County of Fresno

TCP Mitigation Project at CSA 14 Belmont Manor Preliminary Engineering Report

County of Fresno
April 2022

Prepared for:
County of Fresno

Prepared by:
Provost & Pritchard Consulting Group
455 W. Fir Avenue Clovis, CA 93611

Report Prepared for:

County of Fresno

2220 Tulare Street, 6th Floor
Fresno, CA 93721

Contact:
Sebastian Artal, PE
Supervising Engineer
(559) 600-4512

Report Prepared by:

Provost & Pritchard Consulting Group

Nicholas Jacobson, PE

Contact:
Nicholas Jacobson, PE
(559) 449-2700

DATE SIGNED 4/26/22

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Abbreviations

ACP ..... Asbestos Concrete Pipe
Canal ..... Fresno Irrigation District Fancher Creek No.6 Canal
CEQA ..... California Environmental Quality Act
CFC ..... California Fire Code
City ..... City of Fresno
CO ..... Compliance Order
County ..... County of Fresno
County Fire ..... Fresno County Fire Protection District
CSA 14 ..... Fresno County Service Area Number 14
DDW ..... Division of Drinking Water
EOPCC ..... Engineer's Opinion of Probable Construction Cost
EIF ..... Environmental Information Form
ESA ..... Extraterritorial Service Agreement
FID ..... Fresno Irrigation District
FMFCD ..... Fresno Metropolitan Flood Control District
GAC ..... Granular Activated Carbon
GPM ..... Gallons Per Minute
IS/MND ..... Initial Study/Mitigated Negative Declaration
KRP ..... Kings River Pipeline
LAFCo ..... Local Agency Formation Commission
MCL ..... Maximum Contaminant Level
MDD ..... Maximum Day Demand
MMADD ..... Maximum Month Average Day Demand
NEPA ..... National Environmental Policy Act
O&M ..... Operations and Maintenance
OSHA ..... Occupational Safety and Health Administration
P&P ..... Provost & Pritchard Consulting Group
PG&E ..... Pacific Gas & Electric Company
PHD ..... Peak Hour Demand
ROW ..... Righ-of-Way
SOC ..... Synthetic Organic Contaminant
TCP 1,2,3-Trichloropropane

1 Introduction

Fresno County Service Area Number 14 (CSA 14), also known as Belmont Manor is a small public water system in Fresno County. The County of Fresno (County) operates the water system for the residents of CSA 14. CSA 14 utilizes two groundwater wells to supply water to the residents. Each of the wells is contaminated with the synthetic organic contaminant (SOC) 1,2,3 Trichloropropane (TCP) above the State of California Maximum Contaminant Level (MCL). The County is exploring options to remedy the TCP issue experienced by CSA 14.

Previously, the County hired Provost & Pritchard (P&P) to prepare a report entitled, *1,2,3-Trichloropropane Mitigation Feasibility Study* (June 2019, See Appendix A) evaluating the feasibility of using granular activated carbon (GAC) filters as a means to remove the TCP from the groundwater. The study recommended GAC as a solution to the TCP issue and provided estimates for capital, and operations and maintenance (O&M) costs. The County has concerns with the long-term sustainability of GAC treatment due to ongoing O&M costs and have asked P&P to evaluate options for connecting CSA 14 to the City of Fresno (City) system as means to providing a more sustainable solution to the TCP issue experienced by CSA 14. At the time of the June 2019 study, connecting to the City was not evaluated, because it was unknown if the City would agree to provide a connection to CSA 14. The City has since indicated that it would be open to providing CSA 14 a master service connection to the City system if the County can satisfy City requirements and an agreement with mutually agreeable terms can be executed.

2 Background Project Information

The following section provides a brief summary of the existing CSA 14 water system.

2.1 Community Description

CSA 14 is located in the County at the southeast corner of Belmont and Leonard Avenues. Figure 2-1 shows the location of CSA 14 and the surrounding vicinity. The County oversees operation of two public drinking water supply wells (Wells 1 and 2) within CSA 14. CSA 14 serves a year-round population of approximately 115 through 41 service connections and is classified as a community water system. Both wells are contaminated with the TCP at concentrations above the MCL. In addition to exceeding the MCL for TCP, Well 1 also exceeds the MCL for nitrate.

2.1.1 Existing Facilities

The CSA-14 water system consists of a single pressure zone supplied by two (2) groundwater wells equipped with constant speed pumps. The system does not include any storage other than small hydropneumatic tanks located at the well sites. The system is not routinely chlorinated. Figure 2-2 shows the existing CSA 14 water distribution system. A copy of the most recent (as of the preparation of this report) Division of Drinking Water (DDW) Routine Sanitary Survey, which also provides information regarding the existing CSA 14 system, is included as Appendix B.

2.1.2 Water Supply Sources

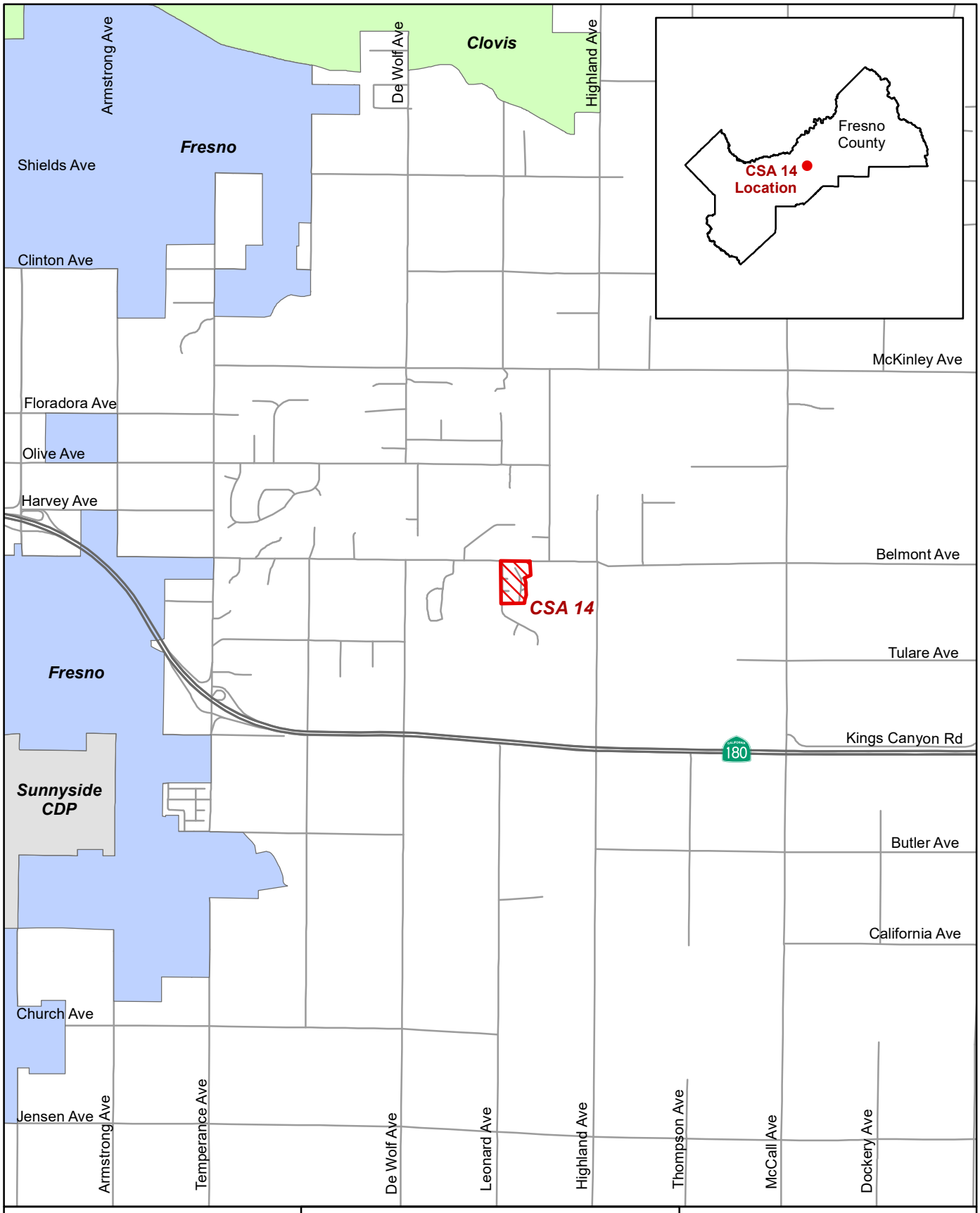
2.1.2.1 Well Number 1 (Well 1) – Inactive Source

Well No. 1 is located on the south side of Belmont Avenue approximately 500 feet east of Leonard Avenue in unincorporated Fresno County. The well is situated on a lot surrounded on three sides by private residences. The well is reported to have been constructed with a total depth of approximately 218 feet and is equipped with a 30-hp constant-speed submersible deep well pump. The County reports that the the pumping rate for Well 1 is approximately 480 gallons per minute (gpm). Water is pumped into an on-site 6,000-gallon hydropneumatic tank which then supplies the distribution system. The well is not equipped with a chlorination system.

Well 1 has historically been designated as a standby source due to the need to bail lubricating oil out of the well. The oil was deposited by an oil-lubricated pump that has since been removed. The County historically operated the well periodically to make sure it is functional in case it is needed for firefighting or when Well 2 has to be taken out of service. Well 1 recently exceeded the MCL for nitrate and can no longer be used to deliver water to the system.

2.1.2.2 Well Number 2 (Well 2) – Active Source

Well No. 2 is located at the eastern end of E. Madison Avenue approximately 800 feet south of Well 1. The well is surrounded to the north, south, and east by an open field. The well is reported to have been constructed with a total depth of approximately 300 feet and is equipped with a 25-hp constant-speed submersible deep well pump. The County reports that the the pumping rate for Well 2 is approximately 180 gpm. Water is pumped into an on-site 110-gallon bladder tank which then supplies the distribution system including the active hydropneumatic tank at the Well 1 site. The well is not equipped with a chlorination system.



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CSA 14 Boundary

Figure 2-1 Vicinity Map

CSA 14 TCP Mitigation Project at Belmont Manor

County of Fresno

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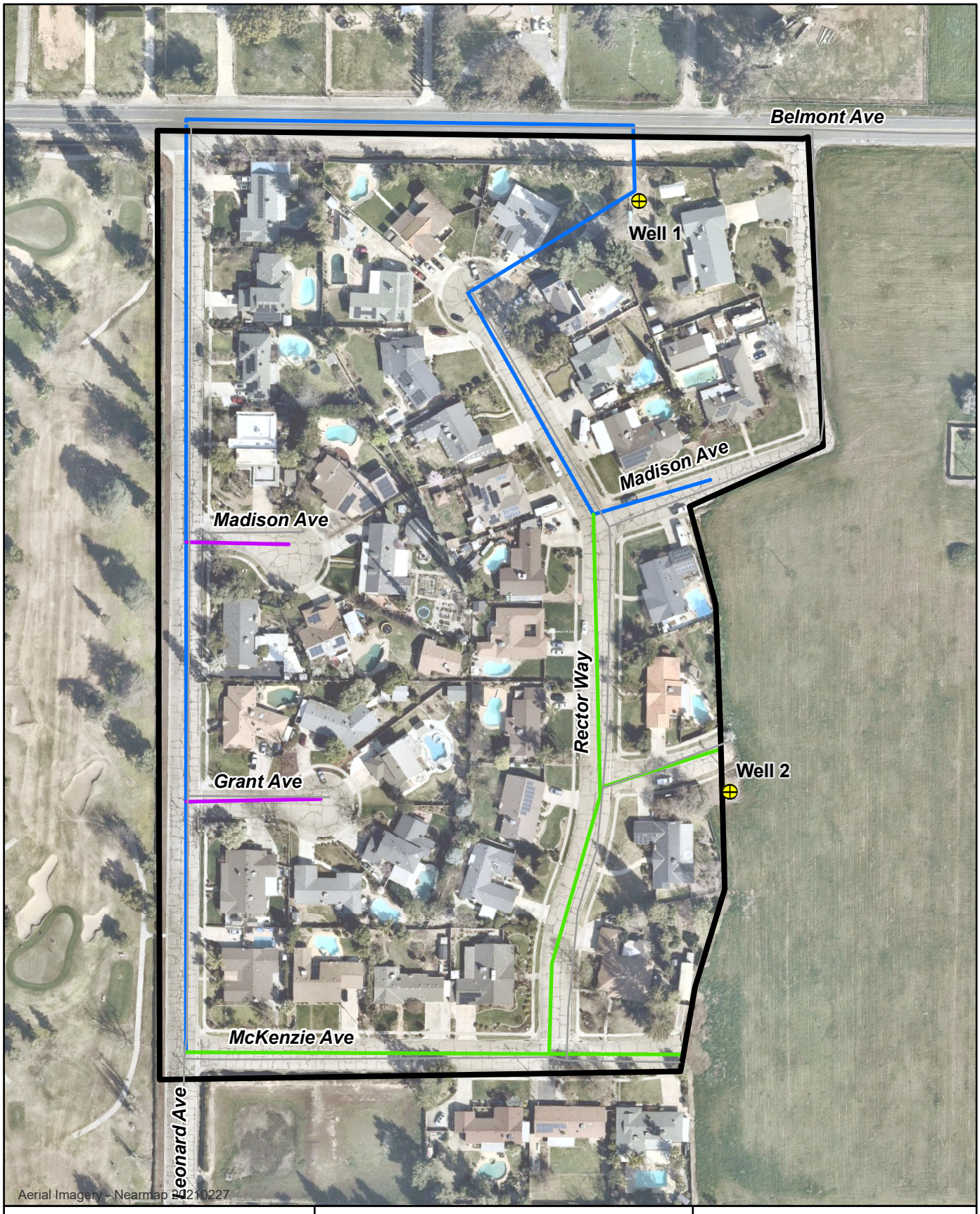

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N

0 50 100
Feet

Well
4-inch Pipeline
6-inch Pipeline
8-inch Pipeline
CSA 14

Figure 2-2 Existing Water System Map

CSA 14 TCP Mitigation Project at Belmont Manor

County of Fresno

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2.1.3 Water Storage

CSA 14 does not currently have any water storage facilities.

2.1.4 Water Treatment

CSA 14 does not currently treat its water supply.

2.1.5 Water Distribution System

According to record drawings the existing CSA 14 water distribution system is comprised of approximately 4,400 linear feet of asbestos concrete pipe (ACP) ranging from 4-inch to 8-inch. The record drawings indicate that the system was constructed in the 1960's.

2.1.6 Hydropneumatic Tanks

CSA 14 has two hydropneumatic tanks connected to the system with capacities of 6,000 and 110 gallons. The 110-gallon hydropneumatic tank is connected downstream of Well 2. Both wells are hydraulically connected to the 6,000-gallon hydropneumatic tank. The 6,000-gallon tank was constructed at the same time as the distribution system.

2.1.7 Emergency Power Supply

CSA 14 does not have backup generators at either of the existing well sites.

2.1.8 Water Meters

All forty-one active service connections in CSA 14 are currently unmetered.

2.2 Existing Water System Demands and Capacity

2.2.1 Water System Demands

The County provided annual water production records for CSA 14 for the years 2012 though 2020, with the exception of December 2020 monthly data (not available at time of report). System water demand will be estimated according to Title 22 recommendations using the annual water production data. Table 2-1 summarizes the annual water production data.

2.2.1.1 Maximum Month Average Day Demand

The total volume of water pumped during a maximum month period (July 2013) was approximately 3,200,000 gallons. The volume of water pumped over the month of July 2013 equates to a maximum month average day demand (MMADD) of approximately 72 gallons per minute (gpm)

2.2.1.2 Maximum Day Demand and Peak Hour Demand

Peaking factors were applied to the MMADD to estimate the maximum day demand (MDD) and peak hour demand (PHD) for CSA 14. Peaking factors used for this analysis were consistent with Title 22. MDD was calculated by applying a peaking factor of 1.5 to MMADD. PHD was calculated by applying a peaking factor of 1.5 to MDD. Using these peaking factors, the MDD is estimated at 108 gpm and the PHD is estimated at

Table 2-1. Summary of Annual Water Production

Annual Water Production									
Month	Year								
	2012	2013	2014	2015	2016	2017	2018	2019	2020
January	700,000	400,000	740,000	593,000	85,000	94,000	275,000	198,000	463,000
February	800,000	600,000	625,000	412,000	165,000	106,000	340,000	137,000	715,801
March	800,000	1,000,000	849,400	746,000	95,000	263,000	199,000	211,000	687,100
April	1,100,000	1,800,000	1,284,300	1,149,000	420,000	279,000	354,000	416,000	825,500
May	1,500,000	2,200,000	1,650,300	1,251,800	456,000	664,000	772,000	675,000	1,667,666
June	2,200,000	2,700,000	2,265,000	1,810,000	715,000	994,000	862,000	592,000	2,189,000
July	2,900,000	3,200,000	1,354,500	1,738,000	843,000	836,000	770,000	1,345,000	2,398,000
August	2,700,000	2,900,000	2,499,000	1,288,000	837,000	1,054,000	834,000	1,872,000	2,347,000
September	2,800,000	2,400,000	1,712,000	782,000	633,000	699,000	690,000	2,221,000	1,843,000
October	1,700,000	2,000,000	1,615,000	357,582	508,000	633,000	716,000	2,022,000	1,633,000
November	1,200,000	1,200,000	1,080,000	240,000	448,000	419,000	559,000	1,099,000	1,114,600
December	500,000	600,000	580,000	238,000	179,000	262,000	262,000	430,000	698,400
Total	**18,900,000**	**21,000,000**	**16,254,500**	**10,605,382**	**5,384,000**	**6,303,000**	**6,633,000**	**11,218,000**	**16,582,067**

161 gpm. The County has indicated that they estimate the peak demand for CSA 14 to be approximately 180 gpm.

Table 2-2. Summary of Water System Demands

Water System Demands	
Demand Type	**Result (gpm)**
MMADD	72
MDD	108
PHD	161
Fire Flow	1,000

2.2.1.3 Fire Flow Requirements

The Fresno County Fire Protection District (County Fire) regulates fire flow requirements for developments. County Fire follows the California Fire Code (CFC). Table 105.1(1) in Appendix B of the CFC dictates that the minimum fire flow requirement for one- and two-family dwellings, groups R-3 and R-4 buildings, and townhouses that are no larger than 3,600 square feet in size and that do not have an automatic sprinkler system shall have a minimum fire flow requirement of 1,000 gpm for a duration no shorter than one hour. It is assumed that the fire flow requirement for CSA 14 is 1,000 gpm for a duration of one hour.

2.2.2 System Capacity

As previously stated in Section 2.1.2 of this report, CSA 14 has two sources. Wells 1 and 2 have reported pumping capacities of 480 gpm and 180 gpm, respectively. The total system pumping capacity is estimated to be 660 gpm , however Well 1 currently exceeds the MCL for nitrate and therefore can't be used to deliver water to the system. Given the inability to utilize Well 1 the total system capacity is reduced to the capacity of Well 2 which is 180 gpm.

Water system capacity is typically measured in terms of firm capacity. Firm capacity is defined as the pumping capacity with the largest well offline. Firm capacity is typically used to provide a conservative measure of system source capacity. For this study, firm capacity will be used to evaluate system capacity. Given the lack of more than one water source, by definition CSA 14 does not have firm capacity.

2.2.3 System Supply and Demand Comparison

2.2.3.1 Title 22 Comparison

Section 64554 in Chapter 16 of Title 22 states that for systems with less than 1,000 connections the system shall have storage capacity equal to or greater than the MDD, unless the system can demonstrate it has an additional source of supply or has an emergency connection that can meet the MDD requirement. CSA 14 is not able to satisfy the Title 22 requirements regarding source supply and storage. It's inability to meet Title 22 requirements for source supply are due to a lack of storage and the absence of a second water supply source. Well 2 pumping capacity exceeds the estimated MDD, but without a viable second source or adequate storage capacity, CSA 14 is unable to demonstrate Title 22 source and storage capacity. Table 2-3 compares existing firm system supply with estimated system demands.

Table 2-3 Title 22 Supply and Demand Comparison

Water Supply and Demand Comparison	
Water Supply Source	**Volume (gallons)**
Well 2 (180 gpm for 24 hours)[1]	259,200
Existing Storage Tank Volume	0
Supply Total	259,200
System Demand (108 gpm for 24 hours)	155,520
Net Surplus/(Deficit)[1,2,3]	**(-)**

Notes:
1. Well 1 has an estimated pumping capacity of 480 gpm, which is not accounted for in this calculation because of the ongoing nitrate issues associated with Well 1. The ongoing nitrate issues preclude CSA 14 from utilizing Well 1 as a drinking water source.
2. Fire flow is not accounted for in this calculation.
3. CSA 14 does not meet Title 22 requirements for source and storage, therefore a supply surplus can't be reported despite Well 2 capacity exceeding the estimated system MDD.

2.2.3.2 California Fire Code Comparison

In addition to the inability of CSA 14 to meet Title 22 requirements for supply capacity, the system also fails to meet minimum CFC requirements for fire flow. The combined capacity of Wells 1 and 2 (660 gpm) do not meet the minimum fire flow requirements of 1,000 gpm set forth in the CFC. To further exacerbate the issue, currently Well 1 can't be used to provide water to the system, therefore system is limited to the capacity of Well 2 (180 gpm) to fight fires. Table 2-4 compares the existing system total supply with the minimum CFC requirements.

Table 2-4 CFC Supply and Demand Comparison

Water Supply and Demand Comparison	
Water Supply Source	**Volume (gallons)**
Well 2 (180 gpm for 1 hour)	10,800
Existing Storage Tank Volume	0
Supply Total	10,800
Minimum Fire Flow Requirement (1,000 gpm for 1 hour)	60,000
Net Surplus/(Deficit)[1]	**(49,200)**

Notes:
1. Well 1 has an estimated pumping capacity of 480 gpm, which is not accounted for in this calculation because of the ongoing nitrate issues associated with Well 1. The ongoing nitrate issues preclude CSA 14 from utilizing Well 1 as a drinking water source.

2.3 Water Quality

As previously stated in Section 1 of this report, CSA 14 has two wells contaminated with TCP at levels above the State MCL. DDW has issued a compliance order, No. 03-23-18R-012 (CO) to CSA 14 regarding the TCP issue. A copy of the CO is included as Appendix C. For additional information regarding overall

groundwater quality in CSA 14 wells, please refer to the report entitled, *1,2,3-Trichloropropane Mitigation Feasibility Study* (Provost & Pritchard, June 2019), which is included as Appendix A. In addition, Well 1 exceed the MCL for nitrates and is no longer being utilized as a water source for the CSA 14 system.

2.4 Existing Operations and Maintenance Practices

County operators operate and maintain the CSA 14 system. County operators routinely visit and oversee the system and perform maintenance as needed. Audited financial statements for the CSA 14 water system were provided by the County for the years of 2015 through 2019. O&M costs for the system vary year over year and average about $33,000 per year which equates to about $67 per month per connection. Table 2-5 shows the O&M expenses for the fiscal years (July 1 – June 30) 2015/2016 – 2019/2020. In Section 4 of this report, life cycle cost opinions are provided for various project alternatives. The life cycle cost estimates in Section 4 include the present worth of 20 years of O&M cost at an assumed interest rate of 3%. Using the average annual O&M expense of $33,000 per year and the assumptions previously stated, the estimated present worth of 20 years of the existing system O&M costs for CSA 14 are approximately $490,000.

Table 2-5 Annual Operations and Maintenance Expense Summary

Annual Operations and Maintenance Expense Summary					
Expense Type	Year				
	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
General Liability Insurance	$318	$289	$ 314	$ 308	$ 305
Maintenance - Equipment	$ 29,369	$ 507	$ 861	$ 454	$ 77
Maintenance - Buildings/Grounds	$1,109	-	-	$ (25)	-
Memberships	$163	$161	$ 156	$ 150	$ 150
Office Expense	$2	$12	$(139)	$ 4	-
Postage	$148	$ 66	$ 104	$ 137	$39
PeopleSoft	$1,321	$ 1,756	$ 1,766	$1,526	$ 705
Professional and Specialized Services	$6,477	$27,457	$15,083	$28,361	$32,987
Special Departmental Expense	$300	-	-	-	-
Utilities	$4,789	$5,424	$6,148	$6,884	$5,160
Total	**$43,995**	**$35,672**	**$ 24,293**	**$37,799**	**$34,423**

3 Problem Description

3.1.1 Water Quality

As stated previously, CSA 14 is under a CO from DDW to remedy the ongoing issue with TCP. Additional information regarding the CO and efforts made to remedy the TCP via treatment can be found in Appendix C and A, respectively. In addition to the ongoing TCP issue, Well 1 has exceeded the MCL for nitrates.

3.1.2 System Capacity and Redundancy

As mentioned previously, CSA 14 has a single water supply well (Well 2). Well 2 has a pumping capacity of 180 gpm, which exceeds the estimated system MDD. As previously stated, Well 1 has exceeded the MCL for CSA 14 and can no longer be utilized as a potable supply source. With the lack of a second supply source and adequate water storage, CSA 14 does not meet Title 22 requirements for source and storage. In addition, CSA 14 does not have the ability to meet minimum CFC requirements for fire flow. The Well 2 capacity falls short of the minimum fire flow requirement of 1,000 gpm. Based on the estimates shown in the previous sections, CSA has, at a minimum, a supply shortfall of approximately 820 gpm during fire flow situations. It is recommended that any alternative for TCP mitigation include measures to provide adequate source capacity to meet both Title 22 and CFC requirements.

3.1.3 System Resiliency

In addition to the system capacity issue highlighted above, the system does not have any back up power to protect against power outages (system resiliency). Power outages are common, especially in the summer months, when power demands are high due to the relatively high temperatures and can last for several hours at a time. CSA 14 is served from the existing Pacific Gas & Electric Company (PG&E) power distribution system. Without backup generators, the CSA 14 water distribution system is vulnerable to power outages. Given all of the recent fires in recent years that have devastated areas in not only PG&E' service areas, but also statewide, it is recommended that any alternative for TCP mitigation include provisions to provide system resiliency.

3.1.4 Water Metering

All of CSA 14's forty-one active service connections are unmetered. California law requires that all water supplied by an urban water supplier to meter all municipal and industrial water service connections by 2025. An urban water supplier is defined as a supplier who provides at least 3,000 acre-feet of water annually or has at least 3,000 service connections within its service area. CSA14 is not considered an urban water suppler. The City of Fresno is considered an urban water supplier. It is recommended that any alternative for water system improvements also include a provision to install water meters on all water services in the service area.

3.1.5 Problem Description Summary

As this discussion shows, the system's problem is multifaceted. Issues with the existing system include deficiencies related to TCP and nitrate contamination (water quality), Title 22 source and storage capacity (system capacity) , a lack of supply to meet fire flow operating conditions (system capacity and redundancy), lack of backup power at the well sites in the event of an emergency (system resiliency) and unmetered service connections (water metering). The following sections discuss possible alternatives to resolve these problems and provide reliable drinking water to the residents of CSA 14.

4 Alternatives Analysis

Four primary alternatives have been identified for the study: (1) connection to the City with a master service via a 16-inch transmission main, (2) connection to the City with a master meter via an 8-inch transmission main and site improvements, (3) consolidation with the City via 16-inch transmission main, and (4) TCP treatment and a new water well.

A master service would include a master meter at the point of connection to the City system and the County would be charged for water that passes through the meter. The County would retain ownership and operation of the CSA 14 water system and new transmission main.

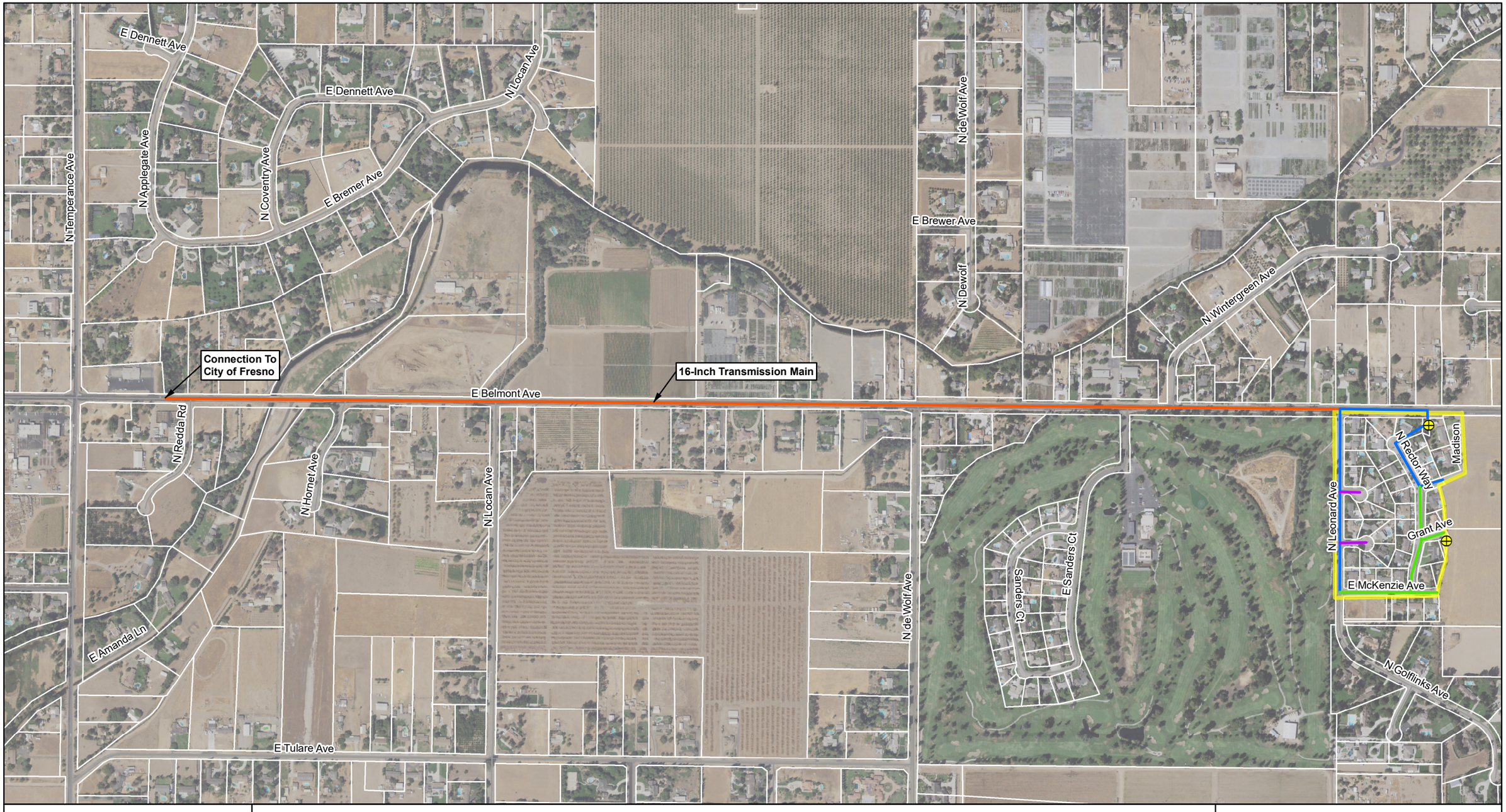
Consolidation would not include a master meter. Instead, the City would take over ownership and operation of the distribution system and transmission main. Residents in the CSA 14 area would become customers of the City. Replacement of the CSA 14 distribution system would likely be a requirement of consolidation due to the age and condition of existing facilities and absence of metered water connections. In addition, under the consolidation option, the City would likely require a second point of connection (in addition to the connection near Belmont and Temperance Avenues) to CSA 14 from the City system. Identification of a second point of connection to the City is outside of the scope of this study.

These alternatives are discussed in further detail and evaluated in the following sections. Each alternative will be evaluated for agency requirements, environmental impacts, planning and land requirements, construction and site considerations, and capital and operating costs.

4.1 Alternative 1: Master Service with 16-Inch Transmission Main

4.1.1 Description

Alternative 1 will include approximately 7,400 linear feet of 16-inch transmission main, a master service meter, fire hydrants, a sampling station, and customer meters for each service in CSA 14. In addition to the major infrastructure, there will be several crossings of Fresno Irrigation District (FID) facilities including the Fancher Number 6 and Briggs Number 7 canals. Alternative 1 allows CSA 14 to continue to be a County owned water system. CSA 14 is not defined as an urban water supplier, therefore, the County could continue to charge CSA 14 residents a flat rate for water, in which case individual customer meters could be omitted from the project. For the purposes of this report individual customer meters are included in this alternative. Costs shown for Alternative 1 include costs for customer meters. Figure 4-1 shows a conceptual layout of Alternative 1. Alternative 1 would provide a single point of connection to the City of Fresno water distribution system leaving CSA 14 vulnerable to outages if the transmission main were to be taken out of service for maintenance. To mitigate against this supply vulnerability, CSA 14 would place Well 2 on standby status for limited use in outage situations. In this situation, Well 2 would only have capacity to meet peak hourly water demand of the system. If Well 2 were to be taken off standby status and placed back into service during a transmission main outage, DDW would require that the County notify CSA 14 residents of the change and that the Well 2 water contains TCP. Well 1 would remain on inactive status due to water quality issues and likely be destroyed. Alternative 1 does not include a generator for backup power. It is assumed that resiliency will be provided from the City system since the City has back up power provisions at many of its water sources.



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0 300 600
Feet

Legend

- Well
- CSA 14
- 4-Inch Pipeline
- 6-Inch Pipeline
- 8-Inch Pipeline
- Transmission Main

Figure 4-1 Alternative 1

CSA 14 TCP Mitigation Project at Belmont Manor

County of Fresno

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4.1.2 Design Criteria

4.1.2.1 Division of Drinking Water

DDW provides regulatory oversight of CSA 14. The project will be subject to the water works standards under Title 22 of the California Code of Regulations.

4.1.2.2 County of Fresno

The Project will be constructed in a County right-of-way (ROW). County road design standards will be followed.

4.1.3 Agency Requirements

4.1.3.1 Fresno Irrigation District

FID was contacted as part of this project to gain an understanding of what FID would require for utility crossings. The response from FID is included as Appendix D. FID will have specific requirements when crossing their existing facilities. Specific standards related to utility crossings are included as Appendix E.

4.1.3.2 Fresno Metropolitan Flood Control District

Fresno Metropolitan Flood Control District (FMFCD) was also contacted as part of this project. FMFCD has plans for future storm drain facilities in the project area. Typically, FMFCD storm drains are constructed six feet north of a roadway centerline. Efforts will be made to accommodate the typical FMFCD alignment for storm drain pipelines.

4.1.3.3 City of Fresno

A connection to the City water distribution system will require approval by the City and the connection will be subject to City requirements. Meetings with the City occurred during the preparation of this report to gain understanding of what the City may require to facilitate the connection of CSA 14 to the City system. In the course of those meetings the City provided some guidance on what may be required as part of this project including, but not limited to:

- *Master meter at connection proposed connection point*
- *16-inch transmission main*
- *County ownership of all facilities downstream of master meter*
- *Fees to acquire dedicated surface water supply*
- *Individual customer meters*
- *Source redundancy*

If this alternative is pursued by the County, the County will have to confirm all requirements and obtain approval from the City.

4.1.4 Environmental Impacts

As part of the feasibility study, a high-level environmental review was performed for Alternative 1. Based on the feasibility level definition of Alternative 1 it appears that an Initial Study/Mitigated Negative Declaration (IS/MND) will be required for compliance with the California Environmental Quality Act (CEQA). In addition to the IS/MND, it is recommended that technical studies, both biological and cultural, be completed to satisfy any requirements under CEQA and the National Environmental Policy Act (NEPA). Assuming

that grant money is pursued to finance all or part of the project it is recommended that an Environmental Information Form (EIF) also be prepared for the Water Board.

4.1.5 Land Requirements

An extraterritorial service agreement (ESA) will have to be executed between the City and County and approval from the Local Agency Formation Commission (LAFCo) will be required to allow the City to provide service outside its service area boundary. Approval from FID will be required for finalizing the ESA.

Additional land acquisition to accommodate the project is not anticipated. Efforts will be made to construct the transmission main within County ROW. Both temporary construction easements and permanent easements will be needed at the main FID utility crossings to accommodate the proposed transmission main.

4.1.6 Construction and Site Considerations

The City of Fresno constructed the Kings River Pipeline (KRP) which consisted of a 72-inch pipeline along the south side of Belmont Avenue which would parallel the proposed Alternative 1 pipeline alignment. Issues arose on the KRP project while crossing the FID Fancher Creek No. 6 canal (Canal). During excavation of the trench along the Canal the contractor ran into debris that was not anticipated including tires and broken pieces of concrete. It's likely that these same conditions may be present in the location Alternative 1 proposed to cross the Canal.

The existing CSA 14 water distribution system is comprised of ACP. Properly installed buried ACP poses little to no risk to human health. Exposure to certain types of airborne asbestos can increase risk for lung disease in humans. Precautions should be taken during construction, by the Contractor, when excavating and exposing existing ACP to limit exposure to airborne asbestos and to dispose of asbestos properly. Alternative 1 does not propose to replace the ACP in the CSA 14 system. Alternative 1 does propose to connect to the existing CSA 14 water distribution system. If Alternative 1 is chosen as the selected alternative and is eventually constructed, the contractor should take special precaution when connecting to the existing system. Should the contractor have to remove any ACP, during the construction, the removed pipe should be stockpiled in a secure location and testing should be performed to characterize the type of asbestos present. Based on the test results the contractor should dispose of the ACP at a facility authorized to handle that type of waste. The contractor should also provide the proper protective gear for their workers who are working in the area of the existing ACP. The contractor should follow all Occupational Safety and Health Administration (OSHA) guidelines with regard to working around and handling of asbestos.

4.1.7 Cost Estimate

Budgetary estimates of O&M costs were developed for the purpose of alternative comparison in this study. Actual O&M costs and water rates are outside the scope of this study. Alternative 1 O&M costs are estimated to be about $8,500 annually which is estimated to be significantly less than the existing annual O&M expense of about $33,000 for CSA 14. Table 4-1 summarizes at a high level, the estimated O&M costs for Alternative 1. Alternative 1 would require the residents to purchase water from the City which would offset some of the potential O&M savings anticipated with Alternative 1 compared to other alternatives. It's estimated that the total annual cost of water would be about $26,000 based on historical water usage. Overall, it's estimated that the residents of CSA 14 would see an increase in their monthly water bill of about $5 due to implementation of Alternative 1.

Table 4-1 Estimate of Annual Operations and Maintenance for Alternative 1

Estimated Annual Operations and Maintenance Expense Summary	
Expense Type	**Estimated Expense Amount ($)**
General Liability Insurance	$300
Maintenance - Equipment	$500
Maintenance - Buildings/Grounds	$250
Memberships	$150
Office Expense	$50
Postage	$100
PeopleSoft	$1,600
Professional and Specialized Services	$5,000
Special Departmental Expense	$50
Utilities	$500
Estimated Annual O&M Cost	**$8,500**
Cost to Purchased Water From City[1]	**$26,130**
Total Estimated Annual O&M	**$34,630**

Notes:
1. Estimated using historical water usage data from CSA 14 and current City water rates.

O&M costs are typically used as one measure of system sustainability. Ultimately the O&M costs fall on the rate payers in the system. Projects that trigger significant increases to O&M may create a situation where rate payers can no longer afford to operate the system despite other perceived positive impacts due to implementation of a project. When evaluating the overall costs of project both capital costs and O&M costs need to be accounted for. Capital costs are a one-time cost to acquire and construct the project and include construction costs and non-construction costs, while O&M costs are incurred throughout the life of the project. Typically, O&M costs are evaluated on a present worth basis over a 20-year period assuming an interest rate for the 20-year period. The capital cost and the present worth of 20-years of O&M are added together to obtain a life-cycle cost. A preliminary engineer's opinion of probable construction cost (EOPCC) and overall life cycle cost for Alternative 1 is included in Table 4-2.

4.1.8 Advantages/Disadvantages

The improvements described in Alternative 1 provide a solution to the water quality issues, source capacity and redundancy issues, resiliency issues and metering issues faced by CSA 14. This solution also provides a measure of system redundancy since Well 2 will continue to be used as a standby source by CSA 14 in emergency situations.

Despite providing a solution that would meet regulatory requirements, Alternative 1 may lead to situations where residents are utilizing a well contaminated with TCP for short durations during any given year due to maintenance or repairs to the proposed 16-inch transmission main. DDW will require that the County notify CSA 14 residents. Alternative 1 is estimated to reduce system O&M costs on an annual basis by about $24,000 per year on average. This savings would be offset by water purchases from the City. Anticipated water bills for Alternative 1 would increase by about $5 per month per connection.

Table 4-2 Alternative 1 Project Life Cycle Cost Summary

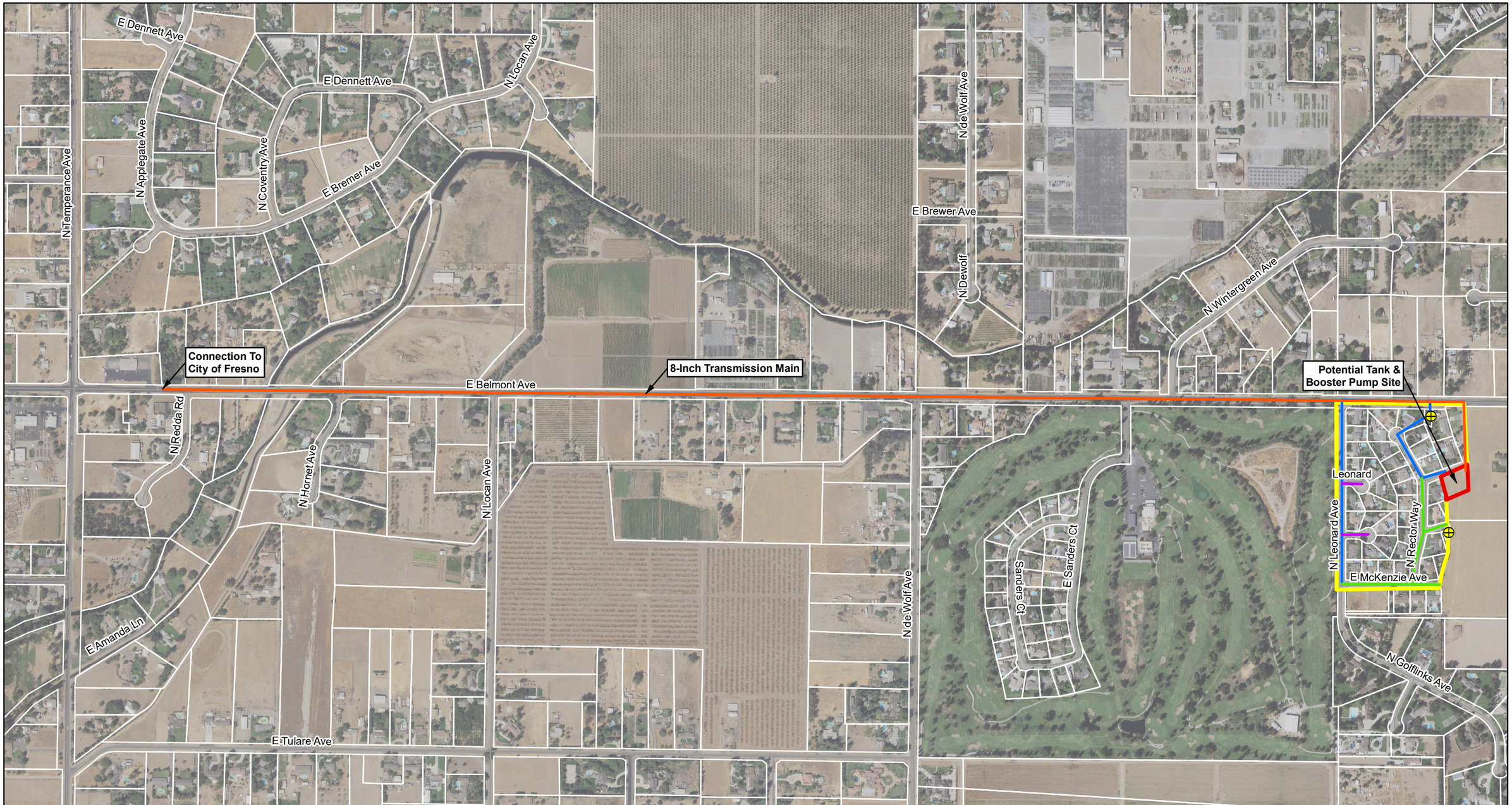
Alternative 1 Project Life Cycle Cost Summary	
Item Description	**Estimated Cost ($)**
Construction Costs	$2,893,000
Non-Construction Costs	$661,500
Contingency (20%)	$579,000
Water Acquisition Cost[1]	$672,000
Total Capital Cost	**$4,805,500**
Present Worth of O&M Costs[2]	$515,000
Life Cycle Cost	**$5,320,500**

Notes:
1. Water acquisition costs presented here are an estimate and are subject to City approval.
2. Present worth of 20 years of O&M assuming a 3% interest rate. See Table 4-1` for estimated annual total O&M cost used for this evaluation

4.2 Alternative 2: Master Service with 8-Inch Transmission Main, Water Storage Tank, and Booster Pump Station

4.2.1 Description

Alternative 2 is similar to Alternative 1. Alternative 2 varies from Alternative 1 with regard to the transmission main and because Alternative 2 includes a water storage tank and booster pump system. Alternative 2 will include approximately 8,700 linear feet of 8-inch transmission main, a master service meter, fire hydrants, a sampling station, a water storage tank to handle fire flow storage, a booster pump station to provide flows during normal and fire flow situations, and customer meters for each service in CSA 14. The storage tank would need to be sized to provide a minimum usable storage volume of 60,000 gallons to provide storage for fire protection. In addition to the major infrastructure, there will be several crossings of FID facilities including the Fancher Number 6 and Briggs Number 7 canals. Alternative 2 allows CSA 14 to continue to be a County owned water system. CSA 14 is not defined as an urban water supplier, therefore, the County could continue to charge CSA 14 residents a flat rate for water, in which case individual customer meters could be omitted from the project. For the purposes of this report individual customer meters are included in this alternative. Costs shown for Alternative 2 include costs for customer meters. Figure 4-2 shows a conceptual layout of Alternative 2. Alternative 2 would provide a single point of connection to the City of Fresno water distribution system leaving CSA 14 vulnerable to outages if the transmission main were to be taken out of service for maintenance. To mitigate against this supply vulnerability, CSA 14 would have the flexibility to utilize water stored in the proposed storage tank and also have the ability to use Well 2 as a standby source for emergencies. If Well 2 were to be taken off standby status and placed back into service during a transmission main outage, DDW would require that the County notify CSA 14 residents of the change and that the Well 2 water contains TCP. Well 1 would remain inactive and likely destroyed due to nitrate contamination. Alternative 2 does not include a generator for back up power. It is assumed that resiliency will be provided from the City system since the City has back up power provisions at many of its



EST. 1968
PROVOST& PRITCHARD
CONSULTING GROUP
An Employee Owned Company

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Feet

Legend

- Well
- CSA 14
- 4-Inch Pipeline
- 6-Inch Pipeline
- 8-Inch Pipeline
- Transmission Main

Figure 4-2 Alternative 2

CSA 14 TCP Mitigation Project at Belmont Manor

County of Fresno

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water sources. An emergency standby generator could also be installed at the storage tank site, however, this was not included in cost for this alternative.

4.2.2 Design Criteria

4.2.2.1 Division of Drinking Water

DDW provides regulatory oversight of CSA 14. The project will be subject to the water works standards under Title 22 of the California Code of Regulations.

4.2.2.2 County of Fresno

The Project will be constructed in a County ROW. County road design standards will be followed.

4.2.3 Agency Requirements

4.2.3.1 Fresno Irrigation District

FID was contacted as part of this project to gain an understanding of what FID would require for utility crossings. The response from FID is included as Appendix D. FID will have specific requirements when crossing their existing facilities. Specific standards related to utility crossings are included as Appendix E.

4.2.3.2 Fresno Metropolitan Flood Control District

FMFCD was also contacted as part of this project. FMFCD has plans for future storm drain facilities in the project area. Typically, FMFCD storm drains are constructed six feet north of a roadway centerline. Efforts will be made to accommodate the typical FMFCD alignment for storm drain pipelines.

4.2.3.3 City of Fresno

A connection to the City water distribution system will require approval by the City and the connection will be subject to City requirements. Meetings with the City occurred during the preparation of this report to gain understanding of what the City may require to facilitate the connection of CSA 14 to the City system. In the course of those meetings the City provided some guidance on what may be required as part of this project including, but not limited to:

- *Master meter at connection proposed connection point*
- *16-inch transmission main*
- *County ownership of all facilities downstream of master meter*
- *Fees to acquire dedicated surface water supply*
- *Individual customer meters*
- *Source redundancy*

If this alternative is pursued by the County, the County will have to confirm all requirements and obtain approval from the City.

4.2.4 Environmental Impacts

As part of the feasibility study, a high-level environmental review was performed for Alternative 2. Based on the feasibility level definition of Alternative 2 it appears that an IS/MND will be required for compliance with CEQA. In addition to the IS/MND, it is recommended that technical studies, both biological and cultural, be completed to satisfy any requirements under CEQA and NEPA. Assuming that grant money is

pursued to finance all or part of the project it is recommended that an EIF also be prepared for the Water Board.

4.2.5 Land Requirements

An ESA will have to be executed between the City and County and approval from the LAFCo will be required to allow the City to provide service outside its service area boundary. Approval from FID will be required for finalizing the ESA.

Additional land acquisition to accommodate the project are anticipated. Land acquired for the project should be large enough to construct a storage tank, booster pump station, and associated electrical facilities. Efforts will be made to construct the transmission main within County ROW. Both temporary construction easements and permanent easements will be needed at the main FID utility crossings to accommodate the proposed transmission main.

4.2.6 Construction and Site Considerations

The City of Fresno constructed the KRP which consisted of a 72-inch pipeline along the south side of Belmont Avenue which would parallel the proposed Alternative 2 pipeline alignment. Issues arose on the KRP project while crossing the FID Canal. During excavation of the trench along the Canal the contractor ran into debris that was not anticipated including tires and broken pieces of concrete. It's likely that these same conditions may be present in the location Alternative 2 proposed to cross the Canal.

The existing CSA 14 water distribution system is comprised of ACP. Properly installed buried ACP poses little to no risk to human health. Exposure to certain types of airborne asbestos can increase risk for lung disease in humans. Precautions should be taken during construction, by the Contractor, when excavating and exposing existing ACP to limit exposure to airborne asbestos and to dispose of asbestos properly. Alternative 1 does not propose to replace the ACP in the CSA 14 system. Alternative 1 does propose to connect to the existing CSA 14 water distribution system. If Alternative 1 is chosen as the selected alternative and is eventually constructed, the contractor should take special precaution when connecting to the existing system. Should the contractor have to remove any ACP, during the construction, the removed pipe should be stockpiled in a secure location and testing should be performed to characterize the type of asbestos present. Based on the test results the contractor should dispose of the ACP at a facility authorized to handle that type of waste. The contractor should also provide the proper protective gear for their workers who are working in the area of the existing ACP. The contractor should follow all Occupational Safety and Health Administration (OSHA) guidelines with regard to working around and handling of asbestos.

4.2.7 Cost Estimate

Budgetary estimates of O&M costs were developed for the purpose of alternative comparison in this study. Actual O&M costs and water rates are outside the scope of this study. Alternative 2 O&M costs are estimated to be about $32,000 annually which is estimated to be slightly less than the existing annual O&M expense of about $33,000 for CSA 14. Table 4-3 summarizes at a high level, the estimated O&M costs for Alternative 2. Alternative 2 would require the residents to purchase water from the City which would offset some of the potential O&M savings anticipated with Alternative 2 compared to other alternatives. It's estimated that the total annual cost of water would be about $26,000 based on historical water usage. Overall, it's estimated that the residents of CSA 14 would see an increase in their monthly water bill of about $53 due to implementation of Alternative 2.

Table 4-3 Estimate of Annual Operations and Maintenance for Alternative 2

Estimated Annual Operations and Maintenance Expense Summary	
Expense Type	**Estimated Expense Amount ($)**
General Liability Insurance	$300
Maintenance - Equipment	$5,000
Maintenance - Buildings/Grounds	$240
Memberships	$160
Office Expense	$50
Postage	$100
PeopleSoft	$1,600
Professional and Specialized Services	$20,000
Special Departmental Expense	$50
Utilities	$4,500
Estimated Annual O&M Cost	**$32,000**
Cost to Purchased Water From City[1]	**$26,130**
Total Estimated Annual O&M	**$58,110**

Notes:
1. Estimated using historical water usage data from CSA 14 and current City water rates.

O&M costs are typically used as one measure of system sustainability. Ultimately the O&M costs fall on the rate payers in the system. Projects that trigger significant increases to O&M may create a situation where rate payers can no longer afford to operate the system despite other perceived positive impacts due to implementation of a project. When evaluating the overall costs of project both capital costs and O&M costs need to be accounted for. Capital costs are a one-time cost to acquire and construct the project and include construction costs and non-construction costs, while O&M costs are incurred throughout the life of the project. Typically, O&M costs are evaluated on a present worth basis over a 20-year period assuming an interest rate for the 20-year period. The capital cost and the present worth of 20-years of O&M are added together to obtain a life-cycle cost. A preliminary engineer's opinion of probable construction cost (EOPCC) and overall life cycle cost for Alternative 2 is included in Table 4-4.

4.2.8 Advantages/Disadvantages

The improvements described in Alternative 2 provide a solution to the water quality issues, source capacity and redundancy issues, resiliency issues and metering issues faced by CSA 14. This solution also provides a measure of system redundancy since a water storage tank is included and Well 2 can continue to be used as a temporary standby source by CSA 14 in emergency situations. Alternative 2 provides more resiliency than Alternative 1 due to the water storage tank.

Despite providing a solution that would meet regulatory requirements, Alternative 2 may lead to situations where residents are utilizing a well contaminated with TCP for short durations during any given year due to

maintenance or repairs to the proposed 16-inch transmission main. DDW will require that the County notify CSA 14 residents. Alternative 2 is estimated to reduce system O&M costs on an annual basis by about $300 per year on average. This savings would be offset by water purchases from the City. Anticipated water bills for Alternative 2 would increase by about $53 per month per connection.

Table 4-4 Alternative 2 Life Cycle Project Cost Summary

Alternative 2 Project Cost Summary	
Item Description	**Estimated Cost ($)**
Construction Costs	$3,245,000
Non-Construction Costs	$789,000
Contingency (20%)	$649,000
Water Acquisition Cost[1]	$672,000
Total Capital Cost	**$5,355,000**
Present Worth of O&M Costs[2]	$866,300
Life Cycle Cost	**$6,221,300**

Notes:
1. Water acquisition costs presented here are an estimate and are subject to City approval.
2. Present worth of 20 years of O&M assuming a 3% interest rate.

4.3 Alternative 3: Consolidation of CSA 14 with the City of Fresno with 16-Inch Transmission Main

4.3.1 Description

Alternative 3 is anticipated to be similar to Alternative 1. The difference between Alternative 1 and 3 would be that under Alternative 3, CSA 14 would become part of the City water system as opposed to remaining an independent community water system. Alternative 3 will include approximately 7,400 linear feet of 16-inch transmission main, fire hydrants, a sampling station, replacement of the existing CSA 14 water distribution system to upgrade to City Standards, and customer meters for each service in CSA 14. The City is considered an urban water supplier, therefore, the City will require that individual customer water meters be installed at each service connection. Meters are included in costs shown for this alternative. In addition to the major infrastructure, there will be several crossings of FID facilities including the Fancher Number 6 and Briggs Number 7 canals. Alternative 3 would provide a single point of connection to the City of Fresno water distribution system leaving CSA 14 vulnerable to outages if the transmission main were to be taken out of service for maintenance. The City would require a second transmission main to provide two points of connection to the CSA 14 service area. Analysis of a second water main is outside the scope of this study and is not included in the alternative cost. Wells 1 and 2 would be destroyed due to water quality issues. Alternative 3 does not include a generator for backup power. It is assumed that resiliency will be provided from the City system since the City has back up power provisions at many of its water sources.

4.3.2 Design Criteria

4.3.2.1 Division of Drinking Water

DDW provides regulatory oversight of CSA 14. The project will be subject to the water works standards under Title 22 of the California Code of Regulations.

4.3.2.2 County of Fresno

The Project will be constructed in a County ROW. County road design standards will be followed.

4.3.3 Agency Requirements

4.3.3.1 Fresno Irrigation District

FID was contacted as part of this project to gain an understanding of what FID would require for utility crossings. The response from FID is included as Appendix D. FID will have specific requirements when crossing their existing facilities. Specific standards related to utility crossings are included as Appendix E.

4.3.3.2 Fresno Metropolitan Flood Control District

FMFCD was also contacted as part of this project. FMFCD has plans for future storm drain facilities in the project area. Typically, FMFCD storm drains are constructed six feet north of a roadway centerline. Efforts will be made to accommodate the typical FMFCD alignment for storm drain pipelines.

4.3.3.3 City of Fresno

A connection to the City water distribution system will require approval by the City and the connection will be subject to City requirements. Meetings with the City occurred during the preparation of this report to gain understanding of what the City may require to facilitate the connection of CSA 14 to the City system. In the course of those meetings the City provided some guidance on what may be required as part of this project including, but not limited to:

- *Master meter at connection proposed connection point*
- *16-inch transmission main*
- *Fees to acquire dedicated surface water supply*
- *Individual customer meters*
- *Source redundancy*
- *Replacement of existing CSA 14 distribution system*

If this alternative is pursued by the County, the County will have to confirm all requirements and obtain approval from the City.

4.3.4 Environmental Impacts

As part of the feasibility study, a high-level environmental review was performed for Alternative 3. Based on the feasibility level definition of Alternative 3 it appears that an IS/MND will be required for compliance with CEQA. In addition to the IS/MND, it is recommended that technical studies, both biological and cultural, be completed to satisfy any requirements under CEQA and NEPA. Assuming that grant money is pursued to finance all or part of the project it is recommended that an EIF also be prepared for the Water Board.

4.3.5 Land Requirements

A consolidation agreement will have to be executed between the City and County to transfer the water system to the City and approval from LAFCo will be required to allow the City to provide service outside its service area boundary. Approval from FID will be required for finalizing the ESA.

Efforts will be made to construct the transmission main with County ROW. Both temporary construction easements and permanent easements will be needed at the FID utility crossings to accommodate the project transmission main.

4.3.6 Construction and Site Considerations

The City of Fresno constructed the KRP which consisted of a 72-inch pipeline along the south side of Belmont Avenue which would parallel the proposed Alternative 3 pipeline alignment. Issues arose on the KRP project while crossing the FID Canal. During excavation of the trench along the Canal the contractor ran into debris that was not anticipated including tires and broken pieces of concrete. It's likely that these same conditions may be present in the location Alternative 3 proposed to cross the Canal.

The existing CSA 14 water distribution system is comprised of ACP. Properly installed buried ACP poses little to no risk to human health. Exposure to certain types of airborne asbestos can increase risk for lung disease in humans. Precautions should be taken during construction, by the Contractor, when excavating and exposing existing ACP to limit exposure to airborne asbestos and to dispose of asbestos properly. Alternative 1 does not propose to replace the ACP in the CSA 14 system. Alternative 1 does propose to connect to the existing CSA 14 water distribution system. If Alternative 1 is chosen as the selected alternative and is eventually constructed, the contractor should take special precaution when connecting to the existing system. Should the contractor have to remove any ACP, during the construction, the removed pipe should be stockpiled in a secure location and testing should be performed to characterize the type of asbestos present. Based on the test results the contractor should dispose of the ACP at a facility authorized to handle that type of waste. The contractor should also provide the proper protective gear for their workers who are working in the area of the existing ACP. The contractor should follow all Occupational Safety and Health Administration (OSHA) guidelines with regard to working around and handling of asbestos.

4.3.7 Cost Estimate

A preliminary EOPCC was prepared for a consolidation option, see Table 4-5 below. The EOPCC shows that capital costs for a consolidation are significantly more expensive than other alternatives. It is unknown if the City of Fresno or CSA 14 residents would be in favor of consolidation and this alternative would have a higher capital cost for replacement of the existing distribution system to meet City Standards. Furthermore, the City would require a second point of connection which would require a second transmission main which was outside the scope of this study and not included in the overall project cost. For these reasons, Alternative 3 is not considered as a viable alternative for this project.

Budgetary estimates of O&M costs were developed for the purpose of alternative comparison in this study. Actual O&M costs and water rates are outside the scope of this study. O&M costs associated with Alternative 3 are lower than both Alternatives 1 and 2. Lower O&M costs related to Alternative 3 are attributed to the transfer of the system to the City and the economies of scale associated with being part of a larger water system. Any maintenance costs associated with CSA 14 would be paid for through CSA 14 customer water charges. It's estimated that the total annual cost of water would be about $26,000 based on historical water

usage. Overall it's estimated that the residents of CSA 14 would see a decrease in their monthly water bill of about $12 due to implementation of Alternative 3.

4.3.8 Advantages/Disadvantages

The improvements described in Alternative 3 provide a solution to the water quality issues, resiliency issues and metering issues faced by CSA 14. This alternative, as envisioned, does not provide a solution to the current source capacity and redundancy issue. This is due to both wells being destroyed and a single point of connection to the City system.

Alternative 3 is estimated to reduce system O&M costs lower than Alternatives 1 and 2, however much of that reduction would be offset by the purchase of water from the City. This savings would be offset by water purchases from the City. Anticipated water bills for Alternative 3 would decrease by about $12 per month per connection when compared to existing rates.

Table 4-5 Alternative 3 Life Cycle Project Cost Summary

Alternative 3 Project Cost Summary	
Item Description	**Estimated Cost ($)**
Construction Costs	$3,697,000
Non-Construction Costs	$851,000
Contingency (20%)	$740,000
Water Acquisition Cost[1]	$672,000
Total Capital Cost	**$5,960,000**
Present Worth of O&M Costs2	$388,800
Life Cycle Cost	**$6,348,800**

Notes:
1. Water acquisition costs presented here are an estimate and are subject to City approval.
2. Present worth of 20 years of O&M assuming a 3% interest rate. O&M costs attributed to CSA 14 are anticipated to be negligible in Alternative 3 largely due to economies of scale that come with connecting to a much larger system. Cost to purchase water is estimated at $26,000 annually based on current City water rates.

4.4 Alternative 4 GAC Treatment and New Well

Previously, the County had hired P&P to prepare a report entitled, *1,2,3-Trichloropropane Mitigation Feasibility Study* (June 2019, See Appendix A) evaluating the feasibility of GAC filters as a means to remove the TCP from the groundwater. The study recommends a system with the capacity to treat both Wells 1 and 2 for TCP so that CSA 14 would have drinking water that meets Title 22 regulations and achieves compliance with the CO. Given that Well 1 is no longer in service due to nitrate issues, Alternative 4 includes the drilling and construction of a new well to replace Well 1. It is assumed that the new well will tap into groundwater that has nitrate levels below the current MCL. Along with the new well, this alternative includes water meters and an emergency generator. Costs shown for Alternative 4 include TCP treatment, a new well, an emergency generator, and individual water meters. The study recommended GAC treatment as a solution to the TCP

issue and provided estimates for capital, and O&M costs. Alternative 4 addresses the issues raised by the CO and in the report.

4.4.1 Design Criteria

4.4.1.1 Division of Drinking Water

DDW provides regulatory oversight of CSA 14. The project will be subject to the water works standards under Title 22 of the California Code of Regulations.

4.4.1.2 County of Fresno

The Project will be constructed in a County ROW. County road design standards will be followed.

4.4.2 Agency Requirements

4.4.2.1 Fresno Irrigation District

FID was contacted as part of this project to gain an understanding of what FID would require for utility crossings. The response from FID is included as Appendix D. FID will have specific requirements when crossing their existing facilities. Specific standards related to utility crossings are included as Appendix E. Based on the response from FID, Alternative 4 does not appear to impact any FID facilities therefore little to no coordination is anticipated going forward.

4.4.2.2 Fresno Metropolitan Flood Control District

FMFCD was also contacted as part of this project. FMFCD has plans for future storm drain facilities in the project area. Based on the response from FMFCD, Alternative 4 does not appear to impact any FMFCD facilities therefore little to no coordination is anticipated going forward.

4.4.2.3 City of Fresno

If this alternative were implemented, the County would continue to own and operate the CSA 14 system independent of the City, therefore the City would have no authority to impose requirements on CSA 14.

4.4.3 Environmental Impacts

As part of the feasibility study, a high-level environmental review was performed for Alternative 4. Based on the feasibility level definition of Alternative 4 it appears that an IS/MND will be required for compliance with CEQA. In addition to the IS/MND, it is recommended that technical studies, both biological and cultural, be completed to satisfy any requirements under CEQA and the NEPA. Assuming that grant money is pursued to finance all or part of the project it is recommended that an EIF also be prepared for the Water Board.

4.4.4 Land Requirements

Additional land acquisition to accommodate the project are anticipated. Land acquired for the project should be large enough to construct a well, treatment system, and associated electrical facilities. It is anticipated that about one-half acre will be needed to accommodate the treatment facilities. Efforts will be made to construct any additional pipelines needed to complete the treatment system within County ROW or County-owned property.

4.4.5 Construction and Site Considerations

Unlike the previous alternatives, there will be no FID crossings with this proposed alternative. Neither existing well site is large enough to accommodate the proposed GAC treatment system. Easements and adequate land acquisition will be required to accommodate the treatment site as envisioned under this alternative.

The existing CSA 14 water distribution system is comprised of ACP. Properly installed buried ACP poses little to no risk to human health. Exposure to certain types of airborne asbestos can increase risk for lung disease in humans. Precautions should be taken during construction, by the Contractor, when excavating and exposing existing ACP to limit exposure to airborne asbestos and to dispose of asbestos properly. Alternative 1 does not propose to replace the ACP in the CSA 14 system. Alternative 1 does propose to connect to the existing CSA 14 water distribution system. If Alternative 1 is chosen as the selected alternative and is eventually constructed, the contractor should take special precaution when connecting to the existing system. Should the contractor have to remove any ACP, during the construction, the removed pipe should be stockpiled in a secure location and testing should be performed to characterize the type of asbestos present. Based on the test results the contractor should dispose of the ACP at a facility authorized to handle that type of waste. The contractor should also provide the proper protective gear for their workers who are working in the area of the existing ACP. The contractor should follow all Occupational Safety and Health Administration (OSHA) guidelines with regard to working around and handling of asbestos.

4.4.6 Cost Estimate

Budgetary estimates of O&M costs were developed for the purpose of alternative comparison in this study. Actual O&M costs and water rates are outside the scope of this study. Alternative 4 O&M costs are estimated to be about $75,000 annually which is estimated to be significantly more than the existing annual O&M expense of about $33,000 for CSA 14. Table 4-6 summarizes at a high level, the estimated O&M costs for Alternative 4. Alternative 4 would not require the residents to purchase water from the City. The increase in O&M is attributable to treatment related costs to remove TCP. The O&M costs shown here assume that no additional treatment other than granular activated carbon treatment. If nitrate treatment is also required because a nitrates could not be avoided in the new well, O&M costs would be even higher.. Overall, it's estimated that the residents of CSA 14 would see an increase in their monthly water bill of about $87 due to implementation of Alternative 4.

O&M costs are typically used as one measure of system sustainability. Ultimately the O&M costs fall on the rate payers in the system. Projects that trigger significant increases to O&M may create a situation where rate payers can no longer afford to operate the system despite other perceived positive impacts due to implementation of a project. When evaluating the overall costs of project both capital costs and O&M costs need to be accounted for. Capital costs are a one-time cost to acquire and construct the project and include construction costs and non-construction costs, while O&M costs are incurred throughout the life of the project. Typically, O&M costs are evaluated on a present worth basis over a 20-year period assuming an interest rate for the 20-year period. The capital cost and the present worth of 20-years of O&M are added together to obtain a life-cycle cost. A preliminary engineer's opinion of probable construction cost (EOPCC) and overall life cycle cost for Alternative 2 is included in Table 4-4.

4.4.7 Advantages/Disadvantages

The improvements described in Alternative 4 provide a solution to the water quality issues, source capacity issues, resiliency issues and metering issues faced by CSA 14. This solution also provides a measure of system resiliency since because the Alternative proposes constructing an emergency generator.

Despite providing a solution that would meet regulatory requirements today, Alternative 4 does not provide protection against future water quality regulations. DDW has indicated that water quality regulations will only get more stringent in the future. If Alternative 4 was selected to be the proposed project, there is a good chance that at some point in the future CSA 14 could be back under a compliance order due to water quality issues due to future regulations. Alternative 4 is estimated to increase system O&M costs. In addition, Alternative 4 does not guarantee a solution to future water quality regulations that are unknown at this time.

Table 4-6 Estimate of Annual Operations and Maintenance for Alternative 4

Estimated Annual Operations and Maintenance Expense Summary	
Expense Type	**Estimated Expense Amount ($)**
General Liability Insurance	$300
Maintenance - Equipment	$5,000
Maintenance - Buildings/Grounds	$240
Memberships	$160
Office Expense	$50
Postage	$100
PeopleSoft	$1,600
Professional and Specialized Services	$21,000
Special Departmental Expense	$50
Utilities	$4,500
Estimated Annual O&M Cost	**$33,000**
Cost to Purchased Water From City[1]	**$0**
TCP Treatment O&M Costs[2]	**$42,600**
Total Estimated Annual O&M	**$75,600**

Notes:
1. Estimated using historical water usage data from CSA 14 and current City water rates.
2. Breakdown of the treatment related costs estimates can be found in Appendix A.

Table 4-7 Alternative 4 Project Cost Summary

Alternative 4 Project Cost Summary	
Item Description	**Estimated Cost ($)**
Construction Costs[1]	$2,847,000
Non-Construction Costs	$859,000
Contingency	$570,000
Total Capital Cost	**$4,276,000**
Present Worth of O&M Costs[2]	$1,113,300
Life Cycle Cost	**$5,389,300**

Notes:
1. Capital costs include all GAC treatment facilities, 20% contingency on facilities costs, sales tax of 8% on GAC vessels, land acquisition, engineering, geotechnical, surveying, construction administration, construction management, inspection, environmental, legal, administration, operations plans, and permitting.
2. Present worth of 20 years of O&M assuming a 3% interest rate

4.5 Alternative 5 No Project

This alternative involves doing nothing and maintaining status quo. No further use of resources for planning or construction would be required. There would be no improvement to the CSA 14 water distribution system nor the water quality. This alternative is not recommended because it does not address any component of the problems described above and would require CSA 14 residents to pay substantial fines imposed by the State Water Board for failure to comply with the CO. Any money paid by CSA 14 resulting from imposed fines would not be put towards funding a project to serve CSA 14 and DDW would continue to require CSA 14 to resolve the water quality issue stated in the CO. This alternative should not be pursued.

4.6 Alternative Evaluation and Selection

The alternatives presented above are similar in many ways; however, there are benefits and risks associated with each that may make one alternative more favorable than the others. Table 4-5 provides a quantitative comparison of the alternatives presented in this section. Table 4-6 presents a qualitative feasibility-level alternative analysis and summarizes the benefits and risks of each alternative presented in this section.

As shown in both Tables 4-8 and 4-9, Alternatives 1, 2, and 4 solve all stated problems, each with advantages and disadvantages. Alternative 3 is not viable because it would only have one source of water via the transmission mains. The City will likely require destruction of both existing wells prior to a consolidation with CSA 14. In addition the City would require a second point of connection to CSA 14 which would make an already costly alternative even more costly since the second point of connection would likely require a substantial amount of additional pipeline. Alternative 5 doesn't solve any issues and is therefore not viable. Neither Alternatives 3 nor 5 should be considered further. Alternative 1 is the selected project. The following section, Section 5, discusses the selected project in more detail.

Table 4-8 Quantitative Evaluation of Alternatives

Quantitative Evaluation of Alternatives					
Alternative	Addresses Stated Problem				Total Estimated Life Cycle Cost
	Water Quality	System Capacity	System Resiliency	Water Metering	
1. Alternative 1 – Master Service with 16-inch Transmission Main[1]	X	X	X	X	$5,320,500
2. Alternative 2 – Master Service with 8-inch Transmission Main, Tank and Booster Pump Station[1]	X	X	X	X	$6,221,300
3. Alternative 3 – Consolidation of CSA 14 with City of Fresno with 16-inch Transmission Main	X	X		X	$6,348,800
4. Alternative 4 - GAC Treatment + Well	X	X	X	X	$5,389,300
5. Alternative 5 – No Project					N/A

Notes:
1. Well 2 can be utilized under this alternative on a standby basis up to five consecutive calendar days, but not more than fifteen calendar days per year and would provide redundancy on an emergency basis. The water served to consumers when Well 2 was used would not meet all primary drinking water standards. DDW would require notification to all CSA 14 residents when Well is placed into service.

Table 4-9 Qualitative Evaluation of Alternatives

Qualitative Evaluation of Alternatives	
Alternative	**Evaluation Results**
1. Alternative 1 – Master Service with 16-inch Transmission Main	Advantages of this alternative include resolving water quality issues, source capacity issues, resiliency issues and metering issues. Well 2 could be utilized on a standby basis for up to five consecutive calendar days, but not more than fifteen calendar days in a year and would provide redundancy on an emergency basis. Disadvantage of this alternative is increased O&M costs. A rate study and a Proposition 218 process would need to be completed to change water rates. Well 2 would not be able to meet fire flow requirements. The water served to consumers during this time would not meet the primary drinking water standard for TCP. Quantitative Summary: This alternative has the lowest present worth cost relative to other viable alternatives.
2. Alternative 2 – Master Service with 8-inch Transmission Main, Tank and Booster Pump Station	Advantages of this alternative include resolving water quality issues, source capacity issues, resiliency issues and metering issues. The storage tank would provide capacity to meet fire flow requirements. Well 2 could be utilized on a standby basis for up to five consecutive calendar days, but not more than fifteen calendar days in a year and would provide redundancy on an emergency basis. The water served to consumers during this time would not meet the primary drinking water standard for TCP. Disadvantage of this alternative is increased O&M costs. A rate study and a Proposition 218 process would need to be completed to change water rates. Quantitative Summary: This alternative has the second highest present worth cost relative to other viable alternatives.
3. Alternative 3 – Consolidation of CSA 14 with City of Fresno with 16-inch Transmission Main	Advantages of this alternative include resolving water quality issues, resiliency issues and metering issues. Disadvantage of this alternative are high capital costs associated with distribution system replacement. Also, the City will likely require additional pipeline to provide a second point of connection and uncertainty as to whether the City and CSA 14 customers would support consolidation. A rate study and a Proposition 218 process would need to be completed to change water rates. Quantitative Summary: This alternative has the highest present worth cost relative to other viable alternatives. Present worth cost could be significantly higher if a second point of connection is factored into the engineer's opinion of probable construction cost.
4. Alternative 4 - GAC Treatment	Advantages of this alternative include resolving water quality issues and providing system capacity to satisfy Title 22. Disadvantage of this alternative include not resolving system resiliency and water metering issues, since it would not provide capacity to meet fire flow requirements or install meters on customer services. Furthermore, if the state changes maximum contaminant levels for constituents in the future or groundwater quality changes over time the wells could require additional treatment. A rate study and a Proposition 218 process would need to be completed to change water rates. Quantitative Summary: This alternative has the second lowest present worth cost relative to other alternatives. There is significant uncertainty surrounding future water quality regulations that could cause this alternative to be far more costly in the future.
5. Alternative 5 – No Project	This alternative does not resolve any issues raised by this report and would only result in CSA 14 residents paying substantial fines until the CO is resolved. This alternative is not recommended and should not be pursued further.

5 Selected Project

A community meeting was held on Thursday January 20, 2022 from 6:00 PM until about 7:00 PM at Sunnyside High School in Fresno, CA. The County and P&P presented the initial findings for each alternative to representatives of CSA 14 in attendance. Of the four alternatives considered, three alternatives (Alternatives 1, 2, and 4) provided long-term solutions to all the issues identified in Section 3 of this report. Based on input from stakeholders, including the City, County, and CSA 14 residents, the preferred project alternative is a connection to the City via master service meter and 16-inch main (Alternative 1).

5.1 Project Description

The Project would include approximately 7,400 linear feet of 16-inch transmission main, a master service meter connecting to the City's water system, fire hydrants, and a sampling station. It is assumed that this alternative will also include customer meters for each service in CSA 14. Metering each water service will make it possible for the County to charge each customer based on individual water usage.

Implementation of this alternative will be contingent upon obtaining approval from the City of Fresno and other stakeholder agencies to allow a master water service connection to the City and service to an area outside the City's service area. In addition to the major infrastructure, there will be several crossings of FID facilities including the Fancher Number 6 and Briggs Number 7 canals. Figure 5-1 shows the selected project.

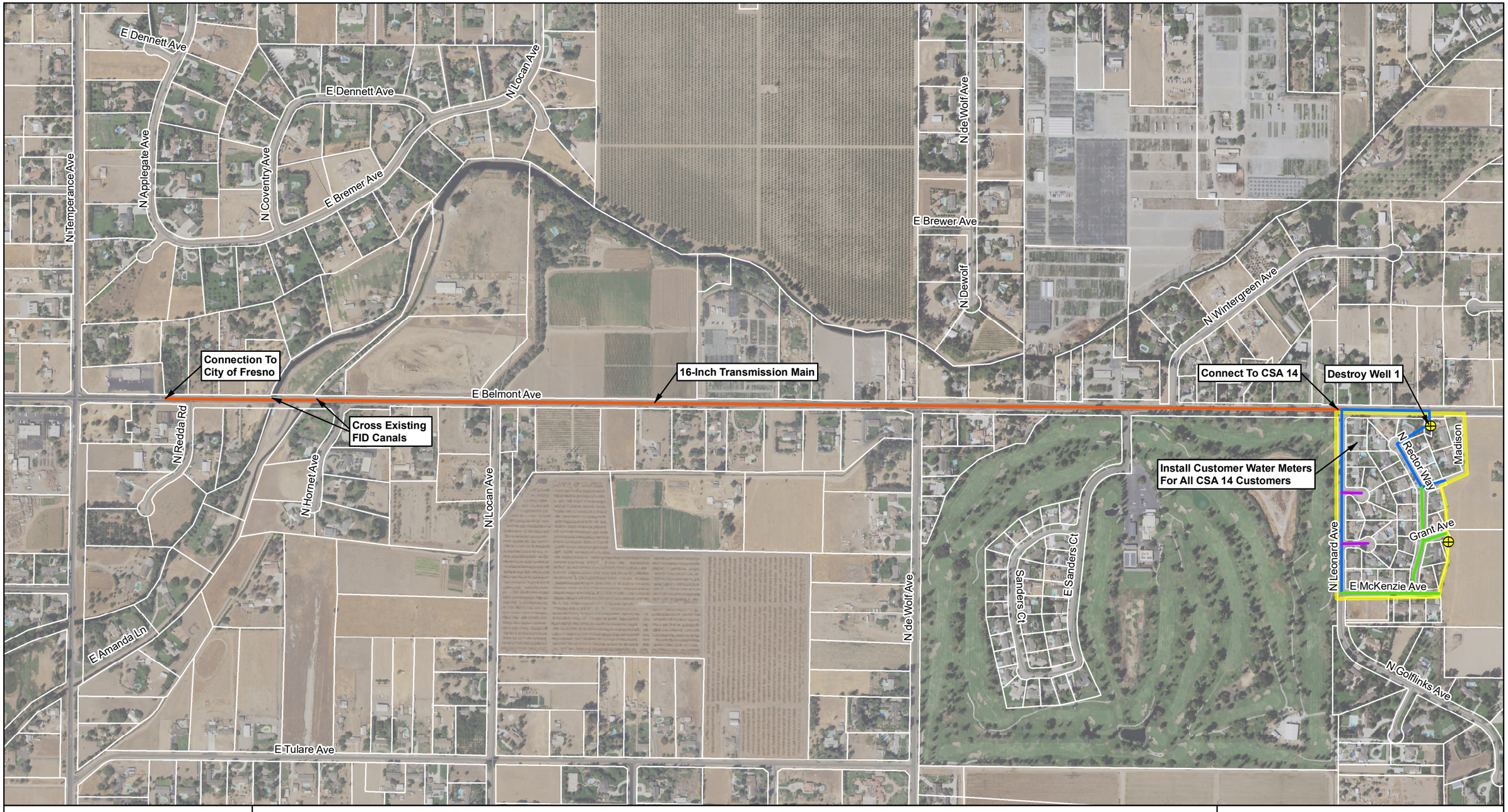
5.2 Justification

The Project provides a remedy for the issues previously discussed in Section 3 of this report. The issues include:

- Water Quality
- System Capacity and Redundancy
- System Resiliency
- Water Metering

5.2.1 Water Quality

CSA 14 is currently under compliance order for a TCP MCL exceedance. In addition to TCP, CSA 14 has issues with nitrates. Connecting to the City of Fresno will allow CSA 14 to comply with the CO for TCP and also remedy the nitrate issue. The Project would provide a single point of connection to the City water distribution system leaving CSA 14 vulnerable to outages if the transmission main were to be taken out of service for maintenance or repairs. To mitigate against this supply vulnerability, CSA 14 would place Well 2 on standby status for limited use in outage situations. Use of the well as a standby source will require approval from the DDW. In addition, the County would have to notify CSA 14 residents when Well 2 comes online for use.



EST. 1968
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An Employee Owned Company

N
0 300 600
Feet

Legend

- Well
- CSA 14
- 4-Inch Pipeline
- 6-Inch Pipeline
- 8-Inch Pipeline
- Transmission Main

Figure 5-1 Project Schematic

CSA 14 TCP Mitigation Project at Belmont Manor

County of Fresno

2/8/2022 : G:\Fresno_County of-1397\139721001-Conn from CSA 14 to City of Fresno\400 GIS\Map\Project_Schematic.mxd

5.2.2 System Capacity and Redundancy

Currently CSA 14 only has one active water source, Well 2. Well 1 can no longer be utilized due to nitrates. Section 64554 in Chapter 16 of Title 22 states that for systems with less than 1,000 connections the system shall have storage capacity equal to or greater than the MDD, unless the system can demonstrate it has an additional source of supply or has an emergency connection that can meet the MDD requirement. A connection to the City of Fresno along with the use of Well 2 as a standby source allows CSA 14 to comply with the requirements of Title 22 since both the connection and Well 2 would be able to provide water supply in excess of the estimated MDD of 108 gpm.

5.2.3 System Resiliency

The Project does not include accommodations for backup power, however the City of Fresno does have backup power at many of its active water sources therefore in the event of a power outage, CSA 14 should still be able to provide water service during a power outage.

5.2.4 Water Metering

Currently CSA 14 does not meter its customers. The project would propose to install water meters for each customer. The water meters would have automatic read capabilities and be compatible with the current County billing system software. Actual size of the water meters would be determined during the design of the project.

5.3 Operations & Maintenance Concerns

The main O&M challenge for the project will likely be maintenance of the interconnection pipeline at the proposed canal crossings in Belmont Avenue. The project will cross two existing FID canals (Fancher Number 6 and Briggs Number 7). Measures to facilitate maintenance of these section of main will be identified in the design phase of the project.

5.4 Local/County Planning Consistency

The Project does not increase the density of the development in CSA 14 nor does it propose to change any existing boundaries. An extra territorial service agreement will have to be formalized between the City and the County. Approval from FID and LAFCo will be required to finalize the extra territorial service agreement.

5.5 Consolidation Governance

The project does not propose to consolidate CSA 14 into the City. The project does propose to connect CSA 14 to the City via master service. As previously stated, the connection will be considered an extra territorial service therefore an agreement will need to be formalized and approval from FID and LAFCo will be required. Under this type of service, CSA 14 will continue to be owned and operated by the County. Existing CSA 14 customers will continue to purchase water from the County. The City will not provide any governance over the CSA 14 system. The City will only provide wholesale water to the County.

5.5.1 Planning Document and Land Acquisition

The project proposes to be constructed within County right-of-way in Belmont Avenue and within CSA 14 service area. The project area is largely within developed area. It is anticipated that an IS/MND will be required for compliance with CEQA. In addition to the IS/MND, it is recommended that technical studies, both biological and cultural, be completed to satisfy any requirements under CEQA and NEPA. Assuming that grant money is pursued to finance all or part of the project it is recommended that an EIF also be prepared for the Water Board.

The project does not appear to require purchase of additional land to accommodate construction. Additional right-of-way may be needed to facilitate the FID canal crossings. In addition, it is likely that there will be a need to obtain both temporary construction easements and permanent utility easements to facilitate the construction of the transmission main.

5.6 Estimated Useful Life

Table 5-1 summarizes the estimated useful life of the major project facilities.

Table 5-1. Estimated Useful Life For Major Project Facilities

Estimated Useful Life For Major Project Facilities	
Facility Type	**Estimated Useful Life Range (in years)[1]**
Pipe	35-40
Meters	10-15
Valves	35-40
Hydrants	40-60
Blow-off valves	35-40

Notes:
1. Useful life range estimates from US EPA publication EPA 816-R-03-016 September 2003

6 Selected Project Cost Estimate

As stated in Section 5 of this report, the selected project is Alternative 1. A detailed breakout of the EOPCC for Alternative 1 is provided in Table 6-1. The EOPCC is a budgetary capital cost based on anticipated infrastructure required for the selected Project. The EOPCC should be revised during design if this alternative is implemented. Costs will vary depending on actual infrastructure required and market conditions at the time of construction.

Table 6-1 Detailed Breakout of the Preliminary Engineer's Opinion of Probable Construction Cost

PRELIMINARY ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST ALTERNATIVE 1 - CSA 14 MASTER SERVICE CONNECTION TO CITY OF FRESNO 16" MAIN					
Item No.	**Item Description**	**Estimated Quantity**	**Unit**	**Unit Price**	**Amount**
Construction Costs					
1	Mobilization, Demobilization, Insurance, and Bonds	1	LS	$145,000	$145,000
2	Prepare and Implement SWPPP (or WPCP)	1	LS	$25,000	$25,000
3	Dust Control	1	LS	$25,000	$25,000
4	Worker Protection	1	LS	$20,000	$20,000
5	Clearing and Grubbing	1	LS	$15,000	$15,000
6	Tie-in to the Existing Water System	1	LS	$20,000	$20,000
7	Demolish Existing Wells/Hydropneumatic Tanks	1	LS	$50,000	$50,000
8	New AMR Water Meter, and Meter Box	40	EA	$2,500	$100,000
9	Miscellaneous Items	1	LS	$25,000	$25,000
10	Traffic Control	1	LS	$100,000	$100,000
11	Fancher No.6 Crossing (Open Channel Canal)	1	LS	$300,000	$300,000
12	Briggs Number 7 Crossing (2x48" Parallel Pipelines)	1	LS	$100,000	$100,000
13	Dewatering	1	LS	$150,000	$150,000
14	Master Service Meter	1	EA	$20,000	$20,000
15	16-inch C900 PVC Transmission Main	7,500	LF	$160	$1,200,000
16	16-Inch Isolation Valves	6	EA	$15,000	$90,000
17	Dry Barrel Fire Hydrants with Bollards	8	EA	$10,000	$80,000
18	Sampling Station	1	EA	$5,000	$5,000
19	Permanent Blow Off Assembly	1	EA	$10,000	$10,000
20	Temporary Trench Resurfacing	7,500	LF	$10	$75,000
21	Permanent Trench Resurfacing	7,500	LF	$45	$337,500
				Overall Construction Subtotal	**$2,892,500**
Non-Construction Costs					
22	Engineering, Geotechnical, surveying	1	LS	$289,250	$289,250
23	Construction Management & Inspection	1	LS	$202,475	$202,475
24	Environmental, Legal, Administration	1	LS	$144,625	$144,625
25	Permitting	1	LS	$15,000	$15,000
26	Water Acquisition Cost (Average of 2012-2014 Annual Production)	1	LS	$671,235	$671,235
27	Right of Way Acquisition	1	LS	$10,000	$10,000
				Total Non-Construction Costs	**$1,332,585**
28	Contingency - 20% of overall construction costs	1	LS	$578,500	$578,500
				Total Project Cost	**$4,803,585**
29	CSA 14 Present Worth of O&M Costs				**$514,400**
				Total Construction + Present Worth Costs	**$5,317,985**

7 Proposed Schedule

The following is a proposed schedule for the selected project. The first step after completion of this project would be to coordinate with stakeholder agencies to determine if a connection to the City's water system will be approved. It is our understanding that the County plans to apply for funding through the Drinking Water State Revolving Fund (DWSRF). The application process typically can take from 12-18 months. In parallel with the application period, construction documents can be prepared for contractor bidding purposes. During this time the County would need to coordinate with the City, FID and LAFCo to finalize the extra territorial agreement between the City and County. Assuming the project is approved for funding through DWSRF, once the bidding period is completed, the Division of Financial Assistance and the County will have to finalize the construction funding agreement. Upon finalizing the agreement, the project would then be constructed.

DWSRF Funding Application Process	12-18 months
Tasks to be completed in parallel with funding application process:	
Agency Approval Process	6-12 months
Acquire pipeline easements	6-12 months
Construction Documents & Agency Review	9 months
Tasks to be completed after funding is secured:	
Construction Bid Process	3 months
Finalize Construction Funding Documents	6 months
Construction	8 months
Total Project Time	**up to 36 months**

Appendix

APPENDIX A

1,2,3-TRICHLOROPROPANE MITIGATION FEASIBILITY STUDY

Fresno County CSA-14

1,2,3-Trichloropropane Mitigation Feasibility Study

Fresno, California
June 26, 2019

DATE SIGNED 6/26/19

Prepared for:
The County of Fresno
Fresno, California

Prepared by:
Provost & Pritchard Consulting Group
286 W. Cromwell, Fresno, California 93711

Report Prepared for:

The County of Fresno

2220 Tulare St. 6th Floor
Fresno, CA 93721

Contact:
Sebastian Artal, P.E.

Report Prepared by:

Provost & Pritchard Consulting Group

286 W. Cromwell
Fresno, California 93711

Contact:
Kevin Berryhill, P.E.
559- 449-2700

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Abbreviations

BAT ..... Best Available Technology
DDW ..... State Water Resources Control Board Division of Drinking Water
DLR ..... Detection Limit for Purposes of Reporting
EBCT ..... Empty Bed Contact Time
GAC ..... Granular Activated Carbon
GPM ..... Gallons per Minute
HLR ..... Hydraulic Loading Rate
MCL ..... Maximum Contaminant Level
MGD ..... Million Gallons per Day
mg/L ..... Milligrams per Liter
NOM ..... Natural Organic Matter
O&M ..... Operation & Maintenance
OEHHA ..... Office of Environmental Health Hazard Assessment
PHG ..... Public Health Goal
PPT ..... Parts per Trillion
PRV ..... Pressure Reducing Valve
PSI ..... Pounds per Square Inch
PSIG ..... Pounds per Square Inch - Gauge
SCADA ..... Supervisory Control and Data Acquisition
SDWIS ..... Safe Drinking Water Information System
SOC ..... Synthetic Organic Chemical
TCP 1,2,3-Trichloropropane
TOC ..... Total Organic Carbon
VFD ..... Variable Frequency Drive

1 Background

1.1 Background

The County of Fresno (County) oversees operation of two public drinking water supply wells (Wells 1 and 2) within County Service Area 14 (CSA-14), also known as Belmont Manor. CSA-14 serves a year-round population of approximately 115 through 41 service connections and is classified as a community water system. Both wells are contaminated with the Synthetic Organic Contaminant (SOC) 1,2,3-trichloropropane (TCP). The purpose of this memorandum is to assess the impacts of the TCP contamination on the water system, to evaluate the most feasible mitigation alternative(s), and to provide a budget for both construction and operation of the recommended mitigation alternative.

1.2 Existing Facilities

The CSA-14 water system consists of a single pressure zone supplied by two (2) groundwater wells equipped with constant speed pumps. The system does not include any storage other than small hydropneumatic tanks located at the well sites. The system is not routinely chlorinated. Following are descriptions of the two wells.

Well No. 1.

Well No. 1 is located on the south side of Belmont Avenue approximately 500 feet east of Leonard Ave in unincorporated Fresno County. The well is situated on a lot surrounded on three sides by private residences. The well is reported to have been constructed with a total depth of approximately 218 feet and is equipped with a 30-hp constant-speed submersible deep well pump. Water is pumped into an on-site 6,500-gallon hydropneumatic tank which then supplies the distribution system. The well is not equipped with a chlorination system.

Well 1 is currently designated as a standby source due to the need to bail lubricating oil out of the well. The oil was deposited by an oil-lubricated pump that has since been removed. The County operates the well periodically to make sure it is functional in case it is needed for firefighting or when Well 2 has to be taken out of service.

Figure 1-1: Well 1

Well No. 2

Well No. 2 is located at the eastern end of E. Madison Avenue approximately 800 feet south of Well 1. The well is surrounded to the north, south, and east by an open field. The well is reported to have been

constructed with a total depth of approximately 300 feet and is equipped with a 25-hp constant-speed submersible deep well pump. Water is pumped into an on-site 110-gallon bladder tank which then supplies the distribution system including the active hydropneumatic tank at the Well 1 site. The well is not equipped with a chlorination system.

Figure 1-2: Well 2

1.3 1,2,3-Trichloropropane Regulatory Background

1,2,3-trichloropropane (TCP) is an exclusively man-made synthetic organic chemical and a carcinogen. TCP was used as a component in agricultural soil fumigants applied over large areas of the Central Valley, including Fresno County. TCP is heavier than water, very slow to biodegrade naturally, and is sparingly volatile – all characteristics that make it persistent in the groundwater and difficult to treat.

In August 2009, the California Office of Environmental Health Hazard Assessment (OEHHA) established a California Public Health Goal (PHG) for TCP of 0.0007 µg/L (0.7 parts per trillion) based on carcinogenicity. This is the second lowest California PHG among all drinking water contaminants. On December 14, 2017 DDW adopted a maximum contaminant level for TCP of 5 parts per trillion (ppt), which is equal to the current detection limit for purposes of reporting (DLR). The MCL has now gone into effect and CSA-14 is

under a DDW compliance order for violation of the TCP MCL at Well 2. Well 1 also exceeds the TCP MCL, but has not violated the rule because it has not been pumped into the system since the rule went into effect.

Numerous water supply wells that surround the CSA-14 service area, including those at the Belmont Country Club and Belmont Water Corporation are also contaminated with TCP.

2 Water Quality

2.1 General

A summary of general mineral, general physical, inorganic, and organic water quality data for Wells 1 and 2 is provided in Tables 2-1 and 2-2 respectively. Apart from the TCP MCL violations, the water produced by the two wells currently meets all drinking water standards.

Both wells produce iron at moderate levels and Well 1 produces low levels of manganese. Although the levels of iron and manganese are below their respective regulatory secondary MCLs, the levels are high enough that they may have some effect on the life of activated carbon if treatment is installed. It is suspected that the moderate color and turbidity noted in the Well 1 water is a result of the iron and manganese. Well 1 also produces water with nitrate at levels approaching the MCL value. As will be described later in this memorandum, the elevated nitrate levels at Well 1 will influence the design of proposed treatment facilities.

Table 2-1: Well 1 General Water Quality

ANALYTE	UNITS	MCL	DATA QUANTITY	AVERAGE	MAX	MIN
ALKALINITY, BICARBONATE AS CACO3	MG/L		4	95.9400	106.6	80.36
ALKALINITY, CARBONATE AS CACO3	MG/L		4	0.0000	0	0
ALKALINITY, HYDROXIDE AS CACO3	MG/L		4	0.0000	0	0
ALKALINITY, TOTAL AS CACO3	MG/L		4	95	100	80
ALUMINUM	UG/L	1000	3	105	260	17
ANTIMONY	UG/L	6	3	0	0	0
ARSENIC	UG/L	10	3	1.47	1.6	1.3
BARIUM	UG/L	1000	3	46.67	49	43
BERYLLIUM	UG/L	4	3	0	0	0
CADMIUM	UG/L	5	3	0	0	0
CALCIUM	MG/L		4	19.75	21	19
CHLORIDE	MG/L	500	3	6.13	7.8	5.1
CHROMIUM, HEXAVALENT	UG/L	10	2	0.55	1.1	0
CHROMIUM, TOTAL	UG/L	50	3	3.07	4	2.5
COLOR	CU	15	4	8.75	15	5
COPPER	UG/L	1300	4	16.03	31	0
CYANIDE	UG/L	150	2	0	0	0
FLUORIDE	UG/L	2000	3	143.33	170	110
FOAMING AGENTS (MBAS)	MG/L	0.5	3	0	0	0
HARDNESS, TOTAL AS CACO3	MG/L		4	112.5	120	110
IRON	UG/L	300	8	477.5	1800	90
LEAD	UG/L	15	3	0.4	1.2	0
MAGNESIUM	MG/L		4	15	16	14
MANGANESE	UG/L	50	8	20.86	100	1.5
MERCURY	UG/L	2	3	0	0	0
NICKEL	UG/L	100	3	0.53	1.6	0
NITRATE (AS N)	MG/L	10	9	4.39	10	0
NITRITE (AS N)	MG/L	1	2	0	0	0
ODOR THRESHOLD @ 60 C	TON	3	4	0.5	1	0
PH, LAB			3	7.63	7.7	7.5
RADIUM-226	PCI/L		2	0.12	0.13	0.1
RADIUM-228	PCI/L		5	0.11	0.44	0
SELENIUM	UG/L	50	3	0	0	0
SILVER	UG/L	100	3	0	0	0
SODIUM	MG/L		4	15.75	17	14
SPECIFIC CONDUCTANCE	UMHOS/CM	1600	3	303.33	340	270
SULFATE	MG/L	500	3	18	19	17
THALLIUM	UG/L	2	3	0	0	0
TURBIDITY, LAB	NTU	5	9	5.59	18	0.35
ZINC	UG/L	5000	3	9.97	13	5.9
GROSS ALPHA	PCI/L	15	8	0.62	2.8	0
URANIUM	PCI/L	20	2	0.41	0.71	0.11
TOTAL DISSOLVED SOLIDS (TDS)	MG/L	1000	3	223.33	260	190
DIBROMOCHLOROPROPANE	UG/L	0.2	3	0.01	0.023	0

*"ND" values are reported as "0"

Table 2-2: Well 2 General Water Quality

ANALYTE	UNITS	MCL	DATA QUANTITY	AVERAGE	MAX	MIN
ALKALINITY, BICARBONATE AS CACO3	MG/L		5	131.2000	147.6	114.8
ALKALINITY, CARBONATE AS CACO3	MG/L		5	0.0000	0	0
ALKALINITY, HYDROXIDE AS CACO3	MG/L		5	0.0000	0	0
ALKALINITY, TOTAL AS CACO3	MG/L		5	130	140	120
ALUMINUM	UG/L	1000	4	2.33	4.7	0
ANTIMONY	UG/L	6	4	0	0	0
ARSENIC	UG/L	10	6	1.90	2.8	0
BARIUM	UG/L	1000	4	51.00	55	43
BERYLLIUM	UG/L	4	4	0	0	0
CADMIUM	UG/L	5	4	0	0	0
CALCIUM	MG/L		5	19.60	22	18
CHLORIDE	MG/L	500	4	6.75	8.2	5.9
CHROMIUM, HEXAVALENT	UG/L	10	2	0.99	1	0.98
CHROMIUM, TOTAL	UG/L	50	4	1.60	1.7	1.5
COLOR	CU	15	5	0	0	0
COPPER	UG/L	1300	5	2.40	7.1	0
CYANIDE	UG/L	150	1	0	0	0
FLUORIDE	UG/L	2000	4	37.50	150	0
FOAMING AGENTS (MBAS)	MG/L	0.5	4	0	0	0
HARDNESS, TOTAL AS CACO3	MG/L		5	113.6	130	98
IRON	UG/L	300	9	65.67	110	0
LEAD	UG/L	15	3	0	0	0
MAGNESIUM	MG/L		5	15.2	18	13
MANGANESE	UG/L	50	9	0.00	0	0
MERCURY	UG/L	2	4	0	0	0
NICKEL	UG/L	100	4	0.00	0	0
NITRATE (AS N)	MG/L	10	16	2.17	2.3	1.99
NITRITE (AS N)	MG/L	1	4	0	0	0
ODOR THRESHOLD @ 60 C	TON	3	5	0.4	1	0
PH, LAB			4	7.73	8.1	7.1
RADIUM-226	PCI/L		2	0.07	0.13	0.01
RADIUM-228	PCI/L		5	0.19	0.55	0
SELENIUM	UG/L	50	4	0	0	0
SILVER	UG/L	100	5	0	0	0
SODIUM	MG/L		5	22.2	25	19
SPECIFIC CONDUCTANCE	UMHOS/CM	1600	4	320.00	360	300
SULFATE	MG/L	500	4	12.7	16	9.8
THALLIUM	UG/L	2	4	0	0	0
TURBIDITY, LAB	NTU	5	10	0.30	0.78	0.13
ZINC	UG/L	5000	4	38.85	60	5.4
GROSS ALPHA	PCI/L	15	8	0.79	3.8	0
URANIUM	PCI/L	20	2	0.70	0.97	0.42
TOTAL DISSOLVED SOLIDS (TDS)	MG/L	1000	4	190.00	230	150
DIBROMOCHLOROPROPANE	UG/L	0.2	6	0.00	0.023	0

*"ND" values are reported as "0"

2.2 1,2,3-Trichloropropane

Table 2-3 includes all TCP results contained in the California Safe Drinking Water Information System (SDWIS) database as of May 30, 2019. Well 2 has officially violated the TCP MCL and is currently the subject of a DDW Compliance Order. TCP results for Well 1 have exceeded the MCL value but the well is not yet subject to the compliance order because it has been designated as a standby source and is not currently being pumped into the system. The level of TCP in Well 2 regularly exceeds ten times the MCL value and that well is therefore considered to be extremely impaired source. The level of TCP in Well 1 is near the threshold for being classified as an extremely impaired source.

Table 2-3: TCP Results (µg/L)

DATE	WELL 1	WELL 2
4/15/2008	0.14	0.14
2/8/2018	0.04	0.061
4/10/2018	0.047	0.06
5/29/2018	0.045	0.049
7/18/2018	0.047	0.052
10/16/2018	0.041	0.063
1/10/2019	0.043	
1/16/2019		0.044

3 Design Criteria

3.1 System Capacity

The County reports pumping rates of 480 and 180 gpm from wells 1 and 2 respectively. The peak domestic demand for the system (not including the demand for firefighting) is estimated by the County to be 180 gpm. That estimated value is close to the 160 gpm estimate arrived at using the maximum month production reported for July 2013 (3.2 million gallons) and Title 22 methodology. The current combined flow from both wells is 660 gpm, which is less than the 1,000 gpm fire-flow required by the California Fire Code.

The solution to the TCP contamination issue must provide at least 180 gpm of water under normal conditions and should not degrade the system's current fire-flow capacity.

3.2 Annual Water Production

Annual water production for the years 2012 through 2018 is presented in Table 3-1. Similar to other California water utilities, there was a large drop in water production starting in 2015. This was a result of emergency drought water conservation measures. Now that the drought is over, it is anticipated that water production will begin to return to historical levels. The average water production for the years 2012 through 2014 (18,700,000 gallons) has been used for the purpose of estimating operations and maintenance costs.

Table 3-1: Annual Water Production

	2012	2013	2014	2015	2016	2017	2018
January	700,000	400,000	740,000	593,000	85,000	94,000	275,000
February	800,000	600,000	625,000	412,000	165,000	106,000	340,000
March	800,000	1,000,000	849,400	746,000	95,000	263,000	199,000
April	1,100,000	1,800,000	1,284,300	1,149,000	420,000	279,000	354,000
May	1,500,000	2,200,000	1,650,300	1,251,800	456,000	664,000	772,000
June	2,200,000	2,700,000	2,265,000	1,810,000	715,000	994,000	862,000
July	2,900,000	3,200,000	1,354,500	1,738,000	843,000	836,000	770,000
August	2,700,000	2,900,000	2,499,000	1,288,000	837,000	1,054,000	834,000
September	2,800,000	2,400,000	1,712,000	782,000	633,000	699,000	690,000
October	1,700,000	2,000,000	1,615,000	357,582	508,000	633,000	716,000
November	1,200,000	1,200,000	1,080,000	240,000	448,000	419,000	559,000
December	500,000	600,000	580,000	238,000	179,000	262,000	262,000
Total	18,900,000	21,000,000	16,254,500	10,605,382	5,384,000	6,303,000	6,633,000

3.3 TCP Influent Levels

The TCP levels in CSA-14's wells are high by health-based standards and the wells are considered extremely impaired. However, the high TCP levels are unlikely to significantly influence the physical design of the GAC

treatment process recommended by this study. The reason is that the TCP levels are almost certainly orders of magnitude lower than the natural organic matter (NOM) that exists in all water supplies. NOM is the result of groundwater or surface water passing through soil or along channels and impoundments that contain naturally occurring organic material (leaves, grass, algae etc.). This organic material breaks down and becomes dissolved in the water. NOM bonds to the same adsorption sites on the carbon as TCP and sites occupied by NOM are not available to adsorb TCP.

3.4 TCP Treatment Objective

The County requires that the TCP levels in the water served to the CSA-14 consumers be below the detection limit, which in the case of TCP, is equal to the MCL (5 ppt).

4 Non-Treatment Alternatives

Non-treatment alternatives including well abandonment, consolidation, well replacement, well and treating surface water are often considered for mitigation of groundwater contamination. However, these alternatives are not viable for CSA-14 for the following reasons:

- Wells 1 and 2 are the only sources of supply – both wells are needed for supply redundancy. This precludes well abandonment as an option.

- There are two adjacent water systems with which to consider consolidation (Belmont Water Corporation and Belmont Country Club). Connection to the more remotely located City of Fresno system could also be considered. Both adjacent systems are struggling to resolve TCP contamination issues at their wells. Both systems are also smaller than CSA-14 and neither system has enough supply capacity to accommodate CSA-14's water usage. It is likely that CSA-14 would need to contribute its own well sources to any potential consolidated system. Further evaluation of the feasibility and cost of consolidation is beyond the scope of this report.

- Extensive TCP contamination exists in the surrounding water systems including the Belmont Water Corporation and Belmont Country Club systems. The extent of the TCP contamination in the region makes well replacement a risky alternative. There is a high likelihood that any new well will be contaminated with TCP or naturally occurring contaminants such as arsenic, iron and manganese at levels above their MCLs.

- CSA-14 has no access to a surface water supply (raw or treated). Additionally, surface water treatment is not viable for a water system of this relatively small size.

5 Treatment Alternatives

5.1 Treatment Processes

Wellhead treatment alternatives including air stripping, reverse osmosis, advanced oxidation, sorbents, biological treatment, and granular activated carbon (GAC) have all been investigated for TCP removal treatment. The only two technologies that are viable for TCP treatment are GAC and engineered biological treatment. GAC treatment has been selected by all other utilities treating for TCP removal; has been identified by DDW as the only best available technology (BAT) for TCP removal; and is recommended in this memorandum. Biological treatment is more expensive, complicated and labor-intensive than GAC.

5.2 GAC System Design

5.2.1 GAC Design Parameters

Empty Bed Contact Time
The adsorption process is dynamic – requiring significant time during which the water is in contact with the carbon for complete removal of TCP to take place. The parameter used to describe the contact time is the empty bed contact time (EBCT), which is calculated by dividing the volume of media by the well flow rate. A total EBCT close to 15 minutes is recommended to accommodate TCP's relatively long adsorption mass transfer zone and the very low treated water TCP objective.

Hydraulic Loading Rate
The hydraulic loading rate (HLR) is calculated by dividing the flow through a single vessel, in gpm, by the cross-sectional area of that vessel. Higher HLR values result in greater pressure loss across the treatment system and can lead to short circuiting (channeling) of TCP through the media bed. HLR values below 6 gpm/ft^2 are recommended with 8 gpm/ft^2 being an upper limit for system sizing.

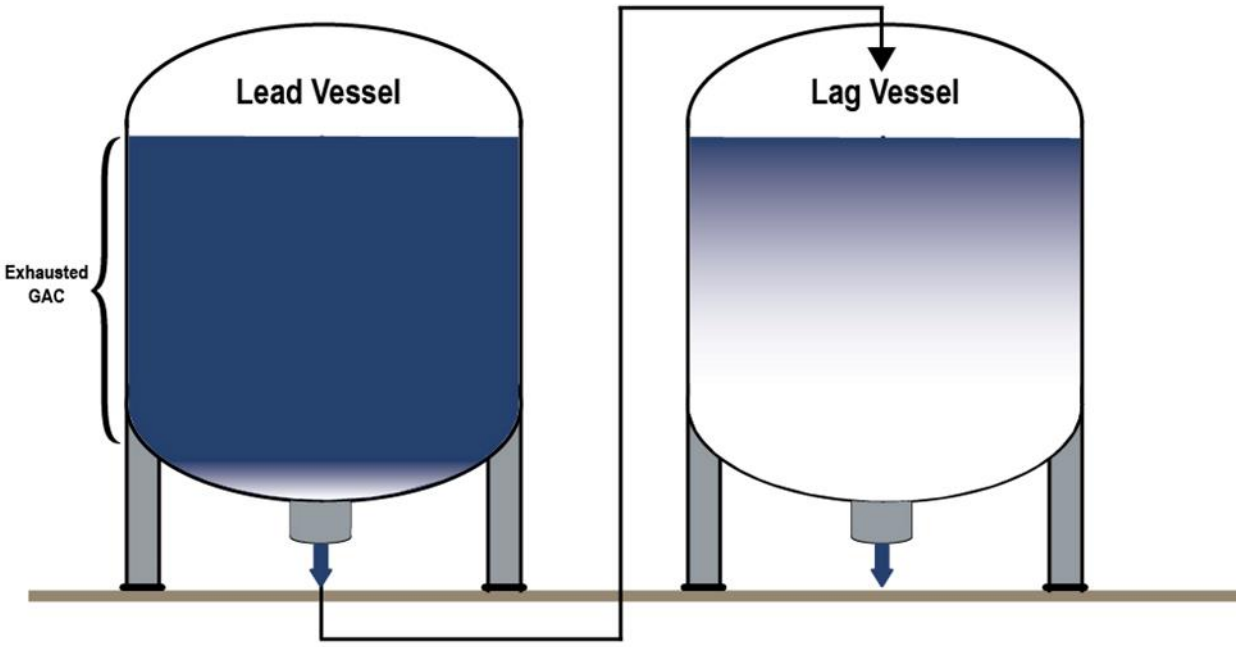
Series / Parallel Operation
For a given EBCT, there are two ways to operate the vessels: with or without pairs of vessels in series. With non-series operation, the water being treated flows through only one GAC vessel before entering the distribution system. With series operation, the water will flow through one vessel (the lead vessel) and then through a second vessel (the lag vessel) before entering the distribution system. The primary disadvantage of operating the vessels in a series configuration is that it increases the pressure drop across the treatment system. The primary advantages of operating the vessels in series are:

- The carbon in the lead vessel can be more completely utilized before it must be changed out. For non-series operation, the carbon in all vessels must be changed out while there is significant carbon adsorption capacity remaining.
- The carbon in the lag vessel acts as a safety buffer and should catch any TCP that unexpectedly makes it past the lead vessel. Unexpected breakthrough from the lead vessel might occur after hydraulic transients; following maintenance backwashing; due to channeling through the bed; or due to desorption of TCP from the carbon.
- The carbon in the lead vessel can be changed out while the well is still in operation and is being treated through the lag vessel. The well must be taken out of service to change out carbon when operating in a non-series configuration.

The following figure illustrates schematically how series operation allows the carbon in the lead vessel to be more fully utilized. In the figure the darker shade of blue represents carbon that has been fully saturated with TCP; the lighter shades of blue represent carbon that has varying degrees of TCP removal capacity remaining.

Because this study proposes that CSA-14 utilize a single treatment plant to treat both wells, it is essential that the vessels be operated in series so that carbon can be changed out at the same time that treated water is being produced to supply the system.

Figure 5-1: Series Vessel Operation



5.2.2 GAC Operational Impacts

Impact on Well Capacity

The addition of GAC treatment will create additional head loss downstream from the wells and will therefore cause the well pumps to operate further to the left on their pump curves (i.e. at a lower flow rate). The head loss across just the carbon media (total for two beds in series) is approximately 3 to 6 feet of water. However; the vessel underdrains and manifold piping add significantly to this. The total head loss across the entire treatment system from the inlet nozzle to the effluent nozzle is estimated to be between 15 and 23 feet of water (up to 10 psi) depending on the specific vessel design features and carbon installed.

Carbon Conditioning and Backwashing

Backwashing of the media must be performed after new carbon is loaded into a vessel. It may also be required if head loss builds up over time and possibly to mitigate nitrate sloughing (described below).

Newly delivered carbon must be soaked and backwashed before it is placed into service. If it is not, excessive head loss and reduced carbon adsorption capacity may result. Typically, the carbon is soaked in water for 24 hours to wet the carbon prior to the initial backwashing. Backwash flow rates will vary depending on the vessel diameter, carbon type installed, and the temperature of the water. The maximum backwash flow rate for a 6-foot diameter vessel is typically approximately 350 gpm. Over a 30-minute backwash, approximately 11,000 gallons are used. Backwashing new carbon accomplishes the following functions:

- Removes trapped air from the internal carbon pores and between media particles;

- Sweeps the resulting air from the carbon vessel;
- Removes carbon fines generated due to physical abrasion during transport.
- Stratifies the media bed;
- Flushes water soluble activation byproducts (e.g. ash) from the carbon.

Backwashing may also be required if the head loss through the adsorption system builds up to unacceptable levels over time. This might result if the well water contains sand or other suspended solids that would accumulate in the top portion of the carbon bed. A typical "maintenance" backwash criteria is to backwash the vessels when the head loss rises to between 10 and 15 psi. However; backwashing after the initial carbon load should occur sparingly since re-stratifying the bed will disrupt the adsorption mass transfer zone and result in reduced carbon life.

For larger municipal systems, water for backwashing is typically supplied from the distribution system, including any water being produced by GAC vessels that are still on-line. For CSA-14, there is not another source of treated water or enough water storage capacity in the system to supply the approximately 11,000-gallons needed to backwash a single vessel. Therefore, a dedicated backwash supply treated water storage tank and pump will be required. Furthermore, the GAC system will not be able to produce treated water while either GAC vessel is being backwashed. The District will require another source of treated water for the approximately 30-minute backwash period. It is proposed that the same tank that will supply treated water for backwashing will also supply treated water directly to the distribution system through a separate booster pump. The County anticipates being able to discharge GAC system backwash water to the CSA-14 storm water pond located near the southern end of the development.

Nitrate Sloughing

Even though GAC is ineffective for nitrate removal water treatment, some small amount of nitrate is adsorbed onto the media. Over time the nitrate adsorbed onto the media can become significant. If the GAC system is subjected to a water quality or hydraulic transient, such as might occur during vessel backwashing or if the water in the vessels is allowed to stagnate, it is possible for the GAC to release the adsorbed nitrate back into the treated water. If the nitrate levels in the raw water are relatively high, the desorption of nitrate from the GAC back into the water may cause the treated water to exceed the nitrate MCL.

DDW typically requires that, for wells that produce water exceeding ½ of the nitrate MCL, a continuous nitrate analyzer be installed. Well 1 has recently exceeded ½ of the nitrate MCL. The analyzer alarm should be configured to automatically shut the well down should the nitrate level exceed an operator adjustable setpoint.

The best way to avoid nitrate sloughing is to keep water flowing through the GAC system as continuously as possible.

Mandatory Chlorination

Bacteria tend to grow on GAC media and this can cause elevated levels of heterotrophic bacteria entering the distribution system. Heterotrophic bacteria, unlike coliform bacteria, are common in water distribution systems and are considered harmless. However; DDW will require the County to add routine chlorination to any water treated through the proposed GAC system. The wells are not currently equipped with chlorination systems so at least one new system will need to be constructed.

Estimated Carbon Usage Rate

There are currently limited operational full-scale treatment plants specifically targeting removal of TCP. Therefore, there is limited data related to carbon usage rates. The carbon usage rate data that is available spans

a broad range of values. Results as low as 0.083 lbs./1,000 gallons and as high as 1.2 lbs./1,000 gallons have been documented. It is noted that the wells representing the upper end of this carbon usage range are believed to produce water containing manganese that may be fouling the carbon. The levels of iron and manganese in Well 1 and iron in Well 2 could result in higher carbon usage rates but the specific impact cannot be further quantified without pilot study or full-scale testing.

For budgeting purposes, it is recommended that the County assume a carbon usage rate of 0.134 lbs./1,000 gallons. This value represents the adjusted average of carbon usage rates for other Central Valley utilities treating for TCP removal not including the extreme high usage rate of 1.2 lbs./1,000 gallons.

6 Recommended Mitigation Project

In order to provide both primary and standby sources of supply meeting the TCP standard, it is recommended that the County treat the water produced by both Well 1 and Well 2 using GAC. Because there is not enough space to construct a treatment plant at the Well 1 site, a centralized treatment plant located next to the existing Well 2 site is proposed. The County has indicated that the owner of the land surrounding Well 2 would likely be willing to sell CSA-14 the land required for this project. In order to be able to produce treated water while carbon is being replaced, the GAC treatment system must utilize two vessels operated in a series configuration.

The best alternative for disposing of backwash water and flush-to-waste water, including water produced mitigating nitrate sloughing events, is to connect the treatment plant to the County controlled CSA-14 storm water basin. A 24-inch storm drain pipeline has been assumed. The treatment plant outlet into the storm drain will be through a standpipe with an air gap.

The difference between normal peak domestic water demands (assumed to be 180 gpm) and the maximum flow rate that would be produced during firefighting (assumed to be 660 gpm) creates a GAC system design challenge. A pair of 10- or 12-foot vessels holding 714 ft^3 of carbon each would be required to handle the firefighting flow rate. However; such a system would be significantly oversized for the more typical 180 gpm flow rate. Conversely, a pair of 6-foot diameters vessels holding 179 ft^3 of carbon each would be almost ideally sized for the 180-gpm flow rate, but could not handle the 660 gpm firefighting flow. In order to provide treated water under both scenarios, a new water storage tank and booster pumping station would be required. At the direction of the County, for the time being, the recommended mitigation project includes 6-foot vessels and is configured to allow untreated water to bypass the GAC system during fire-flow or other unusually high-demand conditions. Furthermore, the recommended mitigation project will result in some reduction in fire-flow as a result of additional head loss created by the new infrastructure. It has been assumed that a pressure reducing valve will be installed in front of the Well 1 site to allow untreated water to enter the distribution system when distribution system pressures drop below an adjustable setpoint.

Additional features required to support the proposed project include:

- Raw water transmission pipeline (4-inch) from Well 1 to the treatment system located at Well 2;
- Storm water pipeline (24-inch) from the GAC treatment plant to the CSA-14 stormwater pond;
- Backwash water supply tank (25,000 gallon); backwash pump (350 gpm); and distribution booster pump (180 gpm);
- Sodium hypochlorite feed system and chlorine residual analyzer;
- Nitrate analyzer to detect nitrate sloughing events; and
- Chain link fence enclosure around the entire treatment site.

A schematic representation of the proposed improvements are presented in Figures 6-1 through 6-3.

SCALE IN FEET
0 50 100 200

LEGEND

- EXISTING FACILITY
- NEW FACILITY
- NEW CHAIN LINK FENCE
- EXISTING PERIMETER CHAIN LINK FENCE
- REMOVE STRUCTURE

EST. 1968
PROVOST & PRITCHARD CONSULTING GROUP
An Employee Owned Company

Figure - 6-1

Water System Vicinity

Fresno County CSA - 14

FACILITY KEY

① WELL 1

② HYDROPNEUMATIC TANK

③ ELECTRICAL PANELS

PRESSURE REDUCING VALVE

1,347 FT
4-INCH TRANSMISSION MAIN

WATER TO EXISTING DISTRIBUTION SYSTEM

①

②

③

SCALE IN FEET
0 5 10 20

LEGEND

EXISTING FACILITY

NEW FACILITY

NEW CHAIN LINK FENCE

EXISTING PERIMETER CHAIN LINK FENCE

REMOVE STRUCTURE

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Figure - 6-2

Well 1 Site

Fresno County CSA - 14

FACILITY KEY

1. WELL 2 AND BLADDER TANK
2. ELECTRICAL BUILDING
3. CHLORINATION
4. 8' GAC VESSELS
5. BACKWASH STANDPIPE
6. BACKWASH SUPPLY TANK
7. BACKWASH AND DISTRIBUTION SUPPLY PUMPS

740 FT
24–INCH
STORM DRAIN

TREATED WATER TO
DISTRIBUTION SYSTEM

1,347 FT
4–INCH
TRANSMISSION MAIN

SCALE IN FEET
0 5 10 20

LEGEND

- EXISTING FACILITY
- NEW FACILITY
- NEW CHAIN LINK FENCE
- EXISTING PERIMETER CHAIN LINK FENCE
- REMOVE STRUCTURE

EST. 1968
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CONSULTING GROUP
An Employee Owned Company

Figure - 6-3

Well 2 Site

Fresno County CSA - 14

7 Cost Opinion

The following table summarizes the estimated costs for capital improvements and ongoing operation and maintenance of the treatment plant. It should be noted that:

- A 20% contingency has been applied to the planning-level construction cost opinion.
- A $50,000 placeholder has been included for property acquisition. The County should independently determine whether this value is appropriate as no formal property appraisal has been completed.
- As noted previously, the proposed project results in a reduction in fire-flow capacity for the system. Additional costs would apply if this outcome needs to be mitigated.
- The capital cost value includes estimated costs for engineering, construction management, environmental, permitting and administration.
- The County should confirm the unit costs for the O&M cost estimate. In particular, the County should confirm that values used for fully burdened labor, TCP laboratory analyses, power, and sodium hypochlorite are representative of the anticipated unit costs.
- A 40-year present worth O&M estimate is included in the summary table based on typical TCP contamination longevities predicted by hydrogeologists for other TCP-contaminated water systems.

More detailed capital and O&M cost breakdowns are included in Appendix A.

Table 7-1: Cost Summary

Capital Cost	40-year O&M	Total
$1,610,000	$1,275,000	$2,885,000

Appendix A
Cost Estimates

Table 1
Summary of Probable Costs (TCP)

Treatment System	Capital Cost	40-year O&M	Total
Wells 1 & 2	$1,609,400	$1,274,415	$2,883,815

Table 2
Opinion of Probable Construction Cost (TCP)

	Wells 1 & 2
Total System Size in Total lbs of Carbon	10,000 lbs
No. of 2 Vessel GAC Trains	1
Design Flow	180 gpm
Site Construction Item	**Cost**
Site demolition, clearing and grubbing	$15,000
Purchase GAC vessels	$200,000
Vessel installation and testing	$20,000
At-grade vessel foundation	$20,000
Additional cost to recess vessels	$0
Site piping modifications/additions and PRV	$100,000
Offsite raw water pipeline (1,350 ft of 4-inch pipe)	$125,000
Offsite storm drain pipeline (740 ft of 18-inch pipe)	$100,000
Nitrate analyzer	$35,000
Chlorination system w/ analyzer	$25,000
Electrical modifications, metering, and telemetry modifications	$100,000
Well pump upgrades to overcome GAC head loss	$0
Backwash supply tank, backwash supply pump, and booster pump	$100,000
Miscellaneous site work, paving, vaults, fences	$100,000
Mobilization (5%)	$47,000
Subtotal Direct Cost	$987,000
Contingency (20%)	$197,400
Sales Tax on GAC Vessels Only (8.0%)	$16,000
Subtotal Construction Cost	$1,200,400
Land acquisition	$50,000
Engineering, geotech, surveying, and construction administration	$200,000
Construction Management and Inspection (7%)	$84,000
Environmental, Legal, Administration (5%)	$60,000
Operations Plan and permitting	$15,000
Total Capital Cost	**$1,609,400**

Table 3
Opinion of Probable Operation and Maintenance Costs (TCP)

Assumptions	
Carbon Usage Rate	0.134 lbs/1000gal
Carbon Cost	$2.00/lb
Power Unit Cost	$0.17/kWh
Pump Efficiency	70%
General Maintenance Labor Hours	4.0 hr/week
Additional Inspection and Maintenance	1.0 hr/system/week
Sampling Labor	0.25 hr/sample
Labor Unit Cost	$64.00/hr
TCP Required Laboratory and Sampling	2.0 sample/site/month
TCP Required Laboratory and Sampling	1.0 sample/pair/month
GAC Changeout Labor Requirement	12.0 hr
TCP Sampling Cost	$165.00/sample
BACT/HPC Sampling Cost	$35.00/sample
Sodium Hypochlorite (12.5%)	$2.00/gal
Present Worth 10 Year O&M Real Discount Rate	1.40%
Present Worth 20 Year O&M Real Discount Rate	1.50%
Present Worth 30 Year O&M Real Discount Rate	1.50%
Present Worth 40 Year O&M Real Discount Rate	1.50%
Present Worth 50 Year O&M Real Discount Rate	1.50%
O&M Costs (TCP)	**Wells 1 & 2**
Total System Size	10,000 lbs
No. of 2 Vessel GAC Trains	1
Design Flow	180 gpm
Duty Cycle	19.8%
Annual Production	19 MG/yr
Costs	
Annual Cost of Carbon Usage	$5,000
Annual Cost of Additional Power	$300
Annual Cost of Additional Labor	$21,000
Annual Cost of Additional Sampling	$6,000
Annual Cost of Vessel Maintenance	$10,000
Annual Cost of Sodium Hypochlorite	$300
Total Annual O&M Cost	**$42,600**
10-year Service Life O&M Costs	**$394,954**
20-year Service Life O&M Costs	**$731,384**
30-year Service Life O&M Costs	**$1,023,075**
40-year Service Life O&M Costs	**$1,274,415**
50-year Service Life O&M Costs	**$1,490,987**

APPENDIX B

FCSA #14 BELMONT MANOR – WATER SYSTEM NO. 1000023 ROUTINE SANITARY SURVEY

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board
Division of Drinking Water

September 20, 2017

Daniel Vang
2220 Tulare Street, 6th Floor
Fresno, CA 93722

RE: FCSA #14 Belmont Manor – Water System No. 1000023
Routine Sanitary Survey

Dear Mr. Vang:

The purpose of this letter is to inform you that the State Water Resources Control Board - Division of Drinking Water conducted a routine inspection of FCSA #14 Belmont Manor Water System on August 8, 2017. A Water System Evaluation and Inspection Report are enclosed. Please acknowledge in writing, by **October 1, 2017**, receipt of this report and your willingness to comply with the requirements and recommendations specified.

The Water System is required to comply with the provisions in the enclosed report. Failure to comply with the requirements within the enclosed report may result in the issuance of enforcement actions to the Water System.

If you have any questions regarding this report, please contact Caitlin Juarez at (559) 447-3300.

Sincerely,

José A. Robledo, P.E.
Senior Water Resource Control Engineer, Fresno District
SOUTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS

JAR/CJ

CC: Emilio Palomo, Field Operator
2220 Tulare Street, 6th Floor
Fresno, CA 93722

Figure 1: FCSA #14 Belmont Manor Service Area

PERMIT STATUS

The FCSA #14/Belmont Manor Water System operates under domestic water supply permit no. 03-12-08P-046 issued by the Division in October 2008. County of Fresno is the legal owner of the Water System and is responsible for complying with the permit and other regulatory requirements as specified in this report.

II. INVESTIGATION AND FINDINGS

SOURCES OF SUPPLY

The Water System utilizes two (2) groundwater wells; Well 01 - a standby source and Well 02 - an active source. The County completed a source water assessment for each well in July 2003. This assessment indicates that Well 01 is potentially vulnerable to agricultural fertilizers used in the area, not associated with any detected contaminants in the well and Well 02 is potentially vulnerable to low density septic

Well 02 is equipped with a 25 horsepower (HP) submersible pump with a capacity of approximately 180 gallons per minute (gpm). The pump discharge is equipped with a 4-inch discharge piping consisting of a check valve, flow meter, and a sample tap. The sample tap should be located downstream of the check valve/clay valve. A check valve could not be identified during the inspection due to piping being wrapped with insulation. **The Water System shall submit photo documentation that the samples tap is located upstream of the check valve.** Well 02 discharges into a 110 gallon capacity bladder tank which then discharges to a common 6,500 gallon hydropneumatic pressure tank located at the wellhead of standby Well 01.

During the inspection, the concrete slab surrounding the well was detached from the finished ground with evidence of burrowing animal activity and erosion. The slab shall be repaired to ensure the current situation does not provide a path for contaminants to reach groundwater. **The Division requires adequate fill be laid around the pad and the ground be graded away from the well or the pad be removed and a new concrete pad poured at least two feet in all directions and a minimum of six inches thick around the well casing.**

WATER SYSTEM PROCESS

Well 01 pumps directly into the shared 6,500-gallon capacity hydropneumatic tank prior to discharging into the distribution system. Well 02 discharges into a 110 gallon capacity bladder tank and serves a couple of homes before entering the shared hydropneumatic tank. The distribution system is looped. The hydropneumatic tank is typically pressurized between 50-60 psi. The Water System process schematic is shown in Figure 2.

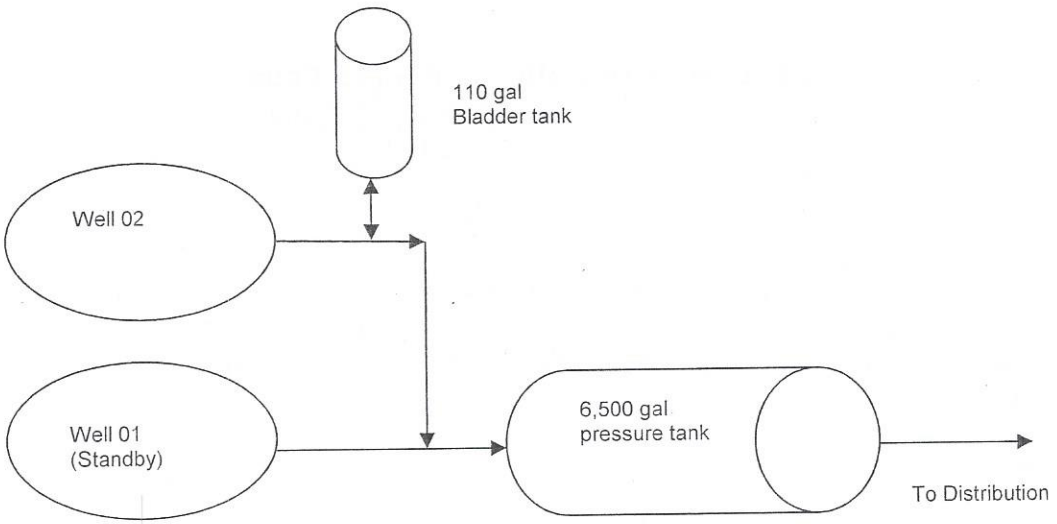


Figure 2. Water System Process Schematic

WATER PRODUCTION

Well 01 and Well 02 are both equipped with a flow meter. The Water Works Standards require all public water systems to record the production on a monthly basis. Production data shall be reported to the Division annually in the Electronic Annual Report. The 2016 Annual Report stated that the month of maximum use occurred in July with 0.843 million gallons with a total of 5.384 million gallons used for the year. The community reports low residential usage with a maximum usage in July of 0.46 gallons per minute (gpm) per service connection and 0.25 gpm per service connection annually.

1, 2, 3 – Trichloroprane Monitoring (1, 2, 3-TCP)

The State Water Board adopted a maximum contaminant level (MCL) for 1,2,3-TCP on July 18, 2017. The new MCL is 0.000005 mg/L or 5 parts per trillion. Additional information about the regulations, including effective date of the MCL and the requirements for initial monitoring will be provided to the Water System as soon as it is finalized. Belmont Manor tested for 1,2,3-TCP in both wells during 2008 and both sample results were 0.00014 mg/L.

Radiological Monitoring

The California Radionuclide Rule became effective on June 11, 2006 and applies to community and nontransient noncommunity water systems. This rule requires community systems to conduct four quarters of initial monitoring for Gross Alpha and Radium-228 activity. The initial monitoring for Gross Alpha activity and Radium-228 has been completed for both Well 01 and Well 02; **the Water System shall collect regular samples for gross alpha activity analysis once every nine years for each well. The next gross alpha samples are due in March 2018.**

Source Bacteriological Monitoring

As part of the Groundwater Rule, the Water System will be required to collect a bacteriological sample from any source that may have contributed to the contamination as part of follow-up sampling after a positive bacteriological sample from the distribution system. Well 02 shall be identified as a source to be sampled on the Bacteriological Sample Siting Plan.

DISTRIBUTION MONITORING

Bacteriological

One (1) routine bacteriological sample shall be collected every month from the distribution system from sampling sites in accordance with an approved Bacteriological Sample Siting Plan (BSSP). The Water System has an approved BSSP on file with the Division, dated January 2009. The samples are taken at the hose bibs at the specified homes. A summary of the past bacteriological samples are included in Appendix D.

Lead and Copper Monitoring

The Water System's most recent round of lead and copper sampling was in June 2017 and resulted in lead and copper 90th percentile concentrations below the respective action levels. The Water System was approved for continued triennial lead and copper monitoring and has maintained the required sampling. The Water System shall remain on triennial monitoring as long as there is not an action level exceedance. **The next round of lead and copper monitoring shall be conducted with the collection of first flush samples at 5 sites during the summer (June-September) of 2020.** A copy of the lab results shall be submitted to the District 23 email account along with the Lead and Copper Tap Sample Results Reporting Form. A summary of the lead and copper sampling results and appropriate form can be found in Appendix E.

NSF STANDARDS 60 AND 61

California Waterworks Standards require that all materials that come into contact with the drinking water be lead free and certified under NSF/ANSI Standard 61 to demonstrate the material does not leach any contaminants into the drinking water. California Water Works Standards also require that chemicals used in the water system, including chlorine, shall be certified under NSF/ANSI standard 60 as a direct additive to drinking water.

RECORD MAINTENANCE AND RETENTION

Title 22 of the California Code of Regulations specifies minimum record maintenance and retention requirements for certain records.

Electronic Submittal of Records and Reports

The Division has implemented a Paperless Office System to reduce paper use, increase efficiency, and provide a more effective way for our staff and the public to view water quality documents. Effective July 1, 2016, all routine submittals to the Division should be sent electronically. This includes all monthly monitoring reports, general correspondence, and any other routine submittals. The analyzing laboratories should continue to submit water quality results via EDT as appropriate and not via the Paperless Office System. In general, instead of mailing hardcopy documents, the Water System will email electronic documents to the Division's Fresno District inbox at DWPDist23@waterboards.ca.gov. Additional guidance and instructions for electronic submittal of documents is available from the Division upon request.

The Division will accept electronic signatures that represent the approval of the signer. Water systems are advised that anything they submit to the Division for compliance purposes is assumed to be endorsed by the water system's management and ownership. Where a signature is specifically required by law or regulation, the Water System should maintain the signed original of the document for the period of time prescribed in the law or regulation.

VI. APPRAISAL OF SANITARY HAZARDS & PUBLIC HEALTH SAFEGUARDS

The Water System is up to date on all water quality monitoring for Well 01 and Well 02. Although the well sites are vulnerable to septic systems and agricultural fertilizers in the area, the related constituents are below the MCL. Belmont Manor is within close proximity of Belmont Water Corporation, Belmont Country Club, Fresno Hmong Alliance, and City of Fresno. The Water System does not have any emergency interties with any of the nearby public water systems. Well 01 has had a history of MCL exceedances for iron, manganese, and turbidity. Quarterly testing should be implemented to investigate if the contaminants are still present.

VII. CONCLUSIONS AND RECOMMENDATIONS

1. By no later than **October 31, 2017**, the Water System shall submit an update Emergency Notification Plan to the Division.

2. By no later than **October 31, 2017,** the Water System shall submit Well 02 driller's log or well completion report to the Division.

3. The concrete slab (surface seal) surrounding Well 02 was detached from the finished ground with evidence of burrowing animal activity. It should be repaired to ensure the current situation does not provide a path for contaminants to reach groundwater. The Division will require adequate fill be laid around the pad and the ground be graded away from the well or the pad removed and a new concrete pad poured at least two feet in all directions around the well casing. By no later than **November 15, 2017**, the Water System shall submit photo documentation to the Division showing the improvements made to the concrete slab.

4. Well 02 is not equipped with a "pump to waste" capability. The Division recommends that this line be installed to discharge highly chlorinated water following well repairs or bacteriological contamination. By no later than **November 15, 2017,** the Water System shall submit photo documentation to the Division of the discharge to waste line.

5. By **December 1, 2017**, the Water System must have a certified cross connection control specialist conduct a Cross-Connection Control Survey. A report documenting the survey finding, recommendations for backflow protection, and documentation of any devices installed shall be submitted to the Division along the survey form at the end of Appendix G.

6. The Water System shall collect quarterly samples for Well 01 for a minimum of one year for iron, manganese, and turbidity to ensure there is no longer an issue. These results shall be submitted to the Division for review.

Appendices

Appendix A:	Photographs
Appendix B:	Source Chemical Monitoring
Appendix C:	Next & Last Sample Report
Appendix D:	Bacteriological Distribution Monitoring Report
Appendix E:	Lead and Copper Monitoring Results
Appendix F:	Emergency Notification Plan
Appendix G:	Cross Connection Survey Guidelines

Small Water System Evaluation and Inspection Report
Drinking Water Field Operations Branch: Fresno District

FCSA #14 Belmont Manor
System No. 1000471
Report Date: September 20, 2017

Contact:	Emilio Palomo	System Type:	Community
Inspection Date:	August 8, 2017	Inspected by:	Caitlin Juarez

I. INTRODUCTION

A routine inspection of the Fresno County Service Area (FCSA) #14 Belmont Manor Water System (Water System) was conducted on August 8, 2017 with Emilio Palomo (Buster), Field Operator. Buster is responsible for sampling and daily operations of the Water System. Ms. Nayiri Moumdjian is the assigned staff analyst overseeing the Water System. The Water System is owned and operated by Fresno County. The mailing address for the Water System is 2220 Tulare Street, 6th Floor Fresno, CA 93722.

ENFORCEMENT HISTORY

The Water System was issued a Boil Water Order on October 23, 2014 due to a mainline water leak detected around Madison and Rector Avenue. The Water System was temporarily shut down to repair of the line. The Water System has not received any enforcement letters or citations since the issuance of the domestic supply permit.

SERVICE AREA

The Water System is classified as a community system and is located in Fresno County along Belmont Avenue, east of Leonard Avenue. The service area is bounded by E. Belmont Avenue, N. Leonard Avenue, E. McKenzie Avenue, Madison and N. Reactor Way. The service area map and location of the wells is shown in Figure 1. The typical lot size is 0.3 acres. The Water System serves a year-round population of approximately 115 via 41 active residential service connections, none of which are metered. Wastewater treatment is provided in the community by individual septic tank/leach field systems. The surrounding land use is primarily agricultural and low density residential.

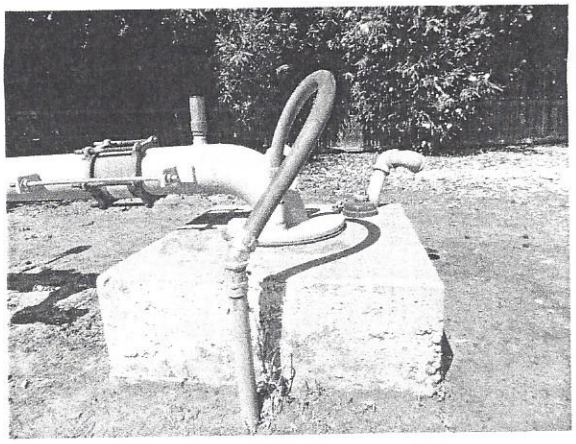
The Water System is only about 1.5 miles east of the City of Fresno service area. The City of Fresno has a 12-inch distribution main at the intersection of E. Belmont Avenue and N. Temperance Avenue. The Water System is also in close proximity to other small public water systems. Belmont Water Corporation (BWC) is a community water system which is located about 3,000 feet southwest of the Water System. Belmont Country Club is a non-transient non-community water system which is located less than 1,000 feet from the Water System. Fresno Hmong Alliance Church is a transient non-community water system which is located about 1,300 feet west of the Water System. The Water System does not have any emergency interties with the nearby public water systems mentioned above.

There is a possibility that there are private wells in the Water System's service area. The Water System should ensure that the service connections to the lots with private wells are equipped with appropriate backflow prevention devices. Based on the 2016 Annual Report, there are no backflow prevention devices in the Water System. This is further discussed in Section IV under cross-connection control program.

Appendix A
FCSA #14 Belmont Manor
System No. 1000023
Photographs

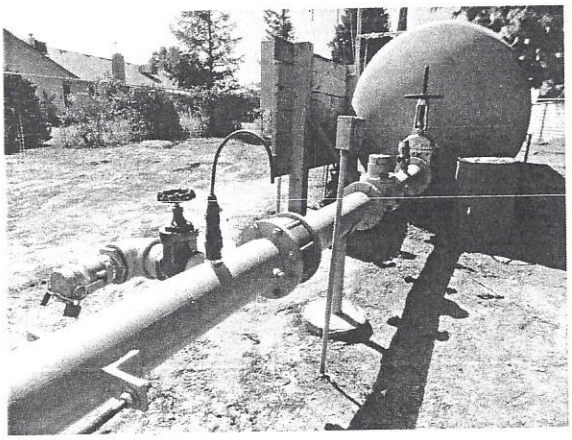
Well 01—*Standby*

Well 01 was drilled in 1985 to a depth of 218 feet. The well has a capacity of approximately 440 gallons per minute.



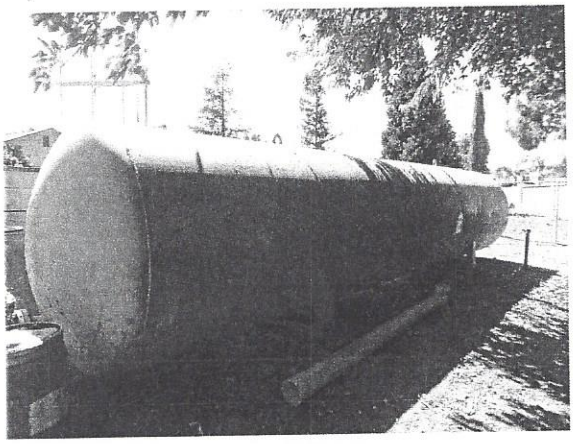
Well 01 Discharge Pipe

Well 01 discharge pipe is equipped with a dedicated sample tap, discharge to waste capabilities, and flow meter.



Well 01 Pressure Tank

Well 01 and Well 02 flow into a shared 6,500 gallon hydropneumatic pressure tank located near Well 01.



STATE OF CALIFORNIA
DRINKING WATER ANALYSES RESULTS REPORT
LAST SAMPLE FOR ALL CONSTITUENTS - ALL RESULTS
REPORT OF SYSTEM: 1000023

SYSTEM NO: 1000023 NAME: FCSA #14/BELMONT MANOR COUNTY: FRESNO

SOURCE NO: 001 NAME: WELL 01 - STANDBY CLASS: STBY STATUS: Active

PSCODE		GROUP/CONSTITUENT IDENTIFICATION		DATE	RESULT	*	MCL	DLR	TRIGGER	UNIT
1000023001	IO	INORGANIC								
		01105	ALUMINUM	2011/04/30	260.0000	*	1000	50	200.000	UG/L
		01097	ANTIMONY	2011/04/30	< .0000		6	6	6.000	UG/L
		01002	ARSENIC	2017/02/13	1.5		10	2	5.000	UG/L
		01007	BARIUM	2011/04/30	43.0000		1000	100	1000.000	UG/L
		01012	BERYLLIUM	2011/04/30	< .0000		4	1	4.000	UG/L
		01027	CADMIUM	2011/04/30	< .0000		5	1	5.000	UG/L
		01034	CHROMIUM (TOTAL)	2011/04/30	4.0000		50	10	50.000	UG/L
		01032	CHROMIUM, HEXAVALENT	2015/02/19	< .2000		10	1	10.000	UG/L
		01291	CYANIDE	2008/04/15	< .0000		150	100	150.000	UG/L
		00951	FLUORIDE (F) (NATURAL-SOURCE)	2011/04/30	.1700		2	.1	2.000	MG/L
		01051	LEAD	2008/04/15	1.2000		--------	5	15.000	UG/L
		71900	MERCURY	2011/04/30	< .0000		2	1	2.000	UG/L
		01067	NICKEL	2011/04/30	1.6000		100	10	100.000	UG/L
		A-031	PERCHLORATE	2012/07/31	< 4.0000		6	4	4.000	UG/L
		01147	SELENIUM	2011/04/30	< .0000		50	5	50.000	UG/L
		01059	THALLIUM	2011/04/30	< .0000		2	1	2.000	UG/L
	NI	NITRATE/NITRITE								
		00618	NITRATE (AS N)	2016/03/29	7.4	*	10	.4	5.000	mg/L
		71850	NITRATE (AS NO3)	2015/02/12	< .0000		45	2	23.000	MG/L
		00620	NITRITE (AS N)	2009/03/27	< 300.0000		1000	400	500.000	UG/L
	RA	RADIOLOGICAL								
		11503	COMBINED RA 226 + RA 228	2008/04/15	.2000		5		5.000	PCI/L
		11504	COMBINED RA 226 + RA 228 COUNTING ERROR	2008/04/15	.3200	*	--------	--------	--------	PCI/L
		01501	GROSS ALPHA	2009/03/27	< 3.0000		15	3	5.000	PCI/L
		01502	GROSS ALPHA COUNTING ERROR	2009/03/27	1.3700	*	--------	--------	--------	PCI/L
		03501	GROSS BETA	2008/12/18	< 4.0000	*	--------	1	--------	PCI/L
		03502	GROSS BETA COUNTING ERROR	2008/12/18	.7990	*	--------	--------	--------	PCI/L
		09501	RADIUM 226	2008/04/15	.1000	*	--------	1	--------	PCI/L
		09502	RADIUM 226 COUNTING ERROR	2008/04/15	.0900	*	--------	--------	--------	PCI/L
		11501	RADIUM 228	2009/03/27	< 1.0000	*	--------	1	--------	PCI/L

SYSTEM NO: 1000023 NAME: FCSA #14/BELMONT MANOR COUNTY: FRESNO

SOURCE NO: 001 NAME: WELL 01 - STANDBY CLASS: STBY STATUS: Active

PSCODE		GROUP/CONSTITUENT IDENTIFICATION		DATE	RESULT	*	MCL	DLR	TRIGGER	UNIT
1000023001	S1	REGULATED VOC								
		34546	TRANS-1,2-DICHLOROETHYLENE	2017/02/13	< 0.500		10	.5	0.500	UG/L
		39180	TRICHLOROETHYLENE	2017/02/13	< 0.500		5	.5	0.500	UG/L
		34488	TRICHLOROFLUOROMETHANE	2017/02/13	< 5.000		150	5	5.000	UG/L
		81611	TRICHLOROTRIFLUOROETHANE (FREON 113)	2017/02/13	< 10.000		1200	10	10.000	UG/L
		39175	VINYL CHLORIDE	2017/02/13	< 0.500		.5	.5	0.500	UG/L
		81551	XYLENES (TOTAL)	2017/02/13	< 1750.000		1750	0.5	1750.000	UG/L
	S2	REGULATED SOC								
		77825	ALACHLOR	2017/02/13	< 1.000		2	1	1.000	UG/L
		39033	ATRAZINE	2017/02/13	< 0.500		1	.5	0.500	UG/L
		81405	CARBOFURAN	1987/07/23	< 5.0000		18	5	5.000	UG/L
		38761	DIBROMOCHLOROPROPANE (DBCP)	2017/02/13	< 0.010		.2	.01	0.010	UG/L
		81287	DINOSEB	1987/07/23	< 100.0000	*	7	2	2.000	UG/L
		77651	ETHYLENE DIBROMIDE (EDB)	2017/02/13	< 0.020		.05	.02	0.020	UG/L
		34386	HEXACHLOROCYCLOPENTADIENE	2008/04/15	< .0000		50	1	1.000	UG/L
		82199	MOLINATE	2008/04/15	< .0000		20	2	2.000	UG/L
		38865	OXAMYL	1987/07/23	< 10.0000		200	20	20.000	UG/L
		39055	SIMAZINE	2017/02/13	< 1.000		4	1	1.000	UG/L
		A-001	THIOBENCARB	2017/02/13	< 1.000		70	1	1.000	UG/L
	UA	STATE UCMR								
		77562	1,1,1,2-TETRACHLOROETHANE	2017/02/13	< 0.500		--------	.5	0.500	UG/L
		77443	1,2,3-TRICHLOROPROPANE (1,2,3,-TCP)	2008/04/15	.1400	*	--------	0.005	0.005	UG/L
		34668	DICHLORODIFLUOROMETHANE (FREON 12)	2017/02/13	< 1000.000		--------	0.5	1000.000	UG/L
		A-033	ETHYL-TERT-BUTYL ETHER	2017/02/13	< 3.000		--------	3	--------	UG/L
		A-034	TERT-AMYL-METHYL ETHER	2017/02/13	< 3.000		--------	3	--------	UG/L
	UB	UNREG. TABLE B								
		77222	1,2,4-TRIMETHYLBENZENE	2017/02/13	< 330.000		--------	0.5	330.000	UG/L
		38458	DIMETHOATE	2008/04/15	< .0000		--------	--------	--------	UG/L

STATE OF CALIFORNIA
DRINKING WATER ANALYSES RESULTS REPORT
LAST SAMPLE FOR ALL CONSTITUENTS - ALL RESULTS
REPORT OF SYSTEM: 1000023

SYSTEM NO: NAME: COUNTY:

SOURCE NO: NAME: CLASS: STATUS:

PSCODE		GROUP/CONSTITUENT IDENTIFICATION		DATE		RESULT	*	MCL	DLR	TRIGGER	UNIT
1000023001	XX	A-036	DIISOPROPYL ETHER	2017/02/13	<	0.0000000000		--------	3	--------	UG/L
		34391	HEXACHLOROBUTADIENE	2017/02/13	<	0.0000000000		--------	.5	0.500	UG/L
		77223	ISOPROPYLBENZENE	2017/02/13	<	0.0000000000		--------	0.5	770.000	UG/L
		A-014	M,P-XYLENE	2017/02/13	<	0.0000000000		--------	.5	--------	UG/L
		601-N	METHOD 601 NEGATIVE - NO 602 REPORTED	1987/07/23	<	.0000		--------	--------	--------	
		602-N	METHOD 602 NEGATIVE - NO 601 REPORTED	1987/07/23	<	.0000		--------	--------	--------	
		81595	METHYL ETHYL KETONE	1987/07/23	<	.0000		--------	5	--------	UG/L
		81596	METHYL ISOBUTYL KETONE	1987/07/23	<	.0000		--------	5	120.000	UG/L
		39356	METOLACHLOR	2008/04/15	<	.0000		--------	--------	--------	UG/L
		81408	METRIBUZIN	2008/04/15	<	.0000		--------	--------	--------	UG/L
		A-010	N-BUTYLBENZENE	2017/02/13	<	0.0000000000		--------	0.5	0.500	UG/L
		77224	N-PROPYLBENZENE	2017/02/13	<	0.0000000000		--------	0.5	260.000	UG/L
		77135	O-XYLENE	2017/02/13	<	0.0000000000		--------	.5	--------	UG/L
		39057	PROMETRYN	2008/04/15	<	.0000		--------	2	2.000	UG/L
		77350	SEC-BUTYLBENZENE	2017/02/13	<	0.0000000000		--------	0.5	0.500	UG/L
		38882	TERBACIL	2008/04/15	<	.0000		--------	--------	--------	UG/L
		77035	TERT-BUTYL ALCOHOL (TBA)	2017/02/13	<	0.0000000000		--------	2	12.000	UG/L
		77353	TERT-BUTYLBENZENE	2017/02/13	<	0.0000000000		--------	0.5	0.500	UG/L
		34699	TRANS-1,3-DICHLOROPROPENE	2017/02/13	<	0.0000000000		.5	.5	--------	UG/L

SYSTEM NO: 1000023 NAME: FCSA #14/BELMONT MANOR COUNTY: FRESNO

SOURCE NO: 013 NAME: WELL 02 CLASS: CTGA STATUS: Active

PSCODE		GROUP/CONSTITUENT IDENTIFICATION		DATE	RESULT	*	MCL	DLR	TRIGGER	UNIT
1000023013	IO	INORGANIC								
		01105	ALUMINUM	2016/03/28	0000000000		1000	50	200.000	UG/L
		01097	ANTIMONY	2016/03/28	0000000000		6	6	6.000	UG/L
		01002	ARSENIC	2015/02/12	1.7000		10	2	5.000	UG/L
		01007	BARIUM	2016/03/28	53		1000	100	1000.000	UG/L
		01012	BERYLLIUM	2016/03/28	0000000000		4	1	4.000	UG/L
		01027	CADMIUM	2016/03/28	0000000000		5	1	5.000	UG/L
		01034	CHROMIUM (TOTAL)	2016/03/28	1.7		50	10	50.000	UG/L
		01032	CHROMIUM, HEXAVALENT	2015/02/19	1.0000		10	1	10.000	UG/L
		01291	CYANIDE	2008/04/15	< .0000		150	100	150.000	UG/L
		00951	FLUORIDE (F) (NATURAL-SOURCE)	2016/03/28	0000000000		2	.1	2.000	MG/L
		01051	LEAD	2016/03/28	0000000000		--------	5	15.000	UG/L
		71900	MERCURY	2016/03/28	0000000000		2	1	2.000	UG/L
		01067	NICKEL	2016/03/28	0000000000		100	10	100.000	UG/L
		A-031	PERCHLORATE	2017/02/13	< 4		6	4	4.000	UG/L
		01147	SELENIUM	2016/03/28	0000000000		50	5	50.000	UG/L
		01059	THALLIUM	2016/03/28	0000000000		2	1	2.000	UG/L
	NI	NITRATE/NITRITE								
		00618	NITRATE (AS N)	2017/02/13	2.2		10	.4	5.000	mg/L
		71850	NITRATE (AS NO3)	2015/02/12	9.6000		45	2	23.000	MG/L
		00620	NITRITE (AS N)	2015/02/12	< .0000		1000	400	500.000	UG/L
	RA	RADIOLOGICAL								
		11503	COMBINED RA 226 + RA 228	2008/04/15	.5600		5		5.000	PCI/L
		11504	COMBINED RA 226 + RA 228 COUNTING ERROR	2008/04/15	.3000	*	--------	--------	--------	PCI/L
		01501	GROSS ALPHA	2009/03/27	< 3.0000		15	3	5.000	PCI/L
		01502	GROSS ALPHA COUNTING ERROR	2009/03/27	.8500	*	--------	--------	--------	PCI/L
		03501	GROSS BETA	2008/12/18	< 4.0000	*	--------	1	--------	PCI/L
		03502	GROSS BETA COUNTING ERROR	2008/12/18	.7880	*	--------	--------	--------	PCI/L
		09501	RADIUM 226	2008/04/15	.0100	*	--------	1	--------	PCI/L

SYSTEM NO: 1000023 NAME: FCSA #14/BELMONT MANOR COUNTY: FRESNO

SOURCE NO: 013 NAME: WELL 02 CLASS: CTGA STATUS: Active

PSCODE	GROUP/CONSTITUENT IDENTIFICATION		DATE	RESULT	*	MCL	DLR	TRIGGER	UNIT
1000023013	S1	REGULATED VOC							
	39180	TRICHLOROETHYLENE	2014/03/14	< .0000		5	.5	0.500	UG/L
	34488	TRICHLOROFLUOROMETHANE	2014/03/14	< .0000		150	5	5.000	UG/L
	81611	TRICHLOROTRIFLUOROETHANE (FREON 113)	2014/03/14	< .0000		1200	10	10.000	UG/L
	39175	VINYL CHLORIDE	2014/03/14	< .0000		.5	.5	0.500	UG/L
	81551	XYLENES (TOTAL)	2014/03/14	< .0000		1750	0.5	1750.000	UG/L
	S2	REGULATED SOC							
	77825	ALACHLOR	2016/08/02	< 0.20		2	1	1.000	UG/L
	39033	ATRAZINE	2016/08/02	< 0.30		1	.5	0.500	UG/L
	34247	BENZO (A) PYRENE	2016/08/02	< 0.10		.2	.1	0.100	UG/L
	A-026	DI(2-ETHYLHEXYL)ADIPATE	2016/08/02	< 1.0		400	5	5.000	UG/L
	39100	DI(2-ETHYLHEXYL)PHTHALATE	2016/08/02	< 3.0		4	3	3.000	UG/L
	38761	DIBROMOCHLOROPROPANE (DBCP)	2015/02/12	< .0000		.2	.01	0.010	UG/L
	38926	ENDOTHALL	2016/08/02	< 20		100	45	45.000	UG/L
	77651	ETHYLENE DIBROMIDE (EDB)	2017/02/13	< 0000000000		.05	.02	0.020	UG/L
	34386	HEXACHLOROCYCLOPENTADIENE	2008/04/15	< .0000		50	1	1.000	UG/L
	82199	MOLINATE	2008/04/15	< .0000		20	2	2.000	UG/L
	39055	SIMAZINE	2016/08/02	< 0.30		4	1	1.000	UG/L
	A-001	THIOBENCARB	2016/08/02	< 0.50		70	1	1.000	UG/L
	UA	STATE UCMR							
	77562	1,1,1,2-TETRACHLOROETHANE	2014/03/14	< .0000		--------	.5	0.500	UG/L
	77443	1,2,3-TRICHLOROPROPANE (1,2,3,-TCP)	2008/04/15	.1400	*	--------	0.005	0.005	UG/L
	34668	DICHLORODIFLUOROMETHANE (FREON 12)	2014/03/14	< .0000		--------	0.5	1000.000	UG/L
	A-033	ETHYL-TERT-BUTYL ETHER	2014/03/14	< .0000		--------	3	--------	UG/L
	A-034	TERT-AMYL-METHYL ETHER	2014/03/14	< .0000		--------	3	--------	UG/L
	UB	UNREG. TABLE B							
	77222	1,2,4-TRIMETHYLBENZENE	2014/03/14	< .0000		--------	0.5	330.000	UG/L
	38458	DIMETHOATE	2008/04/15	< .0000		--------	--------	--------	UG/L
	81894	EPTC	2008/04/15	< .0000		--------	--------	--------	UG/L
	A-011	P-ISOPROPYLTOLUENE	2014/03/14	< .0000		--------	--------	--------	UG/L

SYSTEM NO: NAME: COUNTY:

SOURCE NO: NAME: CLASS: STATUS:

PSCODE		GROUP/CONSTITUENT IDENTIFICATION		DATE	RESULT	*	MCL	DLR	TRIGGER	UNIT
1000023013	XX	39057	PROMETRYN	2008/04/15	< .0000		--------	2	2.000	UG/L
		77350	SEC-BUTYLBENZENE	2014/03/14	< .0000		--------	0.5	0.500	UG/L
		38882	TERBACIL	2008/04/15	< .0000		--------	--------	--------	UG/L
		77035	TERT-BUTYL ALCOHOL (TBA)	2014/03/14	< .0000		--------	2	12.000	UG/L
		77353	TERT-BUTYLBENZENE	2014/03/14	< .0000		--------	0.5	0.500	UG/L
		34699	TRANS-1,3-DICHLOROPROPENE	2014/03/14	< .0000		.5	.5	--------	UG/L

LAST SAMPLE DATE AND MONITORING SCHEDULE

SYSTEM NO: 1000023 NAME: FCSA #14/BELMONT MANOR COUNTY: FRESNO

SOURCE NO: NAME: WELL 01 - STANDBY CLASS: STBY STATUS: Active

PSCODE	GROUP/CONSTITUENT IDENTIFICATION			LAST RESULT	UNITS	MCL	DLR	LAST SAMPLE	COUNT	FREQ MONTHS	MOD	NEXT SAMPLE DUE	NOTES
1000023 - 001	IO INORGANIC												
	01007	BARIUM		43.0000	UG/L	1000	100	2011/04/30	3	108		2020/04	
	01012	BERYLLIUM	<	.0000	UG/L	4	1	2011/04/30	3	108		2020/04	
	01027	CADMIUM	<	.0000	UG/L	5	1	2011/04/30	3	108		2020/04	
	01034	CHROMIUM (TOTAL)		4.0000	UG/L	50	10	2011/04/30	3	108		2020/04	
	00951	FLUORIDE (F) (NATURAL-SOURCE)		.1700	MG/L	2	.1	2011/04/30	3	108		2020/04	
	71900	MERCURY	<	.0000	UG/L	2	1	2011/04/30	3	108		2020/04	
	01067	NICKEL		1.6000	UG/L	100	10	2011/04/30	3	108		2020/04	
	A-031	PERCHLORATE	<	4.0000	UG/L	6	4	2012/07/31	4	108		2021/07	
	01147	SELENIUM	<	.0000	UG/L	50	5	2011/04/30	3	108		2020/04	
	01059	THALLIUM	<	.0000	UG/L	2	1	2011/04/30	3	108		2020/04	
	NI NITRATE/NITRITE												
	00618	NITRATE (AS N)		7.4	mg/L	10	.4	2016/03/29	8	108	M	2025/03	
	00620	NITRITE (AS N)	<	300.0000	UG/L	1000	400	2009/03/27	1	108		2018/03	
	RA RADIOLOGICAL												
	01501	GROSS ALPHA	<	3.0000	PCI/L	15	3	2009/03/27	6	108		2018/03	
	S1 REGULATED VOC												
	34506	1,1,1-TRICHLOROETHANE	<	ND	UG/L	200	.5	2017/02/13	3	108		2026/02	
	34516	1,1,2,2-TETRACHLOROETHANE	<	ND	UG/L	1	.5	2017/02/13	3	108		2026/02	
	34511	1,1,2-TRICHLOROETHANE	<	ND	UG/L	5	.5	2017/02/13	3	108		2026/02	
	34496	1,1-DICHLOROETHANE	<	ND	UG/L	5	.5	2017/02/13	3	108		2026/02	
	34501	1,1-DICHLOROETHYLENE	<	ND	UG/L	6	.5	2017/02/13	3	108		2026/02	
	34551	1,2,4-TRICHLOROBENZENE	<	ND	UG/L	5	.5	2017/02/13	2	108		2026/02	
	34536	1,2-DICHLOROBENZENE	<	ND	UG/L	600	.5	2017/02/13	3	108		2026/02	
	34531	1,2-DICHLOROETHANE	<	ND	UG/L	.5	.5	2017/02/13	3	108		2026/02	
	34541	1,2-DICHLOROPROPANE	<	ND	UG/L	5	.5	2017/02/13	2	108		2026/02	

LAST SAMPLE DATE AND MONITORING SCHEDULE

SYSTEM NO: 1000023 NAME: FCSA #14/BELMONT MANOR COUNTY: FRESNO

SOURCE NO: 013 NAME: WELL 02 CLASS: CTGA STATUS: Active

PSCODE	GROUP/CONSTITUENT IDENTIFICATION		LAST RESULT	UNITS	MCL	DLR	LAST SAMPLE	COUNT	FREQ MONTHS	MOD	NEXT SAMPLE DUE	NOTES
1000023 - 013	**FCSA #14/BELMONT MANOR**		**013**	**WELL 02**								
	GP SECONDARY/GP											
	00440 BICARBONATE ALKALINITY		170.0000	MG/L	--------	--------	2015/02/12	4	36		2018/02	
	00916 CALCIUM		22.0000	MG/L	--------	--------	2015/02/12	4	36		2018/02	
	00445 CARBONATE ALKALINITY	<	.0000	MG/L	--------	--------	2015/02/12	4	36		2018/02	
	00940 CHLORIDE		5.9	MG/L	500	--------	2016/03/28	3	36		2019/03	
	00081 COLOR	<	.0000	UNITS	15	--------	2015/02/12	4	36		2018/02	
	01042 COPPER	<	ND	UG/L	1000	50	2017/02/13	5	36		2020/02	
	38260 FOAMING AGENTS (MBAS)	<	ND	MG/L	.5	--------	2017/02/13	4	36		2020/02	
	00900 HARDNESS (TOTAL) AS CACO3		120.0000	MG/L	--------	--------	2015/02/12	4	36		2018/02	
	71830 HYDROXIDE ALKALINITY	<	.0000	MG/L	--------	--------	2015/02/12	4	36		2018/02	
	01045 IRON	<	ND	UG/L	300	100	2017/02/13	4	36		2020/02	
	00927 MAGNESIUM		17.0000	MG/L	--------	--------	2015/02/12	4	36		2018/02	
	01055 MANGANESE	<	ND	UG/L	50	20	2017/02/13	4	36		2020/02	
	00086 ODOR THRESHOLD @ 60 C		1.0000	TON	3	1	2015/02/12	4	36		2018/02	
	00403 PH, LABORATORY		7.8		--------	--------	2017/02/13	4	36		2020/02	
	01077 SILVER		ND	UG/L	100	10	2016/03/28	4	36		2019/03	
	00929 SODIUM		23.0000	MG/L	--------	--------	2015/02/12	4	36		2018/02	
	00095 SPECIFIC CONDUCTANCE		360	US	1600	--------	2017/02/13	4	36		2020/02	
	00945 SULFATE		16	MG/L	500	.5	2017/02/13	4	36		2020/02	
	70300 TOTAL DISSOLVED SOLIDS		230	MG/L	1000	--------	2017/02/13	4	36		2020/02	
	82079 TURBIDITY, LABORATORY		.2600	NTU	5	.1	2015/02/12	4	36		2018/02	
	01092 ZINC		60	UG/L	5000	50	2017/02/13	4	36		2020/02	
	IO INORGANIC											
	01105 ALUMINUM		ND	UG/L	1000	50	2016/03/28	3	36		2019/03	
	01097 ANTIMONY		ND	UG/L	6	6	2016/03/28	3	36		2019/03	
	01002 ARSENIC		1.7000	UG/L	10	2	2015/02/12	5	36		2018/02	

LAST SAMPLE DATE AND MONITORING SCHEDULE

SYSTEM NO: 1000023 NAME: FCSA #14/BELMONT MANOR COUNTY: FRESNO

SOURCE NO: NAME: WELL 02 CLASS: CTGA STATUS: Active

PSCODE	GROUP/CONSTITUENT IDENTIFICATION			LAST RESULT	UNITS	MCL	DLR	LAST SAMPLE	COUNT	FREQ MONTHS	MOD	NEXT SAMPLE DUE	NOTES
1000023 - S1 013	34561	1,3-DICHLOROPROPENE (TOTAL)	<	.0000	UG/L	.5	.5	2014/03/14	2	72		2020/03	
	34571	1,4-DICHLOROBENZENE	<	.0000	UG/L	5	.5	2014/03/14	2	72		2020/03	
	34030	BENZENE	<	.0000	UG/L	1	.5	2014/03/14	2	72		2020/03	
	32102	CARBON TETRACHLORIDE	<	.0000	UG/L	.5	.5	2014/03/14	2	72		2020/03	
	77093	CIS-1,2-DICHLOROETHYLENE	<	.0000	UG/L	6	.5	2014/03/14	2	72		2020/03	
	34423	DICHLOROMETHANE	<	.0000	UG/L	5	.5	2014/03/14	2	72		2020/03	
	34371	ETHYLBENZENE	<	.0000	UG/L	300	.5	2014/03/14	2	72		2020/03	
	46491	METHYL-TERT-BUTYL-ETHER (MTBE)	<	.0000	UG/L	13	3	2014/03/14	4	72		2020/03	
	34301	MONOCHLOROBENZENE	<	.0000	UG/L	70	.5	2014/03/14	2	72		2020/03	
	77128	STYRENE	<	.0000	UG/L	100	.5	2014/03/14	2	72		2020/03	
	34475	TETRACHLOROETHYLENE	<	.0000	UG/L	5	.5	2014/03/14	2	72		2020/03	
	34010	TOLUENE	<	.0000	UG/L	150	.5	2014/03/14	2	72		2020/03	
	34546	TRANS-1,2-DICHLOROETHYLENE	<	.0000	UG/L	10	.5	2014/03/14	2	72		2020/03	
	39180	TRICHLOROETHYLENE	<	.0000	UG/L	5	.5	2014/03/14	2	72		2020/03	
	34488	TRICHLOROFLUOROMETHANE	<	.0000	UG/L	150	5	2014/03/14	2	72		2020/03	
	81611	TRICHLOROTRIFLUOROETHANE (FREON 113)	<	.0000	UG/L	1200	10	2014/03/14	2	72		2020/03	
	39175	VINYL CHLORIDE	<	.0000	UG/L	.5	.5	2014/03/14	2	72		2020/03	
	81551	XYLENES (TOTAL)	<	.0000	UG/L	1750	0.5	2014/03/14	2	72		2020/03	
S2 REGULATED SOC													
	77825	ALACHLOR	<	0.20	UG/L	2	1	2016/08/02	4	36		2019/08	
	39033	ATRAZINE	<	0.30	UG/L	1	.5	2016/08/02	4	36		2019/08	
	38761	DIBROMOCHLOROPROPANE (DBCP)	<	.0000	UG/L	.2	.01	2015/02/12	5	36	M	2018/02	
	77651	ETHYLENE DIBROMIDE (EDB)	<	ND	UG/L	.05	.02	2017/02/13	4	36		2020/02	
	39055	SIMAZINE	<	0.30	UG/L	4	1	2016/08/02	4	36		2019/08	

State Water Resources Control Board

Division of Drinking Water

Lead and Copper Tap Sample Results Reporting Form

This form must be submitted by the public water system to the regulating entity (DDW District Office or County Agency) for each round of lead and copper sampling

Report Date: (mm/dd/yyyy)	
Water System Name:	
Water System Number:	
Water System Type:	◯ Community ◯ Non-Transient, Non Community
Monitoring Frequency:	◯ 6-month ◯ Annual ◯ Triennial
# of Samples Required:	
# of Samples Reported:	
	90th Percentile Level (mg/L)
Lead:	
Copper:	

	Sample Date	Sample Site Location/Address	Tier 1, 2, 3, or R	Result	
				Lead (mg/L)	Copper (mg/L)
01					
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board
Division of Drinking Water

WATER QUALITY EMERGENCY NOTIFICATION PLAN

Name of Utility: 1000023 FCSA #14 Belmont Manor

Physical Location/Address: Belmont & Leonard Fresno, CA 93727

The following persons have been designated to implement the plan upon notification by the Division of Drinking Water, SWRCB that an imminent danger to the health of the water users exists:

Water Utility: Contact Name & Title	Email Address	Telephone Day	Evening	Cell
1.				
2.				
3.				

The implementation of the plan will be carried out with the following DDW-SWRCB and County Health Department personnel:

DDW-SWRCB & County Health Departments: Contact Name & Title	Telephone Day	Evening
1. José A. Robledo, Fresno District Engineer, SWRCB-DDW	(559) 447-3396	
2. Carl L. Carlucci, Regional Engineer SWRCB DDW-Central CA Region	(559) 447-3300	(559) 280-6363
Hank Gill, Supervising REHS Fresno County Health Department	(559) 600-3357	(559) 600-3357

If the above personnel cannot be reached, contact:

Office of Emergency Services Warning Center (24 hrs.) (800) 852-7550 or (916) 845-8911
When reporting a water quality emergency to the Warning Center, please ask for the State Water Resources Control Board – Division of Drinking Water Duty Officer.

NOTIFICATION PLAN

Attach a written description of the method or combination of methods to be used (radio, television, door-to-door, sound truck, etc.) **to notify customers in an emergency.** For each section of your plan give an estimate of the time required, necessary personnel, estimated coverage, etc. Consideration must be given to special organizations (such as schools), non-English speaking groups, and outlying water users. Ensure that the notification procedures you describe are practical and that you will be able to actually implement them in the event of an emergency. Examples of notification plans are attached for large, medium and small communities.

Report prepared by:

Signature and Title _____ Date _____

Cross-Connection Control for Small Community Water Systems
SWRCB DDW-Fresno District

Purpose of Cross-Connection Control Program: Water provided by a public water system may be contaminated via cross-connections within the distribution system. The purpose of the cross-connection control program is to reduce the hazard of contamination of the public water system by identifying actual and potential cross-connections and taking action to protect the system from these hazards. This is accomplished by installing backflow prevention assemblies where hazards are identified; or ensuring that water-using equipment on the premises is installed in accordance with plumbing code requirements and good practice.

What are cross-connections?

Cross-connections are actual and potential unprotected connections between a potable water system and any source or system containing unapproved water or a substance which is not safe. Examples of cross-connections include:

1. Improperly installed irrigation systems that may allow backsiphonage of stagnant, bacteriologically unsafe water into the piping system.
2. Improperly plumbed water-using devices such as hot-tubs, boilers or commercial dishwashers which may allow unsafe water back into the domestic piping system.
3. Irrigation systems served by an auxiliary source, such as a private well or creek. Such systems create a potential for major contamination of the public water system via interties with the domestic piping system.
4. Interconnections between the potable system and a non-potable system.

What the Regulations Require

Section 7584 of the California Code of Regulations requires that each public water system have a cross connection control program that includes these elements:

1. The adoption of operating rules or ordinances to implement the cross-connection program.
2. The conducting of surveys to identify water user premises where cross connections exist or are likely to occur.
3. The provisions of backflow protection by the water user at all connections where a cross connection hazard has been identified.
4. The provision of at least one person trained in cross connection control to carry out the program.
5. The establishment of a procedure or system for testing backflow prevention assemblies.
6. The maintenance of records of locations, tests, and repairs of backflow prevention assemblies within each water supplier's distribution system.

ELEMENTS OF A CROSS-CONNECTION CONTROL PROGRAM
SWRCB DDW Fresno District

When implementing a Cross-Connection Control Program, the water supplier or health agency should follow an organized plan. The following items should be included as a minimum. The items **explain the Division of Health Services' policy regarding the regulations.**

7584. Responsibility and Scope of Program

The water supplier shall protect the public water supply from contamination by implementation of a cross-connection control program. The program, or any portion thereof, may be implemented directly by the water supplier or by means of a contract with the local health agency, or with another agency approved by the health agency. The water supplier's cross-connection control program shall for the purpose of addressing the requirements of Sections 7585 through 7605 include, but not limited to, the following elements:

(1) ***The adoption of operating rules or ordinances to implement the cross-connection program.***

A public water supplier shall enact an ordinance or rule of service outlining the cross-connection control program and providing enforcement authority.

(2) ***The conducting of surveys to identify places where cross-connections are likely to occur.***

Water utilities do not have any responsibility for controlling or abating cross-connections on a user's premises. All existing facilities where potential cross-connections are suspected, however, shall be listed and inspected or reinspected on a priority basis, where feasible. All applications for new services or for enlarging existing services or changing of occupant shall be reviewed or screened for cross-connect1ons hazards

(3) ***The provision of backflow protection at the user's connection or within the user's premises or both.***

Adequate provisions for implementation and enforcement of backflow protection where needed including the shutting off service when necessary

4) ***The provision of at least one person trained in cross-connection control to carry out the cross-connection program.***

Specific units of the health agency and/or water supplier should be designated to organize and carry out the cross-connection control program. The personnel in those units should be trained as to the causes and hazards of unprotected cross-connections.

(5) ***The establishment of a procedure or system for testing backflow preventers.***

A list of approved backflow preventers and list of certified testers should be made available to each water user required to provide backflow protection.

The list may include backflow devices approved by University of Southern California, Foundation for Cross-Connection Control and IAPMO.

The List of certified testers may be lists developed by the American Water Works Association and local county health agencies.

Cross-Connection Survey Summary Form-Small Community Water Systems

Name of System _____ System Number _____

Description of Survey Procedures-How survey was conducted, (include copy of survey form):
Person conducting survey (List name and qualifications):

_____

_____

Procedures for Residential Connections:

_____

_____

_____

_____

Procedures for Commercial Connections:

_____

_____

_____

_____

Total number of service connections _____ Number of service connections surveyed _____
Number of connections with auxiliary sources (i.e. wells or creek pumps) _____
Number of connections with other hazards _____
Total number of backflow prevention devices _____

Type of Hazard Identified(i.e. private well, hot tub, irrigation system, swimming pool, etc)	Number of connections with hazard	Number of devices installed	Number where device not necessary

Describe follow-up for service connections that did not respond to the survey:

_____

_____

_____

_____

_____

Long-term (Describe on-going cross-connection protection & testing of backflow prevention assemblies)

_____

_____

_____

_____

_____

_____

Submitted by (signature) _____ Date _____

service unless it is functioning as required. These assemblies shall be serviced, overhauled, or replaced whenever they are found to be defective and all costs of testing, repair, and maintenance shall be borne by the water user. Approval must be obtained from the {Water Supplier} prior to removing, relocating or replacing a backflow prevention assembly.

SECTION VI – ADMINISTRATION

The cross-connection control program shall be administered by the {General Manager/ cross-connection control specialist}. The {Water Supplier} will establish and maintain a list of approved backflow prevention assemblies as well as a list of approved backflow prevention assembly testers. The {Water Supplier} shall conduct necessary surveys of water user premises to evaluate the degree of potential health hazards. The {Water Supplier} shall notify users when an assembly needs to be tested. The notice shall contain the date when the test must be completed.

SECTION VII - WATER SERVICE TERMINATION

When the {Water Supplier} encounters water uses that represent a clear and immediate hazard to the potable water supply that cannot be immediately abated, the procedure for terminating water service shall be instituted. Conditions or water uses that create a basis for water service termination shall include, but are not limited *to*, the following:

1. Refusal to install or to test a backflow prevention assembly, or to repair or replace a faulty backflow prevention assembly.

2. Direct or indirect connection between the public water system and a sewer line.

3. Unprotected direct or indirect connection between the public water system and a system or equipment containing contaminants.

4. Unprotected direct or indirect connection between the public water system and an auxiliary water system.

For condition 1, the {Water Supplier} will terminate service to a water user's premises after proper notification has been sent. If no action is taken within the allowed time period water service shall be terminated.

For conditions 2, 3, or 4, the {Water Supplier} shall take the following steps:

1. Make reasonable effort to advise the water user of intent to terminate water service;
2. Terminate water service and lock service valve. The water service shall remain inactive until correction of violations has been approved by the {Water Supplier}.

SECTION VII - EFFECTIVE DATE

This Ordinance shall supersede all previous cross-connection control ordinances and shall take effect thirty (30) days from the date of its adoption. Before the expiration of fifteen (15) days after its adoption this Ordinance shall be published in the _____, a newspaper of general circulation, printed and published in_____.

APPENDIX C

COMPLIANCE ORDER NO. 03-23-18R-012

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

State Water Resources Control Board
Division of Drinking Water

March 22, 2018

System No. 1000023

Daniel Vang, Principal Analyst
FCSA #14 / Belmont Manor
2220 Tulare Street, 6th Floor
Fresno, CA 93722

COMPLIANCE ORDER NO. 03-23-18R-012
1,2,3-TRICHLOROPROPANE (1,2,3-TCP) MAXIMUM CONTAMINANT LEVEL VIOLATION

Enclosed is Compliance Order No. 03-23-18R-012 (hereinafter "Order") issued to the FCSA #14 / Belmont Manor (hereinafter "Water System") public water system. **Please note there are legally enforceable deadlines associated with this Order starting on page 4 of the Order.**

The Water System will be billed at the State Water Resources Control Board's (hereinafter "State Water Board") hourly rate for the time spent on issuing this Order. California Health and Safety Code (hereinafter "CHSC"), Section 116577, provides that a public water system must reimburse the State Water Board for actual costs incurred by the State Water Board for specified enforcement actions, including but not limited to, preparing, issuing and monitoring compliance with an order. At this time, the State Water Board has spent approximately 2 hours on enforcement activities associated with this violation.

The Water System will receive a bill sent from the State Water Board in August of the next fiscal year. This bill will contain fees for any enforcement time spent on the Water System for the current fiscal year.

Any person who is aggrieved by a citation, order or decision issued under authority delegated to an officer or employee of the state board under Article 8 (commencing with CHSC, Section 116625) or Article 9 (commencing with CHSC, Section 116650), of the Safe Drinking Water Act (CHSC, Division 104, Part 12, Chapter 4), may file a petition with the State Water Board for reconsideration of the citation, order or decision. Appendix 1 to the enclosed Citation contains the relevant statutory provisions for filing a petition for reconsideration (CHSC, Section 116701).

Petitions must be received by the State Water Board within 30 days of the issuance of the citation, order or decision by the officer or employee of the state board. The date of issuance is the date when the Division of Drinking Water mails a copy of the citation, order or decision. If the 30th day falls on a Saturday, Sunday, or state holiday, the petition is due the following business day by 5:00 p.m.

Information regarding filing petitions may be found at:

http://www.waterboards.ca.gov/drinking_water/programs/petitions/index.shtml

If you have any questions regarding this matter, please contact Caitlin Juarez of my staff at (559) 447-3395 or me at (559) 447-3300.

Sincerely,

José A. Robledo, P.E.
Senior Water Resource Control Engineer, Fresno District
SOUTHERN CALIFORNIA BRANCH
DRINKING WATER FIELD OPERATIONS

Certified Mail No. 7016 3010 0000 0446 1966

JAR/CJ
Enclosures
cc: Nayiri Moumdjian, Staff Analyst
Fresno County Division of Environmental Health

Compliance Order No. 03-23-18R-012

STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

DIVISION OF DRINKING WATER

Name of Public Water System: FCSA #14 / Belmont Manor

Water System No: 1000023

Attention: Daniel Vang, Principal Analyst
2220 Tulare Street, 6th Floor
Fresno, CA 93722

Issued: March 22, 2018

COMPLIANCE ORDER FOR NONCOMPLIANCE

1,2,3-TCP MAXIMUM CONTAMINANT LEVEL VIOLATION

CALIFORNIA CODE OF REGULATIONS, TITLE 22, SECTION 64444

First Quarter of 2018

The California Health and Safety Code (hereinafter "CHSC"), Section 116655 authorizes the State Water Resources Control Board (hereinafter "State Water Board") to issue a compliance order to a public water system when the State Water Board determines that the public water system has violated or is violating the California Safe Drinking Water Act (hereinafter "California SDWA"), (CHSC, Division 104, Part 12, Chapter 4, commencing with Section 116270), or any regulation, standard, permit, or order issued or adopted thereunder.

The State Water Board, acting by and through its Division of Drinking Water (hereinafter "Division") and the Deputy Director for the Division, hereby issues Compliance Order No. 03-23-18R-012 (hereinafter "Order") pursuant to Section 116655 of the CHSC to the FCSA #14 / Belmont Manor (hereinafter "Water System") for violation of CHSC, Section 116555(a)(1) and California Code of Regulations (hereinafter "CCR"), Title 22, Section 64444 Maximum Contaminant Levels (hereinafter "MCL") – Organic Chemicals.

A copy of the applicable statutes and regulations are included in Appendix 1, which is attached hereto and incorporated by reference.

STATEMENT OF FACTS

The Water System is classified as a community public water system with a population of 115 persons served through 41 service connections. The FCSA #14 / Belmont Manor operates under Domestic Water Supply Permit No. 03-12-08P-046 issued by the State Water Board on October 7, 2008. The Water System utilizes two groundwater wells, one active and one standby as its source of domestic water: Well 02 and Well 01, respectively.

CHSC, Section 116555(a)(1) requires all public water systems to comply with primary drinking water standards as defined in CHSC, Section 116275(c). Primary drinking water standards include maximum levels of contaminants and the monitoring and reporting requirements as specified in regulations adopted by the State Water Board that pertain to maximum contaminant levels.

The State Water Board received laboratory results for one 1,2,3-TCP sample collected on February 8, 2018 from Well 02. The sample showed a 1,2,3-TCP concentration of 0.000061 milligrams per liter (hereinafter "mg/L"). A summary of the Water System's most recent 1,2,3-TCP monitoring results are presented in Table 1 below:

Table 1 – Well 02 1,2,3-TCP Sample Results (mg/L)

(1,2,3-TCP MCL is 0.000005 mg/L)

Compliance Period	Sample Date	Result (mg/L)	Average (mg/L)
2018 1st Quarter	2/08/2018	0.000061*	0.000061
		Running Annual Average (RAA)	**0.000015**

* If any one sample or average of samples would cause the four quarter average (annual average) to exceed the MCL, the water system is immediately in violation.

A 1,2,3-TCP result from standby Well 01 is also showing detection of 1,2,3-TCP. Well 01 was sampled for 1,2,3-TCP on 2/02/2018. The sample showed a 1,2,3-TCP concentration of 0.000040 mg/L.

DETERMINATION

CCR, Title 22, Section 64444, Maximum Contaminant Levels – Organic Chemicals states that public water systems shall comply with the primary MCLs established in table 64444-A (see Appendix 1). The MCL for 1,2,3-TCP is 0.000005 mg/L.

CCR, Title 22, Section 64445.1(c)(5)(C) Repeat Monitoring and Compliance – Organic Chemicals states that if any sample would cause the running annual average to exceed the MCL, the water system is immediately in violation. If a system takes more than one sample in a quarter, the average of all the results for that quarter shall be used when calculating the running annual average. If a system fails to complete four consecutive quarters of monitoring, the running annual average shall be based on an average of the available data.

The 1,2,3-TCP RAA from Well 02 is 0.000015 mg/L. Therefore, the State Water Board has determined that the Water System has failed to comply with primary drinking water standards pursuant to CHSC, Section 116555(a)(1) and the 1,2,3-TCP MCL pursuant to CCR, Title 22, Section 64444 during the first quarter of 2018.

DIRECTIVES

To ensure that the water supplied by the Water System is at all times safe, wholesome, healthful, and potable, the Water System is hereby directed to take the following actions:

1. On or before **March 31, 2021**, comply with CCR, Title 22, Section 64444.

2. Quarterly sampling for 1,2,3-TCP from Well 02 shall begin with the **second quarter of 2018** and shall continue every three months thereafter. The Water System shall ensure that the laboratory, which conducts the analysis, submits the analytical results electronically by State Water Board approved method no later than the 10th day following the month in which the analysis was completed.

3. By **April 10, 2018**, public notification to the customers of the Water System shall be conducted and shall continue every three months for Well 02 until the State Water Board determines that the 1,2,3-TCP contamination is resolved. Public Notification shall be conducted in conformance with CCR, Title 22, Sections 64463.4 and 64465. A copy of Sections 64464.1 and 64465 is included in Appendix 1. Appendix 2: Notification Template shall be used to fulfill this directive, unless otherwise approved by the State Water Board.

4. Complete Appendix 3: Certification of Completion of Notification Form. Submit it together with a copy of the public notification conducted in compliance with the public notification requirement listed above to the State Water Board within 10 days following each notification.

5. Prepare for State Water Board approval, a Corrective Action Plan, identifying improvements to the water system designed to correct the water quality problems identified as an exceedance of the 1,2,3-TCP MCL and ensure that the FCSA #14 /

Belmont Manor delivers water to consumers that meets primary drinking water standards. The plan shall include a time schedule for completion of each of the phases of the project such as design, construction, and startup, and a date as of which the Water System will be in compliance with the 1,2,3-TCP MCL, which date shall be no later than **March 31, 2021**.

6. On or before **May 15, 2018**, submit and present the Corrective Action Plan required under Directive No. 5 above, to the State Water Board's office located at 265 West Bullard Avenue, Suite 101, Fresno, CA 93704.

7. Perform the State Water Board approved Corrective Action Plan, and each and every element of said plan, according to the time schedule set forth therein.

8. On or before **July 10, 2018**, and every three months thereafter, submit a report to the State Water Board in the form provided as Appendix 4 showing actions taken during the previous quarter (calendar three months) to comply with the Corrective Action Plan.

9. Not later than ten (10) days following **March 31, 2021**, demonstrate to the State Water Board that the water delivered by the FCSA #14 / Belmont Manor complies with the 1,2,3-TCP MCL.

10. Notify the State Water Board in writing no later than five (5) days prior to the deadline for performance of any Directive set forth herein if the Water System anticipates it will not timely meet such performance deadline.

11. By **April 10, 2018**, complete and return to the State Water Board the "Notification of Receipt" form attached to this Order as Appendix 5. Completion of this form confirms that

the Water System has received this Order and understands that it contains legally enforceable directives with due dates.

All submittals, with exception of analytical results, required by this Order shall be electronically submitted to the State Water Board at the following address. The subject line for all electronic submittals corresponding to this Order shall include the following information: Water System name and number, compliance order number and title of the document being submitted.

José A. Robledo, P.E.
State Water Resources Control Board
Division of Drinking Water, Fresno District
265 W. Bullard Ave, Suite 101
Fresno, CA 93704

Dwpdist23@waterboards.ca.gov

The State Water Board reserves the right to make modifications to this Order as it may deem necessary to protect public health and safety. Such modifications may be issued as amendments to this Order and shall be effective upon issuance.

Nothing in this Order relieves the Water System of its obligation to meet the requirements of the California SDWA (CHSC, Division 104, Part 12, Chapter 4, commencing with Section 116270), or any regulation, standard, permit or order issued or adopted thereunder.

PARTIES BOUND

This Order shall apply to and be binding upon the Water System, its owners, shareholders, officers, directors, agents, employees, contractors, successors, and assignees.

SEVERABILITY

The directives of this Order are severable, and the Water System shall comply with each and every provision thereof notwithstanding the effectiveness of any provision.

FURTHER ENFORCEMENT ACTION

The California SDWA authorizes the State Water Board to: issue a citation or order with assessment of administrative penalties to a public water system for violation or continued violation of the requirements of the California SDWA or any regulation, permit, standard, citation, or order issued or adopted thereunder including, but not limited to, failure to correct a violation identified in a citation or compliance order. The California SDWA also authorizes the State Water Board to take action to suspend or revoke a permit that has been issued to a public water system if the public water system has violated applicable law or regulations or has failed to comply with an order of the State Water Board, and to petition the superior court to take various enforcement measures against a public water system that has failed to comply with an order of the State Water Board. The State Water Board does not waive any further enforcement action by issuance of this Order.

3-22-2018

Carl L. Carlucci, P.E., Chief
Central California Section
State Water Resources Control Board
Division of Drinking Water

Date

Appendices 5:
1. Applicable Statutes and Regulations
2. Notification Template
3. Certification of Completion of Public Notification
4. Quarterly Progress Report
5. Notification of Receipt

Certified Mail No. 7016 3010 0000 0446 1966

APPENDIX 1. APPLICABLE STATUTES AND REGULATIONS FOR Compliance Order No. 03-23-18R-012 1,2,3-TCP Maximum Contaminant Level Violation

NOTE: The following language is provided for the convenience of the recipient, and cannot be relied upon as the State of California's representation of the law. The published codes are the only official representation of the law. Regulations related to drinking water are in Titles 22 and 17 of the California Code of Regulations. Statutes related to drinking water are in the Health & Safety Code, the Water Code, and other codes.

California Health and Safety Code (CHSC):

Section 116271 states in relevant part:

(a) The state board succeeds to and is vested with all of the authority, duties, powers, purposes, functions, responsibilities, and jurisdiction of the State Department of Public Health, its predecessors, and its director for purposes of all of the following:

(1) The Environmental Laboratory Accreditation Act (Article 3 (commencing with Section 100825) of Chapter 4 of Part 1 of Division 101).

(2) Article 3 (commencing with Section 106875) of Chapter 4 of Part 1.

(3) Article 1 (commencing with Section 115825) of Chapter 5 of Part 10.

(4) This chapter and the Safe Drinking Water State Revolving Fund Law of 1997 (Chapter 4.5 (commencing with Section 116760)).

(5) Article 2 (commencing with Section 116800), Article 3 (commencing with Section 116825), and Article 4 (commencing with Section 116875) of Chapter 5.

(6) Chapter 7 (commencing with Section 116975).

(7) The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Division 43 (commencing with Section 75001) of the Public Resources Code).

(8) The Water Recycling Law (Chapter 7 (commencing with Section 13500) of Division 7 of the Water Code).

(9) Chapter 7.3 (commencing with Section 13560) of Division 7 of the Water Code.

(10) The California Safe Drinking Water Bond Law of 1976 (Chapter 10.5 (commencing with Section 13850) of Division 7 of the Water Code).

(11) Wholesale Regional Water System Security and Reliability Act (Division 20.5 (commencing with Section 73500) of the Water Code).

(12) Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (Division 26.5 (commencing with Section 79500) of the Water Code).

(b) The state board shall maintain a drinking water program and carry out the duties, responsibilities, and functions described in this section. Statutory reference to "department," "state department," or "director" regarding a function transferred to the state board shall refer to the state board. This section does not impair the authority of a local health officer to enforce this chapter or a county's election not to enforce this chapter, as provided in Section 116500...

(k)

(1) The state board shall appoint a deputy director who reports to the executive director to oversee the issuance and enforcement of public water system permits and other duties as appropriate. The deputy director shall have public health expertise.

(2) The deputy director is delegated the state board's authority to provide notice, approve notice content, approve emergency notification plans, and take other action pursuant to Article 5 (commencing with Section 116450), to issue, renew, reissue, revise, amend, or deny any public water system permits pursuant to Article 7 (commencing with Section 116525), to suspend or revoke any public water system permit pursuant to Article 8 (commencing with Section 116625), and to issue citations, assess penalties, or issue orders pursuant to Article 9 (commencing with Section 116650). Decisions and actions of the deputy director taken pursuant to Article 5 (commencing with Section 116450) or Article 7 (commencing with Section 116525) are deemed decisions and actions taken by the state board, but are not subject to reconsideration by the state board except as provided in Section 116540. Decisions and actions of the deputy director taken pursuant to Article 8 (commencing with Section 116625) and Article 9 (commencing with Section 116650) are deemed decisions and actions taken by the state board, but any aggrieved person may petition the state board for reconsideration of the decision or action. This subdivision is not a limitation on the state board's authority to delegate any other powers and duties.

Section 116275 states in relevant part:

(c) "Primary drinking water standards" means:

(1) Maximum levels of contaminants that, in the judgment of the state board, may have an adverse effect on the health of persons.

(2) Specific treatment techniques adopted by the state board in lieu of maximum contaminant levels pursuant to subdivision (j) of Section 116365.

(3) The monitoring and reporting requirements as specified in regulations adopted by the state board that pertain to maximum contaminant levels.

Section 116555 states in relevant part:

(a) Any person who owns a public water system shall ensure that the system does all of the following:
(1) Complies with primary and secondary drinking water standards.
(2) Will not be subject to backflow under normal operating conditions.
(3) Provides a reliable and adequate supply of pure, wholesome, healthful, and potable water.

Section 116577. Enforcement fee states:

(a) Each public water system shall reimburse the state board for actual costs incurred by the state board for any of the following enforcement activities related to that water system:
(1) Preparing, issuing, and monitoring compliance with, an order or a citation.
(2) Preparing and issuing public notification.
(3) Conducting a hearing pursuant to Section 116625.

(b) The state board shall submit an invoice for these enforcement costs to the public water system that requires payment before September 1 of the fiscal year following the fiscal year in which the costs were incurred. The invoice shall indicate the total hours expended, the reasons for the expenditure, and the hourly cost rate of the state board. The costs set forth in the invoice shall not exceed the total actual costs to the state board of enforcement activities specified in this section.

(c) Notwithstanding the reimbursement of enforcement costs of the local primacy agency pursuant to subdivision (a) of Section 116595 by a public water system under the jurisdiction of the local primacy agency, a public water system shall also reimburse enforcement costs, if any, incurred by the state board pursuant to this section.

(d) "Enforcement costs," as used in this section, does not include "litigation costs" pursuant to Section 116585.

(e) The state board shall not be entitled to enforcement costs pursuant to this section if a court determines that enforcement activities were in error.

(f) Payment of the invoice shall be made within 90 days of the date of the invoice. Failure to pay the invoice within 90 days shall result in a 10-percent late penalty that shall be paid in addition to the invoiced amount.

(g) The state board may, at its sole discretion, waive payment by a public water system of all or any part of the invoice or penalty.

Section 116625 (Revocation and suspension of permits) states:

(a) The state board, after providing notice to the permittee and opportunity for a hearing, may suspend or revoke any permit issued pursuant to this chapter if the state board determines pursuant to the hearing that the permittee is not complying with the permit, this chapter, or any regulation, standard, or order issued or adopted thereunder, or that the permittee has made a false statement or representation on any application, record, or report maintained or submitted for purposes of compliance with this chapter. If the permittee does not request a hearing within the period specified in the notice, the state board may suspend or revoke the permit without a hearing. If the permittee submits a timely request for a hearing, the hearing shall be before the state board or a member of the state board, in accordance with Section 183 of the Water Code and the rules for adjudicative proceedings adopted under Section 185 of the Water Code. If the permit at issue has been temporarily suspended pursuant to subdivision (b), the notice shall be provided within 15 days of the effective date of the temporary suspension order. The commencement of the hearing under this subdivision shall be as soon as practicable, but no later than 60 days after the effective date of the temporary suspension order, unless the state board grants an extension of the 60 day period upon request of the permittee.

(b) The state board may temporarily suspend any permit issued pursuant to this chapter before any hearing when the action is necessary to prevent an imminent or substantial danger to health. The state board shall notify the permittee of the temporary suspension and the effective date of the temporary suspension and, at the same time, notify the permittee that a hearing has been scheduled. The hearing shall be held as soon as possible, but not later than 15 days after the effective date of the temporary suspension unless the state board grants an extension of the 15 day period upon request of the permittee, and shall deal only with the issue of whether the temporary suspension shall remain in place pending a hearing under subdivision (a). The hearing shall be conducted under the rules for adjudicative proceedings adopted by the state board under Section 185 of the Water Code. The temporary suspension shall remain in effect until the hearing under this subdivision is completed and the state board has made a final determination on the temporary suspension, which shall be made within 15 days after the completion of the hearing unless the state board grants an extension of the 15 day period upon request of the permittee. If the determination is not transmitted within 15 days after the hearing is completed, or any extension of this period requested by the permittee, the temporary suspension shall be of no further effect. Dissolution of the temporary suspension does not deprive the state board of jurisdiction to proceed with a hearing on the merits under subdivision (a).

Section 116650 states in relevant part:

(a) If the state board determines that a public water system is in violation of this chapter or any regulation, permit, standard, citation, or order issued or adopted thereunder, the state board may issue a citation to the public water system. The citation shall be served upon the public water system personally or by certified mail. Service shall be deemed effective as of the date of personal service or the date of receipt of the certified mail. If a person to whom a citation is directed refuses to accept delivery of the certified mail, the date of service shall be deemed to be the date of mailing.

(b) Each citation shall be in writing and shall describe the nature of the violation or violations, including a reference to the statutory provision, standard, order, citation, permit, or regulation alleged to have been violated.

(c) A citation may specify a date for elimination or correction of the condition constituting the violation.
(d) A citation may include the assessment of a penalty as specified in subdivision (e).
(e) The state board may assess a penalty in an amount not to exceed one thousand dollars ($1,000) per day for each day that a violation occurred, and for each day that a violation continues to occur. A separate penalty may be assessed for each violation and shall be in addition to any liability or penalty imposed under any other law.

Section 116701 (Petitions to Orders and Decisions) states:
(a)
(1) Within 30 days of issuance of an order or decision under authority delegated to an officer or employee of the state board under Article 8 (commencing with Section 116625) or Article 9 (commencing with Section 116650), an aggrieved person may petition the state board for reconsideration.
(2) Within 30 days of issuance of an order or decision under authority delegated to an officer or employee of the state board under Section 116540, the applicant may petition the state board for reconsideration.
(3) Within 30 days of final action by an officer or employee of the state board acting under delegated authority, the owner of a laboratory that was the subject of the final action may petition the state board for reconsideration of any of the following actions:
(A) Denial of an application for certification or accreditation under Section 100855.
(B) Issuance of an order directing compliance under Section 100875.
(C) Issuance of a citation under Section 100880.
(D) Assessment of a penalty under subdivision (e) of Section 100880.
(b) The petition shall include the name and address of the petitioner, a copy of the order or decision for which the petitioner seeks reconsideration, identification of the reason the petitioner alleges the issuance of the order was inappropriate or improper, the specific action the petitioner requests, and other information as the state board may prescribe. The petition shall be accompanied by a statement of points and authorities of the legal issues raised by the petition.
(c) The evidence before the state board shall consist of the record before the officer or employee who issued the order or decision and any other relevant evidence that, in the judgment of the state board, should be considered to implement the policies of this chapter. The state board may, in its discretion, hold a hearing for receipt of additional evidence.
(d) The state board may refuse to reconsider the order or decision if the petition fails to raise substantial issues that are appropriate for review, may deny the petition upon a determination that the issuance of the order or decision was appropriate and proper, may set aside or modify the order or decision, or take other appropriate action. The state board's action pursuant to this subdivision shall constitute the state board's completion of its reconsideration.
(e) The state board, upon notice and hearing, if a hearing is held, may stay in whole or in part the effect of the order or decision subject to the petition for reconsideration.
(f) If an order or decision is subject to reconsideration under this section, the filing of a petition for reconsideration is an administrative remedy that must be exhausted before filing a petition for writ of mandate under Section 100920.5 or 116700.

California Code of Regulations, Title 22 (CCR):

Section 64444. Maximum Contaminant Levels--Organic Chemicals states:
The MCLs for the primary drinking water chemicals shown in table 64444-A shall not be exceeded in the water supplied to the public.

Table 64444-A
Maximum Contaminant Levels Organic Chemicals

Chemical	*Maximum Contaminant Level, mg/L*
(a) Volatile Organic Chemicals (VOCs)	
Benzene	0.001
Carbon Tetrachloride	0.0005
1,2-Dichlorobenzene	0.6
1,4-Dichlorobenzene	0.005
1,1-Dichloroethane	0.005
1,2-Dichloroethane	0.0005
1,1-Dichloroethylene	0.006
cis-1,2-Dichloroethylene	0.006
trans-1,2-Dichloroethylene	0.01
Dichloromethane	0.005
1,2-Dichloropropane	0.005
1,3-Dichloropropene	0.0005

Ethylbenzene	0.3
Methyl-*tert*-butyl ether	0.013
Monochlorobenzene	0.07
Styrene	0.1
1,1,2,2-Tetrachloroethane	0.001
Tetrachloroethylene	0.005
Toluene	0.15
1,2,4-Trichlorobenzene	0.005
1,1,1-Trichloroethane	0.200
1,1,2-Trichloroethane	0.005
Trichloroethylene	0.005
Trichlorofluoromethane	0.15
1,1,2-Trichloro-1,2,2-Trifluoroethane	1.2
Vinyl Chloride	0.0005
Xylenes	1.750*

Table 64444-A (continued)
Maximum Contaminant Levels Organic Chemicals

Chemical	*Maximum Contaminant Level, mg/L*
(b) Synthetic Organic Chemicals (SOCs)	
Alachlor	0.002
Atrazine	0.001
Bentazon	0.018
Benzo(a)pyrene	0.0002
Carbofuran	0.018
Chlordane	0.0001
2,4-D	0.07
Dalapon	0.2
Dibromochloropropane	0.0002
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalate	0.004
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene Dibromide	0.00005
Glyphosate	0.7
Heptachlor	0.00001
Heptachlor Epoxide	0.00001
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.03
Molinate	0.02
Oxamyl	0.05
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated Biphenyls	0.0005
Simazine	0.004
Thiobencarb	0.07
Toxaphene	0.003
1,2,3-Trichloropropane	0.000005
2,3,7,8-TCDD (Dioxin)	3 x 10-8
2,4,5-TP (Silvex)	0.05

Section 64445. Initial Sampling - Organic Chemicals states

(a) Each community and nontransient-noncommunity water system shall collect four quarterly samples during the year designated by the State Board of each compliance period beginning with the compliance period starting January 1,

1993, from each water source at a site prior to any treatment and test for all applicable organic chemicals listed in table 64444-A. The State Board will designate the year based on historical monitoring frequency and laboratory capacity. For surface sources, the samples shall be taken at each water intake. For groundwater sources, the samples shall be taken at each well head. Where multiple intakes or wells draw from the same water supply, the State Board will consider sampling of representative sources as a means of complying with this section. Selection of representative sources shall be based on evidence which includes a hydrogeological survey and sampling results. Wells shall be allowed to flow for a minimum of 15 minutes before sampling to insure that the samples reflect the water quality of the source. In place of water source samples, a supplier may collect samples at sites located at the entry points to the distribution system. The samples shall be representative of each source after treatment. The system shall collect each sample at the same sampling site, unless a change is approved by the State Board.

(b) For any organic chemical added to table 64444-A, the water system shall initiate the quarterly monitoring for that chemical in January of the calendar year after the effective date of the MCL.

(c) A water system may request approval from the State Board to composite samples from up to five sampling sites, provided that the number of the sites to be composited is less than the ratio of the MCL to the DLR in §64445.1. Approval will be based on a review of three years of historical data, well construction and aquifer information for groundwater, and intake location, similarity of sources, and watershed characteristics for surface water. Compositing shall be done in the laboratory and analyses shall be conducted within 14 days of sample collection.

(1) Systems serving more than 3,300 persons shall composite only from sampling sites within a single system. Systems serving 3,300 persons or less may composite among different systems up to the 5-sample limit.

(2) If any organic chemical is detected in the composite sample, a follow-up sample shall be analyzed within 14 days from each sampling site included in the composite for the contaminants which were detected. The water supplier shall report the results to the State Board within 14 days of the follow-up sample collection. If available, duplicates of the original sample taken from each sampling site used in the composite may be used instead of resampling.

(d) A water system may apply to the State Board for a monitoring waiver for one or more of the organic chemicals on table 64444-A in accordance with the following:

(1) A source may be eligible for a waiver if it can be documented that the chemical has not been previously used, manufactured, transported, stored, or disposed of within the watershed or zone of influence and therefore, that the source can be designated nonvulnerable.

(2) If previous use of the chemical locally is unknown or the chemical is known to have been used previously and the source cannot be designated nonvulnerable pursuant to Paragraph (d)(1), it may still be eligible for a waiver based on a review related to susceptibility to contamination. The application to the State Board for a waiver based on susceptibility shall include the following:

(A) previous monitoring results;
(B) user population characteristics;
(C) proximity to sources of contamination;
(D) surrounding land uses;
(E) degree of protection of the water source;
(F) environmental persistence and transport of the chemical in water, soil and air;
(G) elevated nitrate levels at the water supply source; and
(H) historical system operation and maintenance data including previous State Board inspection results.

(3) To apply for a monitoring waiver for VOCs, the water system shall have completed the initial four quarters of monitoring pursuant to subsection (a) or three consecutive years of monitoring with no VOCs detected. If granted a waiver for VOC monitoring, a system using groundwater shall collect a minimum of one sample from every sampling site every six years and a system using surface water shall not be required to monitor for the term of the waiver. The term of a VOC waiver shall not exceed three years.

(4) To obtain a monitoring waiver for one or more of the SOCs, the water system may apply before doing the initial round of monitoring or shall have completed three consecutive years of annual monitoring with no detection of the SOC(s) listed. If the system is granted a waiver for monitoring for one or more SOC(s), no monitoring for the waived SOC(s) shall be required for the term of the waiver, which shall not exceed three years.

(e) For water sources designated by a water supplier as standby sources, the water supplier shall sample each source for any organic chemical added to table 64444-A once within the three-year period beginning in January of the calendar year after the effective date of the MCL.

(f) Water quality data collected prior to January 1, 1988, for VOCs, or January 1, 1990, for SOCs, and/or data collected in a manner inconsistent with this section shall not be used in the determination of compliance with the monitoring requirements for organic chemicals.

(g) MTBE data (i.e., a single sample) collected in a manner consistent with this section after January 1, 1998 in which no MTBE is detected, along with a designation of nonvulnerability pursuant to subsection (d), may be used to satisfy the initial monitoring requirements in subsection (a). If the requirements are satisfied in this way by a water system, the system shall begin annual monitoring pursuant to section 64445.1(b)(1).

(h) Water quality data collected in compliance with the monitoring requirements of this section by a wholesaler agency providing water to a public water system shall be acceptable for use by that system for compliance with the monitoring requirements of this section.

(i) Results obtained from groundwater monitoring performed for an organic chemical in accordance with this section and not more than two calendar years prior to the effective date of a regulation establishing the MCL for that organic chemical may be substituted to partially satisfy the initial monitoring requirements required by this section for that organic chemical. Requests to substitute groundwater monitoring results shall be made in accordance with the following:

1. Requests shall be made in writing by the water system to the State Board; and
2. If the State Board approves the request then results from a given calendar quarter will only be eligible to substitute for a single required initial monitoring result during that same quarter of initial monitoring. (e.g. the second quarter of 2016 may be substituted for the second quarter of 2018).
3. No more than three of the four quarterly samples as required by section 64445(a) or (b) may be substituted.

Section 64445.1. Repeat Monitoring and Compliance – Organic Chemicals.

(a) For the purposes of this article, detection shall be defined by the detection limits for purposes of reporting (DLRs) in table 64445.1-A:

Table 64445.1-A
Detection Limits for Purposes of Reporting (DLRs)
for Regulated Organic Chemicals

Chemical	*Detection Limit for Purposes of Reporting (DLR)(mg/L)*
(a) All VOCs, except as listed	0.0005
Methyl-tert-butyl ether	0.003
Trichlorofluoromethane	0.005
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.01
(b) SOCs	
Alachlor	0.001
Atrazine	0.0005
Bentazon	0.002
Benzo(a)pyrene	0.0001
Carbofuran	0.005
Chlordane	0.0001
2,4-D	0.01
Dalapon	0.01
Dibromochloropropane (DBCP)	0.00001
Di(2-ethylhexyl)adipate	0.005
Di(2-ethylhexyl)phthalate	0.003
Dinoseb	0.002
Diquat	0.004
Endothall	0.045
Endrin	0.0001
Ethylene dibromide (EDB)	0.00002
Glyphosate	0.025
Heptachlor	0.00001
Heptachlor epoxide	0.00001
Hexachlorobenzene	0.0005
Hexachlorocyclopentadiene	0.001
Lindane	0.0002
Methoxychlor	0.01
Molinate	0.002
Oxamyl	0.02
Pentachlorophenol	0.0002
Picloram	0.001
Polychlorinated biphenyls (PCBs)	
(as decachlorobiphenyl)	0.0005
Simazine	0.001
Thiobencarb	0.001
Toxaphene	0.001
1,2,3-Trichloropropane	0.000005

2,3,7,8-TCDD (Dioxin)	5 x 10-9
2,4,5-TP (Silvex)	0.001

(b) When organic chemicals are not detected pursuant to table 64445.1-A.

(1) A water system which has not detected any of the VOCs on table 64444-A during the initial four quarters of monitoring, shall collect and analyze one sample annually. After a minimum of three years of annual sampling with no detection of a VOC in table 64444-A, a system using groundwater may reduce the monitoring frequency to one sample during each compliance period. A system using surface water shall continue monitoring annually.

(2) A system serving more than 3,300 persons which has not detected an SOC on table 64444-A during the initial four quarters of monitoring shall collect a minimum of two quarterly samples for that SOC in one year during the year designated by the State Board of each subsequent compliance period. The year will be designated on the basis of historical monitoring frequency and laboratory capacity.

(3) A system serving 3,300 persons or less which has not detected an SOC on table 64444-A during the initial four quarters of monitoring shall collect a minimum of one sample for that SOC during the year designated by the State Board of each subsequent compliance period. The year will be designated on the basis of historical monitoring frequency and laboratory capacity.

(c) When organic chemicals are detected pursuant to table 64445.1-A.

(1) Prior to proceeding with the requirements of paragraphs (2) through (7), the water supplier may first confirm the analytical result, as follows: Within seven days from the notification of an initial finding from a laboratory reporting the presence of one or more organic chemicals in a water sample, the water supplier shall collect one or two additional sample(s) to confirm the initial finding. Confirmation of the initial finding shall be shown by the presence of the organic chemical in either the first or second additional sample, and the detected level of the contaminant for compliance purposes shall be the average of the initial and confirmation sample(s). The initial finding shall be disregarded if two additional samples do not show the presence of the organic chemical.

(2) If one or both of the related organic chemicals heptachlor and heptachlor epoxide are detected, subsequent monitoring shall analyze for both chemicals until there has been no detection of either chemical for one compliance period.

(3) A groundwater sampling site at which one or more of the following chemicals has been detected shall be monitored quarterly for vinyl chloride: trichloroethylene, tetrachloroethylene, 1,2-dichloroethane, 1,1,1-trichloroethane, cis-1,2-dichloroethylene, trans-1,2-dichloroethylene, or 1,1-dichloroethylene. If vinyl chloride is not detected in the first quarterly sample, the sampling site shall be monitored once for vinyl chloride during each compliance period.

(4) If the detected level of organic chemicals for any sampling site does not exceed any shown in table 64444-A, the water source shall be resampled every three months and the samples analyzed for the detected chemicals. After one year of sampling an approved surface water system or two quarters of sampling a groundwater system, the State Board will consider allowing the water supplier to reduce the sampling to once per year upon request, based on a review of previous sampling data. Systems shall monitor during the quarter(s) which previously yielded the highest analytical results.

(5) If the detected level of an organic chemical for any sampling site exceeds that listed in table 64444-A, the water supplier shall report this information to the State Board within 48 hours of receipt of the result. Unless use of the contaminated source is discontinued, the water supplier shall resample the contaminated source and compliance shall be determined as follows:

(A) Water systems serving more than 3,300 persons shall sample monthly for six months and shall submit the results to the State Board as specified in section 64469. If the average concentration of the initial finding, confirmation sample(s), and six subsequent monthly samples does not exceed the MCL shown in table 64444-A the water supplier may reduce the sampling frequency to once every three months. If the running annual average or the average concentration of the initial finding, confirmation sample(s), and six subsequent monthly samples exceeds the MCL shown in table 64444-A, the water system shall be deemed to be in violation of section 64444.

(B) Water systems serving 3,300 persons or less shall sample quarterly for a minimum of one year and shall submit the results to the State Board as specified in section 64469. If the running annual average concentration does not exceed the MCL in table 64444-A, the water supplier may reduce the sampling frequency to once every year during the quarter that previously yielded the highest analytical result. Quarterly monitoring shall resume if any reduced frequency sample result exceeds the MCL. If the running annual average concentration exceeds the MCL in table 64444-A, the water system shall be deemed to be in violation of section 64444.

(C) If any sample would cause the running annual average to exceed the MCL, the water system is immediately in violation. If a system takes more than one sample in a quarter, the average of all the results for that quarter shall be used when calculating the running annual average. If a system fails to complete four consecutive quarters of monitoring, the running annual average shall be based on an average of the available data.

(6) If any resample, other than those taken in accordance with paragraph (5), of a water sampling site shows that the concentration of any organic chemical exceeds a MCL shown in table 64444-A, the water supplier shall proceed in accordance with paragraphs (1) and (4), or paragraph (5).

(7) If an organic chemical is detected and the concentration exceeds ten times the MCL, the water supplier shall notify the State Board within 48 hours of the receipt of the results and the contaminated site shall be resampled within 48 hours to confirm the result. The water supplier shall notify the State Board of the result of the confirmation sample(s) within 24 hours of the receipt of the confirmation result(s).

(A) If the average concentration of the original and confirmation sample(s) is less than or equal to ten times the MCL, the water supplier shall proceed in accordance with paragraph (5).

(B) If the average concentration of the original and confirmation samples exceeds ten times the MCL, use of the contaminated water source shall immediately be discontinued, if directed by the State Board. Such a water source shall not be returned to service without written approval from the State Board.

Section 64445.2. Sampling of Treated Water Sources states

(a) Each water supplier utilizing treatment to comply with any MCL for an organic chemical listed in table 64444-A shall collect monthly samples of the treated water at a site prior to the distribution system. If the treated water exceeds the MCL, the water supplier shall resample the treated water to confirm the result and report the result to the State Board within 48 hours of the confirmation.

(b) The State Board will consider requiring more frequent monitoring based on an evaluation of (1) the treatment process used, (2) the treatment effectiveness and efficiency, and (3) the concentration of the organic chemical in the water source.

Section 64463. General Public Notification Requirements.

(e) Each water system shall give new customers public notice of any acute violation as specified in section 64463.1(a) that occurred within the previous thirty days, any continuing violation, the existence of a variance or exemption, and/or any other ongoing occurrence that the State Board has determined poses a potential risk of adverse effects on human health [based on a review of estimated exposures and toxicological data associated with the contaminant(s)] and requires a public notice. Notice to new customers shall be given as follows:

(1) Community water systems shall give a copy of the most recent public notice prior to or at the time service begins; and

(2) Noncommunity water systems shall post the most recent public notice in conspicuous locations for as long as the violation, variance, exemption, or other occurrence continues.

Section 64463.4 (Tier 2 Public Notice) states:

(a) A water system shall give public notice pursuant to this section if any of the following occurs:

(1) Any violation of the MCL, MRDL, and treatment technique requirements, except:

(A) Where a Tier 1 public notice is required under section 64463.1; or

(B) Where the State Board determines that a Tier 1 public notice is required, based on potential health impacts and persistence of the violations;

(2) All violations of the monitoring and testing procedure requirements in sections 64421 through 64426.1, article 3 (Primary Standards – Bacteriological Quality), for which the State Board determines that a Tier 2 rather than a Tier 3 public notice is required, based on potential health impacts and persistence of the violations;

(3) Other violations of the monitoring and testing procedure requirements in this chapter, and chapters 15.5, 17 and 17.5, for which the State Board determines that a Tier 2 rather than a Tier 3 public notice is required, based on potential health impacts and persistence of the violations; or

(4) Failure to comply with the terms and conditions of any variance or exemption in place.

(b) A water system shall give the notice as soon as possible within 30 days after it learns of a violation or occurrence specified in subsection (a), except that the water system may request an extension of up to 60 days for providing the notice. This extension would be subject to the State Board's written approval based on the violation or occurrence having been resolved and the State Board's determination that public health and welfare would in no way be adversely affected. In addition, the water system shall:

(1) Maintain posted notices in place for as long as the violation or occurrence continues, but in no case less than seven days;

(2) Repeat the notice every three months as long as the violation or occurrence continues. Subject to the State Board's written approval based on its determination that public health would in no way be adversely affected, the water system may be allowed to notice less frequently but in no case less than once per year. No allowance for reduced frequency of notice shall be given in the case of a total coliform MCL violation or violation of a Chapter 17 treatment technique requirement; and

(3) For turbidity violations pursuant to sections 64652.5(c)(2) and 64653(c), (d) and (f), as applicable, a water system shall consult with the State Board as soon as possible within 24 hours after the water system learns of the violation to determine whether a Tier 1 public notice is required. If consultation does not take place within 24 hours, the water system shall give Tier 1 public notice within 48 hours after learning of the violation.

(c) A water system shall deliver the notice, in a manner designed to reach persons served, within the required time period as follows:

(1) Unless otherwise directed by the State Board in writing based on its assessment of the violation or occurrence and the potential for adverse effects on public health and welfare, community water systems shall give public notice by;

(A) Mail or direct delivery to each customer receiving a bill including those that provide their drinking water to others (e.g., schools or school systems, apartment building owners, or

large private employers), and other service connections to which water is delivered by the water system; and
(B) Use of one or more of the following methods to reach persons not likely to be reached by a mailing or direct delivery (renters, university students, nursing home patients, prison inmates, etc.):
1. Publication in a local newspaper;
2. Posting in conspicuous public places served by the water system, or on the Internet; or
3. Delivery to community organizations.

(2) Unless otherwise directed by the State Board in writing based on its assessment of the violation or occurrence and the potential for adverse effects on public health and welfare, noncommunity water systems shall give the public notice by:
(A) Posting in conspicuous locations throughout the area served by the water system; and
(B) Using one or more of the following methods to reach persons not likely to be reached by a public posting:
1. Publication in a local newspaper or newsletter distributed to customers;
2. E-mail message to employees or students;
3. Posting on the Internet or intranet; or
4. Direct delivery to each customer.

Section 64465 (Public Notice Content and Format) states in relevant part:
(a) Each public notice given pursuant to this article, except Tier 3 public notices for variances and exemptions pursuant to subsection (b), shall contain the following:
(1) A description of the violation or occurrence, including the contaminant(s) of concern, and (as applicable) the contaminant level(s);
(2) The date(s) of the violation or occurrence;
(3) Any potential adverse health effects from the violation or occurrence, including the appropriate standard health effects language from appendices 64465-A through G;
(4) The population at risk, including subpopulations particularly vulnerable if exposed to the contaminant in drinking water;
(5) Whether alternative water supplies should be used;
(6) What actions consumers should take, including when they should seek medical help, if known;
(7) What the water system is doing to correct the violation or occurrence;
(8) When the water system expects to return to compliance or resolve the occurrence;
(9) The name, business address, and phone number of the water system owner, operator, or designee of the water system as a source of additional information concerning the public notice;
(10) A statement to encourage the public notice recipient to distribute the public notice to other persons served, using the following standard language: —Please share this information with all the other people who drink this water, especially those who may not have received this public notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this public notice in a public place or distributing copies by hand or mail; and
(11) For a water system with a monitoring and testing procedure violation, this language shall be included: "We are required to monitor your drinking water for specific contaminants on a regular basis. Results of regular monitoring are an indicator of whether or not your drinking water meets health standards. During [compliance period dates], we ['did not monitor or test' or 'did not complete all monitoring or testing'] for [contaminant(s)], and therefore, cannot be sure of the quality of your drinking water during that time." ...

(c) A public water system providing notice pursuant to this article shall comply with the following multilingual-related requirements:
(2) For a Tier 2 or Tier 3 public notice:
(A) The notice shall contain information in Spanish regarding the importance of the notice, or contain a telephone number or address where Spanish-speaking residents may contact the public water system to obtain a translated copy of the notice or assistance in Spanish; and
(B) When a non-English speaking group other than Spanish-speaking exceeds 1,000 residents or 10 percent of the residents served by the public water system, the notice shall include:
1. Information in the appropriate language(s) regarding the importance of the notice; or
2. A telephone number or address where such residents may contact the public water system to obtain a translated copy of the notice or assistance in the appropriate language; and

(3) For a public water system subject to the Dymally-Alatorre Bilingual Services Act, Chapter 17.5, Division 7, of the Government Code (commencing with section 7290), meeting the requirements of this Article may not ensure compliance with the Dymally-Alatorre Bilingual Services Act.

(d) Each public notice given pursuant to this article shall:
(1) Be displayed such that it catches people's attention when printed or posted and be formatted in such a way that the message in the public notice can be understood at the eighth-grade level;
(2) Not contain technical language beyond an eighth-grade level or print smaller than 12 point; and
(3) Not contain language that minimizes or contradicts the information being given in the public notice.

Appendix 64465-D. Health Effects Language - Inorganic Contaminants.

Contaminant	Health Effects Language
1,2,3-TCP	Some people who drink water containing 1,2,3-trichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.

Section 64469 (Reporting Requirements) states in relevant part:
(d) Within 10 days of giving initial or repeat public notice pursuant to Article 18 of this Chapter, except for notice given under section 64463.7(d), each water system shall submit a certification to the State Board that it has done so, along with a representative copy of each type of public notice given.

Section 64481 (Content of the Consumer Confidence Report) states in relevant part:
(g) For the year covered by the report, the Consumer Confidence Report shall note any violations of paragraphs (1) through (7) and give related information, including any potential adverse health effects, and the steps the system has taken to correct the violation.
(1) Monitoring and reporting of compliance data.

APPENDIX 2. NOTIFICATION TEMPLATE

IMPORTANT INFORMATION ABOUT YOUR DRINKING WATER

Este informe contiene información muy importante sobre su agua potable.
Por favor hable con alguien que lo pueda tradúcir.

FCSA #14 / Belmont Manor Has levels of 1,2,3-TCP Above Drinking Water Standards

---

Our water system recently failed a drinking water standard. Although this is not an emergency, as our customers, you have a right to know what you should do, what happened, and what we are doing to correct this situation.

We routinely monitor for the presence of drinking water contaminants. Testing results we received on _____[Insert date(s) or month, year] show that our system exceeds the standard, or maximum contaminant level (MCL), for 1,2,3-trichloropropane (1,2,3-TCP). The standard for 1,2,3-TCP is 0.000005 mg/L (milligrams per liter) which is equivalent to 0.005 *ug/L* (micrograms per liter). The average level of 1,2,3-TCP over the last year was 0.000015 mg/L OR 0.015 *ug/L*.

What should I do?

- **You do not need to use an alternative (e.g. , bottled) water supply.**
- This is not an immediate risk. If it had been, you would have been notified immediately. However, s*ome people who drink water containing 1,2,3-trichloropropane in excess of the MCL over many years may have an increased risk of getting cancer.*
- If you have other health issues concerning the consumption of this water, you may wish to consult your doctor.

What happened? What is being done?

What happened? What is being done? _____
[Describe corrective action] _____
We anticipate resolving the problem within [estimated time frame] _____.

For more information, please contact:
[Name of Contact] _____
[Phone Number] or _____
[Mailing Address] _____

Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses). You can do this by posting this public notice in a public place or distributing copies by hand or mail.

Secondary Notification Requirements

Upon receipt of notification from a person operating a public water system, the following notification must be given within 10 days [Health and Safety Code Section 116450(g)]:

- SCHOOLS: Must notify school employees, students, and parents (if the students are minors).
- RESIDENTIAL RENTAL PROPERTY OWNERS OR MANAGERS (including nursing homes and care facilities): Must notify tenants.
- BUSINESS PROPERTY OWNERS, MANAGERS, OR OPERATORS: Must notify employees of businesses located on the property.

This notice is being sent to you by FCSA #14 / Belmont Manor in compliance with the California Domestic Water Quality and Monitoring Regulations as a means of keeping the public informed.

State Water System ID: 1000023. Date distributed: _____

APPENDIX 3
CERTIFICATION OF COMPLETION OF PUBLIC NOTIFICATION

Compliance Order Number: 03-23-18R-012

Name of Water System: FCSA #14 / Belmont Manor

System Number: 1000023

Attach a copy of the public notice distributed to the water system's customers.

This form, when completed and sent to dwpdist23@waterboards.ca.gov for the Division of Drinking Water, Fresno District 23, 265 W. Bullard Avenue, Suite 101, Fresno, CA 93704 serves as certification that public notification to water users was completed as required by Title 22, California Code of Regulations, Sections 64463-64465.

Public notification for failure to comply with the **1,2,3-TCP MCL** was conducted on:

Notification was made on _____ (date).

For the _____[Insert month or quarter and year].

To summarize report delivery used and good-faith efforts taken, please check all items below that apply and fill-in where appropriate:

For Community and non-transient non-community public water systems

☐ The notice was distributed by mail or direct delivery to each customer on: _____

One or more of the following methods were used to reach persons not likely to be reached by a mailing or direct delivery or persons served by a transient public water system (renters, nursing home patients, prison inmates, etc.):

☐ Posted the notice at the following conspicuous locations served by the water system. (If needed, please attach a list of locations). _____

☐ Publication of the notice in a local newspaper or newsletter of general circulation (attach a copy of the published notice, including name of newspaper and date published).

☐ Posted the notice on the Internet at www._____

☐ Other method used to notify customers. _____

I hereby certify that the above information is factual.

Certified by: Printed Name _____Title_____

Signature _____

Date _____

Disclosure: Be advised that the California Health and Safety Code, Sections 116725 and 116730 state that any person who knowingly makes any false statement on any report or document submitted for the purpose of compliance with the Safe Drinking Water Act may be liable for, respectively, a civil penalty not to exceed five thousand dollars ($5,000) for each separate violation or, for continuing violations, for each day that violation continues, or be punished by a fine of not more than $25,000 for each day of violation, or by imprisonment in the county jail not to exceed one year, or by both the fine and imprisonment

APPENDIX 4: QUARTERLY PROGRESS REPORT

Water System: FCSA #14 / Belmont Manor	Water System No: 1000023
Compliance Order No: 03-23-18R-012	Violation: 1,2,3-TCP MCL
Calendar Quarter:	Date:

This form should be prepared and signed by Water System personnel with appropriate authority to implement the directives of the Compliance Order and the Corrective Action Plan. Please attach additional sheets as necessary. The quarterly progress report must be submitted by the 10th day of each subsequent quarter, to the Division of Drinking Water, Fresno District 23 Office to the following email address: dwpdist23@waterboards.ca.gov titled appropriately.

Summary of Compliance Plan:

Tasks completed in the reporting quarter:

Tasks remaining to complete:

Anticipated compliance date:

Printed Name **Signature**

Title **Date**

APPENDIX 5 – NOTIFICATION OF RECEIPT

Compliance Order Number: 03-23-18R-012

Name of Water System: FCSA #14 / Belmont Manor

System Number: 1000023

Certification

I certify that I am an authorized representative of the FCSA #14 / Belmont Manor and that Compliance Order No. 03-23-18R-012 was received on _____. Further I certify that the Order has been reviewed by the appropriate management staff of the FCSA #14 / Belmont Manor and it is clearly understood that Compliance Order No. 03-23-18R-012 contains legally enforceable directives with specific due dates.

_____ _____

Signature of Water System Representative Date

THIS FORM MUST BE COMPLETED AND RETURNED TO THE STATE WATER BOARD, DIVISION OF DRINKING WATER, NO LATER THAN April 10, 2018.

Disclosure: Be advised that the California Health and Safety Code, Sections 116725 and 116730 state that any person who knowingly makes any false statement on any report or document submitted for the purpose of compliance with the Safe Drinking Water Act may be liable for, respectively, a civil penalty not to exceed five thousand dollars ($5,000) for each separate violation or, for continuing violations, for each day that violation continues, or be punished by a fine of not more than $25,000 for each day of violation, or by imprisonment in the county jail not to exceed one year, or by both the fine and imprisonment.

APPENDIX D

FRESNO IRRIGATION DISTRICT UTILITY RESPONSE LETTER

2907 S. Maple Avenue
Fresno, California 93725-2208
Telephone: (559) 233-7161
Fax: (559) 233-8227

CONVEYANCE. COMMITMENT. CUSTOMER SERVICE.

March 22, 2021

Juliet Benson
Provost & Pritchard Consulting Group
286 W. Cromwell Avenue
Fresno, CA 93711

RE: Utility Search for County of Fresno Service Area CSA 14
FID Facilities: Various

Dear Ms. Benson:

The Fresno Irrigation District (FID) has reviewed the Utility Search for County of Fresno Service Area CSA 14 for which the County of Fresno proposes to connect to the City of Fresno water system. FID has the following comments and requirements:

Impacted Facilities

1. FID has many canals within the Planning Area as shown on the attached FID exhibit map. The facilities include: Fancher No. 6, Briggs No.7, Eisen No. 11, East Branch-W. Br. No. 5, and East Branch – S. Br. No. 5. Most, if not all of these facilities precede the City, development, and/or roads. FID's canals range from smaller diameter pipelines to large open canals. In some cases, the impacted facilities may need to be upgraded to meet current urban standards or relocated to accommodate urban developments and provide for public safety which will require new pipelines and new exclusive easements. FID will impose the same conditions on this projects as it would with any other project located within the common boundary of the City of Fresno, County of Fresno, and FID including, but not limited to requirements from FID specified exclusive easements, access points, and drive approaches at all road crossings. Should this project include any road improvements, FID requires all impacted open channel drive banks, to be built out to FID specified widths, heights, and overlaid with all-weather road. FID will require that it review and approve all maps and plans which impact FID canals and easements.

    a. Small/Medium Canal Crossings – The majority of the proposed Planning Area will impact existing pipelines and small open channel canals. FID will

require all open channels and existing pipelines impacted by the project area development be upgraded to meet FID's then current standards for urban, rural, industrial areas. The majority of FID's facilities that lie within the proposed Planning Area do not meet FID's urban specifications, including road or highway crossings. The majority of the existing pipelines are monolithic cast-in-place concrete pipe (CIPCP), low head/thin wall PVC, and non-reinforced mortar jointed concrete pipeline. These pipelines were designed for a rural environment and must be replaced as improvement occurs.

b. Large Canal Crossing – There are large canals called the Fancher No. 6 and the Briggs No. 7 that will more than likely be too large to be contained within a pipeline. Project impacts to this facility shall require designs that protect the canal's integrity for an urban setting including the need for access and full right-of-way widths for FID's operations and maintenance needs.

2. FID's facilities that are within the Planning Area carry irrigation water for FID users, recharge water for the City of Fresno, and storm and flood waters during the winter months. In addition to FID's facilities, private facilities also traverse the Planning Area.

Water Supply Impact

1. The Planning Area is located both outside of and within Growth Areas 1 and 2 of the Cooperative Water Utilization and Conveyance Agreement between the City of Fresno and FID. Should any development receive water through any Extraterritorial Agreements, FID requires it review and approve all Agreements. Areas that are outside of the said Conveyance Agreement or within Growth Area 2 are not entitled to waters from FID.

2. California enacted landmark legislation in 2014 known as the Sustainable Groundwater Management Act (SGMA). The act requires the formation of local groundwater sustainability agencies (GSAs) that must assess conditions in their local water basins and adopt locally-based management plans. FID and the City of Fresno are members of the North Kings Groundwater Sustainability Agency which will manage the groundwater basin within the FID service area. This area is heavily reliant on groundwater pumping and SGMA will impact all users of groundwater and those who rely on it. The City of Fresno should consider the potential impacts of the development on the City's ability to comply with requirements of SGMA.

3. FID is concerned that the proposed project may negatively impact local groundwater supplies including those areas adjacent to or neighboring the

proposed Planning Area area. The area was historically native or rural residential with minimal to no water use. Under current circumstances the project area is experiencing a modest but continuing groundwater overdraft. Should the proposed development result in a significant increase in dependence on groundwater, this deficit will increase. FID recommends the City of Clovis require the proposed development balance anticipated groundwater use with sufficient recharge of imported surface water in order to preclude increasing the area's existing groundwater overdraft problem.

4. It should be noted that without the use of surface water, continued dependence on solely a groundwater supply will do nothing to reverse or correct the existing overdraft of the groundwater supply beneath the City of Fresno and FID service area. As additional development within the Planning Area will "harden" or make firmer the need for water, the long-term correction of the groundwater overdraft should be considered as any requirements for developments.

5. As with most developer projects, there will be considerable time and effort required of FID's staff to plan, coordinate, engineer, review plans, prepare agreements, and inspect the project. FID's cost for associated plan review will vary and will be determined at the time of the plan review.

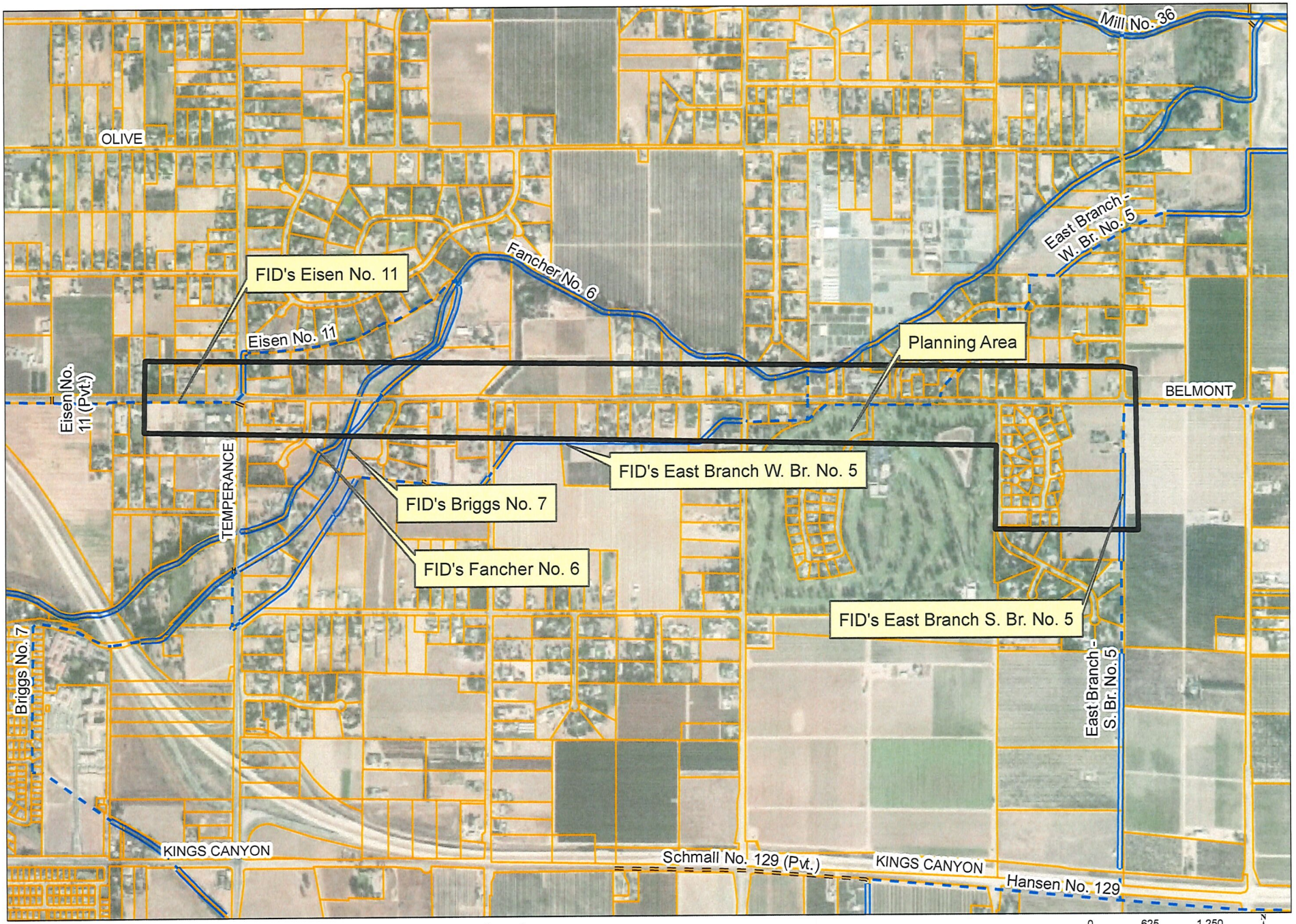
6. The above comments are not to be construed as the only requests FID will have regarding this project. FID will make additional comments and requests as necessary as the project progresses and more detail becomes available.

Thank you for providing this for our review. We appreciate the opportunity to review and comment on the subject documents for the proposed project. If you have any questions please feel free to contact Jeremy Landrith at (559) 233-7161 extension 7407 or jlandrith@fresnoirrigation.com.

Sincerely,

Laurence Kimura, P.E.
Chief Engineer

Attachments



This map was produced by the Fresno Irrigation District and is provided for reference and informational purposes only and is not intended to show map scale accuracy or all inclusive map features, nor for legal purposes. FID makes no statements regarding the accuracy of this map as the features shown are in their approximate location. Please contact the FID Engineering Dept. at (559) 233-7161 for further information on FID facilities.

FRESNO IRRIGATION DISTRICT

Legend

- FID Canal
- Private Canal
- Abandoned Canal
- FID Pipeline
- Private Pipeline
- Abandoned Pipeline
- Stream Group
- Other-Creek\River
- Other-Pipeline
- FID Boundary
- Railroad
- Streets & Hwys
- Parcel
- FMFCD Acquired Basins
- FMFCD Proposed Basins

0 625 1,250 Feet

1 inch = 1,319.03 feet

Date Saved: 1/15/2021 7:42:40 AM
Path: G:\Fidgis\20201222 Master.mxd

Jeremy Landrith

From: Juliet Benson <jbenson@ppeng.com>
Sent: Tuesday, February 23, 2021 11:12 AM
To: Engineering Review
Subject: Utility Request
Attachments: Utility Request Map.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

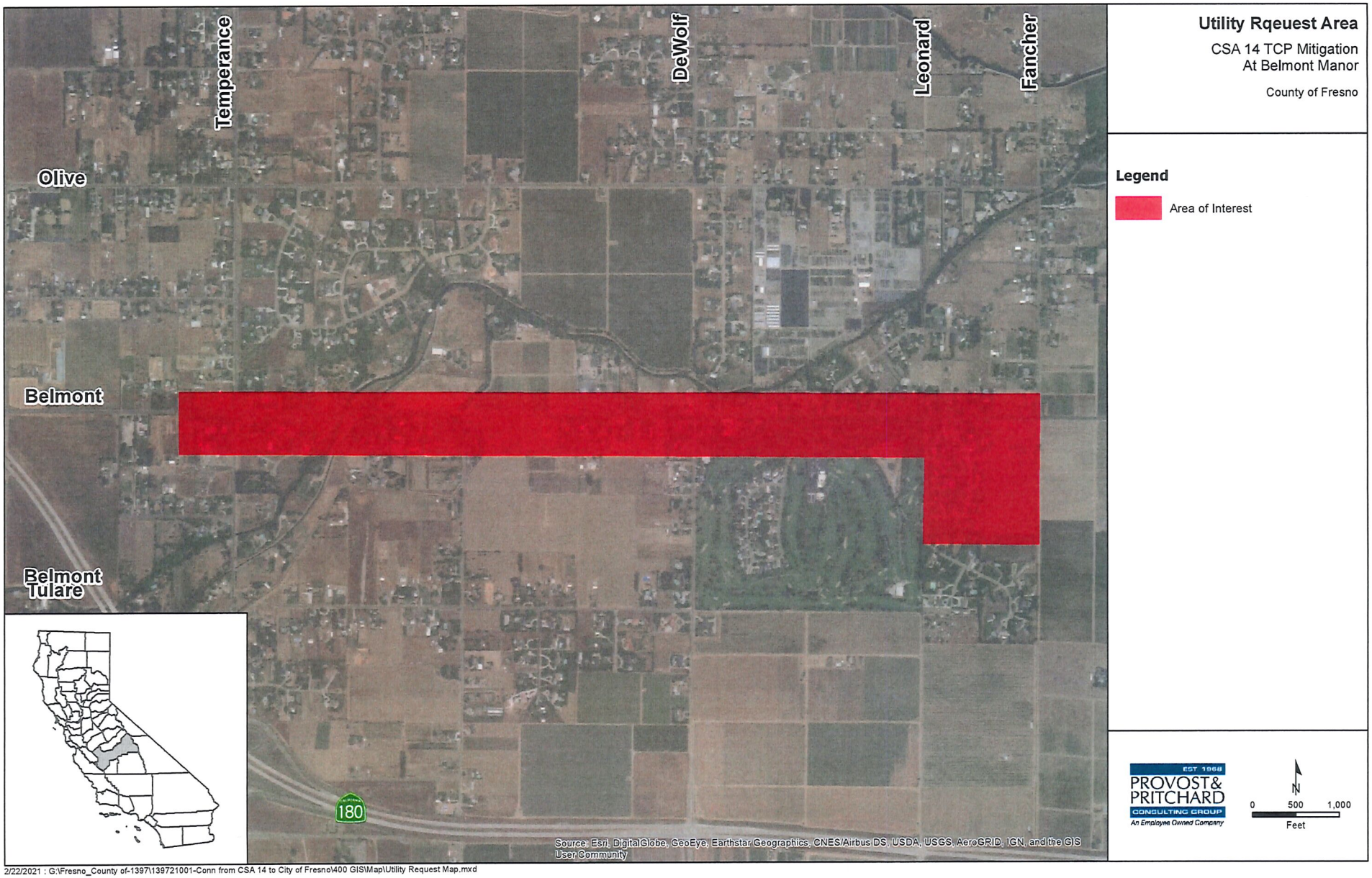
Good Morning,

We are working on the planning and design of a pipeline that will connect the City of Fresno water system to a County of Fresno Service Area, CSA 14. The project is located in the County of Fresno, in Belmont Avenue east of the intersection of Belmont and Temperance Avenues. The project will also include the planning and design of the replacement of the CSA 14 water distribution system, which is located about 1.5 miles east of the intersection of Belmont and Temperance Avenues. The area of interest is within the area shaded red in the attached figure.

We are trying to locate all existing, or any planned, facilities within the project area. If you have facilities in this area please send us any available plats or construction drawings. If plats or drawings are not available please indicate the type, size and location of your facilities on the attached exhibit and return to us. Please notify us, in writing, if you do not have facilities in the project area.

If you have any questions or comments please e-mail me at jbenson@ppeng.com. Any information you can provide regarding your facilities location or operation will help us accommodate them in our design. Thank you in advance for your efforts.

Juliet Benson
Provost & Pritchard Consulting Group
286 W. Cromwell Avenue
Fresno, CA 93711-6162
Office: (559) 449-2700 ext. 212
Fax: (559) 449-2715
E-mail: jbenson@ppeng.com
Website: http://www.ppeng.com



Utility Rqeuest Area

CSA 14 TCP Mitigation
At Belmont Manor

County of Fresno

Legend

Area of Interest

EST 1968
PROVOST& PRITCHARD
CONSULTING GROUP
An Employee Owned Company

N

0 500 1,000
Feet

2/22/2021 : G:\Fresno_County of-1397\139721001-Conn from CSA 14 to City of Fresno\400 GIS\Map\Utility Request Map.mxd

APPENDIX E

FRESNO IRRIGATION DISTRICT STANDARD DRAWINGS

FRESNO IRRIGATION DISTRICT
ENGINEERING HANDBOOK OF

SPECIFICATIONS
AND DRAWINGS

REVISED 6-15-2018

"Your Most Valuable Resource – Water"

Laurence Kimura, Chief Engineer

FID STANDARD DRAWINGS

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	TABLE OF CONTENTS	
	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL T.O.C. SHEET 1 OF 2

FID STANDARD DRAWINGS

ABBREVIATIONS

AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
ACI	AMERICAN CONCRETE INSTITUTE
AGG	AGGREGATE
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALIGN	ALIGNMENT
AP	ANGLE POINT
APPROX	APPROXIMATE
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AV	AIR VENT
BC	BEGIN CURVE
BLDG	BUILDING
BM	BENCHMARK
BTM	BOTTOM
C	CHANNEL
CA	CALIFORNIA
CAL-OSHA	CALIFORNIA DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
C.F.S	CUBIC FEET PER SECOND
CIP	CAST-IN-PLACE
CL	CLASS
℄,C/L	CENTERLINE
CLF	CHAIN LINK FENCE
CLR	CLEAR, CLEARANCE
CIR.	CIRCUMFERENCE
CMLC	CEMENT MORTAR LINED & COATED
CMP	CORRUGATED METAL PIPE
CONC	CONCRETE
CONT	CONTINUOUS
CONST	CONSTRUCT/CONSTRUCTION
CP	CONTROL POINT
CY	CUBIC YARDS
Db	BAR DIAMETER
DEG	DEGREE
DEMO	DEMOLISH/DEMOLITION
DIA.,D,Ø	DIAMETER
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
D/S	DOWNSTREAM
DWG	DRAWING
(E)	EXISTING
EA	EACH
EC	END CURVE
EF	EACH FACE
EG	EXISTING GRADE
EL.,ELEV	ELEVATION
ELEC	ELECTRIC
ELL,ELB	ELBOW
EP	EDGE OF PAVEMENT
ESMT	EASEMENT
EW	EACH WAY
F&I	FURNISH & INSTALL
FB	FLAT BAR
FF	FINISHED FLOOR
FG	FINISHED GRADE
FID	FRESNO IRRIGATION DISTRICT
FL,F/L	FLOW LINE
FNC	FENCE
FT	FEET/FOOT
GA.	GAUGE
GALV.	GALVANIZED
GB	GRADE BREAK
GPM	GALLONS PER MINUTE
GUY	GUY WIRE
HD	HEAD
HDPE	HIGH DENSITY POLYETHYLENE
HGL	HYDRAULIC GRADE LINE
HORIZ,H	HORIZONTAL
HP	HINGE POINT
HWL	HIGH WATER LINE
ID	INSIDE DIAMETER
IN	INCH
INV	INVERT
IP	IRON PIPE
IRR	IRRIGATION
∠	ANGLE
LB,LBS.	POUNDS
LC	LENGTH OF CURVE
LCW	LONG CRESTED WEIR
LF	LINEAR FEET
LT	LEFT
MAX.	MAXIMUM
MH	MANHOLE
MIL	THOUSANDTHS OF AN INCH
MIN.	MINIMUM
MISC	MISCELLANEOUS
N/A	NOT APPLICABLE
NAVD	NORTH AMERICAN VERTICAL DATUM
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NIC	NOT IN CONTRACT
No.,#	NUMBER
NTS	NOT TO SCALE
O.A.	ON CENTER
OD	OUTSIDE DIAMETER
OH	OVERHEAD
OP	OPERATING
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
O&M	OPERATIONS AND MAINTENANCE
(P)	PROPOSED
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVATURE
PI	POINT OF INTERSECTION
PIP	PLASTIC IRRIGATION PIPE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PL	PROPERTY LINE
POC	POINT ON CURVE
POL	POINT ON LINE
POT	POINT ON TANGENT
PP	POWER POLE
PRC	POINT OF REVERSE CURVATURE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENCY
PUE	PUBLIC UTILITY EASEMENT
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
RAD,R	RADIUS
ROC	RADIUS OF CURVE
RC	RELATIVE COMPACTION
RCP	REINFORCED CONCRETE PIPE
RE	REFERENCE
REQD	REQUIRED
REV	REVISION
RGRCP	RUBBER GASKET REINFORCED CONCRETE PIPE
ROW,R/W	RIGHT-OF-WAY
RP	RADIUS POINT
RR	RAILROAD
RT	RIGHT
RTU	REMOTE TERMINAL UNIT
S	SLOPE
SCH	SCHEDULE
SEC	SECTION
SF	SQUARE FEET/FOOT
SP	SERVICE POLE
SQ	SQUARE
SS	STAINLESS STEEL
ST	STRUCTURAL TUBING
STA	STATION
STD.	STANDARD
SWL	SWALE
STWL	STILLING WELL
SYM	SYMMETRICAL
T&B	TOP AND BOTTOM
TB	TOP OF BANK
TBM	TEMPORARY BENCHMARK
TC	TOP OF CURB
TCE	TEMPORARY CONSTRUCTION EASEMENT
TELE	TELEPHONE
TL	TOP OF LINING
TOB	TOP OF BANK
TOE	TOE OF SLOPE
TOP	TOP OF SLOPE
TP	TELEPHONE POLE
TR	TELEPHONE RISER
TRANS	TRANSFORMER
TS	TOP OF STRUCTURE
CIR.D.	TYPICAL
TWL	TOP OF WALL
UG	UNDERGROUND
UP	UTILITY POLE
U/S	UPSTREAM
VERT,V	VERTICAL
WL	WATER LEVEL
W/	WITH
W/O	WITHOUT
YD	YARD
<	LESS THAN
>	GREATER THAN
≤	LESS THAN OR EQUAL TO
≥	GREATER THAN OR EQUAL TO

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	ABBREVIATIONS	
	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE	STANDARD DETAIL P-01
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CALIFORNIA WATER CODE
CHAPTER 3 EXCERPTS
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Chapter 3 - Bridges and Conduits On or Near Highways

7030 Conduit defined

As used in this chapter, "conduit" includes canal, ditch, culvert, pipeline, flume, or other appliance for conducting water. (Enacted by Stats 1961 Ch. 1786)

7031 Highway defined

As used in this chapter, except in Section 7034, "highway" includes both state and county highways as defined by or identified in the Streets and Highways Code. (Enacted by Stats 1961 Ch. 1786)

7031.5 Bridge defined

As used in this chapter, "bridge" means a structure constructed to allow the conducting of water underneath by canal, ditch, flume or other uncovered appliance for conducting water. (Enacted by Stats 1961 Ch. 998)

7032 Ban on obstruction of highway

No conduit shall be laid, constructed, or maintained so as to obstruct any highway. (Enacted by Stats 1961 Ch. 1786)

7033 Standards for conduit crossing or running along highway

Every person or public district or agency who or which initially constructs, or improves for his or its own benefit, any conduit crossing or running along any pre-existing highway, shall construct or improve such conduit in accordance with standards established by the county or State as the case may be, and at the expense of the person so constructing or improving such conduit. (Enacted by Stats 1961 Ch. 1786)

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	CALIFORNIA WATER CODE CHAPTER 3 EXCERPTS	
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CALIFORNIA WATER CODE
CHAPTER 3 EXCERPTS
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7034 Bridges or conduits accepted by county; succession by state to responsibility

Bridges and conduits heretofore or hereafter constructed in a permanent manner, whether by encroachment permit or otherwise, which cross county highways and which have been constructed or brought up to county standards, and have been accepted, either formally or informally by appropriate action, shall, after such acceptance, and regardless of who constructed them, be the sole responsibility of the county, so far as maintenance, repair, improvement for the benefit of the county, reconstruction or replacement of such bridges and conduits are concerned. If any such county highways become state highways, the State shall succeed to the foregoing obligations of the County. The amendment of this section made at the 1963 Regular Session of the Legislature does not constitute a change in, but is declaratory of, the pre-existing law. (Amended by Stats 1963 Ch. 524)

7035 Responsibility for conduit presumed prior to highway

Whenever any conduit for conducting water crosses a highway and no written records exist showing that the highway rights-of-ways existed prior to the conduit rights-of-way, it shall be conclusively presumed that the conduit was in place and lawfully maintained prior to the highway and such conduit shall be repaired, improved for the benefit of the public agency having jurisdiction over such highway, and replaced, if necessary, by the public agency having jurisdiction over such highway, provided that usual acts of maintenance of the conduit, such as cleaning the conduit of dirt or silt, shall be performed by and at the expense of the person using the conduit. (Amended by Stats 1974 Ch. 36)

7036 Agreement between public district or private utility and county to apportion costs

Any public district or private utility and any county may enter into a contract agreeing to pay and apportion between them the costs of locating, removing, repairing, or relocating any facilities owned or to be owned by either party on the roads or other property of the other in such proportion and upon such terms as the governing boards of the parties shall determine to be equitable. This section shall not supersede the provisions of this chapter. (Enacted by Stats 1967 Ch. 998)

STANDARD EASEMENT WIDTHS FOR
OPEN CANALS AND PIPELINES

SOURCE:

Board Policy No. 155

Rev. 5/29/02

Section 22438 of the California Water Code, attached as Exhibit "A" hereto, entitles the District to a secondary easement on each side of any open canal for which the District holds a prescriptive easement, with the width of the secondary easement to be whatever is reasonably required by the District for maintenance, repair, cleaning and operations of the secondary easement and open canal with equipment owned by or available to the District for that use at the time the rights are exercised. Exhibit "B" attached hereto, sets forth the dimensions of secondary easements for Fresno Irrigation District canals which are deemed to be reasonably required and which are claimed by the District under Section 22438.

Easements for pipelines or for open canals for which the District holds a written grant or judgement providing a legal description of the easement are not subject to the secondary easement provisions of Section 22438. District activities and the locations of canal facilities are therefore restricted to the limits established by the legal description of the easement.

For the purposes of acquiring easements for pipelines by grant or condemnation, the standard easement requirements are shown on Exhibit "C", attached hereto. Extraordinary conditions or circumstances may dictate modification of the standard easement, but such modification shall be subject to approval of the Board of Directors.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	STANDARD EASEMENT WIDTHS FOR OPEN CANALS AND PIPELINES	
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STANDARD EASEMENT WIDTHS FOR

OPEN CANALS AND PIPELINES

EXHIBIT "A"

SENATE BILL No. 891

An act to add Section 22438 to the Water Code, relating to irrigation districts.

Approved by the Governor on July 5, 1989.

Filed with the Secretary of State July 5, 1989.

LEGISLATIVE COUNSEL'S DIGEST

SB 891, Vuich. Irrigation Districts: canal easements.

Under existing law, an irrigation district may acquire by any means any property or interest in property to carry out its purposes.

This bill would declare that whenever any irrigation district is the owner of an easement for an open canal for the transportation of water across lands not owned by it, other than as specified, the district shall have a secondary easement on each side of the open canal for the maintenance, repair, cleaning, operation, and control of the open canal, as prescribed, and would specify related matters.

The people of the State of California do enact as follows:

SECTION 1. Section 22438 is added to the Water Code, to read:

22438. (a) Whenever any district is the owner of an easement for an open canal for the transportation of water across lands not owned by it, other than an easement evidenced by a written grant or judgement providing a legal description of the easement, the district shall have a secondary easement on each side of the open canal for the maintenance, repair, cleaning, operation, and control of the open canal and such other use thereof as may be reasonably be required by the district in exercising those rights and in the maintenance, repair, cleaning, and operation of that easement and open canal with equipment owned by or available to the district for that use at the time the rights are exercised. The duration of the secondary easement shall be for so long as the district, or its successors or assigns, continues to own the open canal easement regardless of what use has or has not been made of the secondary easement.

(b) The owner of the land upon which a secondary easement is located, or any lessee of the land, shall have the right to use the surface of the land upon which the secondary easement is located for his or her own purposes to the extent that the use does not unreasonably interfere with the district's ownership or use of the secondary easement, or upon the open canal easement. Any encroachment or obstruction placed or permitted upon the secondary easement by the owner of the land or any lessee of the land, which unreasonably interferes with the secondary easement or the open canal easement, may be removed by the district at the owner's or lessee's expense, or by legal action filed by the district.

This section shall not be construed to limit the right of a district or of any person to acquire any easement by prescriptive or condemnation or to enter into a written agreement concerning an easement or secondary easement upon such terms as are agreed upon the parties.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	STANDARD EASEMENT WIDTHS FOR OPEN CANALS AND PIPELINES EXHIBIT A	
	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL P–04 SHEET 1 OF 1

STANDARD EASEMENT WIDTHS FOR

OPEN CANALS AND PIPELINES EXHIBIT "B"

(Page 1 of 2)

GENERAL REQUIREMENTS

The following requirements have been approved and adopted by the Board of Directors to provide a guideline for establishing adequate Right-of-Way widths for canals and ditches owned, operated, and maintained by the Fresno Irrigation District. Any extraordinary conditions, circumstances, misunderstandings, failure or refusal of a property owner to accept or comply with the general requirements described below should be brought to the immediate attention of the General Manager.

1. When establishing top of bank width required for operation and maintenance purposes, some existing top of bank widths may be more than required by the District, but in most cases, will be less. Therefore, the Right-of-Way line should be established in accordance with the requirements for future improvements, operations, and maintenance of the canal.

2. To determine the requirements for top of bank widths, canals and ditches shall be classified into two different categories. First, canals with banks which are not more than one foot 1.0') above the surrounding ground level will be classified in a "cut" category. Second, canals with banks which are more than one foot (1.0') above the adjacent ground level will be classified as "fill".

3. Required top of bank widths shall be measured on a level plane from the inside edge of the canal or ditch bank.

4. Canals with capacity of 50 C.F.S or more:

   a). Canals which are in a "cut" or at grade shall require a top of bank width no less than twenty feet (20') wide.

   b). Canals which are in a" fill" shall require a top of bank width of no less than fifteen feet (15') plus one and one-half feet (1.5') for each vertical foot outside of the bank slope plus and an additional two feet (2') to establish the Right-of-Way line beyond the outside toe of the canal bank. Easement width will be as required or no less than twenty feet (20') from the top inside bank to Right-of-Way line.

5. Canals with a capacity of less than 50 C.F.S:

   a). Canals which are in a "cut" shall require a top of bank width no less than fifteen feet (15') wide.

   b). Canals which are in a "fill" shall require a top of bank width of no less than twelve feet (12') plus one and one-half feet (1.5') for each vertical foot outside of the bank slope. "Fill" canals also require an additional two feet (2.0') to establish the Right-of-Way line beyond the outside toe of the canal.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	STANDARD EASEMENT WIDTHS FOR OPEN CANALS AND PIPELINES EXHIBIT B	
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STANDARD EASEMENT WIDTH FOR

OPEN CANALS AND PIPELINES EXHIBIT "B"

(Page 2 of 2)

6. Canals with a capacity less than 50 C.F.S: (Alternate)

   a). Canals which are in a "cut" shall require a top of bank width no less than fifteen feet (15') wide.

   b). Canals which are in a "fill" shall require a top of bank width of no less than four feet (4') plus four feet (4.0') for each vertical foot outside of the bank slope.

   c). On smaller sloper type ditches, it may be necessary to resort to access along and outside the ditch, but in all cases the requirements should be established to prevent encroachments on the Right-of-Way.

   d). The alternate section cannot be used if the overall width exceeds the standard width and is permitted only when the District operations and maintenance functions do not require a standard road Right-of-Way.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	STANDARD EASEMENT WIDTHS FOR OPEN CANALS AND PIPELINES EXHIBIT B	
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STANDARD EASEMENT WIDTHS FOR
OPEN CANALS AND PIPELINES EXHIBIT "C"
PIPELINE EASEMENT WIDTHS

The following shall be used by staff in the determination and acquisition of new pipeline easement widths:

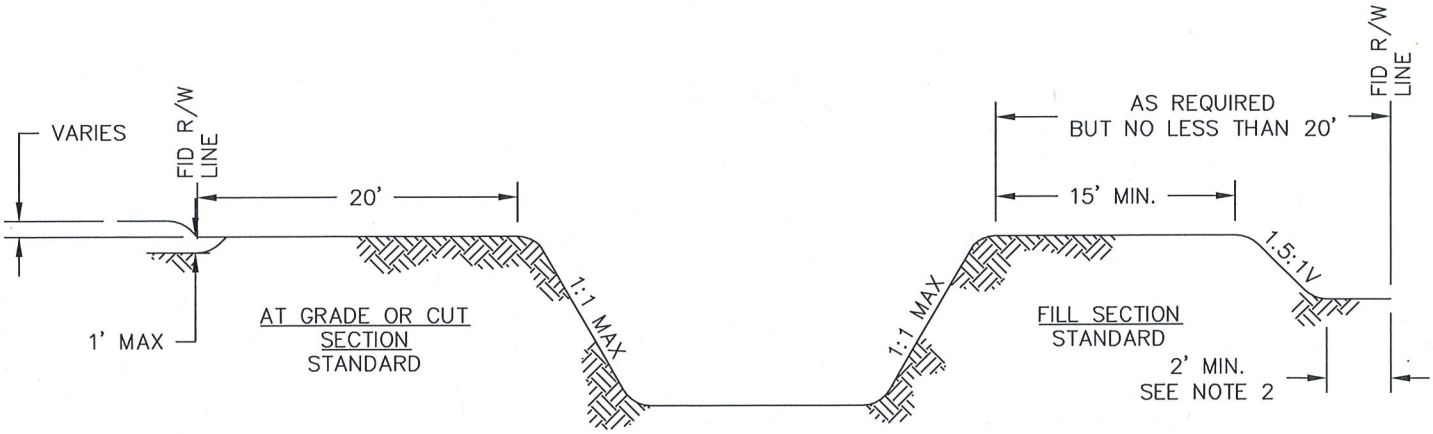
Type of Pipe	Easement Width for Dia. ≤ 24" I.D.	Easement Width for 24" > Dia. ≤ 36" I.D.	Easement Width for Dia. > 36" I.D.
PVC (SDR41, PIP)	20 feet	N/A	N/A
RGRCP (C-361)	20 feet	30 feet	40 feet
CIP (ACI 346)	N/A	30 feet	40 feet
Min. Width Adjacent to Right-of-Way	15 feet	15 feet	20 feet

Where the pipeline easement will be contiguous and parallel to a Joint Use Right-of-Way such as a "local" public street Right-of-Way or a "rural" road with a Right-of-Way sixty feet (60') or less, the required easement may be reduced if the street maintaining agency allows the District to perform maintenance using a portion of the road Right-of-Way. On any street or rural road where curbside parking will be permitted by the street maintaining agency, the easement width may be reduced.

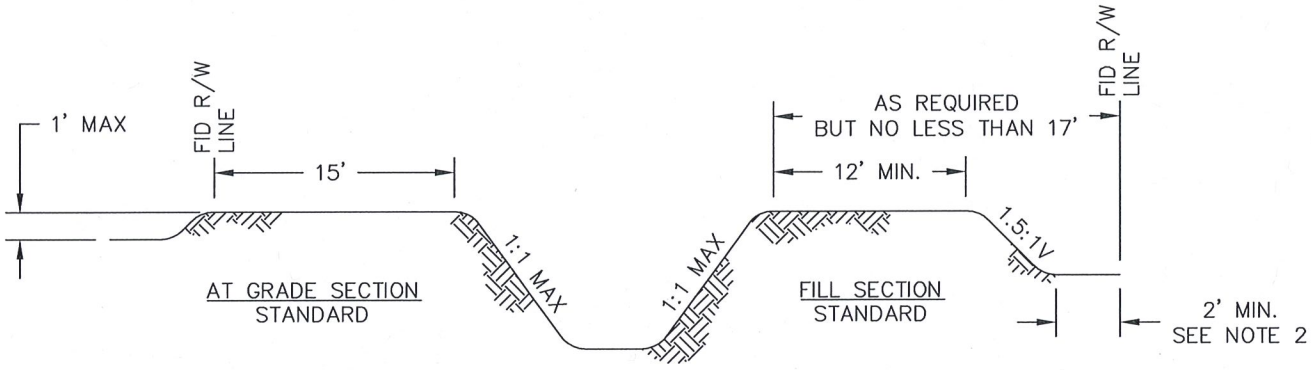
The easement width may not be reduced for controlled access streets designed as freeways, expressways, super arterials, arterials, collectors, or landscaped drives. No easement reduction will be permitted adjacent to turn lanes or bus stops or other locations posted to prohibit stopping or parking without special provision for maintenance access. Written evidence may be required from the street maintaining agency showing that the predetermined easement width reduction can be satisfied.

Where public utility easements or landscape easements will overlap the District's pipeline easement, regardless of pipeline diameter, the required pipeline easement width shall be increased as necessary so that fifty percent (50%) of the required easement width is free from overlapping utilities. The District may waive this easement requirement for landscape easements if the District can be assured the landscaping will not impact the pipeline.

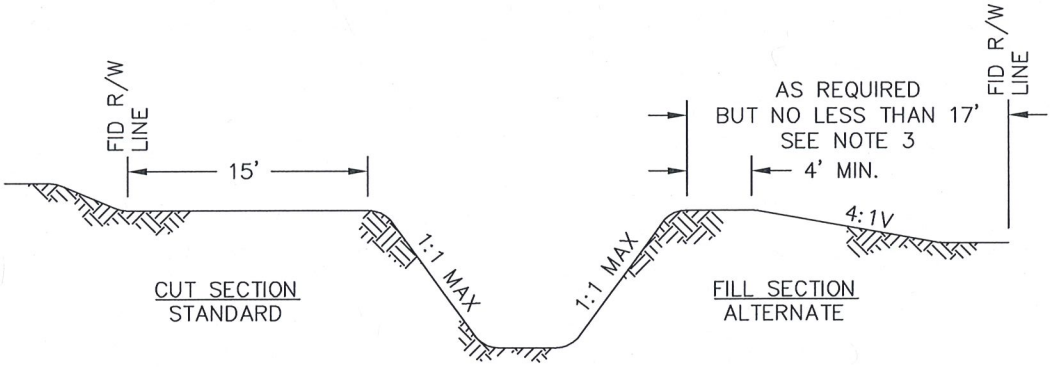
FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	STANDARD EASEMENT WIDTHS FOR OPEN CANALS AND PIPELINES EXHIBIT C	
	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL P–06 SHEET 1 OF 1



50 C.F.S. & UP



UNDER 50 C.F.S.



UNDER 50 C.F.S.

NOTES:

1. ALL PRIVATE FACILITIES TO BE LOCATED OUTSIDE FID RIGHT-OF-WAY.
2. ADD 2 FEET TO EMBANKMENT WIDTH TO ESTABLISH OVERALL RIGHT-OF-WAY WIDTH TO ACCOMMODATE GRADER BLADE CLEARANCE.
3. THE ALTERNATE SECTION CANNOT BE USED IF THE OVERALL WIDTH EXCEEDS THE STANDARD WIDTH AND IS PERMITTED ONLY WHEN DISTRICT OPERATIONS AND MAINTENANCE FUNCTIONS DO NOT REQUIRE A STANDARD ROADWAY.

FRESNO IRRIGATION DISTRICT		CANAL RIGHT-OF-WAY
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 1-01 SHEET 1 OF 1

NOTES:

1. DIMENSIONS AND NOTES ARE FOR LAYOUT PURPOSES ONLY. A SCALED DRAWING SHALL BE PREPARED AND SUBMITTED WITH ALL PLAN SETS PRIOR TO CONSTRUCTION.

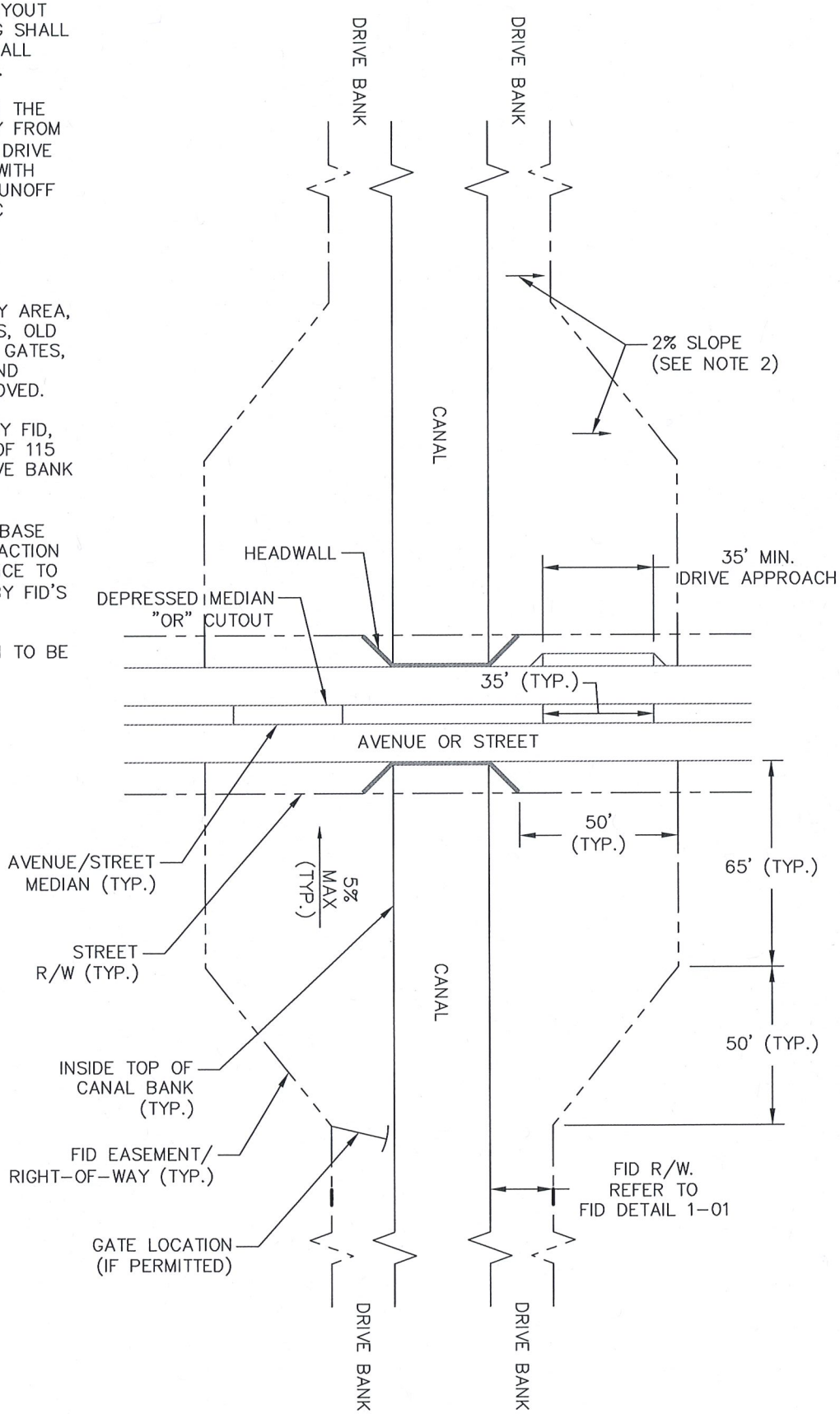
2. DRAINAGE WILL NOT BE ACCEPTED IN THE CANAL AND SHALL BE ROUTED AWAY FROM FID PROPERTY/DRIVE BANKS. SLOPE DRIVE BANKS 2% AWAY FROM THE CANAL WITH PROVISIONS MADE FOR RAINFALL. RUNOFF TO BE CONVEYED TO NEARBY PUBLIC STREETS OR DRAINAGE SYSTEM BY DRAINAGE SWALES OR OTHER FID ACCEPTABLE ALTERNATIVES.

3. WITHIN FID EASEMENT/RIGHT-OF-WAY AREA, ALL EXISTING TREES, BUSHES, DEBRIS, OLD CANAL STRUCTURES, PUMPS, CANAL GATES, AND OTHER NON OR INACTIVE FID AND PRIVATE STRUCTURES MUST BE REMOVED.

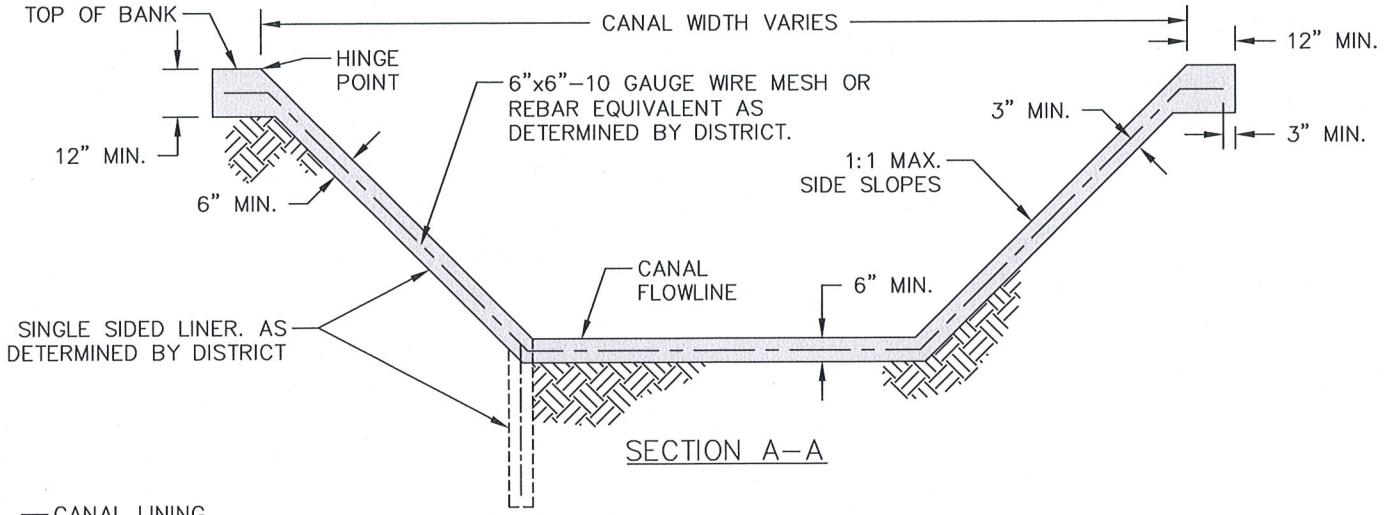
4. IF AN ACCESS GATE IS PERMITTED BY FID, GATE MUST BE PLACED A MINIMUM OF 115 FEET AWAY FROM ROAD, WHERE DRIVE BANK NARROWS TO 20 FEET.

5. THREE INCH (3") THICK AGGREGATE BASE COMPACTED TO 93% RELATIVE COMPACTION SHALL BE REQUIRED AT THE ENTRANCE TO EACH DRIVE BANK AS DETERMINED BY FID'S ENGINEER. NO REGRIND ASPHALT.

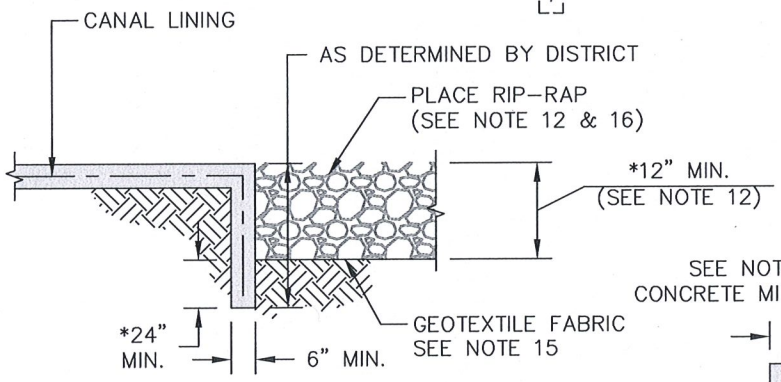
6. DRIVEWAY APPROACH MINIMUM WIDTH TO BE 35 FEET.



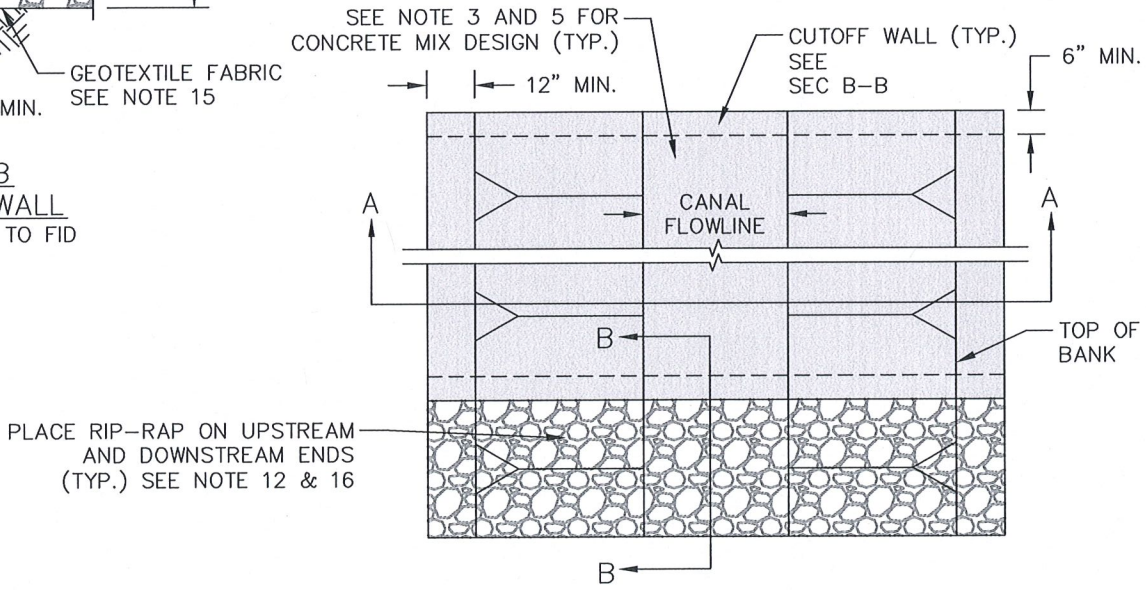
FRESNO IRRIGATION DISTRICT		DRIVE APPROACH – URBAN AREAS
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 1-02 SHEET 1 OF 1



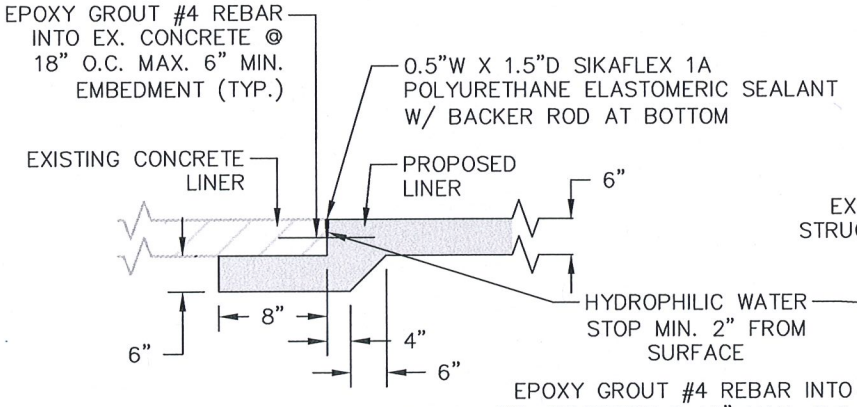
SECTION A-A



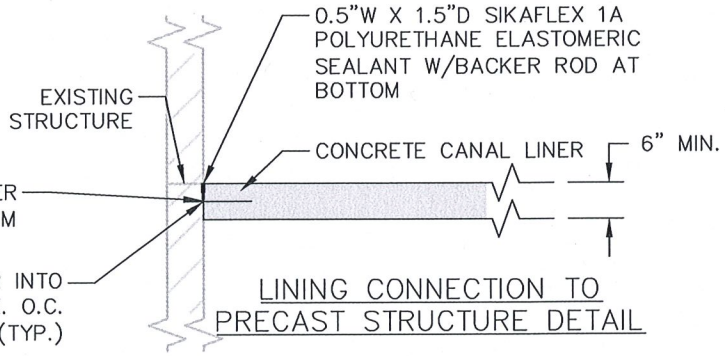
SECTION B-B
LINING CUTOFF WALL
*MIN. DEPTH SUBJECT TO FID ENGINEER



PLAN VIEW



UNDERLAP JOINT DETAIL



LINING CONNECTION TO PRECAST STRUCTURE DETAIL

FRESNO IRRIGATION DISTRICT		CANAL LINING
"Your Most Valuable Resource - Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 2-01 SHEET 1 OF 2

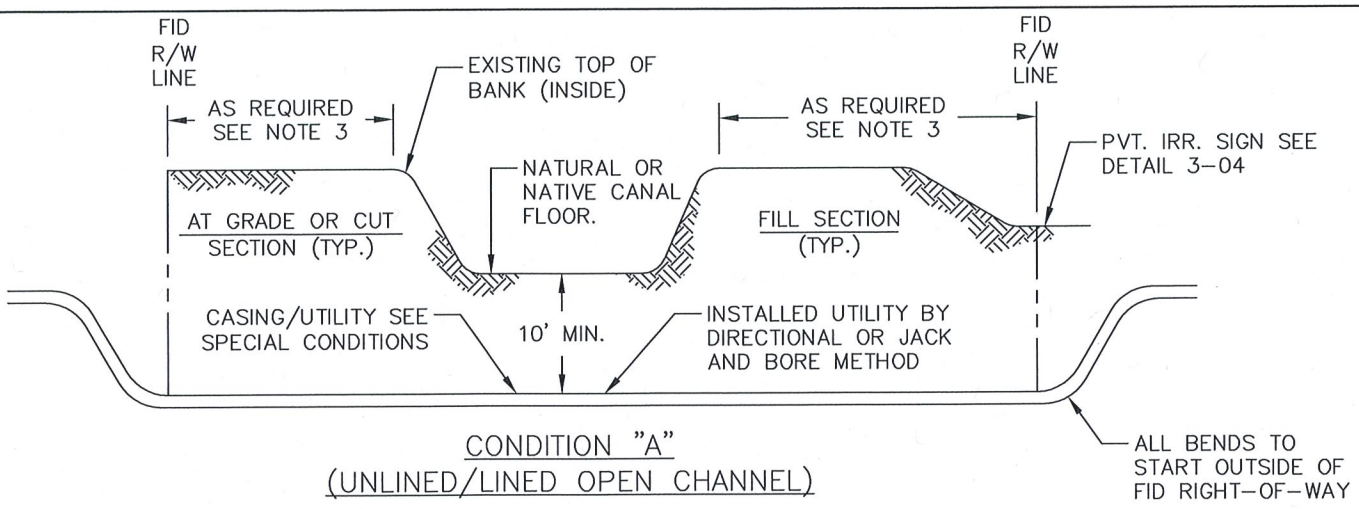
CANAL LINING NOTES:

1. LINING SHALL BE PLACED ON FIRM COMPETENT MATERIAL. IF THE UNDERLYING SOILS ARE NOT SUITABLE FOR CONCRETE PLACEMENT, CONTRACTOR SHALL OVER-EXCAVATE AND REPLACE WITH COMPACTED ENGINEERED FILL.
2. ALL DISTURBED SOILS TO HAVE MINIMUM OF 93% RELATIVE COMPACTION PER ASTM D-1557 IN FILL AREAS FOR A DISTANCE 5 FEET MINIMUM AROUND CONCRETE LINER.
3. CONCRETE LINING SHALL BE A MINIMUM OF 6-1/2 SACK WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,500 PSI.
4. CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGN TO FID FOR APPROVAL PRIOR TO CONSTRUCTION.
5. FIBERCAST 500 OR EQUIVALENT CONCRETE FIBER REINFORCEMENT WITH FIBER LENGTHS BETWEEN 1.5 INCH TO 2 INCH. APPLICATION RATE SHALL BE AT A MINIMUM OF 1.5 POUNDS. PER CUBIC YARD AND BE INCLUDED IN THE CONCRETE MIX.
6. 6" X 6" - 10" X 10" GAUGE WIRE MESH MAY BE UNCOATED OR GALVANIZED.
7. INSTALL ACCESS/SAFETY LADDERS ON ALTERNATE SIDES OF CANAL 18 INCH ON CENTER AT 100 FEET INTERVALS PER CAL OSHA STANDARDS OR AS DETERMINED BY DISTRICT.
8. LINING CUTOFF WALLS TO BE CONSTRUCTED UPSTREAM AND DOWNSTREAM OF CONCRETE LINING. LINING CUTOFF DEPTH TO BE DETERMINED BY DISTRICT.
9. AS DIRECTED BY FID'S INSPECTOR OR ENGINEER, CONTRACTOR SHALL MAKE AVAILABLE 7 DAY AND 28 DAY COMPRESSIVE STRENGTH TEST RESULTS.
10. CONTROL JOINTS REQUIRED EVERY 10 FEET IN TRANSVERSE DIRECTIONS WITH CONCRETE JOINT SEAL AND BACKER ROD.
11. CONCRETE LINER REQUIRED FOR A MINIMUM OF 5 FEET IN LENGTH OR LIMITS OF DISTURBED SOIL, WHICHEVER IS GREATER.

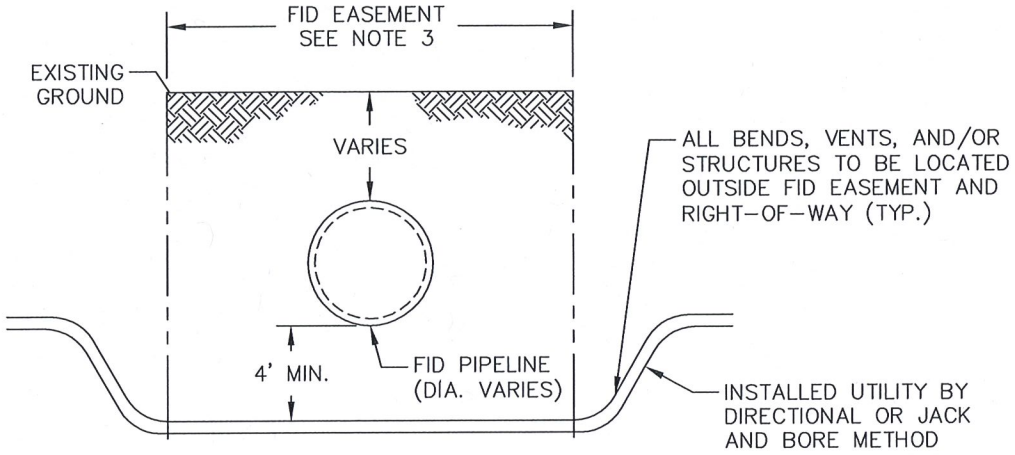
RIP-RAP NOTES:

12. RIP-RAP REQUIREMENT AS DETERMINED BY FID ENGINEER AND/OR INSPECTOR.
13. CLASS 2 RIP-RAP WITH METHOD B PLACEMENT FOR A MINIMUM OF 5 FEET PER 2010 CALTRANS STANDARDS AROUND CHANNEL FLOOR AND SIDE SLOPES OR AS DETERMINED BY FID'S ENGINEER. PLACE WOVEN GEOTEXTILE FABRIC BENEATH RIP-RAP.
14. CUTOFF WALLS SHALL BE EXCAVATED TO A MINIMUM OF 3 FEET BELOW NATIVE GRADE AND 24 INCHES BELOW RIP-RAP SUBGRADE UNLESS OTHERWISE DETERMINED BY FID'S ENGINEER.
15. WOVEN GEOTEXTILE FABRIC SHALL BE MIRAFI FW500 OR APPROVED EQUIVALENT.
16. RIP-RAP REQUIRED FOR A MINIMUM OF 5 FEET ON UPSTREAM AND DOWNSTREAM ENDS OF CONCRETE LINING.

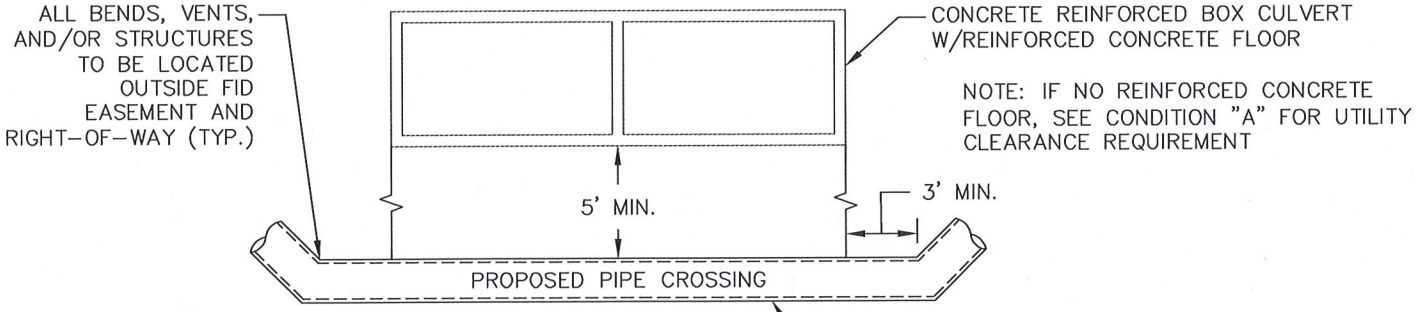
FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	CANAL LINING NOTES
"Your Most Valuable Resource - Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 2-01 SHEET 2 OF 2



CONDITION "A"
(UNLINED/LINED OPEN CHANNEL)



CONDITION "B"
(UNDERGROUND PIPELINE/PIPE CULVERT)



CONDITION "C"
(BOX CULVERT)

NOTES:

1. ALL BORING OPERATIONS ARE NOT ALLOWED DURING FID'S IRRIGATION SEASON (TYPICALLY MARCH 1 THROUGH AUGUST 30).
2. FID'S INSPECTOR SHALL BE ON-SITE DURING THE BORE. UTILITY CLEARANCE MUST BE VERIFIED BY FID'S INSPECTOR.
3. REFER TO DETAIL 1-01 FOR RIGHT-OF-WAY REQUIREMENTS, P-06 FOR PIPELINE EASEMENT REQUIREMENTS.
4. FOR SITE SPECIFIC REQUIREMENTS, SEE SPECIAL CONDITIONS ISSUED WITH PERMIT.
5. ALL BORE PITS MUST BE SITUATED OUTSIDE OF FID'S RIGHT-OF-WAY.
6. WET UTILITY CROSSINGS MAY REQUIRE STEEL CASING AS DETERMINED BY FID ENGINEER.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	PIPE CROSSING – BORING CLEARANCE
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 3-01 SHEET 1 OF 2

FRESNO IRRIGATION DISTRICT
SPECIAL CONDITIONS
FOR
JACK & BORE / DIRECTIONAL BORE UTILITY INSTALLATIONS

(REVISED MARCH 29, 2018)

THE CONTRACTOR IS SUBJECT TO THE CONDITIONS STATED BELOW:

1. FRESNO IRRIGATION DISTRICT'S (FID) ENGINEERING DEPARTMENT, (559) 233-7161, SHALL BE NOTIFIED 48 HOURS PRIOR TO CONSTRUCTION. NO WORK SHALL BEGIN WITHOUT A 'PERMIT TO WORK WITHIN EASEMENT AND RIGHT-OF-WAY' ISSUED BY FID (INSPECTION FEES ARE ASSESSED AS FOLLOWS: MINIMUM OF $125.00 PER WEEK (2 ½ HOURS) OR $50 PER DAY (1 HOUR). IF ADDITIONAL INSPECTION HOURS ARE NECESSARY, THE COST INCURRED WILL BE WITHHELD FROM THE DEPOSIT OR INVOICED TO THE PERMITTEE AT $50.00 PER HOUR). ALL WORK SHALL BE COMPLETED BY THE DATE SPECIFIED ON THE FID PERMIT, AND THE AREA RESTORED TO ITS ORIGINAL CONDITION. ANY WORK REQUIRED AFTER THE COMPLETION DATE, SHALL BE APPROVED BY FID'S ENGINEER AND ASSESSED A LATE COMPLETION FEE AS SPECIFIED ON THE PERMIT.

2. ALL UTILITY CROSSINGS SHALL BE INSTALLED UNDER FID'S PIPELINE/PIPE CULVERT/CANAL/BOX CULVERT AND MINIMUM CLEARANCE SHALL BE MAINTAINED FOR ENTIRE LENGTH OF RIGHT-OF-WAY.

3. AT LOCATIONS WHERE FID APPROVES UTILITY CROSSINGS OVER FID'S PIPELINE, THE UTILITY SHALL BE BACKFILLED WITH A RED CONCRETE SLURRY MIXTURE. THE SLURRY BACKFILL SHALL CONSIST OF A FLUID, WORKABLE MIXTURE OF AGGREGATE, CEMENT AND WATER. AGGREGATE MATERIAL SHALL BE A DIAMETER OF 1/4-INCH (.25") OR LESS WITH A 2-SACK CEMENT MIX AND 4 POUNDS OF RED DYE PER CUBIC YARD.

4. CONSTRUCTION SHALL NOT INTERFERE WITH THE MAINTENANCE AND/OR OPERATION OF FID'S FACILITY. BORE PITS SHALL BE SITUATED SUCH THAT THEY ARE OUTSIDE FID'S RIGHT-OF-WAY LIMITS. LOCATION OF BORE PITS ARE TO BE CONFIRMED WITH FID'S FIELD INSPECTOR.

5. IF THE FID CANAL IS A MAJOR CONVEYOR OF STORM WATERS, THE ANTICIPATED STORM FLOWS THROUGH THE CANAL MAY REQUIRE CONSTRUCTION TO BE TEMPORARILY SHUT DOWN UNTIL PEAK FLOWS HAVE PASSED. JACK AND BORE AND DIRECTIONAL BORE WILL NOT BE ALLOWED DURING FID'S IRRIGATION SEASON, WHICH USUALLY RUNS MARCH 1 THROUGH AUGUST 31.

6. FID SHALL NOT BE RESPONSIBLE FOR ANY WATER THAT MAY FLOW IN THE IRRIGATION FACILITY OR AREA OF CONSTRUCTION DURING THE TIME OF THE UTILITY INSTALLATION, INCLUDING ANY DAMAGE RESULTING FROM SUCH WATER..

7. CONTRACTOR AND/OR AGENCY SHALL HAVE EQUIPMENT MOBILIZED TO REPAIR DAMAGE IN THE EVENT OF A CANAL BREACH.

8. ALL EXCESS MATERIAL AND/OR DEBRIS SHALL BE REMOVED FROM FID'S EASEMENT AND RIGHT-OF-WAY UPON COMPLETION OF ALL UTILITY INSTALLATION.

9. ALL WORK WITHIN FID'S EASEMENT AND RIGHT-OF-WAY SHALL BE INSPECTED AND APPROVED BY FID'S FIELD INSPECTOR OR ENGINEER BEFORE BACKFILLING CAN OCCUR.

10. ALL WORK SHALL BE COMPLETED BY THE DATE SPECIFIED ON THE FID CONSTRUCTION PERMIT AND THE AREA RESTORED TO ITS ORIGINAL CONDITION. ANY WORK REQUIRED AFTER THE COMPLETION DATE SHALL BE APPROVED BY FID'S ENGINEER AND LIQUATED DAMAGES IN THE AMOUNT OF $2,500.00 PER DAY WILL BE ASSESSED.

11. IN SITUATIONS WHERE A CASING IS REQUIRED, VOIDS SHALL BE FILLED WITH SUITABLE MATERIAL THROUGH INJECTION POINTS AT A MINIMUM 3 FEET (3') ON CENTER (I.E. SAND, GROUT, ETC.) AND SEALED IN ORDER TO MINIMIZE FLOW THROUGH CASING/VOID SHOULD THE INTEGRITY BE COMPROMISED AS DETERMINED BY FID'S FIELD INSPECTOR. AT A MINIMUM, CASING ENDS SHALL BE SEALED. CASING/VOID GROUT ENDS SHALL BE TERMINATED AT THE EDGE OF FID'S RIGHT-OF-WAY UNLESS APPROVED OTHERWISE.

BORE AND JACK SPECIFIC NOTES:

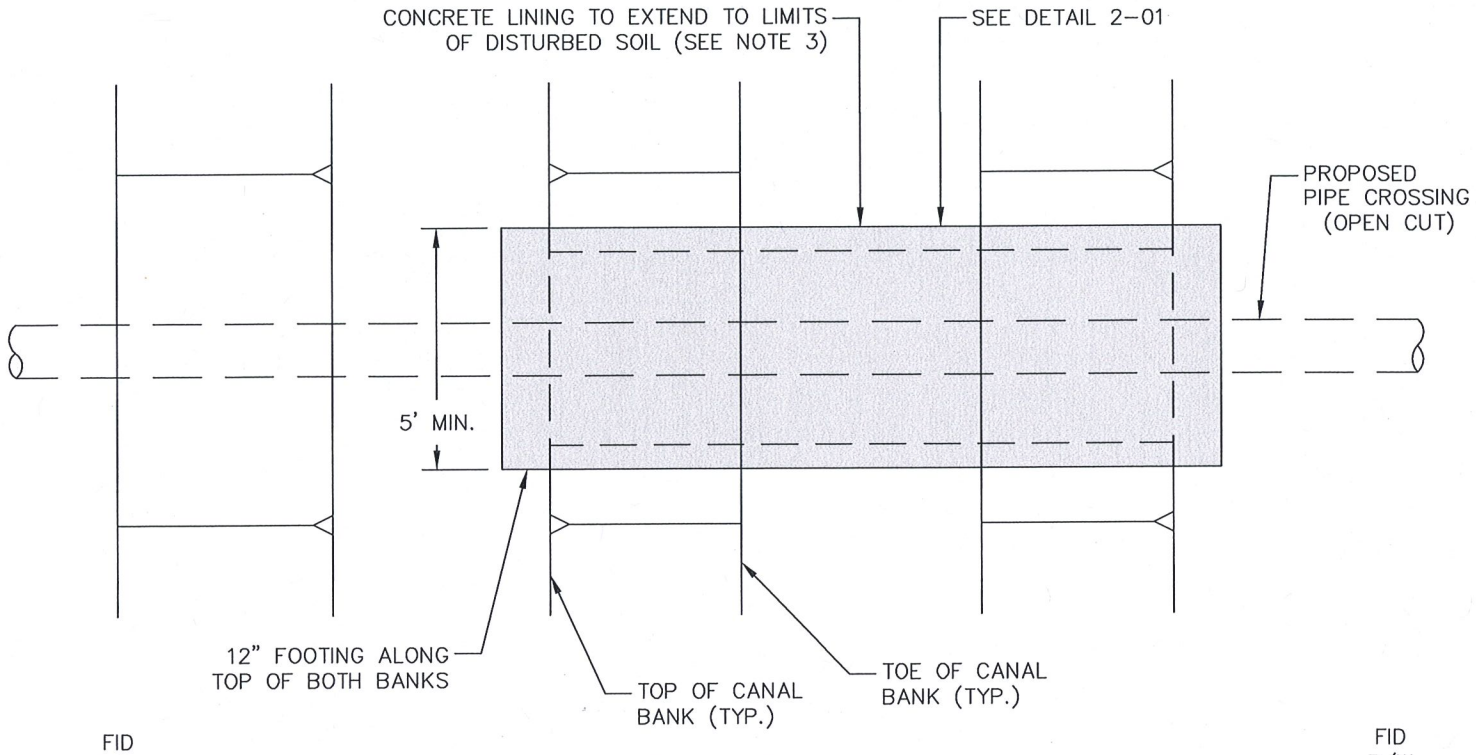
1. TOP OF BORE PITS SHALL BE A MINIMUM OF ONE-FOOT (1') HIGHER THAN EXISTING HIGH WATER MARK OF THE CANAL. IN ADDITION, BORE PITS SHALL BE DESIGNED TO CONTAIN WATER SHOULD THE CANAL BREACH. ALL BORE PIT BERMS SHALL BE COMPACTED TO 93% RELATIVE COMPACTION.

2. BORE PITS SHALL BE BACKFILLED IMMEDIATELY AFTER CONSTRUCTION IS COMPLETED AND ALL DISTURBED SOIL SHALL BE COMPACTED TO A MINIMUM 93% RELATIVE COMPACTION.

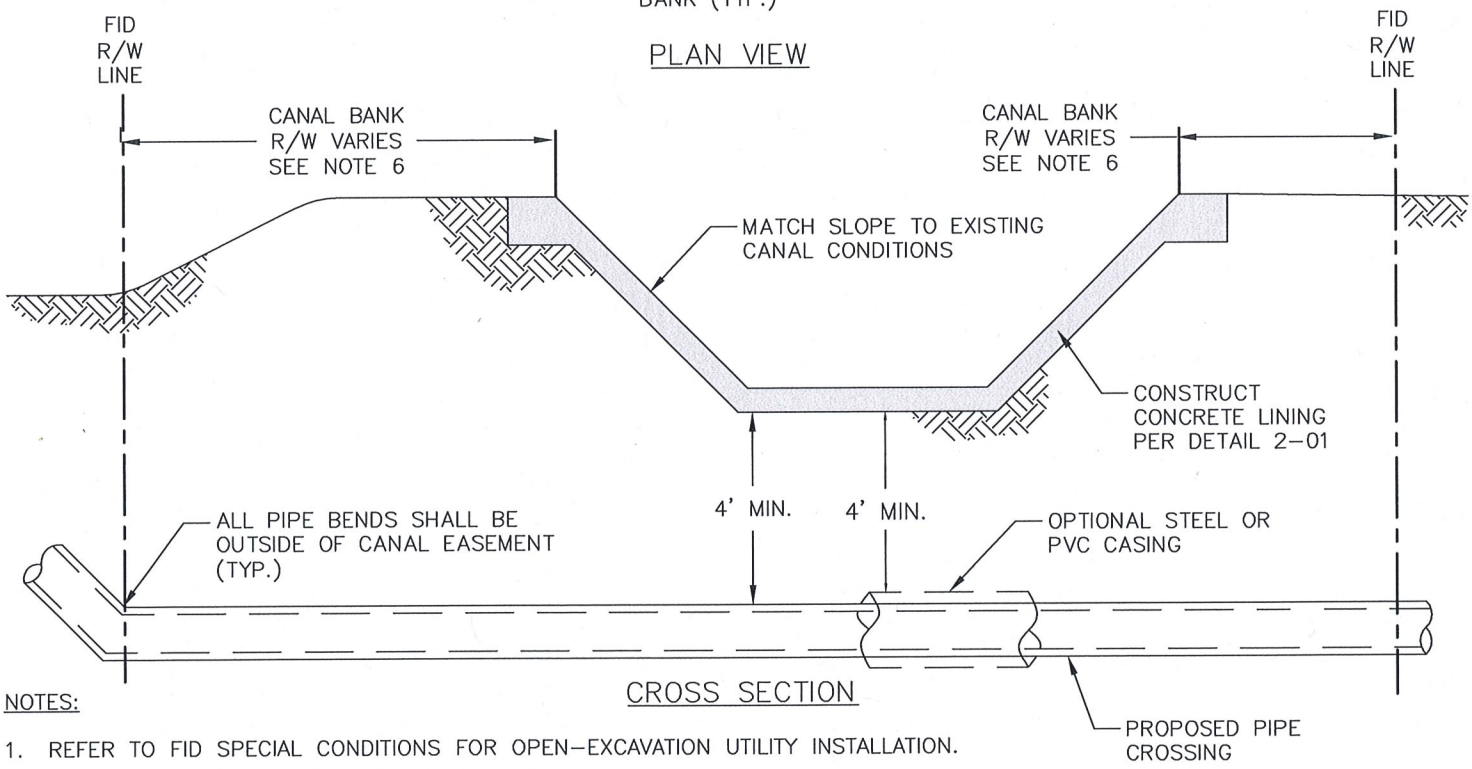
3. COMPACTION TESTS SHALL BE PROVIDED TO FID UPON REQUEST BY FID'S ENGINEER.

4. CASING PIPE SHALL BE PROVIDED WITH END SEALS APPROVED BY FID ENGINEER.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	PIPE CROSSING BORE CLEARANCE NOTES	
	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 3-01
			SHEET 2 OF 2



PLAN VIEW

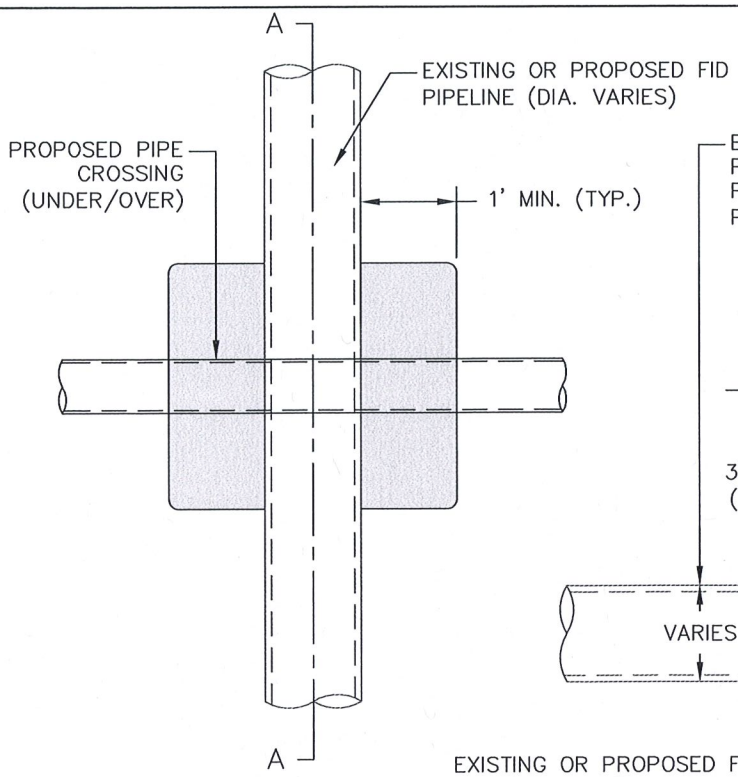


CROSS SECTION

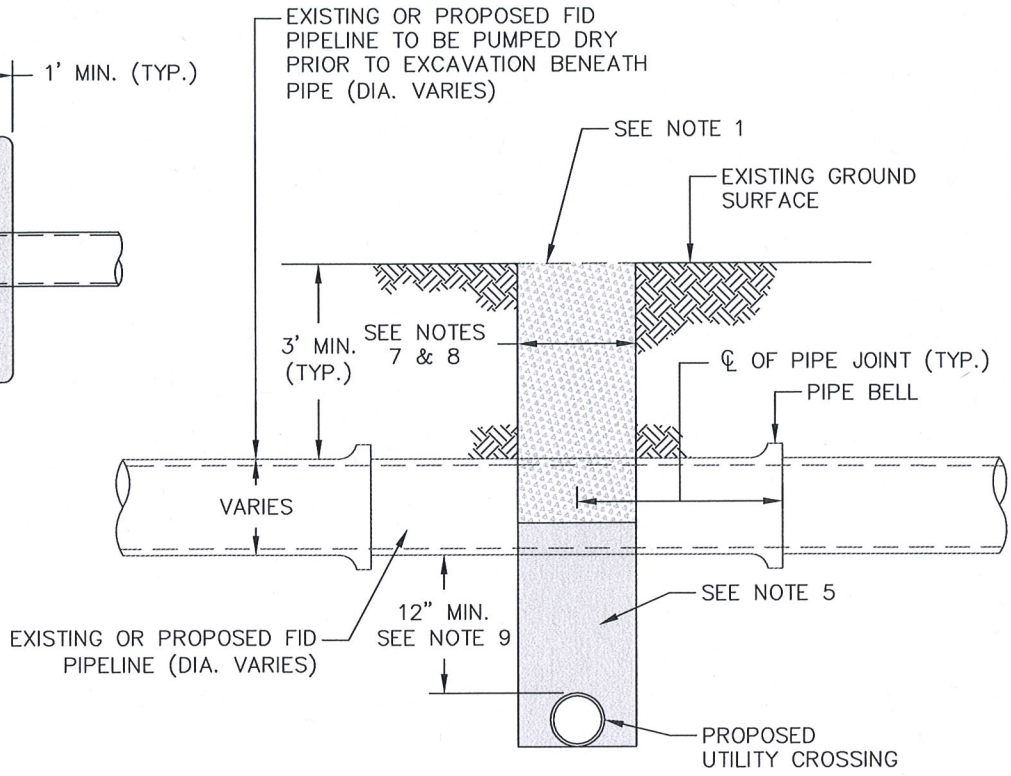
NOTES:

1. REFER TO FID SPECIAL CONDITIONS FOR OPEN-EXCAVATION UTILITY INSTALLATION.
2. ALL DISTURBED SOIL TO HAVE 93% RELATIVE COMPACTION.
3. FID'S INSPECTOR TO DETERMINE LIMITS OF DISTURBED SOIL.
4. NO BENDS, VENTS OR STRUCTURES TO BE LOCATED WITHIN CANAL RIGHT-OF-WAY.
5. CONCRETE LINING REQUIRED FOR OPEN CUT INSTALLATIONS ONLY.
6. WIDTH OF CANAL BANK RIGHT-OF-WAY SHALL CONFORM TO DETAIL 1-01.
7. THE CONCRETE LINER SHALL NOT BE CONSTRUCTED HIGHER THAN THE FLOOR ELEVATION OF AN EXISTING CULVERT OR CHECK STRUCTURE UPSTREAM OF THE PROPOSED CROSSING AS REQUIRED BY FID ENGINEER.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	CANAL CROSSING – OPEN CUT	
"Your Most Valuable Resource – Water"	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 3-02 SHEET 1 OF 1



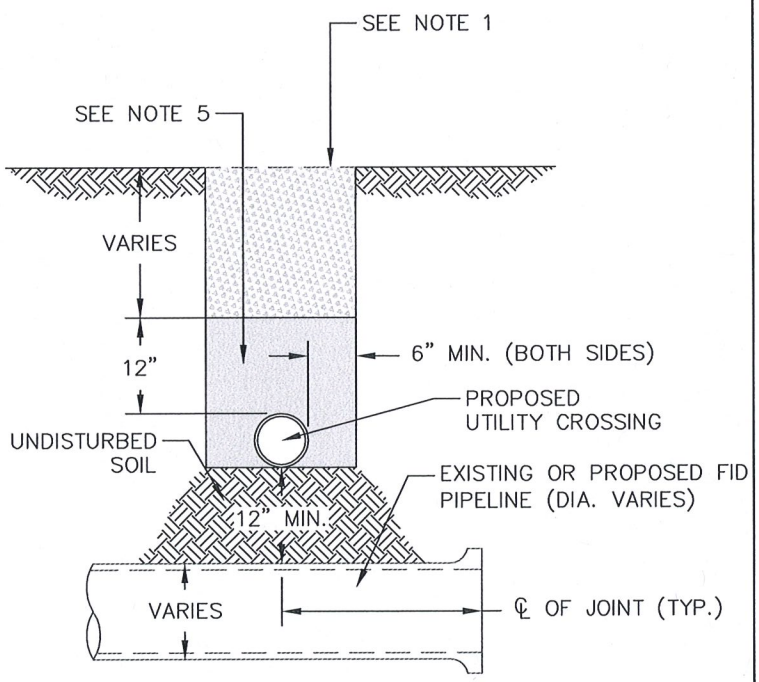
PLAN



SECTION A–A
PIPE CROSSING UNDER FID

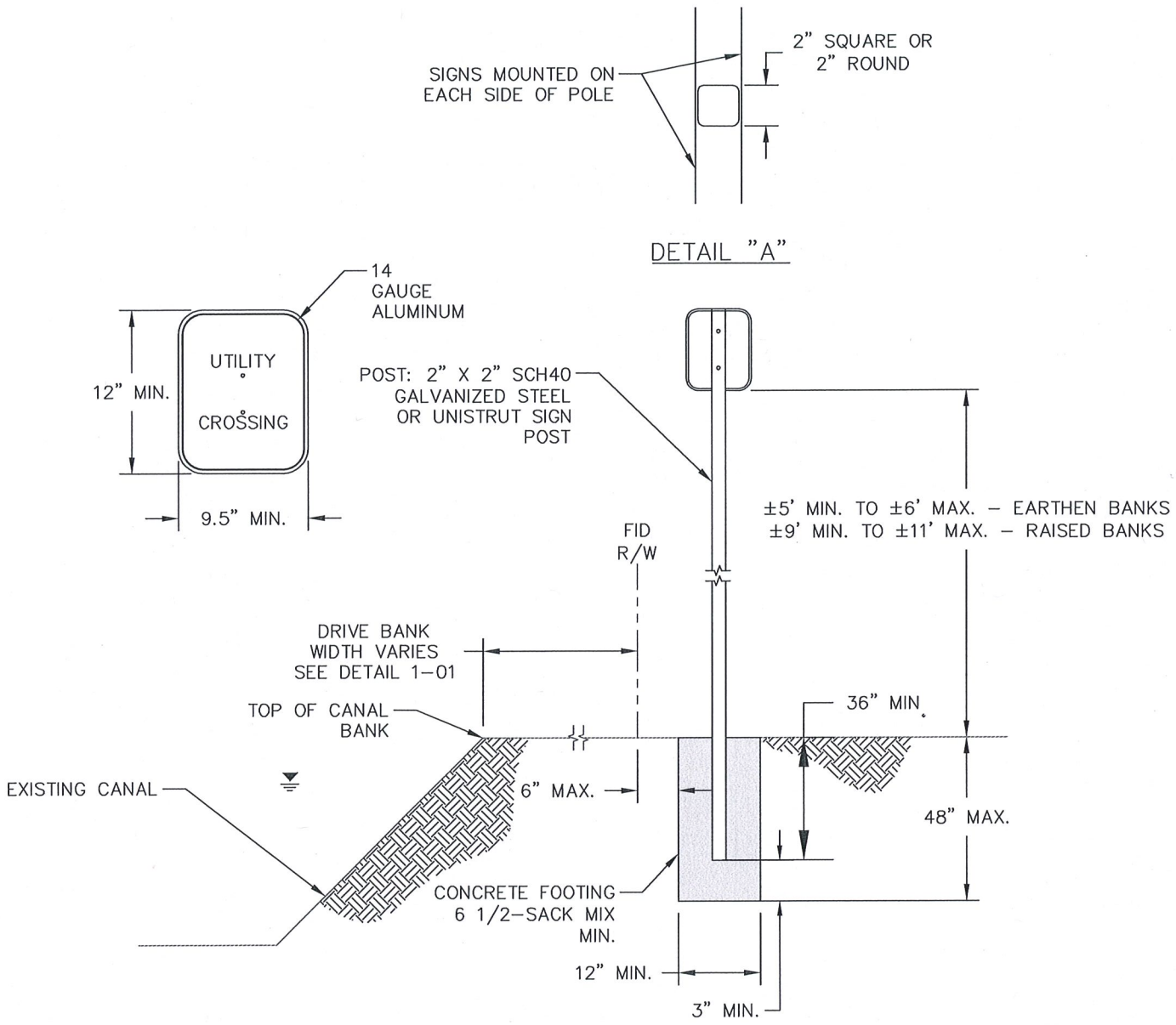
NOTES:

1. ALL COMPACTED BACKFILL TO HAVE A MINIMUM OF 93% RELATIVE COMPACTION. SEE DETAIL 4–02.
2. CONTRACTOR SHALL POT–HOLE AND VERIFY THE HORIZONTAL ALIGNMENT AND VERTICAL DEPTH OF FID'S LINE PRIOR TO COMMENCEMENT OF WORK.
3. NO VIBRATORY COMPACTION WITHIN 10 FEET OF FID FACILITY UNLESS APPROVED OTHERWISE.
4. NO VENTS OR STRUCTURES TO BE LOCATED WITHIN PIPELINE EASEMENT AND/OR RIGHT–OF–WAY.
5. ALL CROSSINGS REQUIRE 2–SACK RED CONCRETE SLURRY WITH 1/4–INCH (.25") MINUS AGGREGATE AND 4 POUNDS OF RED DYE PER CUBIC YARD.
6. AT LOCATIONS WHERE A CASING IS REQUIRED BY UTILITY OWNER, CASING PIPE NEEDS TO MAINTAIN CLEARANCES NOTED.
7. TRENCH WIDTH SHALL NOT EXPOSE PIPE JOINTS WITHOUT BEING SUPPORTED. CONTRACTOR SHALL SUBMIT WORK PLAN CERTIFIED BY A LICENSED ENGINEER TO FID PRIOR TO PERMIT ISSUANCE IF TRENCH WIDTH IS GREATER THAN 48 INCHES WIDE OR 48 INCHES IN LENGTH.
8. ANY JOINT ON FID'S PIPELINE THAT IS EXPOSED ALL AROUND SHALL BE SUPPORTED UNLESS APPROVED BY FID INSPECTOR.
9. ALL UTILITY CROSSINGS MUST BE PLACED A MINIMUM 12 INCHES BELOW EXISTING FID PIPELINES OR 12 INCHES BELOW FID MASTER PLANNED PIPE DIAMETER AND DEPTH, WHICHEVER IS DEEPER.



SECTION A–A
PIPE CROSSING OVER FID

FRESNO IRRIGATION DISTRICT		CONDUIT/PIPELINE CROSSING – OPEN CUT
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 3–03 SHEET 1 OF 1

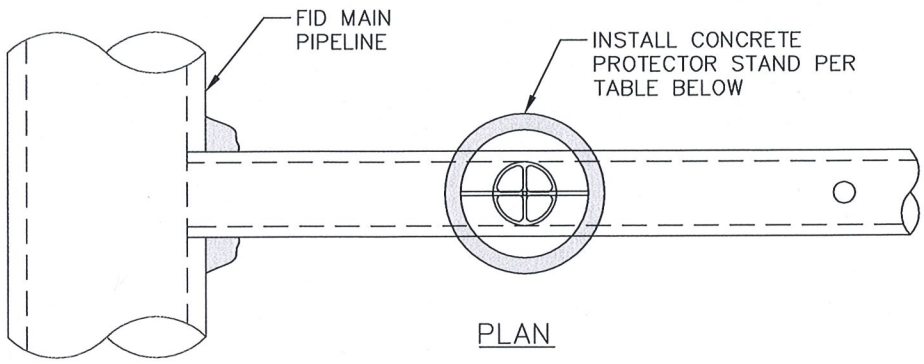


NOTES:

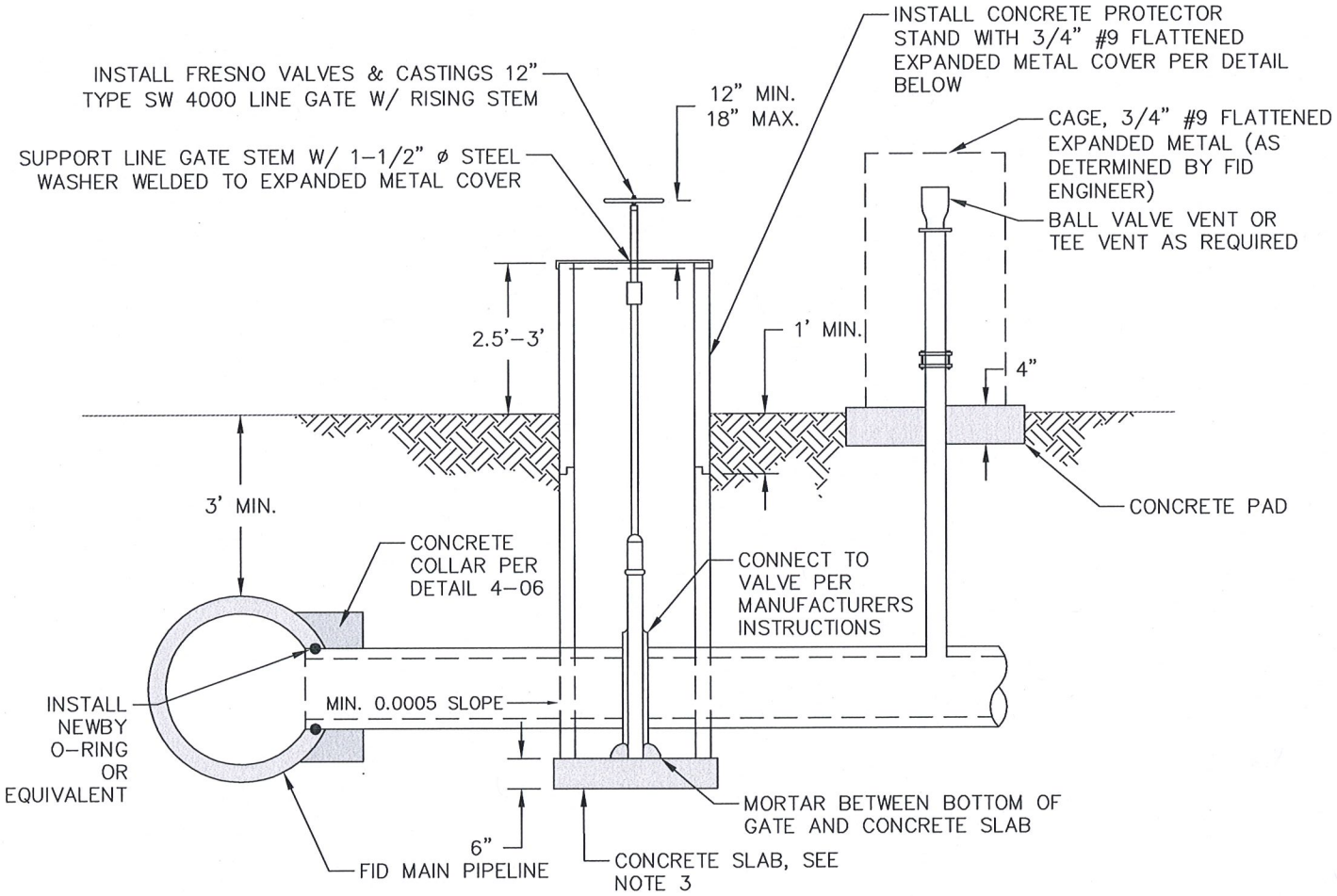
1. OWNER RESPONSIBLE FOR THE FURNISHING, INSTALLATION, AND MAINTENANCE OF PRIVATE UTILITY CROSSING SIGNS.
2. SIGNS SHALL BE VISIBLE FROM EACH DIRECTION.
3. SIGNS SHALL BE MOUNTED ON EACH SIDE OF POLE. SEE DETAIL "A".
4. SIGNS SHALL BE PLACED ON OUTSIDE EDGE OF EACH CANAL BANK, OUT OF THE WAY OF VEHICULAR TRAFFIC.
5. SEE DETAIL 1–01 OF THE FRESNO IRRIGATION DISTRICT ENGINEERING HANDBOOK FOR DISTRICT RIGHT–OF–WAY REQUIREMENTS.
6. DIRECTIONAL BORE INSTALLATIONS ONLY.
7. SIGN LOCATION TO BE DETERMINED BY FID ENGINEER.

FRESNO IRRIGATION DISTRICT		UTILITY CROSSING SIGN
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 3–04 SHEET 1 OF 1

PROTECTOR STAND	
GATE	STAND
≤15"	48"
>15"	60"



PLAN

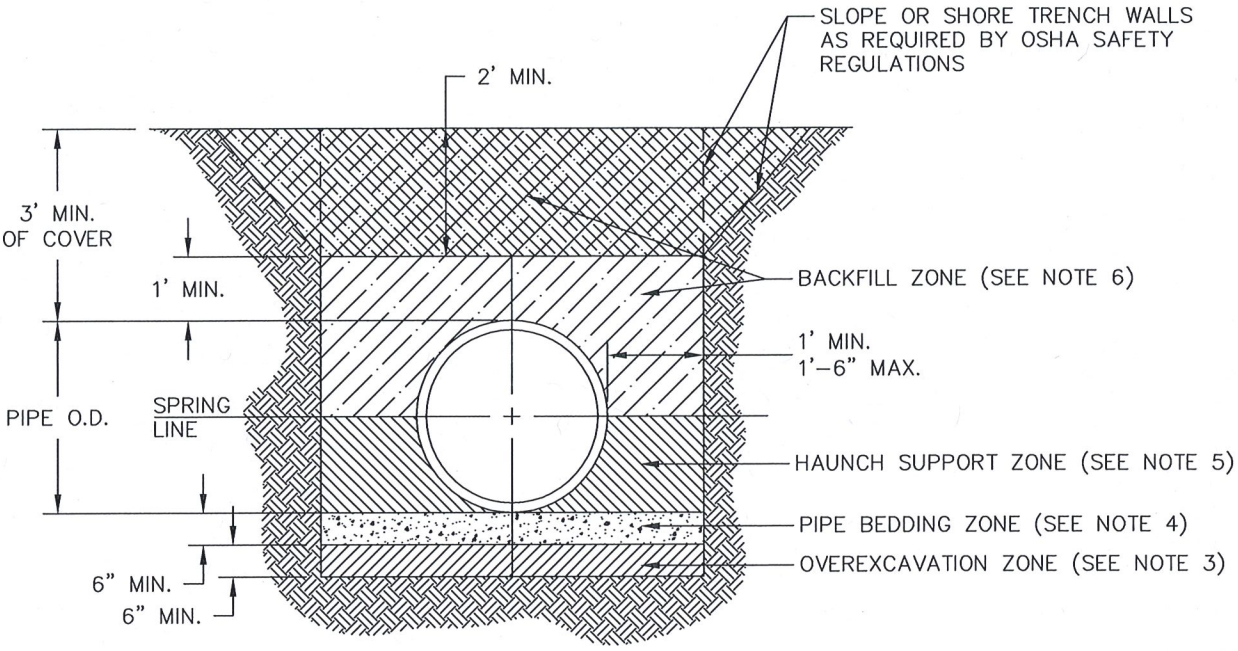


PROFILE

NOTES:

1. DETAIL SHOWS CONNECTION TO CONCRETE FID MAIN PIPELINE. IF FID PIPELINE IS PVC, USE A PVC TEE FITTING INSTEAD OF MORTAR/COLLAR CONNECTION.
2. ALL CONNECTIONS SHALL BE WATERTIGHT.
3. PRESSURE TESTING IS REQUIRED FOR ACCEPTANCE.
4. STRUCTURAL CONCRETE SHALL BE A MINIMUM OF 6-1/2 SACK (611 POUNDS OF PORTLAND CEMENT PER CUBIC YARD) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI, WATER-CEMENT RATIO OF .045 (BY WEIGHT), AIR ENTRAINMENT OF 4% ± 1% AND 4 INCH (4") SLUMP AT PLACEMENT.

FRESNO IRRIGATION DISTRICT		TURNOUT END LINE GATE W/ PROTECTOR STAND
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 4-01 SHEET 1 OF 1



TRENCH EXCAVATION AND BACKFILL NOTES:

1. SHORING OR SLOPING SHALL BE IN COMPLIANCE WITH CALIFORNIA LABOR CODE AND CAL/OSHA REQUIREMENTS.

2. COMPACTION OF ALL MATERIALS SHALL COMPLY WITH ASTM D-1557. COMPACTION TESTING SHALL BE PERFORMED BY THE OWNER/AGNECY AS DIRECTED BY THE DISTRICT ENGINEER OR DISTRICT INSPECTOR.

3. OVEREXCAVATION ZONE:
   BOTTOM OF TRENCH SHALL BE IN FIRM, UNIFORM-BEARING SOIL SURFACES. WHEN UNSUITABLE OR DISTURBED THE CONTRACTOR SHALL REMOVE, REPLACE AND COMPACT MATERIAL TO 95% RELATIVE COMPACTION OR AS DIRECTED BY THE DISTRICT ENGINEER.

4. PIPE BEDDING ZONE:
   PIPE BEDDING SHALL BE UNCOMPACTED GRANULAR SOIL OR APPROVED EQUIVALENT CONTAINING NO MORE THAN 5% MATERIAL PASSING THE NUMBER 200 SIEVE, AND SHALL HAVE A MAXIMUM PARTICLE SIZE OF 3/4 INCH (.75"). HOLES SHALL BE EXCAVATED FOR PIPE BELLS SUCH THAT PIPE IS SUPPORTED ENTIRELY ALONG THE SHAFT AND BELLS AND NOT TO JUST THE BELLS.

5. HAUNCH SUPPORT ZONE:
   HAUNCH SUPPORT BACKFILL SHALL BE GRANULAR MATERIAL CONTAINING MORE THAN 5% MATERIAL PASSING THE NUMBER 200 SIEVE. HAUNCH SUPPORT ZONE SHALL BE SOUND EARTHEN MATERIAL FREE OF ROCKS, HARDPAN, ORGANICS, AND DELETERIOUS MATERIAL, AND HAVE A MAXIMUM PARTICLE SIZE OF 3/4 INCH, PLACED IN LOOSE LIFTS NOT TO EXCEED 6 INCHES (6") IN DEPTH, AND COMPACTED TO A MINIMUM OF 95% RELATIVE COMPACTION, OR 2-SACK CEMENT-SAND SLURRY MIX MAY BE USED. TRENCH WIDTH MAY BE REDUCED BY 6 INCHES (6") ON EACH SIDE OF PIPE IF CEMENT-SAND SLURRY IS USED.

6. BACKFILL ZONE:
   BACKFILL SHALL BE SOUND EARTHEN MATERIAL FREE OF ROCKS, HARDPAN, ORGANICS, AND DELETERIOUS MATERIAL, HAVE A MAXIMUM PARTICLE SIZE OF 3/4 INCH (.75"), PLACED IN LOOSE LIFTS NOT TO EXCEED 8 INCHES (8") IN DEPTH, AND COMPACTED TO 93% RELATIVE COMPACTION (95% WITHIN CITY OR COUNTY RIGHT-OF-WAY FOR TOP 24 INCHES) OR AS SPECIFIED ON THE PLANS.

7. MAC-WRAP:
   ALL URBAN AND LANDSCAPED AREAS REQUIRE MAC-WRAP EXTERNAL JOINT WRAP BAND.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	PIPELINE BACKFILL	
"Your Most Valuable Resource - Water"	"Your Most Valuable Resource - Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 4-02 SHEET 1 OF 1

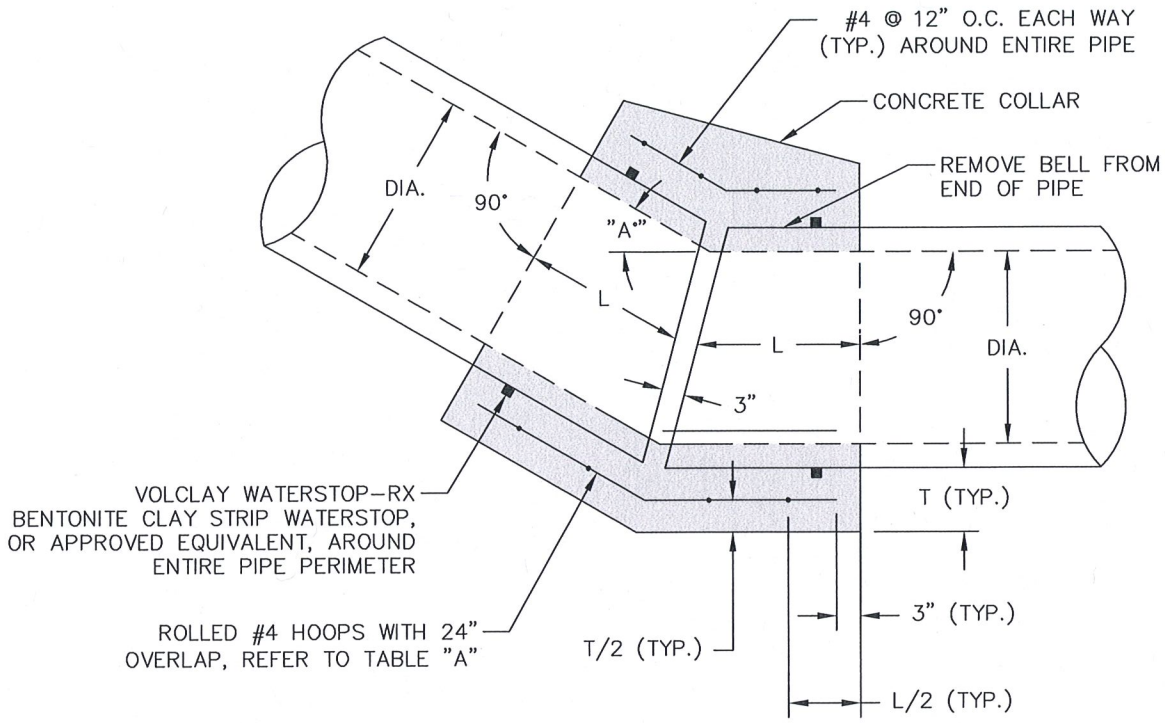
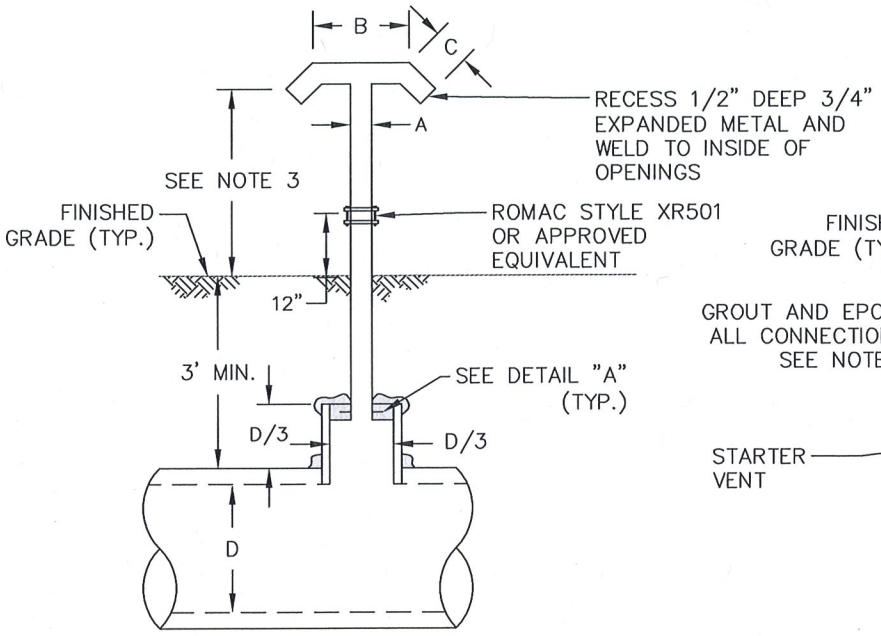


TABLE "A"			
MAX. PIPE SIZE	L (MIN.)	T	MIN. HOOP QTY.
24"	18"	8"	4
48"	24"	10"	4
72"	30"	12"	6
> 72"	BY DESIGN		

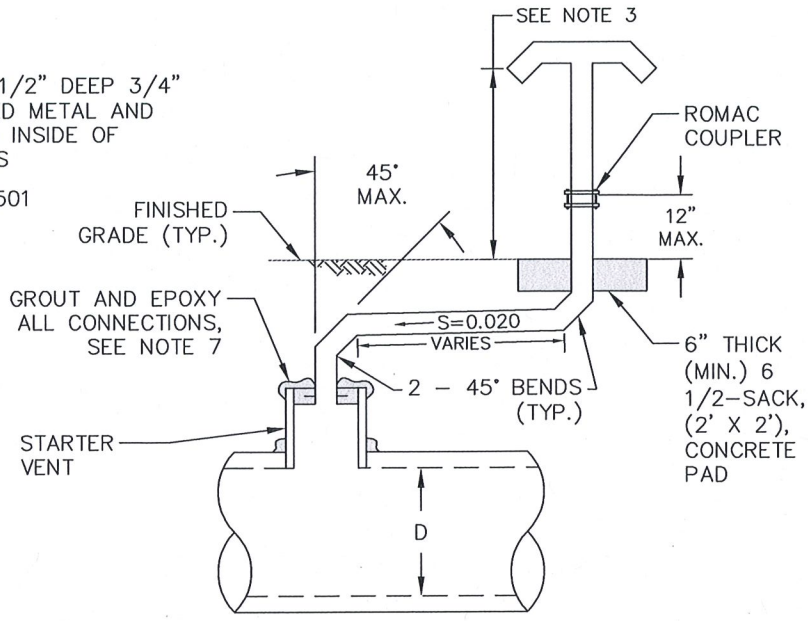
NOTES:

1. ANGLE "A" SHALL BE DETERMINED IN THE FIELD AND REBAR PLACEMENT APPROVED BY FID'S ENGINEER PRIOR TO CONCRETE PLACEMENT. ANGLE "A" SHALL NOT EXCEED 45°.
2. INSIDE JOINT TO HAVE A BRUSHED FINISH AND SHALL BE FLUSH WITH ADJOINING PIPES.
3. JOINT SHALL BE WATERTIGHT.
4. PREPARE SURFACE OF EXISTING PIPES BY WIRE BRUSHING, WATER BLASTING, OR SAND BLASTING AS DIRECTED BY FID ENGINEER OR INSPECTOR.
5. CONCRETE PIPE SHALL BE CLEANED AND TREATED WITH PRE-APPROVED CONCRETE BONDING AGENT PRIOR TO CONCRETE PLACEMENT.
6. DIAMETER OF ROLLED HOOPS SHALL BE INSIDE PIPE DIAMETER + (2 X WALL THICKNESS) + T.
7. FORMS USED TO POUR CONCRETE COLLAR SHALL BE REMOVED PRIOR TO BACKFILL.
8. CONCRETE SHALL BE A MINIMUM OF 6-1/2 SACK (611 POUNDS OF PORTLAND CEMENT PER CUBIC YARD) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,500 PSI, WATER-CEMENT RATIO OF 0.45 (BY WEIGHT), AIR ENTRAINMENT OF 4% ± 1%, AND FOUR INCH (4") SLUMP AT PLACEMENT.
9. CONCRETE SHALL BE VIBRATED AROUND PIPE JOINT DURING PLACEMENT.

FRESNO IRRIGATION DISTRICT		FIELD BEND	
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE	STANDARD DETAIL 4-03	
	DATE: JANUARY 2018	SHEET 1 OF 1	

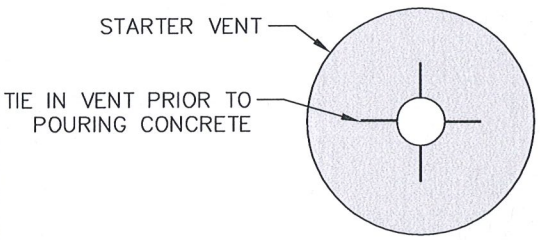


STANDARD VENT



OPTIONAL OFFSET VENT
(4" VENT ONLY AND TO BE DETERMINED BY FID)

DETAIL "A"



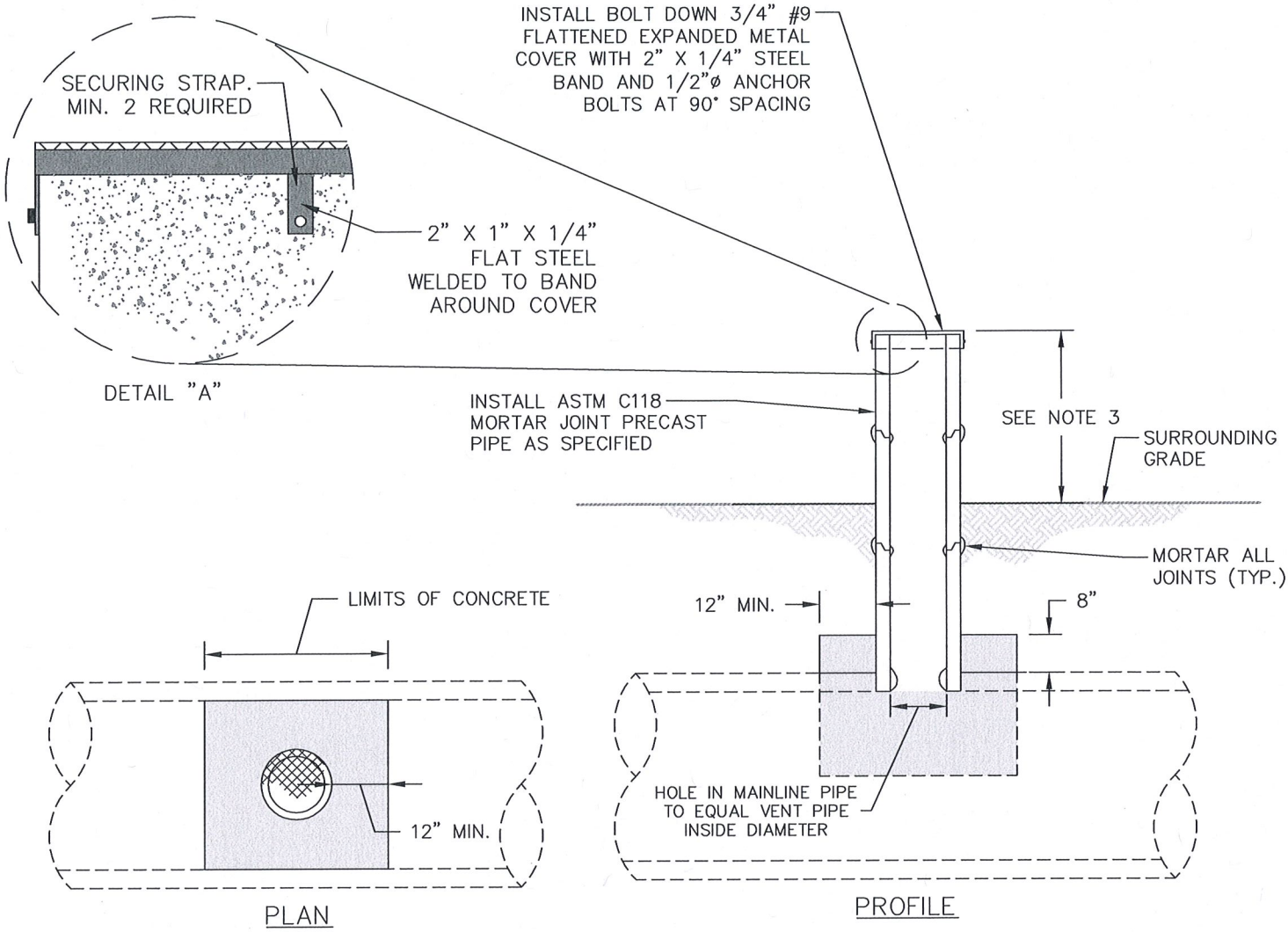
RUBBER GASKET REINFORCED CONCRETE PIPE (RGRCP):	
FOR PIPE DIA. <= 36"	USE 4" DIA. GALVANIZED T-VENT WITH STARTER VENT.
FOR 36" < PIPE DIA. <= 42"	USE 6" DIA. GALVANIZED T-VENT WITH STARTER VENT.
FOR 42" > PIPE DIA. <= 60"	FOR 42" > PIPE DIA. <= 60" USE 8" DIA. GALVANIZED T-VENT WITH STARTER VENT.
FOR PIPE DIA. > 60"	USE 12" DIA. GALVANIZED T-VENT WITH STARTER VENT OR SEE 4-05 FOR CONCRETE VENT.

VENT DESIGN CRITERIA		
"A"	"B"	"C"
4"	18"	7"
6"	22"	8"
8"	22"	8"
12"	22"	8"

NOTES:

1. VENTS SHALL BE INSTALLED AT NO MORE THAN 700 FOOT INTERVALS, IMMEDIATELY UPSTREAM OF PIPELINE GRADE CHANGES, AT HIGH POINTS, IMMEDIATELY DOWNSTREAM OF ANY INLET STRUCTURE, AND IMMEDIATELY UPSTREAM OF ANY BENDS.
2. ALL VENTS SHALL BE WELDED HOT DIPPED GALVANIZED STEEL PIPE WITH EXPANDED METAL COVER.
3. TOP OF VENT SHALL BE A MINIMUM OF 1.5 FEET (1.5') ABOVE HYDRAULIC GRADIENT OR A MINIMUM OF 3 FEET (3') ABOVE SURROUNDING GROUND, WHICHEVER IS GREATER.
4. 90° ELBOW FITTINGS FOR OFFSET VENTS ARE NOT ALLOWED.
5. ALL GALVANIZED PIPE SHALL BE MINIMUM SCHEDULE 40.
6. DEPENDING ON DEPTH OF COVER OVER FID PIPELINE AND VENT DIAMETER, OFFSET VENTS MAY NOT BE ALLOWED.
7. CONSTRUCTION GROUT TO BE NON SHRINK, CONSTRUCTION GRADE OR 5,000 PSI MINIMUM.

FRESNO IRRIGATION DISTRICT		VENT - METAL T
"Your Most Valuable Resource - Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 4-04 SHEET 1 OF 1

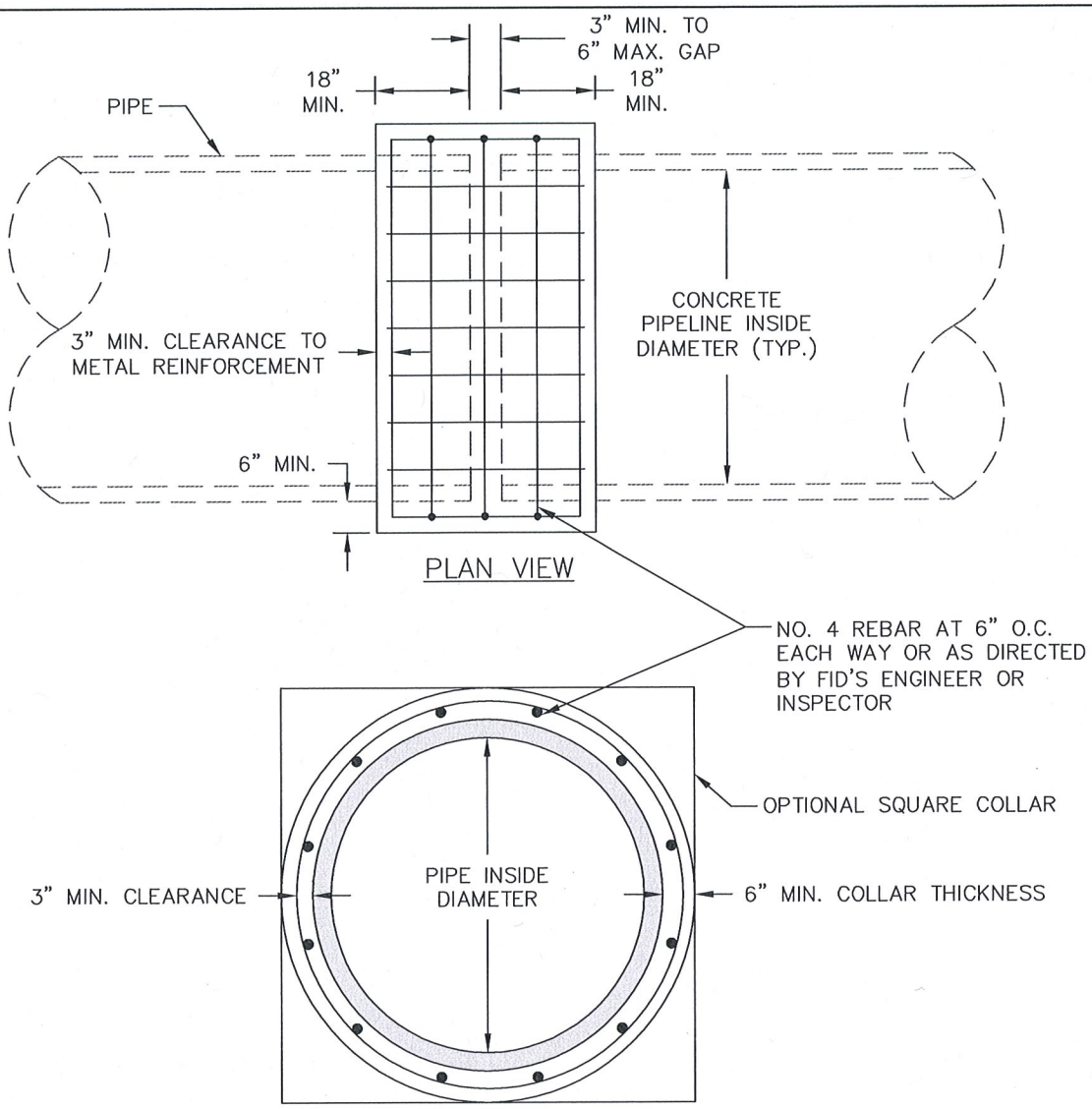


A.S.T.M. C118 CONCRETE PIPE	
PIPE DIA. ≤ 36"	SEE DETAIL 4-04
36" < PIPE DIA. ≤ 42"	USE 6" DIA. CONCRETE VENT WITH EXPANDED METAL COVER.
PIPE DIA. > 42"	USE 8" DIA. CONCRETE VENT STAND WITH EXPANDED METAL COVER.

NOTES:

1. VENTS SHALL BE INSTALLED AT NO MORE THAN 700 FEET (700') INTERVALS, IMMEDIATELY UPSTREAM OF PIPELINE GRADE CHANGES, AT HIGH POINTS, IMMEDIATELY DOWNSTREAM OF ANY INLET STRUCTURE, AND IMMEDIATELY UPSTREAM OF ANY BENDS.
2. ALL 3/4 INCH (.75") EXPANDED METAL TO BE PRIMED AND PAINTED WITH RED OXIDE PAINT.
3. TOP OF VENT SHALL BE 1.5 FEET (1.5') ABOVE HYDRAULIC GRADIENT OR 3 FEET (3') ABOVE SURROUNDING GROUND, WHICHEVER IS GREATER.

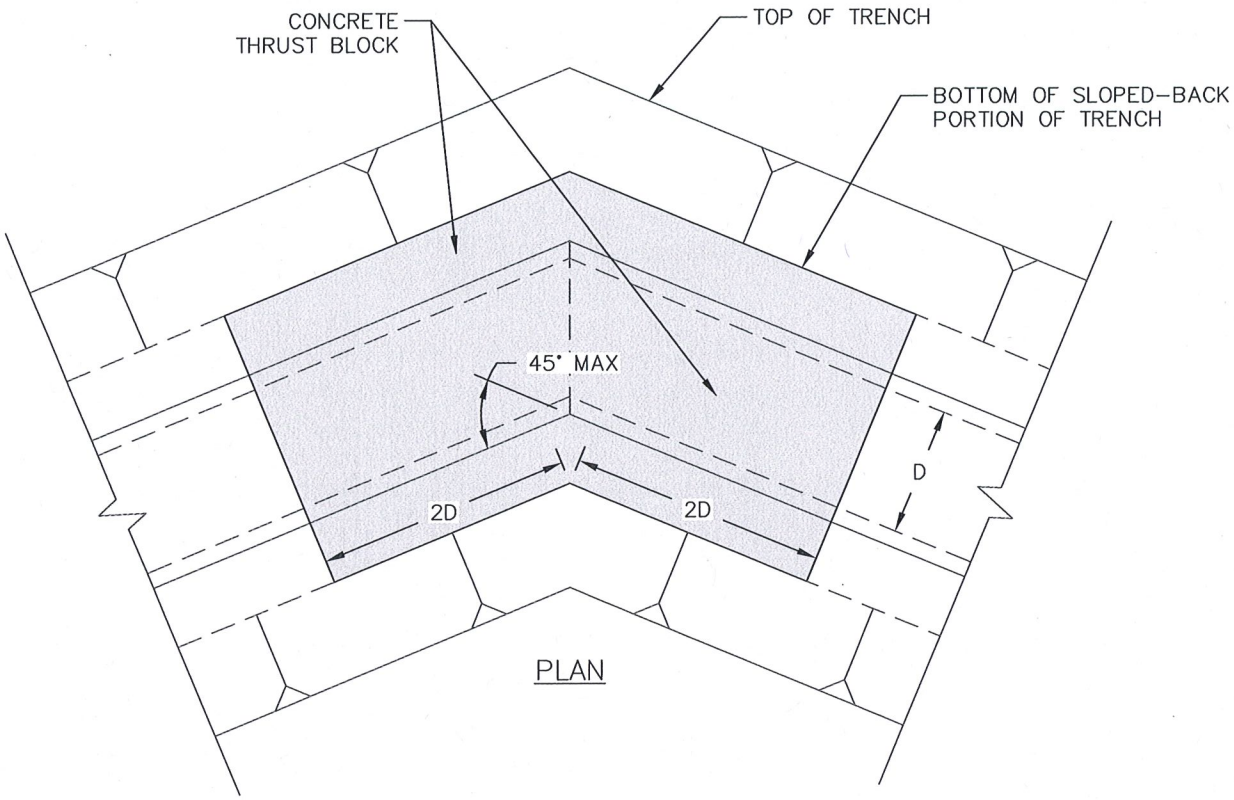
FRESNO IRRIGATION DISTRICT		VENT – CONCRETE	
"Your Most Valuable Resource – Water"		SCALE: NOT TO SCALE	STANDARD DETAIL 4-05
		DATE: JANUARY 2018	SHEET 1 OF 1



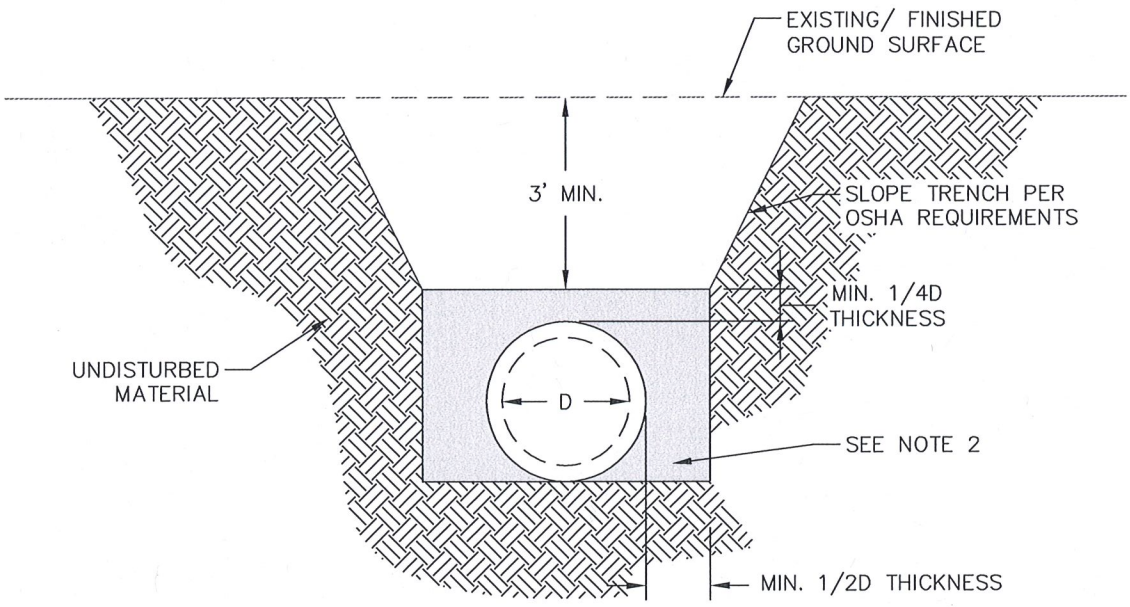
NOTES:

1. JOINT GAP SEAM TO BE GROUTED ON THE INSIDE PRIOR TO PLACING OF COLLAR (HAND HOLE IN EXISTING PIPE IS ALLOWED TO MAKE INSIDE BAND). TO BE INSPECTED PRIOR TO CONCRETE COLLAR BEING POURED.
2. TWENTY–FOUR HOURS AFTER INSIDE BAND IS MADE, COAT WITH EPOXY OVER BANDED AREA.
3. IF REQUIRED, HAND HOLE PLUG TO BE EPOXIED AT MATCHING SURFACES WITH PIPE AND THEN MORTAR AND PLUG HOLE.
4. THE ENTIRE SURFACE OF THE PIPE IN THE COLLAR AREA IS TO BE COATED WITH EPOXY JUST PRIOR TO POURING THE COLLAR. EPOXY TYPE TO BE REZI WELD 1000 OR APPROVED EQUIVALENT.
5. EXTERNAL COLLAR, WHEN IN PLACE AND SET, MUST BE WATERED DOWN TO A POINT OF SATURATION THEN COVERED WITH WET BURLAP AND SHADED WITH 6 INCHES (6") OF SOIL OVER ENTIRE AREA. SAID SOIL MUST BE KEPT MOIST FOR A PERIOD OF FIVE CONTINUOUS DAYS.
6. COLLAR MUST BE APPROVED BY FID'S ENGINEER OR INSPECTOR PRIOR TO BACKFILLING PIPELINE TRENCH.
7. JOINT SHALL BE WATERTIGHT.
5. CONCRETE SHALL BE A MINIMUM OF 6 1/2–SACK WITH A MINIMUM 28–DAY COMPRESSIVE STRENGTH OF 3,500 PSI. FIBERCAST 500 OR EQUIVALENT CONCRETE FIBER REINFORCEMENT WITH FIBER LENGTHS BETWEEN 1.5 INCHES (1.5") TO 2 INCHES (2").
6. APPLICATION RATE AT A MINIMUM OF 1.5 POUNDS PER CUBIC YARD AND SHALL BE INCLUDED IN THE CONCRETE MIX.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	CONCRETE COLLAR
	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018
		STANDARD DETAIL 4–06 SHEET 1 OF 1



PLAN

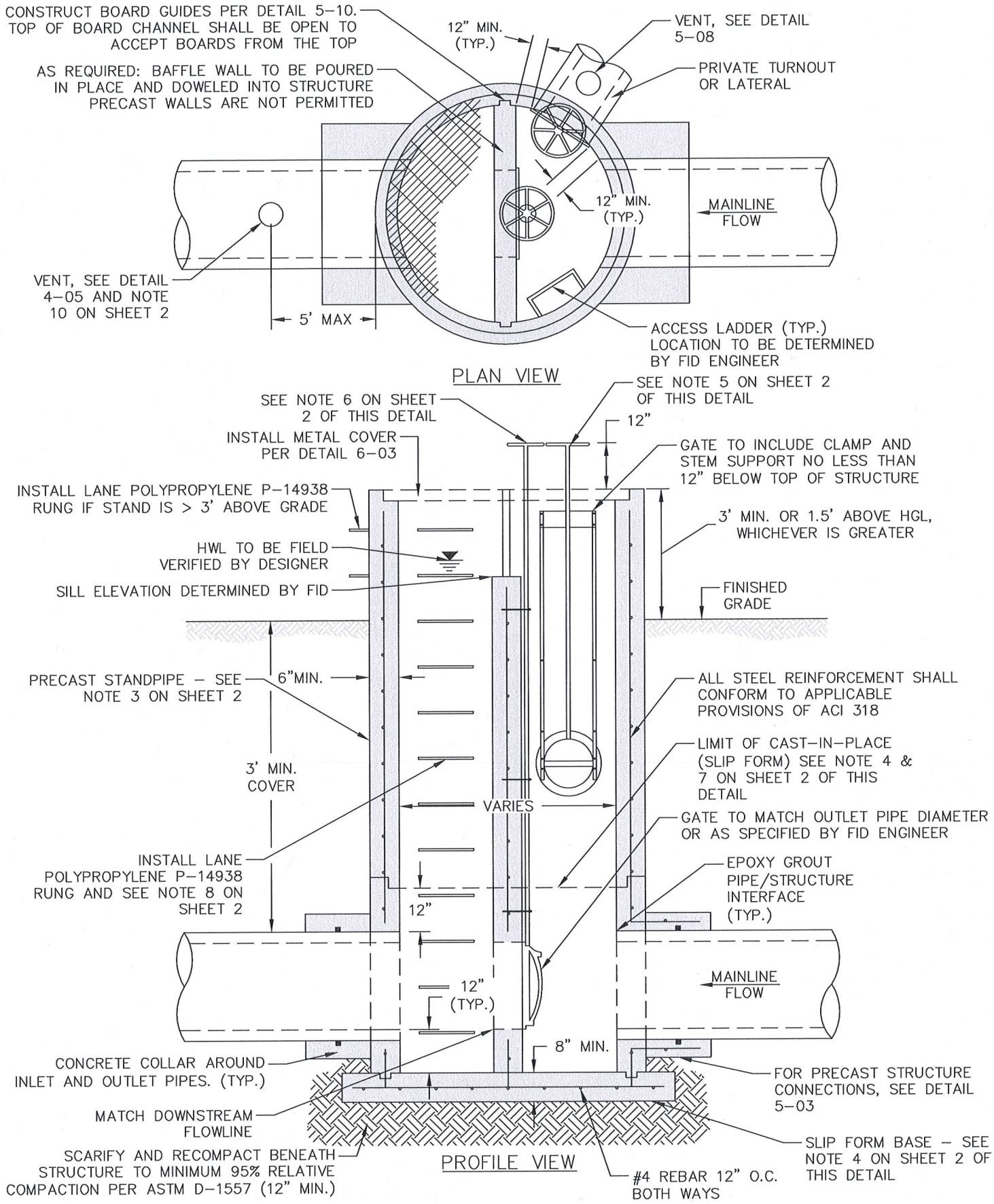


PROFILE

NOTES:

1. THRUST BLOCKS REQUIRED AT EACH PIPELINE BEND.
2. THRUST BLOCK CONCRETE SHALL BE A MINIMUM OF 6–1/2 SACK (611 POUNDS OF PORTLAND CEMENT PER CUBIC YARD) WITH A MINIMUM 28–DAY COMPRESSIVE STRENGTH OF 3,500 PSI, WATER–CEMENT RATIO OF 0.45 (BY WEIGHT), AIR ENTRAINMENT OF 4% ± 1%, AND 3 INCH (3") ± 1 INCH (1") SLUMP AT PLACEMENT.
3. SEE DETAIL 4–02 FOR PIPELINE TRENCH AND BACKFILL REQUIREMENTS.

FRESNO IRRIGATION DISTRICT		THRUST BLOCK
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 4–07 SHEET 1 OF 1



FRESNO IRRIGATION DISTRICT		STANDPIPE	
"Your Most Valuable Resource - Water"	SCALE: NOT TO SCALE	STANDARD DETAIL 5-01	
	DATE: JANUARY 2018	SHEET 1 OF 2	

STRUCTURE NOTES:

1. STRUCTURAL CONCRETE SHALL BE A MINIMUM OF 6–1/2 SACK (611 POUNDS OF PORTLAND CEMENT PER CUBIC YARD) WITH A MINIMUM 28–DAY COMPRESSIVE STRENGTH OF 3,500 PSI, WATER–CEMENT RATIO OF 0.45 (BY WEIGHT), AIR ENTRAINMENT OF 4% ± 1%, AND 4 INCH (4") SLUMP AT PLACEMENT.

2. ALL CAST–IN–PLACE (SLIP FORM) STRUCTURES SHALL INCLUDE FIBERCAST 500 OR EQUIVALENT CONCRETE FIBER REINFORCEMENT WITH FIBER LENGTHS BETWEEN 1.5 INCH (1.5") TO 2 INCH (2"). APPLICATION RATE AT A MINIMUM OF 1.5 POUNDS PER CUBIC YARD.

3. IF PRECAST STANDPIPE IS USED, SET STAND ON PAD BEFORE CONCRETE HAS COMPLETELY SET. USE RAMNEC BUTYL RUBBER JOINT COMPOUND AROUND JOINT OR APPROVED EQUIVALENT WATERSTOP. STANDPIPE SHALL MEET ASTM C–478. ALL JOINTS SHALL BE WATERTIGHT.

4. IF CAST–IN–PLACE (SLIP FORM) IS USED FOR STANDPIPE, BASE SHALL MEET ACI 318 AND ASTM C–150 SPECIFICATIONS. WALLS SHALL BE MIN. 8 INCH (8") THICK. POUR PAD AND WALLS AT THE SAME TIME. ALL JOINTS SHALL BE WATERTIGHT.

5. INSTALL FRESNO VALVES AND CASTINGS GATE PER SPECIFICATIONS ON PLAN SHEET. RISING STEM REQUIRED FOR ALL GATES. FOR DIA. $\leq$ 24 INCH (24") USE TYPE W PRESSURE GATES. FOR DIA. > 24 INCH (24") USE MODEL 20–10C.

6. INSTALL 101C FRESNO VALVES AND CASTINGS GATE PER SPECIFICATIONS ON PLAN SHEET. RISING STEM REQUIRED FOR ALL GATES. CONTRACTOR SHALL SUBMIT SHOP DRAWING FOR FID APPROVAL PRIOR TO ORDERING THE GATE.

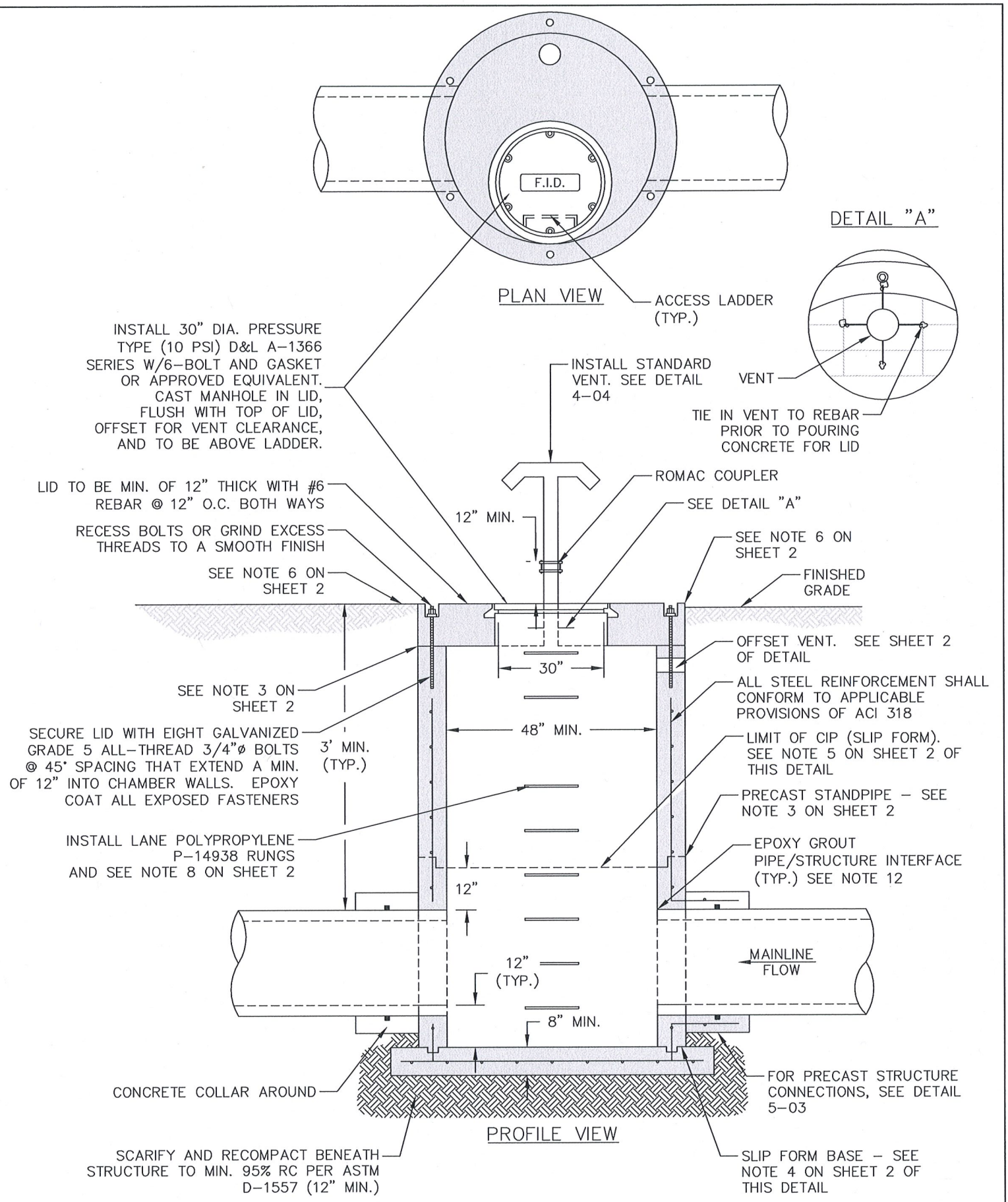
7. TOP OF SLIP FORM SHALL BE CAST WITH APPROPRIATE IMPRESSION RINGS.

8. SEE CAL/OSHA STANDARDS FOR FIXED LADDER REQUIREMENTS.

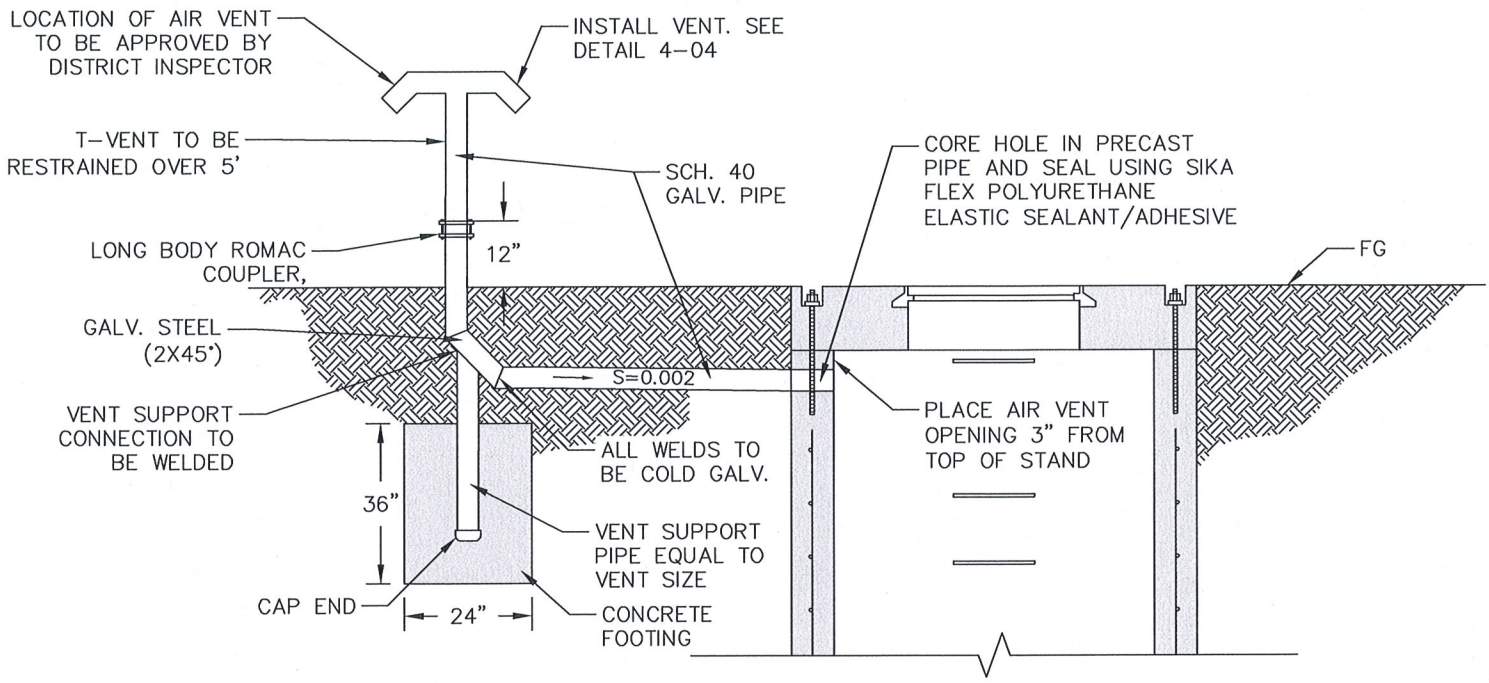
9. FID'S INSPECTOR MUST APPROVE ANY CHANGES THAT MAY OCCUR DUE TO FIELD CONDITIONS.

10. DOWNSTREAM AIR VENT MAY BE REQUIRED BY FID ENGINEER.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	STANDPIPE NOTES	
	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5–01 SHEET 2 OF 2



FRESNO IRRIGATION DISTRICT		SURGE CHAMBER
"Your Most Valuable Resource - Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5-02 SHEET 1 OF 2



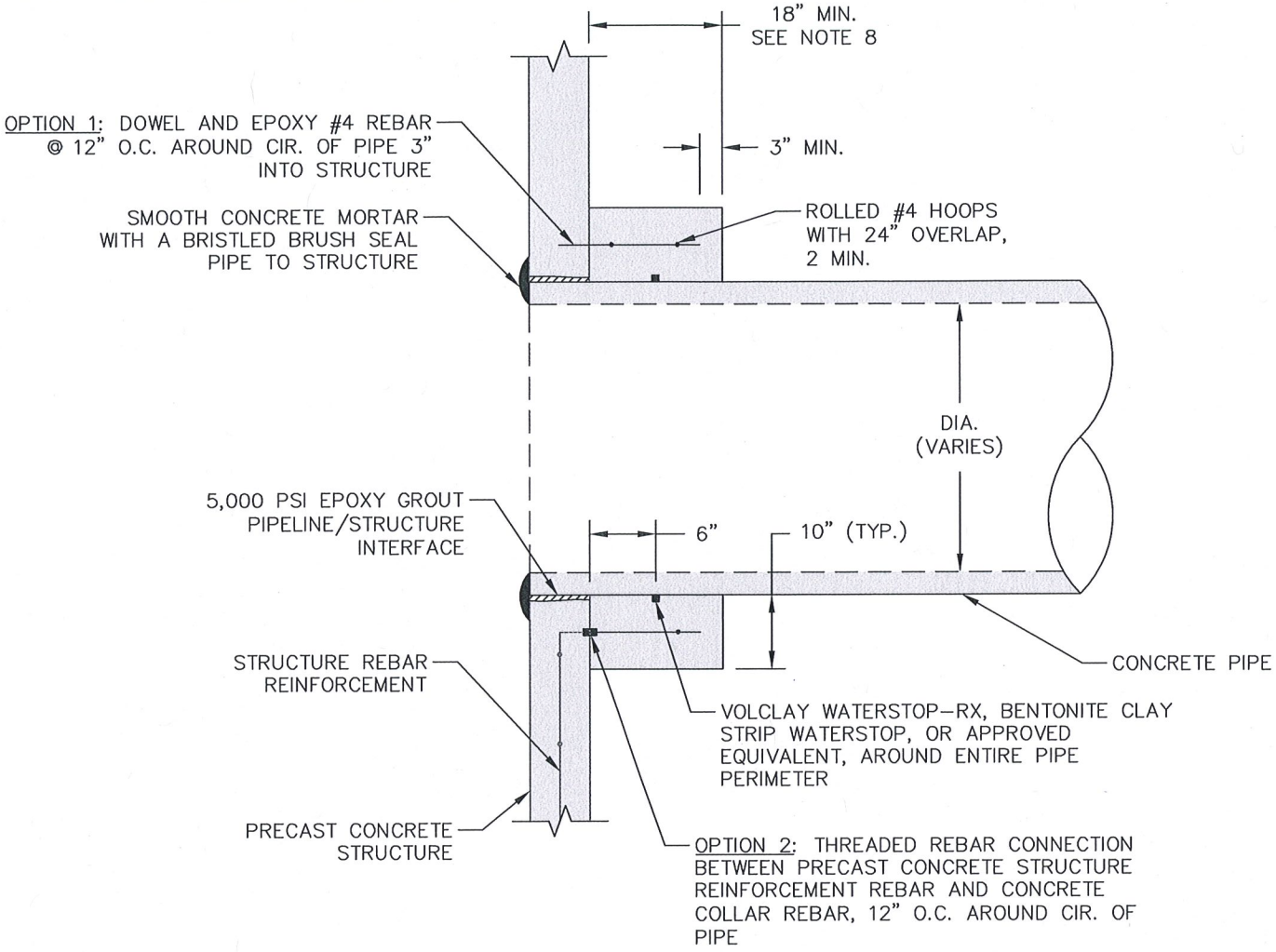
OFFSET VENT DETAIL
(AS DETERMINED BY DISTRICT)

STRUCTURE NOTES:

1. STRUCTURAL CONCRETE SHALL BE A MINIMUM OF 6-1/2 SACK (611 POUNDS OF PORTLAND CEMENT PER CUBIC YARD) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,500 PSI, WATER-CEMENT RATIO OF 0.45 (BY WEIGHT), AIR ENTRAINMENT OF 4% ± 1%, AND 4 INCH SLUMP AT PLACEMENT.
2. ALL CAST-IN-PLACE (SLIP FORM) STRUCTURES SHALL INCLUDE FIBERCAST 500 OR EQUIVALENT CONCRETE FIBER REINFORCEMENT WITH FIBER LENGTHS BETWEEN 1.5 INCH TO 2 INCH. APPLICATION RATE AT A MINIMUM OF 1.5 POUNDS PER CUBIC YARD.
3. USE BUTYL RUBBER JOINT COMPOUND OR SIMILAR WATERSTOP AROUND JOINTS. STANDPIPE SHALL MEET ASTM C-478. ALL JOINTS SHALL BE WATERTIGHT AND GROUTED BOTH INSIDE AND OUTSIDE.
4. IF CAST-IN-PLACE (SLIP FORM) IS USED FOR STANDPIPE, BASE SHALL MEET ACI 318 AND ASTM C-150 SPECIFICATIONS. WALLS SHALL BE MIN. 8 INCH THICK. POUR PAD AND WALLS AT THE SAME TIME. ALL JOINTS SHALL BE WATERTIGHT.
5. TOP OF SLIP FORM SHALL BE CAST WITH APPROPRIATE IMPRESSION RINGS BEFORE CONCRETE HAS COMPLETELY SET.
6. TOP OF LID SHALL BE FLUSH WITH ADJACENT CONCRETE OR 0.10 FEET HIGHER THAN SOIL SURFACE FINISHED GRADE.
7. A MINIMUM OF 12 INCHES OF CONCRETE IS REQUIRED BETWEEN THE TOP THE MAINLINE OF PIPE & THE BOTTOM OF THE LID.
8. SEE CAL/OSHA STANDARDS FOR FIXED LADDER REQUIREMENTS.
9. FID'S INSPECTOR MUST APPROVE ANY DESIGN CHANGES THAT MAY OCCUR DUE TO UNEXPECTED FIELD CONDITIONS.
10. 93% MINIMUM COMPACTION REQUIRED AROUND STAND FOR A MINIMUM OF 5 FEET OR LIMITS OF DISTURBED SOIL, WHICHEVER IS GREATER.
11. DIMENSIONS, REINFORCEMENT, AND NOTES ARE FOR DETAIL PURPOSES ONLY. A SCALED DRAWING SHALL BE PREPARED & SUBMITTED WITH ALL PLAN SETS PRIOR TO CONSTRUCTION.
12. CONSTRUCTION GROUT TO BE NON SHRINK, CONSTRUCTION GRADE OR 5,000 PSI MINIMUM.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	SURGE CHAMBER NOTES	
	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5-02 SHEET 2 OF 2

*FOR CONCRETE WALLS 4 INCHES OR GREATER



NOTES:

1. CONCRETE SHALL BE A MINIMUM OF 6-1/2 SACK (611 POUNDS OF PORTLAND CEMENT PER CUBIC YARD) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,500 PSI, WATER-CEMENT RATIO OF 0.45 (BY WEIGHT), AIR ENTRAINMENT OF 4% ± 1%, AND 4 INCH SLUMP AT PLACEMENT.
2. REMOVE FORMS USED TO POUR CONCRETE COLLAR PRIOR TO BACKFILL.
3. DIAMETER OF ROLLED HOOPS SHALL BE PIPE INSIDE DIAMETER + (2 X WALL THICKNESS) + 10 INCHES.
4. CONCRETE SHALL BE VIBRATED AROUND PIPE JOINT DURING PLACEMENT.
5. CONCRETE PIPE SHALL BE CLEANED AND TREATED WITH CONCRETE BONDING AGENT PRIOR TO CONCRETE PLACEMENT.
6. PREPARE SURFACE OF STRUCTURE BY WIRE BRUSHING, WATER BLASTING, OR SAND BLASTING AS REQUIRED AND TREATED WITH CONCRETE BONDING AGENT PRIOR TO CONCRETE PLACEMENT.
7. IF A VENT IS REQUIRED, VENT SHALL BE INCORPORATED INTO CONCRETE COLLAR. LENGTHEN COLLAR AS NECESSARY. COLLAR TO EXTEND 12 INCH MINIMUM BEYOND VENT.
8. OPTION 1 OR OPTION 2 SHALL BE USED FOR THE STRUCTURE TO COLLAR REBAR CONNECTION.
9. JOINT SHALL BE WATERTIGHT.

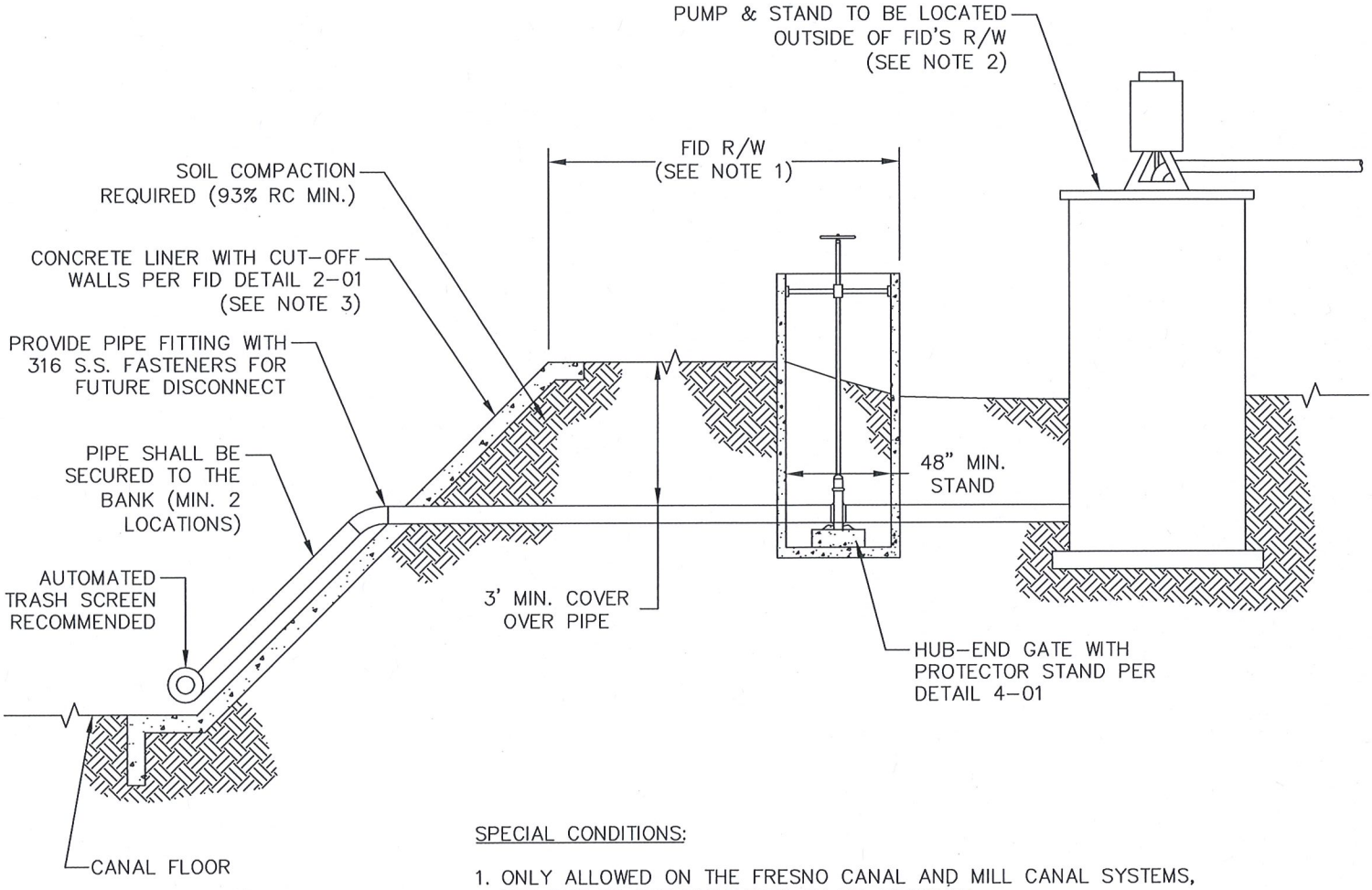
FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	STANDPIPE CONNECTION
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5-03 SHEET 1 OF 1

NOTES:

1. FID R/W:
   CANALS 50 C.F.S. & UP AS REQUIRED NOT LESS THAN 20 FEET.
   CANALS UNDER 50 C.F.S. AS REQUIRED BUT NOT LESS THAN 17 FEET.

2. FLOW METER SHALL BE FURNISHED & INSTALLED PER FID REQUIREMENTS.

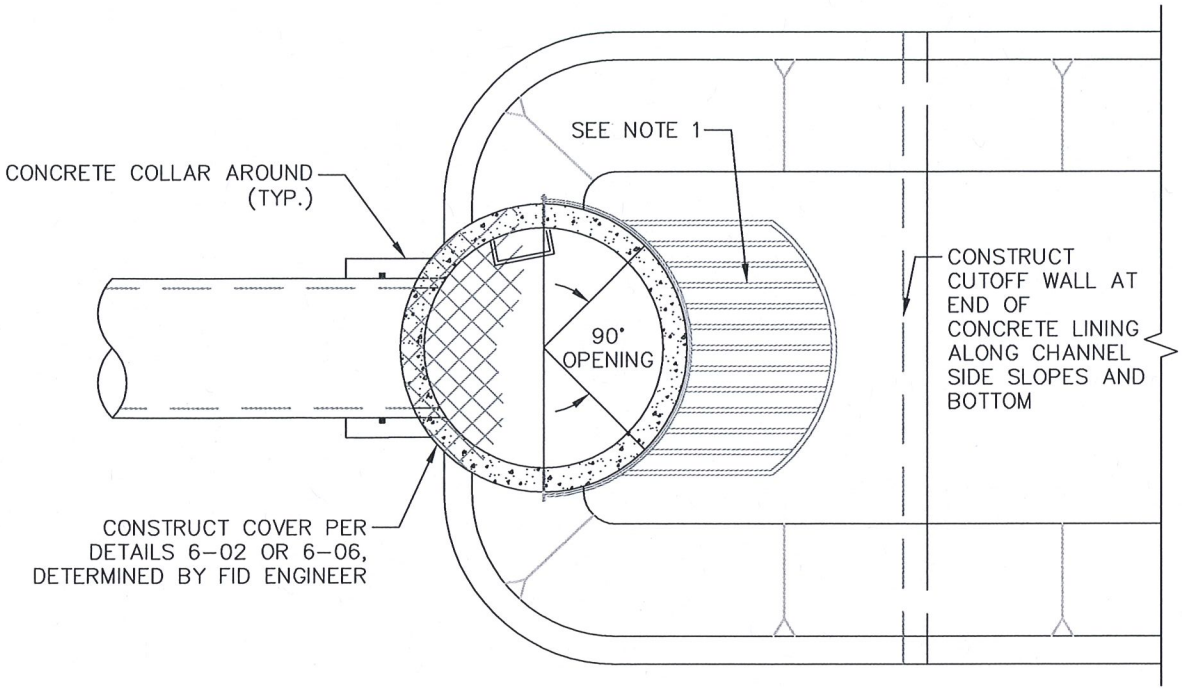
3. IF CONCRETE OR RIP-RAP LINER IS NOT INSTALLED, LANDOWNER ASSUMES ALL RESPONSIBILITY FOR THE REPAIR OR REPLACEMENT OF ANY PRIVATE PIPELINE AND PIPELINE APPURTENANCES DAMAGED DUE TO ANY POTENTIAL BANK EROSION.



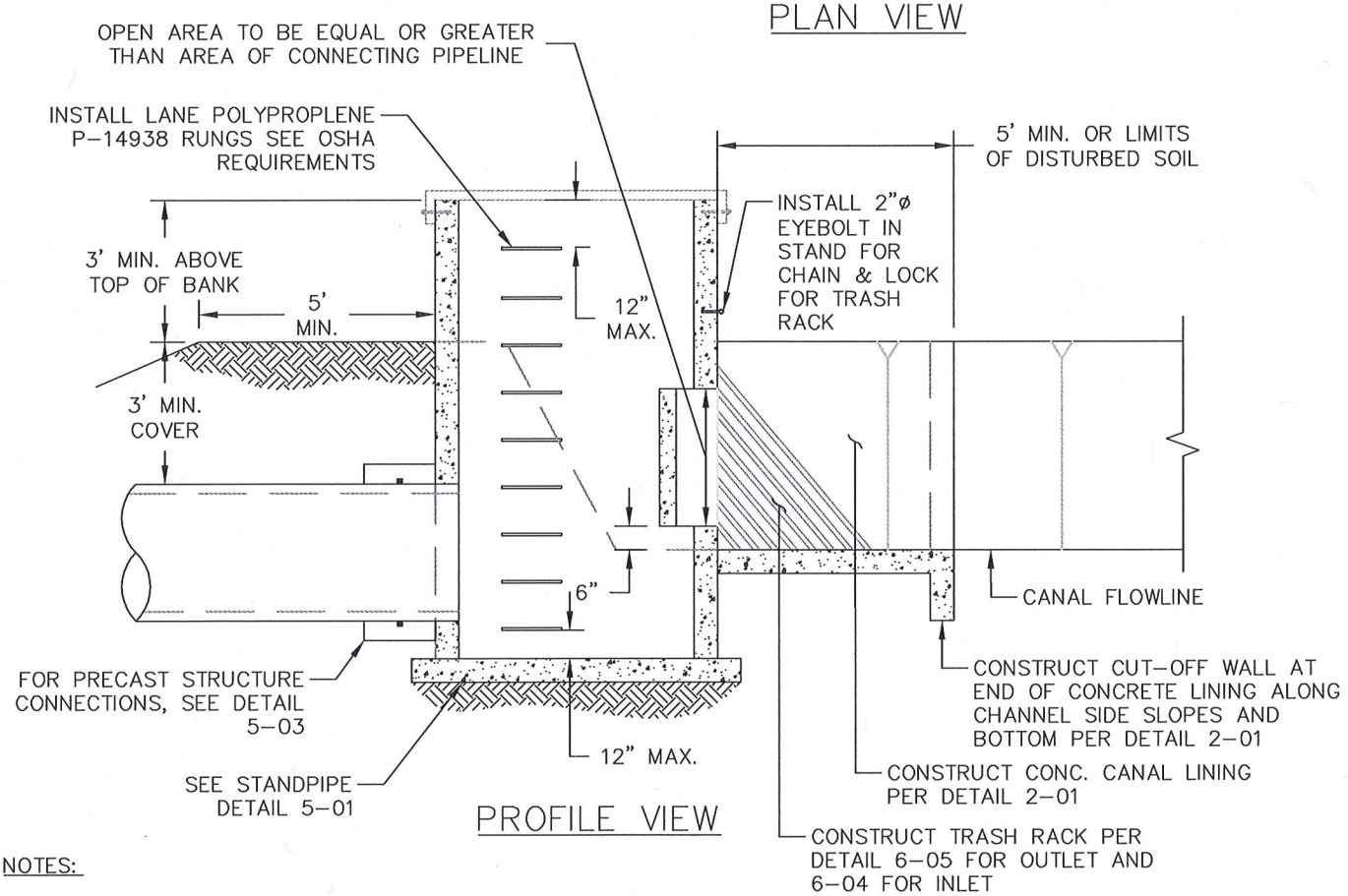
SPECIAL CONDITIONS:

1. ONLY ALLOWED ON THE FRESNO CANAL AND MILL CANAL SYSTEMS, SUBJECT TO DETERMINATION BY FID ENGINEER.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	OFFSET PUMP STAND ROTATING SCREEN INTAKE
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5-04 SHEET 1 OF 1



PLAN VIEW

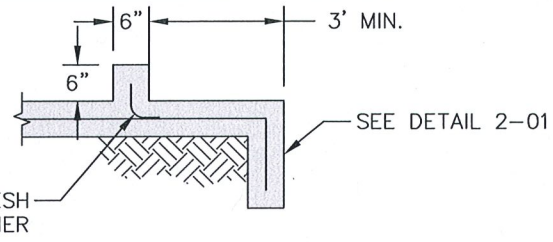


PROFILE VIEW

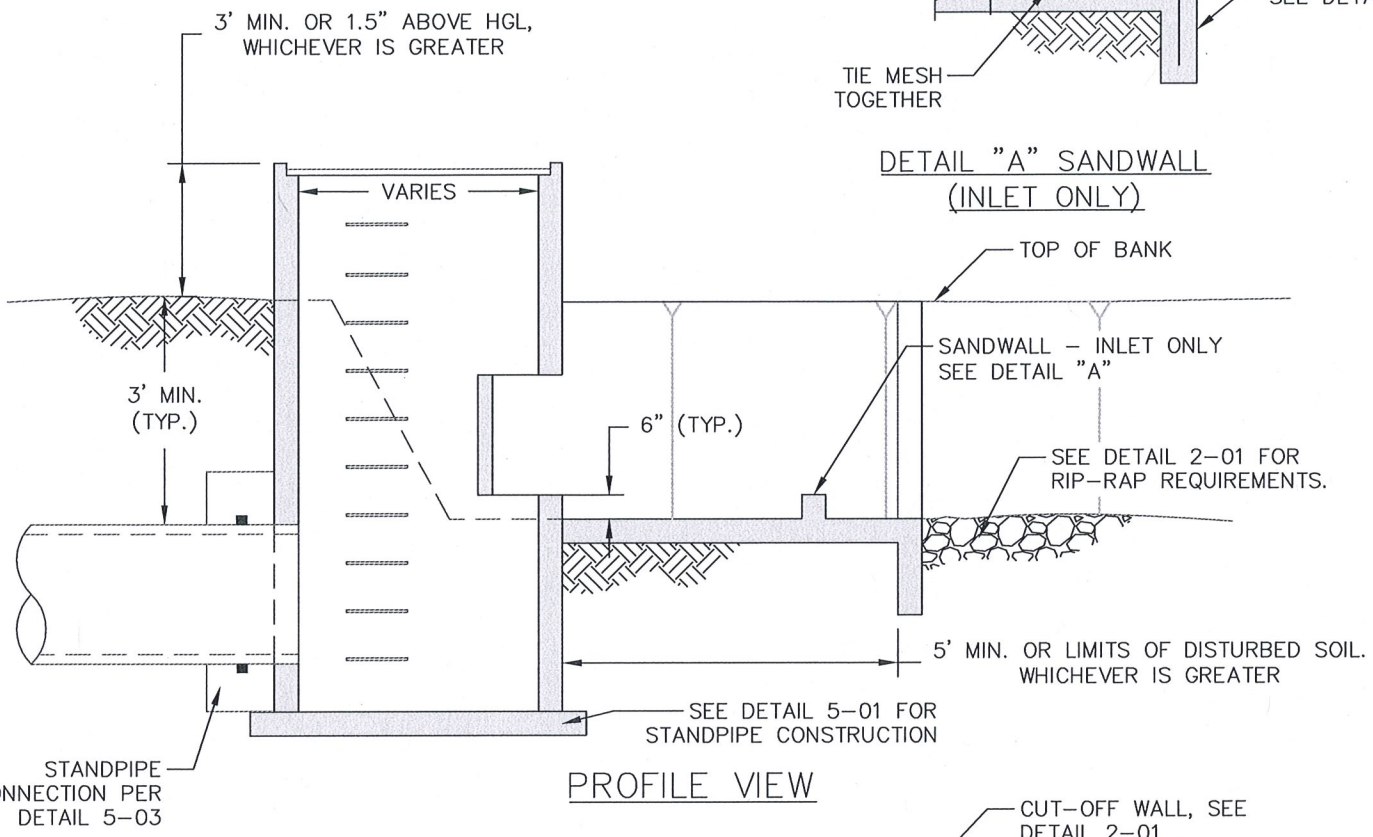
NOTES:

1. BOTTOM MUST REMAIN FLAT AND LEVEL WITH FLOW LINE TO A POINT BEHIND TRASH RACK PLACEMENT.
2. BACKFILL AROUND STRUCTURE TO HAVE 93% RELATIVE COMPACTION.
3. STANDS GREATER THAN 3 FEET SEE DETAIL 6-10.

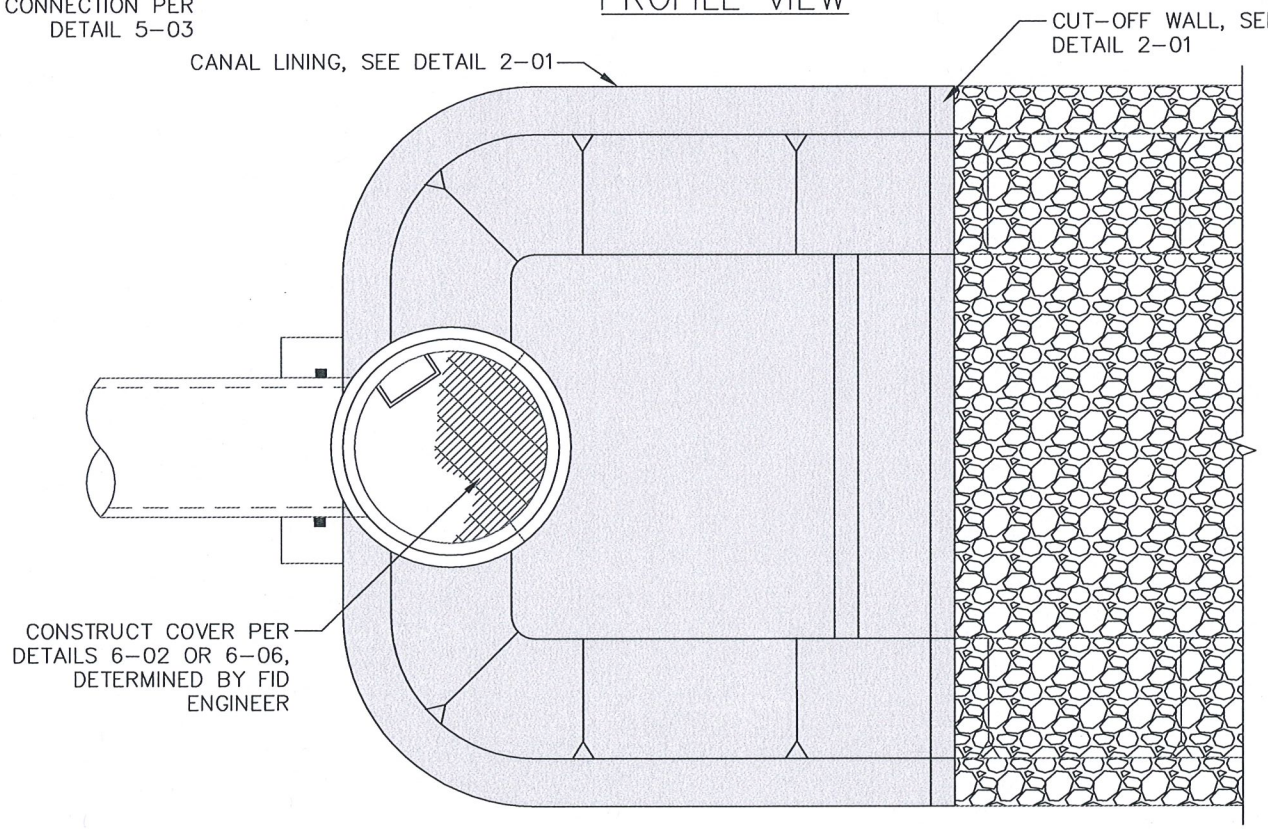
FRESNO IRRIGATION DISTRICT		INLET/OUTLET STAND
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5-05
		SHEET 1 OF 2



DETAIL "A" SANDWALL
(INLET ONLY)

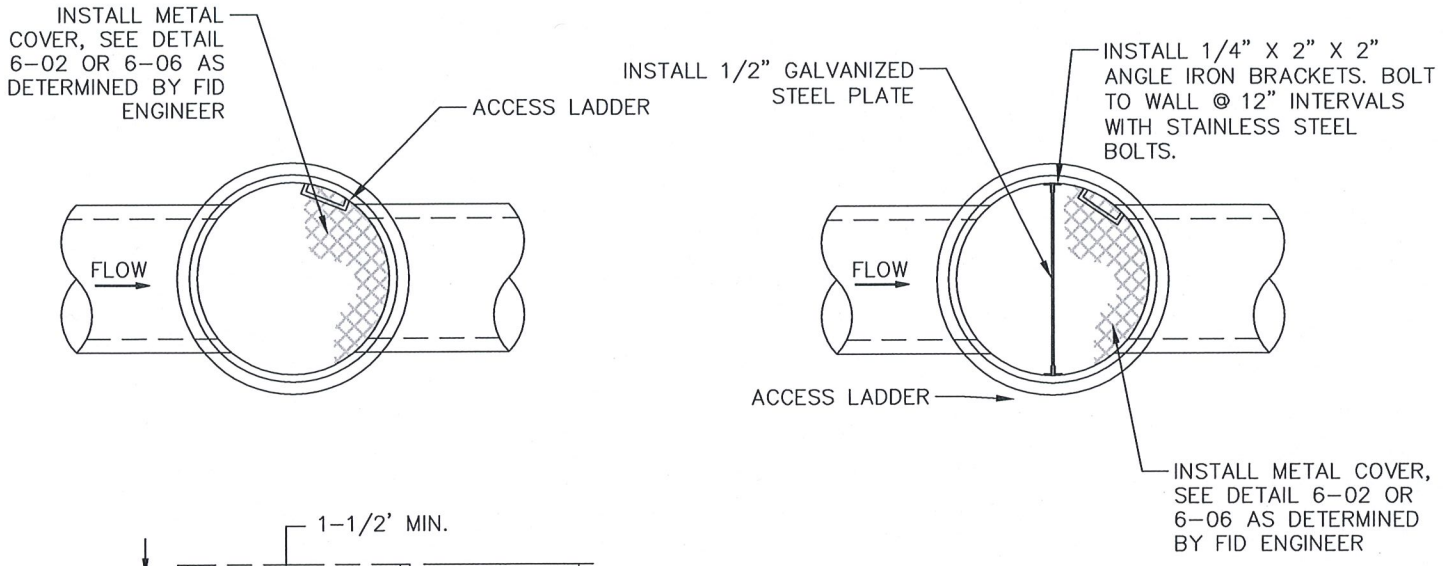


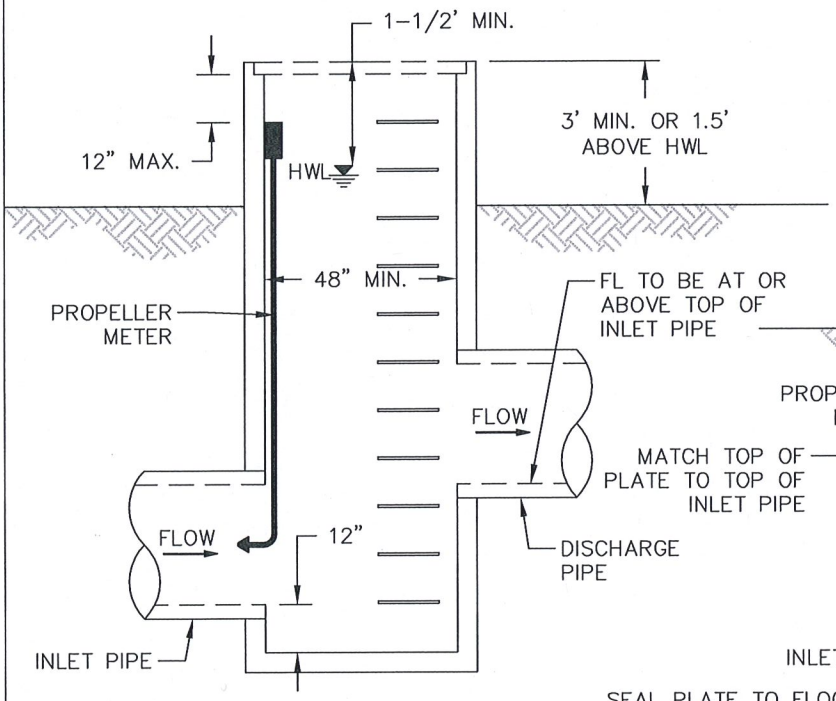
PROFILE VIEW



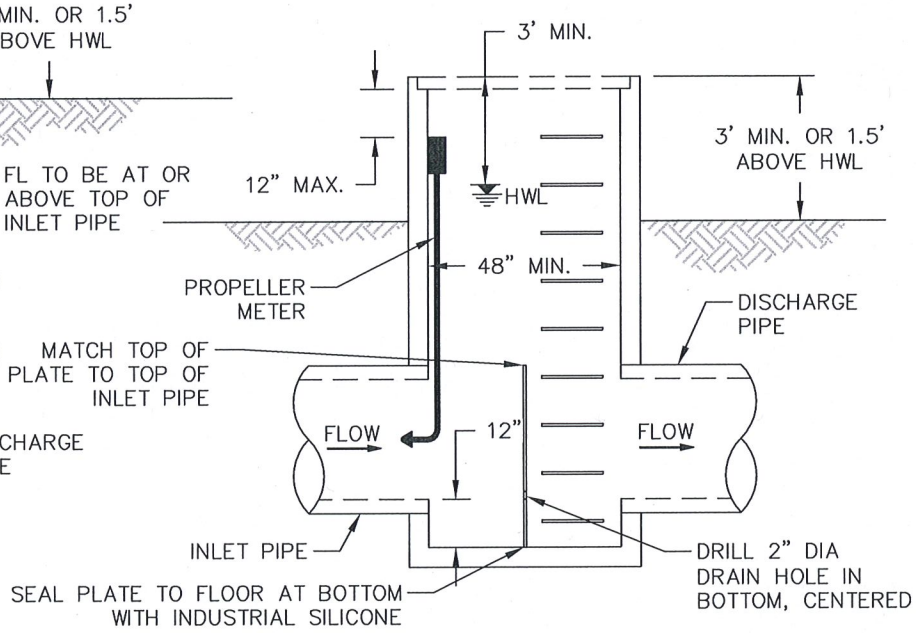
PLAN VIEW

FRESNO IRRIGATION DISTRICT		BATH TUB INSTALLATION
"Your Most Valuable Resource - Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5-05 SHEET 2 OF 2





TYPE "A" METER STAND
OFFSET CONNECTING PIPES

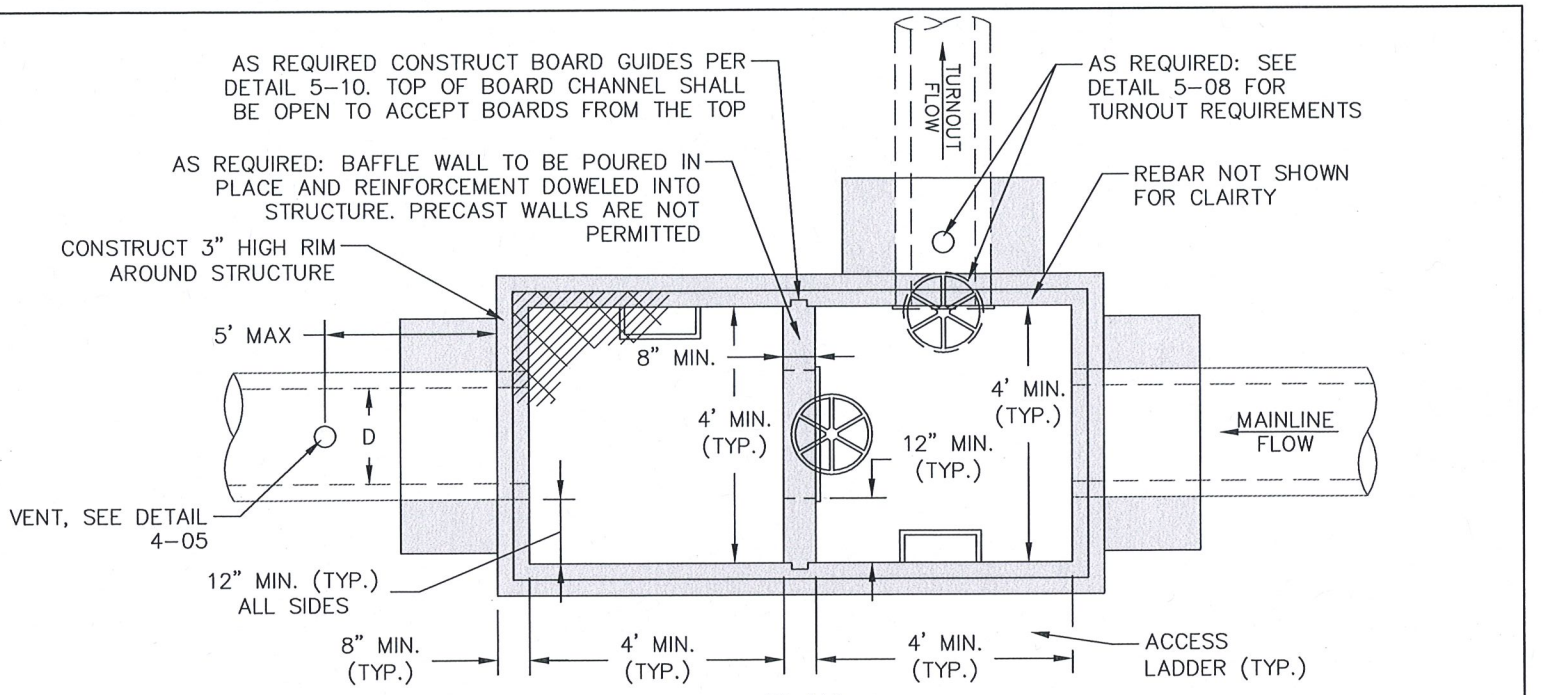


TYPE "B" METER STAND

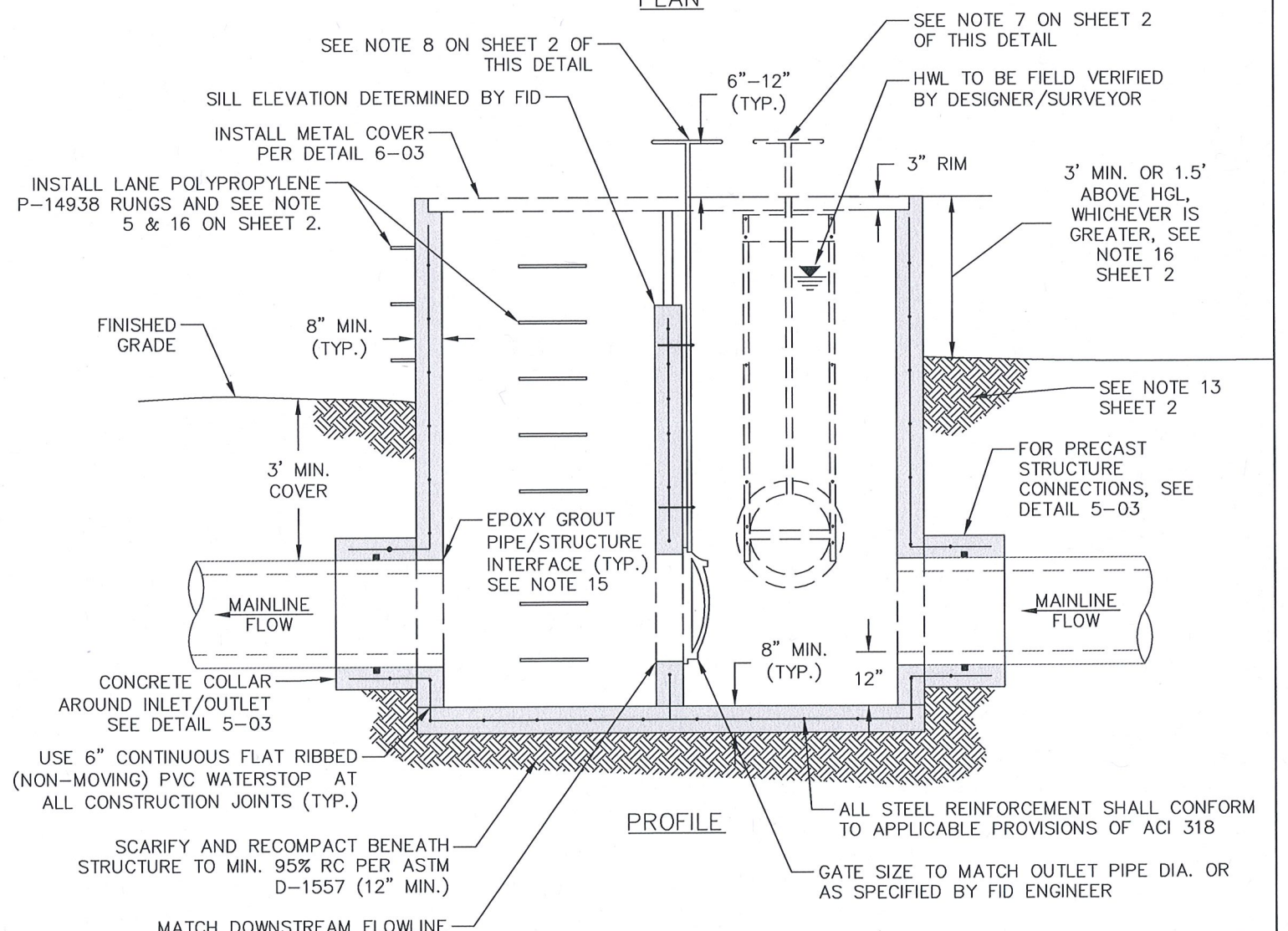
NOTES:

1. SEE DETAIL 5-01 FOR STANDPIPE CONSTRUCTION.
2. ALL METER STANDS MUST BE INSTALLED A MINIMUM OF 10 PIPELINE DIAMETERS DOWNSTREAM FROM GATE OR BEND.

FRESNO IRRIGATION DISTRICT		METER STAND
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5-06 SHEET 1 OF 1



PLAN



PROFILE

FRESNO IRRIGATION DISTRICT		BACKUP STRUCTURE – BOX
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5-07 SHEET 1 OF 2

STRUCTURE NOTES:

1. IF CAST-IN-PLACE STRUCTURE IS USED, THEN STRUCTURE SHALL MEET ACI 318 REQUIREMENTS. THE CONTRACTOR SHALL SUBMIT PROPOSED CONCRETE AND STEEL REINFORCEMENT SPECIFICATIONS TO FID FOR APPROVAL PRIOR TO CONSTRUCTION. ALL CAST-IN-PLACE JOINTS SHALL BE WATERTIGHT.

2. IF PRECAST STRUCTURE IS USED, THEN STRUCTURE SHALL MEET ACI 318 REQUIREMENTS. USE BUTYL OR SIMILAR WATERSTOP AROUND JOINT. JOINTS SHALL BE GROUTED ON THE INSIDE AND OUTSIDE. ALL JOINTS SHALL BE WATERTIGHT.

3. STRUCTURAL CONCRETE SHALL BE A MINIMUM OF 6-1/2 SACK (611 POUNDS OF PORTLAND CEMENT PER CUBIC YARD) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,500 PSI, WATER-CEMENT RATIO OF 0.45 (BY WEIGHT), AIR ENTRAINMENT OF 4% ± 1%, AND 4 INCH SLUMP AT PLACEMENT.

4. ALL CAST-IN-PLACE STRUCTURES SHALL INCLUDE FIBERCAST 500 OR EQUIVALENT CONCRETE FIBER REINFORCEMENT WITH FIBER LENGTHS BETWEEN 1.5 INCH TO 2 INCH. APPLICATION RATE TO BE A MINIMUM OF 1.5 POUNDS PER CUBIC YARD.

5. SEE CAL/OSHA STANDARDS FOR FIXED LADDER REQUIREMENTS.

6. FID'S INSPECTOR MUST APPROVE ALL DESIGN CHANGES THAT OCCUR DUE TO UNEXPECTED FIELD CONDITIONS.

7. AS REQUIRED: INSTALL FRESNO VALVES AND CASTINGS GATE PER SPECIFICATIONS ON PLAN SHEET. RISING STEM REQUIRED FOR ALL GATES. FOR DIAMETER. ≤ 24 INCH USE TYPE W PRESSURE GATES. FOR DIAMETER. > 24 INCH USE MODEL 20-10C. CONTRACTOR SHALL SUBMIT SHOP DRAWING FOR FID APPROVAL PRIOR TO ORDERING THE GATE.

8. AS REQUIRED: INSTALL 101C FRESNO VALVES AND CASTINGS GATE PER SPECIFICATIONS ON PLAN SHEET. RISING STEM REQUIRED FOR ALL GATES. CONTRACTOR SHALL SUBMIT SHOP DRAWING FOR FID APPROVAL PRIOR TO ORDERING THE GATE. GATE SHALL BE GREATER THAN OR EQUAL TO DOWN STREAM PIPE SIZE OR AS DETERMINED BY FID ENGINEER.

9. INSTALL FRESNO VALVES AND CASTINGS 101-C GATE PER SPECIFICATIONS ON PLAN SHEET. RISING STEM REQUIRED FOR ALL GATES.

10. ACCESS LADDERS TO BE PROVIDED AT UPSTREAM/DOWNSTREAM OF THE BAFFLE WALL.

11. GATES GREATER THAN OR EQUAL TO 48 INCH, ADD 3:1 GEAR REDUCER.

12. DIMENSIONS, REINFORCEMENT, AND NOTES ARE FOR DETAIL PURPOSES ONLY. A SCALED DRAWING SHALL BE PREPARED AND SUBMITTED WITH ALL PLAN SETS PRIOR TO CONSTRUCTION.

13. 93% MINIMUM COMPACTION REQUIRED AROUND STAND FOR A MINIMUM OF 5 FEET OR LIMITS OF DISTURBED SOIL, WHICHEVER IS GREATER.

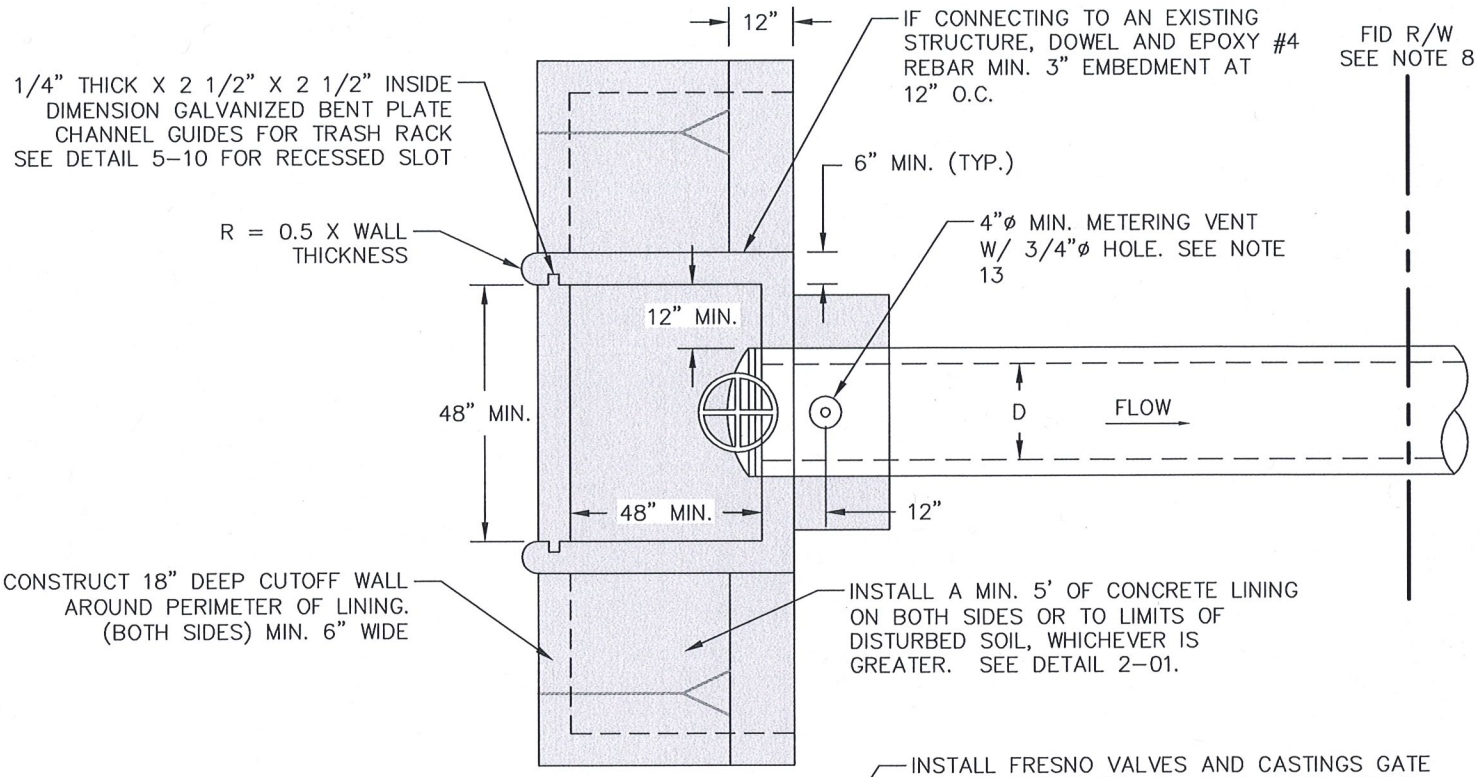
14. DOWN STREAM AIR VENT MAY BE REQUIRED BY FID ENGINEER.

15. CONSTRUCTION GROUT TO BE NON-SHRINK, CONSTRUCTION GRADE OR 5,000 PSI MINIMUM.

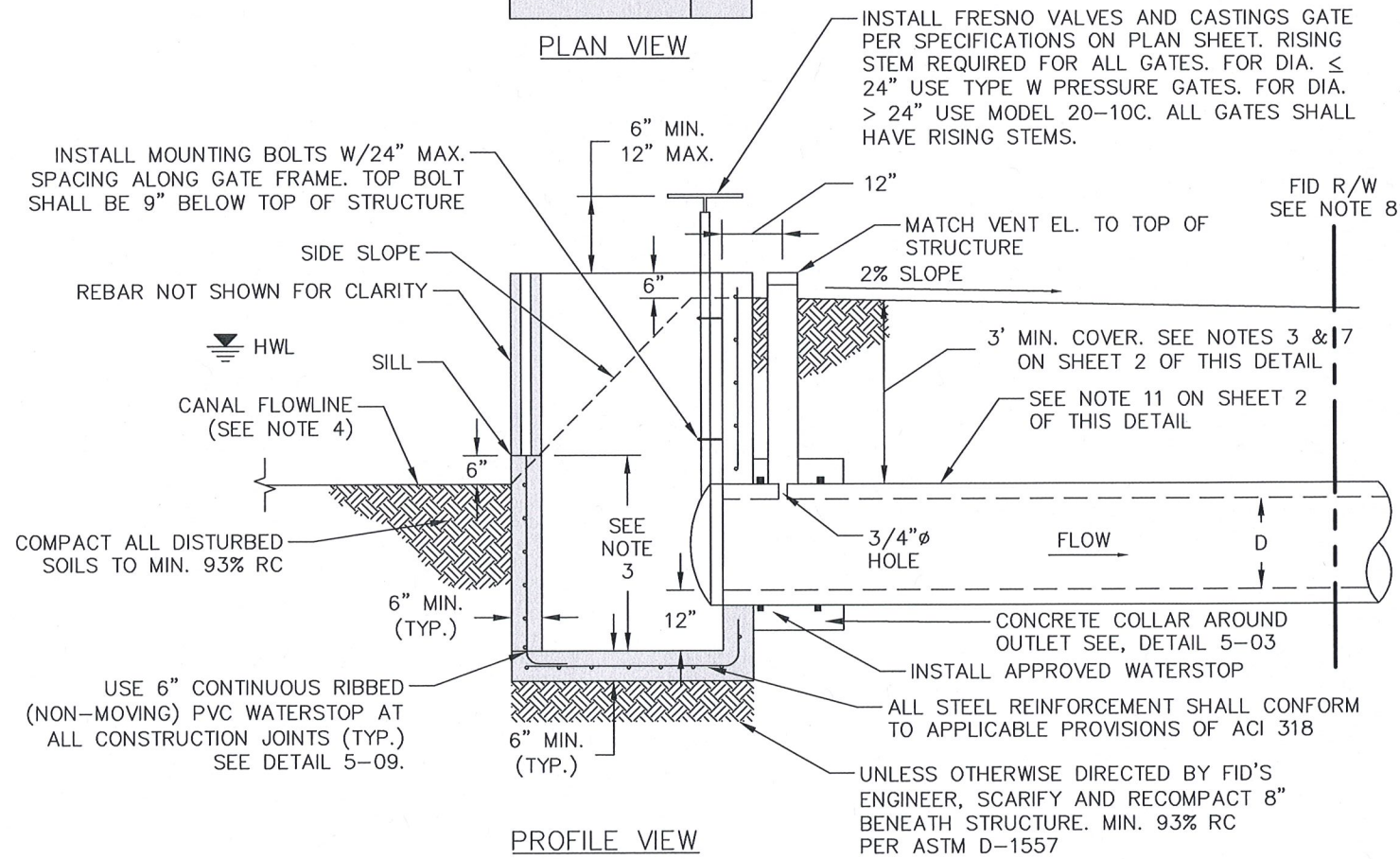
16. EXTERNAL LADDER COVER REQUIRED PER DETAIL 6-10 IF STRUCTURE IS MORE THAN 3 FEET ABOVE GRADE.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	BACKUP STRUCTURE – BOX NOTES
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5-07 SHEET 2 OF 2

NOTE: ALL DESIGNS SUBMITTED TO FID FOR APPROVAL SHALL BE DRAWN TO SCALE AND INCLUDE ELEVATIONS



PLAN VIEW



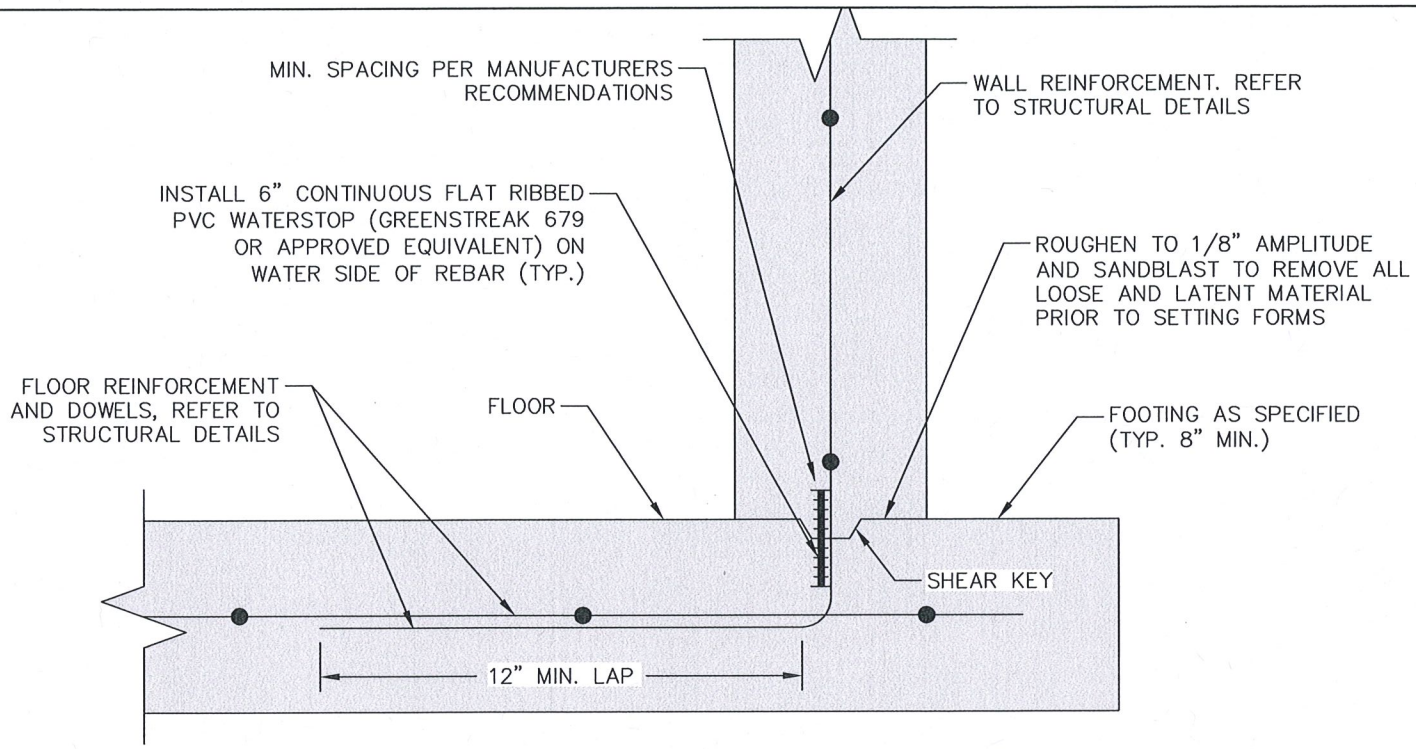
PROFILE VIEW

FRESNO IRRIGATION DISTRICT		TURNOUT	
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5-08	SHEET 1 OF 2

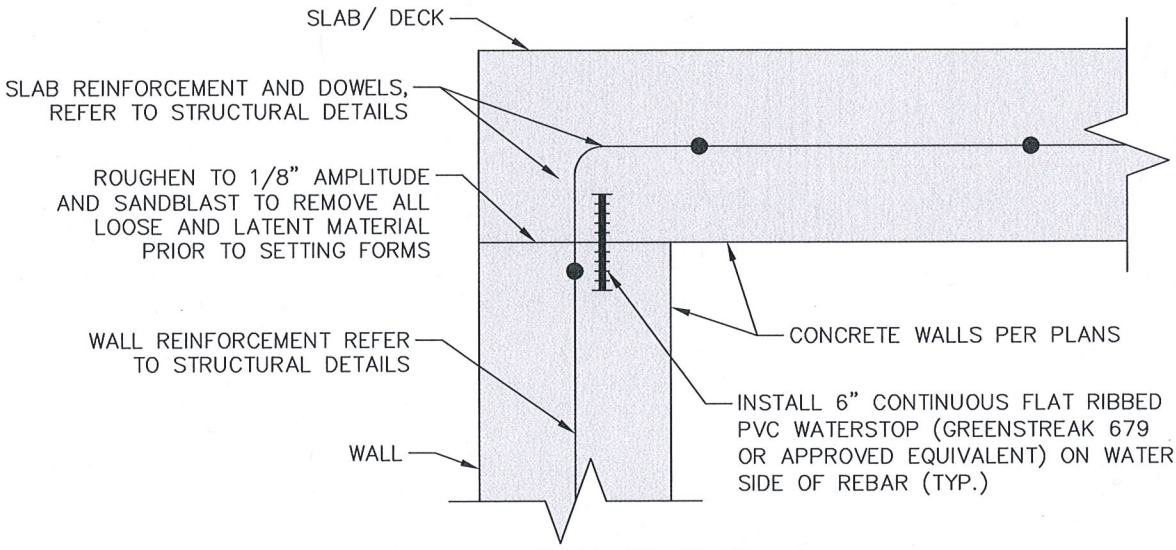
STRUCTURE NOTES:

1. STRUCTURAL CONCRETE SHALL BE A MINIMUM OF 6–1/2 SACK (611 POUNDS OF PORTLAND CEMENT PER CUBIC YARD) WITH A MINIMUM 28–DAY COMPRESSIVE STRENGTH OF 3,500 PSI, WATER–CEMENT RATIO OF 0.45 (BY WEIGHT), AIR ENTRAINMENT OF 4% ± 1%, AND 4 INCH SLUMP AT PLACEMENT.
2. ALL CAST–IN–PLACE STRUCTURES SHALL INCLUDE FIBERCAST 500 OR EQUIVALENT CONCRETE FIBER REINFORCEMENT WITH FIBER LENGTHS BETWEEN 1.5 INCH TO 2 INCH. APPLICATION RATE TO BE A MINIMUM OF 1.5 POUNDS PER CUBIC YARD.
3. VARIES BASED ON MINIMUM 3 FEET COVER OVER PIPE AND SIZE OF CANAL.
4. REMOVE DEPOSITS/SEDIMENT TO THE NATIVE FLOWLINE OF THE CANAL. CANAL FLOWLINE TO BE FIELD VERIFIED.
5. SUBMITTALS FOR CONCRETE MIX AND GATE VALVES REQUIRED PRIOR TO INSTALLATION.
6. COMPACTION TESTING SHALL BE PERFORMED BY THE OWNER/AGENCY AS DIRECTED BY FID'S ENGINEER OR INSPECTOR.
7. SEE DETAIL 4–02 FOR PIPELINE BACKFILL REQUIREMENTS.
8. SEE DETAIL 1–01 FOR RIGHT–OF–WAY REQUIREMENTS.
9. METER/METER STAND MAY BE REQUIRED PER FID DIRECTION.
10. REFER TO LOW FLOW AGREEMENT REQUIREMENT FOR DRIP INSTALLATION.
11. ALL PIPE SHALL CONFORM TO ASTM C–361 FOR CONCRETE PIPE OR PIP 100 PSI PVC FOR PLASTIC PIPE AND SHALL EXTEND BEYOND FID'S EASEMENT. PIPE SHALL BE INSTALLED PER FID SPECIFICATIONS AND FID INSPECTOR INSTRUCTIONS.
12. ADD GEAR BOX REDUCER (3:1) FOR GATES GREATER THAN OR EQUAL TO 48 INCHES.
13. VENT SIZE SHALL BE 4 INCH MINIMUM, VENT SHALL BE CONCRETE FOR CONCRETE PIPE AND PVC FOR PVC PIPE.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	TURNOUT NOTES	
	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5–08 SHEET 2 OF 2



FLOOR TO WALL

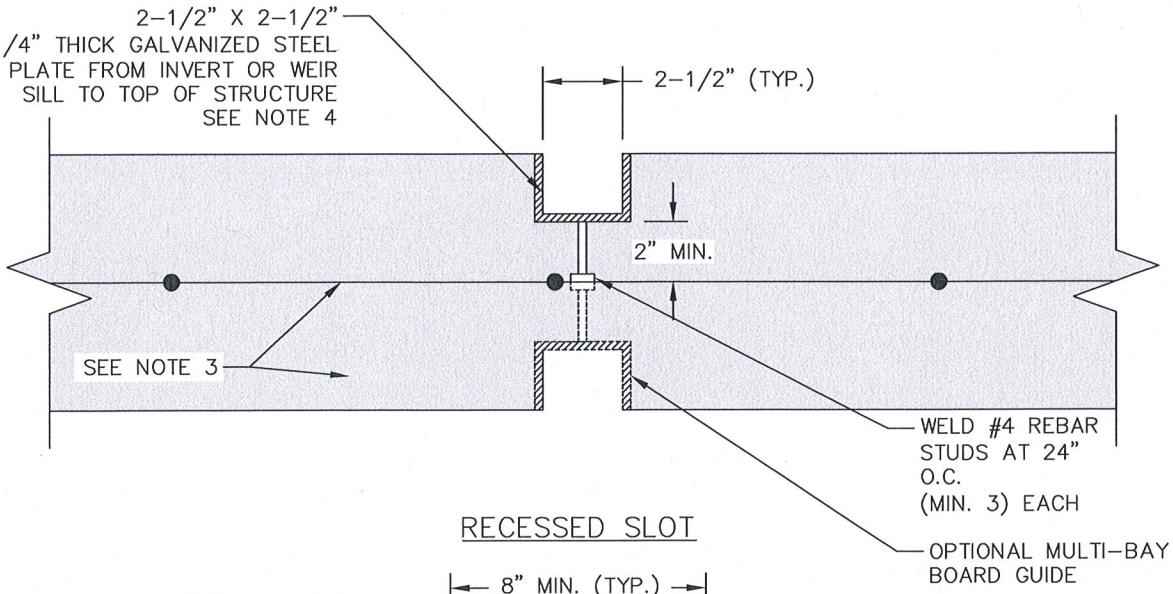


WALL TO SLAB

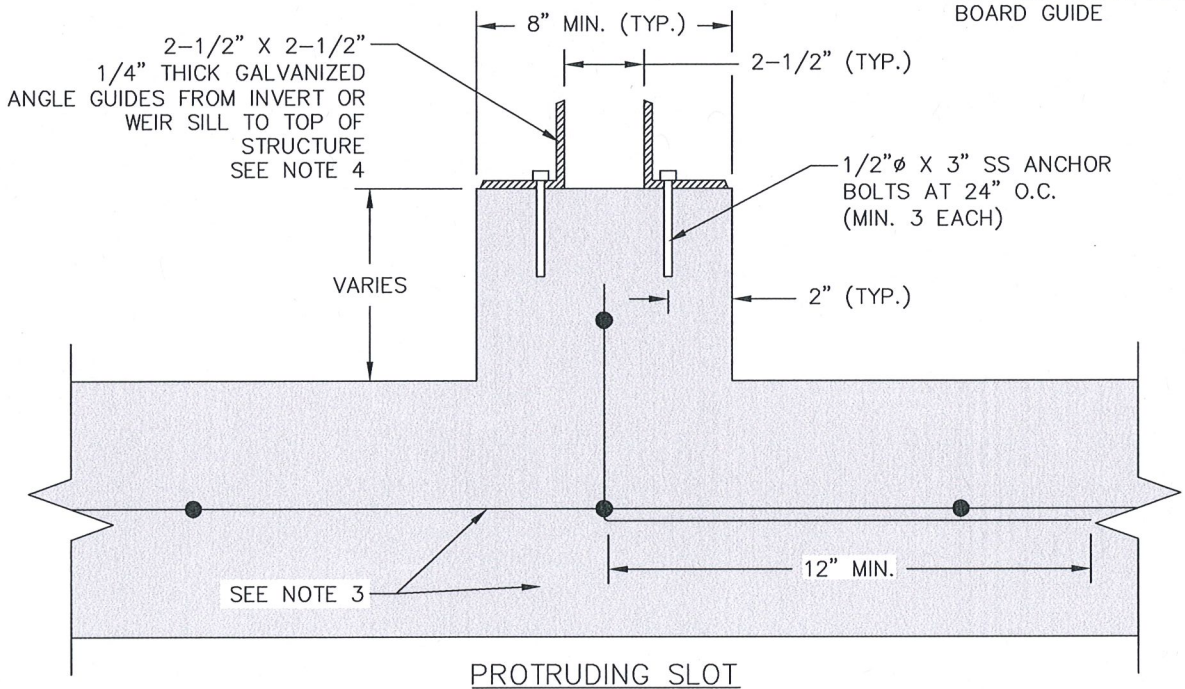
NOTES:

1. ALL JOINTS BETWEEN CONCRETE POURS CONFORM TO THIS STANDARD.
2. CONSTRUCTION JOINTS ARE REQUIRED FOR ALL FLOOR/SLAB TO WALL TRANSITIONS.
3. CONSTRUCTION JOINTS SHALL BE PLACED AS SHOWN ON THE PLANS OR AS PRE-APPROVED BY FID ENGINEER. JOINTS SHALL BE THOROUGHLY CLEANED AND LAITANCE REMOVED BEFORE A NEW POUR IS MADE. EACH JOINT SHALL BE WETTED IMMEDIATELY BEFORE THE PLACING OF NEW CONCRETE.
4. REINFORCING STEEL SHALL JOIN THE CONCRETE BETWEEN POURS WITH A MINIMUM OVERLAP CONFORMING TO ACI 318 OR TO BE DETERMINED BY FID'S ENGINEER.
5. THIS DETAIL INTENTIONALLY DOES NOT SPECIFY CONCRETE THICKNESS OR REINFORCEMENT SIZE, WHICH SHOULD BE DESIGNED SEPARATELY.

FRESNO IRRIGATION DISTRICT		CONSTRUCTION JOINT
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5-09 SHEET 1 OF 1



RECESSED SLOT

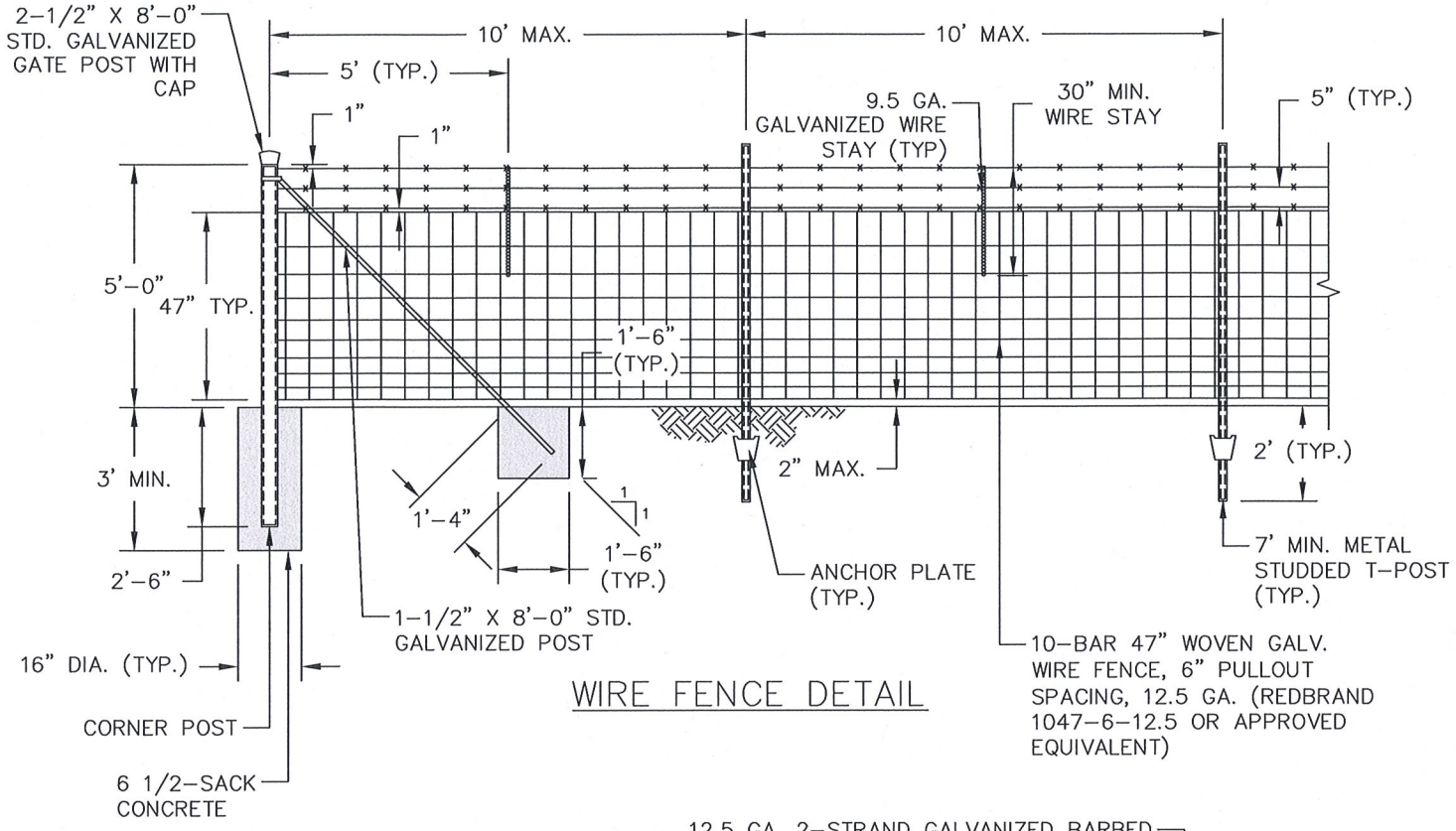


PROTRUDING SLOT
(AS DETERMINED BY FID)

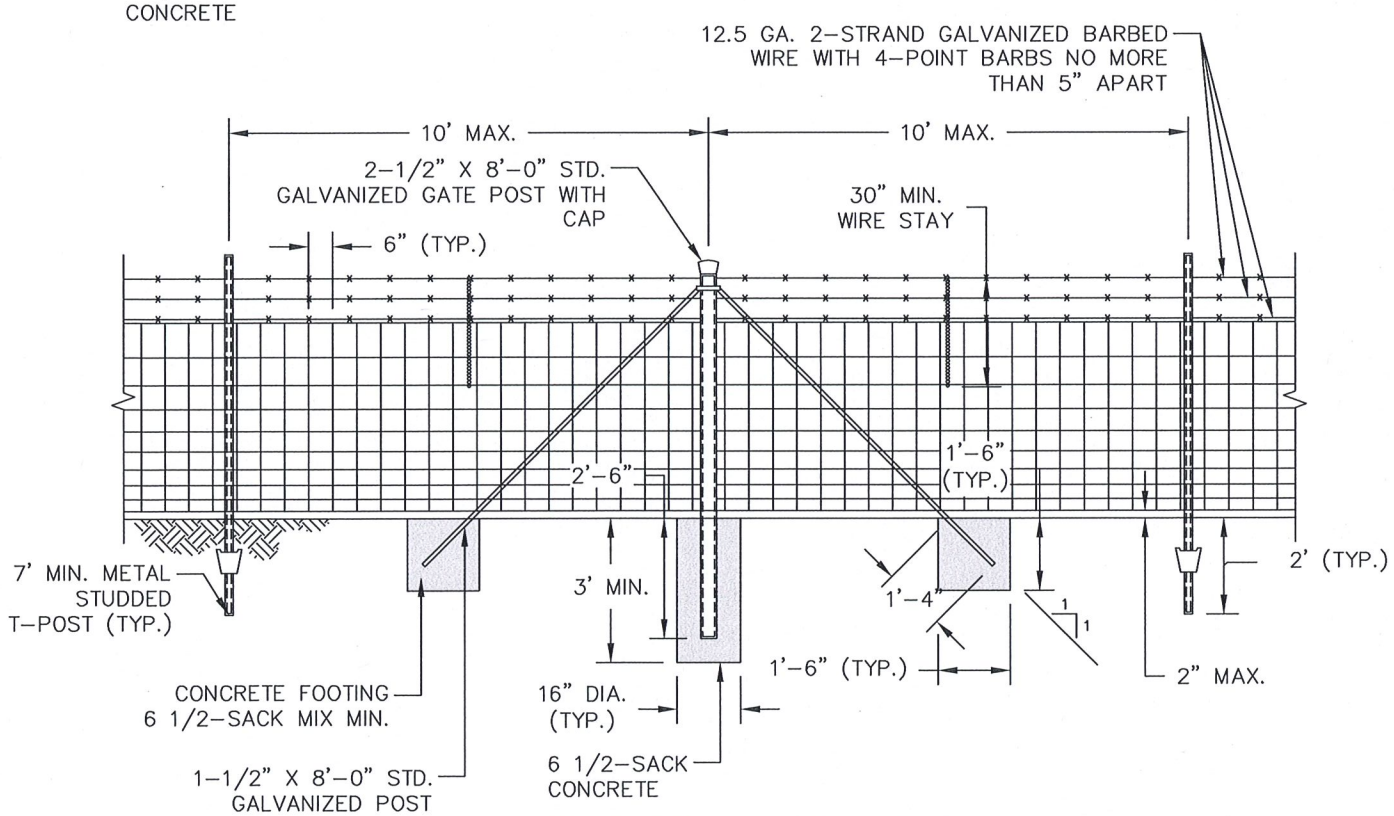
NOTES:

1. ALL BOARD GUIDES SHALL BE 1/4 INCH THICK, 2–1/2 INCH X 2–1/2 INCH GALVANIZED STEEL. ALL DIMENSIONS SHALL BE FROM THE INSIDE OF THE SLOT, USE 1/4 INCH THICK, 3–1/2 INCH X 3–1/2 INCH FOR LARGER CANALS, UNLESS OTHERWISE SPECIFIED, SEE NOTE 4.
2. BOARD GUIDES SHALL BE RECESSED AND PLACED FLUSH WITH CONCRETE WALL FACES, AS SHOWN ON THE PLANS OR AS DIRECTED BY FID'S ENGINEER.
3. THIS DETAIL INTENTIONALLY DOES NOT SPECIFY CONCRETE THICKNESS OR REINFORCEMENT SIZE, WHICH SHALL BE DESIGNED SEPARATELY.
4. LARGER CANAL/PIPELINE SYSTEMS MAY REQUIRE LARGER SIZE BOARD GUIDES AS DETERMINED BY FID'S ENGINEER.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	BOARD GUIDES	
"Your Most Valuable Resource – Water"	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 5–10 SHEET 1 OF 1

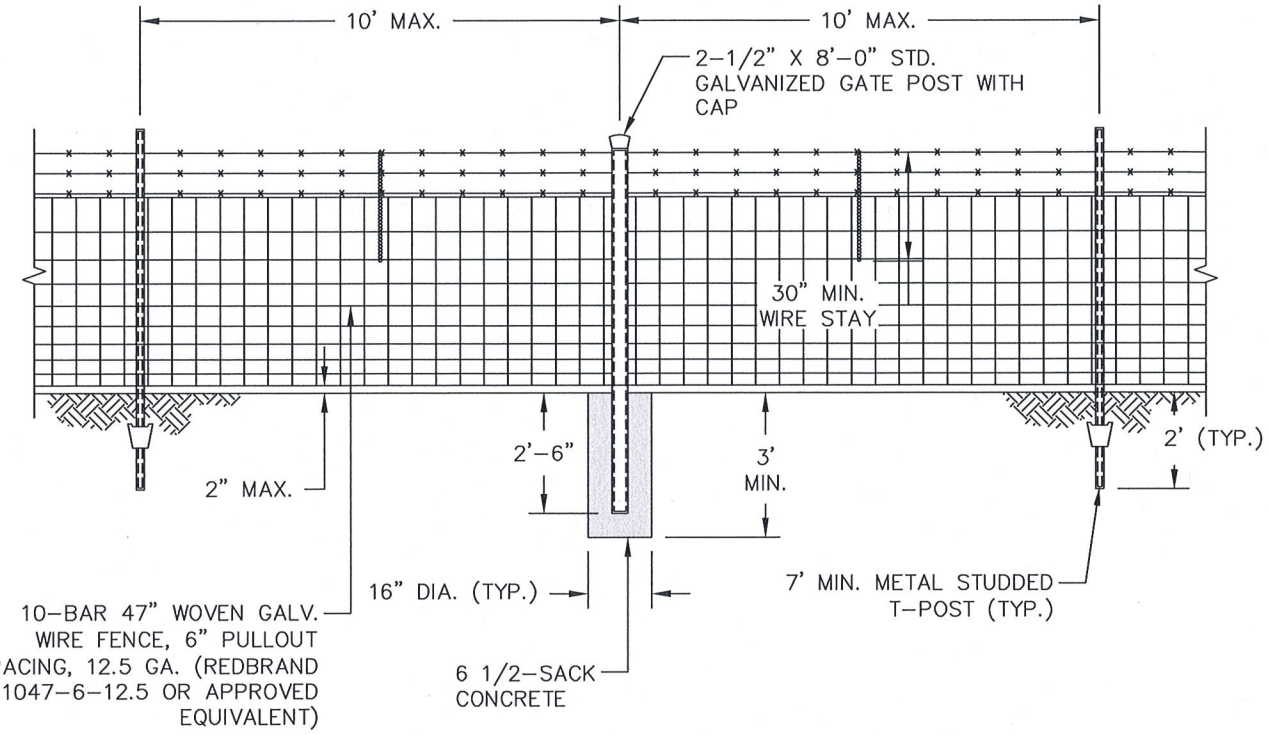


WIRE FENCE DETAIL



WIRE FENCE PULL POST

FRESNO IRRIGATION DISTRICT		FENCE – RURAL	
"Your Most Valuable Resource – Water"		SCALE: NOT TO SCALE	STANDARD DETAIL 6–01
		DATE: JANUARY 2018	SHEET 1 OF 2

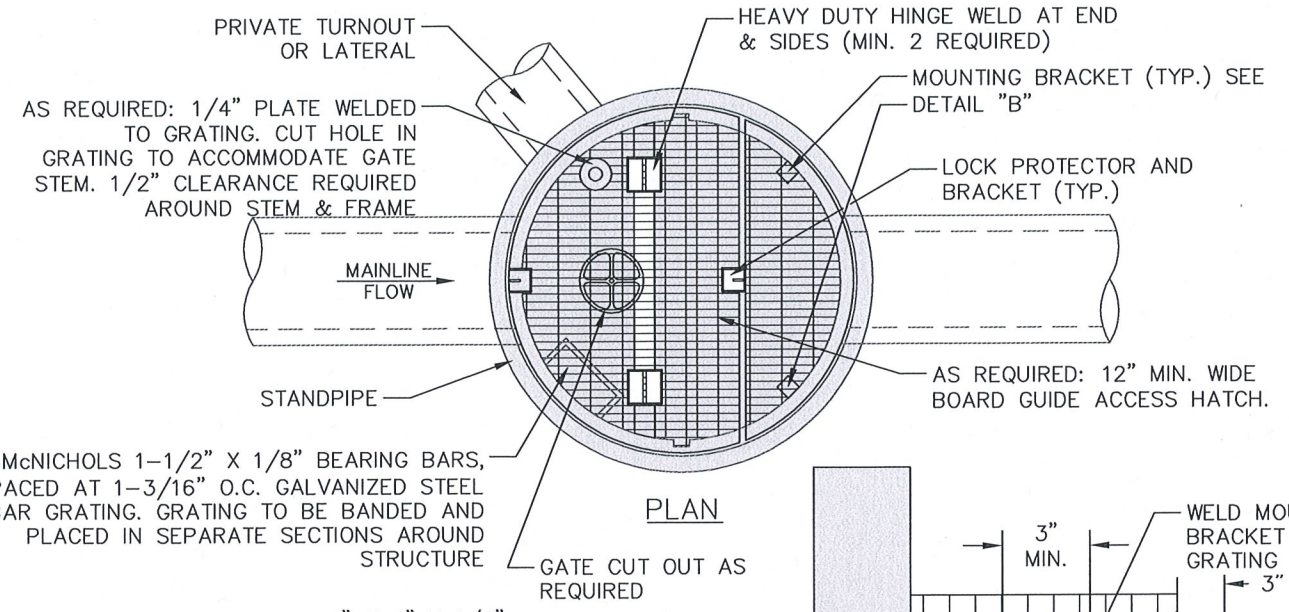


INTERMEDIATE SUPPORT POST

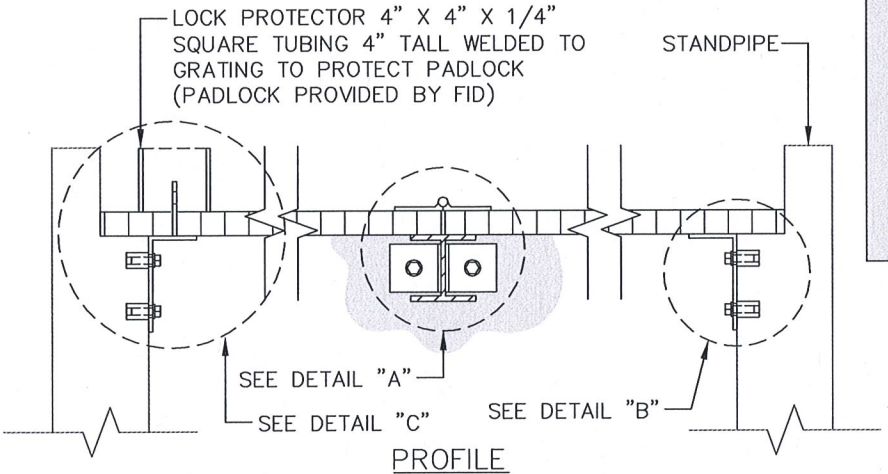
NOTES:

1. FIELD FENCING TO BE PLACED ALONG ALL EXTERIOR PROPERTY LINES.
2. PLACE ALL FENCING AS SPECIFIED IN PLANS.
3. PULL POSTS SHALL BE PLACED AT 500 FEET MAX SPACING.
4. INTERMEDIATE SUPPORT POSTS SHALL BE PLACED AT 100 FEET MAX SPACING.
5. ALL PIPE DIAMETERS SHOWN ARE IRON PIPE SIZES-STANDARD WEIGHT.
6. FENCE POSTS ON CURVES SHALL BE BRACED AS RECOMMENDED BY THE MANUFACTURER.
7. ALL SINGLE DRIVE GATES SHALL BE EQUIPPED WITH GATE FASTENERS SUITABLE FOR LOCKING WITH PADLOCK.
8. CORNER AND END POSTS SHALL BE BRACED IN THE DIRECTION OF PULL.
9. ALTERNATE DETAILS MAY BE SUBMITTED FOR APPROVAL.
10. INCLUDE GATE STOPS ON ALL GATE INSTALLATIONS.
11. FENCE LINES TO BE LOCATED 6 INCHES WITHIN FID PROPERTY LINES.
12. CONCRETE SHALL BE A MINIMUM OF 6-1/2 SACK (611 POUNDS OF PORTLAND CEMENT PER CUBIC YARD) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3,500 PSI, WATER-CEMENT RATIO OF 0.45 (BY WEIGHT), AIR ENTRAINMENT OF 4% ± 1% AND 4 INCH SLUMP AT PLACEMENT.
13. T-POST FASTENERS AND POST TIES AS REQUIRED ON ALL FENCING.

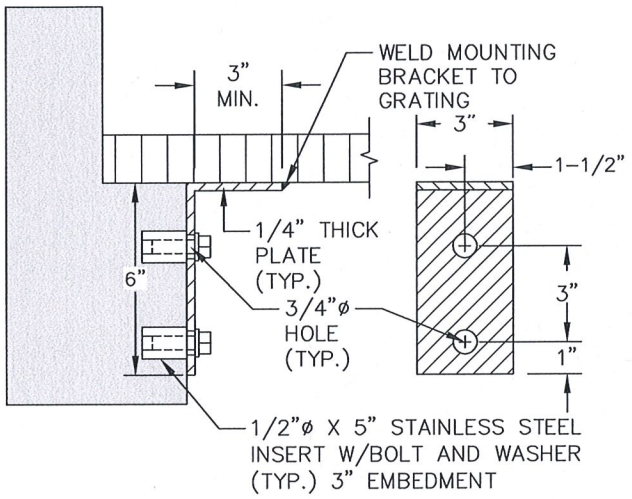
FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	FENCE – RURAL NOTES	
"Your Most Valuable Resource – Water"	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 6-01



PLAN

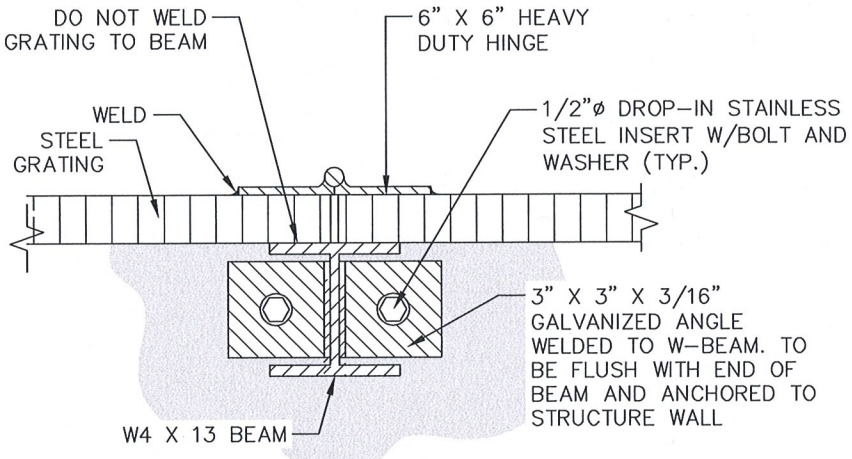


PROFILE

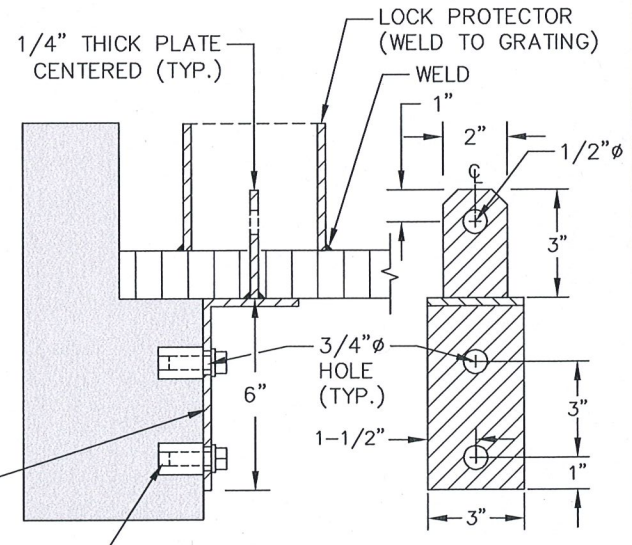


SIDE VIEW FRONT VIEW

DETAIL "B" – MOUNTING BRACKET



DETAIL "A" – SUPPORT BEAM



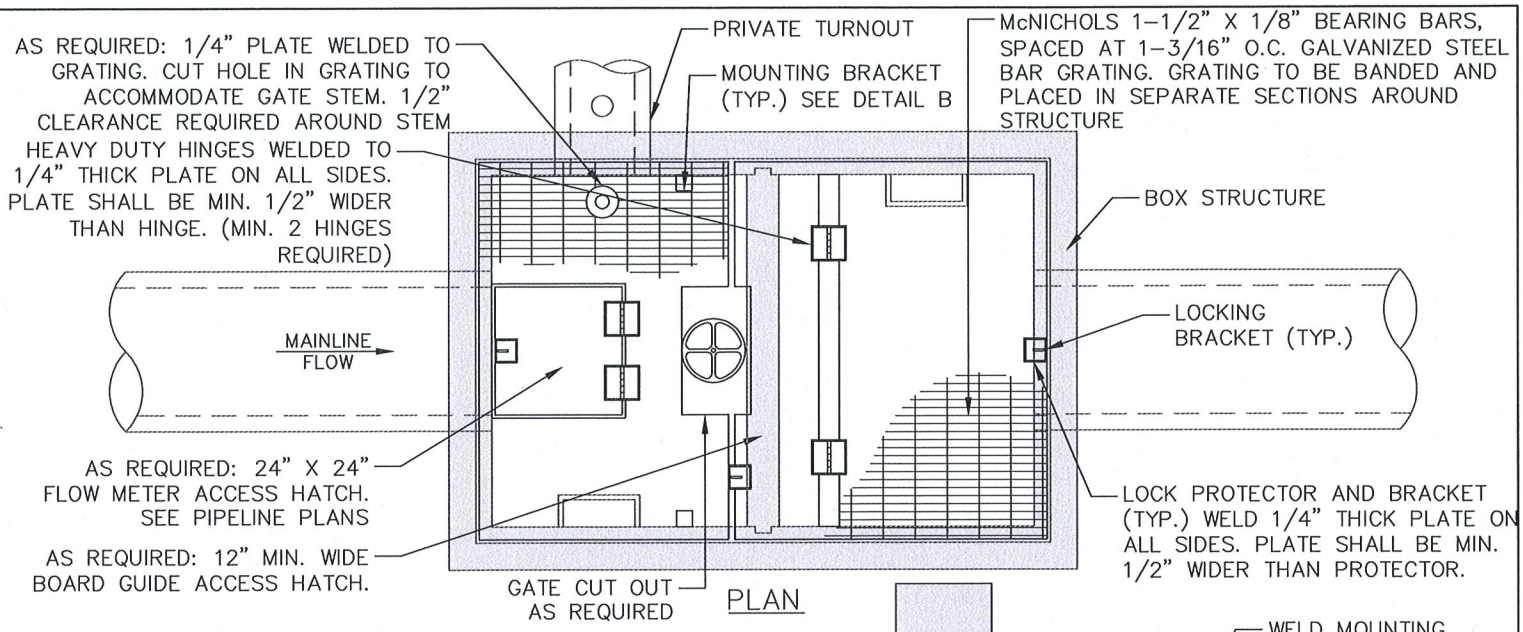
SIDE VIEW FRONT VIEW

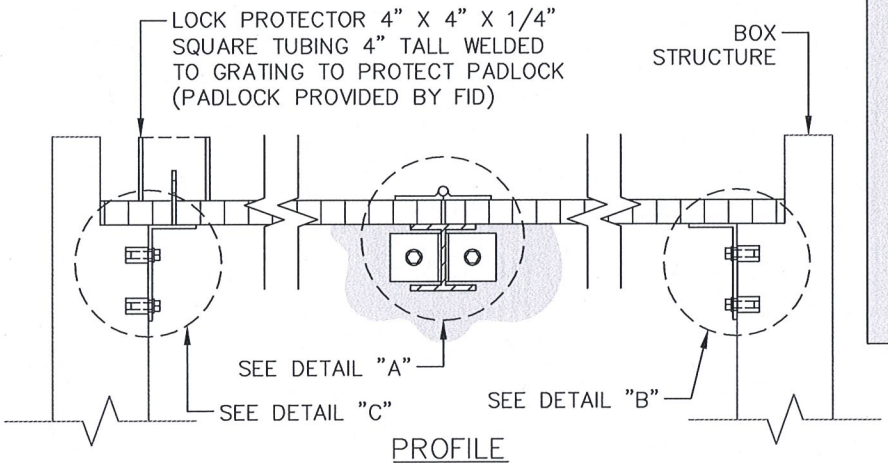
DETAIL "C" – LOCKING BRACKET

NOTES:

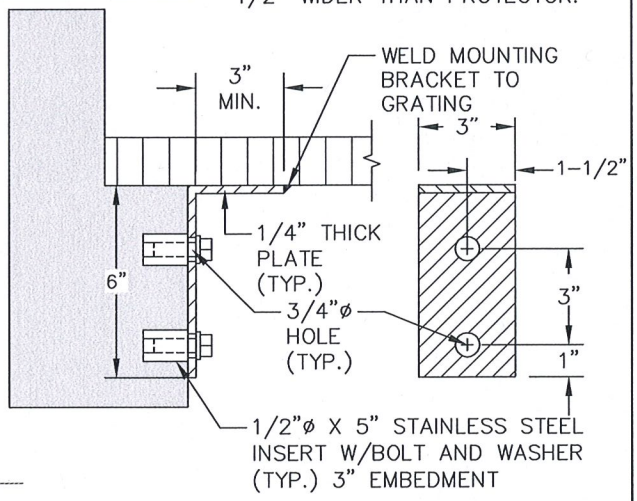
1. ALL STEEL SHALL BE GALVANIZED UNLESS OTHERWISE DIRECTED.
2. DETAIL PROVIDED IS FOR SCHEMATIC PURPOSES ONLY. CONTRACTOR SHALL FABRICATE METAL COVER BASED ON FIELD DIMENSIONS.

FRESNO IRRIGATION DISTRICT		HEAVY DUTY COVER – STANDPIPE
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 6-02 SHEET 1 OF 1



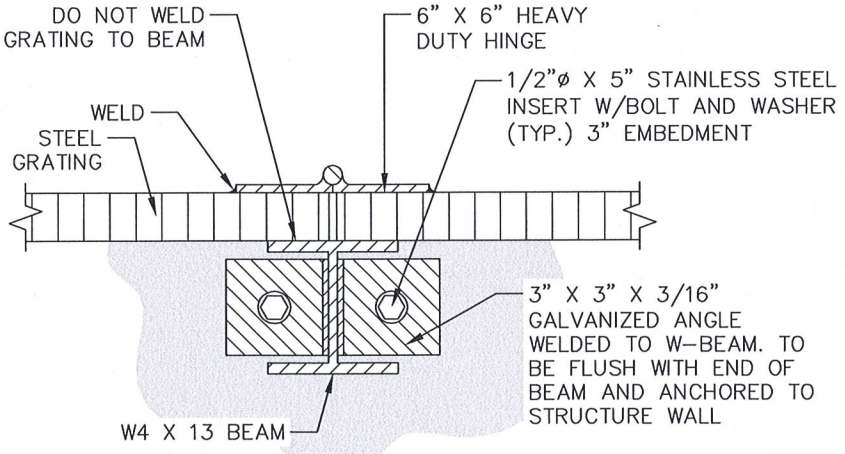


PROFILE

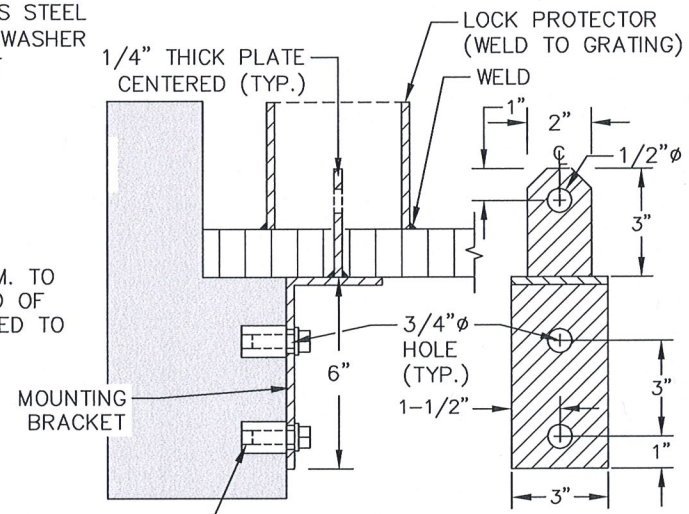


SIDE VIEW FRONT VIEW

DETAIL "B" – MOUNTING BRACKET



DETAIL "A" – SUPPORT BEAM



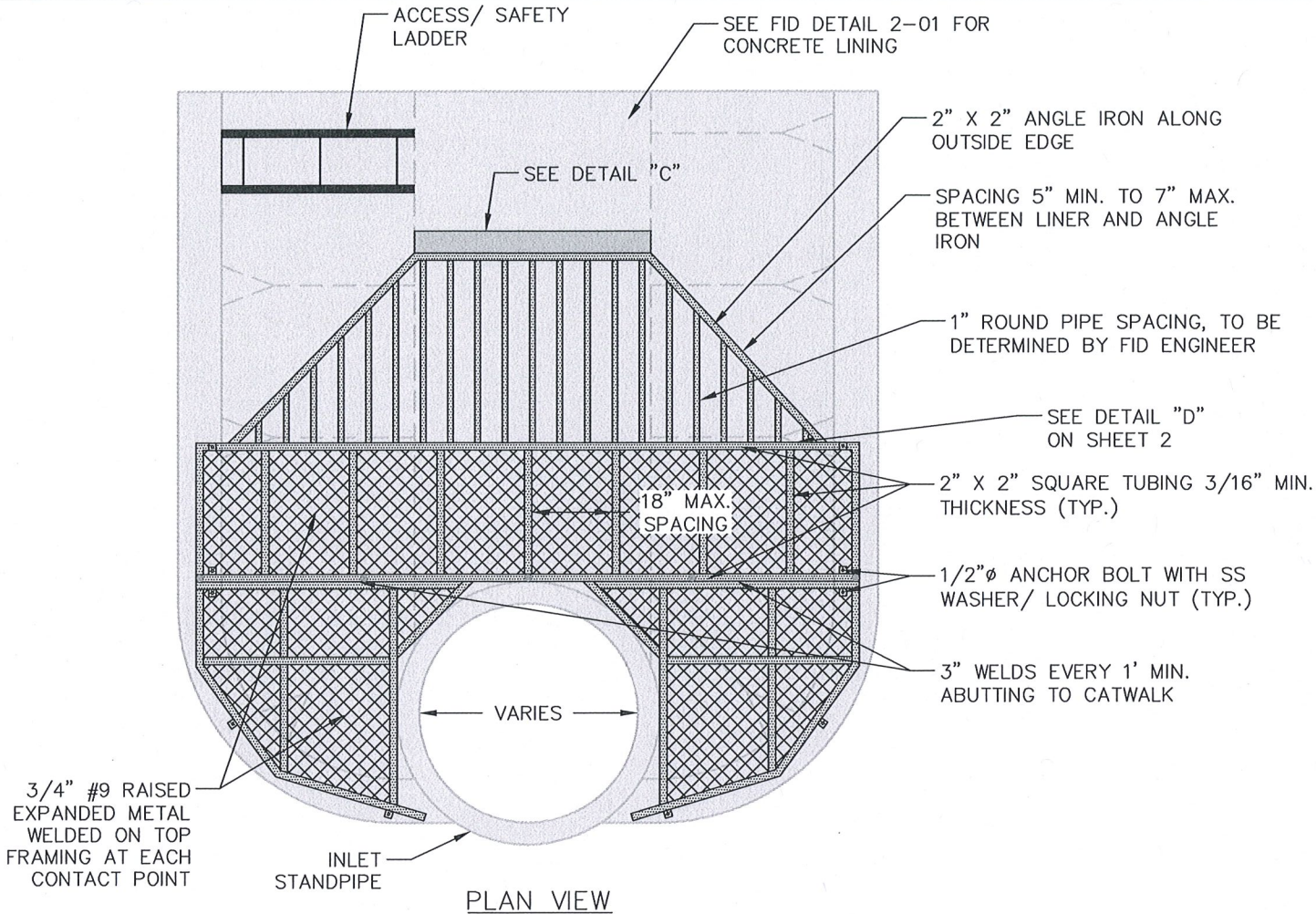
SIDE VIEW FRONT VIEW

DETAIL "C" – LOCKING BRACKET

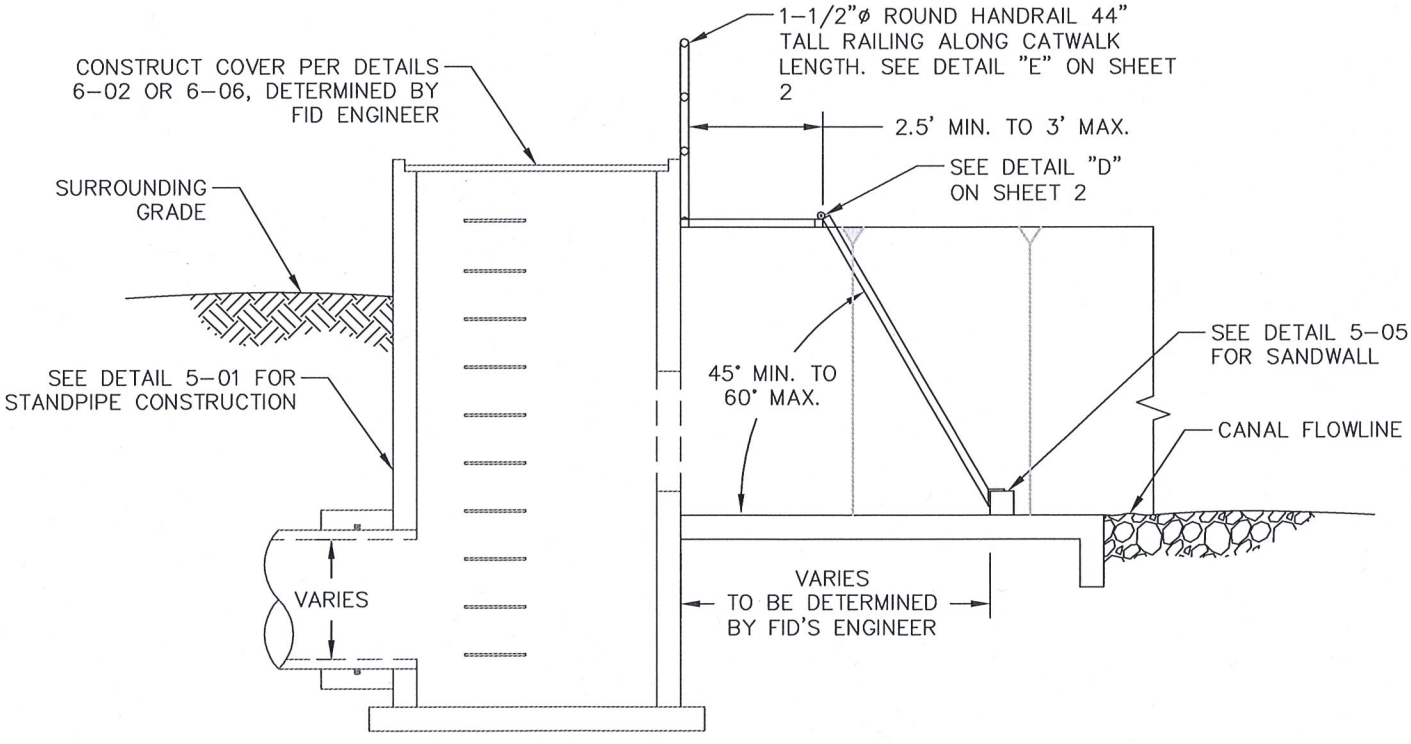
NOTES:

1. ALL STEEL SHALL BE HOT DIPPED GALVANIZED UNLESS OTHERWISE DIRECTED.
2. DETAIL PROVIDED IS FOR SCHEMATIC PURPOSES ONLY. CONTRACTOR SHALL FABRICATE COVER BASD ON FIELD CONDITIONS.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	HEAVY DUTY COVER – BOX STRUCTURE
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 6-03 SHEET 1 OF 1

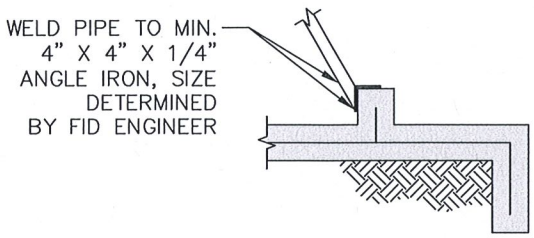


PLAN VIEW

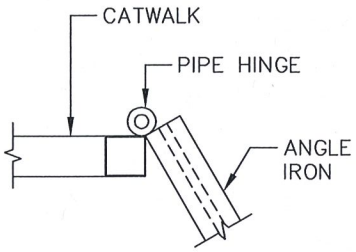


PROFILE VIEW

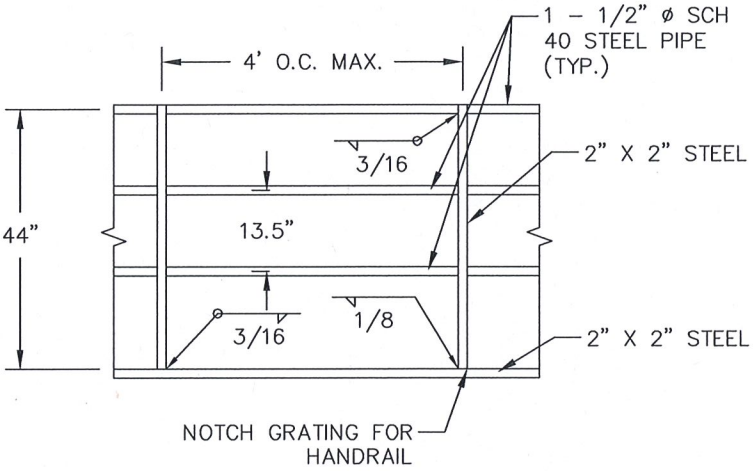
FRESNO IRRIGATION DISTRICT		TRASH RACK – INLET
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 6-04 SHEET 1 OF 2



DETAIL "C"
SANDWALL (INLET ONLY)



DETAIL "D"
(PIPE HINGE FOR RACK & CATWALK CONNECTION)

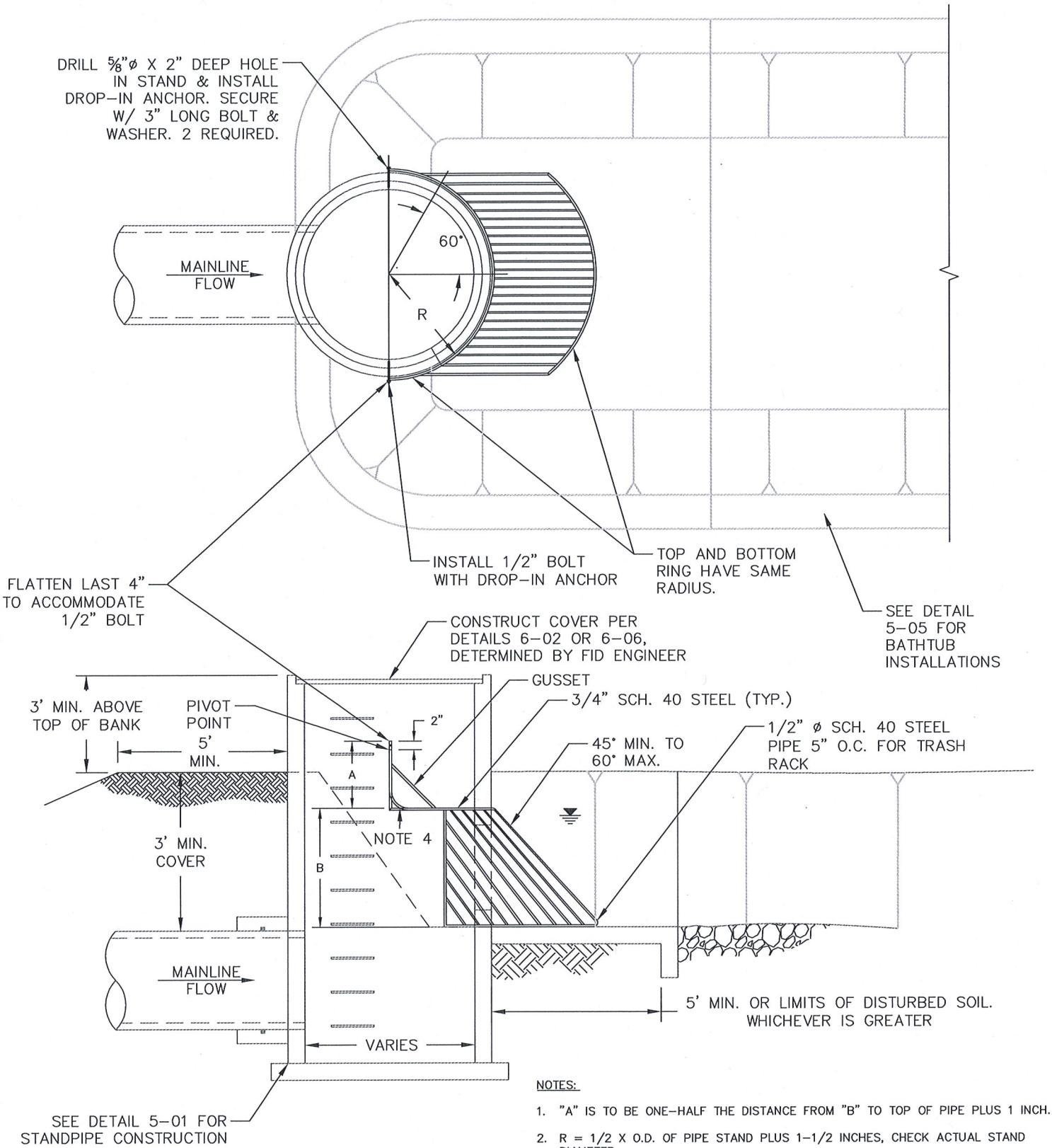


DETAIL "E" HANDRAIL

TRASH RACK NOTES:

1. FOR REFERENCE ONLY. CONTRACTOR SHALL SUBMIT TRASH RACK DESIGN OR SHOP DESIGN TO FID FOR APPROVAL PRIOR TO CONSTRUCTION.
2. ENGINEERING MAY BE REQUIRED BASED ON CANAL SIZE.
3. SPRAY RED OXIDE PRIMER ON ENTIRE CATWALK, TRASH RACK, AND HANDRAIL PRIOR TO INSTALLATION.

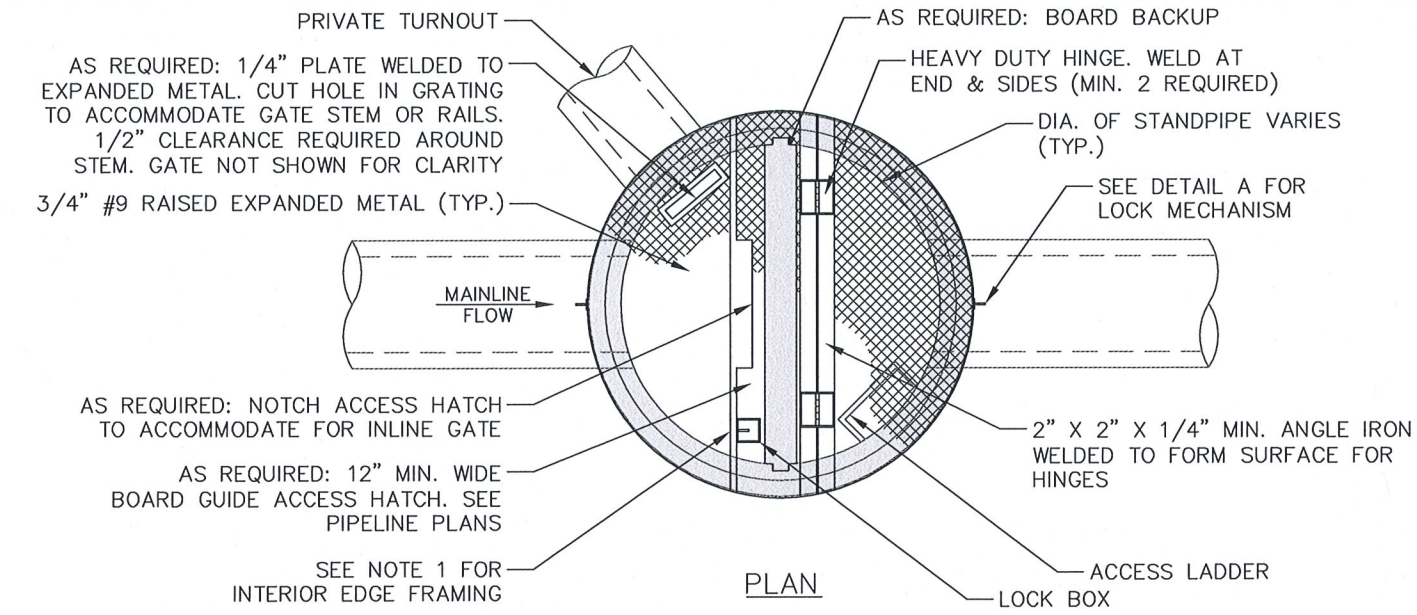
FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	TRASH RACK INLET – NOTES	
	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE	STANDARD DETAIL 6-04
		DATE: JANUARY 2018	SHEET 2 OF 2



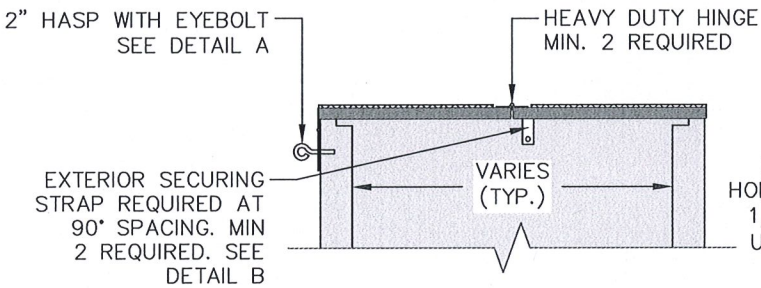
NOTES:

1. "A" IS TO BE ONE-HALF THE DISTANCE FROM "B" TO TOP OF PIPE PLUS 1 INCH.
2. R = 1/2 X O.D. OF PIPE STAND PLUS 1-1/2 INCHES, CHECK ACTUAL STAND DIAMETER.
3. DIMENSIONS ARE CENTER LINE DIMENSIONS.
4. BENDS ARE 6 INCH RADIUS, BUT MAY BE WELDED AT 90°.
5. FOR REFERENCE ONLY. CONTRACTOR SHALL SUBMIT TRASH RACK DESIGN OR SHOP DESIGN TO FID FOR APPROVAL PRIOR TO CONSTRUCTION.
6. SPRAY RED OXIDE ON ENTIRE TRASH RACK PRIOR TO INSTALL.

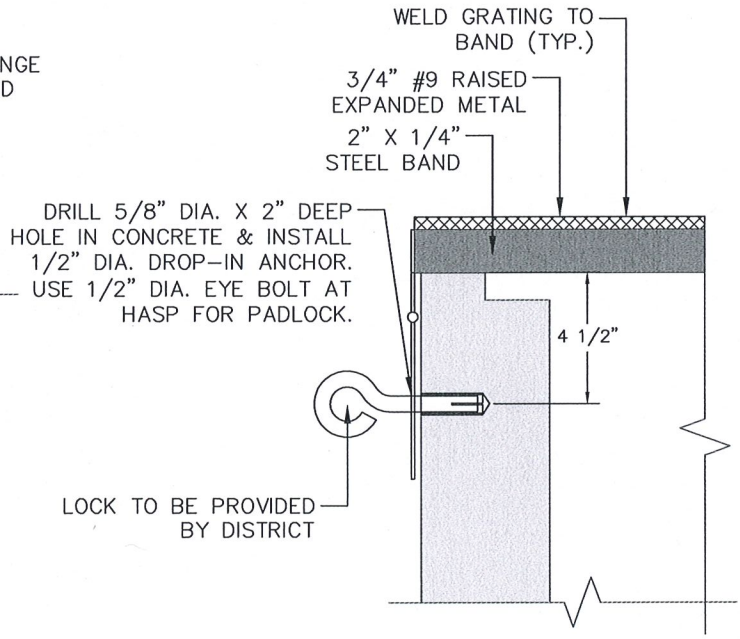
FRESNO IRRIGATION DISTRICT	TRASH RACK – OUTLET	
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 6-05 SHEET 1 OF 1



PLAN



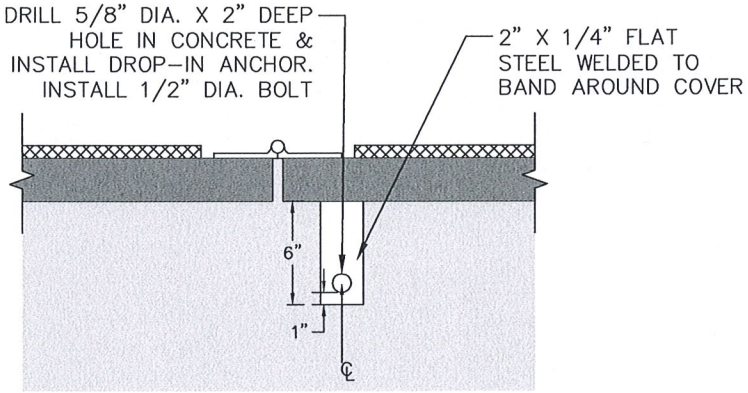
PROFILE



DETAIL A

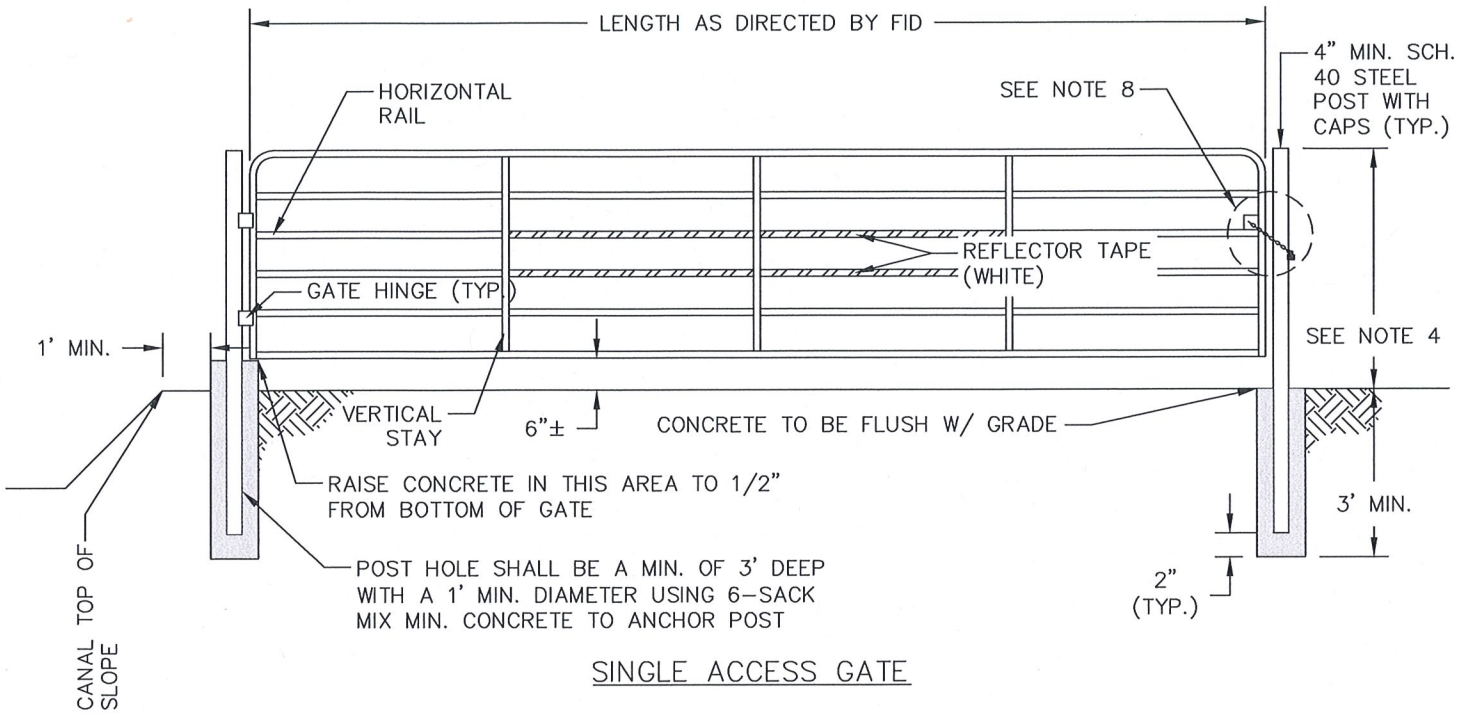
NOTES:

1. ALL INTERIOR EDGES SHALL BE FRAMED WITH 2 INCH X 2 INCH X 1/4 INCH ANGLE IRON.
2. CLEARANCE BETWEEN OUTSIDE EDGE OF STRUCTURE AND COVER SHALL BE 1/4 INCH MINIMUM TO 1/2 INCH MAX AROUND ALL SIDES.
3. COVER SHALL BE PAINTED ON TOP AND BOTTOM WITH A RUST INHIBITOR RED OXIDE PRIMER AND PRIMER SHALL BE APPLIED BEFORE INSTALLING THE COVER ON THE STRUCTURE.
4. DETAIL PROVIDED IS FOR SCHEMATIC PURPOSES ONLY. CONTRACTOR SHALL FABRICATE TRASH RACK BASED ON FIELD DIMENSIONS.
5. DISTRICT MAY REQUIRE SHOP DRAWINGS AND FID APPROVAL PRIOR TO FABRICATION.
6. TURNOUT/ACCESS STANDS – 48 INCH ø OR LESS SHALL BE A COVER WITHOUT HINGES. STAND COVERS GREATER THAN 48 INCH ø SHALL BE INSTALLED PER THIS DETAIL (SEE PLAN) WITH HINGES CENTERED ON OPENING.

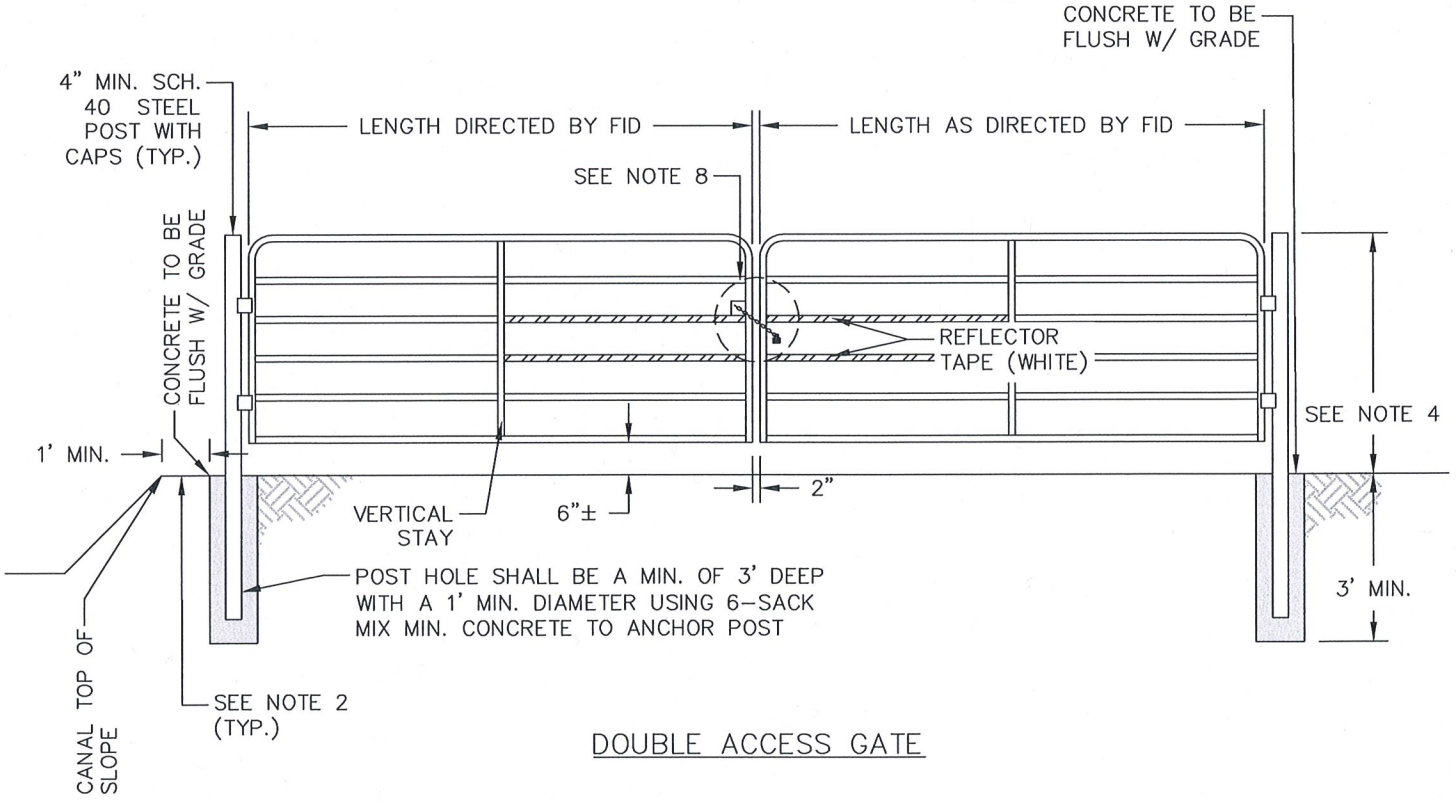


DETAIL B

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	EXPANDED METAL COVER – STANDPIPE
	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018
		STANDARD DETAIL 6-06 SHEET 1 OF 1

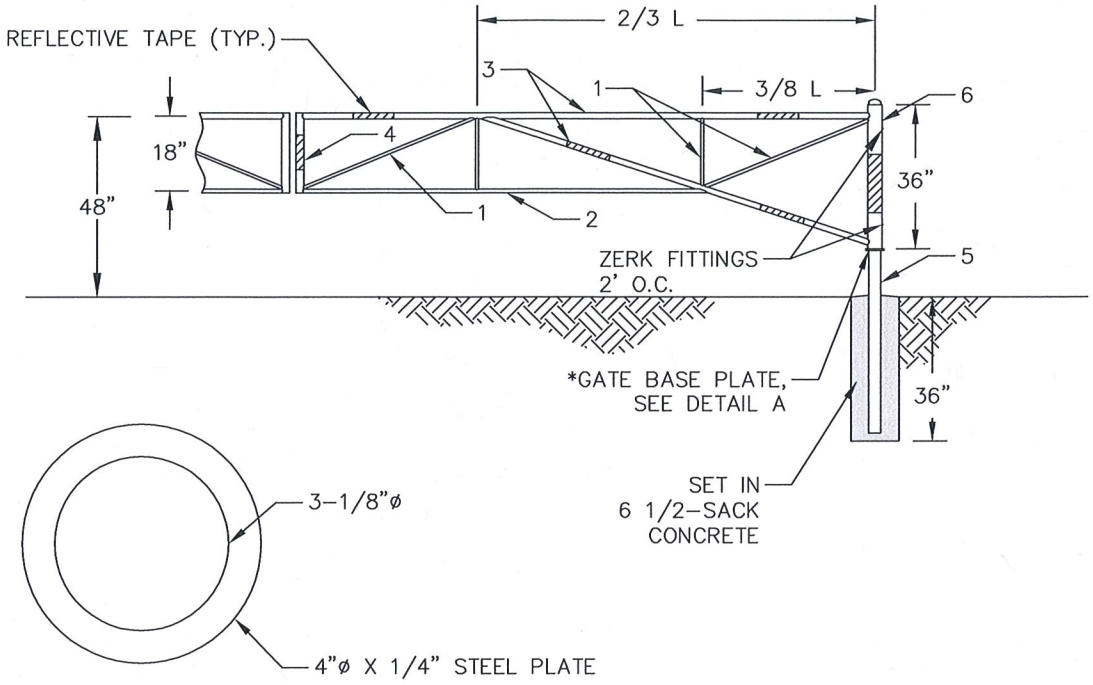


SINGLE ACCESS GATE



DOUBLE ACCESS GATE

FRESNO IRRIGATION DISTRICT		GATE – RURAL
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 6-07 SHEET 1 OF 3



DETAIL "A"

*NOTE: USE .25∠ ALL AROUND TO WELD BASE PLATE, BOTTOM ONLY TO BE PLACED 6" – 12" FROM GRADE

FID PANEL GATE (STEEL PIPE)

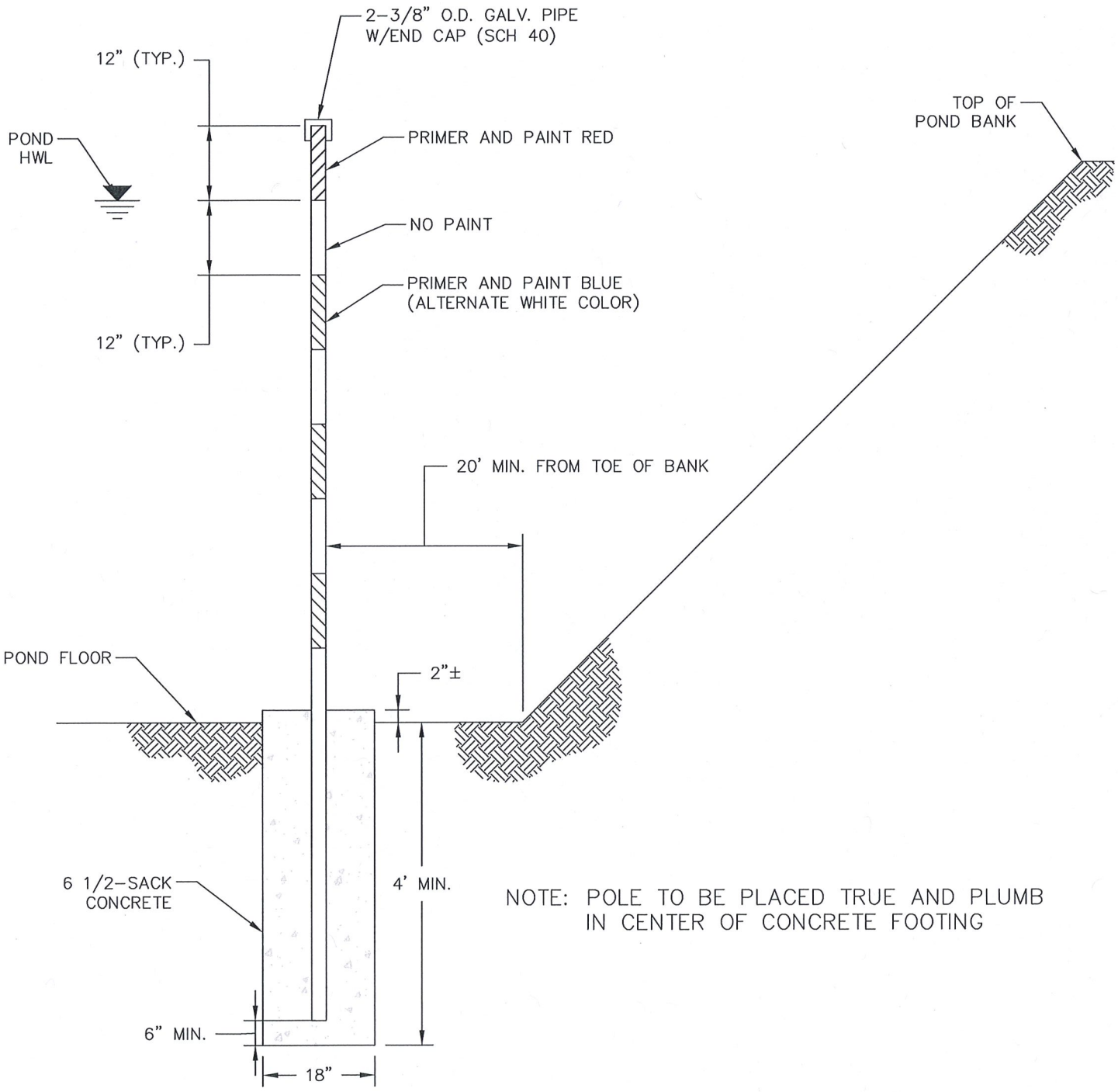
PIPE SCHEDULE (SCHEDULE 40)	
PIPE NO.	DIA.
1	3/4"
2	1"
3	1-1/2"
4	2"
5	3"
6	3-1/2"

FRESNO IRRIGATION DISTRICT		GATE – RURAL PANEL	
"Your Most Valuable Resource – Water"		SCALE: NOT TO SCALE	STANDARD DETAIL 6-07
		DATE: JANUARY 2018	SHEET 2 OF 3

GATE SPECIFICATIONS (RURAL PANEL GATES):

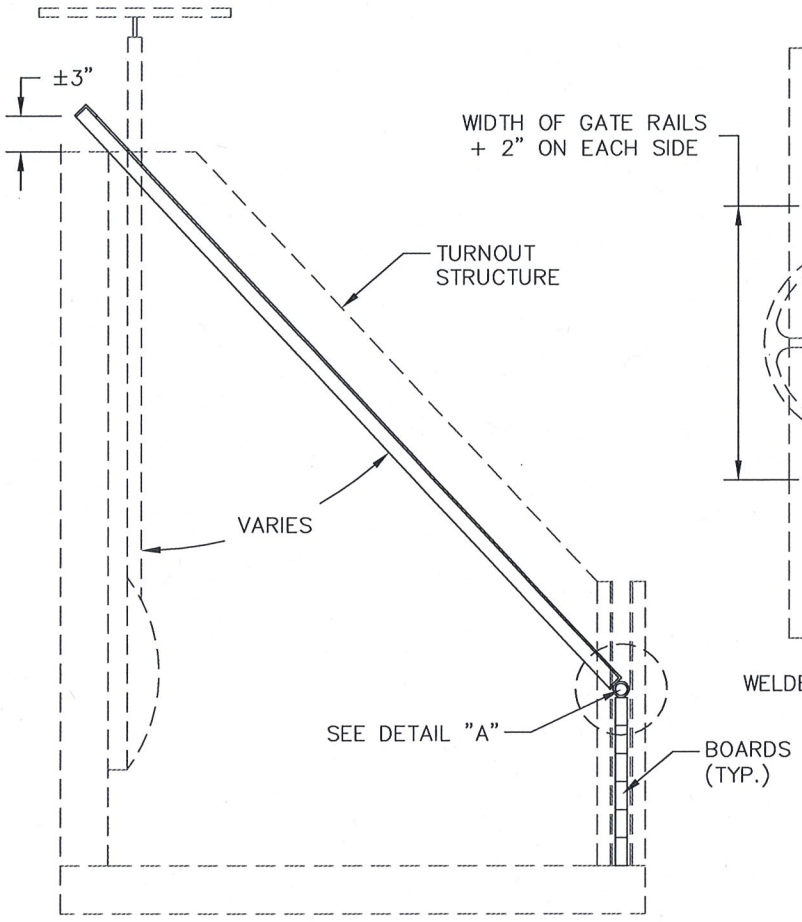
1. STRUCTURE PERMIT AND/OR CONSTRUCTION PERMIT IS REQUIRED FOR ALL GATE INSTALLATIONS.
2. LOCATION TO BE VERIFIED WITH FID INSPECTOR PRIOR TO INSTALLATION.
3. INSTALLED GATE SHALL BE MANUFACTURED BY POWDER RIVER OR APPROVED EQUIVALENT.
4. GATE HEIGHT – 50 INCH MINIMUM.
   GATE WIDTH – AS SPECIFIED IN PLANS OR AS DIRECTED BY FID.
5. GATE FRAME SHALL BE MADE FROM 1.66 INCH O.D. TUBE, OR LARGER TUBULAR STEEL.
6. GATE SHALL HAVE A MINIMUM OF 5 HORIZONTAL RAILS EVENLY SPACED.
7. GATE SHALL HAVE A MINIMUM OF 2 METAL HINGES.
8. GATE SHALL BE SECURED BY A CHAIN (FURNISHED BY THE LANDOWNER) AND PADLOCK (FURNISHED BY THE DISTRICT). AT THE LANDOWNER'S OPTION, ADDITIONAL LOCKS CAN BE INTERLOCKED WITH DISTRICT FURNISHED PADLOCK.
9. VERTICAL STAYS SHALL BE EVENLY SPACED.
10. GATE POSTS WILL BE PAINTED WITH 1 COAT RUSTOLEUM PRIMER AND 2 COATS EXTERIOR RUSTOLEUM (COLOR TO MATCH GATE) OR APPROVED EQUIVALENT. INSTALL OUTRIGGERS AS NECESSARY TO PREVENT 2 WHEEL BYPASS TRAFFIC ON SLOPES.
11. ALL WEEP HOLES SHALL BE FILLED WITH SPRAY FOAM TO PREVENT INSECT INFESTATION.
12. LANDOWNER IS RESPONSIBLE TO MAINTAIN GATE.
13. REFLECTIVE TAPE REQUIRED ON ALL GATES.
14. THESE ARE GUIDELINES ONLY, FINAL DESIGN TO BE PROVIDED BY CONTRACTOR.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	GATE – RURAL PANEL NOTES	
"Your Most Valuable Resource – Water"	"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 6-07 SHEET 3 OF 3

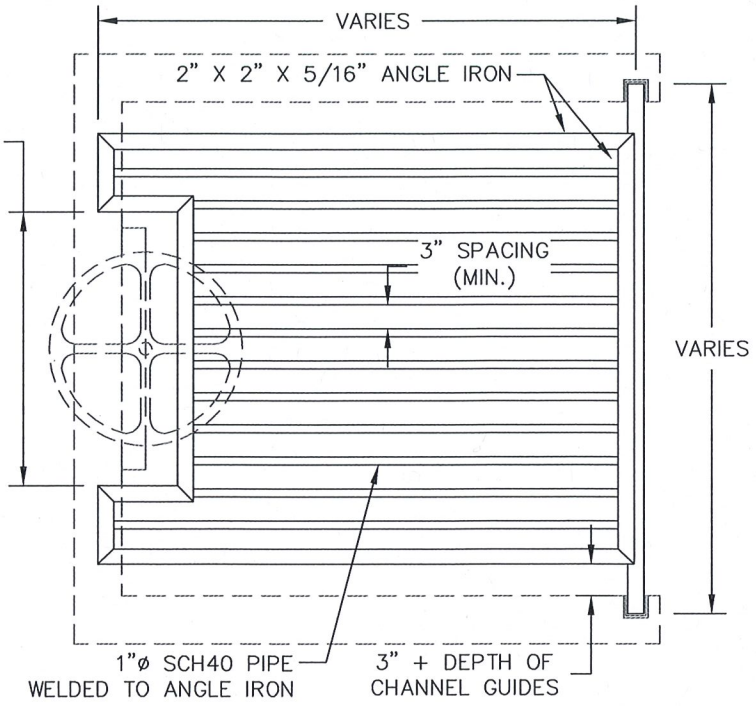


NOTE: POLE TO BE PLACED TRUE AND PLUMB IN CENTER OF CONCRETE FOOTING

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	POND MEASURING POLE
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 6-08 SHEET 1 OF 1



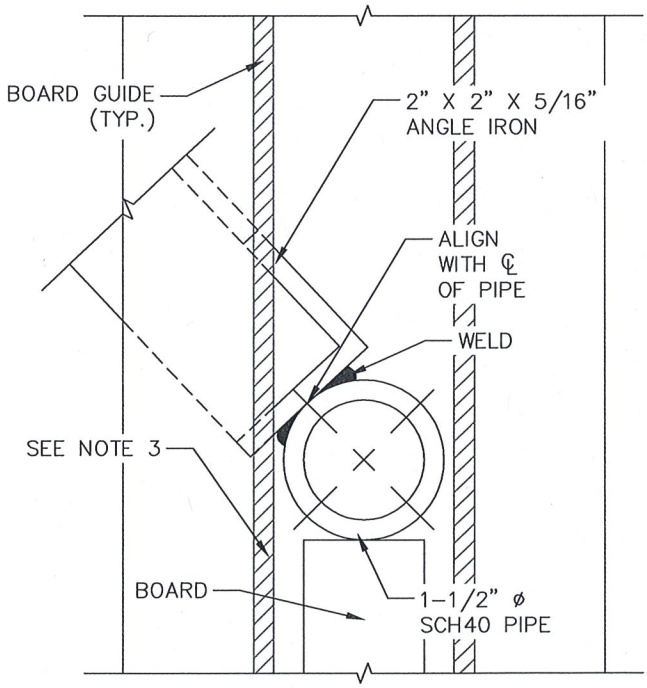
SIDE VIEW



TOP VIEW

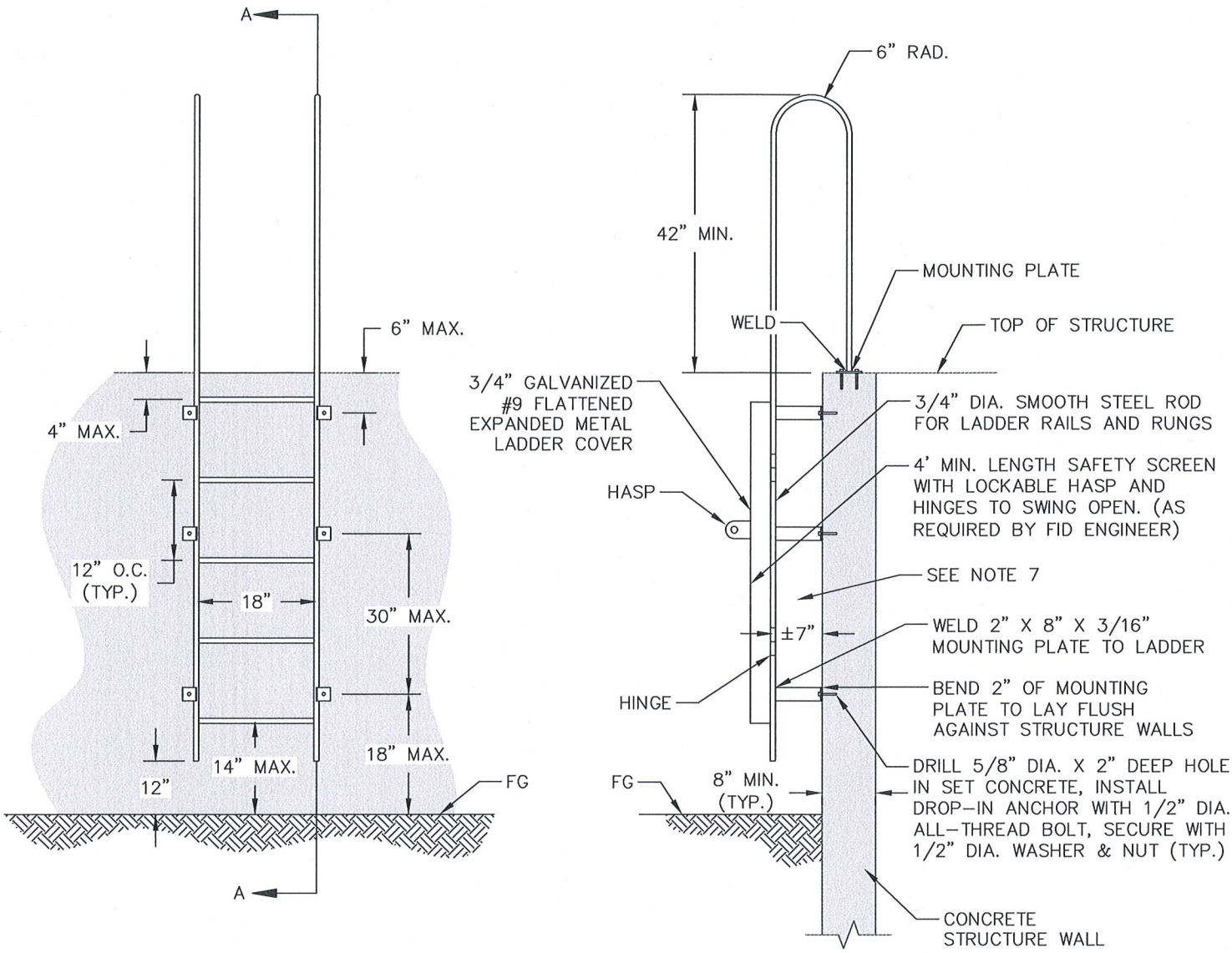
NOTES:

1. UNLESS OTHERWISE NOTES, ALL METAL SHALL BE HOT-DIPPED GALVANIZED.
2. ANY CHANGES OR DEVIATIONS REQUIRED BY FIELD CONDITIONS SHALL BE APPROVED BY FID INSPECTOR.
3. DISTRICT MAY REQUIRE CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.
4. 2.5 INCH X 2.5 INCH X 1/4 INCH BOARD GUIDES. SEE DETAIL 5-10.
5. ALL METALWORK SHALL BE WELDED.
6. DETAIL PROVIDED IS FOR SCHEMATIC PURPOSES ONLY. CONTRACTOR SHALL FABRICATE TRASH RACK BASED ON FIELD DIMENSIONS.



DETAIL "A"

FRESNO IRRIGATION DISTRICT		TRASH RACK – TURNOUT
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 6-09 SHEET 1 OF 1

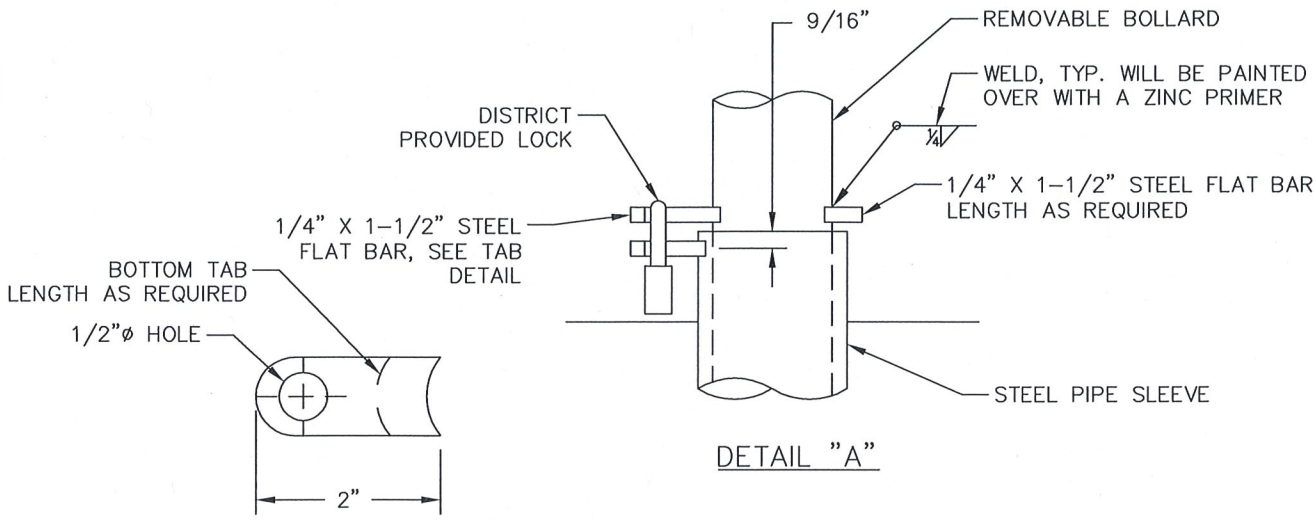


SECTION A–A

NOTES:

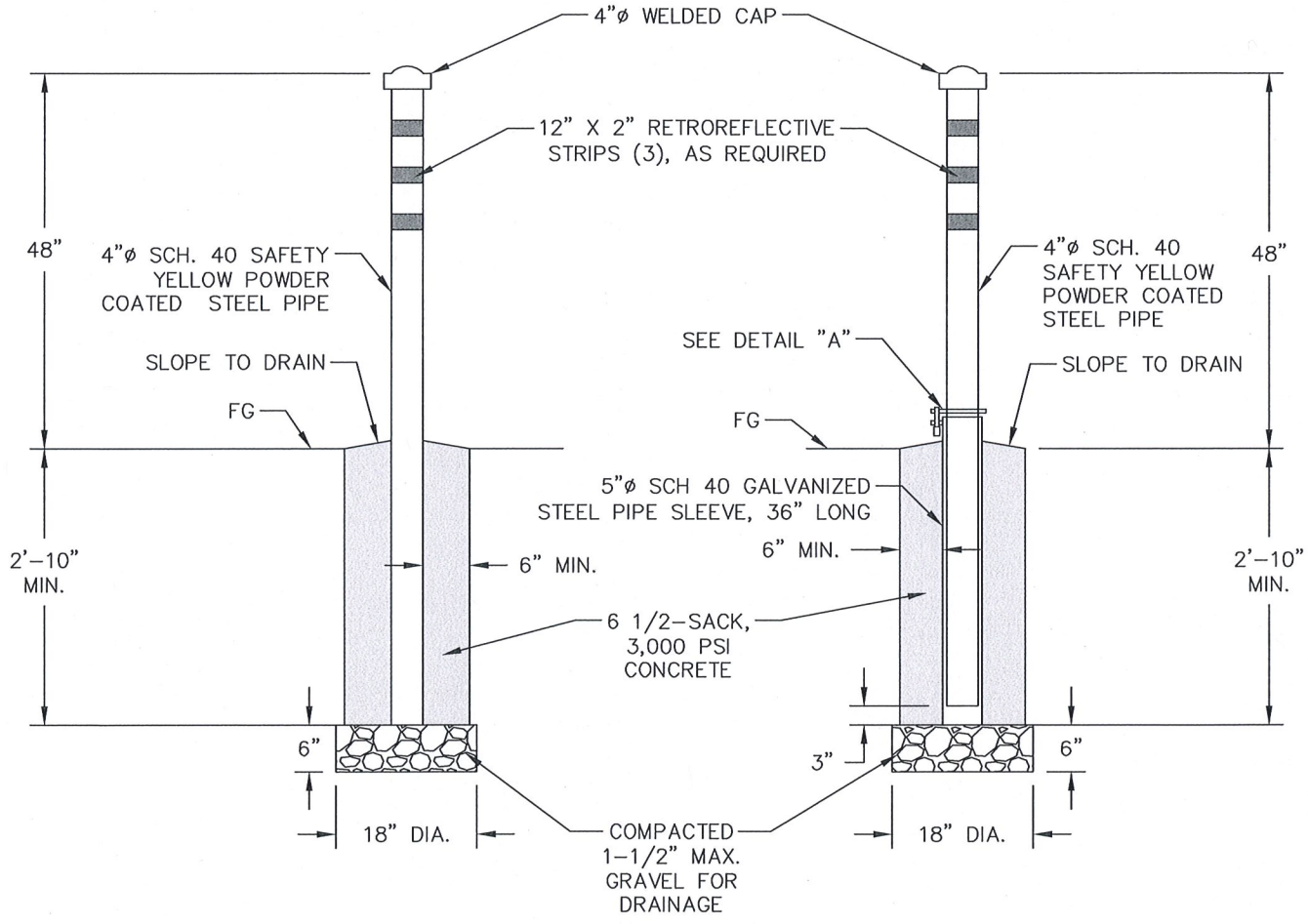
1. LADDER SHALL BE GALVANIZED AND ALL HARDWARE SHALL BE STAINLESS STEEL. LADDER COVER SHALL BE 3/4 INCH #9 FLATTENED EXPANDED METAL.
2. INSTALL HASP FOR LOCK ON SAFETY LADDER COVER.
3. ANY CHANGES OR DEVIATIONS REQUIRED BY FIELD CONDITIONS SHALL BE APPROVED BY FID INSPECTOR.
4. LADDER MUST CONFORM TO ALL CAL OSHA STANDARDS.
5. LADDER SHALL BE REQUIRED FOR STRUCTURES GREATER THAN OR EQUAL TO 5 FEET IN HEIGHT.
6. LADDER COVER SHALL BE TO TOP OF STAND OR MAXIMUM 10 FEET FROM GRADE, BOTTOM OF COVER SHALL BE AT BOTTOM LADDER RUNG.
7. COVER SIDE GAP WITH 3/4 INCH GALV. #9 FLATTENED EXPANDED METAL.

FRESNO IRRIGATION DISTRICT	FRESNO IRRIGATION DISTRICT	LADDER AND COVER CONCRETE STRUCTURES
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE	STANDARD DETAIL 6–10
	DATE: JANUARY 2018	SHEET 1 OF 1



DETAIL "A"

TAB DETAIL



FIXED BOLLARD

REMOVABLE BOLLARD

FRESNO IRRIGATION DISTRICT		BOLLARD
"Your Most Valuable Resource – Water"	SCALE: NOT TO SCALE DATE: JANUARY 2018	STANDARD DETAIL 6-11 SHEET 1 OF 1