

Intakes, Roads, and Shafts Summary Tables

This appendix provides additional details for intake facilities, road modifications, and shaft sites under each alternative to supplement the higher-level information provided in Chapter 3, *Description of the Proposed Project and Alternatives*.

The information in these tables is derived from the engineering project reports for the central, eastern, and Bethany Reservoir alignment alternatives and associated technical memoranda (Delta Conveyance Design and Construction Authority 2022a, 2022b). Information also reflects, where appropriate the engineering project report update (Delta Conveyance Design and Construction Authority 2023a, 2023b).

Tables 3D-2 through 3D-4 show road improvements that would be implemented under the nine project alternatives. Alternatives 2a and 4a, with 7,500 cubic feet per second (cfs) diversion capacity, are the only alternatives that would involve an access road extending from Intake B to Intake A. Alternatives 2b and 4b, with 3,000 cfs capacity using only Intake C, would not require new access roads north of Hood-Franklin Road.

Tables 3D-5 through 3D-7 display the acres needed for launch, reception, and maintenance shaft sites during construction and permanently post-construction. Shaft areas at intakes are included in the overall acreage of each intake shown in Table 3D-1.

1 **Table 3D-1. Summary of Intake Characteristics**

Feature	Intake A Used in Alternatives 2a and 4a	Intake B Used in Alternatives 1, 2a, 2c, 3, 4a, 4c, and 5	Intake C at 3,000 cfs Used in Alternatives 1, 2a, 2b, 3, 4a, 4b, and 5	Intake C at 1,500 cfs Used in Alternatives 2c and 4c
Maximum capacity (cubic feet per second)	1,500 cfs	3,000 cfs	3,000 cfs	1,500 cfs
Size of site during construction (approximately)	166 acres	242 acres	239 acres	220 acres
Size of permanent site postconstruction (approximately)	78 acres	123 acres	109 acres	86 acres
Intake structure length	996 feet along river including training walls 469 feet along river for concrete structure only	1,574 feet along river including training walls 964 feet along river for concrete structure only	1,528 feet along river including training walls 964 feet along river for concrete structure only	1,034 feet along river including training walls 469 feet along river for concrete structure only
Cylindrical tee screen assembly	15 fish screen units	30 fish screen units	30 fish screen units	15 fish screen units
Area of cylindrical tee screen (including fish screen and manifold assembly, and mounted on the face of the structure)	Each unit: 8 feet in diameter and 30 feet long	Each unit: 8 feet in diameter and 30 feet long	Each unit: 8 feet in diameter and 30 feet long	Each unit: 8 feet in diameter and 30 feet long
Sedimentation basin dimensions (basin would be divided into two cells by a turbidity curtain)	Each cell = 1,400 feet long and 395 feet wide at top of the embankment Each cell = 1,088 feet long and 239 feet wide at bottom of the embankment Water surface elevation would vary from about 3 to 27 feet	Each cell = 1,300 feet long and 650 feet wide at top of the embankment Each cell = 990 feet long and 500 feet wide at bottom of the embankment Water surface elevation would vary from about 3 to 27 feet	Each cell = 1,300 feet long and 645 feet wide at top of the embankment Each cell = 990 feet long and 495 feet wide at bottom of the embankment Water surface elevation would vary from about 3 to 26 feet	Each cell = 1,050 feet long and 395 feet wide at top of the embankment Each cell = 738 feet long and 239 feet wide at bottom of the embankment Water surface elevation would vary from about 3 to 26 feet
Sediment Basin Radial Gate Flow Control Structure at the junction with the Outlet Structure and Intake Outlet Shaft	Four large radial gates: 15 feet wide and 40 feet tall, each One small radial gate: 15 feet wide and 8 feet tall Top elevation of flow control structure = 31.2 feet	Four large radial gates: 30 feet wide and 40 feet tall, each One small radial gate: 15 feet wide and 8 feet tall	Four large radial gates: 30 feet wide and 40 feet tall, each One small radial gate: 15 feet wide and 8 feet tall	Four large radial gates: 15 feet wide and 40 feet tall, each One small radial gate: 15 feet wide and 8 feet tall

Feature	Intake A Used in Alternatives 2a and 4a	Intake B Used in Alternatives 1, 2a, 2c, 3, 4a, 4c, and 5	Intake C at 3,000 cfs Used in Alternatives 1, 2a, 2b, 3, 4a, 4b, and 5	Intake C at 1,500 cfs Used in Alternatives 2c and 4c
	Bottom elevation of flow control structure = - 8.7 feet	Top elevation of flow control structure = 30.3 feet Bottom elevation of flow control structure = - 8.8 feet	Top elevation of flow control structure = 29.3 feet Bottom elevation of flow control structure = - 9 feet	Top elevation of flow control structure = 29.3 feet Bottom elevation of flow control structure = - 9 feet
Sediment drying lagoons dimensions (four sediment drying lagoons at each intake)	Each approximately 146 feet wide and 175 feet long at the bottom of the embankment Each approximately 15 to 18 feet deep, containing an average of 10 to 12 feet of water when in use	Each approximately 146 feet wide and 350 feet long at the bottom of the embankment Each approximately 15 to 18 feet deep, containing an average of 10 to 12 feet of water when in use	Each approximately 146 feet wide and 350 feet long at the bottom of the embankment Each approximately 15 to 18 feet deep, containing an average of 10 to 12 feet of water when in use	Each approximately 146 feet wide and 175 feet long at the bottom of the embankment Each approximately 15 to 18 feet deep, containing an average of 10 to 12 feet of water when in use
Sediment drying lagoons outlet structure (to convey water from the lagoons to a pump to return any water to the sediment basin)	Each lagoon outlet structure = approximately 15 feet wide by 15 feet tall Top elevation at the top of lagoon embankment Bottom elevation 20 to 25 feet below top elevation	Same as Intake A	Same as Intake A	Same as Intake A
Intake outlet channel from flow control structure to intake outlet shaft	Top and inside of embankment: 750 feet long and 300 feet wide for all intakes Bottom and inside of embankment = 750 feet long and 75 feet wide	Bottom and inside of embankment = 750 feet long and 146 feet wide	Bottom and inside of embankment = 750 feet long and 146 feet wide	Bottom and inside of embankment = 750 feet long and 75 feet wide
Length of temporary SR 160 levee	3,500 feet along the centerline	4,250 feet along the centerline	4,200 feet along the centerline	3,500 feet along the centerline
Length of permanent levee	7,000 feet along the centerline	7,600 feet along the centerline	6,200 feet along the centerline	5,900 feet along the centerline
Top elevation of permanent levee	31.2 feet (16 to 26 feet above toe of temporary levee fill)	30.3 feet (20 to 23 feet above toe of temporary levee fill)	29.3 feet (20 to 23 feet above toe of temporary levee fill)	29.3 feet (18 to 25 feet above toe of temporary levee fill)

Feature	Intake A Used in Alternatives 2a and 4a	Intake B Used in Alternatives 1, 2a, 2c, 3, 4a, 4c, and 5	Intake C at 3,000 cfs Used in Alternatives 1, 2a, 2b, 3, 4a, 4b, and 5	Intake C at 1,500 cfs Used in Alternatives 2c and 4c
Ground improvement under the levees and facilities embankments	Approximately 1.5 to 2.0 million cubic yards of deep mechanically mixed (DMM) wall sections and approximately 250,000 to 350,000 tons of cement	Same as Intake A	Same as Intake A	Same as Intake A
Cofferdam	Length = 1,751 feet (including cofferdam and DMM wall) Elevation at the top of cofferdam = about 25 feet	Length = 2,942 feet (including sheet piles and DMM wall) Elevation at the top of cofferdam = about 25 feet	Length = 2,897 feet (including sheet piles and DMM wall) Elevation at the top of cofferdam = about 25 feet	Length = 1,789 feet (including sheet piles and DMM wall) Elevation at the top of cofferdam = about 25 feet
Cofferdam impact pile driving duration (total hours) (vibratory pile driving hours not included)	9 hours	15 hours	14 hours	10 hours
Onsite electrical substations facilities footprint	Facilities contained within a 75-foot wide by 125-foot-long enclosure with a separate safety and security fence Smaller transformers less than 10 feet wide by 10 feet long would be positioned at several locations around the site	Same as Intake A	Same as Intake A	Same as Intake A
Standby Engine Generator/Fuel Tank – during Construction and Operation Phases	1 megawatt standby engine generator with a 1528 horsepower engine, installed inside a fenced area of about 30 feet by 30 feet at each electrical building, including both the generator and the fuel tank	Same as Intake A	Same as Intake A	Same as Intake A

Feature	Intake A Used in Alternatives 2a and 4a	Intake B Used in Alternatives 1, 2a, 2c, 3, 4a, 4c, and 5	Intake C at 3,000 cfs Used in Alternatives 1, 2a, 2b, 3, 4a, 4b, and 5	Intake C at 1,500 cfs Used in Alternatives 2c and 4c
Appurtenant Structures Dimensions – during Construction Phase	Office trailers, showers/ washrooms, canteen and common area, and bus shelter Most of these buildings would be 15 feet tall or less (one story) Other buildings for warehousing for materials and temporary work enclosures would be less than 20 feet tall	Same as Intake A	Same as Intake A	Same as Intake A
Appurtenant Structures Dimensions – during Operations Phase	One of the construction buildings would be converted for indoor storage of portable equipment and vehicles used for maintenance of all intakes.	Same as Intake A	Same as Intake A	Same as Intake A
Land reclamation	Approximately 88 acres	Approximately 119 acres	Approximately 130 acres	Approximately 134 acres

- 1 Source: Delta Conveyance Design and Construction Authority 2022a, 2022b.
2 cfs = cubic feet per second; DMM = deep mechanically mixed; SR = State Route.

1 **Table 3D-2. Road Improvements under Central Alignment Alternatives**

Purpose	Road	Start and End Locations	Existing Roadway or Condition	Action	Modification
Access to intake haul road along Lambert Road	Franklin Boulevard	Concrete batch plant driveway to Lambert Road	Not applicable	None	None
Access to intake haul road along Lambert Road	Lambert Road	Franklin Road to intake haul road	22 feet wide: two 10-foot paved lanes with 1-foot shoulders	Widen 3.22 miles of paved road No change to Snodgrass Slough Bridge	32 feet wide: two 12-foot paved lanes with 4-foot shoulders
Access to intake haul road along Hood-Franklin Road	Hood-Franklin Road and Bridge over Snodgrass Slough	East of Snodgrass Slough Bridge to intake haul road	32 feet wide: two lanes with six bridge spans	Widen 180 feet of bridge and roadway on either side of bridge	54 feet wide: add two paved turn lanes onto Intake Haul Road
Access to intake haul road along Hood-Franklin Road	Hood-Franklin Road	East of I-5 to intake haul road	Not applicable	Asphalt overlays	None
Access/haul road from Intake B to Intake A (Alternative 2a only)	Intake haul road	Intake B to Intake A	Not applicable	New 2.54-mile paved road to the west of the abandoned railroad embankment and a 350-foot long by 32-foot-wide bridge over a drainage channel	32 feet wide: two 12-foot wide lanes with 4-foot shoulders
New intake haul road and access to Intakes B and C	Intake haul road	Lambert Road to Intake C access road	Not applicable	New 1.85-mile paved road to the west of the abandoned railroad embankment	32 feet wide: two 12-foot paved lanes with 4-foot-wide shoulders
New intake haul road and access to Intakes B and C	Intake haul road	Intake C access road to Hood-Franklin Road	Not applicable	New 1.3-mile paved road to the west of the abandoned railroad embankment	32 feet wide: two 12-foot paved lanes with 4-foot-wide shoulders
New intake haul road and access to Intake B	Intake haul road	Hood-Franklin Road to Intake B access road	Not applicable	New 0.43-mile paved road to the west of the abandoned railroad embankment	32 feet wide: two 12-foot paved lanes with 4-foot-wide shoulders

Purpose	Road	Start and End Locations	Existing Roadway or Condition	Action	Modification
Temporary realignment of portions during intake construction	SR 160	Randall Island Road to Scribner Road	SR 160	Temporary relocation near intakes Asphalt overlays on all sections	Reconstruction following realignment of highway at intakes
Twin Cities Complex road improvements	Dierssen Road	Franklin Boulevard to East side of I-5	18 feet wide: two 9-foot paved lanes without shoulders	Widen 0.9 miles of paved road	32 feet wide: two 12-foot paved lanes with 4-foot-wide shoulders
Twin Cities Complex road improvements	Franklin Boulevard	Twin Cities Road to 0.5 mile north of Dierssen Road	32 feet wide: two 12-foot paved lanes with 4-foot shoulders	Realign and widen 1.02 miles of paved road	40 feet wide: two 12-foot paved lanes with 8-foot-wide shoulders
Twin Cities Complex road improvements	Twin Cities Road	0.15 mile east of Franklin Boulevard to I-5	22 feet wide: two 10-foot paved lanes with 1-foot shoulders	Widen 1 mile of paved road	44 feet wide: three 12-foot paved lanes (including left-turn merge lane) with 4-foot-wide shoulders
Access road to New Hope Tract tunnel maintenance shaft – Central	West Lauffer Road	Vail Road to New Hope Tract tunnel shaft	32 feet wide: two 10-foot dirt lanes with 1-foot shoulders	Widen 0.83 mile of road	32 feet wide: two 12-foot graveled lanes with 4-foot-wide shoulders
Access road to Staten Island tunnel maintenance shaft	Staten Island Road	Walnut Grove Road to Staten Island shaft	22 feet wide: two 10-foot paved lanes with 1-foot shoulders	None	None
Access road to Bouldin Island tunnel reception and launch shaft	SR 12	I-5 to Little Potato Slough Bridge	44 feet wide: two 12-foot paved lanes with 10-foot shoulders with median barrier	Widen 5.29 miles of paved road	64 feet wide: add two 12-foot paved lanes with reduced 8-foot-wide shoulders
Access road to Bouldin Island tunnel reception and launch shaft	SR 12	Little Potato Slough Bridge to Bouldin Island Road (new intersection)	44 feet wide: two 12-foot paved lanes with 10-foot shoulders with median barrier	Widen 2.86 miles of paved road Widen bridge over Farm Road: 77 feet wide x 60 feet long	64 feet wide: add two 12-foot paved lanes with reduced 8-foot-wide shoulders

Purpose	Road	Start and End Locations	Existing Roadway or Condition	Action	Modification
Access road to Bouldin Island tunnel reception and launch shaft	SR 12 Bridge over Little Potato Slough	SR 12 Bridge over Little Potato Slough	48 feet wide bridge: two 12-foot paved lanes with 10-foot shoulders with a median barrier	Widen 2,980-foot moveable bridge (2,670-foot permanent spans and 310-foot moveable swing bridge)	63 feet wide: two 12-foot paved lanes with 8-foot-wide shoulders
New road	Bouldin Island Road (new road)	Bouldin Island Road (new intersection) to Bouldin Island Tunnel Shaft	Agricultural Land	New 1.94-mile paved road New bridge over SR 12: 32 feet wide x 120 feet long; two 12-foot lanes with no shoulders	New interchange at SR 12. 74 feet wide; two 12-foot paved lanes with no shoulders
Access road to Mandeville Island tunnel maintenance shaft and Bacon Island reception shaft ^a	New South Holt Road overpass over BNSF tracks and EBMUD Mokelumne Aqueducts	South Holt Road to West Lower Jones Road	22 feet wide underpass: two 11-foot lanes with no shoulders	Construct a new bridge over railroad track and aqueducts	New bridge: 24 feet wide x 240 feet long; two 12-foot-wide lanes with no shoulders Bridge height: 23 feet 4 inches above top of railroad tracks Overall overpass: 0.24 mile long
Access road to Mandeville Island tunnel maintenance shaft and Bacon Island reception shaft	West Lower Jones Road (gravel)	South Holt Road to West Lower Jones Road (paved)	Dirt road	Upgraded 0.55 mile of road	New road: 32 feet wide: two 12-foot paved lanes with 4-foot shoulders
Access road to Mandeville Island tunnel maintenance shaft and Bacon Island reception shaft	West Lower Jones Road (gravel)	West Lower Jones Road (paved) to Lower Jones Tract New Access Road	Gravel road	Upgraded 5.17 miles of road	32 feet wide: two 12-foot paved lanes, 0.55 mile with no shoulders and 4.62 miles with 4-foot shoulders
Access road to Mandeville Island tunnel maintenance shaft and Bacon Island reception shaft	Lower Jones Tract new access road and across Middle River Bridge	West Lower Jones Road to Bacon Island New Access Road	Gravel road	Upgrade 4.8 miles of road No change to Middle River Bridge	24 feet wide: two 12-foot gravel lanes with no shoulders

Purpose	Road	Start and End Locations	Existing Roadway or Condition	Action	Modification
Access road to Mandeville Island tunnel maintenance shaft and Bacon Island reception shaft	Bacon Island new access road	Bacon Island tunnel shaft access road to New Connection Slough bridge	Agricultural land and dirt road	Upgrade 4.1 miles of road	24 feet wide: two 12-foot gravel lanes with no shoulders
Access road to Mandeville Island tunnel maintenance shaft and Bacon Island reception shaft	New Connection Slough bridge	Bacon Island new access road to Mandeville Island new access road	None	New moveable bridge; removal of existing Connection Slough bridge	New 375-foot-long x 32-foot-wide moveable bridge
Access road to Mandeville Island tunnel maintenance shaft and Bacon Island reception shaft	Mandeville Island New Access Road	New Connection Slough bridge to Mandeville Island shaft	Agricultural land and dirt road	Upgrade 3.2 miles of road	24 feet wide: two 12-foot gravel lanes with no shoulders
Access road to Mandeville Island tunnel maintenance shaft and Bacon Island reception shaft	Bacon Island new access road	Bacon Island new access road to Bacon Island tunnel shaft	Levee Road	Upgrade 0.4 miles of levee road	24 feet wide: two 12-foot gravel lanes with no shoulders
Access road to Southern Complex on Byron Tract	Extension of Discovery Bay Boulevard	SR 4 to Southern Forebay on-site access roads	Agricultural Land and dirt road	New 0.8-mile road	32 feet wide: two 12-foot paved lanes with 4-foot-wide shoulders
Access road to Southern Complex on Byron Tract	Western Farms Ranch Road	Byron Highway to Southern Forebay on-site access roads	Gravel road	Relocate 0.8 mile of road	32 feet wide: two 12-foot paved lanes with 4-foot-wide shoulders
Access road to Southern Complex West of Byron Highway	Realigned Byron Highway with new traffic circle, extension of Armstrong Road, and truck bypass ramp over Byron Highway	Western Byron Tract to Byron Hot Springs Road	Agricultural land	Realign Byron Highway and add a connection to Armstrong Road	40 feet wide: two 12-foot paved lanes with 8-foot-wide shoulders 32-foot-wide overpass as truck bypass: two 16-foot paved lanes with no shoulders
Access road to Southern Complex West of Byron Highway	Clifton Court Road	Realigned Byron Highway at new traffic circle to Southern Forebay on-site access roads	Agricultural land	Extend road for 0.09 mile	32 feet wide: two 12-foot paved lanes with 4-foot-wide shoulders

Purpose	Road	Start and End Locations	Existing Roadway or Condition	Action	Modification
Access road to Southern Complex West of Byron Highway	Clifton Court Road	Byron Highway to North Bruns Way	Paved road	Widen 0.61 miles of road	32 feet wide: two 12-foot paved lanes with 4-foot-wide shoulders
Access road to Southern Complex West of Byron Highway	North Bruns Way	Clifton Court Road to South Delta Outlet and Control Structure site	Paved road	Widen 0.7 mile of paved road New 180-foot-long and 32-foot-wide bridge over realigned Byron Highway New 220-foot-long and 40-foot-wide bridge over realigned Byron Highway	32 feet wide: two 12-foot paved lanes with 4-foot-wide shoulders New 3-way intersection for on ramp

1 BNSF = BNSF Railway; EBMUD = East Bay Municipal Utility District; SR = State Route.

2 ^a Access route to Mandeville Island site passes by Bacon Island site.

1 **Table 3D-3. Road Improvements under Eastern Alignment Alternatives**

Purpose	Road	Start and End Locations	Existing Roadway or Condition	Action	Modification
Access/haul road from Intake B to Intake A (Alternative 4a only)	Intake haul road	Intake B to Intake A	Not applicable	New 2.54-mile paved road to the west of the abandoned railroad embankment and a 350-foot long by 32-foot-wide bridge over a drainage channel	32 feet wide: two 12-foot wide lanes with 4-foot-wide shoulders
Access road to New Hope Tract Tunnel maintenance shaft – eastern	New Hope Tract tunnel shaft access road	Blossom Road to New Hope Tract tunnel shaft	Agricultural land and dirt road	New 0.29-mile gravel road	24 feet wide: two 12-foot gravel lanes with no shoulders
Access road to Canal Ranch Tract tunnel maintenance shaft	West Pelletier Road	West of I-5 to Canal Ranch Tract tunnel shaft	20 feet wide: two 10-foot lanes with no shoulders	Overlay West Pelletier Road	Only an overlay prior to shaft construction
Improvements to State Route 12 to access Terminous Tract Tunnel Reception Shaft	SR 12	I-5 to Terminous Tract tunnel shaft	40 feet wide: two 12-foot lanes with 8-foot shoulders	Improve 2.3 miles	New pavement and striping
Access road to Terminous Tract tunnel reception shaft	SR 12	East of driveway of Terminous Tract tunnel shaft to west of driveway of Terminous Tract tunnel shaft	40 feet wide: two 12-foot lanes with 8-foot shoulders	New paved acceleration and deceleration lanes	New paved acceleration and deceleration lanes
Access road to King Island tunnel maintenance shaft	West Eight Mile Road	Regatta Lane to King Island tunnel shaft	24 feet wide: two 10-foot lanes with no shoulders	Asphalt overlays preconstruction	None
Access road to Lower Roberts Island tunnel reception shaft and launch shaft	Rough and Ready access road	West Fyffe Street to Lower Roberts Western Yard Track new access road	24 feet wide: two 10-foot lanes with no shoulders	Widen 1.12 miles paved road	32 feet wide: two 12-foot paved lanes with 4-foot shoulders

Purpose	Road	Start and End Locations	Existing Roadway or Condition	Action	Modification
Access road to Lower Roberts Island tunnel reception shaft and launch shaft	Burns Cut new access road	Lower Roberts Western Yard Track new access road to West House Road	Not applicable	New 0.3 miles paved road New bridge over Burns Cut: 24 feet wide x 340 feet long with two 12-foot lanes with 4-foot shoulders	32 feet wide: two 12-foot paved lanes with 4-foot shoulders Construction easement 75 feet wide
Access road to Lower Roberts Island tunnel reception shaft and launch shaft	West House Road	Burns Cut new access road to Lower Roberts new access road	16 feet wide: two 8-foot lanes with no shoulders	Widen 3.2 miles of paved road	32 feet wide: two 12-foot paved lanes with 4-foot shoulders
Access road to Lower Roberts Island tunnel reception shaft and launch shaft	Lower Roberts new access road	West House Road to North Holt Road	Not applicable	New 1.6-mile paved road New bridge over Black Slough: 24 feet wide x 350 feet long: two 12-foot lanes with 4-foot shoulders	32 feet wide: two 12-foot paved lanes with 4-foot shoulders
Access road to Lower Roberts Island tunnel reception shaft and launch shaft	Port of Stockton Expressway	SR 4 to West Fyffe Street	Not applicable	Asphalt overlays	None
Access road to Lower Roberts Island Tunnel Reception Shaft and Launch Shaft	West Fyffe Street	Port of Stockton Expressway to Rough and Ready access road	Not applicable	Asphalt overlays	None
Access road to Upper Jones Tract tunnel maintenance shaft	Bacon Island Road	SR 4 to Upper Jones Tract new access road	20 feet wide: two 10-foot lanes with no shoulders	Asphalt overlays	None
Access road to Upper Jones Tract tunnel maintenance shaft	Upper Jones Tract new access road	Bacon Island Road to Upper Jones Tract tunnel shaft new access road	Not applicable	New 0.8-mile road	24 feet wide: two 12-foot paved lanes with no shoulders

Note: Under the eastern alignment alternatives, road improvements related to intakes and the Twin Cities Complex and access roads to the Southern Complex on Byron Tract and Southern Complex West of Byron Highway would be the same as under the central alignment alternatives.

SR = State Route.

1 **Table 3D-4. Road Improvements under Alternative 5**

Purpose	Road	Start and End Locations	Existing Roadway	Action	Modification
Twin Cities Complex road improvements	Dierssen Road	Franklin Boulevard to I-5	18 feet wide: two 9-foot paved lanes without shoulders	Widen 1 mile of paved road	24 feet wide: two 12-foot paved lanes with 4-foot-wide shoulders
Twin Cities Complex road improvements	Franklin Boulevard	0.22 mile north of Dierssen Road to 0.25 mile south of Dierssen Road	32 feet wide: two 12-foot paved lanes with 4-foot shoulders	Widen 0.48 mile of paved road	Widen to 48 feet: four 12-foot paved through/turn lanes with 4-foot-wide shoulders
Twin Cities Complex road improvements	Twin Cities Road	0.83 mile west of Franklin Boulevard to 0.17 mile east of Franklin Boulevard	22 feet wide: two 10-foot paved lanes with 1-foot shoulders	Widen 1 mile of paved road	44 feet wide: three 12-foot paved lanes (including left-turn merge lane) with 4-foot-wide shoulders
Access road to Lower Roberts Island double launch shaft	Rough and Ready access road	West Fyffe Street to Lower Roberts Western Yard Track new access road	Gravel Road	Construct 1.12 miles of paved road	24 feet wide: two 12-foot paved lanes with no shoulders.
Access road to Lower Roberts Island double launch shaft	Burns Cut new access road	Lower Roberts Western Yard Track New Access Road to West House Road	Not applicable	New 2.0-mile paved road New bridge over Burns Cut: 69 feet wide x 268 feet long; two 12-foot lanes with 4-foot shoulders and room for rail spur	24 feet wide: two 12-foot paved lanes with no shoulders Construction Easement: 75 feet wide
Access road to Lower Roberts Island double launch shaft	West House Road	Burns Cut New Access Road to Lower Roberts New Access Road	16 feet wide: two 8-foot lanes with no shoulders.	Widen 1.18 miles of paved road	24 feet wide: two 12-foot paved lanes with no shoulders.
Access road to Lower Roberts Island double launch shaft	Lower Roberts new access road	West House Road to 0.44 mile west of North Holt Road	Not applicable	New 1.28-mile paved road New bridge over Black Slough: 32 feet wide x 70 feet long; two 12-foot lanes with 4-foot shoulders	24 feet wide: two 12-foot paved lanes with no shoulders.
Access road to Lower Roberts Island double launch shaft	Port of Stockton Expressway	SR 4 to West Fyffe Street	Not applicable	Asphalt overlays	None

Purpose	Road	Start and End Locations	Existing Roadway	Action	Modification
Access road to Lower Roberts Island double launch shaft	West Fyffe Street	Port of Stockton Expressway to Rough and Ready access road	Not applicable	Asphalt overlays	None
Access road to Upper Jones Tract tunnel maintenance shaft	Bacon Island Road	SR 4 to Upper Jones Tract new access road	20 feet wide: two 10-foot lanes with no shoulders.	Asphalt overlays	None
Access road to Upper Jones Tract tunnel maintenance shaft	Upper Jones Tract new access road	Bacon Island Road to Upper Jones Tract tunnel shaft new access road	Not applicable	Driveway improvements	Driveway improvements
Access road to Union Island tunnel maintenance shaft	Clifton Court Road	South Tracy Boulevard to Bonetti Road	20 feet wide: two 10-foot lanes with no shoulders	Asphalt overlays	None
Access road to Union Island tunnel maintenance shaft	Bonetti Road	Clifton Court Road to Union Island tunnel maintenance shaft	20 feet wide: two 10-foot lanes with no shoulders	Asphalt overlays	None
Access road to Bethany Reservoir Pumping Plant and Surge Basin (part of Bethany Complex north access)	Lindemann Road interchange at Byron Highway	not applicable	Lindemann Road 0.5-mile new road Byron Highway: 1 mile on new alignment Southbound on and off ramps: 0.55-mile new ramps Northbound on and off ramps: 0.58-mile new ramps	New interchange with Byron Highway realignment and widening, extension of Lindemann Road New bridge over railroad: 40 feet wide x 130 feet long; two 12-foot lanes with 8-foot shoulders New bridge over realigned Byron Highway and future Byron Highway widening: new bridge: 40 feet wide x 280 feet long; two 12-foot lanes with 8-foot shoulders	Lindemann Road: 32 feet wide: two 12-foot paved lanes with 4-foot shoulders Byron Highway: 66 feet wide: four 12-foot paved lanes with 8-foot shoulders Interchange Ramps: 24 feet wide: one 12-foot lane with 4-foot inside and 8-foot outside shoulders
Access road to Bethany Reservoir Pumping Plant and Surge Basin (part of Bethany Complex north access)	Byron Highway	Lindemann Road Interchange at Byron Highway to Great Valley Parkway	Paved road	Widen 0.5 mile	32 feet wide: two 12-foot paved lanes with 4-foot-wide shoulders.

Purpose	Road	Start and End Locations	Existing Roadway	Action	Modification
Access road to Bethany Reservoir Pumping Plant and Surge Basin (Part of Bethany Complex north access)	Byron Highway frontage road	Lindemann Road Interchange to Mountain House Road	Not applicable	New 1.2-mile paved road	32 feet wide: two 12-foot paved lanes with 4-foot shoulders
Access road to Bethany Reservoir Pumping Plant and Surge Basin (part of Bethany Complex north access)	Surge basin shaft access road	Byron Highway Frontage Road to Mountain House Road	Agricultural land	New 2.1-mile paved road	36 feet wide: two 12-foot paved lanes with 4-foot and 8-foot shoulders
Access road to Bethany Reservoir Pumping Plant and Surge Basin (part of Bethany Complex north access)	Mountain House Road	Byron Highway to Connector Road	26 feet wide: two 11-foot lanes with 2-foot paved shoulders	Widen 1.34 miles of paved road	32 feet wide: two 12-foot paved lanes with 4-foot shoulders
Access road to Bethany Reservoir Pumping Plant and Surge Basin (part of Bethany Complex Kelso Road access)	Kelso Access Road	0.20 miles south of Kelso Road to Kelso Road	Not applicable	New 0.20-mile paved road	24 feet wide: two 12-foot paved lanes with 4-foot shoulders
Access road to Bethany Reservoir Pumping Plant and Surge Basin (part of Bethany Complex south access)	West Grant Line Road	0.14 miles west of Mountain House Road to Mountain House Road	26 feet wide: two 11-foot lanes with 2-foot paved shoulders	Widen for merge lane	0.14 mile widening for merge lane
Access road to Bethany Reservoir Pumping Plant and Surge Basin (part of Bethany Complex South Access)	New Mountain House Road and West Grant Line Road	West Grant Line Road to existing Mountain House Road	Not applicable	New 0.6-mile paved road New bridge over swale: 40 feet wide x 150 feet long: two 12-foot lanes with 4-foot shoulders	32 feet wide: two 12-foot paved lanes with 4-foot shoulders Widen at roundabout
Access road to Bethany Reservoir Pumping Plant and Surge Basin (part of Bethany Complex south access)	Mountain House Road	New Mountain House Road to 0.18 miles north of Surge Basin Shaft Access Road	26 feet wide: two 11-foot lanes with 2-foot paved shoulders	Widen 2.20 miles of paved road	32 feet wide: two 12-foot paved lanes with 4-foot shoulders

Purpose	Road	Start and End Locations	Existing Roadway	Action	Modification
Access road to Pumping Plant and Surge Basin (part of Bethany Complex south access)	New temporary access road to first responders' site	Access road from Mountain House Road to Temporary first responders' site	Not applicable	0.1-mile new road	24 feet wide: two 12-foot paved lanes with 4-foot shoulders
Access road to Bethany Reservoir Aqueduct construction staging area (part of Bethany Complex Kelso Road access)	Kelso Road	0.14 mile east of Mountain House Road to new access road to aqueduct construction staging area	22 feet wide: two 11-foot lanes with no shoulder	Widen 1.23 miles of paved road	32 feet wide: two 12-foot paved lanes with 4-foot shoulders Turn pockets
Access road to Bethany Reservoir Aqueduct construction (part of Bethany Complex south access)	Connector Road	Mountain House Road to Surge Basin shaft access road	Not applicable	0.27-mile new road	32 feet wide: two 12-foot paved lanes with 4-foot shoulders
Access road to Bethany Reservoir Discharge Structure (part of Bethany Complex south access)	Bethany Reservoir Access Road (California Aqueduct Bikeway)	Mountain House Road to Bethany Reservoir Discharge Structure From Mountain House Road to the existing Bethany Reservoir	Paved road	Widen 0.6 mile of existing paved road along Bethany Reservoir New 1.2 miles of paved road	32 feet wide: two 12-foot paved lanes with 4-foot shoulders New 32-foot-wide bridge to span the structure and the discharge channels

- 1 Note: Road improvements related to Intakes B and C would be the same as under central and eastern alignments. Road improvements related to New Hope Tract, Canal
2 Ranch Tract, Terminous Tract, and King Island tunnel shafts would be the same as under the eastern alignment.
3 I = Interstate; SR = State Route.

1 **Table 3D-5. Shaft Site Acreages under Central Alignment Alternatives**

Shaft site	Alternative 1, 6,000 cfs (acres)	Alternative 2a, 7,500 cfs (acres)	Alternative 2b, 3,000 cfs (acres)	Alternative 2c, 4,500 cfs (acres)
Twin Cities Double Launch Shaft	Construction: 479 Permanent: 141	Construction: 546 Permanent: 285	Construction: 322 Permanent: 26	Construction: 392 Permanent: 63
New Hope Tract Maintenance Shaft (central)	Construction: 11 Permanent: 11	Construction: 11 Permanent: 11	Construction: 11 Permanent: 11	Construction: 11 Permanent: 11
Staten Island Maintenance Shaft	Construction: 12 Permanent: 12	Construction: 12 Permanent: 12	Construction: 12 Permanent: 12	Construction: 12 Permanent: 12
Bouldin Island Launch/Reception shaft	Construction: 615 Permanent: 507	Construction: 657 Permanent: 544	Construction: 540 Permanent: 436	Construction: 585 Permanent: 479
Mandeville Island Maintenance Shaft	Construction: 14 Permanent: 14	Construction: 14 Permanent: 14	Construction: 14 Permanent: 14	Construction: 14 Permanent: 14
Bacon Island Reception Shaft	Construction: 15 Permanent: 15	Construction: 15 Permanent: 15	Construction: 15 Permanent: 15	Construction: 15 Permanent: 15
Southern Complex on Byron Tract (Southern Forebay Inlet Structure launch shaft, working shaft launch/maintenance shaft, South Delta Pumping Plant, Southern Forebay, Southern Forebay Outlet Structure and dual tunnel launch shafts)	Construction: 1,457 Permanent: 1,189	Construction: 1,457 Permanent: 1,189	Construction: 1,457 Permanent: 1,189	Construction: 1,457 Permanent: 1,189
Southern Complex West of Byron Highway (South Delta Outlet and Control Structure and California Aqueduct Control Structure)	Construction: 164 Permanent: 112	Construction: 293 Permanent: 210	Construction: 164 Permanent: 112	Construction: 164 Permanent: 112

2 Note: Acreages include ring levees or other levee modifications, and generally exclude access roads, except for levee modification access roads.
3 cfs = cubic feet per second

1 **Table 3D-6. Shaft Site Acreages under Eastern Alignment Alternatives**

Shaft site	Alternative 3, 6,000 cfs (acres)	Alternative 4a, 7,500 cfs (acres)	Alternative 4b, 3,000 cfs (acres)	Alternative 4c, 4,500 cfs (acres)
Twin Cities Double Launch Shaft	Construction: 479 Permanent: 170	Construction: 546 Permanent: 285	Construction: 322 Permanent: 26	Construction: 392 Permanent: 95
New Hope Tract Maintenance Shaft (eastern)	Construction: 11 Permanent: 11	Construction: 11 Permanent: 11	Construction: 11 Permanent: 11	Construction: 11 Permanent: 11
Canal Ranch Tract Maintenance Shaft	Construction: 11 Permanent: 11	Construction: 11 Permanent: 11	Construction: 11 Permanent: 11	Construction: 11 Permanent: 11
Terminus Tract Reception Shaft	Construction: 13 Permanent: 13	Construction: 13 Permanent: 13	Construction: 13 Permanent: 13	Construction: 13 Permanent: 13
King Island Maintenance Shaft	Construction: 12 Permanent: 12	Construction: 12 Permanent: 12	Construction: 12 Permanent: 12	Construction: 12 Permanent: 12
Lower Roberts Island Launch/Reception Shaft	Construction: 407 Permanent: 176	Construction: 445 Permanent: 207	Construction: 327 Permanent: 136	Construction: 376 Permanent: 158
Upper Jones Tract Maintenance Shaft	Construction: 13 Permanent: 13	Construction: 13 Permanent: 13	Construction: 13 Permanent: 13	Construction: 13 Permanent: 13
Southern Complex on Byron Tract (Southern Forebay Inlet Structure launch shaft, working shaft launch/maintenance shaft, South Delta Pumping Plant, Southern Forebay, Southern Forebay Outlet Structure and dual tunnel launch shafts)	Construction: 1,488 Permanent: 1,220	Construction: 1,512 Permanent: 1,244	Construction: 1,457 Permanent: 1,189	Construction: 1,475 Permanent: 1,207
Southern Complex West of Byron Highway (South Delta Outlet and Control Structure and California Aqueduct Control Structure)	Construction: 164 Permanent: 112	Construction: 293 Permanent: 210	Construction: 164 Permanent: 112	Construction: 164 Permanent: 112

2 Note: Acreages include ring levees or other levee modifications, and generally exclude access roads, except for levee modification access roads.
 3 cfs = cubic feet per second

1 **Table 3D-7. Shaft Site Acreages under the Bethany Reservoir Alignment**

Shaft site	Alternative 5, 6,000 cfs (acres)
Twin Cities Double Launch Shaft	Construction: 586 Permanent: 222
New Hope Tract Maintenance Shaft (eastern)	Construction: 11 Permanent: 11
Canal Ranch Tract Maintenance Shaft	Construction: 11 Permanent: 11
Terminus Tract Reception Shaft	Construction: 13 Permanent: 13
King Island Maintenance Shaft	Construction: 12 Permanent: 12
Lower Roberts Island Double Launch Shaft	Construction: 610 Permanent: 300
Upper Jones Tract Maintenance Shaft	Construction: 11 Permanent: 11
Union Island Maintenance Shaft	Construction: 14 Permanent: 14
Bethany Reservoir Pumping Plant and Surge Basin (all facilities)	Construction: 213 Permanent: 184
Bethany Reservoir Aqueduct	Construction: 128 Permanent: 68
Bethany Reservoir Discharge Structure	Construction: 15 Permanent: 13

2 Note: Acreages include ring levees or other levee modifications, and generally exclude access roads, except for levee modification access roads.

3 cfs = cubic feet per second

3D.1 References Cited

- Delta Conveyance Design and Construction Authority. 2022a. *Volume 1: Delta Conveyance Final Draft Engineering Project Report—Central and Eastern Options*. May 2022. Sacramento, CA.
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