

Appendix B. Design Information

Table B-1 lists and defines the types of facilities and services recommended at Lake Berryessa. All publicly accessible facilities and services must meet accessibility requirements. This table is extracted from the Lake Berryessa Concession Infrastructure Design Draft Infrastructure Basis of Design Report, July 2015.

Table B-1. Description of Facilities and Services to be Provided at Lake Berryessa Recreation Areas

Facility/Service	Description
Camping	
Tent Site	Tent-only sites are required to have a picnic table and fire pit. A tent site can be with or without a 12 ft x 12 ft elevated (max 18 in high) level pad. All tent sites are spaced a minimum of 35 ft apart as measured between living areas and fire pits. An area of clustered parking spaces and a water spigot are nearby, if water service is a required service at the recreation area. Each cluster of parking spaces shall consist of the same number of nearby tent sites, plus one extra parking space within the grouping for emergency, park ranger, dumpster, maintenance, or other temporary use. An accessible aisle shall not be used for any kind of parking space. The nearby parking space for each tent site shall not be more than 250 ft away and shall not be closer than 5 ft. One out of every 5 tent sites shall be accessible. Each accessible tent site shall have a 5 ft. wide accessible sidewalk leading to it from a nearby access aisle adjacent to an accessible parking space with access aisle. At each accessible tent site, there is at least one accessible picnic table and fire pit. <i>Required and Authorized services include at least 1 nearby parking space per designated area for a tent.</i>
Overnight Group Use Area	Area identified for temporary clustered tent-only sites with a central group area with several picnic tables and fire pits. Size varies to accommodate 20- 50 people. Parking and water spigot is nearby. This area and its associated parking shall be designed to conform to accessibility requirements. <i>Authorized services include upright barbeques (BBQ).</i>
RV Site	RV sites are required to have a picnic table and fire pit, and are required to have water, sewer, and electric hook ups, if provided at the recreation area. Sites are typically 1,800 to 2,200 square ft for most RV parking spaces and 2,800 to 3,200 square ft for larger accessible double unit RV parking spaces. RV sites are generally intended for back-in vehicle maneuvering, however RV sites can also be pull-through parking spaces, such as standard sites. Each RV parking space shall include a picnic table and fire pit, and shall not be closer than 30 ft to each other. One out of every 5 RV parking areas shall be accessible. At each accessible RV site, there is at least one accessible picnic table and fire pit. <i>Authorized services include an upright BBQ.</i>
Standard Site	Standard sites can serve tents, vehicles with trailers, or RVs and are required to have the following: a picnic table, a fire pit, parking for one car with trailer. Standard sites are generally intended to be pull-through, but can be back-in. Water, sewer, and electric hook ups are required at some standard sites, as shown on the site plans. Sites are typically 1,800 to 2,200 square ft for most combined trailer/tent site parking spaces and 2,800 to 3,200 square ft for larger accessible double unit combined trailer/tent site parking spaces and generally 100 ft long x about 30 ft wide for pull-through campsite parking spaces. Each standard site shall include a picnic table and fire pit, and shall not be closer than 30 ft to each other. One out of every 5

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Facility/Service	Description
	standard site parking areas shall be accessible. At each accessible standard site, there is at least one accessible picnic table and fire pit. Water spigot is nearby. <i>Authorized services include utility hookups for all standard sites and an upright BBQ.</i>
Hike-in/Boat-in Tent-Only Site (Authorized Service Only)	Tent-only sites accessible only via hiking or boat-in. Each site includes a picnic table and fire pit. Sites are typically 100 ft apart. Water spigot nearby. No designated parking space. Sites are near the shoreline where boat can be anchored to a mooring.
Floating Campsite (Authorized Service Only)	Campsites on water spaced about 400 ft apart. These sites accommodate up to 15 people and have a table, propane barbecue grill, food locker, accessible restroom, covered living area and an upper sun deck/sleeping area with room for tents. Typically 20x24 ft. Drinking water must be brought in by visitors.
Lodging	
Cabins	Overnight structure, constructed on-site, set on a foundation or otherwise permanently placed. Site about 2,500 square ft or more. Cabins are above the 455 ft contour. Cabin includes restroom, sink, stove, table, sitting area, and one or two beds. Required units sleep up to 4 adults. Picnic table and fire pit are located outside. Includes water, sewer, and electric hookups and two parking spaces. Cabins shall not be closer than 24 ft to each other. Where there is more than 1 cabin, at least 2 cabins shall be accessible in accordance with accessibility standards for outdoor areas. Each accessible cabin has a 5 ft wide accessible route sidewalk leading to it from a nearby accessible parking space. Each accessible cabin shall have at least one accessible picnic table and fire pit. If an accessible cabin is leased by a person who is not disabled, then the nearby accessible parking space can be used by the renter of the facility. <i>Authorized services include an upright BBQ, additional furniture and amenities, or larger cabins that sleep more.</i>
Park Models	Movable structure designed for long-term or semi-permanent placement. Since they are movable, park models are typically located in areas between the 440 and 455 ft contours, and in the 100 ft buffer zone above the 455 ft contour. Park models must remain under 400 square ft for transport and to avoid being defined as a manufactured home. Park models include a restroom, sink, stove, table, sitting area, and one or two beds. Required units sleep up to 4 adults. A picnic table and fire pit are located outside. Includes water, sewer, and electric hookups and two parking spaces. Park models for public access shall not be closer than 24 ft to each other. Park models for employee housing shall not be closer than 10 ft to each other. Where there is more than 1 park model, at least 2 park models shall be accessible in accordance with accessibility standards for outdoor areas. Each accessible park model has a 5 ft wide accessible route sidewalk leading to it from a nearby accessible parking space. Each accessible park model shall have at least one accessible picnic table and fire pit. If an accessible park model is leased by a person who is not disabled, then the nearby accessible parking space can be used by the renter of the facility. <i>Authorized services include an upright BBQ, additional furniture and amenities, or larger park models that sleep more above the 455 ft contour.</i>
Yurts (Authorized Service Only)	Round, semi-permanent, tent-like structure. Consists of a durable fabric, tension band, and a wood frame set upon a level wood platform. Site about 2,500 square ft or more. Yurts are movable structures and can be below the 455 ft contour. Yurts include basic furniture, including cots or bunk beds, shelf with drawers, table, and couch. Picnic table and fire pit are located outside. Sleeps up to 4 adults. No sewer, water, or electric hookups. Water spigot and comfort stations nearby. Two required parking spaces are located near the structure. Yurts shall not be closer than 50 ft to each other.

Facility/Service	Description
	Where there is more than 1 yurt, at least 2 yurts shall be accessible in accordance with accessibility standards for outdoor areas. Each accessible yurt has a 5 ft wide accessible route sidewalk leading to it from a nearby accessible parking space. Each accessible yurt shall have at least one accessible picnic table and fire pit. If an accessible yurt is leased by a person who is not disabled, then the nearby accessible parking space can be used by the renter of the facility. <i>Authorized services include an upright BBQ, additional furniture and amenities, and water, sewer, and electric hookups.</i>
Rustic Cabins (Authorized Service Only)	Constructed on-site, set on a foundation or otherwise permanently placed. Rustic cabins are only located above the 455 ft contour. Includes cots or bunk beds and a shelf for some storage. Sleeps up to 4 adults. A picnic table and fire pit are located outside each rustic cabin. No sewer, water, or electric hookups. Water spigot and comfort stations are nearby. Two required parking spaces are located near the structure. Rustic cabins shall not be closer than 24 ft to each other. Where there is more than 1 rustic cabin, at least 2 rustic cabins shall be accessible in accordance with accessibility standards for outdoor areas. Each accessible rustic cabin has a 5 ft wide accessible route sidewalk leading to it from a nearby accessible parking space. Each accessible rustic cabin shall have at least one accessible picnic table and fire pit. If an accessible rustic cabin is leased by a person who is not disabled, then the nearby accessible parking space can be used by the renter of the facility. <i>Authorized services include an upright BBQ.</i>
Tent Cabins (Authorized Service Only)	Constructed on-site of prefabricated wood and canvas, and set on a level wood platform as a semi-permanent structure. Tent cabins are above the 455 ft contour. Includes cots or bunk beds. A picnic table and fire pit are located outside each tent cabin. Sleeps up to 4 adults. No sewer, water, or electric hookups. Water spigot and comfort stations are nearby. Two required parking spaces are located near the structure. Tent cabins shall not be closer than 50 ft to each other. Where there is more than 1 tent cabin, at least 2 tent cabins shall be accessible in accordance with accessibility standards for outdoor areas. Each accessible tent cabin has a 5 ft wide accessible route sidewalk leading to it from a nearby accessible parking space. Each accessible tent cabin shall have at least one accessible picnic table and fire pit. If an accessible tent cabin is leased by a person who is not disabled, then the nearby accessible parking space can be used by the renter of the facility. <i>Authorized services include an upright BBQ.</i>
Boating	
Marinas	Marina building includes cashier with service desk, waiting area with benches and tables, and restrooms. The marina building can be constructed on ground or be floating. The marina building can be combined with a restaurant and retail sales. Accessibility requirements will apply to all marina buildings and if on ground, accessibility can be provided by a lift service. Per the LDGMGF, the parking requirement is 0.6 parking spaces per boat slip. The marina parking lot is as close as possible to the marina building. Marina buildings and services are required at Putah Canyon, Steele Canyon, and Spanish Flat. Marina is an authorized service at Monticello Shores and Berryessa Point. At Putah Canyon, the marina is a 1,200 square ft floating marina and is combined with the authorized restaurant and retail service. At Steele Canyon the marina building is on ground in a 1,015 square ft building. As an authorized service, the marina building can be combined with a restaurant and retail service in a larger (up to 3,150 square ft) building. At Spanish Flat, the marina is a 600 square ft floating marina and is combined with the authorized restaurant and retail service.

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Facility/Service	Description
Marina Gangways, Main Docks, Marginal Docks, Finger Floats, Fuel and Sanitary Docks, Other Service Gangways	All marina gangways, docks, floats and appurtenances are to be a pre- fabricated, modular-type construction and assembly, furnished with typical manufacturer's commercial standard design features and term warranty. All facilities shall be from the same manufacturer, and accessibility requirements will apply where the general public has access. The Gangway is 12 ft wide, typically publicly accessible with a continuous maximum 5% gradient, and articulated to move vertically as water levels rise and fall. The Gangway is a required facility/service connecting the marina's Main Dock to the land based publicly accessible parking spaces and collector sidewalks. The attached Main Dock is 12 ft wide, and at a continuous level with the water surface of the reservoir, and provides level connections and continuous access to Marginal Docks and Finger Floats. If a floating marina building is nearby, the Main Dock, in some areas, can function as a dock for fuel dispensing and sanitary waste collection, The fuel and sanitary service dock will typically serve a minimum of 2 boats at a time per RRFDG Chapter III Section H.1. k. The Main and Marginal Docks and Finger Floats are assumed to always be floating about 2 ft above the water surface of the reservoir. Marginal docks are less than 300 ft long and are 6 ft wide for powerboat slips, or 8 ft wide for houseboat slips. Finger Floats are 20 ft long by 3 ft wide for powerboats, or 40 ft long by 6 ft wide for houseboats. A Fuel and Sanitary pump out Dock, accessible to the public, is 40 ft long and 12 ft wide. Other Service Gangways, typically used for connecting fuel or sanitary services to land based bulk fuel and collected sanitary waste storage tanks, and not publicly accessible, are less than 300 ft long and minimum 6-ft wide.
Boat Slips, Berths, and Fairways	Boat slips are uncovered and accommodate various sizes of boats for both private boats and boat rentals. The docks, finger floats, and boat slips are positioned to be functional assuming a reservoir low water level at elevation 400 ft. If the reservoir drops to this elevation, each slip will still have a minimum water depth of 9 ft remaining underneath per RRFDG Chapter III Section H.1.a. Berth dimensions will follow LDGMBF recommendations, however, for purposes of developing a feasible design on the site plans, the following assumptions are used. Single berth clearance for a powerboat is a minimum of 9 ft wide, and double berths are a minimum of 18 ft wide. Single berth clearance for a houseboat is a minimum of 16 ft wide, and double berths are a minimum of 32 ft wide. In accordance with LDGMBF Section G, page 59, each boat berth shall have 0.6 single vehicle parking spaces. Fairway dimensions will allow for safe maneuvering of boats between rows of slips. Fairway dimensions will follow LDGMBF recommendations, however, for purposes of developing a feasible design on the site plans, the following assumptions are used. For powerboats, the site plans show a minimum 42 ft width; this assumes a 24 ft long boat x 1.75 = 42 ft. For houseboats, the site plans show a minimum 105 ft width; this assumes a 60 ft long boat x 1.75 = 105 ft. Accessibility requirements to boat slips and berths will apply. <i>Authorized services include covered boat slips and water spigots placed periodically along the Main Dock or at each boat slip.</i>
Boat Rental	Boat rental service desk is located in the marina building or in a small structure near the boat ramp, depending on the type of boats or watercraft available for rent. Boat rentals are a required service at Putah Canyon, Spanish Flat, and Steele Canyon. Fuel storage and dispenser are a required service where power boat rentals are available. Where boats furnished with sanitary facilities are rented, a sanitary pump-out and storage facility is a required service. Accessibility requirements will apply. <i>Authorized services include additional kayaks, canoes, and paddle boards. Boat rental is an Authorized service at Monticello Shores.</i>

Facility/Service	Description
Boat Launch, Vehicle with Boat Trailer Parking, and Information Kiosk	Sources of boat launch, vehicle with boat trailer parking, and kiosk information: California Department of Boating and Waterways, Boating Facilities Division, Layout, Design and Construction Handbook for Small Craft Boat Launching Facilities (LDCHSCBLF) dated March 1991. Reclamation Recreation Facility Design Guidelines, US Department of interior Bureau of Reclamation (RRFDG) dated April 2013 Boat Launch is as follows: Publicly accessible boat launch ramps are required at Putah Canyon, Spanish Flat, and Steele Canyon. All boat launch ramps are in the same locations as existing launches. Boat launches are single or multi-lane. Each lane is 15 ft wide minimum. A courtesy dock can serve two lanes. General design of boat ramps will conform to RRFDG Ch. III H. 2 and LDCHSCBLF requirements. Vehicle with Boat Trailer Parking is as follows: The vehicle with boat trailer parking lots at Putah Canyon, Spanish Flat, and Steele Canyon have 30 ft wide two-way access on either side of parking spaces. Parking spaces are 12 ft wide x 55 ft long minimum for cars with trailers. Majority of boat trailer parking is within 600 ft of top of launching ramp. General design of vehicle with boat trailer parking will conform to RRFDG Ch. III H. 7 requirements. Kiosk is as follows: An Information kiosk is located nearby. Accessibility requirements will apply. An authorized service is an extension of the boat launch at Spanish Flat to accommodate lower water levels, installation of ramps at Berryessa Point and Monticello Shores, and installing additional ramps near the marinas at Putah Canyon and Spanish Flat.
Fish Cleaning Station (<i>Authorized Service Only</i>)	Includes a 20 ft x 20 ft roof for shade and shelter, a pre-manufactured 96 in x 60 in cutting table with sink and pre-rinse water supply, electrical service for lights and outlets for automatic cutting utensils, and a drain leading to an underground vault for storing waste. Table is positioned in the center of a 22 ft x 22 ft concrete pad with 5 ft clear accessible space provided all around the table. Accessibility requirements will apply.
Courtesy dock	Movable dock, typically 6 ft wide x 60 ft long that is part of a boat launch ramp for loading and unloading, and to mark launching lanes on the ramp.
Boat Exclusion Area	Buoys are used to identify areas where boats and powered personal water craft are prohibited from entering.
Day Use	
Individual Day Use Site	Individual site with a picnic table and upright BBQ. A parking lot is nearby to service multiple individual day use sites. Comfort station and water spigot are nearby. Accessibility requirements will apply.
Group Day Use Area (<i>Authorized Service Only</i>)	Large sites, typically with a group shelter with multiple picnic tables, table and sink, and a larger upright BBQ to accommodate groups of 20 or 50 people. Includes water hookup. Accessibility requirements will apply.
Playground (<i>Authorized Service Only</i>)	Site includes varied children's playground equipment with safety surfacing, and age appropriate play structures. Playground area and related infrastructure are publicly accessible and accessibility requirements will apply.
Open Space/Recreation Area (<i>Authorized Service Only</i>)	Open area near an accessible playground that generally includes various recreation options, such as recreation courts, bocce ball, tennis, basketball, or volleyball. Accessibility requirements will apply.

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Facility/Service	Description
Trail Connection	A trail connection is an identified location where trails are anticipated to eventually connect. There is a sign and parking nearby, and accessibility requirements will apply.
Multi-Use Special Events Center (Authorized Service Only)	Large building for special day-use events, such as seminars, conferences, school group gatherings, reunions, weddings, retreats, etc. Includes central reception area, kitchen, restrooms, storage room, and additional small conference rooms. Assumes total occupancy for approximately 100 people and parking for approximately 50 cars (NCZCO requires 0.5 parking spaces per person for 'conference center'). Approximately 3,050 square ft. Accessibility requirements will apply.
Amenities	
Restaurant (Authorized Service Only)	Restaurant services are authorized at Putah Canyon, Steele Canyon, Monticello Shores, Berryessa Point, and Spanish Flat. Restaurants may offer varying levels of food service, such as sit-down/full service or fast- casual/take-out, such as a sandwich counter, small café, or grill. Full-service restaurant sizes may vary and serve up to 40 customers. Serving beer, wine, and/or liquor is an authorized service. At Putah Canyon, the authorized restaurant is in the floating marina and is a take-out counter with sandwiches, salads, or other café items. An authorized use is seasonal operation of the restaurant. At Steele Canyon, the authorized restaurant is separate from the marina building and assumes about 30 customers at 2,592 square ft. Additional seating can be located outside on a deck. About 22 parking spaces are needed per NCZCO requirements of 1 parking space per 120 square ft of building. At Monticello Shores, Berryessa Point, and Spanish Flat, the authorized restaurant is a take-out sandwich shop/grill in a separate building or located in the marina service building that can be operated seasonally or year- round.
Retail Store (Authorized Service Only)	Retail building and service selling food snacks, ice, beverages, recreation supplies, wood, or other items for camping and boating activities. Retail can be combined with the marina building or a restaurant. At Putah Canyon, the authorized retail store is combined with the marina portion of the building. About 1-2 parking spaces are needed per NCZCO requirements of 1 parking space per 250 square ft of retail. At Steele Canyon, the authorized retail store is combined with the marina building. About 4 parking spaces are needed per NCZCO requirements of 1 parking space per 250 square ft of retail. Retail is an authorized service at Monticello Shores, Berryessa Point, and Spanish Flat. The required number of parking spaces will be provided.
Facilities/Infrastructure	
Entry Station	Small building located at vehicle entrance to recreation area for visitor registration, fee collection, etc. At least 2 entry lanes and one exit lane. Setback a minimum of 150 ft. off Knoxville Road or main public right-of-way. Accessibility requirements will apply. Includes 2 parking spaces, one of which is a van-accessible parking space with access to the entry station. Vehicle turnaround space is typically identified for vehicles to turn around and exit in a nearby area visible to the Entry Station building. The station building is approximately 52 square ft. A self service fee depository is also included at the entry station area. Approximately 25 square ft. <i>Authorized services include a manual or automatic gate and one-way spike strips and an additional entry station at Putah Canyon.</i>
Restroom	At all sites, men's and women's restrooms are located inside buildings that have other uses (such as the marina, concessionaire offices, multi-purpose building, restaurants, and single building retail stores), and are open during normal business hours. Accessibility requirements

Facility/Service	Description
	will apply to all restrooms with toilet stalls, sinks, soap dispenser, towel dispenser or hand dryer, and waste receptacle.
Vault Toilet	Prefabricated 2-unit vault toilet buildings are typically located in areas that do not have underground water service or sewer. Accessibility requirements will apply in addition to use of sweet-smelling technology. Building footprint is approximately 250 square ft. <i>An authorized service is electric hookup and replacing vault toilets with comfort stations with toilets only.</i>
Comfort Station with Toilets only	Restroom with water, sewer, and electric hookups. Accessibility requirements will apply. Building footprint is approximately 700 square ft.
Comfort Station with Toilets and Family Room only	Restroom with water, sewer and electric. One dish washing sink is included. Accessibility requirements will apply. Building footprint is approximately 925 square ft. <i>An authorized service is comfort station with toilets, family room, and showers only.</i>
Comfort Station with Toilets, Family Room and Showers only	Restroom typically located in or near camp site areas. Each has water, sewer, and electric and accessible shower stalls. One dish washing sink is included. Accessibility requirements will apply. Building footprint is approximately 925 square ft.
Comfort Station with Toilets, Family Room, Showers and Laundry (Authorized Service Only)	Restroom typically located in or near campsite areas. Each has full water, sewer, and electric, accessible shower stalls, and laundry facility including washer and drier units, folding tables, vending machines. Accessibility requirements will apply. Building footprint is approximately 1,100 square ft. One dish washing sink is included. Laundry is only provided at Putah Canyon and Steele Canyon.
Fuel and Sanitary Land Based Storage Facility	Fuel dispensing is required at marinas. Sanitary services are required where houseboats are used or floating marina buildings are used. The fuel and sanitary service dock typically serves a minimum of 2 boats at a time per RRFDG Chapter III Section H.1. k. Storage tanks for bulk fuel and collected sanitary waste are located at a nearby land based storage facility on the shoreline near the gangway to the dock. Footprint size of the pad for both storage tanks is about 30 ft x 40 ft. These tanks are accessed by fuel and sanitary trucks. Fuel and sanitary storage is required at Putah Canyon, Spanish Flat and Steele Canyon. <i>As an authorized service, Monticello Shores has a fuel dispenser, bulk fuel storage, and sanitary storage facilities.</i>
RV Dump Station	Includes an area for disposal of stored sewage, a water source to flush sewage holding tanks, and separate potable water source. Accessibility requirements will apply. Pull through space for RVs.
Small Boat Repair/ Yard Shop (Authorized Service Only)	Building and service yard area for boat repairs. Where marinas are located, the building is combined with a tow service. At Steele Canyon and Putah Canyon, these are 30 ft x 60 ft buildings with nearby service yard for maintenance, repairs, and storage.
Concessionaire Office (Authorized Service Only)	Building or park model-structure for supervisor, administrative, and maintenance personnel.
Dry Boat Storage (Authorized Service Only) and Open Boat Storage	Required service at Putah Canyon, an open land area is provided that will store a grouping of about 20-30 boats on trailers. A tractor with universal boat trailer operation will move boats. <i>At Steele Canyon, authorized boat storage consists of two separate 4-story, 3 sided buildings, each with a sloped roof provide storage space for about 96 stacked boats. A fork-lift operation will move boats. An authorized service is a fully enclosed building.</i>

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Camp Host Site	An RV site or a standard site with full hookups, picnic table, and fire pit. <i>An upright BBQ is an authorized service.</i> At Spanish Flat, the camp host site has water and electric hookup only. <i>A camp host site is authorized for Monticello Shores and Berryessa Point.</i>
Employee Housing (Authorized Service Only)	Multiple park models to house seasonal or permanent employees. There is at least one parking space per employee housing unit, plus one additional parking space as an extra in each parking space area. Accessibility requirements will apply. <i>At Steele Canyon, there are 10 park models as an authorized service. Employee housing is an authorized service at Putah Canyon with 6 park models.</i>
Parking and Access	
Vehicle Parking Spaces, Pedestrian Access and Walkways	Vehicle parking will meet or exceed the requirements of ACoEEDM. 90 degree vehicle parking spaces, including accessible parking spaces and adjacent access aisles, are 10 ft wide x 20 ft long. 45 degree vehicle parking spaces, including accessible parking spaces and adjacent access aisles, are 10 ft wide x 17 ft long and are only located off one way access drives. Vehicle parking spaces are not closer than 5 ft to any cabin, park model, yurt or tent site. All pedestrian access aisles adjacent to accessible parking spaces will have an evident accessible path leading to an accessible facility. Each vault toilet has at least two parking spaces, and each restroom has at least 3 parking spaces; at each of these locations, at least one space is accessible with an access aisle. An access aisle cannot be used for parking at any time, but it can be used as a drop off or pick up area. Accessible parking spaces, including accessible RV parking spaces and accessible pull-through parking spaces are sloped at 2% or less and are paved with pavement markings with an accessible parking sign. Adjacent access aisles are paved. Other RV and pull-through sites may be steeper with a gravel surface. The approaches and exits of these parking spaces may be steeper, but with no more than a 9% algebraic difference between adjacent surfaces. Other gravel parking and pavement surfaces can be at outdoor boat storage areas, vehicle with boat trailer parking spaces and single RV and pull-through parking spaces, and tent site, cabin and yurt parking spaces that are not for accessible parking. Pedestrian walkways that are an accessible route will be a paved concrete sidewalk, and will be a minimum of 5 ft wide. Each accessible lodging facility, including tent sites, has a 5-ft wide accessible route sidewalk leading to it from a nearby accessible parking space. In vehicle parking lots adjacent or close to marinas, there are 5-ft wide collector sidewalks placed on the perimeter of the lot adjacent to many of the parking spaces closest to the marina use. These collector walks are used to off-load equipment and supplies by the public from their vehicles, provide a safe pedestrian access route to the marina main entrance gangway, and provide potential for convenient reserved parking for employees, staff and possible service vehicles. Each restroom and vault toilet has at least one accessible parking space and accessible route sidewalk.
Vehicle with Boat Trailer Parking	Parking areas have 30 ft wide two-way drive lanes. Each parking space is 12 ft x 55 ft. per RRFDG Chapter III Section H.7.
Access Drive Sources of Design, Access Drive Width, and Access Drive Profiles	Primary access drives are generally located and designed to be in the same general footprint and follow the existing access drives, however, periodic deviations are needed due to the following: 1) desired access to other areas of interest, 2) smoother or more continuous, or safer transition gradients, 3) a need to find or create flatter areas for accessible parking and access areas, 4) to create better or safer visibility at intersections, 5) to reduce potential for erosion due to slopes being too steep or abrupt, and others. Surface materials on access drives and vehicle circulation areas are either pavement or gravel. The design intent for paved surfaces is to provide this type surfacing in higher traffic areas such as primary access drives leading in and out of the site, particularly to the top of public boat ramp areas where vehicles with trailers maneuver and turn. Paved surfaces will also be needed on the access drives leading to the marina facilities, and where steep access drives lead into a property off the adjacent County Roads toward and past a Control Station building.

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	Paved surfaces are also needed at truck maneuvering areas around bulk fuel and sanitary waste storage tanks, and at accessible parking spaces and access aisles. Although there are a few other exceptions, most other vehicle access drives and roads can have a gravel surface. The following summarizes the design sources and criteria for various access drive road width and profile scenarios: The Department of Army Corps of Engineers (ACOEEDM) Engineering and Design Manual EM 1110-2-410 dated 31 Dec 1982, titled: Design of Recreation Areas and Facilities-Access and Circulation. Chapter 2, Elements of Design and Chapter 7, Parking California Title 14 Natural Resources, State Responsibility Area (SRA) Fire Safe Regulations, published July 4, 2014. American Association of State Highway and Transportation Officials (AASHTO) A Policy on Geometric Design of Highways and Streets, dated 2011. Caltrans Highway Design Manual (CHDM), dated 9/22/14. Access Drive Widths are as follows: 24 FT WIDE TWO-WAY CIRCULATION ROAD is defined as a 24 ft wide corridor, consisting of 20 ft wide pavement with 2 ft wide gravel shoulders. From ACOEEDM: paragraphs 2-4 b. (2) (a) and 2-4 d. (4) (a) and also: SRA 1273.01 Road Width. Per input from Reclamation, some 24 ft wide two-way circulation roads are not paved, and gravel is the preferred surface material, see plans. 16' WIDE ONE-WAY CIRCULATION ROAD is defined as a 16 ft wide corridor, consisting of 12 ft wide pavement with 2 ft wide gravel shoulders. From ACOEEDM: paragraphs 2-4 b. (2) (b) and 2-4 d. (4) (a) and also: SRA 1273.08 One-Way Roads. Per input from Reclamation, some 16 ft wide one-way circulation roads are not paved, and gravel is the preferred surface material, see plans. 16' WIDE OFF ROAD SHARED ACCESS DRIVE is defined as a 16 ft wide corridor, consisting of 12 ft wide pavement with 2 ft wide gravel shoulders. From matching requirements of SRA 1273.08 One-Way Roads, and also: exceeds 10 ft width requirement of SRA 1273.10 Driveways. Per input from Reclamation, some 16 ft wide off-road shared access drives are not paved, and gravel is the preferred surface material, see plans. 15' WIDE SERVICE ROAD is defined as a 15 ft wide corridor, consisting of 12 ft wide pavement with 1.5 ft wide gravel shoulders. From ACOEEDM, paragraphs 2-4 b. (3) the standard is 10 ft wide, and 2-4 d. (4) (b) the standard is 1.5 ft wide. SRA 1273 does not address 'service drives', but has standards for 'one-way roads' (12 ft wide not including shoulders) and 'driveways' (10 ft wide or 14 ft unobstructed). The 15 ft width is a conservative compromise of the above standards and could possibly change to 10 ft wide pavement with 1.5 ft wide shoulders. Per input from Reclamation, 15 ft wide service roads are not paved, and gravel is the preferred surface material, see plans. 12-FT WIDE MAINTENANCE ACCESS ROAD is defined as a 12 ft wide corridor, consisting of 10 ft wide gravel with 1 ft wide gravel shoulders, and is typically placed on non-publicly access drives to, from, and around the perimeter of the infrastructure ponds, and is on the access ways to spray fields and other infrastructure facilities. This width is also used where the existing access width no longer has access to the public and may serve a similar function as previously, or where an increased width would substantially increase earthwork costs and aesthetic impacts. This road definition is per input from Reclamation. THREE-POINT TURNAROUND is defined as a 16 ft or 24 ft wide corridor, consisting of 12 ft and 20 ft wide pavement respectively, with 2 ft. wide gravel shoulders. From SRA 2014 1273.05. Roadway Turnarounds, and CA Dept. of Forestry & Fire Protection-CalFire, Fire Safe Standards-Turnouts and Turnarounds pg. VI-11. This type of turnaround is only placed at dead ends off which buildings are accessed. An SRA Roadway Turnaround is not placed at the ends of parking lots, although a regular vehicle turnaround is typically provided. The SRA required 'T' shape is modified to a 'Y' shape to make it easier to navigate, and to offer a more aesthetic or 'natural' look, thereby 'fitting' better into adjacent topography. 'Y' shape turnaround areas are not used where RVs or vehicles with trailers are expected to travel. Per input from

Facility/Service	Description
	Reclamation, some three-point turnarounds are not paved, and gravel is the preferred surface material, see plans. CUL-DE-SAC TURNAROUND The minimum radius of cul-de-sac turnarounds is 42 ft per input from Reclamation. The 42 ft dimension is interpreted as an outside radial dimension, and a 2 ft wide outside shoulder is included as part of the 42 ft, as illustrated on page 7 of 22 in SRA Recommended Change to SRA Fire Safe Regulations California Code of Regulations title 14, 1270 Fire Safe Regulations sketch dated 2/6/13, and from page 2 of SRA Fire Safe Regulations, 2014 1273.05 Roadway Turnarounds: "The minimum turning radius for a turnaround shall be 40 ft from the centerline of the road..." From ACoEEDM: there is no mention of cul-de-sac turnarounds. From RRFDG: there is no mention of cul-de-sac turnarounds. Per input from Reclamation, some cul-de-sac turnarounds are not paved, and gravel is the preferred surface material, see plans. Access Drive Profiles are as follows: CHDM, Chapter 80 – Application of Design Standards has Topic Number 82.1, paragraph (8), titled: Transportation Facilities Under the Jurisdiction of Others. The paragraph states: "Generally, if the local road or street is a Federal-aid route it should be designed to conform to AASHTO standards." Therefore, the road profiles are designed using AASHTO standards as a primary reference. Crest Vertical Curve criteria: For sight stopping distance purposes, at 15 mph design speed, use 76.7 lf as a minimum length per AASHTO. The drawings use 80 lf min. in areas where a 15 mph speed is expected. Reduced crest vertical curve distances are used in areas where the 15 mph speed limit is not expected, like top of boat ramps, site entrance areas and intersections. Valley Vertical Curve criteria: For 15 mph design speed, use 45 lf min. for length of curve per AASHTO. The drawings use 50 ft min. in areas where a 15 mph speed is expected. Reduced valley vertical curve distances are used in areas where the 15 mph speed limit is not expected, like site entrance areas and intersections. There are no net changes in grade anywhere of 9% or more without a vertical curve. Maximum slope or grades of all publicly accessed drives and roads will not exceed the existing gradient that is at the same location, or 13.5%. Slope or grades of publicly accessed boat ramps will conform to LDCHSCBLF recommendations. Minimum stopping sight distance for 15 mph roads is 100 ft in accordance with CHDM, Table 201.1. An increase of 20% of the distance should be applied where sustained downgrades are steeper than 3%. Public access drives and roads steeper than 10% will be paved, their shoulders can be gravel.

Notes:

ACoEEDM – Army Corps of Engineers Engineering and Design Manual (Dec 1982)
LDCHSCBLF - Layout, Design and Construction Handbook for Small Craft Boat Launching Facilities
LDGMBF – Layout and Design Guidelines for Marina Berthing Facilities (July 2005)
NCZCO – Napa County Zoning Code of Ordinances
RRFDG – Reclamation Recreation Facility Design Guidelines (April 2013)
SRAFSR – SRA Fire Safe Regulations (updated 2012)