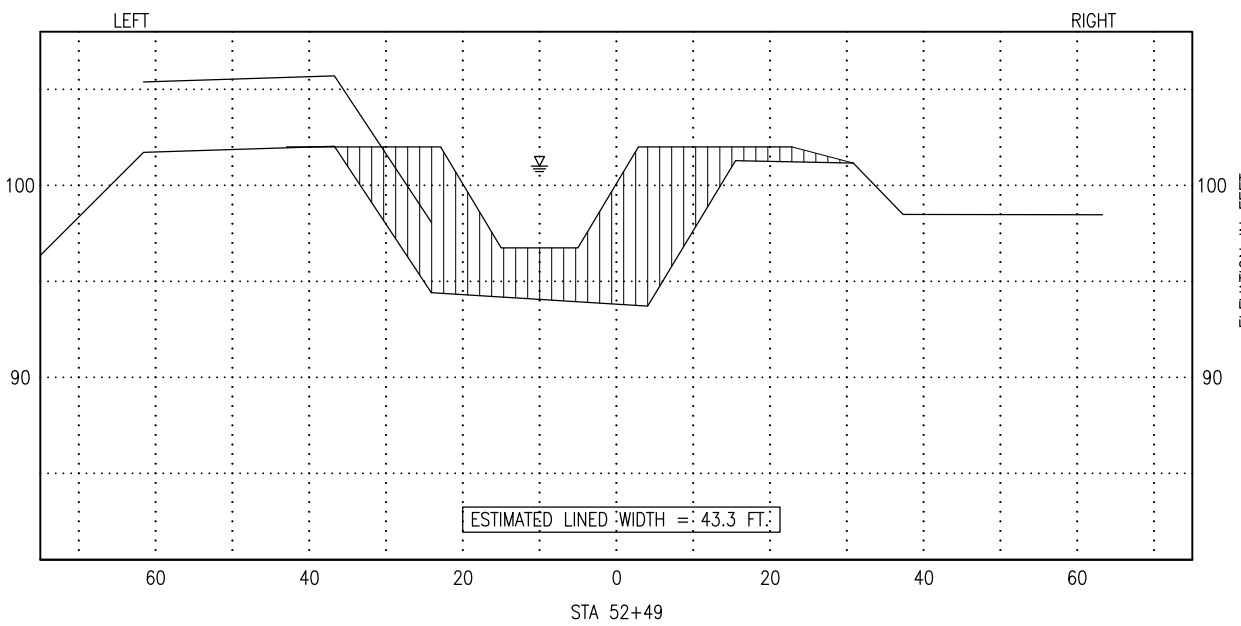
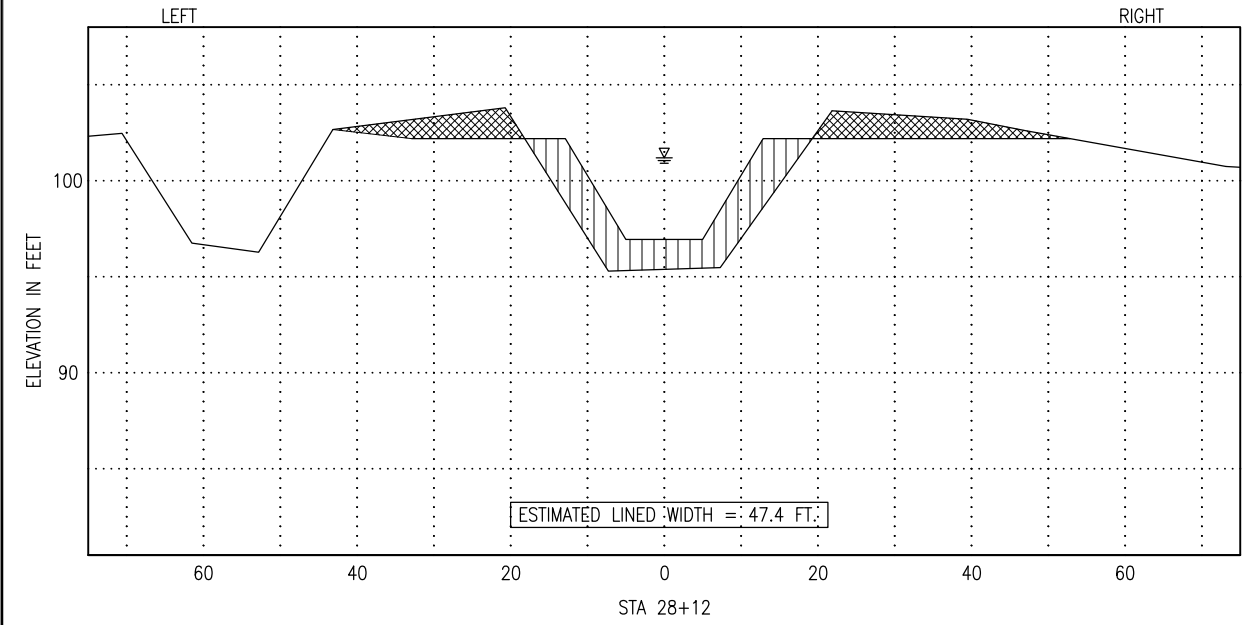
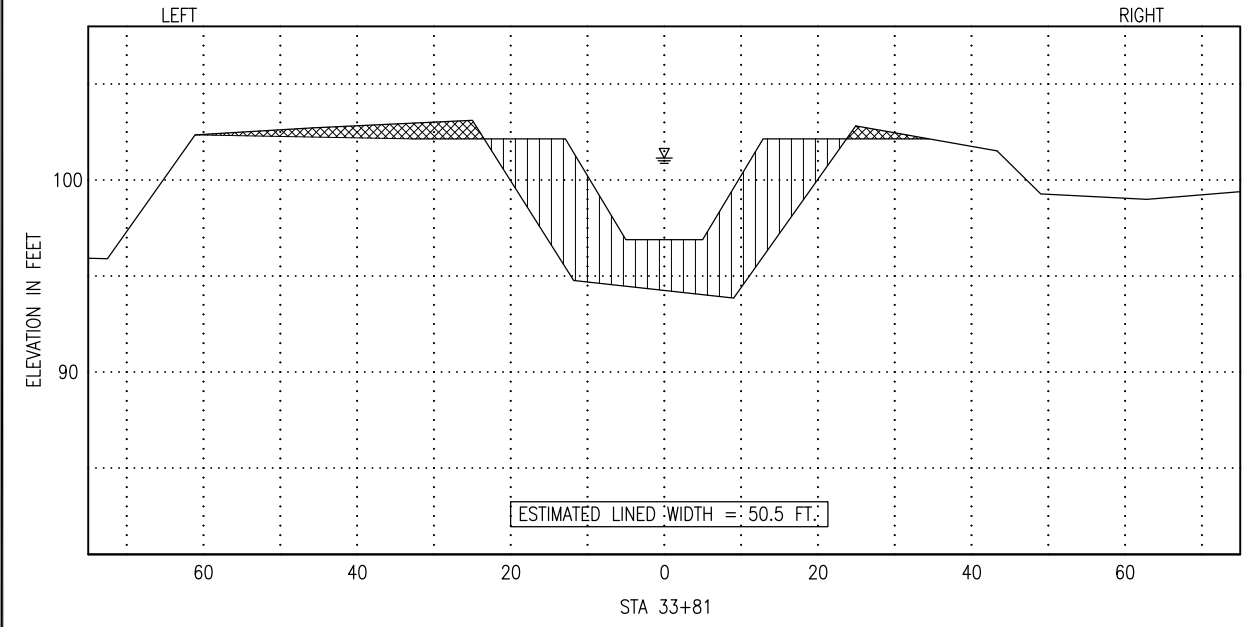
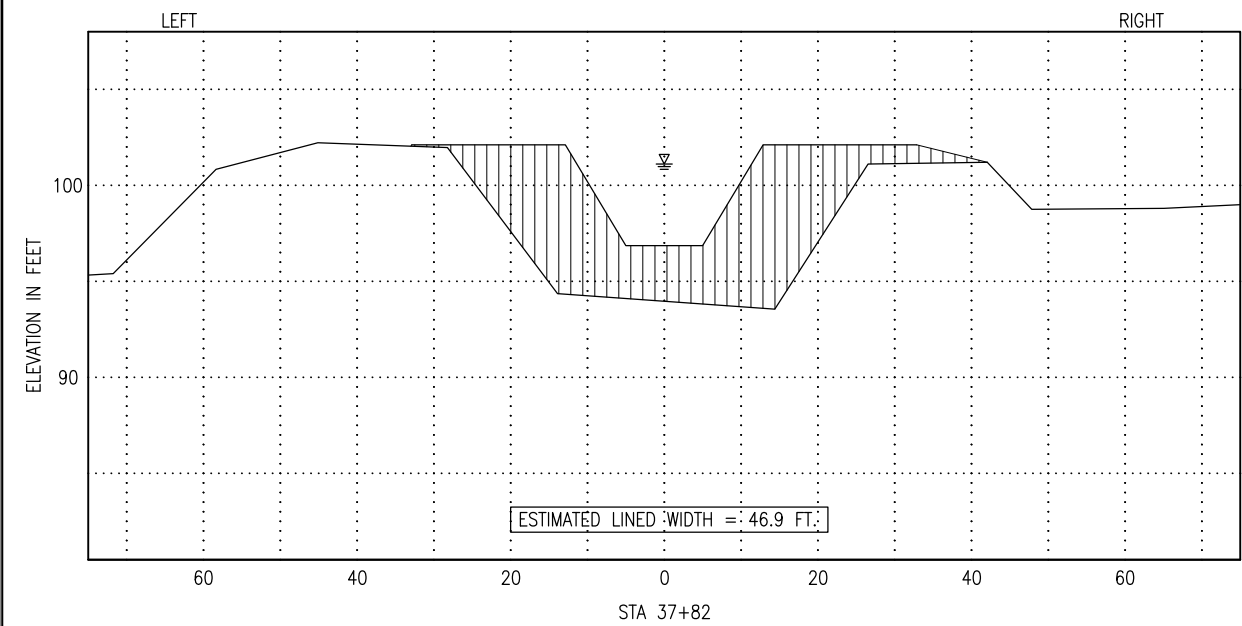
FIREBAUGH CANAL WATER DISTRICT
MENDOTA CALIFORNIA

2nd LIFT CANAL LINING PROJECT
PHASE III
CROSS SECTIONS
STA 0+41 TO STA 23+17

SUMMERS ENGINEERING INC.
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DATE	APRIL 2012	APPROVED	
DRAWN	KY	DRAWING NO.	CS-1
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DRAWING NAME: FCD12006.DWG



EXPLANATION OF SYMBOLS

FILL AREA

CUT AREA

FIREBAUGH CANAL WATER DISTRICT
MENDOTA CALIFORNIA

2nd LIFT CANAL LINING PROJECT
PHASE III
CROSS SECTIONS
STA 28+12 TO STA 52+49

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HANFORD Consulting Engineers CALIFORNIA

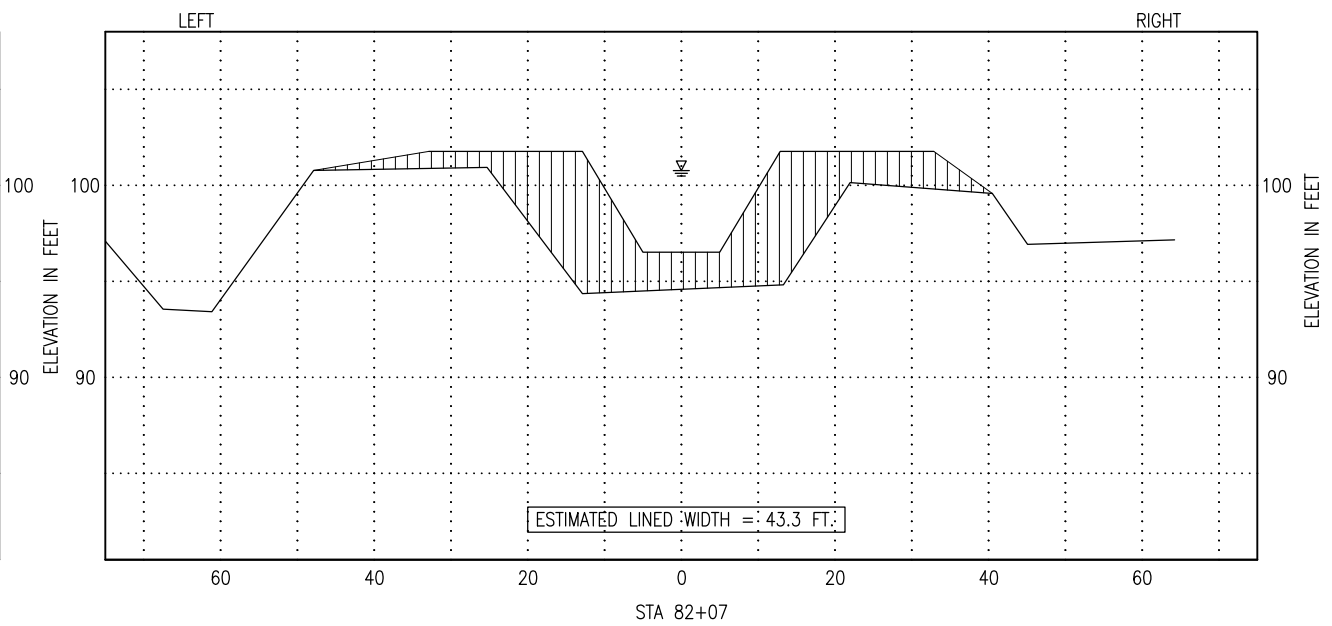
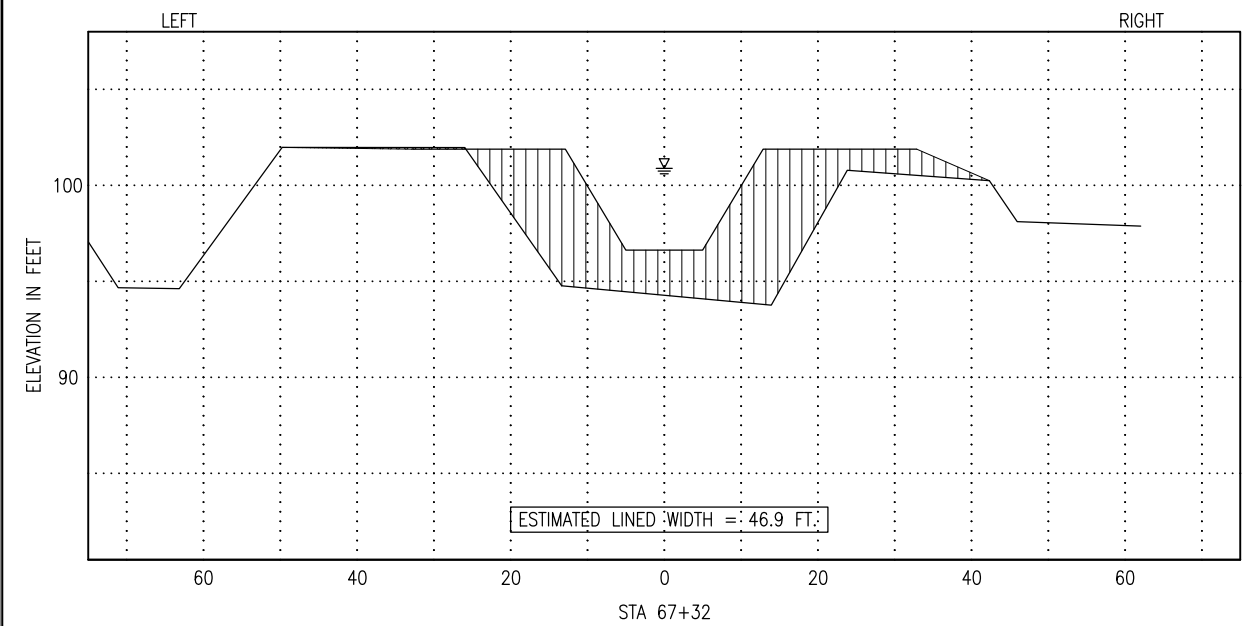
DATE APRIL 2012
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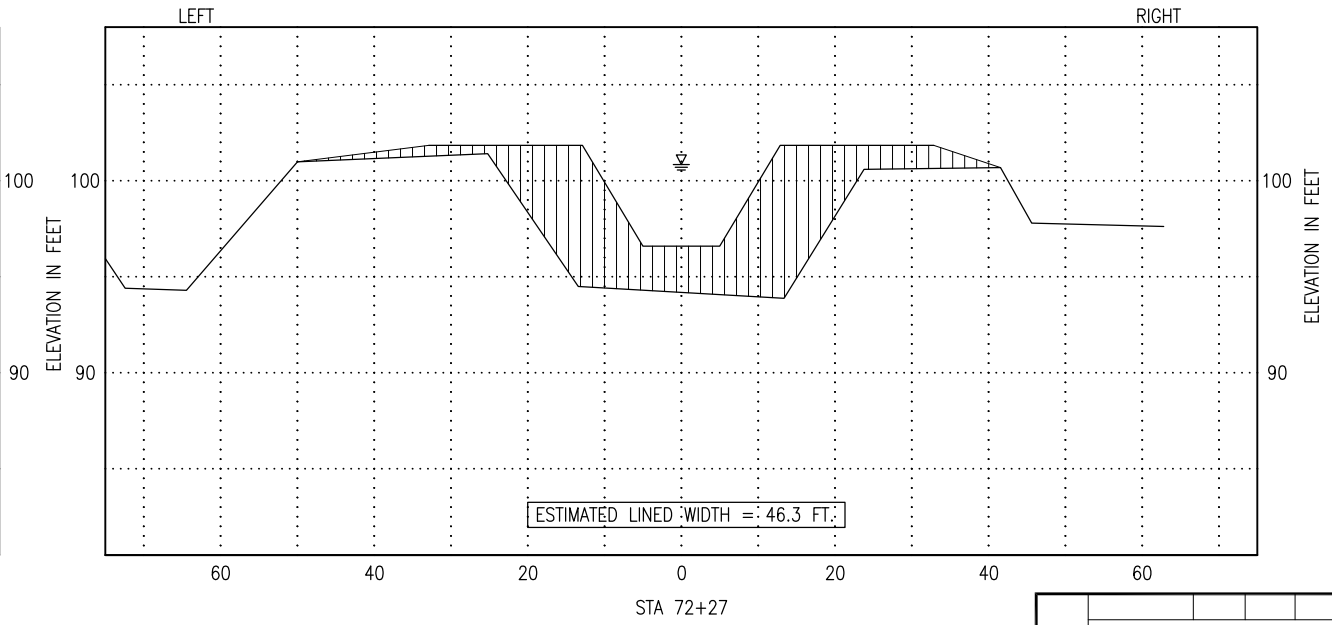
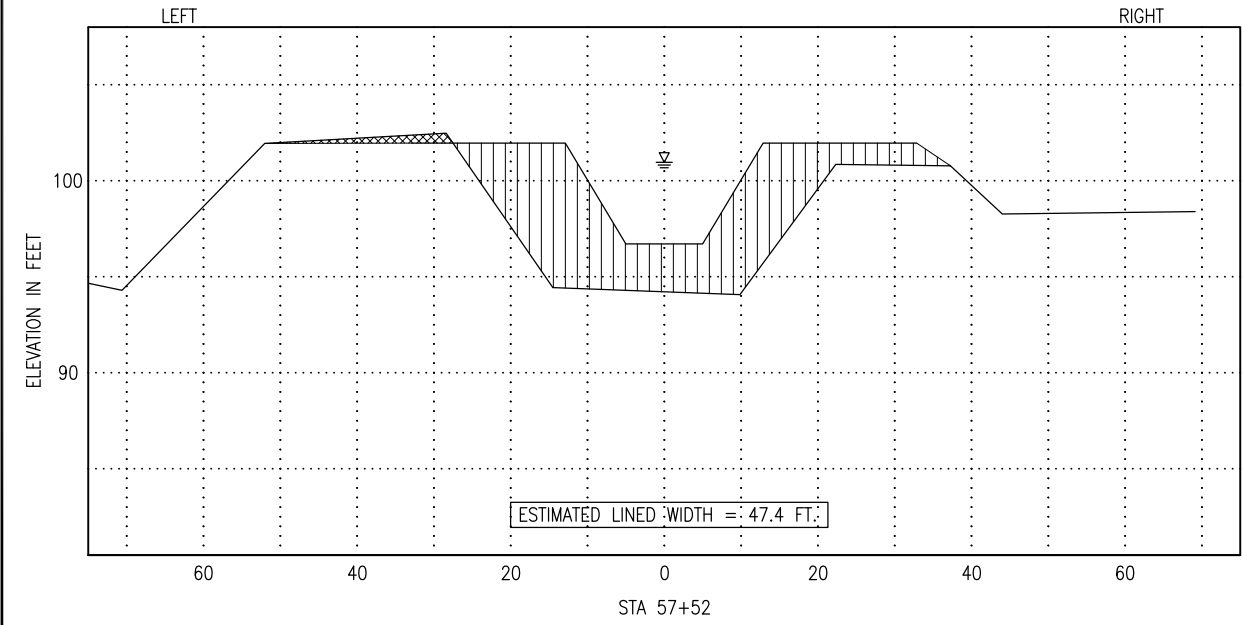
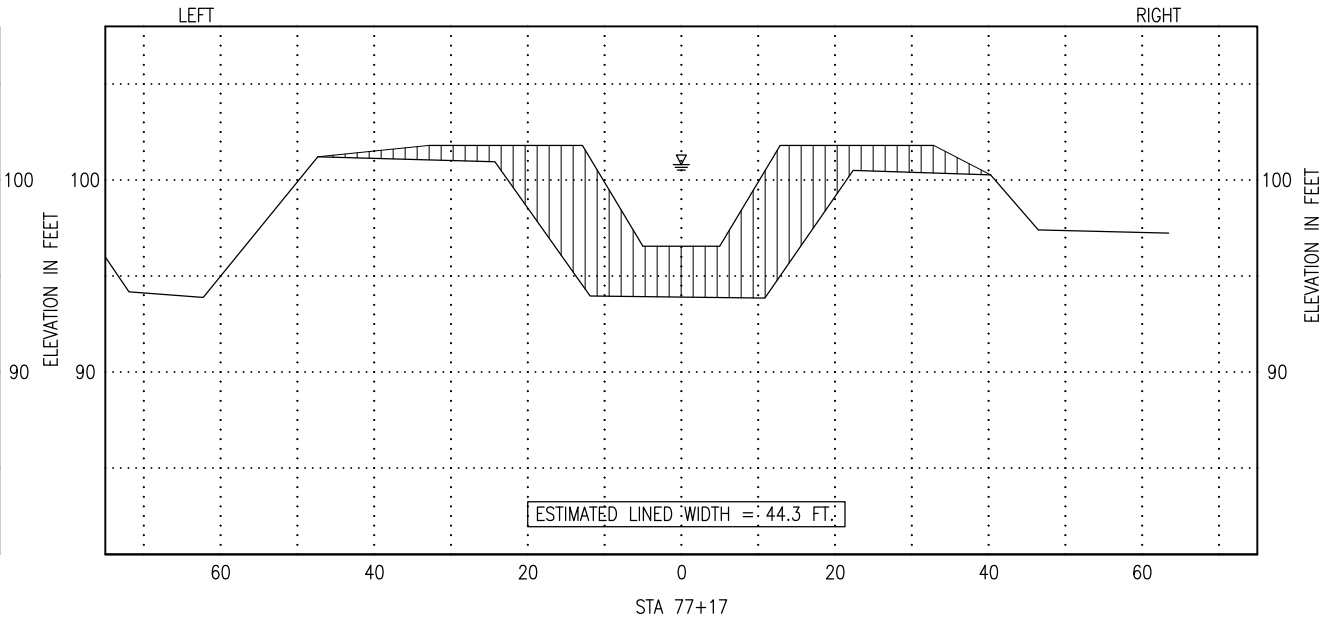
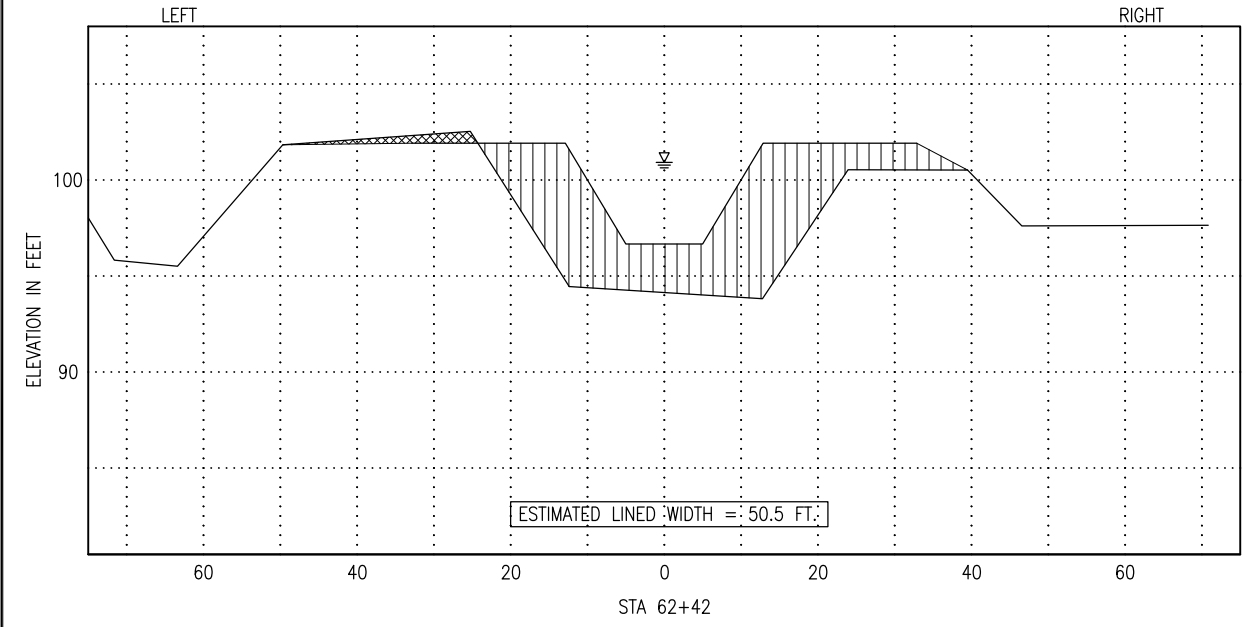
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REVISIONS				



EXPLANATION OF SYMBOLS

FILL AREA

CUT AREA



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Subject to Revision
JULY 13, 2012

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FIREBAUGH CANAL WATER DISTRICT
MENDOTA CALIFORNIA

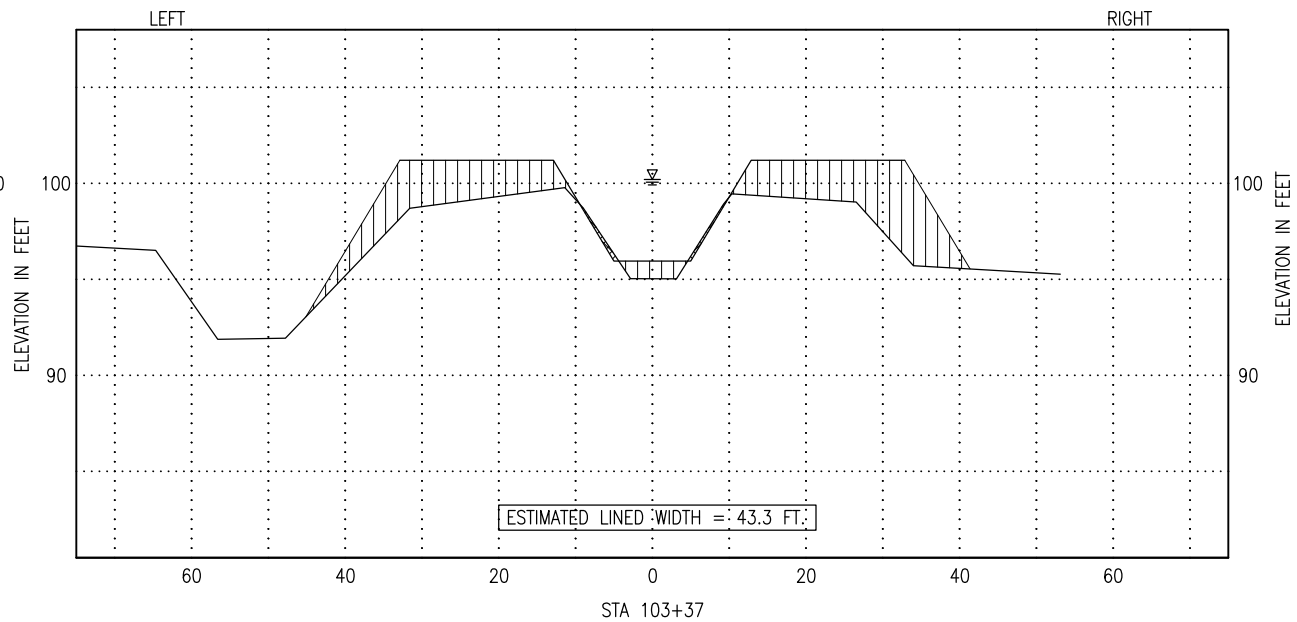
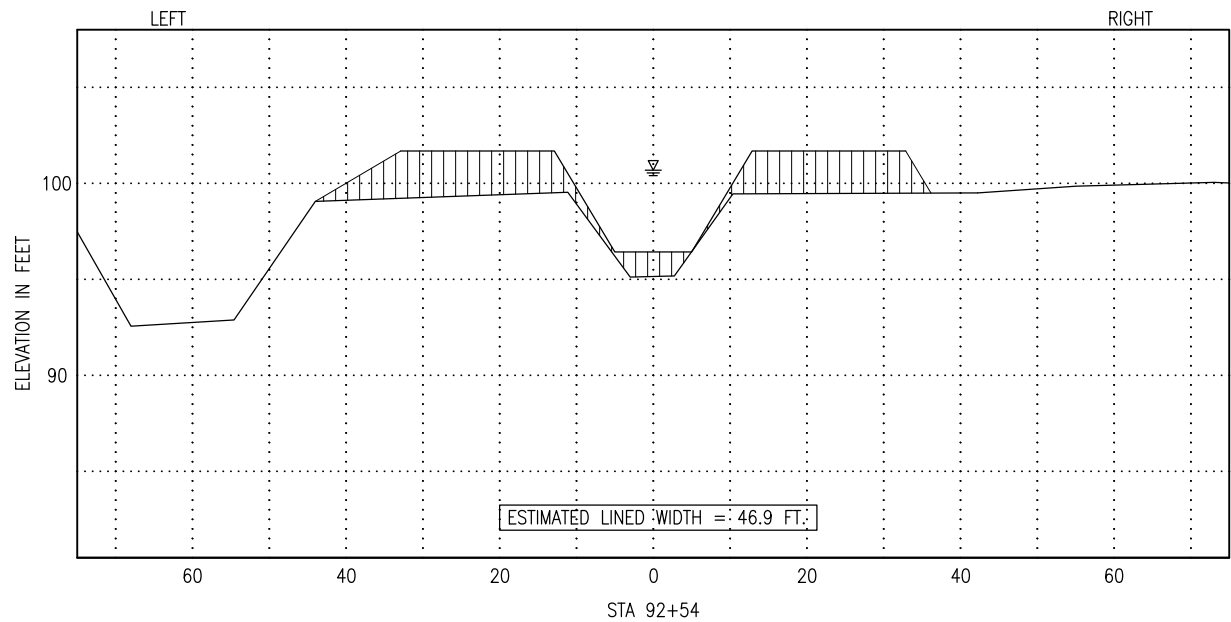
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PHASE III
CROSS SECTIONS
STA 57+52 TO STA 82+07

SUMMERS ENGINEERING INC.
Consulting Engineers CALIFORNIA

DATE APRIL 2012
DRAWN KY
CHECKED JCL

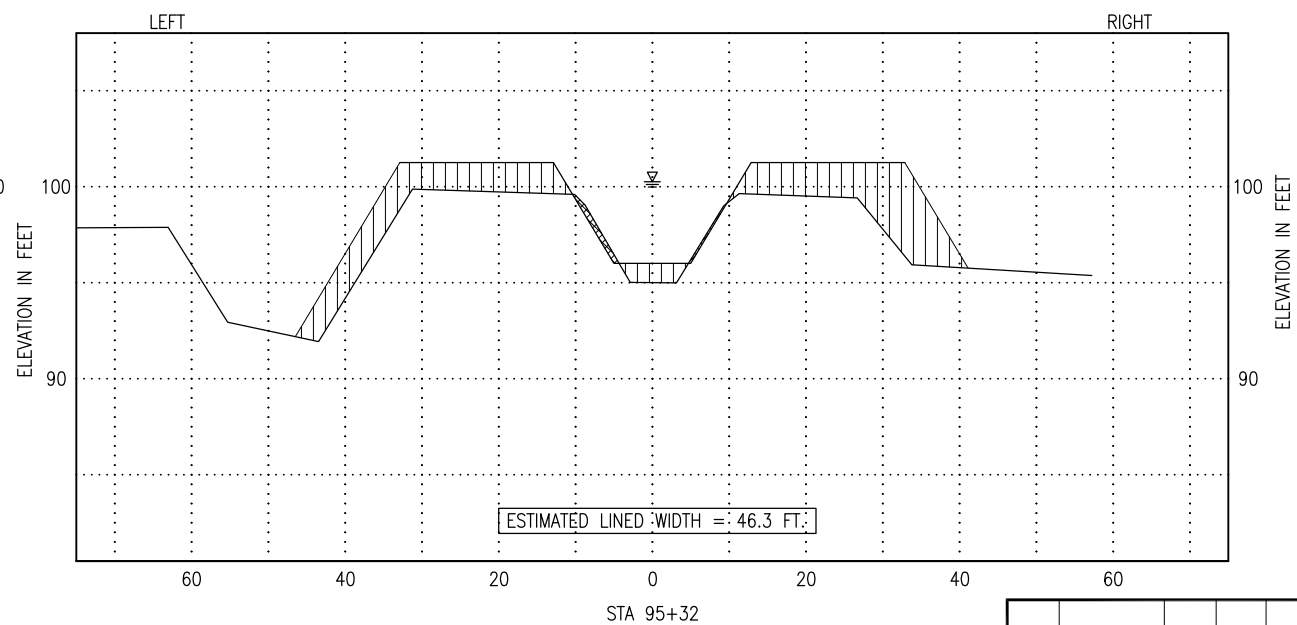
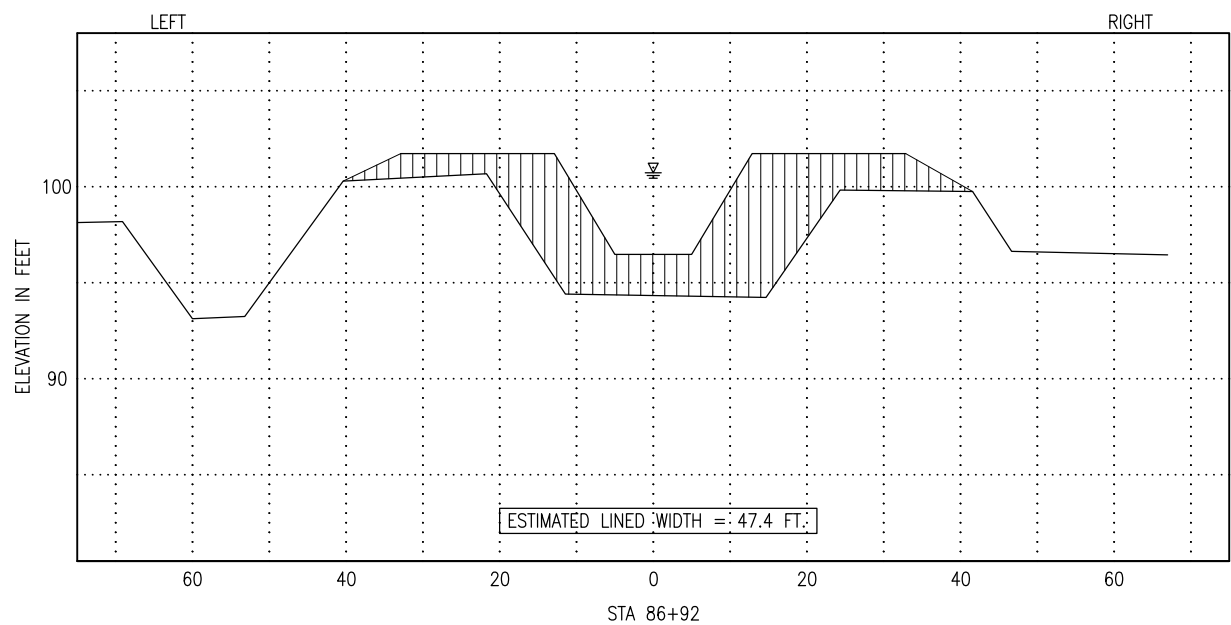
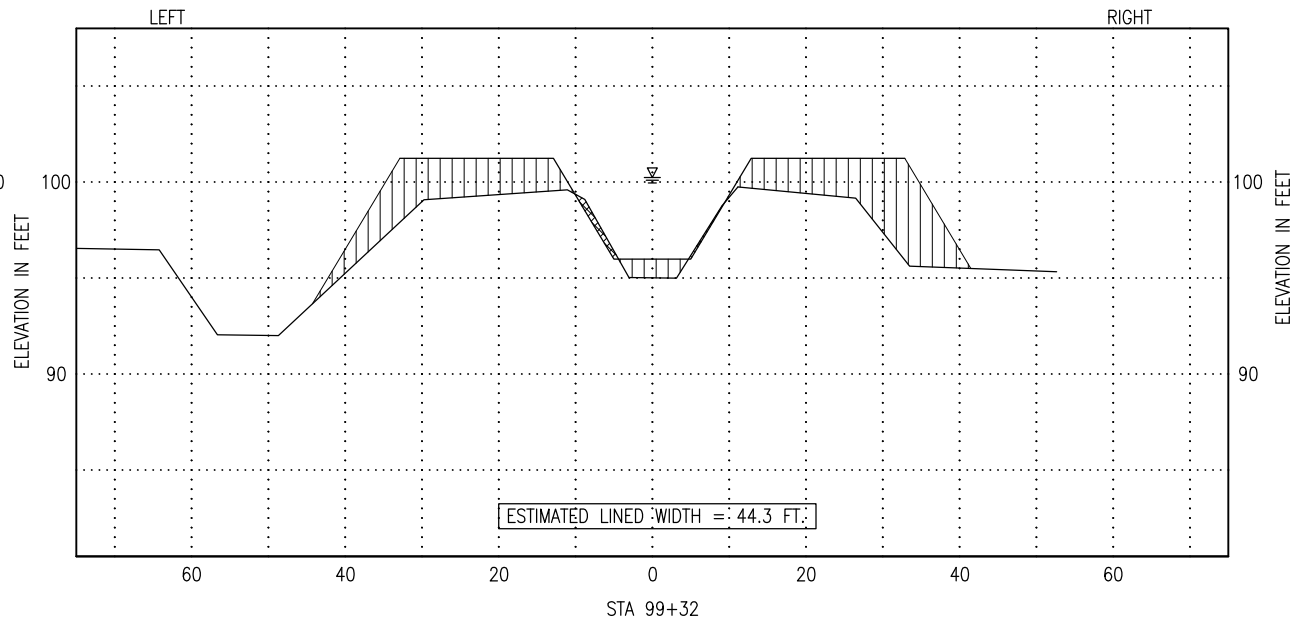
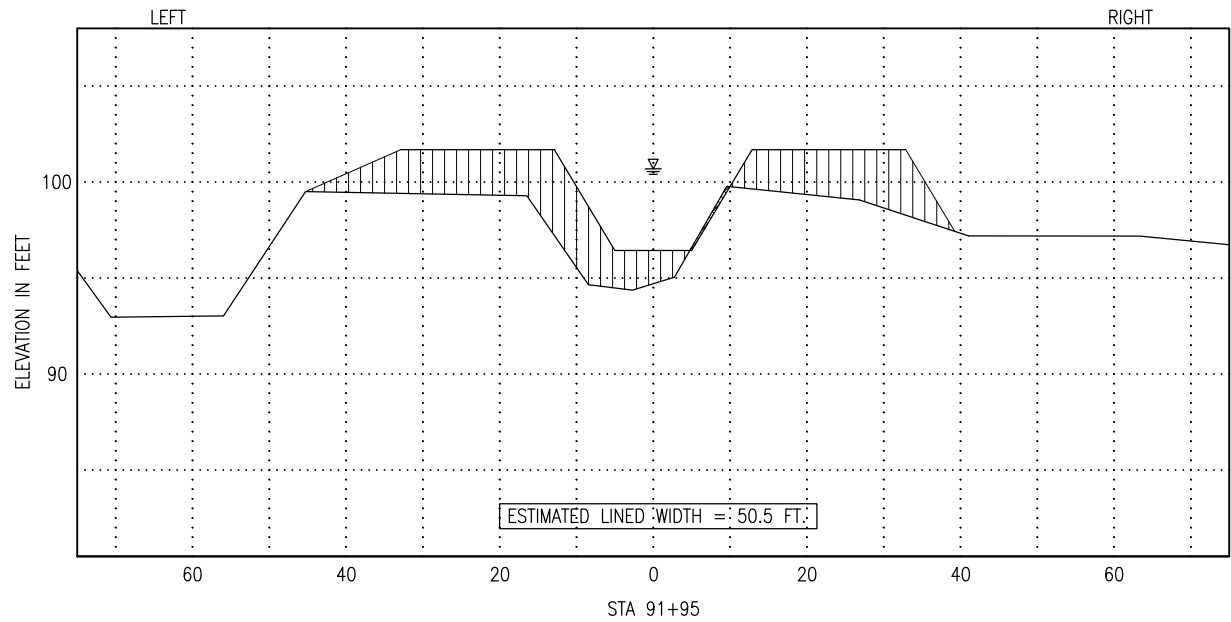
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SHEET 3 OF 5

DRAWING NAME: FCD12006.DWG



EXPLANATION OF SYMBOLS

- ||||| FILL AREA
- ||||| CUT AREA



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JULY 13, 2012

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REVISIONS				

FIREBAUGH CANAL WATER DISTRICT
MENDOTA CALIFORNIA

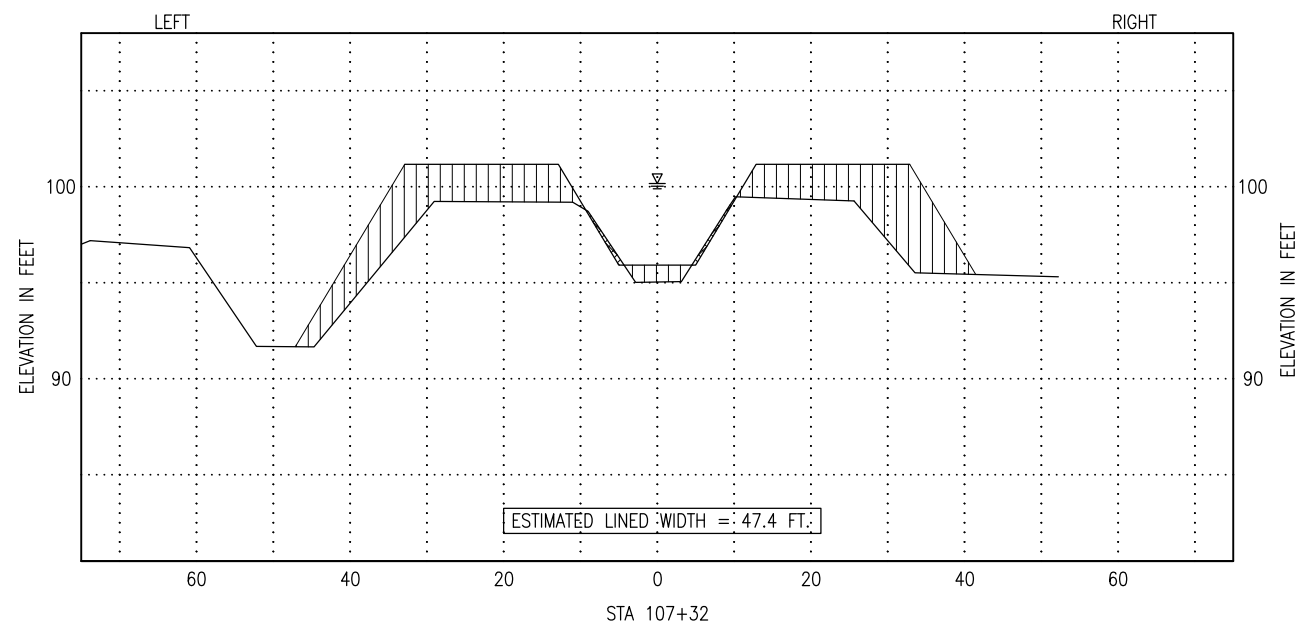
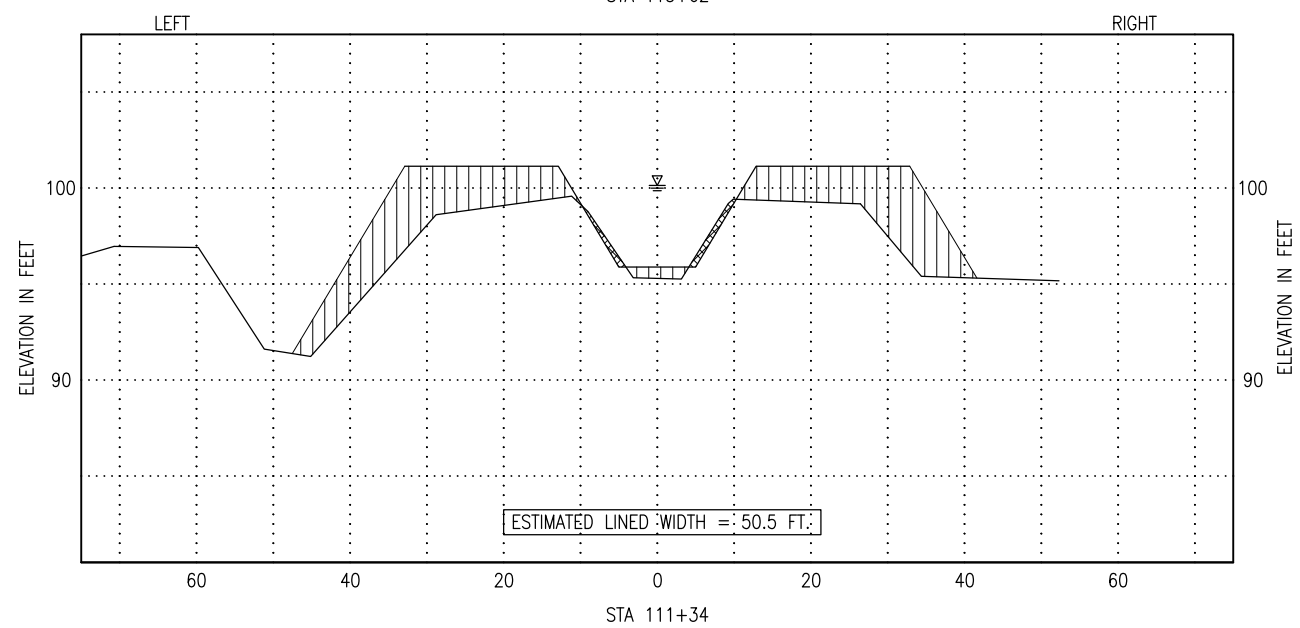
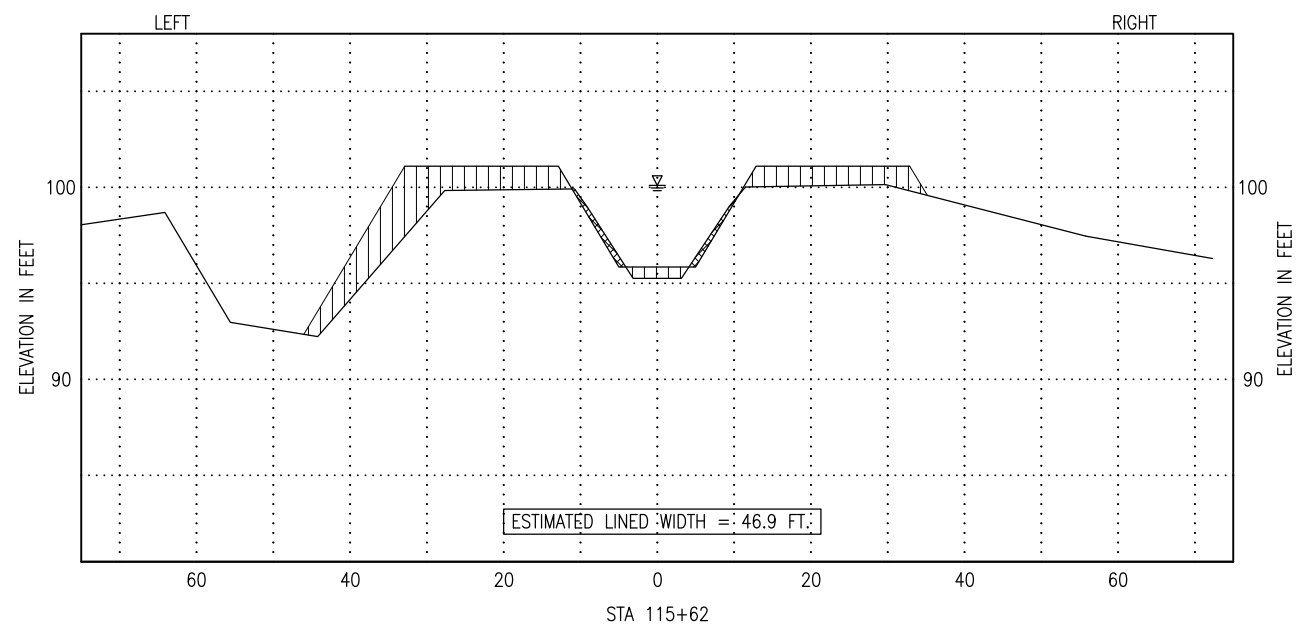
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PHASE III

CROSS SECTIONS
STA 86+92 TO STA 103+37


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DATE	APRIL 2012	APPROVED	
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CHECKED	JCL	SHEET	4 OF 5

DRAWING NAME: FCD12006.DWG



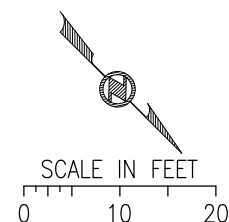
EXPLANATION OF SYMBOLS

 FILL AREA

 CUT AREA

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JULY 13, 2012

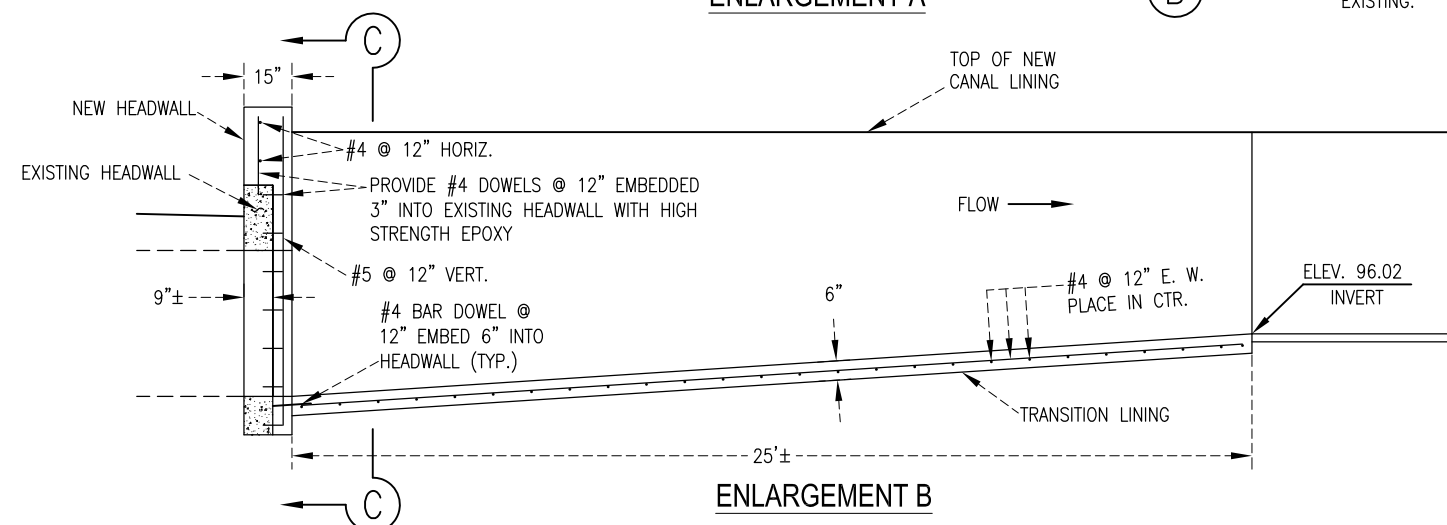
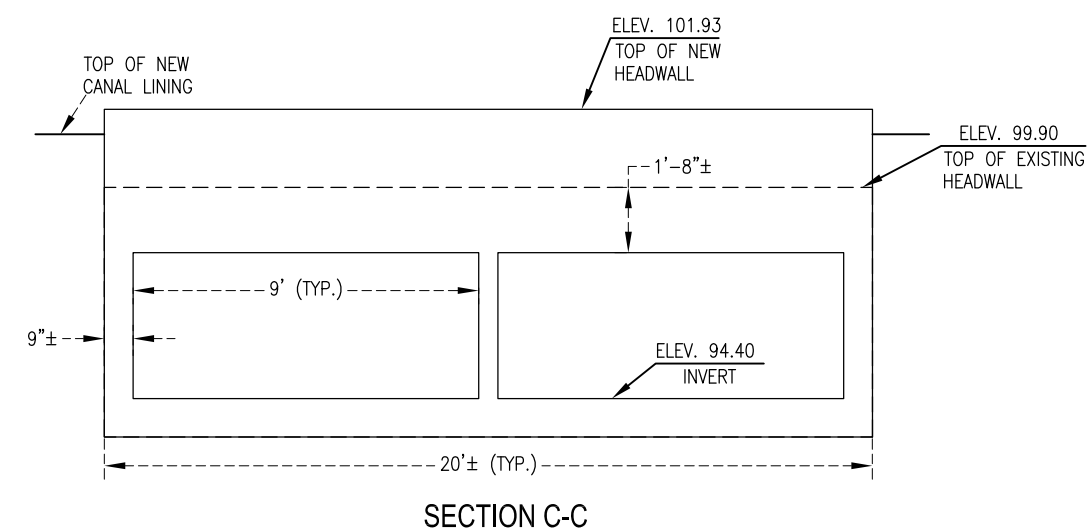
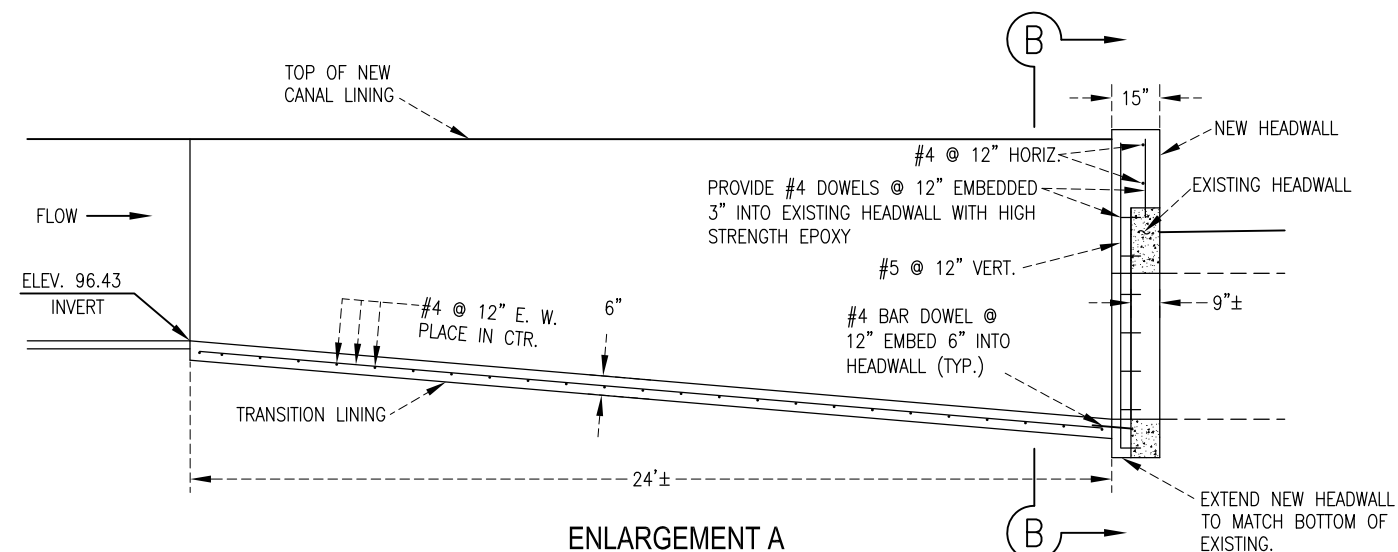
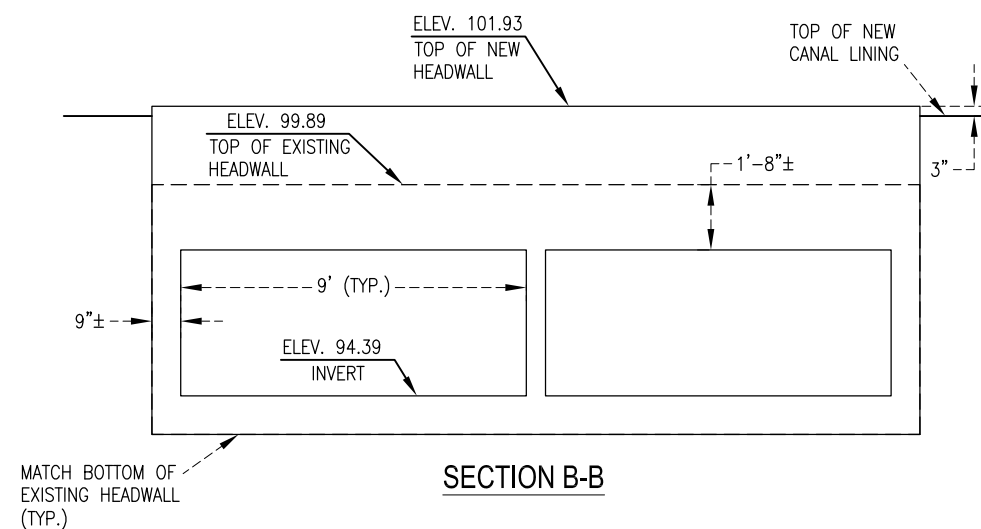
				SUMMERS ENGINEERING INC. HANFORD Consulting Engineers CALIFORNIA			
				DATE APRIL 2012 DRAWN KY CHECKED JCL		APPROVED _____ DRAWING NO. _____ CS-5 SHEET 5 OF 5	
NO. DATE MADE CHKD. APPD. REVISIONS				DRAWING NAME: FCD12005.DWG			



■ 1. SEE DWG. NO. CK-1 FOR APPLICABLE GENERAL NOTES.

- 2. FIELD FIX TRANSITION LINING AS REQUIRED. THE CONNECTION BETWEEN THE NEW HEADWALL AND TRANSITION LINING SHALL BE WATER TIGHT ON ALL SIDES.
- 3. TRANSITION LINING SUBGRADE (SIDES AND BOTTOM) SHALL BE COMPACTED TO 90% MAXIMUM DRY DENSITY PER ASTM D-1557.

REINFORCED CONCRETE	6.1 CUBIC YARDS
TRANSITION LINING	136 SQUARE YARDS



**Call USA At Least 48 Hours Prior To Any
Excavation 1-800-642-2444**

DO NOT SCALE FROM
DRAWINGS ON THIS SHEET

PRELIMINARY
For Review Only
Subject to Revision
JULY 13, 2012

2nd LIFT CANAL LINING PROJECT
PHASE III

NEES AVENUE HEADWALLS

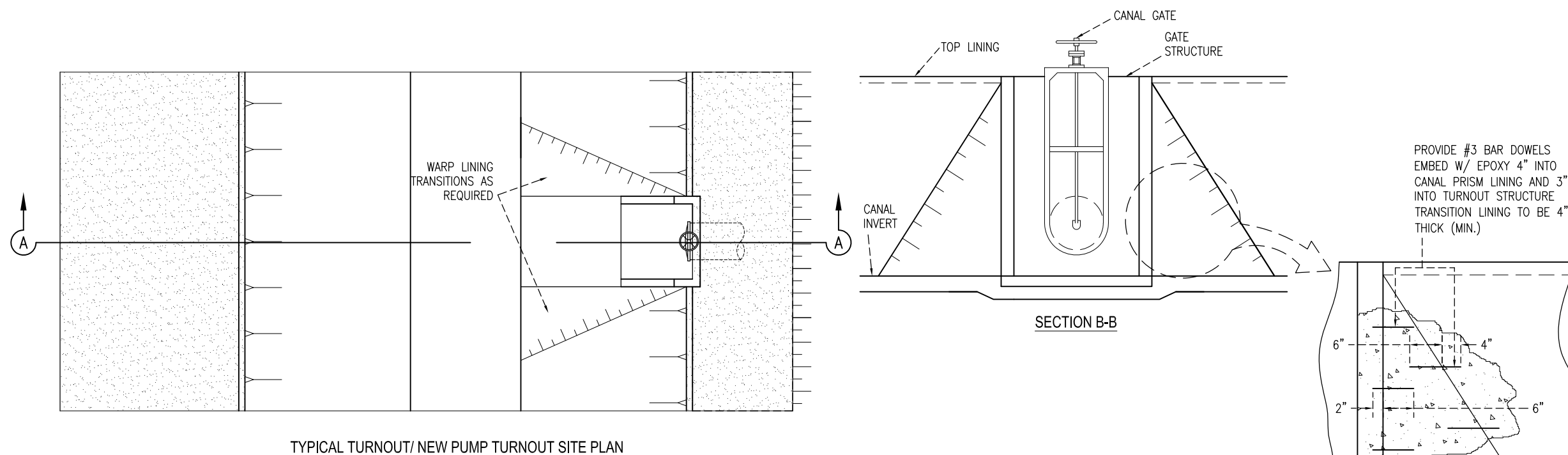
SUMMERS ENGINEERING INC.
Consulting Engineers

DATE	MAY 2012	APPROVED	
DRAWN	KY	DRAWING NO.	SP-1
CHECKED	JCL	SHEET	1 OF 1
DRAWING NAME : FCD12009.dwg			

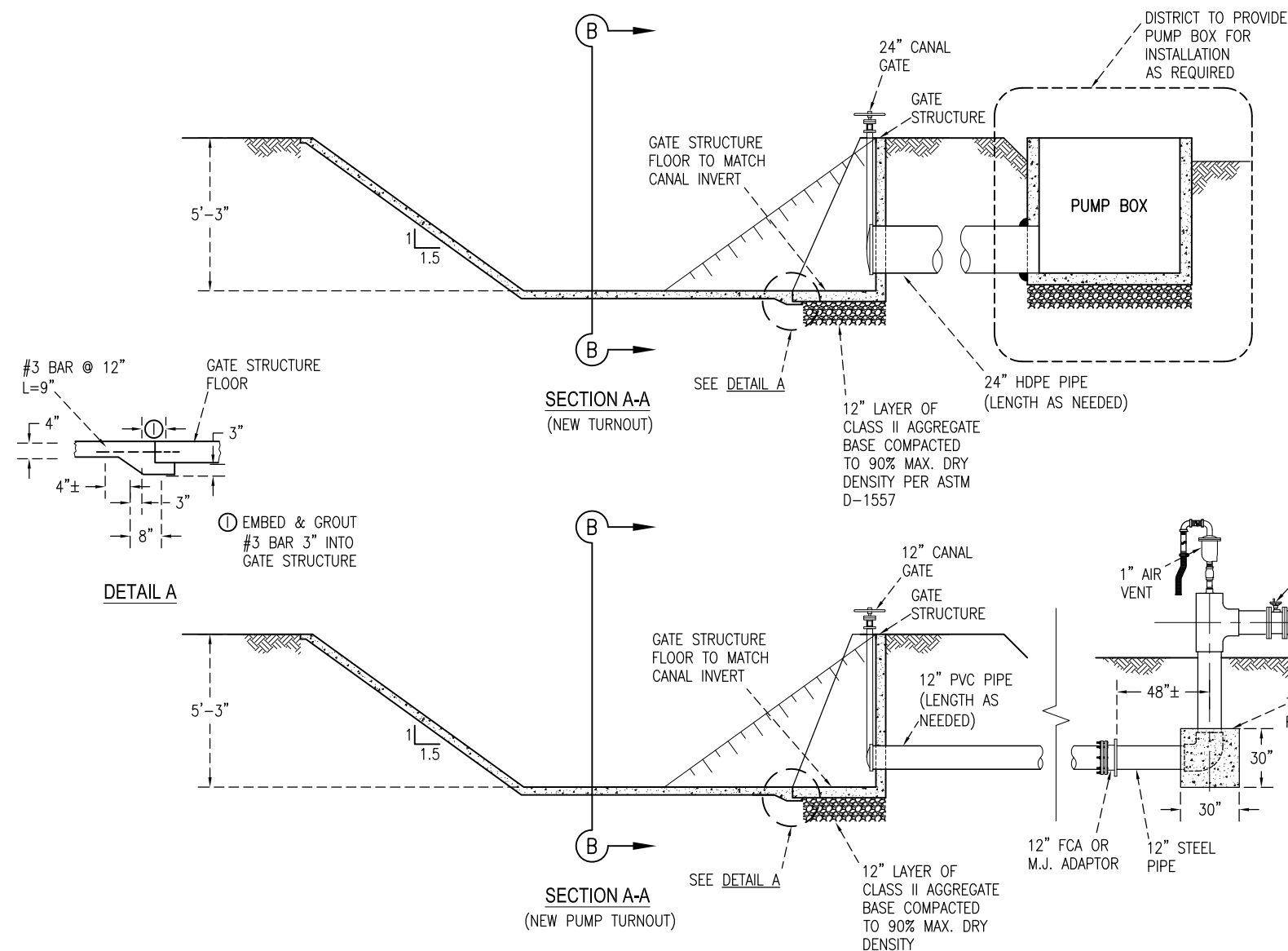
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GENERAL NOTES

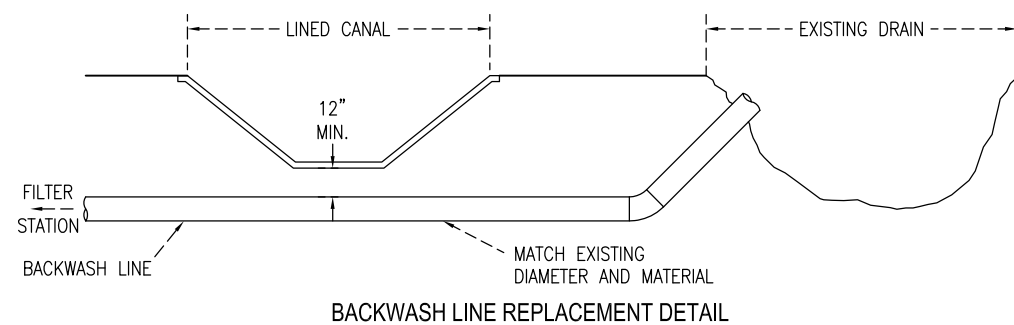
- 1. TURNOUT STRUCTURES AND GATES SHALL BE PROVIDED AND LOCATED BY THE DISTRICT AND INSTALLED BY THE CONTRACTOR.
- 2. PROVIDE SMOOTH TRANSITION LINING FROM CANAL PRISM TO CONCRETE TURNOUT STRUCTURE. TRANSITION LINING TO BE 4" THICK REINFORCED WITH #3 BARS AT 12" EACH WAY.
- 3. 24" OUTLET PIPE TO BE HDPE TYPE N-12 BY ADS OR APPROVED EQUAL WITH WATER TIGHT JOINTS.
- 4. RETURN INLETS ARE TO BE REMOVED AND REPLACED AS NECESSARY. THE RETURN PIPE IS TO MATCH THE EXISTING PIPE DIAMETER. PAYMENT FOR RETURN INLETS IS TO BE INCLUDED IN THE UNIT COST FOR LINED CANAL IN THE BID SCHEDULE.
- 5. ALL STEEL PIPE AND FITTINGS SHALL BE IN ACCORDANCE WITH AWWA C-200 ($\frac{1}{4}$ " WALL, MINIMUM). ALL STEEL FLANGES SHALL BE IN ACCORDANCE WITH AWWA C-207, CLASS D. ALL PIPE, FLANGES, AND MECHANICAL COUPLINGS SHALL BE FUSION BONDED EPOXY LINED AND COATED (12 MILS. MINIMUM) IN ACCORDANCE WITH AWWA C-213. ALL EXPOSED PIPE SHALL BE COATED WITH 2 OR MORE COATS OF HIGH SOLIDS EPOXY IN ACCORDANCE WITH AWWA C-210. EXTERIOR TOP COAT SHALL BE COMPATIBLE ALIPHATIC POLYURETHANE.
- 6. ALL PVC PIPE SHALL BE 100 PSI PLASTIC IRRIGATION PIPE MANUFACTURED IN ACCORDANCE WITH ASTM D1784 AND SCA430DD AND HAVE A MAXIMUM DIMENSION RATIO OF 41.
- 7. AIR RELEASE VALVE SHALL BE MODEL EAV GTR-2T BY EUROPUR, USA.



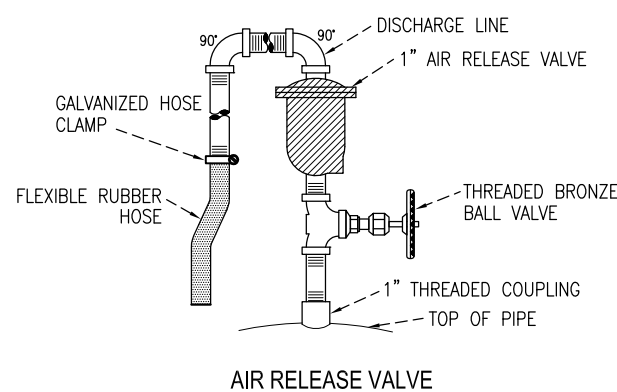
TYPICAL TURNOUT/ NEW PUMP TURNOUT SITE PLAN



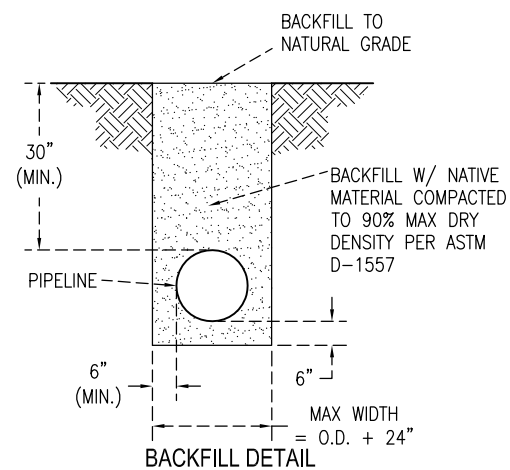
SECTION A-A
(NEW PUMP TURNOUT)



BACKWASH LINE REPLACEMENT DETAIL



AIR RELEASE VALVE



BACKFILL DETAIL

**Call USA At Least 48 Hours Prior To Any
Excavation 1-800-642-2444**

**Caution : Overhead Power Lines
in this Area**

DO NOT SCALE FROM
DRAWINGS ON THIS SHEET

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JULY 13, 2012

FIREBAUGH CANAL WATER DISTRICT
MENDOTA CALIFORNIA

2nd LIFT CANAL LINING PROJECT
PHASE III

TURNOUT DETAILS

SUMMERS ENGINEERING INC.
Consulting Engineers

DATE	MAY 2012	APPROVED	
DRAWN	JCL/NAP	DRAWING NO.	TO-1
CHECKED	JCL	SHEET	1 OF 1
DRAWING NAME : FCD12008.dwg			

DRAWING NAME : FCD12008.dwg