

Creek	Location Notes	FIS Station (ft)	Bkf Ch or Bridge/Culvert Opening Width (ft)	Bridge/Culvert Opening Height (ft)	Flood Flow Conveyance Notes
SA CK	C/L PVT DRIVE BDGE	43,840	28.5	7.7	Pvt driveway bdge crossing; 28.5 ft-wide by 7.7 ft-high clear-span pvt driveway bridge with grouted rock apron and mid-bank vert conc ret wall abutments; does not appear a flood constriction
SA CK	C/L CANYON RD BDGE	41,000	28.0	10.0	Canyon Rd bdge culvert; 28 ft-wide by 10 ft-wide reinforced conc rectangular culvert with conc bottom and existing denil-type fish ladder; barrier to fish migration; does not appear to be a flood constriction
SA CK	C/L MEADOW WAY BDGE	38,830	31.0	18+	Meadow Way bdge crossing; 31 ft-wide by 18+ ft-high timber pier supported timber bridge deck; Does not appear to be a fish passage barrier or a flood constriction
SA CK	C/L BOLINAS-FFX RD BDGE	35,600	18.0	13.0	Bolinas-Fairfax Rd bdge crossing; 18 ft-wide by 13 ft-high reinforced conc rect culvert with conc bottom (at grade); Effective ht of opening is approx 10-11 ft due to hanging sewer pipe
SA CK	C/L CREEK RD BDGE	34,600	50-55	nd	Creek Rd bdge crossing; 67 ft-wide (effective width approx. 50-55 ft accounting for approx. 30-35 deg skew) pier supported conc bdge deck; appears neither a fish passage barrier nor a flood constriction
SA CK	C/L PASTORI AVE BDGE	31,740	28.0	10.0	Pastori Ave bdge crossing; Approx. 28 ft-wide 10 ft-high reinforced concrete rectangular culvert with conc bottom and existing denil type fish ladder; Existing fish passage barrier; Does not appear to be a flood constriction
SA CK	MINIMUM LOCAL BKF WIDTH	42,685	22.5		Minimum
SA CK	MINIMUM LOCAL BKF WIDTH	42,408	21.0		Minimum in narrow ch section caused by approx. 8-10 horiz ft encroachment by LB RR bank
SA CK	MINIMUM LOCAL BKF WIDTH	40,182	17.8		Minimum
SA CK	MINIMUM LOCAL BKF WIDTH	39,327	15.0		Minimum
SA CK	MINIMUM LOCAL BKF WIDTH	38,546	15.5		Minimum in narrow ch section caused by approx. 8-10 horiz ft encroachment by RB vert timber ret wall
SA CK	MINIMUM LOCAL BKF WIDTH	37,593	20.5		Minimum bkf width at d/s end of approx. 6 ft-high LB floodplain unit
SA CK	MINIMUM LOCAL BKF WIDTH	37,562	19.6		Bkf width at crest of relict concrete dam
SA CK	MINIMUM LOCAL BKF WIDTH	35,401	22.0		Reach average
SA CK	MINIMUM LOCAL BKF WIDTH	35,075	16.0		Narrow ch section caused by RB vert conc ret wall and d/s BR OC
SA CK	MINIMUM LOCAL BKF WIDTH	33,213	20.0		Minimum

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FFX CK	INLET CMP AT SCHOOL	9,130	8.0	8.0	White Hill School pvt rd xing culvert; 8 ft-diam RCP culvert; May be a flood constriction; Dec-31-05 HWMs in vicinity not adequate to determine backwater effect
FFX CK	C/L PVT FOOTBRIDGE	8,102	nd	nd	Private footbridge not a flood constriction
FFX CK	INLET CMP AT SFD BLVD	8,000	8.0	8.0	Sir Francis Drake Blvd culvert; 8 ft-diam CMP; existing polymer-coated CMP in d/s 23 ft-long section; culvert capacity less than Dec 31, 2005 flood; Dec 31, 2005 flood overtopped channel u/s from culvert HWM approx 1.5 ft depth on chain-link fence along sidewalk above headwall; Recommend removal and replacement with 12-16 ft-wide, 10-ft high open bottom arch culvert on reinforced concrete strip footings;
FFX CK	C/L PVT FOOTBRIDGE	7,491	19.0	10.5	Apt complex pedestrian footbridge; minor infill at abutments; does not appear to be a flood constriction
FFX CK	BOX CULVERT AT PVT DRV	6,358	7.0	5.0	Pvt driveway crossing; 5' high by 7' wide rectangular concrete box culvert; undersized culvert opening appears to produce flooding onto LB apt complex property and RB Olema Rd; Recommend removal and replacement with larger culvert or restored natural channel if room allows and a clear-span bridge deck crossing; Project design by Questa, Inc. underway
FFX CK	C/L ARCH CULVERT AT MARIN RD	4,081	26.0	8.0	Marin Rd Bridge culvert; 26 ft-wide 8 ft-high elliptical arch culvert on concrete strip footings with natural bottom; LB gr bar up to WSE + 1 ft; approx. 6-8 ft-wide ineffective flow area at LB edge of culvert at inlet; approx. 3 ft-wide ineffective flow area at LB edge at outlet; existing alder 10 ft d/s from outlet does not appear to constrain flow conveyance capacity of culvert; high water marks not adequate to determine if culvert caused overbank flow during the December 31, 2005 flood
FFX CK	C/L BOX CULVERT AT OLEMA RD	3,340	13.7	9.7	Olema Road Bridge culvert; 13.7 ft-wide by 9.7 ft-high concrete rectangular box culvert approx. at grade; 10 in-diam cast iron sewer pipe reduces effective ht of opening to approx. WSE + 8 ft near d/s end of culvert; RB weeping willow d/s from outlet recommended for removal due to evidence of debris blockage; Modifying or replacing u/s wingwalls may reduce culvert entrance losses; Analysis required to identify and prioritize flood management objectives and design solutions
FFX CK	C/L PVT DRV BDGE	3,271	19.0	11.0	Private driveway bridge; 19 ft-wide, 11 ft-high area between piers effective; bank areas ineffective; does not appear to be a constriction
FFX CK	C/L PVT FOOTBRIDGE	3,240	nd	nd	Private pedestrian footbridge; does not appear to be a flood constriction

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FFX CK	C/L BOX CULVERT AT SCENIC RD	2,570	14.0	11.0	Scenic Road Bridge culvert; 14 ft-wide by 11 ft-high concrete box culvert; left 3 ft ineffective; top 3 ft partially ineffective; u/s RB wingwall only 20 degrees from face; Lombardy Poplars at LB TOB block entrance to culvert and should be removed either alone or as part of bank regrading project to decrease culvert entrance losses; d/s RB and LB wingwalls either failing or poorly designed; Recommend replacing both with new vertical wingwalls angled tan <sup>1</sup> (3) from face
FFX CK	C/L PVT DRV BDGE	2,335	17.0	8.5	Private driveway clear-span bridge deck crossing; Spans between vert conc ret walls at both banks with natural bottom; 17 ft-wide by 8.5 ft-high; Bridge deck appears to somewhat reduce flood conveyance capacity of the vert conc ret wall confined reach u/s but does not appear to be a severe flood constriction; no high water mark evidence near site to determine effect of bridge deck on flood WSE profile during Dec 31, 2005 flood
FFX CK	C/L CULVERT AT AZALEA RD	2,200	15.2	8.5	Azalea Road Bridge culvert; 15.2 ft-wide by 8.5 ft-high natural bottom rect conc culvert; 2.5 ft-wide section at edge of RB wall appears ineffective; 40 degree bend at entrance to culvert; To maximize flood flow conveyance capacity of the existing culvert, reduce entrance losses and ineffective width within the culvert by laying back RB over 120 ft-long reach upstream from the inlet and replace with vert conc ret wall with wing wall section aligned to form 3:1 width transition to culvert inlet as may be constrained to match existing at TOB Arroyo Avenue roadbed; More detailed hydraulic analysis is required to determine if these actions would be sufficient to achieve tbd flood management objective for the crossing; Complete culvert removal and replacement may be required to provide sufficient flood flow conveyance through crossing

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FFX CK	C/L CULVERT AT SPRUCE ST	1,786	17.6	10.3	Spruce St Bridge culvert; 17.6 ft-wide by 10.3 ft-high natural bottom rectangular concrete box culvert; 3.5 ft-wide ineffective along LB edge of culvert caused by culvert's 40 degree turn to left and trees situated within flow path immediately upstream from inlet; BR outcrop in bed of channel along LB and in toe of LB bar within inlet the through length of culvert; To maximize flood flow conveyance of the existing Spruce St culvert, recommend remove u/s-most of two u/s alder trees to reduce entrance losses; d/s exit conditions do not appear limiting, although RB d/s from culvert outlet is slightly within flow path; Bank stabilization projects are recommended at both LB and RB downstream from culvert which should be designed to lay back not encroach into the channel to maximize flow conveyance through culvert
FFX CK	C/L CULVERT AT MERWIN AVE	1,560	18.0	6.5	Merwin Ave Bridge culvert; 18 ft-wide by 6.5 ft-high natural bottom rectangular concrete box culvert; extremely high entrance and exit losses caused by sinuous ch planform u/s and d/s; Recommend removal and replacement of structure with new planform and replacement and/or modification of existing bank stabilization structures to provide for minimum 18-ft-width throughout reach-scale site; Replacement has ramifications for sites u/s to Spruce St; Recommend all LB and RB sites between Town of Fairfax Peri Park and Spruce St be combined into one comprehensive reach-scale channel and riparian canopy enhancement and flood management improvement project
FFX CK	INLET BOLINAS-FFX RD CULVERT	500	10.0	6.0	Bolinas-Fairfax Rd culvert; rectangular concrete box culvert; inlet dimensions assumed same as outlet dimensions (10 ft-wide by 6 ft-high); Culvert is severe flood constriction; Recommend removal of culvert and replacement with larger culvert, natural channel restoration, or hybrid natural channel restoration and vertical sheetpile walls; Existing culvert is overlain by public and private housing, utilities, and infrastructure; Removal and replacement is an expensive complicated project; Apparently no feasibility study has been completed to date
FFX CK	MINIMUM LOCAL BKF WIDTH	7,248	9.0	na	Minimum in narrow reach; banks appear constructed of fill
FFX CK	MINIMUM LOCAL BKF WIDTH	4,458	9.0	na	Minimum in reach narrowed by LB vert conc ret wall encroachment
FFX CK	MINIMUM LOCAL BKF WIDTH	3,800	10.0	na	Minimum, upper bank failing in narrow section

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FFX CK	MINIMUM LOCAL BKF WIDTH	2,150	11.5	na	Multiple mature trees at toe of RB vert conc ret wall appear to reduce flow conveyance depending on reach hydraulic regime; Channel width is 16 ft, effective width is 11.5 ft
FFX CK	MINIMUM LOCAL BKF WIDTH	1,520	12.8	na	Minimum, gabion wall encroaches into channel at section